

Riley-Purgatory-Bluff Creek Watershed District

Board of Managers Regular Meeting

Wednesday, April 3, 2019

7:00pm Board Meeting

DISTRICT OFFICE

18681 Lake Drive East

Chanhassen

Agenda

1. **Call to Order** **Action**
2. **Approve Agenda** **Action**
3. **Public Hearing : Hyland Lake Alum Project**
4. **Public Hearing : Chanhassen Cost-share Vacuum Truck**
5. **Public Hearing : Duck Lake Partnership Project**
6. **Public Hearing : Purchase Properties for Wetland Restoration at Pioneer Trail**
7. **Adopt resolution 2019-009 adopting policy on application of chloride-management plan requirements to residential subdivisions** **Action**
8. **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.

9. **Reading and approval of minutes** **Action**
 - a. Board of Manager Meeting, March 1, 2019
10. **Citizen Advisory Committee** **Action**
 - a. *Report*
 - b. *Motion*

11. Consent Agenda

(The consent agenda is considered as one item of business. It consists of routine administrative items or items not requiring discussion. Any manager may remove an item from the consent agenda for action.)

- a. Accept March Staff Report
- b. Accept March Engineer's Report (with attached Inspection Report)
- c. Authorize Administrator to sign off on quote from Freshwater Scientific Services for vegetation surveys.
- d. Approve 2018 Annual Report
- e. Approve permit #2018-074 for the construction of a ground storage reservoir by the City of Eden Prairie with staff recommendations.
- f. Approve permit #2019-003 for the Stable Path single-family residential development in Minnetonka with engineer recommendations.
- g. Approve permit #2019-007 for the Beverly Hills single-family residential development in Eden Prairie with engineer recommendations.
- h. Approve permit #2019-008 for the construction of a pavilion at Staring Lake in Eden Prairie with engineer recommendations.

12. Action Items

Action

- a. Accept February Treasurer's Report
- b. Approve Paying of the Bills
- c. Consider approval of variance requests associated with permit application 2019-004 Duck Lake Road.
- d. Consider approval of permit application 2019-004 for the reconstruction of Duck Lake Road in Eden Prairie with staff recommendations.
- e. Approval of the following organizational changes:
 - i. Approve job description changes for Community Outreach Coordinator to Communication and Project Manager and commensurate compensation adjustment
 - ii. Approve job description change for Office and Outreach Assistant to Education and Outreach Coordinator
 - iii. Approve job description change for Permit and Project Manager to Watershed Planning Manager
- f. Adopt resolution 2019-010 to support application to host a member of Minnesota Green Corps, a program of the Minnesota Pollution Control Agency for the 2019-2020 program year
- g. Adopt resolution 2019-011 ordering Hyland Lake alum treatment project
- h. Adopt resolution 2019-012 approving Chanhassen Cost-share grant for purchase of regenerative air vacuum sweeper truck.
- i. Adopt resolution 2019-013 ordering the Duck Lake Partnership project
- j. Adopt resolution 2019-014 ordering the wetland restoration and flood mitigation project at 101 and the acquisition of 730 and 750 Pioneer Trail.

13. Discussion Items

Information

- a. Lennar Development Galpin Blvd Update
- b. Upcoming April Board Meeting:
 - i. Board/Staff Retreat Governance
 - ii. Eden Prairie/Board Workshop March 19, 2019, 5:00pm
- c. Update on St. Hubert's Opportunity Project
- d. Update on internal efforts to improve regulatory program efficiency

14. Upcoming Events

Information

- First Friday Hike with the Watershed, April 5th, 12:00-1:00pm, Purgatory Creek Recreation Area, Eden Prairie
- Meet and Greet, April 10, 2019, 4:00pm-6:30pm, 18681 Lake Drive East, Chanhassen
- Smart Salting for Parking Lots and Sidewalks Course, April 11th, 9am-2pm, 18681 Lake Drive East, Chanhassen
- Governance Workshop, April 23rd, 1pm-4:30pm, U of M Landscape Arboretum
- Regulatory Listening Session, April 24th, 11am-1pm, 18681 Lake Drive East, Chanhassen
- Regular Board Meeting, May 1, 2019, 7:00pm, 18681 Lake Drive East, Chanhassen

Last updated: March 14, 2019

APPLICATION EVALUATION WORKSHEET

Reviewer instructions

Please be specific when commenting. Include application sections/quotations where possible. Project must score at least a 5 to be eligible for funding. Projects that score a zero for questions 4 or 5 may be recommended for funding on condition that additional information or modification be provided.

Section 1: Applicant information

Name **City of Chanhassen** Address **7700 Market BLVD** Applicant type **Local Government**
 Project type **Pollution reduct.** Project cost **\$237,990.00** Amount requested **\$30,000.00**

Section 2: Eligibility pre-screening

If yes, forward to grant review committee. If no, stop reviewing. Return to applicant with request for information.

1. Does the project take place within the watershed district?..... **Y** / N
2. Did CCSWCD technician conduct a site vist?..... Y / N **NA**
3. Are the following application pieces included? (check all present) **Y** / N
 - Grant application form
 - Project designs (including map and plant list if applicable)
 - Project cost estimate (with contractor bids as appropriate)

Section 3: Project design

If yes, score a 1. If no, score a 0.

4. Are the designs thorough and provide adequate detail? 1
Explain:
5. Are the cost estimate and bids reasonable?..... 1
Explain:

Section 4: Program outcomes

Goals are listed on page two. Score a point for each plan goal the project addresses up to a maximum of 5 points. If none, application does not qualify for funding.

6. Does the project support any of the 10-Year Plan goals? 2
Score a 1 for each item the project addresses. Score a 2 if the project excels at addressing it.
 7. Does the project have quantifiable benefits to water quality, habitat, flooding?..... 2
Explain:
 8. Will the project increase awareness of water resource issues? 1
Explain:
 9. Will the project increase visibility and general knowledge of clean water projects? 1
Explain:
 10. Is the applicant willing to have the project shared (on website, social media, tours etc)? _____
- Total: 8

Funding recommendation:

Fund fully Do not fund Fund partially Request modification/clarification

Review notes: Reviewed March 18, 2019 by M. Jordan (staff), T. Jeffery (staff), M. Torkelson (CAC), D. Kopfmann (CAC), with notes submitted prior by S. Ristow (CCSWCD).

The review committee recommends the project be funded at the amount requested. See attached table for a summary of pollution reduction benefits from a study conducted by John Gulliver at the St. Anthony Falls Laboratory and the City of Prior Lake

Reviewer guide

Points possible: 15
 1-4 = do not fund
 5-8 = fund/request modification if needed
 9-15 = fund

Last updated: March 14, 2019

10 YEAR PLAN GOALS

Use these goals in evaluating question #6

Goal	Strategy
WQual1, WQual2, & WQual3 (Water Quality)	WQual S1. The District seeks to minimize the negative impacts of erosion and sedimentation through the District's regulatory, education and outreach, and incentive programs. WQual S3. The District encourages cities and developers to seek opportunities to incorporate habitat protection or enhancement into development and redevelopment projects. WQual S6. The District will seek opportunities to establish and preserve natural corridors for wildlife habitat and migration. WQual S7. The District will promote the use of natural materials and bioengineering for the maintenance and restoration of shorelines and streambanks where appropriate. WQual S11. The District recognizes the multiple benefits of vegetated buffers and promotes the use of vegetated buffers around all waterbodies. WQual S12. The District will assist and cooperate with cities, MPCA, MDNR, MnDOT, other watershed and other stakeholders in implementing projects or other management actions based on the Minnesota Pollution Control Agency's Twin Cities Metro Chloride TMDL. WQual S13. The District will continue to minimize pollutant loading to water resources through implementation of the District's capital improvement, regulatory, education and outreach, and incentive programs. WQual S15. The District will cooperate with other entities to investigate treatment effectiveness of emerging practices.
WQuan2 (Water Quantity)	WQuan S1. The District will preserve and enhance the natural function of the floodplain and maintain floodplain storage volume. WQuan S2. The District will promote strategies that minimize baseflow impacts. WQuan S3. The District will continue to promote infiltration, where feasible, as a best management practice to reduce runoff volume, improve water quality, and promote aquifer recharge. WQuan S7. The District promotes/encourages cities and developers to implement Low Impact Development (LID) practices and will work with cities to reduce regulatory barriers to LID practices. WQuan S9. The District will work with cities and other stakeholders to encourage conservation practices (e.g. water reuse) to protect creeks, lakes and wetlands.

QUATIFICATION OF BENNEFITS

Use for evaluating question #7. Check and fill in all those that apply.

- | | |
|---|---|
| <input type="checkbox"/> Habitat restoration: _____ ft ² | <input type="checkbox"/> Flood reduction _____ gal water captured/year |
| <input checked="" type="checkbox"/> Pollution reduction: TBD* lb phosphorus/year | <input type="checkbox"/> Flood reduction _____ gal water infiltrated/year |
| <input checked="" type="checkbox"/> Pollution reduction: TBD* lb sediment/year | <input type="checkbox"/> Flood reduction _____ gal water abstracted/year |
| <input type="checkbox"/> Pollution reduction: _____ lb salt/year | <input type="checkbox"/> Other _____ |

*See attached table for removal estimates from a study by John Gulliver at the Saint Anthony Falls Laboratory and the City of Prior Lake

	Total	Sweep	Material	Total	Distance	Time	Production	Efficiency	Production	Efficiency	Total P	Cost E	Water by	Litter by	Soil by	Rock or	
	Time (day)	Time (day)	(lbs)	Distance	Swept (mi)	Since	(lbs/hr)	(lbs/mi)	(lb P/hr)	(lb P/mi)	(lb P)	\$/lb P	%	%	%	Trash by	
				(mi)		Last										weight	
						(day)										weight	
FREQUENCY																	
AVG	Zone 1	0.085	0.076	2275	9.0	7.9	17.8	1438	308	0.70	0.14	1.04	\$224	27.1%	12.6%	55.2%	4.9%
AVG	Zone 2	0.100	0.081	2327	12.1	9.3	17.7	1287	287	0.71	0.16	1.23	\$268	31.4%	18.1%	46.2%	4.3%
AVG	Zone 4	0.105	0.092	2477	12.8	9.3	7.9	1182	292	0.51	0.14	1.13	\$288	36.6%	17.5%	41.0%	4.7%
TREE COVER																	
AVG	Zone LOW	0.095	0.088	1490	10.6	10.5	10.2	722	144	0.28	0.06	0.57	\$467	30.1%	12.4%	52.3%	5.0%
AVG	Zone MED	0.100	0.089	2419	13.1	9.7	9.3	1135	253	0.49	0.11	1.03	\$261	35.6%	16.6%	43.6%	4.2%
AVG	Zone HIGH	0.106	0.087	3051	13.0	8.2	7.9	1894	488	1.01	0.29	1.85	\$183	36.0%	22.0%	37.1%	4.8%
TIME SINCE LAST																	
AVG	6-8	0.099	0.087	2540	12.3	9.0	7.0	1284	311	0.53	0.13	1.02	\$308	37.5%	16.1%	41.4%	4.9%
AVG	13-15	0.103	0.094	2060	12.2	9.2	13.8	972	263	0.60	0.21	1.47	\$294	29.2%	25.0%	41.4%	4.3%
AVG	18-28	0.115	0.063	4913	17.0	8.0	21.0	3501	632	2.29	0.41	3.22	\$82	42.3%	21.1%	32.2%	4.3%
AVG	28+	0.127	0.087	2140	11.0	10.3	35.0	1011	206	0.51	0.10	1.06	\$232	41.6%	16.9%	36.3%	5.3%

Cost share grant application 2018



Do not fill in gray boxes.
District use only.

Applicant type (check one) Homeowner Non-profit - 501(c)(3)
 Business or corporation Public agency or local government unit School

Project type (check all that apply) Raingarden Vegetated swale Lake/creek/wetland buffer
 Shoreline/bank stabilization Wetland restoration Pervious hard surface Infiltration basin
 Conservation practice Other Purchase of Vacuum Sweeper to reduce fine particulate

Applicant information

Works or resides in district?

Name City of Chanhassen Address 7700 Market Boulevard
City/State/Zip Chanhassen, MN 55317
Phone 952-227-1160 Alt phone 952-227-1162 Email engdept@ci.chanhassen.mn.us

Primary contact Same as applicant (leave blank)

Name _____ Address _____
City/State/Zip _____
Phone _____ Alt phone _____ Email _____

Project location

Address City wide City/State/Zip City of Chanhassen

Property Identification Number (PID) n/a

Property owner(s) n/a Project located in district?

Project summary

Tributary to a waterbody?
 No Yes, indirectly Yes, adjacent

Title City of Chanhassen Vacuum Sweeper Truck Purchase

Total project cost \$237,990.00 Grant amount requested \$30,000.00

Estimated start date 2019 Estimated completion date Life of vehicle: 15 years

Sub-watershed _____ Project located in priority drainage area?

Is project tributary to a water body? No, water remains on site Yes, indirectly Yes, directly adjacent

2-3 sentence project description

The City of Chanhassen plans to purchase a vacuum sweeper truck to be used on a year-round basis. The vacuum sweeper will collect fine particulates before they enter water bodies and the sewer system. The vehicle will be used city wide near lakes, streams and other water bodies.

Is this work required as a part of a permit? No Yes

(If yes: describe how the project provides water quality treatment beyond permit requirements on the next page.)

Site visit One of the requirements for a complete application is a site visit from district staff.

Have you had a site visit? No Yes

(If you answered no, please contact staff to schedule one: 952-607-6512)

Project details

Do not fill in gray boxes.
District use only.

Checklist To be considered complete the following must be included with the application.

- | | |
|---|---|
| <input type="checkbox"/> location map | <input checked="" type="checkbox"/> project time-line |
| <input type="checkbox"/> site plan & design schematics | <input type="checkbox"/> proof of property ownership |
| <input checked="" type="checkbox"/> itemized budget or contractor bid | <input type="checkbox"/> plant list & planting plan
(if project includes plants) |

Is time-line reasonable?	<input type="checkbox"/>
Is budget reasonable?	<input type="checkbox"/>
Is plan comprehensive?	<input type="checkbox"/>
Does plant list conform to district's approved plant list?	<input type="checkbox"/>

Description

Describe the current site conditions, as well as site history, and past management.

The City of Chanhasen currently does not have a vacuum sweeper truck. Currently, only sweepers are used. The Vector Street Sweeper is included in the City's 2019 CIP.

What are the project objectives and expected outcomes? Give any additional project details.

The street department sweeps all the streets at least once each year, starting as soon as weather permits in the spring. The vector sweeper is necessary to pick up debris and fine particulates that street sweepers cannot pick up. This sweeper will be used more frequently in the downtown area, and near impaired water bodies to help keep street debris from entering these features. In addition, the vector sweeper would help meet the City's stormwater MS4 permit requirement. The ultimate goal of the project is to reduce the fine particulates and phosphorous entering the City's waterways.

Are there multiple objectives?	<input type="checkbox"/>
Does the project have well-defined, measurable results?	<input type="checkbox"/>

List other key participants and their roles

The vehicle will be owned, operated, and maintained by City of Chanhasen staff. The Public Works Directors or his/her designee will be responsible for the ongoing reporting requirements

Does the project demonstrate strong partnerships & support?	<input type="checkbox"/>
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Which cost share goals does the project support? (check all that apply)

- Improve watershed resources Increase awareness of the vulnerability of watershed resources
- Increase familiarity with and acceptance of solutions to improve waters
- Foster water resource stewardship

How does the project support the goals you checked?

The volume of particulates collected will be a direct reduction in the amount of sediment entering water bodies.

Project details (continued)

Do not fill in gray boxes.
District use only.

Benefits Estimate the project benefits in terms of restoration and/or **annual** pollution reduction. If you are working with a designer or contractor, they can provide these numbers. If you need help, contact the district cost share program coordinator.

The model of the vactor sweeper truck that the City anticipates purchasing is the Tymco 500X, which is a regenerative air sweeper. This is the only street sweeper on the market with a high efficiency dust separator, which maximizes fine dust particulate separation. In addition, it has a gutter broom which has a tilt adjuster that will allow the sweeper to remove debris from curbs, gutters, and other obstacles that a conventional sweeper could not. Fine dust particulates can contain multiple contaminants which will be picked up by stormwater runoff. This sweeper will be used in tandem with a conventional sweeper, and will result in a direct reduction of the fine particulate entering the water bodies in Chanhassen.

Does the project provide water quality treatment?

Does the project provide restoration?

How will you share the project results with your community?

The Engineering Department prepares an annual report which is brought to City Council each year. The sediment reduction by the Vactor Sweeper Truck will be a metric that is tracked and reported as a component of the annual report

Is there educational value to the project?

Will the project be visible to the public?

Are there other projects that could be initiated as a result of this one?

The vehicle is part of a larger effort by the City to improve water quality and reduce the amount of fine particulate and phosphorous entering the waterways.

Evaluation

How will the project be monitored and evaluated?

The vehicle will be equipped with GPS which will track miles, location, hours of use, and volume collected. This will be reported on an annual basis. The volume of particulates collected will be a direct reduction in the amount of sediment entering waterways.

Maintenance agreement

I acknowledge that receipt of a grant is contingent upon agreeing to maintain the project for the number of years outlined in the cost share guidelines document Yes

Authorization

Name of landowner or responsible party Todd Gerhardt
Signature [Signature] Date 2-28-19



27365 Zachary Avenue • Elko, MN 55020

Toll Free 1-877-461-3650 • Office 952-461-3650 • Fax 952-461-3689

November 12, 2018

Charlie Burke
Street Superintendent
City of Chanhassen
7700 Market Blvd. PO Box 147
Chanhassen, Minnesota 55317

Dear Charlie,

Thank you for the opportunity to quote a new Tymco 500X mounted on an International chassis.
The Minnesota State contract number is S-843(5), #103152.

Base Price	\$252,500.00
Air Horn	\$250.00
Electric, Heated West Coast Mirrors	Standard
12" Parabolic Mirrors	Standard
2 Cameras, Color Monitor	\$2,450.00
Cloth High Back Air Ride Seats	Standard
AM/FM/CD Player	Standard
Abrasion Protection Package	Standard
Air Purge	\$225.00
Auto Sweep Interrupt (ASI)	\$1,850.00
Auxiliary Hydraulic System	\$1,400.00
Gutter Broom Tilt Adjuster (Left & Right)	\$2,800.00
Reverse Pick-Up Head System	\$650.00
Gutter Broom Override (Left & Right)	\$2,800.00
Hydraulic Curtain Lifter System	\$1,400.00
Hopper Vibrator (Electric)	Standard
LED Light Bar	\$1,350.00
Hopper Deluge System	\$1,450.00
High Output Water System	\$865.00
Broom Assist Head (BAH)	\$4,500.00
Base Price Includes Factory Training for 4 People in Waco, TX	Standard

\$274,490.00

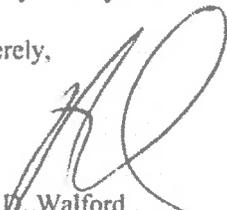
Less trade-in Cat Loader with Plow, Wing, Bucket, Grapple Bucket, Spare Tire, & Rim :- \$ 36,500.00

Price: \$237,990.00

The City of Chanhassen is responsible for 6.5% MN motor vehicle sales tax, titling, & registration fees.

Thank you for your interest.

Sincerely,


Alan D. Walford
Vice President

Capital Improvement Program
City of Chanhassen, MN

2019 thru 2023

Department Major Equipment
Contact Paul Oehme
Type Equipment
Useful Life
Category Street Equipment
Priority n/a

Project # EQ-118
Project Name Vactor Street Sweeper

Account #1 720-7025-4705

Account #3

Account #2

Account #4

Total Project Cost: \$291,000

Description

This purchase is for a vacuum street sweeper. A loader would be sold in conjunction with this purchase (#140 - 1987 caterpillar 936 with 8,400 hours). The estimated value of the loader is \$30,000. The trade in value of the loader will be used to offset the purchase of the sweeper.

Justification

The street department sweeps all the streets at least once a year starting as soon as weather permits in the spring. The vactor sweeper is necessary to pick up debris and fine particulates that street sweepers cannot pick up. The vactor street sweeper would help meet the City's storm water MS4 permit requirement. This vactor sweeper will be used more often in the downtown and around impaired water bodies to help keep street debris from entering these features. It is one of the most cost effective best management practices available to municipalities.

Expenditures	2019	2020	2021	2022	2023	Total
Equipment	291,000					291,000
Total	291,000					291,000

Funding Sources	2019	2020	2021	2022	2023	Total
Other Agency Contribution	30,000					30,000
Surface Water Utility Fund	261,000					261,000
Total	291,000					291,000

Budget Impact/Other

Memorandum

To: Administrator Bleser and Project Manager Jordan
From: Greg Fransen, Matt Kumka, and Scott Sobiech
Subject: Opinion of Probable Construction Cost for Duck Lake Subwatershed Improvements
Date: 3/14/19
Project: 23270053.14 025

Engineer's opinions of probable costs for design, permitting, and construction were developed for each conceptual design. These opinions of costs, project reserves, contingency, documentation and discussion are intended to provide background information for feasibility alternatives assessment, analysis purposes and budget authorization by the RPBCWD. The cost of time escalation is not included in the opinions of probable cost. All costs are presented in 2019 US dollars.

Quantities were estimated with calculations based on available information. Because of the limited level of design at this phase of the project the rainwater garden dimensions, areas, and volumes for construction were assumed based on general site information and a typical sizing. Actual siting and sizing remain to be completed after site surveys are conducted.

Unit costs are based on recent bid prices, published construction cost index resources, and similar stormwater BMP projects. Unit process were developed and compared to similar project prices. Costs associated with Planning Engineering and Design (PED) are based on percentages of estimated construction cost and are within a range similar to those used in past projects designed by Barr. Costs associated with Construction Management (CM) are based on estimated costs to manage the construction process, based on Barr's experience with similar projects, but may change depending on the services that are provided during construction. The estimates also include Permitting and Regulatory Approvals, which is intended to account for additional planning and coordination costs that are likely to be incurred as the project is permitted with the city. It is assumed that RPBCWD permits will not be needed for this project and that an official bidding process will not be needed.

The opinions of cost include tasks and items related to engineering and design, permitting, and constructing each conceptual design. The opinions of cost do not include other tasks following construction of each alternative presented such as operations and maintenance, or monitoring.

Contingency used in these opinions of probable cost are intended to help identify an estimated construction cost amount for the minor items likely to be included in the current Project scope, but which have not yet been quantified or estimated directly during the feasibility evaluation. Stated another way, contingency is the resultant of the pluses and minuses that cannot be estimated at the level of project

definition that exists. The contingency includes the cost of ancillary items not currently itemized in the quantity summaries but commonly identified in more detailed design and required for completeness of the work. A 10% contingency is applied to the estimated construction cost to account for the costs of these items.

Industry resources for cost estimating (*AACE International Recommended Practice No. 18R-97, and ASTM E2516-06 Standard Classification for Cost Estimate Classification System*) provide guidance on cost uncertainty, depending on the level of project design developed. The opinion of probable cost for the alternatives evaluated generally corresponds to a Class 4/5 estimate characterized by completion of limited engineering and use of deterministic estimating methods. As the level of design detail increases, the level of uncertainty is reduced. Figure A-1 provides a graphic representation of how uncertainty (or accuracy) of cost estimates can be expected to improve as more detailed design is developed.

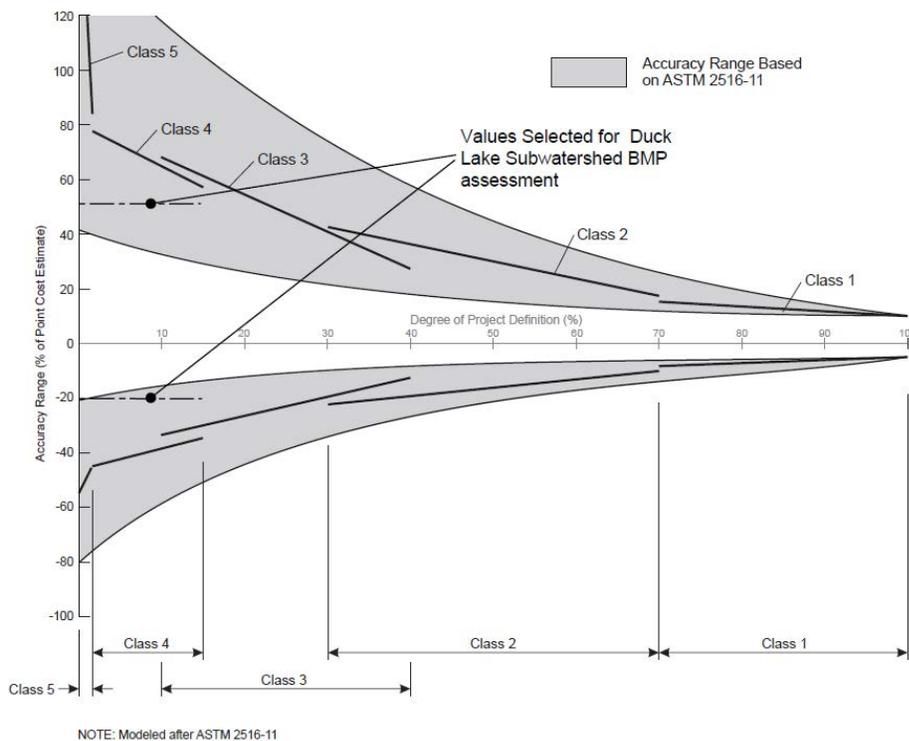


Figure A-1 Relationship between Cost Accuracy and Degree of Project Definition

At this early stage of design, the range of uncertainty of total project cost is high. Due to the early stage of design, it is standard practice to place a broad accuracy range around the point cost estimate.

The accuracy range is based on professional judgment considering the level of design completed, the complexity of the project, and the uncertainties in the project scope; the accuracy range does not include

To: Administrator Bleser and Project Manager Jordan
From: Greg Fransen, Matt Kumka, and Scott Sobiech
Subject: Opinion of Probable Construction Cost for Duck Lake Subwatershed Improvements
Date: 3/14/19
Page: 3

costs for future scope changes that are not part of the project as currently defined or risk contingency. The estimated accuracy range for this point estimate is generally -20% to +50%.

The opinion of probable cost provided is made on the basis of Barr Engineering's experience and qualifications and represents our best judgment as experienced and qualified professionals familiar with the project. It is acknowledged that additional investigations and additional site specific information that becomes available in the next stage of design may result in changes to the proposed configuration, cost and functioning of project features. This opinion is based on project-related information available to Barr Engineering at this time and includes a conceptual-level feasibility design of the project. The opinion of cost may change as more information becomes available and further design is completed. In addition, because we have no control over the eventual cost of labor, materials, equipment or services furnished by others, or over the contractor's methods of determining prices, or over competitive bidding or market conditions, Barr Engineering cannot and does not guarantee that proposals, bids, or actual costs will not vary from the opinion of probable cost presented in this memorandum. If the RPBCWD wishes greater assurance as to the probable construction and total project cost, the RPBCWD should authorize further investigation and design of a selected alternative.

Table 1 provides a summary of the opinion of probable construction cost for the four project elements as well as an anticipated range of cost given the conceptual level of design. Table 2 provides the engineer's opinion of total project cost. These costs exclude development of cooperative agreements with the city, maintenance agreements with private property owners, and easements for construction on private parcels. These costs also assume that no purchase of additional easements will be required. The opinions of costs below do not include the cost to maintain the stormwater BMP following construction. Additional cost breakdown is provided in the tables attached to the memo.

Table 1 Engineer's Opinion of Probable Construction Cost – Feasibility Estimate Summary

Project Component	Engineer's Opinion of Probable Construction Cost (\$) ⁽¹⁾		
	Point Estimate	Low	High
Rain Barrels (60)	\$5,200	\$4,700	\$5,800
Trees (50)	\$19,000	\$16,000	\$29,000
Planter Boxes (10)	\$12,500	\$10,000	\$19,000
Rainwater Gardens (10)	\$110,000	\$88,000	\$165,000
TOTAL	\$147,000	\$119,000	\$219,000
Note(s): Approximate values based on available information. Soil borings are required during the next phase of design to identify existing soil characteristics and estimate the groundwater elevation. Estimate includes all BMP costs. The estimated accuracy range for the Total Construction Cost as the project is defined is -20% to +50%.			

Table 2 Engineer's Opinion of Probable Total Project Cost – Feasibility Estimate Summary

Project Component	Engineer's Opinion of Probable Construction Cost (\$) ⁽¹⁾		
	Point Estimate	Low	High
Rain Barrels (60)	\$5,200	\$4,700	\$5,800
Trees (50)	\$22,800	\$18,300	\$34,200
Planter Boxes (10)	\$12,750	\$10,200	\$19,100
Rainwater Gardens (10)	\$143,000	\$115,000	\$215,000
TOTAL	\$184,000	\$148,000	\$274,000
Note(s): Approximate values based on available information. Soil borings are required during the next phase of design to identify existing soil characteristics and estimate the groundwater elevation. Estimate includes all BMP costs. The estimated accuracy range for the Total Construction Cost as the project is defined is -20% to +50%. Total Cost is rounded to the nearest \$1,000.			

REV 1	SHEET: 1	OF 4
BY: MEK2	DATE: 3/13/2019	
CHECKED BY: GDF	DATE: 3/13/2019	
APPROVED BY:	DATE:	
ISSUED:	DATE:	

ENGINEER'S OPINION OF PROBABLE PROJECT COST

PROJECT: Duck Lake Subwatershed WQ Improvement
 LOCATION: City of Eden Prairie, MN
 PROJECT #: 23/27-0053.14-025

**Engineer's Opinion of Probable Project Cost
 Curbside Rainwater Garden**

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization	LS	1	\$ 500	\$500.00	1,2,3,4,5,6
B	Excavation and Embankment	CY	35	\$ 15	\$525.00	1,2,3,4,5
C	Infiltration Planting Soil	CY	13	\$ 65	\$845.00	1,2,3,4,5
D	Subsoil Loosening	SF	150	\$ 1.50	\$225.00	1,2,3,4,5
E	Curb Cut Inlet Structure	EA	1	\$ 2,500.00	\$2,500.00	1,2,3,4,5
F	Pavement Removal and Disposal	SF	40	\$ 25	\$1,000.00	1,2,3,4,5
H	Curb and Gutter Replacement	LF	10	\$ 65	\$650.00	1,2,3,4,5
I	Stone Step Down Structure	EA	1	\$ 800	\$800.00	1,2,3,4,5
J	Asphalt Pavement Patching	SF	20	\$ 30	\$600.00	1,2,3,4,5
K	4" Steel Edging	LF	70	\$ 9	\$630.00	1,2,3,4,5
L	Plantings	SY	25	\$ 16	\$400.00	1,2,3,4,5
M	Shredded Hardwood Mulch	CY	8	\$ 65	\$520.00	1,2,3,4,5
N	#20 Cont. Tree	EA	1	\$ 280	\$280.00	1,2,3,4,5
O	Lawn Sod	SY	30	\$ 5	\$150.00	1,2,3,4,5
Q	Warranty	Year	3	\$ 150	\$450.00	1,2,3,4,5
	CONSTRUCTION SUBTOTAL per Rainwater garden				\$10,000.00	1,2,3,4,5,9
	CONSTRUCTION CONTINGENCY (10%)				\$1,000.00	1,5,9
	ESTIMATED CONSTRUCTION COST PER RAINWATER GARDEN				\$11,000.00	1,2,3,4,5,9
	ESTIMATED CONSTRUCTION COST FOR 10 RAINWATER GARENS		10	\$ 11,000	\$110,000.00	1,2,3,4,5
	ESTIMATED CONSTRUCTION COST	-20%			\$88,000.00	5,8,9
	ACCURACY RANGE	50%			\$165,000.00	5,8,9
	PLANNING, ENGINEERING & DESIGN				\$25,000.00	1,2,3,4,5,9
	PERMITTING & REGULATORY APPROVALS				\$2,000.00	1,5,6,7,9
	CONSTRUCTION MANAGEMENT				\$6,000.00	1,5,9
	ESTIMATED TOTAL PROJECT COST				\$143,000.00	1,2,3,4,5,7,8,9
	ESTIMATED TOTAL PROJECT ACCURACY	-20%			\$115,000.00	5,8,9
	RANGE	50%			\$215,000.00	5,8,9

Notes

- ¹ Limited Design Work Completed (0 - 10%).
- ² Quantities are based on construction of one (1) Rainwater Garden based on previous similar projects.
- ³ Unit Prices Based on Information Available at This Time.
- ⁴ No Soil Borings Available.
- ⁵ This feasibility-level (Class 4, < 10% design completion per ASTM E 2516-06) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.
- ⁶ Mobilization based on a single contractor constructing ten (10) similar rainwater gardens.
- ⁷ Includes costs for preparing maintenance and access agreements. Assumes that wetland mitigation/replacement is not required.
- ⁸ Estimate costs are to design, construct, and permit each alternative. The estimated costs do not include maintenance, monitoring or additional tasks following construction.
- ⁹ Estimate costs are reported to nearest thousand dollars.

BARR PREPARED BY: BARR ENGINEERING COMPANY ENGINEER'S OPINION OF PROBABLE PROJECT COST PROJECT: Duck Lake Subwatershed WQ Improvement LOCATION: City of Eden Prairie, MN PROJECT #: 23/27-0053.14-025	REV 1	SHEET: 1	OF 4
	BY: MEK2		DATE: 3/13/2019
	CHECKED BY: GDF		DATE: 3/13/2019
	APPROVED BY:		DATE:
	ISSUED:	DATE:	
	ISSUED:	DATE:	
	ISSUED:	DATE:	

**Engineer's Opinion of Probable Project Cost
Downspout Planter Box**

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES	
A	Mobilization	LS	1	\$ 750	\$750.00	1,2,3,4,5	
B	Premium Decking Wood (Recommend Pressure treated, comp	EA	6	\$ 5	\$31.00	1,2,3,4	
C	Wall Support (Recommend Pressure treated, composite or ce	EA	1	\$ 25	\$25.00	1,2,3,4	
D	Base Wood	EA	1	\$ 10	\$10.00	1,2,3,4	
E	Plywood (Recommend Pressure treated, composite or cedar)	EA	1	\$ 36	\$36.00	1,2,3,4	
F	Downspout Diverter	EA	1	\$ 50	\$50.00	1,2,3,4	
G	Pond Liner	EA	1	\$ 69	\$69.00	1,2,3,4	
H	Decorative Trim (optional)	EA	2	\$ 7	\$14.00	1,2,3,4	
I	Paver/ Concrete Block	EA	6	\$ 2	\$10.00	1,2,3,4	
J	Sandy Soil Mix	EA	1	\$ 2	\$2.00	1,2,3,4	
K	clean course sand	EA	8	\$ 3	\$21.00	1,2,3,4	
L	compost	EA	1	\$ 8	\$8.00	1,2,3,4	
M	Pea Gravel	EA	4	\$ 4	\$16.00	1,2,3,4	
N	Splash Rock	EA	1	\$ 4	\$4.00	1,2,3,4	
O	Hard Wood Mulch	EA	2	\$ 4	\$7.00	1,2,3,4	
P	#1 Cont Perennials	SF	16	\$ 4	\$64.00	1,2,3,4	
Q	PVC Male and Female Electrical Conduit adapters	EA	1	\$ 25	\$25.00	1,2,3,4	
CONSTRUCTION SUBTOTAL					\$1,140.00	1,2,3,4,5,7	
CONSTRUCTION CONTINGENCY (10%)					\$110.00	1,4,7	
ESTIMATED CONSTRUCTION COST					\$1,250.00	1,2,3,4,5,7	
ESTIMATED CONSTRUCTION COST FOR 10 PLANTER BOXES					10 \$ 1,250	\$12,500.00	1,2,3,4,5
ESTIMATED CONSTRUCTION COST				-20%	\$10,000.00	5,8,9	
ACCURACY RANGE				50%	\$19,000.00	5,8,9	
PLANNING, ENGINEERING & DESIGN					\$250.00	1,2,3,4,5,7	
ESTIMATED TOTAL PROJECT COST					\$12,750.00	1,2,3,4,5,6,7	
ESTIMATED TOTAL PROJECT ACCURACY				-20%	\$10,200.00	4,6,7	
RANGE				50%	\$19,130.00	4,6,7	

Notes	
1	Limited design work completed (30% - 70%).
2	Quantities based on plans and specifications for a single 2'x2'x3' planter obtained from Philadelphia Water Department website http://www.phillywatersheds.org/whats_in_it_for_you/residents/how-build-downspout-planter accessed on March 13, 2019.
3	Unit prices based on information available at this time.
4	This feasibility-level (Class 2, 30% - 70% design completion per ASTM E 2516-06) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.
5	Mobilization based on a single contractor constructing five (5) similar planters.
6	Estimate costs are to design, construct, and install each planter. The estimated costs do not include maintenance, monitoring or additional tasks following installation.
7	Estimate costs are reported to nearest ten dollars.



PREPARED BY: BARR ENGINEERING COMPANY

REV 1 SHEET: 1 OF 4

BY: MEK2 DATE: 3/13/2019

CHECKED BY: GDF DATE: 3/13/2019

APPROVED BY: DATE:

ISSUED: DATE:

ISSUED: DATE:

ISSUED: DATE:

ISSUED: DATE:

ENGINEER'S OPINION OF PROBABLE PROJECT COST
PROJECT: Duck Lake Subwatershed WQ Improvement
LOCATION: City of Eden Prairie, MN
PROJECT #: 23/27-0053.14-025

Engineer's Opinion of Probable Project Cost Tree Plantings

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization	LS	1	\$ 1,600	\$1,600.00	1,2,3,4,5
B	Shredded Hardwood Mulch	CY	15	\$ 65	\$975.00	1,2,3,4
C	#20 Container Tree	EA	50	\$ 280	\$14,000.00	1,2,3,4
D	Tree Gator	EA	50	\$ 15	\$750.00	1,2,3,4
CONSTRUCTION SUBTOTAL					\$17,300.00	1,2,3,4,5,7
CONSTRUCTION CONTINGENCY (10%)					\$1,700.00	1,4,7
ESTIMATED CONSTRUCTION COST					\$19,000.00	1,2,3,4,5,7
ESTIMATED CONSTRUCTION COST				-20%	\$16,000.00	5,8,9
ACCURACY RANGE				50%	\$29,000.00	5,8,9
PLANNING, ENGINEERING & DESIGN					\$3,800.00	1,2,3,4,5,7
ESTIMATED TOTAL PROJECT COST					\$22,800.00	1,2,3,4,5,6,7
ESTIMATED TOTAL PROJECT COST				-20%	\$18,300.00	4,6,7
ACCURACY RANGE				50%	\$34,200.00	4,6,7

Notes

¹ Limited design work completed (30% - 70%).

² Quantities based on previous similar projects.

³ Unit prices based on information available at this time.

⁴ This feasibility-level (Class 2, 30% - 70% design completion per ASTM E 2516-06) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

⁵ Mobilization based on a single contractor installing 50 trees.

⁶ Estimate costs include identifying suitable locations, sourcing, and installing 50 trees. The estimated costs do not include maintenance, monitoring or additional tasks following installation.

⁷ Estimate costs are reported to nearest hundred dollars.



PREPARED BY: BARR ENGINEERING COMPANY

REV 1 SHEET: 1 OF 4

BY: MEK2 DATE: 3/13/2019

CHECKED BY: GDF DATE: 3/13/2019

APPROVED BY: DATE:

ENGINEER'S OPINION OF PROBABLE PROJECT COST
PROJECT: Duck Lake Subwatershed WQ Improvement
LOCATION: City of Eden Prairie, MN
PROJECT #: 23/27-0053.14-025

ISSUED: DATE:

ISSUED: DATE:

ISSUED: DATE:

ISSUED: DATE:

Engineer's Opinion of Probable Project Cost Rain Barrels

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Rain Barrel	LS	60	\$ 79	\$4,740.00	1,2,3
	CONSTRUCTION SUBTOTAL				\$4,700.00	1,2,3,4
	CONSTRUCTION CONTINGENCY (10%)				\$470.00	1,2,3,4
	ESTIMATED CONSTRUCTION COST				\$5,170.00	1,2,3,4
	ESTIMATED TOTAL PROJECT COST				\$5,200.00	1,2,3,4
ESTIMATED ACCURACY RANGE			-10%		\$4,700.00	3,4
			10%		\$5,800.00	3,4

Notes

¹ Unit prices based on Estimate #1001 provided to RPBCWD by Recycling Association of Minnesota on 3/7/2019.

² Assumes that rain barrels are distributed at a central location and installed by the end user.

³ This feasibility-level (Class 1, 70% - 100% design completion per ASTM E 2516-06) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -10% to +10%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

⁴ Estimate costs are reported to nearest hundred dollars.

Grant Application Form



*Prepared For
Local Government*



MN DNR WATERS

*Please return application and supporting materials to your DNR Waters
Area Hydrologist.*

**FLOOD DAMAGE REDUCTION PROGRAMS
HAZARD MITIGATION GRANT APPLICATION**

Application Date: March 12, 2019

Local Unit of Government Applicant: Riley Purgatory Bluff Creek Watershed District (RPBCWD)

Authorized Agent: Claire Bleser, District Administrator

Address: 18681 Lake Drive East Chanhassen, MN 55317 Carver
Number & Street City/State Zip code County

Phone No: (952)687-1348 Fax No: () Cell Phone: (952)607-6512

E-mail address: cbleser@rpbcd.org

Contact person (if different from authorized agent): Terry Jeffery, Watershed Planner

Address: 18681 Lake Drive East Chanhassen, MN 55317 Carver
Number & Street City/State Zip code County

Phone No: (952)807-6885 Fax No: () Cell Phone: (952)687-1107

E-mail address: tjeffery@rpbcd.org

Project Funding Breakout

Total Estimated Project Cost	\$591,900
Amount Requested From DNR Waters	\$295,950
Amount from other state agencies	N/A
Total share of all local government sources	\$112,000
Estimated in-kind match	\$183,950
Federal share	N/A
Private share	N/A

Check the following types of flood damage reduction activities included in project along with a quantity (if applicable) and cost or percentage of total project costs.

	Activity	Quantity		Cost or Percentage
X	Acquisition	2	Number of Homes	\$591,900/100%
	Levee		Miles	
	Levee Improvement		Lineal Feet	
	Floodwall		Lineal Feet	
	Ring Dike		Number of Ring Dikes	
	Ring Dike Improvement		Number of Ring Dikes	
	Flood Storage Easement		Acres	
	Impoundment		Acre Feet	
	Impoundment Improvement			
	Flood Warning System			
	Feasibility Study			
	Flood Insurance Study			
	Floodplain Mapping			
	Geographic Information System			
	Hydrology / Hydraulic Study			
	Other			

Project Narrative

(Please attach resolutions authorizing application and signature, a map of the site, highlighting area(s) damaged and the location of the proposed project.)

I. a.) Briefly describe and itemize the damage(s):

Properties located at 730,750 and 770 Pioneer Trail are susceptible to flooding ever since the homes were constructed in the 1960's and 1970's in an area that meets the criteria set forth in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual to be considered a jurisdictional wetland. The City of Chanhassen is in the process of acquiring 770 Pioneer Trail. The properties are part of a 102-acre sub-watershed which is part of the larger Bluff Creek watershed.

The sub-watershed drains through the properties' backyards. A 10" concrete field tile takes the small rain events and a 24" culvert along Pioneer Trail takes the runoff volume during larger rain events. The subwatershed drains into Bluff Creek which is an impaired water. The TMDL indicates that flows are the primary cause of TSS in the system.

The watershed has been hydraulically modeled by Chanhassen and it is in the RPBCWD model. These models show that, in addition to resulting in wetland impacts, lowering the outlet and/or increasing the outlet size to reduce the bounce in the area would increase the rate and volume of water being discharged downstream. This would cause flooding in a different area in the Bluff Creek tributary and increase the amount of erosion within and adjacent to Bluff Creek.

Flooding of basements and garages is a common occurrence in rain events over 3" per 24 hrs. or back to back rain events. Flooding of basements causes several thousand dollars' worth of damage. Floodwaters and the reoccurring high-water table have affected the foundations of the structures. Concrete walls have cracked and shifted do to the persistent flooding problem. These areas are on private well and septic. The frequent inundation and high subsurface water table compromise the septic system and limit the ability to repair or relocate.

b.) Describe the repetitive nature of the flooding:

Atlas 14 rainfall data was used in modeling to confirm historical records of flooding of backyards and structures for relatively low rainfall events. 24-hour rainfall depths are as follows; 1 year – 2.50", 2 year – 2.86", 5 year – 3.57", 10 year – 4.26", 100 year – 7.40". The modeling did not look at the upper end of the 90% CI (e.g. 10.0" for 100-year storm event). The elevations used below are in NGVD29.

For a 2-year storm (50% annual probability of occurrence), the wetland area floods to a modeled elevation of 925.97'. This leads to a water level approximately 30' from 750 Pioneer Trail and 50' from 730 Pioneer Trail. This 50% storm also results in inundation of outbuildings on both properties. Flooding resulting from a 10-year (10% annual probability of occurrence) storm floods a modeled elevation of 927.94 and comes to within approximately five feet of the main dwelling at 750 Pioneer and within 25-feet of 730 Pioneer. At the 25-year event, inundation occurs to an elevation of 929.33 and is to the foundation of 750 Pioneer and within 15-feet of the foundation at 730 Pioneer. All septic systems are submerged by this event. Full inundation of 750 Pioneer Trail occurs with the 100-year storm event (1% annual probability of occurrence) with a ponding elevation of 931.33 feet msl. 730 Pioneer Trail has water to the foundation at the 100-year storm event and is inundated with the 500-year even (932.72' msl).

It bears repeating that modeling relied upon mean storm events and did not look at the upper end of the 90% confidence interval. Further, the mid-21st century moderate estimate for the 1% annual probability of occurrence event is 10.2 inches with a pessimistic estimate of 17.6 inches.

This modeling corresponds with owner reports of persistent flooding of yards and basements at relatively high probability storm events.

Project Narrative

II. **Describe the proposed project and its objective:**

(Please include project location, a list of funding sources, how local funding will be obtained and identify implementing parties and their roles.)

The project proposes to acquire two remaining properties at 730 and 750 Pioneer Trail. (770 Pioneer to be acquired separately.) The total acquisition of the three parcels would be for approximately 7.35 acres. The objective of the project is to acquire the properties and remove the structures. Once the properties are acquired and structures removed, the City and Riley Purgatory Bluff Creek watershed district plan to collaborate on a wetland restoration project.

Funding for the proposed property acquisitions is as follows:

50% from the DNR Flood Assistance Grant Program
50% from local agencies funding.

The exact split of local funding has not been determined at this time, but the City is committed to help fund the local share and finding partners to help fund the project. The Riley Purgatory Bluff Creek Watershed District has committed to help fund the local share. Approximately \$400,000 has already been committed between the City of Chanhassen and the watershed district for the local match of the purchase of the properties. The City is also in discussions with other Carver County agencies to help fund the remaining local share.

This project is identified in the City's Local Water Management Plan, is included in Riley Purgatory Bluff Creek Watershed Management Plan and the Bluff Creek TMDL implementation plan. The Watershed District has made stormwater retention, and rate control a critical goal of their plan.

Project Narrative

III. a.) Summarize the alternative flood mitigation measures that were considered to achieve the desired benefits.

A plan was studied to replace the drain tile while maintaining the existing culverts size and invert. Even though this replacement would improve conveyance of water from the wetland during rainfall events, the overall contributing watershed is too large for it to have any significant impact on reducing the floodplain for all levels of storms.

Increasing the overall size, and therefore rate, of the wetland outlet is not feasible as this would potentially create an erosive condition downstream along with increased localized flooding at individual downstream roadway culverts and structures. In addition, Bluff Creek is an impaired water that has existing erosion and sedimentation issues that would only be worsened by increased the discharge rate from the upstream wetland catchment.

Lowering the outlet elevation was not feasible as it would likely result in the draining of approximately 18 acres of wetland. This would be in addition to the deleterious impacts discussed with increasing the outlet size.

b.) Is the proposed project the least environmentally damaging alternative that is feasible and prudent? Why?

The proposed purchase of the three homes is the least environmentally impacting option. The other engineered alternatives studied to reduce the risk of flooding to the homes increase the volume and rate of runoff to the downstream system. This increase in discharge would result in an increase in erosive condition downstream along with increased localized flooding at individual downstream roadway culverts and potentially impact downstream structures. In addition, Bluff Creek is an impaired water that has a turbidity impairment that would only be exacerbated by increased the discharge rate and volume from the upstream wetland catchment. Retaining a larger volume of storm water before it reaches the three properties is not practical since the area is mostly fully developed.

The proposed purchase of the three homes is the first proposed step to improving the environmental conditions in the sub-watershed and helping to improve Bluff Creek waters. After the homes are purchased the City along with other partners plans to complete a wetland restoration project that will help reduce the rate of discharge into Bluff Creek and help improve water quality.

(If project requires a mandatory environmental review)

c.) Has an environmental review been completed for the proposed project? If not, is an environmental review part of the application proposal?

This does not trigger a mandatory EAW. However, a hazardous materials assessment on the structures will be completed before the structures are demolished. Hazardous assessment is part of the application.

Project Narrative

IV. Describe and itemize the costs (including environmental and natural resource costs) associated with the project:

(include a budget/cost schedule. If the project will be completed in phases, please include a phasing schedule for the project.)

Environmental costs do not need to be quantified in terms in money.

	Bob & Elizabeth Haak 770 Pioneer Trail Chanhassen MN 55317	Jim Hedberg 750 Pioneer Trail Chanhassen MN 55317	Bob & Betty Wold 730 Pioneer Trail Chanhassen MN 55317	Totals
Acres	2.35	2.65	2.35	\$7.35
Appraisal Costs	\$1,500.00	\$3,000.00	\$3,000.00	\$7,500.00
Attorney's Fee	By Landowner	By Landowner	By Landowner	
Realtor Fee	By Landowner	By Landowner	By Landowner	
Appraised Value	\$330,000.00	\$237,900.00	\$275,000.00	\$842,900.00
Closing Costs	\$6,000.00	\$6,000.00	\$6,000.00	\$18,000.00
Environmental Due Diligence (Phase I and II if Required)	\$2,000.00	\$2,000.00	\$2,000.00	\$6,000.00
Capping Well	\$2,000.00	\$2,000.00	\$2,000.00	\$6,000.00
Removal of Septic Tank	\$1,500.00	\$1,500.00	\$1,500.00	\$4,500.00
Structure Demolition & Restoration	\$25,000.00	\$25,000.00	\$25,000.00	\$75,000.00
Total	\$368,000.00	\$277,400.00	\$314,500.00	\$959,900.00
DNR Flood Mitigation Grant	\$180,000.00	\$138,700.00	\$157,250.00	\$475,950.00
Local Share	\$188,000.00	\$138,700.00	\$157,250.00	\$483,950.00

Project Narrative

V. Describe and itemize the benefits (including environmental and natural resource costs) associated with this project:

(Please describe the anticipated results of this project.)

Environmental benefits do not need to be quantified in terms of money.

The total project includes acquisition of three properties and wetland restoration.

The project benefits include:

- Structures susceptible to flooding will be removed.
- Septic systems susceptible to flooding will be removed
- Wells susceptible to flooding will be removed.
- Land acquired will be restored to high quality wetlands
- Water quality will be improved
- Run off rates for this subwatershed will be reduced.
- Bluff Creek water quality will be improved.
- Bluff Creek water runoff rates will be lowered.
- Opportunities for recreational activities will be created.

Project Narrative

VI. List opportunities for public involvement and describe public response to the proposed project:

The property owners have been engaged throughout the process and are willing sellers.

During the update of the RPBCWD Local Surface Water Management Plan, resident surveys found that wetlands were one of the highest rated water resources. During the plan update process, wetland restoration and protection was identified as a key strategy. Both the Citizens' Advisory Committee and the Technical Advisory Committees were engaged in the development of District priorities and implementation planning.

Chanhasen Parks and Recreation and Carver County Public Works have both identified a need for a trail along Pioneer Trail. This will provide opportunity to construct that trail which will provide the public access to the wetland and allow the District and the City of Chanhasen to expand their education and outreach programs.

RPBCWD has already secured a grant from the MN Board of Water and Soil Resources to restore the wetland.

a.) Describe partners (if any) and their role in this project.

The City of Chanhasen was the lead agency for acquiring 770 Pioneer Trail. The RPBCWD will be the lead agency for the acquisition of the remaining two parcels. The RPBCWD has already engaged other property owners to see if the restoration could expand beyond these three parcels and will continue to do so.

RPBCWD has secured a grant from the BWSR for the restoration of the wetland and will work with BWSR, Chanhasen, and Carver County to see that the wetland is restored.

Project Narrative

VII. Flood Insurance: Do the local government units within your jurisdiction participate in the National Flood Insurance Program?

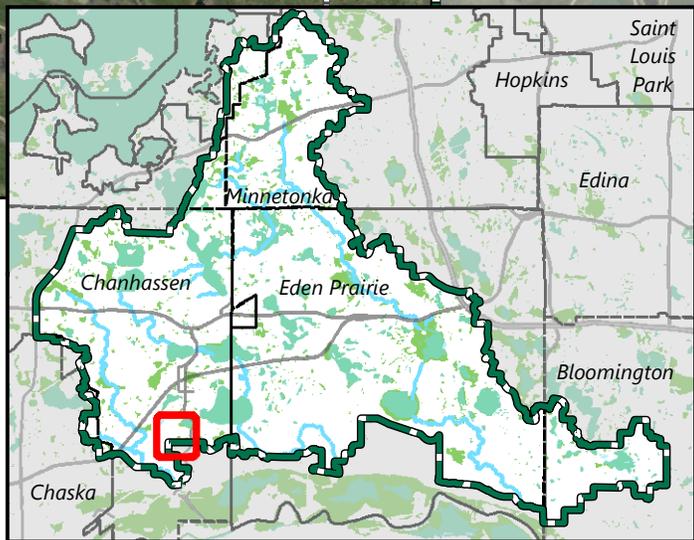
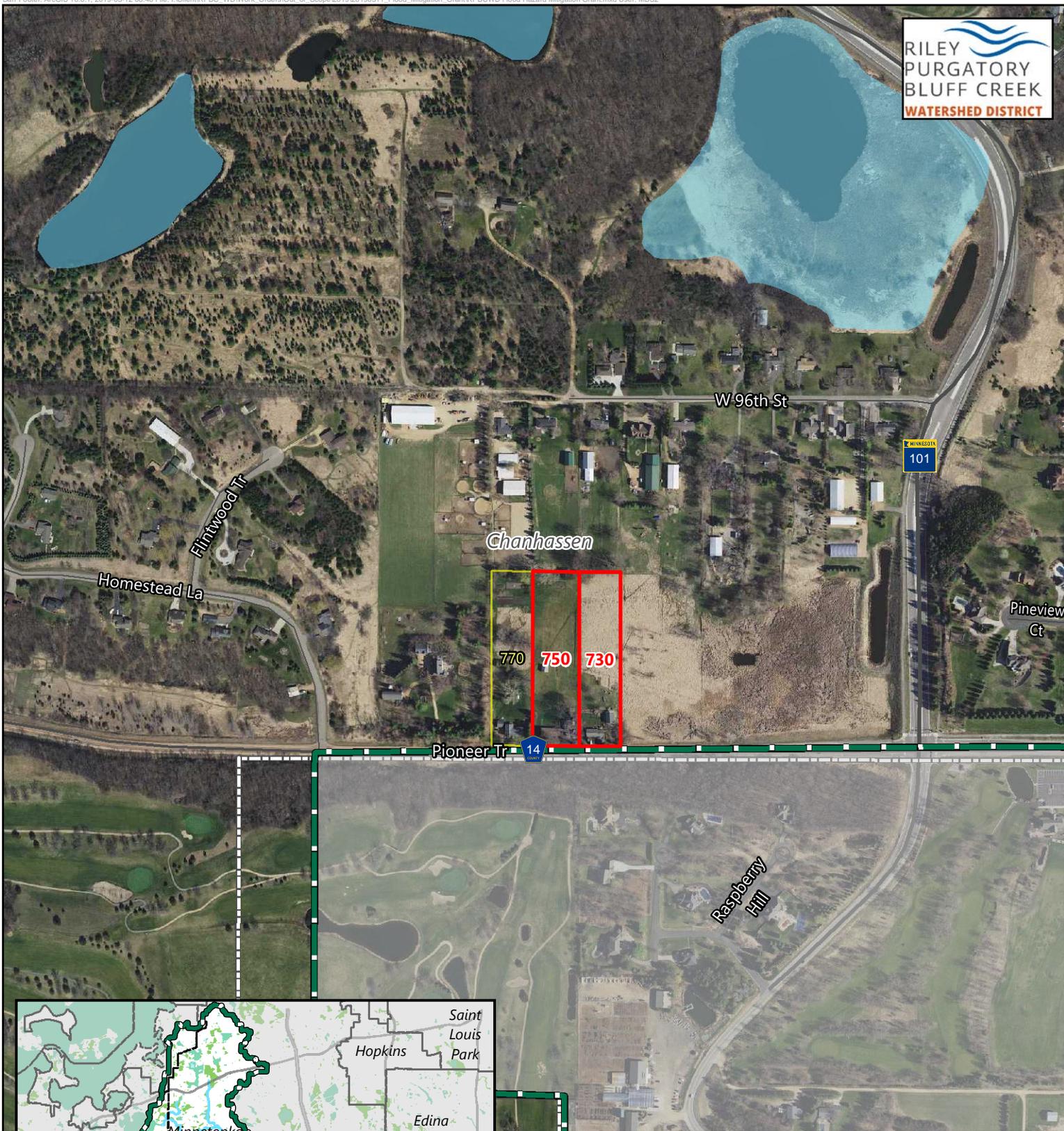
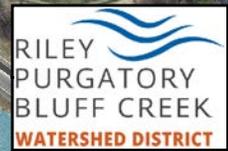
Chanhassen participates in the National Flood Insurance Program.

VIII. Zoning Ordinances: Is your local government unit administering a state approved shoreland ordinance and flood plain ordinance?

Chanhassen administers a state approved shoreland and flood plain ordinance.

IX. Is this proposed study, plan, or project identified in a comprehensive local water plan prepared under M.S. Chapter 110B or 112 or M.S. 473.875-473.883?

The project is identified in both the RPBCWD Local Water Management Plan and in Chanhassen Local Water Management Plan.



Feet



**RPBCWD FLOOD HAZARD
MITIGATION GRANT
730 and 750 Pioneer Trail,
Carver County**
Riley Purgatory Bluff Creek
Watershed District

Local Government Resolution

BE IT RESOLVED that the Riley Purgatory Bluff Creek Watershed District, hereinafter referred to as the "Applicant" act as legal sponsor for the project contained in the **Flood Damage Reduction Grant Assistance Program Application** to be submitted on March 4, 2019 and that Claire Bleser, Administrator is hereby authorized to apply ~~for~~^{to} the Department of Natural Resources for funding of this project on behalf of the Applicant.

BE IT FURTHER RESOLVED that the Applicant has the legal authority to apply for financial assistance, and the institutional, administrative, and managerial capability to ensure adequate acquisition, maintenance and protection of the proposed project.

BE IT FURTHER RESOLVED that the Applicant has the financial capability to provide any required matching funds.

BE IT FURTHER RESOLVED that the Applicant has not incurred any costs and has not entered into any written agreements to purchase property proposed by this project.

BE IT FURTHER RESOLVED that the source of Applicant's matching funds shall not include other State funds.

BE IT FURTHER RESOLVED that the source of Applicant's matching funds shall be **\$157,250 as identified in the 2019 Annual Budget under the line item "Wetland Restoration and Flood Mitigation."**

BE IT FURTHER RESOLVED that the Applicant hereby pledges to complete the project or phase if it exceeds the total funding provided by the Department of Natural Resources and any required local match.

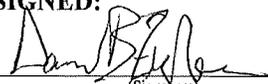
BE IT FURTHER RESOLVED that the Applicant has not violated any Federal, State, or local laws pertaining to fraud, bribery, graft, kickbacks, collusion, conflict of interest or other unlawful or corrupt practice.

BE IT FURTHER RESOLVED that upon approval of its application by the state, the Applicant may enter into an agreement with the State of Minnesota for the above- references project, and that the Applicant certifies that it will comply with all applicable laws and regulations as stated in the contract agreement.

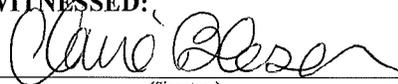
NOW, THEREFORE BE IT RESOLVED that District Administrator is hereby authorized to execute such agreements as are necessary to implement the project on behalf of the applicant.

I CERTIFY THAT the above resolution was adopted by the Board of Managers of the Riley Purgatory Bluff Creek Watershed District on March 1, 2019.

SIGNED:


(Signature)
SECRETARY
(Title)
3-1-2019
(Date)

WITNESSED:


(Signature)
Administrator
(Title)
3-1-2019
(Date)

RESOLUTION 2019-009
RILEY-PURGATORY-BLUFF CREEK WATERSHED DISTRICT
BOARD OF MANAGERS

Adopting policy on application of chloride-management plan requirement
to residential subdivisions

Manager _____ offered the following resolution and moved its adoption,
seconded by Manager _____ .

WHEREAS the 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 states that watershed district managers must adopt rules to accomplish the purposes of chapter 103D and implement the powers as specified by Minnesota Statutes section 103D.335, and the RPBCWD Board of Managers has adopted rules to protect water resources and mitigate flood risk in the Riley-Purgatory-Bluff Creek watershed;

WHEREAS on August 8, 2018, the board adopted revisions to the RPBCWD Rules, adding subsection 3.8 of Rule J: Stormwater Management to require an applicant for approval of land-disturbing activity on property other than a single-family home site to provide a plan for post-project management of chloride use on the site;

WHEREAS the exemption from the chloride-management plan requirement applies to “single-family home site[s],” not “existing single-family” properties, there is ambiguity as to how the chloride-plan requirement applies to residential subdivisions proposing creation of single-family home properties that the RPBCWD Board of Managers wishes to clarify through adoption of an interpretive policy; and

WHEREAS the RPBCWD Board of Managers finds that:

- Roads and common areas in a subdivision development are almost uniformly maintained and operated by either a homeowner’s association (which usually hires a professional property-management provider) or the city;
- The logistical complexities of imposing chloride-management requirements on individual property owners would not result in commensurate reduction in chloride use, though RPBCWD can use the opportunity to provide individual

property owners with information on the risk chloride pose for water resources;
and

- Packaged deicer, as is used by most single-family property owners, accounts for only 5 percent of the salt use in the metro area. Given this, limiting the operation of the provision to roads and common areas in residential subdivisions will effectively and efficiently serve the purpose of the RPBCWD chloride policy.

NOW, THEREFORE, BE IT RESOLVED that the RPBCWD Board of Managers hereby adopts an interpretive policy limiting the applicability of the requirements in subsection 3.8 of RPBCWD’s Stormwater Manage Rule J to the public and common areas of residential subdivision developments; individual home properties are excluded.

The question was on the adoption of the resolution and there were __ yeas and __ nays as follows:

<u>Yea</u>	<u>Nay</u>	<u>Abstain</u>	<u>Absent</u>
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CRAFTON
 KOCH
 PEDERSON
 WARD
 ZIEGLER

Upon vote, the chair declared the resolution adopted.

* * * * *

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 _____, 2019.

 _____, Secretary

MEETING MINUTES

Riley-Purgatory-Bluff Creek Watershed District

March 1, 2019, Board of Managers Monthly Meeting

PRESENT:

Managers: Jill Crafton, Treasurer

Larry Koch

Dorothy Pedersen, Vice President

Dick Ward, President

David Ziegler, Secretary

Staff: Claire Bleser, RPBCWD Administrator

Amy Herbert, Amy Herbert LLC, Recorder

Terry Jeffery, Project and Permit Manager

Scott Sobiech, Engineer (Barr Engineering Company)

Michael Welch, Smith Partners

Other attendees: Matt Lindon, CAC

Bill Satterness, Eden Prairie Resident

1. Call to Order

1 President Ward called to order the Friday, March 1, 2019, Board of Managers Monthly Meeting at 1:05 p.m. at
2 the District Office, 18681 Lake Drive East, Chanhassen, MN 55317.

2. Approval of the Agenda

3 Manager Pederson moved to approve the agenda as presented. Manager Ziegler seconded the motion. Manager
4 Koch moved to amend the motion in order to amend the agenda to move item 9l to become item 4c, include a
5 review of the RPBCWD's 2018 finances under agenda item 9a or 9b, remove items 8c, f, g, h, i, and j from the
6 Consent Agenda and add as Action Items 10c - Staff Retreat and 10d - Discuss the Board's and District's 2019
7 calendar in terms of what will happen this year and what needs to be accomplished. Administrator Bleser
8 requested the addition of items 9n - Order Public Hearing on Alum Project and 10e - Discuss what is happening
9 with Prince's property adjacent to Lake Ann. The motion to amend failed for lack of a second. Upon a vote, the
10 motion on the table carried 4-1 [Manager Koch voted against the motion.]

11 Manager Crafton moved to add to the agenda 9n - Order Public Hearing on Hyland Lake Alum Project. Manager
12 Ziegler seconded the motion. Upon a vote, the motion carried 4-0. [Manager Koch abstained from vote].

13 Manager Koch requested the following items be removed from the Consent Agenda: 8c – Authorize President to
14 Execute Cooperative Agreement with the City of Eden Prairie and Lower Minnesota Watershed District After
15 Execution from City of Eden Prairie; 8f – Approve Task Order for Hyland Lake Alum Application; 8g – Approve
16 Task Order for Lake Riley Subwatershed Assessment; 8h – Approve Task Order for Mitchell Lake Subwatershed
17 Assessment; 8i – Approve Task Order for RPBCWD Permit/Grant Database System Agreement; 8j – Approve
18 Task Order 6f WOMP Station. President Ward added these items as Discussion Items.

3. Matters of General Public Interest

19 Mr. Bill Satterness of 8597 Red Oak Drive, Eden Prairie, handed out written comments and read them aloud,
20 suggesting that RPBCWD undertake greater efforts to control zebra mussels, especially in light of their discover
21 in Lake Riley last year. He offered resolutions on the topic for consideration by the managers.

22 Administrator Bleser updated the Board on the information staff has collected and discussions held with other
23 entities on the topic of aquatic invasive species (AIS) including decontamination stations. She said it is important
24 to know who is willing to do what regarding the different aquatic invaders. President Ward indicated that staff
25 should continue to take a collaborative approach, working with other entities on a comprehensive approach to
26 AIS. Manager Koch suggested the Administrator prepare a summary of what is going on within the District
27 regarding AIS so the summary can be disseminated to the District's constituents. The Board agreed and directed
28 the Administrator to summarize where the District is at in its efforts on this issue and to send an email blast with
29 such information to constituents.

4. Reading and Approval of Minutes

a. Minutes of Board of Managers Meeting, February 6, 2019

30 Manager Ziegler requested adding the words "to amend" on page 3, line 49, the word "groundwater" to
31 line 24 on page 2, the words "the proposal" to line 30 on page 2 and adding the recorder to the list of
32 attendees. He also noted that "as written" should replace the words "as amended" on page 4, line 87 and
33 that on page 4, line 105 the number should be 5 instead of 50. Manager Ziegler pointed out that the City
34 of Minnetonka should replace the City of Eden Prairie on page 5, line 154.
35

36 Manager Pedersen requested that the minutes include the following remarks on page 4, line 97:
37 "Manager Pedersen congratulated the staff on progress made toward data collection and water
38 conservation over the past two years."

39 Attorney Welch noted edits to the minutes as shared with him by Attorney Smith, and he said the words
40 "for the Cost-Share Program" should be included at the end of the sentence on page 2, line 46. He
41 corrected line 109, page 4 so the sentence reads, "Manager Koch moved to approve the Consent Agenda
42 with the deletion of the drainage easement requirement in condition 7." Attorney Smith pointed out
43 corrections to be made on page 7 under item 11k, so the paragraph reads: "Manager Koch moved to
44 direct staff to prepare and publish the Plan Amendment regarding item 9.7.2 in the District's 10-Year
45 Plan to amend the language in the Plan to reflect that the Board will review Cost-Share applications
46 above \$10,000, and delegate review and approval of Cost-Share applications for grants of \$10,000 or
47 less to the Administrator, as discussed by the Board and staff earlier this evening in the Cost-Share
48 Program workshop. Manager Ziegler seconded the motion. Upon a vote, the motion carried 5-0.
49 Attorney Welch also corrected the list of conditions on page 5 starting on line 157, to identify the
50 conditions in the Permit Application Review report for Permit 2018-073 as follows:

- 51 1. *Continued compliance with General Requirements*
- 52
- 53 2. *Permit applicant must provide the name and contact information of the general contractor*
54 *responsible for the site. RPBCWD must be notified if the responsible party changes during the permit*
55 *term.*
- 56
- 57 3. *Permit applicant must provide a draft maintenance agreement and inspection plan for the*

58 management of stormwater BMPs and buffer areas, including exhibit clearly identifying buffer area,
59 buffer monument locations and all stormwater BMPs. The maintenance agreement must include pump
60 station operation parameters consistent with approved plans and modeling.

61
62 4. The city of Eden Prairie must enter an agreement with RPBCWD to maintain the project facilities
63 and wetland buffers after approval of a draft by RPBCWD.

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

65
66 1. Per Rule J Subsection 4.5, upon completion of the site work, the permittee must submit as-built
67 drawings demonstrating that at the time of final stabilization, stormwater facilities and waterbody
68 crossings conform to design specifications as approved by the District.

69
70 2. Performance monitoring for the proprietary filter chamber will be required to ensure that the
71 project is able to meet the RPBCWD water quality requirements as has been proposed. In accordance
72 with Rule J, Subsection 2.6 performance monitoring, and as a stipulation of issuing a permit for this
73 project, the Applicant must collaborate with RPBCWD (including, but not limited to, site access and
74 system modification to facilitate monitoring) in implementing a monitoring program, as RPBCWD staff
75 and engineer deem appropriate, to monitor the proposed proprietary filter chamber to determine the
76 ability of the system to achieve the estimated water quality treatment as presented in the design for three
77 years. The city of Eden Prairie must reimburse RPBCWD for all expenses associated with RPBCWD
78 monitoring of the system for three years (including equipment and staff time).

79 Manager Ziegler moved to approve the February 6, 2019, meeting minutes as amended. Manager
80 Pedersen seconded the motion. Upon a vote, the motion carried 5-0.

5. Organizational Activities

a. Committees: Personnel

81
82 Manager Koch moved to appoint Manager Ziegler as the sole member of the Personnel Committee. The
83 motion failed for lack of a second. Manager Ward moved to appoint Manager Crafton and Manager
84 Pedersen to the Personnel Committee. Manager Crafton seconded the motion. Administrator Bleser
85 reviewed with the Board the responsibilities of the Personnel Committee as identified in the Employee
86 Handbook. Upon a vote, the motion carried 5-0.

b. Committees: Governance

87
88 Manager Koch moved to appoint himself and President Ward as the two members of the Governance
89 Committee. The motion failed for to lack of a second. Manager Pedersen moved to appoint President
90 Ward and Manager Ziegler as the two members of the Governance Committee. Manager Ziegler
91 seconded the motion. Upon a vote, the motion carried 4-1 [Manager Koch voted against the motion.]

6. Permit and Cost-Share Database

92 Mr. Jeffery presented on the proposed contract with Houston Engineering Inc. for development of a permitting
93 and cost-share database for RPBCWD. He reported that Michelle Jordan and he have provided the requirements
94 they want to see in the database, or the ways the District's requirements differ from the database Houston
95 constructed for Capitol Region Watershed District and the other watershed organizations to Houston. He said
96 Houston used that information to put together the cost proposal in the Board's monthly meeting packet. Mr.

97 Jeffery explained that the proposal does provide the District's ability to record, retrieve, and share the data with
 98 stakeholders in a much more efficient way than the current process. Mr. Jeffery pointed out the proposal shows
 99 that if the District moves forward with the database right now, Houston could have the tool up by August. He said
 100 if the District waits until the state municipal stormwater permit is updated by December, it would eliminate the
 101 need for patches of more recent code and the tool would be up by January.

102 Manager Koch raised his concerns and stated that before he makes a decision, he wants to know who owns what
 103 in terms of the software and license rights. He talked about the contracts he deals with in his profession and that
 104 he deals with licensing and intellectual property. Mr. Jeffery responded that staff has had consent conversations
 105 with Capitol Region Watershed District staff have consented to the District using the database, and he is sure the
 106 District can secure a letter to that effect. Manager Koch said a letter does not adequately secure RPBCWD's
 107 interest. Mr. Jeffery stated that he would work with legal counsel on the necessary contract provisions.

7. Lower Riley Creek Enhancement Plan

108 Administrator Bleser announced that a draft cooperative agreement is in place as of earlier today, and it highlights
 109 the cooperative element regarding inspections. She summarized the Plan and displayed a PowerPoint slide of the
 110 project map. Administrator Bleser stated that \$150,000 will be coming in from the Lower Minnesota River
 111 Watershed, \$150,000 from the City of Eden Prairie, and the City of Eden Prairie will cover costs up to \$50,000
 112 for storm water pipe infrastructure along the creek. She highlighted discussions with the new City of Eden Prairie
 113 staff over the last few months regarding details of the project. Administrator Bleser noted that staff anticipates the
 114 cooperative agreement going in front of the City of Eden Prairie City Council in the next four to five weeks. She
 115 said that the Board of Managers could approve the Cooperative Agreement conditional on the City of Eden
 116 Prairie's approval. She said in terms of timing, staff anticipates a fall start to the project. Manager Koch said he
 117 has trouble approving agreements he hasn't seen and wants to see the agreements he is to sign off on. He asked if
 118 it would cause a problem to hold over the cooperative agreement until the next meeting. Staff responded no, it
 119 would not cause a problem. The Board agreed to hold over the cooperative agreement until the Board's April
 120 monthly meeting. Administrator Bleser said she would send a PDF of the cooperative agreement to the managers.

121 Attorney Welch asked the Board for direction on an element of the contract. He described the issue and asked the
 122 Managers if it is important to the managers that the investment the District makes in this project has a lifespan
 123 that is protected under the agreement for more than the 20 years identified in the contract. Attorney Welch noted
 124 the property is public property and declarations won't be recorded on it. Engineer Sobiech said 20 years is more
 125 than enough time to establish a very robust project. Attorney Welch talked about ways the Board could approach
 126 this issue.

127 After discussion among the managers, Manager Koch moved to direct legal counsel regarding terms of the
 128 contract 20 years is enough time to establish the project and that for any transfer within the 20-year period the
 129 transferee would be responsible for the maintenance and after 20 years the transferee would agree not to take any
 130 action that would materially degrade the project. Manager Pedersen seconded the motion. Upon a vote, the
 131 motion carried 5-0.

8. Citizen Advisory Committee

132 Mr. Matt Lindon summarized the most recent CAC meeting. He commented that the CAC is as healthy and
 133 functional as the Committee has ever been. He talked about the CAC subcommittees, including education, lakes
 134 and streams, stormwater, landscaping for water quality, groundwater, and wetlands, and explained that each
 135 subcommittee is responsible for its own charter. He summarized the CAC's review of and discussion about the

136 District's Cost-Share Program. Manager Ziegler noted a citizen suggested to him via an email that the Board
137 handle corrections to its minutes with change tracking via email, and still complying with the Open Meeting Law,
138 instead of during the monthly meeting in order to save time. The Board, Attorney, and staff discussed the idea.
139 Manager Koch moved to adopt the process of providing Word documents to the managers and staff, who will
140 compile comments using the redline tracking feature, and the Administrator will compile those comments into the
141 final draft minutes to be included in the Board packet as the draft minutes. Manager Ziegler seconded the motion.
142 Upon a vote, the motion carried 5-0.

9. Consent Agenda

143 Manager Koch moved to approve the Consent Agenda as amended. Manager Crafton seconded the motion. Upon
144 a vote, the motion carried 5-0.

10. Action Items

a. Accept January Treasurer's Report

145 Treasurer Crafton reported that she and the District Administrator reviewed the report in accordance
146 with the District's practices and procedures. Treasurer Crafton moved to accept the January
147 Treasurer's report. Manager Ziegler seconded the motion. Manager Koch raised his concerns
148 including that information on the report's page 2 is not consistent with the budget adopted by the
149 Board. He also noted that at last month's meeting he requested staff present information at this
150 meeting about the 2018 year-end financials. There was discussion of the Treasurer's Report, grants
151 received since the time the 2019 budget was adopted, 2018 year-end financials, and opinions on how
152 information should be presented in the Treasurer's Report. Manager Crafton called the question on
153 the motion on the table. Upon a vote, the motion carried 4-1 [Manager Koch voted against the
154 motion.]
155

b. Approve Paying of the Bills

156
157 Manager Crafton moved to pay the bills. Manager Pedersen seconded the motion. Upon a vote, the
158 motion carried 5-0.
159

c. Direct Governance Committee to Review Fund Balance Policy Update and Investment Deposit Policy

160
161 President Ward moved to have the Governance Committee review the District's Fund Balance
162 Policy and Investment Deposit Policy. Upon a vote, the motion carried 5-0.
163

d. Wetland Restoration Project at Pioneer Trail [Chanhassen Transferring Grant to Watershed District]

164
165
166 Mr. Jeffery explained that in front of the Board is action to authorize staff to apply for a Department
167 of Natural Resources (DNR) grant to purchase specific properties. He used PowerPoint slides to
168 display a map showing three properties in Chanhassen built in the floodplain in the 1960s. He noted
169 that these properties drain into the same watershed as the Avienda project. Mr. Jeffery reported that
170 the City of Chanhassen is in the process of purchasing one of the properties and that the owners of
171 the other two properties have communicated that they will sell their properties to the City. He added
172 that the DNR grant would be a 50-50 match and the City of Chanhassen has \$300,000 available in
173 funds that were provided to offset water-resource impacts of the Avienda project. He reiterated that
174
175

176 staff is asking the Board to direct staff to apply for a DNR grant for this project. Mr. Jeffery said
 177 staff will come back in April with more details on the project. He noted that the District has Clean
 178 Water Legacy grant funds for the restoration but those funds can't be used to purchase the property.
 179 Mr. Jeffery noted that ordering the project would require a public hearing. Mr. Jeffery responded to
 180 manager questions.

181
 182 Manager Koch moved to approve the resolution and to authorize the President or Secretary to sign
 183 off on the Resolution and have the District's legal counsel to review and approve the resolution
 184 before it is signed. Manager Crafton seconded the motion. Upon a vote, the motion carried 5-0.

185
 186 **e. Adopt Resolution 2019-008 to Amend 2018 Plan's Cost-Share Program**

187 Manager Ziegler moved to adopt Resolution 2019-008 to Amend the 2018 Plan's Cost-Share
 188 Program. Manager Crafton seconded the motion. There was a roll call vote.
 189

<i>Manager</i>	<i>Aye</i>	<i>Nay</i>	<i>Absent</i>	<i>Abstain</i>
Crafton	X			
Pedersen	X			
Ward	X			
Ziegler	X			
Koch	X			

190 The president declared the motion adopted 5-0.

191 **f. Approve Release of Cost-Share Program**

192 Manager Ziegler moved to approve and release the new Cost-Share Program. Manager Pedersen
 193 seconded the motion. Manager Koch raised his concerns about what the eligible percentage could
 194 apply toward and the lack of language to clarify such. He said there are inconsistencies about when
 195 a project can move forward. Manager Koch moved to amend the motion and to direct Legal Counsel
 196 to review the Cost-Share Program information for inconsistencies that might cause issues and for
 197 staff to make changes as needed to clear up the inconsistencies. Manager Ziegler seconded the
 198 motion to amend. Upon a vote, the motion to amend carried 2-0-3 [Managers Ward, Pedersen, and
 199 Crafton abstained from vote.] Upon a vote the motion on the table carried 4-1 [Manager Koch voted
 200 against the motion.]
 201

202 **g. Authorize Administrator to Execute Task Order 26 Stormwater Model Option**
 203 **Alternative Phase A**

204 Administrator Bleser detailed the Option Alternative Phase A and explained staff's recommendation
 205 to authorize the Administrator to Execute Task Order 26 Stormwater Model Option Alternative
 206 Phase A. Manager Crafton moved to Authorize the Administrator to Execute Task Order 26
 207 Stormwater Model Option Alternative Phase A. Manager Pedersen seconded the motion. Upon a
 208 vote, the motion carried 5-0.

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h. AIS Survey

Administrator Bleser shared a presentation from the Bassett Creek Watershed Management Commission about how it gathered information about who in the watershed was doing what about invasive species. She went through the presentation and the tables within it. Administrator Bleser said one idea is for the District to engage the different entities within the watershed to formally identify what each of those entities is willing to do toward AIS and to identify gaps. The Board indicated it is interested in staff moving forward in this direction.

i. After-the-Fact Permit Applications (Manager Koch)

Manager Koch moved to direct staff to gather data and come back to the Board with recommendations on how to deal with after-the-fact permits including how the District will get information on that permit and will be reimbursed costs. Mr. Jeffery responded that the managers recently adopted an updated fee schedule that addresses this matter and directs that any after-the-fact permit application must be decided by the Board of Managers. Mr. Jeffery said he will confirm the language in that resolution. Manager Koch requested an update about it at the next monthly Board meeting because the District wants to make sure it recoups its costs.

j. Permit Fees and Data (Manager Koch)

Manager Koch discussed his opinion that there was a significant deficit in permit fees against costs in 2018 and that the District should analyze what were the District's permit costs and fees and review the information and review the fees, whether the District changes fees this year or next year. He said he thinks the District should even amend its rules to make sure the District can recoup the costs of having to go chase those people for inspections. Manager Koch moved to direct staff to collect the information he just described and deliver the information to the Board so the Board can analyze it and decide if the fee schedule still makes sense. Mr. Jeffery commented that retrieving the Engineer's and legal counsel's past costs per permit fee wouldn't be difficult, but he hasn't tracked his time per permit. There was discussion about tracking time and analyzing permit fee costs.

President Ward remarked he thinks it is the staff's role to analyze this issue and if staff thinks changes are needed, then staff should bring the topic in front of the Board at a monthly meeting. The discussion continued about the data behind the permit fees set by the District. Manager Koch's motion failed for lack of a second. After additional discussion, Mr. Jeffery asked if the Board wants him to begin tracking the time he spends on permit activities and on a permit-by-permit basis. President Ward said this is for staff to discuss and figure out. Administrator Bleser said staff will figure out the logistics of tracking staff time going forward with the 2019 construction year.

k. Hire IT Consultant (Manager Koch)

Manager Koch stated that because of the risks of hacking and data breaches. He felt it is important for the District to hire an information technology consultant. He moved to direct staff to solicit proposals for an IT consultant and receive and bring to the Board at least three IT consultant proposals. The motion failed due to lack of a second.

l. Create an Audit and Risk Committee (Manager Koch)

Manager Koch talked about why he felt it is important to create an Audit and Risk Committee. He moved to create an Audit and Risk Committee that would include at least two Board managers, the

254 District Administrator, and the accountant and would supervise the annual audit and make
255 recommendations to the Board. The motion failed due to lack of a second.

256
257 Manager Koch commented that an agenda item held over from last month was the legal review item.
258 He stated that Attorney Smith said he felt Smith Partners could cover contracting, Open Meeting
259 Law and Data Practices Act.

260
261 **m. Hire an HR Consultant (Manager Koch)**

262 Manager Koch explained to the Board why he felt it is important for the District to hire an HR
263 consultant. He moved to direct staff to solicit proposals from at least three HR managers to review
264 the District's policies and procedures and to bring the proposals to the Board. The motion failed due
265 to lack of a second.

266
267 **n. Host Public Hearing on Hyland Lake Alum Treatment at April Meeting**

268 Administrator Bleser explained that later on the agenda is a Task Order for this project, which is
269 included in the District's 10-Year Plan and in the District's budget. She described the timeline for
270 the project and said a public hearing is required before the project can be ordered. She asked the
271 Board to direct staff to publish notice for an April 3, 2019, public hearing on the Hyland Lake Alum
272 Treatment.

273
274 Manager Koch moved to authorize legal counsel and the District Administrator to work on and
275 publish the notice for the April 3, 2019, public hearing for the Hyland Lake Alum Treatment.
276 Manager Ziegler seconded the motion. Upon a vote, the motion carried 5-0.

277
278 **o. Authorize President to Execute Cooperative Agreement with the City of Eden Prairie
279 and Lower Minnesota Watershed District After Execution from City of Eden Prairie**

280 *[Item tabled to the Board's next monthly meeting. See item 10d.]*

281
282 **p. Approve Task Order for Hyland Lake Alum Application**

283 Manager Ziegler moved to Approve Task Order for Hyland Lake Alum Application. Manager
284 Pedersen seconded the motion. Attorney Welch recommended the Board's condition approval of
285 work on items 4 and 5 are contingent on the board ordering of the project. Manager Ziegler moved
286 to amend to make items 4 and 5 of the task order contingent upon ordering the project. Manager
287 Pedersen seconded the motion. The motion to amend carried 5-0. President Ward called the vote on
288 the amended motion. The amended motion carried 5-0.

289
290 **q. Approve Task Order for Lake Riley Subwatershed Assessment**

291 Manager Koch confirmed with staff that RPBCWD has an existing service agreement with Wenck.
292 Manager Koch moved to approve the Task Order for Lake Riley Subwatershed Assessment subject
293 to amendment if deemed necessary by legal counsel to make the task order consistent with the
294 existing services agreement with Wenck. Manager Ziegler seconded the motion. Upon a vote, the
295 motion carried 5-0.

296
297 **r. Approve Task Order for Mitchell Lake Subwatershed Assessment**

298 Manager Koch moved to approve the Task Order for Mitchell Lake Subwatershed Assessment

299 subject to amendment if deemed necessary by Legal Counsel to make the task order consistent with
300 the existing services agreement with Wenck. Manager Ziegler seconded the motion. Upon a vote,
301 the motion carried 5-0.

302 **s. Approve Task Order for RPBCWD Permit/Grant Database System Agreement**

303 The Board tabled this item to a future meeting in order for Legal Counsel to have time to review the
304 agreement.
305

306 **t. Approve Task Order 6f WOMP Station**

307 Manager Koch asked if any of the Watershed Outlet Monitoring Program functions are things the
308 District should consider having staff do instead of Barr. Administrator Bleser and Engineer Sobiech
309 talked about Barr staff collecting data after storms. Administrator Bleser noted that in previous staff
310 discussions about that work, District staff have raised concerns with its capacity to do that work.
311 Manager Ziegler moved to approve Task Order 6f WOMP station services. Manager Koch seconded
312 the motion. Upon a vote, the motion carried 5-0.
313
314

11. Discussion Items

315 **a. Chloride Management Plan Rule J Section 3.8**

316 Mr. Jeffery summarized that staff would like to have a policy in place that clearly communicates the
317 chloride management requirements for single-family home developments and staff will come back next
318 month with that policy. Attorney Welch said the distinction staff is raising is that single-family owned
319 home properties' common areas, if any, and any public or private streets would be subject to the chloride
320 requirement, but individual single-family home properties within a subdivision would not. There was
321 discussion of the details, and staff communicated it believes the nuances can be handled through a policy.
322 Mr. Jeffery noted that the Board adopted an updated financial assurance schedule in January and the
323 schedule should have specified a chloride financial assurance. He said staff will bring this proposed
324 language back to the Board next month as well.
325

326 **b. Upcoming April Board Meeting**

327 **i. Board/Staff Retreat Governance**

328 Administrator Bleser reported she is working on coordinating with the Board of Water and Soil
329 Resources for a date for this retreat and will update the Board when she has more details.
330

331 **ii. Eden Prairie/Board Workshop March 19, 2019, 5:00 p.m., Eden Prairie City Hall,**
332 **Lower Level**

333 President Ward explained the joint workshop between the Board of Managers and the City of
334 Eden Prairie City Council will be on March 19 at 5 p.m. until no later than 6:30 p.m. at Eden
335 Prairie City Hall in the lower level.
336

12. Upcoming Events

- 337
- Carver County Stormwater Workshop, March 8, 8:30 a.m. -11:30 a.m., Chaska Government

Center

- RPBCWD at Eden Prairie Home and Garden Expo, March 16, 9:00 a.m.-3:00 p.m., Grace Church, Eden Prairie
- Citizen Advisory Committee Meeting, March 18, 2019, 6:00 p.m., District Office, 18681 Lake Drive East, Chanhassen
- Smart Salt Training for Schools, March 25, 9:00 a.m.-2:30 p.m., Bloomington Public Works
- RPBCWD Regular Monthly Board Meeting and Public Hearing, April 3, 2019, 7:00 p.m., District Office, 18681 Lake Drive East, Chanhassen
- First Friday Hike with the Watershed, April 5, noon-1:00 p.m., Location TBC
- Meet and Greet, April 10, 2019, 4:00 p.m.-6:30 p.m., District Office, 18681 Lake Drive East, Chanhassen

13. Adjourn

Manager Pedersen moved to adjourn the meeting. Manager Pedersen seconded the motion. Upon a vote, the motion carried 5-0. The meeting adjourned at 4:02 p.m.

Respectfully submitted,

David Ziegler, Secretary

Minutes: Monday, March 18, 2019
RPBCWD Citizen's Advisory Committee Monthly Meeting
Location: RPBCWD offices: 18681 Lake Street, Chanhassen

CAC Members

Jim Boettcher	P	Peter Iverson	A	Sharon McCotter	E	Marilynn Torkelson	P
Scott Bryan	E	Daryl Kirt	A	Jan Neville	P	Lori Tritz	P
Anne Deuring	P	Denny Kopfmann	P	Joan Palmquist	P	Ali Tuttle	R
Barry Hofer	E	Matt Lindon	P	Samir Penkar	P		

Michelle Jordan	RPBCWD staff	P
Dick Ward	RPBCWD Board of Managers	P
Larry Koch	RPBCWD Board of Managers	P
Terry Jeffery	RPBCWD Permits Coordinator & Project Manager	P

Summary of key actions/motions for the Board of Managers:

1. **Motions:** None

I. Opening

- A. Call CAC meeting to Order:** President Lori Tritz called the meeting to order at 6:03 p.m. Welcome
- B. Attendance:** As noted above.
- C. Matters of general public interest:** None
- D. Approval of Agenda:** The date of the next Board meeting should be April 3. Jim moved and Jan seconded to approve the agenda as corrected. Motion carried.
- E. Approval of CAC Meeting Minutes:** Joan moved and Jan seconded to approve the minutes of the February 25, 2019 CAC meeting. Motion carried.

II. Manager Dick Ward: Stopped in to introduce himself and thanked us for our diligence and commitment to the Watershed District.

III. Staff Reports

- A. Staffer of the Month - Terry Jeffery,** Permit Coordinator and Project Manager for the Watershed District, gave us an overview of what he does for the District, including the wetland inventory and assessment (including a brief Wetlands 101) with the goal of identifying wetlands that could be restored or enhanced. We have 2011 individual wetlands totaling 5000 acres. Terry explained how a developer might get a permit to fill a wetland including nearby mitigation and out-of-the-watershed mitigation. Terry gave an update on the status of the 3 wet properties on Pioneer Trail and the former Prince property development. He feels the proposal for 169 units on the former Prince property to be quite ecologically sensitive.
- B. Cost Share Update:** Michelle reported the revamped Stewardship Grant program (cost share) was approved at the last Board meeting and is up and running. The review committee has already met to review a grant request for a vacuum sweeper truck by the City of Chanhassen which they recommended for approval. Because the grant was for more than \$20,000 it needs to go to a public hearing and then to the Board of Managers for review.
- C. Project Updates:** Applications are now closed for the targeted Duck Lake neighborhood raingarden project. The goal of 25% participation was attained. Michelle hopes to use this project as a template for other subwatersheds. Michelle also wants to create a maintenance guide for rain gardens.

There has been winter kill in Duck Lake and Lake Lucy, probably due to low oxygen levels from snow covered ice. It is a natural phenomenon (for once humans weren't responsible!). Fish kills can also happen in the summer due to high heat or bacteria.

- IV. Board of Managers Meeting:** Matt Lindon reported the major topics discussed were the AIS decontamination site at Lake Riley, the revamped cost share program, the permit & cost share database, the former Prince Property, and the Pioneer Trail wetland restoration project.
- V. New Business**
- A. Subcommittee Charters:** Joan, in conversation with Terry Jeffery, created a Wetland Subcommittee Charter. It is an excellent example of what we are hoping each subcommittee will undertake. We would like to keep all charters in a central location so as CAC members come and go, the records will remain. We will spend time after the adjournment of our meeting in subcommittee work.
- B. Amend CAC Bylaws:** We reviewed the changes to the bylaws – basically responsibilities of CAC members. One typo was corrected. The newest members found the more specific language helpful. Joan moved and Matt seconded to approve the bylaw changes. Motion carried. Michelle distributed the final bylaws via email.
- VI. April Meeting Topics**
- A. Presentation: Groundwater (early on the agenda)
B. Discussion: Excess Salt Use Response – Sharon
C. Citizen Lake Monitoring - Sharon
- VII. Upcoming Events**
- A. RPBCWD Board of Managers meeting April 3, 7:00 pm, 18681 Lake Drive East (Marilynn will attend)
B. RPBCWD CAC meeting April 15 at 6:00 pm, 18681 Lake Drive East
C. 2019 Water Summit Bridging Science and Society, May 9-10, 2019, Science Museum of Minnesota, St. Paul
D. Sustainable Lawn class on May 21 and June 5
E. Workshop at EP City Hall at 5:30 tomorrow
F. Metro Wide Sustainability Commission Conference, 4/13/2019, 8:30 – 3:30, at Hennepin Ave United Methodist Congregation. Let Lori know tomorrow.
G. Isaac Walton Watershed Summit at Normandale, \$35, March 23, 9:30 – 4:00
- VIII. Adjourn CAC meeting:** Joan moved and Denny seconded to adjourn. Motion carried. Meeting adjourned at 7:58 pm and we continued working in subcommittees until 8:30.

RPBCWD March staff report

<i>Administration</i>		Staff update	Partners
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.	Administrator Bleser continues to work with the Auditor and Accountant on the Audit. A special meeting is planned in April to review the Audit.	
Annual Report	Water Quality Fact Sheets are completed.	The Annual Report is scheduled to be approved by the board at the April 3rd meeting. Administrator Bleser presented the annual report specific to Eden Prairie at a joint City of Eden Prairie/RPBCWD workshop.	
Internal Policies	Work with Governance Manual and Personnel Committees to review bylaws and manuals as necessary	The personnel committee has met to discuss organizational changes and salary adjustment.	
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 2019.	The CAC met for their regular monthly meeting, March 18. Draft minutes are included in the board packet. Administrator Bleser introduced herself to the new CAC at their February meeting. Staff Jeffery introduced himself at the March CAC Meeting and gave a presentation on an update of the Wetlands Program.	
Membership		The District has renewed its MAWD membership.	
<i>District-Wide</i>			
Regulatory	Review regulatory program to maximize	2 permit applications received.	

<p>Program</p>	<p>efficiency. Engage Technical Advisory Committee and Citizen Advisory Committee on possible rule changes. Implement regulatory program.</p>	<p>2 permits have been issued administratively. 6 Applications are currently under review. Staff Jeffery has met with potential applicants on 4 pending projects. Staff Jeffery met with Kimley Horn, the interim City Engineer for Chanhassen, and LMNRWD to discuss forthcoming Hwy 101 reconstruction project. See table at end of document for more details. Staff Jeffery and Engineer Sobiech will be hosting a listening session for stakeholders on April 24, 2019</p>	
<p>Aquatic Invasive Species</p>	<p>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. Review AIS inspection program. Keep abreast in technology and research in AIS.</p>	<p>The District hosted its Riley-Purgatory Creek Summit. State agencies, researchers and local government units came together to discuss the vegetation management plans and carp management. The District has scheduled vegetation surveys after ice out and is working with a hatchery to secure mature bluegills to restocks some of the lakes. The District will be hosting an AIS continuing education training for Adopt-a-Dock and other interested volunteers, July 9th (evening).</p>	<p>City of Chanhassen City of Eden Prairie University of Minnesota MN DNR Carver County</p>
<p>Cost-Share</p>	<p>Review program to determine efficiencies and needs. Recommend modification as necessary. Review applications and recommend implementation.</p>	<p>The Cost-share review committee met for the first time to review the application from the City of Chanhassen for a vacuum sweeper truck. The committee recommended the application for approval, as well as some minor</p>	

		adjustments to the application evaluation sheet.	
Data Collection	Continue Data Collection in permanent sites. Identify monitoring sites to assess future project sites.	<p>Staff completed last lake monitoring sampling event on the ice.</p> <p>WOMP stations: Continued bi-weekly sampling of the station; attended annual meeting to discuss changes and updates to data access, sampling procedures, and field sheets.</p> <p>Both Duck lake and Lake Lucy incurred a fish kill.</p> <p>Water quality report was submitted to the board in February.</p> <p>Staff is working on testing different spent lime/sand mixtures to determine filtering efficiencies.</p> <p>Started purchasing and assembling ENVIRODIY parts for pond project data stations.</p> <p>Submitted bluegill stocking applications for Lucy, Staring, Rec Area, Rice Marsh, and Duck</p> <p>Submitted carp management permits.</p>	<p>Metropolitan Council</p> <p>City of Eden Prairie</p> <p>University of MN</p>
District Hydrology and Hydraulics Model	<p>Coordinate maintenance of Hydrology and Hydraulics Model.</p> <p>Coordinate model update with LGUs if additional information is collected.</p> <p>Partner and implement with the City of Bloomington on Flood Evaluation and Water Quality Feasibility.</p>	At the March board meeting, the managers approved moving forward on a task order to look at flood vulnerabilities in the Hyland Lake Region	City of Bloomington
Education and Outreach	<p>Implement Education & Outreach Plan, review at year end.</p> <p>Manage partnership activities with other organizations.</p>	The District partnered with Richfield Bloomington WMO to offer a smart salting workshop for 29 Bloomington school staff.	Smart Salt Parking Lot and Sidewalk for school:

	<p>Coordinate Public Engagement with District projects.</p>	<p>Staff Swope worked with 2 volunteers to run a district booth at the EP Expo, in partnership with 9-Mile Creek WD. This year's cohort of Master Water Stewards completed the in-class portion of their training in March.</p> <p>Educator mini grants have been opened and two have already been received. A training for volunteers interested in participating in the Speaker's Bureau was held.</p> <p>The District will host a Smart Salting for Parking Lots and Sidewalks Training on April 11th, for anyone who manages snow and ice at a facility.</p> <p>Staff Swope is working with 3 students from Macalester College on a project to improve and expand the district's environmental justice work.</p> <p>A high school senior from Minnetonka has applied through her school to intern with the District as part of a capstone project (similar to Aimi Dickel in 2018).</p> <p>Staff composed an application to host a MN Greencorp member in 2019-2020, and identified 3 projects that Greencorps member could complete to build community resilience and increase District capacity. Submittal of application is conditional on board approval.</p> <p>Staff have continued to publicize the district's work and initiatives. In March, Eden Prairie News featured an article</p>	<p>RBWMO and City of Bloomington EP Expo: 9Mile WD</p> <p>Environmental Justice project: Macalester College</p> <p>High School Capstone: Minnetonka High School</p>
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		about our photo contest and one about an upcoming Smart Salting Training.	
Groundwater Conservation	<p>Work with other LGUs to monitor assess and identify gaps.</p> <p>Engage with the Technical Advisory Committee to identify potential projects.</p> <p>Develop a water conservation program (look at Woodbury model)</p>	Carver County WMO is piloting a groundwater conservation project in Chaska. Staff has been in contact with them to learn more about the project.	TBD
Lake Vegetation Management	<p>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.</p> <p>Implement herbicide treatment as needed.</p> <p>Secure DNR permits and contract with herbicide applicator.</p> <p>Lakes the District is monitoring for treatment include: Lake Susan, Lake Riley, Lotus Lake, Mitchell Lake, Red Rock Lake and Staring Lake.</p> <p>Work with Three Rivers Park District for Hyland Lake</p>	LGUs together with Consultants and university researchers identified next steps in the management of AIS in the Riley and Purgatory Creek Watersheds.	<p>City of Eden Prairie</p> <p>City of Chanhassen</p> <p>University of Minnesota</p> <p>MNDNR</p>
Opportunity Projects	Assess potential projects as they are presented to the District	A meeting was held with St. Hubert stakeholders to go over initial project ideas. The information gathered was used to draft the final memo of potential opportunity projects. Next steps include evaluating proposed bmps using the District's project scoring process and facilitating stakeholder consensus on a bmp(s) that address the goals and interests of all parties.	St Hubert Catholic Community

Total Maximum Daily Load	Continue working with Minnesota Pollution Control Agency on the Watershed Restoration And Protection Strategies (WRAPS). Engage the Technical Advisory Committee.	No Updates	MPCA
Repair and Maintenance Grant	Develop and formalize grant program.	No Updates	
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.	The Newman lab is finalizing the LVMP monitoring reports for Riley and Staring and project/sampling planning for spring/summer 2019. All cores for the Gulliver research have been collected.	Stormwater ponds partners: Bloomington, Chanhassen, Eden Prairie, Minnetonka and Shorewood Plant Management: Chanhassen Eden Prairie
Watershed 50 year Anniversary	Come explore with us! Finalize anniversary program for 2019. Implement anniversary events.	The Junior Watershed Explorer booklets are done and are available to the public. The first badges have been mailed out to participants. Our community mural from Feb 2nd has been finalized and delivered to the district office. The next opportunity to paint the “spring” mural will be June 22nd. A “walk-with-the watershed” will be at Purgatory Creek Recreation area April 5th at 12 noon.	

Watershed Plan	Review and identify needs for amendments.	Cost-share amendment has been distributed to all required parties and posted on the website.	
Wetland Conservation Act (WCA)	Administer WCA within the Cities of Shorewood and Deephaven. Represent the District on Technical Evaluation Panel throughout the District	Staff Jeffery attended the TEP for Duck Lake Road which was held on February 26 th . Staff Jeffery has been participating in the TEP discussions for the trail construction along T.H. 5 to the UofM Arboretum.	City of Shorewood City of Deephaven City of Chanhasen MCWD BWSR DNR ACOE
Wetland Management	Identify potential restoration/rehabilitate wetlands and wetland requiring protection.	Staff continues to input MNRAM into our database.	City of Chanhasen MNDNR
Bluff Creek One Water			
Chanhasen High School Re-use	Continue to work with all partners. Complete site restoration and start system. Finalize and implement E and O for project. Monitor Project.	No update. Will work with Peterson and the ISD #112 staff to coordinate starting the system for the season at the appropriate time.	ISD 212 City of Chanhasen Metropolitan Council
Bluff Creek Tributary Restoration	Implement and finalize restoration. Monitor Project.	No updates. Waiting for weather to cooperate for archeologists to conduct surveys for USACE permit.	City of Chanhasen
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 resource, reduce volume, rate, pollution loads to Bluff Creek	Staff Jeffery has submitted the grant application for 530 Pioneer Trail to the DNR for review. Staff Jeffery has been working with the owner of 530 to coordinate schedules.	City of Chanhasen MN DNR
Riley Creek One Water			
Lake Riley Alum	Continue to monitor the waters.	No updates	

Lake Susan Improvement Phase 2	Complete final site stabilization and spring start up. Finalize and implement E and O for project. Monitor Project.	No updates	City of Chanhassen Clean Water Legacy Amendment
Lower Riley Creek Stabilization	Coordinate agreement and acquire easements if needed for the restoration of Lower Riley Creek reach D3 and E. Implement Project. Continue Public Engagement for project and develop signage of restoration.	The cooperative agreement is finalized and we are waiting for the City of Eden Prairie to sign off on it.	City of Eden Prairie Lower Minnesota Watershed District
Rice Marsh Lake Alum Treatment	Monitor Project.	No updates	City of Eden Prairie City of Chanhassen
Rice Marsh Lake Watershed Load Project 1	Conduct feasibility. Develop cooperative agreement with City of Chanhassen	On hold until Public Works Director and Water resources Coordinator are in place. They have been hired but do not start until sometime in April.	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 Project Start design	On hold until Public Works Director and Water resources Coordinator are in place. They have been hired but do not start until sometime in April.	City of Chanhassen
<i>Purgatory Creek One Water</i>			
Duck Lake Raingarden Project	Work with the City to implement neighborhood BMP. Identify neighborhood BMP to help improve water resources to Duck Lake. Implement neighborhood BMPs.	Community member interest sign-ups have been closed, and an estimate of probable cost developed by the District Engineer. The project will be presented at a public hearing April 3, 2019.	City of Eden Prairie

Hyland Lake Internal Load control	Implement Hyland Lake Alum application.	Public Hearing to order project is scheduled for our April board meeting.	Three Rivers Park District City of Bloomington
Lotus Lake – Internal Load Control	Monitor treatment and plant populations.	No updates	
Scenic Heights	Continue implementing restoration effort. Work with the City of Minnetonka and Minnetonka School District on Public Engagement for project as well as signage.	Work has begun on planning the second volunteer planting event this spring. The summer explorers club is going to care for the gravel bed nursery over the summer with a new crop of trees. A second seeding of native plants will be conducted by the contractor in late spring.	Minnetonka Public School District City of Minnetonka Hennepin County
Silver Lake Restoration	Order project Design Project Work with the City of Chanhassen for Design, cooperative agreement and implementation	No Updates.	City of Chanhassen
Professional Development			
Impact Magazine & 2019 Specialty Conference	Staff Jordan’s article titled: Weaving Education and Outreach Into Your Projects: An Integral Part of Creating Success has been accepted for Impact Magazine. Jordan presented on the topic at the American Water Resources Association spring specialty conference on Integrated Water Resource Management in Omaha, NE. The historic flooding of the Missouri and Platte Rivers provided a powerful backdrop for discussions on flood control, pollution prevention, and supply. The importance of stakeholder engagement at multiple levels (organizational to		

	individual) was a common theme throughout the conference.
11th National Monitoring Conference	Staff Dickhausen and Staff Maxwell attended the 11th National Monitoring Conference hosted by the EPA, USGS, NWQMC, and NALMS in Denver, CO. from March 25th - March 29th. Over the course of the conference, they attended multiple sessions on topics related to water monitoring across the country. LimnoTech staff led several workshops at the conference on implementing EnviroDIY technology in water monitoring programs; in these workshops, they spoke about the District implementing this technology in our monitoring program.
Technical Advisory Panel	Staff Bleser is on the Technical Advisory Panel for a research from John Gulliver for MNDOT. Staff Bleser took part into a conference call to discuss methodology of the research.
Staff presentations	Staff Bleser presented at the City of Eden Prairie/RPBCWD joint workshop.
Environmental Law Institute	Staff Bleser will be leading two communication/engagement workshop as part of a two-day training from Wednesday, May 29 to midday Friday, May 31, 2019 at the National Conservation Training Center (NCTC) in Shepherdstown, West Virginia. Staff from all 50 states, DC, all 5 territories, 17 tribes, all 10 EPA regions, and EPA Headquarters will be participating, totaling over 200 people.

Regulatory Program

PERMIT #	APPLICANT	PROJECT	DATE SUBMITTED ON-LINE PAPER COMPLETE	STATUS	RULES
2018-044	United Properties	(r)Smith Village mixed use - Eden Prairie	6/8/18 6/29/18	Incomplete- no borings at proposed location of BMPs. Comments provided 7/9/18 and 12/11/18	C-EPSC J-Stormwater
2018-066	Presbyterian Homes	(r) Castle Ridge - Eden Prairie	10/18/18 10/23/18	Application on-hold per email correspondence w/ engineer 11/9/18 & 11/28/18	C-EPSC D-Buffers J-Stormwater
2018-071	MNTKA Public Schools	LAX Field Construction	12/6/18 Not received	Conditionally approved. Awaiting maintenance agreement	C - EPSC J-Stormwater
2018-072	Three Rivers Park District	Parking Reconfiguration - Bloomington	12/20/18 12/28/18	Conditionally approved. Awaiting maintenance agreement.	C-EPSC J-Stormwater
2018-073	Eden Prairie - Streets	Preserve Blvd Reconstruction	12/20/18	Approved - conditions met.	B-Floodplain C-EPSC D-Buffers J-Stormwater
2018-074	Eden Prairie - Utilities	Ground Storage Reservoir	12/21/18 12/26/18 1/28/19	On the 4/3/19 board meeting	C-EPSC J-Stormwater
2019-001	Lennar	(r) Nelson Property - Galpin Ave, Chanhassen	1/11/19 1/11/19	Noticed incomplete on 2/5/19. Developer working with City on PUD/	B-Floodplain C-EPSC D-Buffers G-Water X-ing J-Stormwater
2019-002	Shelangoski	Single family	1/8/19	Administratively approved	C-EPSC

		residence			
2019-003	Wooddale Builders	(r) Stable Path	1/16/19 1/16/19	On 4/3/19 agenda	C-EPSC J-Stormwater
Not Assigned	City of Chanhassen/ MNDOT	T.H. 101 Reconstruction	No application submitted.	In design and permit application phase. There have been 3 stakeholder meetings held.	B-Floodplain C-EPSC D-Buffers G-Water X-ing J-Stormwater
Not Assigned	Moments of Chanhassen, LLC	(r) Moments Senior Living	No application submitted.	Pre-application meeting with city and development team held on 12/20/18	C-EPSC D-Buffers J-Stormwater
2019-004	Eden Prairie - Engineering	Duck Lake Road	1/16/19 1/18/19	Tentatively scheduled for 4/3/19 board mtg	B-Floodplain C-EPSC D-Buffers G-Water X-ing J-Stormwater K-Variances
2019-005	Eden Prairie - Engineering	Single Tree Ln Improvements	1/17/19 1/22/19	Administratively approved 2/5/19	C-EPSC
2019-006	Minnetonka - Engineering	2019 Mill & Overlay Project	1/14/19 1/14/19	Administratively approved on 1/15/19	C-EPSC
2019-007	Great Oaks 2nd, LLC	Beverly Hills	1/25/19 2/28/19 3/08/19	Scheduled for 4/3/19 board mtg	C-EPSC, J-Stormwater
2019-008	Eden Prairie Parks	Staring Lake Pavilion	2/19/19 1/21/19	Schedules for 4/3/19 board mtg	C-EPSC, J-Stormwater
2019-009	Marcus Reidel	Reidel Home Addition	2/18/19 2/6/19 2/19/19	Administratively approved 2/22/19	C-EPSC, J-Stormwater
2019-010	ISD #112	Chan HS Sanitary Service Repair	2/22/19 2/25/19	Administratively approved 3/1/19	C-EPSC
2019-011	Bre Retail Residual Owner 6	Chase Bank	3/12/19 3/14/19	Under Review	C-EPSC, J-Stormwater
2019-012	Andrew	Outbuilding	3/21/19 3/28/19	Under Review	C-EPSC, J-Stormwater

	Costigan		3/28/19		
2019-013	Adam & Kelly Cozine	Pool	3/22/19 3/25/19	Under review	C-EPSC, J-Stormwater
2019-014	Eden Prairie - Engineering	Hennepin Town Rd Turn Lane	3/7/19 3/7/19	Administratively approved on 3/22/19	C-EPSC
2019-015	Chanhassen - Engineering	Lake Dr. East M & O	3/26/19 3/28/19	Under review	C-EPSC
Not Assigned	Hennepin County Library	Minnetonka Library Improvements	No submittal	Pre-submittal meeting w/ BKBM on 3/19/19	C-EPSC, J-Stormwater
Not Assigned	Minnetonka Residential Project	Legacy Homes	No submittal	Pre-submittal meeting w/ Wenck on 3/22/19	C-EPSC, D-Buffers, J-Stormwater

Memorandum

To: Riley-Purgatory-Bluff Creek Watershed District Board of Managers and District Administrator
From: Barr Engineering Co.
Subject: Engineer's Report Summarizing March 2019 Activities for April 3, 2019, Board Meeting
Date: March 28, 2019

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 2019.

General Services

- a. Worked with RPBCWD staff to update large wall map to reflect District branding and 2018 boundary change.
- b. Finalized Lower Riley Creek Corridor Enhancement Plan.
- c. Participated in the Participated in March 15th regroup meeting with Administrator Bleser, Counsel Smith, Manager Ward, and staff Jeffery in preparation for April 3rd meeting..
- d. Participated in the Duck Lake subwatershed assessment progress meeting on March 5th with Administrator Bleser, Community Outreach Coordinator Jordon, and Eden Prairie staff (Leslie Stovring and Patrick Sejkora to discuss outcome of public information meeting, the city policy on rainwater gardens and curb cuts, future activities (public hearing, project ordering, door knocking, quote requests, construction, tree planting, etc.) and project timeline.
- e. Met with Administrator Bleser and various RPBCWD staff on March 15th to discuss 2019 field sampling locations, spent lime treatment system monitoring and enhancement timelines, pond assessment work, upcoming project identified in the District 10-year plan, and brainstormed regulatory program improvements/modifications.
- f. Reviewed spent lime column testing data and worked on developing modifications to Lake Susan Spent lime system. Coordinated with suppliers and contractors on potential system enhancements. Began developing contract documents (i.e., plans, specifications, contract, etc.) for modifications to the Lake Susan spent lime filter.
- g. Provided 100-year flood elevation of the Purgatory Creek (801.33 NGVD29) adjacent to 11631 Welters Way in Eden Prairie to Patrick Sejkora (Eden Prairie staff).
- h. Provided Administrator Bleser a work scope for the USACE cultural field investigation for Bluff Creek Tributary restoration.
- i. Participated in the March 1st regular Board of Managers meeting.
- j. Prepared Engineer's Report for engineering services performed during March 2019.

- k. Miscellaneous discussions and coordination with Administrator Bleser about Lake Susan spent lime system, Bluff Creek restoration cultural work, regulatory reviews, District restructuring, audit questions, and upcoming Board meeting agenda.

Permitting Program

- a. *Permit 2018-028 Oak Point Elementary Parking Lot:* This project involves construction of a new parking lot and walkway in the southwest portion of the Oak Point Elementary School parcel on Staring Lake Parkway in Eden Prairie. The permit was conditionally approved at the September 5, 2018 regular meeting. The applicant submitted a modification request on January 22, 2019. Review comments were provided to the applicant on February 5th. Because the application is considered complete but the applicant has not addressed the comments in time for the March 1st meeting, the applicant requested a 60-day extension for the permit review period. Permit Coordinator Jeffery issued the extension until May 23, 2019. Responded to applicant's questions about restricted site criteria, timeline for resubmittal, and required infiltration testing.
- b. *Permit 2019-001: Galpin Site/Nelson Property:* The project proposes to construction of a 191 lot single family residential development on approximately 161 acres west of Lake Ann and Lake Lucy (formerly the Prince property). The site is located 0.5 miles north of Highway 5 on the east side of Galpin Blvd in Chanhassen, MN. There are 14 wetlands onsite, some of which the city of Chanhassen, the local governmental unit responsible for WCA, will allow to be filled and mitigated. The large wetland complex in the center of the site will be preserved and receives all stormwater runoff from the upland areas. This wetland is directly connected to Lake Ann and Lake Lucy. The site will be mass graded prior to construction of public improvements for urban development, including storm sewer and six stormwater basins. No development is proposed along the Lake Lucy and Lake Ann shorelines. This project will trigger RPBCWD Rules B, C, D, G, and J. Received materials on January 24th and completed completeness review with comments provided to the applicant on February 13, 2019. The application is considered incomplete. Reviewed updated MNRAM submitted by the applicant and provided RPBCWD wetland value determinations.
- c. *Permit 2019-003: Stable Path:* The project proposes to create a 17 lot subdivision of detached single-family homes on +/- 5.9 acres of land located along Stable Path in Eden Prairie, MN. This project will trigger RPBCWD Rules for erosion prevention and sediment control (Rule C) and stormwater management (Rule J). Reviewed revised submittal received on March 18, 2018. Drafted a permit review report for consideration at the April 3rd Board of Managers meeting.
- d. *Permit 2019-004: Duck Lake Road reconstruction:* The project includes full reconstruction of Duck Lake Road from Duck Lake Trail to Mallard Court in Eden Prairie, MN. The project also includes replacing the culvert under Duck Lake Road, installing a backyard drain behind the homes along pardons Drive, constructing an infiltration basin, and filling a portion of the floodplain of Duck Lake with only partial compensatory storage proposed). This project will trigger RPBCWD Rules B, C, D, F, G, and J. The applicant is requesting a variance from the requirement to provide compensatory storage (Rule B, subsection 3.2), the minimum wetland buffer width requirement (Rule D, subsection 3.2), no net increase in flood stage associated with a waterbody crossing (Rule G, subsection 3.2a), no increase in peak discharge (Rule J,

- subsection 3.1a), water quality treatment of all site runoff (Rule J, subsection 3.1c), and wetland protection criteria (Rule J, subsection 3.10bii). The DNR also confirmed that a project specific work in public waters permit is required for the project because the RPBCWD general permit does not apply to fill in public waters. Reviewed MNRAM summaries to determine wetland management classifications and additional wetland information. Received a complete application on March 7, 2019, reviewed revised submittals, reviewed MNDNR project filed for denied outlet modification, worked with applicants engineer to address modeling discrepancies. Revised information received on March 23rd and 26th was also reviewed. Drafted a permit review report for consideration at the April 3rd Board of Managers meeting.
- e. *Permit 2019-007: Beverly Hill:* The project proposes to construction of a 17 lot single family residential development on approximately 7.1 acres in Eden Prairie. The site is located north of Highway 61, near the intersection of Eden Prairie Road and Beverly Drive. The project includes one pond with infiltration bench on the northwest corner of the site, as well as, a rain garden to the northeast and a rain garden to the south of the site. This project will trigger RPBCWD Rules C, and J. Received materials on February 8th and completed completeness review with comments provided to the applicant on February 19th. Comments were addressed, and a complete submittal was received on March 8th. A full review of the application was completed on March 23rd. The revised information was reviewed and a permit review report was drafted for consideration at the April 3rd Board of Managers meeting.
 - f. *Permit 2019-008: Staring Lake Pavilion:* the project includes the reconstruction of the existing Staring Lake Park building, the surrounding trail and plaza areas, and a small portion of the adjacent parking area. The project includes an underground rock infiltration trench with a pre-treatment sump catch basin located south of the building on the parking lot island. The overflow from the rock infiltration trench will discharge into an infiltration basin that is to be constructed in the greenspace area just to the west of the existing driveway entrance. This project will trigger RPBCWD Rules C, and J. Received materials on February 19th and completed completeness review with comments provided to the applicant on February 28th. A complete submittal was received on March 18th, reviewed, and a permit review report was drafted for consideration at the April 3rd Board of Managers meeting.
 - g. *Permit 2019-011: Westwind Plaza:* The project proposes the demolition of a portion of an existing parking lot and construction of a new bank building in the shopping center at the northeast quadrant of the Highway 101 and Highway 7 intersection. The project includes two underground infiltration storage systems. This project will trigger RPBCWD Rules C, and J. Received materials on March 14th. The application was considered incomplete because electronic p8 model files were not submitted, and the 100-year, 10 day snowmelt event was not modeled in HydroCAD. A completeness review with comments was provided to the applicant on March 25th.
 - h. Performed erosion control inspections of active sites on March 18th and 19th. (see attached inspection report).
 - i. Miscellaneous conversations with Permit Manager Jeffery about technical questions on permit requirements for potential development and redevelopment projects.

Data Management/Sampling/Equipment Assistance

- a. Prepared, uploaded and verified 10 RMB laboratory (RMB) reports.
- b. Testing and correspondence with RMB regarding their Electronic Data Delivery for RMB subcontracted laboratories.

Task Order 6: WOMP Station Monitoring

Purgatory Creek Monitoring Station at Pioneer Trail

- a. Download and review data.
- b. File management – lab sheets.
- c. Update datalogger files.

Purgatory Creek Monitoring Station at Valley View Rd

- a. Download and review data.
- b. Review and summarize 2018 data. Prep data for entry into database.
- c. Site visit to inspect stream conditions during spring snowmelt.
- d. Update datalogger files.

Task Order 13b: Lake Susan Watershed Treatment and Stormwater Reuse Enhancements Design and Construction Administration

- a. All punch list items, with the exception of the items noted under the following item (b) have been completed by Peterson.
- b. Remaining items to be completed during winter 2018/2019 or at spring start-up
 1. Plant live plugs per the plans (Peterson)
 2. Coordinate with Watertronics on programming changes needed over the winter (Peterson). Re-upload system program with implemented changes to match the functional description in Div. 4090000 Section 1.09 and the requests for the HMI screen read-outs (Peterson/Watertronics)
 3. Verify system functions according to the functional description in Div. 409000 after programming modifications with Watertronics (Peterson/Barr Engineering)
 4. Dial in VFD and float set points for the iron-enhanced sand filter system (Peterson/Barr Engineering)
 5. Re-start the system and train of City staff on operations (Peterson)

Task Order 14b: Lower Riley Creek Final Design

- a. The city of Eden Prairie was unable to provide pedestrian bridge plans and specification signed by a professional engineer for the cities bridge. To keep the project moving and based on the direction from Administrator Bleser, Barr is reviewing and incorporating performance specification for the bridge and bridge foundation into the final plans and specifications. The

- performance specification will establish the criteria the design needs to meet, and it will be up to the contractor to complete the design for approval by the City.
- b. Received the permit from the US Army Corps of Engineers. We also contacted the DNR to discuss the DNR's permit application review.
 - c. Continued to work with Administrator Bleser and the city to complete the cooperative agreement.

Task Order 19: Chanhassen High School Stormwater Reuse Design

- a. No activity during March.

Task Order 21B: Bluff Creek Stabilization Project

- a. Began preparing to complete the cultural/historical investigation begin required by the US Army Corps of Engineers.
- b. Contacted the contractor, Sunram Construction, to discuss a revised timeline and draft a change order to revise the timeline and project cost.

Task Order 23: Scenic Heights School Forest Restoration

- a. No activity during March.

Task Order 24: Preliminary Engineering Study for Silver Lake Water Quality Treatment Project

- a. No activity during March.

Task Order 25: Duck Lake Water Quality Improvement Project

- a. Met with District staff and Eden Prairie City Engineering Department staff on March 5 to review community responses gathered at the February 12 public meeting and during the water quality BMP signup period that ended on February 28. The signups met the goals set out by District staff. Barr created a large format map showing property locations where residents had signed up for the various classes of water quality BMPs. City staff provided guidance for rainwater garden construction that would treat runoff from city right of way.
- b. Developed an engineer's opinion of cost for implementing the project, based on the BMP project goals set by District staff.
- c. Developed a technical memorandum estimating the pollutant reductions in runoff flowing to Duck Lake that would be expected through implementation of the project.

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

- a. Notified City of Bloomington staff that Task Order 26 was authorized, and received authorization to use the City's stormwater models for the evaluation.

To: Riley-Purgatory-Bluff Creek Watershed District Board of Managers and District Administrator
From: Barr Engineering Co.
Subject: Engineer's Report Summarizing March 2019 Activities for April 3, 2019, Board Meeting
Date: March 28, 2019
Page: 6

- b. Started reviewing City of Bloomington stormwater models and model parameters for Purgatory Creek and Hyland Lake. The first step includes a review of information provided by the City and making minor adjustments to the subwatershed divides so that they are consistent with subwatersheds used in the District's model.

In April, staff will begin the process of converting the City's XP-SWMM models to PCSWMM and updating the District's stormwater model.

To: RPBCWD Board of Managers
From: Dave Melmer
Subject: March 18 and 19, 2019—Erosion Inspection
Date: March 26, 2019
Project: 23/27-0053.14 PRMT 9016

Barr staff has inspected construction sites in the Riley Purgatory Bluff Creek Watershed District for conformance to erosion and sediment control policies. Listed below are construction projects and the improvement needed for effective erosion control. The sites were inspected from March 18-19, 2019.

Site Inspections

2015-010	Children's Learning Adventure - Private - Commercial/Industrial Northwest Corner of Highway 5 and Galpin Avenue Chanhassen, Minnesota 55317 No change since last month. Will monitor vegetation growth and establishment thru spring growing season-2019.	2019-03-19
2015-016	Blossom Hill - Private - Residential 10841 Blossom Rd Eden Prairie, Minnesota 55347 Majority of site is snow covered.	2019-03-18
2015-036	Saville West Subdivision - Private - Residential 5325 County Road 101 Minnetonka, Minnesota 55345 No change since February inspection. Site is snow covered.	2019-03-19
2015-050	Arbor Glen Chanhassen - Private - Residential 9170 GREAT PLAINS BLVD Chanhassen, Minnesota 55317 Open CA(s): Rock entrances need to be refreshed and at some sites installed. Tracking to street/sediment at gutter--needs a clean up. Catch basin protection installation next month. Deadline: 3/20/2019 Perimeter control (silt fence). Roadway and detention pond installed. All slopes have been stabilized and covered. Catch basin protection installation next month..	2019-03-19
2015-055	Hampton Inn Eden Prairie - Private - Commercial/Industrial 11825 Technology Drive Eden Prairie, Minnesota 55344 Site construction continues. Building demolition complete. BMP's in place. Piling and foundation currently being installed along with excavation activity.	2019-03-18
2016-017	SWLRT - Government - Other Varies Eden Prairie, Minnesota 55344	2019-03-18

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SWLRT work continues at Emerson site. BMP's installed. No other activity observed to date. March-2019.

2016-019 **Powers Ridge Lot 2 - Private - Commercial/Industrial** **2019-03-19**
1361 Lake Dr. West Chanhassen, Minnesota 55317
No site activity observed to date.

2016-020 **Prairie View Enclave - Private - Commercial/Industrial** **2019-03-18**
12701 Pioneer Trail Eden Prairie, Minnesota 55347
No activity observed to date.

2016-026 **Foxwood Development - Private - Residential** **2019-03-19**
9150 and 9250 Great Plains Blvd Chanhassen, Minnesota 55317
Multiple house construction CA opened. Site representative was notified. CA will remain open until visual on correction can be verified. Majority of site is snow covered. Rock entrances being installed or refreshed on day of inspection. (March)

2016-028 **Summit Place Apartments Drainage Improvements - Private - Residential** **2019-03-18**
8501 Flying Cloud Drive Eden Prairie, Minnesota 55344
No construction activity observed to date.

2016-032 **CSAH 61 Improvements - Government - Linear** **2019-03-18**
N/A Eden Prairie, Minnesota 55347
Construction continues. Slopes are covered with matting or have been spray tac'd. Area near creek crossing is completed.-- BMP's look good. Construction west of Lions tap continues to Eden Prairie Road. --BMP's look good. Access this month difficult due to snowmelt. (March-2019)

2016-033 **Anderson Lakes-Purgatory Trail - Government - Other** **2019-03-18**
Anderson Lakes PKWY and Purgatory Creek Eden Prairie, Minnesota 55344
No construction observed to date.

2016-041 **Chanhassen West Water Treatment Plant - Government - Other** **2019-03-19**
2070 Lake Harrison Road Chanhassen, Minnesota 55317
Will inspect after spring snowmelt--2019.

2016-042 **18663 St. Mellion Place--Eden Prairie (Bear Path)** **2019-03-18**

Will inspect after snowmelt-spring/2019.

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2017-001	Kopesky 2nd Addition - Private - Residential 18340 82nd St Eden Prairie, Minnesota 55347 Open CA(s): House site along West 82nd street needs rock entrance. Deadline: 4/15/2019	2019-03-18
	Site grading complete-house construction continues at two sites. Perimeter control installed. Majority of site is snow covered.	
2017-006	6687 Horseshoe Curve Chanhassen	2019-03-19
	No activity observed to date.	
2017-007	Cedarcrest Stables - Private - Residential 16870 CEDARCREST DR Eden Prairie, Minnesota 55347	2019-03-18
	No activity observed to date.	
2017-022	Chanhassen High School Stormwater Reuse - Government - Other 220 Lyman Blvd Chanhassen, Minnesota 55317	2019-03-19
	No change from last month.	
2017-023	Eden Prairie Assembly of God - Private - Commercial/Industrial 16591 Duck Lake Trail Eden Prairie, Minnesota 55346	2019-03-19
	Will inspect spring -2019 for vegetation growth and establishment.	
2017-024	Prairie Bluffs Senior Living - Private - Residential 10280 Hennepin Town Rd Eden Prairie, Minnesota 55347	2019-03-18
	Construction continues. CA opened for silt fence maintenance and bare soils. (Street tracking added). Site representative was notified. Majority of site is still snow covered. CA will remain opened. Street tracking observed after snowmelt.	
2017-026	6135 Ridge Road	2019-03-19
	No change since February inspection. Site is snow covered.	
2017-029	Tweet Pediatric Dentistry - Private - Commercial/Industrial 7845 Century Blvd. Chanhassen, Minnesota 55317	2019-03-19
	Will inspect next spring --2019-for vegetation growth and establishment.	
2017-030	Elevate - Private - Commercial/Industrial 12900 Technology Drive Eden Prairie, Minnesota 55344	2019-03-18
	Construction continues. Perimeter control installed. Catch basin protection installed. Some catch basins have bladders installed and	

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drainage will be directed to other basins. BMP's look good. Site is well maintained. Minor tracking to parking lot. March-2019.

2017-031 **Lion's Tap - Private - Commercial/Industrial** **2019-03-18**
16180 Flying Cloud Drive Eden Prairie, Minnesota 55347
No activity observed to date.

2017-032 **11193 Bluestem Lane - Government - Other** **2019-03-18**
11193 Bluestem Lane Eden Prairie, Minnesota 55347
Construction complete. Bio-logs can be removed. Will continue inspection after snowmelt.

2017-037 **The Venue - Private - Commercial/Industrial** **2019-03-19**
525 W 78th St Chanhassen, Minnesota 55317
Open CA(s): Rock entrance needs to be installed at entrance on ESE side of site. Catch basin protection needs to be installed site wide soon. Site representative was notified. Deadline: 4/20/2019

Construction continues.

2017-038 **West Park - Private - Residential** **2019-03-19**
760& 781 Lake Susan Drive 8601 Great Plains Blvd Chanhassen, Minnesota 55317
Construction continues. March-south side heavy tracking observed CA will remain open. Majority of site is snow covered. Silt fence on north side will need repairs once snow recedes/melts.

2017-039 **Mission Hill Senior Living - Private - Residential** **2019-03-19**
8600 Grate Plains Boulevard Chanhasen, Minnesota 55317
Construction continues. Majority of site is snow covered. Minor tracking to street observed.

2017-047 **Fawn Hill - Private - Residential** **2019-03-19**
7240 Galpin Road Chanhassen, Minnesota 55331
Open CA(s): CA opened for rock entrance at house site. Site representative was notified. Deadline: 4/20/2019

Site is snow covered--March inspection. CA opened for rock entrance at house site. Site representative was notified.

2017-052 **Old Excelsior Senior Living - Private - Residential** **2019-03-19**
17705 Hutchins Drive Minnetonka , Minnesota 55345
Open CA(s): CA for bare soils, no protection back of curbs and tracking/sediment at curb-gutter--site representative was notified. Deadline: 4/20/2019

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Exterior Construction complete. Perimeter control installed. BMP's
Site landscape grading halted for winter. Majority of site is snow
covered..

2017-063 **Clear Springs Elementary 2018 Gymnasium Addition -** **2019-03-19**
Government - Other
5621 County Road #101 Minnetonka, Minnesota 55345
Construction complete. Site is well contained. Final site grading to be
completed after spring snowmelt. Site is snow covered.

2017-064 **Scenic Heights Elementary School Forest Restoration -** **2019-03-19**
Government - Other
5650 Scenic Heights Drive Minnetonka, Minnesota 55345
Restoration suspended for winter. Site is snow covered.

2017-069 **Scheels Redevelopment - Private - Commercial/Industrial** **2019-03-18**
8301 Flying Cloud Dr. Eden Prairie, Minnesota 55344
No change since February inspection.

2017-072 **O'Reilly Auto Parts Eden Prairie - Private -** **2019-03-18**
Commercial/Industrial
8868 AZTEC DRIVE Eden Prairie, Minnesota 55347
No construction activity observed to date.

2017-073 **Preserve Village - Private - Residential** **2019-03-18**
9625 Anderson Lakes Pkwy Eden Prairie, Minnesota 55344
No change since February inspection.

2018-001 **Panera - Private - Commercial/Industrial** **2019-03-19**
531 W. 79th Street Chanhassen, Minnesota 55317
Construction complete. Will inspect next spring after snowmelt.

2018-004 **903 Lake Drive Chanhassen - Government - Other** **2019-03-19**
903 Lake Drive Chanhassen, Minnesota 55317
Construction appears to be completed. Will inspect next spring
through growing season--2019.

2018-011 **Maloney Shoreline Stabilization - Existing Single-Family** **2019-03-18**
108 Pioneer Trail Chanhassen, Minnesota 55327
No activity observed to date.

2018-014 **Eden Prairie Road Reconstruction** **2019-03-18**

Construction activity observed at south end. BMP's installed.
Construction continues on roadway. Road closed on north end.
(March-2019).

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2018-015 Starbucks Coffee House - Private - Commercial/Industrial 2019-03-19
19285 Highway 7 19245 Highway 7 Shorewood, Minnesota 55401
Construction continues. Site is snow covered. (March)

2018-016 Avienda - Private - Commercial/Industrial 2019-03-19
SW corner of Powers and Lyman Boulevard Chanhassen, Minnesota 55317
No activity observed to date.

2018-020 9770 Sky Lane - Existing Single-Family 2019-03-18
9770 Sky Lane Eden prairie, Minnesota 55347
Construction continues. Site is snow covered. (March)

2018-021 9810 Sky Lane - Existing Single-Family 2019-03-18
9810 Sky Lane Eden prairie, Minnesota 55347
Construction continues. Site is snow covered. (March)

2018-022 Sunrise Park Court Improvement - Government - Other 2019-03-18
9401 Bloomington Ferry Road Bloomington, Minnesota 55438
No change since February inspection.

2018-024 Kittelson Pool - Existing Single-Family 2019-03-19
2165 Wynsong Lane Chanhassen, Minnesota 55317
Construction complete- Will inspect spring 2019 for sod/seeding installation.

2018-025 Magellan Pipeline UCD Dig 8 through 12 2019-03-19

Open CA(s): Contractor parking area needs rock entrance installed-- tracking to street observed. CA opened. Site representative was notified. Deadline: 4/20/2019

Site work has begun at SW corner of site. Minimal BMP's installed. Much of site is flooded or snow covered.

2018-027 MAMAC - Private - Commercial/Industrial 2019-03-19
8189 Century Boulevard Chanhassen, Minnesota 55317
Construction continues. Site is snow covered.

2018-028 Oak Point Elementary School Parking Lot - Government - Other 2019-03-18
13400 Staring Lake Parkway Eden Prairie, Minnesota 55347
No construction observed to date.

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2018-034	Basin 05-11-A Cleanout - Government - Other Corner of Sequioa and Ginger Eden Prairie, Minnesota 55346 Robert Ellis-site representative stated that this work will begin in 2019. No activity observed to date.	2019-03-19
2018-038	Eden Prairie Senior Living - Private - Residential 8460 Franlo Rd Eden Prairie, Minnesota 55344 Construction continues.	2019-03-18
2018-039	Emerson Site Improvments - Private - Commercial/Industrial 12001 Technology Drive Eden Prairie, Minnesota 55344 Same conditions as February.	2019-03-18
2018-040	Center Point Carver Line Receiver Construction complete. Site is snow covered.	2019-03-19
2018-041	Abra Auto Body - Private - Commercial/Industrial 13075 Pioneer Trail Eden Prairie, Minnesota 55347 No activity observed to date.	2019-03-18
2018-043	Control Concepts - Private - Commercial/Industrial 8077 Century Boulevard Chanhassen, Minnesota 55317 No activity observed to date.	2019-03-19
2018-044	Smith Village - Private - Residential 16389 Glory Lane Eden Prairie, Minnesota 55344 No site activity observed to date.	2019-03-19
2018-047	Peterson Borrow Site - Private - Commercial/Industrial 15900 Flying Cloud Drive Eden Prairie, Minnesota 55347 BMP's in place. Pit is being used. Rock ditch checks installed to control spring snow melt run off.	2019-03-18
2018-049	D'Alessandro Home - Existing Single-Family 18702 Heathcote Dr Deephaven, Minnesota 55391 Construction has continues. CA opened for missing silt fence. Site is snow covered. CA will remain open until a visual confirmation of CA correction. (March)	2019-03-19
2018-050	Eden Prairie Cemetery - Private - Commercial/Industrial 8810 Eden Prairie Road Eden Prairie, Minnesota 55437	2019-03-18

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Construction limits have been surveyed and staked. No other activity observed to date.

2018-052 **HCRRA Culvert Replacement - Government - Linear** **2019-03-19**
Hennepin County Wayzata and Deephaven, Minnesota 55401
Construction complete. BMP's installed. Will inspect spring -2019 for vegetation growth and establishment.

2018-053 **Roberts Residence - Existing Single-Family** **2019-03-19**
5925 Ridge Road Shorewood, Minnesota 55331
No change since February inspection.

2018-055 **Park Trail Improvement Project - Government - Other** **2019-03-18**
1700 W. 98th Street Bloomington, Minnesota 55431
No change since February inspection..

2018-056 **Bluff Creek Restoration - Government - Other** **2019-03-19**
Liberty on Bluff Creek, Outlot B Audubon Road Chanhassen,
Minnesota 55317
No construction activity observed to date.

2018-058 **Walker Home - Existing Single-Family** **2019-03-18**
9108 Stephens Pointe Eden prairie, Minnesota 55347
Majority of site is snow covered.

2018-059 **Mason Point Landscaping - Existing Single-Family** **2019-03-18**
15363 Mason Pointe Eden Prairie, Minnesota 55347
Trees within construction area have been marked. No other activity observed to date.

2018-060 **Loichinger Residence** **2019-03-18**

Construction continues. Rock entrance has been installed. (March)

2018-061 **McCoy Lake Inlet Sediment Removal - Government - Other** **2019-03-18**
Mitchell Road and Cumberland Road Eden Prairie, Minnesota
55347
No construction to date.

2018-063 **Lake Susan Trail Rehab 2018 - Government - Other** **2019-03-19**
903 Lake Drive East Chanhassen, Minnesota 55317
Construction complete. Will inspect next spring for vegetation growth and establishment.

March 4, 2019

RE: 2019 Aquatic Plant Surveys for RPBCWD

Claire Bleser – District Administrator
Riley Purgatory Bluff Creek Watershed District
14500 Martin Drive
Suite 1500
Eden Prairie, MN 55344

Claire:

I have attached a proposal and services agreement for the requested aquatic plant surveys to be completed in 2019. If you agree with the terms of the attached agreement, please mail (or email) a signed copy of the agreement to my office.

As always, please feel free to contact me with any questions or additional requests. I am looking forward to collaborating with you and your staff again in 2019.

Sincerely,



James A. Johnson; MS, CLM
Aquatic Ecologist
Freshwater Scientific Services, LLC



PROPOSAL

March 4, 2019

1 PROJECT 2019 Aquatic Plant Surveys for RPBCWD

2 REQUESTED SERVICES

-
- 1 – Early-Spring CLP Delineation Surveys (Apr/May; 2 Lakes)
 - 2 – Late-Summer PI Surveys (Aug/Sep; 3 Lakes)
-

Curlyleaf Pondweed (CLP) Delineation Surveys

These surveys will search the littoral portions of Red Rock Lake and Lotus Lake to document the location and density of CLP. During each of these surveys, I will use a combination of surface observations, rake tosses, and sonar readings to locate and map CLP beds. Following each survey, I will use desktop GIS to map the location and density of CLP, propose treatment plots, and provide calculations of the area and depth in each proposed plot.

Point-Intercept Aquatic Plant Surveys

These lake-wide surveys will be conducted in the later summer (Jul-Sept) on Lotus Lake, Rice Marsh, and Lucy Lake. These surveys will use the same points as used in the most recent PI survey for each lake. At each of these sample points, I will document water depth, plant taxa retrieved (rake method), plant height, and the growth density of retrieved plant taxa (individually and collectively).

3 DELIVERABLES

Freshwater will provide the following items to you after completing the proposed services:

Item	Delivery Deadline
1 – CLP Delineation Reports (2 lakes)	1 week after completed
2 – Aquatic Vegetation Reports (3 lakes)	Dec 31, 2019

4 PRICE QUOTE

The following pricing for the proposed services will be honored through December 31, 2019.

Item	Price
1 – CLP Delineation Surveys	
• Lotus (150 acres)	\$ 1,450
• Red Rock (90 acres)	\$ 1,250
3 – Point-Intercept Surveys	
• Lotus (~190 points)	\$ 2,750
• Lucy (~125 points)	\$ 2,380
• Rice Marsh (~135 points)	\$ 2,450
Total	\$ 10,280

SERVICES AGREEMENT

1 AGREEMENT

This agreement is for services to be provided to Pulaski Lake Improvement District (“Client”) by Freshwater Scientific Services, LLC (“Freshwater”).

This agreement starts when signed by both Freshwater and Client, and ends on December 31, 2019. However, it may be ended at an earlier date by either Freshwater or Client with 30-days written notice. If ended early, Client agrees to pay Freshwater for all costs associated with completed services, and Freshwater agrees to provide Client with all of the materials or data already collected.

This document covers the entire agreement between Freshwater and Client, and overrides any other previous written or oral agreements between them. However, this agreement may be changed later on if both parties agree to such changes in writing (as described in item 6).

This agreement is governed by the laws of Minnesota. If any part of this agreement is found to be legally invalid or unenforceable, it will not affect the validity or enforceability of the rest of the agreement.

2 SERVICES

Freshwater will provide the following services to Client (see the attached proposal dated 3/4/19 for a full description of the services):

- | |
|---|
| 1 – Early-Spring CLP Delineations (2 lakes) |
| 2 – Summer PI Plant Surveys (3 Lakes) |

Freshwater will provide all equipment and personnel needed to conduct these services and will obtain any required permits needed to complete the services listed.

3 DELIVERABLES

Freshwater will provide the following items to Client after each survey is completed (see proposal for delivery dates):

- | |
|--|
| 1 – CLP Delineation Reports (2 lakes) |
| 2 – Lake Aquatic Veg Reports (3 Lakes) |

4 PAYMENT

Freshwater will invoice Client for the amount shown upon delivery of the reports (see attached proposal for details).

- | | |
|-----------------------------|----------|
| 1 – CLP Delineation Reports | \$ 2,700 |
| 2 – Aquatic Veg Reports | \$ 7,580 |

Client agrees to pay Freshwater within 30 days of being invoiced (due date will be explicitly stated on invoices). If Freshwater has not received full payment after the indicated due date, Client may be charged a late fee of 1.5% of the amount due for each month that it is left unpaid.

5 INSURANCE

Freshwater carries the following insurance (certificate available upon request):

General Liability Aggregate	\$2,000,000
Products/Operations	\$2,000,000
Personal/Advertising Injury	\$1,000,000
Watercraft Liability	\$ 500,000

6 COMMUNICATION

All required communication between **Client** and **Freshwater** will use the following contacts, with email being the primary means of communication:

Riley Purgatory Bluff Creek Watershed District

Contact: Claire Bleser – District Administrator

Phone: (952) 607-6512

Email: cbleser@rpbcwd.org

Freshwater Scientific Services, LLC

Contact: James A. Johnson

15771 Creekside Lane

Osseo, MN 55369

Phone: (651) 336-8696

Email: james@freshwatersci.com

Any communication regarding changes to this agreement must be explicitly stated in writing and signed or electronically authorized (emailed consent) by both parties to be effective.

7 ACCEPTANCE

I have read this entire agreement and understand its meaning and requirements. I am a representative of the **Riley Purgatory Bluff Creek Watershed District** with the legal authority to enter into this agreement on its behalf, and I willfully accept the terms of this agreement.

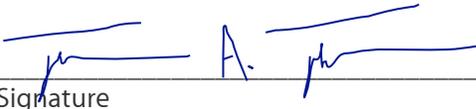
Signature

Date

Title/Position

Name (printed)

I have read this entire agreement and understand its meaning and requirements. I am a representative of **Freshwater Scientific Services, LLC** with the legal authority to enter into this agreement on its behalf, and I willfully accept the terms of this agreement.



3/4/2019

Aquatic Ecologist

Signature

Date

Title/Position

James A. Johnson

Name (printed)

Water Resources Report

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
2018 ANNUAL REPORT



Executive Summary

The Riley Purgatory Bluff Creek Watershed District (RPBCWD) had a successful water quality sampling season in 2018, 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 2018 sampling effort are presented in this report.

2018 LAKE SUMMARY

During the 2018 monitoring season, 13 lakes and one high value wetland (Lake Idlewild) 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 all waterbodies, assessed carp populations within the Riley and Purgatory Chain of Lakes, and assessed zooplankton and phytoplankton populations in five lakes. Staff were able to remove 1,901 common carp from the Purgatory Creek Recreation Area during the spring spawning run which reduced 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. Unfortunately, zebra mussels were found on Lake Riley, which is the first lake within the District to become infested. Successful alum treatments occurred on Lotus Lake, Round Lake, and Rice Marsh Lake in 2018. Herbicide treatments for curly leaf pondweed were conducted on Lotus Lake, Lake Susan, Mitchell Lake, Red Rock Lake, Staring Lake, and Lake Riley.

Surface water samples were collected, analyzed, and compared to standards set by the Minnesota Pollution Control Agency (MPCA) to assess overall lake health. Figure 1 displays lakes sampled in 2018 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). Lake Ann, Lake Idlewild, Lake Riley, Round Lake, Duck Lake, and Silver Lake met all three MPCA standards in 2018; Round (TP), Riley (Chl-a), Duck (TP), and Silver (Chl-a) did not previously meet all standards in 2017. This is the first time since data has been collected that Lake Riley and Silver Lake met all water quality standards. Lotus Lake, Red Rock, Rice Marsh, and Lake Susan all exceeded both the Chl-a and TP standards in 2018. Similar to 2017, Hyland did not meet all three standards in 2018. Mitchell Lake also did not meet all water quality standards due to the declined summer secchi disk average. Both Red Rock and Rice Marsh Lake declined in water quality as both

Chl-a and TP summer averages increased. All lakes met the nitrate/nitrite water quality standard and only Lake Idlewild did not meet the chloride standard.

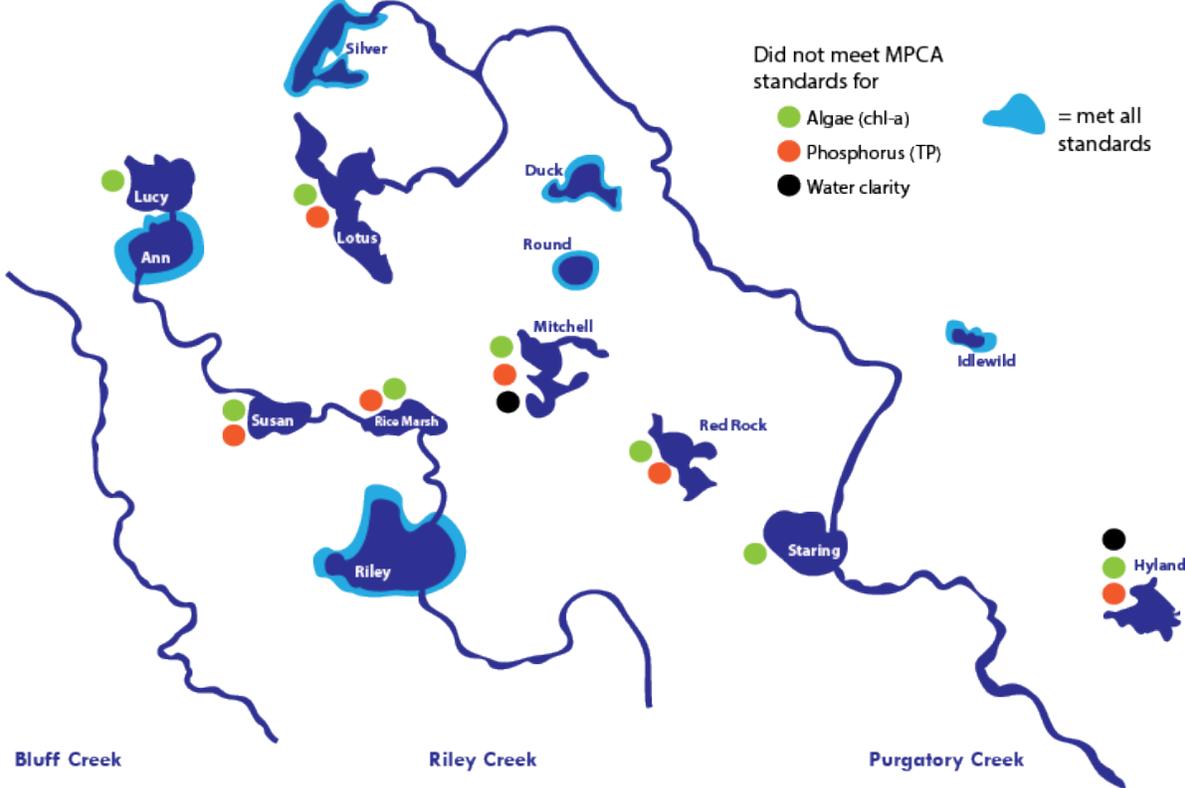


Figure 1 2018 Lake Water Quality

Summary of the lake water quality data collected in 2018 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) were assessed 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, 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.

2018 STREAM SUMMARY

In 2018, the District collected water quality samples and performed data analysis on 21 different sampling sites along Riley Creek (six sites), Bluff Creek (five sites), and Purgatory Creek (ten sites). During the 2018 creek monitoring season (April-September) water chemistry and turbidity were regularly measured at the 18-regular water quality monitoring sites every two weeks. Water samples were collected to assess nutrient (TP 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. The District collected macroinvertebrates at all five Riley Creek regular water quality sites in 2018. Sections of Purgatory Creek were walked and assessed using the Creek Restoration Action Strategy (CRAS) evaluation, which identifies stream reaches in the most need of restoration. Staff walked two new reaches during these evaluations. Overall, the 2018 CRAS scores of subreaches previously walked remained very similar to past scores. The two tributary streams not previously walked were determined to be in good to moderate condition. In 2018, the CRAS was published in the Water Science Bulletin of the Center for Watershed Protection.

The summary for all three creeks is based on water quality parameters developed by the MPCA in 2014 for Eutrophication and TSS. 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 > 4mg/L, summer season average TP < 0.1mg/L, TSS < 10% exceedance of 30mg/L limit during the summer season, summer season average Chl-a <18ug/L, and summer season average pH < 9su and >6su (MPCA, 2016).

P3 was the only regular creek sampling site to meet all MPCA water quality standards in 2018 (Figure 2). The overall number of water quality standard impairments increased from 2017 to 2018; Bluff had 10, Riley had seven, and Purgatory had nine (previously ten, two and seven, respectively). Bluff Creek remained the stream with the most impaired water quality, as previously seen in 2015, 2016, and 2017, with TP impairments at all sites, as well as TSS impairments at three sites, a DO impairment at B5, and a fish impairment at B1. Once again, TP was the water quality standard most impaired in 2018 with 10 of the 18 sites not meeting the standard (summer average <0.1 mg/L). TSS impairments increased from five impairments in 2017 to nine in 2018. The dissolved oxygen standard (daily minimum of 4mg/L) was impaired across five stream sites. All sites met the pH water quality standard (< 9su and >6su). Similar to 2016 and 2017, P2 was the only site which did not meet the Chl-a standard (summer average <18ug/L).

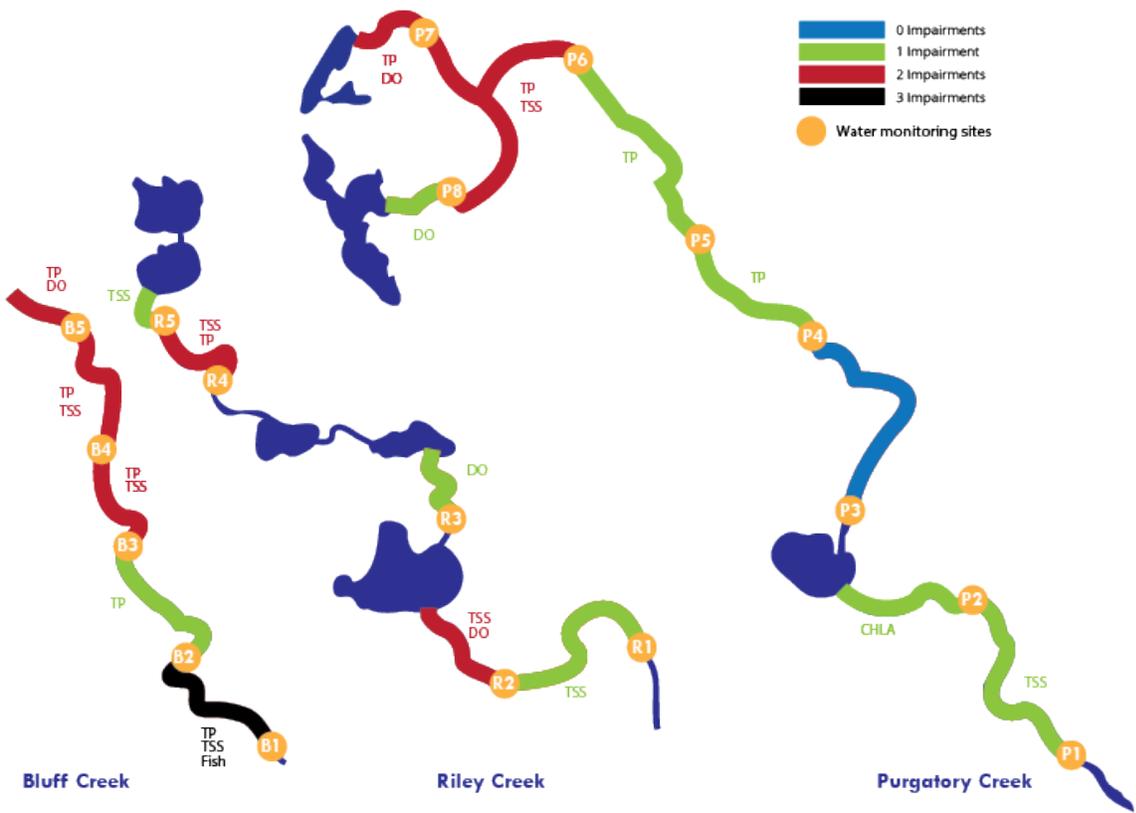


Figure 2 2018 Stream Water Quality

Summary of stream water quality data collected on Bluff Creek, Riley Creek, and Purgatory Creek in 2018 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 > 4mg/L, average Total Phosphorus (TP) < 0.1mg/L, Total Suspended Solids (TSS) < 10% exceedance of 30mg/L limit, average Chlorophyll-a (CHLA) <18ug/L, average pH < 9su and > 6su. 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
CRAS	Creek Restoration Action Strategy
CS	Chronic Standard
DO	Dissolved Oxygen
<i>E. coli</i>	<i>Escherichia coli</i>
EPA	Environmental Protection Agency
EWM	Eurasian Watermilfoil
ft	Foot/Feet
FWSS	Freshwater Scientific Services
GPS	Global Positioning System
ha	Hectare
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
NWS	National Weather Service
OHWL	Ordinary High-Water Level
ORP	Oxidation Reduction Potential
Ortho-P	Ortho-Phosphate
PAR	Photosynthetic Active Radiation
PCL	Purgatory Chain of Lakes
RCL	Riley Chain of Lakes
RPBCWD/District	Riley Purgatory Bluff Creek Watershed District
sec	Second
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
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 subwatersheds: Riley Creek Watershed, Purgatory Creek Watershed, and Bluff Creek Watershed.

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.

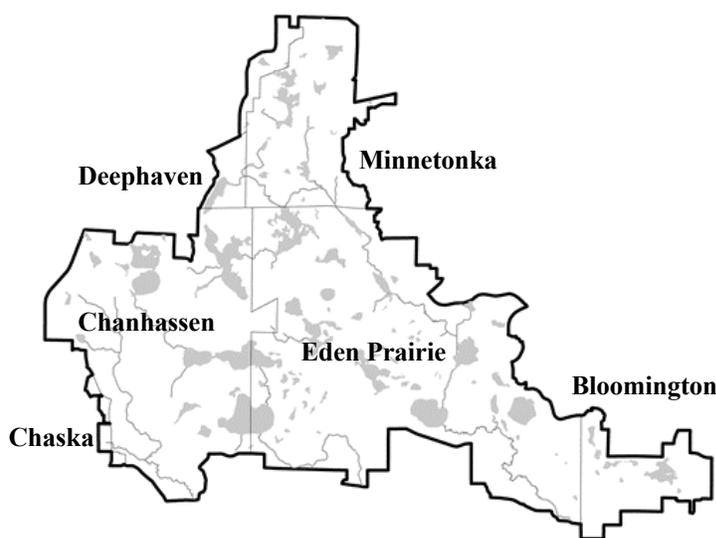


Figure 1-1 Riley Purgatory Bluff Creek Watershed District Boundary

Table 1-1 District Water Resource Sampling Partnerships

Water Resource	RPBCWD	Three Rivers Park District	EP	UMN	METC
Duck Lake	■				
Hyland Lake	■	■			
Lake Ann	■				
Lake Idlewild	■		■		
Lake Lucy	■				
Lake Riley	■			■	
Lake Susan	■			■	
Lotus Lake	■				
Mitchell Lake	■		■	■	
Red Rock Lake	■		■		
Rice Marsh Lake	■				
Round Lake	■		■		
Silver Lake	■				
Staring Lake	■			■	
Bluff Creek	■				■
Purgatory Creek	■				■
Riley Creek	■		■		■

Through partnerships with the cities of Chanhassen and Eden Prairie (EP), Three Rivers Park District, the University of Minnesota (UMN), and the Metropolitan Council (METC), water quality data was collected on 13 lakes, one high value wetland (Lake Idlewild), and 23 creek sites in the District. The 22 creek sites include six on Bluff Creek, six on Riley Creek, and eleven on Purgatory Creek. Lake McCoy and Neil Lake, which are 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 long-term monitoring program which identifies pollutant loads entering the Minnesota River. 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 (Section 4.5). Bank pin data was also 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 Riley Creek water quality sites in September and will be rotating through each stream moving forward.

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 also been identified as being detrimental to lake health and are continually monitored by the District. Winter monitoring occurred on the Riley Chain of Lakes (Lucy, Ann, Susan, Rice Marsh, and Riley), as well as four separate stormwater ponds in 2018. 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. Data was not collected in November and December due to unsafe ice conditions. In addition to lakes and streams, multiple stormwater ponds and other specialty projects were monitored to evaluate their effectiveness or contributing pollutant loads to the watershed.

Table 1-2 RPBCWD 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	■	■	■	■	■	■	■	■	■	■		
Mitchell Lake				■	■	■	■	■	■	■		
Red Rock Lake				■	■	■	■	■	■	■		
Rice Marsh Lake	■	■	■	■	■	■	■	■	■	■		
Round Lake												
Lake Riley	■	■	■	■	■	■	■	■	■	■		
Staring Lake				■	■	■	■	■	■	■		
Lake Susan	■	■	■	■	■	■	■	■	■	■		
Silver Lake				■	■	■	■	■	■	■		
Bluff Creek (5 sites)				■	■	■	■	■	■	■		
Purgatory Creek (8 sites)				■	■	■	■	■	■	■		
Riley Creek (5 sites)				■	■	■	■	■	■	■		

*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 2018 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 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 Water Quality Sondes, Lakes DS-5/ Streams MS-5) 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, and flow measurements (Flow Tracker) were collected as well. 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 2-2.

Table 2-2 Basic Water Quality Monitoring Activities

Pre-Field Work Activities	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Collect Zooplankton Tow (pulling a net) from Lake Bottom to Top Collect Phytoplankton Tow (2m surface composite sample) Collect Zebra Mussel Veliger Tow (pulling a net) from Lake Bottom to Top at Multiple Sites
Winter Lakes	<ul style="list-style-type: none"> Navigate to Monitoring Location Record Ice Thickness Read Secchi Disk Depth and Record Climatic Data Record Water Quality Sonde Readings at one Meter Intervals Collect Water Samples from top and bottom
Streams – Physical, Chemical, and Biological	<ul style="list-style-type: none"> Navigate to Monitoring Location Measure Total Flow by Measuring Velocity at 0.3 to 1 Foot Increments across Stream Record Water Quality Sonde Measurements Upstream of Flow Measurement in 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	<ul style="list-style-type: none"> 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

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 (2-3m). For all other lakes within the District, water samples were collected at the surface, middle, and bottom of

the lake. Lakes are monitored at the same location on each sampling trip, typically at the deepest part 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 using 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 2m 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-foot increments across the width of the stream using the FlowTracker Velocity Meter at each sampling location. If no water or flow was recorded, 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.

2.2 Analytical Laboratory Methods

RMB Environmental Labs, located in Detroit Lakes, 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 and phytoplankton 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 control duplicate samples and special water quality monitoring project samples. 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 for identification and 10% of zooplankton samples were Margaret Rattei at Barr Engineering for quality control duplicate samples.

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

Parameter	Standard Method
Alkalinity	EPA 310.2
Ammonia	EPA 350.1 Rev 2.0
Nitrogen, Nitrate & Nitrite	EPA 353.2 Rev 2.0
Chlorophyll-a	SM 10200H
Total Phosphorus	EPA 365.3
Orthophosphate	EPA 365.3
Chloride	SM 10200H

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 or lakes >15ft deep and < 80% of the total lake surface area able to support aquatic plants (littoral area), and 'shallow' lakes or lakes <15ft 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 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 as the Secchi Disk was visible at a deeper depth in the water column.

Chlorides (Cl) are of increasing concern, especially during the winter when road salt is heavily used. Targeted sampling occurs both during the winter and during early spring melting periods when salts are being flushed through our waterbodies. The Cl standard is the same for both deep lakes and shallow lakes. The table 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)	≤ 0.060	≤ 0.040
Chlorophyll-a (ug/L)	≤ 20	≤ 14
Secchi Disk (m)	≥ 1	≥ 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 levels but do not exceed the Chl-a (seston), cBOD, diel DO flux, or pH levels meet the eutrophication standard. The District added Chl-a to its sampling regime in 2015 to account for the polluted condition when Chl-a (periphyton) concentration exceeds 18ug/L. The daily minimum DO concentration for all Class 2B Waters cannot dip below 4mg/L to achieve the MPCA standard, which was used in the analysis for the Annual Report.

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 30mg/L more than 10 percent of the time during that period.

Table 3-2 MPCA Water Quality Standards for Streams

MPCA Standard	Parameter	Criteria
Eutrophication	Phosphorus	≤ 100ug/L

	Chlorophyll-a (seston)	$\leq 18\mu\text{g/L}$
	Diel Dissolved Oxygen	$\leq 3.5\text{mg/L}$
	Biochemical Oxygen Demand	$\geq 2\text{mg/L}$
	pH Max	$\leq 9\text{su}$
	pH Min	$\geq 6.5\text{su}$
Total Suspended Solids	TSS	$\leq 30\text{mg/L}$

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 2018.

4.1 2018 Lakes Water Quality Summary

The 2018 growing season Chl-a mean concentrations for all lakes sampled within the District are shown in Figure 4-1. Four lakes sampled within the District are categorized as ‘deep’ by the MPCA (>15ft deep, < 80% littoral area): Lake Ann, Lotus Lake, Lake Riley, and Round Lake. The MPCA standard for Chl-a in deep lakes (< 14ug/L) was met by Lake Ann, Lake Riley and Round Lake. Although Lotus Lake did not meet the standard, Chl-a levels decreased (a decrease of 18.6 ug/L from 2017). The remainder of the lakes sampled in 2018 are categorized as ‘shallow’ by the MPCA (<15ft deep, >80% littoral area): Duck Lake, Hyland Lake, Lake Lucy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Staring Lake, Lake Susan, and Silver Lake. Water quality metrics on Lake Idlewild, classified as a high-value wetland, were compared to MPCA shallow lake standards. The water quality standard for shallow lakes (< 20ug/L) was met by Duck Lake, Lake Idlewild, and Silver Lake in 2018. Lake Lucy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, and Staring Lake did not meet the standard, while Hyland Lake and Lake Susan more than doubled the MPCA standard. Chl-a levels increased from 2017 on Lucy, Red Rock, Rice Marsh, Susan, and Mitchell. The increases in Chl-a from 2017 in Red Rock and Rice Marsh were rather high (increases of 22.6ug/L and 12ug/L respectively). Hyland Lake and Staring Lake decreased in levels from 2017, with Staring just exceeding the MPCA standard (23.1ug/L) in 2018.

Overall, six of the 14 lakes sampled in 2018 met the MPCA Chl-a standards for their lake classification (six lakes also met standard in 2017, although not the same lakes): Lake Ann, Duck Lake, Lake Idlewild, Lake Riley, Round Lake, and Silver Lake.

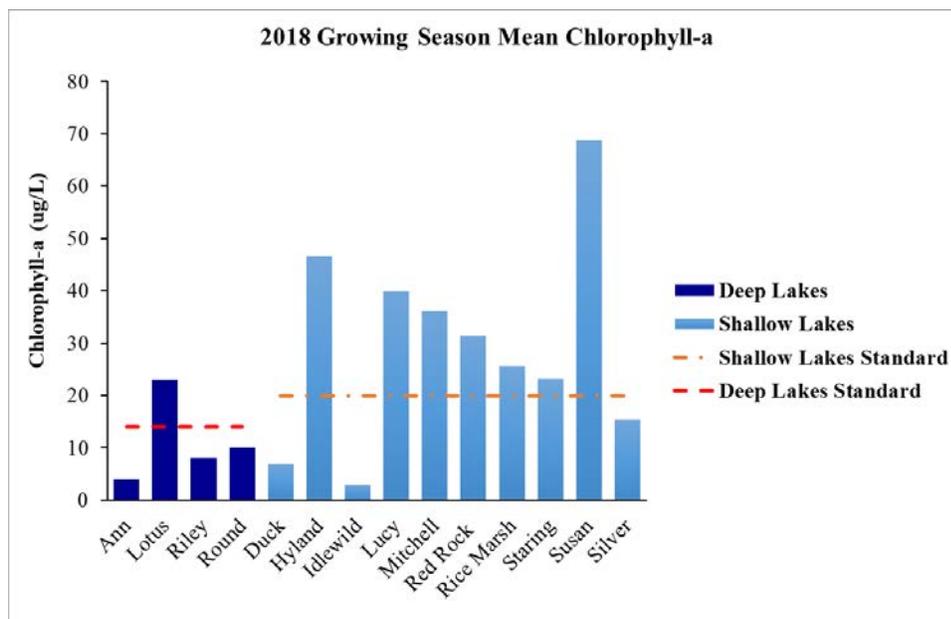


Figure 4-1 2018 Lake Growing Season Mean Chlorophyll-a

Lakes growing season (June-September) mean chlorophyll-a concentrations (ug/L) for shallow (lakes <15ft. 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 2018. The dashed lines represent the Minnesota Pollution Control Agency water quality standards for Chlorophyll-a for shallow (<20ug/L-orange dashed line) and deep lakes (<14ug/L-red dashed line).

The TP growing season averages for all lakes sampled within the District in 2018 are shown in Figure 4-2. The MPCA standard for TP in deep lakes (<0.040mg/L) was met by Lake Ann, Lake Riley, and Round Lake. TP levels were above the standard in Lotus; Round Lake’s TP average decreased 0.015mg/L from 2017, putting it just under the standard. Lake Riley’s TP levels continue to decrease year-to-year since the application of the aluminum sulfate treatment in 2016 (decrease of 0.003mg/L from 2017). For shallow lakes, the MPCA TP standard (<0.060mg/L) was met by Duck Lake, Lake Idlewild, Lake Lucy, Staring Lake, and Silver Lake in 2018. Despite having met the standard in 2017, both Red Rock and Rice Marsh did not meet the standard in 2018. Three of the shallow lakes decreased in overall TP levels, Hyland, Staring and Duck (Duck decreased TP by 0.022 mg/L, putting it below the standard).

Overall, eight of the 14 lakes sampled met the MPCA total phosphorus standard for their lake classification in 2018: Lake Ann, Duck Lake, Lake Idlewild, Lake Lucy, Lake Riley, Round Lake, Silver Lake, and Staring Lake.

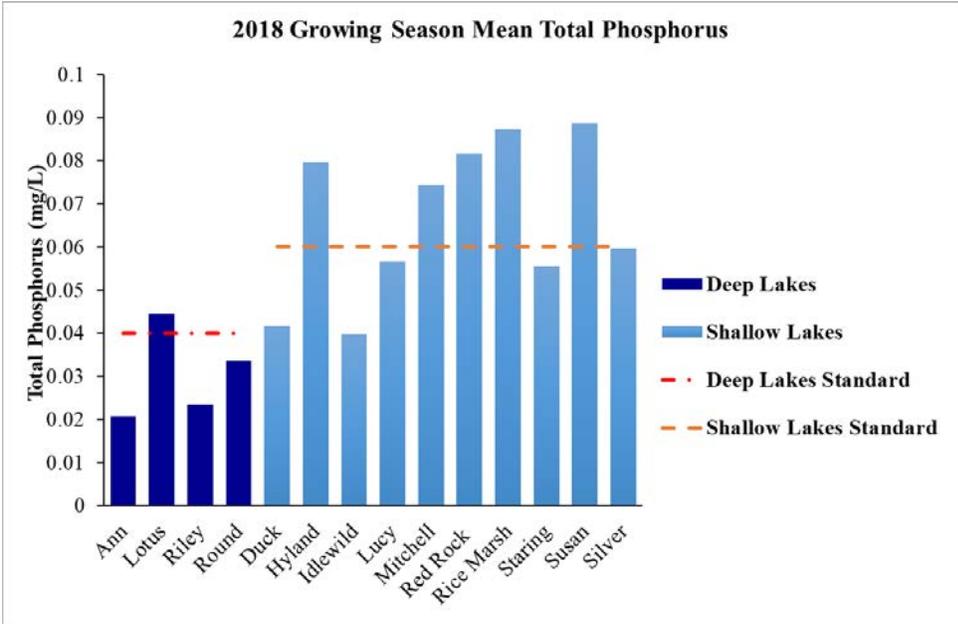


Figure 4-2 2018 Lakes Growing Season Mean Total Phosphorus

Lakes growing season (June-September) mean total phosphorus concentrations (mg/L) for shallow (lakes <15ft. deep, >80% littoral area-light blue bars) and deep lakes (lakes >15ft. deep, <80% littoral area-dark blue bars) in the Riley Purgatory Bluff Creek Watershed District during 2018. The dashed lines represent the Minnesota Pollution Control Agency water quality standards for Total Phosphorus for shallow (<0.060ug/L-orange dashed line) and deep lakes (<0.040ug/L-red dashed line).

The 2018 secchi disk growing season means for all District lakes sampled are shown in Figure 4-3. The MPCA standard for secchi disk depth/water clarity for deep lakes (> 1.4m) was met by all deep lakes in the District (Ann, Lotus, Riley, and Round). Ann, Lotus, and Riley all increased in clarity (1.04m, 0.006m, and 0.96m respectively). Round Lake only decreased 0.08m in average clarity. For shallow lakes, eight of ten lakes monitored achieved the MPCA secchi disk depth water quality standard (>1m). Hyland lake and Mitchell Lake were the only lakes which did meet the standard, although they were close, measuring an average clarity of 0.95m and 0.99m respectively. Hyland, Idlewild, Silver, and Staring all increased in water clarity.

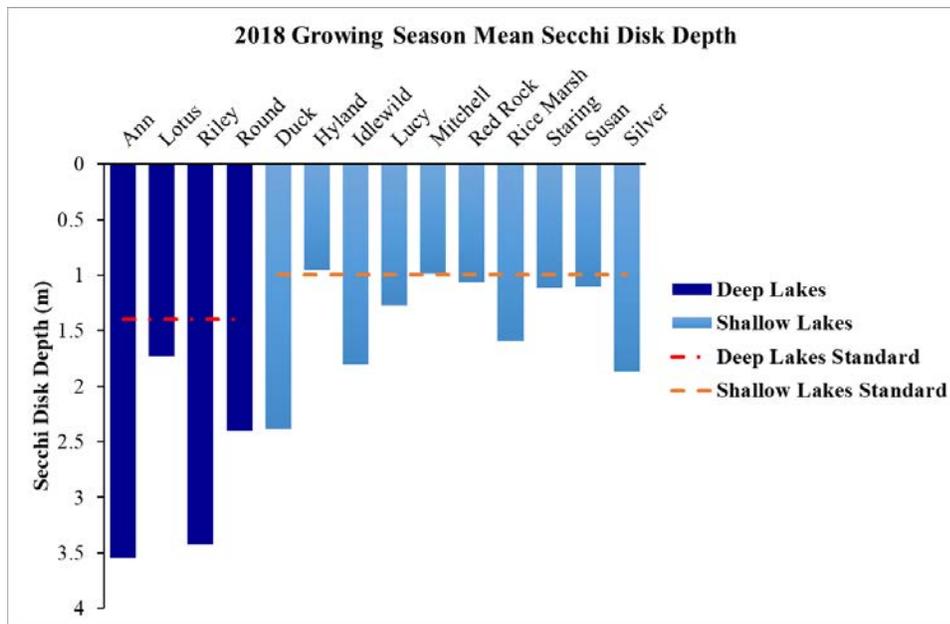


Figure 4-3 2018 Lakes Growing Season Mean Secchi Disk Depth

Lakes growing season (June-September) mean secchi disk depths (m) for shallow (lakes <15ft. deep, >80% littoral area-light blue bars) and deep lakes (lakes >15ft. deep, <80% littoral area-dark blue bars) in the Riley Purgatory Bluff Creek Watershed District during 2018. The dashed lines represent the Minnesota Pollution Control Agency water quality standards for secchi disk depths for shallow (>1m-orange dashed line) and deep lakes (>1.4m-red dashed line).

4.2 Alum Treatments

In May of 2016, the District treated Lake Riley with the first dose of aluminum sulfate (alum). In fall of 2018, the District treated both Lotus Lake and Rice Marsh Lake with the first round of alum. The City of Eden Prairie also treated Round Lake with a second dose of Alum in October of 2018. Alum is a compound which works to reduce the growth of algae by trapping the nutrient phosphorus (the main food source of algae) in the lake sediments. These treatments were applied by injecting the alum into water several feet below the surface of the lake. Upon contact with water, alum becomes aluminum hydroxide (also called floc), a fluffy precipitate. As floc settles to the bottom of the lake, it interacts with phosphorus, binding it, making it unusable by algae. This process also collects other particles suspended in the water column, helping to improve water clarity.

District staff have continued to monitor phosphorus levels on Lake Riley as a part of regular sampling, tracking the continued effectiveness of the treatment. Figure 4-4 illustrates total phosphorus (TP) levels two years prior to treatment, through the end of the 2018 growing season (29 months after the alum was applied). TP data was included from May 2014 to late September 2018 to highlight the abrupt changes in TP concentrations during that time. There was a large reduction in epilimnetic TP (upper layer of water in a thermally-stratified lake) after the treatment in May of 2016. This led to Lake Riley achieving the MPCA standard over the summer growing season (June-September) in 2016. During the 2018 growing season, TP levels continued meeting the MPCA standard in the epilimnion; only one sample this season did not meet the standard (Figure 4-4). The average TP level for the 2018 growing season was the lowest it has been since before the alum treatment (0.0235mg/L). TP levels sampled in the hypolimnion (the bottom layer of water in a thermally-stratified lake) rose almost 0.6mg/L from May through September in 2015. In 2016, TP levels in the hypolimnion were drastically reduced after treatment and increased about 0.06mg/L through September of that year. During the 2018 growing season, TP levels in the hypolimnion increased 0.19mg/L between June through September, which was 0.03mg/L more of an increase than in 2017 during those same months. Overall, this increase is still significantly less than what was observed in years before the alum treatment. In 2016, the decrease in TP led to reductions in summer averages of Chl-a (algae) concentrations, from 27.4ug/L in 2015 to 14.92ug/L. Additionally, secchi disk depth noticeably increased from 1.7m in 2015 to 2.89m in 2016. In 2018, the average secchi depth was the deepest recorded since before the alum treatment was applied (3.425 m, up from 2017 average of 2.46m). Chl-a

level was also at its lowest recorded since before the treatment (7.98 ug/L, down from the 2017 average of 15.64 ug/L).

The District and its partners will continue monitoring water clarity and nutrient levels in 2019, as a part of regular monitoring, but also to track the continued effectiveness of the alum treatments on these lakes. Future monitoring will also indicate when a second dose of alum should be applied. More information about Lake Riley, Lotus Lake, and Rice Marsh Lake nutrient and water clarity data can be seen in the Fact Sheets located in Exhibits F.

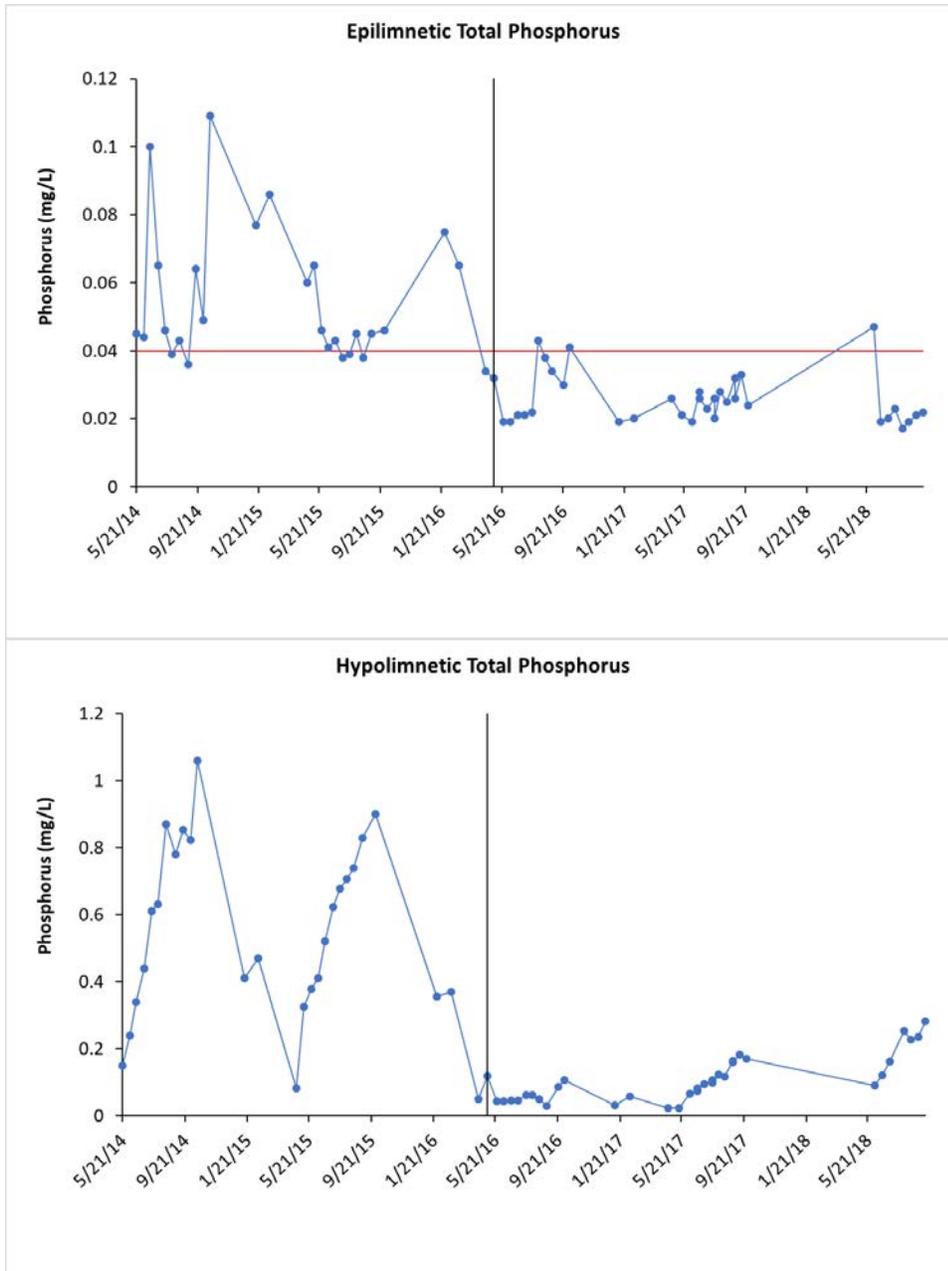


Figure 4-4 Lake Riley Total Phosphorus Levels pre- and post- Alum Treatment

Total phosphorus levels (TP) in Lake Riley between May 21, 2014 and September 11, 2018. The graphs reflect levels before and after the aluminum sulfate (Alum) treatment carried out in May of 2016 (indicated by vertical bar). The upper graph displays TP levels (mg/L) measured from 2m composite samples taken at the surface of the lake. The MPCA water quality standard for TP is represented in the upper graph by the horizontal red line (0.04mg/L). The lower graph displays the TP levels (mg/L) measured from samples taken 0.5-1m above the sediment in the deepest point of the lake.

4.3 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 to 2018, staff built and deployed two EnviroDIY stations run by EnviroDIY Mayfly circuit boards on Rice Marsh Lake and Lake Riley. 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 Exhibits A for 2018 level sensor results. Lake Levels for 2017 are also provided for a year-to-year comparison. In both the Lakefinder database and in Exhibits 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. National Oceanic and Atmospheric Administration (NOAA) precipitation data collected from the area was also included in Exhibits A to evaluate how rain events influenced lake levels. Rain data recorded at the Flying Cloud Drive Airport, Eden Prairie, MN is included alongside lake level data from lakes in Hennepin County (including Lake Riley). A combination of rain data from Meteorological Station Chanhassen WSFO and Chanhassen 1.0 ESE is included alongside lake level data from lakes in Carver County.

In 2018, lake level measurements were collected on 13 lakes in the District and one high value wetland, Lake Idlewild (Table 4-1). Silver Lake experienced the greatest seasonal water level change over the 2018 season, increasing 0.402ft from ice-out to the last day of recording (Nov. 9). Round Lake had the largest range of fluctuation through 2018, having a low elevation of 878.671ft, and a high of 880.379ft (1.708ft difference). On average, lake levels decreased by 0.013ft over the 2018 season. The average fluctuation range across all lakes was 1.036ft.

Table 4-1 Lake Water Levels Summary

The 2018 (March-November) and historical recorded lake water levels (ft) for all monitored lakes within the Riley Purgatory Bluff Creek Watershed District. 2018 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.

Lake	2018 Lake Water Level Data				Historical Lake Water Levels			
	Seasonal Flux	Flux Range	High level	Low level	Highest Level	Date	Lowest Level	Date2
Ann	-0.139	0.864	956.437	955.573	957.93	2/18/1998	952.80	9/28/1970
Duck	0.007	0.704	914.623	913.919	916.12	6/20/2014	911.26	11/10/1988
Hyland	-0.265	1.078	816.300	815.222	818.68	8/11/1987	811.66	12/2/1977
Idlewild	0.160	1.282	854.507	853.225	860.78	3/29/1976	853.10	1/7/1985
Lotus	-0.104	0.830	895.943	895.113	897.08	7/2/1992	893.18	12/29/1976
Lucy	-0.090	0.830	956.567	955.737	957.67	6/20/2014	953.29	11/10/1988
Mitchell	0.332	1.050	871.951	870.901	874.21	6/25/2014	865.87	7/25/1977
Red Rock	-0.137	0.751	840.666	839.915	842.69	7/13/2014	835.69	9/28/1970
Rice Marsh	0.154	1.250	876.145	874.895	877.25	5/28/2012	872.04	8/27/1976
Riley	-0.177	0.505	865.137	864.632	866.74	7/6/1993	862.00	2/1/1990
Round	0.344	1.708	880.379	878.671	884.26	8/17/1987	875.29	7/25/1977
Silver	0.402	1.076	899.827	898.751	901.03	6/20/2012	894.78	6/6/1972
Staring	-0.373	1.401	815.206	813.805	820.00	7/24/1987	812.84	2/12/1977
Susan	-0.300	1.178	881.797	880.619	883.77	6/21/2014	879.42	12/29/1976
Average	-0.013	1.036						

4.4 Powers Blvd Riley Creek Crossing

In 2013, a Use and Attainability Analysis (UAA) identified Lake Susan Park Pond as a significant contributing source of nutrient pollution to Lake Susan. In 2015 and 2016, staff conducted sampling on Lake Susan Park Pond and at the Lake Susan Park Pond outlet to confirm the UAA findings. Results indicated the pond was contributing nutrient pollution, but at a lesser level than indicated by the UAA. In 2017, the District proposed actions to improve the water quality in Lake Susan through implementing the Lake Susan Park Pond Treatment and Stormwater Reuse Enhancement Project which was completed in 2018. As part of the project, staff placed an automated water-sampling unit on Riley Creek at the culvert passing under Powers Blvd, just upstream of Lake Susan and Lake Susan Park Pond. This was done to better quantify rain event nutrient loading from upstream sources. 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. Additionally, this information could potentially guide efforts to reduce nutrient loading from upstream sources. Water samples were collected and analyzed for total dissolved phosphorus (TDP), total phosphorus (TP), total suspended solids (TSS), and Chlorophyll-a (Chl-a) in 2017 and 2018. The automated water-sampling unit also estimated flow of the creek at that point.

In 2018, total phosphorus levels at the sampling site during storm events were high compared to the MPCA standard, but the first flush average TP level was down from 2017. As seen in Table 4-2, the average TP across 13 samples was 0.331mg/L (0.681mg/L in 2017). This level is still more than three times the MPCA eutrophication water quality standard for class 2B streams (≤ 0.1 mg/L TP). The highest TP reading was 1.04mg/L (1.62mg/L was the highest sampled TP in 2017, Figure 4-6). The TDP average across the sampling events was 0.058mg/L (up from 0.034mg/L in 2017). The highest measurement was 0.076mg/L (0.066mg/L in 2017, Figure 4-6; Table 4-2). TSS concentrations at the sampling site were also high, but the average was less than half of the average in 2017. The average amount of TSS across the 13 samples taken was 310.61mg/L (down from 659.5mg/L in 2017, Table 4-2). To achieve the MPCA TSS stream water quality standard, a stream may not exceed 30mg/L TSS more than 10% of the time. Two of 13 samples taken in 2018 fell below 30mg/L TSS (Figure 4-5). Eleven Chl-a samples were taken from the site in 2018. Apart from one sample, which had 19ug/L Chl-a, all samples contained less than the MPCA eutrophication water quality standard of ≤ 18 ug/L Chl-a (Table 4-2). 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 Riley Creek.

Table 4-2 2018 Powers Blvd Riley Creek Crossing Nutrient Summary

Powers Blvd Riley Creek Crossing Total Dissolved Phosphorus (mg/L), Total Phosphorus (mg/L), Chlorophyll-a (ug/L), and Total Suspended Solids (mg/L) concentrations (max, min, and average) from 2018 automated, flow-paced samples. The table also includes the Minnesota Pollution Control Agency water quality standards.

Parameter	# of samples	Minimum	Maximum	Average	MPCA Water Quality Standards
TP (mg/L)	13	0.072	1.04	0.331	≤ 0.1 mg/L
TDP (mg/L)	13	0.04	0.076	0.058	-
Chl-a (ug/L)	11	1	19	6.00	≤ 18 ug/L
TSS (mg/L)	13	9.6	969	310.61	≤ 30 mg/L

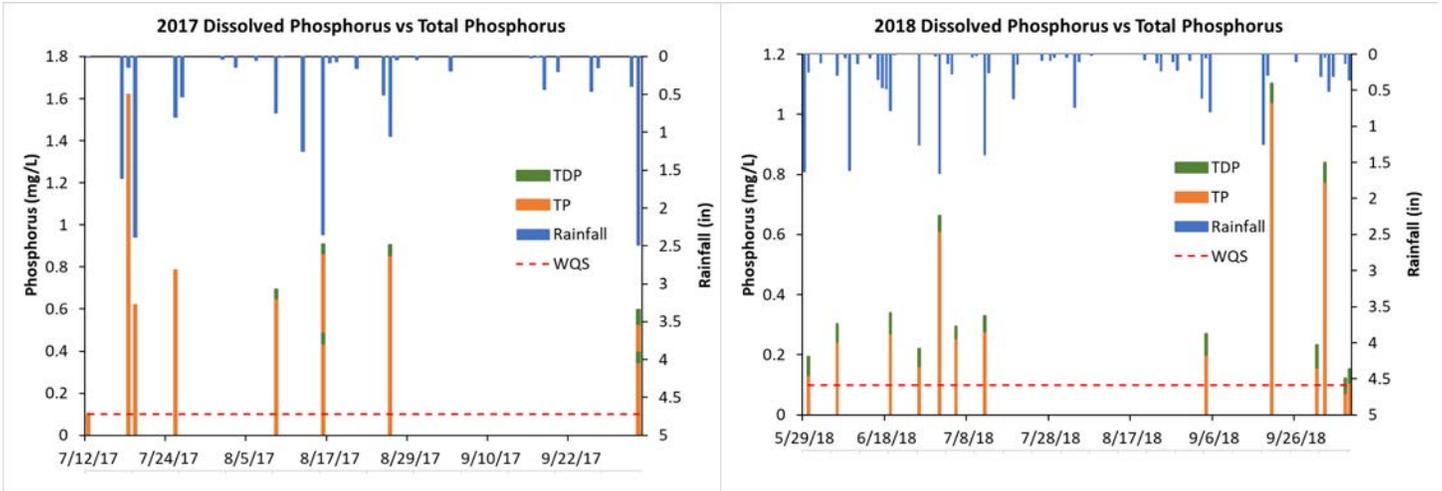


Figure 4-6 2017 and 2018 Upper Riley Creek Phosphorus

The Total Dissolved Phosphorus (TDP) and Total Phosphorus (TP) concentrations (mg/L) from Riley Creek under Powers Blvd from 2017 and 2018 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).

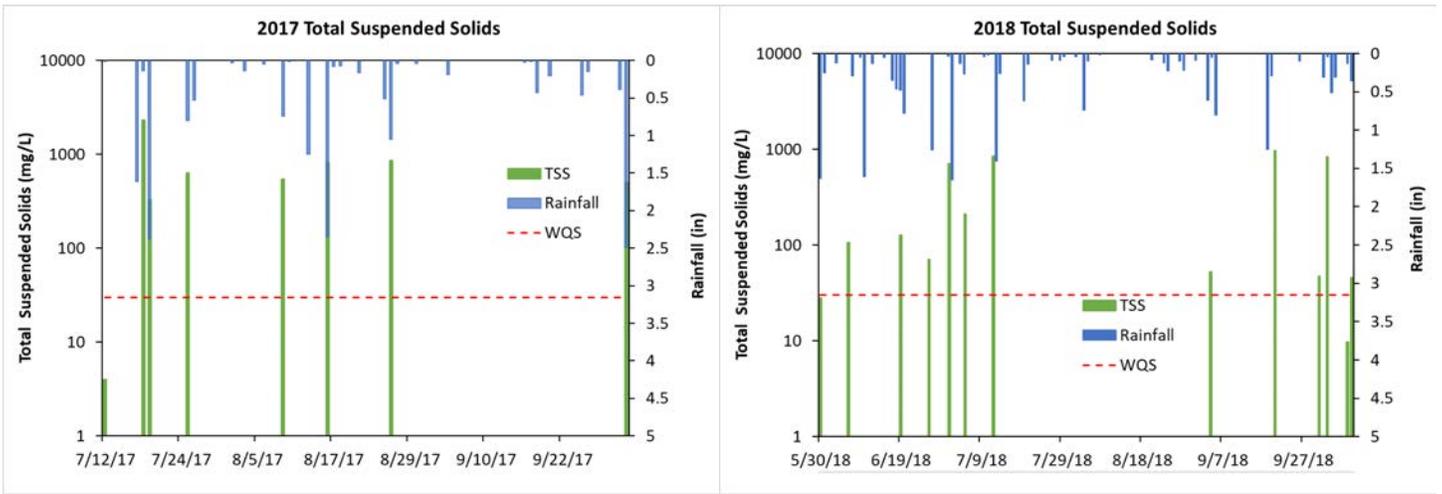


Figure 4-5 2017 and 2018 Upper Riley Creek Total Suspended Solids

Total Suspended Solids (TSS) concentrations (mg/L) from Riley Creek under Powers Blvd from 2017 and 2018 automated, level triggered, flow-paced samples. 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).

4.5 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 and was updated in April of 2017. The CRAS was published in the Center for Watershed Protection Science Bulletin in 2018. A severe site list was developed which includes subreaches from all three creeks (Table 4-3).

Table 4-3 Severe Reaches Identified by the Creek Restoration Action Strategy

Stream	Tier II Rank	Tier I Rank	Reach	Subreach	Location
Purgatory	1	9	P7	P7E	Covington Road to Pond in Covington Park
Riley	2	2	R2	R2E	Middle 1/3 between Dell Road and Eden Prairie Road
Bluff	3	5	BT3	BT3A	Audubon Road to Pioneer Trail
Purgatory	4	4	P1	P1E	1,350 feet DS of Pioneer Trail to Burr Ridge Lane
Bluff	5	1	B1	B1D	475 feet US of Great Plains Blvd to Great Plains Blvd
Bluff	6	7	B3	B3A	750 feet DS of Railroad to 860 feet DS of Railroad
Bluff	7	10	B3	B3C	1,675 feet US of Audubon Road to Lyman Blvd
Bluff	8	6	R2	R2D	Upper 1/3 between Dell Road and Eden Prairie Road
Bluff	9	3	B5	B5C	Galpin Blvd to West 78th Street
Bluff	10	8	B5	B5B	985 feet US of Galpin Blvd to Galpin Blvd

Note: US = Upstream; DS = Downstream

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 2018 staff walked Reach 8 of Purgatory Creek (including a tributary to this reach PT-4, that had not been assessed) and subreach P5A. Additionally, staff walked a northern tributary stream to P7 which began south of Highway 7 (PT-5). The tributary sites were especially in need of a full assessment as no previous scores had been calculated. 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 in “representative” erosion sites to evaluate general erosion rates for each reach. Changes to the CRAS based upon 2018 creek walks can be seen in Table 4-4, Exhibits E, and in our Fact Sheets in Exhibits F. A summary of the 2018 creek walks can be seen below.

Purgatory Creek – PT-4A

This subreach is one that had not been previously walked and assessed by staff for the purpose of informing the CRAS. This reach begins in a ditch on the north side of Duck Lake Trail, at the intersect with Dell Road. It continues upstream (north/northeast) for about 0.2 stream miles, where it enters a wetland complex and eventually connects to the main channel of Purgatory Creek. The reach passes

through deciduous forest and residential areas prior to the wetland. The riparian width for a majority of the subreach was approximately 50m along the left bank and 5m along the right bank. The substrate in this reach consisted mainly of sand, with several areas of sandy/silt. The immediate substrate north of Duck Lake Trail is cobble and gravel, mixed with placed riprap. Slope gradients in this reach were predominantly flat, 0% to 10%, with some steep slopes, over 60% for the first 10 meters of the subreach. Apart from the first 50 to 75 meters, the channel was not very sinuous. The channel development was fair to poor (riffle, run, pool). This subreach contained a great deal of woody debris jams and garbage. Several Eden Prairie park signs were encroaching on the channel or had fallen in the stream indicating the channel had shifted or high flows had occurred. Residential lawns were mowed close to the stream edge along the right bank. The immediate surrounding vegetation was dominated by thick brush, much of which consisted of buckthorn. There was moderate erosion throughout the subreach. The heavier areas of erosion and cutting occurred at the beginning of the subreach. As the reach continued, more of the lower areas of cutting were beginning to heal over, but there were several areas of bank that were bare. There was also considerable amount of sediment deposition in the beginning of the subreach. The exposed metal culvert within the stream has had the topsoil eroded away and could potentially be a risk if it moved at high flows in the future. Much of the subreach was littered with trash. For the full creek walk summary, see Exhibits E.

Purgatory Creek - PT-5A&B

This subreach is also one that had not been previously walked and assessed by staff for the purpose of informing the CRAS. This reach is made up of two subreaches, PT-5A and PT-5B. The tributary begins about 80 meters upstream of the recreational trail off Vine Hill Road. It continues downstream (south/southwest) for about 0.92 stream miles to where it meets Vine Hill Road. The stream starts at three locations, all draining the adjacent wetland area. The channel had little stream development (riffle, run, pool), and the channel was very shallow. The reach was surrounded by a mixture of wetland grasses/sedges and deciduous forests. In subreach A, the riparian widths were wide, but in subreach B, they were very narrow, less than five meters. A mixture of sand and silt made up the majority of the substrate. Slope gradients were very flat, allowing for connectivity to the floodplain. Staff observed a great deal of woody debris in the channel. It was fairly stable, although much of the stream was incised, about 0.1-0.5m. Infrastructure risks were low, excluding some erosion around the culvert under Del Ann Circle. For the full creek walk summary, see Exhibits E.

Purgatory Creek – P8

Scores for this reach remained relatively similar to the first assessment in 2015. This reach starts at Lotus Lake and passes through residential areas, deciduous forest, and wetlands, ending at Dell Road. The riparian width on the right bank averaged about 50m. The average width of riparian zone on the left bank was closer to 10m. There were several areas where the immediate upper bank was mowed to the channel on the left bank. The substrate in this reach consisted predominantly of sand/silt, with some areas exhibiting heavy mixtures of gravel/silt, gravel/sand, and silt/detritus. Slope gradients were low, between 0% and 10% for most of the reach. There were several stretches where the gradient was above 40%, and a few short areas that exceeded slopes of 60%. There were few areas where the channel was sinuous, but it was mostly fair at best. The channel development (riffle/run/pool) was fair-to-poor. Most of the channel was a run or glide. There was a built-up driveway/parking area with a wood retaining wall on the left bank in P8B and a partially filled culvert under Chanhassen Road that may pose some infrastructure risk. The bank slopes here were greater than 60%, mostly bare, and seemed to have had some continuous erosion occurring (there were several sediment deposits downstream of this bank).

Purgatory Creek – P5A

This subreach starts at Highway 62 and passes through a large wetland complex, ending at Eden Prairie Road. The riparian width was wide, averaging about 75m on both banks. The wide wetland floodplain was bordered by residential area on both sides. The channel banks were

covered by wetland grasses, sedges and other herbaceous vegetation along the majority of the subreach. Sediment throughout the subreach was predominantly sand, with some sites containing mixtures of sand/silt, and some areas with cobble. The slope gradients throughout were very low, between 0% and 5%. There was a great deal of connectivity to the surrounding floodplain/wetland (water levels were a bit higher during the walk and the stream was connected to backwaters and small branches flowing to and from the wetland). Sinuosity of the channel was good at the start of the subreach but worsened moving downstream. The stream development (riffle/run/pool) was poor. There was a very low percent of riffles, runs, and pools; most of the stream was in a glide. In the beginning of the reach, the erosion along both banks was moderate and continuous. Cutting in the beginning stretch, measured around 1.5m high and didn't start to subside until about 150m into the subreach. Bank sloughing is occurring at several points. There is also quite a bit of sediment deposition and some deep scours along the bends in this section of the subreach.

Table 4-4 2018 Creek Restoration Action Strategy Updates

Tier I and Tier II scores for the Creek Restoration Action Strategy for 2017 and the corresponding updates from 2018 for subreaches within P8, PT-4, P5, and PT-5.

Reach	Subreach	Location	2017 Tier I Scores	2018 Tier I Scores	Tier II Scores
P8	P8A	Lotus Lake to Chanhassen Road	12	14	10
P8	P8B	Chanhassen Road to 120m West of Tartan Curve	16	16	10
P8	P8C	Wetland	n/a	n/a	n/a
P8	P8D	Tartan Curve to Duck Lake Trail	12	14	14
P8	P8E	Duck Lake Trail to Dell Road	18	18	12
PT-4	PT-4A	Duck Lake Trail to Main Channel	n/a	16	10
P5	P5A	Highway 62 to Eden Prairie Road	12	10	8
PT-5	PT-5A	Upper Silver Branch Tributary	n/a	14	12
PT-5	PT-5B	Middle Silver Branch Tributary	n/a	16	10

Note: Red = Severe
 Orange = Poor
 Green = Moderate
 Blue = Good

In 2019, staff will finish the second complete walk of Purgatory Creek and update accordingly. CRAS updates and potential additional monitoring for 2019:

- 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.
- Adding macroinvertebrates Index of Biotic Integrity to CRAS scoring methodology.

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 2018 (2017 and 2018 measurements shown in Table 4-5). 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, as well as replace any pins which were not found in 2018. In 2018, reach R5 had the highest estimated lateral loss (in/year) while reach three had the highest bank loss per one-yard stretch of creek (ft3).

Table 4-5 2017-2018 Bank Pin Data

Lateral creek bank loss per year as well as the estimated bank volume loss for a one-yard section of streambank at each of the 18 regular creek monitoring sites. Lateral loss was determined by taking the mean from each bank and then averaging the left and right bank means. Bank heights used to calculate the volume of bank loss were based off bank heights measured during installation in 2015. 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.

Average Lateral Loss (in/year)

Site			Estimated bank loss per one-yard stretch of creek (ft3)	
	2017	2018	2017	2018
R5	1.08	8.99	3.22	2.41
R4	1.08	0.42	1.15	0.25
R3	4.05	5.31	4.65	3.18
R2	-0.04	--	-0.01	--
R1	4.50	2.96	6.64	1.23
P8	-1.64	0.55	-0.12	0.12
P7	3.37	2.02	1.76	2.48
P6	1.23	0.73	0.85	0.35
P5	3.82	0.77	2.86	0.41
P4	2.79	0.83	1.40	0.27
P3	1.07	0.94	0.86	0.51
P2	0.75	0.50	0.56	0.24
P1	7.11	0.38	7.11	0.46
B5	0.49	-0.79	0.90	-0.23
B4	10.16	5.58	25.84	3.66
B3	2.79	--	5.38	--
B2	2.07	3.00	0.82	1.25
B1	4.43	-0.67	8.59	-0.25

4.6 Chloride Monitoring

Chloride (Cl) levels in our 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 exposed to indefinitely without causing chronic toxicity) is 230mg/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 860mg/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 2018, staff carried out Cl sampling in lakes and streams every other week during the spring, switching to monthly sampling in summer/fall/winter. In 2018, winter monitoring included the Purgatory Chain of Lakes (Hyland, Lotus, Mitchell, Red Rock, Round, Silver and Staring), the Upper and Lower Purgatory Creek Recreation Area (UPCRA and LPCRA), Idlewild (a high value wetland) and a chain of ponds that drain the City of Eden Prairie Center to Purgatory Creek. During sampling, staff collected a surface 2m composite sample and a bottom water sample to be analyzed for Cl. Since 2013, except for some samples taken from Idlewild, every sample taken from the RCL and PCL, has fallen below the MPCA CS of 230mg/L (Figure 4-7; Figure 4-8). Cl levels have stayed relatively consistent within lakes year-to-year.

Figure 4-9 shows Cl levels within the four stormwater ponds, which includes all sampling events since 2013. In the spring of 2015, staff were no longer able to take accurate water samples on Pond A due to low water levels, so, sampling began on Pond B, directly upstream. In 2018, due to inconsistencies with getting samples without disturbing sediment, staff reverted to sampling Pond A in place of Pond B for several monitoring events. Most samples taken from Eden Pond greatly exceed the class 2B CS, some exceeding the class 2B MS. Except for two sampling events, all samples taken from Pond K exceed the class 2B MS, although, there has been a noticeable drop in Cl levels since sampling began in 2013. It is important to note that these stormwater ponds are not classified as class 2B surface waters by the MPCA; the CS is given in the figure to demonstrate how much higher Cl levels accumulating within these ponds are before water moves into Purgatory creek. Staff will continue the winter monitoring of Cl in the Purgatory Chain of Lakes in 2019 which will include: Lotus, Silver, Duck, Round, Mitchell, Red Rock, Staring, and Hyland Lake. Rice Marsh Lake will also be monitored for Cl in the 2019 winter, along with the stormwater ponds draining Eden Prairie Center, UPCRA, and LPCRA. Once-a-month Cl sampling will continue as part of sampling SOP's during the regular growing season on both lakes and streams.

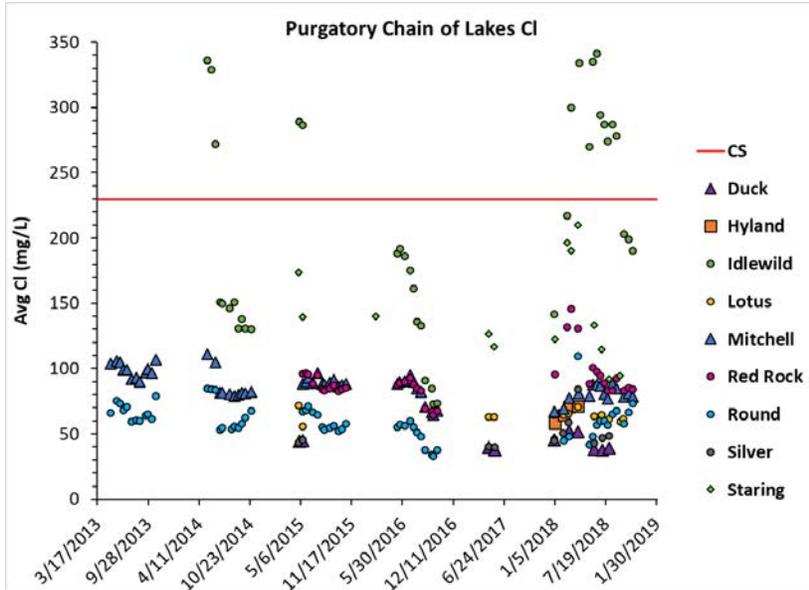


Figure 4-7 2013-2018 Chloride Levels within the Purgatory Chain of Lakes

All chloride sampling results (mg/L) on the Purgatory Chain of Lakes from 2013-2018. The MPCA chloride chronic standard for class 2B waters (230mg/L) is indicated by the red line.

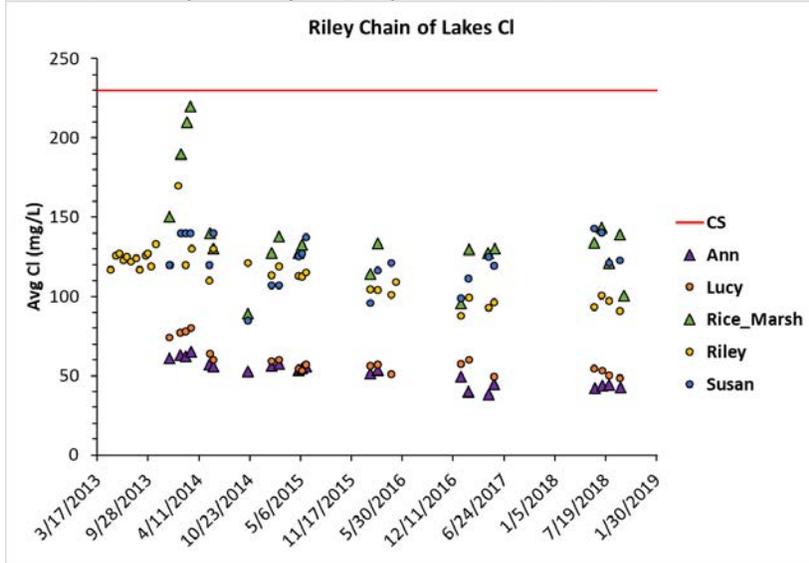


Figure 4-8 2013-2018 Chloride Levels within the Riley Chain of Lakes

All chloride sampling results (mg/L) on the Riley Chain of Lakes from 2013-2018. The MPCA chloride chronic standard for class 2B waters (230mg/L) is indicated by the red line.

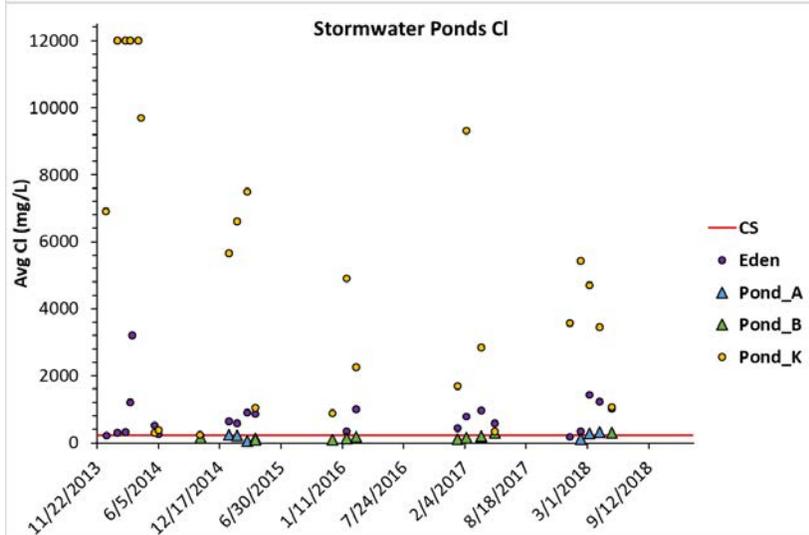


Figure 4-9 2013-2018 Chloride Levels within Stormwater Ponds

All chloride results (mg/L) on stormwater ponds draining the City of Eden Prairie Center to Purgatory Creek from 2013-2018. The MPCA chloride chronic standard (230mg/L) for class 2B waters indicated by the red line.

4.7 Nitrate Monitoring

The toxicity of nitrates to aquatic organisms has been a growing concern in MN over the last decade. Nitrate (NO₃), 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 4.9mg/L nitrate-N.

During sampling, staff collects a surface 2m composite, a sample at the thermocline of the lake, and a bottom water sample to be analyzed for nitrate+nitrite and ammonia+ammonium. 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 has been omitted. 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 4-6). This lab also tests for ammonia in the form of ammonia+ammonium (Figure 4-10). As seen in Table 4-6, all the 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 0.03mg/L. Therefore, it is possible that some of the samples contained less than 0.03mg/L nitrate; because of this, actual average nitrate levels in District lakes may be lower than what measured (Table 4-6).

Table 4-6 2018 Lakes Summer Average Nitrate+Nitrite

2018 growing season (June-September) average nitrate+nitrite levels for District lakes. The MPCA proposed chronic standard (CS) is included in the table (orange). Lower limit of lab analysis of nitrate+nitrite is 0.03mg/L, some of these averages may be lower than indicated.

Lake	Average Nitrate+Nitrite (mg/L)
CS	4.9
Ann	0.030
Duck	0.040
Lotus	0.230
Lucy	0.030
Rice Marsh	0.040
Riley	0.040
Silver	0.040
Staring	0.580
Susan	0.450
Idlewild	<0.05
Mitchell	<0.05
Red Rock	<0.05
Round	<0.05

Ammonia (NH₃), 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 0.04mg/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 0.04mg/L. The lower limit for sample data provided by the City of Eden Prairie for Red Rock, Round, Idlewild, and Mitchell Lakes is 0.16mg/L. Due to these limits, some of the average levels of Ammonia+Ammonium provided in Figure 4-10 may actually be lower than what is given. In lakes and streams, ammonium (NH₄⁺) is usually much more predominant than ammonia (NH₃) 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). Figure 4-10 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 2018 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.

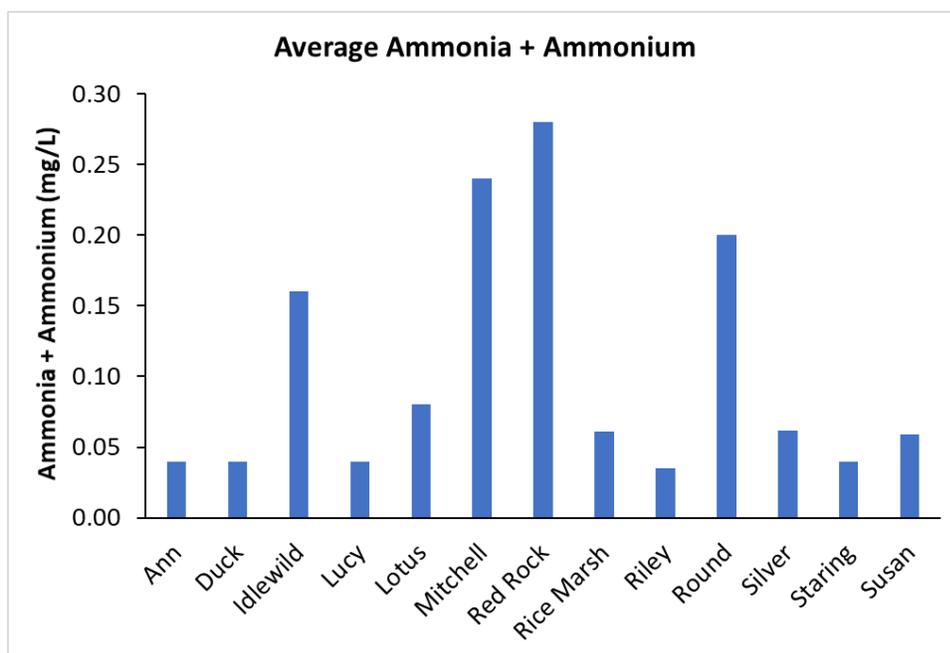


Figure 4-10 2018 Lakes Summer Average Ammonia+Ammonium

The figure includes the average levels of ammonia+ammonium from samples taken on each lake during regular sampling within the growing season (June-September).

4.8 Zooplankton and Phytoplankton

In 2018, 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 m²) 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:

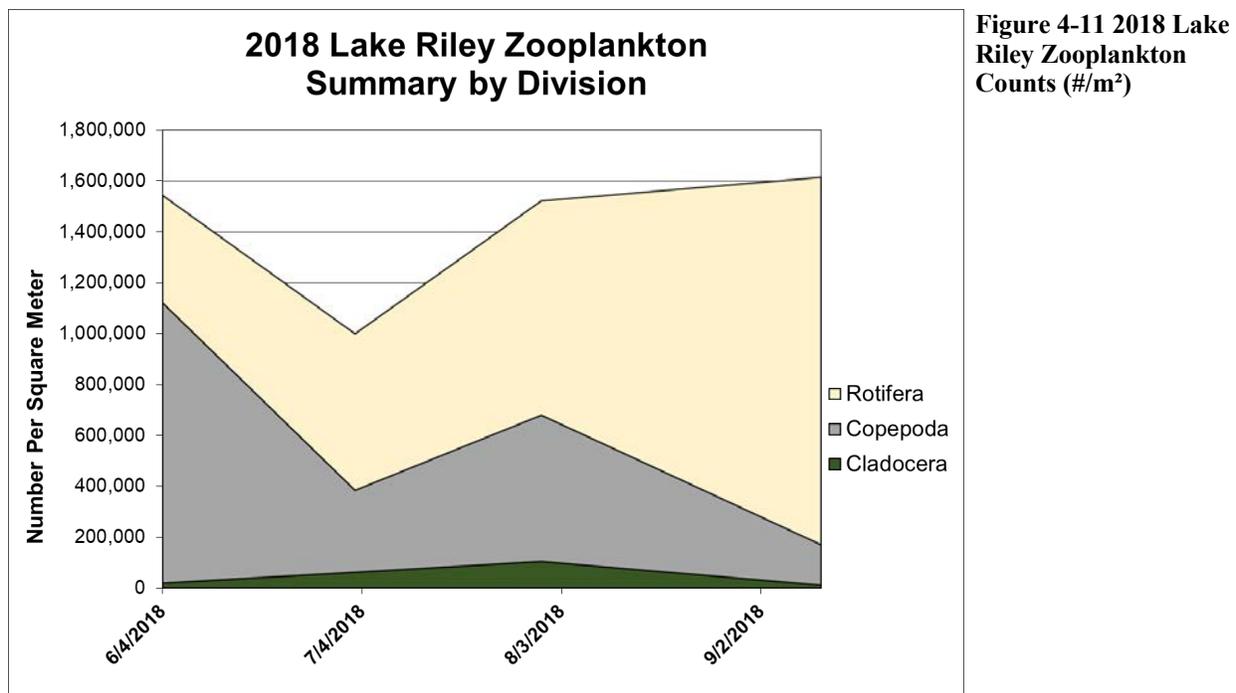
1. Epilimnetic Grazing Rates (Burns 1969): The epilimnion is the uppermost portion of the lake during stratification where zooplankton feed. Zooplankton can be a form of bio control for algae that may otherwise grow to an out-of-control state and therefore influence water clarity.
2. Population Monitoring (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 insuring 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 Sedgwick 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 insuring 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 2018, all three groups of zooplankton were captured in Lake Riley (Exhibits C), however only 3.6% of the population was comprised of Cladocera. As expected, rotifers were the most abundant zooplankton sampled (Figure 4-11). Contrary to 2016 and 2017, the number of rotifers identified in 2018 steadily increased over sampling events with the highest number observed during the last fall sampling event at 1.4 million. Copepod numbers followed the opposite trend as seen with the rotifers with the last event having the lowest number of 158 thousand. Cladoceran numbers remained low across all sampling dates; the highest number was recorded in late July (106 thousand), followed by the lowest number in August (13 thousand). Total Cladoceran counts in 2018 were about half of what was seen in 2016 and 2017 (around 450 thousand). This reduction may be due to the continual increase in water clarity caused by the alum treatment, causing increased predation on zooplankton populations. Additionally, zebra mussels were discovered in 2018 which could also be contributing to the increased water clarity and therefore predation. The most predominant Cladocera found in Riley was *Daphnia pulex* which was found across all sample dates except the last and can be found across the North American continent.



Cladocera consume algae and have the potential to improve water quality if they are abundant in large numbers. The 2018 Cladocera seasonal trend of estimated epilimnetic grazing rates was very similar to what was observed in 2016 and 2017. Due to the lower numbers of Cladocera as seen in the past, grazing rates were near half. The late June grazing rate was the highest at 13% in June and the lowest rate was near 0% in September (Figure 4-12). The highest June grazing rate was linked to the highest number of *Daphnia pulex* recorded for the year.

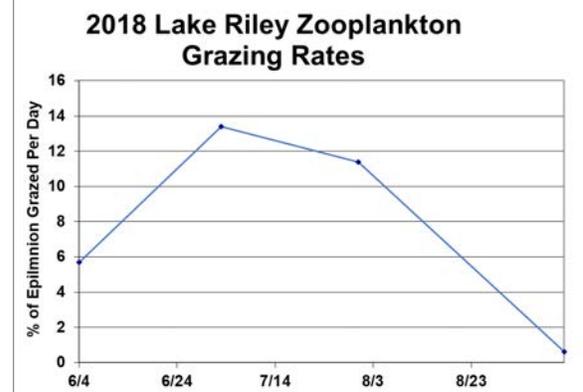


Figure 4-12 2018 Lake Riley Epilimnetic Grazing Rates

During the summer of 2018, staff collected four phytoplankton samples on Lake Riley (Exhibits D). The seasonal abundance of phytoplankton is presented in Figure 4-13. The early June phytoplankton population was comprised of primarily *Rhodomonas sp.* (Cryptophyceae) cells which made up 55% of the total phytoplankton abundance (TPA). Cryptophytes are motile unicellular algae that grow photosynthetically and are broadly distributed in lakes, usually preferring nutrient-rich environments. Cyanobacteria dominated the phytoplankton population for the remainder of the year at (97%, 91%, and 97% TPA). *Aphanizomenon sp.* was the predominant cyanobacteria found and is known as a possible toxin producer that may potentially produce cylindrospermopsin, anatoxins, and saxitoxins. These toxic compounds have the potential to pose serious threats to human and environmental health via contamination of drinking water, recreational exposure to waterborne toxins and possible accumulation of toxins in the food-web.

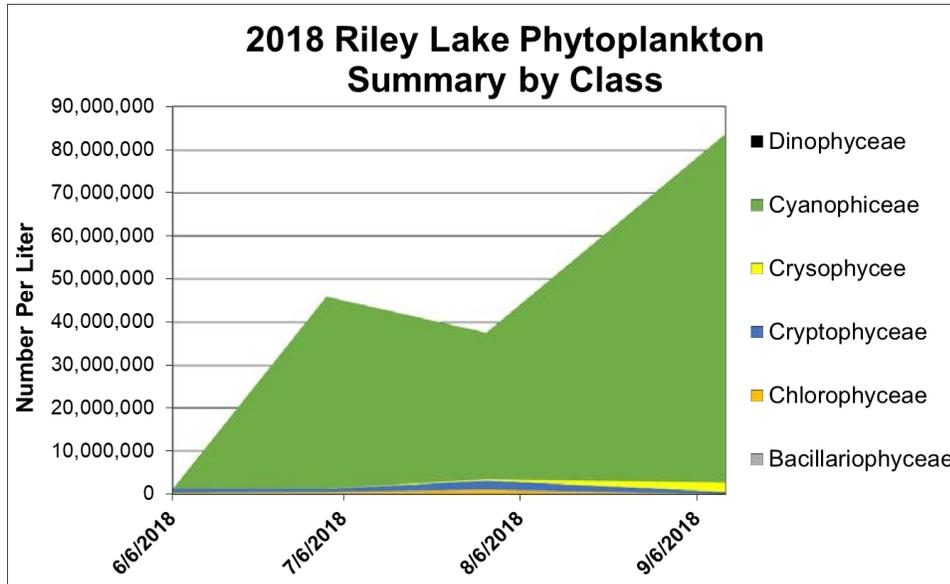


Figure 4-13 2018 Lake Riley Phytoplankton Abundance (#/L) by Class.

Lotus Lake

In 2018, all three groups of zooplankton were present in Lotus Lake (Exhibits C). Rotifers were the most abundant zooplankton sampled (Figure 4-14). June rotifer numbers were high (3 million) before declining to 511 thousand in early July and less 176 thousand for the remainder of the year. Copepod numbers remained relatively level throughout the year averaging 600 thousand across all sample dates. Cladoceran numbers began at 246 thousand in June before decreasing to an average of 100 thousand for the remainder of the year. The highest spring Cladocera numbers can be attributed to largest abundance of *Daphnia retrocurva* sampled in 2018. *Daphnia retrocurva* is known for its large curved helmet it develops in late spring-to-summer to reduce predation by planktivorous fish and invertebrates.

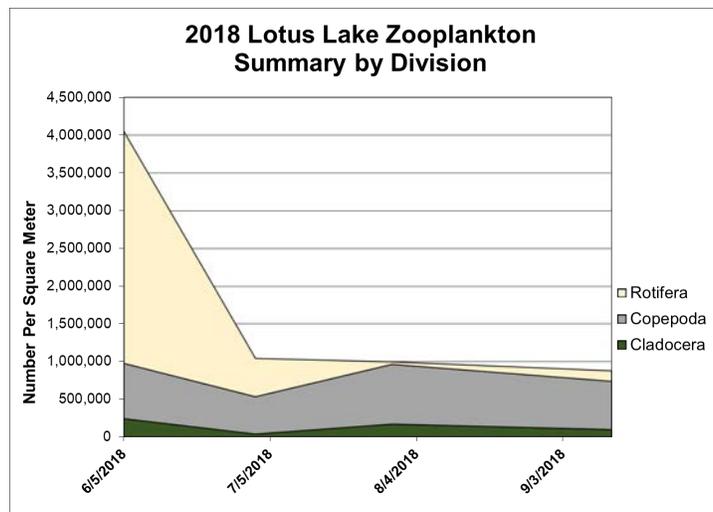


Figure 4-14 2018 Lotus Lake Zooplankton Counts (#/m²)

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% (Figure 4-15). As expected, grazing rates followed a similar trend to what was seen in the population fluctuations; the largest grazing rate occurred on June 5th when the spike in *Daphnia retrocurva* numbers occurred.

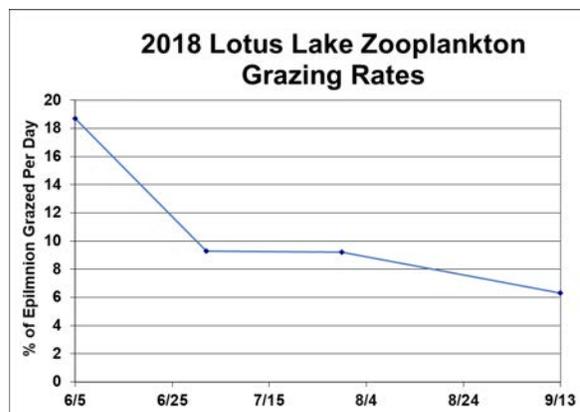


Figure 4-15 2018 Lotus Lake Epilimnetic Grazing Rates

During the summer of 2018, staff collected four phytoplankton samples on Lotus Lake (Exhibits D). The abundance of phytoplankton across all sampling dates is presented in Figure 4-16. Cyanobacteria was the dominant species across all sampling dates (96%, 58%, 99%, and 96% total phytoplankton abundance by sampling event). The June cyanobacteria population was dominated by *Aphanothece* sp. which may produce toxic compounds. *Aphanizomenon* sp. was the dominant species of cyanobacteria for the remainder of the year with a massive spike occurring in late July. *Aphanizomenon* are a potential cylindrospermopsin, anatoxins, and saxitoxins producer.

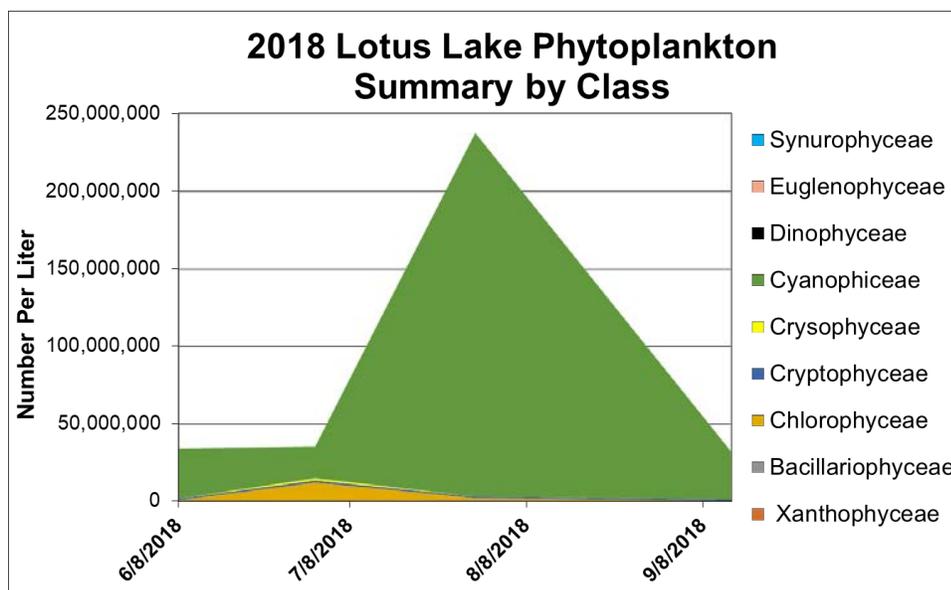


Figure 4-16 2018 Lotus Lake Phytoplankton Abundance (#/L) by Class.

Lake Susan

Rotifers were the most abundant zooplankton captured in 2018 in Lake Susan (Exhibits C). Both rotifer and cladocera numbers were overall significantly lower in 2018 than in 2017, while copepoda numbers remained similar. The rotifer population was variable over the sampling events with a spike in rotifers occurring in early July (2 million organisms). Copepod numbers were highest during the first sampling event (557 thousand) but remained stable across the remainder of the year, averaging around 270 thousand (Figure 4-17). Overall, Cladocera numbers were low, under 20 thousand individuals per sampling event, except for the spring sample which had 182 thousand organisms. The lowest Cladocera

population was recorded in late July when only 8 thousand individuals were captured. The most abundant Cladocera captured in Lake Susan was *Daphnia galeata mendotae*.

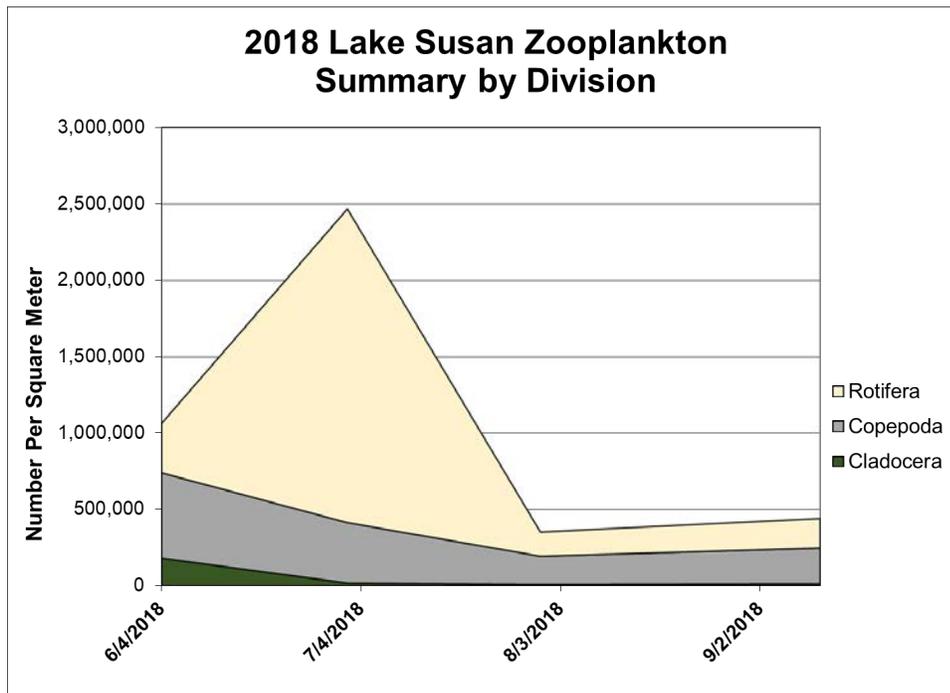


Figure 4-17 2018 Lake Susan Zooplankton Counts (#/m²)

The estimated epilimnetic grazing rates upon algae observed in 2018 were very low, ranging from 0.1% to 11% (Figure 4-18). This is mainly due to the very limited number of Cladocera present in all the samples collected. The highest grazing rate was observed in early June when *Daphnia galeata mendotae* were more numerous in the zooplankton community.



Figure 4-18 2018 Lake Susan Epilimnetic Grazing Rates

During the summer of 2018, staff collected four phytoplankton samples on Lake Susan (Exhibits D). Abundance of phytoplankton by Class are presented in Figure 4-19. During the spring sample, *Rhodomonas sp.* (Cryptophyceae) cells were 48% of the total phytoplankton abundance (TPA) found. Cryptophytes are motile unicellular algae that grow photosynthetically and are broadly distributed in lakes, usually preferring nutrient-rich environments. Cyanobacteria was the dominant phytoplankton species for the remainder of the year with TPA values at 93%, 98%, and 97% respectively. *Aphanizomenon sp.* and *Lyngbia sp.* of cyanobacteria were the most common species present in the early July sample. *Aphanizomenon* may produce cylindrospermopsin, anatoxins, and saxitoxins. Near the end of July and in the September sample, *Cylindrospermopsis sp.* was the dominant species present. *Cylindrospermopsis* is a well-studied species due to the production of toxins like cylindrospermopsin and anatoxin; it was also shown to produce paralytic shellfish poisoning (PSP) toxins. These toxic compounds

can pose serious threats to human and environmental health via contamination of drinking water, recreational exposure to waterborne toxins and possible accumulation of toxins in the food-web.

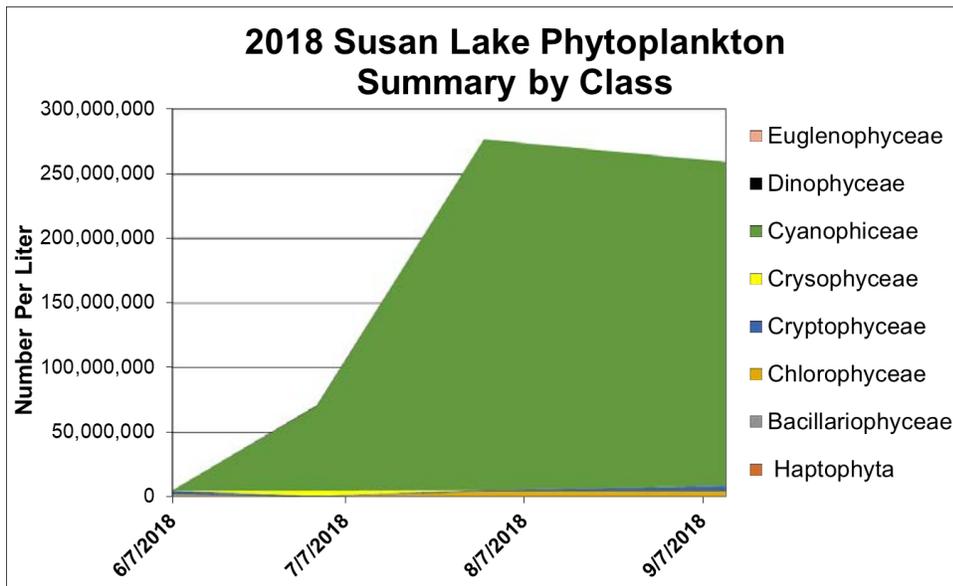


Figure 4-19 2018 Lake Susan Phytoplankton Abundance (#/L) by Class.

Rice Marsh Lake

In 2018, all three groups of zooplankton were captured in Rice Marsh Lake (Exhibits C), in which 13% of the population was comprised of Cladocerans, down from 27% in 2017. As expected, rotifers were the most abundant zooplankton sampled in 2018, however Copepod abundance was similar (Figure 4-20). Rotifer densities were highest during the first sampling event in July, while Copepod densities were highest in August. Cladoceran numbers began at its highest density of 173 thousand before declining to just under 23 thousand in early October. Across all sampling dates the Cladoceran community was dominated by small-bodied zooplankton, consisting of mainly *Bosmina longirostris*, *Ceriodaphnia sp.*, and *Chydorus sphaericus*.

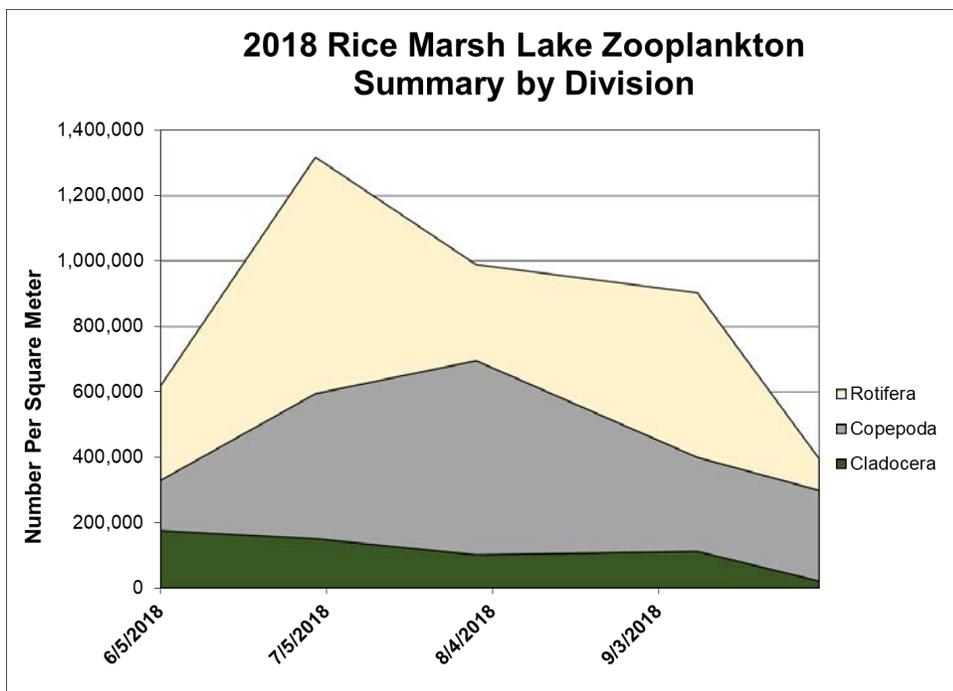


Figure 4-20 2018 Rice Marsh Lake Zooplankton Counts (#/m²)

The estimated epilimnetic grazing rates of Cladocera observed in 2018 ranged from near 0% to 23% on Rice Marsh Lake (Figure 4-21). The early June grazing rate was the highest, before averaging near 3% for the remainder of the year. The highest June grazing rate was linked with the presence of the larger bodied Cladocera *Daphnia galeata mendotae*. The most common Cladocera present was *Bosmina longirostris* which are commonly found in bog lakes such as Rice Marsh Lake.

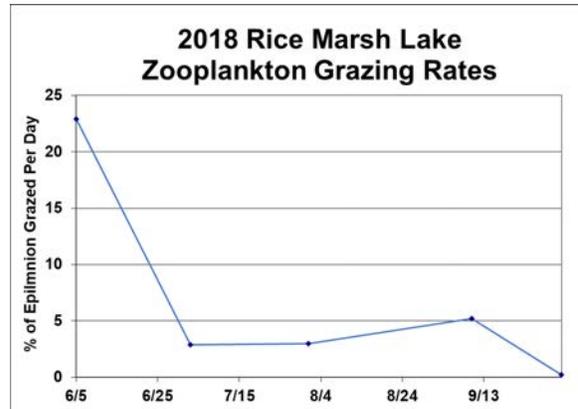


Figure 4-21 2018 Rice Marsh Lake Epilimnetic Grazing Rates

During the summer of 2018, staff collected five phytoplankton samples on Rice Marsh Lake (Exhibits D). Abundance of phytoplankton by Class for Rice Marsh Lake is presented in Figure 4-22. During the first June sampling event, *Uroglena sp.* (Crysophyceae) cells were 50% of the total phytoplankton abundance (TPA). *Uroglena sp.* may be a source of taste and odor problems. *Aphanizomenon sp.* was the dominant species in the sample and is a potentially toxic species. *Lyngbya sp.* was the dominant species during the late July sample, comprising 83% of TPA in the sample, and is potentially toxic. In August, *Rhodomonas sp.* (Cryptophyte) was the dominant species in the sample, comprising 65% of the TPA. Cryptophytes are motile unicellular algae that grow photosynthetically and are broadly distributed in lakes, usually preferring nutrient-rich environments. In October the dominant species in the sample was *Aphanizomenon sp.* which comprised 90% of the TPA. *Aphanizomenon* are a potential cylindrospermopsin, anatoxins, and saxitoxins producer.

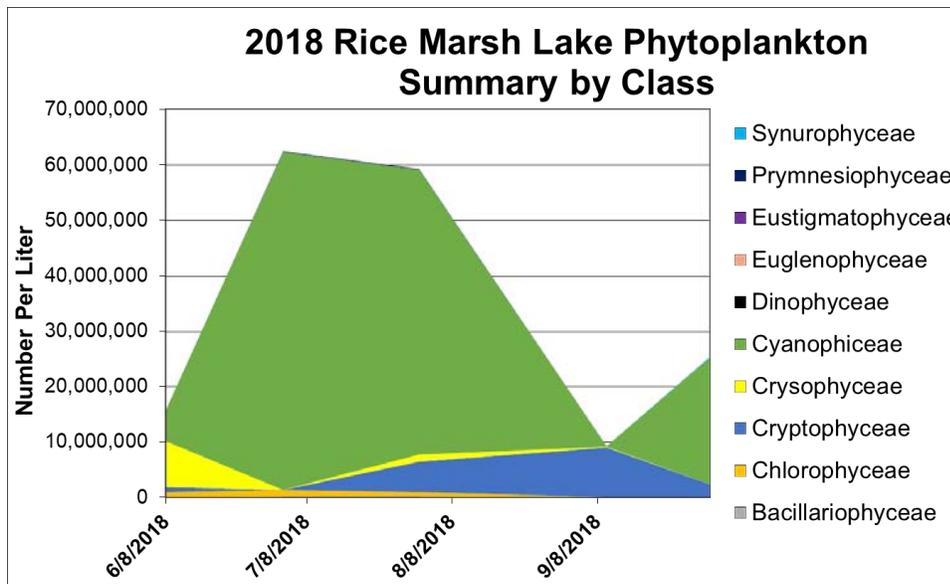


Figure 4-22 2018 Rice Marsh Lake Phytoplankton Abundance (#/L) by Class.

Staring

In 2018, all three groups of zooplankton were present and equally distributed across the year in Staring Lake (Exhibits C). The first June sampling event had the highest number organisms across all groups (Figure 4-23). Early June rotifer numbers were near 507 thousand before a decline to 47 thousand in June, and an average of 167 thousand for the remainder of the for the remainder of the year. Copepod numbers began the year around 1.7 million before declining to an average of 212 thousand. Cladoceran numbers remained relatively stable across all sampling dates except for the early July sample which bottomed out at 87 thousand. The most abundant Cladocera were *Bosmina longirostris* which are common in lakes and ponds across the United States.

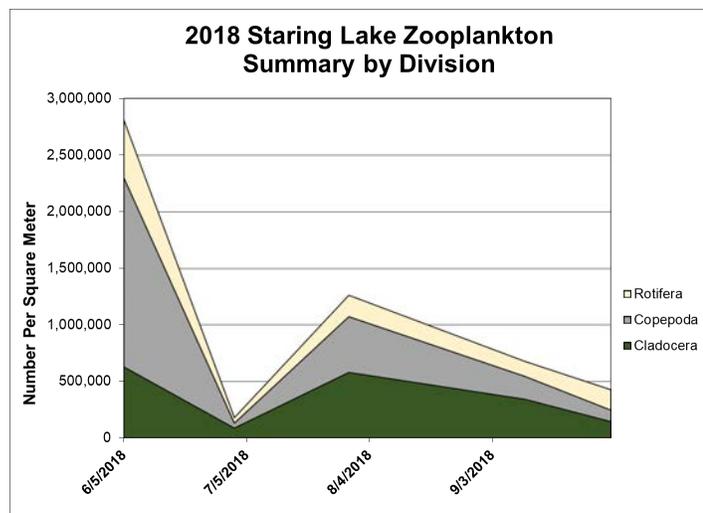


Figure 4-23 2018 Staring Lake Zooplankton Counts (#/m²)

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% (Figure 4-24). The max grazing rate in June corresponded with the highest population of cladocera and optimal feeding temperatures near 21 degrees Celsius. Grazing rates were variable across the remaining sampling dates.

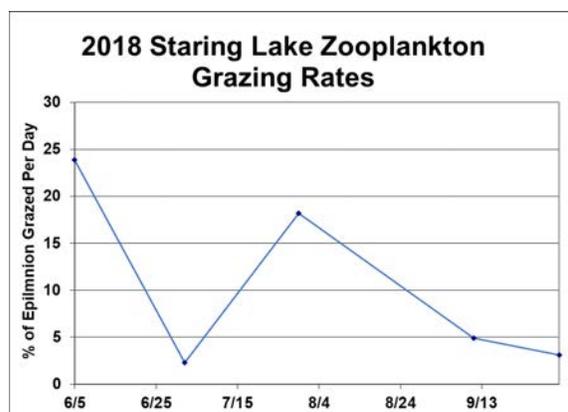


Figure 4-24 2018 Staring Lake Grazing Rates

During the summer of 2018, staff collected five phytoplankton samples on Staring Lake (Exhibits D). Abundance of phytoplankton by Class are presented in Figure 4-25. Cyanobacteria concentrations were extremely high across all sampling dates and comprised 95%, 98%, 99%, 99%, and 99% of the total phytoplankton abundance (TPA) respectively. *Aphanozomenon sp.*, *Microcystis wesenbergii*, and *Aphanocapsa sp.* were the most common. All mentioned species have the potential to produce harmful toxins which can pose serious threats to human and environmental health via contamination of drinking water, recreational exposure to waterborne toxins, and possible accumulation of toxins in the food-web.

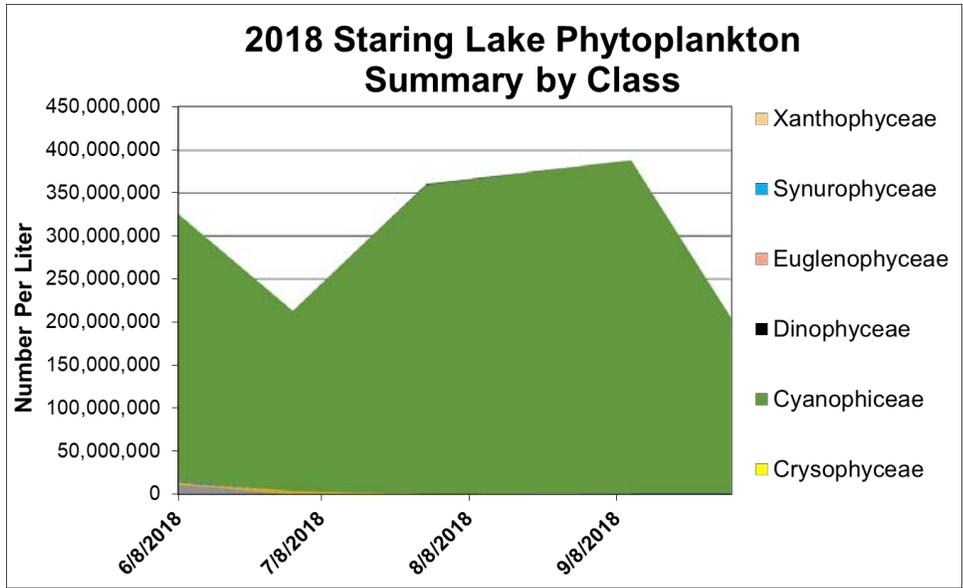


Figure 4-25 2018 Staring Lake Phytoplankton Abundance (#/L) by Class.

4.9 Winterkills and Fish Stocking

Winterkills are common across the state of Minnesota, especially in shallow eutrophic (nutrient-rich) lakes with muck bottoms and an abundance of aquatic plants. Many shallow lakes within the Riley Purgatory Bluff Creek Watershed District have had a history of winterkills. A winterkill occurs when dissolved oxygen (DO) levels within a lake drop below 4 mg/L for an extended period, causing fish to suffocate and perish. During the summer season, oxygen is added to lakes through wind action and photosynthesis by phytoplankton and macrophytes. In the winter, if there is limited snow to block sunlight, phytoplankton and some macrophytes may continue to photosynthesize and help prevent a winterkill from occurring. Microorganisms near the lake bottom and in the sediment of a lake are continuously decomposing material and consume DO in that process. If a large snow event occurs or snow coverage has been present for an extended period, it becomes too dark for photosynthesis to occur. The high organic content in shallow lakes provide an abundance of food for the decomposers which can cause DO levels to become depleted and a fish kill can occur.

In late March of 2018, RPBCWD staff were notified about a possible winterkill on Rice Marsh Lake by a resident who contacted the City of Chanhassen. Staff went out and conducted a regular water quality sampling event on the lake to observe if a fish kill occurred. Upon arriving at the lake, staff noticed many eagles and osprey sitting around the edge of the open water caused by the aeration unit and hypothesized that they were feeding. Immediately after drilling an ice hole, staff observed small bluegills floating to the top of the hole, deteriorated water clarity, and a smell was present, all of which confirmed a winterkill had occurred. DO levels in Rice Marsh Lake across all depths were less than 2 mg/l. After sampling Rice Marsh Lake, staff also sampled Duck Lake where similar conditions were observed, indicating a winterkill had occurred. The surface DO level was at 8 mg/L, while the remaining levels were below 2 mg/L. The high surface DO in Duck was likely caused by the power auger agitating the surface water. Lake residents attempted to prevent a winterkill by plowing away strips of snow totaling four to five acres to increase photosynthesis but were unsuccessful.

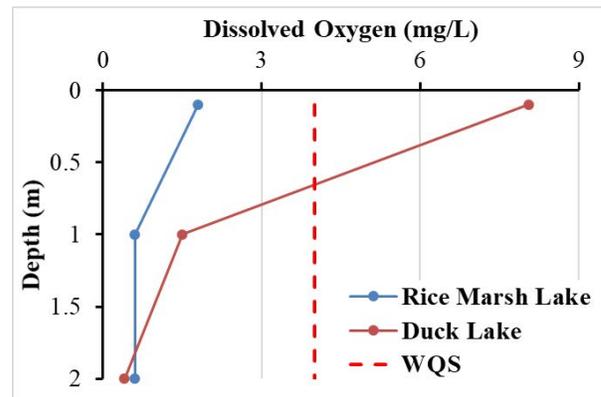


Figure 4-26 Duck Lake and Rice Marsh Lake Dissolved Oxygen Levels in March 2018

Staff had been operating an aeration unit on Rice Marsh Lake successfully and a large open water area was present all winter in 2018. No winterkills had previously occurred on Rice Marsh Lake since the aeration unit was installed in 2010. Preventing a winterkill in Rice Marsh Lake is a critical part of the Common Carp Management Plan for the Riley Chain of Lakes. Common carp have been known to move from various lakes in the Riley Chain into Rice Marsh Lake to spawn. Before the aeration unit was operational, Rice Marsh Lake would winterkill every few years which would eliminate all predators of common carp in the system and allow carp to successfully spawn. These successful spawning events caused large carp populations to form in all lakes within the Riley Chain. Since operation of the unit in 2010, no winterkills, and subsequently no major recruitment events of common carp occurred within the Riley Creek system until this winterkill.

Fish stocking following a winterkill is a common practice to reestablish a fish population. Due to the importance of Rice Marsh Lake in combating carp within the Riley Chain of Lakes, it was decided that bluegill sunfish would be stocked into the lake. Bluegill sunfish can suppress a carp population by consuming carp eggs during the spawn. A well-established bluegill population in a lake can completely control a carp population and prevent it from becoming a problem. Since the certified private hatchery was delivering bluegill to Rice Marsh Lake, staff also directed the stocking of bluegills in the Upper Purgatory Creek Recreational Area and Staring Lake. These two water bodies have variable carp

populations that are not under full control and stocking bluegill has been used in the past to aid in common carp control. The stocking was used to bolster bluegill populations within the system with the hope of eliminating carp recruitment. Bluegill stocking rates can be seen in Figure 4-27.

Figure 4-27 2018 Bluegill Stocking Rates

Lake	Number of Bluegill Stocked
Rice Marsh Lake	1000
Staring	300
UPCRA	200
LPCRA	500

No spring fish kills were identified in 2018 as a result of the bacterial infection *Flexibacter columnaris* which in the past has occurred on Lotus Lake and Lake Susan.

4.10 Lake Susan 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, and from 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.



Figure 4-28 Spent Lime Treatment System

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 4-28). 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.

Observation and monitoring data collected by District staff in 2016, suggested the system was underperforming and inundated for extended periods, which deviated from the original design parameters. In the spring of 2017, Barr completed additional field investigations, and laboratory testing for the Lake Susan spent lime system. Utilizing spent lime from the system, it was found that soluble reactive phosphorus (SRP) removals were on the order of 80-90%; within column tests which simulate the contact time within the Lake Susan system, removals were 30-40%. Additional testing led to modifications to attempt to improve system performance and address observed short-circuiting of flow through the system at no cost to the District. These modifications included the replacement of the cleanout pipes to eliminate leaky joints, modification of the header pipe so that pipe joints have welded connections, filling holes at the bottom of splash basin at the entrance to the system and of the monitoring hole in the side of the chamber, adding additional spent lime to the system, and removal of one stoplog in the manhole with the intention of promoting water level fluctuation in the spent lime system. Following the modifications, the system was put online for the summer of 2017 and was sampled weekly during the summer and into the fall. Similar to 2016, the system continued to underperform in 2017.

In 2018, sampling ports were installed at various locations within the spent-lime and monitored to allow the District and Barr to see removals throughout the spent lime layers. Monitoring results within the spent lime were again highly variable and did not indicate the consistent removal of nutrients. Due to the observed differences in water levels between the water on the surface of the media and the underdrain system, the reduced ability to extract water from the sampling port within the spent lime by mid-summer, the observation of no flow through the media during bucket tests at the site, and limited shifts in pH, it is hypothesized that the water is unable to contact or filter through the spent lime. Therefore, the material has significantly limited opportunity to form the calcium precipitates and remove phosphorus.

District staff and Barr Engineering will be meeting in 2019 to discuss possible next steps to improve removal efficiencies of the spent lime unit. Possible modifications include:

- Mixing spent lime with sand to increase filtering capacity.
- Replace two clean outs with perforated pipe to increase flow through the system.
- Modify the inlet so that inflow can be more precisely controlled to limit inundation duration.
- Modify the underdrains so water flows upward through the filter media to an overflow to increase water contact time with the spent lime.
- Adding baffles within the filter to create a longer flow path and extend residence time to increase phosphorus reductions.

4.11 Rice Marsh Lake Stormwater Inputs

Based on the Use and Attainability (UAA) assessment in 2016, 44% of the load of phosphorus entering Rice Marsh Lake was attributed to watershed runoff (Barr 2016). The District wanted to better capture and understand rain event nutrient loading into Rice Marsh Lake from the residential and business area northwest of the lake. This area was identified as a potential site for a water quality improvement project in the UAA. However, more information on nutrient loading at this site was needed. In August of 2016, District staff deployed an automated water-sampling unit at a storm drain pipe access point on Dakota Lane. They redeployed this unit again at this point in 2017 and 2018. This pipe drains to a stormwater pond which then drains into Rice Marsh Lake. 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 analyzed for TDP, TP, TSS, and Chl-a. The automated water-sampling unit also tracked flow of water in the storm drain pipe at that point. In conjunction with the unit samples taken during/after a rain event, staff collected post-rain samples from the receiving stormwater pond. TP results were compared to MPCA TP standards for stormwater ponds.

In 2018, the amount of TP moving through the culvert after rain events was high, as seen in Figure 4-29. Five of the total nine samples taken had TP levels exceeding the ceiling of the MPCA standard for stormwater ponds (0.1mg/L – 0.25mg/L), the highest being 0.558mg/L. Three of remaining samples exceeded the floor of the standard (Figure 4-29). TP levels in the pond were lower, none exceeding the ceiling of the MPCA TP water quality standard (Figure 4-30); all but one sample exceeded the floor of the standard. Relative to TP measurements, TDP readings were low, the highest in-drain reading measuring 0.112mg/L, and the highest pond reading measuring 0.068mg/L (Figure 4-29, Figure 4-30). TSS was also quite high in samples taken from the stormwater drain pipe. Six of the nine samples had TSS levels higher than 30mg/L (MPCA standard for TSS in District creeks is <10% of the time exceedance of 30mg/L TSS, Figure 4-31). There is no water quality standard for TSS in a stormwater pond, but all samples collected from the pond had TSS levels below 30mg/L (Figure 4-32). These results indicate the stormwater pond is continuing to reduce the amount of nutrients entering Rice Marsh Lake from these inputs. However, removing more nutrients from the water before it enters the pond via a treatment system or BMP could potentially lead to a greater increase in water quality of the lake.

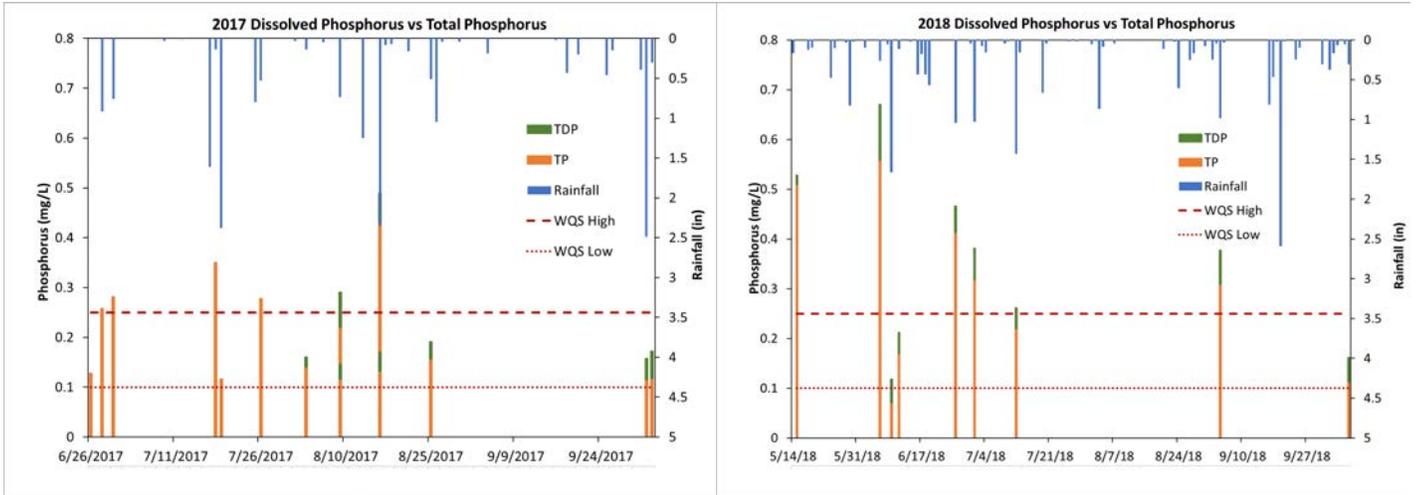


Figure 4-29 2017 and 2018 Stormwater Phosphorus Inputs to Rice Marsh Lake

Total Dissolved Phosphorus (TDP) and Total Phosphorus (TP) concentrations (mg/L) from the stormwater draining into the pond at the northwest end of Rice Marsh Lake. Dashed lines represent the Minnesota Pollution Control Agency TP Standards for stormwater ponds (0.1mg/L-0.25mg/L).

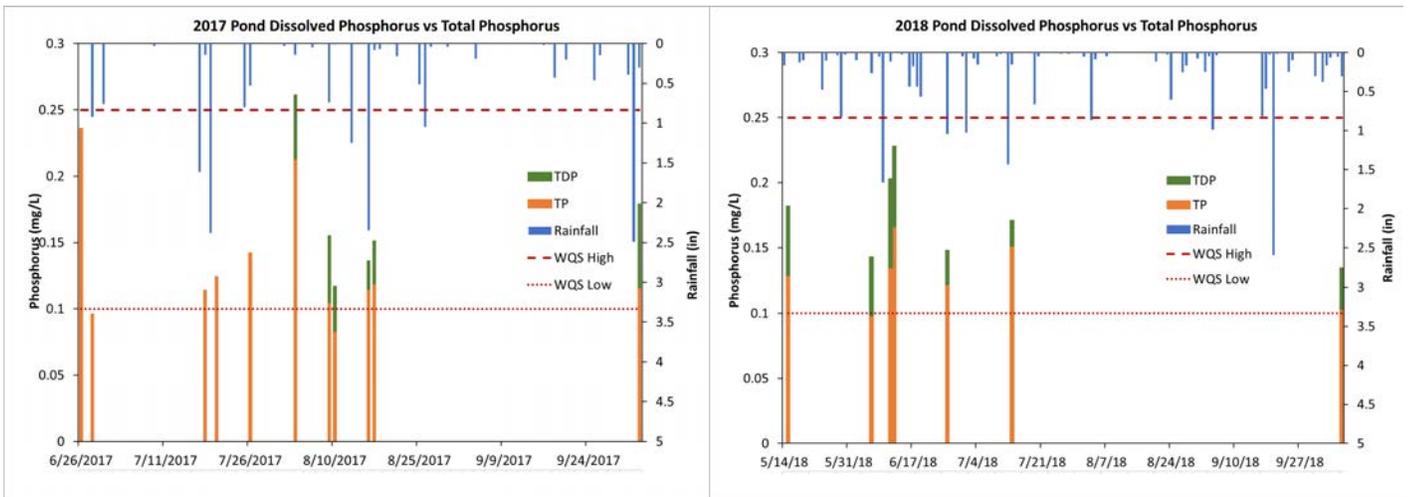


Figure 4-30 2017 and 2018 Stormwater Pond Phosphorus Inputs to Rice Marsh Lake

Total Dissolved Phosphorus (TDP) and Total Phosphorus (TP) concentrations (mg/L) from the stormwater pond draining into the northwest corner of Rice Marsh Lake. Dashed lines represent the Minnesota Pollution Control Agency TP standards for stormwater ponds (0.1mg/L-0.25mg/L).

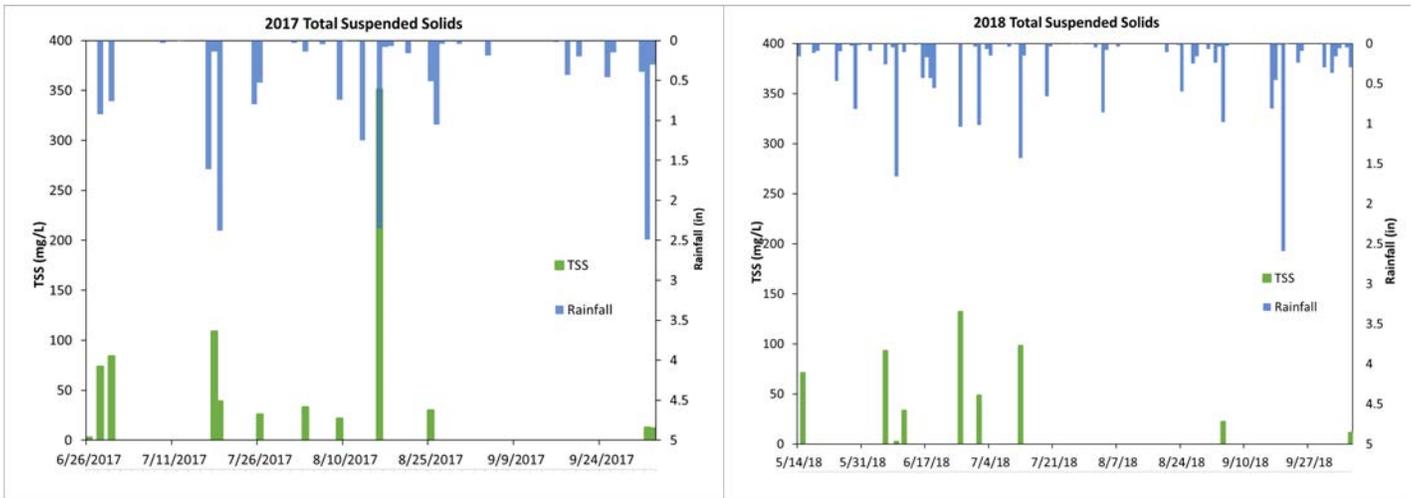


Figure 4-31 2017 and 2018 Stormwater Total Suspended Solids Input to Rice Marsh Lake

Total Suspended Solids (TSS) concentrations (mg/L) from the stormwater draining into the pond at the northwest corner of Rice Marsh Lake.

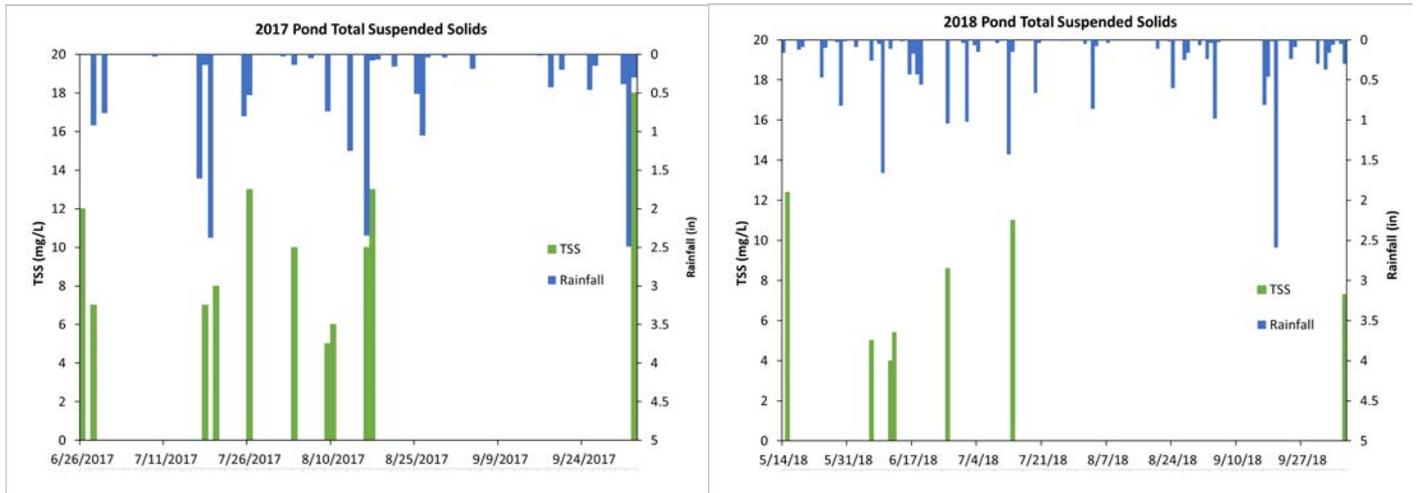


Figure 4-32 2017 and 2018 Stormwater Pond Total Suspended Solids Inputs to Rice Marsh Lake

Total Suspended Solids (TSS) concentrations (mg/L) from the stormwater pond draining into the northwest end of Rice Marsh Lake.

4.12 EnviroDIY

Over the course of 2018, staff has been working with staff from the environmental engineering/science consultant firm LimnoTech to implement EnviroDIY technology into everyday District water monitoring and data collection. EnviroDIY is a part of WikiWatershed, a web toolkit designed to help citizens, conservation practitioners, municipal decision-makers, researchers, educators, and students advance knowledge and stewardship of fresh water (EnviroDIY 2019). Staff learned how to build monitoring stations from the ground up, how to pair them with professional grade water sensors, and how to deploy them in the field. They also learned how to program the stations with the assistance of LimnoTech and UMN scientists, utilizing open-source code developed by researchers/scientists from the EnviroDIY community. These stations are a reliable, cost-efficient alternative to monitoring stations used by the District in the past. Not only is there the added benefit of staff being able to edit and troubleshoot sensor/station programming on their own, but these stations are set up to allow for staff, and eventually the public, to access and review real-time data remotely. Additionally, staff can deploy these for Education and Outreach Programming, so kids can instantly compare water quality they collected with the logger data.

On January 11th, 2018, the District hosted a day-long workshop led by LimnoTech staff on choosing parts for, and the construction of a general EnviroDIY water quality monitoring station. During the workshop, staff and attendees built six monitoring stations to be used in the District for monitoring. These stations utilize an EnviroDIY Mayfly Data Logger microprocessor board connected to an external 3.7 v battery and 3.5-watt solar panel. Each station was outfitted with an air temperature sensor, a MaxSonar WRMT ultrasonic range finder, a Yosemitech Y520-A 4-electrode conductivity sensor, and a Yosemitech Y511-A optical turbidity sensor. Data collected was stored on an on-board SD card connected to the board, as well as uploaded to an online repository via a Hologram global SIM card and a GPRSbee rev.6 antenna. The Mayfly boards, along with the battery and other components were housed inside of a Pelican Case 1120 waterproof box which was set up to be able to attach to a post or structure in/around the creek/lake/pond site. Over the course of 2018, staff purchased materials for, assembled and deployed two more EnviroDIY stations to be used as lake level sensors (these were deployed in 2018 on Rice Marsh Lake and Lake Riley after ice-out). All eight of these stations were programmed by LimnoTech staff, and any troubleshooting that occurred on these units during 2018 was also carried out by LimnoTech staff.

On December 13th, the District hosted another day-long workshop, led by LimnoTech staff, on programming, setup/connecting to, and troubleshooting/changing code of the EnviroDIY stations. In the week prior to this workshop, staff worked through a series of online tutorials on setting up and connecting instruments and devices to microprocessor boards, as well as tutorials on introduction to programming and accessing online repositories and resources. During the workshop, staff learned how to use existing, open-source code (found via code libraries provided by the EnviroDIY online community) to digitally locate and activate station sensors, as well as change and write code in order to make the sensors collect and log data. After completing this training, staff purchased parts to build two more general water monitoring sensors for the 2019 season. In total, the District has 10 EnviroDIY stations: eight built and programmed, and two which staff will assemble and program in 2019. Of these stations, four were installed at different sites around the District as a test deployment in 2018 (two general stations and two lake level stations). After some troubleshooting of sensor programming, these stations all measured and logged data continuously until they were removed for the winter (each station was programmed to collect sensor readings at a set interval, e.g. every 15 min). Staff plans on deploying all 10 in 2019.

On June 29th, 2018, staff installed one of the general water monitoring EnviroDIY stations (station RPB 3) in Purgatory Creek on the west side of Vine Hill Road. On July 13th, 2018, another was installed in Bluff Creek just upstream of the culvert running under Pioneer Trail (station RPB 4, installed just upstream of regular stream monitoring site B2). These units were each attached to an eight-foot section of metal fence post which was driven into the sediment (RPB 3 was placed in the pooling part of the stream just below the discharging culvert, and RPB 4 was placed in the pool just upstream of B2). These units

measured water level, water temperature, air temperature, conductivity, and turbidity. They were both pulled from their sites on November 11th, 2018.



Figure 4-33 EnviroDIY Water Monitoring Stations

One of the District's EnviroDIY general monitoring stations (Left), equipped with air temperature, ultrasonic range, water temperature, conductivity, and turbidity sensors. The EnviroDIY water level monitoring station (Right) is equipped with sensor which measures water level, conductivity, and water temperature.

4.13 Wetland Inventory

As part of the Riley-Purgatory-Bluff Creek Watershed District Wetland inventory program, field assessments began June 2018 and ended November 2018. During this period, staff conducted wetland assessments to be recorded in the District database. Wetland assessments started at the west end of the district. A total of 102 wetlands were assessed and recorded using MnRAM 3.2 digital/manual worksheet. Notable flora and fauna were also documented to further assess the ecological integrity of each wetland being scored. Other documentation, such as directional photographs and GIS mapping were added to the documentation of each wetland. To gain a deeper understanding of the wetlands being assessed, historic and current county mapping data was used to identify possible disturbances of wetland ecology, municipal drainage, and stormwater management systems. Web Soil Survey was also used in the assessments to classify hydric soil type within wetland bounds to help in the scoring process. Each wetland assessed was given a name for future identification based on their mapped location section, township, and range, followed by a specific number (e.g. a group of wetlands located in T116 R23 S04 would be identified as 04-116-23-001, 04-116-23-002, and so on). The ultimate goals of the wetland assessment program are as follows: The District will have an as-complete-as-possible inventory of wetlands in the watershed; the District will have an objective measure of the wetland quality based upon functions and values provided by the wetland for the implementation of the District's regulatory program; the District will be able to identify wetlands that are degraded and well suited for ecological enhancement, or relic wetlands that are fully drained but candidates for hydrologic restoration.

In July 2018, staff lead a wetland walk aimed toward community outreach to educate the public. Thirteen individuals attended the event. They were introduced to some of the basics in the assessment and scoring process of wetland ecology. Board of Water and Soil Resources (BWSR) MnRAM scoring systems, along with Circular 39 and Cowardin Wetland Classification Systems were part of the information presented, along with a pamphlet of wetland types and the flora found within each. Site visits to wetlands in the vicinity of Rice Marsh Lake were also a part of this event. This in-the-field observation provided an opportunity for people to see firsthand the different type of wetland ecology found within the district boundary.



Figure 4-34 Sundew plants found in local wetland.

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 5-1). 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. Figure 5-1 identifies what AIS monitoring/management occurred in 2018 excluding common carp management.

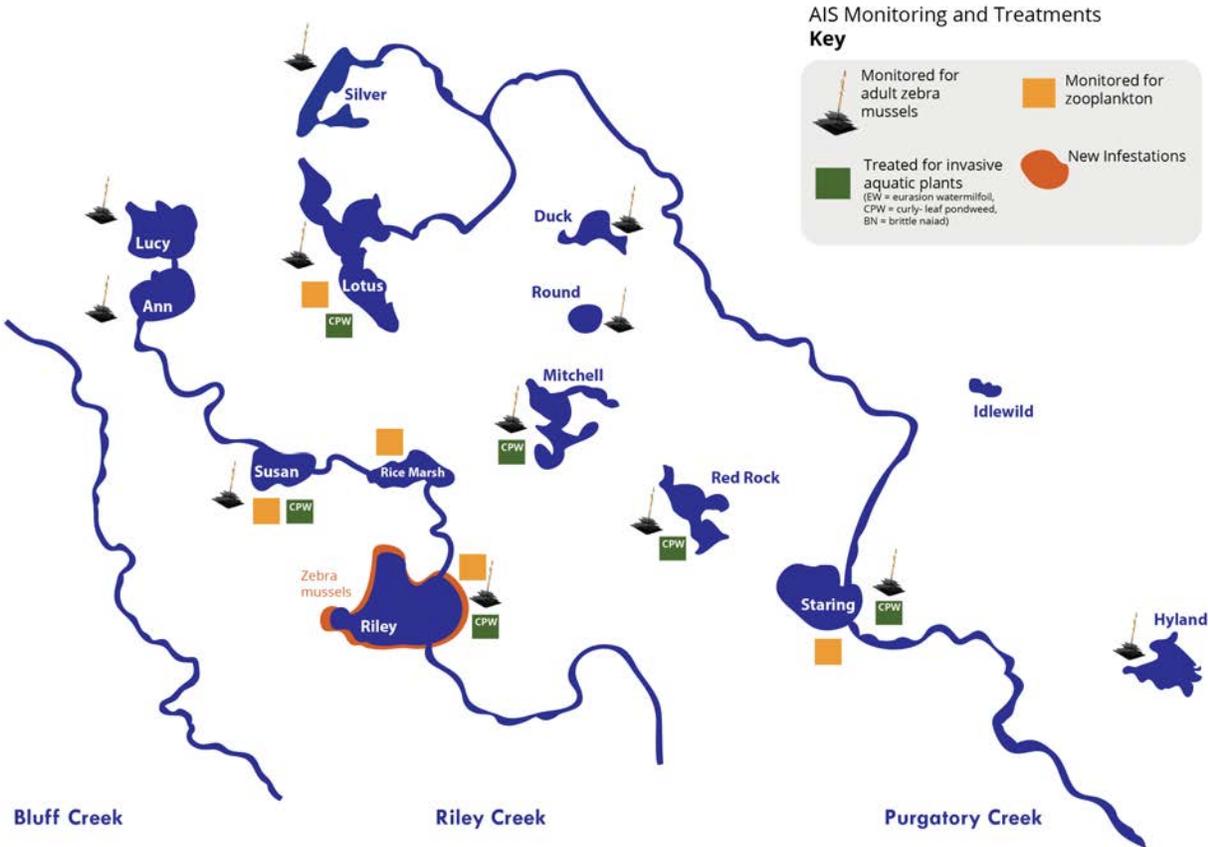


Figure 5-1 2018 Aquatic Invasive Species Sampling

Aquatic Invasive Species work conducted in 2018 within the Riley-Purgatory-Bluff Creek Watershed District. Zebra mussel plate symbol indicates some the installation of monitoring plates and bi-weekly public boat launch scans. Lakes that received zooplankton and phytoplankton sampling are identified by orange squares and lakes that received herbicide treatments are identified by green squares (CPW=curly-leaf pondweed; BN=Brittle Naiad; EW=Eurasian watermilfoil). The orange outline around Lake Riley indicates the new infestation of zebra mussels found in 2018. All lakes received juvenile mussel sampling; none were found. This map excludes carp management.

Table 5-1 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	
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	
Duck	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. 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. 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 early the spring of 2018, herbicide treatments were carried out on Lotus Lake, Mitchell Lake, Red Rock Lake, Lake Riley, Staring Lake, and Lake Susan for curly leaf pondweed. No Eurasian watermilfoil or brittle naiad treatments occurred.

Staring Lake Eurasian Watermilfoil

Eurasian watermilfoil (EWM) is a species native to Europe and Asia that has been introduced to the United States. The concern with this species is that it can form dense mats that outcompete native species and interfere with recreational activities such as boating, swimming, and fishing. Since the infestation of EWM in Staring Lake in 2015, the District has been working with James Johnson from the Freshwater Scientific Services (FWSS) and has developed a mechanical and chemical rapid response strategy to potentially eliminate the plant from the lake. The strategy of hand-pulling followed by a fall herbicide treatment has been successfully used to control new infestations of EWM on Weaver Lake (Hennepin Co.) and Lake Charlotte (Wright Co.). In 2018, Johnson, the District, and the University of Minnesota (UMN) all surveyed Staring for EWM. Only one removal event took place in which District staff mechanically pulled 80 plants from the northwest end of the lake and another 30 plants from the northeast

end (just northwest of the Staring Outdoor Center, Figure 5-2). No herbicide was applied to Staring in 2018.

On June 20th, Johnson located about 15 individuals/small clusters of EWM across the lake (Figure 5-2). As the summer went on, EWM infested areas and density of stands increased. The UMN and District staff located several more areas of infestation in August, October and November (Figure 5-2). During two of the UMN scans, June 28th and August 15th, UMN researchers identified possible hybrid watermilfoil growing at two points during each date, but genetic testing will be done to determine strain (Figure 5-2). Hybrid watermilfoil is a hybrid of EWM and the native northern watermilfoil. It is similar to EWM in that it spreads and forms dense stands that choke out native plants. During the November 6th partial lake survey, District staff located about 147 individuals (as seen in Figure 5-2, stands of EWM on this date were dense and some of these points may include a small cluster of plants). These points will help guide removal and treatment actions in 2019. If stands continue to grow in such densities, mechanical removal may end, making herbicide treatment the singular control practice in 2019. Staff will continue to monitor for EWM in 2019 to determine how extensive herbicide treatments will need to be, as well as their effectiveness.

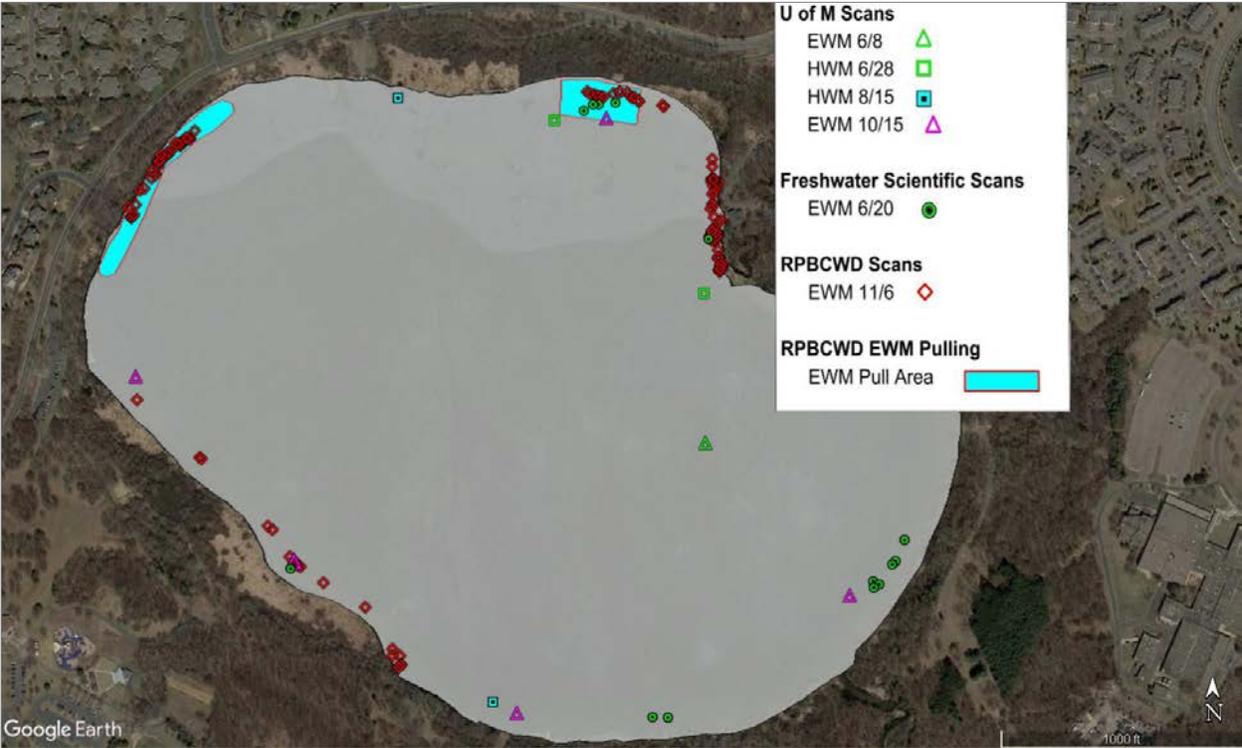


Figure 5-2 2018 Staring Lake Eurasian Watermilfoil Surveys and Removal Areas

The points represent Eurasian watermilfoil plants (individuals or small clumps of plants), as well as plants that were possibly hybrid watermilfoil species, observed during several EWM surveys carried out during summer/fall of 2018. District staff, the UMN, and Freshwater Scientific all carried out scans at different times. District staff pulled about 110 total plants within the two areas represented by the blue polygons.

Brittle Naiad

Brittle Naiad 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 fairly resilient plant; it can survive in some polluted and eutrophic waters and can reproduce by fragmentation. With that said, brittle naiad is a very new AIS and not much is known about its effects especially in Minnesota.

Lotus Lake Brittle Naiad

On September 26, 2017, Riley Purgatory Bluff Creek Watershed District staff found brittle naiad (*Najas minor*) located on both sides of the public boat access on the south side of Lotus Lake. The plants were found during a routine boat launch aquatic invasive species (AIS) inspection. These inspections, conducted bimonthly, consist of staff searching around the boat launch for various types of aquatic invasive species for 5-10 minutes after the 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 Keegan Lund 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 from the GPS points (Figure 5-3). That fall, an herbicide was applied to the lake in an area totaling 2.42 acres across all areas where brittle naiad was found.



Figure 5-3 2017 Lotus Lake Brittle Naiad Treatment Areas

The red polygons indicate the areas treated with herbicide during the fall of 2017 for brittle naiad. The total area treated was 2.42ac.

On September 24th and 26th of 2018, RPBCWD staff conducted brittle naiad surveys to determine the effectiveness of the herbicide and to see if the plant had spread throughout the lake. During the scan staff drove a lap around the lake and every brittle naiad plant found was marked with a handheld GPS device. Results of the survey can be seen in Figure 5-4.

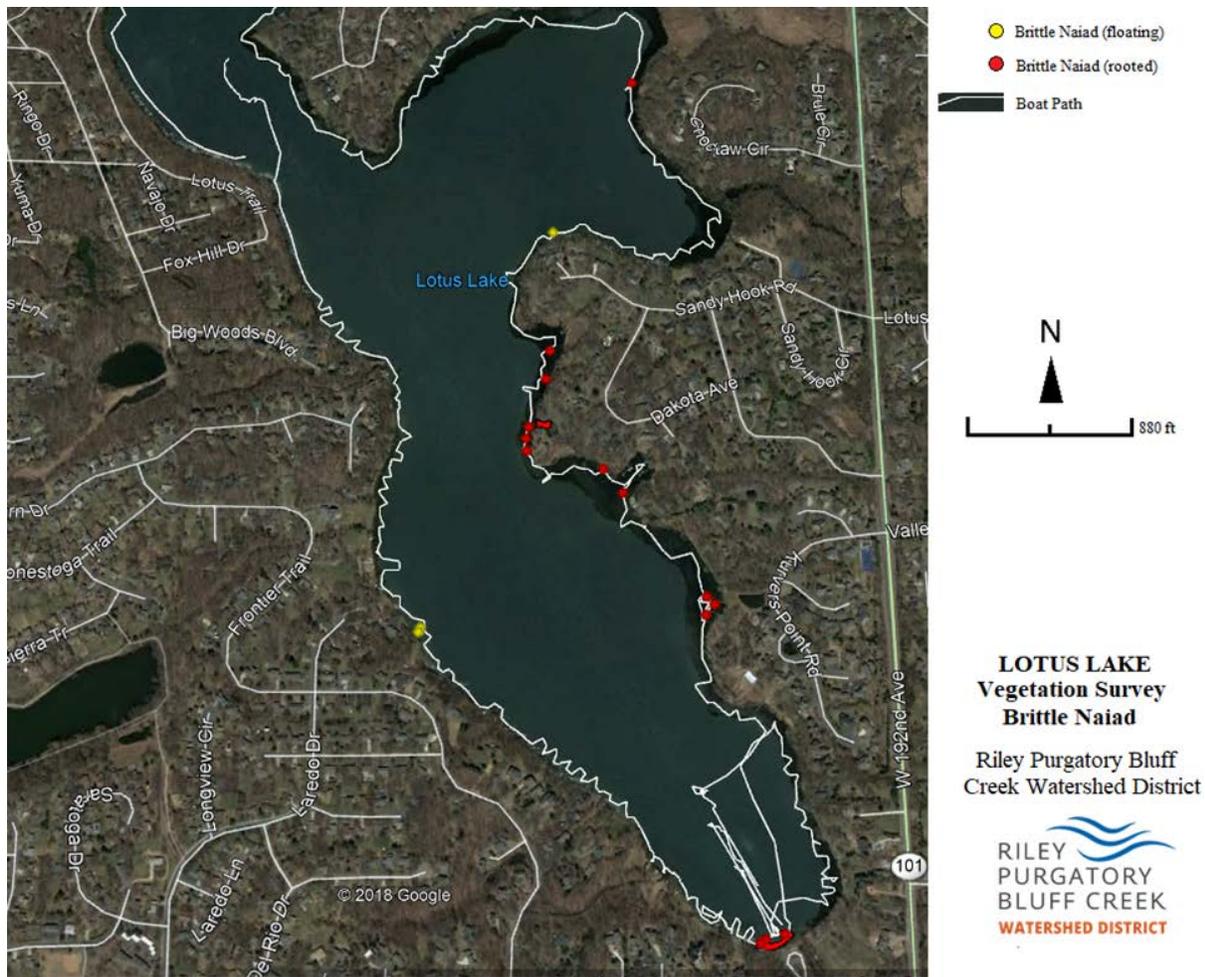


Figure 5-4 2018 Lotus Lake brittle naiad map.

Based on the 2018 brittle naiad scan, it appears the overall plant distribution has 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. Due to the limited water clarity of Lotus Lake, brittle naiad was observed growing between 0.5 to three feet of water. The plant growing depth may increase due to the alum treatment that occurred during the fall of 2018 which should increase water clarity in 2019. Additional vegetation scans will occur in 2019 to see if the plant distribution expands.

Lake Ann Brittle Naiad

Freshwater Scientific Services, LLC surveyed the aquatic plant community of Lake Ann (Carver County, MN) on August 2, 2017 using the point-intercept survey method described. This survey was based upon 366 sample points arranged in a uniform grid (50m spacing) across the entire lake. At each designated sample location, plants were collected using a double-headed, 14-tine rake on a rope. For each rake sample, the rake was dragged over the lake bottom for approximately 5 ft before retrieving.

During the 2017 survey Brittle Naiad (*najas minor*) was discovered at one location in the northeast corner of the lake near the public swimming beach and dock (Figure 5-5). 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 0.25ac area as part of the rapid response plan in attempt to slow or stop the plant from spreading.



Freshwater Scientific Services LLC

Lake Ann
Brittle Naiad Survey
8/2/2017

■ Brittle Naiad location and treatment area.



Figure 5-5 2017 Lake Ann Brittle Naiad Discovery and Treatment Map.

On September 28th, 2018 RPBCWD staff conducted another brittle naiad scan to assess treatment results (Figure 5-6). During the scan staff drove a shallow and deep lap around the lake and searched for the presence of the plant. The survey was conducted on a sunny day to aid visibility of the plant, however strong north winds did decrease visibility along the south side of the lake. 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 suggest that brittle naiad was more widely distributed than it was in the 2017 survey. As part of the continuation of the rapid response plan, the district will be in discussion with the Minnesota Department of Natural Resources and Herbicide Applicator to discuss options for treatment on Lake Ann to prevent further spread of the invasive plant.

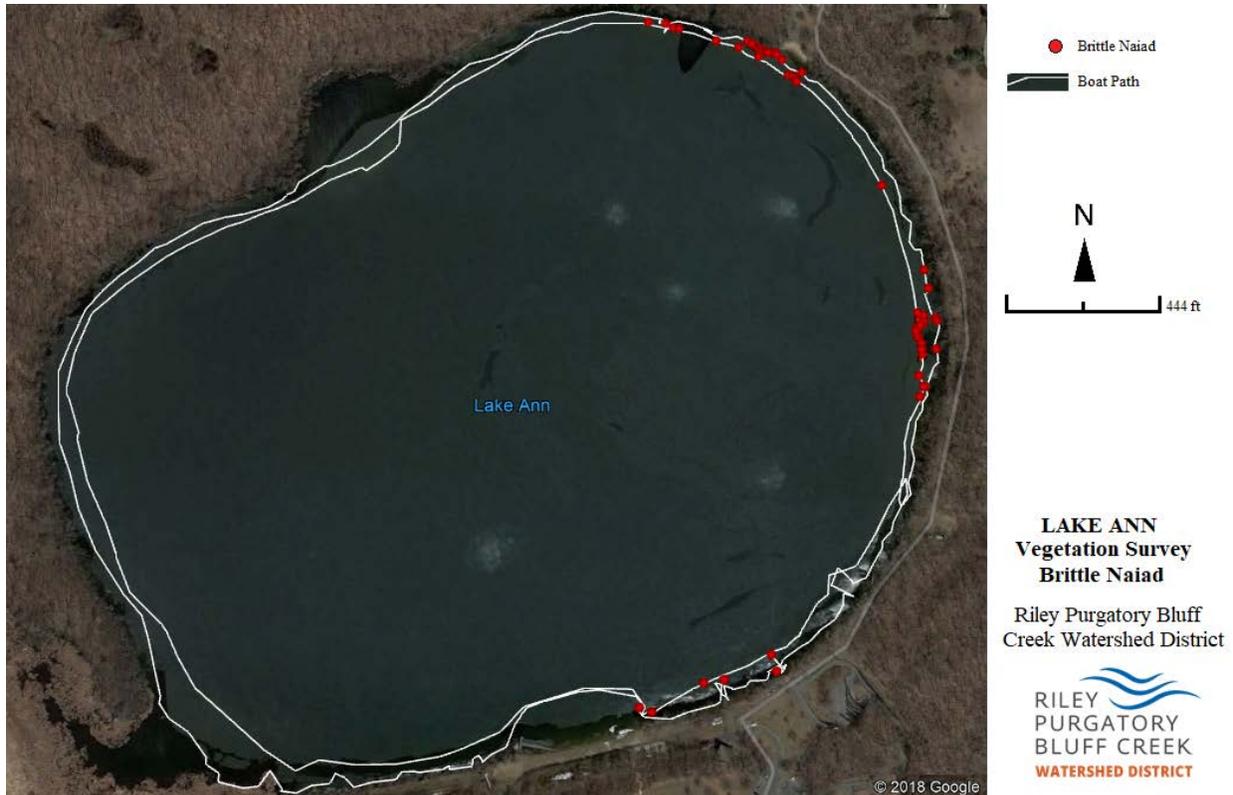


Figure 5-6 2018 Lake Ann Brittle Naiad Assessment Map.

5.3 Common Carp Management

The RPBCWD, in cooperation with the University of Minnesota (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 the University. 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 between late July and early October (totaling nine transects per lake). If the total biomass estimate of carp is above 100kg/h, the population is considered harmful to lake water quality and the District would need to consider removing carp. Young of the year (YOY) carp are monitored by conducting five, 24-hour small mesh fyke net sets between August and September. If YOY carp are captured during this sampling, it suggests successful recruitment has occurred, and monitoring efforts should be increased on that water body. At that point, the District would also consider the removal of excess carp.

District staff completed fyke net surveys on all lakes within the RCL, as well as lakes within the Purgatory Chain of Lakes (PCL), including Lotus Lake, Staring Lake, the Upper Purgatory Creek Recreational Area (UPCRA), and the Lower Purgatory Recreation Area (LPCRA). 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 and bullhead species. Similar to 2017, Lake Riley had the highest number of bluegills captured in 2018 averaging 107 fish per net, while an average of only 19 bluegills/net were captured on Staring Lake. Many other Centrarchid species, including pumpkinseed sunfish and black crappie, were also very common across all lakes. Larger predator fish including

northern pike and largemouth bass were also captured via fyke netting. The most diverse fish population was observed in LPCRA where 14 different species were captured. A full summary table of the fish captured for each lake can be found in Exhibits B. Similar to 2017, no YOY carp were captured in any of the lakes during fyke net surveys in 2018. The lack of young individuals captured in lakes indicates that 2018 was a very poor recruitment year for common carp overall. One YOY carp was captured during fyke netting on the UPCRA and nine YOY carp were captured in the LPCRA indicating some recruitment occurred. Reviewing past sampling data, this appears to be the first recruitment event since 2015.

The PCL lakes (Staring and Lotus) and the Purgatory Recreation Area were surveyed via electrofishing in 2018. The RCL will be sampled via electrofishing in 2019. In 2018, the common carp biomass estimate was 95.1 kg/h on Lotus Lake, which is up from the 2017 estimate of 68.8 kg/h (Table 5-2). This number is still under the carp biomass threshold (100 kg/ha). Comparing the past four years of electrofishing data (Figure 5-7) the carp population has remained stable, with slight year to year variability. With no YOY carp captured, combined with a lower adult carp biomass estimate, the resident carp population in Lotus Lake is of limited concern in relation to the degradation water quality. As seen in Figure 5-7, 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 61.7 kg/ha. In 2018, it was lower still at 41.1 kg/h (Table 5-2). These fish consisted of individuals from the 2014/2015-year class, which was the last successful recruitment year for common carp in the system.

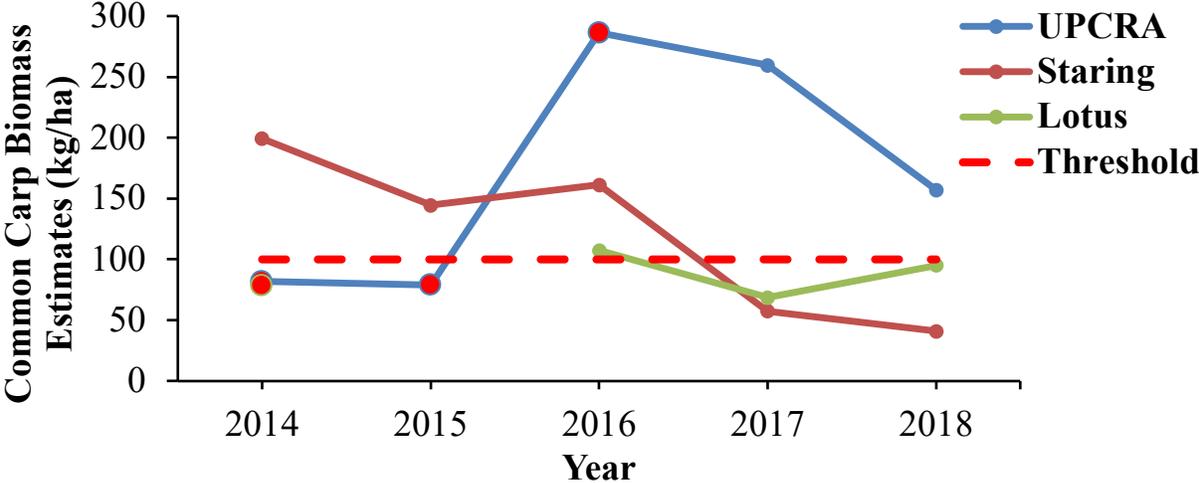


Figure 5-7 Purgatory Chain of Lakes Common Carp Biomass Estimates
Common carp biomass estimates (kg/ha) for the Purgatory Creek Chain of Lakes from 2014-2018 as compared to the 100 kg/h threshold. Red markers indicate only one sampling event occurred as opposed to the suggested three.

The LPCRA was not electrofished in 2018 due to access issues and the amount of brittle naiad present in the system. In 2018 the UPCRA again had a carp biomass estimate that exceeded the biomass threshold at 157.6 kg/h (Table 5-2). This number is down significantly from the 245.2 kg/ha estimate in 2017. Since the UPCRA area is essentially the top of the system (fish cannot get to Silver Lake and Lotus Lake), and has a deep-water refuge, fish move to this location. Due to the shallowness of the system, winter seining would have limited effectiveness at capturing carp. Additionally, winter seining may yield limited success in Staring Lake due to the low number of carp captured. The reduction in biomass estimates in both Staring and Purgatory Creek Recreational Area suggest that spring removals utilizing the Purgatory Creek Trap Net and backpack electrofishing may have been able to reduce carp populations in the Purgatory Creek System, specifically in 2018 (more information in next section). Even though the carp biomass estimate was lower in UPCRA, levels still exceeded the threshold and carp could reduce water quality in the system. Additionally, fyke nets captured nine YOY carp which suggests some level of recruitment occurred in the recreation area. Staff will continue to monitor the carp population in 2019. Overall, 14

carp were tagged with implant-style VHF transmitters, twelve fish in Staring and four in the UPCRA. This will allow staff to locate when and where in the lake the carp are schooling and moving.

Table 5-2 2018 Common Carp Biomass Estimates for the Purgatory Chain of Lakes

	Lake	Fish per Hour	Density per Hectare	Average Weight (kg)	Carp Biomass (kg/ha)
Purgatory Chain	Lotus	5.3	28.2	3.4	95.1
	Staring	5.6	29.2	1.4	41.1
	Upper Purgatory Wetland	31.4	151.2	1.1	157.1
	Lower Purgatory Wetland	-	-	-	-

*Lower Purgatory Creek Recreational Area not sampled.

Floating Trap Net and Backpack Electrofishing

In the spring of 2018, staff placed a large floating trap net below the barrier in Purgatory Creek during peak spawning runs to capture common carp as an experimental gear (Figure 5-8). This net was checked daily; staff sorted fish, releasing natives and removing carp. In 2018, the barrier was closed on May 4th after northern pike were allowed to move upstream into the recreational area to spawn and return to Staring Lake. Because of the extended winter season and the abrupt end due too rapidly warming water temperatures, it appeared that northern pike and common carp spawning runs overlapped more than normal (as suggested by Chizinski et al., 2016). The floating trap net was deployed May 7th. The City of Eden Prairie opened, cleaned, and closed the fish barrier multiple times during the spring and late summer due to high water levels in the Purgatory Creek Recreational Area. During this time, fish could potentially move freely throughout the system when the trap net wasn't present. Fish species found in the floating trap net included northern pike, black crappie, freshwater drum, bigmouth buffalo, bluegills, largemouth bass, and black bullheads. The first carp was captured on May 8th. The total number of carp removed via floating trap net was 48 (139 were removed in 2017). Staff hoped a larger number of fish would have been captured by the trap net, but this net is an experimental gear and it was unsure how many would be captured.

In 2018 staff also utilized a backpack electrofishing unit and block nets to remove common carp during the spring spawning run. These two gears were deployed in the channel upstream of the barrier to trap carp between the net and barrier, and at the breach in the berm that separates the Upper and Lower Purgatory Creek Recreational Area. Most of the fish captured via backpack electrofishing were captured at the breached berm site which allowed water to short circuit the overflow structure. Water was always flowing at this location which led to carp concentrating in the shallow water near the breach before they



Figure 5-8 Large floating trap net deployed in Purgatory Creek.

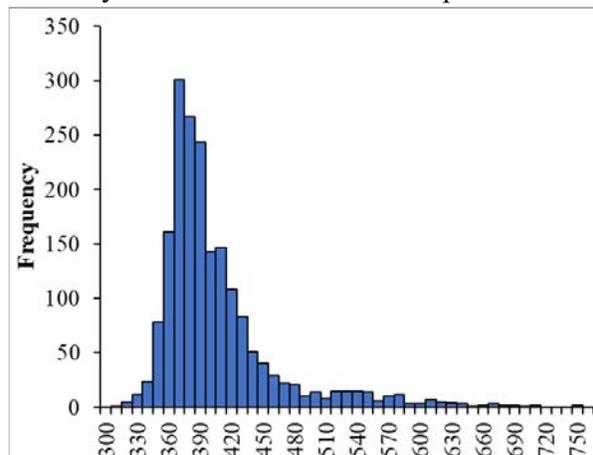


Figure 5-9 2018 Size Structure of Common Carp Removed from the Purgatory Creek Rec Area.

tried to move upstream. The sheet piling, combined with the consistent flow, eroded the downstream side of the berm, causing a drop that impeded carp movement. A block net was anchored on one 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 up to three times a day, taking about an hour each time from installation of the net to completion of sampling. Utilizing both the trap net and backpack electrofishing, a total of 1,901 carp were captured and removed from the LPCRA. In late October 2015, 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 and made up the majority of the fish captured from LPCRA as seen in Figure 5-9. Most of the carp were removed when water levels at the barrier were between 29-31 inches in depth (based on the installed staff gauge), and when temperatures ranged between 18 to 25 degrees Celsius (Figure 5-10). District staff have been working with the City of Eden Prairie to stabilize the berm while still allowing staff to utilize the location for future carp removal events. Staff will hopefully be placing an automated monitoring station at the barrier in 2019 to maximize removal efforts in the future.

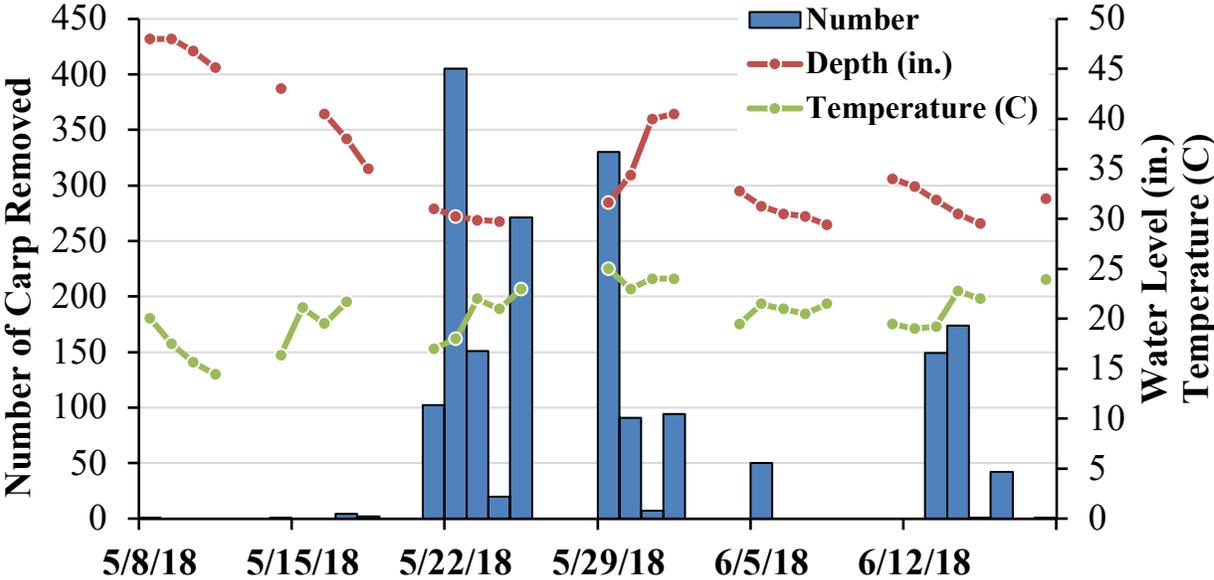


Figure 5-10 Purgatory Creek Recreational Area Common Carp removal vs Environmental Variables

5.4 Zebra Mussel Detection in Lake Riley

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, cause cuts in 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 2018. 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 Lake Riley and Lotus Lake, each of which were sampled twice due to the amount of summer traffic on these lakes. RMB Environmental Labs processed the samples and found no zebra mussel veligers across all lakes. Adult zebra mussel presence was assessed using monitoring plates that were hung from all public access docks and private docks of

residents participating in the Adopt-a-Dock program. Monitoring plates were checked monthly and no mussels were found across all lakes during the 2018 open water season. Additionally, public accesses were scanned for approximately ten minutes during each regular water quality sampling period (bi-weekly). Staff visually searched rocks, docks, sticks, and vegetation for adult zebra mussels. No adult zebra mussels were found utilizing this technique in 2018.

On October 22, 2018, RPBCWD staff conducted a more intensive zebra mussel scan 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 monitoring efforts mentioned above. Staff conducted five scans, varying in distance from 175ft to 900 ft, across the lake. Scans were conducted from shore out to waste deep water, most of which occurred between one to three feet of water. Staff utilized a handheld GPS device to track the scan route and mark points where zebra mussels were found. Structures and items checked for mussels included woody debris, rocks, aquatic vegetation, inlet pipes, bricks, and garbage.



Figure 5-11 Zebra mussels found in Lake Riley.

Zebra mussels were found at all five scan locations during the assessment, however only a single individual was found near the boat launch and in the northeast bay (). A total of 91 individual zebra mussels were found across all scans. 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 (Figure 5-11). Most zebra mussels were found on rock, wood, and items placed in the water, including pvc pipes and bricks. In discussion with our AIS specialist, it was determined that a rapid response would not be effective and was not recommended.

Following the confirmation of zebra mussels in Lake Riley staff distributed MN DNR zebra mussel fact sheets to all lakeshore owners (MNDNRb, 2015) and hosted an informational zebra mussel workshop in December. Additionally, staff conducted more extensive zebra mussel scans on all lakes within the District that had public accesses after mussels were found on Riley. The scans followed all the same procedures described in our normal boat launch scans but included three scans of varying distances across each lake in addition to a boat launch scan. No zebra mussels were found during these additional scans.

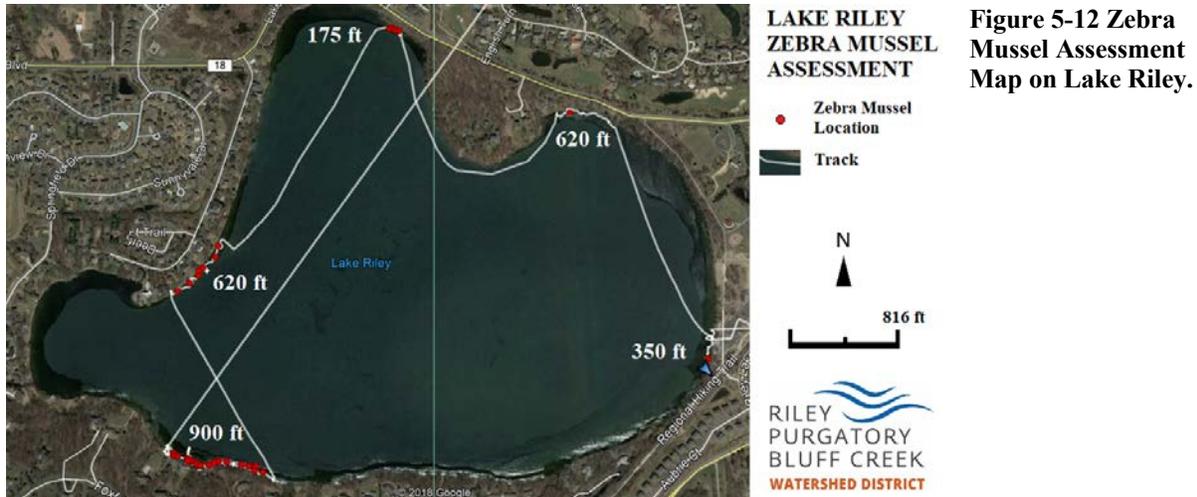


Figure 5-12 Zebra Mussel Assessment Map on Lake Riley.

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. In Table 5-3, the different variables associated with zebra mussels that the District currently measured in 2018 are presented for Lake Riley and compared to the criteria used to determine the level of infestation by zebra mussels in North America (Mackie and Claudi 2010). In Table 5-3, variables are 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 Lake Riley. 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.

Table 5-3 Lake Riley Suitability for Zebra Mussels

	Parameter	Mean Value	Risk Potential
Chalk Variables	Calcium (mg/L)	48.7	High
	Alkalinity (mg/L)	121.75	High
	pH	8.69	High
Trophic Variables	TP (mg/L)	0.024	Moderate
	Chl-a (ug/L)	7.98	Moderate
	Secchi (m)	3.43	High
Physical Variables	Temp (deg C)	24.69	High
	DO (% saturation)	104.56	High
	DO (mg/L)	8.79	High
	Cond (uS/cm)	483.7	High
	Hard Structure	n/a	High

Calcium concentrations in Lake Riley were estimated based on average monthly alkalinity samples. The estimated calcium concentrations in Lake 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 Lake Riley. The nutrient variables, overall, 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. 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. These variables all change with depth, however optimal conditions for each were present in Lake Riley. Hard structure suitability was estimated as highly suitable for zebra mussels. 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 Lake Riley included predominantly rock and woody debris and is hypothesized to not be limiting for zebra mussels.

Based on the results in Table 5-3, the suitability of Lake Riley to support a robust and expansive zebra mussel population is high. 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. The District will look at suitability for zebra mussels across all lakes in the district in 2019.

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 2018 sampling season (See Exhibits F). The lake fact sheets include: Lake Ann, Duck Lake, Hyland Lake, Lake Idlewild (high value wetland), Lotus Lake, Lake Lucy, 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	2017 & 2018 Lake Level Sensor Graphs
Exhibit B	2018 Fyke Net Summary Data
Exhibit C	2018 Zooplankton Summary Data
Exhibit D	2018 Phytoplankton Summary Data
Exhibit E	2018 Creek Assessments
Exhibit F	2018 Lake and Creek Fact Sheets

Exhibit A

2017 & 2018 Lake Level Sensor Graphs

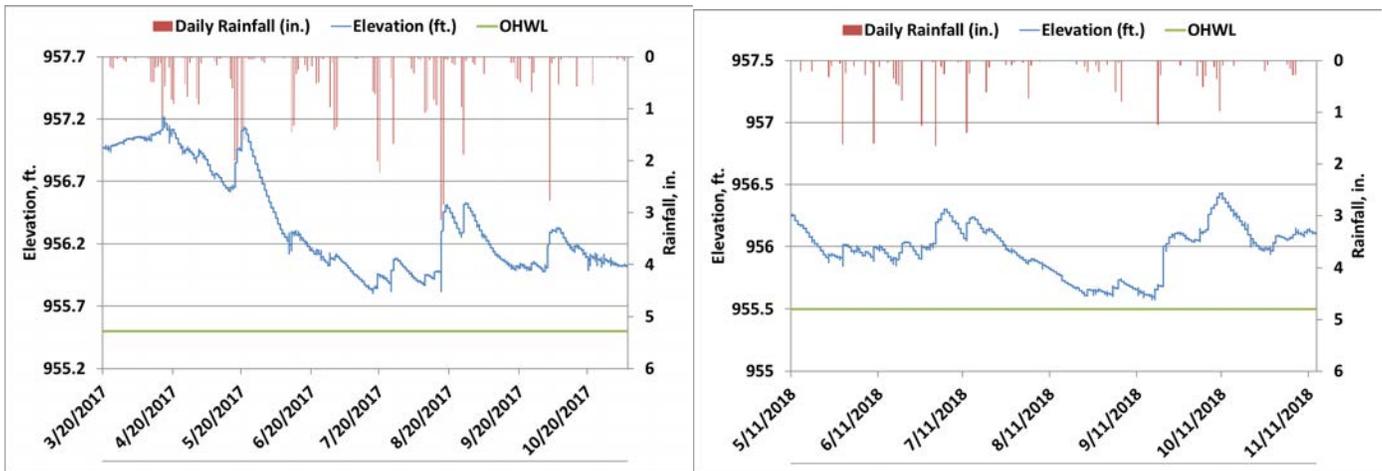


Figure A-1. **Lake Ann** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

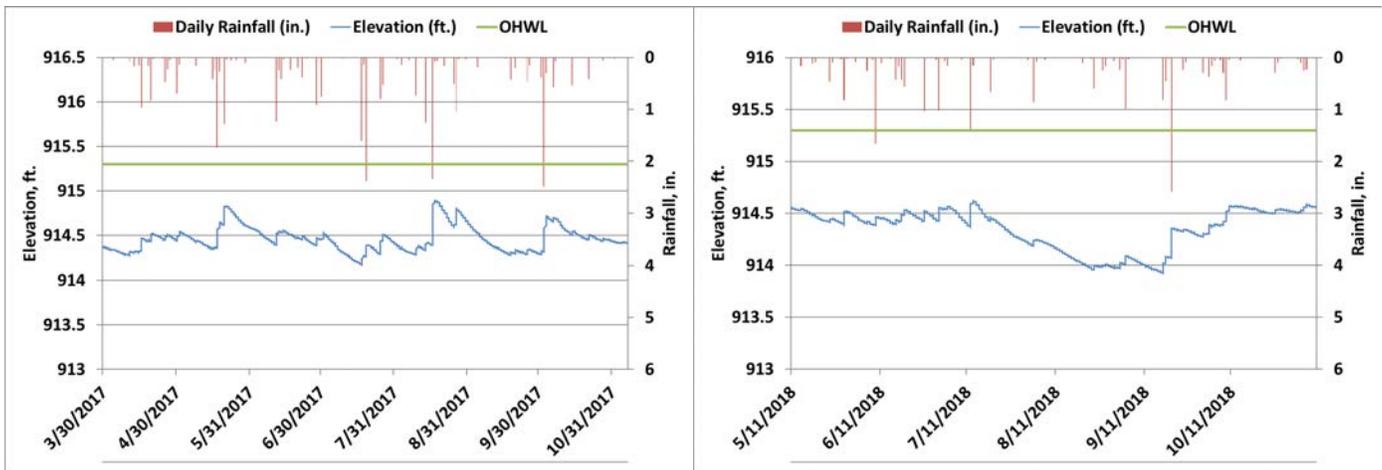


Figure A-2. **Duck Lake** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

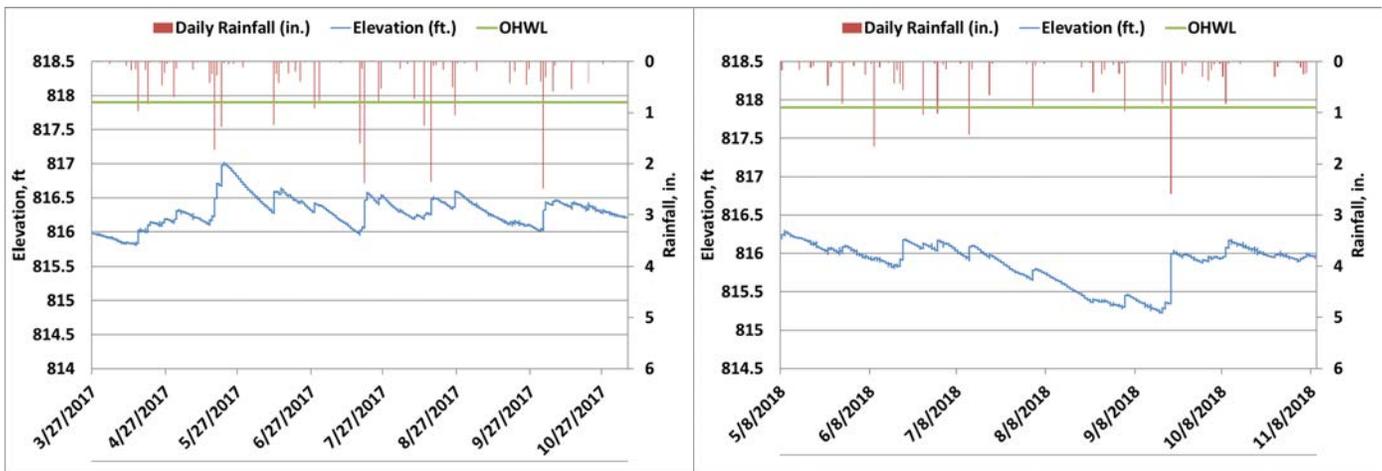


Figure A-3. **Hyland Lake** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

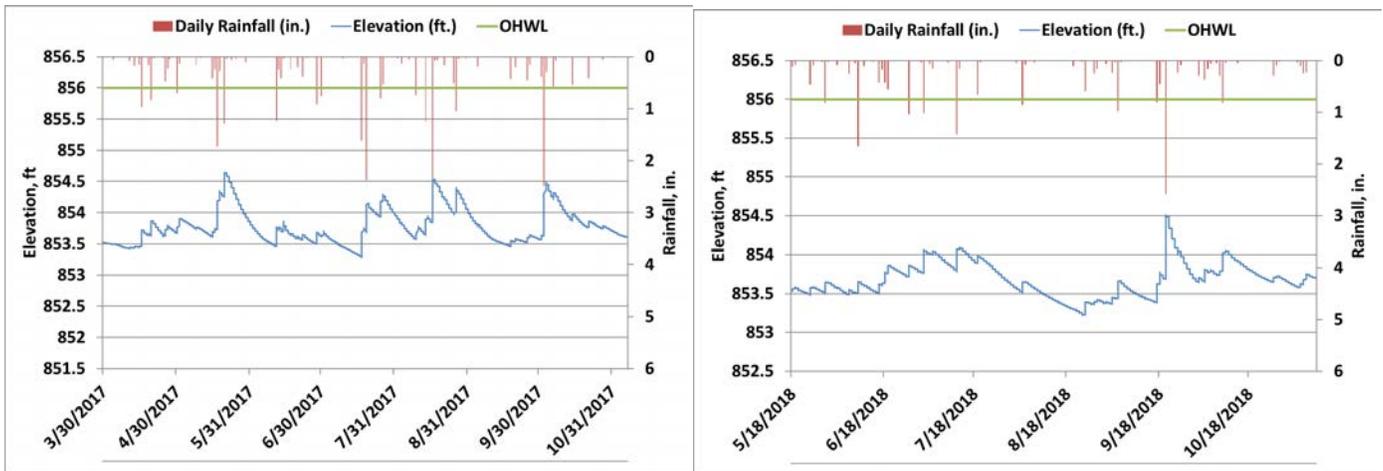


Figure A-4. **Lake Idlewild** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

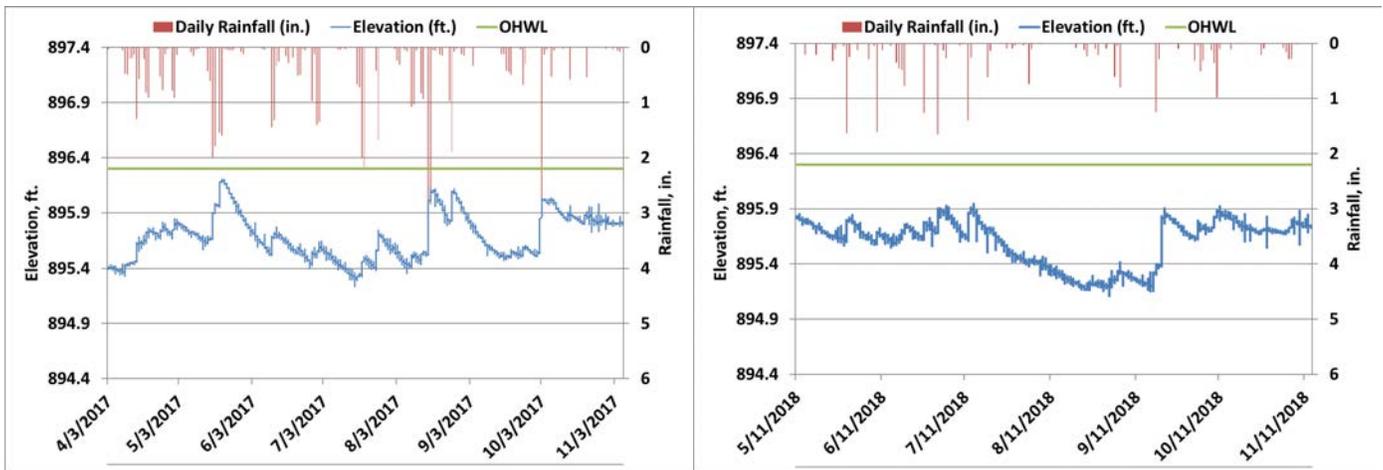


Figure A-5. **Lotus Lake** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

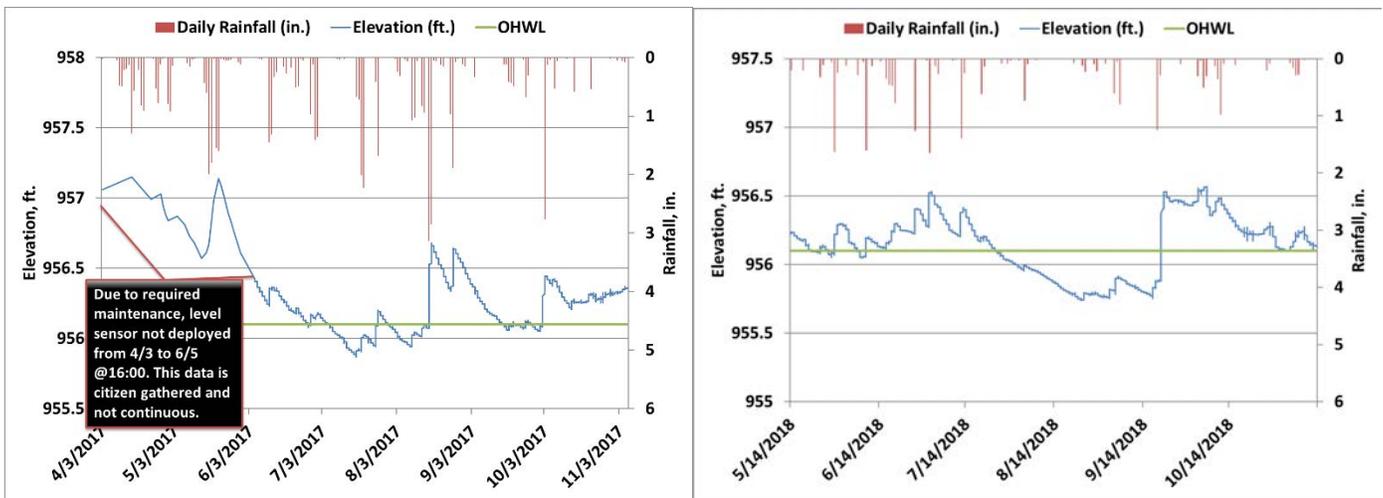


Figure A-6. **Lake Lucy** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

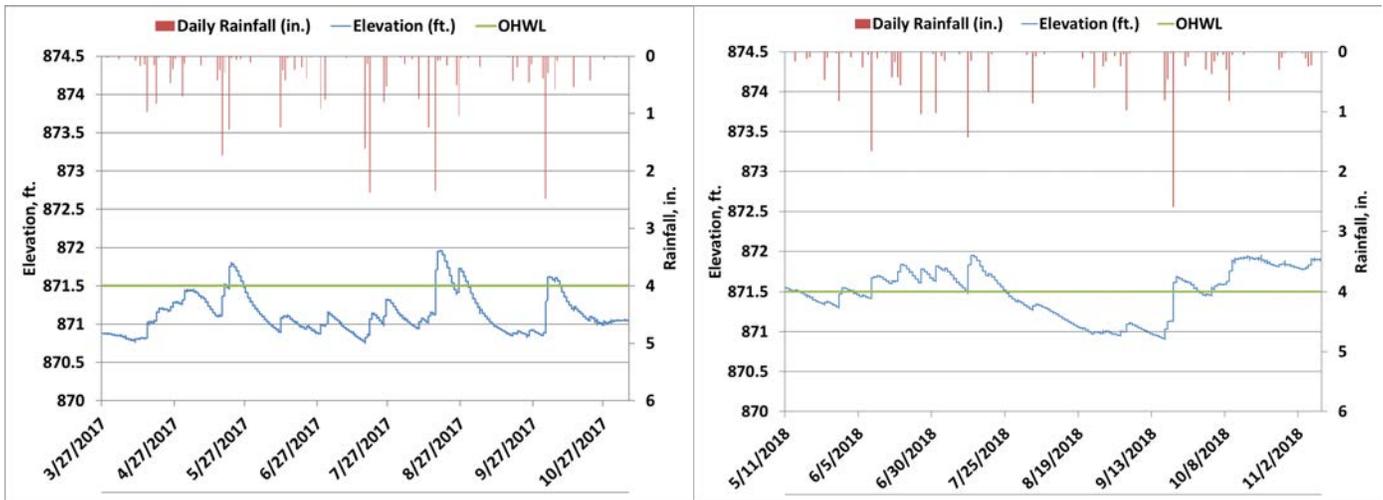


Figure A-7. **Mitchell Lake** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

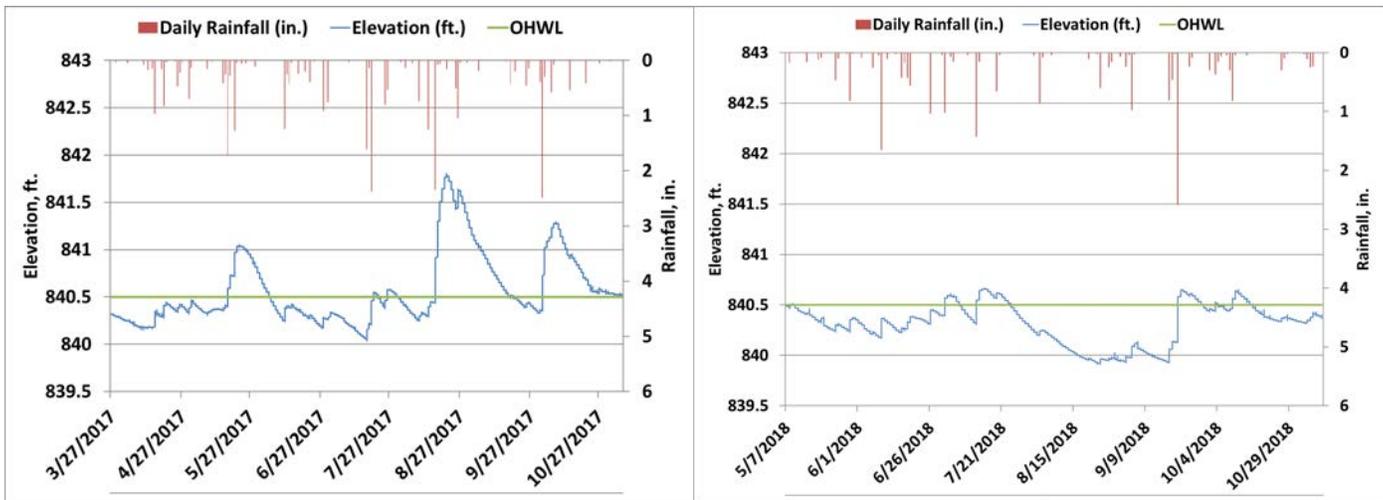


Figure A-8. **Red Rock Lake** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

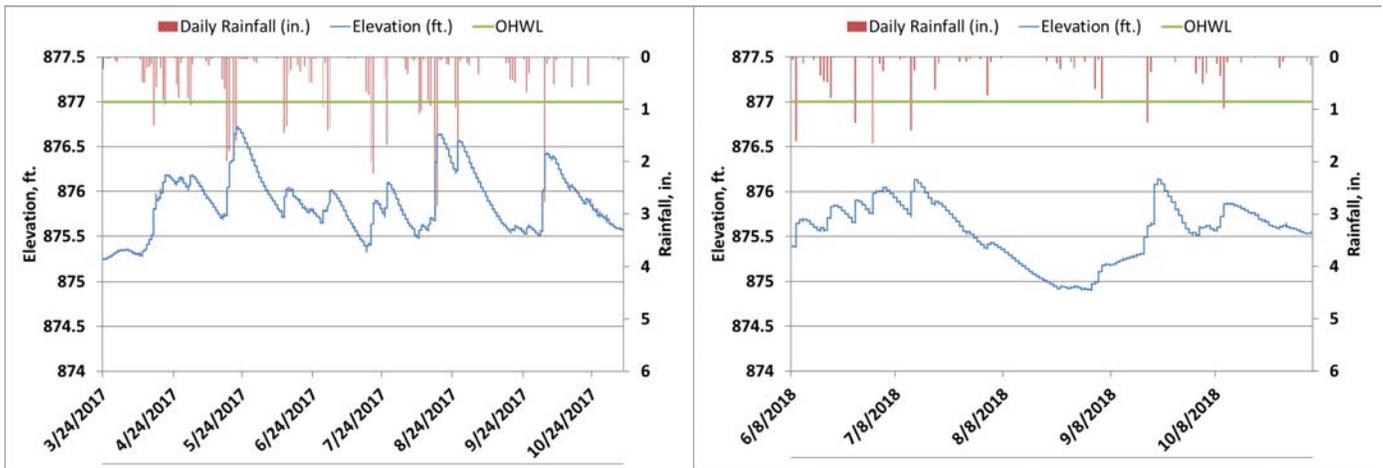


Figure A-9. **Rice Marsh Lake** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

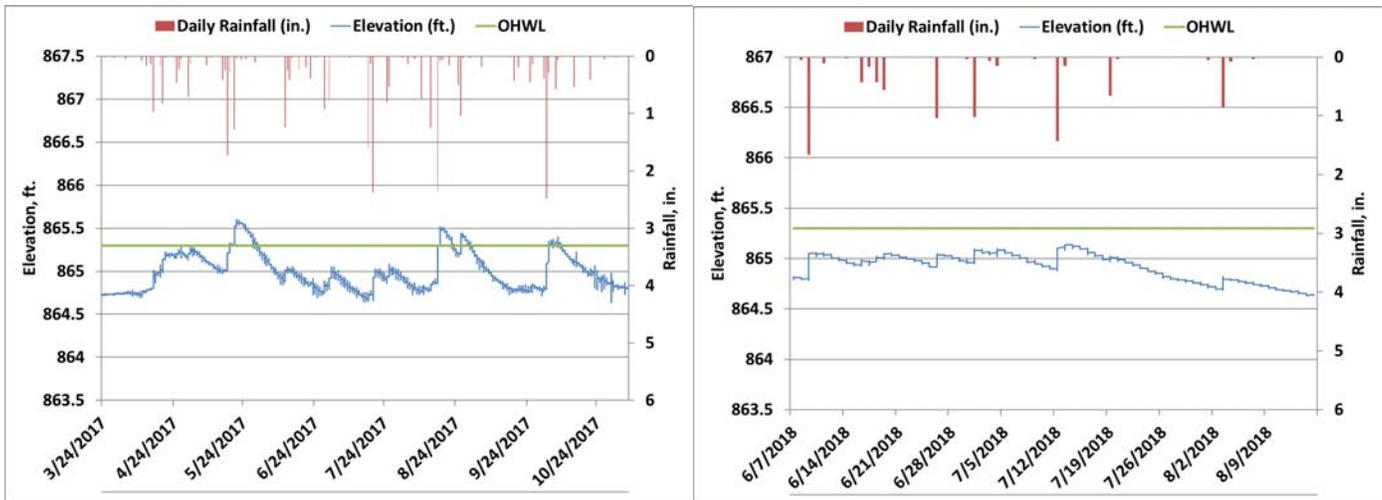


Figure A-10. **Lake Riley** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

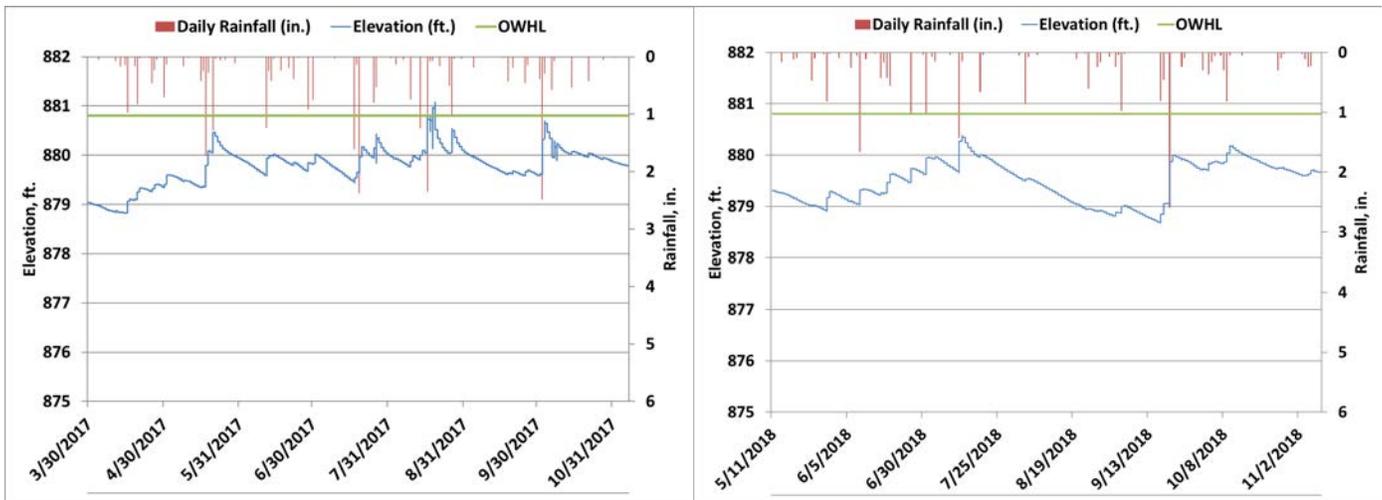


Figure A-11. **Round Lake** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

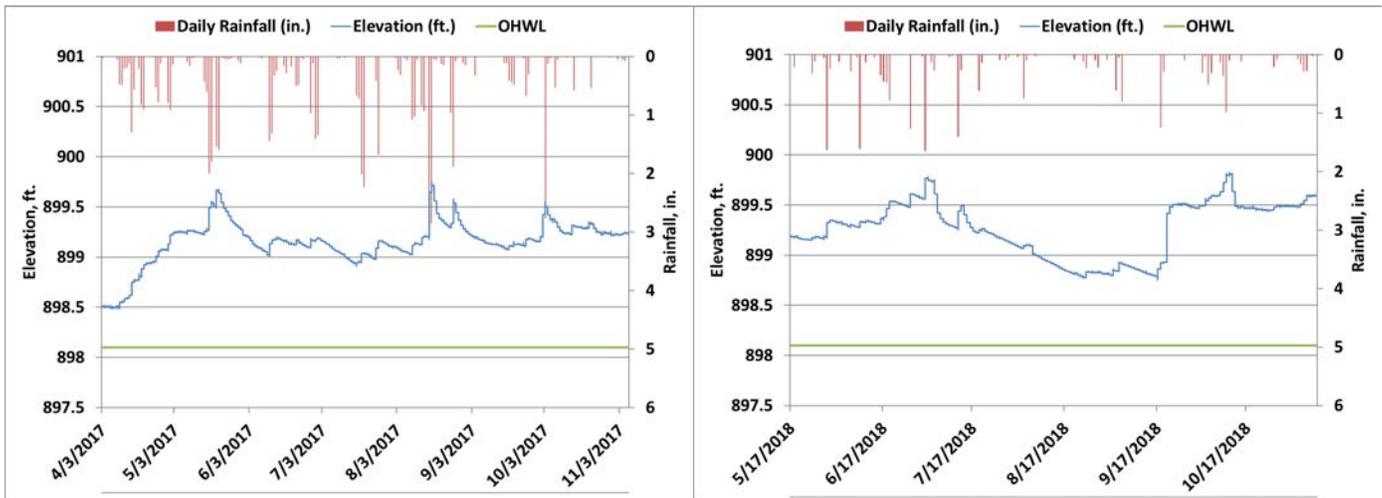


Figure A-12. **Silver Lake** level elevation data (ft.) for 2017 and 2018 along with the lake's ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

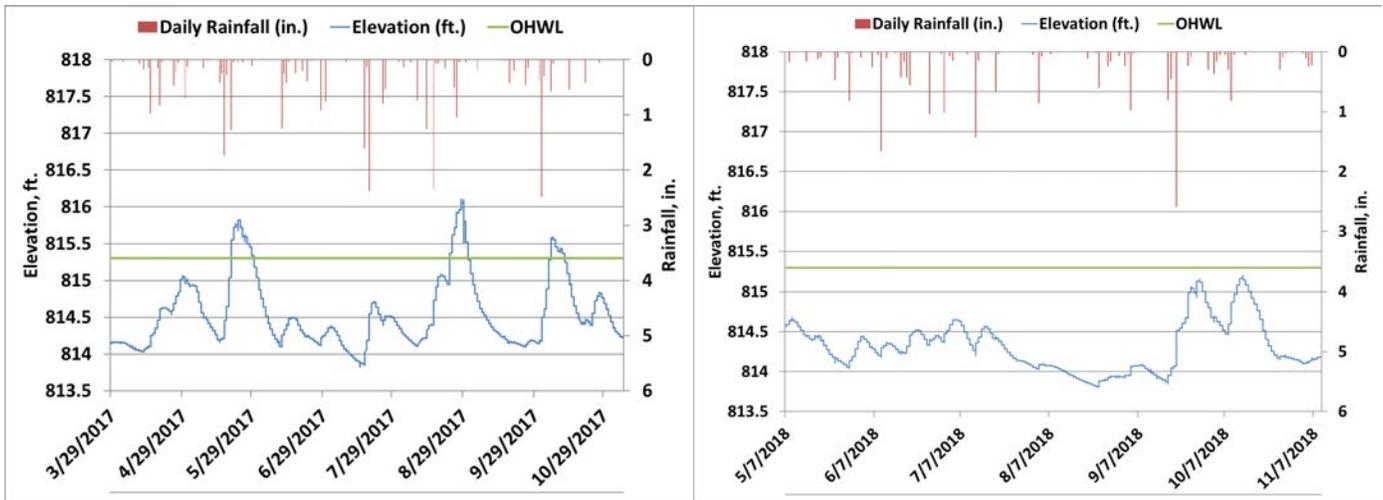


Figure A-13. **Staring Lake** level elevation data (ft.) for 2017 and 2018 along with the lake’s ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

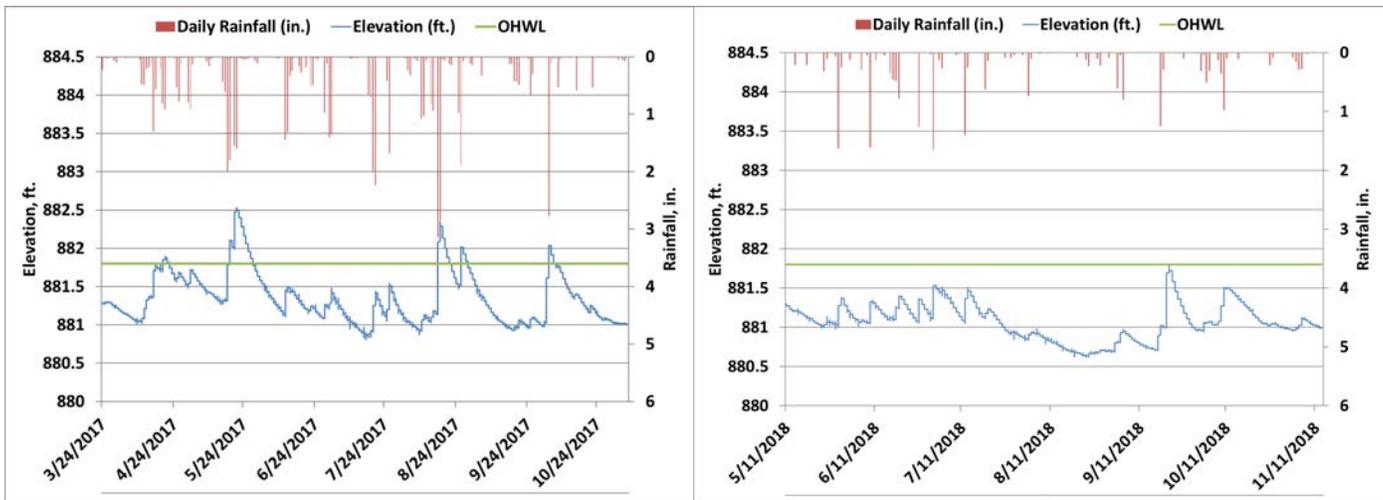


Figure A-14. **Lake Susan** level elevation data (ft.) for 2017 and 2018 along with the lake’s ordinary high-water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph (NOAA).

Exhibit B

2018 Fyke Net Summary Data

Table B4: 2018 Lower Purgatory Creek Recreational Area fyke net data

Species	Number of fish caught in each category (inches)								Total	Fish/Net
	0-5	6-8	9-11	12-14	15-19	20-24	25-29	30+		
<i>black bullhead</i>	59	210	2						437	109.25
<i>black crappie</i>	75	72							147	36.75
<i>bluegill</i>	126	18							144	36
<i>common carp</i>	9	5		21	37	2	1		75	18.75
<i>freshwater drum</i>					1				1	0.25
<i>green sunfish</i>	44								44	11
<i>golden shiner</i>	24	5							29	7.25
<i>hybrid sunfish</i>	39	2							41	10.25
<i>largemouth bass</i>	19	2	1	1					23	5.75
<i>northern pike</i>						1	1		2	0.5
<i>pumpkinseed</i>	104	1							105	26.25
<i>white sucker</i>			1	3	3				7	1.75
<i>yellow bullhead</i>	50	43	11	1					105	26.25
<i>yellow perch</i>	13	45							58	14.5
<i>painted turtle</i>									6	1.5
<i>snapping turtle</i>									2	0.5

Table B5: 2018 Upper Purgatory Creek Recreational Area fyke net data

Species	Number of fish caught in each category (inches)								Total	Fish/Net
	0-5	6-8	9-11	12-14	15-19	20-24	25-29	30+		
<i>black bullhead</i>	26	373							837	209.25
<i>black crappie</i>	84	118							202	50.5
<i>bluegill</i>	267	12							383	95.75
<i>common carp</i>	1		1	1	1	1			5	1.25
<i>green sunfish</i>	69								69	17.25
<i>golden shiner</i>	1								1	0.25
<i>hybrid sunfish</i>	98								98	24.5
<i>largemouth bass</i>	14	1							15	3.75
<i>northern pike</i>						1	1	1	3	0.75
<i>pumpkinseed</i>	230								297	74.25
<i>yellow bullhead</i>	4	22	7						33	8.25
<i>yellow perch</i>	130	12							142	35.5
<i>painted turtle</i>									16	4
<i>snapping turtle</i>									1	0.25

Table B6: 2018 Rice Marsh Lake fyke net data

Species	Number of fish caught in each category (inches)								Total	Fish/Net
	0-5	6-8	9-11	12-14	15-19	20-24	25-29	30+		
<i>black crappie</i>		2							2	0.4
<i>bluegill</i>	108	123							303	60.6
<i>hybrid sunfish</i>	1								1	0.2
<i>largemouth bass</i>	5								5	1
<i>northern pike</i>		1						1	2	0.4
<i>pumpkinseed</i>	1								1	0.2
<i>yellow bullhead</i>		3	5						8	1.6
<i>painted turtle</i>									22	4.4
<i>snapping turtle</i>									12	2.4

Table B7: 2018 **Lake Riley** fyke net data

Species	Number of fish caught in each category (inches)								Total	Fish/Net
	0-5	6-8	9-11	12-14	15-19	20-24	25-29	30+		
<i>black bullhead</i>		1							1	0.2
<i>black crappie</i>	1	2	2						5	1
<i>bluegill</i>	318	62							536	107.2
<i>largemouth bass</i>	2								2	0.4
<i>northern pike</i>							1		1	0.2
<i>pumpkinseed</i>	7	7							14	2.8
<i>walleye</i>		1				1			2	0.4
<i>yellow bullhead</i>	1	7	15	2					25	5
<i>yellow perch</i>	1								1	0.2
<i>painted turtle</i>									35	7
<i>snapping turtle</i>									4	0.8

Table B8: 2018 **Staring Lake** fyke net data

Species	Number of fish caught in each category (inches)								Total	Fish/Net
	0-5	6-8	9-11	12-14	15-19	20-24	25-29	30+		
<i>black bullhead</i>		56	9	1					66	13.2
<i>black crappie</i>		1							1	0.2
<i>bluegill</i>	92	3							95	19
<i>common carp</i>					3				3	0.6
<i>green sunfish</i>	1								1	0.2
<i>golden shiner</i>		1							1	0.2
<i>largemouth bass</i>	8								8	1.6
<i>pumpkinseed</i>	6								6	1.2
<i>white sucker</i>				2	8				10	2
<i>yellow bullhead</i>		9	6	1					16	3.2
<i>yellow perch</i>	9	1							10	2

Table B9: 2018 **Lake Susan** fyke net data

Exhibit C

2018 Zooplankton Summary Data

Table C1: 2018 Lake Riley Zooplankton Counts (#/m²)**LAKE RILEY**

		6/4/2018	7/3/2018	7/31/2018	9/11/2018
DIVISION	TAXON	#/m2	#/m2	#/m2	#/m2
CLADOCERA	<i>Bosmina longirostris</i>	7,534	0	4,426	0
	<i>Ceriodaphnia sp.</i>	0	0	4,426	0
	<i>Chydorus sphaericus</i>	0	7,873	0	0
	<i>Daphnia ambigua/parvula</i>	0	0	0	0
	<i>Daphnia galeata mendotae</i>	0	15,746	17,705	0
	<i>Daphnia pulex</i>	15,068	39,365	35,410	0
	<i>Daphnia retrocurva</i>	0	0	35,410	13,184
	<i>Diaphanosoma leuchtenbergianum</i>	0	0	8,852	0
	Immature Cladocera	0	0	0	0
	<i>Kindtii</i>	0	0	0	0
	CLADOCERA TOTAL	22,602	62,984	106,229	13,184
COPEPODA	<i>Cyclops sp. / Mesocyclops sp.</i>	248,621	70,857	61,967	46,146
	<i>Diaptomus sp.</i>	120,544	78,730	79,672	52,738
	Nauplii	730,795	173,206	433,768	59,330
	Copepodid	0	0	0	0
	COPEPODA TOTAL	1,099,960	322,793	575,407	158,213
ROTIFERA	<i>Asplanchna priodonta</i>	60,272	23,619	278,851	0
	<i>Brachionus sp.</i>	7,534	0	8,852	0
	<i>Filinia longiseta</i>	0	7,873	4,426	0
	<i>Lecane sp.</i>	0	0	0	0
	<i>Monostyla sp.</i>	0	0	0	0
	<i>Keratella cochlearis</i>	105,476	133,841	278,851	876,766
	<i>Keratella quadrata</i>	45,204	39,365	8,852	19,777
	<i>Kellicottia sp.</i>	0	0	0	0
	<i>Polyarthra vulgaris</i>	195,883	70,857	44,262	283,466
	<i>Trichocerca cylindrica</i>	0	0	0	19,777
	<i>Trichocera similis</i>	0	7,873	4,426	0
	<i>Trichocerca multigrinis</i>	0	15,746	17,705	13,184
	<i>Conochilus sp.</i>	0	283,428	181,475	19,777
	<i>Noltholca</i>	7,534	0	0	0
	<i>UID Rotifer</i>	0	31,492	13,279	210,951
	ROTIFERA TOTAL	421,902	614,094	840,980	1,443,697
TOTALS		1,544,464	999,871	1,522,616	1,615,095

Table C2: 2018 Staring Lake Zooplankton Counts (#/m²)

STARING

DIVISION	TAXON	6/5/2018 #/m2	7/2/2018 #/m2	7/30/2018 #/m2	9/11/2018 #/m2	10/2/2018 #/m2
CLADOCERA	<i>Bosmina longirostris</i>	373,384	23,732	226,999	91,199	58,162
	<i>Ceriodaphnia sp.</i>	26,670	0	108,565	111,465	36,351
	<i>Chydorus sphaericus</i>	8,890	39,553	98,695	111,465	36,351
	<i>Daphnia ambigua/parvula</i>	0	0	0	0	0
	<i>Daphnia galeata mendotae</i>	151,131	23,732	98,695	0	7,270
	<i>Daphnia pulex</i>	53,341	0	0	0	0
	<i>Daphnia retrocurva</i>	0	0	0	0	0
	<i>Diaphanosoma leuchtenbergianum</i>	17,780	0	49,348	30,400	7,270
	Immature Cladocera	0	0	0	0	0
	<i>Kindtii</i>	0	0	0	0	0
CLADOCERA TOTAL		631,196	87,017	582,301	344,529	145,406
COPEPODA	<i>Cyclops sp. / Mesocyclops sp.</i>	595,636	7,911	118,434	81,066	36,351
	<i>Diaptomus sp.</i>	231,142	23,732	98,695	40,533	7,270
	Nauplii	844,558	15,821	256,607	81,066	58,162
	Copepodid	0	0	19,739	0	0
COPEPODA TOTAL		1,671,336	47,464	493,475	202,664	101,784
ROTIFERA	<i>Asplanchna priodonta</i>	26,670	15,821	19,739	10,133	7,270
	<i>Brachionus sp.</i>	0	0	0	0	0
	<i>Filinia longiseta</i>	0	0	9,870	0	0
	<i>Lecane sp.</i>	0	0	0	0	0
	<i>Monostyla sp.</i>	0	0	0	0	0
	<i>Keratella cochlearis</i>	426,724	23,732	29,609	81,066	94,514
	<i>Keratella quadrata</i>	35,560	0	0	0	0
	<i>Kellicottia sp.</i>	0	0	39,478	0	0
	<i>Polyarthra vulgaris</i>	17,780	7,911	39,478	40,533	79,973
	<i>Trichocerca cylindrica</i>	0	0	9,870	0	0
	<i>Trichocera similis</i>	0	0	0	0	0
	<i>Trichocerca multigrinis</i>	0	0	39,478	0	0
	<i>Conochilus sp.</i>	0	0	0	0	0
	<i>UID Rotifer</i>	0	0	0	0	0
ROTIFERA TOTAL		506,735	47,464	187,521	131,732	181,757
TOTALS		2,809,268	181,945	1,263,297	678,924	428,947

Table C3: 2018 Lotus Lake Zooplankton Counts (#/m²)

LOTUS LAKE

DIVISION	TAXON	6/5/2018 #/m2	7/2/2018 #/m2	7/30/2018 #/m2	9/13/2018 #/m2
CLADOCERA	<i>Bosmina longirostris</i>	68,371	0	45,656	0
	<i>Ceriodaphnia sp.</i>	0	0	0	0
	<i>Chydorus sphaericus</i>	4,558	0	0	0
	<i>Daphnia ambigua/parvula</i>	0	0	0	0
	<i>Daphnia galeata mendotae</i>	41,022	0	0	0
	<i>Daphnia pulex</i>	4,558	0	0	0
	<i>Daphnia retrocurva</i>	127,625	43,546	98,921	43,772
	<i>Diaphanosoma leuchtenbergianum</i>	0	0	30,437	56,279
	Immature Cladocera	0	0	0	0
	<i>Kindtii</i>	0	0	0	0
CLADOCERA TOTAL		246,135	43,546	175,014	100,051
COPEPODA	<i>Cyclops sp. / Mesocyclops sp.</i>	350,970	10,887	167,405	93,798
	<i>Diaptomus sp.</i>	173,206	152,412	114,140	75,038
	Nauplii	200,554	326,598	509,824	456,483
	Copepodid	4,558	0	0	12,506
COPEPODA TOTAL		729,289	489,897	791,368	637,826
ROTIFERA	<i>Asplanchna priodonta</i>	154,974	0	0	0
	<i>Brachionus sp.</i>	0	0	0	0
	<i>Filinia longiseta</i>	4,558	0	0	0
	<i>Lecane sp.</i>	0	0	0	0
	<i>Monostyla sp.</i>	0	0	0	0
	<i>Keratella cochlearis</i>	2,629,997	10,887	15,219	87,545
	<i>Keratella quadrata</i>	287,157	0	0	0
	<i>Kellicottia sp.</i>	0	304,825	15,219	0
	<i>Polyarthra vulgaris</i>	0	65,320	0	0
	<i>Trichocerca cylindrica</i>	0	0	0	0
	<i>Trichocera similis</i>	0	0	0	0
	<i>Trichocerca multirinis</i>	0	0	0	0
	<i>Conochilus sp.</i>	0	130,639	0	50,026
	<i>UID Rotifer</i>	0	0	0	0
ROTIFERA TOTAL		3,076,686	511,670	30,437	137,570
TOTALS		4,052,109	1,045,113	996,820	875,448

Table C4: 2018 Lake Susan Zooplankton Counts (#/m²)

LAKE SUSAN

DIVISION	TAXON	6/4/2018 #/m2	7/2/2018 #/m2	7/31/2018 #/m2	9/11/2018 #/m2
CLADOCERA	<i>Bosmina longirostris</i>	14,842	0	0	7,120
	<i>Ceriodaphnia sp.</i>	0	0	0	0
	<i>Chydorus sphaericus</i>	0	0	0	0
	<i>Daphnia ambigua/parvula</i>	0	0	0	0
	<i>Daphnia galeata mendotae</i>	103,893	19,212	0	0
	<i>Daphnia pulex</i>	63,078	0	0	0
	<i>Daphnia retrocurva</i>	0	0	0	0
	<i>Diaphanosoma leuchtenbergianum</i>	0	0	7,534	7,120
	Immature Cladocera	0	0	0	0
	<i>Kindtii</i>	0	0	0	0
CLADOCERA TOTAL		181,814	19,212	7,534	14,239
COPEPODA	<i>Cyclops sp. / Mesocyclops sp.</i>	237,471	76,847	82,874	85,435
	<i>Diaptomus sp.</i>	148,419	86,452	0	7,120
	Nauplii	170,682	230,540	105,476	135,272
	Copepodid	0	0	0	7,120
COPEPODA TOTAL		556,572	393,838	188,349	234,947
ROTIFERA	<i>Asplanchna priodonta</i>	0	0	0	0
	<i>Brachionus sp.</i>	0	0	0	0
	<i>Filinia longiseta</i>	0	288,174	0	0
	<i>Lecane sp.</i>	0	0	0	0
	<i>Monostyla sp.</i>	0	0	0	0
	<i>Keratella cochlearis</i>	126,156	1,709,835	158,213	192,229
	<i>Keratella quadrata</i>	115,025	9,606	0	0
	<i>Kellicottia sp.</i>	81,631	0	0	0
	<i>Polyarthra vulgaris</i>	3,710	0	0	0
	<i>Trichocerca cylindrica</i>	0	0	0	0
	<i>Trichocera similis</i>	0	48,029	0	0
	<i>Trichocerca multigrinis</i>	0	0	0	0
	<i>Conochilus sp.</i>	0	0	0	0
	<i>UID Rotifer</i>	0	0	0	0
ROTIFERA TOTAL		326,522	2,055,644	158,213	192,229
TOTALS		1,064,908	2,468,694	354,097	441,416

Table C5: 2018 Rice Marsh Lake Zooplankton Counts (#/m²)**RICE MARSH**

DIVISION	TAXON	6/5/2018	7/3/2018	8/1/2018	9/10/2018	10/2/2018
		#/m ²				
CLADOCERA	<i>Bosmina longirostris</i>	48,368	109,205	28,252	108,301	22,602
	<i>Ceriodaphnia sp.</i>	24,184	25,201	18,835	0	0
	<i>Chydorus sphaericus</i>	16,123	0	47,087	4,709	0
	<i>Daphnia ambigua/parvula</i>	0	0	0	0	0
	<i>Daphnia galeata mendotae</i>	88,675	0	0	0	0
	<i>Daphnia pulex</i>	0	0	0	0	0
	<i>Daphnia retrocurva</i>	0	0	0	0	0
	<i>Diaphanosoma leuchtenbergianum</i>	0	16,801	9,417	0	0
	Immature Cladocera	0	0	0	0	0
	<i>Kindtii</i>	0	0	0	0	0
	CLADOCERA TOTAL	177,350	151,207	103,592	113,010	22,602
COPEPODA	<i>Cyclops sp. / Mesocyclops sp.</i>	24,184	58,803	197,767	28,252	56,505
	<i>Diaptomus sp.</i>	0	0	0	0	0
	Nauplii	128,982	386,417	395,534	258,980	220,369
	Copepodid	0	0	0	0	0
	COPEPODA TOTAL	153,166	445,220	593,300	287,233	276,873
ROTIFERA	<i>Asplanchna priodonta</i>	0	268,812	197,767	0	0
	<i>Brachionus sp.</i>	0	0	0	0	0
	<i>Filinia longiseta</i>	0	16,801	0	0	0
	<i>Lecane sp.</i>	0	0	0	4,709	0
	<i>Monostyla sp.</i>	0	0	0	0	0
	<i>Keratella cochlearis</i>	290,209	159,607	37,670	56,505	16,951
	<i>Keratella quadrata</i>	0	0	0	0	0
	<i>Kellicottia sp.</i>	0	0	0	0	0
	<i>Polyarthra vulgaris</i>	0	92,404	56,505	442,621	79,107
	<i>Trichocerca cylindrica</i>	0	0	0	0	0
	<i>Trichocera similis</i>	0	0	0	0	0
	<i>Trichocerca multicornis</i>	0	0	0	0	0
	<i>Conochilus sp.</i>	0	184,808	0	0	0
	<i>Euchlaris sp.</i>	0	0	0	0	0
	UID Rotifer	0	0	0	0	0
ROTIFERA TOTAL	290,209	722,433	291,941	503,834	96,058	
TOTALS		620,724	1,318,860	988,834	904,077	395,534

Exhibit D

2018 Phytoplankton Summary Data

Table D1: 2018 Lotus Lake Phytoplankton #/L

	6/8/2018	7/2/2018	7/30/2018	9/13/2018
Class	#/L	#/L	#/L	#/L
<i>Xanthophyceae</i>			283	
<i>Bacillariophyceae</i>	23730	18931.03	565737	4924
<i>Chlorophyceae</i>	665268	12033594.11	1674299	238154
<i>Cryptophyceae</i>	722222	1449042	678885	1092307
<i>Crysophyceae</i>		1308812	84861	
<i>Cyanophyceae</i>	32515683	20427093.74	234818196	30533432
<i>Dinophyceae</i>	5777	3272.0309	1980	616
<i>Euglenophyceae</i>			283	308
<i>Synurophyceae</i>			283	1231
Total	33932680	35240744.91	237824807	31870972

Table D2: 2018 Staring Lake Phytoplankton #/L

	6/8/2018	7/2/2018	7/30/2018	9/11/2018	10/2/2018
Class	#/L	#/L	#/L	#/L	#/L
<i>Eustigmatophyceae</i>			1239		
<i>Bacillariophyceae</i>	12097812	535586.2261	39965	6155	380410
<i>Chlorophyceae</i>	1489951	2803609.114	375173	114769	162835
<i>Cryptophyceae</i>	1252846	177011.5	325294	738461	636886
<i>Crysophyceae</i>	2057	25287.36			
<i>Cyanophyceae</i>	310776419	209538717.3	359139319	387411843	203039782
<i>Dinophyceae</i>	187	3540.23	311353	1846	1033
<i>Euglenophyceae</i>			310		
<i>Synurophyceae</i>	374			615	1033
<i>Xanthophyceae</i>	187				
Total	325619833	213083751.7	360192653	388273689	204221979

Table D3: 2018 Lake Riley Phytoplankton #/L

	6/6/2018	7/3/2018	7/31/2018	9/11/2018
Class	#/L	#/L	#/L	#/L
<i>Bacillariophyceae</i>	111692	36556	26736	3316
<i>Chlorophyceae</i>	296308	554554	1114566	15978
<i>Cryptophyceae</i>	784615	725926	1986792	587868
<i>Crysophyceae</i>	8000		380189	2080147
<i>Cyanophyceae</i>	34088	44663630	33992751	81034089
<i>Dinophyceae</i>	1692	2333	36792	16882
Total	1236395	45982999	37537826	83738280

Table D4: 2018 **Rice Marsh** Lake Phytoplankton #/L

	6/8/2018	7/3/2018	8/1/2018	9/10/2018	10/2/2018
Class	#/L	#/L	#/L	#/L	#/L
<i>Bacillariophyceae</i>	6000	221074	188701	918	730
<i>Chlorophyceae</i>	1009600	1095530	803146	36756	34287
<i>Cryptophyceae</i>	810000	32340	5528205	8982433	2425615
<i>Crysophyceae</i>	8350000		1196581	114865	
<i>Cyanophyceae</i>	5485000	60986132	51449572	147487	22870082
<i>Dinophyceae</i>	400	103359	1795	13324	5836
<i>Euglenophyceae</i>		4511	6821	919	365
<i>Eustigmatophyceae</i>		2051	2154		
<i>Prymnesiophyceae</i>		61523	119658		
<i>Synurophyceae</i>					72951
<i>Bacillariophyceae</i>	6000	221074	188701	918	730
Total	15661000	62506520	59296633	9296702	25409866

Table D5: 2018 **Lake Susan** Phytoplankton #/L

	6/7/2018	7/2/2018	7/31/2018	9/11/2018
Class	#/L	#/L	#/L	#/L
<i>Haptophyta</i>	11382			
<i>Bacillariophyceae</i>	2049	8988	76000	90677
<i>Chlorophyceae</i>	1837072	61334	3753260	4045366
<i>Cryptophyceae</i>	2492683	704981	1463000	4370626
<i>Crysophyceae</i>	11382	3877395		
<i>Cyanophyceae</i>	905431	65814599	271549379	250903930
<i>Dinophyceae</i>	4325	476214	342000	60663
<i>Euglenophyceae</i>		176	38000	5984
Grand Total	5264324	70943687	277221639	259477246

Exhibit E

2018 Creek Assessments

Purgatory Creek Assessment

Duck Lake Trail to Purgatory Creek Main Channel

Conducted by: RPBCWD staff [Zach Dickhausen] and University of MN volunteer
Conducted on: 15 October 2018

Summary

Site/Scope

On the 15th of October at 10:48, 2018, Riley Purgatory Bluff Creek Watershed District (RPBCWD) staff conducted a stream corridor assessment of the tributary Reach PT-4 of Purgatory Creek. Staff started at Duck Lake Trail and walked downstream into the wetland complex where the tributary connects to the main channel. Staff walked both sides of the creek to assess overall stream conditions and to discover and prioritize possible restoration locations (walked approximately 0.20 stream miles). Staff conducted a Modified Pfankuch Channel Stability Assessment and a Minnesota Pollution Control Agency (MPCA) Stream Habitat Assessment (MSHA) on each subreach to better characterize the stream. A GPS, and a GPS-enabled camera were used to mark points and take photos.

- All pictures were taken Facing Downstream unless noted otherwise.
- Right and Left bank are defined by looking downstream.
- Erosion was defined as Slight, Moderate, or Severe.
- Stream bank Erosion was measured from the streambed to the top of the eroding bank.
- Vegetation was defined as Sparse, Patchy, or Dense.
- All measurements were recorded in Meters.
- All major erosion sites were labeled on the GPS by the erosion site number and reach

Weather Conditions

10/15/2018

Wind: 2.4 mph

Temp: 5.3 °C

Cloud Cover: 25 %

Stream Features

This subreach passes through deciduous forest surrounded by residential area, ending at its confluence with the main channel within a wetland area just north of Duck Lake Trail. The riparian width for a majority of the subreach was approximately 50m along the left bank and 5m along the right bank. The substrate in this reach consisted mainly of sand, with several areas of sandy/silt. The immediate substrate north of Duck Lake Trail is cobble and gravel, mixed with placed riprap. Slope gradients in this reach were predominantly flat, 0% to 10%, with the initial slope gradient of 60% for about 10 meters at the very start of the subreach. Apart from the first 50 to 75m, the channel was not sinuous and channel development was fair to poor (riffle, run, pool). The majority of the few riffles occurred towards the beginning of the subreach and there were very few pools.

Areas of Concern

This subreach contained a great deal of woody debris jams and garbage. Several Eden Prairie park signs were encroaching on the channel or had fallen in the stream indicating the channel had shifted or high flows had occurred. Residential lawns were mowed close to the stream edge along the right bank. The immediate surrounding vegetation was dominated by thick brush, much of which consisted of buckthorn. There was moderate erosion throughout the subreach. The heavier areas of erosion and cutting occurred at the beginning of the subreach. As the reach continued, more of the lower areas of cutting were beginning to heal over, but there were several areas of bank that were bare. There was also considerable amount of sediment deposition in the beginning of the subreach. There were no major erosion/mass wasting sites or infrastructure risks. The

exposed metal culvert within the stream has had the topsoil eroded away and could potentially be a risk if it moved at high flows in the future. Much of the subreach was littered with trash.

Subreach PT-4A- Duck Lake Trail to Main Channel

ROSGEN: E5; MSHA: 46.75 (Fair); Pfankuch: 86 (Fair)

Staff began this creek walk at Duck Lake Trail where the tributary's surface flow begins in the steep ditch on the north side of the road. The start of the reach was full of placed boulders/riprap, some of which were partially covered with moss and duckweed (IMG_3573, IMG_3577). The immediate slopes were quite steep, grades greater than 60% on the left bank, but as staff continued out of the roadside ditch area, grades lessened quickly to 5%. There was lots of woody canopy cover, consisting of a mixture of buckthorn (which was very dense in areas) and large deciduous trees. The substrate at the beginning was a mixture of cobble and gravel within the boulders (IMG_3574). Throughout the subreach there was considerable leaf litter accumulation, but it was heaviest in the first quarter. Staff observed a great deal of woody debris and small downed trees within the channel throughout the subreach (IMG_358, IMG_3581). The channel was quite sinuous for the first 50 to 75m. All of this, along with the thick growth of the understory of buckthorn slowed the navigation of this section. Within the first 20m of the beginning of the stream, staff observed cutting on both banks. On the right bank, the cutting measured about 0.6m high (IMG_3581); on the left bank the cutting measured about 0.15m to 1.2m high (IMG_3582). The cutting on both banks continued through the sinuous part of the subreach. Staff noticed a considerable amount of trash and dumped items such as tires in the stream throughout the subreach (IMG_3584, IMG_3585).

Continuing downstream, staff started noticing sediment deposition; there was a bar near the right bank (IMG_3586) and a great deal of deposition along the left bank just after that (IMG_3588). Staff continued to encounter heavy amounts of woody debris (IMG_3589 – IMG_3592), but the frequency did decrease. The canopy soon opened and the amount of buckthorn decreased, although the left bank still was rather dense with buckthorn through many parts of the subreach. Staff also observed an Eden Prairie park boundary sign in the stream (IMG_3592) and several others in and along the channel throughout the reach (IMG_3598, IMG_3601, IMG_3606, IMG_3619). Staff observed another sediment deposition bar along the left bank (IMG_3594). Just downstream was a pile of woody debris that was causing the stream to pool (IMG_3595). About 100m into the walk, the woody vegetation thinned out along the right bank and the lawns of the residential area were set back about 5 to 7m. The channel soon straightened, and staff observed a wood/brush pile on the right bank measuring about 2m tall and 6m long (IMG_3596).



	<p>IMG_3576</p> <p>Woody Debris and boulder riffle.</p>		<p>IMG_3577</p> <p>General Stream photo; lots of boulders in-stream and on banks.</p>
	<p>IMG_3580</p> <p>Multiple downed trees and heavy woody debris.</p>		<p>IMG_3581</p> <p>Erosion on RB, 0.6m high.</p>
	<p>IMG_3582</p> <p>Erosion on left bank, 0.15 - 1.2m high.</p>		<p>IMG_3584</p> <p>Tire in channel.</p>
	<p>IMG_3585</p> <p>Garbage in channel.</p>		<p>IMG_3586</p> <p>Sediment bar near RB.</p>

	<p>IMG_3588</p> <p>Large sediment deposition bar and woody debris, LB; visible mattress coils.</p>		<p>IMG_3589</p> <p>General stream photo; heavy woody debris.</p>
	<p>IMG_3590</p> <p>Sediment deposit and woody debris.</p>		<p>IMG_3591</p> <p>Rebar and woody debris.</p>
	<p>IMG_3592</p> <p>Eden Prairie park marker sign in stream.</p>		<p>IMG_3594</p> <p>Deposition bar, LB.</p>
	<p>IMG_3595</p> <p>Woody debris; tire and some garbage in stream.</p>		<p>IMG_3596</p> <p>Brush pile on RB, 2m high by 6m long.</p>

The cutting along both banks decreased; much of which was healing over and had grass growing on it. Continuing downstream, there were several more occurrences of heavy woody debris, some of it causing water to pool (IMG_3597 – IMG_3600). Staff did still observe some erosion that wasn't quite fully healed; there was an occurrence on the right bank that measured 0.8m and stretched for about 8m (IMG_3603). Here the channel narrowed, and the banks were very low (IMG_3604). Staff saw more trash/scrap in the channel (IMG_3606). Just downstream the stream started to wind for a few meters and there was some deposition along the right bank and cutting along the opposite bank (IMG_3608). As the stream straightened again, there was a stretch of

creek that had thick grass and herbaceous vegetation growing on both upper banks (IMG_3609). Within the grass was some lumber spanning the creek channel (IMG_3609). Staff observed more deposition along the right bank (IMG_3614) and another small tree across the channel (IMG_3615). By this point, the lawns of the residential area were within 2m of the right bank, and the slope grade was close to 0%. Staff observed another brush pile on the right bank (IMG_3616). The canopy on the right bank was made up of a tree every 10–20m. Just after the brush pile, there was a large, metal culvert in the channel through which the stream flowed through (IMG_3616, IMG_3617). It appeared to be an old stream crossing that which the topsoil had eroded away. There were also some railroad ties laid across the top of the pipe. Continuing downstream, there were several railroad ties laid along the top of the right bank (IMG_3618). Downstream was a log pile on the right bank (IMG_3619), followed by two more sites of heavy debris (IMG_3620, IMG_3621). At this point, the vegetation along the right bank started to get thicker, consisting of grasses, sedges and other herbaceous wetland plants (IMG_3622). Staff finally came to the end of the reach where the subreach entered a wetland which eventually met up with the main channel (IMG_3623).

	<p>IMG_3597</p> <p>Woody debris dam causing water to pool.</p>		<p>IMG_3598</p> <p>Eden Prairie park marker sign on left bank LB.</p>
	<p>IMG_3599</p> <p>Woody debris; deposition along LB.</p>		<p>IMG_3600</p> <p>Heavy woody debris.</p>
	<p>IMG_3601</p> <p>Eden Prairie park marker sign across stream; some trash in stream.</p>		<p>IMG_3603</p> <p>Some erosion starting to heal over with grass cover, 0.8m high by 8m on RB.</p>

	<p>IMG_3604</p> <p>General stream photo.</p>		<p>IMG_3605</p> <p>Erosion on LB healing, 0.6m high by 7m long.</p>
	<p>IMG_3606</p> <p>Metal pole, tire and railroad tie in stream; Eden Prairie park marker sign (not in photo).</p>		<p>IMG_3608</p> <p>Deposition along RB; metal marker pin with pink flagging.</p>
	<p>IMG_3609</p> <p>General stream photo; lumber across channel.</p>		<p>IMG_3614</p> <p>Soil deposition along RB.</p>
	<p>IMG_3615</p> <p>Fallen tree across channel.</p>		<p>IMG_3616</p> <p>Wood pile on RB.</p>

	<p>IMG_3617</p> <p>Metal pipe in channel; stream flows through it.</p>		<p>IMG_3618</p> <p>Eden Prairie park marker sign and railroad ties on RB.</p>
	<p>IMG_3619</p> <p>Log pile and Eden Prairie park marker sign on RB.</p>		<p>IMG_3620</p> <p>Heavy woody debris.</p>
	<p>IMG_3621</p> <p>Woody debris.</p>		<p>IMG_3622</p> <p>General stream photo.</p>
	<p>IMG_3623</p> <p>Tributary disappearing into wetland; end of subreach before connecting with channel.</p>		

Purgatory Creek Assessment

Silver Branch North Tributary

Conducted by: RPBCWD staff [Josh Maxwell] and University of MN volunteer

Conducted on: 10 October 2018

Summary

Site/Scope

On the 10th of October 2018, Riley Purgatory Bluff Creek Watershed District (RPBCWD) staff and a University of Minnesota student conducted a stream corridor assessment of two subreaches of the north tributary stream that enters Reach P7 of Purgatory Creek. Staff started eighty meters upstream of the recreational trail off Vine Hill Road and walked downstream to Vine Hill Road (approximately 0.92 stream miles). Staff walked both sides of the creek to assess overall stream conditions and to discover and prioritize possible restoration locations. Staff conducted a Modified Pfankuch Channel Stability Assessment and a Minnesota Pollution Control Agency (MPCA) Stream Habitat Assessment (MSHA) on the subreach to better characterize the stream. A GPS, and a GPS-enabled camera were used to mark points and take photos.

- All pictures were taken Facing Downstream unless noted otherwise.
- Right and Left bank are defined by looking downstream.
- Erosion was defined as Slight, Moderate, or Severe.
- Stream bank Erosion was measured from the streambed to the top of the eroding bank.
- Vegetation was defined as Sparse, Patchy, or Dense.
- All measurements were recorded in Meters.
- All major erosion sites were labeled on the GPS by the erosion site number and reach (E#R2).

Weather Conditions

Wind: 7 mph

Temp: 7.8°C

Cloud Cover: 100%

Rain Total: 1.04 inches

Stream Features

This tributary stream section begins at three locations, all of which drain from wetlands. The channel was relatively shallow and was considered a glide/run for most of the tributary. There was very little stream development (riffle, run, pool) across both subreaches. The surrounding vegetation was a mix of deciduous forests and wetland grasses and sedges. The riparian widths were very wide in subreach A but were only 5m wide in subreach B. Residential housing bordered most of subreach B along both banks. All subreaches had similar substrates with fine sand and silt being predominant. Near the wetland origins the substrate was primarily muck. Slope gradients within the upper reaches were very flat, which would allow the stream to easily access the floodplain if needed during highwater conditions. The stream was not sinuous; there were long, straight stretches within each subreach. Woody debris and overhanging vegetation were the most common instream habitat in this tributary.

Areas of Concern

Overall the tributary was considered fairly stable. Pfankuch scores indicated moderately stable conditions across all subreaches. The stream did appear to be incised for much of the reach by about 0.1-0.5m. Infrastructure risks were relatively low, however the culvert under Del Ann Circle was experiencing some

erosion. Additionally, the very flat slopes and residential housing proximity to the stream were of concern if high water conditions occur. In subreach B, bank vegetation had been cleared and grass was mowed to the stream edge which was causing some larger erosion sites. MSHA scores were fair much like what is seen throughout the district. The culvert under Vine Hill Road was also clogged.

Subreach PT-5A–Upper Subreach of the Silver Branch Tributary

Rosgen: E5; **MSHA:** 42 (Fair); **Pfankuch:** 72 (Moderately Stable)

The PT-5A subreach begins 80m upstream of the recreational trail off Vine Hill Road and includes an additional tributary branch that joins from the east (IMG_3492). The stream begins from the drainage of an upstream wetland (IMG_3493). The channel bankfull width at the start of the subreach was 0.9m wide and 0.3m deep. The depth of the stream on the day of the assessment was 0.1m. The substrate was predominantly muck and the stream was continuously incised between 0.1-0.2m (IMG_3494). Shortly downstream, a small tributary entered on the right bank (IMG_3495) and stretched 15m west from the mainstem (IMG_3497). The main stream depth after the confluence increased to 0.3m (IMG_3498). The bankfull width increased to 1m and the bankfull depth increased to 0.7m. The stream was considered a glide with very limited channel development and sinuosity. The surrounding slopes were flat. The surrounding vegetation was comprised of wetland grasses and sedges. The stream, under high water conditions, could access the large surrounding floodplain. Brush, shrubs, and small trees increased in density as staff moved downstream. Consequently, woody debris also increased moving downstream (IMG_3499). Due to the recent rains, the wetland was draining into the channel at multiple points as seen in IMG_3501 and IMG_3502. Also, a fallen tree on the left bank which roots exposed raw soil can be seen in those images.

	<p>IMG - 3492</p> <p>Tributary start; wetland draining to creek; US.</p>		<p>IMG - 3493</p> <p>Stream start; US.</p>
	<p>IMG - 3494</p> <p>Stream start; DS photo.</p>		<p>IMG - 3495</p> <p>Tributary entering RB.</p>

	<p>IMG - 3497</p> <p>RB tributary start 15m from main stem.</p>		<p>IMG - 3498</p> <p>DS of confluence; width increase to 1m.</p>
	<p>IMG - 3499</p> <p>Woody debris increasing.</p>		<p>IMG - 3500</p> <p>General stream photo; straight stream channel.</p>
	<p>IMG - 3501</p> <p>Exposed soil from tree fell; wetland drainage on LB and RB.</p>		<p>IMG - 3502</p> <p>Exposed soil from tree fell; wetland drainage on LB and RB.</p>

The stream then crossed under the recreational trail off Vine Hill Road via metal culvert (IMG_3503 and IMG_3504). In IMG_3504 another fallen tree had exposed soil and was causing erosion measuring approximately 0.8m x 1m. The substrate immediately downstream of the culvert was gravel due to the channel confinement causing increased velocities, but soon substrate transitioned to sand/silt. About 6m downstream of the recreational trail, another small tributary stream entered on the right bank (IMG_3505) and stretched approximately 15m to the west (IMG_3506). The surrounding vegetation shifted to small trees and shrubs, depositing increased woody debris into the stream (IMG_3507). The channel also widened and was shallow in depth. Cutting occurred sporadically along both banks measuring up to 0.5m high (IMG_3508). Moving downstream, staff found another fallen tree which exposed approximately 1.3m x 4m of raw soil (IMG_3509). After the root exposure, the stream became continuously incised by 0.5m. An additional drainage channel entered on the right bank which stretched to the west about 5m (IMG_3511). Woody debris became more intense and caused multiple woody debris dams (IMG_3510 and IMG_3512). Continuing downstream, staff came across a brick riffle (IMG_3513) followed by an old culvert blocking the channel and causing a debris dam (IMG_3514). Staff then moved downstream a distance and came across a depositional island close to the left bank (IMG_3517). Then, a wooden bridge was found across the stream (IMG_3518). Near the confluence of the east tributary (IMG_3520), staff observed a sediment deposition island (IMG_3519).

	<p>IMG - 3503</p> <p>Metal culvert under recreational trail.</p>		<p>IMG - 3504</p> <p>Metal culvert under recreational trail; US view.</p>
	<p>IMG - 3505</p> <p>Tributary confluence on RB.</p>		<p>IMG - 3506</p> <p>Tributary confluence on RB; start 15m from main stem.</p>
	<p>IMG - 3507</p> <p>General stream photo; increased woody debris.</p>		<p>IMG - 3508</p> <p>Stream incised 0.5m.</p>
	<p>IMG - 3509</p> <p>Exposed root system with 1.3m of erosion.</p>		<p>IMG - 3510</p> <p>General stream photo; woody debris dam.</p>

	<p>IMG - 3511</p> <p>Confluence of small drainage tributary on LB.</p>		<p>IMG - 3512</p> <p>Thick woody debris dam; US.</p>
	<p>IMG - 3513</p> <p>Brick riffle; US</p>		<p>IMG - 3514</p> <p>Rusted metal culvert in debris dam.</p>
	<p>IMG - 3515</p> <p>Instream brushpile.</p>		<p>IMG - 3516</p> <p>General stream photo.</p>
	<p>IMG - 3517</p> <p>General stream photo; deposition island.</p>		<p>IMG - 3518</p> <p>Wooden bridge.</p>

	<p>IMG - 3519</p> <p>Sediment island.</p>		<p>IMG - 3520</p> <p>Confluence with additional tributary branch on left bank.</p>
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Immediately at the confluence, instream sediment was extremely soft, and staff had extreme difficulty walking. Staff walked upstream from the confluence on the east tributary branch. Characteristics of the east tributary channel matched the mainstream channel characteristics (IMG_3521). Moving upstream, along the left bank, was a woody debris and yard waste dump site in a shallow intermittent wetland (IMG_3522 and IMG_3523). Bordering the pond was residential housing, set back approximately 20m from the stream edge. Staff then came to an additional channel split and walked up the northern branch (IMG_3525). Near the confluence, the stream was incised about 0.3m, but this cutting reduced moving upstream as the stream became smaller (IMG_3526). Staff soon came to the recreational trail off Vine Hill Road, about 350m east on the trail from the mainstream intersection (IMG_3528). North of the trail was a large wetland that had a water control structure regulating water flow into the tributary channel (IMG_3530).

Staff then went back to the east channel split and walked up the east tributary (IMG_3531). Again, this tributary shared many of the same characteristics before ending at a wetland (IMG_3532). Residential housing was set back 15m from the left bank with multiple yard waste dump sites near the stream. Near the wetland the sediment was muck and very soft. Staff then returned to the main channel before it ended about 100m upstream of the De Ann Circle.

	<p>IMG - 3521</p> <p>Upstream view of RB, tributary.</p>		<p>IMG - 3522</p> <p>Tree and yard dumpsite along RB.</p>
	<p>IMG - 3523</p> <p>Tree and yard dumpsite in shallow intermittent wetland along RB.</p>		<p>IMG - 3524</p> <p>General stream photo; US.</p>

	<p>IMG - 3525</p> <p>Stream split; US.</p>		<p>IMG - 3526</p> <p>US view up north channel.</p>
	<p>IMG - 3528</p> <p>North channel start at recreational trail; US.</p>		<p>IMG - 3530</p> <p>Water control structure draining wetland to north channel.</p>
	<p>IMG - 3531</p> <p>East channel view upstream from confluence.</p>		<p>IMG - 3532</p> <p>East channel start from wetland.</p>
	<p>IMG - 3533</p> <p>Back to mainstream channel below confluence; general photo.</p>		

Subreach PT-5B –100m Upstream of the De Ann Circle Road to Vine Hill Road
Rosgen: E5; MSHA: 43.3 (Fair); Pfankuch: 73 (Moderately Stable)

Staff began subreach PT-5B 100m upstream of Dell Ann Circle. The sediment was primarily comprised of sand. The left bank had erosion measuring 1m in height for approximately 30m (IMG_3534). The riparian zone was reduced in this transect, measuring between 1-5m, with residential housing along both banks (IMG_3535 and IMG_3536). The vegetation was completely cleared along the right bank. Continuing downstream staff came to a

constructed boulder riffle (IMG_3536) before reaching the metal culvert under Del Ann Circle (IMG_3537). Behind the culvert on the right side was a smaller bank failure with erosion occurring (IMG_3538). After Del Ann circle was a large and deep pool that had a rock riffle controlling the water level (IMG_3539). Residents had placed a wooden bridge over the stream which can also be seen in IMG_3539. Both banks had lawns mowed to the stream edge, causing cutting. Bank cutting increased up to 1m on stream bends as seen on the left bank in IMG_3540. Sediment near the culvert was predominantly gravel before shifting back to sand/silt with clay, as it returned to a glide (IMG_3541) before entering the wetland (IMG_3542).

	<p>IMG - 3534</p> <p>LB 1m erosion.</p>		<p>IMG - 3535</p> <p>General stream photo; residential housing close.</p>
	<p>IMG - 3536</p> <p>Boulder riffle.</p>		<p>IMG - 3537</p> <p>Metal culvert under Del Ann Circle.</p>
	<p>IMG - 3538</p> <p>Erosion behind metal culvert under Del Ann Circle.</p>		<p>IMG - 3539</p> <p>DS of Del Ann Circle; resident bridge; mowed yards to stream edge.</p>
	<p>IMG - 3540</p> <p>LB erosion 0.9m tall.</p>		<p>IMG - 3541</p> <p>General stream photo.</p>

The channel split when it reached the wetland, however, most of the flow was leaving to the left (IMG_3543). The flow in the right channel was very slow and it appeared to disperse into the wetland. Following the left channel, sinuosity increased, and overhanging wetland grasses and sedges were dense. Continuing downstream, residential housing was present on the left bank. Staff observed a deck-like, wooden platform near the stream edge (IMG_3544). Further downstream, the upper right bank had a plastic erosion tarp covering it (IMG_3545). Staff then discovered another channel, located north of the left channel, which was draining the wetland (IMG_3547). Eventually, the two channels merged (IMG_3548) before flowing to Vine Hill Road (IMG_3549 and IMG_3550). At Vine Hill Road, the culvert was very clogged which staff partially cleared (IMG_3551 and IMG_3552).

	<p>IMG - 3542</p> <p>Stream enters wetland; main flow to the left.</p>		<p>IMG - 3543</p> <p>View of left channel from confluence.</p>
	<p>IMG - 3544</p> <p>Wooden platform and mowed grass to stream edge on LB</p>		<p>IMG - 3545</p> <p>Plastic erosion control tarp covering high LB.</p>
	<p>IMG - 3546</p> <p>General stream photo.</p>		<p>IMG - 3547</p> <p>Upstream view of channel forming out of wetland.</p>

	<p>IMG - 3548</p> <p>Wetland channel and left channel confluence.</p>		<p>IMG - 3549</p> <p>View downstream after wetland channel and left channel confluence.</p>
	<p>IMG - 3550</p> <p>General stream photo.</p>		<p>IMG - 3551</p> <p>Clogged metal culvert under Vine Hill Road.</p>
	<p>IMG - 3552</p> <p>Clogged metal culvert under Vine Hill Road.</p>		

Exhibit F

2018 Lake and Creek Fact Sheets



RILEY PURGATORY
BLUFF CREEK
WATERSHED DISTRICT



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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 2018, two managers retired (Chadwick & Yetka), and two new managers were appointed (Koch & Ziegler).



President (right)

Dick Ward - Hennepin 7/31/20
8625 Endicott Trail
Eden Prairie, MN 55347
Home: (612) 759-9150
Email: dickward@rpbcwd.org

Vice President (middle)

Dorothy Pedersen – Hennepin 7/31/20
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 7/31/19
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

Retired manager

Leslie Yetka - Hennepin 7/31/19
17452 Hampton Court
Minnetonka, MN 55345
Home: (952) 933-3281

Richard Chadwick - Carver 7/31/18
9530 Foxford Road
Chanhassen, MN 55317
Home: (952) 445 2425

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 2018 CAC members were:

Chair

Member

Paul Bulger
15807 South Lund Road
Eden Prairie, MN 55346

Secretary

Anne Deuring
17149 Chiltern Hills Road
Minnetonka, MN 55345

Member

Joan Palmquist
8905 Cove Point Road
Eden Prairie, MN 55347

Member

Peter Iversen
8002 Island Road
Eden Prairie, MN 55347

Member

Marilynn Torkelson
8956 Braxton Drive
Eden Prairie, MN 55347

Vice Chair

Sharon McCotter
7000 Utica Lane
Chanhassen, MN 55317

Member

Jim Boettcher
7476 Crocus Court
Chanhassen, MN 55317

Member

Matt Lindon
9026 Belvedere Drive
Eden Prairie, MN 55347

Member

Lori Tritz
10346 Englewood Drive
Eden Prairie, MN 55347

Member

Curt Kobilarcsik
9149 Springfield Drive
Chanhassen, MN 55317

Member (appointed to board)

David Ziegler
16729 Baywood Terrace
Eden Prairie, MN 55346

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 2018 TAC members were:

<i>Name and position</i>	<i>Organization</i>	<i>Address</i>
Steve Christopher <i>Board Conservationist</i> (651) 296-2633	Board of Water and Soil Resources	520 Lafayette Road North Saint Paul, MN 55155
Matt Lindon <i>Citizen Advisor</i>	Citizen Advisory Committee	9026 Belvedere Drive Eden Prairie, MN 55347
Paul Moline (952) 361-1825	Carver County	Government Center Administration Building 600 East Fourth Street Chaska, MN 55318
Mike Wanous <i>Administrator</i> (952) 466-5230	Carver County Soil & Water Conservation District	11360 Highway 212, Suite 6, Cologne, MN 55322
Steve Segar <i>Water Resources Engineer</i> (952) 563-4867	City of Bloomington	1700 West 98 th Street Bloomington, MN 55431
Paul Oehme <i>City Engineer/Director of Public Works</i> (952) 227-1169	City of Chanhassen	7700 Market Boulevard P.O. Box 147 Chanhassen, MN 55317
Matt Clark <i>City Engineer</i> (952) 448-9200	City of Chaska	One City Hall Plaza Chaska, MN 55318
Robert Bean Jr. <i>Water Resources Engineer</i> (952) 448-8838 x2607	City of Deephaven (Bolton & Menk, Inc.)	2638 Shadow Lane, Suite 200 Chaska, MN 55318
Leslie Stovring/ Dave Modrow <i>Water Resources Coordinator/ Water Resource Engineer</i> (952) 949-8327	City of Eden Prairie	8080 Mitchell Road Eden Prairie, MN 55344

Tom Dietrich <i>Water Resources Engineering Coordinator</i> (952) 939-8239	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 <i>Land & Water Unit</i> (612) 348-2027	Hennepin County	701 Fourth Ave S, Suite 700, Mpls MN 55415
Linda Loomis <i>District Administrator</i> (763) 545-4659	Lower Minnesota River Wa- tershed District	6677 Olson Memorial High- way Golden Valley, MN 55427
Joe Mulcahy <i>Water Resources</i>	Metropolitan Council	390 North Robert Street St. Paul, MN 55101
Jennie Skancke/ Jason Spiegel <i>Area Hydrologist</i> (651) 259-5790	Minnesota Department of Natural Resources	1200 Warner Road St. Paul, MN 55106
Chris Zadak <i>Watershed Division</i> (651) 757-2837	Minnesota Pollution Control Agency	520 Lafayette Rd. N. St. Paul, MN 55155
Melissa Jenny/Ryan Malterud <i>Senior Project Manager</i> (651)290-5286	US Army Corps of Engineer	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.



2018 TAC Members:

Back Row: Paul Oehme (Chanhassen), Mike Wanous (Carver County Soil and Water Conservation District), Steve Segar (Bloomington), Tom Dietrich (Minnetonka), Vanessa Strong (Chanhassen), Leslie Stovring (Eden Prairie), Dave Modrow (Eden Prairie), Front Row: Bill Alms (Shorewood), Jennie Skancke (MDNR), Steve Christopher (BWSR), Bob Bean (Deephaven), Rod Rue (Eden Prairie).

EMPLOYEES AND CONSULTANTS

The watershed district employs six full-time staff members.



Left to right: Terry Jeffery, Zach Dickhausen, Claire Bleser, Josh Maxwell and Michelle Jordan

Administrator

Claire Bleser, PhD
cbleser@rpbcwd.org
952-687-1348

Permit coordinator & project manager

Terry Jeffery
tjeffery@rpbcwd.org
952-807-6885

Community outreach coordinator

Michelle Jordan
mjordan@rpbcwd.org
952-607-6481

Water resource coordinator

Josh Maxwell
jmaxwell@rpbcwd.org
952-607-6486

Water resource technician

Zach Dickhausen
zdickhausen@rpbcwd.org
952-607-6036

Office and Outreach Assistant (2018 new hire)

Maya Swope
mswope@rpbcwd.org
952-687-1348



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

Accounting

Nancy Martinson, Redpath and Company
4810 White Bear Parkway
White Bear Lake, MN 55110
Telephone: (651) 426-5844
Email: pmoeller@hlbtr.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

Auditing

Peggy Moeller, Redpath and Company
4810 White Bear Parkway
White Bear Lake, MN 55110
Telephone: (651) 426-7000
Facsimile: (651) 426-5004
Email: pmoeller@hlbtr.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 manage 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.

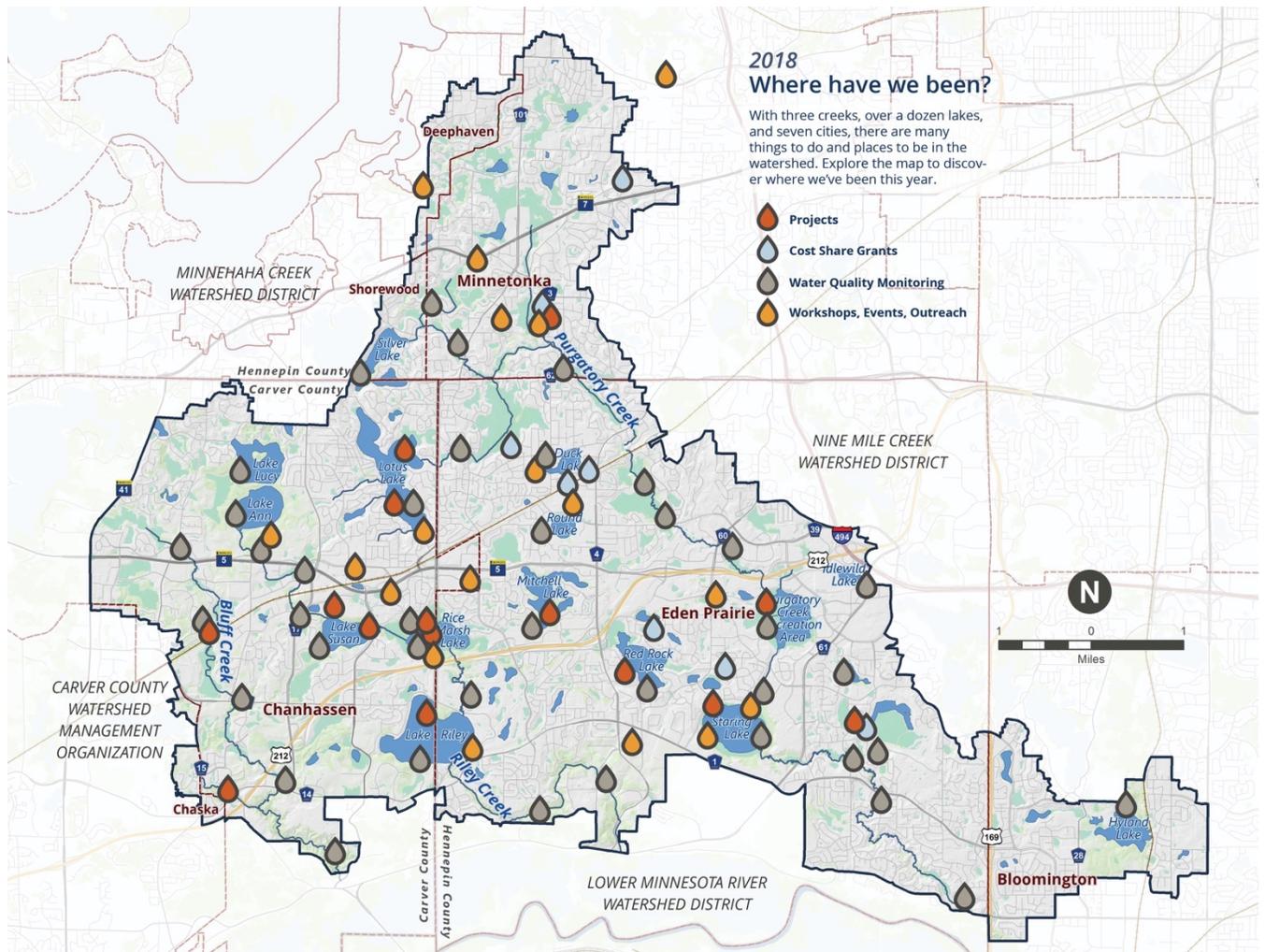
The following report is a summary of District activities in 2018.

2018 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 2018 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 in the form of a 11" by 17" folded brochure. Approximately 1500 copies were distributed. These were 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/>

Spotlight projects

2018 projects included invasive plant management, water quality improvements, and creek restoration.

SAND FILTER AT LAKE SUSAN PARK POND



RPBCWD teamed up with the city of Chanassan to construct an iron-enhanced sand filter at the edge of Lake Susan Park Pond. The filter traps phosphorus in the pond water before it flows into Lake Susan. Phosphorus is food for algae, the aquatic organisms responsible for turning lakes green. Less phosphorus means less potential for algae blooms, which is better for swimmers and wildlife alike! The project also includes a system to reuse stormwater from the pond on nearby park athletic fields.

ALUM IN LOTUS & RICE MARSH LAKE



In September, Lotus Lake and Rice Marsh Lake were treated with a compound called aluminum sulfate (alum). Alum is applied underwater, where it sinks to the lake bottom and forms a thin "blanket." There, it binds with phosphorus in the sediment and prevents algae from using that phosphorus to grow. Continued monitoring will track long-term performance of the alum, and the second half of this split-dose treatment will be applied in 3-5 years.

LOOKING AHEAD

STRETCH OF RILEY CREEK TO BE RESTORED



The Lower Riley Creek Restoration is a multi-year project to stabilize the streambanks of Riley Creek, and to re-connect the creek to its floodplain. It will reduce erosion, improve water quality, and increase habitat in and along the creek. It will prevent an estimated 1,200 lbs of phosphorus, and 2,139,730 lbs of sediment from polluting the water each year. The project is a partnership with the Lower Minnesota River Watershed District and City of Eden Prairie, and is scheduled to start in 2019.

2018 ANNUAL COMMUNICATION

It's been an exciting year for the watershed!

The Riley Purgatory Bluff Creek Watershed District's (RPBCWD) 4th generation 10-Year Management Plan was approved by the Board of Water & Soil Resources. We welcomed two new managers, one new staff member and many new volunteers, all with a desire for protecting and restoring our waters. This is the same passion that led 70 residents from the Riley and Purgatory Creek watersheds to petition the State to create a watershed district 50 years ago. On July 31st, 1969, the Riley-Purgatory Creek Watershed District was formed. Later in 1984 Bluff Creek would be added to the district. In 2019, RPBCWD will be hosting a series of events throughout the watershed to commemorate 50 years of watershed protection. I hope that you can come explore and celebrate our water resources.

Sincerely,
Claire Bieser
District Administrator



Board of managers

CHANGES AT THE DISTRICT

In 2018, we bid farewell to two members of the Board of Managers and welcomed two. Our Board President, and two-term board member Leslie Yeika, and board manager Richard Chadwick served their last meetings this summer. We are grateful for their leadership and wish them the best in their future endeavors. In August, we welcomed newly appointed David Ziegler of Eden Prairie, and Larry Koch of Chanassan. They represent Hennepin and Carver Counties, respectively, and will help us implement the district's goals and policies.

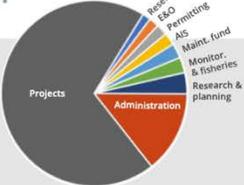


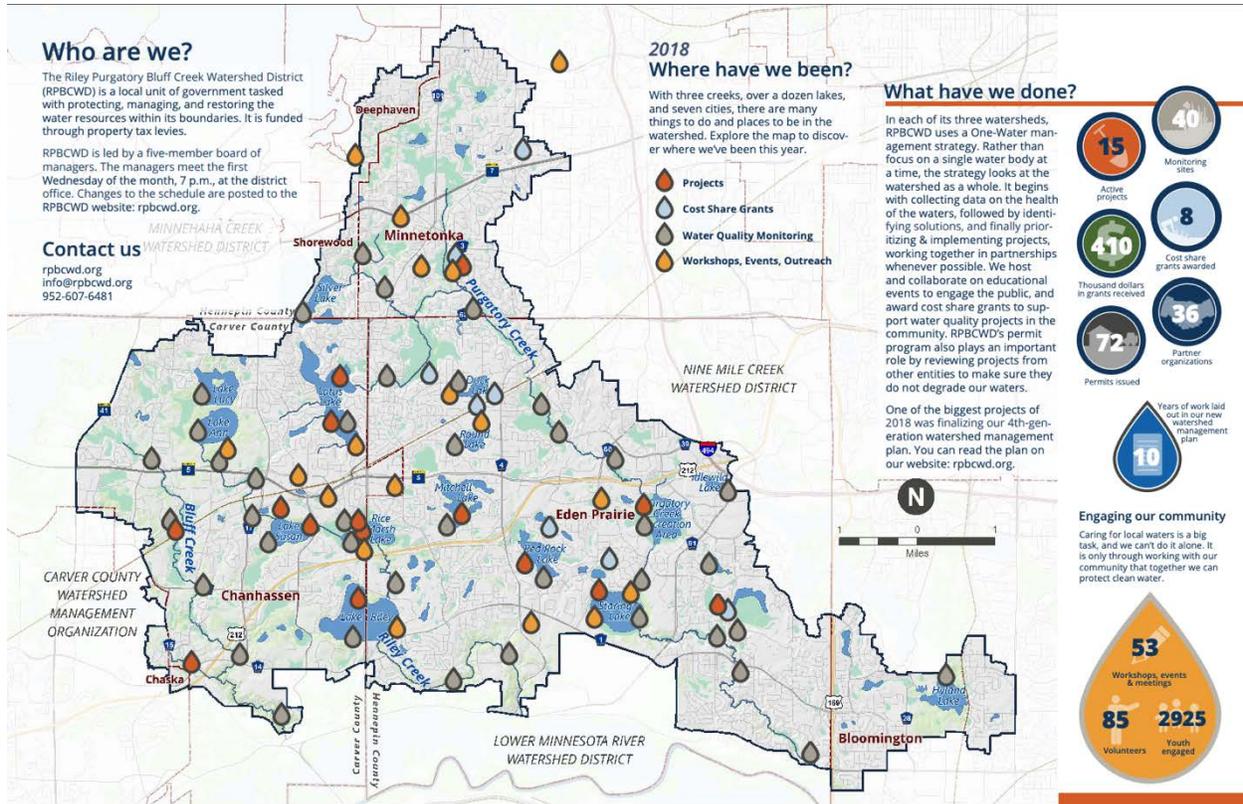
2018 BOARD (left to right)	
Larry Koch	612-210-5001
David Ziegler	952-905-1889
Dorothy Pedersen	952-933-2141
Dick Ward	612-759-9150
Jill Crafton	612-816-9971
	Member Secretary
	Vice Pres.
	President
	Treasurer

Your tax dollars at work for clean water

The watershed district is funded through property tax levies. That means, if you live within RPBCWD you are helping make the work of protecting clean water possible.

The 2019 levy is \$3,602,500. The budget for 2019, which includes funds from previous levies, is \$6,917,492. Where will those dollars go? To projects like those highlighted above, administration, research & planning, monitoring & fisheries, a maintenance fund, aquatic invasive species, permitting, education & outreach (E&O), and a reserve fund in case of an emergency.



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 2017. The District retained JMSC Futurity as its accountant and Smith Partners, PLLP as its legal counsel. BARR Engineering was selected as District Engineer in May 2017. Included in our pool of consultant were Wenck Associates, Limnotech, SRF, HDR, Next solicitation will be issued in 2019. In 2018, the District switched accountant and selected the accounting department at Redpath and Company to be the District's accountant. Redpath and Company conducted the District's annual financial audit. The next solicitation of services will be in 2019.

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 projects. 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. Three projects (Lotus

Lake Internal Control, Rice Marsh Lake Internal Control, Duck Lake Watershed Load Control) were identified for the 2018 year in addition to completing projects that were active in 2017 (Bluff Creek Stabilization, Fire Station 2, Chanhassen High School Reuse, Lake Susan Water Quality Improvement Phase 2, Lower Riley Creek Restoration and Stabilization, and Scenic Heights Habitat Restoration). Please find below the status of the projects:

- Bluff Creek Watershed
 - Bluff Creek Tributary Stabilization (delayed due to additional permitting material requested by USACE)
 - Chanhassen High School (substantially completed)
- Riley Creek Watershed
 - Rice Marsh Lake Internal Control (completed)
 - Lower Riley Creek Restoration and Stabilization (design completed)
 - Lake Susan Water Quality Improvement Phase 2 (substantially completed)
- Purgatory Creek Watershed
 - Fire Station 2 (completed)
 - Purgatory Creek berm (in progress)
 - Lotus Lake Internal Control (completed)
 - Purgatory Creek at 101 Restoration (completed)
 - Silver Lake Phase 1 Feasibility (completed)
 - Scenic Heights Restoration (in progress)
 - Hyland Lake Internal Control (partner completed)
 - Duck Lake Watershed Load (in progress)

STATUS OF LOCAL PLAN ADOPTION AND IMPLEMENTATION

The District received 4 Local Surface Water Management Plans to review. The City of Deephaven, Shorewood, Minnetonka and Chanhassen all submitted their plans. The City of Deephaven and Shorewood were approved. The City of Minnetonka and Chanhassen are approved pending meeting conditions.

FINANCIAL STATUS

The District's fund balances 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 Redpath and Company, 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 bal-

ance sheet, an analysis of changes in final balances, and all additional statements necessary for full financial disclosures. The 2018 Audited Financial Report may be found on our website at <http://www.rpbcwd.org/library/annual-reports-andcommunications/>. (Posted when finalized and available.)

2018 ANNUAL AUDIT

The District's annual audit can be found at the following website: <http://rpbcwd.org/library/annual-reports-and-communications/> (Posted when finalized and available.)

2018 ANNUAL BUDGET

The District adopted its 2018 Annual Budget in September 2017 (see following figure).

	2018 Budget	Fund Transfers	Revised 2018 Budget	Current Month	Year-to-Date	Year-to Date Percent of Budget
REVENUES						
Plan Implementation Levy	\$3,420,000.00		\$3,420,000.00	-	3,408,872.90	99.67%
Permit	20,000.00		20,000.00	-	57,001.50	285.01%
Grant Income	373,175.00		475,475.00	-	309,775.27	65.15%
Data Collection Income	-		-	-	6,921.78	---
Other Income	-		-	-	23,729.26	---
Investment Income	-		-	-	35,309.43	---
Past Levies	1,736,968.00		1,736,968.00	-	-	0.00%
Partner Funds	445,000.00		594,091.00	-	214,091.00	36.04%
TOTAL REVENUE	\$5,995,143.00	\$0.00	\$6,246,534.00	\$0.00	\$4,055,701.14	64.93%
EXPENDITURES						
Administration						
Accounting and Audit	40,000.00		40,000.00	-	37,637.39	94.09%
Advisory Committees	4,000.00		4,000.00	-	2,803.95	70.10%
Insurance and bonds	12,000.00		12,000.00	-	20,862.00	173.85%
Engineering Services	103,000.00		103,000.00	-	94,001.42	91.26%
Legal Services	75,000.00		75,000.00	-	63,177.92	84.24%
Manager Per Diem/Expense	19,000.00		19,000.00	-	14,139.87	74.42%
Dues and Publications	8,000.00		8,000.00	-	9,288.00	116.10%
Office Cost	100,000.00		100,000.00	-	121,350.60	121.35%
Permit Review and Inspection	90,000.00		90,000.00	-	154,851.24	172.06%
Recording Services	15,000.00		15,000.00	-	7,901.25	52.68%
Staff Cost	434,000.00		434,000.00	-	442,878.73	102.05%
Subtotal	\$900,000.00	\$0.00	\$900,000.00	\$0.00	\$968,892.37	107.65%
Programs and Projects						
District Wide						
10-year Management Plan	9,662.00		9,662.00	-	34,542.25	357.51%
AIS Inspection and early response	75,000.00		75,000.00	-	55,759.73	74.35%
Cost-share	200,000.00		200,000.00	-	32,807.40	16.40%
Creek Restoration Action Strategies Phase	20,000.00		20,000.00	-	-	0.00%
Data Collection and Monitoring	180,000.00		180,000.00	-	183,154.39	101.75%
District Wide Floodplain Evaluation - Atlas 14/SMM model	30,000.00		30,000.00	-	-	0.00%
Education and Outreach	115,000.00		115,000.00	-	119,680.95	104.07%
Plant Restoration - U of M	40,000.00		40,000.00	-	19,474.28	48.69%
Repair and Maintenance Fund *	177,005.00		177,005.00	-	-	0.00%
Survey and Analysis Fund *	13,464.00	(13,464.00)	-	-	-	---
Wetland Management*	150,000.00		150,000.00	-	29,728.31	19.82%
District Groundwater Assessment	-		-	-	166.38	---
Groundwater Conservation*	130,000.00		130,000.00	-	-	0.00%
Lake Vegetation Implementation	75,000.00		75,000.00	-	17,368.26	23.16%
Opportunity Project*	100,000.00		100,000.00	-	-	0.00%
TMDL - MPCA	10,000.00		10,000.00	-	-	0.00%
Stormwater Ponds - U of M	-	22,092.00	22,092.00	-	-	0.00%
Subtotal	\$1,325,131.00	\$8,628.00	\$1,333,759.00	\$0.00	\$492,681.95	36.94%
Bluff Creek						
Bluff Creek Tributary*	236,741.00		282,129.00	-	41,038.08	14.55%
Chanhassen High School *	282,478.00	50,000.00	382,478.00	-	340,573.23	89.04%
Subtotal	\$519,219.00	\$50,000.00	\$664,607.00	\$0.00	\$381,611.31	57.42%
Riley Creek						
Lake Riley - Alum Treatment*	22,424.00		22,424.00	-	17,423.96	77.70%
Lake Susan Improvement Phase 1 *	7,106.00		7,106.00	-	-	0.00%
Lake Susan Water Quality Improvement Phase 2 *	353,365.00	100,000.00	552,456.00	-	539,036.38	97.57%
Rice Marsh Lake in-lake phosphorus load	150,000.00		150,000.00	-	76,017.94	50.68%
Riley Creek Restoration (Reach E and D3) *	1,427,987.00		1,427,987.00	-	119,269.55	8.35%
Subtotal	\$1,960,882.00	\$100,000.00	\$2,159,973.00	\$0.00	\$751,747.83	34.80%
Purgatory Creek						
Fire Station 2 (Eden Prairie)	100,262.00		100,262.00	-	101,318.90	101.05%
Purgatory Creek Rec Area- Berm/retention area - feasibility/design	50,000.00		50,000.00	-	-	0.00%
Lotus Lake in-lake phosphorus load control	345,000.00		345,000.00	-	239,227.04	69.34%
Lotus Lake - Feasibility Phase 1	18,802.00		18,802.00	-	-	0.00%
Purgatory Creek at 101*	246,259.00	(100,000.00)	146,259.00	-	24,414.38	16.69%
Silver Lake Restoration - Feasibility Phase 1	11,003.00		11,003.00	-	10,489.50	95.33%
Scenic Heights	208,957.00		208,957.00	-	97,730.82	46.77%
Hyland Lake in-lake phosphorus load control	20,000.00		20,000.00	-	-	0.00%
Duck Lake watershed load	220,000.00		220,000.00	-	6,044.50	2.75%
Subtotal	\$1,220,283.00	(\$100,000.00)	\$1,120,283.00	\$0.00	\$479,225.14	42.78%
Reserve	\$99,628.00	(\$58,628.00)	41,000.00	-	-	0.00%
TOTAL EXPENDITURE	\$6,025,143.00	\$0.00	\$6,219,622.00	\$0.00	\$3,074,158.60	49.43%
EXCESS REVENUES OVER (UNDER) EXPENDITURES	(\$30,000.00)	\$0.00	\$26,912.00	\$0.00	\$981,542.54	

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.

2019 WORKPLAN

Administration	
Accounting and Audit	<p>Coordinate with Accountant for the development of financial reports.</p> <p>Coordinate with the Auditor.</p> <p>Continue to work with the Treasurer to maximize on fund investments.</p>
Internal Policies	<p>Work with Governance Manual and Personnel Committees to review bylaws and manuals as necessary</p>
Advisory Committees	<p>Engage with the Technical Advisory Committee on water conservation, chloride management and emerging topics</p> <p>Engage with the Citizen Advisory Committee on water conservation, annual budget and emerging topics.</p> <p>Facilitate recruitment of CAC members for 2019.</p>
District-Wide	
Regulatory Program	<p>Review regulatory program to maximize efficiency.</p> <p>Engage Technical Advisory Committee and Citizen Advisory Committee on possible rule changes.</p> <p>Implement regulatory program.</p>
Aquatic Invasive Species	<p>Review AIS monitoring program</p> <p>Develop and implement Rapid Response Plan as appropriate</p> <p>Coordinate with LGUs and keep stakeholders aware of AIS management activities.</p> <p>Manage and maintain the aeration system on Rice Marsh Lake as per the Riley Chain of Lakes Carp Management Plan.</p> <p>Review AIS inspection program.</p> <p>Keep abreast in technology and research in AIS.</p>
Cost-Share	<p>Review program to determine efficiencies and needs.</p> <p>Recommend modification as necessary.</p> <p>Review applications and recommend implementation.</p>
Creek Restoration Action Strategy	<p>Review updates to the field CRAS analysis.</p>
Data Collection	<p>Continue Data Collection in permanent sites.</p>

	Identify monitoring sites to assess future project sites.
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.
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	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)
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. 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	<p>Review and monitor progress on University of Minnesota grant.</p> <p>Support Dr John Gulliver and Dr Ray Newman research and coordinate with local partners.</p> <p>Keep the manager abreast to progress in the research.</p> <p>Identify next management steps.</p>
Watershed 50 year Anniversary	<p>Come explore with us!</p> <p>Finalize anniversary program for 2019.</p> <p>Implement anniversary events.</p>
Watershed Plan	<p>Review and identify needs for amendments.</p>
Wetland Conservation Act (WCA)	<p>Administer WCA within the Cities of Shorewood and Deephaven.</p> <p>Represent the District on Technical Evaluation Panel throughout the District</p>
Wetland Management	<p>Identify potential restoration/rehabilitate wetlands and wetland requiring protection.</p>
<i>Bluff Creek Watershed</i>	
Chanhasen High School Re-use	<p>Continue to work with all partners.</p> <p>Complete site restoration and start system.</p> <p>Finalize and implement E and O for project.</p> <p>Monitor Project.</p>
Bluff Creek Tributary Restoration	<p>Implement and finalize restoration.</p> <p>Monitor Project.</p>
Wetland Restoration at 101	<p>Remove 3 properties from flood zone, restore a minimum 7 acres and as many as 16 acres of wetlands, connect public with resource, reduce volume, rate, pollution loads to Bluff Creek</p>
<i>Riley Creek Watershed</i>	
Lake Riley Alum	<p>Continue to monitor the waters.</p>
Lake Susan Improvement Phase 1	<p>Continue to monitor spent lime treatment facility.</p> <p>(This item will be rolled into our Data Collection Program)</p>
Lake Susan Improvement Phase 2	<p>Complete final site stabilization and spring start up.</p> <p>Finalize and implement E and O for project.</p> <p>Monitor Project.</p>
Lower Riley Creek Stabilization	<p>Coordinate agreement and acquire easements if needed for the restoration of Lower Riley Creek reach D3 and E.</p> <p>Implement Project.</p>

	Continue Public Engagement for project and develop signage of restoration.
Rice Marsh Lake Alum Treatment	Monitor Project.
Rice Marsh Lake Watershed Load Project 1	Conduct feasibility. Develop cooperative agreement with 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 Project Start design
<i>Purgatory Creek Watershed</i>	
Duck Lake Raingarden Project	Work with the City to implement neighborhood BMP. Identify neighborhood BMP to help improve water resources to Duck Lake. Implement neighborhood BMPs.
Fires Station 2	Monitor Project.
Hyland Lake Internal Load control	Implement Hyland Lake Alum application.
Lotus Lake – Internal Load Control	Monitor treatment and plant populations.
Scenic Heights	Continue implementing restoration effort. Work with the City of Minnetonka and Minnetonka School District on Public Engagement for project as well as signage.
Silver Lake Restoration	Order project Design Project Work with the City of Chanhassen for Design, cooperative agreement and implementation

REGULATORY PROGRAM

Regulation plays an important role in managing water resource problems. For instance, municipal land use planning and zoning powers are invaluable for ensuring that land uses are compatible with the surrounding environment. The District's current regulatory program was adopted by the Board of Managers in November of 2014. These rules were amended on August 8th 2018 to address stakeholder concerns. It implements a watershed approach to potential impacts to water resources that ensures a consist level of protection across the watershed.

The program includes thirteen rules, A-M, which can be viewed in detail on the District's website: rpbcwd.org/permits/.



REGULATORY PROGRAM

Regulation ensures proper integration of water resource protection when development and redevelopment projects occur.

The District received 76 permit applications in 2018. Seventy permits were approved in 2018 and none were denied. It is estimated that more than nine (9) tons of Total Suspended Solids (TSS) and approximately 85 lbs of Total Phosphorus were prevented from entering our stormwater sewers and ultimately our water resources. In addition, approximately 89,300 cubic feet of water was abstracted during every 1.1-inch rainfall event. There were twelve projects which included buffers.

Summary		Estimated		
Permit Type	Number	Total TSS (lbs)	Total TP (lbs)	Volume (cft)
Governmental	33	11,540	59.7	47,263
Private Development	19	7,152	25.0	42,065
Ex. Single Family	18	Not Computed		
Withdrawn/ Review in Progress	6	Not Computed		
TOTAL	76	18,692	84.7	89,328

While TSS and TP removals were similar in 2018 to 2017, government projects accounted for the majority of the removals. This is consistent with the fact that government permits outpaced private developments at an almost 2:1 ratio. Although pollutant removal remained consistent, the volume of stormwater abstracted reduced almost 30% from the preceding year. This is most likely a reflection of recent changes to the NPDES permit which resulted in more restricted sites,

Six applications requested a variance from District rules.

The District hosted two workshops targeting property manager and builders.

The regulatory program prevented sediment pollution, reduced food for algae and helped slow down and soak in water it falls.

90

Dump trucks of sediment/yr



110

Tons less algae/yr



8350

Bathtub full of water infiltrated per 1.1" rainfall



AQUATIC INVASIVE SPECIES

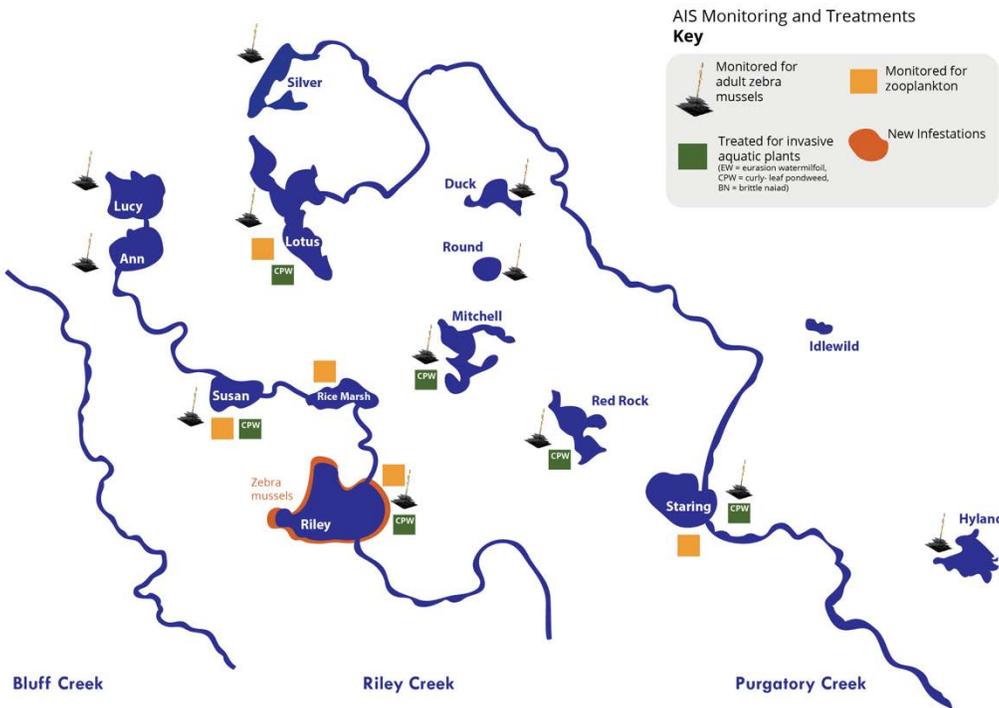
The District understands the importance of AIS monitoring, inspections, and preventions. The District also recognizes that it is more cost effective to prevent an infestation than to restore a resource after an AIS has established itself. The AIS program is to help support AIS inspections, AIS monitoring and rapid responses to a new infestation.



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 14 volunteers, monitored our lakes for zebra mussels. Unfortunately, Zebra Mussels were detected in Lake Riley in October. The District worked with the MN DNR to determine the extent of spread and identify if rapid response could occur. However, the spread was too large. The District notified all lake shore owners throughout the District and held an informational session.

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 2018, the District conducted herbicide treatments on aquatic invasive species as part of 4 vegetation management plans and 1 rapid response plan.

Lake Vegetation Management Plans

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 both curlyleaf pondweed and eurasian watermilfoil. In 2018, the District conducted one herbicide treatment on Lake Riley. The first treatment treated 15 acres for curlyleaf pondweed. The treatment are 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 these invasive species.

Curlyleaf pondweed treatment areas



Lake Susan



Over 6 acres of curlyleaf pondweed were treated on Lake Susan. The treatment is part of an effort to restore the native plant population in Lake Susan post carp control and prior to a future alum treatment. We will continue to monitor curlyleaf pondweed in 2019 to determine if there is a need to do additional treatments.

Mitchell Lake



In 2018, the District treated 13 acres of Mitchell Lake for curlyleaf pondweed. In addition, the City of Eden Prairie conducted mechanical harvesting. This treatment is part of a vegetation management plan to manage curlyleaf pondweed drafted between the City of Eden Prairie and the Watershed District. The District and the City of Eden Prairie will reevaluate the plan in 2019.

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 2019.

DISTRICT FLOODPLAINS

In 2017, the District conducted community resilience workshops focusing on our changing climate. Through the workshops, the following climate hazards were identified as top concerns:

- Extreme precipitation
- Drought
- Extreme heat
- Warmer winters

The District in 2018 worked with the TAC to identify ways to further our understandings of climate hazards in the District. The District took on two projects. One of which was to include higher definition in our monitoring of seasonal streams to determine potential flooding challenges. The District will continue to monitor a tributary to Purgatory Creek in 2019. The other project is in partnership with the City of Bloomington, specifically looking at the Hyland Lake watershed. The project is closely looking at the flooding potentials of homes in that region as well as looking at opportunities to mitigate and reduce pollutant impacts due to the increase rain precipitations. The project will begin in 2019.

GROUNDWATER CONSERVATION

The District continues to explore practices that promote groundwater conservation. In September 2018, the District hosted an educational groundwater conservation presentation in which staff from the City of Woodbury spoke about an innovative groundwater conservation program in their city. In order to extend the capacity of a local groundwater supply, city staff developed a program to encourage city residents to use “smart” irrigation controllers. These systems sense moisture and limit unnecessary irrigation.

Twenty-two people attended this presentation, including members of the RPBCWD Board of Managers, Citizen Advisory Committee, and Technical Advisory Committee.

In 2019, the District will further explore ideas and identify how it will engage in groundwater conservation.

INCENTIVE PROGRAM

The District has three incentive programs. The cost-share program funds and supports community projects that protect, improve, and increase awareness to water resources. The earth day mini-grant provides funds to educators to engage their students in an activity relating to our water resources. The repair and maintenance program helps cover some of the normal and routine maintenance cost.

COST-SHARE PROGRAM

Funding and support for community projects that protect, improve, and increase awareness of water resources.

The cost-share program provides funding and technical assistance for projects that protect and conserve water resources, and increase public awareness of the vulnerability of these resources and solutions to improve them.

In 2018, the watershed district's cost-share program funded nine projects including three raingardens and 10,000 ft² of habitat restoration. The watershed also provided technical guidance to community members through a partnership with the Carver County Soil and Water Conservation District. Some of these community members did not apply for a cost-share grant, but still went on to engage with the district in other meaningful ways.

District staff also worked together with the citizens advisory committee to begin the process of the updating the cost-share program. It is anticipated that the updated program will be ready to open in spring of 2019.



In 2018, the watershed district's cost-share program funded nine community projects to protect and improve water resources:



9 projects



10,000 ft² of habitat restored

EARTH DAY MINI-GRANTS

Ten applications were received for the mini-grants. Nine of the applications were approved. The approved grants included requests to purchase snow-shoes to hike frozen Duck Lake in the winter, sampling nets to investigate insects living in Bluff Creek, rain boots to explore a tributary, and books to learn about water use. Other grants included creating terrariums to study the water cycle, and visiting a nature center to learn about wetlands and rivers. The increase in interest in the program led staff to look into expanding it for 2019, renaming it Educator Mini-Grants and hosting rolling deadlines.

Prairie View Elementary students use their new grant-purchased snow-shoes to explore frozen duck Lake



REPAIR & MAINTENANCE FUND

In 2018, no funds were requested 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.)

EXECUTIVE SUMMARY

The Riley Purgatory Bluff Creek Watershed District (RPBCWD) had a successful water quality sampling season in 2018, 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 2018 sampling effort are presented in this report.

2018 LAKE SUMMARY

During the 2018 monitoring season, 13 lakes and one high value wetland (Lake Idlewild) 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 all waterbodies, assessed carp populations within the Riley and Purgatory Chain of Lakes, and assessed zooplankton and phytoplankton populations in five lakes. Staff were able to remove 1,901 common carp from the Purgatory Creek Recreation Area during the spring spawning run which reduced 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. Unfortunately, zebra mussels were found on Lake Riley, which is the first lake within the District to become infested. Successful alum treatments occurred on Lotus Lake, Round Lake, and Rice Marsh Lake in 2018. Herbicide treatments for curly leaf pondweed were conducted on Lotus Lake, Lake Susan, Mitchell Lake, Red Rock Lake, Staring Lake, and Lake Riley.

Surface water samples were collected, analyzed, and compared to standards set by the Minnesota Pollution Control Agency (MPCA) to assess overall lake health. **Figure 1** displays lakes sampled in 2018 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). Lake Ann, Lake Idlewild, Lake Riley, Round Lake, Duck Lake, and Silver Lake met all three MPCA standards in 2018; Round (TP), Riley (Chl-a), Duck (TP), and Silver (Chl-a) did not previously meet all standards in 2017. This is the first time since data has been collected that Lake Riley and Silver Lake met all water quality standards. Lotus Lake, Red Rock, Rice Marsh, and Lake Susan all exceeded both the Chl-a and TP standards in 2018. Similar to 2017, Hyland did not meet all three standards in 2018.

Mitchell Lake also did not meet all water quality standards due to the declined summer secchi disk average. Both Red Rock and Rice Marsh Lake declined in water quality as both Chl-a and TP summer averages increased. All lakes met the nitrate/nitrite water quality standard and only Lake Idlewild did not meet the chloride standard.

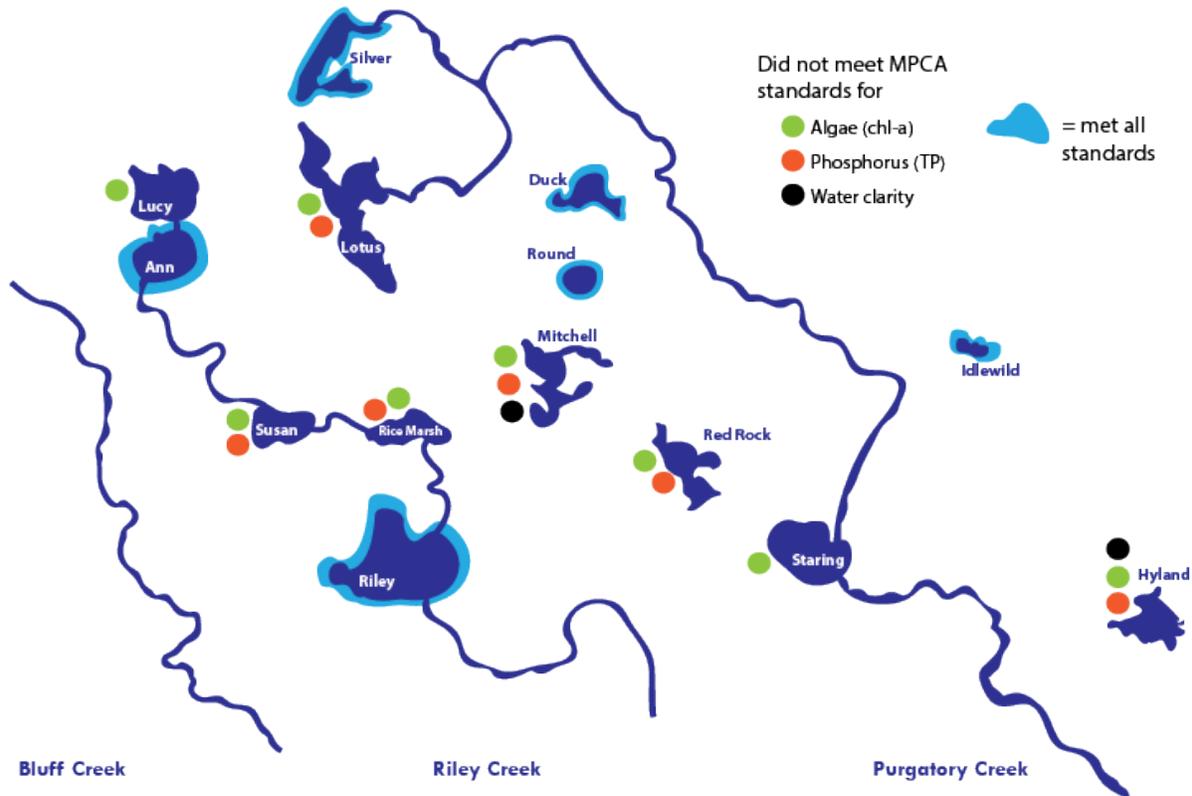


Figure 1 2018 Lake Water Quality

Summary of the lake water quality data collected in 2018 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) were assessed 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, 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.

2018 STREAM SUMMARY

In 2018, the District collected water quality samples and performed data analysis on 21 different sampling sites along Riley Creek (six sites), Bluff Creek (five sites), and Purgatory Creek (ten sites). During the 2018 creek monitoring season (April-September) water chemistry and turbidity were regularly measured at the 18-regular water quality monitoring sites every two weeks. Water samples were collected to assess nutrient (TP 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. The District collected macroinvertebrates at all five Riley Creek regular water quality sites in 2018. Sections of Purgatory Creek were walked and assessed using the Creek Restoration Action Strategy (CRAS) evaluation, which identifies stream reaches in the most need of restoration. Staff walked two new reaches during these evaluations. Overall, the 2018 CRAS scores of subreaches previously walked remained very similar to past scores. The two tributary streams not previously walked were determined to be in good to moderate condition. In 2018, the CRAS was published in the Water Science Bulletin of the Center for Watershed Protection.

The summary for all three creeks is based on water quality parameters developed by the MPCA in 2014 for Eutrophication and TSS. 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 > 4mg/L, summer season average TP < 0.1mg/L, TSS < 10% exceedance of 30mg/L limit during the summer season, summer season average Chl-a < 18ug/L, and summer season average pH < 9su and > 6su (MPCA, 2016).

P3 was the only regular creek sampling site to meet all MPCA water quality standards in 2018 (Figure 2). The overall number of water quality standard impairments increased from 2017 to 2018; Bluff had 10, Riley had seven, and Purgatory had nine (previously ten, two and seven, respectively). Bluff Creek remained the stream with the most impaired water quality, as previously seen in 2015, 2016, and 2017, with TP impairments at all sites, as well as TSS impairments at three sites, a DO impairment at B5, and a fish impairment at B1. Once again, TP was the water quality standard most impaired in 2018 with 10 of the 18 sites not meeting the standard (summer average < 0.1 mg/L). TSS impairments increased from five impairments in 2017 to nine in 2018. The dissolved oxygen standard (daily minimum of 4mg/L) was impaired across five stream sites. All sites met the pH water quality standard (< 9su and > 6su). Similar to 2016 and 2017, P2 was the only site which did not meet the Chl-a standard (summer average < 18ug/L).

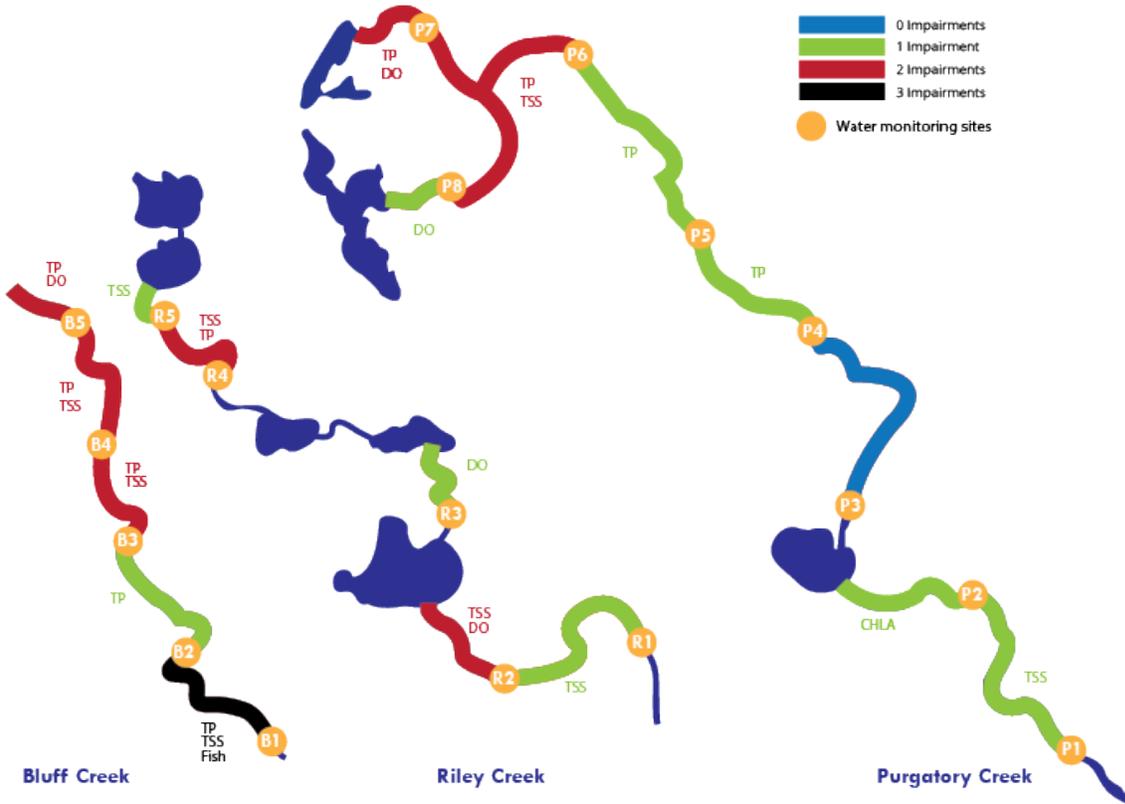


Figure 2 2018 Stream Water Quality

Summary of stream water quality data collected on Bluff Creek, Riley Creek, and Purgatory Creek in 2018 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 $> 4\text{mg/L}$, average Total Phosphorus (TP) $< 0.1\text{mg/L}$, Total Suspended Solids (TSS) $< 10\%$ exceedance of 30mg/L limit, average Chlorophyll-a (CHLA) $< 18\text{ug/L}$, average pH $< 9\text{su}$ and $> 6\text{su}$. 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 2018 the District implemented a new E&O Plan. The following pages describe the District's E&O programs and major activities in 2018.



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 2018 program included three ongoing programs – Adopt a Dock, Master Water Stewards, and Service Learners. The district also led a tree-planting, cosponsored a volunteer clean-up event, and hosted a year-end celebration.

Adopt a Dock



Adopt a Dock is a citizen science initiative. Lakeshore residents to monitor for aquatic invasive species.. Invasive mus-sels were found on a plate in Lake Riley, after the district had already been confirmed the species in the lake.

Master Water Stewards



A partnership with the Fresh-water Society, MWS trains community volunteers to prevent A through projects and education. In 2018, 4 stewards graduated from the program and 5 new stewards began classes.

Service Learners



Service learners are college students or other community members who gain first-hand experience at the district through volunteering.

In 2018, the watershed district's volunteer program engaged community members through three different opportunities and four events:

85  volunteers

660  hours volunteered

8  programs & events

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 (Non-point source Education For Municipal Officials), presentations to city councils and commissions, and watershed tours or workshops.

Highlights from 2018 included participating in the Minnesota Association of Watershed District's Annual Tour, and hosting a technical training on creek assessment and restoration.

The District also hosted a groundwater conservation workshop, and presented to local city councils.



In 2018, the watershed district's local leader program engaged community members through a watershed tour, workshops, and presentations:

120 
tour attendees



Groundwater
conservation workshop



7
activities



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. Examples activities include guest presentations and citizen science opportunities for local schools and scout groups, service learning opportunities for high-school and college students, and providing financial and other resources to increase education about, and access to local water bodies.

Earth Day Mini-Grants



The mini-grant program offers funding to educators for projects that or activities related to water resources. 9 projects were funded in 2018 including a trip to a nature center, snowshoes for exploring a frozen lake, and terrariums to learn the water cycle.

Staring Nature Center Partnership



The district partners with the Staring Lake Nature Center in Eden Prairie to support their water resources programming. In 2018, three schools (~120 4th graders) visited the center several times to learn about the health of Staring Lake.

School & Community Events



The district seeks out and responds to requests to present at schools and other youth events.

In 2018, the watershed district's youth outreach program engaged children and their families by:



9 mini-grant projects



2925

individuals engaged



21

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. Examples of continuing education programs include seminars for professionals on best management practices, workshops for residents on raingardens, Project WET trainings for educators, and tours of resources or projects.

Salt Solutions Workshops



In partnership with Nine Mile Creek Watershed District, Minnehaha Creek Watershed District, Basset Creek Watershed Management Commission, and the City of Minnetonka, the District offered workshops for non-profits and faith-based organizations to learn to reduce winter salt pollution.

Turf & Winter Maintenance Training



Through a Minnesota Pollution Control Agency Grant, the watershed district is able to offer certification trainings in best practices for turfgrass and winter maintenance professionals. In 2018 the District hosted two grant-supported workshops.

Business Luncheons



The District developed and hosted business luncheon series in 2018. Each of the three luncheons targeted a different business audience and focused on a pertinent topic.

In 2018, the watershed district's continuing education program served the community through:



270 participants



16 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. Passive communications include press releases and advertisements with both traditional and social media, as well as print materials and interpretive signage. Active communications include direct connections between district staff and representatives, and the community.

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. Over 1000 copies were distributed in 2018.

Media



Electronic newsletter and press releases are written throughout the year. Social media platforms are also utilized. In 2018, 390 social media posts were published.

Engagement events



From tabling at local fairs, to formal presentations, the district engaged with the public in a variety of ways in 2018.

In 2018, the watershed district's communications program engaged the community and raised awareness through:



1000
fact sheets



18
events



25
presentations

390
social media posts

WETLANDS

Wetlands are, second to coral reefs, the most diverse ecosystems on the planet. Migratory birds along with other wildlife species depend on these complex ecosystems for their unique habitats and the plant species found within. Each wetland is unique and can be classified based on soil chemistry, unique plant life, water regime, and wildlife. Along with being remarkable systems, wetland ecosystems contribute to the filtration of incoming water which keep water bodies within the District healthy and diverse. Because of the wetland importance in ecological health, the District has begun conducting a wetland inventory to catalog and classify vast types found through our 50 square mile District.



Starting June 2018, the Riley-Purgatory-Bluff-Creek Watershed District began the process of assessing wetlands located on the westside of the District in Chanhasen, as well as the Rice Marsh Lake area. These assessments used scoring techniques focusing on different flora and fauna, soil chemistry and hydrologic regime found within each wetland. The assessments were ultimately used to identify the quality of the habitat and type of wetland for our database.

Within the bounds of the District are some truly unique and beautiful wetlands. The Minnesota County Biological Survey classified a bog in the District as a unique natural community with rare species found within. When assessed, the bog found in the Bear Path community in Eden Prairie received one of the higher scores for ecological health. One species found within this rare bog, was the carnivorous sundew plant (adjacent). Bogs are known for the nutrient poor soil, and because of this, only very specific plants are able to grow; the sundew is one of these plants. Glistening drops found on the sundew resemble drops of the morning dew, consequently, insects are drawn to the plant. These insects are eventually absorbed to supplement the poor mineral nutrition of the soil the plant grows in.

In July 2018, the District hosted a wetland walk to engage the community on wetland ecology. During this event, individuals were exposed to some of the techniques and scoring used when assessing wetland ecology. A pamphlet identifying various types of wetlands and the flora found within each of these specific systems was also provided to assist in the walk. The walk occurred in the northwest corner of Rice Marsh Lake. This area of the lake was specifically chosen to enhance the material presented

where site visits were made to differing wetland types. This in-the-field observation provided an opportunity for people to see firsthand the different type of wetland ecology found within the district boundary.

The wetland inventory process is still underway, and the district is excited to have these ecological wonders documented. The purpose of this documentation is to identify wetlands that are degraded and well suited for ecological enhancement or relic wetlands that are fully drained but candidates for hydrologic restoration. This process will ultimately enhance the ecological integrity of the district, provide habitat for wildlife and better overall water quality.



BLUFF CREEK WATERSHED

The District is actively engaged in two projects in the Bluff Creek Watershed:

- Bluff Creek Tributary Restoration Project
- Chanhassen High School Reuse Project

BLUFF CREEK TRIBUTARY RESTORATION PROJECT

In 2017, the District conducted a feasibility and began design of the Bluff Creek Tributary Restoration Project. The site is located between Audubon Rd and Highway 212. The reach 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 and will be implemented due to additional information requested by the United States Army Corps of Engineer.

CHANHASSEN HIGH SCHOOL

The District partnership with the city of Chanhassen and Eastern Carver County School District designed in 2017 a stormwater reuse for irrigation at Chanhassen High School with the goal of implementing a project 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.

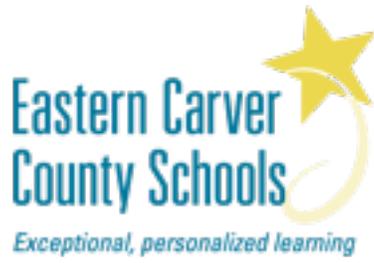


According to irrigation meter records, the school campus purchases an average of 3.8 million gallons (MG) of groundwater annually from the city of Chanhassen's domestic water supply to irrigate about 11 acres of green space (athletic fields and areas around

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 proposed reuse system would meet 51% of the total school campus annual irrigation demand by using 14 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 proposed 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.

District significantly completed the project in 2018.



PURGATORY CREEK WATERSHED

The District is actively engaged in two projects in the Purgatory Creek Watershed:

- Fire Station 2 Water Reuse
- Lotus Lake Alum
- Purgatory Creek Restoration
- Scenic Heights
- Silver Lake Water Quality Project

FIRE STATION 2 WATER REUSE

Through a grant from the Metropolitan Council, the District partnered with the city of Eden Prairie to implement water conservation practices at Fire Station Two. A cistern captures and treats rainwater from the station's roof. This can then be used for irrigating the grounds and washing fire trucks.

A cost-sharing grant from the District also supported the transition of the grounds to low-mow grasses and native plants. This type of landscaping requires less water and upkeep. Both practices also help to reduce stormwater runoff and pollution.

Signs along the trails invite visitors to explore, and to get involved by taking these practices back to their homes, workplaces, and gathering spaces.



LOTUS LAKE ALUM

In 2018, the District completed an alum treatment on Lotus Lake.



PURGATORY CREEK RESTORATION

The Purgatory Creek Restoration on the northeast corner of 101 and 62 was implemented in 2016 and is now complete.

PURGATORY CREEK BERM – EDEN PRAIRIE



The District with the City of Eden Prairie worked together in 2018 to determine what is the best course of action in regards to a breach in the berm. The breach currently gives us the best opportunity to manage the carp population. The District will continue to work with the City of Eden Prairie in 2019.



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

2018 Updates

Site work began in the winter of 2018 with the removal of woody invasive plants. A forestry mower was used to mechanically remove smaller plants, and hand cutting for larger trees and shrubs. The dense buckthorn and Tartarian honeysuckle were ground down to the forest floor during the coldest weeks of the winter to eradicate the rooting stalk and limit re-sprouts.



This dramatically opened the site, clearing space for what will be native prairie, oak savanna, and forest edge habitat. In the spring, the eroded gully that allows stormwater to flow to the pond was restored, creating a wider channel with bio-engineered rock riffles to prevent future erosion. Throughout the growing season invasive plants were continually treated with precision application of herbicide in an effort to exhaust the herbaceous invasive plant seed bank and prevent re-establishment of buckthorn.



In the fall, volunteers planted over 100 native trees and shrubs (*header photo*). These were grown in a gravel bed tree nursery that was built by an Eagle Scout candidate and placed around the pond and vegetated swale. Shortly after, the first 1.3 acres of short grass prairie were installed. Eagle Scouts also helped to fix an eroded walking trail and install a sign about the ecological role of nurse stumps designed by a Minnetonka High School student. Finally, the entire Scenic Heights Elementary student body was engaged in creating a clay mural exploring the diversity of plants and animals we hope to see as a part of the restoration project.

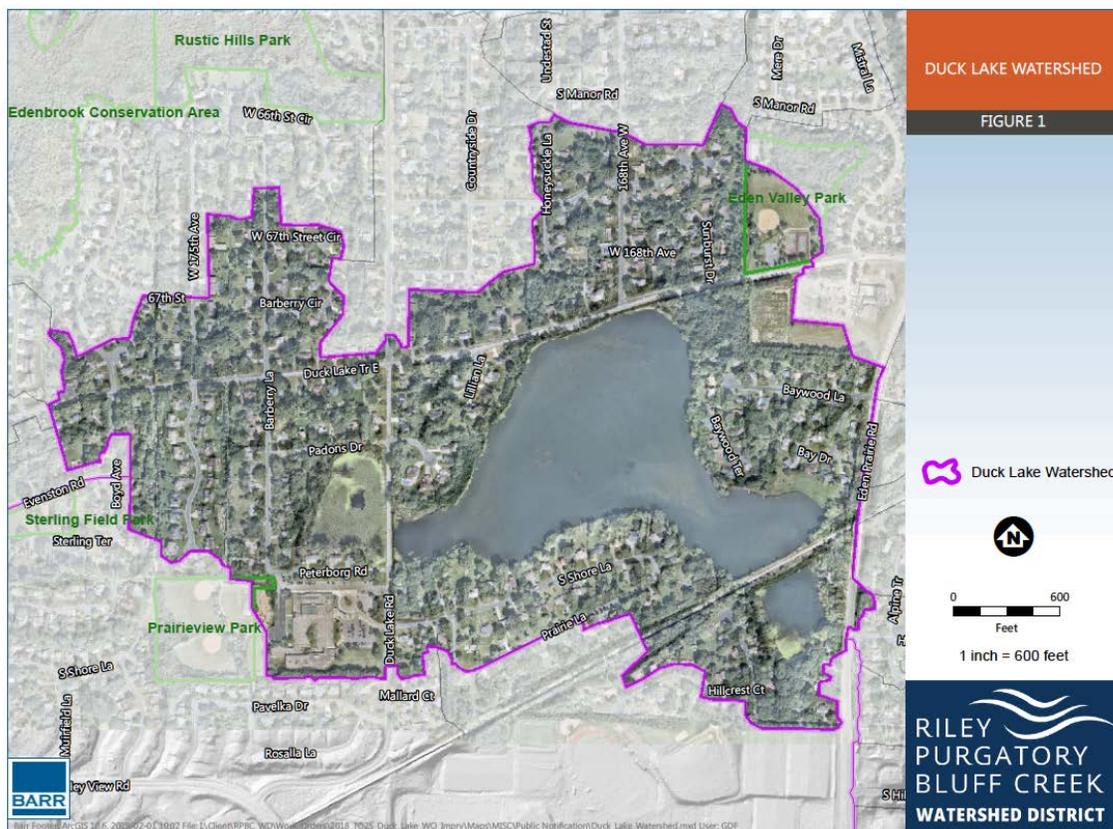


2019 Plans

Invasive plant management will continue with a focus on herbaceous plants like garlic mustard and motherwort. Care will be taken to enhance valuable pockets of spring ephemeral plants. The rest of the 7-acre site will be seeded with native seed mixes in the late spring. Establishment will be assisted with touch-up seedings and weed management throughout the growing season. Volunteers will again be gathered to plant over 2,000 native flowering plants in the late spring, and the school body will be engaged in designing signage and educational materials for the forest.

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 we 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. In 2018 the District reached out to the City of Eden Prairie to be a part of the effort. It is projected that the project will be kicked off in winter 2019, and implemented summer/fall 2019.



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 began a feasibility study in 2017 to evaluate the viability of constructing a BMP to treat runoff from Pleasant View Road and Ridge Road, and to identify if an iron enhanced sand filtration system would be the preferred BMP for the site. This study evaluates the feasibility of other stormwater BMPs, as well. Estimated total phosphorus removals and engineer's opinion of project costs were determined for five feasible BMPs.

The District completed the feasibility and is working with the City of Chanhasen for final design. Implementation is slated for 2020.

RILEY CREEK WATERSHED

The District is actively engaged in three projects in the Riley Creek Watershed:

- Lake Susan Park Pond
- Chanhassen Town Center
- Lower Riley Creek Restoration

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.



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 substantially completed the project in 2018. 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.

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 exasperated 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.

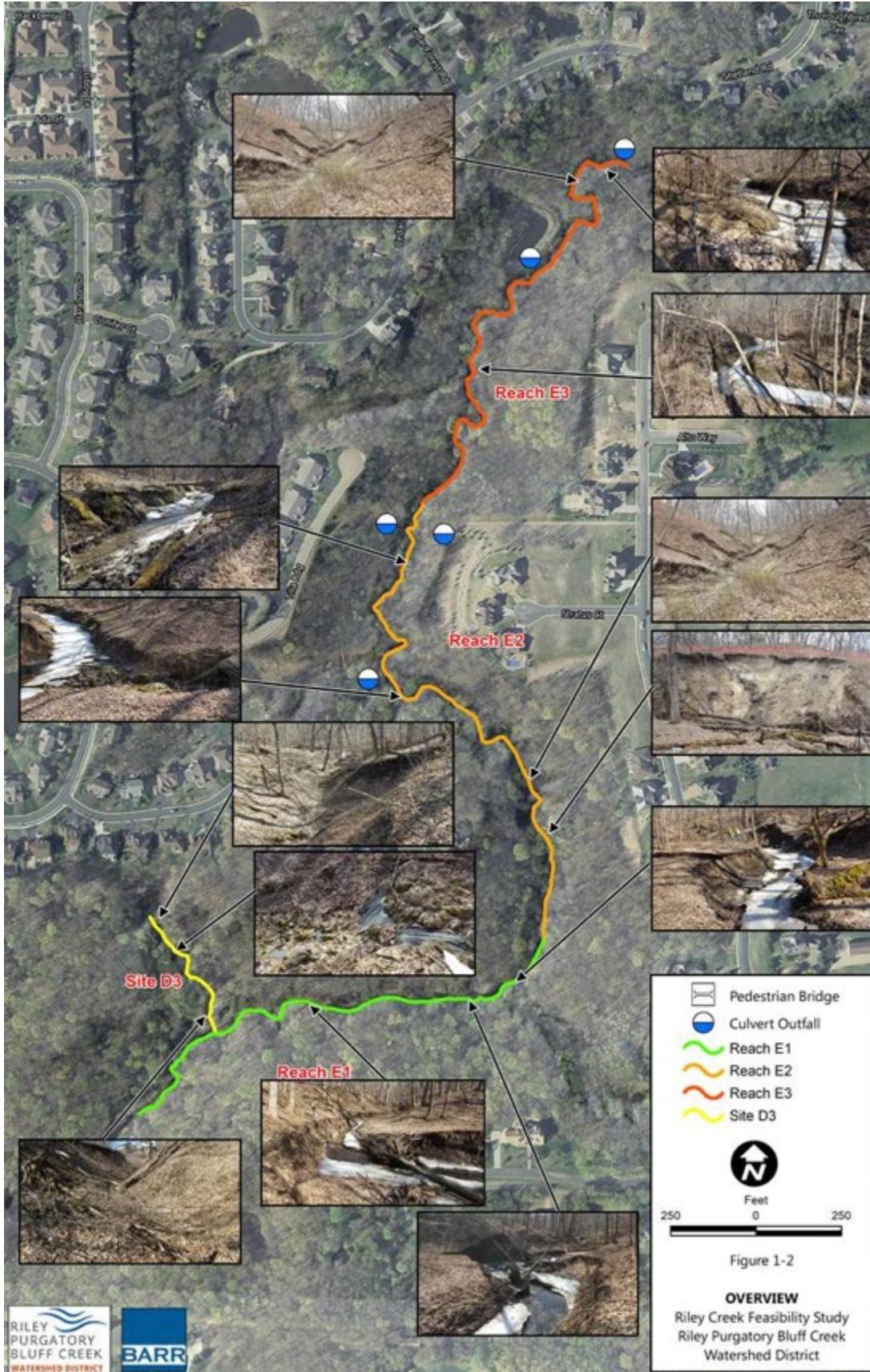
The vision for this project is to provide an ecologically diverse stream reach that significantly reduces streambank erosion, provides diverse habitat layers, and enhances the public's access and their understanding of why stable stream systems are important. This project will reduce erosion and improve 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. Construction of the project will be in 2019.



LOWER MINNESOTA RIVER
WATERSHED DISTRICT





Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2018-074

Received complete: January 28, 2018 (60-day extension sent on February 19, 2019)

Board Meeting: April 3, 2019

Applicant: City of Eden Prairie, Rick Wahlen

Consultant: AE2S, Justin Klabo

Project: Eden Prairie Ground Storage Reservoir

Location: Address Unassigned, Eden Prairie Road, Eden Prairie, MN

Reviewer: Terry Jeffery, Permit Coordinator

Rule Conformance Summary

Rule	Issue	Conforms to RBPCCWD 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
L	Permit Fee	See Comment	Government Agency
M	Financial Assurance	See Comment	Government Agency

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 March 1, 2019 meeting of the managers:

Resolved that the application for Permit 2018-074 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 2018-074 to the applicant on behalf of RPBCWD.

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

Project Description

This project will involve the construction of a ground storage reservoir, a pump house and replica train depot, trail connection, an access road, and water main. Some of the work proposed will take place on a portion of a parcel now owned by the Minnesota Department of Transportation; the city is in the process of acquiring that portion from MnDOT. At the same time, much of the storm water management system is proposed to be constructed on property owned by the Hennepin County Regional Railroad Authority (HCRRA). The applicant will need to provide proof of completion of the transaction whereby it will obtain rights to the MnDOT property, and proof of rights to access the HCRRA property and to use it for construction, inspection and maintenance of the stormwater management facilities in perpetuity. The receiving water is Red Rock Lake. The applicant will address storm water management through the installation of two infiltration basins. There is a wetland on the MNDOT parcel that is not within the acquisition area and is located far enough from the proposed property boundary as to not require the establishment of buffer on the subject property.

The project site information is summarized below:

1. Total Site Area: 12.0 acres
2. Existing Site Impervious Area: 0.0 acre
3. New Site Impervious Area: 1.25 acres
4. Total Disturbed Area: 7.0 acres (304,920 square feet)

Exhibits:

1. Permit Application from Eden Prairie dated December 21, 2018.
2. Email correspondence dated January 8, 2019 providing comments and notification of an incomplete application.
3. Correspondence dated February 19, 2019 extending the review period 60-days from the original March 28th 60-day review period.
4. Civil Design Plan Sheets by AE2S (59 sheets) dated December 10, 2018 (revised February 13, 2019)
5. Stormwater Management Plan by AE2S dated December 24, 2018 (revised February 13, 2019)
6. MIDS Model – Existing Conditions dated December 21, 2018 (revised February 13, 2019)
7. MIDS Model – Proposed Conditions dated December 21, 2018 (revised February 13, 2019)
8. Existing and Proposed Conditions HydroCAD Model dated December 21, 2018 (revised February 13, 2019)
9. Geotechnical Evaluation Report by Northern Technologies, LLC dated August 14, 2018

10. Notice of Decision for WCA Wetland Boundary and Type determination and No Loss determination dated September 24, 2018.
11. Letter of Conditional Approval of Property Conveyance No. 2018-0129 from MNDOT to City of Eden Prairie dated Jan 2, 2019.
12. Draft Maintenance Agreement undated. Received February 14, 2019.

Rule Specific Permit Conditions

Rule C: Erosion and Sediment Control

Because the project will alter 7 acres (304,920 square feet) of land-surface area 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 AE2S, Inc includes installation of perimeter control where applicable, inlet protection for storm sewer catch basins, rock construction entrances, sequencing of construction activities, protection of infiltration areas during site development, placement of a minimum of 6 inches of topsoil, decompaction of areas compacted during construction to 1400 kilopascals or less, retention of native topsoil onsite, and final stabilization methods. The contractor to be responsible for erosion control at the site needs to be determined and a place holder has been included in the plans. (RPBCWD must be notified if the responsible party changes during the permit term.) 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 day to day erosion and sediment control inspection and maintenance at the site.

Rule J: Stormwater Management

Because the project will involve disturbance of 7.0 acres (304,920 square feet) of area, and creates 1.25 acres of new impervious surfaces, the project must meet the criteria of RPBCWD's Stormwater Management rule (Rule J, Subsection 2.3). As there is currently no impervious surface on the site, the applicant must treat all newly constructed impervious surfaces. The total impervious area to be treated for the site is 1.25 acres.

The applicant is proposing to construct two bioretention features. Pretreatment will be provided through the construction of a sump manhole and a vegetated swale. These practices will be used to provide the required rate control, volume abstraction and water quality management on the site.

The location of the proposed stormwater conveyance ditches and culverts, as well as the bounce (live storage) within infiltration basin #2, rely upon land owned by the Hennepin County Regional Railroad Authority (HCRRA). The applicant has provided notes from a meeting held with HCRRA but has not adequately demonstration that they have been granted the rights to perform work on the HCRRA

property, utilize HCRRRA property for stormwater management, or to enter the property to inspect and maintain the facilities in perpetuity.

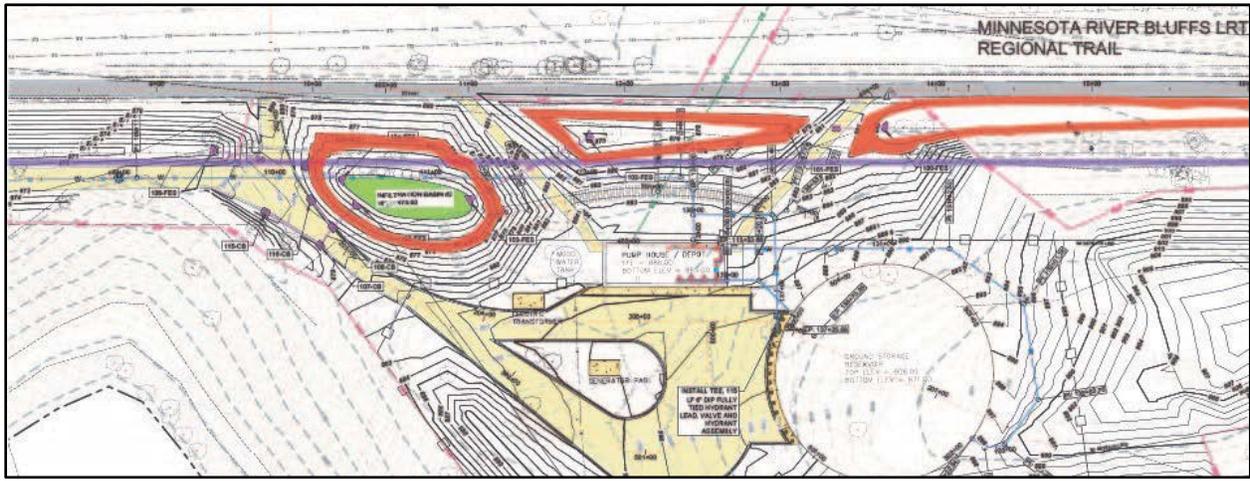


Figure 1 Stormwater conveyance and treatment on HCRRA property. Red = 100-year flood elevation and purple line = HCRRA property boundary

Rate Control

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. Under proposed conditions, the entire site drains from north to southwest and leaves the site via a connection to the existing storm sewer in the southwest corner of the property. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in the following table.

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
MNDOT Pond	1.5	1.3	5.9	3.9	22.1	15.2	1.5	1.4

Upon demonstration of rights to construct, inspect and maintain the stormwater management features on HCRRA property, the storm water management plan conforms to RPBCWD Rule J, Subsection 3.1.a

Volume Abstraction

Subsection 3.1.b of Rule J requires the abstraction onsite of 1.1 inches of runoff from all new and fully reconstructed impervious surface on the parcel. An abstraction volume of 5,004 cubic feet is required from the 1.25 acres of newly constructed impervious area on the project for volume retention. The

applicant is proposing two bioretention basins and infiltration beneath a pervious pavers parking area beyond that volume needed to compensate for the pavers to provide abstraction volume. The table below summarizes the volume abstraction on the site.

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Volume (cubic feet) ¹	Abstraction Depth Provided (inches)
1.1	5,004	5,295	1.16

¹ The volume reduction shown is the amount provided which includes, in addition to the newly constructed impervious area, existing and undisturbed impervious area which will be directed to the BMP.

Soil borings advanced by Northern Technologies, LLC showed silty sand over clayey sand to a depth of 8.5 feet below the surface. At a depth of 8.5 feet (854.0' NAVD 88), soil texture changed to poorly graded sand with silt. The plan indicates that the materials will be excavated to the poorly graded sand and back filled with MnDOT Fine Filter Aggregate (sand).

The surface elevation of the proposed infiltration basin #1 is 862.5' NAVD 88 and will be excavated to the in-situ sand layer at 854.0 feet. No groundwater nor secondary indicators of groundwater were observed to the bottom of the boring at an elevation of 848.0 feet. This minimum separation of 6.0 feet from the infiltration bottom is in excess of the requisite 3-feet of separation required by Rule J, subsection 3.1.b. Pretreatment for infiltration basin #1 will come through the construction of a vegetated swale.

The borings advanced by NTI, LLC in the proposed location for infiltration basin #2 showed a three-foot layer of clayey sand over poorly graded sand. Plans indicate this layer will be excavated and replaced with sand.

No water nor secondary indicators of groundwater were encountered within this boring that was advanced to an elevation of 861.5 feet. The infiltration basin will be excavated to the in-situ sand layer at 868.0 feet. The minimum separation to ground water is at least 6.5 feet. This exceeds the minimum 3-foot separation required by rule. Pretreatment for infiltration basin #2 will be achieved using a sump manhole.

Poorly graded sand has a universal soil classification of SP are in the hydrologic soil group "A". The permeability testing showed infiltration rates at the proposed infiltration surface to be 1.6 inches per hour in the location of Infiltration Basin #1. Design of the infiltration features was based upon an infiltration rate of 0.8 inches per hour or one-half the measured rate as required by rule. At infiltration basin #2 the measured infiltration rate was 0.48 inch per hour so one-half or 0.24 inches per hour was used to design #2. At Based upon the infiltration rate, the infiltration surface area and the volume of water received, the infiltration basins will drain in less than 48 hours as required by RPBCWD Rule J, Subsection 3.1.b.iii.

The design of the infiltration practices conforms to RPBCWD Rule J, Subsection 3.1.b upon demonstration of rights to construct, inspect and maintain the stormwater management features on HCRRRA property.

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. The city is proposing two bioretention basins to meet the water quality requirements. The table below summarized the water quality treatment provided for the site. Based on information reviewed, the proposed project conforms to Rule J, Subsection 3.1.c.

Pollutant of Interest	Existing Load (lbs/yr)	Regulated Site Loading (lbs/yr)	Required Load Removal (lbs/yr)¹	Provided Load Reduction (lbs/yr)	Proposed Discharge [Nondeg lbs/yr]
Total Suspended Solids (TSS)	62.9	633.4	570.6 (90%)	603.5 (95.3%)	29.9
Total Phosphorus (TP)	0.19	1.92	1.15 (60%)	1.83 (95.3%)	0.09

¹Required load reduction is calculated based on the removal criteria in Rule J, Subsection 3.1c and the new and reconstructed impervious area site load.

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 and 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 elevations of the structure and the adjacent stormwater management feature 100-year event flood elevations are summarized below. In addition to the two infiltration basins, there are three impoundment areas created by the tailwater of the conveyance system. These areas are included in the table and identified by their storm sewer design nomenclature. Two of these areas are visible in Figure 1 on page 4.

Stormwater Facility	Low Floor Elevation of Building Adjacent to Facility [pumphouse](feet)	100-year Event Flood Elevation of Adjacent Stormwater Facility (feet)	Freeboard (feet)
Infiltration Basin #1	No structure nearby	865.3	NA
Infiltration Basin #2	886.0	874.4	10.6
FES 100	886.0	880.1	5.9
FES 102	886.0	877.5	8.5
SDCB 110	No structure nearby	868.7	NA

The proposed freeboard separation is compliant with Rule J, subsection 3.6.

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 has provided information consistent with the requirements of subsection 3.8, the proposed projects conforms with Rule J, subsection 3.8.

Maintenance

Subsection 3.7 of Rule J requires the submission of 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.

- J1. Permit applicant must demonstrate that they have the rights to construct, inspect, and maintain stormwater management practices on land owned by Hennepin County Railroad Authority.
- J2. The applicant must enter into a maintenance agreement with the RPBCWD.

Rule L: Permit Fee:

Fees for the project are:

Rule C & J NA Govt

Rule M: Financial Assurance:

..... NA Govt

Applicable General Requirements:

- 1. The RPBCWD Administrator 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. The applicant shall provide in situ infiltration measurements upon completion of the infiltration features demonstrating infiltration rates consistent with design assumptions.

Findings

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

Recommendation:

Approval, contingent upon:

1. Continued compliance with General Requirements.
2. The Applicant must provide the name and contact information of the individual responsible for day to day erosion and sediment control inspection and maintenance at the site.
3. Demonstration of acquisition of MnDOT property and rights to enter onto Hennepin County Railroad Authority property to construct, inspect, and maintain stormwater management features.
4. Receipt of a signed and executed maintenance agreement. The agreement must be reviewed and approved by RPBCWD.

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, stormwater facilities conform to design specifications as approved by the District. No financial assurance may be released prior to the provision of as-built drawings.

Board Action

It was moved by Manager _____, seconded by Manager _____ to approve permit application No. 2018-074 with the conditions recommended by staff.



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

Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2019-003

Considered at Board of Managers Meeting: April 3, 2019

Received complete: January 22, 2019 (60 day review timeline extension to May 22, 2019 was issued by RPBCWD Permit Coordinator on February 20, 2019)

Applicant: Wooddale Builders

Consultant: Robert S. Molstad, Sathre-Bergquist, Inc.

Project: Stable Path Residential Development –17 detached single-family homes on +/- 5.9 acres of land located along Stable Path. A large filtration basin with elevated drintile to promote underground infiltration at the southwest corner of the site will provide storm water quantity, volume and quality control.

Location: Stable Path and Dell Road, Eden Prairie, MN

Reviewer: Heather Hlavaty, E.I.T. and Scott Sobiech, P.E., Barr Engineering

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 3, 2019 meeting of the managers:

Resolved that the application for Permit 2019-003 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 2019-003 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	
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	Yes.	
		Wetland Protection	NA	No wetlands have been delineated on the site.
L	Permit Fee	See comment.	\$2,000 was received on January 22, 2019	
M	Financial Assurance	See comment.	The financial assurance is calculated at \$70,173	

Background

The applicant is creating a 17 lot single-family home subdivision on +/- 5.9 acres of land located along Stable Path. This proposed residential development will consist of detached single family villa style homes with 1 level living. The project includes one sand filtration basin with an elevated drain tile to promote underground infiltration on the southwest corner of the site, as well as four vegetated swales which act as pre-treatment before runoff reaches the basin. Rain barrels will be provided for each of the 17 lots to capture roof runoff. The combination of these best management practices provides stormwater quantity, volume and quality control. A Minnesota Wetland Conservation Act (WCA) Notice Of Decision by the local governmental unit responsible for WCA, city of Eden Prairie, indicated no wetland are present on the site. The applicant also will be completing, at the direction of the city, reconstruction along Thomforde Trail, a linear transportation feature adjacent to the development. Because the proposed reconstruction of Thomforde Trail entails reconstruction creating less than 5,000 square feet of fully reconstructed impervious surface within a public linear corridor (i.e., not as “a component of a larger ... redevelopment project” which would remove it from operation of RPBCWD’s provisions for linear projects), a permit under Rule J is not required for this work.

The project site information is summarized below:

	Project Site
Total Site Area (acres)	5.90
Existing Site Impervious (acres)	0
New (Increase) in Site Impervious Area (acres)	1.71 (>100% increase)
Total Disturbed Area (acres)	4.5

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

1. Signed Application dated January 16, 2019
2. Construction Plan Sheets (10 sheets) dated October 22, 2018 (revised February 4, 2019)
3. Preliminary Plat Sheet dated October 26, 2018 (revised February 7, 2019)
4. Alta/NSPS Land Title Survey Sheet dated October 16, 2018
5. Stormwater Management Plan dated October, 2018 (revised March 8, 2019)
6. Stable Path Development Narrative dated January 8, 2019
7. Stable Path Development SWPPP
8. RPBCWD Preliminary Review Comments and Responses dated December 26, 2018
9. Geotechnical Exploration Report dated October 3, 2018
10. Minnesota Wetland Conservation Act Notice Of Decision dated December 4, 2018
11. Electronic HydroCAD and P8 models received on March 8, 2019
12. Thomforde Trail Reconstruction Area Summary Exhibit received on March 8, 2019
13. Engineer's opinion of cost provided in an email on February 13, 2019

Rule C: Erosion and Sediment Control

Because the project will involve 4.5 acres of land-disturbing activity, 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 Sathre-Bergquist, Inc. includes installation of silt fence, inlet protection for storm sewer catch basins, a rock construction entrance, decompaction of areas compacted during construction, and retention of native topsoil onsite. To conform to the RPBCWD Rule C the following revisions are needed:

- C1. The name and contact information of the general contractor responsible for the site must be provided.

Rule J: Stormwater Management

Because the project will disturb 4.5 acres of land-surface area the project must meet the criteria of RPBCWD's Stormwater Management rule (Rule J, Subsection 2.1). The criteria listed in Subsection 3.1 will apply to the entire project site because the project will increase the imperviousness of the entire site by more than 100 percent (Rule J, Subsection 2.3).

The developer is proposing construction of one sand filtration basin and four vegetated swales to provide the rate control, volume abstraction and water quality management on the site. Due to site constraints discussed in the volume abstraction section below, abstraction credit for the sand filtration basin is only associated with evapotranspiration. One rain barrel will also be provided for each of the 17 lots to reduce runoff volume by capturing roof runoff. Vegetated filter strips and swales will provide pretreatment for the sand filtration basin.

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
South	6.3	1.5	12.9	2.5	27.0	16.0	0.9	0.9
North	0.2	0.0	0.4	0.0	0.9	0.0	0.0	0.0
East	0.3	0.2	0.6	0.3	1.2	0.7	0.0	0.0

Volume Abstraction

Subsection 3.1.b of Rule J requires the abstraction onsite of 1.1 inches of runoff from all impervious surface of the parcel. An abstraction volume of 6,828 cubic feet is required from the 1.71 acres (74,488 square feet) of impervious area on the site for volume retention.

Soil borings performed by Haugo GeoTechnical Services show that soils in the project area are primarily clays (infiltration rate of 0.06 in/hr). Because groundwater was not encountered in the soil borings while drilling and sampling or after auger removal from the boreholes, the required 3-foot separation between the groundwater elevation and bottom of the filtration practice is provided. Because the engineer concurred that the soil boring information support 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 is required to 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 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. Because of clay soils, a Magellan gas line easement on the north side of the property, and utility conflicts, the abstraction standard in Subsection 3.3a of Rule J cannot practicably be achieved. As a result, other Low-Impact Design techniques were implemented to reduce impervious surface area as well as abstract runoff. The site modified the front yard setback by 5 feet to reduce the amount of impervious surface. Also, the project is preserving an area along the northern property line as native vegetation to promote infiltration and the natural habitat. A rock layer below the draitile of the filtration basin will also be constructed to provide additional storage. The depth of the rock layer will not exceed 0.6 feet in order to drawdown the stored volume within 48 hours. Finally, to promote water reuse and abstraction as much as feasibly possible, the developer will be providing each homeowner with a rain barrel (50 gallon). The Engineer concurs with the site constraints described above and the Applicant has provided abstraction on the project site to the maximum extent practicable, thus the proposed activity conforms to Rule J, Subsection 3.3b. The table below summarizes the volume abstraction for the site.

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Depth (inches)	Provided Abstraction Volume (cubic feet)
1.1	6,828	0.44	3,015

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 a sand filtration basin and four vegetated swales to achieve the required TP and TSS removals and submitted a P8 model and MIDS calculator file to estimate the TP and TSS removals. The results of this modeling are summarized in Tables below. The first table show the removal efficiencies are achieved and the second Table shows there is no net increase in TSS or TP loading leaving the site from existing conditions. 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) ¹	Provided Load Reduction (lbs/yr)
Total Suspended Solids (TSS)	1,497	1,347 (90%)	1,348 (90%)
Total Phosphorus (TP)	4.80	2.88 (60%)	2.90 (61%)

¹Required load reduction is calculated based on the removal criteria in Rule J, Subsection 3.1c and the load generated from all the impervious area on the site.

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)	587	149	-438
Total Phosphorus (TP)	1.9	1.9	0

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 low floor elevation of the homes and the adjacent stormwater management feature is summarized below. The project meets the requirements of Rule J, Subsection 3.6.

Location Riparian to Stormwater Facility		Low Floor Elevation of Building (feet)	100-year Event Flood Elevation of Adjacent Stormwater Facility (feet)	Freeboard (feet)
Block	Lot			
1	1	915.9	913.2	2.7
1	2	915.3	912.4	2.9
1	3	915.5	912.4	3.1
1	4	915.5	912.4	3.1
1	5	915.5	912.4	3.1
1	6	915.0	912.4	2.6
1	7	914.1	910.4	3.7
1	8	913.2	910.4	2.8
1	9	912.4	910.4	2.0
2	1	914.5	912.0	2.5
2	2	915.0	912.0	3.0
2	3	915.5	912.0	3.5
2	4	915.5	912.0	3.5
2	5	915.0	912.9	2.1
2	6	915.2	912.9	2.3
2	7	916.5	912.9	3.6
2	8	917.0	912.8	4.2

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.

- J1. Permit applicant must provide a maintenance and inspection declaration. 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 review prior to recording.

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. Under the policy in adopted resolution 2019-009, the RPBCWD chloride-management plan requirement applies to the streets and common areas of the project site, but not the individual single-family homes. Because the streets within the proposed residential development are within public right of way that will be maintained by the city of Eden Prairie and the City has provided its chloride management plan and its designated state-certified chloride applicator is Eden Prairie’s Streets Division Manager, Larry Doig, the proposed development conforms with Rule J, subsection 3.8.

Rule L: Permit Fee:

Fees for the project are:

Rule C & J\$2,000

The RPBCWD permit fee schedule adopted in January 2019 provides that costs of site inspections, analysis of the proposed activities, services of consultants and compliance assurance in excess of \$2,000 for properties less than 5 acres will be charged to the permit applicant.

Rule M: Financial Assurance:

Rules C: Silt fence: 1,880 L.F. x \$2.50/L.F. =\$4,700

Inlet protection: 16 x \$100 =\$1,600

Rock Entrance: 1.0 x \$900 =\$900

Restoration: 4.5 acres x \$2,500/acre =\$11,250

Rules J: Filtration Basin, Rain Barrel, and Swales: \$36,275 x 125% of engineer’s opinion of cost= \$45,344

Contingency (10%)\$6,379

Total Financial Assurance.....\$70,173

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. Return or allowed expiration of any remaining surety and permit close out is dependent on the permit holder providing proof that all required documents have been recorded and providing as-built drawings that show that the project was constructed as approved by the Managers and in conformance with the RPBCWD rules and regulations.

Findings

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

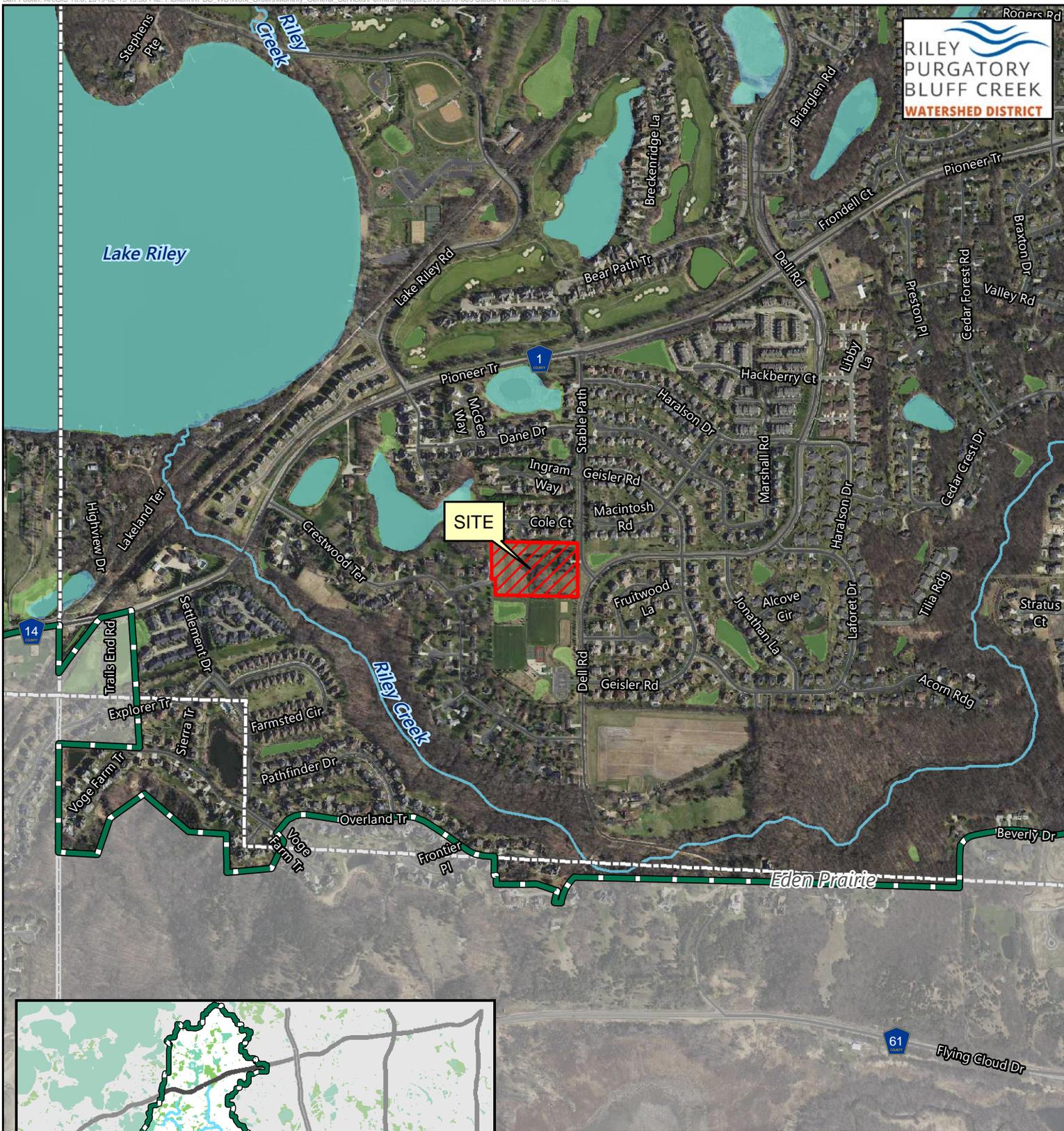
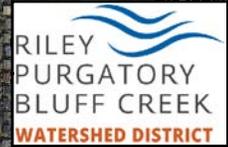
Recommendation:

Approval of the permit issuance contingent upon:

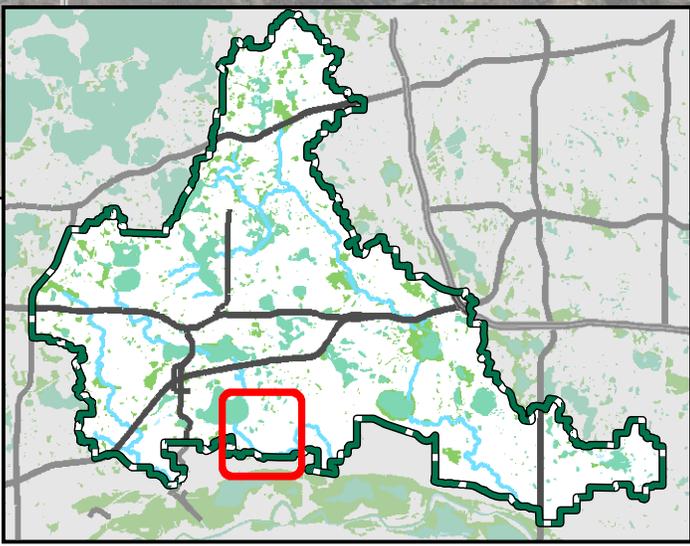
1. Continued compliance with General Requirements.
2. Financial Assurance in the amount of \$70,173.
3. The applicant must provide the name and contact information of the individual responsible for erosion control at the site. RPBCWD must be notified if the responsible individual changes during the permit term.
4. Receipt in recordation a maintenance declaration for the stormwater management facilities. Drafts of any and 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, stormwater facilities conform to design specifications as approved by the District.
2. Single-family homes to be constructed on lots in the subdivision created under the terms of permit 2019-003, if issued, must have an impervious surface area and configuration materially consistent with the approved plans. Individual lot 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.



SITE



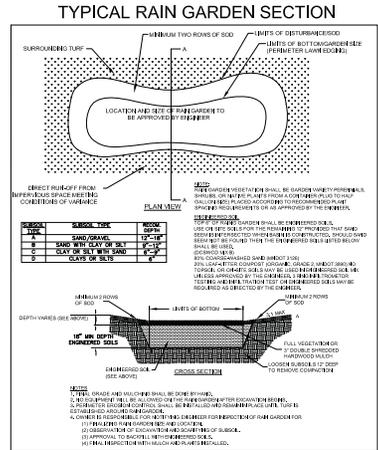
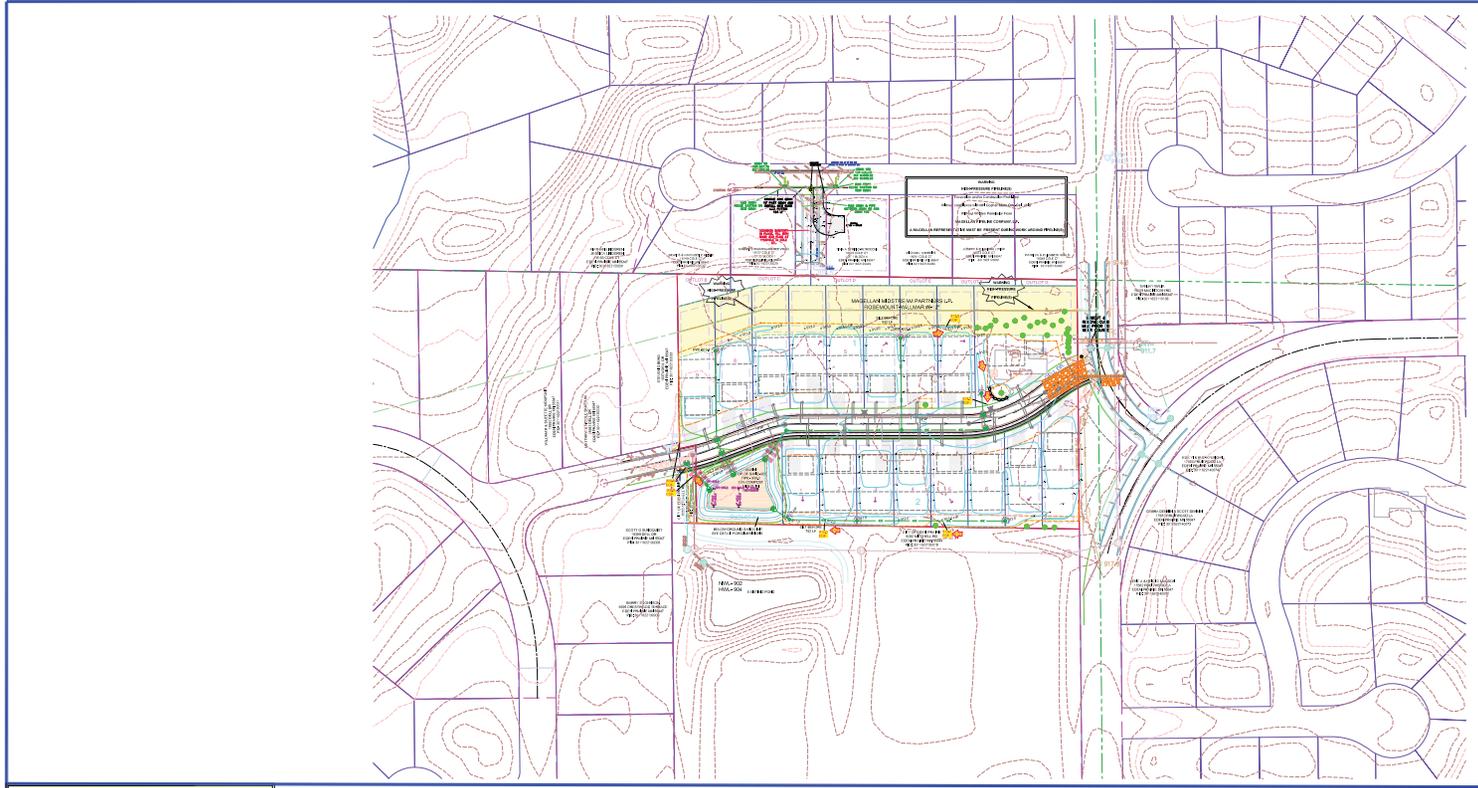
Permit Location Map



Feet



STABLE PATH
Permit 2019-003
Riley Purgatory Bluff Creek
Watershed District



- GENERAL NOTES:**
1. DETAIL SILT FENCE AS SHOWN ON PLAN, AS REQUIRED BY THE CITY OF EDEN PRAIRIE OR DIRECTED BY THE ENGINEER.
 2. THE WATER QUALITY BASIN MUST BE EXCAVATED AT THE BEGINNING OF GRADE OPERATIONS TO PROVIDE TEMPORARY STORAGE WATER DURING CONSTRUCTION. SOAK AND INLET MUST BE INSTALLED FROM THE POND AS NECESSARY DURING CONSTRUCTION AND AT THE COMPLETION OF THE PROJECT.
 3. BEFORE GRADING, INSTALL IMPERFORATED RIBBER PIPE PERMANENTLY TO THE GRADING CONTRACTOR. TEMPORARY DRAINAGE PIPE SHALL BE USED FOR INTERIM DRAINAGE DURING THE CONSTRUCTION PERIOD AS NECESSARY AND DIRECTED BY THE ENGINEER. INSTALL SILT FENCE AND EXCAVATED POND.
 4. IMPERF POND, SILT FENCE, AND ROCK ENTRANCE BERM AFTER ALL RAINFALL EVENTS AS REQUIRED BY THE PDES PERMITS.
 5. LINE ALL PONDS WITH A MINIMUM 2\"/>
 - 6. REMOVE IMPERFORATED RIBBER PIPE WHEN STORM SEWER AND OUTLET STRUCTURE FOR BASIN ARE INSTALLED.
 - 7. SOLES: 4\"/>
 - 8. SUB PADS 3\"/>
 - 9. THE GRADING CONTRACTOR IS RESPONSIBLE FOR ALL STORM WATER INSPECTIONS ACCORDING TO THE MPCA STORM WATER PERMIT. THIS INCLUDES BOTH WEEKLY INSPECTIONS AND INSPECTIONS DONE AFTER A 50\"/>
 - 10. A COPY OF THE INSPECTION REPORT MUST BE EMAILED TO THE ENGINEER AND DELIVERED ON WEBSITE BARS.
 - 11. THE CONTRACTOR SHALL PLACE INLET PROTECTION DEVICES IN ACCORDANCE WITH THE CITY OF EDEN PRAIRIE DETAIL. PROTECTION SHALL BE REMOVED WHEN RESTORATION HAS BEEN COMPLETED TO REMOVE SILT FENCE AND MANHOLE DOORING ON TO THE STREETS. THE ROCK BERMS SHALL BE THE WIDTH OF THE ENTRANCE AND 2 FEET HIGH WITH 4\"/>
 - 12. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM THE BUILDING PAD AND STREET AREAS THROUGHOUT CONSTRUCTION.
 - 13. THE CONTRACTOR SHALL ATTEMPT TO PREVENT SOIL MATERIALS FROM LEAVING THE SITE BY EROSION AND VEHICLE WHEEL TRACKS. PACKING SHALL BE RESPONSIBLE FOR CLEANING OF STREET, SOILS AND VEHICLE TRACKS THAT EXIST ANYWHERE ON THE PROJECT SITE MATERIALS ON THE STREET. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ANY AND ALL DAMAGES ARISING OUT OF HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL EXISTING UTILITIES.
 - 14. BUILDING PADS ARE 1\"/>
 - 15. RESTORATION - SILT FENCES
 - A. RESTORATION OF DETURRED AREAS WITH 1\"/>
 - B. SEED POND SLOPES AND DETURRED AREAS WITH MINDOT 310 OR BWSP R SEED MIX AT RATE OF 100 LBS/ACRE AND FERTILIZE WITH 20-20-0 AT 100 LBS/ACRE.
 - C. SEED BASIN AREAS WITH MINDOT 33-81 SEED MIX AT RATE OF 35 LBS/ACRE AND FERTILIZE WITH 20-20-0 AT 100 LBS/ACRE.
 - D. SEED ALL OTHER DETURRED AREAS WITH MINDOT 250 SEED MIX AT RATE OF 100 LBS/ACRE AND FERTILIZE WITH 20-20-0 AT 100 LBS/ACRE (UNLESS OTHERWISE NOTED).
 - E. ONLY PHOSPHOROUS FREE FERTILIZER TO BE USED ON SITE.
 - F. MULCH WITH TYPE 1A A RATE OF 1\"/>
 - G. PLACE APPROX STORM SEWER INLET PROTECTION ROCK OR AROUND ALL STORM SEWER INLETS AND MANHOLE INLETS. STREET CONSTRUCTION COMPLETED, REFER TO CITY DETAILS FOR APPROVED DESIGN.
 - H. MANHOLE SILT FENCE UNTIL TYPED AND ESTABLISHED.
 - I. RESTORATION WORK WILL BE COMPLETED WITHIN 72 HOURS OF GRADING COMPLETION.
 - 16. SILT FENCE: BEFORE GRADING: 1\"/>

SYMBOL LEGEND

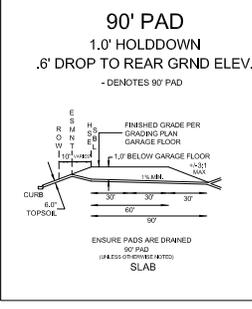
DESCRIPTION	PROPOSED	EXISTING
MAJOR CONTOUR		
MINOR CONTOUR		
WATERMARK		
BLU GRASS BACKSTOP BOUNDARY		
PROTECT BOUNDARY LINE		
DRAINAGE AND UTILITY LOCATIONS		
CURB AND GUTTER		
INDICATOR		
DRIVEWAY DRIVEWAYS		
BACKSTOP CATCH BASIN		
CATCH BASIN		
STORM SEWER MANHOLE		
MANHOLE SECTION VIEW SHAP		
STORM STRUCTURE LABEL		
SEWERAGE STRUCTURE LABEL		
PROTECT		
GRADE WAVE		
WELL		
DRAINAGE CONTROL AREA		
DRAINAGE CONTROLER SCALE		
SOIL BORING LOCATION		
SILT FENCE		
WATER BUFFER BERM		
ROCKWALL		
SPOT ELEVATION		
TIE SPOT ELEVATION		
UTILITY POLE		
LIGHT POLE		
MANHOLE PARKING SPACE		

CITY OF EDEN PRAIRIE TYPICAL MIN VIAL ROADWAY SECTION ON

SECTION	NO.	DATE	DESCRIPTION	BY	DATE	DESCRIPTION
1	01	01/15/18	ISSUED FOR PERMITS	RS	01/15/18	RS
2	02	02/15/18	ISSUED FOR PERMITS	RS	02/15/18	RS
3	03	03/15/18	ISSUED FOR PERMITS	RS	03/15/18	RS
4	04	04/15/18	ISSUED FOR PERMITS	RS	04/15/18	RS
5	05	05/15/18	ISSUED FOR PERMITS	RS	05/15/18	RS
6	06	06/15/18	ISSUED FOR PERMITS	RS	06/15/18	RS
7	07	07/15/18	ISSUED FOR PERMITS	RS	07/15/18	RS
8	08	08/15/18	ISSUED FOR PERMITS	RS	08/15/18	RS
9	09	09/15/18	ISSUED FOR PERMITS	RS	09/15/18	RS
10	10	10/15/18	ISSUED FOR PERMITS	RS	10/15/18	RS
11	11	11/15/18	ISSUED FOR PERMITS	RS	11/15/18	RS
12	12	12/15/18	ISSUED FOR PERMITS	RS	12/15/18	RS

EXISTING UTILITIES SHOWN ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ANY AND ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES ARISING OUT OF HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL EXISTING UTILITIES.

CONTRACTOR MUST GRADE THE PUBLIC RIGHT-OF-WAY PER CITY DETAIL R-2. ALL SITE GRADING MUST BE COMPLETED, CERTIFIED BY THE DEVELOPER'S ENGINEER, AND ALL "OFF ROAD" GRADING EQUIPMENT REMOVED FROM THE SITE BEFORE STARTING ANY PUBLIC UTILITY WORK.



DRAWING NAME	NO.	BY	DATE	REVISIONS
Sheets - Stable				
DRAWN BY				
CHECKED BY				
DATE				
10/22/18				

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

Robert S. Wolstad
ROBERT S. WOLSTAD, P.E.
Date: 10/22/18 Lic. No. 24108

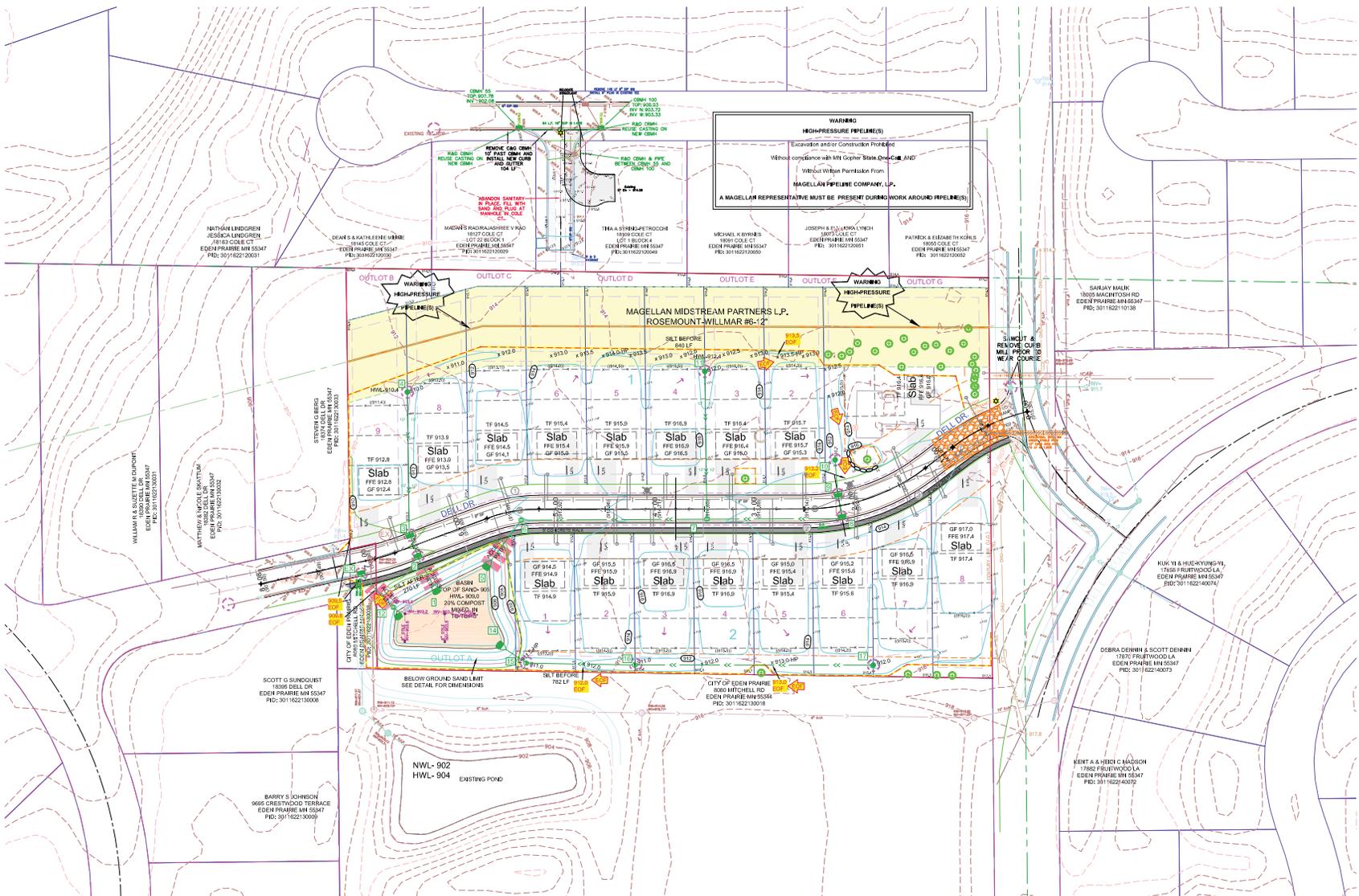
SATHRE-BERGOQUIST, INC.
160 SOUTH BROADWAY WAYZATA, MN 55391 (952) 478-6000

CITY PROJECT NO. —
EDEN PRAIRIE, MINNESOTA

FINAL GRADING PLAN

STABLE PATH
WOODDALE BUILDERS

FILE NO. 9745-038
5
10



SYMBOL LEGEND		
DESCRIPTION	PROPOSED	EXISTING
MAJOR CONTOUR		
MINOR CONTOUR		
WATERMARK		
BLANKET BACKSTOP BOUNDARY		
PROJ. BOUNDARY LINE		
DRAINAGE AND UTILITY EXISTENTS		
CURB AND GUTTER		
REINFORCEMENT		
DRAINAGE TRENCHES		
BACKSTOP CATCH BASIN		
CATCH BASIN		
STORM SEWER MANHOLE		
UTILITY AND SECTION VIEW SHAP		
STORM STRUCTURE LABEL		
SEWER STRUCTURE LABEL		
SEWER SERVICE MANHOLE		
TRUNK		
GATE VALVE		
WELL		
DRAINAGE CONTROL STRUCTURE		
SEWERAGE CONTROL STRUCTURE		
SEA BARRAGE LOCATION		
SET OFF		
WELDED REINFORCEMENT		
REINFORCEMENT		
SPOT ELEVATION		
TRC SPOT ELEVATION		
UTILITY VALVE		
LIGHT POLE		
HANDICAP PARKING SPACE		

EXISTING UTILITIES SHOWN ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ANY AND ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES ARISING OUT OF HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL EXISTING UTILITIES.

DRAWING NAME	NO.	BY	DATE	REVISIONS
Sheets - Stable				
DRAWN BY				
CHECKED BY				
DATE				
10/22/18				

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Robert S. Wolstad
 Robert S. Wolstad, P.E.
 Date: 10/22/18 Lic. No. 2470

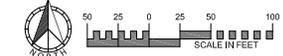
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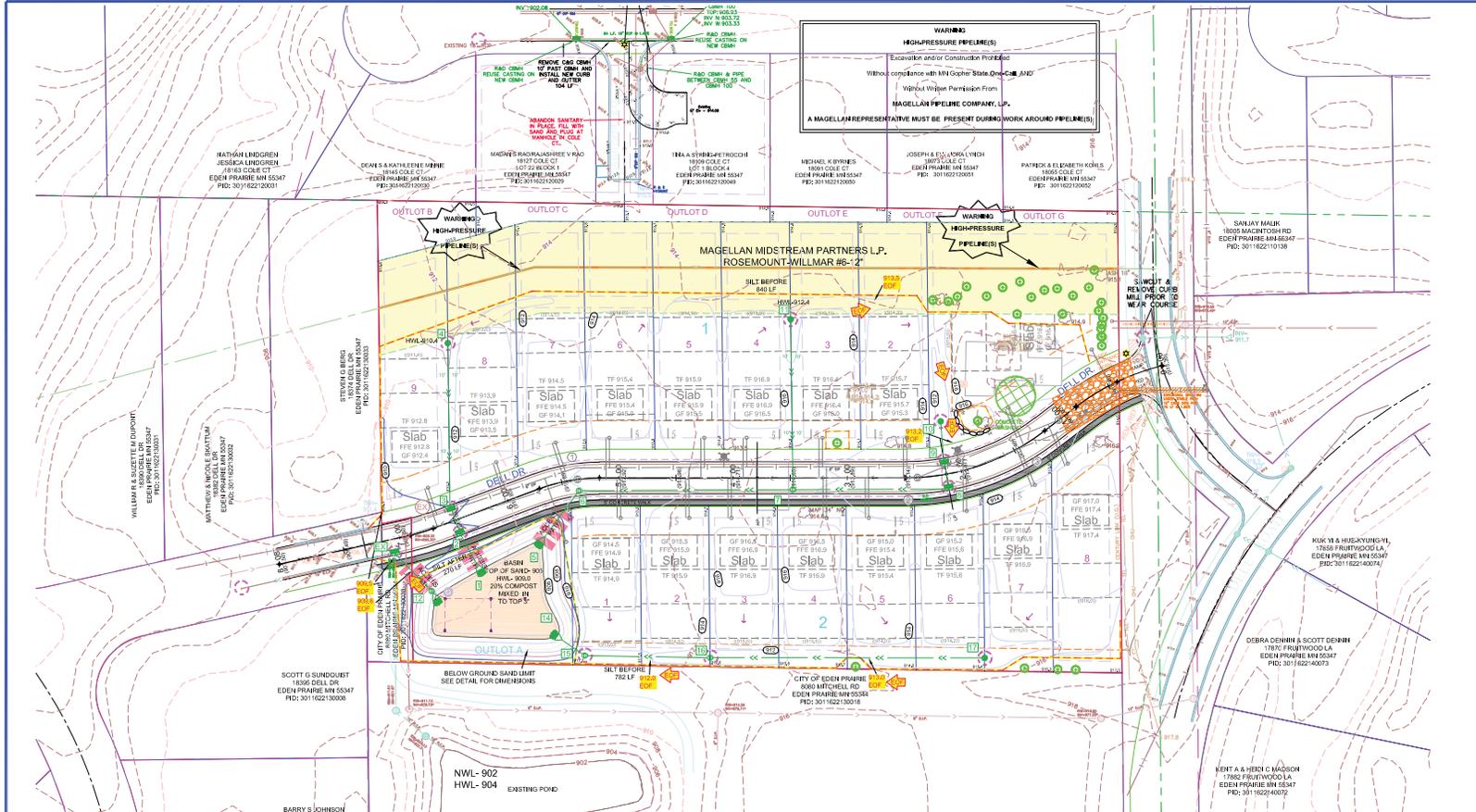
CITY PROJECT NO. —

EDEN PRAIRIE, MINNESOTA

FINAL GRADING PLAN
STABLE PATH
WOODDALE BUILDERS

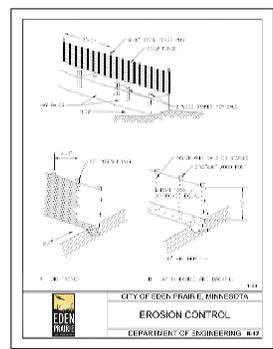
FILE NO. 9745-038
6
 SCALE IN FEET
10





SYMBOL LEGEND		
DESCRIPTION	PROPOSED	EXISTING
MAJOR CONTOUR		
LOT LINE		
WATERMAIN		
SEWER MAIN		
PARCEL BOUNDARY LINE		
DRAINAGE AND UTILITY EASEMENTS		
CURB AND GUTTER		
RIGHT-OF-WAY		
DRAINAGE CLEANOUTS		
BACKFLOW CHECK VALVE		
CATCH BASIN		
STORM SEWER MANHOLE		
FLARED END SECTION W/IR-PAP		
STORM STRUCTURE LABEL		
SANITARY STRUCTURE LABEL		
SANITARY SEWER MANHOLE		
HYDRANT		
GATE VALVE		
WELL		
DRAIN FLOW DIRECTION ARROW		
EMERGENCY CHECK VALVE		
SOIL BORING LOCATION		
WETLAND BUFFER POST		
BARBICURE		
SPOT ELEVATION		
TRC SPOT ELEVATION		
UTILITY POLE		
LIGHT POLE		
HANDICAP PARKING SPACE		

	ROCK ENTRANCE BERM
	SILT FENCE
	POST GRADING SILT FENCE
	CONCRETE WASHOUT
	INLET PROTECTION



EXISTING UTILITIES SHOWN ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ANY AND ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES ARISING OUT OF HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL EXISTING UTILITIES.

DRAWING NAME	NO.	BY	DATE	REVISIONS
Sheets - Stable				
DRAWN BY				
TCW				
CHECKED BY				
RSM				
DATE				
10/22/18				

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Robert S. Wolstad
 ROBERT S. WOLSTAD, P.E.
 Date: 10/23/18 Lic. No. 24128

SATHRE-BERQUIST, INC.
 160 SOUTH BROADWAY WAYZATA, MN 55391 (952) 478-6000

CITY PROJECT NO. —

EDEN PRAIRIE, MINNESOTA

FINAL EROSION CONTROL PLAN

STABLE PATH
WOODDALE BUILDERS

FILE NO. 9745-038

7

10

- NOTES:**
- Natural topography and soil conditions must be protected. Including retention onsite of native topsoil to the greatest extent possible.
 - 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.
 - Final site stabilization measures must specify that at least six (6) inches of topsoil or organic matter be spread and incorporated into the underlying soil during final site treatment wherever topsoil has been removed.
 - Construction site waste such as discarded building materials, concrete truck washout, chemicals, litter and sanitary waste must be properly managed.
 - 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.
 - All temporary erosion and sediment control BMPs must be removed upon final stabilization.
 - Soil surfaces compacted during construction and remaining previous upon completion of construction must be decompacted to achieve a soil compaction testing pressure of less than 1,400 kN/m² 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.
 - 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 body 14 days elsewhere.
 - 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.

Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2019-007

Considered at Board of Managers Meeting: April 3, 2019

Received complete: March 8, 2019

Applicant: Great Oaks 2nd, LLC

Consultant: Nicholas Polta, Pioneer Engineering

Project: Beverly Hills Residential Development –17 detached single-family homes on +/- 7.11 acres of land located north of Highway 61, near the intersection of Eden Prairie Road and Beverly Drive. A large pond with infiltration bench at the northwest corner of the site and two rain gardens to the south and east side of the site will provide storm water runoff rate, volume and quality control.

Location: Beverly Drive and Eden Prairie Road, Eden Prairie, MN

Reviewer: Heather Hlavaty, E.I.T. and Scott Sobiech, P.E., Barr Engineering

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 3, 2019 meeting of the managers:

Resolved that the application for Permit 2019-007 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 2019-007 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	
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	Yes.	
		Wetland Protection	NA	No wetlands have been identified on site.
L	Permit Fee	See comment.	\$2,000 was received on 2/8/2019	
M	Financial Assurance	See comment.	The financial assurance is calculated at \$78,323	

Background

The applicant is creating a 17 lot single-family home subdivision on +/- 7.11 acres of land located near the intersection of Eden Prairie Road and Beverly Drive. This proposed residential redevelopment incorporate the construction of a cul-de-sac with access to Beverly Drive. Eleven lots are proposed to be located on this cul-de-sac. Three lots are proposed to have direct driveway access to Beverly Drive a, and three lots are proposed to have driveway access to Eden Prairie Road. The project includes one pond with infiltration bench on the northwest corner of the site, as well as, a rain garden to the northeast and a rain garden to the south of the site. The combination of these best management practices provides stormwater runoff rate, volume and quality control. An investigation conducted by Anderson Engineering of MN, LLC in accordance with the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual confirmed that no wetlands are present on the site.

The project site information is summarized below:

	Project Site
Total Site Area (acres)	7.11
Existing Site Impervious (acres)	0.73

	Project Site
Disturbed Site Impervious Area (acres)	0.63 (87%)
New (Increase) in Site Impervious Area (acres)	1.93 (>100% increase)
Total Disturbed Area (acres)	6.18

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

1. Signed Application dated February 7, 2019
2. Construction Plan Sheets (19 sheets) dated January 18, 2019 (revised March 18, 2019)
3. Preliminary Plat and Rezoning Application Narrative
4. Alta/NSPS Land Title Survey Sheets dated July 24, 2018 and September 26, 2018
5. Stormwater Management Plan dated January 18, 2019 (revised February 25, 2019)
6. RPBCWD Preliminary Review Comments and Responses dated February 20, 2019
7. Geotechnical Evaluation Report dated November 26, 2014
8. Geotechnical Exploration Report dated November 13, 2018
9. Beverly Hills Engineer's Estimate dated February 20, 2019
10. Electronic HydroCAD and P8 models received on March 20, 2019
11. Response to Comments from RPBCWD dated March 18, 2019
12. Soil boring by Haugo GeoTechnical Services dated March 15, 2019

Rule C: Erosion and Sediment Control

Because the project will involve 6.18 acres of land-disturbing activity, 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 Pioneer Engineering includes installation of erosion control fence, inlet protection for storm sewer catch basins, a rock construction entrance, erosion control blanket, straw bio rolls, rip rap at outfalls, decompaction of areas compacted during construction, six inches of top soil, and retention of native topsoil onsite. To conform to the RPBCWD Rule C the following revisions are needed:

- C1. The name and contact information of the general contractor responsible for the site must be provided (this information does not need to be provided prior to making a recommendation to the RPBCWD Board).

Rule J: Stormwater Management

Because the project will disturb 6.18 acres of land-surface area, the project must meet the criteria of RPBCWD's Stormwater Management rule (Rule J, Subsection 2.1). The criteria listed in Subsection 3.1

will apply to the entire project site because the project will increase the imperviousness of the entire site by more than 100 percent (Rule J, Subsection 2.3).

The developer is proposing construction of one pond with infiltration bench and two rain gardens to provide the rate control, volume abstraction and water quality management on the site. The pond will serve as pretreatment for the infiltration bench and vegetation will pretreat runoff before entering the rain gardens.

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
Northwest	0.01	0.00	0.38	0.00	3.90	1.23	0.50	0.48
Northeast	0.00	0.00	0.11	0.07	2.78	1.91	0.71	0.32
Southeast	0.00	0.00	0.02	0.02	0.83	0.83	0.14	0.01

Volume Abstraction

Subsection 3.1.b of Rule J requires the abstraction onsite of 1.1 inches of runoff from all impervious surface of the parcel. An abstraction volume of 7,703 cubic feet is required from the 1.93 acres (84,028 square feet) of impervious area on the site for volume retention.

Soil borings performed by Haugo GeoTechnical Services on November 13, 2018 and March 15, 2019, and Braun Intertec on Number 26, 2014 show that soils in the project area are primarily sandy. Soil borings were performed at each proposed BMP location and all indicate sandy soils. The applicant used a design infiltration rate of 0.8 in/hr beneath the infiltration bench and rain gardens based on the MPCA’s recommended design infiltration rate for sandy soils. With an infiltration rate of 0.8 in/hr, the infiltration BMPs will drawdown within the required 48 hours. The table below summarizes the volume abstraction for the site.

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Depth (inches)	Provided Abstraction Volume (cubic feet)
1.1	7,703	2.63	18,382

Because groundwater was not encountered in the soil borings while drilling and sampling or after auger removal from the boreholes, the required 3-foot separation between the groundwater elevation and bottom of the infiltration practice will be achieved. The engineer concurs with the modeling, and finds that the proposed project conforms with Rule J, Subsection 3.1.b.

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 a retention pond with infiltration bench and two rain gardens 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. 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) ¹	Provided Load Reduction (lbs/yr)
Total Suspended Solids (TSS)	939.4	845.5 (90%)	901.8 (96%)
Total Phosphorus (TP)	3.0	1.8 (60%)	2.0 (67%)

¹Required load reduction is calculated based on the removal criteria in Rule J, Subsection 3.1c and the load generated from all the impervious area on the site.

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)	1,603	38	-1,565
Total Phosphorus (TP)	5.1	2.0	-3.1

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 low floor elevation of the homes and the adjacent stormwater management feature is summarized below.

Location Riparian to Stormwater Facility	Low Floor Elevation of Building (feet)	100-year Event Flood Elevation of Adjacent Stormwater Facility (feet)	Freeboard (feet)
Lot			
1	896.2	887	9.2
2	897.3	887	10.3
3	898.3	887	11.3
4	898.5	887	11.5
5	898.8	887	11.8
6	897.4	895.4	2.0
7	897.4	895.4	2.0
8	897.6	895.4	2.2
9	899.4	895.4	4.0
10	898.7	895.4	3.3
11	896.6	895.4	Utilized Appendix J1
12	892.3	895.4	Utilized Appendix J1
13	890.0	895.4	Utilized Appendix J1
14	888.8	895.4	Utilized Appendix J1
15	870.0	869.0	Utilized Appendix J1
16	867.2	869.0	Utilized Appendix J1
17	871.0	869.0	2.0

As shown above, the required 2-foot freeboard is not provided from some of the homes ; therefore, an analysis as outlined in Appendix J1 was conducted on lots not meeting the required freeboard. Because no groundwater was observed in the 21-foot soil borings throughout the project site, the applicant added 2 feet to the boring depth to approximate the seasonal high-water as suggested in Appendix J1. The required separation from the seasonal high-water table determined using Plot 1 in Appendix J1 are summarized below. The RPBCWD Engineer concurs that the proposed project is in conformance with Rule J, Subsection 3.6.

Lot	Low Floor Elevation of Building (feet)	Provided Distance from Rain Garden (feet)	Approximated Seasonal High-Water Table Elevation ¹	Required Separation to Groundwater based on Appendix J (feet)	Provided Separation to Groundwater (feet)
11	896.6	65	880.7	5.5 ²	15.9
12	892.3	40	880.7	8.5 ²	11.6
13	890.0	31	880.7	0.28 ³	9.3
14	888.8	39	880.7	0.27 ³	8.1
15	870.0	98	852.0	3.0 ²	18.0
16	867.2	28	852.0	11.0 ²	15.2

¹The seasonal high-water table was assumed to be 2.0 feet above the lowest boring elevation closest to the stormwater facility (ST-4 near Lots 11, 12, 13, and 14; SB-1 near Lots 15 and 16)

² Using Appendix J1 Plot 1

³ Using Appendix J1, Plot 6

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.

- J1. Permit applicant must provide a maintenance and inspection declaration. 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 review prior to recording.

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. Under the policy in adopted resolution 2019-009, the RPBCWD chloride-management plan requirement applies to the streets and common areas of the project site, but not the individual single-family homes. Because the streets within the proposed residential development are within public right of way that will be maintained by the city of Eden Prairie and the City has provided its chloride management plan and its designated state-certified chloride applicator is Eden Prairie’s Streets Division Manager, Larry Doig, the proposed development conforms with Rule J, subsection 3.8.

Rule L: Permit Fee:

Fees for the project are:

Rule C & J \$2,000 (received on 2/8/2019)

Rule M: Financial Assurance:

Rules C: Silt fence: 3,361 L.F. x \$2.50/L.F. =	\$8,403
Inlet protection: 18 x \$100 =	\$1,800
Rock Entrance: 2 x \$900 =	\$1,800
Restoration: 6.18 acres x \$2,500/acre =	\$15,450
Rules J: Pond, infiltration bench, and rain gardens: \$35,000 x 125% of engineer’s opinion of cost=	\$43,750
Contingency (10%)	<u>\$7,120</u>
Total Financial Assurance.....	\$78,323

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. Return or allowed expiration of any remaining surety and permit close out is dependent on the permit holder providing proof that all required documents have been recorded and providing as-built drawings that show that the project was constructed as approved by the Managers and in conformance with the RPBCWD rules and regulations.

Findings

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

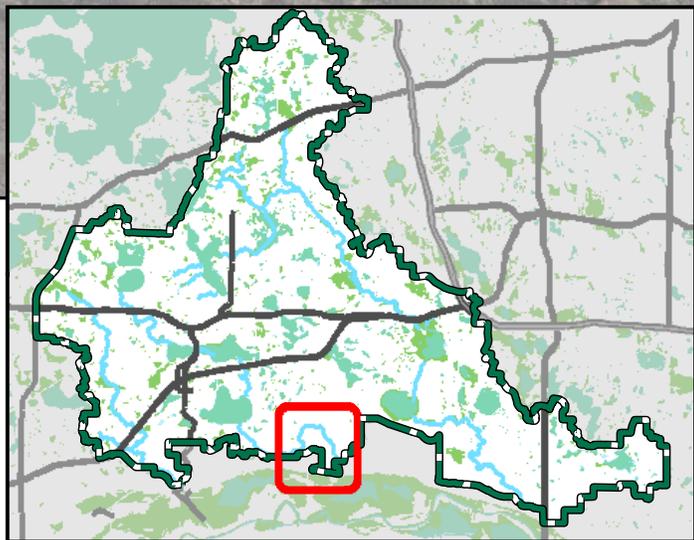
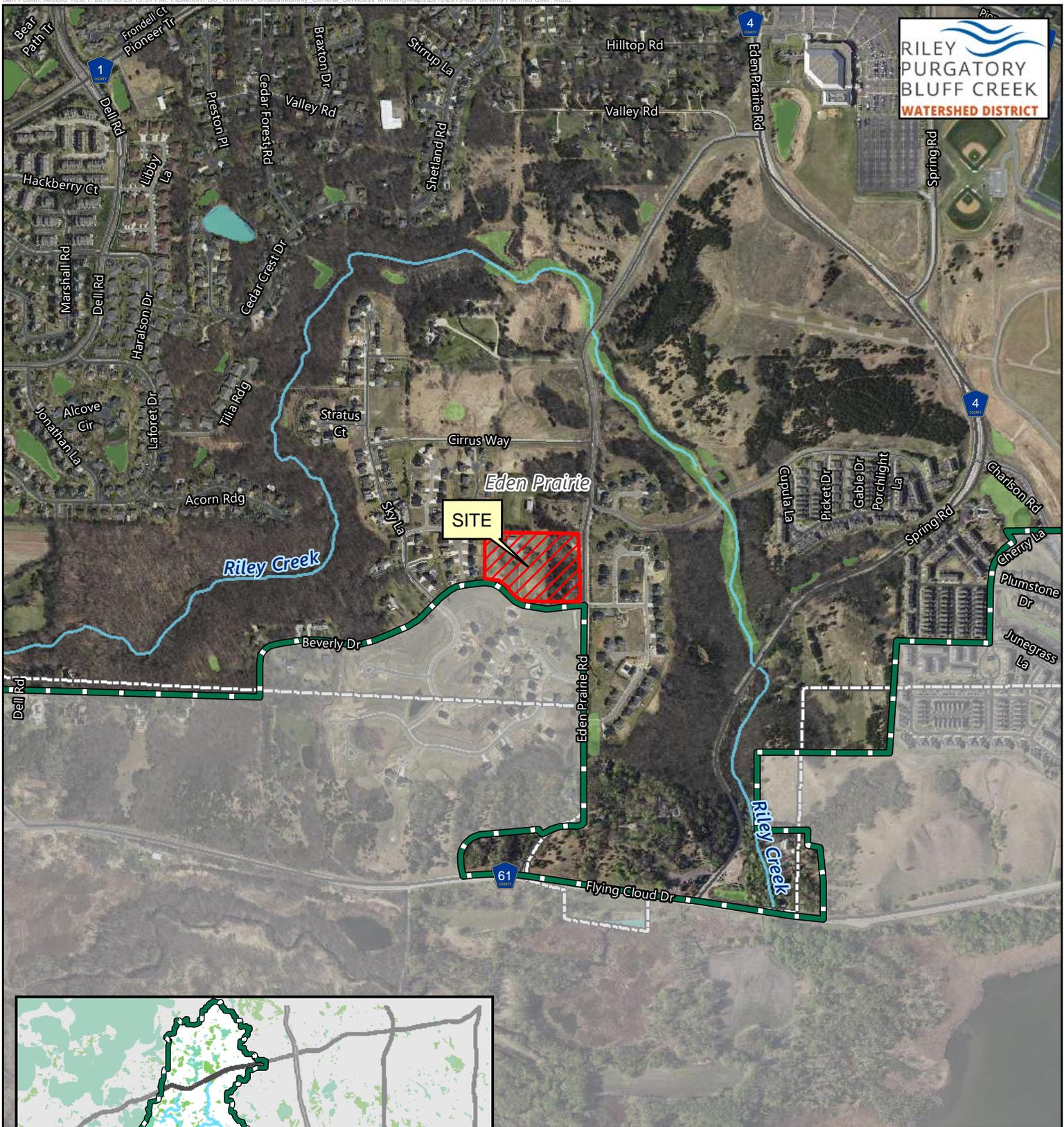
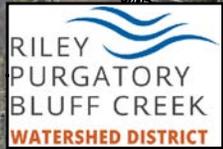
Recommendation:

1. A two-year permit term is recommended since the construction is anticipated to continue through 2021.
1. Approval of the permit issuance contingent upon
 - a. Continued compliance with General Requirements.
 - b. Financial Assurance in the amount of \$78,323.
 - c. 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.
 - d. Receipt in recordation a maintenance declaration for the stormwater management facilities. Drafts of any and 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 3.1.b.ii measured infiltration capacity of the soils at the bottom of the infiltration bench and two rainwater gardens 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 divided by 2. 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 (in the form of an application for a permit modification or new permit).
2. 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, stormwater facilities conform to design specifications as approved by the District.
3. Single-family homes to be constructed on lots in the subdivision created under the terms of permit 2019-007, if issued, must have an impervious surface area and configuration materially

consistent with the approved plans. Individual lot 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.



Permit Location Map

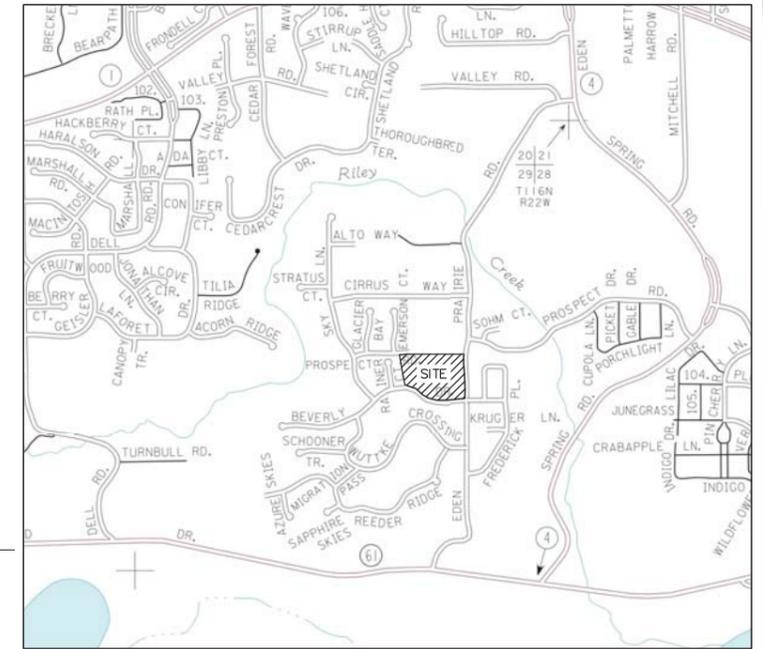


Feet

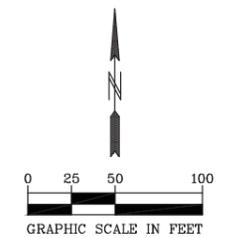


BEVERLY HILLS
Permit 2019-007
Riley Purgatory Bluff Creek
Watershed District

BEVERLY HILL PRELIMINARY PLAT EDEN PRAIRIE, MINNESOTA



LOCATION MAP



- SHEET INDEX**
- 1. COVER SHEET
 - 2. LEGEND
 - 3. EXISTING CONDITIONS
 - 4. PRELIMINARY PLAT
 - 5. PRELIMINARY SITE PLAN
 - 6. REMOVAL PLAN
 - 7. PRELIMINARY GRADING PLAN
 - 8. PRELIMINARY EROSION CONTROL PLAN
 - 9. PRELIMINARY SEEDING PLAN
 - 10-11. GRADING DETAILS
 - 12. PRELIMINARY SANITARY & WATERMAIN PLAN
 - 13. PRELIMINARY STORM SEWER
 - 14. STREET PROFILES
 - 15-17. DETAILS
- L1. PRELIMINARY LANDSCAPE PLAN
 - T1. PRELIMINARY TREE PRESERVATION PLAN

BENCH MARK
TOP OF NUT HYDRANT
SE QUADRANT OF
EDEN PRAIRIE RD. & BEVERLY DR.
ELEV. = XXX.XX

00-ENG-118239-SHEET-COVER

PIONEERengineering

CIVIL ENGINEERS LAND PLANNERS LAND SURVEYORS LANDSCAPE ARCHITECTS
2422 Enterprise Drive (651) 681-1914
Mendota Heights, MN 55120 Fax: 681-9488
www.pioneereng.com

I hereby certify that this plan 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.
Name: John M. Molinaro
Reg. No.: 45831 Date: 1-18-2019

Revisions:
1. 2-13-19 City Comments
2. 2-25-19 City & Watershed Comments
3. 3-18-19 Watershed Comments

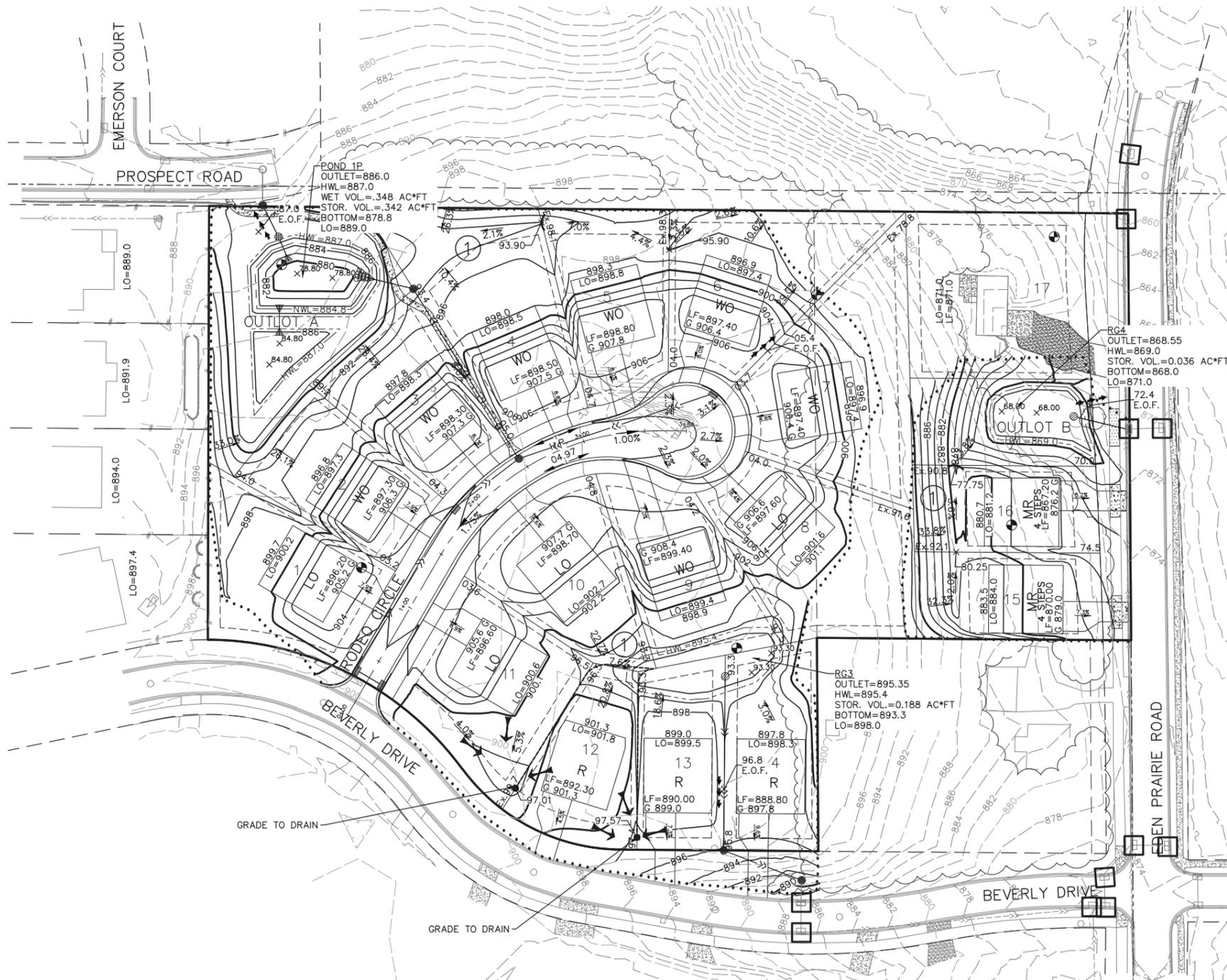
Date: 1-18-2019
Designed: NAP/
Drawn: MSN

COVER SHEET

GREAT OAKS 2ND, LLC.
1900 OAK STREET
MENDOTA HEIGHTS, MINNESOTA 55118

BEVERLY HILL
EDEN PRAIRIE, MINNESOTA

1 OF 19



SITE BALANCE:
 TOTAL CUT - 17,812 CY
 TOTAL FILL + 21,088 CY
 BALANCE = 3,276 CY

PROPOSED ZONING REQUIREMENTS R-9.5:

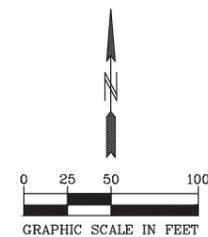
MINIMUM LOT WIDTH	70'
MINIMUM CUL-DE-SAC FRONTAGE:	55'
MINIMUM LOT AREA	9,500 SF
MINIMUM SETBACK FROM ROW:	30'
MINIMUM SIDE SETBACK:	5', 10'
MINIMUM REAR SETBACK:	20'

BUILDING REQUIREMENTS:

LF = HWL + 2'
 LF = EOF + 1'

LEGEND

- PERIMETER EROSION CONTROL FENCE. INSTALL BEFORE START OF GRADING
- [Symbol] CATCH BASIN INLET PROTECTION TO BE INSTALLED PRIOR TO START OF GRADING
- [Symbol] CATCH BASIN INLET PROTECTION TO BE INSTALLED PRIOR TO START OF GRADING



BENCH MARK
 TOP OF NUT HYDRANT
 SE QUADRANT OF
 EDEN PRAIRIE RD. & BEVERLY DR.
 ELEV. = XXX.XX
 00-ENG-118239-SHEET-GRAD

PIONEEREngineering
 CIVIL ENGINEERS LAND PLANNERS LAND SURVEYORS LANDSCAPE ARCHITECTS

2422 Enterprise Drive
 Mendota Heights, MN 55120
 (651) 681-1914
 Fax: 681-9488
 www.pioneereng.com

I hereby certify that this plan 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

Name: John M. Molinaro
 Reg. No.: 45831 Date: 1-18-2019

Revisions:
 1. 2-13-19 City Comments
 2. 2-25-19 City & Watershed Comments
 3. 3-18-19 Watershed Comments

Date: 1-18-2019
 Designed: NAP/
 Drawn: MSN

PRELIMINARY GRADING PLAN

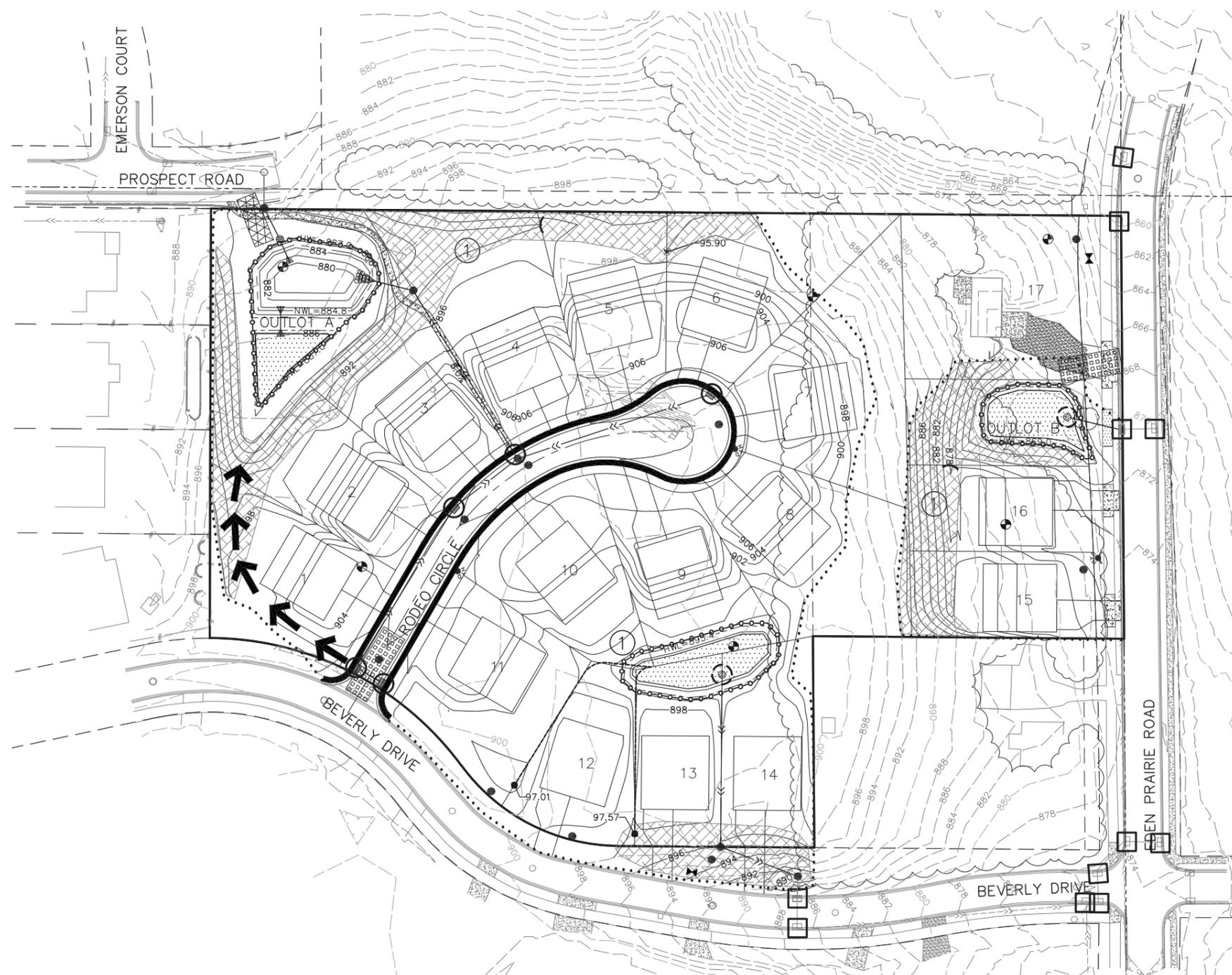
GREAT OAKS 2ND, LLC.
 1900 OAK STREET
 MENDOTA HEIGHTS, MINNESOTA 55118

BEVERLY HILL
 EDEN PRAIRIE, MINNESOTA

7 OF 19

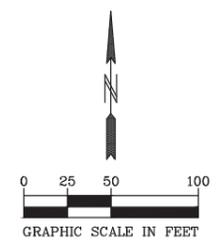
RPBCWD EROSION CONTROL NOTES

1. NATURAL TOPOGRAPHY AND SOIL CONDITION 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.



LEGEND

- | | | | |
|--|---|--|--|
| | ROCK CONSTRUCTION ENTRANCE
INSTALL BEFORE START OF GRADING | | CATCH BASIN INLET PROTECTION
TO BE INSTALLED AFTER 1ST LIFT
OF BITUMINOUS. |
| | PERIMETER EROSION CONTROL FENCE.
INSTALL BEFORE START OF GRADING | | CATCH BASIN INLET PROTECTION
TO BE INSTALLED PRIOR TO
START OF GRADING |
| | 2' SOD OR EROSION CONTROL FENCE AT
BACK OF CURB. TO BE INSTALLED AFTER
COMPLETION OF SIDEWALK CONSTRUCTION. | | CATCH BASIN INLET PROTECTION
TO BE INSTALLED WITH CATCH
BASIN GRATE. |
| | MNDOT CAT 3 EROSION CONTROL BLANKET.
INSTALL WITHIN 7 DAYS OF GRADING
COMPLETION | | CATCH BASIN INLET PROTECTION
TO BE INSTALLED PRIOR TO
START OF GRADING |
| | STABILIZED EMERGENCY OVERFLOW
MNDOT CAT 6 EROSION CONTROL BLANKET.
INSTALL WITHIN 7 DAYS OF GRADING
COMPLETION | | STRAW BIO ROLLS. INSTALL WITHIN 7 DAYS
OF GRADING COMPLETION OR BEFORE 1ST
RAINFALL EVENT WHICHEVER IS FIRST |
| | SECONDARY EROSION CONTROL FENCE.
TO BE INSTALLED 48 HOURS AFTER
COMPLETION OF GRADING. | | SUMPED RIP RAP PERMANENT ENERGY
DISSIPATER, INSTALL WITHIN 24 HOURS
AFTER CONNECTION TO A SURFACE WATER. |
| | FILTRATION AREA (SEE DETAIL) | | DIVERSION DITCH TO BE PLACED AS NEEDED
UNTIL STORM SEWER CONSTRUCTED |



BENCH MARK
TOP OF NUT HYDRANT
SE QUADRANT OF
EDEN PRAIRIE RD. & BEVERLY DR.
ELEV. = XXX.XX
00-ENG-118239-SHEET-EROS

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Name: John M. Molinaro
Reg. No. 45831 Date: 1-18-2019

Revisions:
1. 2-12-19 City Comments
2. 2-25-19 City & Watershed Comments
3. 3-18-19 Watershed Comments

Date: 1-18-2019
Designed: NAP/
Drawn: MSN

**PRELIMINARY
EROSION CONTROL PLAN**

GREAT OAKS 2ND, LLC.
1900 OAK STREET
MENDOTA HEIGHTS, MINNESOTA 55118

BEVERLY HILL
EDEN PRAIRIE, MINNESOTA

Thursday, March 21, 2019

Re: Organizational changes and salary adjustment

Dear Managers,

I and the personnel committee met to discuss organizational changes in order to meet the needs of the district. At the board's workshop at the start of the year focusing on Planning for 2019, three priorities were identified in order for work to move forward. These are the following: implement the plan, plan to the next level, and increase collaboration on projects. With this in mind, I have identified several needs. In regard to implementing the plan, the following programs need additional staff time:

- Wetland Inventory, Assessment and Restoration Projects
- Repair and Maintenance
- Opportunity Projects
- Groundwater Conservation
- AIS
- Hennepin County Chloride Initiative
- Wetland Conservation Act (WCA).

In regard to planning for the future and furthering collaboration, I have identified the need to further engage stakeholders and be more engage in planning right from the start.

In order to meet the vision of the board and then needs of the District, the following changes must happen. Staff time must be freed to meet the needs and staff responsibilities need to be redistributed. Included in this packet are for you a before and after organizational chart highlighting internal structure changes. Four changes are identified. First, the Project and Permit Manager would become the Watershed Planning Manager (WPM). Responsibilities would differ in that non-administrative permits would be processed by the District's Engineer where cost can be recuperated except for government bodies. This will free up time for the WPM to work on the Wetlands Program, groundwater conservation program, opportunity projects as well as planning for the future and increased collaboration with communities. The Watershed Technician II will have a more active role as well in the Wetland Program. Additional field work will also be taken on by a summer intern.

The Community Outreach Coordinator will move into the Communication and Project Manager and the Office and Outreach Coordinator will be moving to an Education and Outreach Coordinator. The Communication and Project Manager will supervise the Education and Outreach Coordinator and manage opportunity projects, cost-share program and capital improvement project. The Education and Outreach

Coordinator will actively manage our volunteer programs and focus on reaching out to underserve population as well as actively implementing the Education and Outreach Plan.

Please note that the Community Outreach Coordinator's move to the Communication and Project Manager is a grade level change and requires a salary adjustment. No other salary adjustments are proposed at this time.

I have included in this packet, before and after changes to the position mentioned above, organizational chart (current and new), catalogue of seasonal staff that we have hired in 2019. I also have included a ppt discussing the proposed changes. All employees identified through the job title changes meet the qualification of the new roles.

I have met with the personnel committee and we recommend the following changes:

1. **Move the Project and permit manager to Watershed Panning Manager.**
2. **Move the Community Outreach Coordinator to Communication and Project Manager with a salary adjustment of \$6,800 and pay grade increase from 5 to 6.**
3. **Move the Office and Outreach Assistant to Education and Outreach Coordinator.**

Sincerely,



Claire Bleser

Manager _____ moves that the following organization and salary adjustment be made effective April 1, 2019:

1. **Move the Project and permit manager to Watershed Panning Manager.**
2. **Move the Community Outreach Coordinator to Communication and Project Manager with a salary adjustment of \$6,800 and pay grade increase from 5 to 6.**
3. **Move the Office and Outreach Assistant to Education and Outreach Coordinator.**

FIGURE 1-2

2019



ORGANIZATIONAL STRUCTURE

Multiple individuals are included in the governance of the Riley Purgatory Bluff Creek Watershed District. These include a board of managers, advisory committees, consultants, staff, and volunteers.



ORGANIZATIONAL STRUCTURE

Multiple individuals are included in the governance of the Riley Purgatory Bluff Creek Watershed District. These include a board of managers, advisory committees, consultants, staff, and volunteers.





RPBCWD Manager Goals from January 2019 Visioning Workshop

Administration

1. *Operate in a manner that uses District resources and capacity efficiently and effectively while advancing the District's vision and goals.*
- Complete all scheduled projects on time and on budget
 - Implementation of best management practices in all facets of operation
 - Become recognized for strong leadership
 - Analysis of work
 - Administrative efficiency
 - Transparency of operation and finance

Data Collection

1. *Collect data and use the best available science to recommend and support management decisions.*
- Sharing of data with other stakeholders (both directions)
 - Keep up with climate change data and make adjustments to plan
 - Continue to shift data collection to most efficient method

Education and Outreach

1. *Design, maintain, and implement Education and Outreach programs to educate the community and engage them in the work of protecting, managing, and restoring water resources.*
- Continue to develop volunteer resources for educating the public
 - Involved with planning process
 - Collaboration with staff and managers
 - Outreach to District partners
 - Develop district-wide adopt-a-storm sewer program
 - Collaboration with constituents

Planning

1. *Plan and conduct the District's implementation program to most effectively accomplish its vision with consideration for all stakeholders and resources.*
 2. *Include sustainability and the impacts of climate change in District projects, programs, and planning.*
- Identify opportunities
 - Become entrepreneurial thinkers
 - Create a vision initiate a "customer satisfaction" survey
 - Successful execution of the 10-year plan for 2019
 - Better cooperation on projects with our cities
 - Better use of financial resources working with cities
 - Plan for salt minimization (50% reduction)
 - Plan project like Ford Plant, change from 100% impervious to green space with business and living space
 - Better use of financial resources working with businesses
 - Improve and create joint projects on a larger scale
 - Identify common goals to achieve water quality in Eden Prairie
 - Learn about Shorewood's storm water goals related to green-step cities actions
 - Create partnerships
 - Visioning
 - Learn about Chanhassen's water quality goals and plans
 - Learn what Eden Prairie's goals are for water quality
 - Learn about Eden Prairie's Green Step city stormwater goals
 - Learn about Minnetonka's stormwater goals and what actions they are planning
 - Extend use of H + H model to identify climate change impacts in Carver County/ Chanhassen

Regulation

1. *Implement the District's regulatory program to protect water resources from further degradation, enhancing resources when possible.*
 2. *Support Carver and Hennepin County to operate effectively as Ditch Authorities.*
- Obeying the laws, rules, and regulations
 - Following our bylaws and policies

Groundwater

1. *Promote the sustainable management of groundwater resources.*
- Develop an educational groundwater protection program

Water Quality

1. *Protect, manage, and restore water quality of District lakes and creeks to maintain designated uses.*
 2. *Preserve and enhance the quantity, as well as the functions and values of District Wetlands.*
 3. *Preserve and enhance the habitat important to fish, waterfowl, and other wildlife.*
- Successful completion of the workplan
 - Reduced algae growth in targeted lakes
 - Reduced erosion in Riley Creek
 - Increased public and private partnership
 - Entrepreneurial thinkers: develop a process
 - Work with stakeholders
 - Customer satisfaction survey: feedback
 - District leadership for long term

Water Quantity

1. *Protect and enhance the ecological function of District floodplains to minimize adverse impacts.*
2. *Limit the impact of storm water runoff on receiving waterbodies.*

Other ideas from the Board of Managers

- Develop a timeline of success for stakeholder collaboration
- Come up with 3-5 projects to enhance relationship with stakeholders
- Collaboration and engagement with partners and constituents
- Improve use of best management practices
- Successful completion of workplan
- Greenstep cities: identify their goals (listen)

- Share H + H model info with cities and brainstorm how we can partner for solutions
- Build better planning relationships—businesses municipalities, residents
- Water reuse plan for Eden Prairie High school
- Work with stakeholders to lead on water issues and improvements
- Implement first year of 10-year plan
- Do a customer satisfaction survey
- Create a visioneering plan/ process
- Identify 4-6 new and creative partnership opportunities

Administration

Handwritten notes on pink sticky notes under Administration.

Education and Outreach

Handwritten notes on pink sticky notes under Education and Outreach.

Regulation

Handwritten notes on pink sticky notes under Regulation.

Groundwater

Handwritten notes on pink sticky notes under Groundwater.

Data Collection

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Planning

Handwritten notes on pink sticky notes under Planning.

Water Quality

Handwritten notes on pink sticky notes under Water Quality.

Water Quantity

Handwritten notes on pink sticky notes under Water Quantity.

Planning for 2019

Reorganizational Proposal

Handwritten notes on pink sticky notes at the bottom right.

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3 Priorities



Implementation Plan



Planning to the next level



Collaborating on projects

District Project and Programs

10-year Management Plan
AIS Inspection and early response
Chloride Initiative
Chloride Lower Minnesota
Creek Restoration Action Strategies Phase 2*
Data Collection and Monitoring
District Wide Floodplain Evaluation - Atlas 14/SMM model*
Education and Outreach
Plant Restoration - U of M
Repair and Maintenance Fund *
Survey and Analysis Fund *
Wetland Management*
Groundwater Conservation*
Lake Vegetation Implementation
Opportunity Project*
Stormwater Pond
TMDL - MPCA

Bluff Creek Tributary*
Wetland Restoration and Flood Mitigation*
Chanhasen High School * Finishing
Lake Riley - Alum Treatment 1st dose * monitoring
Lake Susan Improvement Phase 1 * Monitoring
Lake Susan Water Quality Improvement Phase 2 *~ Finishing
Rice Marsh Lake in-lake phosphorus load Monitoring
Rice Marsh Lake Water Quality Improvement Phase 1*
Riley Creek Restoration (Reach E and D3) *~
Upper Riley Creek Stabilization and Restoration*
Fire Station 2 (Eden Prairie)* Finished
Purgatory Creek Rec Area- Berm/retention area - feasibility/design*
Lotus Lake in-lake phosphorus load control* Monitoring
Lotus Lake - Feasibility Phase 1
Purgatory Creek at 101* Finished
Silver Lake Restoration - Feasibility Phase 1*
Scenic Heights*
Hyland Lake in-lake phosphorus load control
Duck Lake watershed load*

- Operations
- Human Resources
- State and National Representation
- Financials
- Grants

Needs

Implementation Plan Needs on:

- Wetland Inventory, Assessment and Restoration Projects
- Repair and Maintenance
- Opportunity Projects
- Groundwater Conservation
- AIS
- Hennepin County Chloride Initiative
- Wetland Conservation Act (WCA)

Planning for the future

- Engaging all stakeholders

Furthering Collaboration

- Provide opportunity for stakeholder feedback

How can we
do it?

1

Free up staff
time

2

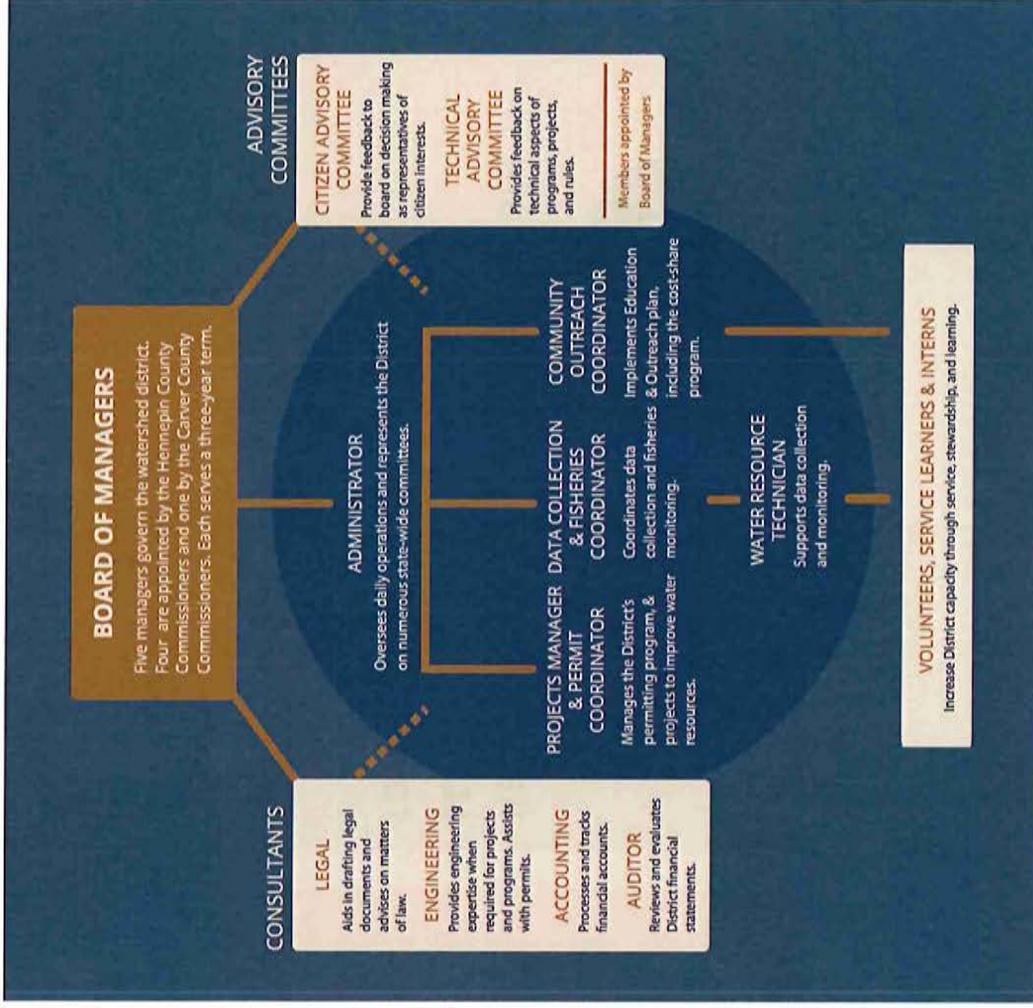
Redistribute
staff
responsibilities

3

Re-evaluate

Implementation Plan Needs on:

- Wetland Inventory, Assessment and Restoration Projects
- Repair and Maintenance
- Opportunity Projects
- Groundwater Conservation AIS
- Hennepin County Chloride Initiative
- Wetland Conservation Act (WCA) Planning for the future
- Engaging all stakeholders
- Furthering Collaboration
- Provide opportunity for stakeholder feedback



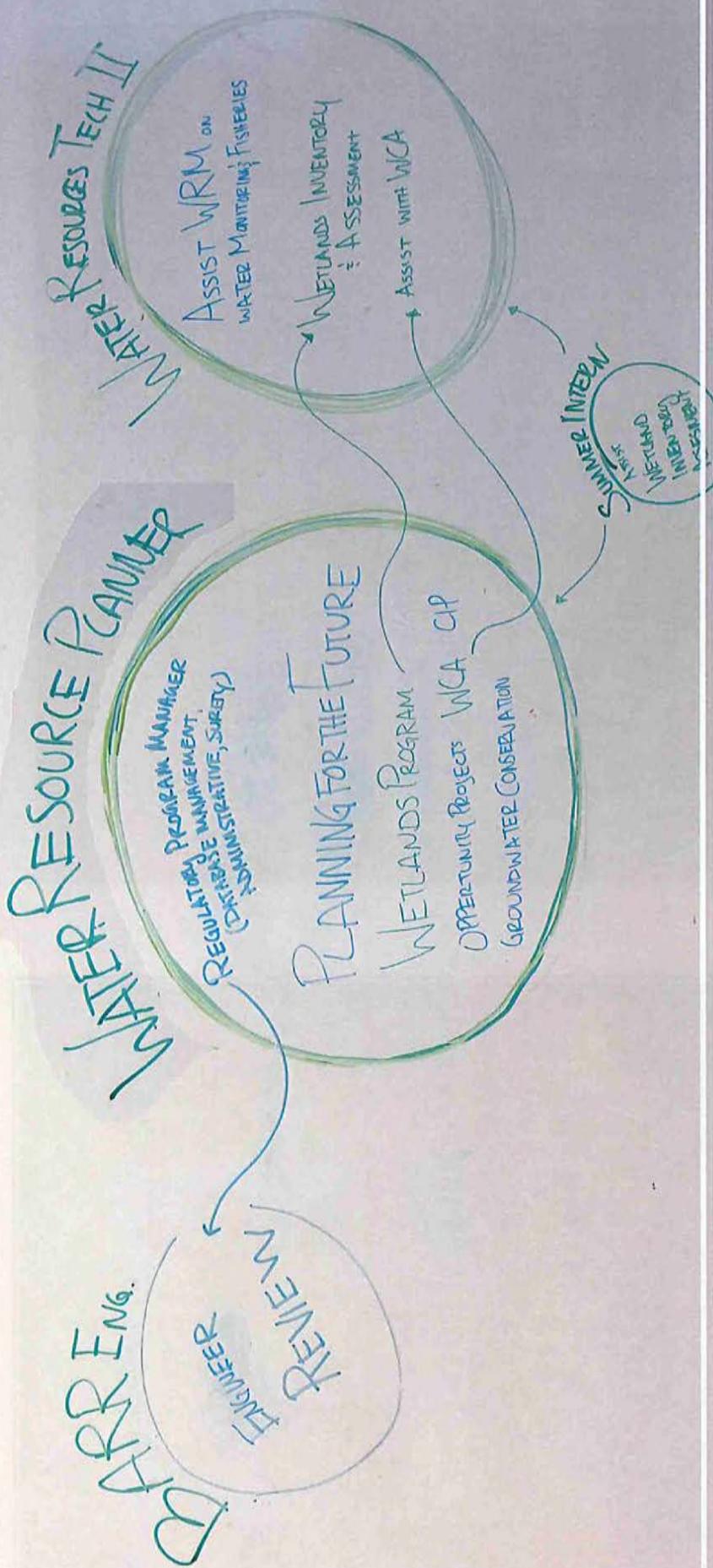
Water Resources Manager

WATER RESOURCE MANAGER

MANAGE DIRECT MONITORING PROGRAM
MANAGE FISHERIES PROGRAM
PROCESS ZOOPLANKTON SAMPLES
ANALYZE DATA
CRAS
FLEET MANAGEMENT
OVERSEE WRS TECH II & INTERNS
SAFETY OFFICER

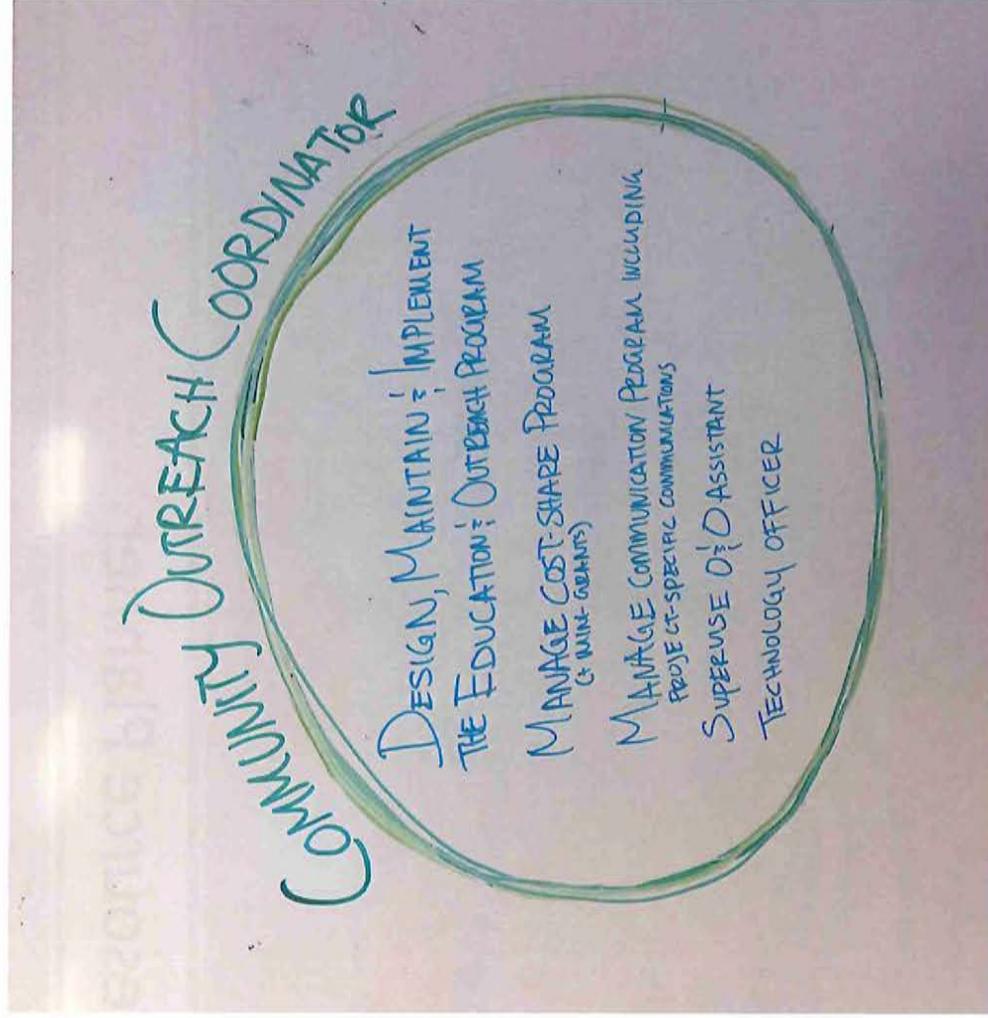
Project Manager





Water Resource Planner

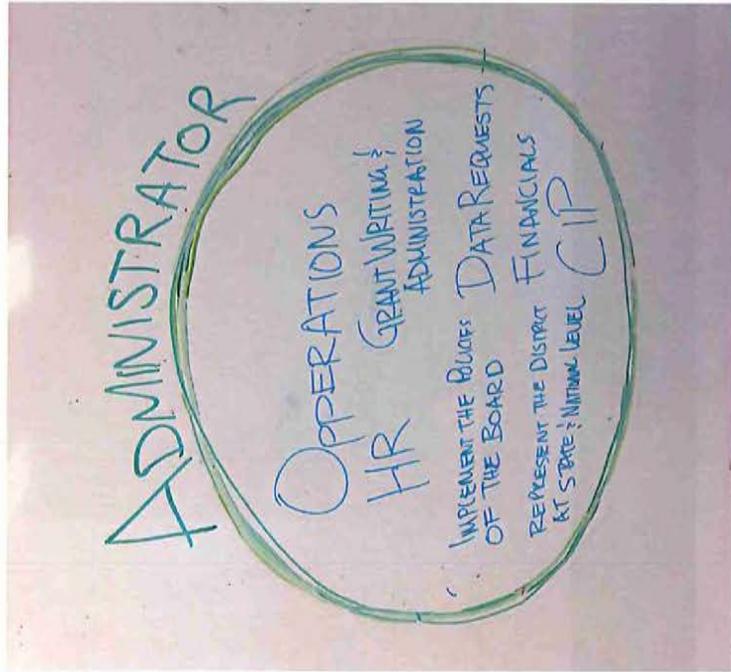
Community Outreach Coordinator



Communication and Project Manager



Administrator



Old

POSITION TITLE: Permitting and Natural Resource Project Manager

REPORTS TO: Administrator

STATUS: Exempt FLSA

SALARY: \$65,000 - \$85,000

PRIMARY OBJECTIVE:

This position is responsible for the development and management of the regulatory program including permitting, plan review, site inspection, and enforcement. The position will also be responsible for the development of a wetland protection program including WCA administration within certain areas of the District. The position will also be responsible for managing some natural resources projects. Responsibilities may include preparing work plans and cost estimates, interpreting data, preparing technical reports, and coordinating site activities. He or She should be comfortable in preparing reports and presenting findings to the board.

JOB DUTIES AND RESPONSIBILITIES:

Administer Regulatory Program (50%)

1. Assists in the development of District Rules, policies and procedures relating to permitting.
2. Review permit applications, including site plans, hydrologic and hydraulic and water quality modeling, and other materials; Work with permitting review team in investigating and researching to make recommendations to the board.
 - Process permit application that fall under the Administrator issuance authority.
 - Delegate tasks to consulting engineer as necessary.
3. Oversee site inspection for compliance with district rules and permit conditions.
 - Supervise consultant and seasonal staff.
 - Inspect sites including final walkthrough.
 - Responsible for record management (eg. financial assurances, maintenance declarations) of the regulatory program.
4. Initiate and oversee enforcement actions.
5. Develop and maintain permit database including maintenance declarations and agreements as well as financial assurance.
6. Administer the Wetland Conservation Act for two communities.
7. Serve as staff liaison to Technical Environmental Panel.
8. Other duties as assigned.

Natural Resource Project Coordinator (40%)

1. Assist the District in the development and implementation of a program to preserve and enhance the quantity, as well as the function and value of wetlands.
 - a. Manage seasonal staff.
 - b. Assess all known wetlands within the District boundaries utilizing the MN Routine Assessment Method.

- c. Develop and maintain database of wetland assessments.
 - d. Utilize GIS and other remote sensing data to identify wetlands with the potential to be restored or enhanced.
 - e. Interact with community members to answer wetland related questions.
 - f. Develop wetland protection plan including high priority areas.
2. Assist in the planning and implementation of structural and nonstructural best management practices designed to restore and protect surface and groundwater quality and quantity.
 3. Oversee capital improvement and restoration project implementation.
 4. Assist in the maintenance of the District GIS program.
 5. Create GIS exhibits and maps for staff members.
 6. Assist in preparing and submitting grant proposals.
 7. Other Duties as assigned

Education and Outreach (10%)

1. Assist the Education and Outreach Coordinator as needed with current and future programing.
2. Assist in the review of cost share grants.
3. Periodically make presentations to various organizations.
4. Develop and lead a course on wetland science for targeted audiences.
5. Other duties as assigned.

REQUIRED KNOWLEDGE, SKILLS AND ABILITIES:

1. Bachelors Degree in Biology, Environmental Resource Management, Hydrology, or related field required or equivalent experience.
2. Experience in water resource management
3. Familiarity with local, state and federal water resources regulatory programs and management.
4. Ability to communicate effectively both verbally and in writing to a wide range of individuals and groups.
5. Ability to traverse difficult terrain.
6. Ability to work with minimal supervision.
7. Valid driver's license.
8. Some irregular work hours involving evening and weekend work is required.
9. Certified Wetland Scientist.
10. Experience supervising and implementing natural resource capital improvement projects.
11. Flexible working style, self-initiative, self-motivation, and a willingness to work with teams to meet project needs and schedules
12. Demonstrated experience meeting timelines and achieving project expectations
13. Project management experience and interpersonal skills
14. Demonstrated project organization and management/leadership skills
15. Knowledge of Microsoft products, P8, MIDS, Hydrocad, and Arc GIS.
16. Ten years of relevant experience.

New

POSITION TITLE: Watershed Planning Manager

REPORTS TO: Administrator

STATUS: Exempt FLSA

SALARY: \$65,000 - \$85,000

PRIMARY OBJECTIVE:

The Watershed Planning Manager is responsible for working directly with municipalities and other stakeholders to identify, develop, and implement watershed management best practices. The position will also be responsible for the development of a wetland protection program including WCA administration within certain areas of the District and will provide technical assistance with WCA throughout the District. This program will assess all known wetlands and identify, develop, and implement wetland restoration, rehabilitation, and protection projects. This position will administer the regulatory program, including supervision of seasonal staff and consulting engineers. Responsibilities may include preparing work plans and cost estimates, interpreting data, preparing technical reports, and coordinating site activities. The individual should be comfortable in preparing reports and presenting findings to the board in written and oral format. The individual should be able to navigate uneven terrain in any weather condition.

JOB DUTIES AND RESPONSIBILITIES:

Natural Resource Planning (50%)

1. Oversee the development and implementation of a program to preserve and enhance the quantity, as well as the function and value of wetlands.
 - a. Manage seasonal staff.
 - b. Assess all known wetlands within the District boundaries utilizing the MN Routine Assessment Method.
 - c. Develop and maintain database of wetland assessments.
 - d. Utilize GIS and other remote sensing data to identify wetlands with the potential to be restored or enhanced.
 - e. Interact with community members to answer wetland related questions.
 - f. Develop wetland protection plan including high priority areas.
2. Identify potentially restorable wetlands, including enhancement of existing wetlands.
 - a. Coordinate with landowners to acquire easement or other rights to perform necessary work and protect in perpetuity.
 - b. Oversee the development of wetland restoration plans.
 - c. Acquire necessary permits from oversight agencies.
3. Assist in the planning and implementation of structural and nonstructural best management practices designed to restore and protect surface and groundwater quality and quantity.
4. Assist in the maintenance of the District GIS program.
5. Develop GIS database of wetland management classifications.
6. Create GIS exhibits and maps for staff members.

7. Assist in preparing and submitting grant proposals.
8. Other Duties as assigned

Administer Regulatory Program (25%)

1. Assists in the development of District Rules, policies and procedures relating to permitting.
2. Review permit applications, including site plans, hydrologic and hydraulic and water quality modeling, and other materials; Work with permitting review team in investigating and researching to make recommendations to the board.
 - Process permit application that fall under the Administrator issuance authority.
 - Delegate tasks to consulting engineer as necessary.
3. Oversee site inspection for compliance with district rules and permit conditions.
 - Supervise consultant and seasonal staff.
 - Inspect sites including final walkthrough.
 - Responsible for record management (eg. financial assurances, maintenance declarations) of the regulatory program.
4. Initiate and oversee enforcement actions.
5. Develop and maintain permit database including maintenance declarations and agreements as well as financial assurance.
6. Administer the Wetland Conservation Act for two communities.
7. Serve as staff liaison to Technical Environmental Panel.
8. Other duties as assigned.

Community Planning and Engagement (20%)

1. Liaise with Public Works Directors, City Engineers, Community Development Directors and others.
2. Attend, as appropriate, municipal committees meetings.
3. Work with developers to identify sensitive ecological areas, especially as it pertains to wetlands for restoration and/or protection.
4. Host and facilitate meetings with above stakeholders to identify areas to improve, offer education on process, or otherwise improve relationships and efficiency.
5. Identify overlaps between municipal planning efforts and the RPBCWD LSWMP.
6. Identify overlaps between municipal and RPBCWD Capital Improvement Plans.
7. Work with potable water producers/suppliers to develop groundwater conservation strategies.
8. Serve as staff liaison to Technical Environmental Panel.

Education and Outreach (5%)

1. Assist the Education and Outreach Coordinator as needed with current and future programing.
2. Assist in the review of cost share grants.
3. Periodically make presentations to various organizations.
4. Develop and lead a course on wetland science for targeted audiences.
5. Other duties as assigned.

REQUIRED KNOWLEDGE, SKILLS AND ABILITIES:

1. Bachelors Degree in Biology, Natural Resource Management, Environmental Science, Planning, or related field required or equivalent experience.
2. Experience in water resource management
3. Familiarity with local, state and federal water resources regulatory programs and management.
4. Ability to communicate effectively both verbally and in writing to a wide range of individuals and groups.
5. Ability to traverse difficult terrain.
6. Ability to work with minimal supervision.
7. Valid driver's license.
8. Some irregular work hours involving evening and weekend work is required.
9. Certified Wetland Scientist.
10. Experience supervising and implementing natural resource capital improvement projects.
11. Flexible working style, self-initiative, self-motivation, and a willingness to work with teams to meet project needs and schedules
12. Demonstrated experience meeting timelines and achieving project expectations
13. Project management experience and interpersonal skills
14. Demonstrated project organization and management/leadership skills
15. Knowledge of Microsoft products, P8, MIDS, Hydrocad, and Arc GIS.
16. Ten years of relevant experience.

OLD

**Water Resources Technician
2018 Job Description**

POSITION TITLE: Water Resource Technician
REPORTS TO: Water Resources Coordinator
STATUS: Full time, Fair Labor Standards Act Exempt
SALARY RANGE: \$34,000 – \$51,000

PRIMARY OBJECTIVE:

The Water Resource Technician reports directly to the Water Resource Coordinator, providing technical support and assistance in the protection, improvement and management of the water resources located within the District. This position involves assisting the Water Quality Coordinator with the operation of the watershed wide monitoring program for lakes and streams, including maintenance of equipment, and the collection, analysis and reporting of the data on water quality within the district. The Water Resources Technician will also assist in developing specialty water quality projects tied to water quality monitoring and assist in implementing the District's carp management/fisheries program. Additionally, the Water Resource Technician will help supervise District interns and volunteer help.

Essential Functions:

- 1. Assist in the operation and development of the District's monitoring program, specialty water quality projects, and fisheries research/management program. This will include but is not limited to:**
 - a. Install and maintain the District's network of flow meters, samplers, and water level sensors.
 - b. Ensure all equipment is properly functioning and perform repairs and/or regular maintenance as needed.
 - c. Collect water samples and other physical and biological information in lakes, streams and other water features.
 - d. Monitor the overall health and stability of the District's lakes and streams.
 - e. Conduct stream surveys to assess habitat, survey macroinvertebrates, survey fish populations, and identify areas of concern (i.e. severe erosion).
 - f. Assist in conducting the District's zooplankton and phytoplankton monitoring plan including monthly sample collection and reporting.
 - g. Assisting with the development and implementation of fisheries programs and plans within the District including, but not limited to, the District's carp management plan. This will involve, management/maintenance and operation of aeration systems, stocking of fish, and the use of various fisheries sampling equipment including small mesh gill nets, block nets, boat and backpack electrofishers, and VHF telemetry tracking tags and receivers.
 - h. Assist in the development of the AIS monitoring program.
 - i. Assist in the development and implementation of additional specialty water quality projects.
 - j. Assist in supervising the work of District interns/volunteers to ensure efficient and orderly field operations by determining priorities, assigning work, evaluating work completion and purchasing materials.
 - k. Assist in managing and performing quality control of the District's database.
 - l. Assist in the analysis and interpretation of the monitoring data in order to draw conclusions and guide decision making. Prepare monthly and annual monitoring reports.
 - m. Other duties as assigned.

2. Other duties. This will include but is not limited to:

- a. Conducting basic office maintenance
- b. Assisting in the management and maintenance of the District's fleet vehicles
- c. Assist the Education and Outreach Coordinator with the District's various education and outreach programs.
- d. Designing and constructing specialty project items for the District office and various District Programs, including but not limited to education and outreach teaching tools/props, miscellaneous sampling/monitoring equipment, and miscellaneous office needs.
- e. Representing RPBCWD at events and in the field as needed.
- f. Staying up-to-date on information, studies and methods in the water resource science field
- g. Assisting in training volunteers and intern staff
- h. Providing technical assistance as needed
- i. Other

REQUIRED KNOWLEDGE, SKILLS, and QUALIFICATIONS:

- Proficient in water quality QA-QC and the use/application of water quality monitoring equipment (e.g., YSI sonde)
- Course work or experience with water quality monitoring, chemistry and water resource sciences
- Strong organizational, written, and oral communications skills
- Ability to work well with a team and independently as needed
- Must be proficient with MS Office Suite
- Knowledge of ArcGIS
- Self-motivation and ability to work independently without close supervision
- Willingness to travel throughout the project area and attend evening/weekend events
- Strong interpersonal skills and a collaborative attitude

ACTIVITY AND FIELD WORK COMPONENTS:

- This position requires a valid driver's license and good driving record
- Ability to drive, maneuver/handle work pickup-trucks and use them for intended purposes (hauling, trailering, off-road site access)
- Ability to trailer and launch a boat, including larger custom/specialty boats
- Ability to lift and carry approximately 50 pounds over uneven surfaces and slopes
- Working outdoors under all weather conditions
- Installation of equipment in the field and in the water
- Working in waters with waders
- Comfortable handling and processing large numbers of fish
- Ability to use/operate and maintain specialty tools/equipment

MINIMUM QUALIFICATIONS

- a. A BA/BS degree in natural resource science, conservation biology, plant ecology, or another applicable field with at least one year of professional experience in natural resource management; OR three years professional experience with multiple phases of natural resource restoration and management or a related field;
- b. General knowledge of watershed management, aquatic and terrestrial ecology;
- c. Ability to work and conduct surveys outdoors and under adverse weather conditions;
- d. Ability to occasionally lift articles weighing up to 50-pounds and frequently lift and/or carry objects up to 25 pounds, such as heavy tools and file boxes;

- e. Ability to walk and stand on rough terrain and the use of power tools or mechanical equipment;
- f. Ability to oversee field projects and to train and direct the activities of other field staff;
- g. A valid driver's license;
- h. Ability to work some evenings and weekends.

DESIRED QUALIFICATIONS

- a. Ability to create maps and analyze spatial data using ArcGIS

New

**Water Resources Technician
2019 Job Description**

POSITION TITLE: Water Resource Technician II
REPORTS TO: Water Resources Coordinator and Project and Permitting Manager
STATUS: Full time, Fair Labor Standards Act Exempt
SALARY RANGE: \$47,200 - \$70,800

PRIMARY OBJECTIVE:

The Water Resource Technician reports directly to the Water Resource Coordinator, providing technical support and assistance in the protection, improvement and management of the water resources located within the District. This position involves assisting the Water Quality Coordinator with the operation of the watershed wide monitoring program for lakes and streams, including maintenance of equipment, and the collection, analysis and reporting of the data on water quality within the district. The Water Resources Technician will also assist in developing specialty water quality projects tied to water quality monitoring and assist in implementing the District's carp management/fisheries program. This position will also assist in the development of the District's wetland program, including identifying and assigning function/value to wetland areas within the District. Additionally, the Water Resource Technician will help supervise District interns and volunteer help.

Essential Functions:

- 1. Assist in the operation and development of the District's monitoring program, specialty water quality projects, and fisheries research/management program. This will include but is not limited to:**
 - a. Install and maintain the District's network of flow meters, samplers, and water level sensors.
 - b. Ensure all equipment is properly functioning and perform repairs and/or regular maintenance as needed.
 - c. Collect water samples and other physical and biological information in lakes, streams and other water features.
 - d. Monitor the overall health and stability of the District's lakes and streams.
 - e. Conduct stream surveys to assess habitat, survey macroinvertebrates, survey fish populations, and identify areas of concern (i.e. severe erosion).
 - f. Conduct the District's zooplankton and phytoplankton monitoring plan including monthly sample collection and reporting.
 - g. Assisting with the development and implementation of fisheries programs and plans within the District including, but not limited to, the District's carp management plan. This will involve, management/maintenance and operation of aeration systems, stocking of fish, and the use of various fisheries sampling equipment including small mesh gill nets, block nets, boat and backpack electrofishers, and VHF telemetry tracking tags and receivers.
 - h. Assist in the development of the AIS monitoring program.
 - i. Assist in the development and implementation of additional specialty water quality projects.
 - j. Assist in supervising the work of District interns/volunteers to ensure efficient and orderly field operations by determining priorities, assigning work, evaluating work completion and purchasing materials.
 - k. Assist in managing and performing quality control of the District's database.

- l. Assist in the analysis and interpretation of the monitoring data in order to draw conclusions and guide decision making. Prepare monthly and annual monitoring reports.
- m. Other duties as assigned.

2. Assist in the development of the District's wetland assessment/monitoring program. This will include but is not limited to:

- a. Conducting MnRAM assessments of wetlands within the District
- b. Assisting in the development and updating of the District's wetland inventory
- c. Carrying out in office and on-site assessments of wetlands, including assessments of value and delineation of wetland boundaries.
- d. Assisting in the review of wetland delineation reports.
- e. Assisting with site visits/inspections.
- f. Attending relevant TEP meetings.

3. Other duties. This will include but is not limited to:

- a. Conducting basic office maintenance
- b. Assisting in the management and maintenance of the District's fleet vehicles
- c. Assist the Education and Outreach Coordinator with the District's various education and outreach programs.
- d. Designing and constructing specialty project items for the District office and various District Programs, including but not limited to education and outreach teaching tools/props, miscellaneous sampling/monitoring equipment, and miscellaneous office needs.
- e. Representing RPBCWD at events and in the field as needed.
- f. Staying up-to-date on information, studies and methods in the water resource science field
- g. Assisting in training volunteers and intern staff
- h. Providing technical assistance as needed
- i. Other

REQUIRED KNOWLEDGE, SKILLS, and QUALIFICATIONS:

- Proficient in water quality QA-QC and the use/application of water quality monitoring equipment (e.g., YSI sonde)
- Course work or experience with water quality monitoring, chemistry and water resource sciences
- Course work or experience in wetland ecology and delineation
- Strong organizational, written, and oral communications skills
- Ability to work well with a team and independently as needed
- Must be proficient with MS Office Suite
- Knowledge of ArcGIS and the ability to create maps and analyze spatial data
- Self-motivation and ability to work independently without close supervision
- Willingness to travel throughout the project area and attend evening/weekend events
- Experience supervising multiple employees
- Strong interpersonal skills and a collaborative attitude

ACTIVITY AND FIELD WORK COMPONENTS:

- This position requires a valid driver's license and good driving record

- Ability to drive, maneuver/handle work pickup-trucks and use them for intended purposes (hauling, trailering, off-road site access)
- Ability to trailer and launch a boat, including larger custom/specialty boats
- Ability to lift and carry approximately 50 pounds over uneven surfaces and slopes
- Working outdoors under all weather conditions
- Installation of equipment in the field and in the water
- Working in waters with waders
- Comfortable handling and processing large numbers of fish
- Ability to use/operate and maintain specialty tools/equipment

MINIMUM QUALIFICATIONS

- a. A BA/BS degree in natural resource science, conservation biology, plant ecology, or another applicable field with at least three years of professional experience in natural resource management; OR five years professional experience with multiple phases of natural resource restoration and management or a related field;
- b. General knowledge of watershed management, aquatic and terrestrial ecology;
- c. General knowledge of wetland ecology;
- d. Ability to work and conduct surveys outdoors and under adverse weather conditions;
- e. Ability to occasionally lift articles weighing up to 50-pounds and frequently lift and/or carry objects up to 25 pounds, such as heavy tools and file boxes;
- f. Ability to walk and stand on rough terrain and the use of power tools or mechanical equipment;
- g. Ability to oversee field projects and to train and direct the activities of other field staff;
- h. A valid driver's license;
- i. Ability to work some evenings and weekends.

PREFERED QUALIFICATIONS

- a. Experience with statistical analysis of data;
- b. Some programming knowledge and experience writing/editing code for use with water quality instruments and monitoring;
- c. WDCP Wetland Delineator Certification;
- d. Experience doing MnRAM assessments of wetlands and/or reviewing wetland delineations;
- e. Experience with carpentry, metalworking, and/or design and constructing of specialized projects.

Old

Riley Purgatory Bluff Creek Watershed District
18681 Lake Drive East
Chanhassen, MN 55317

POSITION TITLE: Community Outreach Coordinator
REPORTS TO: Administrator
SUPERVISES: Office & Outreach Assistant

PRIMARY OBJECTIVE:

The role of the Community Outreach Coordinator is to design, maintain, and implement an Education and Outreach (E&O) Program to protect, manage, and restore water resources. The E&O Program directly contributes to the goals of the District's 10-Year Plan, and improves water quality by leveraging the power of residents, students, professionals, and local leaders to effect change. By fostering an engaged community, the District can increase awareness, grow stewardship, and build capacity to do the shared work of protecting our water resources

ESSENTIAL FUNCTIONS:

1. Engage the District's audiences (residents, youth, businesses/professionals, local leaders) in projects and programs by building and maintaining connections with, and a presence in, the communities it serves.
 - a. Plan and implement formal and informal communication efforts: website and social media, electronic newsletter, press releases, annual communication, and others.
 - b. Manage project specific passive (ex: flyers, articles) and active (ex: community meetings, tours, open houses) engagement.
2. Build community awareness of local resources, issues, and best practices. Tailor strategies to present complex and/or technical issues in a manner appropriate for each audience.
 - a. Coordinate youth education programs and opportunities.
 - b. Coordinate outreach and trainings for local leaders, businesses, and professionals.
 - c. Develop events/programs for residents that include educational and recreational opportunities.
3. Provide resources to increase stewardship within the community. Identify and respond to District and community resource needs.
 - a. Manage the Cost Share Program, including organizing site visits, leading funding recommendation committees, preparing funding recommendations and grant agreements, and tracking individual grant budgets and reimbursement requests.
 - b. Coordinate and present at workshops, trainings, and community events.
4. Build community capacity by working with audiences to develop a network of watershed champions.
 - a. Build connections with existing community groups and volunteer organizations.
 - b. Identify opportunities for partnership and collaboration.
 - c. Develop, manage and supervise volunteer programs.
5. Collect data, evaluate, and adjust the E&O program to improve effectiveness.
6. Other
 - a. Supervise Office & Outreach assistant.
 - b. Manage projects as assigned by District Administrator.
 - c. Research and stay up to date on developments in the fields of water resources, facilitation, education, and communications.
 - d. Serve as liaison to Citizen Advisory Committee.
 - e. Supervise District interns, service learners, and volunteers as appropriate.
 - f. Assist District staff as needed (ex. data collection).
 - g. Other duties as assigned.

REQUIRED KNOWLEDGE & SKILLS

1. Bachelors in environmental science/natural resources, or education/communications.
2. 5 years of related experience.
3. Understanding of the principals of stormwater management and aquatic ecosystems.
4. Project or program management experience.
5. Supervisory experience.
6. Adobe Creative Suite proficiency.
7. Ability to present and communicate effectively to a wide range of audiences.
8. Experience working with K-12 students, either formally or informally.
9. Availability to work evenings and weekends.
10. Ability to manage multiple deadlines concurrently.
11. Valid driver's license.

DESIRED KNOWLEDGE & SKILLS

1. Masters degree in environmental science/natural resources, or education/communications.
2. Project WET certification.
3. Graphic design experience.
4. Experience with Zoho CRM.
5. Art of Hosting or similar facilitation training.

SALARY RANGE: \$47,500 – \$62,500

New

Riley Purgatory Bluff Creek Watershed District
18681 Lake Drive East
Chanhassen, MN 55317

POSITION TITLE: Communications and Project Manager
REPORTS TO: Administrator
SUPERVISES: Education & Outreach Coordinator
TYPE: Full-time, exempt from the provisions of the Fair Labor Standards Act.
Pay Grade: 6

PRIMARY OBJECTIVE

The Communications and Project Manager works in partnership with staff, consultants, stakeholders, and member communities to implement Riley Purgatory Bluff Creek Watershed District (District) communications and oversees the Education and Outreach program. This position is also responsible for project management, and will assist in the planning, development and implementation of structural and non-structural best management practices designed to manage, protect and enhance water and natural resources.

PRIMARY DUTIES AND RESPONSIBILITIES

- Oversee formal and informal communication efforts for the District, including District newsletter, social media, press releases, website updates and maintenance, etc.
- Direct the development and oversee the coordination of the District's Education and Outreach Program including budget development.
- Supervise Education and Outreach Coordinator, contractors, consultants, and interns.
- Oversee the integration of education and outreach into capital improvement projects
- Manage the District's Grants Program including the development of budget, RFPs, negotiation of grant agreements, organizing site visits, leading grant funding recommendation committees, preparation of funding recommendation reports, tracking individual projects, grant budgets, reimbursement requests, reporting, and inspection.
- Lead and assist in the planning, development, management and implementation of structural and non-structural best management practices designed to manage, protect and enhance water and natural resources. This includes monitoring scope, schedules and project budgets, consultant/contractor supervision, and project implementation from scoping through closeout.
- Assist in the preparation for regular and special board meetings; routinely attend and participate in board meetings, as assigned.
- Participates as a member of the staff team for District planning, projects, and programs by cooperating with other staff and consultants, contributing ideas, providing comments when requested, and helping where needed.
- Research and stay up to date with developments in the field of water resources.
- Effectively represents water and watershed issues at meetings, conferences, before the media, and to other local units of government, City Departments, the Riley Purgatory Bluff Creek Watershed District Board of Managers, partner organizations, and the public.
- Prepares reports and summaries for the District Administrator and Board of Managers, as required/requested.
- Other duties, as assigned.

KNOWLEDGE, SKILLS AND ABILITIES:

REQUIRED KNOWLEDGE & SKILLS

1. Master's or Bachelor's Degree in Landscape Architecture, Natural Resource Management, Urban Planning, Public Administration, Business Administration, Water Resources Science or a related field and coursework with an ecological or environmental focus. Master's degree preferred, but not required. An equivalent combination of relevant education/experience/professional licenses may be considered.
2. Minimum of five (5) years of related experience including research, public education, management, negotiations, construction site supervision, budget development and management, watershed-based planning, urban environmental planning, development of storm water management systems, preservation/restoration of urban ecosystems.
3. Knowledge of public process in government, urban resource management and environmental issues, storm water management practices, program management techniques, public education/public information, design and graphics, dispute resolution, and group dynamics and interactions.
4. Able to analyze technical reports, and to develop/coordinate/facilitate work teams and individuals.
5. Able to work successfully with considerable independence.
6. Project or program management experience.
7. Supervisory experience.
8. Able to display excellent verbal, written, organizational, and interpersonal communication skills.
9. Availability to work evenings and weekends.
10. Ability to manage multiple deadlines concurrently.
11. Valid driver's license.

DESIRED KNOWLEDGE & SKILLS

1. Master's degree in above fields.
2. Graphic design experience.
3. Facilitation training.
4. Web Management expertise.
5. Social Media Experience.
6. Construction Management training.

Reports to: The Communications and Project Manager reports directly to, and is supervised by, the District Administrator. The position will meet with the District Administrator regularly to prioritize project workload commitments and to discuss issues pertaining to this position.

Old

Organization: Riley-Purgatory-Bluff Creek Watershed District

Position Title: Office & Outreach Assistant

Reports To: Community Outreach Coordinator and the District Administrator

Type of Position: Full-time, exempt from the provisions of the Fair Labor Standards Act

Salary Range: \$35,000 - \$55,000 (hiring range \$35,000 - \$40,000, depending on qualifications), plus paid vacation & personal time off, PERA contributions, medical/dental insurance

POSITION OBJECTIVE

This position assists with the water resource education and outreach programs of the Riley-Purgatory-Bluff Creek Watershed District and day-to-day office activities. The primary objective of this position is to assist in the improvement and protection of the water resources of the Riley-Purgatory-Bluff Creek Watershed by providing water resource education and outreach programs and resources to citizens, community leaders, municipal staff, landowners, schools and others in the Riley-Purgatory-Bluff Creek Watershed District. The secondary objective is to assist in the day-to-day office activities such as room set-up, receipt and organization of District files and documents.

JOB DUTIES AND RESPONSIBILITIES

Outreach (60%)

1. Implement formal and informal education and outreach programs and activities.

a. Implement District education and public outreach activities as assigned, and help meet the goals, and strategies of the District's Education and Outreach Plan. Programs can include but are not limited to:

i. School presentations, fieldtrips, community tabling events, such city open houses and sustainability fairs, and presentations to nonprofits groups and other organizations

ii. Strategies for non-structural, non-point source pollution control, e.g. Water Festivals, storm drain marking projects

iii. Professional trainings for maintenance, operations, and public works staff in both the public and private sector (e.g., snow and ice removal training)

b. Assist with the development of educational materials and literature for the District

c. Coordinate registration and logistics for a wide variety of programs and events

2. Assist with formal and informal communication efforts to reach target audiences in the District.

a. Assist with website updates

b. Contribute newsletter articles and other content to the District's e-newsletter

c. Assist with the District's Annual Report and other written communications

3. Assist with the coordination of education and outreach partnering opportunities.

a. Develop and maintain positive relationships with other entities—cities, schools, universities, agencies, organizations and associations—to promote the RPBCWD's mission and goals through outreach activities

Office (30%)

4. Provides administrative support to the District Administrator

- a. Assists in preparing the annual work plan, annual report, and comprehensive plan
- b. Updates website with monthly agenda, meeting minutes, public notices and other information as required
- c. Prepares all materials for Board packet, including copying, assembling, mailing, emailing
- d. Sends required Legal Notices, Requests for Proposals, etc. as needed to newspapers and posts on District website
- e. Maintains meeting minutes, agendas, resolutions, board packets, and other information in an accurate and timely manner

5. Provides general office support in an efficient and effective manner

- a. Greets and routes visitors Answers calls, takes messages and follows up as appropriate
- b. Prepares, opens and routes mail
- c. Orders and maintains office supplies
- d. Manages electronic mailing lists to assure accuracy
- e. Organizes paper and electronic files efficiently
- f. Sets up meetings, conferences, calls, accommodations, catering, and prepares agendas and handouts as necessary
- g. Maintains District directory containing information on Managers and staff
- h. Prepares correspondence and reports as required in a timely, accurate manner
- i. Coordinates office space and office equipment maintenance

Other duties and responsibilities (10%)

1. Participates as a member of the staff team for District projects and programs by cooperating with other staff and consultants, contributing ideas, providing comments when requested, and helping where needed
2. Provides educational materials and literature reviews as needed for staff, to clients, to the public, for website development, or for program evaluation
3. Works collaboratively with and provides directions as needed to consultants and interns or volunteers
4. Researches and stays up to date with developments in the field of water resources
5. Other duties include but are not limited to:
 - a. Effectively represents water and watershed issues at meetings, conferences, and to other local units of government, City Departments, the Riley-Purgatory-Bluff Creek Watershed District Board of Managers, partner organizations, and the public
 - b. Prepares reports and summaries for the Community Outreach Coordinator, District Administrator and Board of Managers as needed

MINIMUM QUALIFICATIONS: 1-2 years of experience preferred implementing water resource and/or environmental education, outreach and communications programs to a variety of audiences. Bachelor's degree in natural resources with an emphasis in communication, bachelor's degree in Education with experience in natural resources. A graduate degree in a related field may be

considered in lieu of work experience. Knowledge of technical and regulatory water quality and stormwater issues. Demonstrated written, verbal, and presentation skills. Demonstrated networking, team-building, research, coordination, and multi-tasking skills. Ability to work with a diverse public audience. Must have a reliable vehicle and a valid US driver's license with no recent suspensions.

DESIRED QUALIFICATIONS: Understanding of social marketing and behavioral change strategies. Experience with non-formal, non-traditional teaching settings (e.g., outside of classroom, adult learners). Previous experience with local units of government and stormwater education or urban environmental education.

KNOWLEDGE, SKILLS AND ABILITIES

1. Proficiency with a personal computer and Microsoft software packages for word processing, spreadsheet, database management and computer generated graphics, specifically, but not limited to, Microsoft Office, Excel, Word, Access, PowerPoint, Adobe InDesign, Illustrator and Photoshop.
2. Ability to effectively use email and Internet applications and other common software applications.
3. Ability to take direction, work independently with a minimum of supervision, use good time management practices, possess the ability to set priorities and balance large volumes of diverse work.
4. Ability to work collaboratively to develop education and outreach programming with local and agency staff, consultants and associates.
5. Ability to develop and maintain effective working relationships with the District Administrator, the Community Outreach Coordinator, RPBCWD Board of Managers, Citizens Advisory Committee, city and agency staff, members of the public, and other interested parties.
6. Ability to effectively communicate verbally and in written form to a wide variety of audiences ranging from elected officials to K12 students.
7. Creativity in developing and presenting educational information and exhibits.

(The above is intended to describe the general content of and requirements for the performance of this job. It is not to be construed as an exhaustive statement of duties, responsibilities or requirements and does not imply a contract.)

TO APPLY: Submit cover letter, resume, and three references by **December 29, 2017, at 4 PM** to: Claire Bleser via e-mail to: cbleser@rpbcwd.org

New

Organization: Riley-Purgatory-Bluff Creek Watershed District

Position Title: Education & Outreach Coordinator

Reports To: Communication & Project Manager and the District Administrator

Type of Position: Full-time, exempt from the provisions of the Fair Labor Standards Act

Salary Range: \$42,400 - \$63,600, depending on qualifications, plus paid vacation & personal time off, PERA contributions, medical/dental insurance

POSITION OBJECTIVE

This position coordinates the water resource education and outreach programs of the Riley-Purgatory-Bluff Creek Watershed District, under the direction of the Communications & Project Manager and the District Administrator. The primary objective of this position is to assist in the improvement and protection of the water resources of the Riley-Purgatory-Bluff Creek Watershed by providing water resource education and outreach programs and resources to citizens, community leaders, municipal staff, landowners, schools and others in the Riley-Purgatory-Bluff Creek Watershed District. Additionally, this position supports the communications program and works to build District capacity through the implementation and management of a volunteer program.

JOB DUTIES AND RESPONSIBILITIES

Outreach (90%)

- 1. Coordinate, design and implement formal and informal education and outreach programs and activities.** Programs can include but are not limited to:
 - a. School presentations, fieldtrips, community tabling events, such as city open houses and sustainability fairs, and presentations to nonprofits groups and other organizations
 - b. Strategies for non-structural, non-point source pollution control, e.g. Water Festivals, storm drain marking projects
 - c. Professional trainings for maintenance, operations, and public works staff in both the public and private sector (e.g., snow and ice removal training)
 - d. Develop educational materials and literature for the District
 - e. Coordinate registration and logistics for a wide variety of programs and events

- 2. Communicate with target audiences via formal and informal communication efforts.**
 - a. Manage District social media accounts *to* promote district work and goals, via Facebook, Instagram, and Twitter
 - b. Work to effectively reach, understand, and engage diverse and/or underserved audiences
 - c. Assist with website updates
 - i. Update website with monthly agenda, meeting minutes, public notices, and other information as required.
 - ii. Manage online public calendar of upcoming events and meetings
 - iii. Assist with generation of web content
 - d. Contribute newsletter articles and other content to the District's e-newsletter

- e. Assist with the District's Annual Report and other written communications
- f. Assist with project-specific communications of District projects

3. Manage and grow volunteer program at the District

- a. Recruit, coordinate, and manage volunteer participants for Adopt-a-Dock, Master Water Stewards, service learners, and other programs.
- b. Provide and manage opportunities for volunteers
- c. Organize community volunteer events
- d. Grow and formalize volunteer program by fostering new partnerships and improving structure of current programs

4. Coordinate education and outreach partnering opportunities.

- a. Develop and maintain positive relationships with other entities—cities, schools, universities, agencies, organizations and associations—to promote the RPBCWD's mission and goals through outreach activities

5. Provides general office support in an efficient and effective manner

- a. Orders and maintains office supplies
- b. Manages electronic mailing lists to assure accuracy
- c. Sets up meetings, conferences, calls, accommodations, catering, and prepares agendas and handouts as necessary
- d. Maintains District directory containing information on Managers and staff
- e. Prepares correspondence and reports as required in a timely, accurate manner
- f. Coordinates office space and office equipment maintenance

Other duties and responsibilities (10%)

1. Participates as a member of the staff team for District projects and programs by cooperating with other staff and consultants, contributing ideas, providing comments when requested, and helping where needed
2. Provides educational materials and literature reviews as needed for staff, to the public, for website development, or for program evaluation
3. Works collaboratively with and provides directions as needed to consultants and interns or volunteers
4. Researches and stays up to date with developments in the field of water resources
5. Other duties include but are not limited to:
 - a. Effectively represents water and watershed issues at meetings, conferences, and to other local units of government, City Departments, the Riley-Purgatory-Bluff Creek Watershed District Board of Managers, partner organizations, and the public
 - b. Prepares reports and summaries for the Communication and Project Manager, District Administrator and Board of Managers as needed

MINIMUM QUALIFICATIONS: 3 years of experience preferred implementing water resource and/or environmental education, outreach and communications programs to a variety of audiences, managing and recruiting volunteers. Bachelor's degree in natural resources with an emphasis in communication, bachelor's degree in Education with experience in natural resources. A graduate degree in a related field may be considered in lieu of work experience. Knowledge of technical and regulatory water quality and storm

water issues. Demonstrated written, verbal, and presentation skills. Demonstrated networking, team-building, research, coordination, and multi-tasking skills. Ability to work with a diverse public audience. Must have a reliable vehicle and a valid US driver's license with no recent suspensions.

DESIRED QUALIFICATIONS: Understanding of social marketing and behavioral change strategies. Experience with non-formal, non-traditional teaching settings (e.g., outside of classroom, adult learners). Training in volunteer management. Knowledge of Adobe Suites other similar publishing software, and experience in web updates and content design. Previous experience with local units of government and stormwater education or urban environmental education.

KNOWLEDGE, SKILLS AND ABILITIES

1. Proficiency with a personal computer and Microsoft software packages for word processing, spreadsheet, database management and computer generated graphics, specifically, but not limited to, Microsoft Office, Excel, Word, Access, PowerPoint, Adobe InDesign, Illustrator and Photoshop.
2. Ability to effectively use email and Internet applications and other common software applications.
3. Ability to take direction, work independently with a minimum of supervision, use good time management practices, possess the ability to set priorities and balance large volumes of diverse work.
4. Ability to work collaboratively to develop education and outreach programming with local and agency staff, consultants and associates.
5. Ability to develop and maintain effective working relationships with the District Administrator, the Community Outreach Coordinator, RPBCWD Board of Managers, Citizens Advisory Committee, city and agency staff, members of the public, and other interested parties.
6. Ability to effectively communicate verbally and in written form to a wide variety of audiences ranging from elected officials to K12 students.
7. Creativity in developing and presenting educational information and exhibits.

(The above is intended to describe the general content of and requirements for the performance of this job. It is not to be construed as an exhaustive statement of duties, responsibilities or requirements and does not imply a contract.)

2019 Seasonal Staff

Name	Job Title	Program	Season
Emily Kreiter	Water Resources Research Assistant	Hennepin County Chloride	Summer
Tim Toavs	Water Quality Assistant	Data Collection	Summer
Mat Nicklay	Water Quality Assistant	Data Collection	Summer
Abbie Tekiela	Water Quality Assistant	Wetland Program Data Collection	Summer
Emma Nyquist	Water Quality Assistant	Wetland Program Permitting Inspection	Summer
Aimi Dieckel	Artist in residence	Education and Outreach	Summer
Olivia Holstine	Water Quality Assistant	Data Collection Wetland Program	Fall



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

Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2019-008

Considered at Board of Managers Meeting: April 3, 2019

Received complete: February 19, 2019

Applicant: Jay Lotthammer, City of Eden Prairie

Consultant: Adam Pawelk, Hansen Thorp Pellinen Olson, Inc.

Project: Staring Lake Pavilion – reconstruction of the existing Staring Lake park building and surrounding trail, plaza, and parking areas. The project is bounded by Staring Lake Parkway on the west, Pioneer Trail on the south, and Staring Lake on the north. An underground infiltration trench with sump manhole and an infiltration basin will provide storm water runoff rate, volume and quality control.

Location: 14800 Pioneer Trail, Eden Prairie, MN

Reviewer: Heather Hlavaty, E.I.T. and Scott Sobiech, P.E., Barr Engineering

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 3, 2019 meeting of the managers:

Resolved that the application for Permit 2019-008 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 2019-008 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
C	Erosion Control Plan	See comment.	See rule-specific permit condition C1.
D	Wetland and Creek Buffers	Yes	

Rule	Issue	Conforms to RBPCWD Rules?	Comments	
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	Yes.	
		Wetland Protection	Yes.	
L	Permit Fee	NA	Governmental Entity	
M	Financial Assurance	NA	Governmental Entity	

Background

The applicant is reconstructing the existing Staring Lake Park building, the surrounding trail and plaza areas, and a small portion of the adjacent parking area. The site is located near the intersection of Staring Lake Parkway and Pioneer Trail. The project includes an underground rock infiltration trench with a pre-treatment sump catch basin located south of the building on the parking lot island. The overflow from the rock infiltration trench will discharge into an infiltration basin that is to be constructed in the greenspace area just to the west of the existing driveway entrance. The combination of these best management practices provides stormwater runoff rate, volume and quality control. There is a wetland downstream from the proposed land disturbing activities. On April 29, 2016, the applicant provided a wetland delineation report, mapped delineation boundary maps, and MnRAM assessment. According to the MnRAM assessment and RPBCWD, Rule D, Appendix D1, the wetland is rated as a High value wetland. In addition, Staring Lake is located downgradient from the proposed activities.

This project is part of a larger project to reconstruct Staring Lake Park and two permits have previously been issued for other work at the site. Updated project site information based on the proposed design is summarized below in conjunction with previous permit applications for the site.

	2016-005	2018-008	2019-008
Total Site Area (acres)	37.75	37.75	37.75
Existing Site Impervious (acres)	4.02	3.91	4.29

	2016-005	2018-008	2019-008
Existing Impervious Area to be Disturbed and replaced:	0.62 (15% disturbance of site impervious area)	0.48 (12% disturbance of site impervious area)	0.50 (12% disturbance of site impervious area)
New (Increase) in Site Impervious Area (acres)	-0.11 (3% decrease in site impervious area)	0.38 (10% increase in site impervious area)	0.07 (2% increase in site impervious area)
Reconstructed Exempt Impervious Surface	0	0.13	0.44
Total Disturbed Area (acres)	2	2	1.79

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

1. Signed Application dated February 19, 2019
2. Civil Construction Plan Sheets (15 sheets) dated February 14, 2019 (Revised Sheets C4 and C6 on March 18, 2019)
3. Architectural Plan Sheets by DSO Architects (15 sheets) dated February 14, 2019
4. Proposed Conditions Drainage Map dated February 20, 2019
5. Stormwater Management Narrative dated February 20, 2019 (revised March 18, 2019)
6. Geotechnical Evaluation Report by Braun Intertec dated February 12, 2019
7. Standard Test Method for Permeability of Granular Soils by Braun Intertec dated March 15, 2019
8. Electronic HydroCAD and P8 models received on February 20, 2019 (revised March 18, 2019)
9. P8 and HydroCAD model output files received on February 20, 2019 (revised March 18, 2019)

Rule C: Erosion and Sediment Control

Because the project will involve 1.79 acres of land-disturbing activity, 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 Hansen Thorp Pellinen Olson, Inc. includes installation of silt fence, sediment control logs, inlet protection for storm sewer catch basins, a rock construction entrance, erosion control blanket, decompaction of areas compacted during construction, and retention of native topsoil onsite. To conform to the RPBCWD Rule C the following revisions are needed:

- C1. The name and contact information of the general contractor responsible for the site must be provided (this information does not need to be provided prior to making a recommendation to the RPBCWD Board).

Rule D: Wetland and Creek Buffers

Because the proposed work triggers a permit under RPBCWD Rule J (see analysis below) and there is a wetland downgradient from the proposed construction activities, Rule D, Subsections 2.1a and 3.1 require buffer on edge of the wetland downgradient from the area to be disturbed.

On April 29, 2016 the applicant provided a wetland delineation report, mapped delineation boundary maps, and MnRAM assessment. According to the MnRAM assessment and RPBCWD, Rule D, Appendix D1, the wetland is rated as a High value wetland rather than the previously assumed exceptional value wetland. Rule D, Subsection 3.1.a.ii requires high value wetland buffer with an average of 60 feet from the delineated edge of the wetland, minimum 30 feet. The applicant provided a 74 foot average, 30 foot minimum buffer as shown on the revised Wetland Buffer Exhibit dated May 23, 2016. The wetland buffer provided under previously approved permit 2016-005 is also located downgradient from the proposed activities under this application, thus conforming to the average and minimum widths identified in Rule D, Subsection 3.1 for high value wetlands. The applicant provided buffer monument locations consistent with criteria in Rule D, Subsection 3.4. 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 3.5.

The written maintenance agreement was entered into as a part of permit 2016-005 and the buffer has been established and maintained as required. The proposed project conforms to the wetland and creek buffer requirements of Rule D.

Rule J: Stormwater Management

Because the project will disturb 1.79 acres of land-surface area, the project must meet the criteria of RPBCWD's Stormwater Management rule (Rule J, Subsection 2.1). Under paragraph 2.5 of Rule J, Common scheme of development, activities subject to Rule J on a parcel or adjacent parcels under common or related ownership will be considered in the aggregate, and the requirements applicable to the activity under this rule will be determined with respect to all development that has occurred on the site or on adjacent sites under common or related ownership since the date this rule took effect (January 1, 2015). Because different projects were permitted (RPBCWD Permit 2016-005 and 2018-008) on the site, the current activities proposed must be considered in aggregate with the activities proposed under Permit 2019-008. The criteria listed in Subsection 3.1 will apply to the disturbed and new impervious areas proposed for the present project because the project, in aggregate with other permitted activities, only increases the impervious by a total of 12 percent and only disturbs a combined total of 39 percent of the existing impervious surface on the parcel (Rule J, Subsection 2.3).

The developer is proposing construction of a pretreatment sump catch basin prior to runoff entering the rock infiltration trench which overflows to an infiltration basin to provide the rate control, volume abstraction and water quality management on the 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. The proposed project is in conformance with RPBCWD Rule J, Subsection 3.1.a.

2-Year Discharge (cfs)		10-Year Discharge (cfs)		100-Year Discharge (cfs)		10-Day Snowmelt (cfs)	
Ex	Prop	Ex	Prop	Ex	Prop	Ex	Prop
3.4	1.9	7.4	3.8	16.1	7.8	0.4	0.4

Volume Abstraction

Subsection 3.1.b of Rule J requires the abstraction onsite of 1.1 inches of runoff from all new or disturbed impervious surface of the parcel. An abstraction volume of 2,082 cubic feet is required from the 0.50 acres (21,848 square feet) of disturbed and reconstructed, and new impervious area on the site for volume retention.

Soil borings performed by Braun Intertec on February 12, 2019 show that soils in the project area are primarily poorly graded sand. Because groundwater was not encountered in the soil borings while drilling and sampling or after auger removal from the boreholes, the required 3-foot separation between the groundwater elevation and bottom of the infiltration practice is met. The applicant provided permeability testing demonstrating an infiltration rate between 3.0-13.7 inches per hour (in/hr) at the rock trench and 2.6-3.7 in/hr at the proposed infiltration basin. The engineer concurs with the infiltration rates used for the design of the rock trench and infiltration basin, 3.3 in/hr and 1.6 in/hr respectively (Rule J subsection 3.1bii). Based on the design infiltration rate the basin will drawdown within 30 hours (Rule J, subsection 3.1biii)

The table below summarizes the volume abstraction for the site.

	Abstraction Depth (inches)	Abstraction Volume (cubic feet)
Requirement	1.1	2,003
Provided	5.4	10,211

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 a retention pond with infiltration bench and two rain gardens 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. 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) ¹	Provided Load Reduction (lbs/yr)
Total Suspended Solids (TSS)	279.9	251.9 (90%)	259.4 (93%)
Total Phosphorus (TP)	0.90	0.54 (60%)	0.80 (89%)

¹Required load reduction is calculated based on the removal criteria in Rule J, Subsection 3.1c and the load generated from only the disturbed impervious area with exposed underlying soils (0.44 acres) on the site.

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)	178.6	101.1	-77.5
Total Phosphorus (TP)	1.1	0.7	-0.4

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 or less than 1 foot above the emergency overflow according to Rule J, Subsection 3.6. The low floor elevation of the Staring Lake Pavilion and the adjacent stormwater management feature is summarized below. Because the low floor elevation is 1.2 feet above the

emergency overflow from the stormwater facility, the project meets the requirements of Rule J, Subsection 3.6.

Location Riparian to Stormwater Facility	Low Floor Elevation of Building (feet)	100-year Event Flood Elevation of Adjacent Stormwater Facility (feet)	Emergency Overflow Elevation (feet)	Freeboard to Emergency Overflow (feet)
Staring Lake Pavilion	899.70	898.52	898.50	1.2

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.

- J1. Permit applicant must provide a draft maintenance and inspection plan for review and approval by RPBCWD.

Wetland Protection

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 runoff elevation in the subwatershed, for any wetland receiving discharge directly from the land disturbing activities. Because the applicant has demonstrated, and the engineer concurs, that the proposed flow rate and volumes flowing towards the wetland are less than the existing flows, the project meets the Bounce and Inundation criterion. In addition, the proposed rock trench and infiltration basin treat the runoff from the disturbed areas to 93% TSS removal and 89% TP removal, thus conforming to 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. The City of Eden Prairie’s Streets Division Manager, Larry Doig, is authorized to implement the City’s chloride management plan and documentation provided confirms he is certified by the Minnesota Pollution Control Agency as a certified salt applicator (Rule J, subsection 3.8).

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.

Findings

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

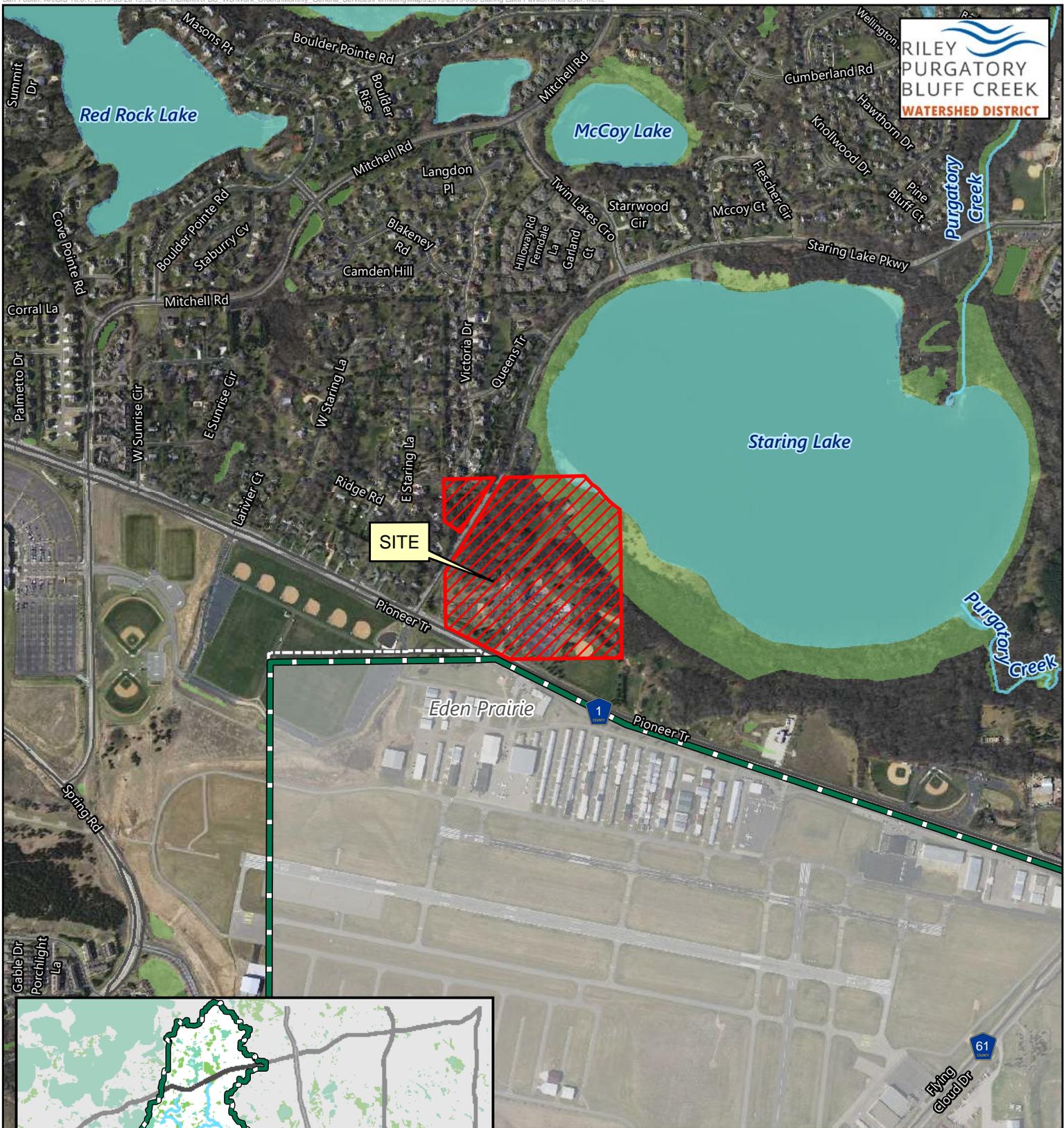
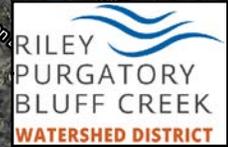
Recommendation:

Approval of the permit issuance contingent upon:

1. Continued compliance with General Requirements.
2. Permit applicant must provide a maintenance and inspection plan for the management of stormwater BMPs. Once approved by RPBCWD, the plan must be documented in a written agreement with the RPBCWD.

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, stormwater facilities conform to design specifications as approved by the District.
2. The work on the Staring Lake Pavilion parcel under the terms of permit 2019-008, 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.



Permit Location Map

STARING LAKE PAVILION
Permit 2019-008
Riley Purgatory Bluff Creek
Watershed District



Feet





March 28, 2019

Claire Bleser
District Administrator
Riley Purgatory Bluff Creek Watershed District
18681 Lake Drive E.
Chanhassen, Minnesota 55317

Dear Claire:

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, 2019.

Please examine these statements and if you have any questions or need additional copies, please call me.

Sincerely,

REDPATH AND COMPANY, LTD.

A handwritten signature in black ink that reads "Mark Gibbs". The signature is written in a cursive style.

Mark C. Gibbs, CPA
Enclosure



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, 2019 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.

A handwritten signature in black ink that reads "Redpath and Company, LTD." in a cursive style.

REDPATH AND COMPANY, LTD.

St. Paul, Minnesota

March 28, 2019

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
Cash Disbursements
February 28, 2019

Accounts Payable:

<u>Check #</u>	<u>Payee</u>	<u>Amount</u>
4747	Barr Engineering	\$28,826.24
4748	Carver County	150.00
4749	CenterPoint Energy	1,046.91
4750	CenturyLink	183.76
4751	Coverall of the Twin Cities	213.68
4752	Jill Crafton	195.93
4753	CSM Financial, LLC	7,413.36
4754	Dunn & Semington, LLC	322.00
4755	Freshwater Society	1,000.00
4756	HDR Engineering, Inc.	1,242.92
4757	HealthPartners	4,455.79
4758	Amy Herbert, LLC	1,851.38
4759	Iron Mountain	89.95
4760	Larry Koch	673.17
4761	Limnotech	525.00
4762	Lincoln National Life Insurance	448.21
4763	MN Association of Watershed Districts	7,500.00
4764	Metro Sales, Inc.	363.99
4765	Metro Watershed Partners	3,000.00
4766	Purchase Power	135.95
4767	Redpath & Company	2,535.31
4768	RMB Environmental Laboratories	2,950.00
4769	Smith Partners	14,089.07
4770	Southwest News Media	1,679.93
4771	SRF	6,622.95
4772	Viking Industrial Sprinkler Co.	71.25
4773	Wenck, Inc.	90.30
4774	Xcel Energy	662.39
4775	David Ziegler	434.57
Total Accounts Payable:		<u><u>\$88,774.01</u></u>

Payroll Disbursements:

Payroll Processing Fee	248.30
Employee Salaries	32,929.16
Employer Payroll Taxes	2,876.74
Employer Benefits (H.S.A. Match)	525.00
Employee Benefit Deductions	(396.26)
Staff Expense Reimbursements	142.94
PERA Match	2,469.66
Total Payroll Disbursements:	<u><u>\$38,795.54</u></u>
Prior years outstanding checks voided:	(1,247.22)
Klein Bank-VISA	2,417.47
TOTAL DISBURSEMENTS:	<u><u>\$128,739.80</u></u>

Memos

The 2019 mileage rate is .58 per mile. The 2018 rate was .54.5
Klein Bank VISA will be paid on-line.

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
Fund Performance Analysis - Table 1
February 28, 2019

	2019 Budget	Fund Transfers	Revised 2019 Budget	Current Month	Year-to-Date	Year-to Date Percent of Budget
REVENUES						
Plan Implementation Levy	\$3,602,500.00	-	\$3,602,500.00	-	-	0.00%
Permit	50,000.00	-	50,000.00	3,500.00	6,550.00	13.10%
Grant Income	708,079.00	-	708,079.00	205,440.00	205,440.00	29.01%
Investment Income	35,000.00	-	35,000.00	5,791.61	26,384.84	75.39%
Past Levies	2,511,789.00	-	2,511,789.00	-	-	0.00%
Partner Funds	432,000.00	-	432,000.00	-	-	0.00%
TOTAL REVENUE	\$7,339,368.00	\$0.00	\$7,339,368.00	\$214,731.61	\$238,374.84	3.25%
EXPENDITURES						
Administration						
Accounting and Audit	42,000.00	-	42,000.00	2,783.61	5,554.21	13.22%
Advisory Committees	5,000.00	-	5,000.00	-	-	0.00%
Insurance and bonds	20,000.00	-	20,000.00	-	-	0.00%
Engineering Services	106,000.00	-	106,000.00	8,822.50	16,664.50	15.72%
Legal Services	78,000.00	-	78,000.00	9,445.68	19,950.50	25.58%
Manager Per Diem/Expense	20,000.00	-	20,000.00	1,502.95	1,502.95	7.51%
Dues and Publications	12,000.00	-	12,000.00	9,179.93	12,499.43	104.16%
Office Cost	144,000.00	-	144,000.00	10,351.28	29,532.75	20.51%
Permit Review and Inspection	135,000.00	(25,000.00)	110,000.00	17,487.99	35,668.52	32.43%
Permit and Grant Database	-	39,900.00	39,900.00	-	-	0.00%
Recording Services	10,000.00	-	10,000.00	1,851.38	2,844.57	28.45%
Staff Cost	550,000.00	-	550,000.00	42,709.13	92,418.75	16.80%
Subtotal	\$1,122,000.00	\$14,900.00	\$1,136,900.00	\$104,134.45	\$216,636.18	19.05%
Programs and Projects						
District Wide						
10-year Management Plan	5,000.00	-	5,000.00	1,442.27	1,825.40	36.51%
AIS Inspection and early response	75,000.00	-	75,000.00	34.78	460.73	0.61%
Cost-share	267,193.00	(14,900.00)	252,293.00	-	-	0.00%
Creek Restoration Action Strategies Phase	-	-	-	-	-	---
Data Collection and Monitoring	186,000.00	-	186,000.00	9,487.16	18,063.72	9.71%
District Wide Floodplain Evaluation - Atlas 14/SMM model	30,000.00	18,000.00	48,000.00	-	-	0.00%
Education and Outreach	119,000.00	-	119,000.00	5,376.72	8,799.40	7.39%
Plant Restoration - U of M	42,000.00	-	42,000.00	-	-	0.00%
Repair and Maintenance Fund *	177,005.00	-	177,005.00	-	-	0.00%
Wetland Management*	145,272.00	-	145,272.00	-	-	0.00%
District Groundwater Assessment	-	-	-	-	-	---
Groundwater Conservation*	130,000.00	-	130,000.00	-	-	0.00%
Lake Vegetation Implementation	75,000.00	-	75,000.00	-	-	0.00%
Opportunity Project*	200,000.00	-	200,000.00	6,622.95	6,622.95	3.31%
TMDL - MPCA	10,000.00	-	10,000.00	-	-	0.00%
Stormwater Ponds - U of M	86,092.00	-	86,092.00	-	-	0.00%
Hennepin County Chloride Initiative	120,800.00	-	120,800.00	-	1,000.00	0.83%
Lower Minnesota Chloride Cost-Share	217,209.00	-	217,209.00	-	-	0.00%
Subtotal	\$1,885,571.00	\$3,100.00	\$1,888,671.00	\$22,963.88	\$36,772.20	1.95%
Bluff Creek						
Bluff Creek Tributary*	291,091.00	-	291,091.00	71.50	396.50	0.14%
Chanhassen High School *	41,905.00	-	41,905.00	-	26.00	0.06%
Wetland Restoration at Pioneer	561,870.00	-	561,870.00	-	-	0.00%
Subtotal	\$894,866.00	\$0.00	\$894,866.00	\$71.50	\$422.50	0.05%
Riley Creek						
Lake Riley - Alum Treatment*	5,000.00	-	5,000.00	-	-	0.00%
Lake Susan Water Quality Improvement Phase 2 *	13,420.00	-	13,420.00	-	-	0.00%
Rice Marsh Lake in-lake phosphorus load	73,983.00	-	73,983.00	-	-	0.00%
Rice Marsh Lake Water Quality Improvement Phase 1	150,000.00	-	150,000.00	-	-	0.00%
Riley Creek Restoration (Reach E and D3)	1,680,562.00	-	1,680,562.00	361.17	797.34	0.05%
Lake Riley & Rice Marsh Lake Subwatershed Assessment	72,500.00	-	72,500.00	-	-	0.00%
Upper Riley Creek Stabilization	425,000.00	-	425,000.00	-	-	0.00%
Subtotal	\$2,420,465.00	\$0.00	\$2,420,465.00	\$361.17	\$797.34	0.03%
Purgatory Creek						
Purgatory Creek Rec Area- Berm/retention area - feasibility/design	50,000.00	-	50,000.00	-	-	0.00%
Lotus Lake in-lake phosphorus load control	105,772.00	-	105,772.00	90.30	90.30	0.09%
Silver Lake Restoration - Feasibility Phase 1	168,013.00	-	168,013.00	-	-	0.00%
Scenic Heights	111,226.00	-	111,226.00	-	-	0.00%
Hyland Lake in-lake phosphorus load control	120,000.00	-	120,000.00	-	-	0.00%
Mitchell Lake Subwatershed Assessment	87,500.00	-	87,500.00	-	-	0.00%
Duck Lake watershed load	213,955.00	-	213,955.00	1,118.50	3,747.00	1.75%
Subtotal	\$856,466.00	\$0.00	\$856,466.00	\$1,208.80	\$3,837.30	0.45%
Reserve	\$160,000.00	(\$18,000.00)	142,000.00	-	-	0.00%
TOTAL EXPENDITURE	\$7,339,368.00	\$0.00	\$7,339,368.00	\$128,739.80	\$258,465.52	3.52%
EXCESS REVENUES OVER (UNDER) EXPENDITURES	\$0.00	\$0.00	\$0.00	\$85,991.81	(\$20,090.68)	

*Denotes Multi-Year Project - See Table 2 for details

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT

Multi-Year Project Performance Analysis - Table 2

February 28, 2019

	Total Project	FUNDING SOURCE			Month Ended 02/28/19	Year To-Date	Lifetime Costs	Remaining
		District funds	Partner Fund	Grants				
Programs and Projects								
District Wide								
District Wide Floodplain Evaluation - Atlas 14/SMM model	48,000.00	48,000.00	-	-	-	-	-	48,000.00
Repair and Maintenance Fund	202,005.00	177,005.00	-	-	-	-	25,000.00	177,005.00
Wetland Management	150,000.00	150,000.00	-	-	-	-	29,728.31	120,271.69
Groundwater Conservation	130,000.00	130,000.00	-	-	-	-	-	130,000.00
Opportunity Project*	200,000.00	200,000.00	-	-	6,622.95	6,622.95	6,622.95	193,377.05
Hennepin County Chloride Initiative	120,800.00	19,000.00	-	101,800.00	-	1,000.00	1,000.00	119,800.00
Lower Minnesota Chloride Cost-Share	217,209.00	20,000.00	-	197,209.00	-	-	-	217,209.00
Stormwater Ponds - U of M	86,092.00	44,092.00	42,000.00	-	-	-	-	86,092.00
Subtotal	\$1,154,106.00	\$788,097.00	\$42,000.00	\$299,009.00	\$6,622.95	\$7,622.95	\$62,351.26	1,091,754.74
Bluff Creek								
Bluff Creek Tributary*	292,362.00	242,362.00	50,000.00	-	71.50	396.50	96,056.04	196,305.96
Chanhassen High School *	508,000.00	208,000.00	100,000.00	200,000.00	-	26.00	451,121.10	56,878.90
Wetland Restoration at Pioneer	561,870.00	450,000.00	0.00	111,870.00	-	-	-	561,870.00
Subtotal	\$1,362,232.00	\$900,362.00	\$150,000.00	\$311,870.00	\$71.50	\$422.50	\$547,177.14	\$815,054.86
Riley Creek								
Lake Riley - Alum Treatment 1st dose *	260,000.00	260,000.00	-	-	-	-	254,999.83	5,000.17
Lake Susan Water Quality Improvement Phase 2 *	662,491.00	330,000.00	99,091.00	233,400.00	-	-	649,070.80	13,420.20
Rice Marsh Lake in-lake phosphorus load	150,000.00	150,000.00	-	-	-	-	76,017.94	73,982.06
Riley Creek Restoration (Reach E and D3) *	1,565,000.00	1,265,000.00	300,000.00	-	361.17	797.34	181,292.49	1,383,707.51
Lake Riley & Rice Marsh Lake Subwatershed Assessment	72,500.00	12,500.00	5,000.00	55,000.00	-	-	-	72,500.00
Upper Riley Creek Stabilization	450,000.00	450,000.00	0.00	-	-	-	-	450,000.00
Subtotal	\$3,159,991.00	\$2,467,500.00	\$404,091.00	\$288,400.00	\$361.17	\$797.34	\$1,161,381.06	\$1,998,609.94
Purgatory Creek								
Purgatory Creek Rec Area- Berm/retention area - feasibility/design	50,000.00	50,000.00	-	-	-	-	-	50,000.00
Lotus Lake in-lake phosphorus load control	345,000.00	345,000.00	-	-	90.30	90.30	239,317.34	105,682.66
Scenic Heights	260,000.00	165,000.00	45,000.00	50,000.00	-	-	148,773.76	111,226.24
Mitchell Lake Subwatershed Assessment	87,500.00	12,500.00	5,000.00	70,000.00	-	-	-	87,500.00
Duck Lake watershed load	220,000.00	220,000.00	-	-	1,118.50	3,747.00	9,791.50	210,208.50
Subtotal	\$962,500.00	\$792,500.00	\$50,000.00	\$120,000.00	\$1,208.80	\$3,837.30	\$397,882.60	\$564,617.40
Total Multi-Year Project Costs	\$6,638,829.00	\$4,948,459.00	\$646,091.00	\$1,019,279.00	\$8,264.42	\$12,680.09	\$2,168,792.06	\$4,470,036.94

Riley Purgatory Bluff Creek Watershed District
Balance Sheet
As of February 28, 2019

ASSETS

Current Assets

General Checking-Klein	\$799,977.42
Checking-Klein/BMW	1,021,302.69
Investments-Standing Cash	3,466.03
Investments-Wells Fargo	4,114,835.02
Accrued Investment Interest	8,670.64
Due From Other Governments	130,547.73
Taxes Receivable-Delinquent	20,556.16
Pre-Paid Expense	27,361.36
Security Deposits	7,244.00

Total Current Assets: \$6,133,961.05

LIABILITIES AND CAPITAL

Current Liabilities

Accounts Payable	\$188,710.15
Retainage Payable	13,469.38
Salaries Payable	18,017.81
Permits & Sureties Payable	761,416.00
Deferred Revenue	20,556.16
Unavailable Revenue	6,666.16

Total Current Liabilities: \$1,008,835.66

Capital

Fund Balance-General	\$4,183,185.70
Fund Balance	\$941,939.69

Total Capital \$5,125,125.39

Total Liabilities & Capital \$6,133,961.05

RILEY PURGTORY BLUFF CREEK WATERSHED DISTRICT
Klein Bank VISA Activity
February 28, 2019

DATE	PURCHASED FROM	AMOUNT	DESCRIPTION	ACCOUNT #	RECEIPT
02/06/19	Kowalski's	128.58	Board Meeting Food	10-00-4010	Y
02/11/19	Microsoft	127.89	Software	10-00-4203	Y
02/13/19	Target	12.87	Office Supplies	10-00-4200	Y
02/14/19	GoGoAir.com	32.00	Staff Travel	10-00-4320	Y
02/14/19	Center for Watershed Protection	500.00	Membership Dues	10-00-4245	Y
02/14/19	Center for Watershed Protection	740.00	Training & Education	10-00-4265	Y
02/14/19	Delta Airlines	506.00	Staff Travel	10-00-4320	Y
02/21/19	Verizon	350.54	Phones	10-00-4240	Y
02/26/19	Randy's Sanitation	65.84	Trash Service	10-00-4220	Y
02/26/19	O'Reilly Auto	42.93	Vehicle Supplies	10-00-4322	Y
02/26/19	Kowalski's	9.99	Office Supplies	10-00-4200	Y
03/01/19	Kowalski's	15.00	Board Meeting Food	10-00-4010	Y
03/09/19	Quill	428.51	Office Supplies	10-00-4200	Y
03/10/19	Microsoft	120.96	Software	10-00-4203	Y
03/11/19	Cub Foods	35.91	Office/Meeting Supplies	10-00-4205	Y
03/12/19	Quill	109.31	Office Supplies	10-00-4200	Y
03/14/19	Ikea	83.85	Office Supplies	10-00-4200	Y
03/15/19	USPS PO	4.05	Office Supplies	10-00-4200	Y
		\$3,314.23	General Administration Total		
02/11/19	Kwik Trip	52.18	Vehicle Gas	20-05-4322	Y
02/12/19	Eden Prairie Chamber of Commerce	575.00	Membership Dues	20-08-4245	Y
02/12/19	Kowalski's	20.85	Meeting Supplies	20-08-4205	Y
02/13/19	Walgreen's	37.61	Windows to the Watershed	20-08-4205	Y
02/15/19	Facebook	25.00	Facebook Advertisement	20-08-4275	Y
02/16/19	Facebook	1.49	Facebook Advertisement	20-08-4275	Y
02/15/19	SuperAmerica	40.80	Vehicle Gas	20-05-4322	Y
02/19/19	Eddie Bauer	51.54	Wetland Management Supplies	20-13-4201	Y
02/19/19	Home Depot	43.86	Data Collection Supplies	20-05-4201	Y
02/19/19	Menards	6.37	Data Collection Supplies	20-05-4201	Y
02/20/19	Kowalski's	29.06	Meeting Supplies	20-08-4205	Y
02/25/19	ShopFLS	461.40	Data Collection Supplies	20-05-4201	Y
02/26/19	Amazon	49.50	Data Collection Supplies	20-05-4201	Y
02/26/19	Bruegger's Bagels	28.98	Meeting Supplies	20-08-4205	Y
02/26/19	Kowalski's	24.27	Riley Purgatory AIS Meeting	20-15-4345	N
02/28/19	AWRA	50.00	Training & Education	20-08-4265	Y
02/28/19	Home Depot	25.18	Data Collection Supplies	20-05-4201	Y
02/28/19	Hedbergs LS and Mason	5.08	Data Collection Supplies	20-05-4260	Y
03/01/19	Frattalone's Eden Prairie	13.97	Data Collection Supplies	20-05-4201	Y
03/04/19	Amazon	49.50	Secchi Disks	20-05-4635	Y
03/04/19	SODAQ	180.91	Pond Study	40-07-4201	Y
03/04/19	SODAQ	144.73	Pond Study	50-09-4201	Y
03/04/19	Hologram	31.11	Pond Study	40-07-4201	Y
03/04/19	Hologram	24.88	Pond Study	50-09-4201	Y
03/04/19	Voltaic	219.42	Pond Study	40-07-4201	Y
03/04/19	Voltaic	175.53	Pond Study	50-09-4201	Y
03/04/19	Pololu Corporation	25.59	Pond Study	40-07-4201	Y
03/04/19	Pololu Corporation	20.47	Pond Study	50-09-4201	Y
03/04/19	Amazon	106.49	Pond Study	40-07-4201	Y
03/04/19	Amazon	85.19	Pond Study	50-09-4201	Y
03/05/19	DigiKey	5.89	Pond Study	40-07-4201	Y
03/05/19	DigiKey	4.72	Pond Study	50-09-4201	Y
03/04/19	McMaster Carr	80.12	Pond Study	40-07-4201	Y
03/04/19	McMaster Carr	64.09	Pond Study	50-09-4201	Y
03/06/19	Adafruit	114.16	Pond Study	40-07-4201	Y
03/06/19	Adafruit	91.33	Pond Study	50-09-4201	Y
03/08/19	Amazon	31.90	Education Supplies	20-08-4260	Y
03/08/19	Amazon	33.30	Pond Study	40-07-4201	Y
03/08/19	Amazon	26.64	Pond Study	50-09-4201	Y

RILEY PURGTORY BLUFF CREEK WATERSHED DISTRICT
Klein Bank VISA Activity
February 28, 2019

DATE	PURCHASED FROM	AMOUNT	DESCRIPTION	ACCOUNT #	RECEIPT
03/10/19	Amazon	86.39	Education Supplies	20-08-4260	Y
03/11/19	The UPS Store	8.15	Pond Study	40-07-4201	Y
03/11/19	The UPS Store	6.52	Pond Study	50-09-4201	Y
03/11/19	Osh Park	19.11	Pond Study	40-07-4201	Y
03/11/19	Osh Park	15.29	Pond Study	50-09-4201	Y
03/11/19	Amazon	29.95	Pond Study	40-07-4201	Y
03/11/19	Amazon	23.96	Pond Study	50-09-4201	Y
03/11/19	Amazon	248.61	Pond Study	40-07-4201	Y
03/11/19	Amazon	198.88	Pond Study	50-09-4201	Y
03/12/19	DigiKey	9.61	Pond Study	40-07-4201	Y
03/12/19	DigiKey	7.68	Pond Study	50-09-4201	Y
03/12/19	McMaster Carr	19.54	Pond Study	40-07-4201	Y
03/12/19	McMaster Carr	15.63	Pond Study	50-09-4201	Y
03/12/19	U of M Continued Learning	215.00	Training & Education	20-08-4265	Y
03/12/19	Webstaurant Store	266.53	Data Collection Supplies	20-05-4200	Y
03/13/19	Amazon	11.24	Pond Study	40-07-4201	Y
03/13/19	Amazon	9.00	Pond Study	50-09-4201	Y
03/12/19	Delta	396.60	Staff Travel	20-08-4320	Y
03/14/19	SuperAmerica	50.02	Vehicle Gas	20-05-4322	Y
03/16/19	Facebook	18.50	Facebook Advertisement	20-08-4275	Y
		\$4,714.32	District-Wide Total		
		\$8,028.55	GRAND TOTAL		

Riley-Purgatory-Bluff Creek Watershed District Permit Application Review

Permit No: 2019-004

Received complete: March 7, 2019

Considered at Board of Manager's Meeting: April 3, 2019

Applicant: City of Eden Prairie; Mary Krause

Consultant: Bolton and Menk, Tim Olson

Project: Duck Lake Road Reconstruction – the project proposes to reconstruct Duck Lake Road from Duck Lake Trail to Mallard Court, replacing a waterbody crossing, and filling a portion of the Duck Lake floodplain. The applicant proposes stormwater management facilities including one infiltration basin and a proprietary hydrodynamic separator to provide water quality treatment, volume abstraction and rate control for runoff prior to discharging offsite.

Location: Duck Lake Road from Duck Lake Trail to Mallard Court in Eden Prairie

Reviewer: Jay Hawley E.I.T. and Scott Sobiech, PE Barr Engineering

Applicable Rule Conformance Summary

Rule	Issue	Conforms to RPBCWD Rules?	Comments	
B	Floodplain Management and Drainage Alterations	No	See Rule K variance request for providing compensatory storage.	
C	Erosion Control Plan	See Comment	See Rule Specific Permit Condition C1.	
D	Wetland and Creek Buffers	See Comment	See Rule Specific Permit Condition D1-D2.	
F	Streambank and Shoreline Stabilization	Yes		
G	Waterbody Crossings and Structures	No	See Rule Specific Permit Conditions G1-G2 and Rule K variance request for no net increase in flood stage.	
J	Stormwater Management	Rate	No	Rule K variance request for rate control.
		Volume	Yes	
		Water Quality	No	Rule Specific Permit Condition J1 and Rule K variance request for treating offsite runoff.
		Low Floor Elev.	Yes	
		Maintenance	See Comment	See Rule Specific Permit Condition J2.
		Chloride Management	Yes	
		Wetland Protection	See Comment	See Rule Specific Permit Condition J3.
K	Variances and Exceptions	See Comment	See Rule K Variance Request.	

Rule	Issue	Conforms to RPBCWD Rules?	Comments
L	Permit Fees	NA	Governmental Agency
M	Financial Assurances	NA	Governmental Agency

Potential Board Variance Action

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 3, 2019, meeting of the managers and the managers’ findings, as well as the factual findings in the permit report that follows:

Resolved that variances [1, 3, 4 and 5] for Permit 2019-004 are approved based on the facts and analysis provided by the RPBCWD engineer below and at the April 3, 2019, meeting of the managers and the managers’ findings in the record of the April 3 meeting, and subject to the following conditions:

1. [CONDITION(S)]

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 3, 2019 meeting of the managers:

Resolved that the application for Permit 2019-004 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 variances and permit have been affirmatively resolved, the RPBCWD president or administrator is authorized and directed to sign and deliver to the applicant, Permit 2019-004 on behalf of RPBCWD.

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

Project Description

The proposed project and associated compliance measures involve the following elements:

- Reconstruction of Duck Lake Road and associated driveways within the right of way from Duck Lake Trail to Mallard Court. The project involves linear roadway reconstruction of approximately 2,240 feet of Duck Lake Road.
- Construction of approximately 660 feet of 10-foot wide trail between Petterborg Road and Padons Road, through Duck Lake. The other portions of the trail to be constructed on the west side of Duck Lake Road between Duck Lake Trail and Pavelka Drive, roughly 1,050 feet, is proposed to be 8 feet wide.
- Construction of 1,050 feet of 5-foot wide sidewalk is proposed on the east side of Duck Lake Road.
- Replacing the existing 12-inch culvert (waterbody crossing) under Duck Lake Road that connects the east and west cells of Duck Lake with an 8-foot wide by 4-foot high box culvert. By increasing the size of the crossing under Duck Lake Road the applicant is reducing the flood elevation of the western cell of Duck Lake by distributing the stored water over the entire surface area of Duck Lake (both the west and east cells).
- Constructing or reconstructing six outfalls into Duck Lake.
- Filling a portion of the Duck Lake floodplain to reconstruct Duck Lake Road and construct a 10 foot wide trail on the west side of the roadway and providing partial compensatory storage.
- Constructing a stormwater infiltration basin to treat runoff from about 0.1 acres of Duck Lake Road and 1.4 acres of impervious surface from Prairie View Elementary School. In addition, a proprietary hydrodynamic separator is proposed to treat runoff from 0.4 acres of Duck Lake Road. The proposed best management practices are needed to provide water quality treatment, volume abstraction, and rate control for runoff prior to discharging offsite. The applicant is also proposing four proprietary pretreatment structures to remove coarse particles from runoff from the portion of the reconstructed Duck Lake Road through Duck Lake.
- Construction of a French drain within an existing drainage and utility easement on a portion of 17208 Padons Drive, 17216 Padons Drive, 6836 Duck Lake Road, 17209 Duck Lake Trail, and 17217 Duck Lake Trail to help improve the ability of the low area to dry between storm event.
- Dedication of wetland buffers to the limits of right of way around wetland 05-33-A, which is disturbed by the project.

The following water resources are within the project site or downgradient of the proposed activities. Table 1 provides a brief explanation of how each resource is implicated in the permit application review process.

Table 1 Water Resources potential impacts by proposed project

Water Resource	Potential resource impacts
Duck Lake (a.k.a. Public Water 27-069P)	Changing the waterbody crossing in contact with the bed of Duck Lake and constructing/reconstructing six outfalls into the lake.
Wetland 05-33-A (Western portion of Duck Lake, PW 27-069P)	A portion of the wetland will be filled to reconstruction Duck Lake Road

The work is proposed within the city of Eden Prairie right of way, on a portion of a parcel owned by Independent School District 272 (i.e. Prairie View Elementary School), and within an existing drainage and utility easement on 17208 Padons Drive, 17216 Padons Drive, 6836 Duck Lake Road, 17209 Duck Lake Trail, and 17217 Duck Lake Trail.

The project site information (within RPBCWD) is summarized in Table 2.

Table 2. Project site information

	Project Total
Existing Site Impervious (acres)	1.5
Existing Impervious Area Disturbed (acres)	1.5
New (Increase) in Site Impervious Area (acres)	0.38
Proposed Impervious Area (acres)	1.88
Exempt Trail and Sidewalk Area (acres)	0.31
Total Disturbed Area (acres)	3.5
Total Site Area (acres)	3.5

Exhibits:

The following list is a summary of the dates materials were provided for review.

1. Pre-application submittal materials received September - December, 2018, permit application submittal materials received January 22 and February 12, 2019 and revised submittal received March 7, 2019 including
 - a. Pre-application Materials
 - i. Duck Lake outlet information received from the City of Eden Prairie on September 28, 2018.

- ii. Draft Stormwater Narrative dated November, 2018
- iii. SSA Models for Existing and Proposed conditions received December 10, 2018
- b. Riley Purgatory Bluff Creek Watershed District – Permit Application Submittal: Duck Lake Road Improvements Project, Eden Prairie, MN dated January 2019 (revised March 2019)
 - i. Stormwater Narrative dated January 22, 2019 (revised March 8, 2019)
 - ii. Signed permit application dated January 18, 2019
 - iii. Variance Requests for compensatory flood storage, wetland buffer width, no net increase in flood stage, rate control, water quality and wetland protection received January 22, 2019 (revised March 7, 2019)
 - iv. SSA Models for Existing and Proposed conditions received February 12, 2019 (revised March 7, 2019 and March 26, 2019)
 - v. Report Of Geotechnical Exploration and Review by AET dated May 30, 2018
 - vi. Report Of Geotechnical Report Limitation and Guidelines for Use by AET dated May 22, 2018
 - vii. Report of Double Ring Infiltrometer Testing by AET dated July 9, 2018
 - viii. MIDS calculator for Existing and Proposed conditions February 12, 2019 (revised March 7, 2019, and March 26, 2019)
 - ix. Minnesota Wetland Conservation Act Notice of Decision Type and Boundary Determinations for wetland W1-A (West Duck Lake) and W1-B (East Duck Lake) along Duck Lake Road between Mallard Court and Padons Drive dated September, 2018 by Bolton & Menk
 - x. Duck Lake Road Improvements – Local Road Wetland Replacement Plan Application by Bolton and Menk dated August 28, 2018
 - xi. Duck Lake Outfall– Wetland Delineation report by Bolton & Menk dated September 5, 2018
 - xii. MnRAM Site Response Report for wetland 27-116-22-08-001 received on March 5, 2019
 - xiii. Certificates of Survey at 17040 and 17060 South Shore Lane received January 22, 2019
 - xiv. Agreements received January 22, 2019
 - xv. Partial set of Construction Plans dated January 22, 2019 (additional plans received February 12, 2019; 95% plans received February 26, 2019; revisions dated March 5, 2019)
 - xvi. RPBCWD Erosion Intensity Worksheet received March 7, 2019
 - xvii. Pedestrian Facility Option cost comparison table received on March 7, 2019
 - xviii. Draft Maintenance Agreement, including information for the SciClone and Rain Guardian facilities, received on March 7, 2019

2. Correspondence providing applicant with comments after November 21, 2018 meeting sent on November 26, 2019
3. Correspondence providing applicant with a summary of Board of Manager comments from the December 5, 2018 workshop sent on December 7, 2019
4. Correspondence informing applicant of incomplete submittal (January 22, 2019) and preliminary review comments sent on February 7, 2019
5. Applicant's response to RPBCWD February 7, 2019 preliminary comments on pre-application submittal received on February 12, 2019
6. RPBCWD Erosion Intensity Worksheet requested by and sent to applicant on February 13, 2019.
7. Applicant's response to RPBCWD February 7, 2019 comments received March 7, 2019
8. Applicant's response to RPBCWD March 21, 2019 verbal comments received March 23, 2019

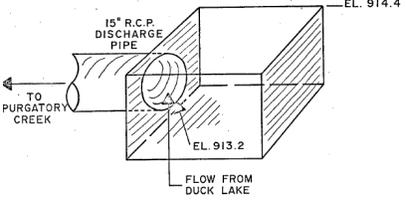
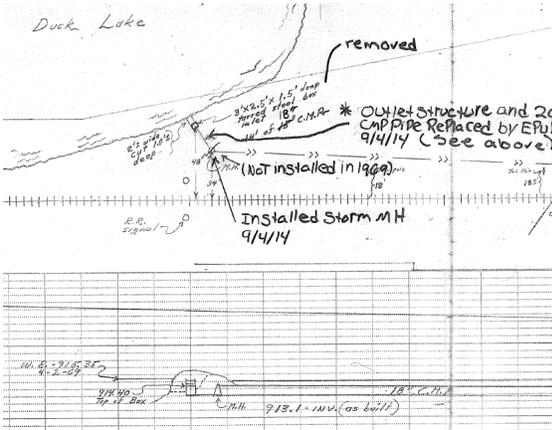
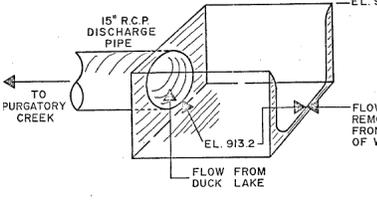
Department of Natural Resources Permitting

Because the project proposes to fill a portion of the Duck Lake floodplain and provide a waterbody crossing in contact with the bed of Duck Lake, the determination of the 100-year flood elevation of Duck Lake is a critical element of the analysis necessary to assess compliance of the project with RPBCWD rules. In 2014, the RPBCWD completed hydrologic and hydraulic (H&H) modeling for the Purgatory Creek watershed and established the flood elevation for the 1 percent chance event (the 100-year flood elevation) for Duck Lake to be 916.1 feet based on the best available data. As part of the Duck Lake Road permit application the applicant supplied information about the Duck Lake outlet that is different than what was used in the district's H&H modeling. The city's data show that the outlet is an 18-inch CMP at elevation 913.28 mean sea level (M.S.L.) rather than a box weir structure at elevation 914.4 M.S.L. connected to a 15-inch pipe as depicted in the 1969 as-built drawings. Table 3 illustrates the Duck Lake outlet configurations.

The data submitted by the city also show that the lake outlet was replaced in 2014 by the city of Eden Prairie. In 2014 the city of Eden Prairie under took the outlet replacement by surveying the elevation of the discharge pipe at the outlet and replacing it with a new discharge pipe at the same elevation. Department of Natural Resources staff have indicated to RPBCWD that no DNR permit was applied for or issued to modify the Duck Lake outlet in 2014. (DNR provided RPBCWD with its 1979 project file for a city request to modify the outlet. According to the file, the 1979 outlet modification request, which proposed lowering the outlet, was denied by the DNR. (The request, DNR denial, and an associated RPBCWD letter are attached for reference.) The DNR's file for this matter clearly shows the control elevation for Duck Lake was established in 1969 by a steel box structure at elevation 914.4 M.S.L. (1.12 feet higher than the existing condition). The photos in the middle column of Table 3 illustrate that the steel box structure was modified sometime after 1969 by removing one of the sides (consistent with the City's 1979 request), thus changing the control elevation of the lake. As noted, information provided by

Eden Prairie staff indicates the outlet elevation is controlled by the 18-inch CMP pipe at elevation 913.28 M.S.L.

Table 3. Duck Lake Outlet information

1969 Duck Lake Outlet	DNR Denied Modification Configuration and 2014 Observed Outlet	2014 Reconstructed Outlet
 <p>Source: Exhibit B in Duck Lake Outlet Control Level memo dated 2/12/79 from Carl Jullie, City of Eden Prairie Director of Public Works</p>  <p>Source: Marked up 1969 As built 2355 provided by Eden Prairie 9/28/18</p>	 <p>Source: Exhibit B in Duck Lake Outlet Control Level memo dated 2/12/79 from Carl Jullie, City of Eden Prairie Director of Public Works</p>  <p>Photo source: Email Mary Krause, Sr. Project Engineer, dated 9/28/19</p>	 <p>Photo source: Email Mary Krause, Sr. Project Engineer, dated 9/28/19</p>
<p>Control Feature: Box Weir Structure with 15-inch CMP</p> <p>Control Elevation: 914.4 M.S.L.</p>	<p>Control Feature: 18-inch CMP</p> <p>Control Elevation: 913.28 M.S.L.</p>	<p>Control Feature: 18-inch CMP</p> <p>Control Elevation: 913.28 M.S.L.</p>

The DNR has indicated that the city will need to obtain DNR approval for the revised lake elevation.

This regulatory uncertainty notwithstanding, the city has elected to pursue an RPBCWD permit for the Duck Lake Road work using the 2014 information and lake level measurements. By placing the 2014 Duck Lake outlet configuration in the RPBCWD's H&H model, RPBCWD's engineer was able to confirm

that the existing 100-year, 24-hour flood elevation predicted by the applicant's modeling matches the elevation predicted by RPBCWD H&H model. The applicant's modeled existing 100 year flood elevation for the 100-year, 24 hour event was 915.04 M.S.L. for the eastern portion of Duck Lake and 916.49 M.S.L. west of Duck Lake Road. However, the 100-year, 10-day snowmelt event yielded a slightly higher flood elevation of 915.17 M.S.L. Therefore, the 100-year flood elevation for the portion of the lake east of Duck Lake Road is 915.17 M.S.L.

Because the project proposes to fill a portion of the Duck Lake floodplain and provide a waterbody crossing in contact with the bed of Duck Lake, the modeling and permit analysis associated with the submittal are very dependent on the outlet from Duck Lake. Therefore, should the DNR require that the lake outlet be restored to its original permitted or another elevation, a permit modification would be required to demonstrate the proposed project remains compliant with RPBCWD requirements.

Rule A: Procedural Requirements

Because the proposed project includes undertaking an activity for which a RPBCWD permit is required, the city of Eden Prairie must obtain the required permit prior to commencing the activity that is regulated by the District and must conform to the RPBCWD's Procedural Requirements (Rule A).

Rule A, Subsection 2.1 requires that an application bearing the original signature of the property owner(s) must be submitted to the District to obtain a permit. The city of Eden Prairie submitted an application signed by a senior project engineer on behalf of the city. Because the construction of the infiltration basin on ISD 272 property is part of the project, the City provided documentation demonstrating that the necessary land-use rights have been obtained for the proposed activities. The construction drawings also indicate that a portion of the proposed storm sewer utility work will take place within an existing drainage and utility easement on 17208 Padons Drive, 17216 Padons Drive, 6836 Duck Lake Road, 17209 Duck Lake Trail, and 17217 Duck Lake Trail.

Rule B: Floodplain Management and Drainage Alterations

Because the proposed project involves the placement of fill below the 100-year flood elevation of Duck Lake and altering surface flow below the 100-year flood elevation, the project activities must conform to the RPBCWD's Floodplain Management and Drainage Alterations rule (Rule B).

Because the project does not proposed to construct or reconstruct structures that have low floors, Rule B subsection 3.1 does not apply.

Table 4 below summarizes the locations where filling of land below the 100-year flood elevation is proposed in waterbodies on the site.

Table 4. Compensatory storage analysis

Waterbody ID	Floodplain Description	Floodplain Fill (CY)	Compensatory Storage Provided (CY)	100-year Flood Elevation (M.S.L.)	Cause of Impact
Public Water 27-069P	Duck Lake	1,151	118	915.17 (East) 916.49 (West)	Fill from proposed Duck Lake Road reconstruction and trail

The 118 cubic yards of compensatory proposed is a combination of excavation in the SW quadrant of Pardons and duck Lake Road, storage in the proposed storm sewer, and storage in the proposed box culvert under Duck Lake Road. The supporting materials demonstrate, and the RPBCWD Engineer concurs, that fill will be placed and only 10.3% of the required compensatory storage will be created below the 100-year flood elevation as summarized in the table above, resulting in a net decrease in the floodplain storage. Because the project plans do not comply with the compensatory storage requirement, the Applicant has requested a variance from the criteria of Rule B, Subsection 3.2. (see variance discussion below). The City is also proposing to upsize the existing 12-inch corrugated metal culvert under Duck Lake Road with a 8-foot wide by 4-foot high reinforced concrete box culvert to reduce the flood risk for 23 parcels west of Duck Lake Road. Because an independent analysis of the floodplain fill and culvert upsizing was not provided by the applicant the effects of the project on flood risk, basin or channel stability, groundwater hydrology, stream base flow, water quality or aquatic or riparian habitat (Rule B, Subsection 3.3) is included under the variance analysis.

The design plans include temporary and permanent erosion control measures as well as appropriate site restoration methods (Rule B, Subsection 3.5). The design plans also include a note indicating that 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 (Rule B, Subsection 3.6).

Aside from the variance request for the lack of compensatory storage, the project is in conformance with RPBCWD Rule B. Filling in a public water is outside the scope of actions authorized by DNR General Permit 2015-1192. As such, if the RPBCWD permit is issued, it will not constitute authorization of the proposed work for purposes of DNR Work in Waters rule (Minn. R. ch. 6115) or any other state regulatory purposes. The applicant must, at a minimum, obtain a project-specific permit from DNR for placing fill below the OWH of Duck Lake.

Rule C: Erosion and Sediment Control

Because the project will alter more than 3.1 acres of surface area the project must conform to the requirements in the RPBCWD Erosion Prevention and Sediment Control rule (Rule C, Subsection 2.1).

The erosion control plans prepared by Bolton and Menk include installation of silt fence, sediment control log, floating silt curtain, inlet protection for storm sewer catch basins, placement of a minimum of 6 inches of topsoil, decompaction of pervious areas compacted during construction prior to topsoil placement, 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 general contractor responsible for the site. RPBCWD must be notified if the responsible party changes during the permit term.

Rule D: Wetland and Creek Buffers

Because the proposed work triggers a permit under RPBCWD Rules B, , F, G and J and one wetland will be disturbed by the proposed construction activities, Rule D, Subsections 2.1a and 3.1 requires buffer around the entirety of wetland disturbed by the proposed work. The local governmental unit (LGU) responsible for administering the Wetland Conservation Act (city of Eden Prairie) issued a WCA notice of decision indicating the portion of Duck Lake west of Duck Lake Road was a type 2/3/4 wetland (Wetland 05-33-A).

The applicant provided a wetland delineation report dated August 28, 2018. Minnesota Wetland Conservation Act Notice of Decision, dated August 16, 2017, was included with the submittal. The MnRAM analyses submitted indicates that the wetland is high value (Appendix D1). Rule D, Subsection 3.1.a.iii requires a wetland buffer with an average of 60 feet from the delineated edge of the wetland, minimum 30 feet. The buffer widths are summarized in the Table 5.

Table 5. Wetland buffer analysis

Wetland ID	RPBCWD Wetland Value	Required Minimum Width ¹ (ft)	Required Average Width ¹ (ft)	Provided Minimum Width (ft)	Provided Average Width (ft)
Wetland 05-33-A	High	30	60	7	7.3

¹ Average and minimum required buffer width under Rule D, Subsection 3.1.a.

The Applicant provided buffer zone and marker location information on the construction drawings confirming that the proposed buffer area extends to the right-of-way limits. The Applicant is proposing revegetating disturbed areas within the proposed buffer with native vegetation in conformance 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 3.5.

The Applicant requested a variance from the criteria of Rule D, Subsection 3.2 for not providing the average or minimum buffer width. Because the proposed buffer extends to the available right of way limits will meet the 3.2 requirement, the variance request was not analyzed.

The following revisions are needed to conform to the RPBCWD Rule D the following revisions are needed:

- D1. The applicant must provide a monument detail for RPBCWD review and approval.
- D2. Buffer areas and maintenance requirements must be documented in an agreement approved by RPBCWD. As a public entity, the city of Eden Prairie may comply with this requirement by entering into a maintenance agreement with the RPBCWD. The maintenance agreement must also include an exhibit clearly showing the buffer area and monument locations.

Rule F: Shoreline and Streambank Stabilization

The applicant's proposed reconstruction of Duck Lake Road will impact the existing shoreline of Duck Lake where the roadway embankment through the lake connects to the riparian areas and the roadway construction will result in replacement of shoreline along both sides of the road. In addition, the current road way is eroding at a rapid pace and beginning undermining the roadway, therefore restoration is needed to ensure further sedimentation and catastrophic failure leading to deposition of the road materials into the lake does not occur (Rule F, Subsection 3.1) Also, the applicant proposes installation of six new outfalls into the lake, which also triggers the rule. These outfalls are needed to convey runoff into Duck Lake and prevent erosion of the shoreline.

The applicant completed the Erosion Intensity Score Worksheet in accordance with subsection 3.2, which shows the site is a low-energy site. This indicates the shoreline stabilization may be completed using bioengineering practices. The applicant indicated the plantings were selected by certified wetland professionals to best stabilize the roadway slope, restore wetland areas and reestablish aquatic habitat. A combination of live plantings (Arrowhead, Water Plantain and River Bulrush) and native seed (MNDOT wet prairie seed mix 34-262 and mesic prairie general seed mix 35-241) will be utilized at varying elevations (Rule F, subsection 3.3a.i). The slope is 3H:1V to minimize fill in the lake and conform to subsection 3.3a.ii. The 3H:1V slope will also minimize the horizontal encroachment, thus conforming to subsection 3.3a.iii. Information submitted by the applicant indicates the project design and shoreline restoration measures reflect the underlying soil conditions, thus conforming to subsection 3.3a.iv.

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 F, subsection 3.3e).

The proposed project conforms to RPBCWD Rule F.

Rule G: Waterbody Crossings and Structures

The applicant proposes to replace the existing waterbody crossing connecting the east and west sections of Duck Lake, a public water, which will involve placing a culvert in the bed and bank of the lake, thus conformance with RPBCWD's Waterbody Crossings Rule (Rule G) is required for this project. A new 8-foot wide by 4-foot high reinforced concrete box culvert is proposed to replace the existing 12-inch CMP under Duck Lake Road. The applicant is also proposing the construction or reconstruction of six outfalls into Duck Lake. The criteria in subsections 3.1, 3.2, 3.3, and 3.7 apply to the project.

This work represents a demonstrated public benefit by improving the traffic flow and reducing the flood elevation of the western portion of Duck Lake to reduce roadway overtopping for the 100-year event (Rule G, Subsection 3.1a).

The existing and proposed crossings were modeled by the applicant's engineer using Autodesk Storm and Sanitary Analysis (SSA). As discussed above, RPBCWD's engineer placed 2014 Duck Lake outlet configuration in the RPBCWD's H&H model to confirm the existing flood elevations predicted by the applicants modeling match those predicted by RPBCWD H&H model. While the modeling produced similar flood elevation, several minor corrections were made to the applicant models to better align with typical engineering inputs. The SSA modeled existing flood elevation for the 100-year, 24 hour event was estimated to be 915.04 M.S.L. for the eastern portion of Duck Lake and 916.49 M.S.L. west of Duck Lake Road. However, the 100-year, 10-day snowmelt event yielded a slightly higher flood elevation of 915.17 M.S.L. Therefore, the existing 100-year flood elevation for the portion of the lake east of Duck Lake Road is 915.17. The applicants modeling shows that the 100-year frequency flood elevation upstream of the crossing will be lowered to 915.19 M.S.L. and the downstream flood elevation will be increased to elevation of 915.19 M.S.L. The modeling results also indicate an increase in the east basin flood stage for the 100-year, 10-year, and 2-year rainfall events of between 0.11 feet to 0.03 feet. Because the project plans do not comply with the requirement that the proposed waterbody crossing result in no net increase in flood stage, the Applicant has requested a variance from the criteria of Rule G, Subsection 3.2a. (see variance discussion below).

The existing 12-inch crossing is not used for navigation, thus compliance with the requirement of Rule G, Subsection 3.2b is not relevant. While the applicant did not provide a water quality analysis specific to the waterbody crossing or its impacts on the pollutant transfer between west and east portions of Duck Lake, the applicant designed the box culvert with submerged inverts by 2.5 feet to utilize the water in the eastern portion of Duck Lake to dissipate the flow energy and reduce increased scour, erosion or sedimentation. Because the 100-year 24-hour modeling indicates flow velocities slightly greater than 4 feet per second, erosion protection measures are required at the downstream end of the proposed box culvert to conformance with Rule G, Subsection 3.2c.

As a result of the lowering of the Duck Lake outlet, the existing 12-inch CMP culvert is elevated above the control elevation of Duck Lake, thus eliminating fish passage except during high water periods. Terrestrial wildlife is able to cross over the top of the roadway in a similar manner as current conditions allow. Because the proposed box culvert inverts would be set roughly 2.5 feet below existing control elevation or 3.3 feet below the historic lake outlet, the proposed crossing will provide fish passage and is in conformance with Rule G, Subsection 3.2d.

The narrative prepared by Bolton and Menk indicated the following four alternatives were considered

1. No change: Leaving the existing culvert in place was considered but ruled out. The existing culvert is in a state of disrepair and without replacement could lead to the roadway failing.
2. Replacement in kind: The existing culvert capacity would need to be replaced to eliminate any stage increase on the east cell of Duck Lake. The Applicant indicated reducing flooding on the west cell is a primary goal of the project.
3. Replace with 8'x4' Box culvert: Replacing the existing culvert with the 8'x4' box culvert represents the minimal impact solution because it has adequate capacity to equalize the flood elevation of the western and eastern portion of Duck Lake while fitting under the road section, which is consistent with Rule G, Subsection 3.2e.
4. Additional culvert sizes: Numerous culvert sizes were considered, but the 8'x4' box culvert achieves the equalization goals of the project.

Because the applicant also proposed to construction or reconstruct a total of six outfalls into Duck Lake, the project must conform to Rule G, subsection 3.3. The project is proposing to install MnDOT Class III riprap according to MNDOT standard plate 3133 at the six outfalls to minimize erosion of the shoreline, consistent with Rule G, subsection 3.3a. The project also proposes to use four proprietary pretreatment structures to remove coarse particles, a stormwater infiltration basin to treat runoff from about 0.1 acres of Duck Lake Road, and a proprietary hydrodynamic separator is proposed to treat runoff from the northern 0.4 acres of Duck Lake Road prior to discharging runoff to Duck Lake (Rule G, subsection 3.3b).

The project SWPPP includes a note directing the contractor that no work affecting the bed or banks of a protected water shall occur between April 1 and June 15 (Rule G, Subsection 3.7a). 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 and Rule F, subsection 3.3e).

Rule G, Subsection 3.7d requires compliance with the applicable criteria in section 3 of Rule F. The propose riprap placement extends from the outfalls to the control elevation of Duck Lake, thus

representing the minimal horizontal encroachment to prevent erosion (Rule F, subsection 3.3a). Based on MNDOT's standard plate, the project proposes the use stone rip-rap having an average size of 9 inches, with a geotextile and transition layer of granular bedding sized consistent with the erosion intensity at the outfall locations, thus conforming to Rule F, Subsections 3.3b.

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

- G1. The design must be modified to reduce the velocity or to include erosion protection at the downstream end of the proposed 8'x4' box culvert under Duck Lake Road.
- G2. Permit applicant must provide a draft maintenance agreement for the waterbody crossing, in accordance with Rule G, Section 5. As a public entity, the city may comply with this requirement by entering into a maintenance agreement with the RPBCWD.

Rule J: Stormwater Management

Because the project will alter more than 3.1 acres of surface area, conformance with RPBCWD's Stormwater Management Rule (Rule J) is required.

The project entails construction or reconstruction of 1.88 acres of linear impervious surface; therefore, stormwater management for this linear portion of the project must be provided in accordance with the criteria of Subsection 3.2 (Rule J, Subsection 2.4). The 1.88 acres of constructed or reconstructed impervious surface includes 0.31 acres of trail and sidewalk that is 10 feet or less in width bordered downgradient by a pervious area extending at least half the trail width; therefore, 0.31 acres of trail and sidewalk is exempt from RPBCWD's stormwater management rule (Rule J, Subsection 2.2).

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 SSA 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 Table 6 The applicant requested a variance from the criteria of Rule J, Subsection 3.1a because the proposed project will increase peak discharge rates at the site boundary (See Rule K variance discussion).

Table 6. Rate control summary:

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
Duck Lake Outlet	0.4	0.5	1.4	1.7	4.0	4.0	4.0	4.0

Volume Abstraction

Subsection 3.2c of Rule J requires the abstraction onsite of the larger of 0.55 inches of runoff from the new and fully reconstructed linear impervious surfaces or 1.1 inches from the net increase in linear impervious area. In this case 0.55 inches of runoff from the new and fully reconstructed impervious surfaces is the larger volume. An abstraction volume of 3,134 cubic feet is required from the 1.57 acres (68,389 square feet) of linear impervious surface on the site for volume retention.

Soil boring information collected by AET indicate the soils on the site are predominately loamy sands. Soil borings collect for the project encountered groundwater at depths ranging from 0 feet to 6.8 feet below the ground surface at the time of drilling, corresponding to groundwater elevations of about 913 to 910½ feet. The applicant prepared, and the engineers concurs with, a figure showing the approximate groundwater elevation and required separation between groundwater and potential BMP bottoms to illustrate a large portion of the site is not suitable for infiltration because the required 3-foot separation between the groundwater elevation and bottom of infiltration practice could not be met. Because the engineer concurred that the soil boring information, high groundwater, limited area within the linear corridor, and underground utility conflict support that the abstraction standard in subsection 3.2 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 at least 0.55 inches of runoff from site impervious surface determined in accordance with paragraph 3.2, 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. Because of high groundwater, utilities, and limited space within the linear corridor, the abstraction standard in Subsection 3.3a of Rule J cannot practicably be achieved. No groundwater was not observed in the soil boring collected at the proposed infiltration basin (B-15) on a portion of ISD 272 property where the city obtained property rights to construct and maintain an infiltration basin, thus confirming adequate separation to groundwater (Rule J, subsection 3.1biiA). In accordance with 3.1biiC, AET performed an infiltration test at the proposed bottom of the infiltration

basin to establish a measured rate of 3.73 inches per hour and the design infiltration rate of 1.87 inches per hour. The Engineer concurs that because there is insufficient separation to the groundwater table, utility conflicts, and limited space to reuse stormwater, the Applicant is providing abstraction to the maximum extent practicable (see Table 5) on the project site and the proposed activity conforms to Rule J, Subsection 3.3b.

Table 7. Volume abstraction summary

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Volume (cubic feet)
0.55	3,134	2,949

Water Quality Management

Subsection 3.1.c of Rule J requires the Applicant to 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), as well as no net increase in pollutant loading from existing conditions. Because the applicant has demonstrated and the engineer concurs with the information presented, the site was determined to be a restricted site. Rule J, subsection 3.3c allows for off-site abstraction and treatment in the watershed. The Applicant is proposing a stormwater infiltration basin to treat runoff from about 0.1 acres of Duck Lake Road and 1.4 acres of impervious surface from Prairie View Elementary School. In addition, a proprietary hydrodynamic separator is proposed to treat runoff from 0.4 acres of Duck Lake Road. The proposed best management practices are needed to provide water quality treatment, volume abstraction, and rate control for runoff prior to discharging offsite. The applicant is also proposing four proprietary pretreatment structures to remove coarse particles from runoff from the portion of the reconstructed Duck Lake Road through Duck Lake. A MIDS water quality model was developed to estimate the TP and TSS loading from the watersheds and the removal capacity of the proposed BMPs. The results of this modeling are summarized in Table 8 and Table 9 below. The results show the proposed project will remove sufficient TSS and TP to achieve an overall reduction to Duck Lake that is consistent with the required annual removals. Because the removals rely on treating stormwater runoff from Prairie View Elementary School (off-site runoff) rather than the required reduction “from site runoff” the applicant has request a variance.

Table 8. Annual TSS and TP removal summary:

Pollutant of Interest	Regulated Site Loading (lbs/yr)	Required Load Removal (lbs/yr) ¹	Provided Load Reduction (lbs/yr) ²
Total Suspended Solids (TSS)	617	555(90%)	573 (92.9%)
Total Phosphorus (TP)	3.4	2.0 (60%)	2.75 (80.9%)

¹Required load reduction is calculated based on the removal criteria in Rule J, Subsection 3.1c and the new and reconstructed impervious area site loading

Table 9. 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) ¹	Change (lbs/yr)
Total Suspended Solids (TSS)	617	180	-406
Total Phosphorus (TP)	3.4	1.6	-1.8

The following revisions are need to conform with Rule J, Subsection 3.1.c.

- J1. Because the water quality modeling and anticipated TSS removal is dependent on the performance of the proprietary hydrodynamic separator (HDS) removal efficiency, the applicant must demonstrate via testing information or modeling confirming the manufactures claimed 50% TSS and provide HDS sizing design computations, which was used in the analysis, or a removal rate that allows the project to remain compliant to Rule J, Subsection 3.1c. Any adjustment to the modeling or design that involves or causes the project to no longer be in compliance with RPBCWD requirements must be submitted to RPBCWD for approval of a permit modification. The engineer recommends that the managers delegate the necessary authority to the administrator to approve such modification requests unless the request requires approval of a variance.

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. In addition, a stormwater-management facility must be constructed at an elevation that ensures that no adjacent habitable building will be brought into noncompliance with a standard in this subsection 3.6. The project does not propose to construct or reconstruct structures that have low-floor elevations. However, the project will

construct an infiltration basin with a 100-year flood elevation of 920.07 M.S.L. near Prairie View Elementary school. The low floor elevation of the school is approximately 928 M.S.L. resulting in 7.03 feet of freeboard above the 100-year elevation in the infiltration basin. The RPBCWD Engineer concurs that the proposed project is in conformance with Rule J, Subsection 3.6.

Maintenance

Subsection 3.7 of Rule J requires the submission of 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.

- J2. Permit applicant must provide a draft maintenance and inspection plan. As a public entity, the city of Eden Prairie may comply with this requirement by entering into a maintenance agreement with the 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. The City of Eden Prairie's Streets Division Manager, Larry Doig, is authorized to implement the City's chloride management plan and documentation provided confirms he is certified by the Minnesota Pollution Control Agency as a certified salt applicator, thus conforming with Rule J, subsection 3.8.

Wetland Protection

Because the proposed activities discharge to a protected wetland (Wetland 05-33-A) on the site and alter the discharge the wetland receive from the site, the proposed activities must conform to RPBCWD wetland protection criteria (Rule J, subsection 3.10). Wetland 05-33-A falls in the high value category. Table 11, discussed under the variance analysis, summarizes the wetland impacts from the project under the criteria in Rule J, Table J1. The criteria from Table J1 for a high value wetland are summarized below:

- "no change" in the runout control elevation,
- The 10-year bounce be limited to "Existing plus 0.5 feet"
- The inundation period for the 1- and 2-year event be limited to "Existing plus 1 day".
- The inundation period for the 10-year event be limited to "Existing plus 7 day".

The analysis shows the bounce for the 10-year event will be reduced by 1.22 feet. In addition, the applicant proposes to lower the runout control elevation from 913.61 M.S.L. to 913.28 M.S.L. which does not conform to the criteria in Table J1. The following revisions are need to conform with Rule J, Subsection 3.10.a:

- J3. The applicant must redesign the box culvert to maintain the runout control elevation and provide an analysis demonstrating that the redesigned project will conform to the criteria in Table J1.

The Applicant requested a variance from the criteria of Rule J, Subsection 3.10b for the impacts to the Wetland 05-33-A. As summarized in the water quality analysis in Table 8, the runoff will be treated by an infiltration basin, and a proprietary stormwater HDS to provide 92.7% TSS and 80.9% TP removal prior to discharging to the wetland in accordance with Rule J, subsection 3.10b. Because the proposed treatment system will meet the 3.10b requirement, the variance request was not analyzed.

Rule K: Variances and Exceptions

Table 10 summarizes the Applicant’s request for six variances from the RPBCWD regulatory requirements.

Table 10. Variance request summary

Variance number	Rule	Subsection	Requested Variance	Notes
1.	B	3.2	Floodplain compensatory storage	Not providing full compensatory storage
2.	D	3.2	Buffer width	Variance not needed because the project conforms to rule by buffering to ROW limits (3.2g)
3.	G	3.2a	No net increase in flood stage	Increase downstream flood stages
4.	J	3.1a	Rate control	Increase rate leaving the site
5.	J	3.1c	Water quality	Allow treatment of off-site runoff
6.	J	3.10bii	Wetland protection	Variance not needed because the project conforms to rule by achieving required TSS and TP treatment (3.10bii).

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.

It is the applicant's obligation to address these criteria to support a variance request. The applicant's variance request, taken from their March 7, 2019 submittal, is attached to this review. Following is the RPBCWD engineer's assessment of information received relevant to the applicant's variance requests

Variance Requests #1 and #3

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 to be at or below the same elevation for fill in the floodplain of the a water basin. Because an independent analysis of the floodplain compensatory storage and upsizing the culvert under Duck Lake Road was not provided by the applicant, this variance analysis analyzes the combined effects of the proposed alterations. Because upsizing the culvert is directly related to the flood stage, the variance request from the no net increase in flood stage is also analyzed here.

- Related to variance criterion 1 – The supporting materials demonstrate the proposed project will involve an aggregate total of 1,151 cubic yards of fill and only 118 cubic yards of compensatory storage below the 100 year floodplain, thus providing a net decrease in the floodplain storage by 1,033 cubic yards (a 90% shortfall). The deviations from RPBCWD standard is substantial. Table 11 summarizes the impacts to flood elevation (a.k.a., flood stage) for various precipitation events. The decrease in flood elevation for the western basin varies from 0.79 feet for the 2 year event to 1.34 feet for the 100-year, 24-hour event. Increases in flood elevations for the eastern basin vary between 0.02 feet for the snowmelt conditions to 0.14 feet (1.3 inches) for the 50-year, 24-hour rainfall event.

Table 11. Summary of flood elevations and site discharge

Precipitation Event	Metric	Existing Condition	Proposed Condition	Change
100-Year, 10-Day Snowmelt	East Duck Lake Basin Elevation (M.S.L.)	915.17	915.19	0.02
	West Duck Lake Basin Elevation (M.S.L.)	916.29	915.19	-1.1
	Site Discharge (cfs)	4.0	4.0	0.0
	Discharge from West to East Basin (cfs)	11.7	23.0	11.3

Precipitation Event	Metric	Existing Condition	Proposed Condition	Change
100-Year, 24-Hour	East Duck Lake Basin Elevation (M.S.L.)	915.04	915.15	0.11
	West Duck Lake Basin Elevation (M.S.L.)	916.49	915.15	-1.34
	Site Discharge (cfs)	4.0	4.0	0.0
	Discharge from West to East Basin (cfs)	36.9	57.0	20.1
50-Year, 24-Hour	East Duck Lake Basin Elevation (M.S.L.)	914.65	914.79	0.14
	West Duck Lake Basin Elevation (M.S.L.)	916.41	914.88	-1.53
	Site Discharge (cfs)	3.4	3.8	0.4
	Discharge from West to East Basin (cfs)	26.2	50.3	24.1
10-Year, 24-Hour	East Duck Lake Basin Elevation (M.S.L.)	914.06	914.15	0.09
	West Duck Lake Basin Elevation (M.S.L.)	915.61	914.39	-1.22
	Site Discharge (cfs)	1.4	1.7	0.3
	Discharge from West to East Basin (cfs)	2.8	31.0	28.2
2-Year, 24-Hour	East Duck Lake Basin Elevation (M.S.L.)	913.71	913.74	0.03
	West Duck Lake Basin Elevation (M.S.L.)	914.65	913.86	-0.79
	Site Discharge (cfs)	0.4	0.5	0.1
	Discharge from West to East Basin (cfs)	1.6	15.0	13.4

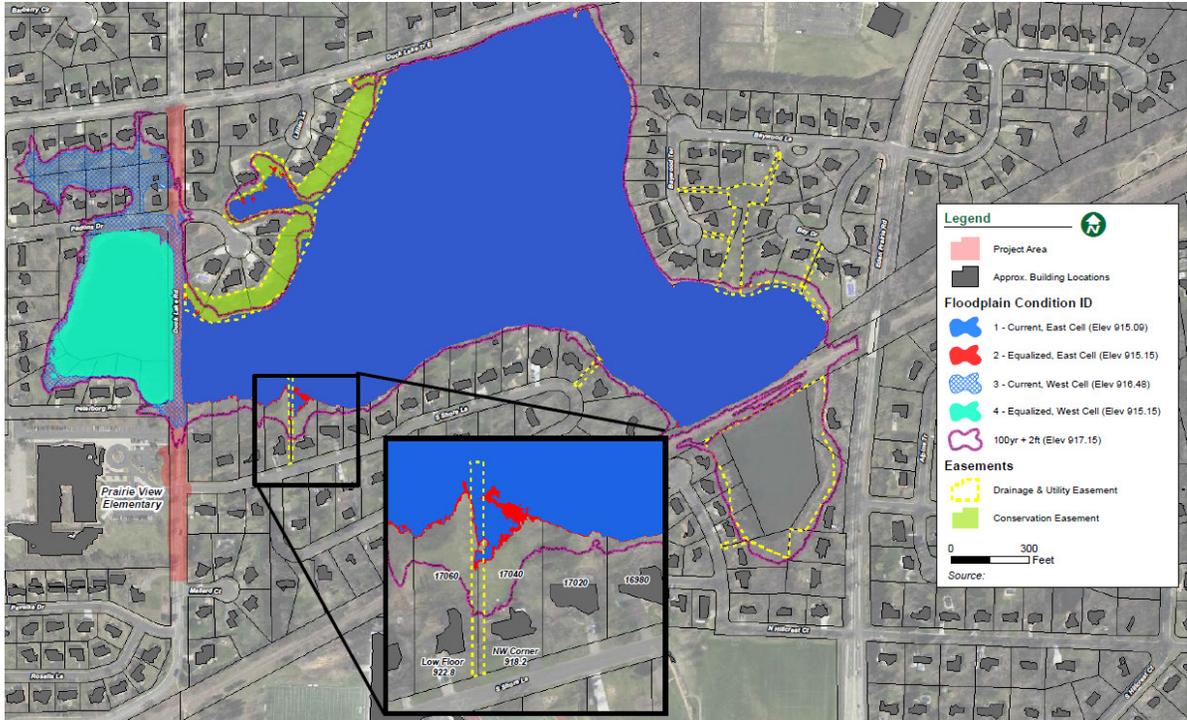
- With regard to variance criteria 2 – The supporting materials demonstrate that placing the fill in the floodplain to widen and raise Duck Lake Road and replacing the culvert under the roadway will eliminate the roadway overtopping for the 100-year event, thus improving services because the roadway would remain open.
- With regard to variance criteria 3 –
 - Adverse impacts of flooding considers two primary elements, the potential of flooding and what the flooding impacts. The applicant supplied a flood risk analysis, including the below figure illustrating the 100-year flood elevation and outlining the 2 foot freeboard elevation and Table 12 summarizing the number of parcels and area impacts by the proposed project. The figure indicates there are a couple of homes that are close to the 2-foot freeboard outline. Because no low floor elevations were provided by the applicant, the potential impact to structures from the 0.11 feet increase in the 100-year,

24-hour flood elevation of the eastern basin was not be assessed. The analysis shows 66 parcels adjacent to the existing 100-year floodplain of Duck Lake but only seven structures west of Duck Lake Road are impacted by the 100-year flood elevation. Because the proposed project lowers the 100-year flood elevation of the western basin to 915.19 M.S.L. (a 1.1 feet reduction), the project improves freeboard levels for the adjacent homes, reducing the flood risk for structures west of Duck Lake Road. By upsizing the culvert under Duck Lake Road, the 100-year flood elevation east of Duck Lake Road, increases the 100-year floodplain by 0.2 acres of additional inundations. In addition, because of the storage capacity of the eastern portion of Duck Lake the increase in discharge under Duck Lake Road presented in Table 5 leads to increases in high water levels, all less than 0.14 feet, about 1.7 inches.

- The City provided information showing existing drainage and utility easements, shown in the above figure as yellow dashed lines. The easements do not cover all land below the existing or proposed 100-year flood elevation.

Table 12. Summary 100-year flood elevation effects on flood risk to property.

Lake Basin	Condition	Parcels Impacted	Approx. Structures Impacted	Total Area (ac)	% Change in Flood Area
East	Existing	43	0	43.2	0.5%
	Proposed	43	0	43.4	
West	Existing	23	7	8.4	-38.6%
	Proposed	11	0	5.2	



- The proposed equalizer pipe will reduce the bounce elevation for wetland 05-33-A by 0.79 feet for the 2-year event, 1.22 feet for the 10-year event and 1.34 feet for the 100-year event. The significant reduction in the 2-year bounce has the potential to adversely impact the hydrology of the wetland. The applicant did not provide an analysis of more frequent precipitation event (i.e. 1-year, etc.). As part of the replacement to the culvert under Duck Lake Road, the applicant proposes to lower the runout control elevation from 913.61 M.S.L. to 913.28 M.S.L. Lowering the runout control elevation will have an adverse impact of the hydrology of Wetland 05-33-A because it will change the normal water level.
- Because the applicant did not provide a water quality analysis of the culvert upsizing or the shortfall in compensatory storage, the water quality impacts on wetland 05-33-A or the pollutant transfer between west and east portions of Duck Lake was not analyzed.
- With regard to variance criterion 4, the applicant evaluated eight corridor layouts to minimize the environmental impacts of the proposed road reconstruction on Duck Lake.

To provide the full amount of required compensation at the available depth of excavation of 1.9' (Lake Elev 913.28 M.S.L. – Proposed 100 Year 915.14 M.S.L.), approximately 14,210 square feet of area is needed. One to two residential lots would need to be purchased to fully meet the compensatory storage requirement. The cost to purchase the property, relocate the resident to a similar property and home, demolish the home, excavate the area and stabilize the lot would add approximately \$500,000 - \$800,000 to the project. This represents a technically feasible

alternative to alleviate the need for the variance but at a cost the city has indicated it is not willing to incur. Note that economic hardship also cannot constitute grounds for finding a practical difficulty as long as any reasonable use of the property exists under the RPBCWD rules.

None of the eight design alternatives presented would eliminate the need for fill in the floodplain. Several of the options, such as a bridge over Duck Lake or a boardwalk on the east or west side of the road, have the potential to reduce the amount of fill and the required compensatory storage, thus reducing the significance of the variance request. However, the applicant only provided fill and compensatory storage estimates for the selected alternative. The applicant dismissed the bridge layout because the anticipated cost (\$2.5 million) would be greater than the anticipated total project cost (\$1.8 million). A boardwalk option on the west side of Duck Lake Road would also reduce magnitude of the variance required but likely would not eliminate the need for the variance request. The applicant dismissed the west boardwalk option for the following reasons:

- The city does not own equipment to remove snow from the boardwalk in the winter. The city also indicated utilizing a different piece of equipment to remove snow from this 650-foot section of boardwalk is not practical when the city is responsible for 80+ miles of plowing along school routes within 24 hours.
- Overhead utility poles present adjacent to the corridor present constructability challenges. Xcel has denied a request place the line underground and indicated taking the line out of services during the summer is not very probable due to the high demand. Xcel Energy requires a 15-foot minimum clear zone.
- The equipment needed to install 20-foot piles that would be required for a boardwalk would be within the distribution line arc zone, which is prohibited unless the line is deenergized.
- The cost of a boardwalk on the west side of the road (\$600,000) would about 9-11 times the cost of the proposed bituminous trail and represent of 27% of the total project cost (cost breakdown table provided by the applicant is attached for reference).

The applicant dismissed the east boardwalk option for the following reasons:

- The city does not own equipment to remove snow from the boardwalk in the winter. The city also indicated utilizing a different piece of equipment to remove snow from this 350 foot section of boardwalk when the city is responsible for 80+ miles of plowing along school routes within 24 hours.
- Some students would need cross Duck Lake Road twice to use a trail on the east side of Duck Lake Road.
- The cost of a boardwalk on the west side of the road (\$600,000) would be about between 9-11 times the cost of the proposed bituminous trail and represent of 26% of the total project cost (cost breakdown table provided by the applicant is attached for reference)

Technical measures incorporated into the project plan to reduce the significance of the variance include the narrowing of Duck Lake Road through Duck Lake from a standard 52 foot wide section to 40 foot wide section.

Technical measure to offset the impact to water quality and improve the treatment of runoff before discharging to Wetland 05-33-A include the proposed infiltration basin and HDS. The two storm best management practices result in a net decrease of 406 lbs/year of TSS and 1.8 lbs/year of TP loading to Duck Lake relative to existing conditions.

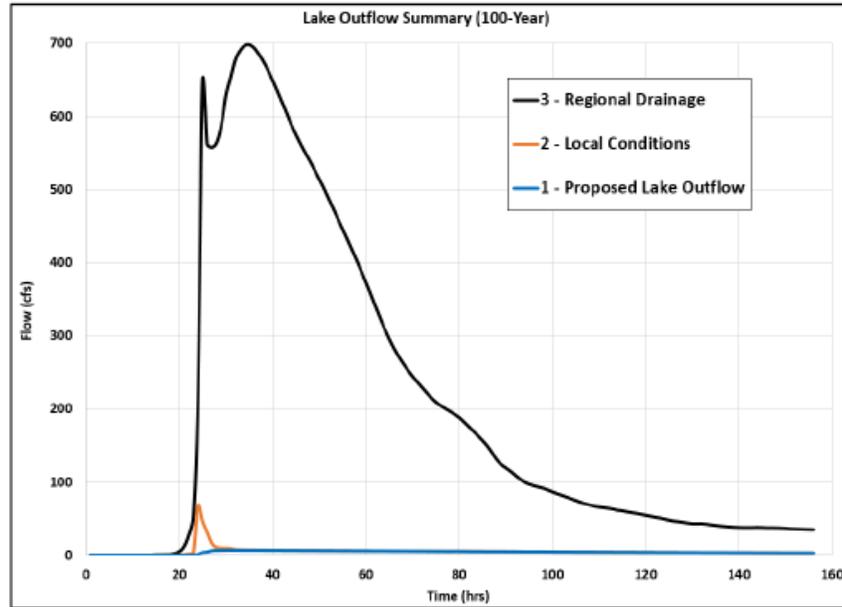
- With regard to variance criterion 5, the applicant has created the circumstances leading to the variances, but did so to improve the public pedestrian and vehicular safety.

The engineer makes no determination as to whether there is an adequate technical basis for the managers to rely on to grant the requested variances from the compensatory storage (Rule B, subsection 3.2) and no net increase in flood stage (Rule G, subsection 3.2a) requirements. The managers may wish to consider – in weighing whether to approve the variance – conditioning approval on the city's providing acknowledgement of the increased flood risk to properties around Duck Lake, or requiring the city to indemnify and hold RPBCWD harmless in the event of action arising from increased flooding.

Variance Request #4

The fourth variance request is from the requirement to limit peak runoff flow rates to that from existing conditions for the two- and 10- -year frequency storm events. (Rule J, Subsection 3.1.a). For purposes of the Board of Managers' consideration, the following factors were analyzed based on Rule K.

- Related to variance criterion 1 – The applicant supplied a modeling results of peak site discharges as summarized in Table 6. The peak discharge rate leaving Duck Lake increases by between 0.1 cfs (25% increase) to 0.3 cfs (21% increase) for the 2-year rainfall and 10-year events respectively. While these deviations from RPBCWD standards are substantial on a percentage basis, the 0.1 cfs increase in the 2-year discharge is within the accuracy of the modeling assumptions.
- With regard to variance criteria 2 and 3 –Table 12 indicates the peak flow rate leaving Duck Lake and discharging to Purgatory Creek represents a very small fraction of the discharge in Purgatory Creek (0.5% for the 100-year event), thus constituting a relatively low potential to adversely impact, flood elevations and channel stability in Purgatory Creek. The following figure presents an example of this for the 100-year, 24-hour rainfall event. In addition, the 0.1 cfs increase in the 2-year represents about 0.05% of the flow in Purgatory Creek while the 0.3 cfs increase in the 10-year event represents roughly 0.08% of the flow in Purgatory Creek.



- The applicant indicated the only technical measure to eliminate the need for the variance would be to replace the existing culvert in kind, which would not achieve the project flood reduction goal. Because an alternatives analysis was not presented it is difficult to be certain a design modification is not feasible (variance criterion 4).
- With regard to variance criterion 5, the applicant has created the circumstances leading to the variances, but did so to reduce flooding problems west of Duck Lake Road, and to improve the public pedestrian and vehicular safety.

The engineer finds that because the increased rates would have an immaterial impact on downstream storm sewer and Purgatory Creek, there is adequate technical basis for the managers find that practical difficulty presented outweighs the significance of the deviance from the RPBCWD standard at issue.

Variance Request #5

The fifth variance request is from the requirement to provide pollutant removal “from site runoff” . (Rule J, Subsection 3.1.c). For purposes of the Board of Managers’ consideration, the following factors were analyzed based on Rule K.

- Related to variance criterion 1 – The applicant’s design includes treatment of 0.5 acres of impervious surface from the 1.57 acres of impervious surface on the site. This represents about 32% of the site. The deviations from RPBCWD standard is substantial.
- With regard to variance criteria 2 and 3 –Because of the applicant is proposing to treat runoff from a portion of the adjacent school property to the required annual TSS and TP removal requirements the proposed alternations will not have significant adverse effects to governmental services, water resources, flood levels, or neighboring properties.

- Technical measures incorporated into the project plan to alleviate the practical difficulty (variance criterion 4) include reducing the width of a section of Duck Lake Road from the standard 52 feet to 40 feet. In addition, by treating the offsite runoff the applicant's design reduces the TSS and TP loading to the lake by 95% and 78% respectively (see Tables 6 and 7). By reducing the pollutant load to the lake beyond what would have resulted from strict compliance with the criteria, the applicant's design provides additional resource protection.
- With regard to variance criterion 5, the practical difficulty is the result of limited area available to provide water quality treatment on the project site and the topography challenge to route the runoff to areas suitable for construction of best management practices.

The engineer finds there is adequate technical basis for the managers to rely on to grant the requested variance to allow the treatment of off-site runoff in lieu of strictly treating site runoff, as long as the city enters an agreement with the school district committing to maintenance of the drainage rights necessary for continuing compliance with the permit, if issued, and RPBCWD regulatory requirements.

Applicable General Requirements:

1. The RPBCWD Administrator 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.

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 Rules B, G, and J criteria related to compensatory storage, no net increase in flood stage, rate control, and allowing treatment of off-site runoff instead of site runoff.
3. Aside from the variance requests for Rules B, G, and J, the proposed project will conform to the remaining criteria of Rules B, G, and J if the Rule Specific Permit Conditions listed above are met.
4. The proposed project will conform to Rules C and D if the Rule Specific Permit Conditions listed above are met.
5. The proposed project conforms to Rules F.

Recommendation:

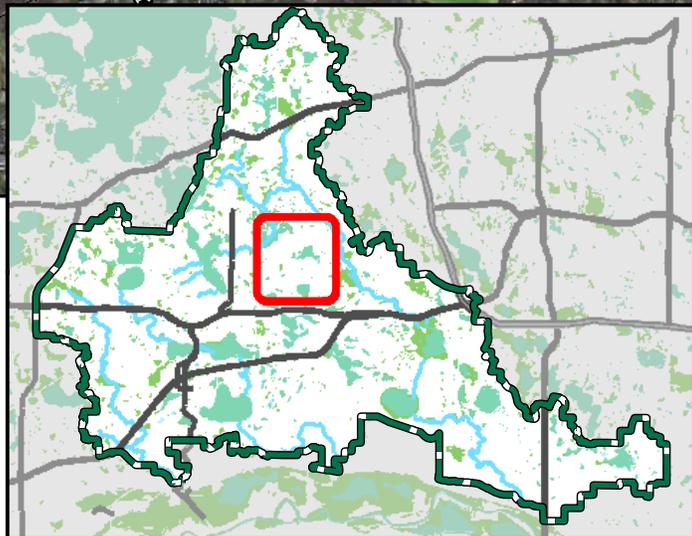
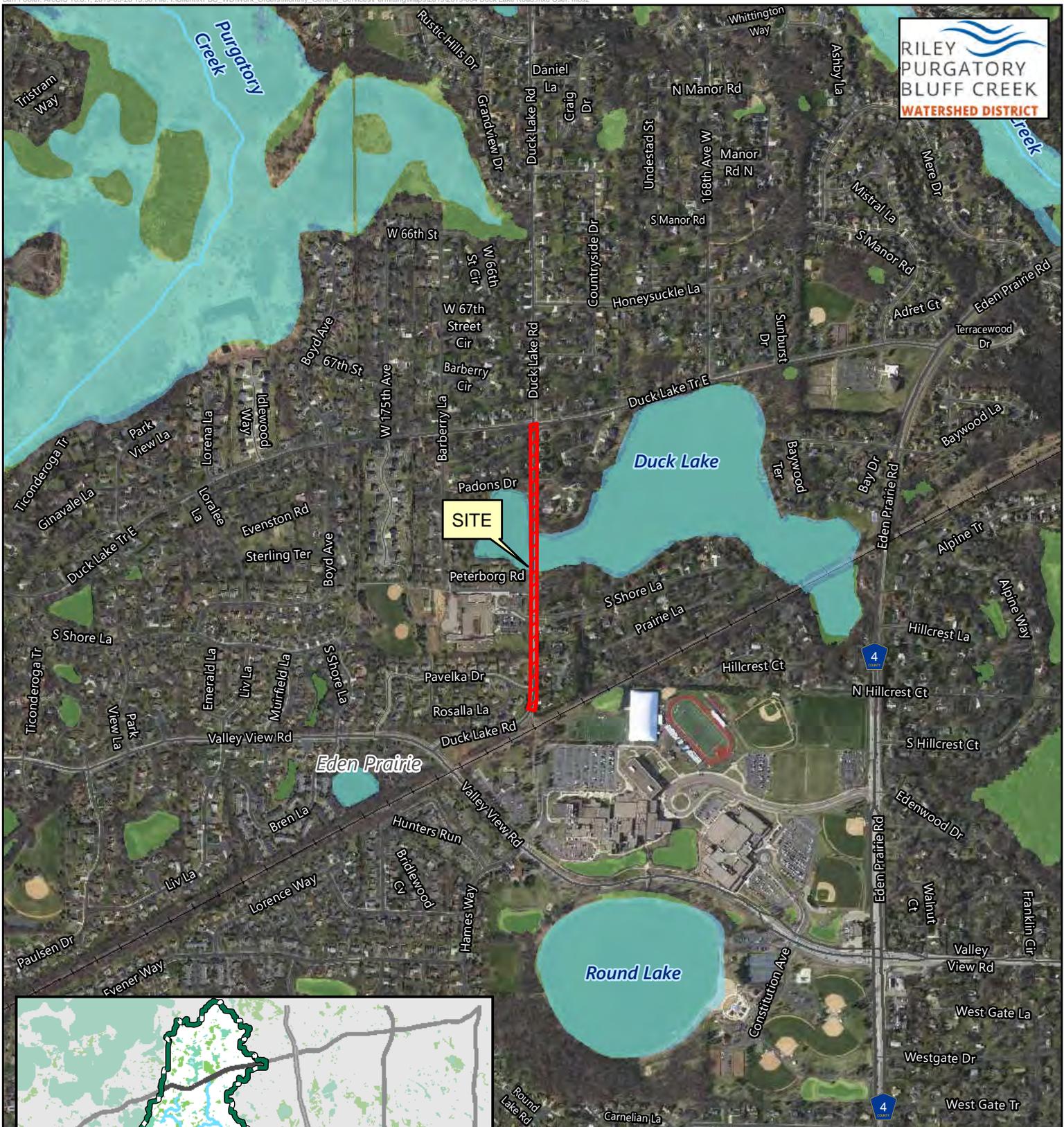
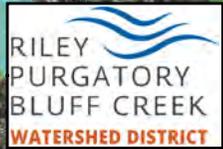
If the managers grant the variances (with such conditions as the managers may impose), the engineer recommends approval of the permit, contingent upon:

1. A two-year permit term is recommended since the construction is anticipated to continue through 2020.
2. Continued compliance with General Requirements
3. Permit applicant must provide the name and contact information of the general contractor responsible for the site. RPBCWD must be notified if the responsible party changes during the permit term.
4. The applicant must provide a monument detail for RPBCWD review and approval.
5. The design needs to be modified reduce the velocity or to include erosion protection at the downstream end of the proposed 8'x4' box culvert under Duck Lake Road.
6. Because the water quality modeling and anticipated TSS removal is dependent on the performance of the proprietary hydrodynamic separator (HDS) remove efficiency, the applicant must demonstrate via testing information or modeling confirming the manufactures claimed 50% TSS and provide HDS sizing design computations, which was used in the analysis, or a removal rate that allows the project to remain compliant to Rule J, Subsection 3.1c. Any adjustment to the modeling or design that involves or causes the project to no longer be in compliance with RPBCWD requirements must be submitted to RPBCWD for approval of a permit modification. The engineer recommends that the managers delegate the necessary authority to the administrator to approve such modification requests unless the request requires approval of a variance.
7. The applicant must redesign the box culvert to maintain the runout control elevation and provide an analysis demonstrating that the redesigned project will conform to the criteria in Table J1.
8. Permit applicant must provide a draft maintenance agreement and inspection plan for the management of stormwater BMPs and waterbody crossing, including exhibit clearly identifying stormwater BMPs. Once approved by RPBCWD, the City must enter an agreement with RPBCWD to maintain the project facilities in accordance with the plan.

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

1. Filling in a public water is outside the scope of actions authorized by DNR General Permit 2015-1192. As such, if the RPBCWD permit is issued, it will not constitute authorization of the proposed work for purposes of DNR Work in Waters rule (Minn. R. ch. 6115) or any other state regulatory purposes. The applicant must, at a minimum, obtain a project-specific permit from DNR for placing fill below the OWH of Duck Lake. Further, any modification of the project plans material to compliance with RPBCWD rules or this permit – whether undertaken to comply with requirements imposed or actions undertaken by DNR – must be submitted to RPBCWD in the form a request for a permit modification.

2. 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, stormwater facilities and waterbody crossings conform to design specifications as approved by the District.



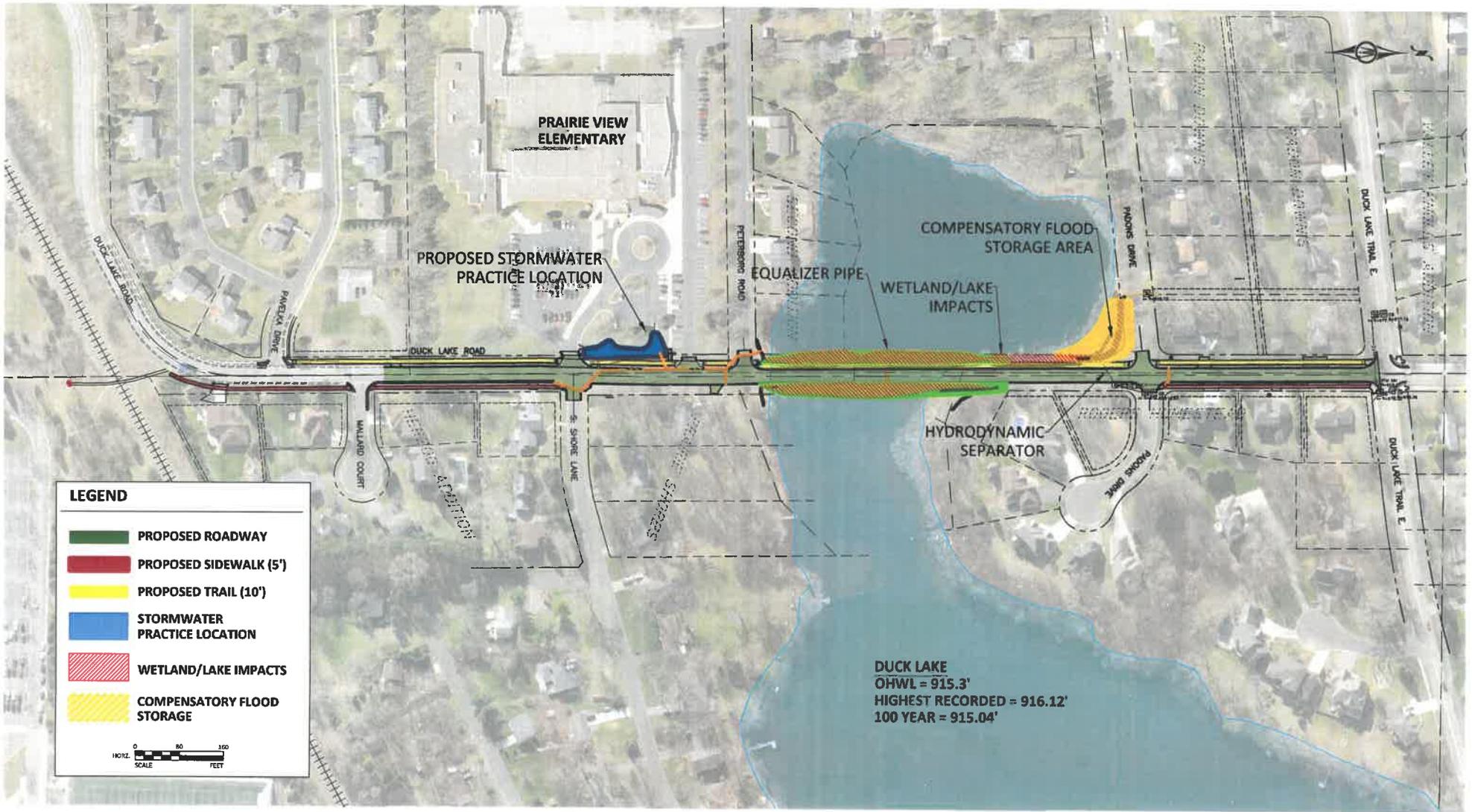
Permit Location Map



Feet



DUCK LAKE ROAD
Permit 2019-004
Riley Purgatory Bluff Creek
Watershed District



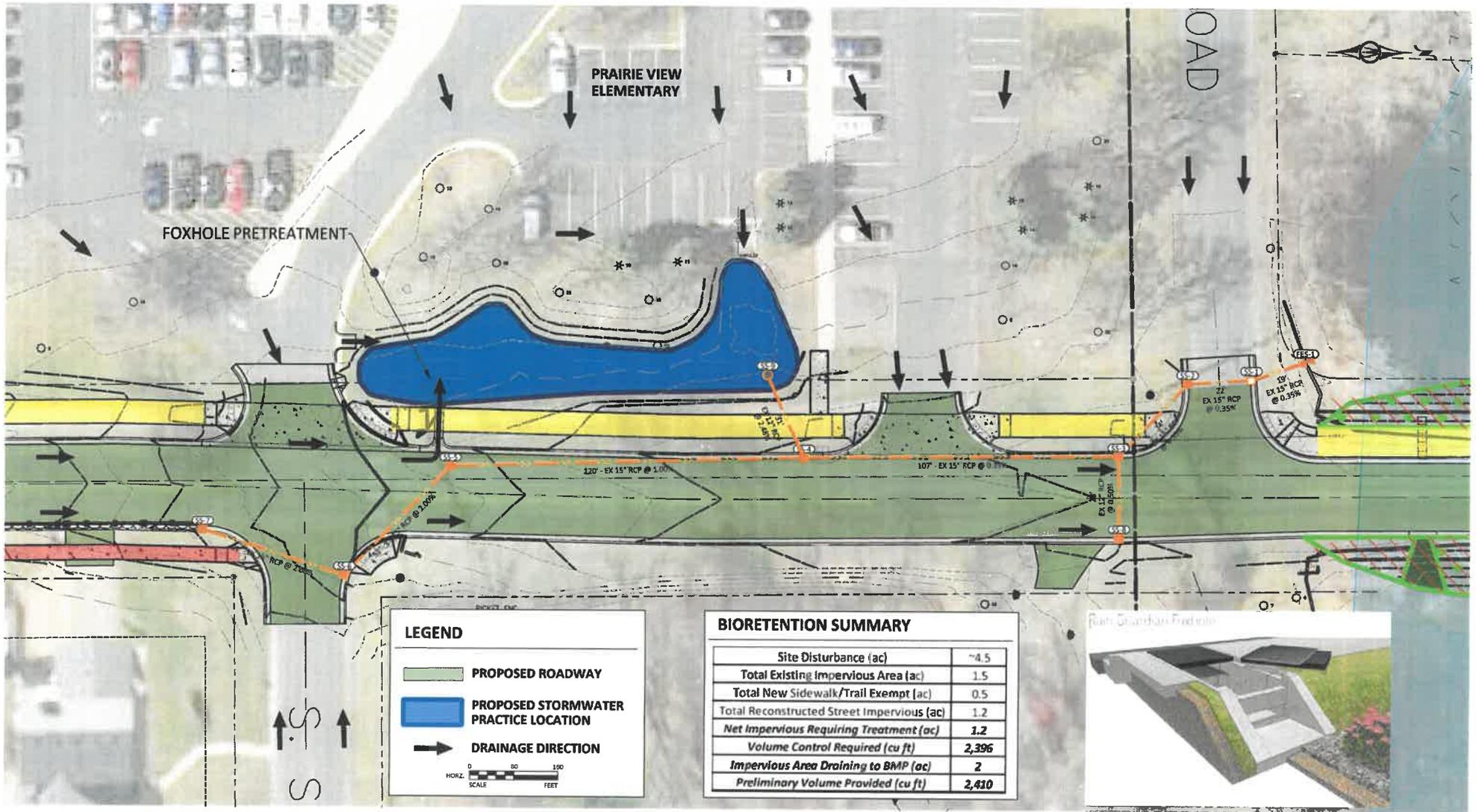
PRELIMINARY STORMWATER MANAGEMENT

EDEN PRAIRIE
 DUCK LAKE ROAD RECONSTRUCTION

Figure 1 - Location Map



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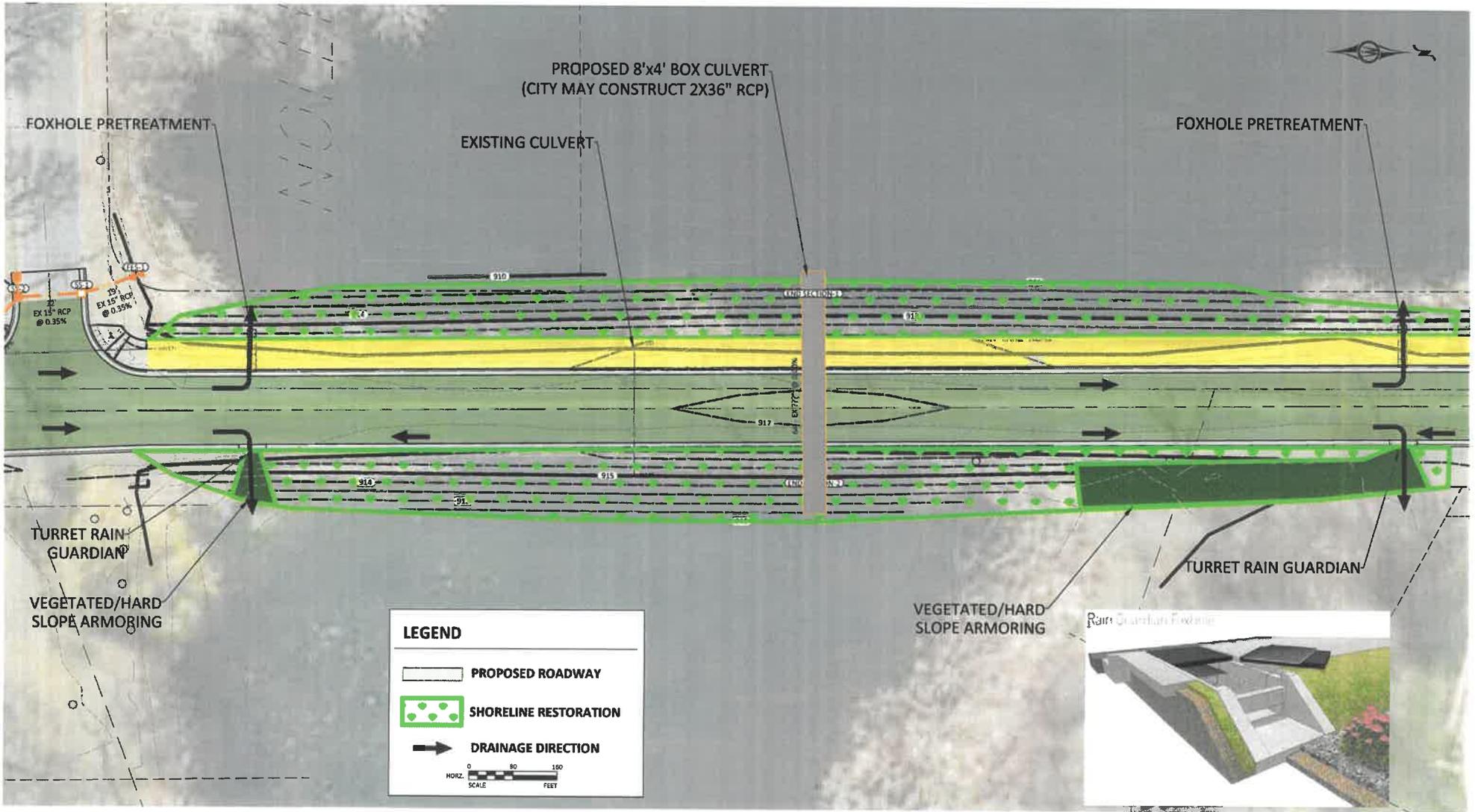
PRELIMINARY STORMWATER MANAGEMENT

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DUCK LAKE ROAD RECONSTRUCTION

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Figure 3 - School BMP Layout





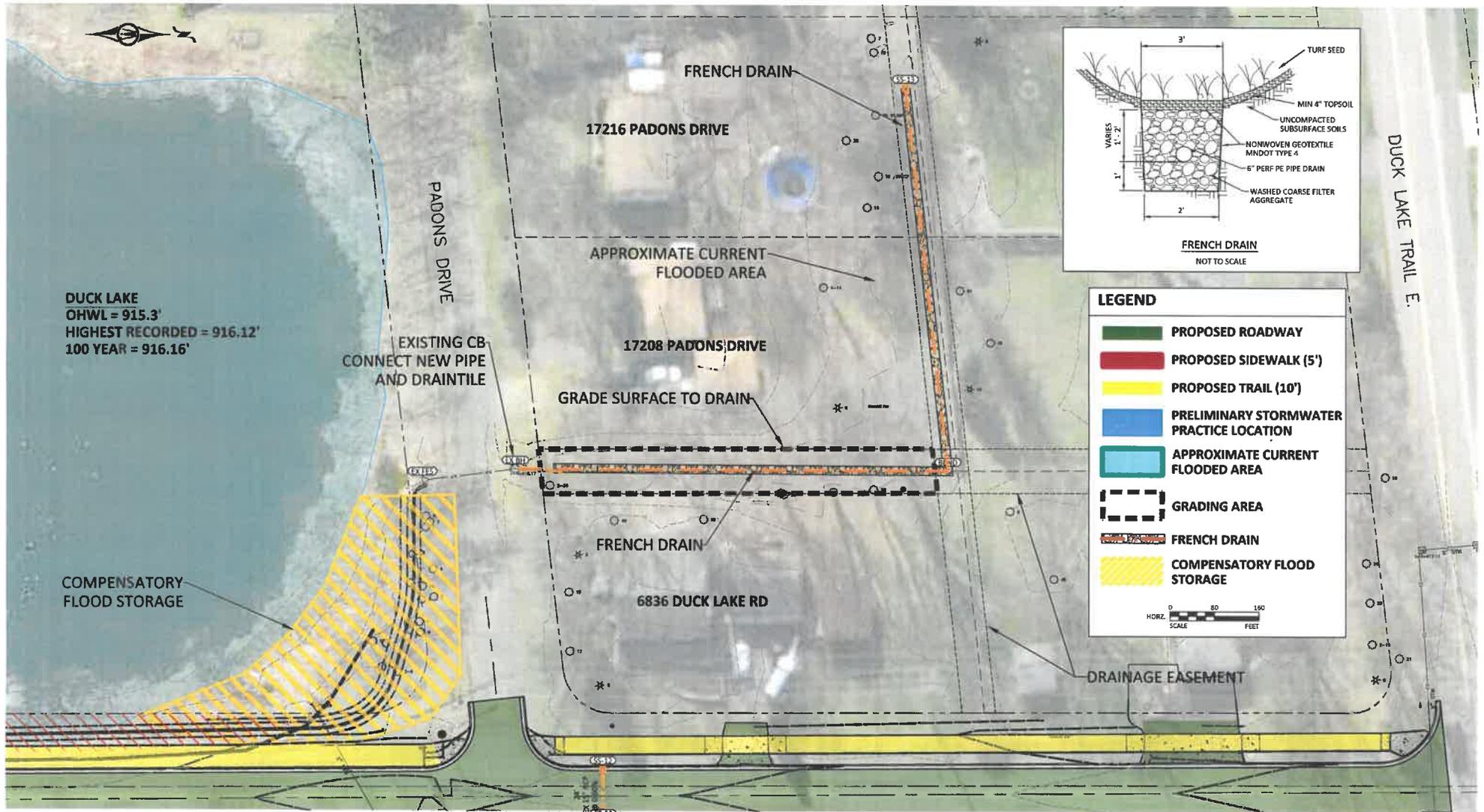
PRELIMINARY STORMWATER MANAGEMENT

EDEN PRAIRIE
DUCK LAKE ROAD RECONSTRUCTION

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Figure 4 - In-Lake BMPs





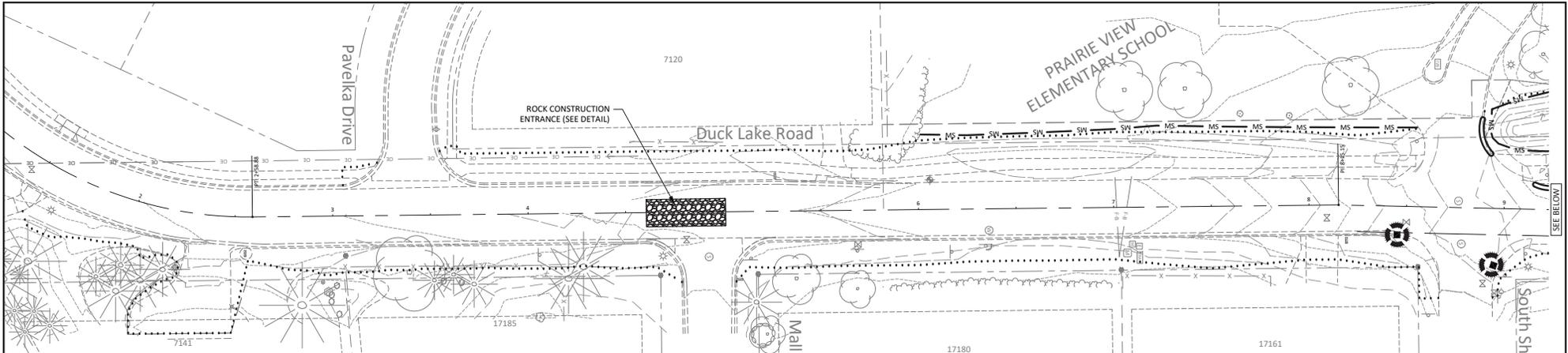
PADONS DRIVE BACKYARD AREA IMPROVEMENTS

Figure 5 - Padons Drive Improvements

EDEN PRAIRIE
 DUCK LAKE ROAD RECONSTRUCTION

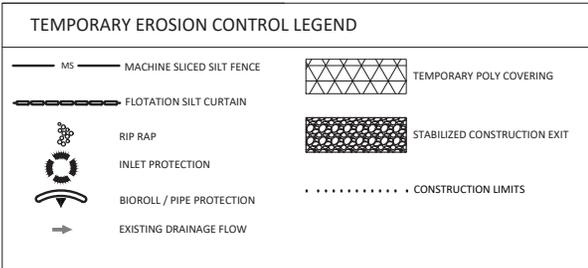


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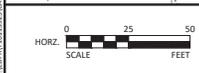
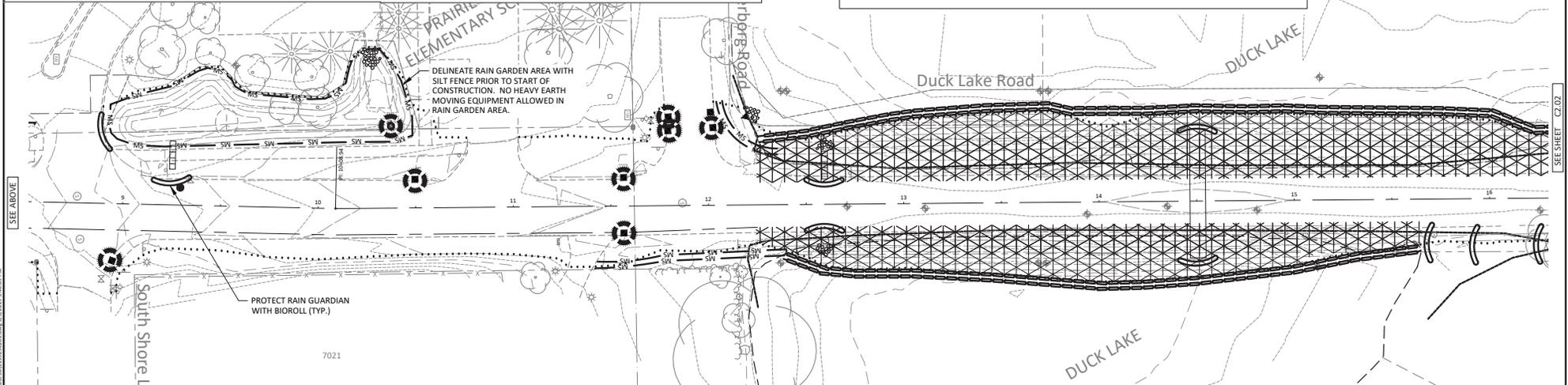


- EROSION AND SEDIMENT CONTROL NOTES**
1. NATURAL TOPOGRAPHY AND SOIL CONDITIONS MUST BE PROTECTED, INCLUDING RETENTION ONSITE OF NATIVE TOPSOIL TO THE GREATEST EXTENT POSSIBLE.
 2. ADDITIONAL MEASURES, SUCH AS HYDRAULIC MULCHING AND OTHER PRACTICES AS SPECIFIED BY THE DISTRICT MUST BE USED ON SLOPES OF 3:1 (H:V) OR STEEPER TO PROVIDE ADEQUATE STABILIZATION.
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 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 PVIOUS UPON COMPLETION OF CONSTRUCTION MUST BE DECOMPACTED TO ACHIEVE A SOIL COMPACTION TESTING PRESSURE OF LESS THAN 1,400 KILOPASCALS OR 200

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.
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10. 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.
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12. NO ACTIVITY AFFECTING THE BED OR BANKS OF DUCK LAKE MAY BE CONDUCTED BETWEEN APRIL 1 AND JUNE 30.



DUCK LAKE
 OHWL = 915.3
 WEST 100 YR HWL = 916.61
 EAST 100 YR HWL = 915.04



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

MICHAEL R. WARNER
 LIC. NO. 44693 DATE 3/06/2019



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DESIGNED	MIRW	NO.	REVISION
DRAWN	MIRW	STATE AID	02/20/2019
CHECKED	SL	RPRCWD	03/05/2019
CITY PLAN NO.	T16.113925		

CITY OF EDEN PRAIRIE, MINNESOTA
 DUCK LAKE ROAD IMPROVEMENTS
 TEMPORARY EROSION CONTROL
 S.A.P.181-121-001

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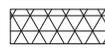
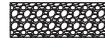
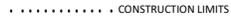
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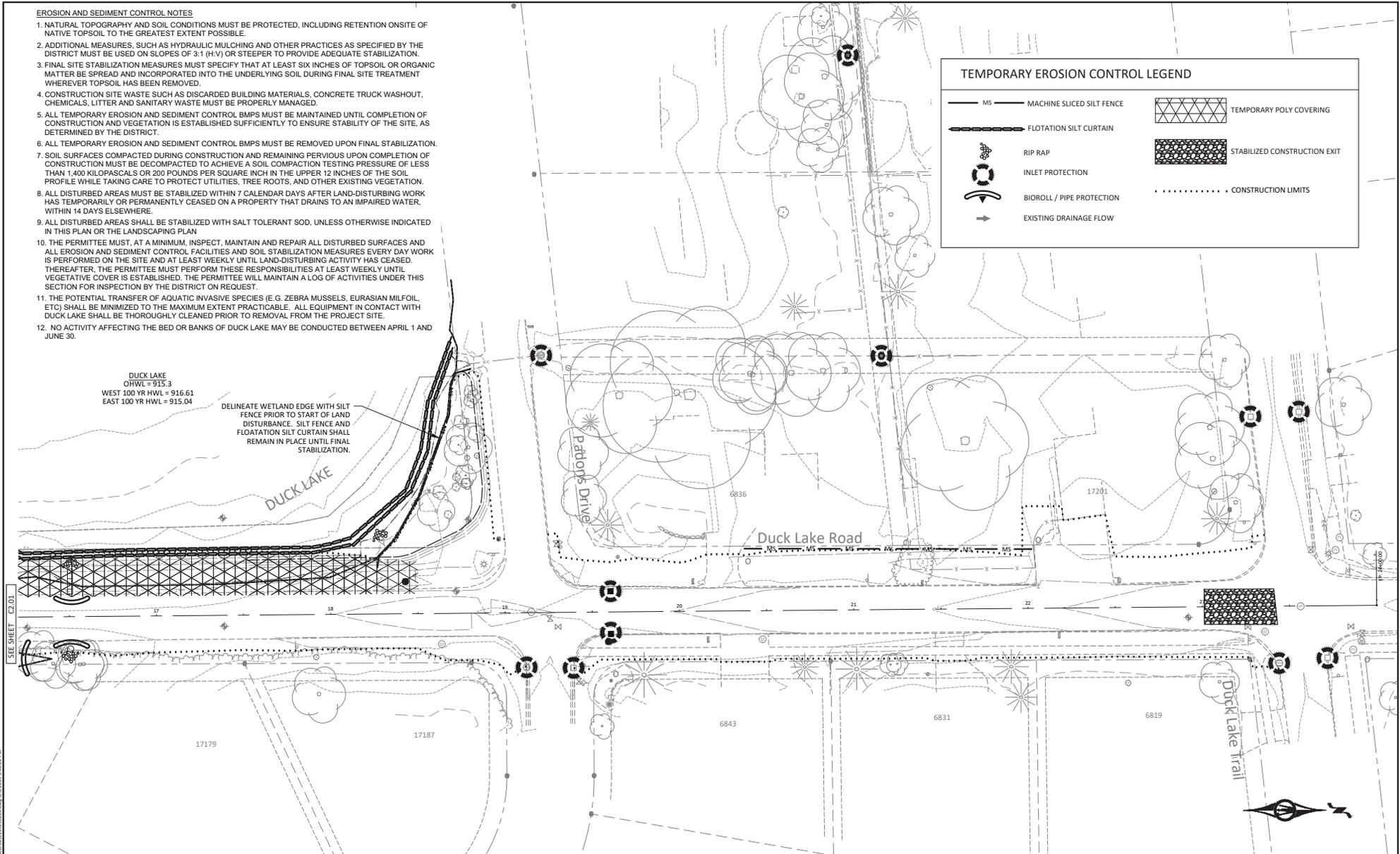
SEE ABOVE

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TEMPORARY EROSION CONTROL LEGEND

	MACHINE SLICED SILT FENCE		TEMPORARY POLY COVERING
	FLOTATION SILT CURTAIN		STABILIZED CONSTRUCTION EXIT
	RIP RAP		CONSTRUCTION LIMITS
	INLET PROTECTION		
	BIOROLL / PIPE PROTECTION		
	EXISTING DRAINAGE FLOW		



DUCK LAKE
OHWL = 915.3
WEST 100 YR HWL = 916.61
EAST 100 YR HWL = 915.04

DELINEATE WETLAND EDGE WITH SILT FENCE PRIOR TO START OF LAND DISTURBANCE. SILT FENCE AND FLOTATION SILT CURTAIN SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION.

SEE SHEET C2.01



MICHAEL R. WARNER
LIC. NO. 44693 DATE 3/16/2019



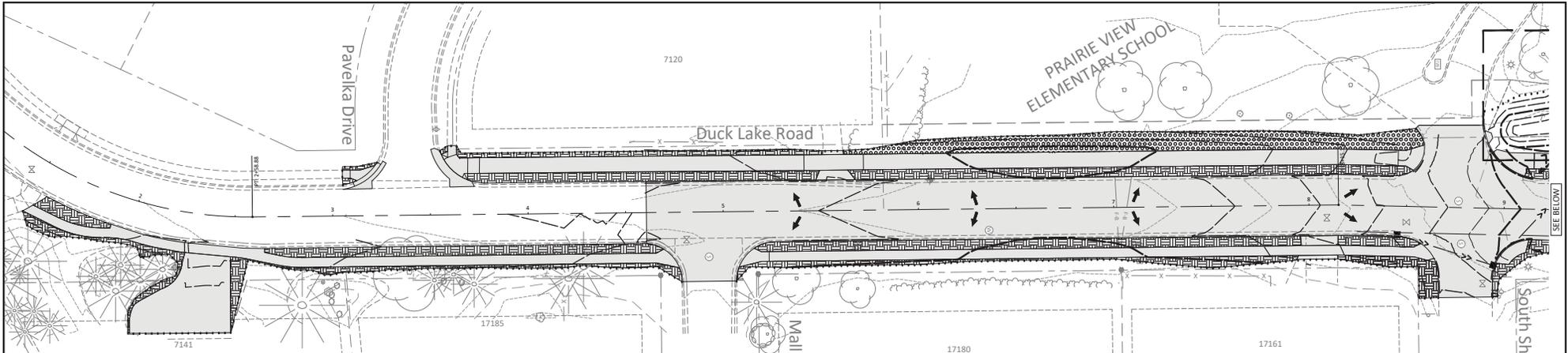
12224 NICOLLET AVENUE
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Email: burns@bolton-menk.com
www.bolton-menk.com

DESIGNED	MRW	NO.	02/20/2019
DRAWN	MRW	STATE AID	RPBCWD 03/05/2019
CHECKED	SL		
CITY FILE NO.	T16.113925		

CITY OF EDEN PRAIRIE, MINNESOTA
DUCK LAKE ROAD IMPROVEMENTS
TEMPORARY EROSION CONTROL
S.A.P.181-121-001

SHEET
C2.02

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EROSION AND SEDIMENT CONTROL NOTES

1. NATURAL TOPOGRAPHY AND SOIL CONDITIONS MUST BE PROTECTED, INCLUDING RETENTION ON-SITE 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 PERSISTENT 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. ALL DISTURBED AREAS SHALL BE STABILIZED WITH SALT TOLERANT SOD, UNLESS OTHERWISE INDICATED IN THIS PLAN OR THE LANDSCAPING PLAN.
10. 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.
11. THE POTENTIAL TRANSFER OF AQUATIC INVASIVE SPECIES (E.G. ZEBRA MUSSELS, EURASIAN MILFOIL, ETC) SHALL BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE. ALL EQUIPMENT IN CONTACT WITH DUCK LAKE SHALL BE THOROUGHLY CLEANED PRIOR TO REMOVAL FROM THE PROJECT SITE.
12. NO ACTIVITY AFFECTING THE BED OR BANKS OF DUCK LAKE MAY BE CONDUCTED BETWEEN APRIL 1 AND JUNE 30.

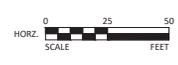
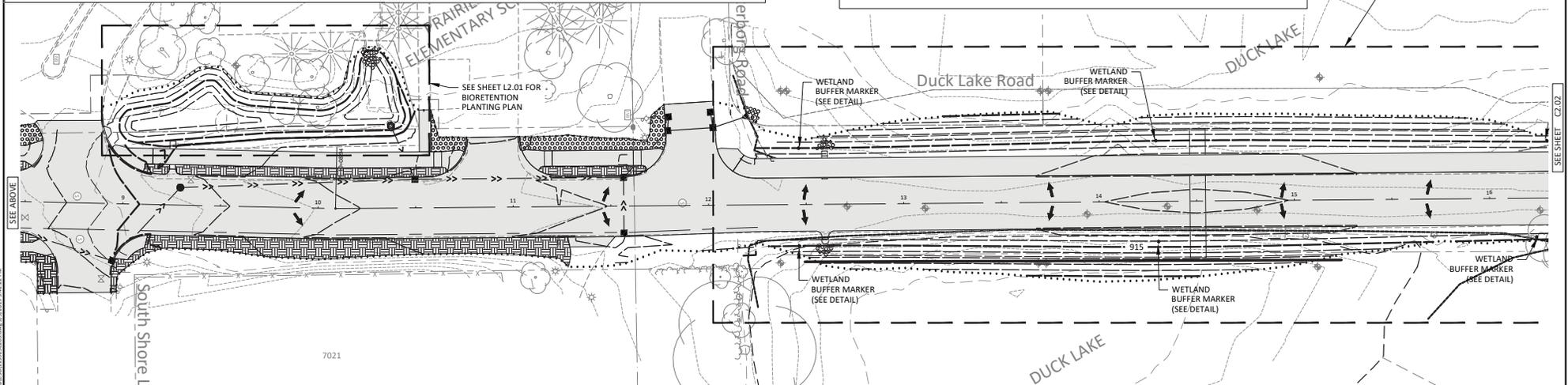
PERMANENT EROSION CONTROL LEGEND

.....	CONSTRUCTION LIMITS		SOD
	RIP RAP		SEED MIX 25-151 AND HYDROMULCH
→	PROPOSED DRAINAGE FLOW		

DUCK LAKE
 OHWL = 915.3
 WEST 100 YR HWL = 916.61
 EAST 100 YR HWL = 915.04



SEE SHEET L2.02-L2.03 FOR SHORELINE RESTORATION PLAN



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

MICHAEL R. WARNER
 LIC. NO. 44693 DATE: 3/16/2019



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DESIGNED BY	NO.	REVISION	DATE
MIRW <td></td> <td>STATE AID</td> <td>02/20/2019</td>		STATE AID	02/20/2019
MIRW <td></td> <td>RPCBWD</td> <td>03/05/2019</td>		RPCBWD	03/05/2019
SL <td></td> <td></td> <td></td>			
CHECKED BY			
DATE			
PROJECT NO.			
T16.113925			

CITY OF EDEN PRAIRIE, MINNESOTA
 DUCK LAKE ROAD IMPROVEMENTS
 PERMANENT EROSION CONTROL
 S.A.P. 181-121-001

SHEET
C2.03

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EROSION AND SEDIMENT CONTROL 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.
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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.
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PERMANENT EROSION CONTROL LEGEND

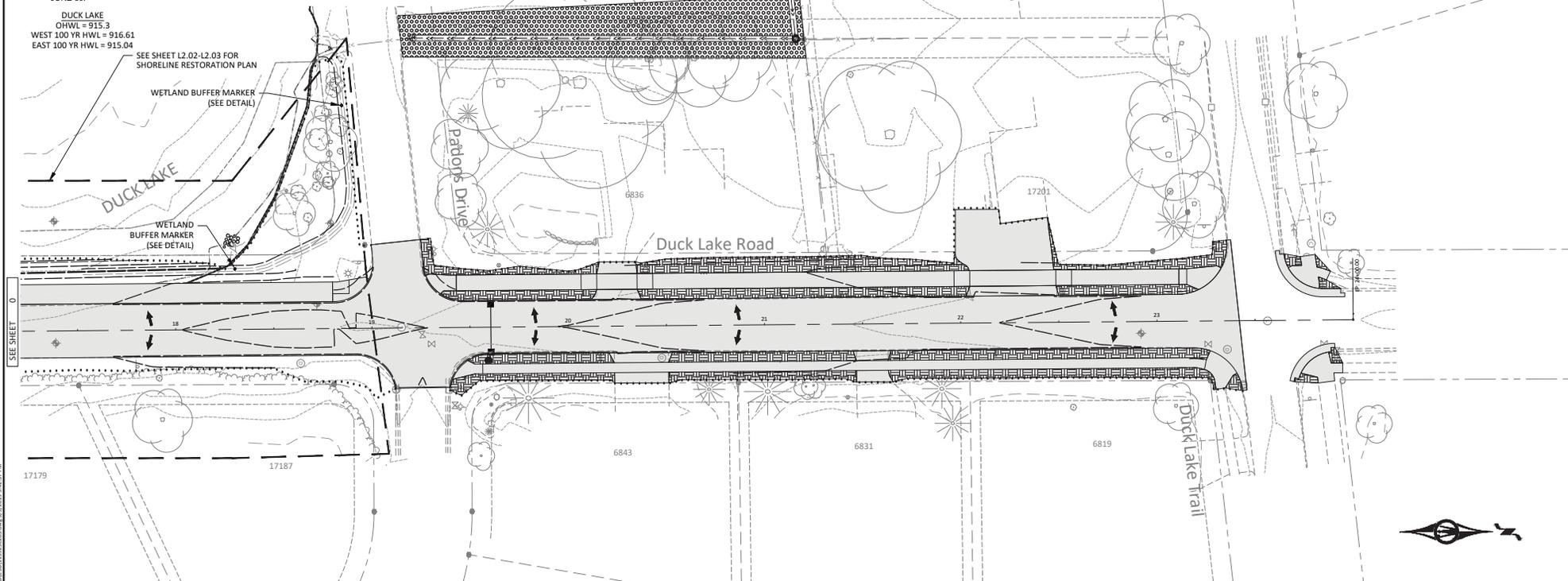
- CONSTRUCTION LIMITS
- RIP RAP
- PROPOSED DRAINAGE FLOW
- SOD
- SEED MIX 25-151 AND HYDROMULCH

DUCK LAKE
OHWL = 915.3
WEST 100 YR HWL = 916.61
EAST 100 YR HWL = 915.04

SEE SHEET L2.02-L2.03 FOR
SHORELINE RESTORATION PLAN

WETLAND BUFFER MARKER
(SEE DETAIL)

WETLAND
BUFFER MARKER
(SEE DETAIL)



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.

MICHAEL R. WARNER
LIC. NO. 44693 DATE 3/06/2019



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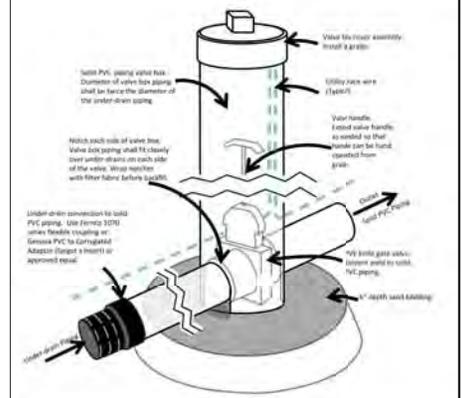
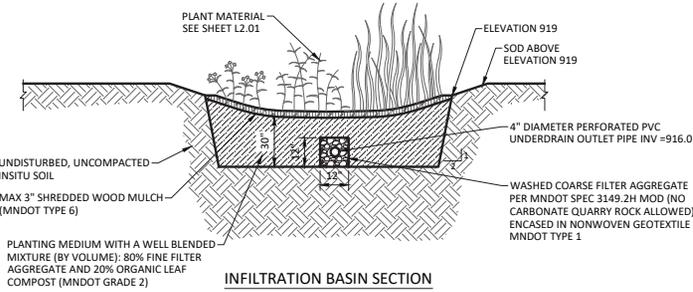
DESIGNED	MRW	NO.	02/20/2019
DRAWN	MRW	STATE AID	RPBCWD 03/05/2019
CHECKED	SL		
COUNTY FILE NO.	T16.113925		

CITY OF EDEN PRAIRIE, MINNESOTA
DUCK LAKE ROAD IMPROVEMENTS
PERMANENT EROSION CONTROL
S.A.P.181-121-001

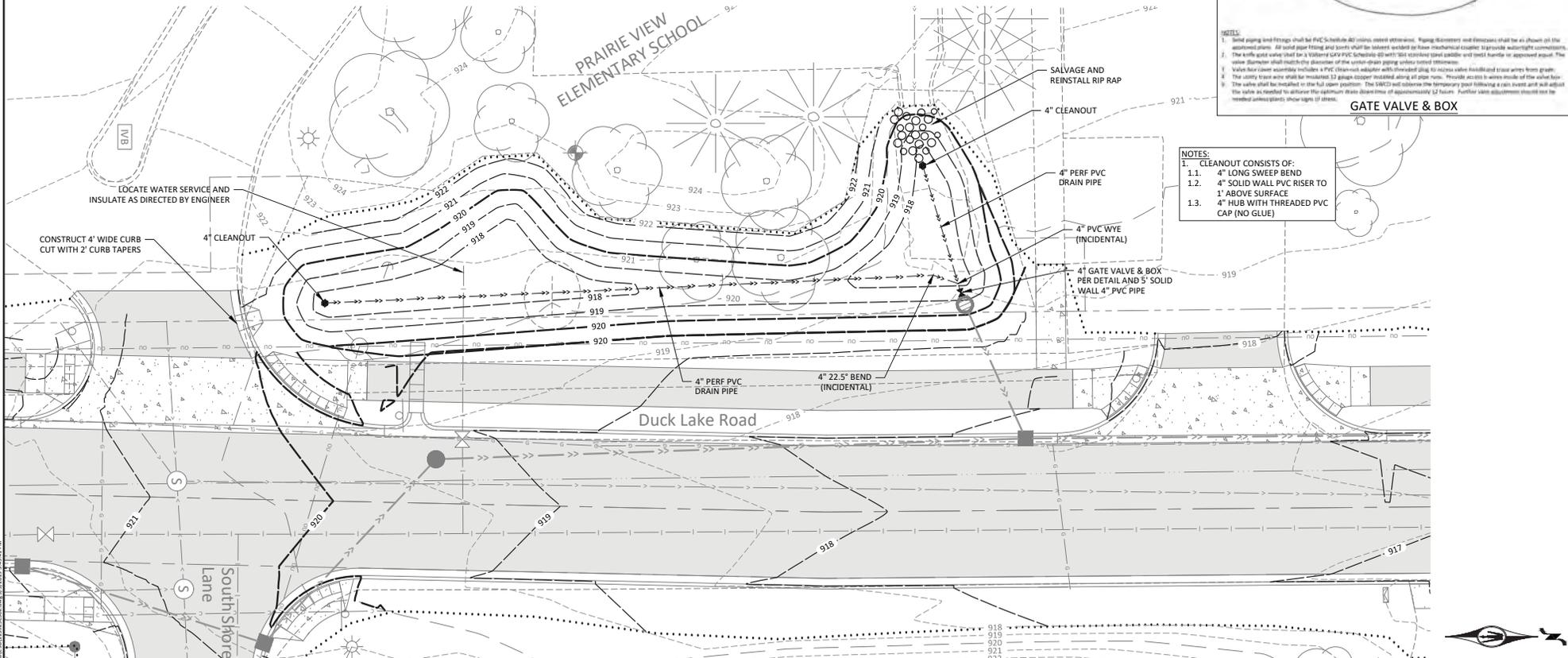
SHEET
C2.04

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- SITE GRADING NOTES**
- THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
 - EXISTING GRADE CONTOURS SHOWN AT 1 FOOT INTERVALS. PROPOSED GRADE CONTOURS SHOWN AT 1 FOOT INTERVALS.
 - IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.
 - ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE MINIMUM 6 INCHES OF TOPSOIL.
 - WETLAND BOUNDARY SHALL BE PROTECTED BY THE CONTRACTOR USING REDUNDANT EROSION CONTROL PRACTICES PRIOR TO CONSTRUCTION TO CLEARLY IDENTIFY AREA NOT TO BE DISTURBED.
 - ANY CONSTRUCTION SEDIMENT FROM THE CONTRACTOR'S ACTIVITIES DISCOVERED IN WETLAND AREA SHALL BE REMOVED IMMEDIATELY UPON DISCOVERY AT THE CONTRACTOR'S EXPENSE.
 - ALL INLET PROTECTION AND CULVERT END PROTECTION SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED.
 - ENSURE ADEQUATE COVERAGE OF SEED AND MULCH MATERIAL.
 - POSITIVE DRAINAGE SHALL BE MAINTAINED DURING CONSTRUCTION AT ALL TIMES.
 - THE CONTRACTOR SHALL PROTECT ALL TREES ON SITE UNLESS INDICATED TO BE REMOVED.
 - THE CONTRACTOR SHALL PROTECT ALL DRAINAGE WAYS ON SITE AND DISTURB AS LITTLE AS POSSIBLE. IF DISTURBED THE CONTRACTOR SHALL STABILIZE THE DRAINAGE WAY WITHIN 24 HOURS.



- NOTES:**
- CLEANOUT CONSISTS OF:
 - 4\"/>



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MICHAEL R. WARNER
LIC. NO. 44693 DATE: 3/19/2019



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DESIGNED	MRW	DATE	02/20/2019
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CLIENT FILE NO.	SL		
	T16-113925		

CITY OF EDEN PRAIRIE, MINNESOTA
DUCK LAKE ROAD IMPROVEMENTS
GRADING PLAN - INFILTRATION BASIN
S.A.P. 181-121-001

SHEET
C3.02

SITE GRADING NOTES

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11. THE CONTRACTOR SHALL PROTECT ALL DRAINAGE WAYS ON SITE AND DISTURB AS LITTLE AS POSSIBLE. IF DISTURBED THE CONTRACTOR SHALL STABILIZE THE DRAINAGE WAY WITHIN 24 HOURS.

DUCK LAKE
OHWL = 915.3
WEST 100 YR HWL = 916.61
EAST 100 YR HWL = 915.04

PROTECT WETLAND EDGE AT ALL TIMES DURING CONSTRUCTION. ALL GRADING SHALL REMAIN ON THE UPGRADE SIDE OF THE WETLAND EDGE. ALL SILT FENCE OR OTHER EROSION AND SEDIMENT CONTROL SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION.

WETLAND BUFFER MARKER
(SEE DETAIL)

DELINEATED WETLAND

EXISTING EDGE OF WATER

WETLAND BUFFER MARKER
(SEE DETAIL)

Padons Drive

Duck Lake Road



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.

MICHAEL R. WARNER
LIC. NO. 44693 DATE: 3/08/2019



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DRAWN	SL		
CLEAR FILE NO.	T16-113925		

CITY OF EDEN PRAIRIE, MINNESOTA
DUCK LAKE ROAD IMPROVEMENTS
GRADING PLAN - DUCK LAKE FLOOD STORAGE
S.A.P. 181-121-001

SHEET
C3.03

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SITE SPECIFIC DATA*			
PROJECT NUMBER	7737		
PROJECT NAME	DUCK LAKE RD IMP.		
PROJECT LOCATION	EDEN PRAIRIE, MN		
STRUCTURE ID	SC-6-V		
WATER QUALITY FLOW RATE (CFS)	2.0		
PEAK FLOW RATE (CFS)	17.0		
PEAK STORM DURATION (YEARS)	100		
PIPE DATA	I.E.	MATERIAL	SIZE
INLET PIPE 1	913.35	RCP	18X29
OUTLET PIPE 1	913.35	RCP	18X29
RIM ELEVATION	917.17		
SUMP ELEVATION	906.35		
SURFACE LOADING REQUIREMENT	HS-20		
FRAME AND COVER	Ø30"		
SKIMMER WALL HEIGHT	STANDARD		
KNOWN GROUNDWATER ELEVATION	910.2		
NOTES: INLET AND OUTLET PIPES ARE 18" X 29" ARCH PIPE.			
CONCEPT ONLY - NOT FOR CONSTRUCTION			
*PER ENGINEER OF RECORD			

PERFORMANCE DATA			
TREATMENT FLOW RATE (CFS)	2.21		
WET VOLUME (CU FT)	197.82		
TSS REMOVAL EFFICIENCY	80%		
STORAGE CAPACITY (CU FT)	42		

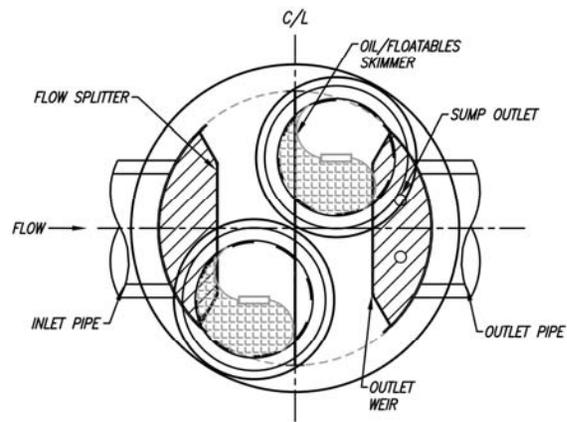
STORAGE CAPACITIES				
SUMP CHAMBER CAPACITY				
	DIAMETER (FT)	AREA (SF)	HEIGHT (FT)	TOTAL (CF)
CHAMBER 1	6.00	28.26	7.00	197.82

GENERAL NOTES

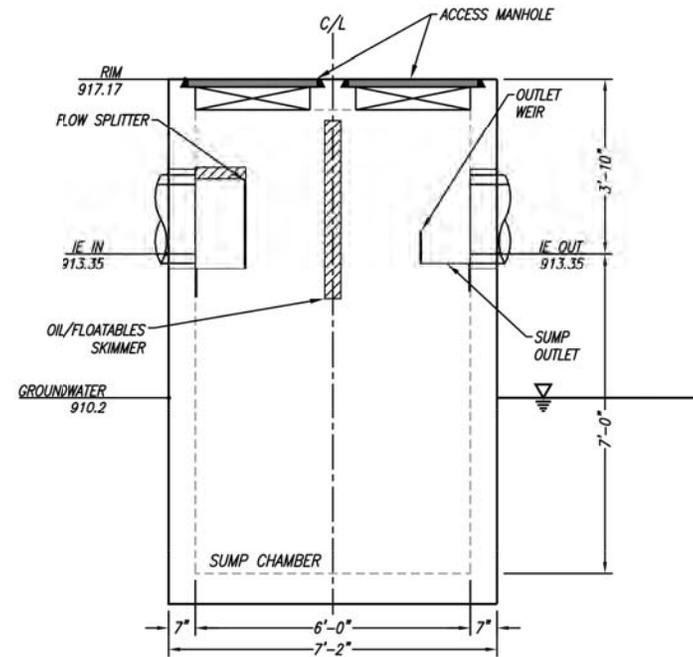
- BIO CLEAN TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
- ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS, AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS, AND ACCESSORIES PLEASE CONTACT BIO CLEAN.
- ALTERNATIVE HATCHES OR MANHOLES AVAILABLE UPON REQUEST.

INSTALLATION NOTES

- CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SCICLONE UNIT AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
- MANUFACTURER RECOMMENDS A 6"-12" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
- ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH).
- ALL GAPS AROUND PIPES SHALL BE SEALED WATERTIGHT WITH A NON-SHRINK GROUT PER MANUFACTURER'S STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
- CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. ALL COVERS SHALL BE SHIPPED LOOSE. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.



PLAN VIEW
NTS



ELEVATION VIEW
NTS

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SC-6-V
HYDRODYNAMIC SEPARATOR
SITE SPECIFIC DETAIL

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.

MICHAEL R. WARNER
LIC. NO. 44693 DATE 3/06/2019



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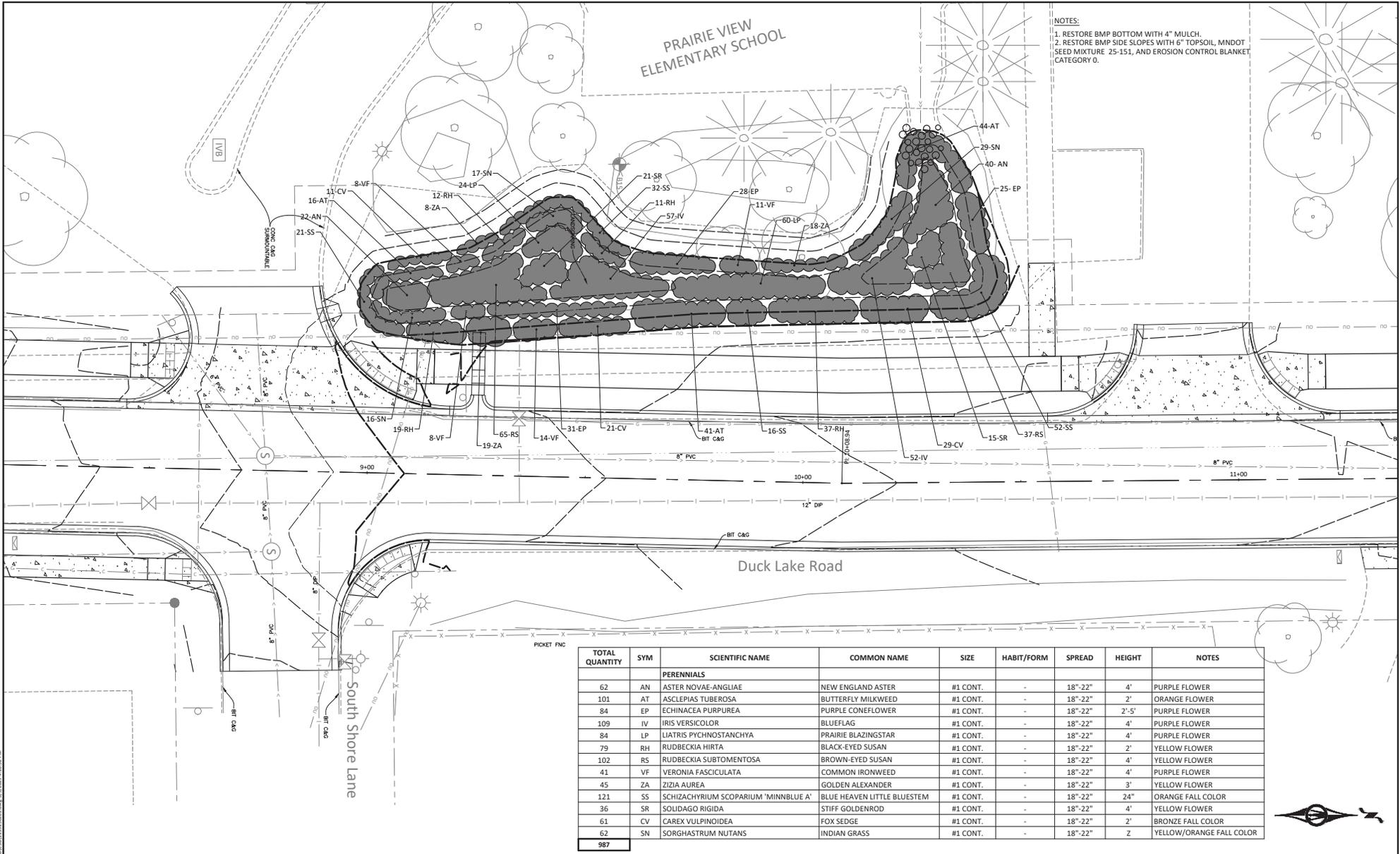
DESIGNED	MRW	DATE	02/20/2019
DRAWN	MRW	DATE	03/05/2019
CHECKED	SL		
CLEAN FILE NO.	T16.113925		

CITY OF EDEN PRAIRIE, MINNESOTA
DUCK LAKE ROAD IMPROVEMENTS
STANDARD DETAILS
S.A.P. 181-121-001

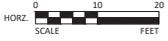
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PRAIRIE VIEW
ELEMENTARY SCHOOL

- NOTES:
 1. RESTORE BMP BOTTOM WITH 4" MULCH.
 2. RESTORE BMP SIDE SLOPES WITH 6" TOPSOIL, MNDOT SEED MIXTURE 25-151, AND EROSION CONTROL BLANKET CATEGORY O.



TOTAL QUANTITY	SYM	SCIENTIFIC NAME	COMMON NAME	SIZE	HABIT/FORM	SPREAD	HEIGHT	NOTES
PERENNIALS								
62	AN	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	#1 CONT.	-	18"-22"	4'	PURPLE FLOWER
101	AT	ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED	#1 CONT.	-	18"-22"	2'	ORANGE FLOWER
84	EP	ECHINACEA PURPUREA	PURPLE CONEFLOWER	#1 CONT.	-	18"-22"	2'-5'	PURPLE FLOWER
109	IV	IRIS VERSICOLOR	BLUEFLAG	#1 CONT.	-	18"-22"	4'	PURPLE FLOWER
84	LP	LIATRIS PYNHSTANCHYA	PRAIRIE BLAZINGSTAR	#1 CONT.	-	18"-22"	4'	PURPLE FLOWER
79	RH	RUDBECKIA HIRTA	BLACK-EYED SUSAN	#1 CONT.	-	18"-22"	2'	YELLOW FLOWER
102	RS	RUDBECKIA SUBTOMENTOSA	BROWN-EYED SUSAN	#1 CONT.	-	18"-22"	4'	YELLOW FLOWER
41	VF	VERONIA FASCICULATA	COMMON IRONWEED	#1 CONT.	-	18"-22"	4'	PURPLE FLOWER
45	ZA	ZIZIA AUREA	GOLDEN ALEXANDER	#1 CONT.	-	18"-22"	3'	YELLOW FLOWER
121	SS	SCHIZACHYRIUM SCOPARIUM 'MINNBLUE A'	BLUE HEAVEN LITTLE BLUESTEM	#1 CONT.	-	18"-22"	24"	ORANGE FALL COLOR
36	SR	SOLIDAGO RIGIDA	STIFF GOLDENROD	#1 CONT.	-	18"-22"	4'	YELLOW FLOWER
61	CV	CAREX VULPINOIDEA	FOX SEDGE	#1 CONT.	-	18"-22"	2'	BRONZE FALL COLOR
62	SN	SORGHASTRUM NUTANS	INDIAN GRASS	#1 CONT.	-	18"-22"	2'	YELLOW/ORANGE FALL COLOR
987								



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.

MICHAEL R. WARNER
 LIC. NO. 44693 DATE 3/16/2019



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DRAWN	MRW	STATE AID	RPCWBD 03/05/2019
CHECKED	SL		
CITY FILE NO.	T16-113925		

CITY OF EDEN PRAIRIE, MINNESOTA
 DUCK LAKE ROAD IMPROVEMENTS
 LANDSCAPE PLAN
 S.A.P. 181-121-001

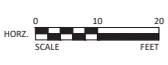
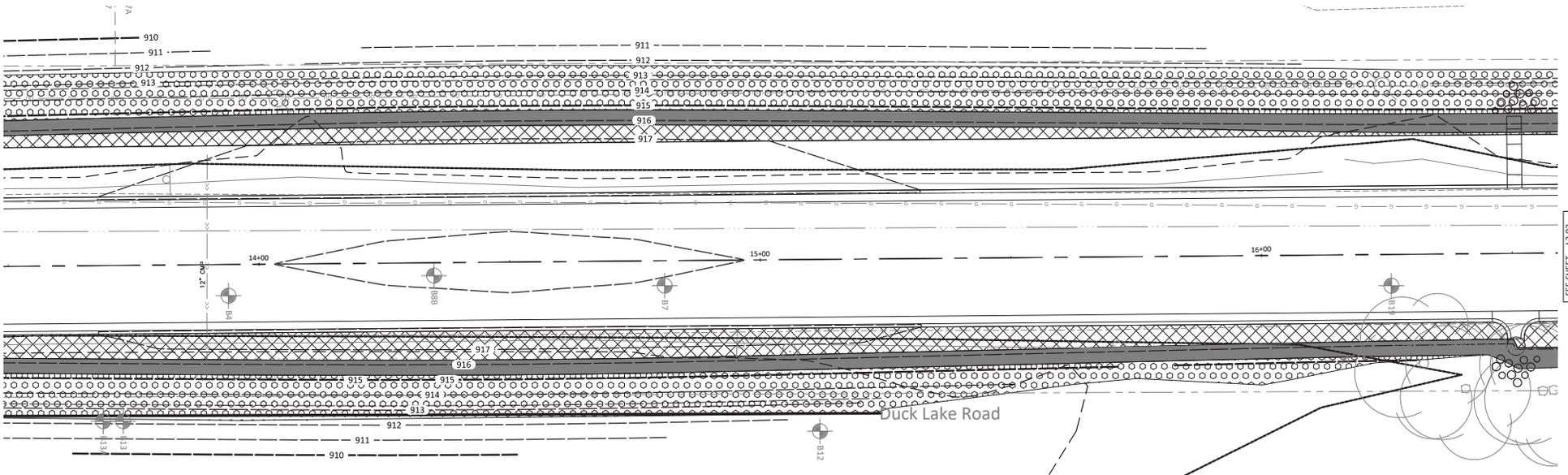
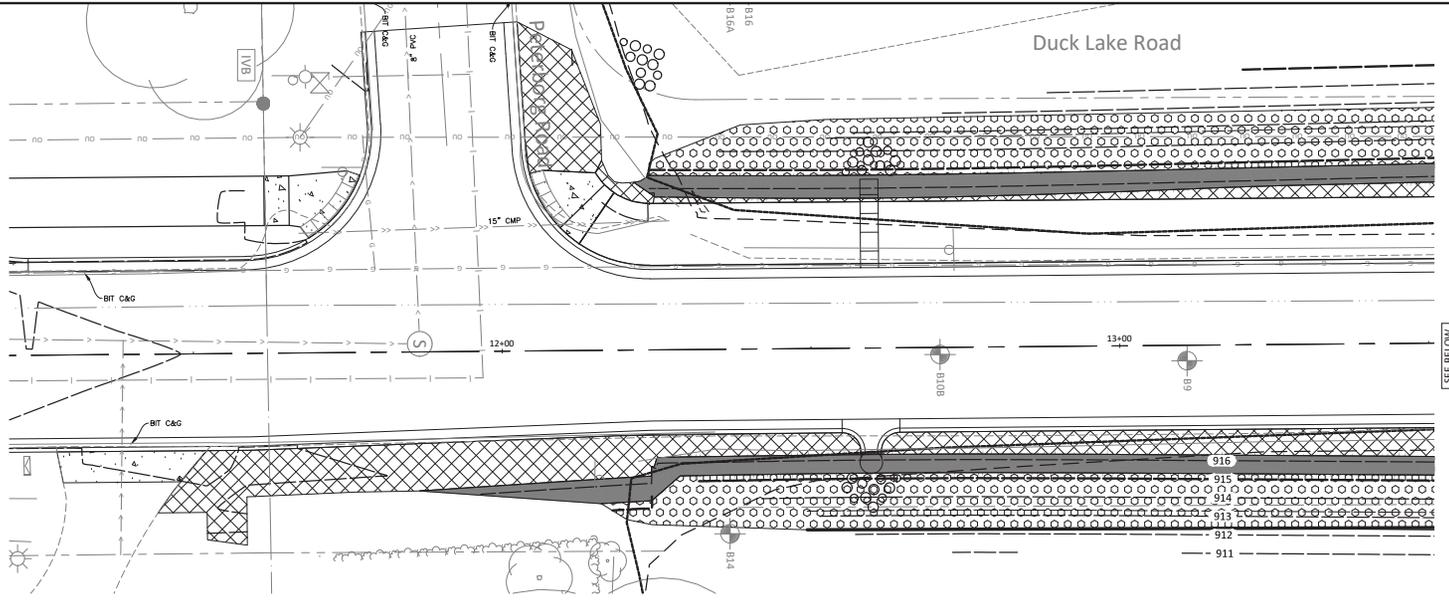
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Duck Lake Road

LAKE SECTION LANDSCAPE LEGEND

-  1' BELOW WATER TO ELEV. 915.3:
PLACE STAGGERED ROWS OF 6" POTS ON 5' GRID
SAGITTARIA LATIFOLIA (ARROWHEAD)
ALISIMA SUBCORDATUM (WATER PLANTAIN)
SCIRPUS FLUVIATILIS (RIVER BULRUSH)
-  ELEV. 915.3 TO 916.3:
MNDOT SEED MIX 34-262 & CAT 3 BLANKET
-  ELEV. 916.3 TO ROAD EDGE:
MNDOT SEED MIX 35-241 & CAT 3 BLANKET



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.

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DESIGNED	MRW	DATE	02/20/2019
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CHECKED	SL	DATE	03/05/2019
CITY FILE NO.	T16-113925		

CITY OF EDEN PRAIRIE, MINNESOTA
DUCK LAKE ROAD IMPROVEMENTS
LANDSCAPE PLAN
S.A.P. 181-121-001

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Applicant Variance Information on following pages

EXECUTIVE SUMMARY

Duck Lake Road is a State Aid Road and a minor north/south collector road in the City. This project includes full reconstruction of Duck Lake Road from Duck Lake Trail to Mallard Court, bisecting Duck Lake within the project area. This segment of Duck Lake Rd is in poor condition and exhibiting many failures including sloughing, longitudinal and transverse cracking. Additionally, pedestrian facilities do not extend throughout this corridor, making pedestrian passage dangerous. This project also looks to mitigate longtime safety and flooding issues by designing the roadway to help minimize the opportunity for water overtopping the road, and mitigate annual flooding around the west cell of Duck Lake and north of Padons Drive.

A primary goal of the project is to improve pedestrian safety adjacent to Prairie View Elementary School (650+ students, K-6) by providing continuous pedestrian facilities on both sides of the road, throughout the corridor. The City has made a substantial effort to minimize environmental impacts by deviating from their traditional design standard as well as State Aid (MnDOT) pedestrian and bike safety standards. Eight corridor layouts were evaluated for the segment bisecting Duck Lake (Peterborg Drive to Padons Drive).

1. Standard typical section which is 53' wide (30' face of curb to face of curb (f/f) with a 5' boulevard, an 8' trail and a 5' sidewalk).
2. Standard typical section, eliminating the boulevards, 10' trail and 7' sidewalk.
3. Standard typical section, no boulevards, and utilizing sheet piling or gabion walls to minimize fill in the lake.
4. Minimizing street width through the lake section, below City standard and within State Aid standard.
5. Eliminating the traditional pedestrian facility on one side of the corridor and constructing a boardwalk over Duck Lake.
6. Eliminating pedestrian facilities on the east side of the road.
7. Equalize flooding between the west and east cells of Duck Lake to prevent overtopping of the road during large rainfall events.
8. Boardwalk on west side through the lake section.

Throughout preliminary design, the project team evaluated the layouts to best balance 1) transportation and pedestrian safety, 2) constructability and costs, and 3) temporary and permanent environmental impacts. The minimal impact alternatives (Layouts 3, 4 and 8) have a potential to impact overhead powerlines and were carefully reviewed with Xcel Energy, two contractors who specialize in similar work, against State pedestrian standards, and in the context of Occupational Safety and Health Administration (OSHA) requirements. These options are not feasible, due to both constructability and safety. Layout #5 also helped minimize environmental impacts by constructing a boardwalk on the east side in lieu of a traditional pedestrian facility. This option was eliminated due to the high cost of the boardwalk (approximately 12 times more than traditional pedestrian facilities) along with the required winter and long-term maintenance for boardwalks. Also, the boardwalk is not being consistent with the City goal of providing the primary pedestrian corridor on the west side of the road to serve the elementary school, eliminating forcing the elementary students from crossing Duck Lake Road at multiple locations with the specific concern of crossing Duck Lake Road during peak school traffic in the morning and evening. The City is dedicated to providing a safe extension of pedestrian facilities in this area, which includes children walking to school during winter months.

The final layout of the corridor, through Duck Lake, includes the street; 26' wide f/f, no boulevard on the west, a 10 ft trail on the west side, and a 3 foot boulevard on the east for safety an overall corridor width of 40 feet rather than the city standard of 52 feet.

To reconstruct Duck Lake Road to meet State Aid Standards, improve vehicular and pedestrian safety, and minimize environmental impacts to the extent possible the City of Eden Prairie is requesting Six (6) Variances from the RPBCWD.

1. Rule B: Floodplain Management, Criteria 3.2, Compensatory Flood Storage

Project Benefit: The proposed equalized flood condition in Duck Lake provides an increase in flood protection overall and will provide safe access for emergency vehicles during critical rain fall events.

2. Rule D: Wetland and Creek Buffer, Criteria 3.2, Buffer Width

Project Benefit: The proposed project will not achieve the full buffer standard for wetlands. However, there will be a buffer widening of 6' to 11' along the lake corridor and full shoreline restoration. The restoration will reduce or eliminate the current erosive state and provide sustainable, native vegetation for long term slope stability and habitat improvement.

3. Rule G: Water Body Crossings and Structures, Criteria 3.2a, No net increase in flood stage.

Project Benefit: The proposed equalized flood condition in Duck Lake provides an increase in flood protection overall and will provide safe access for emergency vehicles during critical rain fall events.

4. Rule J: Stormwater Management, Criteria 3.1a, Rate

Project Benefit: The proposed increase in rate for the 2-year and 10-year events is negligible compared to the added flood control benefit and does not impact downstream system capacity for larger flooding events.

5. Rule J: Stormwater Management, Criteria 3.1c, Water Quality

Project Benefit: The proposed water quality and volume control BMP on the school site will not only provide the minimum required stormwater management according to Rule J, it will also exceed the required treatment for a watershed that discharges almost completely untreated to Duck Lake. The project will enhance environmental project beyond the minimum project requirement.

6. Rule J: Stormwater Management, Criteria 3.10bii, Wetland Protection

Project Benefit: Meeting the precise intent of the water quality rule through the lake section will result in additional lake fill. Therefore, the City has maximized the pollutant removal through surficial pre-treatment structures and necessary shoreline restoration resulting in a wider buffer, more stable and sustainable shoreline, and improved near shore habitat.

This project presents numerous challenges. This permit narrative discusses, at length, the commitment the City has made to consider all viable options to improve roadway safety and minimize environmental impact. While the selected roadway layout does not meet the City's desire for a pedestrian facility on both sides of the road, it does provide continuous access along the critical west side of the corridor. It also helps to minimize overall environmental impacts, it improves public safety by reducing the opportunity for floodwaters to overtop the road, and mitigates annual flooding to numerous properties around Duck Lake and north of Padons Drive.



Exhibit 3: Two bikes traveling side by side through lake section.

During extreme rainfall events when public safety is most crucial, the west cell of Duck Lake will overtop into the east cell, further exacerbating the safe passage of emergency vehicles. The high peak water surface elevation in the west cell also causes water to encroach on several properties immediately adjacent to the lake. Water also backs up into the neighborhood just north of Padons Drive, causing extensive inundation periods (weeks to

The Corridor Layout Section from the applicant narrative is provided for consideration of Variance Request #1

Corridor Layout

The proposed improvements affecting the lake include replacing the road section, converting the roadway through Duck Lake to an urban section, widening the road to meet the minimum State Aid standards, addition of storm sewer, addition of stormwater treatment and floodplain mitigation, and construction of a single multi-use trail.

The goal of the project is to balance public safety with transportation, corridor layout and suitable construction methods while minimizing temporary and permanent environmental impacts. The City and design team evaluated the corridor in two segments: (1) the segments north and south of Duck Lake, and (2) the segment through the lake, between Peterborg Road and Padons Drive. In an effort to balance project goals, eight potential typical sections for the segment crossing Duck Lake were evaluated. The options are summarized in Table 1 and considered the following design components in relation to the City's standard for road construction.

1. Standard typical section which is 53' wide (30' face of curb to face of curb (f/f) with a 5' boulevard, an 8' trail and a 5' sidewalk).
2. Standard typical section, eliminating the boulevards, 10' trail and 7' sidewalk.
3. Standard typical section, no boulevards, and utilizing sheet piling or gabion walls to minimize fill in the lake.

4. Minimizing street width through the lake section, below City standard and within State Aid standard.
5. Eliminating the traditional pedestrian facility on one side of the corridor and constructing a boardwalk over Duck Lake.
6. Eliminating pedestrian facilities on the east side of the road.
7. Equalize flooding between the west and east cells of Duck Lake to prevent overtopping of the road during large rainfall events.
8. Boardwalk on west side through the lake section.

Layout 7 was selected to best balance all design criteria.

Table 1: Summary of options considered and resulting pedestrian and impact minimization alternatives.

OPTION	TRAIL		SIDEWALK		BOARDWALK	WEST BLVD		EAST BLVD		SHEET PILING	GABION WALL
	SIDE	WIDTH	SIDE	WIDTH		SIDE	WIDTH	SIDE	WIDTH	SIDE	SIDE
LAYOUT #1	EAST	8'	WEST	5'	NO	YES	5	YES	5		
LAYOUT #2	EAST	10'	WEST	7'	NO	NO		NO			
LAYOUT #3	EAST	10'	WEST	7'	NO	NO		NO		EAST	
LAYOUT #4	EAST	10'	WEST	7'	NO	NO		NO		WEST & EAST	
LAYOUT #5	NO		WEST	7'	EAST	NO		NO			
LAYOUT #6	EAST	10'	WEST	7'	NO	NO		NO			WEST & EAST
LAYOUT #7	WEST	10'	NO		NO	NO		YES	3		
LAYOUT #8	NO		NO		WEST	YES	3	YES	3		

Alternatives Considered for Avoidance and Minimization of Environmental Impacts

A final design and construction technique best suited for the overall goals while minimizing aquatic resource impacts was selected. Construction techniques were evaluated based on constructability, environmental impacts and the long-term stability of the road. The Duck Lake substrate consists of organic material not suitable for road construction. In order to address the presence of the organics, numerous construction techniques and final design alternatives were considered with varying levels of short- and long-term environmental impacts. Outside of the eight alternatives discussed herein, no-impact alternatives were also considered.

Once the final design was selected, the plans were evaluated on how to effectively minimize impacts while retaining a safe corridor. The minimization efforts for the selected layout are summarized in the Minimization section.

Initial Considerations and Related State Pedestrian Facility Requirements

The City considered placing the pedestrian access between the schools and residential neighborhoods on the east side of the road, either through the construction of a traditional trail or boardwalk. This would require a second crossing at the school, either at Peterborg Road or at the bus exit of the school. The second pedestrian crossing is within 300 feet of the South Shore Lane pedestrian crossing. MNDOT Bikeway Facility Design Manual suggests that pedestrian crossings be greater than 1,500 feet, two school crossings within 300 feet of each other would be problematic, particularly at high traffic periods of drop off and pick up.

The City considered a 6-foot sidewalk versus a 10-foot trail on the west side. This option was not considered because of the nature of the pedestrian traffic. Both foot and bicycle traffic will utilize the trail, requiring a wider trail. The MNDOT Bikeway Facility Design Manual suggests that a 10-foot wide bituminous trail be used for multi-use trails. For safety reasons and the proximity of the schools, the City prefers a wider trail, allowing for both bike and pedestrian traffic.

The City has minimized impacts within their design by:

- Reducing the width of the boulevard from the preferred 8 feet for snow storage to the minimum standard of 5 feet.
- MnDOT Bikeway Facilities Design Manual recommends a 10' shared use path when there is only one pedestrian facility. The manual also recommends a minimum 5-foot separation between the path and curb. The final design minimizes impact by reducing the trail width to 8' and reduces the shoulder to 2'.
- The final design is the State Aid minimum for trail design.
- Increasing the in-slopes of the roadway from the design standard of 4:1 to 3:1.

Non-Feasible Alternatives with No Impact:

1. "No-Build" Alternative – The "no-build" alternative is not a prudent option for this project. If the reconstruction is not completed, Duck Lake Road will continue to degrade, Duck Lake will continue to overtop the road in large storm events and safety for pedestrians and vehicles would not be addressed.
2. Same Alignment Alternative – Another alternative that would avoid permanent impacts to Duck Lake would be to complete reconstruction of Duck Lake Road through upland areas to state aid standards. However, within the lake crossing simply do a mill and overlay to existing widths and elevations, not changing the existing footprint of the road across Duck Lake. Although the City would achieve reconstruction of the majority of the Duck Lake Road, this alternative would not address the overtopping of the road by storm events; safety for pedestrians and vehicles issues; continued scouring and sloughing in the road corridor; and susceptibility to the need for emergency repairs.
3. Simple maintenance practices such as a mill and overlay for the entire project corridor are only a short-term remedy and are not sustainable for the long term, as the side slopes and roadway will continue to erode causing further safety issues and deterioration of the roadway. It is more prudent to construct a planned project rather than deal with an emergency situation. In addition, as a State Aid project, the entire corridor must be constructed to those standards in order to receive funding. The current alignment through Duck Lake is 13-foot lanes with no shoulders and 1:1 slopes. Leaving this configuration would not meet state aid standards required for this reconstruction and the City would not be able to utilize these funds and provide a safe and stable road corridor for pedestrians and vehicles.

Non-feasible Alternatives with Impact: A series of alternatives were considered during the project development phase, including a discussion with the TEP on February 2, 2018, to determine if wetland impacts could be avoided and/or minimized while providing the required standards and safe passage for pedestrians and vehicles. The following alternatives were reviewed, but were unable to completely avoid impacts.

1. Pedestrian Facility Alternative - Use of a boardwalk for a trail in lieu of a traditional

paved trail. The road corridor would be constructed to State Aid standards. This option was considered for the pedestrian facility on the east and west sides of the road.

a) Western Boardwalk Constructability. Construction of a boardwalk on the west side of the road would be challenging if not impossible due to the following factors:

- There are overhead utility poles and lines over the corridor where the boardwalk would need to be constructed. The City requested that the lines be moved underground but Xcel Energy has denied the request and as a result going underground is not considered an option. The overhead lines are transmission lines, which means that boardwalk construction is especially dangerous, if not impossible.
- A ten-foot boardwalk with a five-foot boulevard from the road would require a deck with 12 feet of clearance constructed at the same elevation of 917.0 to meet ADA requirements. This would place the boardwalk between the Duck Lake Road and the Xcel utility poles. These poles support two sets of transmission lines with a sag elevation of 954.0 and distribution lines with a sag elevation of 946.0. Below these elevations are the Xcel neutral wire and communication lines. For safety reasons, Xcel Energy requires a 15-foot clear zone from their distribution lines, or an elevation of 931.0. This clear zone is required for any equipment or materials that may arc from their wires causing safety concerns to operators and people on the ground and may cause wide spread black outs. Constructing a boardwalk under these very tight and dangerous limitations are a direct violation of Occupational Safety and Health Administration (OSHA) requirements.
- Several contractors were contacted regarding the constructability of a boardwalk with the power lines in place while deenergized. While taking the powerlines out of service would reduce the risk of injury, Xcel Energy indicated that “taking the line out of commission for 3-4 weeks in mid/late summer is not very probable since loads will most likely be at their highest”.
- The shortest equipment to drive 20 foot helical pipes is a small excavator (CAT 314, or similar) which has a cab height of 10 feet, a first-knuckle height of 14 feet and a full boom height of 26 feet. The arc zone of the powerline is approximately 14’ above the curb line. In order to raise the steel auger and pilings into position, the arm of the excavator will be within the arc zone of the distribution lines. Regardless if the pilings are set from the road or deck of the boardwalk, the construction of the boardwalk is not feasible because of the equipment needed to reach the required depth for the pilings is with the distribution lines arc zone when charged. Figure 17 is a figure showing the dangers of constructing a boardwalk on the west side of Duck Lake Road.
- The City of Eden Prairie’s policy for school routes, including pedestrian facilities on school routes, is to be plowed within 24 hours for snows >1”. To utilize different equipment to plow a 650 foot

stretch of pedestrian facility is not reasonable when the city has 80+ miles to plow along school routes within that first 24 hours.

- City Park staff stated that maintaining structures such as boardwalks in the winter requires equipment that is currently not owned by the City due to the unique nature of boardwalks, and thus the boardwalk would not be open for use the entire year. Since the boardwalk would represent the primary pedestrian facility, simply raising the blade of a skid steer would not result in safe passage for children. In addition, it is their experience that boardwalks have an increased need for maintenance and a decreased life span in relation to a traditional paved walkway.
 - The cost of a boardwalk on the west side of the road was determined to be approximately 9 to 11 times the cost of a bituminous trail and would result in an additional expense that could not be included within the current project budget (refer to Ped Facility Cost Comparison table in Appendix K). This would eliminate one of the main goals for completing the project, which is increased pedestrian safety.
- b) Eastern Boardwalk Constructability. A boardwalk was also considered on the east side of the road within the lake area. It was determined that a trail on the east side would not be a good option due to the following factors.
- The school and a portion of the existing sidewalk system is on the west side of the road. Placing a lake crossing on the east side would require that students cross Duck Lake Road twice; once to get to the boardwalk and once to get from the boardwalk to the school. This would add a safety issue that could be avoided by constructing the pedestrian facilities on the west side.
 - City Park staff stated that maintaining structures such as boardwalks in the winter requires equipment that is currently not owned by the City due to the unique nature of boardwalks, and thus the boardwalk would not be open for use the entire year. In addition, it is their experience that boardwalks have an increased need for maintenance and a decreased life span in relation to a traditional paved walkway.
 - The cost of a boardwalk was determined to be approximately 9 to 11 times the cost of a bituminous trail and would result in an additional expense that could not be included within the current project budget. This would eliminate one of the main goals for completing the project, which is increased pedestrian safety.

The proposed plans use the west side of the corridor as the primary pedestrian route as the elementary school is located on the west side of the road. In addition, the City's bike and pedestrian plan indicates construction of a pedestrian route on the west side, further solidifying the west side being the primary route. If an additional pedestrian facility were needed on the east side in the future, a boardwalk would be considered as an alternative to minimize additional permanent lake and wetland impacts.

2. Excavate and Refill – This option involves removing organics and refilling the excavation in compacted lifts with suitable material between two rows of temporary sheet pile (sheeting). The depth of organics ranges from 3 feet to 7 feet. This

technique requires all organics within the footprint of the roadway and trail be removed to expose the native coarse alluvial soils. To complete construction of this technique, sheet piling would be installed across the lake section on either side of the roadway.

- a) Dewatering and excavation within the construction area between the sheeting would be required to allow work within a more stable environment. The dewatering could potentially result in ground settlement, displacement of groundwater from its natural flow path, provide non-suitable conditions for the local biota or vegetation, release odors or acid sulfate from peaty soils, and reduce the amount of water available to the local environment.
 - b) The area between the construction area and sheeting would then be filled in lifts with MNDOT specification 3149.2.B.3 for select granular material (Super Sand), a clean, coarse-grained sand. Super Sand would be capped 2 feet above the existing water level with MNDOT specification 3149.2.B.2 for select granular material, which is a fine sand. Once completed the sheet pile would be removed resulting in a potential for sloughing or settling of the granular material from the side slopes into the lake.
 - c) Driving sheet pile on the west side of the lake corridor would run into issues with the overhead transmission lines and would be difficult if not infeasible to complete.
 - d) This option is best performed during the winter due to dewatering issues that may cause settlement of adjacent structures because of the nature of the organic soils. With the existence of a school to the south of the crossing, winter construction is not an option, as school is in session during those months.
 - e) The sheet pile creates a permanent, vertical barrier at the shore line. No additional habitat or shoreline restoration would occur.
 - f) Driving sheet pile on the west side of Duck Lake road would interfere with overhead electrical. The energy company has informed the City that moving the overhead electrical would be too costly and will not consider moving it. Therefore, sheet pile on the west side of Duck Lake road is infeasible from a safety and constructability perspective.
3. Sheet Pile Wall Option – This option would include setting a permanent sheet pile retaining wall that would be driven the length of the lake crossing on either side of the roadway. This would reduce the footprint of the road section to be excavated.
- a) The trench would be dewatered, excavated and backfilled in the same manner as option 1 with the same potential impacts.
 - b) The sheet pile would remain in place, eliminating the 1:3 slopes that would be left when Option 2 is completed. The presence of permanent sheet pile would result in a sheer wall with no ability to restore any native habitat within the corridor.
 - c) Driving sheet pile on the west side of the lake corridor would run into issues with the overhead transmission lines and would be difficult if not be feasible to complete.
 - d) The sheet pile walls would provide no transition from the road to the deeper

water in the lake, resulting in a safety hazard.

- e) This option is best performed during the winter due to dewatering issues that may cause settlement of adjacent structures because of the nature of the organic soils. With the existence of a school to the south of the crossing, winter construction is not an option, as school is in session during those months.
4. Lightweight Fill Option – Lightweight fill can be used to minimize settlement of the roadway due to weight increase on existing organic soils from new embankment structures. Minimizing the settlement generally refers to allowing secondary settlement to occur as it has been occurring in the past, which is substantially less than the primary settlement. Using this approach, the existing soils are subcut a sufficient thickness for the proposed grade raise. The replacement thickness depends on the unit weight of the lightweight material used.
 - a) Lightweight fill will need to be placed within the road corridor. Options for lightweight fill include geofirm blocks, cellular concrete, woodchips or tire derived aggregate.
 - b) The Lightweight Fill Option is typically considered the least environmentally damaging option because it entails a thinner embankment section. However, it would have to be completed in conjunction with a floated embankment and surcharge because of the virgin swamp deposits that are being constructed over. This would lead to an embankment width similar to that of the feasible option discussed below. As a result, the floated embankment with surcharge option would have fewer environmental impacts.
 5. Bridge options were considered as an environmentally beneficial alternative that could lead to elimination of lake fill and restoration of the pre-settlement lake bottom. A bridge spanning approximately 300' of Duck Lake could be constructed. However, the north end of the bridge, traditional construction would continue and the west cell of Duck Lake would still have approximately 330 linear feet of lake fill and permanent impact. This option is severely limited in terms of overall project costs. City staff and structural engineers estimated a total cost of \$2.5M for a bridge. The total project cost for the selected alternative is approximately \$1.8M. A bridge alternative is not feasible for the City to construct at this time.

Feasible Alternative with Impacts: In order to meet the pedestrian safety and environmental impact reduction goals of the projects, feasible alternatives were developed that minimize impact to the maximum extent practicable.

1. Floated Embankment with Surcharge Option – This option places a widened embankment over the in-place organic soils (floated embankment), and then places a surcharge across the widened embankment as well as the existing road embankment. The surcharge would be left for a period of time to allow the organic soils to settle. Once the optimum amount of settling has occurred the surcharge would be excavated and removed to the road section grade.

The surcharge would be placed in lifts, or stages. The first stage would consist of 2 feet of Super Sand to be placed directly over the organic soils, which is allowed to settle for two weeks. The second stage would consist of placing an additional 2 feet of Super Sand, in addition to the settlement that occurred during second stage for two weeks. The third stage consists of placing the remaining fill up to proposed finish grade, in addition to the amount of settling during the second stage, this lift will

remain for another two weeks. The final stage includes placing the surcharge two feet above final grade for a period of six months.

The road would be constructed with a traditional trail on the west side with no boulevard and no pedestrian facilities on east side.

- a) Construction timing, embankment width and road access will allow the City to maintain the crossing to vehicular traffic throughout the surcharge process, except for times when the surcharges are being placed.
- b) Sheet piles are not required on the west side, reducing the impact of the transmission lines on the project.
- c) Balances transportation and pedestrian safety.
- d) Feasible to construct.
- e) Provides a narrow band of natural habitat between the road corridor and the lake when completed.

Final Layout Impacts

The City and project team considered eight (8) layout options for the segment crossing Duck Lake, each with varying costs and resulting permanent environmental impact. Layout 7 meets the ultimate goal of pedestrian safety while reducing environmental impact to the maximum extent practicable. Table 2 below describes the layout option and the permanent environmental impact associated with each option for the area between Pardons Dr and Peterborg Rd along the lake corridor. Refer to Figure 1 in Appendix A for a general project layout, including major stormwater management components and construction plans for more information.

A “pros and cons” list was also developed to compare relative project cost, temporary and permanent environmental impacts, and long-term maintenance. Table 3 summarizes the project team’s approach to narrowing in on a proposed solution.

Duck Lake Road is a State Aid Route; therefore, State Aid design standards must be met. If State Aid design standards are not met, funding could be significantly jeopardized and roadway safety improvements may be neglected or shifted far into the future when funds become available. In 2016, the Duck Lake Road Annual Average Daily Traffic (AADT) was measured as 1,150. The minimum State Aid design standard for an urban roadway with this AADT includes 10-11 foot wide lanes and 1-2 foot curb reaction. In an effort to minimize aquatic resource impacts, the City decreased the roadway through Duck Lake to the minimum State Aid design standard, which includes 11-foot lanes, with 2-feet of curb reaction, an 8 foot multi-use trail, with 2 foot bituminous boulevard and 1:3 in-slopes where the road crosses the lake. The design selected for upland areas includes 13-foot lanes, with 2-feet of curb reaction, 5-foot boulevards, an 8 foot multi-use boardwalk on the west side and a 5-foot sidewalk on the east side.

Table 2: Summary of permanent environmental impacts.

OPTION	DESCRIPTION	PERMANENT ENVIRONMENTAL IMPACT
		(SF)
LAYOUT #1	Traditional sidewalk (5') and trail (8') per City Standards (5' boulevard both sides)	23,829
LAYOUT #2	Traditional sidewalk and trail on both sides of the road, no boulevard	20,439
LAYOUT #3	Traditional sidewalk on west side, construct trail utilizing sheet piling, no boulevard	12,472
LAYOUT #4	Sidewalk and trail constructed utilizing sheet piling, no boulevard	6,848
LAYOUT #5	Traditional sidewalk on west side, boardwalk on east side, no boulevards	14,432
LAYOUT #6	Sidewalk and trail constructed utilizing gabion walls, no boulevard	8,910
LAYOUT #7	Traditional trail on west side, no boulevard, no pedestrian facilities on east side	18,318
LAYOUT #8	Boardwalk only on west side, no pedestrian facilities on east side.	12,314

Proposed Corridor Layout

Following the review of, and in an effort to balance, the permanent environmental impacts, pedestrian safety, feasibility and constructability, the City is moving forward with Layout #7, a traditional trail along the west side of Duck Lake Road, with no boulevard, to minimize overall environmental impacts. Several layouts provided less permanent environmental impact but costs were significantly higher (27% - 50% greater, see Appendix K). Layout 4 also introduces permanent sheet piling in the lake which eliminates a natural and native shoreline and habitat. Layout 6 with the Gabion Walls was not feasible due to the soil's constructability requirements. The final design is consistent with Layout 7 and the following design elements.

- Within the 66-foot right-of-way, north and south of Duck Lake the City's standard typical section will be constructed with an 8-foot wide multi-use trail on the west side and a 5-foot wide sidewalk on the east side.
- Between Peterborg Road and Padons Drive a narrowed road will be constructed with a section including a 26' f/f road, 3' boulevard on the east side, and a 10 foot multi-use trail along the west side of the road with 1:3 slopes constructed into Duck Lake.

Table 3: Pros and cons of roadway layout options.

LAYOUT	DESCRIPTION	PROS	CONS
1	Traditional sidewalk (5') and trail (8') per City Standards (5' boulevard both sides)	Consistent with City standards	Largest permanent environmental impact of layouts.
		Added safety factor of boulevards provided.	
		Provides year-round access to the schools on both sides of the roadway.	
2	Traditional sidewalk and trail on both sides of the road, no boulevard	Provides year-round access to the schools on both sides of the roadway.	Second largest permanent environmental impact of layouts.
			Significant permit requirements for compensatory flood storage.
3	Traditional sidewalk on west side, construct trail utilizing sheet piling, no boulevard	Provides year-round access to the schools on one side of the roadway.	Dewatering required for installation of temporary sheet piling.
			Potential for ground settlement, displacement of groundwater flow or release of odors.
			Potential for sloughing or settling of granular fill material when the sheet piling is removed.
			High cost for temporary sheet pile installation.
4	Sidewalk and trail constructed utilizing permanent sheet piling, no boulevard	Least amount of permanent environmental impacts.	Aquatic habitat not provided on the sheet piling resulting in permanent loss of habitat.
		Provides year-round access to the schools on both sides of the roadway.	Dewatering required for installation of permanent sheet piling.
			Potential for ground settlement, displacement of groundwater flow or release of odors.
			High cost associated with sheet piling (approx. \$1.5M).
			Requires treatment (i.e. fencing) on top of sheet piling.
5	Traditional sidewalk on west side, boardwalk on east side, no boulevards	Provides a year-round primary access to the school on the west side.	High cost for boardwalk construction (approx. \$400k).
		Secondary access provided on the east side as a boardwalk.	High environmental impacts.
			No boulevards result in reduced safety within the corridor.
6	Sidewalk and trail constructed utilizing gabion walls, no boulevard	Provides year-round access to the schools on both sides of the roadway.	Existing soils cannot support gabion walls.
			Aquatic habitat not provided on the gabion walls resulting in permanent loss of habitat.
7	Traditional trail on west side, no boulevard, no pedestrian facilities on east side	Slope restoration allows habitat to establish along the lake corridor.	Significant permit requirements for compensatory flood storage.
		Overhead utility lines can be avoided with a trail.	Environmental impacts 3 rd highest of the layouts evaluated.
		Sheet piles can be avoided.	
		Provides a primary, year-round access to the schools on the west side.	

		Maintains traffic during most of the construction period.	
		Provides a trail in accordance with the City's pedestrian facility Plan.	
8	Boardwalk on west side, no pedestrian facilities on east side.	Able to reduce permanent environmental impacts.	Risks closure of pedestrian access to the school during periods of inclement weather such as snow, ice or fog if equipment needed to clear the walkway is not readily available.
			Overhead utility lines limit constructability. The City requested relocation underground; denied by utility company. A shift in the location of the lines is not feasible.
			Boardwalk life span lower than a trail or sidewalk.
			Specialized equipment to maintain boardwalk during the winter required.
			High cost for boardwalk construction.
9	Bridge over lake with no pedestrian facilities at ground level.	The two cells of the lake are reconnected environmentally as well as hydraulically.	Significantly higher cost.
			Duck Lake would still have approximately 330' lineal feet of fill and permanent impact on the west cell due to traditional construction methods.

Project costs were carefully compared to environmental impact to best balance the project goals. A planning level cost breakdown of the pedestrian facilities was generated and provided in Appendix K. Construction methods through the road section are consistent for each option. Therefore, only the costs for the pedestrian facilities through the lake were considered in determining the approximate cost for each layout. Layout 7 does not provide the lowest environmental impact. However, the difference in cost for pedestrian facilities is substantial (\$600,000 - \$1,650,000) to reduce the environmental. Layout 7 meets the ultimate goal of pedestrian safety while reducing environmental impact to the maximum extent practicable.

II. Regulatory Agency Coordination and Permitting

On July 10th, 2017 and February 2nd, 2018, Water Resources Stakeholder Group meetings were conducted to present project challenges and preliminary layouts to the regulatory agencies. Additional meetings with RPBCWD were also conducted to present preliminary and final design options to clearly identify permitting requirements. The agencies included:

- City of Eden Prairie
- Hennepin County
- Riley Purgatory Bluff Creek Watershed District (RPBCWD)
- Board of Water and Soil Resources (BWSR)
- Minnesota Department of Natural Resources (MnDNR)
- US Army Corps of Engineers (USACE)

Prior to the start of construction, including the roadbed surcharge periods expected to commence in summer 2019, all project permitting will be complete. Numerous permitting requirements will take effect as a result of this project. Wetland and DNR work in water permitting has been initiated and results will be shared with RPBCWD as approved. In general, the following permits will be obtained.

dry the soils between rainfall events. During rain events, the tile will still likely experience a tail water condition and water will stand in the back yards until the rainfall event has stopped. Then, the tile will drain surficial water as well as dry the adjacent soils.

While it is not possible to lower the culvert under Pardons Drive, it is recommended that the area in the drainage and utility easement between addresses 6836 Duck Lake Rd and 17208 Padons Dr should be graded to surface drain to a new pipe and apron at elevation approximately 913.30. The catch basin at Padons Dr could remain in place and the new pipe field connected, if the structure is still in good condition, as seen Figure 5.

The 8' x 4' concrete box culvert equalizer will also provide some hydraulic relief from the backyard areas north of Padons Drive. When the equalizer culvert is installed, the tail water condition in the west cell of Duck Lake will be lower. The reduction in tail water is most effective for rainfall events larger than the 25-year (5.39 inches in 24 hours) rain fall event. If the culvert under Pardons Drive is upsized and the equalizer culvert is installed, the peak elevation in the back yard areas is substantially lower (approximately 1.5 to 2.3 feet) for all rainfall events. Refer to Figure 5 in Appendix A for the French drain layout.

Rule K: Variances.

According to Rule K, RPBCWD grants exceptions if “better natural resource protection or enhancement can be achieved by the project as proposed”. This is a challenging project that is important for pedestrian safety, road way safety, environmental protection and flood control. The project described above meets these requirements and is economically feasible for the City of Eden Prairie to complete. Through nearly two years of project planning, water resources stakeholder meetings, alternatives analysis and final design, the City of Eden Prairie has made substantial effort to reduce the number of variance requested. The following describes each potential variance.

Rule B: Floodplain Management – Criteria 3.2, Compensatory Flood Storage

- Given significant limitations in available space for compensatory flood storage, the City has provided as much extra storage as practical.
- The lack of compensatory flood storage available is not the primary cause of the rise in lake elevation under the proposed condition. Restoring the lakes natural bounce by including an equalizer culvert is not dependent on providing compensatory flood storage.
- The remaining 1,000 cu yds of compensatory flood storage equates to approximately 0.01 feet (0.12”) over the surface area of Duck Lake.
- The increase in flood stage in the east cell relatively minor when compared to the expansion in flood storage in the west cell.
- The minor increase in flood stage in the east cell is negligible in terms of flood plain area and does not introduce new flood hazard for any homeowner.
- The decrease in flood stage on the west cell is anticipated to benefit 12 properties and reduce flooding to as many as 7 structures.
- The reduction in flood elevation in the west cell eliminates roadway overtopping.
- Assuming approximately 1,000 cubic yards of excavation is still required, and an available depth of excavation of approximately 1.9' (Lake Elev 913.28 – Proposed 100 Year 915.15), approximately 14,210 square feet of area is needed. To fully meet the compensatory flood storage requirement for the selected Layout 7, would require the purchase of one or two residential lots. The cost to purchase property, relocate the resident(s) to a similar property and home, demolish the home, excavate the area and stabilize the lot would be approximately \$500,000-\$800,000.

The proposed equalized flood condition in Duck Lake provides an increase in flood protection overall and will provide safe access for emergency vehicles during critical rain fall events.

Rule D: Wetland and Creek Buffer – Criteria 3.2, Buffer Width

- RPBCWD requires buffer to wetlands based on its environmental value.
- The average buffer widths range from 20 to 80 feet and the minimum buffer widths range from 10 to 40 feet (low to exception value, respectively).
- Duck Lake Road has an average 4' buffer width on the west side of the road and 1' (or less) on the east side.
- The existing buffer is nearly vertical in some areas and highly eroded along the east side of the road.
- Near shore habitat suffers because of erosion slopes and sediment deposition in the lake.
- The proposed buffer width will be an average of 15', with a minimum of 11'.
- In order to meet the average buffer required for exceptional value wetlands, additional fill in Duck Lake would be required to flatten the slopes.
- The project includes restoration of the shoreline to a native vegetated state.
 - From the water surface to 1' above the OHW – 6" native potted plants on a 10' grid.
 - From the OHW to 1' above the OHW – MnDOT seed mix 34-262 (wet prairie)
 - 1' above OHW to road edge - MnDOT seed mix 35-241 (mesic prairie)

The proposed project will not achieve the full buffer standard for wetlands. However, there will be a buffer widening of 6' to 11' along the lake corridor and full shoreline restoration. The restoration will reduce or eliminate the current erosive state and provide sustainable, native vegetation for long term slope stability and habitat improvement.

Rule G: Water Body Crossings and Structures – Criteria 3.2a, No net increase in flood stage.

- The need for regional peak flood control on the west cell and reduction/elimination of roadway overtopping is a primary goal of the project.
- In order to equalize the east and west cells of Duck Lake, a larger culvert under Duck Lake Road is required. This shifts volume from the west cell to the east cell, resulting in an increase in flood elevation within the east cell.
- The impacts of the flood elevation increase have been vetted through inundation mapping and extreme event analyses, as described herein. For the 100-year flood event, an increase in flood elevation of 0.1' is anticipated.
- The increase in elevation is displayed in Figure 11. The flood increase is negligible over most of the lake, with minimal floodplain expansion mostly contained in conservation and drainage and utility easement.
- Table 6 above describes the potential reduction in flooding on the west cell of Duck Lake and no impact to structures on the east cell.
- Overtopping of Duck Lake Road will be eliminated for the 100-year event and will allow for safe passage of emergency vehicles during times of highest need.

The proposed equalized flood condition in Duck Lake provides an increase in flood protection overall and will provide safe access for emergency vehicles during critical rain fall events.

Rule J: Stormwater Management – Criteria 3.1a, Rate.

- The need for regional peak flood control on the west cell and reduction/elimination of roadway overtopping is a primary goal of the project.
- In order to equalize the east and west cells of Duck Lake, a larger culvert under Duck Lake Road is required. This causes an increase in rate from the west cell to the east cell, but a reduction in peak elevation in the west cell.
- The full flow gravity capacity of Duck Lake outlet (18" CMP @ 0.38%) is 3.83 cfs. The 2-year and 10-year rainfall events produce peak discharges of 0.8 cfs and 2.4 cfs, respectively, during the equalized condition. Even though a minor increase in discharge will be observed, the downstream infrastructure has capacity to serve the increase and no adverse impact is anticipated to occur along the riparian corridor of Purgatory Creek.
- The only way to maintain peak water surface elevations and rate in Duck Lake would be to replace the existing culvert with one that has similar capacity. This would restore the current flooding condition and provide no additional flood improvements to the region.
- There is no increase in discharge rate for the 50- and 100-year rainfall events, when flood flows are more critical.

The proposed increase in rate for the 2-year and 10-year events is negligible compared to the added flood control benefit and does not impact downstream system capacity for larger flooding events.

Rule J: Stormwater Management – Criteria 3.1c, Water Quality.

- RPBCWD requires treatment of all site runoff.
- The restricted corridor requires treatment of adjacent impervious to show net volume control and water quality standards are met.
- The City of Eden Prairie and Prairie View Elementary have entered into an agreement that will enhance the schools property with a stormwater BMP that will not only be used to meet the volume control standard for the site, but exceed the required volume control and water quality requirements.
- The school intends to develop curriculum and outdoor class room space surrounding the infiltration feature and will assist the city in long term maintenance.
- All agreements have been signed describing property acquisition and easements, short and long term maintenance, etc.

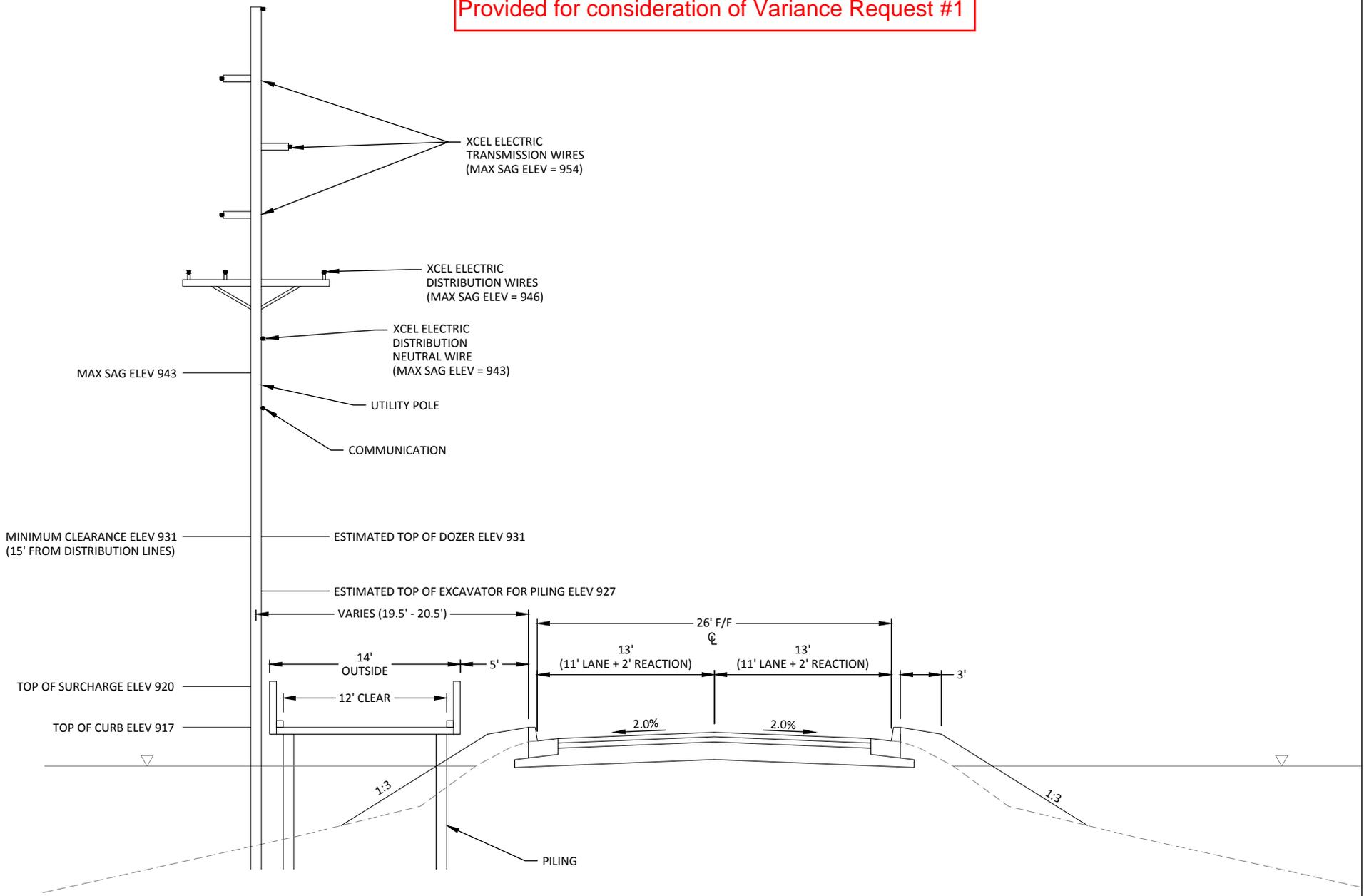
The proposed water quality and volume control BMP on the school site will not only provide the minimum required stormwater management according to Rule J, it will also exceed the required treatment for a watershed that discharges almost completely untreated to Duck Lake. The project will enhance environmental project beyond the minimum project requirement.

Rule J: Stormwater Management – Criteria 3.10bii, Wetland Protection.

- Treatment of runoff through the lake section does not exist in the existing condition.
- Eroding banks, limited vegetated buffer, and lack of established vegetation are further degrading the near shore habitat.
- Criteria 3.10bii states that for exceptional value wetlands, the wetland may not be used for stormwater management unless no other alternative is feasible.
- The water table through the lake section averages from 2.5' to 3' below the road centerline, and approximately 2' and less from the shoulder to the lake.
- Construction of permanent stormwater infrastructure is not feasible with the high groundwater. Also, creating additional lateral green space for stormwater BMPs will result in additional fill in the lake.
- The project will maximize water quality by providing surficial treatment of large sediment particles and gross solids using Rain Guardian Structures.
- The wetland/shoreline buffer will be widened by an average of 10' and improved through strategic restoration of the bank using deep rooted, native vegetation.

Meeting the precise intent of the water quality rule through the lake section will result in additional lake fill. Therefore, the City has maximized the pollutant removal through surficial pre-treatment structures and necessary shoreline restoration resulting in a wider buffer, more stable and sustainable shoreline, and improved near shore habitat.

Provided for consideration of Variance Request #1



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Duck Lake Road Improvements
Ped Facility Cost Comparison

Provided for consideration of Variance Request #1

Cost Assumptions								
TRAIL	\$70	/LF	SHEETPILE	\$1,600	/LF	PROPERTY ACQ.	\$350,000	/HOUSE
SIDEWALK	\$100	/LF	GABION	\$950	/LF			
BOARDWALK	\$1,000	/LF	WEST LENGTH	600				
BLVD	\$25	/CY	EAST LENGTH	425				

OPTION	APPROX TRAIL	APPROX SIDEWALK	APPROX BOARDWALK	APPROX BLVD	APPROX SHEETPILE	APPROX GABION	APPROX TOTAL COST FOR PED FACILITIES	PERMANENT ENVIRONMENTAL IMPACT	WETLAND CREDIT COSTS	APPROX TOTAL PROJECT COSTS	% OF TOTAL COST FOR PED FACILITY
	COST	COST	COST	COST	COST	COST		(SF)	(ACRE)		
LAYOUT #1	\$42,000	\$42,500	\$0	\$47,500	\$0	\$0	\$132,000	23,829	\$61,268	\$1,885,369	7.0%
LAYOUT #2	\$42,000	\$42,500	\$0	\$0	\$0	\$0	\$84,500	20,439	\$52,552	\$1,829,153	4.6%
LAYOUT #3	\$42,000	\$42,500	\$0	\$0	\$960,000	\$0	\$1,044,500	12,472	\$32,068	\$2,768,669	37.7%
LAYOUT #4	\$42,000	\$42,500	\$0	\$0	\$1,640,000	\$0	\$1,724,500	6,848	\$17,607	\$3,434,208	50.2%
LAYOUT #5	\$0	\$42,500	\$600,000	\$0	\$0	\$0	\$642,500	14,432	\$37,107	\$2,371,708	27.1%
LAYOUT #6	\$42,000	\$42,500	\$0	\$0	\$0	\$973,750	\$1,058,250	8,910	\$22,909	\$2,773,260	38.2%
LAYOUT #7	\$42,000	\$0	\$0	\$11,800	\$0	\$0	\$53,800	18,318	\$47,099	\$1,793,000	3.0%
LAYOUT #8	\$0	\$0	\$600,000	\$28,500	\$0	\$0	\$628,500	12,314	\$31,661	\$2,352,262	26.7%

MN DNR General Permit 2015-1192



General Permit Number
2015-1192

Public Waters Work General Permit

Expiration Date: 05/20/2020

Pursuant to Minnesota Statutes, Chapter 103G, and on the basis of statements and information contained in the permit application, letters, maps, and plans submitted by the applicant and other supporting data, all of which are made part hereof by reference, **PERMISSION IS HEREBY GRANTED** to the applicant to perform actions as authorized below.

Project Name: Riley-Purgatory-Bluff Creek Watershed District	County: Hennepin and Carver	Watershed: Lower Minnesota River - Shakopee	Resource: All Public Waters within Riley-Purgatory-Bluff Creek Watershed	
Purpose of Permit: Sediment Removal, Sand Blanket w/o Excavation, Sand Blanket w/ Excavation, Riprap (Natural Rock), Retaining Wall, Erosion Control/Stabilization Fill & Grading, Culvert Construction/Modification/Replacement, Bridge Construction/Modification/Replacement, Bioengineering		Authorized Action: Place natural rock riprap; shape banks/shorelines for placement of riprap or bioengineering; install beach sand blankets; construct retaining walls, bridges and culverts; remove structures; remove sediment; all in accordance with the Conditions of this permit.		
Permittee: Riparian Property Owners within Riley-Purgatory-Bluff Creek Watershed District		Authorized Agent: N/A		
Property Description (land owned or leased or where work will be conducted):				
Authorized Issuer: Tom Hovey	Title: Water Regulations Unit Supervisor	Issued Date: 09/22/2015	Effective Date: 09/22/2015	Expiration Date: 05/20/2020

This permit is granted **subject to** the following **CONDITIONS**:

APPLICABLE FEDERAL, STATE, OR LOCAL REGULATIONS: The permittee is not released from any rules, regulations, requirements, or standards of any applicable federal, state, or local agencies; including, but not limited to, the U.S. Army Corps of Engineers, Board of Water and Soil Resources, MN Pollution Control Agency, watershed districts, water management organizations, county, city and township zoning.

NOT ASSIGNABLE: This permit is not assignable by the permittee except with the written consent of the Commissioner of Natural Resources.

NO CHANGES: The permittee shall make no changes, without written permission or amendment previously obtained from the Riley-Purgatory-Bluff Creek Watershed District or the Commissioner of Natural Resources, in the dimensions, capacity or location of any items of work authorized hereunder.

SITE ACCESS: The permittee shall grant access to the site at all reasonable times during and after construction to authorized representatives of the Commissioner of Natural Resources for inspection of the work authorized hereunder.

TERMINATION: This permit may be terminated by the Commissioner of Natural Resources at any time deemed necessary for the conservation of water resources of the state, or in the interest of public health and welfare, or for violation of any of the conditions or applicable laws, unless otherwise provided in the permit.

GENERAL PERMIT CONDITIONS *(Continued from previous page)*

COMPLETION DATE: Construction work authorized under this permit shall be completed on or before the date specified above. The permittee may request an extension of the time to complete the project by submitting a written request, stating the reason thereof, to the Commissioner of Natural Resources.

WRITTEN CONSENT: In all cases where the permittee by performing the work authorized by this permit shall involve 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 thereon or interests therein, the permittee, before proceeding, shall obtain the written consent of all persons, agencies, or authorities concerned, and shall acquire all property, rights, and interests needed for the work.

PERMISSIVE ONLY / NO LIABILITY: This permit is permissive only. No liability shall be imposed by the State of Minnesota or any of its officers, agents or employees, officially or personally, on account of the granting hereof or on account of any damage to any person or property resulting from any act or omission of the permittee or any of its agents, employees, or contractors. This permit shall not be construed as estopping or limiting any legal claims or right of action of any person other than the state against the permittee, its agents, employees, or contractors, for any damage or injury resulting from any such act or omission, or as estopping or limiting any legal claim or right of action of the state against the permittee, its agents, employees, or contractors for violation of or failure to comply with the permit or applicable conditions.

EXTENSION OF PUBLIC WATERS: Any extension of the surface of public waters from work authorized by this permit shall become public waters and left open and unobstructed for use by the public.

WETLAND CONSERVATION ACT: Where the work authorized by this permit involves the draining or filling of wetlands not subject to DNR regulations, the permittee shall not initiate any work under this permit until the permittee has obtained official approval from the responsible local government unit as required by the Minnesota Wetland Conservation Act.

INVASIVE SPECIES - EQUIPMENT DECONTAMINATION: All equipment intended for use at a project site must be free of prohibited invasive species and aquatic plants prior to being transported into or within the state and placed into state waters. All equipment used in designated infested waters, shall be inspected by the Permittee or their authorized agent and adequately decontaminated prior to being transported from the worksite. The DNR is available to train inspectors and/or assist in these inspections. For more information refer to the "Best Practices for Preventing the Spread of Aquatic Invasive Species" at http://files.dnr.state.mn.us/publications/ewr/invasives/ais/best_practices_for_prevention_ais.pdf. Contact your regional Invasive Species Specialist for assistance at www.mndnr.gov/invasives/contacts.html. A list of designated infested waters is available at www.mndnr.gov/invasives/ais/infested.html. A list of prohibited invasive species is available at www.mndnr.gov/eco/invasives/laws.html#prohibited.

CONSTRUCTION DEWATERING - GENERAL: All construction dewatering in excess of 10,000 gallons per day or one million gallons per year must be authorized by a separate water appropriation permit. All worksite discharge water must be treated for sediment reduction prior to return to the surface water. Water from designated infested waters shall not be diverted to other waters, transported on a public road, or transported or appropriated off property riparian to infested waters without a DNR permit specifically for this use. All equipment in contact with infested waters must be decontaminated upon leaving the site.

EROSION AND SEDIMENT CONTROL: In all cases, methods that have been determined to be the most effective and practical means of preventing or reducing sediment from leaving the worksite shall be installed in areas that slope to the water and on worksite areas that have the potential for direct discharge due to pumping or draining of areas from within the worksite (e.g., coffer dams, temporary ponds, stormwater inlets). These methods, such as mulches, erosion control blankets, temporary coverings, silt fence, silt curtains or barriers, vegetation preservation, redundant methods, isolation of flow, or other engineering practices, shall be installed concurrently or within 24 hours after the start of the project, and will be maintained for the duration of the project in order to prevent sediment from leaving the worksite. DNR requirements may be waived in writing by the authorized DNR staff based on site conditions, expected weather conditions, or project completion timelines.

EXCAVATED MATERIALS - FLOODPLAIN CONCERN: Excavated material shall not be permanently placed within community designated floodplain areas or shoreland areas, unless all necessary local permits and approvals have been obtained.

GENERAL PERMIT CONDITIONS (Continued from previous page)

AQUATIC PLANT MANAGEMENT: For projects where vegetation is placed waterward of the ordinary high water level, a separate Aquatic Plant Management (APM) permit is needed from the DNR Area Fisheries Manager. See contact list at: http://files.dnr.state.mn.us/fisheries/management/dnr_fisheries_managers.pdf. A permit shall be obtained (no fee required) for each site in order to monitor plant source, species, and planting location. Vegetation must be appropriate for the site and free of invasive species. This condition does not apply when only woody vegetation is used, such as willow and dogwood.

APPLICABLE PROJECTS: A project not meeting applicable conditions of this permit or a project the DNR identifies as having the potential for significant resource impacts, is not authorized herein. Rather, such projects will require an individual DNR permit application.

ENVIRONMENTAL REVIEW: If the project proposal is part of a project that requires mandatory environmental review pursuant to MN Environmental Quality Board rules, then the permit is not valid until environmental review is completed.

RETAINING WALLS: Retaining walls are generally discouraged because their impact on the near-shore aquatic environment can be severe and they restrict wildlife movement, however, they may be permitted if the following conditions are met: a. Existing or expected erosion problems shall preclude the use of riprap shore protection with a finished slope of 2:1 (horizontal to vertical) or more gentle, due to steep banks, nearby structures or other extenuating circumstances; or there shall be a demonstrated need for direct shoreland docking. b. Design shall be consistent with existing uses in the area. Examples are: riverfront commercial-industrial areas having existing structures of this nature, dense residential areas where similar retaining walls are common, or where barges are utilized to carry equipment and supplies. c. Adequate engineering studies shall be performed on foundation conditions, tiebacks, internal drainage, construction materials, and protection against flanking. d. The facility shall not be an aesthetic intrusion upon the area and is consistent with all applicable local, state, and federal management plans and programs for the water body. e. Encroachment below the ordinary high water elevation shall be limited to the absolute minimum necessary for construction.

ICE RIDGE REMOVAL: Ice ridge removal projects must meet the DNR "no permit required" conditions for ice ridge removal specified in Minn. Rules part 6115.0215, Subpart 4. If not, a DNR Individual permit is required as District rules do not address this category of project.

HYDROLOGIC / HYDRAULIC DATA REPORTING :: Unless waived by the DNR Area Hydrologist, hydrologic modeling to show the impacts of a bridge or culvert constructed in a Public Water to the 100-year flood elevation is required. Additional modeling may also be required for temporary fill or temporary structures required during demolition or construction. Calculations showing calculated velocities through the structures at 2-year peak flows may also be required.

FISHERY PROTECTION - EXCLUSION DATES: No activity affecting the bed of the protected water may be conducted between March 15 and April 15 on watercourses, or between April 1 and June 30 on all other waterbodies, to minimize impacts on fish spawning and migration. If work during this time is essential, it shall be done only upon written approval of the Area Fisheries Manager. See contact list at: http://files.dnr.state.mn.us/fisheries/management/dnr_fisheries_managers.pdf. Should work begin elsewhere in the project area within these dates, all exposed soils that are within 200 feet of Public Waters and drain to those waters must complete erosion control measures within 24 hours of its disturbance to prevent sediment from entering Public Waters.

REPORTING: The Riley-Purgatory-Bluff Creek Watershed District shall submit annually or as requested a summary report of the projects authorized under this General Permit to the Area Hydrologist.

CONSTRUCTION AIDS: No construction is allowed of temporary channel diversions or placement of fill for temporary work pads, bypass roads, access roads, or coffer dams to aid in the construction of any authorized structure unless approved in writing by the Area Hydrologist prior to beginning work.

FISH PASSAGE: Bridges, culverts and other crossings shall provide for fish movement unless the structure is intended to impede rough fish movement or the stream has negligible fisheries value as determined by the DNR Area Hydrologist in consultation with the Area Fisheries Manager. The accepted practices for achieving these conditions include: Where possible a single culvert or bridge shall span the natural bankfull width adequate to allow for debris and sediment transport rates to closely resemble those of upstream and downstream conditions. A single culvert shall be recessed in order to pass bedload and sediment load. Additional culvert inverts should be set at a higher elevation. All culverts should match the alignment and slope of the natural stream channel, and extend through the toe of the road side slope. "Where possible" means that other conditions may exist and could take precedence, such as unsuitable substrate, natural slope and background velocities, bedrock, flood control, 100 year flood elevations, wetland/lake level control elevations, local

GENERAL PERMIT CONDITIONS *(Continued from previous page)*

ditch elevations, and other adjacent features. Rock Rapids or other structures may be used to retrofit crossings to mimic natural conditions.

PHOTOS AND AS-BUILTS: Upon completion of the authorized work, the permittee may be required to submit a copy of established benchmarks, representative photographs, and may be required to provide as-built surveys of Public Watercourse crossing changes.

EXCAVATION OF PUBLIC WATERS: Excavation of Public Waters is authorized by this permit only when the proposed excavation is consistent with Minnesota Rules 6115.0200 and 6115.0201.

REMOVAL OF STRUCTURES: Removal of structures from public waters is authorized by this permit when the proposed removal is consistent with Minnesota Rules 6115.0211 subp. 8.

cc: Jeanne Daniels, EWR District Manager

EXCERPTS for MN DNR 1979 Permit File:

- a) MN DNR 1979 Denial to Lower Duck Lake Outlet
- b) RPBCWD 1979 Recommendation to DNR
- c) Eden Prairie's 1978 Work in Public Waters Application

DEPARTMENT OF NATURAL RESOURCES

Office Memorandum

TO : File 79-6056

DATE: June 13, 1983

FROM : ^{KW} Kent Lokkesmoe, Regional Hydrologist
Metro Region Division of Waters

PHONE:

SUBJECT:

This file is closed. The permit application to lower the control of elevation was denied and no demand for hearing was made.

ch

444 Lafayette Road, Space Center Bldg., St. Paul, MN 55101

296-4810

August 3, 1979

City of Eden Prairie
c/o Martin J. Hanson
8950 Eden Prairie Road
Eden Prairie, Minnesota 55344

CERTIFIED

Dear Mr. Hanson:

RE: ORDER OF THE COMMISSIONER, APPLICATION 79-6056

The Department of Natural Resources has reviewed the City's application for a permit to modify the water level control structure of Duck Lake (27-69), Hennepin County, SW $\frac{1}{4}$, SE $\frac{1}{4}$, Section 5, T116N, R22W.

It has been determined that the application must be denied, based on the following:

- 1) Minnesota Code of Agency Rules 1.5024 "Water level controls and dam construction or reconstruction" state the policy of the DNR is to "oppose the artificial manipulation of water levels except where the balance of affected public interests clearly warrants the establishment of appropriate controls, and it is not proposed solely to satisfy private interests."
- 2) The permit rules, Section 1.5024 B 1 b, also provide that the proposed facilities shall be "reasonably consistent with natural conditions".
- 3) The ordinary high water level has been determined to be 915.3, NGVD. The existing control structure is at elevation 914.4, NGVD and the proposed elevation is 913.2.
- 4) The permit rules, Section 1.5024 b 1. d, states that permanent lake level control facilities shall be approved when..... justification has been made of the need in the terms of public and private interests and the available alternatives, including impact on receiving waters and public uses thereof, through a detailed hydrologic study.
- 5) The public comments voiced at the public hearing held on February 14, 1979, reflect very little public support for the project.
- 6) The Riley-Purgatory Creek Watershed District recommended denial of the permit application.

CITY OF EDEN PRAIRIE
August 3, 1979
PAGE TWO

Minnesota Statutes, Chapter 105, quotes in part as follows: "In all permit applications, the applicant has the burden of proving that the proposed project is reasonable, practical, and will adequately protect public safety and promote the public welfare."

In view of our observations, we cannot conclude that your proposal is indeed reasonable, practical, and will promote the public welfare; therefore, the application in all respects is denied.

If you wish to contest this determination, you have the right to demand a public hearing, under Chapter 105, Minnesota Statutes, provided such demand is made within 30 days of receipt of this order.

Sincerely,

DIVISION OF WATERS

Larry Seymour
Director

LS
LS/JDch

cc: Darrell Hanson, C.O.
Riley-Purgatory Creek WSD
R. Obermeyer, Barr Engineering
Hennepin County SWCD
Division of Waters, St. Paul

ATTACHMENTS TO COMMISSIONER'S ORDER

Attached is the Order of the Commissioner relating to waters of the State of Minnesota. Pursuant to Minnesota Statutes, Section 105.44, Subdivision 3 and 6, the applicant, the managers of the watershed district, the board of supervisors of the soil and water conservation district or the mayor of the city may demand a hearing on the Order provided the demand for hearing and the bond required by subdivision 6 be filed with the Commissioner within 30 days. The statutes further provide that if no demand for hearing be made or if a hearing is demanded but no bond is filed as required by subdivision 6, the order shall become final at the expiration of 30 days after mailed notice thereof and no appeal of the order may be taken to the district court.

Subdivision 6 requires that an applicant filing a demand for a public hearing execute and file a corporate surety bond or equivalent security to the state of Minnesota. The bond or security shall be conditioned for the payment of certain costs and expenses of the public hearing if the Order is affirmed without material modification; however, the applicant's liability is limited to \$750.00. No bond or security is required of a public authority which demands a hearing. The \$750.00 limit does not apply when a public hearing is demanded by a public authority which is not the applicant.

Office Memorandum

DEPARTMENT Attorney General
Natural Resources

TO : FILE

DATE: 8-8-79

FROM : CARL CONNEY

Carl Conney

PHONE: _____

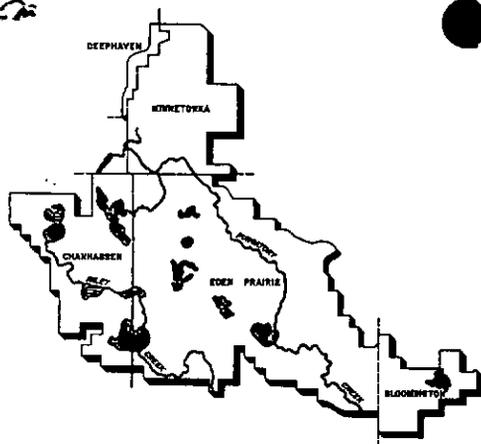
SUBJECT: Order of Commissioner
Application 79-6056

This file appears in order. My comments are as follows:

1. In #3, the statement is made that the ordinary high water level has been determined to be 915.3, which may mislead people to believe that the Commissioner is establishing O.H.W. under M.S. § 105.43.

Riley-Purgatory Creek Watershed District

8950 COUNTY ROAD #4
EDEN PRAIRIE, MINNESOTA 55343



April 26, 1979

RECEIVED

APR 30 1979
REGION VI
WATERS

79-6056

TO PA
{ RETURN
KC

Mr. Kent Lokkensmoe
Department of Natural Resources
1200 Warner Road
St. Paul, Minnesota 55106

Re: Duck Lake Water Levels - Permit
Application - City of Eden Prairie

Dear Mr. Lokkensmoe:

At the last regular meeting of the Riley-Purgatory Creek Watershed District held on April 4, 1979, the Board of Managers recommended that the permit application of the City of Eden Prairie to set water levels of Duck Lake be denied. In that regard, please find enclosed an excerpt of the minutes noting action taken by the Board of Managers at that meeting. Should you have any questions regarding this recommendation of the Riley-Purgatory Creek Watershed District, please feel free to contact the undersigned.

Very truly yours,

Donald F. Pennie

Donald F. Pennie, President
RILEY-PURGATORY CREEK WATERSHED DISTRICT

DFP/njr
Enclosure

cc: Board of Managers
Mr. Robert Obermeyer
Mr. Frederick S. Richards
City of Eden Prairie

Chapter 105 Permit Application - Minnesota Department of Natural Resources - Duck Lake - Eden Prairie

The managers renewed consideration of the pending permit application before the Minnesota Department of Natural Resources submitted by the City of Eden Prairie to seek authority to set the water level of Duck Lake by establishing a control structure in connection therewith. General discussion followed during which the managers noted that there may well remain a question as to whether any flooding, as being experienced by some riparian land owners, would be resolved in the event the water levels of Duck Lake were lowered. Following general discussion during which the managers again reviewed the transcript of the public hearing held in February of this year, it was moved by Peterson, seconded by Rahr that the Board of Managers recommend to the Department of Natural Resources that the city's application seeking permission to lower the lake levels of Duck Lake be denied. A roll call vote on the motion was as follows:

PETERSON	YES
RAHR	YES
PENNIE	YES

Chairman Pennie advised the managers and those present that the district would inform the Department of Natural Resources that the watershed district would recommend that no permit be issued to the city as requested.

Mr. Pennie then suggested that the riparian owners of Duck Lake attempt to arrive at a consensus of what would be the most appropriately established lake levels and outlet discharge elevations for Duck Lake taking into account all riparian land owners. Mr. Pennie reported that, at his request, the watershed district's engineers had prepared and submitted to the managers a proposal to undertake a groundwater study for Duck Lake. Mr. Pennie noted that this proposal was prepared by the watershed district engineers in order to respond to some suggestions that the flooding problem being experienced by various riparian land owners was due to groundwaters and not the surface water lake levels of Duck Lake. In regard to the engineering proposal, Mr. Pennie further commented that the watershed district would not undertake this study at its cost inasmuch as this appeared to be a private matter and not one involving a public project at this time. Dr. William M. McKewan, a resident in this area, was present to acknowledge these comments and indicated that the Duck Lake Homeowners Association would consider several of these matters mentioned by Mr. Pennie and the other managers. In any event any further consideration by the managers with regard to undertaking necessary studies to attempt to find alternate solutions to the various flooding problems which are reoccurring in the Duck Lake area was tabled until such time as the residents in that area could discuss among themselves and/or further with the city possible solutions to these problems and prepare and submit to the watershed district any appropriate petitions which the district may then consider. Chairman Pennie so ordered the matter continued.

REC
MAR 6 1978
REGION 1
WATERS

Duck Lake Spillway H
2-14-79

November 15, 1978

MEMO

TO: Duck Lakeshore Property Owners
FROM: City of Eden Prairie Engineering Dept.
SUBJECT: Duck Lake Outlet Control Level

Dear Lakeshore Owner:

The purpose of this memo is to explain and help clarify the City's proposed plan to adjust the elevation of the outlet control structure at the southeast corner of Duck Lake.

In response to local residents, the City is requesting approval from the Minnesota Department of Natural Resources (DNR) to lower the level control outlet from 914.43 to 913.2 in Duck Lake. The current elevation of the lake is 913.2, as measured by the City of Eden Prairie Engineering Department on November 14, 1978. The lower basement elevations around Duck Lake range from 912.1 to 913.1 and experience water problems in the spring and following heavy summer rainfalls. These houses were constructed prior to the establishment of the present level control structure in the spring of 1969. The new outlet elevation will not adversely affect the 100-year flood level of 916 as determined in the Eden Prairie Drainage Plan, September, 1970.

The City submitted the application to the Minnesota DNR along with copies to the Riley-Purgatory Creek Watershed District, Hennepin County Shoreland Management Department, and Hennepin County Soil and Water Conservation District on August 18, 1978. At the September 6 meeting of the Watershed District, the Board of Managers requested the DNR to hold a public hearing on the permit application. In a letter dated November 6, 1978, Ronald Harnack of the DNR suggested a public hearing be held by the City and/or Watershed District with a representative of the DNR. Advance notice of this meeting will be provided to all Duck Lake lakeshore owners.

The Minnesota DNR established File #79-6056 on this permit application on August 22, 1978. A copy of the permit application and historic water levels can be seen at the City Offices from 8:00 A.M. to 4:30 P.M. If you have any questions on this matter, you may contact the Engineering Department at 941-2262.

Engineering Dept.
CITY OF EDEN PRAIRIE



August 18, 1978

79-6056

Mr. Ron Harnack
Department of Natural Resources
Division of Waters
1200 Warner Road
St. Paul,, MN 55106

Dear Mr. Harnack:

Please find enclosed our Application for Permit to work in public waters. If you have any questions on this matter please feel free to contact me at 941-2262.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Martin J. Hanson'.

Martin J. Hanson
Engineer

MJH:kh
Enclosure

RECEIVED
AUG 21 1978
REGION VI
WATERS

79-6056

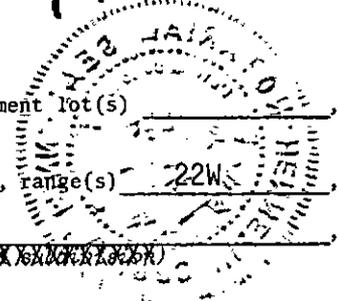
EXHIBIT A

PROPOSAL

In response to local residents, the City of Eden Prairie is requesting approval from the Minnesota Department of Natural Resources to lower the level control outlet from 914.43 to 913.2 on Duck Lake. At the lake's current elevation 913.8 (July 18, 1978,) the City is receiving complaints of basement water from residents of Padons Drive. The lower basement elevations in this area range from 912.1 to 913.4 and were constructed prior to the establishment of the present level control structure in the spring of 1969. The new outlet elevation will not affect the 100 year flood elevation of 916 as determined in the Eden Prairie Drainage Plan, September, 1970.

74-6056

APPLICATION FOR PERMIT TO WORK IN PUBLIC WATERS



City of Eden Prairie, the owner of land in Government lot(s) _____
(print or type applicant's name)

quarter section(s) SW 1/4, SE 1/4 section(s) 5, township no.(s) 116 N, range(s) 22W

8950 Eden Prairie Road, Eden Prairie, MN
(fire no., box no. or address)

county(ies) Hennepin, which is riparian to Duck Lake
(name of lake or stream)

applies pursuant to Minnesota Statutes Chapter 105 and other applicable statutes for a permit to work in the public water(s) named above, in accordance with all data, maps, plans, and other information submitted herewith and made a part hereof.

PROPOSAL

IT IS PROPOSED TO: excavate, fill, construct, remove,
(check) install, abandon, or other(specify) modify

THE FOLLOWING: dam, shore-protection, shoreline, harbor, channel, bridge,
(check) culvert, wharf, obstruction, or other(specify) level control structure
(see exhibit A)

JUSTIFICATION

Explain why this project is needed:

Present water surface elevation is below outlet elevation, and it causing basement flooding in backwater areas on the western side of the lake.

ENVIRONMENTAL IMPACT

1. Anticipated changes in water and related land resources:

Small reduction in surface area

2. Unavoidable but anticipated detrimental effects:

Possible increase in aquatic vegetation

3. Alternatives to the action proposed:

- 1) Raising existing houses and basement elevations.
- 2) Remove basement floors and replace with waterproof slab, waterproof walls

PROJECT SITE DATA

1. Describe the type and amount of aquatic vegetation present: Open water with small areas of reeds in undeveloped or roadside shoreland. Urban landscaping borders remaining shoreline

2. Describe the nature of the material beneath the water: Silt and muck

3. Describe the nature of the upland area: Suburban residential, rural

4. Describe type and amount of nearby shoreland development: 60% single family residential
40% rural

5. ENCLOSE SKETCH DESCRIBING WATER LEVEL FLUCTUATIONS. See Exhibit B
(see instructions)

(continued on reverse side)

ATTACH EXTRA SHEETS IF NECESSARY

RECEIVED
AUG 21 1978
REGION VI
WATERS

CONSTRUCTION DATA (also attach sketch or drawing)

Channelling	Existing	Proposed	Alterations along shore	Proposed
Total length (feet) - - - - -	_____	_____	Distance along shore (feet)- - - - -	_____
Length in lake/stream (feet)- - -	_____	_____	Distance waterward (feet)- - - - -	_____
Bottom width (feet) - - - - -	_____	_____	Thickness of fill material (feet)- - -	_____
Side slopes (ratio) - - - - -	_____	_____	Depth of excavation (feet) - - - - -	_____
Average depth (feet)- - - - -	_____	_____		
Gradient (%)- - - - -	_____	_____		

- Describe type of excavation equipment to be used, if known:
- Describe location (include map) and characteristics of spoil disposal site proposed:
- Would maintenance excavation be necessary? (check) YES NO Explain:
- Volume of material to be removed initially (cubic yards): Muck or silt _____
Sand or gravel _____ Rock or stone _____

ATTACHMENTS \$15.00 filing fee, photographs, other (specify) Exhibits A & B

Applicant declares that information submitted herewith and statements made herein are a true and correct representation of the facts, and that the filing of this application and information with the Commissioner of Natural Resources is prima facie evidence of the correctness thereof.

COMPLETE APPLICATION SUBMITTED TO:

(1) _____
Name of city or township
Riley-Purgatory Creek
street & post office

(2) _____
Name of watershed district

(3) Shoreland Management Administrator
of Hennepin County

Dated this 18th day of August 19 78

Signed Martin J. Hanson (applicant)

For: City of Eden Prairie

Address 8950 Eden Prairie Road

City Eden Prairie

State Minnesota Zip code 55344

Phone 941-2262

(4) Hennepin County Soil & Water Conservation Dist.
State of Minnesota)
County of Hennepin) ss. AFFIDAVIT

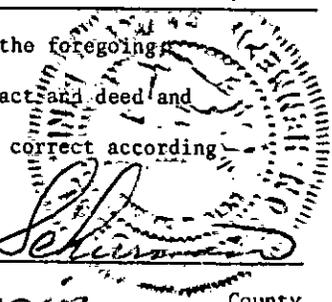
on this 18th day of August, 19 78 before me personally appeared _____

Martin J. Hanson

paid \$15 8/22/1978

who being first duly sworn and to me known to be the person _____ who executed the foregoing application, acknowledge(s) that he executed the same as his own free act and deed and that the statements, maps, plans, documents, and other supporting data are true and correct according to his best knowledge and belief.

Eugene E. Schirmer
Notary Public Hennepin County
My commission expires April 9th 19 79



2/27-5302

79-056

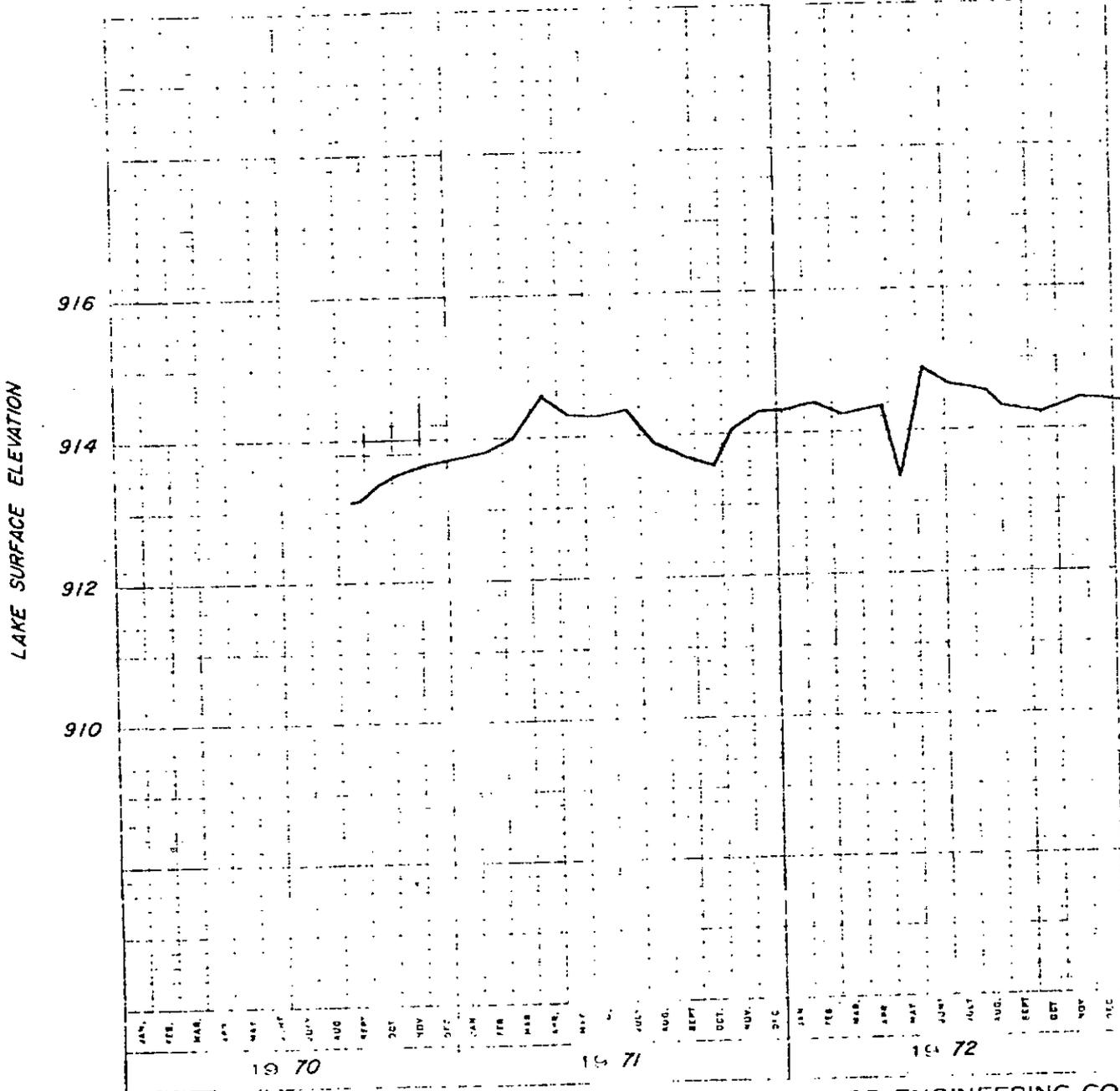
EXHIBIT B

1 of 3

PROJECT: Riley-Purgatory Creek Watershed District

LAKE GAGE NO. 2

LOCATION: Duck Lake



BARR ENGINEERING CO.
CONSULTING HYDRAULIC ENGINEERS

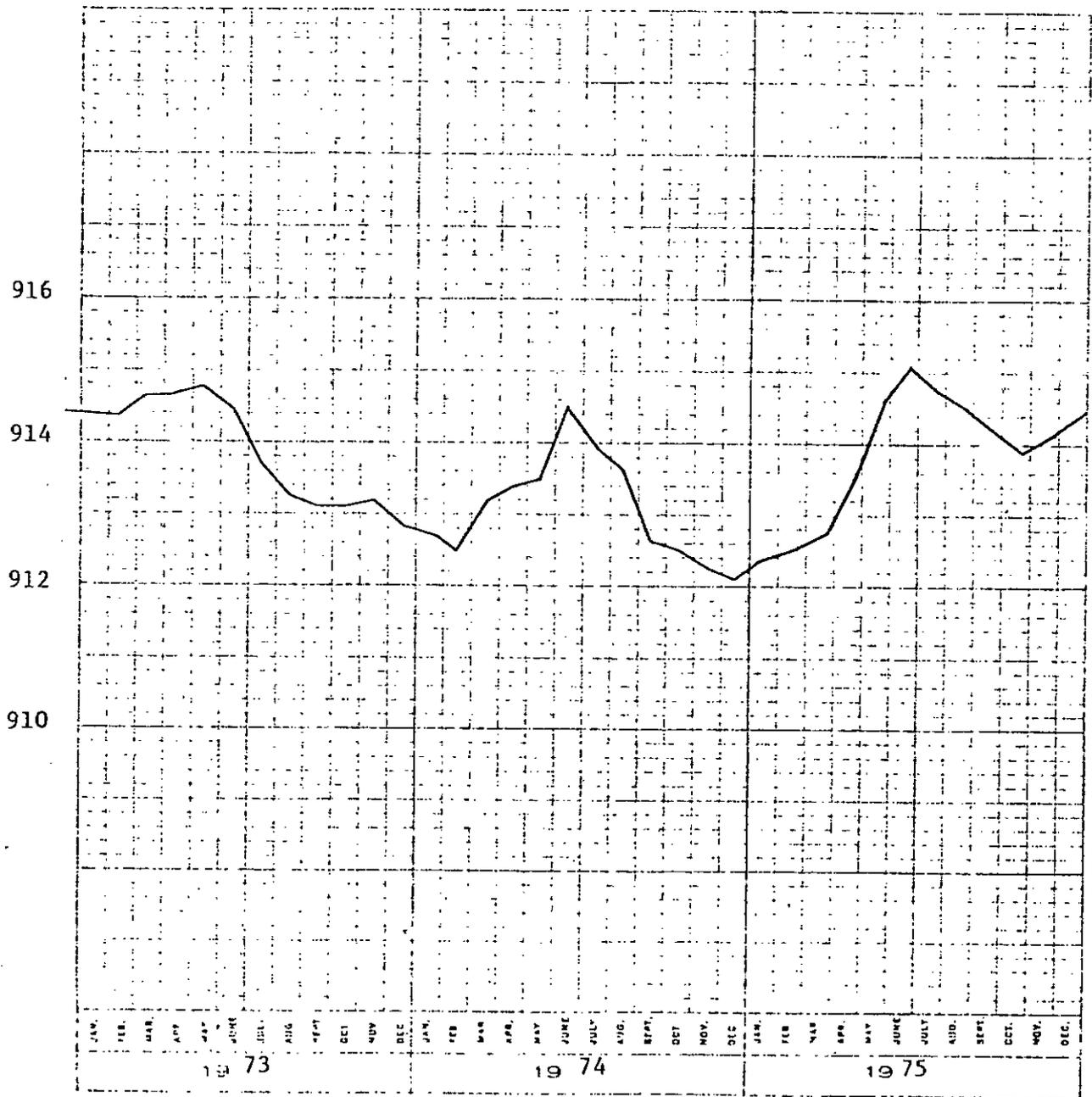
79-6056

EXHIBIT B
2 of 3
LAKE GAGE NO. 2

PROJECT: RILEY-PURGATORY CREEK
WATERSHED DISTRICT

LOCATION: DUCK LAKE

Elevation Previous High	914.88	6-6-72
Elevation Previous Low	913.14	9-15-70

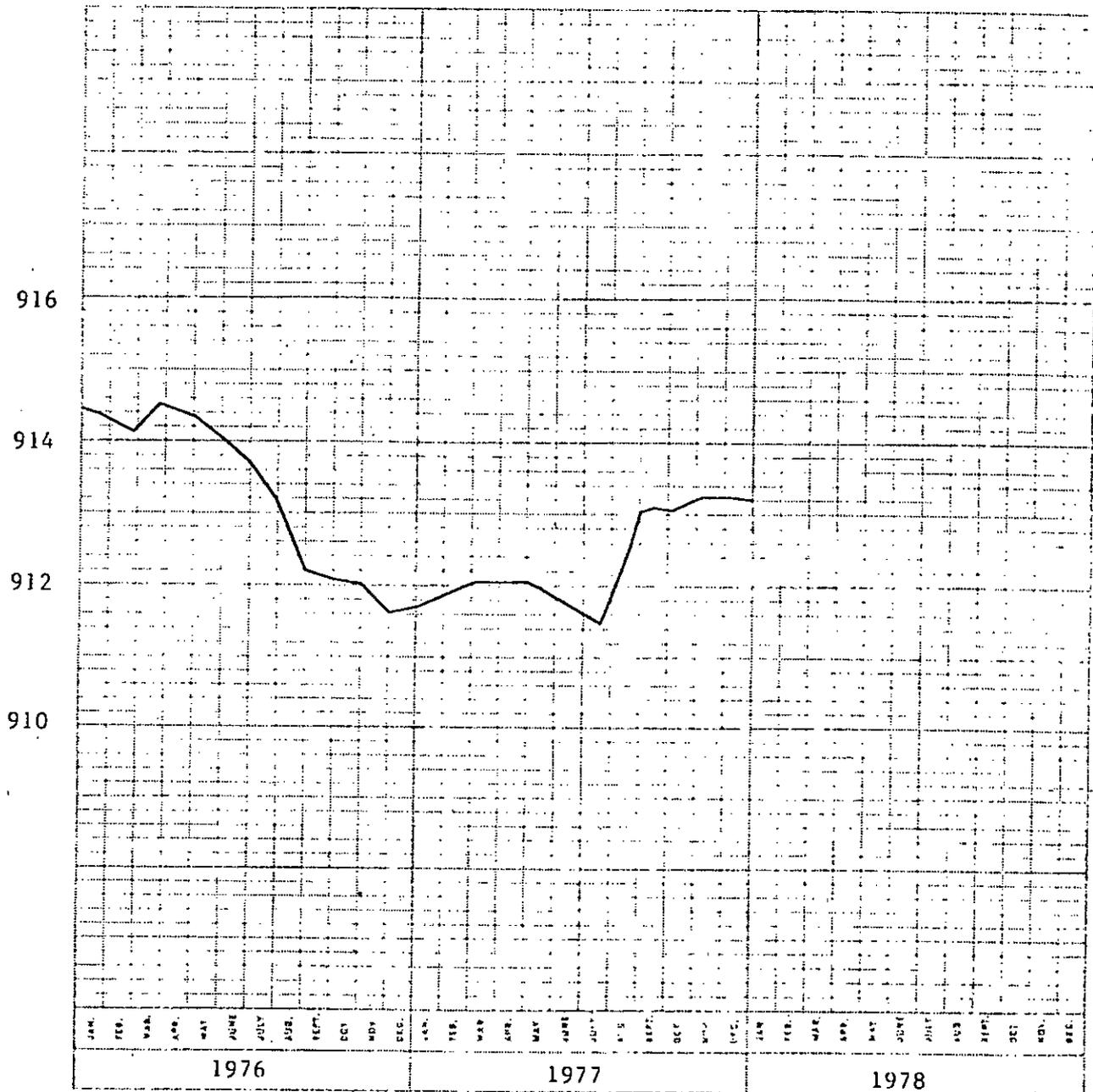


BARR ENGINEERING CO.
CONSULTING HYDRAULIC ENGINEERS

PROJECT: RILEY-PURGATORY CREEK
WATERSHED DISTRICT
LOCATION: DUCK LAKE

LAKE GAGE NO. 2

Elevation Previous High 915.14 6-19-75
Elevation Previous Low 911.49 6-25-77



2509-bL

BARR ENGINEERING CO.
CONSULTING HYDRAULIC ENGINEERS

RECEIVED
MAR 16 1979
REGIONAL
WATERS

Duck Lake Exhibit E
2-14-79

MEMO

February 12, 1979

TO WHOM IT MAY CONCERN

SUBJECT: Duck Lake Outlet Control Level

FROM: Carl Jullie, P.E. Director of Public Works
City of Eden Prairie



In August of 1978, the City engineering staff submitted an application to the Minnesota Dept. of Natural Resources, with copies to the Riley-Purgatory Creek Watershed District, the Hennepin Co. Shoreland Management Dept. and the Hennepin Co. Soil and Water Conservation District for a permit to lower the top edge of the outlet control structure at the southeast corner of Duck Lake. The purpose of this adjustment would be to help reduce the back-up of storm water in the drainage swale north of Padons Dr. and west of Duck Lake Road as noted on attached Exhibit A. This water back-up is a concern to the adjacent residents because it results in soft, wet ground that is hard to maintain, mosquito breeding close to the homes and an increase in the ground water pressure which adds to wet basement problems. The basement elevations of houses in the area are noted on Exhibit A.

At the Sept. 6, 1978 meeting of the Watershed Dist., the Board of Managers suggested that a public hearing be held on this matter. The City staff concurred and requested the Board of Managers to call for a public hearing on February 14, 1979. The areas notified of this hearing are within the limits shown on Exhibit A. The owners of record per the tax statements were mailed notices on January 26, 1979 and the notice was published in the Eden Prairie News on February 1 and 8, 1979.

Exhibit B shows the proposed adjustment of the outlet control structure. Presently, the level of Duck Lake must rise to elevation 914.4 before water can begin to flow over the edge of the box weir structure and into the 15" discharge pipe, the bottom of which is at elevation 913.2. The discharge pipe follows the northerly side of the railroad tracks and outfalls into Purgatory Creek east of Co. Rd. 4. Whenever the lake level exceeds elevation 913.2, then water begins to back up in said drainage swale north of Padons Drive causing the problem noted.

Our proposal is to remove the front face of the box weir at the outlet, so that water can begin to flow out of the lake at elevation 913.2 rather than 914.4. During periods of heavy precipitation and runoff, the lake level could still rise above 913.2 temporarily, but then would return in a matter of hours after the precipitation or snowmelt stopped to the 913.2 "normal" elevation. During dry periods, the level would of course continue to recede below 913.2 due to evaporation and seepage.

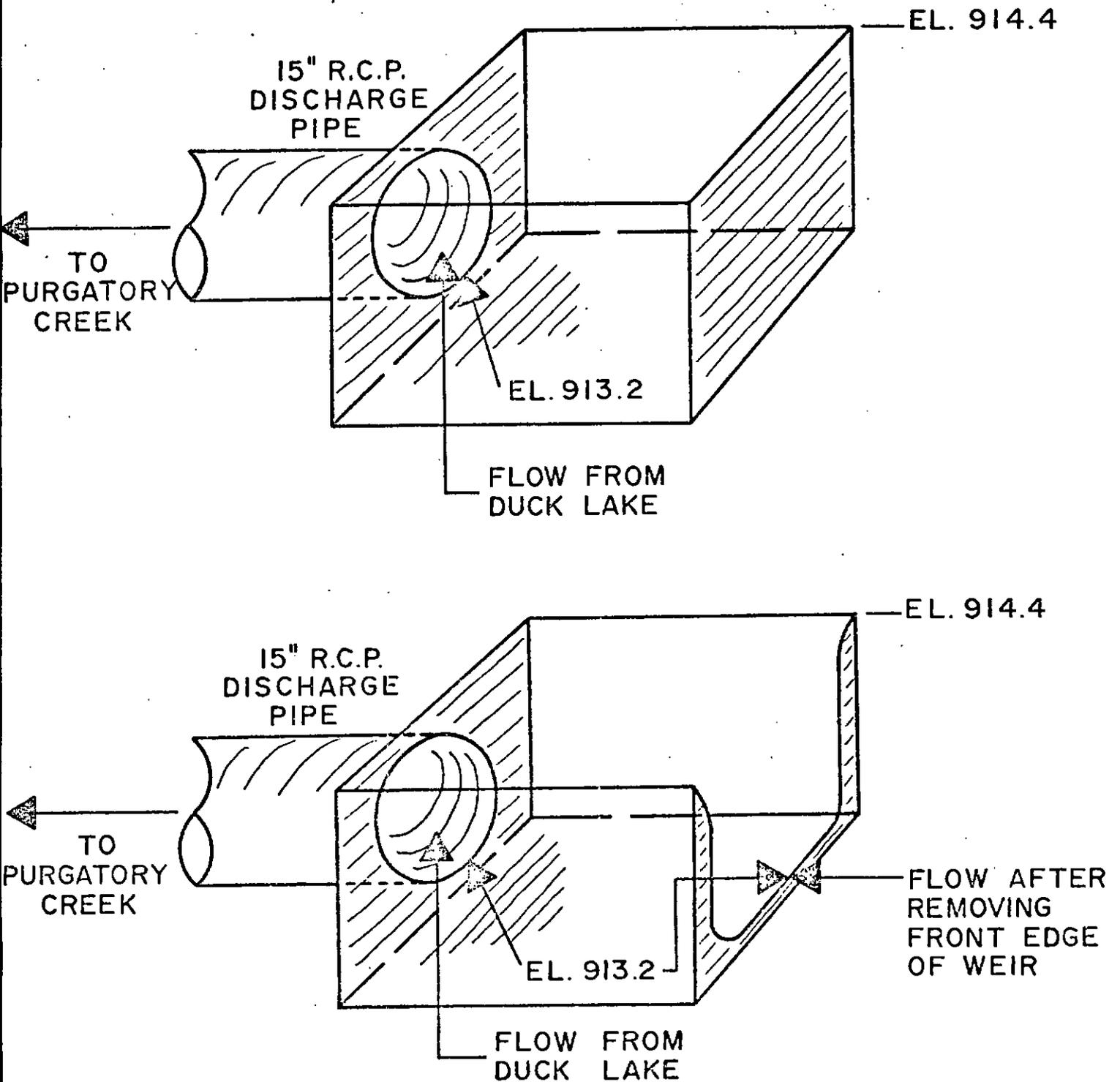
We do not believe that the proposed elevation adjustment would cause any adverse effects to the lakeshore property or the water quality of Duck Lake. The proposed elevation of 913.2 is the same level observed in November, 1978 which seemed to match the shoreline very well and the drainage swale north of Padons Drive was dry. The Rieke-Carroll-Muller Assoc. report of August, 1967 Duck Lake Drainage Study (Exhibit C) did recommend that the lake level be set at 913 in the fall of each year to accommodate the spring run-off. Our proposal of a 913.2 level is consistent with this recommendation.

If any unanticipated problems do occur as a result of the proposed elevation adjustment, the box weir can easily be restored to its original condition by the City's maintenance crews.

Exhibit D is a record of Duck Lake surface elevations per records of the Riley-Purgatory Creek Watershed District.

Attached also are copies of correspondence received to date regarding this matter.

"BOX WEIR OUTLET" DUCK LAKE



Thursday, March 21, 2019

Re: Organizational changes and salary adjustment

Dear Managers,

I and the personnel committee met to discuss organizational changes in order to meet the needs of the district. At the board's workshop at the start of the year focusing on Planning for 2019, three priorities were identified in order for work to move forward. These are the following: implement the plan, plan to the next level, and increase collaboration on projects. With this in mind, I have identified several needs. In regard to implementing the plan, the following programs need additional staff time:

- Wetland Inventory, Assessment and Restoration Projects
- Repair and Maintenance
- Opportunity Projects
- Groundwater Conservation
- AIS
- Hennepin County Chloride Initiative
- Wetland Conservation Act (WCA).

In regard to planning for the future and furthering collaboration, I have identified the need to further engage stakeholders and be more engage in planning right from the start.

In order to meet the vision of the board and then needs of the District, the following changes must happen. Staff time must be freed to meet the needs and staff responsibilities need to be redistributed. Included in this packet are for you a before and after organizational chart highlighting internal structure changes. Four changes are identified. First, the Project and Permit Manager would become the Watershed Planning Manager (WPM). Responsibilities would differ in that non-administrative permits would be processed by the District's Engineer where cost can be recuperated except for government bodies. This will free up time for the WPM to work on the Wetlands Program, groundwater conservation program, opportunity projects as well as planning for the future and increased collaboration with communities. The Watershed Technician II will have a more active role as well in the Wetland Program. Additional field work will also be taken on by a summer intern.

The Community Outreach Coordinator will move into the Communication and Project Manager and the Office and Outreach Coordinator will be moving to an Education and Outreach Coordinator. The Communication and Project Manager will supervise the Education and Outreach Coordinator and manage opportunity projects, cost-share program and capital improvement project. The Education and Outreach

Coordinator will actively manage our volunteer programs and focus on reaching out to underserve population as well as actively implementing the Education and Outreach Plan.

Please note that the Community Outreach Coordinator's move to the Communication and Project Manager is a grade level change and requires a salary adjustment. No other salary adjustments are proposed at this time.

I have included in this packet, before and after changes to the position mentioned above, organizational chart (current and new), catalogue of seasonal staff that we have hired in 2019. I also have included a ppt discussing the proposed changes. All employees identified through the job title changes meet the qualification of the new roles.

I have met with the personnel committee and we recommend the following changes:

1. **Move the Project and permit manager to Watershed Panning Manager.**
2. **Move the Community Outreach Coordinator to Communication and Project Manager with a salary adjustment of \$6,800 and pay grade increase from 5 to 6.**
3. **Move the Office and Outreach Assistant to Education and Outreach Coordinator.**

Sincerely,



Claire Bleser

Manager _____ moves that the following organization and salary adjustment be made effective April 1, 2019:

1. **Move the Project and permit manager to Watershed Panning Manager.**
2. **Move the Community Outreach Coordinator to Communication and Project Manager with a salary adjustment of \$6,800 and pay grade increase from 5 to 6.**
3. **Move the Office and Outreach Assistant to Education and Outreach Coordinator.**

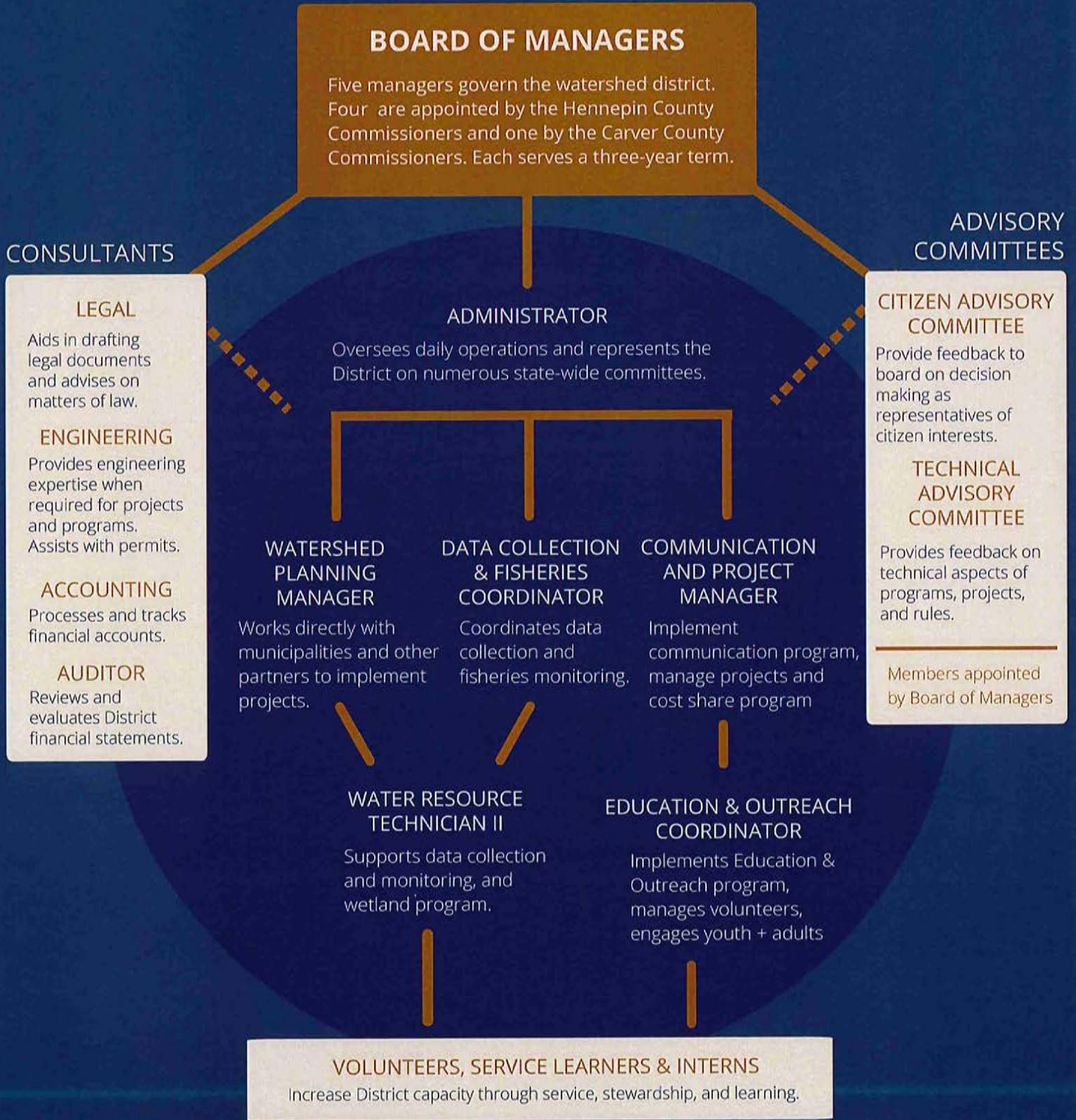
FIGURE 1-2

2019



ORGANIZATIONAL STRUCTURE

Multiple individuals are included in the governance of the Riley Purgatory Bluff Creek Watershed District. These include a board of managers, advisory committees, consultants, staff, and volunteers.



ORGANIZATIONAL STRUCTURE

Multiple individuals are included in the governance of the Riley Purgatory Bluff Creek Watershed District. These include a board of managers, advisory committees, consultants, staff, and volunteers.





RPBCWD Manager Goals from January 2019 Visioning Workshop

Administration

1. *Operate in a manner that uses District resources and capacity efficiently and effectively while advancing the District's vision and goals.*
- Complete all scheduled projects on time and on budget
 - Implementation of best management practices in all facets of operation
 - Become recognized for strong leadership
 - Analysis of work
 - Administrative efficiency
 - Transparency of operation and finance

Data Collection

1. *Collect data and use the best available science to recommend and support management decisions.*
- Sharing of data with other stakeholders (both directions)
 - Keep up with climate change data and make adjustments to plan
 - Continue to shift data collection to most efficient method

Education and Outreach

1. *Design, maintain, and implement Education and Outreach programs to educate the community and engage them in the work of protecting, managing, and restoring water resources.*
- Continue to develop volunteer resources for educating the public
 - Involved with planning process
 - Collaboration with staff and managers
 - Outreach to District partners
 - Develop district-wide adopt-a-storm sewer program
 - Collaboration with constituents

Planning

1. *Plan and conduct the District's implementation program to most effectively accomplish its vision with consideration for all stakeholders and resources.*
 2. *Include sustainability and the impacts of climate change in District projects, programs, and planning.*
- Identify opportunities
 - Become entrepreneurial thinkers
 - Create a vision initiate a "customer satisfaction" survey
 - Successful execution of the 10-year plan for 2019
 - Better cooperation on projects with our cities
 - Better use of financial resources working with cities
 - Plan for salt minimization (50% reduction)
 - Plan project like Ford Plant, change from 100% impervious to green space with business and living space
 - Better use of financial resources working with businesses
 - Improve and create joint projects on a larger scale
 - Identify common goals to achieve water quality in Eden Prairie
 - Learn about Shorewood's storm water goals related to green-step cities actions
 - Create partnerships
 - Visioning
 - Learn about Chanhassen's water quality goals and plans
 - Learn what Eden Prairie's goals are for water quality
 - Learn about Eden Prairie's Green Step city stormwater goals
 - Learn about Minnetonka's stormwater goals and what actions they are planning
 - Extend use of H + H model to identify climate change impacts in Carver County/ Chanhassen

Regulation

1. *Implement the District's regulatory program to protect water resources from further degradation, enhancing resources when possible.*
 2. *Support Carver and Hennepin County to operate effectively as Ditch Authorities.*
- Obeying the laws, rules, and regulations
 - Following our bylaws and policies

Groundwater

1. *Promote the sustainable management of groundwater resources.*
- Develop an educational groundwater protection program

Water Quality

1. *Protect, manage, and restore water quality of District lakes and creeks to maintain designated uses.*
 2. *Preserve and enhance the quantity, as well as the functions and values of District Wetlands.*
 3. *Preserve and enhance the habitat important to fish, waterfowl, and other wildlife.*
- Successful completion of the workplan
 - Reduced algae growth in targeted lakes
 - Reduced erosion in Riley Creek
 - Increased public and private partnership
 - Entrepreneurial thinkers: develop a process
 - Work with stakeholders
 - Customer satisfaction survey: feedback
 - District leadership for long term

Water Quantity

1. *Protect and enhance the ecological function of District floodplains to minimize adverse impacts.*
2. *Limit the impact of storm water runoff on receiving waterbodies.*

Other ideas from the Board of Managers

- Develop a timeline of success for stakeholder collaboration
- Come up with 3-5 projects to enhance relationship with stakeholders
- Collaboration and engagement with partners and constituents
- Improve use of best management practices
- Successful completion of workplan
- Greenstep cities: identify their goals (listen)

- Share H + H model info with cities and brainstorm how we can partner for solutions
- Build better planning relationships—businesses municipalities, residents
- Water reuse plan for Eden Prairie High school
- Work with stakeholders to lead on water issues and improvements
- Implement first year of 10-year plan
- Do a customer satisfaction survey
- Create a visioneering plan/ process
- Identify 4-6 new and creative partnership opportunities

Administration

Handwritten notes on pink sticky notes under Administration.

Education and Outreach

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Regulation

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Groundwater

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Data Collection

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Planning

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Water Quality

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Water Quantity

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Planning for 2019

Reorganizational Proposal

Handwritten notes on pink sticky notes at the bottom right.

Handwritten notes on a piece of paper at the top right.

3 Priorities



Implementation Plan



Planning to the next level



Collaborating on projects

District Project and Programs

10-year Management Plan
AIS Inspection and early response
Chloride Initiative
Chloride Lower Minnesota
Creek Restoration Action Strategies Phase 2*
Data Collection and Monitoring
District Wide Floodplain Evaluation - Atlas 14/SMM model*
Education and Outreach
Plant Restoration - U of M
Repair and Maintenance Fund *
Survey and Analysis Fund *
Wetland Management*
Groundwater Conservation*
Lake Vegetation Implementation
Opportunity Project*
Stormwater Pond
TMDL - MPCA

Bluff Creek Tributary*
Wetland Restoration and Flood Mitigation*
Chanhassen High School * Finishing
Lake Riley - Alum Treatment 1st dose * monitoring
Lake Susan Improvement Phase 1 * Monitoring
Lake Susan Water Quality Improvement Phase 2 *~ Finishing
Rice Marsh Lake in-lake phosphorus load Monitoring
Rice Marsh Lake Water Quality Improvement Phase 1*
Riley Creek Restoration (Reach E and D3) *~
Upper Riley Creek Stabilization and Restoration*
Fire Station 2 (Eden Prairie)* Finished
Purgatory Creek Rec Area- Berm/retention area - feasibility/design*
Lotus Lake in-lake phosphorus load control* Monitoring
Lotus Lake - Feasibility Phase 1
Purgatory Creek at 101* Finished
Silver Lake Restoration - Feasibility Phase 1*
Scenic Heights*
Hyland Lake in-lake phosphorus load control
Duck Lake watershed load*

- Operations
- Human Resources
- State and National Representation
- Financials
- Grants

Needs

Implementation Plan Needs on:

- Wetland Inventory, Assessment and Restoration Projects
- Repair and Maintenance
- Opportunity Projects
- Groundwater Conservation
- AIS
- Hennepin County Chloride Initiative
- Wetland Conservation Act (WCA)

Planning for the future

- Engaging all stakeholders

Furthering Collaboration

- Provide opportunity for stakeholder feedback

How can we
do it?

1

Free up staff
time

2

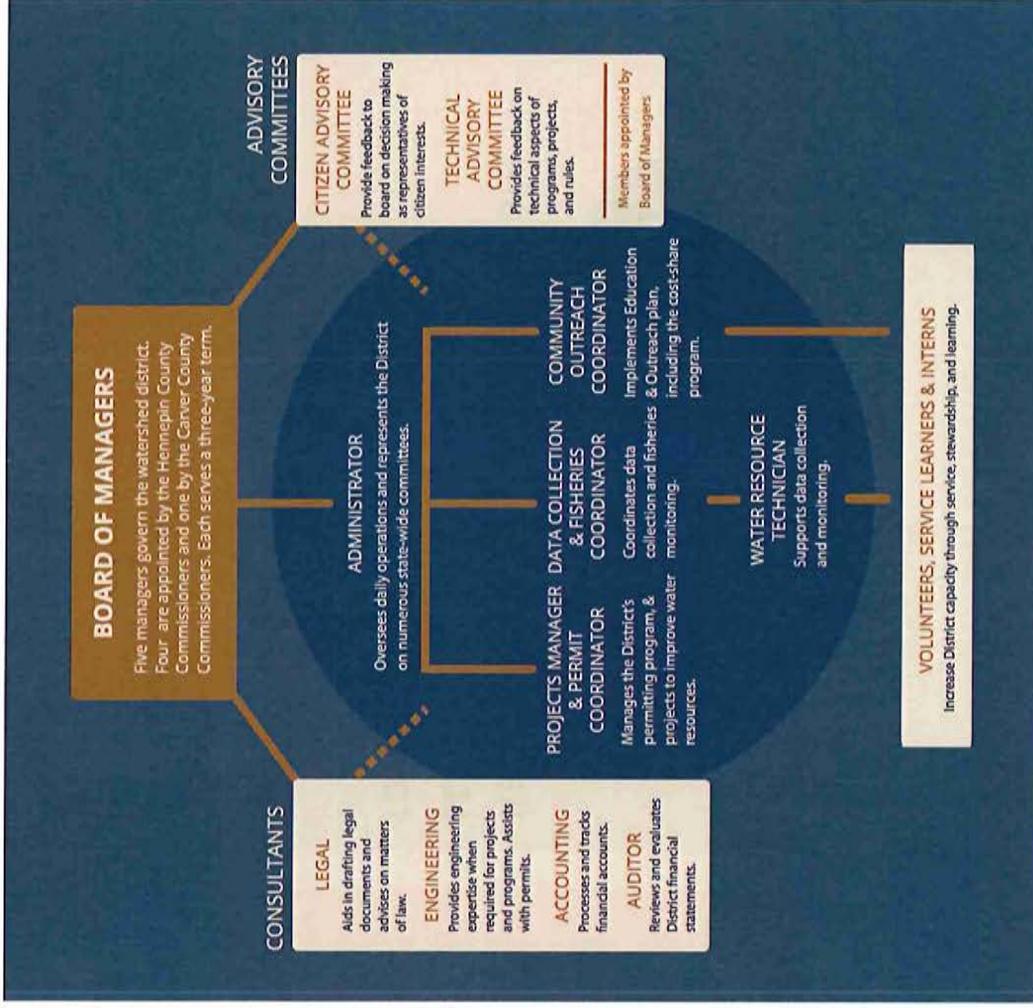
Redistribute
staff
responsibilities

3

Re-evaluate

Implementation Plan Needs on:

- Wetland Inventory, Assessment and Restoration Projects
- Repair and Maintenance
- Opportunity Projects
- Groundwater Conservation AIS
- Hennepin County Chloride Initiative
- Wetland Conservation Act (WCA) Planning for the future
- Engaging all stakeholders
- Furthering Collaboration
- Provide opportunity for stakeholder feedback



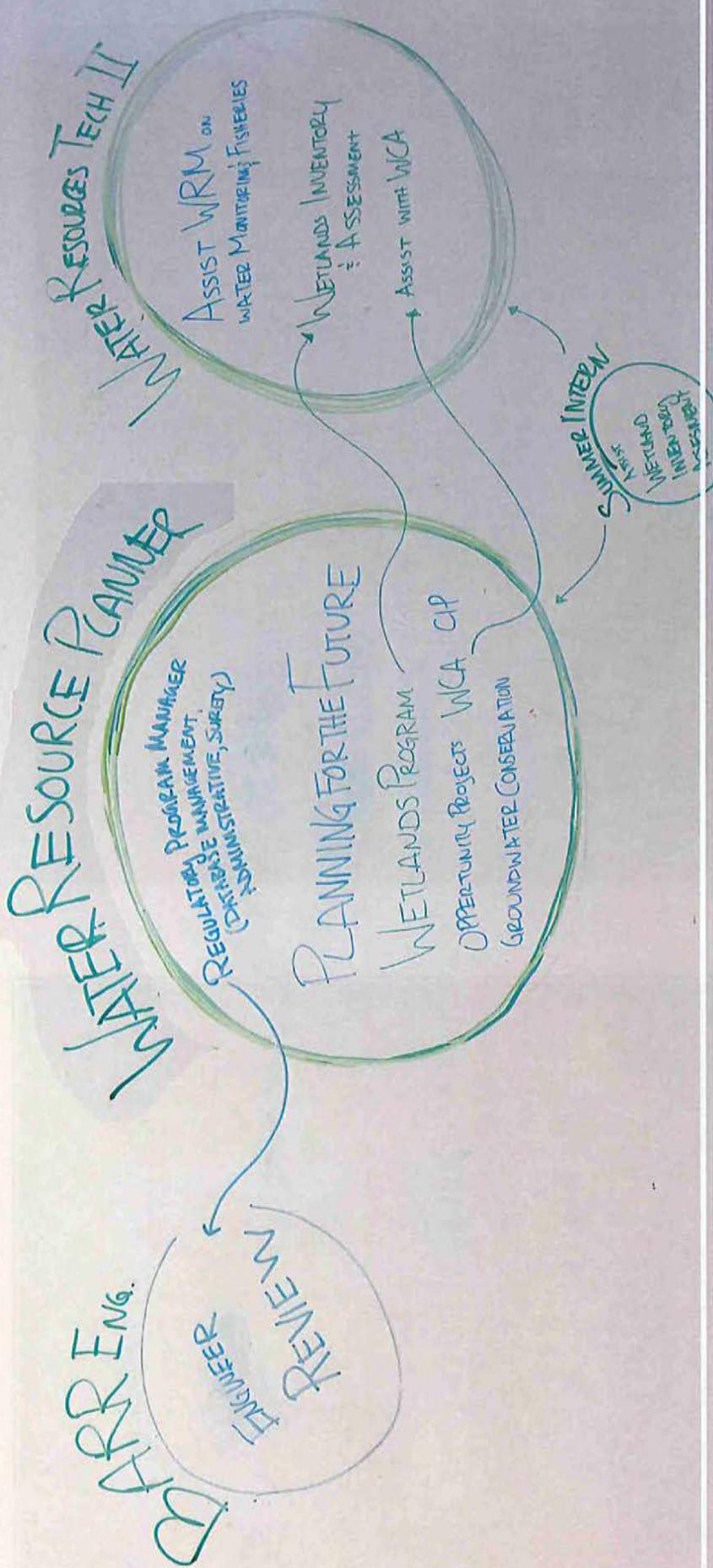
Water Resources Manager

WATER RESOURCE MANAGER

MANAGE DIRECT MONITORING PROGRAM
MANAGE FISHERIES PROGRAM
PROCESS ZOOPLANKTON SAMPLES
ANALYZE DATA
CRAS
FLEET MANAGEMENT
OVERSEE WRS TECH II & INTERNS
SAFETY OFFICER

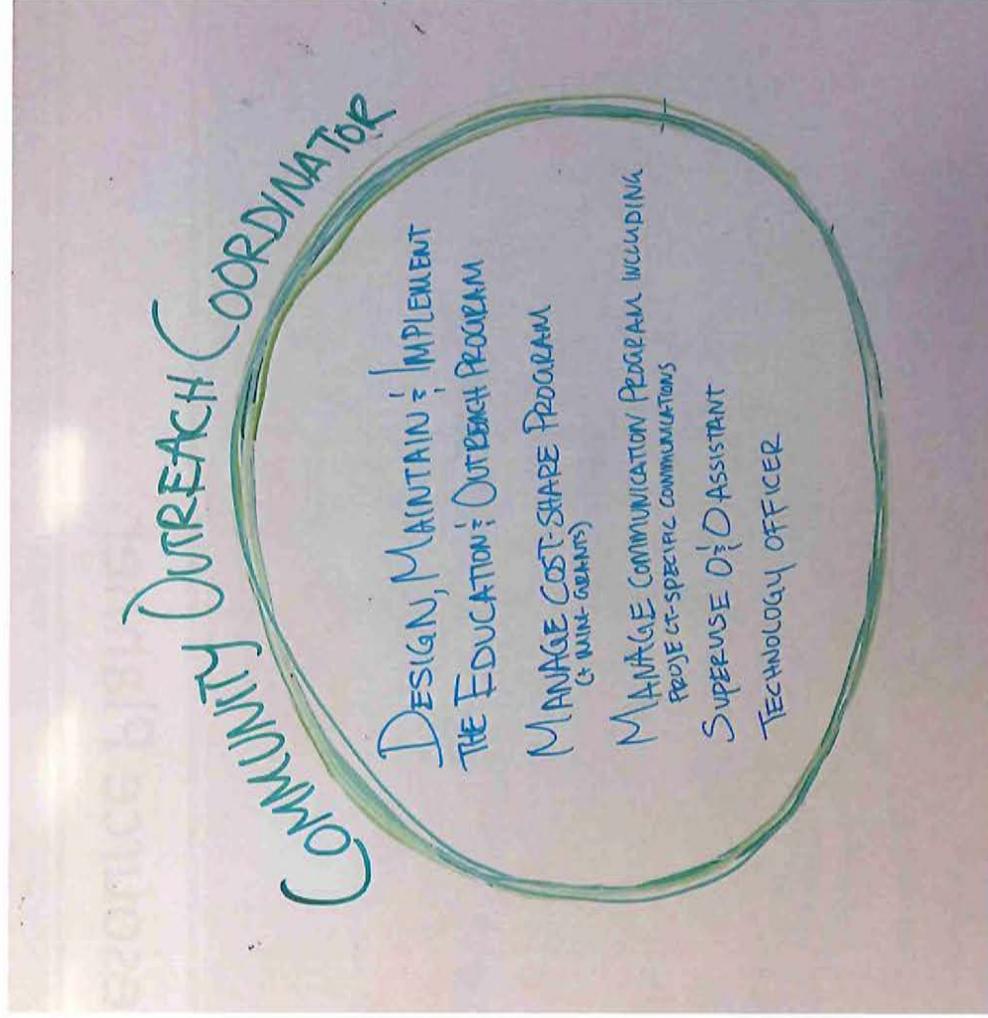
Project Manager





Water Resource Planner

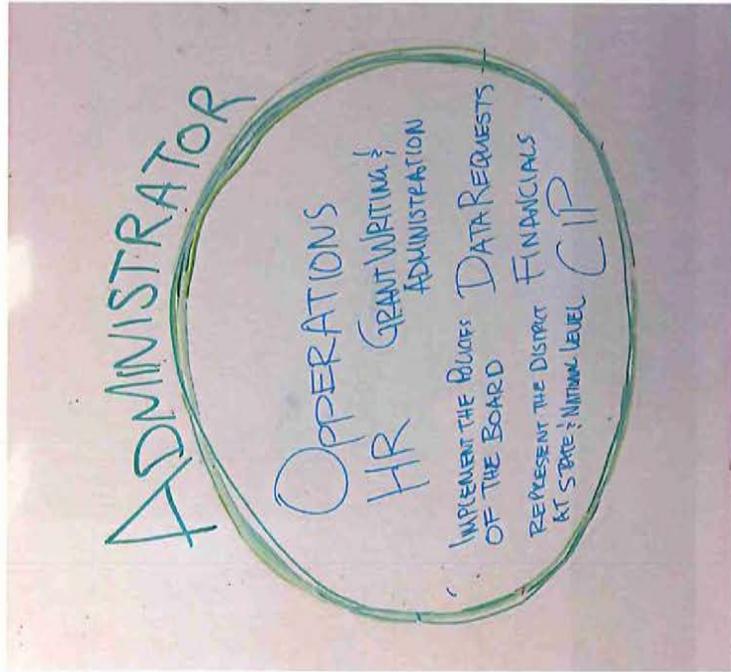
Community Outreach Coordinator



Communication and Project Manager



Administrator



Old

POSITION TITLE: Permitting and Natural Resource Project Manager

REPORTS TO: Administrator

STATUS: Exempt FLSA

SALARY: \$65,000 - \$85,000

PRIMARY OBJECTIVE:

This position is responsible for the development and management of the regulatory program including permitting, plan review, site inspection, and enforcement. The position will also be responsible for the development of a wetland protection program including WCA administration within certain areas of the District. The position will also be responsible for managing some natural resources projects. Responsibilities may include preparing work plans and cost estimates, interpreting data, preparing technical reports, and coordinating site activities. He or She should be comfortable in preparing reports and presenting findings to the board.

JOB DUTIES AND RESPONSIBILITIES:

Administer Regulatory Program (50%)

1. Assists in the development of District Rules, policies and procedures relating to permitting.
2. Review permit applications, including site plans, hydrologic and hydraulic and water quality modeling, and other materials; Work with permitting review team in investigating and researching to make recommendations to the board.
 - Process permit application that fall under the Administrator issuance authority.
 - Delegate tasks to consulting engineer as necessary.
3. Oversee site inspection for compliance with district rules and permit conditions.
 - Supervise consultant and seasonal staff.
 - Inspect sites including final walkthrough.
 - Responsible for record management (eg. financial assurances, maintenance declarations) of the regulatory program.
4. Initiate and oversee enforcement actions.
5. Develop and maintain permit database including maintenance declarations and agreements as well as financial assurance.
6. Administer the Wetland Conservation Act for two communities.
7. Serve as staff liaison to Technical Environmental Panel.
8. Other duties as assigned.

Natural Resource Project Coordinator (40%)

1. Assist the District in the development and implementation of a program to preserve and enhance the quantity, as well as the function and value of wetlands.
 - a. Manage seasonal staff.
 - b. Assess all known wetlands within the District boundaries utilizing the MN Routine Assessment Method.

- c. Develop and maintain database of wetland assessments.
 - d. Utilize GIS and other remote sensing data to identify wetlands with the potential to be restored or enhanced.
 - e. Interact with community members to answer wetland related questions.
 - f. Develop wetland protection plan including high priority areas.
2. Assist in the planning and implementation of structural and nonstructural best management practices designed to restore and protect surface and groundwater quality and quantity.
 3. Oversee capital improvement and restoration project implementation.
 4. Assist in the maintenance of the District GIS program.
 5. Create GIS exhibits and maps for staff members.
 6. Assist in preparing and submitting grant proposals.
 7. Other Duties as assigned

Education and Outreach (10%)

1. Assist the Education and Outreach Coordinator as needed with current and future programing.
2. Assist in the review of cost share grants.
3. Periodically make presentations to various organizations.
4. Develop and lead a course on wetland science for targeted audiences.
5. Other duties as assigned.

REQUIRED KNOWLEDGE, SKILLS AND ABILITIES:

1. Bachelors Degree in Biology, Environmental Resource Management, Hydrology, or related field required or equivalent experience.
2. Experience in water resource management
3. Familiarity with local, state and federal water resources regulatory programs and management.
4. Ability to communicate effectively both verbally and in writing to a wide range of individuals and groups.
5. Ability to traverse difficult terrain.
6. Ability to work with minimal supervision.
7. Valid driver's license.
8. Some irregular work hours involving evening and weekend work is required.
9. Certified Wetland Scientist.
10. Experience supervising and implementing natural resource capital improvement projects.
11. Flexible working style, self-initiative, self-motivation, and a willingness to work with teams to meet project needs and schedules
12. Demonstrated experience meeting timelines and achieving project expectations
13. Project management experience and interpersonal skills
14. Demonstrated project organization and management/leadership skills
15. Knowledge of Microsoft products, P8, MIDS, Hydrocad, and Arc GIS.
16. Ten years of relevant experience.

New

POSITION TITLE: Watershed Planning Manager

REPORTS TO: Administrator

STATUS: Exempt FLSA

SALARY: \$65,000 - \$85,000

PRIMARY OBJECTIVE:

The Watershed Planning Manager is responsible for working directly with municipalities and other stakeholders to identify, develop, and implement watershed management best practices. The position will also be responsible for the development of a wetland protection program including WCA administration within certain areas of the District and will provide technical assistance with WCA throughout the District. This program will assess all known wetlands and identify, develop, and implement wetland restoration, rehabilitation, and protection projects. This position will administer the regulatory program, including supervision of seasonal staff and consulting engineers. Responsibilities may include preparing work plans and cost estimates, interpreting data, preparing technical reports, and coordinating site activities. The individual should be comfortable in preparing reports and presenting findings to the board in written and oral format. The individual should be able to navigate uneven terrain in any weather condition.

JOB DUTIES AND RESPONSIBILITIES:

Natural Resource Planning (50%)

1. Oversee the development and implementation of a program to preserve and enhance the quantity, as well as the function and value of wetlands.
 - a. Manage seasonal staff.
 - b. Assess all known wetlands within the District boundaries utilizing the MN Routine Assessment Method.
 - c. Develop and maintain database of wetland assessments.
 - d. Utilize GIS and other remote sensing data to identify wetlands with the potential to be restored or enhanced.
 - e. Interact with community members to answer wetland related questions.
 - f. Develop wetland protection plan including high priority areas.
2. Identify potentially restorable wetlands, including enhancement of existing wetlands.
 - a. Coordinate with landowners to acquire easement or other rights to perform necessary work and protect in perpetuity.
 - b. Oversee the development of wetland restoration plans.
 - c. Acquire necessary permits from oversight agencies.
3. Assist in the planning and implementation of structural and nonstructural best management practices designed to restore and protect surface and groundwater quality and quantity.
4. Assist in the maintenance of the District GIS program.
5. Develop GIS database of wetland management classifications.
6. Create GIS exhibits and maps for staff members.

7. Assist in preparing and submitting grant proposals.
8. Other Duties as assigned

Administer Regulatory Program (25%)

1. Assists in the development of District Rules, policies and procedures relating to permitting.
2. Review permit applications, including site plans, hydrologic and hydraulic and water quality modeling, and other materials; Work with permitting review team in investigating and researching to make recommendations to the board.
 - Process permit application that fall under the Administrator issuance authority.
 - Delegate tasks to consulting engineer as necessary.
3. Oversee site inspection for compliance with district rules and permit conditions.
 - Supervise consultant and seasonal staff.
 - Inspect sites including final walkthrough.
 - Responsible for record management (eg. financial assurances, maintenance declarations) of the regulatory program.
4. Initiate and oversee enforcement actions.
5. Develop and maintain permit database including maintenance declarations and agreements as well as financial assurance.
6. Administer the Wetland Conservation Act for two communities.
7. Serve as staff liaison to Technical Environmental Panel.
8. Other duties as assigned.

Community Planning and Engagement (20%)

1. Liaise with Public Works Directors, City Engineers, Community Development Directors and others.
2. Attend, as appropriate, municipal committees meetings.
3. Work with developers to identify sensitive ecological areas, especially as it pertains to wetlands for restoration and/or protection.
4. Host and facilitate meetings with above stakeholders to identify areas to improve, offer education on process, or otherwise improve relationships and efficiency.
5. Identify overlaps between municipal planning efforts and the RPBCWD LSWMP.
6. Identify overlaps between municipal and RPBCWD Capital Improvement Plans.
7. Work with potable water producers/suppliers to develop groundwater conservation strategies.
8. Serve as staff liaison to Technical Environmental Panel.

Education and Outreach (5%)

1. Assist the Education and Outreach Coordinator as needed with current and future programing.
2. Assist in the review of cost share grants.
3. Periodically make presentations to various organizations.
4. Develop and lead a course on wetland science for targeted audiences.
5. Other duties as assigned.

REQUIRED KNOWLEDGE, SKILLS AND ABILITIES:

1. Bachelors Degree in Biology, Natural Resource Management, Environmental Science, Planning, or related field required or equivalent experience.
2. Experience in water resource management
3. Familiarity with local, state and federal water resources regulatory programs and management.
4. Ability to communicate effectively both verbally and in writing to a wide range of individuals and groups.
5. Ability to traverse difficult terrain.
6. Ability to work with minimal supervision.
7. Valid driver's license.
8. Some irregular work hours involving evening and weekend work is required.
9. Certified Wetland Scientist.
10. Experience supervising and implementing natural resource capital improvement projects.
11. Flexible working style, self-initiative, self-motivation, and a willingness to work with teams to meet project needs and schedules
12. Demonstrated experience meeting timelines and achieving project expectations
13. Project management experience and interpersonal skills
14. Demonstrated project organization and management/leadership skills
15. Knowledge of Microsoft products, P8, MIDS, Hydrocad, and Arc GIS.
16. Ten years of relevant experience.

OLD

**Water Resources Technician
2018 Job Description**

POSITION TITLE: Water Resource Technician
REPORTS TO: Water Resources Coordinator
STATUS: Full time, Fair Labor Standards Act Exempt
SALARY RANGE: \$34,000 – \$51,000

PRIMARY OBJECTIVE:

The Water Resource Technician reports directly to the Water Resource Coordinator, providing technical support and assistance in the protection, improvement and management of the water resources located within the District. This position involves assisting the Water Quality Coordinator with the operation of the watershed wide monitoring program for lakes and streams, including maintenance of equipment, and the collection, analysis and reporting of the data on water quality within the district. The Water Resources Technician will also assist in developing specialty water quality projects tied to water quality monitoring and assist in implementing the District's carp management/fisheries program. Additionally, the Water Resource Technician will help supervise District interns and volunteer help.

Essential Functions:

- 1. Assist in the operation and development of the District's monitoring program, specialty water quality projects, and fisheries research/management program. This will include but is not limited to:**
 - a. Install and maintain the District's network of flow meters, samplers, and water level sensors.
 - b. Ensure all equipment is properly functioning and perform repairs and/or regular maintenance as needed.
 - c. Collect water samples and other physical and biological information in lakes, streams and other water features.
 - d. Monitor the overall health and stability of the District's lakes and streams.
 - e. Conduct stream surveys to assess habitat, survey macroinvertebrates, survey fish populations, and identify areas of concern (i.e. severe erosion).
 - f. Assist in conducting the District's zooplankton and phytoplankton monitoring plan including monthly sample collection and reporting.
 - g. Assisting with the development and implementation of fisheries programs and plans within the District including, but not limited to, the District's carp management plan. This will involve, management/maintenance and operation of aeration systems, stocking of fish, and the use of various fisheries sampling equipment including small mesh gill nets, block nets, boat and backpack electrofishers, and VHF telemetry tracking tags and receivers.
 - h. Assist in the development of the AIS monitoring program.
 - i. Assist in the development and implementation of additional specialty water quality projects.
 - j. Assist in supervising the work of District interns/volunteers to ensure efficient and orderly field operations by determining priorities, assigning work, evaluating work completion and purchasing materials.
 - k. Assist in managing and performing quality control of the District's database.
 - l. Assist in the analysis and interpretation of the monitoring data in order to draw conclusions and guide decision making. Prepare monthly and annual monitoring reports.
 - m. Other duties as assigned.

2. Other duties. This will include but is not limited to:

- a. Conducting basic office maintenance
- b. Assisting in the management and maintenance of the District's fleet vehicles
- c. Assist the Education and Outreach Coordinator with the District's various education and outreach programs.
- d. Designing and constructing specialty project items for the District office and various District Programs, including but not limited to education and outreach teaching tools/props, miscellaneous sampling/monitoring equipment, and miscellaneous office needs.
- e. Representing RPBCWD at events and in the field as needed.
- f. Staying up-to-date on information, studies and methods in the water resource science field
- g. Assisting in training volunteers and intern staff
- h. Providing technical assistance as needed
- i. Other

REQUIRED KNOWLEDGE, SKILLS, and QUALIFICATIONS:

- Proficient in water quality QA-QC and the use/application of water quality monitoring equipment (e.g., YSI sonde)
- Course work or experience with water quality monitoring, chemistry and water resource sciences
- Strong organizational, written, and oral communications skills
- Ability to work well with a team and independently as needed
- Must be proficient with MS Office Suite
- Knowledge of ArcGIS
- Self-motivation and ability to work independently without close supervision
- Willingness to travel throughout the project area and attend evening/weekend events
- Strong interpersonal skills and a collaborative attitude

ACTIVITY AND FIELD WORK COMPONENTS:

- This position requires a valid driver's license and good driving record
- Ability to drive, maneuver/handle work pickup-trucks and use them for intended purposes (hauling, trailering, off-road site access)
- Ability to trailer and launch a boat, including larger custom/specialty boats
- Ability to lift and carry approximately 50 pounds over uneven surfaces and slopes
- Working outdoors under all weather conditions
- Installation of equipment in the field and in the water
- Working in waters with waders
- Comfortable handling and processing large numbers of fish
- Ability to use/operate and maintain specialty tools/equipment

MINIMUM QUALIFICATIONS

- a. A BA/BS degree in natural resource science, conservation biology, plant ecology, or another applicable field with at least one year of professional experience in natural resource management; OR three years professional experience with multiple phases of natural resource restoration and management or a related field;
- b. General knowledge of watershed management, aquatic and terrestrial ecology;
- c. Ability to work and conduct surveys outdoors and under adverse weather conditions;
- d. Ability to occasionally lift articles weighing up to 50-pounds and frequently lift and/or carry objects up to 25 pounds, such as heavy tools and file boxes;

- e. Ability to walk and stand on rough terrain and the use of power tools or mechanical equipment;
- f. Ability to oversee field projects and to train and direct the activities of other field staff;
- g. A valid driver's license;
- h. Ability to work some evenings and weekends.

DESIRED QUALIFICATIONS

- a. Ability to create maps and analyze spatial data using ArcGIS

New

**Water Resources Technician
2019 Job Description**

POSITION TITLE: Water Resource Technician II
REPORTS TO: Water Resources Coordinator and Project and Permitting Manager
STATUS: Full time, Fair Labor Standards Act Exempt
SALARY RANGE: \$47,200 - \$70,800

PRIMARY OBJECTIVE:

The Water Resource Technician reports directly to the Water Resource Coordinator, providing technical support and assistance in the protection, improvement and management of the water resources located within the District. This position involves assisting the Water Quality Coordinator with the operation of the watershed wide monitoring program for lakes and streams, including maintenance of equipment, and the collection, analysis and reporting of the data on water quality within the district. The Water Resources Technician will also assist in developing specialty water quality projects tied to water quality monitoring and assist in implementing the District's carp management/fisheries program. This position will also assist in the development of the District's wetland program, including identifying and assigning function/value to wetland areas within the District. Additionally, the Water Resource Technician will help supervise District interns and volunteer help.

Essential Functions:

- 1. Assist in the operation and development of the District's monitoring program, specialty water quality projects, and fisheries research/management program. This will include but is not limited to:**
 - a. Install and maintain the District's network of flow meters, samplers, and water level sensors.
 - b. Ensure all equipment is properly functioning and perform repairs and/or regular maintenance as needed.
 - c. Collect water samples and other physical and biological information in lakes, streams and other water features.
 - d. Monitor the overall health and stability of the District's lakes and streams.
 - e. Conduct stream surveys to assess habitat, survey macroinvertebrates, survey fish populations, and identify areas of concern (i.e. severe erosion).
 - f. Conduct the District's zooplankton and phytoplankton monitoring plan including monthly sample collection and reporting.
 - g. Assisting with the development and implementation of fisheries programs and plans within the District including, but not limited to, the District's carp management plan. This will involve, management/maintenance and operation of aeration systems, stocking of fish, and the use of various fisheries sampling equipment including small mesh gill nets, block nets, boat and backpack electrofishers, and VHF telemetry tracking tags and receivers.
 - h. Assist in the development of the AIS monitoring program.
 - i. Assist in the development and implementation of additional specialty water quality projects.
 - j. Assist in supervising the work of District interns/volunteers to ensure efficient and orderly field operations by determining priorities, assigning work, evaluating work completion and purchasing materials.
 - k. Assist in managing and performing quality control of the District's database.

- l. Assist in the analysis and interpretation of the monitoring data in order to draw conclusions and guide decision making. Prepare monthly and annual monitoring reports.
- m. Other duties as assigned.

2. Assist in the development of the District's wetland assessment/monitoring program. This will include but is not limited to:

- a. Conducting MnRAM assessments of wetlands within the District
- b. Assisting in the development and updating of the District's wetland inventory
- c. Carrying out in office and on-site assessments of wetlands, including assessments of value and delineation of wetland boundaries.
- d. Assisting in the review of wetland delineation reports.
- e. Assisting with site visits/inspections.
- f. Attending relevant TEP meetings.

3. Other duties. This will include but is not limited to:

- a. Conducting basic office maintenance
- b. Assisting in the management and maintenance of the District's fleet vehicles
- c. Assist the Education and Outreach Coordinator with the District's various education and outreach programs.
- d. Designing and constructing specialty project items for the District office and various District Programs, including but not limited to education and outreach teaching tools/props, miscellaneous sampling/monitoring equipment, and miscellaneous office needs.
- e. Representing RPBCWD at events and in the field as needed.
- f. Staying up-to-date on information, studies and methods in the water resource science field
- g. Assisting in training volunteers and intern staff
- h. Providing technical assistance as needed
- i. Other

REQUIRED KNOWLEDGE, SKILLS, and QUALIFICATIONS:

- Proficient in water quality QA-QC and the use/application of water quality monitoring equipment (e.g., YSI sonde)
- Course work or experience with water quality monitoring, chemistry and water resource sciences
- Course work or experience in wetland ecology and delineation
- Strong organizational, written, and oral communications skills
- Ability to work well with a team and independently as needed
- Must be proficient with MS Office Suite
- Knowledge of ArcGIS and the ability to create maps and analyze spatial data
- Self-motivation and ability to work independently without close supervision
- Willingness to travel throughout the project area and attend evening/weekend events
- Experience supervising multiple employees
- Strong interpersonal skills and a collaborative attitude

ACTIVITY AND FIELD WORK COMPONENTS:

- This position requires a valid driver's license and good driving record

- Ability to drive, maneuver/handle work pickup-trucks and use them for intended purposes (hauling, trailering, off-road site access)
- Ability to trailer and launch a boat, including larger custom/specialty boats
- Ability to lift and carry approximately 50 pounds over uneven surfaces and slopes
- Working outdoors under all weather conditions
- Installation of equipment in the field and in the water
- Working in waters with waders
- Comfortable handling and processing large numbers of fish
- Ability to use/operate and maintain specialty tools/equipment

MINIMUM QUALIFICATIONS

- a. A BA/BS degree in natural resource science, conservation biology, plant ecology, or another applicable field with at least three years of professional experience in natural resource management; OR five years professional experience with multiple phases of natural resource restoration and management or a related field;
- b. General knowledge of watershed management, aquatic and terrestrial ecology;
- c. General knowledge of wetland ecology;
- d. Ability to work and conduct surveys outdoors and under adverse weather conditions;
- e. Ability to occasionally lift articles weighing up to 50-pounds and frequently lift and/or carry objects up to 25 pounds, such as heavy tools and file boxes;
- f. Ability to walk and stand on rough terrain and the use of power tools or mechanical equipment;
- g. Ability to oversee field projects and to train and direct the activities of other field staff;
- h. A valid driver's license;
- i. Ability to work some evenings and weekends.

PREFERED QUALIFICATIONS

- a. Experience with statistical analysis of data;
- b. Some programming knowledge and experience writing/editing code for use with water quality instruments and monitoring;
- c. WDCP Wetland Delineator Certification;
- d. Experience doing MnRAM assessments of wetlands and/or reviewing wetland delineations;
- e. Experience with carpentry, metalworking, and/or design and constructing of specialized projects.

Old

Riley Purgatory Bluff Creek Watershed District
18681 Lake Drive East
Chanhassen, MN 55317

POSITION TITLE: Community Outreach Coordinator
REPORTS TO: Administrator
SUPERVISES: Office & Outreach Assistant

PRIMARY OBJECTIVE:

The role of the Community Outreach Coordinator is to design, maintain, and implement an Education and Outreach (E&O) Program to protect, manage, and restore water resources. The E&O Program directly contributes to the goals of the District's 10-Year Plan, and improves water quality by leveraging the power of residents, students, professionals, and local leaders to effect change. By fostering an engaged community, the District can increase awareness, grow stewardship, and build capacity to do the shared work of protecting our water resources

ESSENTIAL FUNCTIONS:

1. Engage the District's audiences (residents, youth, businesses/professionals, local leaders) in projects and programs by building and maintaining connections with, and a presence in, the communities it serves.
 - a. Plan and implement formal and informal communication efforts: website and social media, electronic newsletter, press releases, annual communication, and others.
 - b. Manage project specific passive (ex: flyers, articles) and active (ex: community meetings, tours, open houses) engagement.
2. Build community awareness of local resources, issues, and best practices. Tailor strategies to present complex and/or technical issues in a manner appropriate for each audience.
 - a. Coordinate youth education programs and opportunities.
 - b. Coordinate outreach and trainings for local leaders, businesses, and professionals.
 - c. Develop events/programs for residents that include educational and recreational opportunities.
3. Provide resources to increase stewardship within the community. Identify and respond to District and community resource needs.
 - a. Manage the Cost Share Program, including organizing site visits, leading funding recommendation committees, preparing funding recommendations and grant agreements, and tracking individual grant budgets and reimbursement requests.
 - b. Coordinate and present at workshops, trainings, and community events.
4. Build community capacity by working with audiences to develop a network of watershed champions.
 - a. Build connections with existing community groups and volunteer organizations.
 - b. Identify opportunities for partnership and collaboration.
 - c. Develop, manage and supervise volunteer programs.
5. Collect data, evaluate, and adjust the E&O program to improve effectiveness.
6. Other
 - a. Supervise Office & Outreach assistant.
 - b. Manage projects as assigned by District Administrator.
 - c. Research and stay up to date on developments in the fields of water resources, facilitation, education, and communications.
 - d. Serve as liaison to Citizen Advisory Committee.
 - e. Supervise District interns, service learners, and volunteers as appropriate.
 - f. Assist District staff as needed (ex. data collection).
 - g. Other duties as assigned.

REQUIRED KNOWLEDGE & SKILLS

1. Bachelors in environmental science/natural resources, or education/communications.
2. 5 years of related experience.
3. Understanding of the principals of stormwater management and aquatic ecosystems.
4. Project or program management experience.
5. Supervisory experience.
6. Adobe Creative Suite proficiency.
7. Ability to present and communicate effectively to a wide range of audiences.
8. Experience working with K-12 students, either formally or informally.
9. Availability to work evenings and weekends.
10. Ability to manage multiple deadlines concurrently.
11. Valid driver's license.

DESIRED KNOWLEDGE & SKILLS

1. Masters degree in environmental science/natural resources, or education/communications.
2. Project WET certification.
3. Graphic design experience.
4. Experience with Zoho CRM.
5. Art of Hosting or similar facilitation training.

SALARY RANGE: \$47,500 – \$62,500

New

Riley Purgatory Bluff Creek Watershed District
18681 Lake Drive East
Chanhassen, MN 55317

POSITION TITLE: Communications and Project Manager
REPORTS TO: Administrator
SUPERVISES: Education & Outreach Coordinator
TYPE: Full-time, exempt from the provisions of the Fair Labor Standards Act.
Pay Grade: 6

PRIMARY OBJECTIVE

The Communications and Project Manager works in partnership with staff, consultants, stakeholders, and member communities to implement Riley Purgatory Bluff Creek Watershed District (District) communications and oversees the Education and Outreach program. This position is also responsible for project management, and will assist in the planning, development and implementation of structural and non-structural best management practices designed to manage, protect and enhance water and natural resources.

PRIMARY DUTIES AND RESPONSIBILITIES

- Oversee formal and informal communication efforts for the District, including District newsletter, social media, press releases, website updates and maintenance, etc.
- Direct the development and oversee the coordination of the District's Education and Outreach Program including budget development.
- Supervise Education and Outreach Coordinator, contractors, consultants, and interns.
- Oversee the integration of education and outreach into capital improvement projects
- Manage the District's Grants Program including the development of budget, RFPs, negotiation of grant agreements, organizing site visits, leading grant funding recommendation committees, preparation of funding recommendation reports, tracking individual projects, grant budgets, reimbursement requests, reporting, and inspection.
- Lead and assist in the planning, development, management and implementation of structural and non-structural best management practices designed to manage, protect and enhance water and natural resources. This includes monitoring scope, schedules and project budgets, consultant/contractor supervision, and project implementation from scoping through closeout.
- Assist in the preparation for regular and special board meetings; routinely attend and participate in board meetings, as assigned.
- Participates as a member of the staff team for District planning, projects, and programs by cooperating with other staff and consultants, contributing ideas, providing comments when requested, and helping where needed.
- Research and stay up to date with developments in the field of water resources.
- Effectively represents water and watershed issues at meetings, conferences, before the media, and to other local units of government, City Departments, the Riley Purgatory Bluff Creek Watershed District Board of Managers, partner organizations, and the public.
- Prepares reports and summaries for the District Administrator and Board of Managers, as required/requested.
- Other duties, as assigned.

KNOWLEDGE, SKILLS AND ABILITIES:

REQUIRED KNOWLEDGE & SKILLS

1. Master's or Bachelor's Degree in Landscape Architecture, Natural Resource Management, Urban Planning, Public Administration, Business Administration, Water Resources Science or a related field and coursework with an ecological or environmental focus. Master's degree preferred, but not required. An equivalent combination of relevant education/experience/professional licenses may be considered.
2. Minimum of five (5) years of related experience including research, public education, management, negotiations, construction site supervision, budget development and management, watershed-based planning, urban environmental planning, development of storm water management systems, preservation/restoration of urban ecosystems.
3. Knowledge of public process in government, urban resource management and environmental issues, storm water management practices, program management techniques, public education/public information, design and graphics, dispute resolution, and group dynamics and interactions.
4. Able to analyze technical reports, and to develop/coordinate/facilitate work teams and individuals.
5. Able to work successfully with considerable independence.
6. Project or program management experience.
7. Supervisory experience.
8. Able to display excellent verbal, written, organizational, and interpersonal communication skills.
9. Availability to work evenings and weekends.
10. Ability to manage multiple deadlines concurrently.
11. Valid driver's license.

DESIRED KNOWLEDGE & SKILLS

1. Master's degree in above fields.
2. Graphic design experience.
3. Facilitation training.
4. Web Management expertise.
5. Social Media Experience.
6. Construction Management training.

Reports to: The Communications and Project Manager reports directly to, and is supervised by, the District Administrator. The position will meet with the District Administrator regularly to prioritize project workload commitments and to discuss issues pertaining to this position.

Old

Organization: Riley-Purgatory-Bluff Creek Watershed District

Position Title: Office & Outreach Assistant

Reports To: Community Outreach Coordinator and the District Administrator

Type of Position: Full-time, exempt from the provisions of the Fair Labor Standards Act

Salary Range: \$35,000 - \$55,000 (hiring range \$35,000 - \$40,000, depending on qualifications), plus paid vacation & personal time off, PERA contributions, medical/dental insurance

POSITION OBJECTIVE

This position assists with the water resource education and outreach programs of the Riley-Purgatory-Bluff Creek Watershed District and day-to-day office activities. The primary objective of this position is to assist in the improvement and protection of the water resources of the Riley-Purgatory-Bluff Creek Watershed by providing water resource education and outreach programs and resources to citizens, community leaders, municipal staff, landowners, schools and others in the Riley-Purgatory-Bluff Creek Watershed District. The secondary objective is to assist in the day-to-day office activities such as room set-up, receipt and organization of District files and documents.

JOB DUTIES AND RESPONSIBILITIES

Outreach (60%)

1. Implement formal and informal education and outreach programs and activities.

a. Implement District education and public outreach activities as assigned, and help meet the goals, and strategies of the District's Education and Outreach Plan. Programs can include but are not limited to:

i. School presentations, fieldtrips, community tabling events, such city open houses and sustainability fairs, and presentations to nonprofits groups and other organizations

ii. Strategies for non-structural, non-point source pollution control, e.g. Water Festivals, storm drain marking projects

iii. Professional trainings for maintenance, operations, and public works staff in both the public and private sector (e.g., snow and ice removal training)

b. Assist with the development of educational materials and literature for the District

c. Coordinate registration and logistics for a wide variety of programs and events

2. Assist with formal and informal communication efforts to reach target audiences in the District.

a. Assist with website updates

b. Contribute newsletter articles and other content to the District's e-newsletter

c. Assist with the District's Annual Report and other written communications

3. Assist with the coordination of education and outreach partnering opportunities.

a. Develop and maintain positive relationships with other entities—cities, schools, universities, agencies, organizations and associations—to promote the RPBCWD's mission and goals through outreach activities

Office (30%)

4. Provides administrative support to the District Administrator

- a. Assists in preparing the annual work plan, annual report, and comprehensive plan
- b. Updates website with monthly agenda, meeting minutes, public notices and other information as required
- c. Prepares all materials for Board packet, including copying, assembling, mailing, emailing
- d. Sends required Legal Notices, Requests for Proposals, etc. as needed to newspapers and posts on District website
- e. Maintains meeting minutes, agendas, resolutions, board packets, and other information in an accurate and timely manner

5. Provides general office support in an efficient and effective manner

- a. Greets and routes visitors Answers calls, takes messages and follows up as appropriate
- b. Prepares, opens and routes mail
- c. Orders and maintains office supplies
- d. Manages electronic mailing lists to assure accuracy
- e. Organizes paper and electronic files efficiently
- f. Sets up meetings, conferences, calls, accommodations, catering, and prepares agendas and handouts as necessary
- g. Maintains District directory containing information on Managers and staff
- h. Prepares correspondence and reports as required in a timely, accurate manner
- i. Coordinates office space and office equipment maintenance

Other duties and responsibilities (10%)

1. Participates as a member of the staff team for District projects and programs by cooperating with other staff and consultants, contributing ideas, providing comments when requested, and helping where needed
2. Provides educational materials and literature reviews as needed for staff, to clients, to the public, for website development, or for program evaluation
3. Works collaboratively with and provides directions as needed to consultants and interns or volunteers
4. Researches and stays up to date with developments in the field of water resources
5. Other duties include but are not limited to:
 - a. Effectively represents water and watershed issues at meetings, conferences, and to other local units of government, City Departments, the Riley-Purgatory-Bluff Creek Watershed District Board of Managers, partner organizations, and the public
 - b. Prepares reports and summaries for the Community Outreach Coordinator, District Administrator and Board of Managers as needed

MINIMUM QUALIFICATIONS: 1-2 years of experience preferred implementing water resource and/or environmental education, outreach and communications programs to a variety of audiences. Bachelor's degree in natural resources with an emphasis in communication, bachelor's degree in Education with experience in natural resources. A graduate degree in a related field may be

considered in lieu of work experience. Knowledge of technical and regulatory water quality and stormwater issues. Demonstrated written, verbal, and presentation skills. Demonstrated networking, team-building, research, coordination, and multi-tasking skills. Ability to work with a diverse public audience. Must have a reliable vehicle and a valid US driver's license with no recent suspensions.

DESIRED QUALIFICATIONS: Understanding of social marketing and behavioral change strategies. Experience with non-formal, non-traditional teaching settings (e.g., outside of classroom, adult learners). Previous experience with local units of government and stormwater education or urban environmental education.

KNOWLEDGE, SKILLS AND ABILITIES

1. Proficiency with a personal computer and Microsoft software packages for word processing, spreadsheet, database management and computer generated graphics, specifically, but not limited to, Microsoft Office, Excel, Word, Access, PowerPoint, Adobe InDesign, Illustrator and Photoshop.
2. Ability to effectively use email and Internet applications and other common software applications.
3. Ability to take direction, work independently with a minimum of supervision, use good time management practices, possess the ability to set priorities and balance large volumes of diverse work.
4. Ability to work collaboratively to develop education and outreach programming with local and agency staff, consultants and associates.
5. Ability to develop and maintain effective working relationships with the District Administrator, the Community Outreach Coordinator, RPBCWD Board of Managers, Citizens Advisory Committee, city and agency staff, members of the public, and other interested parties.
6. Ability to effectively communicate verbally and in written form to a wide variety of audiences ranging from elected officials to K12 students.
7. Creativity in developing and presenting educational information and exhibits.

(The above is intended to describe the general content of and requirements for the performance of this job. It is not to be construed as an exhaustive statement of duties, responsibilities or requirements and does not imply a contract.)

TO APPLY: Submit cover letter, resume, and three references by **December 29, 2017, at 4 PM** to: Claire Bleser via e-mail to: cbleser@rpbcwd.org

New

Organization: Riley-Purgatory-Bluff Creek Watershed District

Position Title: Education & Outreach Coordinator

Reports To: Communication & Project Manager and the District Administrator

Type of Position: Full-time, exempt from the provisions of the Fair Labor Standards Act

Salary Range: \$42,400 - \$63,600, depending on qualifications, plus paid vacation & personal time off, PERA contributions, medical/dental insurance

POSITION OBJECTIVE

This position coordinates the water resource education and outreach programs of the Riley-Purgatory-Bluff Creek Watershed District, under the direction of the Communications & Project Manager and the District Administrator. The primary objective of this position is to assist in the improvement and protection of the water resources of the Riley-Purgatory-Bluff Creek Watershed by providing water resource education and outreach programs and resources to citizens, community leaders, municipal staff, landowners, schools and others in the Riley-Purgatory-Bluff Creek Watershed District. Additionally, this position supports the communications program and works to build District capacity through the implementation and management of a volunteer program.

JOB DUTIES AND RESPONSIBILITIES

Outreach (90%)

- 1. Coordinate, design and implement formal and informal education and outreach programs and activities.** Programs can include but are not limited to:
 - a. School presentations, fieldtrips, community tabling events, such as city open houses and sustainability fairs, and presentations to nonprofits groups and other organizations
 - b. Strategies for non-structural, non-point source pollution control, e.g. Water Festivals, storm drain marking projects
 - c. Professional trainings for maintenance, operations, and public works staff in both the public and private sector (e.g., snow and ice removal training)
 - d. Develop educational materials and literature for the District
 - e. Coordinate registration and logistics for a wide variety of programs and events

- 2. Communicate with target audiences via formal and informal communication efforts.**
 - a. Manage District social media accounts *to* promote district work and goals, via Facebook, Instagram, and Twitter
 - b. Work to effectively reach, understand, and engage diverse and/or underserved audiences
 - c. Assist with website updates
 - i. Update website with monthly agenda, meeting minutes, public notices, and other information as required.
 - ii. Manage online public calendar of upcoming events and meetings
 - iii. Assist with generation of web content
 - d. Contribute newsletter articles and other content to the District's e-newsletter

- e. Assist with the District's Annual Report and other written communications
- f. Assist with project-specific communications of District projects

3. Manage and grow volunteer program at the District

- a. Recruit, coordinate, and manage volunteer participants for Adopt-a-Dock, Master Water Stewards, service learners, and other programs.
- b. Provide and manage opportunities for volunteers
- c. Organize community volunteer events
- d. Grow and formalize volunteer program by fostering new partnerships and improving structure of current programs

4. Coordinate education and outreach partnering opportunities.

- a. Develop and maintain positive relationships with other entities—cities, schools, universities, agencies, organizations and associations—to promote the RPBCWD's mission and goals through outreach activities

5. Provides general office support in an efficient and effective manner

- a. Orders and maintains office supplies
- b. Manages electronic mailing lists to assure accuracy
- c. Sets up meetings, conferences, calls, accommodations, catering, and prepares agendas and handouts as necessary
- d. Maintains District directory containing information on Managers and staff
- e. Prepares correspondence and reports as required in a timely, accurate manner
- f. Coordinates office space and office equipment maintenance

Other duties and responsibilities (10%)

1. Participates as a member of the staff team for District projects and programs by cooperating with other staff and consultants, contributing ideas, providing comments when requested, and helping where needed
2. Provides educational materials and literature reviews as needed for staff, to the public, for website development, or for program evaluation
3. Works collaboratively with and provides directions as needed to consultants and interns or volunteers
4. Researches and stays up to date with developments in the field of water resources
5. Other duties include but are not limited to:
 - a. Effectively represents water and watershed issues at meetings, conferences, and to other local units of government, City Departments, the Riley-Purgatory-Bluff Creek Watershed District Board of Managers, partner organizations, and the public
 - b. Prepares reports and summaries for the Communication and Project Manager, District Administrator and Board of Managers as needed

MINIMUM QUALIFICATIONS: 3 years of experience preferred implementing water resource and/or environmental education, outreach and communications programs to a variety of audiences, managing and recruiting volunteers. Bachelor's degree in natural resources with an emphasis in communication, bachelor's degree in Education with experience in natural resources. A graduate degree in a related field may be considered in lieu of work experience. Knowledge of technical and regulatory water quality and storm

water issues. Demonstrated written, verbal, and presentation skills. Demonstrated networking, team-building, research, coordination, and multi-tasking skills. Ability to work with a diverse public audience. Must have a reliable vehicle and a valid US driver's license with no recent suspensions.

DESIRED QUALIFICATIONS: Understanding of social marketing and behavioral change strategies. Experience with non-formal, non-traditional teaching settings (e.g., outside of classroom, adult learners). Training in volunteer management. Knowledge of Adobe Suites other similar publishing software, and experience in web updates and content design. Previous experience with local units of government and stormwater education or urban environmental education.

KNOWLEDGE, SKILLS AND ABILITIES

1. Proficiency with a personal computer and Microsoft software packages for word processing, spreadsheet, database management and computer generated graphics, specifically, but not limited to, Microsoft Office, Excel, Word, Access, PowerPoint, Adobe InDesign, Illustrator and Photoshop.
2. Ability to effectively use email and Internet applications and other common software applications.
3. Ability to take direction, work independently with a minimum of supervision, use good time management practices, possess the ability to set priorities and balance large volumes of diverse work.
4. Ability to work collaboratively to develop education and outreach programming with local and agency staff, consultants and associates.
5. Ability to develop and maintain effective working relationships with the District Administrator, the Community Outreach Coordinator, RPBCWD Board of Managers, Citizens Advisory Committee, city and agency staff, members of the public, and other interested parties.
6. Ability to effectively communicate verbally and in written form to a wide variety of audiences ranging from elected officials to K12 students.
7. Creativity in developing and presenting educational information and exhibits.

(The above is intended to describe the general content of and requirements for the performance of this job. It is not to be construed as an exhaustive statement of duties, responsibilities or requirements and does not imply a contract.)

2019 Seasonal Staff

Name	Job Title	Program	Season
Emily Kreiter	Water Resources Research Assistant	Hennepin County Chloride	Summer
Tim Toavs	Water Quality Assistant	Data Collection	Summer
Mat Nicklay	Water Quality Assistant	Data Collection	Summer
Abbie Tekiela	Water Quality Assistant	Wetland Program Data Collection	Summer
Emma Nyquist	Water Quality Assistant	Wetland Program Permitting Inspection	Summer
Aimi Dieckel	Artist in residence	Education and Outreach	Summer
Olivia Holstine	Water Quality Assistant	Data Collection Wetland Program	Fall

Appendix D. Sample host site agreement

The actual agreement is subject to change based on updated CNCS/AmeriCorps policies for the 2019-2020 program year.



520 Lafayette Road North
St. Paul, MN 55155-4194

Minnesota GreenCorps host site agreement

Program Year 2017 - 2018

Doc Type: Agreement



CR #:	
SWIFT #:	

I. Purpose

This Agreement is between the State of Minnesota, acting through its Commissioner of the Minnesota Pollution Control Agency (MPCA), 520 Lafayette Road North, St Paul, MN 55155, using the Minnesota GreenCorps Program, herein after referred to as "State" or "MPCA," and <Insert host site name and address>, herein after referred to as the "Host Site." The Agreement delineates the terms, conditions, and rules of participation in the Minnesota GreenCorps Program for the 2017-2018 program year.

II. Term of agreement

Effective date: September 13, 2017, or the date the State obtains all required signatures under Minn. Stat. § 16C.05, subd. 2, whichever is later.

Expiration date: August 14, 2018, or until all obligations have been satisfactorily fulfilled, whichever occurs first.

III. Authorized representatives

The MPCA's Authorized Representative is Cristina Villella, Minnesota GreenCorps Program Coordinator, 520 Lafayette Road North, St Paul, MN 55155, 651-757-2580, cristina.villella@state.mn.us or her successor.

The Host Site's Authorized Representative is <Name, title, address, telephone number, email>, or his/her successor. If the Host Site's Authorized Representative changes at any time during this Agreement, the Host Site must immediately notify the MPCA.

The Host Site supervisor(s) is/are: <Name, title, address, telephone number, email>, or successor.

If the supervisor(s) changes at any time during this Agreement, the Host Site must immediately notify the MPCA.

IV. Member position description

The Host Site, along with listed partners, will provide direction, supervision, and resources for the following Minnesota GreenCorps member (Member) position (s) **<Insert position title>**.

<Insert position description>

A. Member eligibility requirements

1. Must be a minimum of 18 years of age or older at the start of the term of service.
2. Must be a U.S. Citizen, U.S. National, or Lawful Permanent Resident Alien of the U.S.
3. Must successfully pass a criminal background search of the National Sex Offender Public Registry, the Minnesota Bureau of Criminal Apprehension, and the corresponding government entity from their state of current residence.
4. Must not have a criminal history, as concluded from a fingerprint-based Federal Bureau of Investigation (FBI) criminal history check, which precludes the member's ability to have recurring access to vulnerable populations (i.e., children, elderly, and persons with a disability).
5. Must have a High School Diploma/GED
6. Must have completed a two-year Associate of Arts degree or completed sophomore year in a four-year college program.

Must be able to make a commitment to complete 11 months of service.

B. Travel

1. Some positions may require driving, a valid driver's license, and passing a driving record check administered by the MPCA.
2. Some positions may require access to a personal vehicle for transportation and travel.

C. Qualifications/skills

1. Education

A two-year Associate of Arts degree or completion of sophomore year in a four-year college program is required. A four-year college degree with a major or significant course work related to environmental protection, energy conservation and efficiency, urban planning, or other relevant aspect of the Minnesota GreenCorps Program is preferred.

2. Work skills

- a. Effective communication, presentation, and writing skills
- b. Ability to build and maintain relationships
 - 1) Motivate others
 - 2) Demonstrate flexibility in work assignments
 - 3) Work both independently and with others
 - 4) Work with individuals from a variety of backgrounds
- c. Ability to take the initiative in work assignments, organize them, and complete them
- d. Ability to research and organize information
- e. Functional computer skills: word processing, spreadsheet, database

3. Interest/commitment

Demonstrated interest and experience in environmental and sustainability issues, including energy and water conservation, air quality, urban planning, local foods, active transportation, environmental education, and a commitment to community and Minnesota GreenCorps service.

D. Physical requirements

Some positions may require the ability to perform fieldwork, sometimes in adverse weather, traversing rough terrain, and occasionally moving equipment.

E. Performance requirements and expectations

1. Travel to the Twin Cities for orientation (September 2017). Travel expenses will be paid/reimbursed by Minnesota GreenCorps.
2. Travel to attend four quarterly trainings. Travel expenses will be paid/reimbursed by Minnesota GreenCorps.
3. Submit an online timesheet to report service hours once every two weeks.
4. Submit quarterly and final project progress reports.
5. Complete 1,700 hours.

While Minnesota GreenCorps members will be selected for placement based on their qualifications and commitment to service, host sites must understand that members are not necessarily bringing highly specialized skills to their position. The members are participating in the Minnesota GreenCorps program in order to give back to their communities and gain valuable skills and experience in the environmental field. Host sites will often need to invest time in on-the-job training for the members.

V. Responsibilities of the MPCA

The MPCA, acting through the Minnesota GreenCorps Program Coordinator, supporting staff, and management, is responsible for providing oversight to the Minnesota GreenCorps Program on a statewide level, including member management, site management, and compliance with all AmeriCorps regulations. The Minnesota GreenCorps Program Coordinator is an employee of the MPCA.

A. Member selection process

1. Interviewing: The MPCA will accept and screen all applications for Member positions. The MPCA will sort and review applications, and select candidates for interviews.

2. **Selecting:** The MPCA will make selection decisions. The MPCA has the responsibility and authority to extend an offer for a position to an applicant, and will make the final selection decisions.
3. **Background checks:** The MPCA will conduct background checks on applicants prior to their official acceptance into the Minnesota GreenCorps Program. The check will include a: 1) national sex offender database search, 2) state criminal database search, 3) FBI fingerprint based check for members working with vulnerable populations, and 4) driver's license and driving record verification. Member participation in the Minnesota GreenCorps Program is contingent upon passing all relevant background checks.

B. Member management

1. **Member training:** The MPCA is responsible for coordinating the logistics and scheduling the member trainings that occur throughout the year. The MPCA will reimburse travel expenses for members to attend Minnesota GreenCorps-sponsored training. Member orientation(s) topics will include: AmeriCorps/Minnesota GreenCorps policies and procedures; OnCorps reports (the inline reporting system for AmeriCorps programs); reporting requirements; training in topic areas; and safety, including right-to-know and emergency procedures.
2. **Oversight:** While the Host Site will provide day-to-day supervision, the MPCA will communicate regularly with the Host Site and site supervisor to ensure that the tasks and activities of the member project align with the position description and goals of the Minnesota GreenCorps Program and the MPCA. The MPCA will work with the member and host site to refine project measures throughout the term of service. The MPCA is also responsible for data compilation and reporting to interested parties including ServeMinnesota, Corporation for National and Community Service (CNCS), MPCA management, and other interested parties.
3. **Mentors:** The MPCA will provide each Minnesota GreenCorps Member with a mentor that will provide technical assistance and support throughout the program year.
4. **Member site visits:** The MPCA will conduct up to two site visits during the year with each Member. Site visits will be scheduled by the MPCA with the Minnesota GreenCorps member and site supervisor.
5. **Monitoring program requirements:** The Minnesota GreenCorps Program Coordinator will track and monitor each Member's progress in completing program requirements. This includes monitoring Members' service hours to ensure the Member will fill the minimum hour requirement by August 2018.
6. **Member personnel file:** The MPCA will maintain a personnel file for each Member.
7. **Member benefits:** The MPCA is responsible for administering/overseeing member benefits (as applicable) including: living allowance, health insurance and workers' compensation. The MPCA will provide assistance to qualifying Members in receiving federal student loan forbearance, childcare reimbursement, and education awards from the corresponding government entities that provide such benefits. The MPCA will also provide travel reimbursement for approved expenses.
8. **Reasonable accommodation:** A reasonable accommodation is any modification or adjustment to a job, practice, or work environment that makes it possible for an individual with a physical or mental disability to perform the essential functions of a job. The MPCA must provide such accommodations, upon request by members with disabilities, unless doing so imposes undue financial or administrative burden to the program.
9. **Member discipline:** The MPCA will work closely with the Host Site supervisor regarding setting expectations and, if necessary, administering discipline for performance-related issues, including but not limited to: tardiness, failure to meet deadlines, failure to complete service position duties, etc.
10. **Grievance procedures:** The MPCA will ensure that employee work problems are appropriately resolved; when necessary, the MPCA will ensure that Grievance Procedures are administered as prescribed in the Member Service Agreement.
11. **Site re-assignment:** In the event that a Host Site environment becomes unsuitable for a Member to continue their service work, the MPCA reserves the right to terminate the site partnership and move the Member to another site, should an opportunity exist.

C. Member suspension, release from service, and termination

1. Only the MPCA's designated staff has the authority to suspend or release a Member either for cause or for compelling personal circumstances. Host Site supervisors must actively work with the MPCA to address performance issues before suspension or release from service is considered.
2. **Terminating:** Only MPCA's designated staff has the authority to suspend or release a Minnesota GreenCorps member from service for disciplinary reasons. Site supervisors must actively work with the MPCA to address performance issues before termination is considered.

D. Host Site management

1. **Training:** Host site orientation topics will include: AmeriCorps/Minnesota GreenCorps policies and procedures, OnCorps reports, and reporting requirements.
2. **Site visits:** The Minnesota GreenCorps Program Coordinator and/or other MPCA staff will conduct up to two site visits with each site. The site visits will review progress in relation to the expectations laid out in the Site Agreement, celebrate success, and provide assistance in problem solving.

3. Monitor and approve in-kind: The Minnesota GreenCorps Program Coordinator will monitor in-kind reports submitted to OnCorps by the Site Supervisor, and will approve in-kind reports once proper documentation is received.
4. Background checks: The MPCA will conduct and pay for background checks on host site supervisors prior to the start of the Minnesota GreenCorps Program. The check will include 1) national sex offender database search, and 2) state criminal database search. If a site supervisor has recurring access to vulnerable populations, an additional fingerprint check will be required. Site participation in the Minnesota GreenCorps Program is contingent upon passing both background checks.

E. Insurance

1. The Members will be covered under the MPCA Commercial General Liability and Commercial Automobile Liability insurance policies as volunteers. If the members are using vehicles belonging to the Host Site organization to conduct business on behalf of the Minnesota GreenCorps Program, the Host Site's insurance is primary. Any other insurance that may be available would only respond after the organization's insurance is exhausted.

VI. Host Site responsibilities

The Host Site, acting primarily through the Host Site supervisor, is responsible for the following as a Minnesota GreenCorps participant:

A. Member support and management

1. Member recognition: Minnesota GreenCorps members are not "employees" or "volunteers" of the host site.
2. Supervision: Provide day-to-day professional supervision of the Minnesota GreenCorps member(s), equating to at least **3.2 hours per week (0.08 full time employee [FTE])**, per member. Set a daily schedule with the Minnesota GreenCorps member to ensure a full-time member is serving approximately 40 hours/week, and then hold the member accountable to this set schedule.
3. Provide appropriate safety training, including right-to-know and emergency procedures.
4. Workspace, computer access, supplies, materials. Provide reasonable workspace for members to complete the tasks of their project. This includes a desk, phone, computer, access to office supplies, access to a printer, copy machine, materials needed for Minnesota GreenCorps member projects (displays, fact sheets, manuals, etc.). Members must have regular access to the internet for Minnesota GreenCorps-related purposes (i.e., completing timesheets, using the Minnesota GreenCorps website, checking email) as well as to complete the tasks of their project. It is recommended the host site provide a host site email address to the Minnesota GreenCorps member if possible.
5. On-site training: Invite the Minnesota GreenCorps member to participate in relevant on-site training and/or staff meetings. Minnesota GreenCorps members may record this time toward their service hours.
6. Member professional development: Host sites are encouraged to provide at least \$150 towards member professional development, such as attending conferences, seminars, workshops, trainings, etc.
7. Work environment: Maintain a work environment that is welcoming, respectful, and free of harassment and discrimination, and safe. Name badge: Provide the member with a name badge, if required, according to the personnel policies of the host site.
8. Reasonable accommodation: Members with mental or physical disabilities have the right to request reasonable accommodations through their host site. The host site should work closely with the Minnesota GreenCorps Program Coordinator and the MPCA's Human Resource Office to support and respond to such requests.
9. Grievance procedures: Discuss work problems with members, engage in informal problem solving, and (if required) support the Grievance Procedures included in the Member Service Agreement.

B. Supervisor responsibilities

1. Attend supervisor training: Supervisors are required to participate in a one-day Site Supervisor Orientation at the start of the program year to learn roles and responsibilities. If a host site is unable to attend the supervisor training, they must let the MPCA know in writing and work with the MPCA to receive proper training.
2. Approve timesheets: Verify the member's service hours by approving his or her timesheet online once every two weeks through the OnCorps Reports online system. Member timesheets must be approved by supervisors on time for the member to receive his or her living allowance.
3. Participate in site visits: Participate in a bi-annual site visit facilitated by the Minnesota GreenCorps Program Coordinator. The purpose of the visit will be to review progress in relation to the expectations laid out in the Site Agreement, celebrate success, and provide assistance in problem solving.
4. Maintain open lines of communication: Maintain open lines of communication with the Minnesota GreenCorps member, Minnesota GreenCorps Program Coordinator, and MPCA professional staff in relation to the member's role and performance.

5. Discipline/termination (if necessary): Ensure that members comply with the terms of the Member Service Agreement. Host sites must be involved with resolving work problems of members and may be involved in the Grievance Procedures. The Host Site Supervisor must notify and work closely with the MPCA Human Resources staff on disciplinary action. A site may not decide to terminate a member. Only designated MPCA staff has the authority to suspend or release a Minnesota GreenCorps member from service for disciplinary reasons.
6. Complete performance evaluations: Complete a mid-year and end-of-year member performance evaluation.
7. Submit in-kind documentation: Submit in-kind reports monthly through the OnCorps Reports online system, and provide hard copy documentation.
8. Reportable and measurable outcomes: Oversee and approve the member's submission of quarterly updates to the MPCA on project progress on forms and a timeline determined by the MPCA, and a final report that includes lessons learned and project measures for success.

VII. Prohibited activities for AmeriCorps members

The Host Site understands that when accumulating service or training hours, or otherwise performing activities supported by the AmeriCorps Program or the Corporation, members may not engage in the following activities:

- A. Attempting to influence legislation.
- B. Organizing or engaging in protests, petitions, boycotts, or strikes.
- C. Assisting, promoting, or deterring union organizing.
- D. Impairing existing Agreements for services or collective bargaining agreements.
- E. Engaging in partisan political activities or other activities designed to influence the outcome of an election to any public office.
- F. Participating in, or endorsing, events or activities that are likely to include advocacy for or against political parties, platforms, political candidates, proposed legislation, or elected officials.
- G. Engaging in religious instruction; conducting worship services; providing instruction as part of a program that includes mandatory religious instruction or worship; constructing or operating facilities devoted to religious instruction or worship; maintaining facilities primarily or inherently devoted to religious instruction or worship; or engaging in any form of religious proselytization.
- H. Providing a direct benefit to: a for-profit business entity, a labor union, a partisan political organization, a non-profit organization that fails to comply with the restrictions contained in section 501(c)(3) of the Internal Revenue Code of 1986 or an organization engaged in the religious activities described above.
- I. Voter registration drives.
- J. Raise funds for living allowances or for an organization's general (as opposed to project) operating expenses or endowment; or write a grant application to the Corporation or any other federal agency.
 1. Per § 2520.40 AmeriCorps members may:
 - a. Raise resources directly in support of a program's service activities.
 - b. Perform fundraising activities including, but not limited to, the following:
 - i. Seeking donations of books from companies and individuals for a program in which volunteers teach children to read.
 - ii. Writing a grant proposal to a foundation to secure resources to support the training of volunteers.
 - iii. Securing supplies and equipment from the community to enable volunteers to help build houses for low-income individuals
 - iv. Securing financial resources from the community to assist in launching or expanding a program that provides social services to the members of the community and is delivered, in whole or in part, through the members of a community-based organization.
 - v. Seeking donations from alumni of the program for specific service projects being performed by current members.

An AmeriCorps member may spend no more than 10% of his or her originally agreed-upon term of service, as reflected in the member enrollment in the National Service Trust, performing fundraising activities, as described in § 2520.40.

- K. Clerical work or research unless such activities are incidental to the member's direct service activities.
- L. Providing abortion services or referrals for receipt of such services.
- M. Such other activities as the Corporation may prohibit.
- N. AmeriCorps members may not engage in the above activities directly or indirectly by recruiting, training, or managing others for the primary purposes of engaging in one of the activities listed above. Individuals may

exercise their rights as private citizens and may participate in the activities listed above on their initiative, on non-AmeriCorps time, and using non-CNCS funds. Individuals should not wear the AmeriCorps logo while doing so.

- O. Nonduplication. Per § 2540.100, Corporation assistance may not be used to duplicate an activity that is already available in the locality of a program. In addition, unless the requirements of the nondisplacement clause (below) are met, Corporation assistance will not be provided to a private nonprofit entity to conduct activities that are the same or substantially equivalent to activities provided by a State or local government agency in which such entity resides.
- P. Nondisplacement. Per § 2540.100, an employer may not displace an employee or position, including partial displacement such as reduction in hours, wages, or employment benefits, as a result of the use by such employer of a participant in a program receiving Corporation assistance.
 - 1. An organization may not displace a volunteer by using a participant in a program receiving Corporation assistance.
 - 2. A service opportunity will not be created under this chapter that will infringe in any manner on the promotional opportunity of an employed individual.
 - 3. A participant in a program receiving Corporation assistance may not perform any services or duties or engage in activities that would otherwise be performed by an employee as part of the assigned duties of such employee.
 - 4. A participant in any program receiving assistance under this chapter may not perform any services or duties, or engage in activities, that:
 - a. Will supplant the hiring of employed workers.
 - b. Are services, duties, or activities with respect to which an individual has recall rights pursuant to a collective bargaining agreement or applicable personnel procedures.
 - 5. A participant in any program receiving assistance under this chapter may not perform services or duties that have been performed by or were assigned to any:
 - a. Presently employed worker.
 - b. Employee who recently resigned or was discharged.
 - c. Employee who is subject to a reduction in force or who has recall rights pursuant to a collective bargaining agreement or applicable personnel procedures.
 - d. Employee who is on leave (terminal, temporary, vacation, emergency, or sick).
 - e. Employee who is on strike or who is being locked out.

VIII. Non-displacement policy

A Minnesota GreenCorps member, as an AmeriCorps participant, is not an employee or volunteer of the host site organization. A Minnesota GreenCorps member may not displace an employee of the host site, including partial displacement such as reduction in hours, wages, or employment benefits. A Minnesota GreenCorps member may not perform services or duties that have been performed by or were assigned to any:

- A. Currently employed worker
- B. Employee who recently resigned or was discharged
- C. Employee who is subject to a reduction in workforce or who has recall rights pursuant to a collective bargaining agreement or applicable personnel procedures
- D. Employee who is on leave (terminal, temporary, vacation, emergency, or sick)
- E. Employee who is on strike or is being locked out

IX. Harassment and non-discrimination policy

The Minnesota GreenCorps Program prohibits discrimination based on race, color, creed, religion, national origin, sex, marital status, status with regard to public assistance, membership, or activity in a local human rights commission, disability, sexual orientation, age, political affiliation, and, in most cases, religion.

Harassment based on the protected class status listed in the paragraph above is also prohibited, including both overt acts of harassment and those acts that create a negative work environment.

Discriminatory harassment is any behavior based on protected class status that is unwelcome and personally offensive and, thereby, may affect morale and interfere with the Member's ability to perform. For example, harassment based on national origin has been defined by the U.S. Equal Employment Opportunity Commission as "Ethnic slurs and other verbal or physical conduct relating to an individual's national origin."

Sexual harassment has also been specifically defined by the Minnesota Human Rights Act, which states in regard to employment, that:

“Sexual harassment” includes unwelcome sexual advances, requests for sexual favors, sexually motivated physical contact or other verbal or physical conduct or communication of a sexual nature when: (1) submission to that conduct or communication is made a term or condition, either explicitly or implicitly, of obtaining employment; (2) submission to or rejection of that conduct or communication by an individual is used as a factor in decision affecting that individual's employment; or (3) that conduct or communication has the purpose or effect of substantially interfering with an individual's employment, and in the case of employment, the employer knows or should know of the existence of the harassment and fails to take timely and appropriate action.

Discriminatory harassment may occur: 1) among peers or coworkers, 2) between managers and subordinates, or 3) between Members and the public.

A. AmeriCorps program civil rights policy

The CNCS has zero tolerance for the harassment of any individual or group of individuals for any reason. CNCS is committed to treating all persons with dignity and respect. CNCS prohibits all forms of discrimination based upon race, color, national origin, gender, age, religion, sexual orientation, disability, gender identity or expression, political affiliation, marital or parental status, or military service. All programs administered by, or receiving Federal financial assistance from CNCS, must be free from all forms of harassment. Whether in CNCS offices or campuses, in other service-related settings such as training sessions or service sites, or at service-related social events, such harassment is unacceptable. Any such harassment, if found, will result in immediate corrective action, up to and including removal or termination of any CNCS employee or volunteer. Recipients of Federal financial assistance, be they individuals, organizations, programs and/or projects are also subject to this zero tolerance policy. Where a violation is found, and subject to regulatory procedures, appropriate corrective action will be taken, up to and including termination of Federal financial assistance from all Federal sources.

Slurs and other verbal or physical conduct relating to an individual's gender, race, ethnicity, religion, sexual orientation or any other basis constitute harassment when it has the purpose or effect of interfering with service performance or creating an intimidating, hostile, or offensive service environment. Harassment includes, but is not limited to: explicit or implicit demands for sexual favors; pressure for dates; deliberate touching, leaning over, or cornering; offensive teasing, jokes, remarks, or questions; letters, phone calls, or distribution or display of offensive materials; offensive looks or gestures; gender, racial, ethnic, or religious baiting; physical assaults or other threatening behavior; or demeaning, debasing or abusive comments or actions that intimidate.

CNCS does not tolerate harassment by anyone including persons of the same or different races, sexes, religions, or ethnic origins; or from a CNCS employee or supervisor; a project, or site employee or supervisor; a non-employee (e.g., client); a co-worker or service member.

I expect supervisors and managers of CNCS programs and projects, when made aware of alleged harassment by employees, service participants, or other individuals, to immediately take swift and appropriate action. CNCS will not tolerate retaliation against a person who raises harassment concerns in good faith. Any CNCS 7 employee who violates this policy will be subject to discipline, up to and including termination, and any grantee that permits harassment in violation of this policy will be subject to a finding of non-compliance and administrative procedures that may result in termination of Federal financial assistance from CNCS and all other Federal agencies.

Any person who believes that he or she has been discriminated against in violation of civil rights laws, regulations, or this policy, or in retaliation for opposition to discrimination or participation in discrimination complaint proceedings (e.g., as a complainant or witness) in any CNCS program or project, may raise his or her concerns with our Office of Civil Rights and Inclusiveness (OCRI). Discrimination claims not brought to the attention of OCRI within 45 days of their occurrence may not be accepted in a formal complaint of discrimination. No one can be required to use a program, project or sponsor dispute resolution procedure before contacting OCRI. If another procedure is used, it does not affect the 45-day time limit. OCRI may be reached at 202-606-7503 (voice), 202-606-3472 (TTY), eo@cns.gov, or through <http://www.nationalservice.gov/>.

B. Complaint procedures

Members have the right to report a concern or complaint about discrimination or discriminatory harassment to their Host Site supervisor, the MPCA's Minnesota GreenCorps Program Coordinator, the MPCA Community and Business Assistance Development Manager, or to the MPCA Human Resources Department. In fulfilling the obligation to maintain a positive and productive work environment, Host Site supervisors, the MPCA's Minnesota GreenCorps staff, and the MPCA Human Resources Department are expected to address or report any suspected discrimination or discriminatory harassment.

The following is the contact information for the MPCA Human Resources Office:

Human Resources Office
Minnesota Pollution Control Agency
520 Lafayette Road North
Saint Paul, MN 55155
651-757-2587 (voice), 651-282-5332 (TTY)
651-296-5341 (fax); Kellie.McNamara@state.mn.us (email)

Members also have a right to contact other local, state, and federal government agencies, including:

Office of Civil Rights and Inclusiveness
Corporation for National and Community Service
1201 New York Avenue, NW
Washington, D.C. 20525
202-606-7503 (voice); 202 565-2799 (TTY)
202-565-3465 (fax); eo@cns.gov (email)

C. Retaliation

It is unlawful to retaliate against any person who, or organization that, files a complaint about such discrimination. In addition to filing a complaint with local and state agencies that are responsible for resolving discrimination complaints, Members may bring a complaint to the attention of CNCS.

X. In-kind contributions

The MPCA does not charge a fee for participation in the Minnesota GreenCorps Program. However, host sites are expected to provide in-kind contributions in the form of supervision, operating costs (office space, internet, telephone), and equipment costs associated with hosting a member. The expected contribution for hosting one member is \$5,500, broken down into the following categories:

Category	Estimated minimum contribution per member
Supervision (at least 0.08 FTE, 3.2 hours per week)	\$4,000
Operating costs (office space, internet connection, phone connection, computer purchase or rental, office equipment)	\$1,500

Host sites will be required to verify all in-kind contributions, including how expenses were calculated. Host site supervisors are required to report their in-kind supervision hours monthly in OnCorps Reports, the online system for Minnesota AmeriCorps programs. In-kind contributions cannot be provided from a federal source of funds, unless permission has been provided from the granting federal agency. Host sites are expected to maintain any source documentation for seven years.

XII. Recital

- A. Under Minn. Stat. § 15.061 the State is empowered to engage such assistance as deemed necessary.
- B. The State is in need of agreeing upon rules of participation, roles, and responsibilities for Host Sites.
- C. The Host Site represents that it is duly qualified and agrees to perform all services described in this Contract to the satisfaction of the State.

XIII. Survival of terms

The following clauses survive the expiration or cancellation of this Contract: Indemnification; State audits; Government data practices; Governing law, jurisdiction, and venue; and Data disclosure.

A. Indemnification

In the performance of this Contract by Host Site, or Host Site's agents or employees, the Host Site must indemnify, save, and hold harmless the State, its agents, and employees, from any claims or causes of action, including attorney's fees incurred by the State, to the extent caused by Host Site's:

1. Intentional, willful, or negligent acts or omissions.
2. Actions that give rise to strict liability.
3. Breach of contract or warranty.

The indemnification obligations of this section do not apply in the event the claim or cause of action is the result of the State's sole negligence. This clause will not be construed to bar any legal remedies the Host Site may have for the State's failure to fulfill its obligation under this Contract.

B. State audits

Under Minn. Stat. § 16C.05, subd. 5, the Host Site's books, records, documents, and accounting procedures and practices relevant to this Contract are subject to examination by the State and/or the State Auditor or Legislative Auditor, as appropriate, for a minimum of six years from the end of this Contract.

C. Government data practices

Government data practices. The Host Site and State must comply with the Minnesota Government Data Practices Act, Minn. Stat. ch. 13, (or, if the State contracting party is part of the Judicial Branch, with the Rules of Public

Access to Records of the Judicial Branch promulgated by the Minnesota Supreme Court as the same may be amended from time to time) as it applies to all data provided by the State under this Contract, and as it applies to all data created, collected, received, stored, used, maintained, or disseminated by the Host Site under this Contract. The civil remedies of Minn. Stat. § 13.08 apply to the release of the data governed by the Minnesota Government Practices Act, Minn. Stat. ch. 13, by either the Host Site or the State.

If the Host Site receives a request to release the data referred to in this clause, the Host Site must immediately notify and consult with the State's Authorized Representative as to how the Host Site should respond to the request. The Host Site's response to the request shall comply with applicable law.

D. Governing law, jurisdiction, and venue

Minnesota law, without regard to its choice-of-law provisions, governs this Contract. Venue for all legal proceedings out of this Contract, or its breach, must be in the appropriate state or federal court with competent jurisdiction in Ramsey County, Minnesota.

E. Data disclosure

Under Minn. Stat. § 270C.65, subd. 3 and other applicable law, the Host Site consents to disclosure of its social security number, federal employer tax identification number, and/or Minnesota tax identification number, already provided to the State, to federal and state agencies, and state personnel involved in the payment of state obligations. These identification numbers may be used in the enforcement of federal and state laws, which could result in action requiring the Host Site to file state tax returns, pay delinquent state tax liabilities, if any, or pay other state liabilities.

XIV. Certification

- This Agreement serves as a binding contract between the Host Site and the MPCA for the 2017-2018 program year. The terms of this Agreement will end on August 14, 2018. The MPCA may cancel this Agreement at any time, with or without cause, upon 30 days' written notice to the Host Site. Amendments to this Agreement may be made only with the consent of both parties and shall be done in writing.
- If a Member exits the Minnesota GreenCorps Program early either for cause or compelling personal circumstances, or is relocated to a different Host Site, this agreement will automatically end on the last day of the Member's service at this Host Site.
- Failure to adhere to policies or to fulfill responsibilities outlined in this Agreement will become part of the selection criteria in the event of a re-application process for future year programs.
- **Termination for insufficient funding.** The State may immediately terminate this Agreement if it does not obtain funding from ServeMinnesota or other funding source; or if funding cannot be continued at a level sufficient to allow for the payment of the work scope covered here. Termination must be by written or fax notice to the Host Site. The State is not obligated to pay for any work performed after notice and effective date of termination. However, the Host Site will be entitled to payment, determined on a pro rata basis, for services satisfactorily performed to the extent that funds are available. The State will not be assessed any penalty if the Agreement is terminated because of the decision of the Minnesota Legislature or other funding source not to appropriate funds. The State must provide the Host Site notice of the lack of funding within a reasonable time of the State's receiving that notice.
- By signing this Agreement, I acknowledge that I have read, understand and agree to all terms and conditions of this Agreement.

Host Site

The Host Site certifies that the appropriate persons have executed the Agreement on behalf of the Host Site as required by applicable articles, bylaws, resolutions, or ordinances.

Host Site Authorized Representative

Print name: _____
Title: _____
Signature: _____
Date: _____

Host Site Supervisor

Print name: _____
Title: _____
Signature: _____
Date: _____

Minnesota Pollution Control Agency (with delegated authority)

Print name: Katie Koelfgen
Title: Assistant Division Director
Signature: _____
Date: _____

**RESOLUTION NO. 2019-010
RILEY-PURGATORY-BLUFF CREEK WATERSHED DISTRICT
BOARD OF MANAGERS**

**SUPPORT FOR APPLICATION TO HOST A MINNESOTA GREENCORPS
MEMBER IN 2019-2020 PROGRAM YEAR**

Manager _____ offered the following resolution and moved its adoption, seconded by Manager _____:

WHEREAS the Riley-Purgatory-Bluff Creek Watershed District (District) has applied to host an AmeriCorps member from the Minnesota GreenCorps, a program of the Minnesota Pollution Control Agency (MPCA), for the 2019-2020 program year; and;

WHEREAS if the MPCA selects the District, the organization is committed to implementing the proposed project as described in the host site application, and in accordance with pre-scoped position description; and

WHEREAS the MPCA requires that the District enter into a host site agreement with the MPCA that identifies the terms, conditions, roles and responsibilities;

NOW THEREFORE BE IT RESOLVED that the Board of Managers hereby agrees to enter into and sign a host site agreement with the MPCA to carry out the member activities specified therein and to comply with all the terms, conditions, and matching provisions of the host site agreement and authorizes and directs the Watershed District Administrator, to sign the grant agreement on its behalf.

The question was on the adoption of the resolution and there were ___ yeas, ___ nays, ___ abstains, and _____ absent as follows:

	<u>Yea</u>	<u>Nay</u>	<u>Abstain</u>	<u>Absent</u>
CRAFTON				
KOCH				
PEDERSEN				
WARD				
ZIEGLER				

Upon vote, the president _____.

* * * * *

I, David Ziegler, 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 the District and find the same to be a true and correct transcription thereof.

IN TESTIMONY WHEREOF, I set my hand this 3 day of April 2019.

David Ziegler, Secretary

RESOLUTION NO. 2019-011
RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
BOARD OF MANAGERS

ORDERING THE HYLAND LAKE ALUM TREATMENT PROJECT

Manager _____ offered the following resolution and moved its adoption, seconded by
Manager _____:

WHEREAS the Riley Purgatory Bluff Creek Watershed District's (District) 2018 10-Year Watershed Management Plan (Plan) identified the Hyland In-Lake Project for in-lake phosphorus load control as a Proposed Project in the Purgatory Creek Watershed (Plan, Section 7, Table 7-2);

WHEREAS in May 2018 the District received an alum dosing study providing technical analysis and recommendations to ensure that the proper dose is applied, that the alum treatment is effective for the long term, that the treatment targets the appropriate phosphorus sediment pool, and that the treatment does not involve overdosing and excessive costs; the study provided treatment specifications, contractor selection, treatment monitoring and post application monitoring;

WHEREAS based on the May 2018 study. The District anticipates two alum applications over a 3- or 4-year period, as guided by monitoring results;

WHEREAS the District Engineer in his dosing study estimated the cost of the project for alum application, supervision and monitoring to be \$193,000; the initial cost estimate for the Project is approximately \$13,000 for engineering, including quote solicitation, project oversight and monitoring, and \$180,000 for the alum application;

WHEREAS the Project is proposed to be funded through the District's ad valorem property tax levy to implement its watershed management plan pursuant to Minnesota Statutes Section 103B.241, 77% of which is paid by District property taxpayers in Hennepin County, and 23% in Carver County;

WHEREAS on April 3, 2019, the District held a duly noticed public hearing on the Project, consistent with Minnesota Statutes Section 103B.251, subdivision 3, to give interested members of the public an opportunity to comment on the Project;

NOW THEREFORE BE IT RESOLVED that the Board of Managers finds that the Hyland Lake Alum Treatment Project is consistent with water quality improvement and phosphorus load control objectives of the District for the Purgatory Creek Watershed, and that the proposed Project will be conducive to public health, will promote the general welfare, and complies with the Watershed Law, the Metropolitan Water Management Planning Law, and the District's Plan;

BE IT FURTHER RESOLVED that the Board of Managers hereby orders that the Project be established and implemented through the coordination of a phased alum treatment with other

best management practices to address internal loading and thereby provide an integrated approach to restoring Hyland Lake's water quality and habitat, and that the Engineer, under direction of the Administrator, proceed with making the necessary surveys, plans and specifications, and advertise for bids, and that the Administrator proceed, with the advice of legal counsel, to develop any necessary and appropriate site access or use agreements and necessary property rights for the Project, and implementation agreement for the due consideration and approval by the Board of Managers,

The question was on the adoption of the resolution and there were _____ yeas and _____ nays as follows:

	<u>Yea</u>	<u>Nay</u>	<u>Abstain</u>	<u>Absent</u>
CRAFTON				
KOCH				
PEDERSON				
WARD				
ZIEGLER				

Upon vote, the president declared the resolution _____.

Dated: April ____, 2019.

David Ziegler, Secretary

* * * * *

I, David Ziegler, 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 the District and find the same to be a true and correct transcription thereof.

IN TESTIMONY WHEREOF, I set my hand this _____ day of _____, 2019.

David Ziegler, Secretary

RESOLUTION NO. 2019-012
RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
BOARD OF MANAGERS

ORDERING CHANHASSEN VACUUM STREETSWEEP COST SHARE

Manager _____ offered the following resolution and moved its adoption, seconded by
Manager _____:

WHEREAS the Riley Purgatory Bluff Creek Watershed District's (District) 2018 10-Year Watershed Management Plan (Plan) includes a cost share program for local government and commercial facilities, lake associations, homeowner associations and nonprofits, and single family residential projects (Plan, Section 9.7), and specifically supports initiatives aimed at building capacity for water-quality improvement practices;

WHEREAS the City of Chanhassen has submitted an application for District cost share funding in the amount of \$30,000 to support the acquisition of a vacuum street sweeper, which has a total cost of \$237,990, as a best management practice to improve water quality;

WHEREAS the District's share for the project is proposed to be funded through the District's ad valorem property tax levy to implement its watershed management plan pursuant to Minnesota Statutes Section 103B.241, 77% of which is paid by District property taxpayers in Hennepin County, and 23% in Carver County;

WHEREAS on April 3, 2019, the District held a duly noticed public hearing on the proposed cost share application, pursuant to Section 9.7 of the Plan and consistent with Minnesota Statutes Section 103B.251, subdivision 3, to give interested members of the public an opportunity to comment on the Project;

NOW THEREFORE BE IT RESOLVED that the Board of Managers finds that the proposed cost share grant is consistent with the objectives of the District, and that the proposed cost share grant will be conducive to public health, will promote the general welfare, and complies with the Watershed Law, the Metropolitan Water Management Planning Law, and the District's Plan;

BE IT FURTHER RESOLVED that the Board of Managers hereby approves the cost share grant in the amount not to exceed \$30,000 and directs the Administrator to proceed, with the advice of legal counsel, to prepare and execute the appropriate cost share agreement with the City of Chanhassen.

The question was on the adoption of the resolution and there were _____ yeas and _____ nays as follows:

Yea Nay Abstain Absent

CRAFTON
KOCH
PEDERSON
WARD
ZIEGLER

Upon vote, the president declared the resolution _____.

Dated: April ____, 2019.

David Ziegler, Secretary

* * * * *

I, David Ziegler, 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 the District and find the same to be a true and correct transcription thereof.

IN TESTIMONY WHEREOF, I set my hand this _____ day of _____, 2019.

David Ziegler, Secretary

Memorandum

To: RPBCWD Board of Manager, Administrator Bleser, and Community Outreach Coordinator Jordan
From: Greg Fransen and Scott Sobiech, P.E.
Subject: Duck Lake Water Quality Improvement Phase 1 Summary
Date: March 29, 2019
Project: 23270053.14-025
c: Michelle Jordan

This memorandum summarizes proposed actions within the Duck Lake watershed to improve the water quality in Duck Lake, located in the city of Eden Prairie, Minnesota. Figure 1 shows the contributing subwatersheds and the drainage patterns of the Duck Lake watershed. The proposed actions described here were identified by Barr Engineering Co. (Barr) staff and Riley-Purgatory-Bluff Creek Watershed District (RPBCWD or District) staff during Phase 1 of Task Order 25, which was authorized by the RPBCWD Board of Managers on October 3, 2018.

The RPBCWD's 2018 Watershed Management Plan (Planning for the Next 10 Years 2018-2027; Plan) and 2018 budget identified the Duck Lake phosphorus load reduction project for implementation in 2018. RPBCWD staff identified a need for a subwatershed assessment to identify water quality best management practices (BMPs) that would be effective in achieving the goals outlined in the 10-year plan. Task Order 25 was therefore developed as a phased approach, with the subwatershed assessment performed during phase 1 and project implementation performed during phase 2.

Phase 1 of Task Order 25 included five tasks:

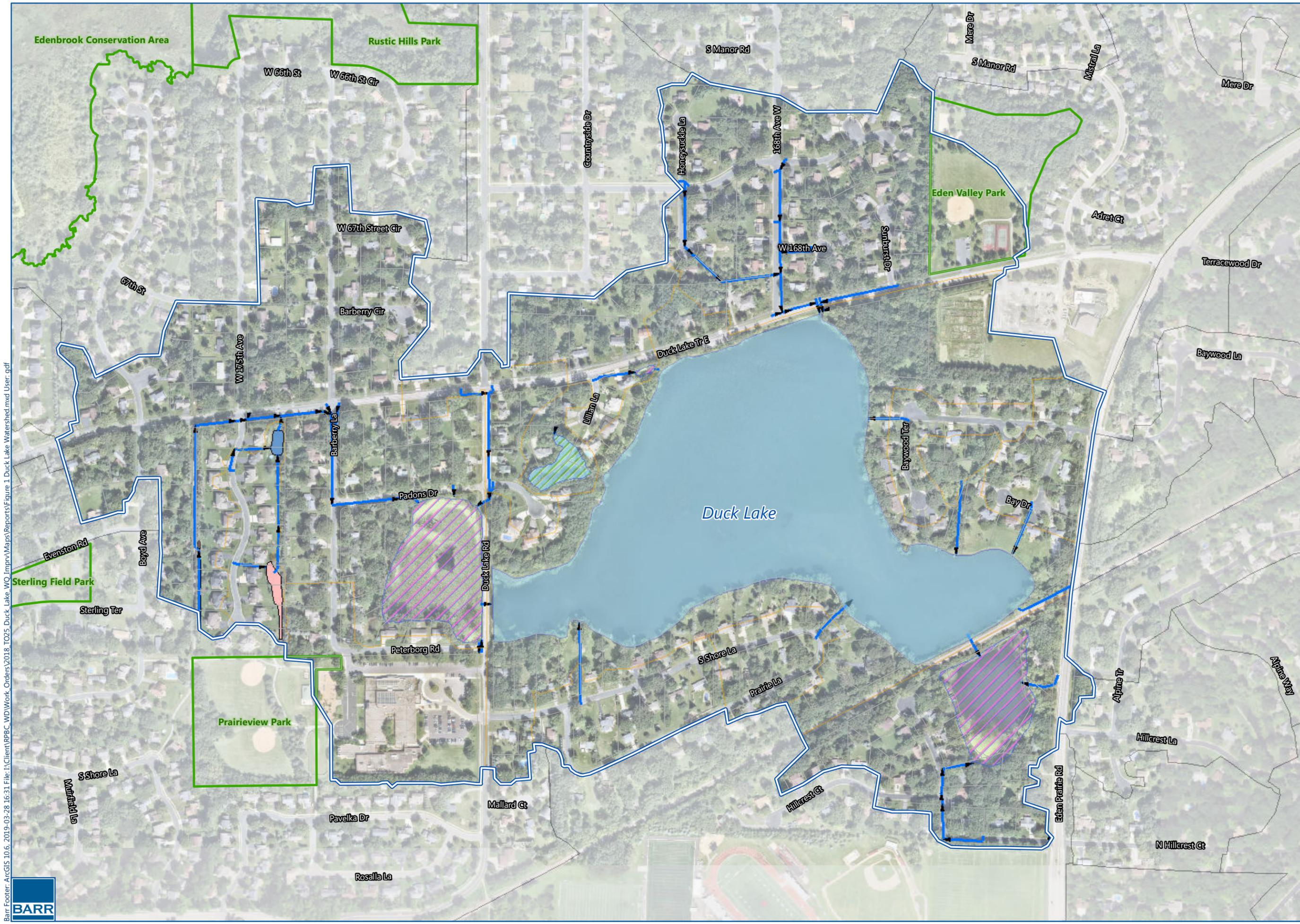
1. Kick-off meeting and regular project meetings
2. Desktop assessment
3. Field assessment and water quality BMP prioritization
4. Property owner outreach and education
5. Summary memorandum (this memorandum) and presentation to the RPBCWD Board of Managers

The methodology and results of the first four tasks are described in the sections below.

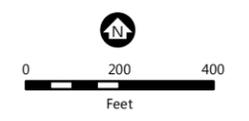
Kick-off Meeting and Regular Project Meetings

The project kick-off meeting was held at Barr offices on October 23, 2018 and attended by RPBCWD staff and Barr staff. The main objectives for the kick-off meeting were to identify the desired project outcomes, to review the project tasks and schedule, and to coordinate RPBCWD and Barr staff efforts. Regular

FIGURE 1
DUCK LAKE WATERSHED



- Storm Sewer Pipes
- Parcel Boundary
- Duck Lake Watershed
- Infiltration BMPs
- Lakes
- Constructed Ponds
- Stormwater Wetlands
- Wetlands
- Park Boundaries



Barr Footer: ArcGIS 10.6 - 2019-03-28 16:31 File: I:\Client\RPBC, WD\Work_Orders\2018_TO25_Duck_Lake_WQ\Imprv\Maps\Reports\Figure_1_Duck_Lake_Watershed.mxd User: gdf



meeting were thereafter held on an approximately monthly basis, with the exception of February when a scheduled meeting was canceled due to inclement weather. City of Eden Prairie staff were invited and attended project meetings in January and March to provide input on potential opportunities for coordination and collaboration with city water quality improvement programs, and to identify potential opportunities for cost-sharing during Phase 2 (implementation). Table 1 summarizes the meetings held during Phase 1. Barr staff provided attendees with agenda for each meeting, and compiled and distributed meeting notes, including action item assignments, for each meeting.

Table 1. Project Meeting Summary

Meeting Purpose	Date	Attendance
Project Kick-off	10/23/2018	RPBCWD: Administrator Bleser, Community Outreach Coordinator Jordan Barr: Scott Sobiech, Greg Fransen, Matt Kumka
Field Assessment Summary	11/13/2018	RPBCWD: Administrator Bleser, Community Outreach Coordinator Jordan Barr: Scott Sobiech, Greg Fransen, Matt Kumka
Project Coordination	12/5/2018	RPBCWD: Administrator Bleser, Community Outreach Coordinator Jordan Barr: Scott Sobiech, Greg Fransen, Matt Kumka City of Eden Prairie: Leslie Stovring
Project Coordination	1/7/2019	RPBCWD: Administrator Bleser, Community Outreach Coordinator Jordan Barr: Scott Sobiech, Greg Fransen, Matt Kumka City of Eden Prairie: Leslie Stovring
Public Meeting and BMP Signup Summary	3/5/2019	RPBCWD: Community Outreach Coordinator Jordan Barr: Scott Sobiech, Greg Fransen, Matt Kumka City of Eden Prairie: Leslie Stovring, Patrick Sejkora

Desktop Assessment

The purpose of the desktop watershed assessment was to identify areas within the Duck Lake watershed where untreated stormwater runoff was flowing into storm sewers that discharged directly to Duck Lake.

To perform the desktop watershed assessment, Barr gathered geographic information system (GIS) data from a number of sources, including current underground utility and parcel boundary information from the city of Eden Prairie, topographic information from the Minnesota Department of Natural Resources, soil information from the U.S. natural resource conservation service (NRCS), subwatershed divides previously developed by Barr for the RPBCWD, and the locations of existing stormwater BMPs and shoreline restoration projects provided by RPBCWD staff.

Based on the collected data, Barr identified several areas in the watershed where drainage patterns and soil conditions favored the establishment of dispersed small rainwater garden BMPS that could collect

runoff from impervious surfaces like driveways or streets, allowing the runoff to infiltrate into the soil. Barr then imported the gathered GIS data into a mobile data collection application that would be used for conducting a field assessment to identify specific locations where an effective water quality BMP could be constructed.

Field Assessment and BMP Prioritization

Barr staff performed a walking field assessment of the watershed during October and November, 2018. More than 50 potential rainwater garden sites were identified during the survey. Tree canopy within the watershed was found to be variable; some areas had extensive mature trees while others had large breaks in the canopy. Trees act as water quality BMPs by intercepting rainfall before it hits the ground and by pulling water out of the soil, thus regenerating the infiltration capacity more quickly than turf grass. However, leaf and seed litter on impervious surfaces can also become a nutrient source to downstream resources, so the water quality impact of individual urban trees is difficult to measure and highly dependent on tree siting and maintenance.

The field assessment found a variety of curb and gutter conditions along the streets of the Duck Lake watershed. Some areas had streets with concrete curb and gutters, while others had low bituminous curbs. Rainwater gardens adjacent to streets typically require some sort of "cut" through the existing curb to create an inlet for water to flow from the street into the rainwater garden. RPBCWD staff commented that in the past the city of Eden Prairie has been reluctant to allow modifications to city streets for construction of small distributed stormwater BMPs.

Based on the desktop and field assessments, four types of water quality BMPs were identified for further development:

- Front yard curbside rainwater gardens
- Downspout rain barrels
- Downspout planter boxes
- Tree plantings

Figure 2 shows an example of a front yard curbside rainwater garden of similar size to those envisioned for the Duck Lake watershed. The conceptual plan-view sketch in Figure 2 shows the main parts of this type of rainwater garden, which includes a below-ground inlet to maintain the unbroken curb line. A grate along the gutter serves to collect water from the street and route it to the inlet.

Figure 3 shows an example of a planter box. The planter box, also called a "rainwater garden in a box", typically collects rainwater from a roof downspout. The planter box is filled with growth media (a mixture of soil and rocks) which soaks up the water for later use by the plants. Figure 4 shows a rain barrel, which also typically receives water from roof downspouts. Water fills the barrel and is then used to water vegetation during dry periods. The most effective locations for planter boxes and rain barrels are at

downspouts that would otherwise discharge water to impervious surfaces like sidewalks or driveways, where the water would pick up pollutants and carry them to Duck Lake.

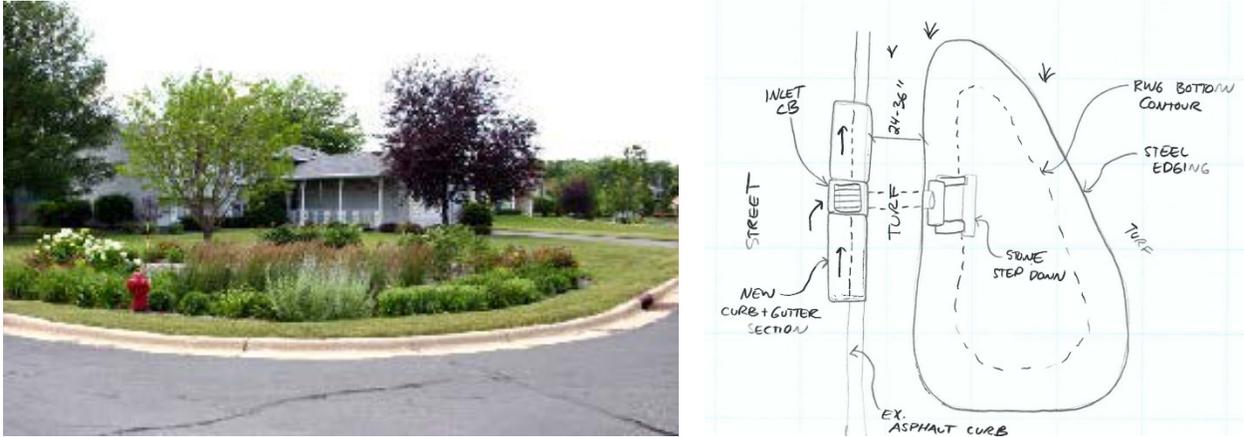


Figure 2. Rainwater garden example and concept sketch (image source: Barr Engineering Co.)



Figure 3. Planter Box (image source: Philadelphia Water Department)



Figure 4. Rain barrel (image source: Recycling Association of Minnesota)

Several other types of water quality BMPs were considered but eliminated from consideration for this project, including permeable pavers for driveways, which would have been too expensive for the project implementation budget, and larger BMPs on institutional sites, because the owners of those sites were already planning to construct their own BMPs.

Property Owner Outreach and Education

The purpose of the property owner outreach program was to gauge the interest of residents whose property had been identified as a likely (“priority”) site for hosting a rainwater garden BMP, and to gather names of other residents who were interested in hosting rainwater gardens or installing other stormwater BMPs. RPBCWD community Outreach Coordinator Jordan took the lead in planning and executing the initial property owner outreach program. The initial outreach program included:

- Creating a website to survey residents about their views on Duck Lake’s water quality, and allowing residents to sign up for various types of BMPs
- Letters to all watershed residents informing them of the web survey and inviting them to a public meeting where additional information would be presented
- Letters to owners of priority sites asking if they would be interested in hosting a rainwater garden
- A public informational meeting held on February 12, 2019 at the Eden Prairie Community Center.

Community Outreach Coordinator Jordan led the public meeting, which was attended by 20 watershed residents. Matt Kumka, Barr’s landscape architect, attended and conducted a short presentation on the various types of BMPs. Patrick Sejkora from the City of Eden Prairie engineering department also attended.

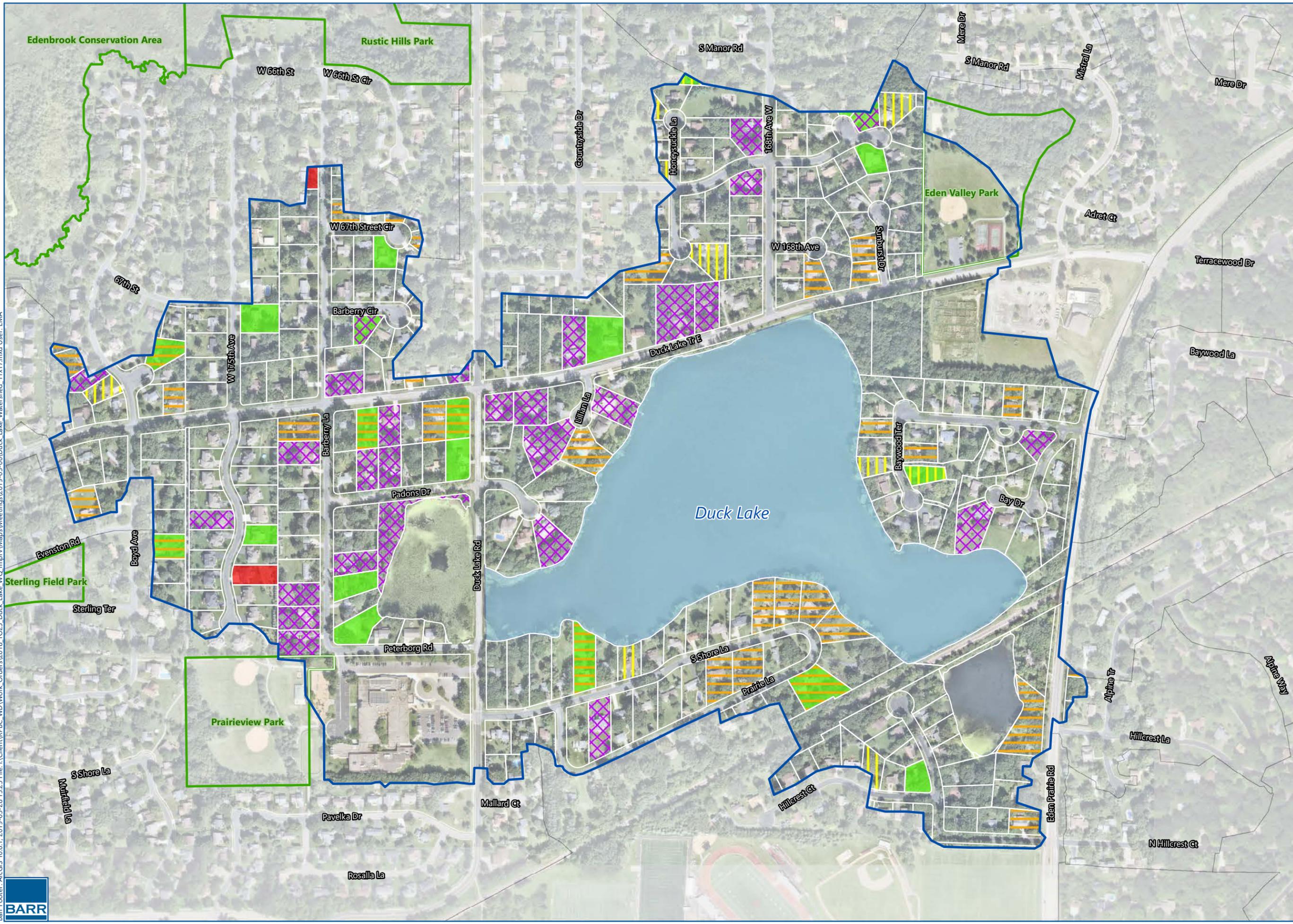
The website signup options for rain barrels, downspout planters, and trees were closed on March 8. The rainwater garden signup option remains open at this time. Results of the signup program are summarized in Table 2 and locations are shown graphically in Figure 5.

Table 2. Water Quality BMP Signup Summary

BMP Type	Number of Requests
Rainwater garden (priority site ¹)	8 ²
Rainwater Garden (other site)	11 ²
Planter Box	10
Rain Barrel	31 (57 barrels ³)
Tree	36

- (1) Priority sites were locations identified in the field assessment as having the highest potential for construction of a rainwater garden that would be effective in providing water quality benefits.
- (2) Potential rainwater garden locations require further site evaluation and owner agreements before proceeding with construction.
- (3) Several residents requested more than one rain barrel

FIGURE 5
DUCK LAKE WATERSHED
Resident BMP Interest

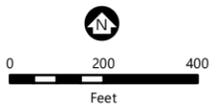


Rainwater Garden Interest

- No
- Yes

Other Interest

- ▨ Rain Barrel
- ▨ Planter Box
- ▨ Tree
- Parcel Boundary
- Duck Lake Watershed
- ▭ Lakes
- Park Boundaries



Barr Footer: ArcGIS 10.6.1, 2019-03-28 15:25 File: I:\Client\RPBC_WD\Work Orders\2018_TO25_Duck_Lake_WQ\mxd\Maps\Meetings\2019-03-06\Duck_Lake_Watershed_11x17.mxd User: EMA



Costs and Benefits of Identified BMPs

Barr prepared an engineer's opinion of probable cost (OPC) for implementing the identified BMPs (see Table 3) and provided the OPC as a memorandum to RPBCWD staff (see Attachment A). The costs provided in the OPC were included in the public notice for a public hearing.

The Minnesota Pollution Control Agency's MIDS Calculator software was used to estimate the annual volume reduction and annual phosphorus removal for the identified BMPs (see Table 3). Because the project is in the concept level of design and detailed information at each potential site is unavailable, the following assumptions were made about BMP configurations, contributing drainage areas, and operation:

- Rainwater gardens were assumed to have a water quality volume of 150 cubic feet, matching the footprint and excavation assumed in the OPC.
- Rainwater gardens were assumed to receive stormwater runoff from one half (one side) of a 150-foot long by 32-foot wide section of paved street (roughly half a block), equaling 2,400 square feet of contributing impervious surface.
- Rain barrels were assumed to receive 45 gallons of roof runoff that would ordinarily be discharged to impervious surface, and were assumed to be drained fully to pervious areas within 48 hours after a rainfall event.
- Planter boxes were assumed to have an inside volume of 12 cubic feet, with 20% of that volume (2.4 cubic feet) available for water storage (i.e. the remaining volume would consist of planting media and vegetation and would therefore be unavailable for water storage).
- Removals were not estimated for trees due to the low certainty of siting and vegetation management.

Table 3. Engineer’s Opinion of Probable Construction Cost and Pollutant Reduction Estimates

BMP Type	Estimated Number of BMPs	Estimated Total Implementation Cost ¹	Estimated Annual Total Phosphorus Removal	Estimated Annual Runoff Volume Reduction
Rainwater Gardens	10	\$143,000 (\$115,000-\$215,000)	0.88 lbs	351,000 gallons
Planter Boxes	10	\$12,750 (\$10,200-\$19,100)	0.04 lbs	17,000 gallons
Rain Barrels	60	\$5,200 (\$4,700-\$5,800)	0.45 lbs	178,000 gallons
Trees	50	\$22,800 (\$18,300-\$34,200)	N/A	N/A
Total		\$184,000 (\$148,000-\$274,000)	1.37 lbs	546,000 gallons

(1) Estimated total cost represents the total cost to implement the assumed number of BMPs. See Attachment A for more details. This feasibility-level (Class 4, < 10% design completion per ASTM E 2516-06) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. Operation and Maintenance costs are not included.

Next Steps

If the RPBCWD Board of Managers choose to order the project, some the next steps towards implementation of the BMPs described above would include:

Rainwater gardens

- Commitment from the City of Eden Prairie in support of curb cuts
- Visits to interested residents to ensure their commitment towards hosting a BMP
- Soil infiltration tests, topographic survey, and utility location to ensure site suitability
- Obtaining landowner maintenance agreements
- Rainwater garden design, followed by bidding and construction (as a single bidding package)
- Construction

Planter Boxes

- Selecting a contractor to construct planter boxes
- Visiting interested landowners to identify appropriate locations for planter box installation

Rain Barrels

- Purchasing rain barrels
- Distributing rain barrels to residents who signed up

To: RPBCWD Board of Manager, Administrator Bleser, and Community Outreach Coordinator Jordan
From: Greg Fransen and Scott Sobiech, P.E.
Subject: Duck Lake Water Quality Improvement Phase 1 Summary
Date: March 29, 2019
Page: 8

Trees

- Ordering the trees through a landscape contractor
- Visiting the landowner to help them choose an appropriate site for tree planting
- Tree planting by the landscape contractor

Attachment A

Opinion of Probable Construction Cost for Duck Lake Subwatershed Improvements

Memorandum

To: Administrator Bleser and Project Manager Jordan
From: Greg Fransen, Matt Kumka, and Scott Sobiech
Subject: Opinion of Probable Construction Cost for Duck Lake Subwatershed Improvements
Date: 3/14/19
Project: 23270053.14 025

Engineer's opinions of probable costs for design, permitting, and construction were developed for each conceptual design. These opinions of costs, project reserves, contingency, documentation and discussion are intended to provide background information for feasibility alternatives assessment, analysis purposes and budget authorization by the RPBCWD. The cost of time escalation is not included in the opinions of probable cost. All costs are presented in 2019 US dollars.

Quantities were estimated with calculations based on available information. Because of the limited level of design at this phase of the project the rainwater garden dimensions, areas, and volumes for construction were assumed based on general site information and a typical sizing. Actual siting and sizing remain to be completed after site surveys are conducted.

Unit costs are based on recent bid prices, published construction cost index resources, and similar stormwater BMP projects. Unit process were developed and compared to similar project prices. Costs associated with Planning Engineering and Design (PED) are based on percentages of estimated construction cost and are within a range similar to those used in past projects designed by Barr. Costs associated with Construction Management (CM) are based on estimated costs to manage the construction process, based on Barr's experience with similar projects, but may change depending on the services that are provided during construction. The estimates also include Permitting and Regulatory Approvals, which is intended to account for additional planning and coordination costs that are likely to be incurred as the project is permitted with the city. It is assumed that RPBCWD permits will not be needed for this project and that an official bidding process will not be needed.

The opinions of cost include tasks and items related to engineering and design, permitting, and constructing each conceptual design. The opinions of cost do not include other tasks following construction of each alternative presented such as operations and maintenance, or monitoring.

Contingency used in these opinions of probable cost are intended to help identify an estimated construction cost amount for the minor items likely to be included in the current Project scope, but which have not yet been quantified or estimated directly during the feasibility evaluation. Stated another way, contingency is the resultant of the pluses and minuses that cannot be estimated at the level of project

definition that exists. The contingency includes the cost of ancillary items not currently itemized in the quantity summaries but commonly identified in more detailed design and required for completeness of the work. A 10% contingency is applied to the estimated construction cost to account for the costs of these items.

Industry resources for cost estimating (*AACE International Recommended Practice No. 18R-97, and ASTM E2516-06 Standard Classification for Cost Estimate Classification System*) provide guidance on cost uncertainty, depending on the level of project design developed. The opinion of probable cost for the alternatives evaluated generally corresponds to a Class 4/5 estimate characterized by completion of limited engineering and use of deterministic estimating methods. As the level of design detail increases, the level of uncertainty is reduced. Figure A-1 provides a graphic representation of how uncertainty (or accuracy) of cost estimates can be expected to improve as more detailed design is developed.

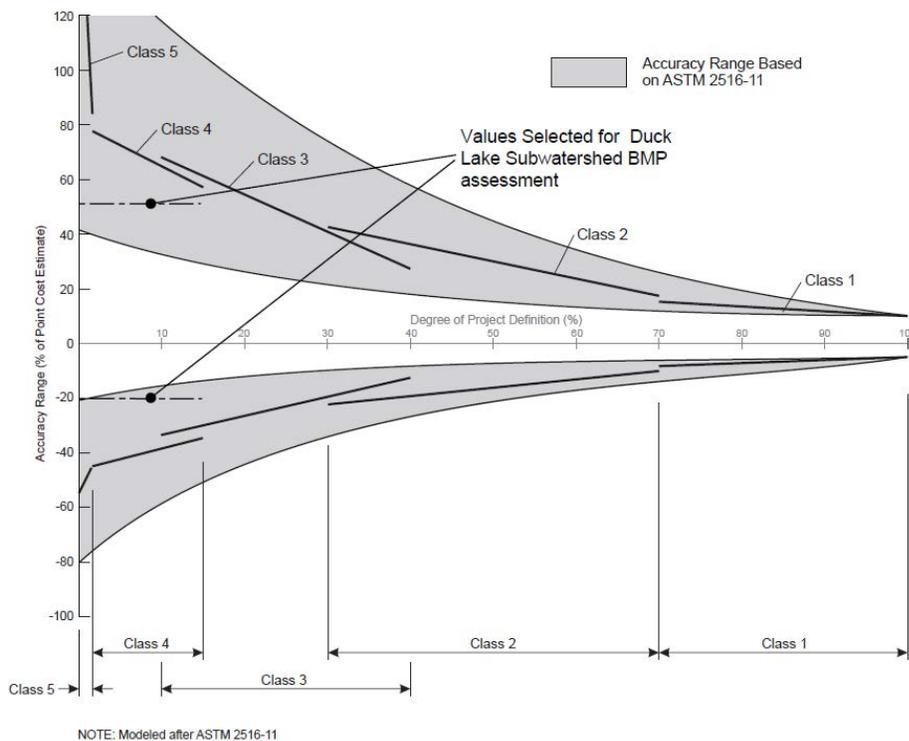


Figure A-1 Relationship between Cost Accuracy and Degree of Project Definition

At this early stage of design, the range of uncertainty of total project cost is high. Due to the early stage of design, it is standard practice to place a broad accuracy range around the point cost estimate.

The accuracy range is based on professional judgment considering the level of design completed, the complexity of the project, and the uncertainties in the project scope; the accuracy range does not include

To: Administrator Bleser and Project Manager Jordan
From: Greg Fransen, Matt Kumka, and Scott Sobiech
Subject: Opinion of Probable Construction Cost for Duck Lake Subwatershed Improvements
Date: 3/14/19
Page: 3

costs for future scope changes that are not part of the project as currently defined or risk contingency. The estimated accuracy range for this point estimate is generally -20% to +50%.

The opinion of probable cost provided is made on the basis of Barr Engineering's experience and qualifications and represents our best judgment as experienced and qualified professionals familiar with the project. It is acknowledged that additional investigations and additional site specific information that becomes available in the next stage of design may result in changes to the proposed configuration, cost and functioning of project features. This opinion is based on project-related information available to Barr Engineering at this time and includes a conceptual-level feasibility design of the project. The opinion of cost may change as more information becomes available and further design is completed. In addition, because we have no control over the eventual cost of labor, materials, equipment or services furnished by others, or over the contractor's methods of determining prices, or over competitive bidding or market conditions, Barr Engineering cannot and does not guarantee that proposals, bids, or actual costs will not vary from the opinion of probable cost presented in this memorandum. If the RPBCWD wishes greater assurance as to the probable construction and total project cost, the RPBCWD should authorize further investigation and design of a selected alternative.

Table 1 provides a summary of the opinion of probable construction cost for the four project elements as well as an anticipated range of cost given the conceptual level of design. Table 2 provides the engineer's opinion of total project cost. These costs exclude development of cooperative agreements with the city, maintenance agreements with private property owners, and easements for construction on private parcels. These costs also assume that no purchase of additional easements will be required. The opinions of costs below do not include the cost to maintain the stormwater BMP following construction. Additional cost breakdown is provided in the tables attached to the memo.

Table 1 Engineer's Opinion of Probable Construction Cost – Feasibility Estimate Summary

Project Component	Engineer's Opinion of Probable Construction Cost (\$) ⁽¹⁾		
	Point Estimate	Low	High
Rain Barrels (60)	\$5,200	\$4,700	\$5,800
Trees (50)	\$19,000	\$16,000	\$29,000
Planter Boxes (10)	\$12,500	\$10,000	\$19,000
Rainwater Gardens (10)	\$110,000	\$88,000	\$165,000
TOTAL	\$147,000	\$119,000	\$219,000
Note(s): Approximate values based on available information. Soil borings are required during the next phase of design to identify existing soil characteristics and estimate the groundwater elevation. Estimate includes all BMP costs. The estimated accuracy range for the Total Construction Cost as the project is defined is -20% to +50%.			

Table 2 Engineer's Opinion of Probable Total Project Cost – Feasibility Estimate Summary

Project Component	Engineer's Opinion of Probable Construction Cost (\$) ⁽¹⁾		
	Point Estimate	Low	High
Rain Barrels (60)	\$5,200	\$4,700	\$5,800
Trees (50)	\$22,800	\$18,300	\$34,200
Planter Boxes (10)	\$12,750	\$10,200	\$19,100
Rainwater Gardens (10)	\$143,000	\$115,000	\$215,000
TOTAL	\$184,000	\$148,000	\$274,000
Note(s): Approximate values based on available information. Soil borings are required during the next phase of design to identify existing soil characteristics and estimate the groundwater elevation. Estimate includes all BMP costs. The estimated accuracy range for the Total Construction Cost as the project is defined is -20% to +50%. Total Cost is rounded to the nearest \$1,000.			

REV 1	SHEET: 1	OF 4
BY: MEK2	DATE: 3/13/2019	
CHECKED BY: GDF	DATE: 3/13/2019	
APPROVED BY:	DATE:	
ISSUED:	DATE:	

ENGINEER'S OPINION OF PROBABLE PROJECT COST

PROJECT: Duck Lake Subwatershed WQ Improvement
 LOCATION: City of Eden Prairie, MN
 PROJECT #: 23/27-0053.14-025

**Engineer's Opinion of Probable Project Cost
 Curbside Rainwater Garden**

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization	LS	1	\$ 500	\$500.00	1,2,3,4,5,6
B	Excavation and Embankment	CY	35	\$ 15	\$525.00	1,2,3,4,5
C	Infiltration Planting Soil	CY	13	\$ 65	\$845.00	1,2,3,4,5
D	Subsoil Loosening	SF	150	\$ 1.50	\$225.00	1,2,3,4,5
E	Curb Cut Inlet Structure	EA	1	\$ 2,500.00	\$2,500.00	1,2,3,4,5
F	Pavement Removal and Disposal	SF	40	\$ 25	\$1,000.00	1,2,3,4,5
H	Curb and Gutter Replacement	LF	10	\$ 65	\$650.00	1,2,3,4,5
I	Stone Step Down Structure	EA	1	\$ 800	\$800.00	1,2,3,4,5
J	Asphalt Pavement Patching	SF	20	\$ 30	\$600.00	1,2,3,4,5
K	4" Steel Edging	LF	70	\$ 9	\$630.00	1,2,3,4,5
L	Plantings	SY	25	\$ 16	\$400.00	1,2,3,4,5
M	Shredded Hardwood Mulch	CY	8	\$ 65	\$520.00	1,2,3,4,5
N	#20 Cont. Tree	EA	1	\$ 280	\$280.00	1,2,3,4,5
O	Lawn Sod	SY	30	\$ 5	\$150.00	1,2,3,4,5
Q	Warranty	Year	3	\$ 150	\$450.00	1,2,3,4,5
	CONSTRUCTION SUBTOTAL per Rainwater garden				\$10,000.00	1,2,3,4,5,9
	CONSTRUCTION CONTINGENCY (10%)				\$1,000.00	1,5,9
	ESTIMATED CONSTRUCTION COST PER RAINWATER GARDEN				\$11,000.00	1,2,3,4,5,9
	ESTIMATED CONSTRUCTION COST FOR 10 RAINWATER GARENS		10	\$ 11,000	\$110,000.00	1,2,3,4,5
	ESTIMATED CONSTRUCTION COST	-20%			\$88,000.00	5,8,9
	ACCURACY RANGE	50%			\$165,000.00	5,8,9
	PLANNING, ENGINEERING & DESIGN				\$25,000.00	1,2,3,4,5,9
	PERMITTING & REGULATORY APPROVALS				\$2,000.00	1,5,6,7,9
	CONSTRUCTION MANAGEMENT				\$6,000.00	1,5,9
	ESTIMATED TOTAL PROJECT COST				\$143,000.00	1,2,3,4,5,7,8,9
	ESTIMATED TOTAL PROJECT ACCURACY	-20%			\$115,000.00	5,8,9
	RANGE	50%			\$215,000.00	5,8,9

Notes

- ¹ Limited Design Work Completed (0 - 10%).
- ² Quantities are based on construction of one (1) Rainwater Garden based on previous similar projects.
- ³ Unit Prices Based on Information Available at This Time.
- ⁴ No Soil Borings Available.
- ⁵ This feasibility-level (Class 4, < 10% design completion per ASTM E 2516-06) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.
- ⁶ Mobilization based on a single contractor constructing ten (10) similar rainwater gardens.
- ⁷ Includes costs for preparing maintenance and access agreements. Assumes that wetland mitigation/replacement is not required.
- ⁸ Estimate costs are to design, construct, and permit each alternative. The estimated costs do not include maintenance, monitoring or additional tasks following construction.
- ⁹ Estimate costs are reported to nearest thousand dollars.

BARR PREPARED BY: BARR ENGINEERING COMPANY ENGINEER'S OPINION OF PROBABLE PROJECT COST PROJECT: Duck Lake Subwatershed WQ Improvement LOCATION: City of Eden Prairie, MN PROJECT #: 23/27-0053.14-025	REV 1	SHEET: 1	OF 4
	BY: MEK2		DATE: 3/13/2019
	CHECKED BY: GDF		DATE: 3/13/2019
	APPROVED BY:		DATE:
	ISSUED:		DATE:
	ISSUED:		DATE:
	ISSUED:		DATE:

**Engineer's Opinion of Probable Project Cost
Downspout Planter Box**

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES	
A	Mobilization	LS	1	\$ 750	\$750.00	1,2,3,4,5	
B	Premium Decking Wood (Recommend Pressure treated, comp	EA	6	\$ 5	\$31.00	1,2,3,4	
C	Wall Support (Recommend Pressure treated, composite or ce	EA	1	\$ 25	\$25.00	1,2,3,4	
D	Base Wood	EA	1	\$ 10	\$10.00	1,2,3,4	
E	Plywood (Recommend Pressure treated, composite or cedar)	EA	1	\$ 36	\$36.00	1,2,3,4	
F	Downspout Diverter	EA	1	\$ 50	\$50.00	1,2,3,4	
G	Pond Liner	EA	1	\$ 69	\$69.00	1,2,3,4	
H	Decorative Trim (optional)	EA	2	\$ 7	\$14.00	1,2,3,4	
I	Paver/ Concrete Block	EA	6	\$ 2	\$10.00	1,2,3,4	
J	Sandy Soil Mix	EA	1	\$ 2	\$2.00	1,2,3,4	
K	clean course sand	EA	8	\$ 3	\$21.00	1,2,3,4	
L	compost	EA	1	\$ 8	\$8.00	1,2,3,4	
M	Pea Gravel	EA	4	\$ 4	\$16.00	1,2,3,4	
N	Splash Rock	EA	1	\$ 4	\$4.00	1,2,3,4	
O	Hard Wood Mulch	EA	2	\$ 4	\$7.00	1,2,3,4	
P	#1 Cont Perennials	SF	16	\$ 4	\$64.00	1,2,3,4	
Q	PVC Male and Female Electrical Conduit adapters	EA	1	\$ 25	\$25.00	1,2,3,4	
CONSTRUCTION SUBTOTAL					\$1,140.00	1,2,3,4,5,7	
CONSTRUCTION CONTINGENCY (10%)					\$110.00	1,4,7	
ESTIMATED CONSTRUCTION COST					\$1,250.00	1,2,3,4,5,7	
ESTIMATED CONSTRUCTION COST FOR 10 PLANTER BOXES					10 \$ 1,250	\$12,500.00	1,2,3,4,5
ESTIMATED CONSTRUCTION COST				-20%	\$10,000.00	5,8,9	
ACCURACY RANGE				50%	\$19,000.00	5,8,9	
PLANNING, ENGINEERING & DESIGN					\$250.00	1,2,3,4,5,7	
ESTIMATED TOTAL PROJECT COST					\$12,750.00	1,2,3,4,5,6,7	
ESTIMATED TOTAL PROJECT ACCURACY				-20%	\$10,200.00	4,6,7	
RANGE				50%	\$19,130.00	4,6,7	

Notes	
1	Limited design work completed (30% - 70%).
2	Quantities based on plans and specifications for a single 2'x2'x3' planter obtained from Philadelphia Water Department website http://www.phillywatersheds.org/whats_in_it_for_you/residents/how-build-downspout-planter accessed on March 13, 2019.
3	Unit prices based on information available at this time.
4	This feasibility-level (Class 2, 30% - 70% design completion per ASTM E 2516-06) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.
5	Mobilization based on a single contractor constructing five (5) similar planters.
6	Estimate costs are to design, construct, and install each planter. The estimated costs do not include maintenance, monitoring or additional tasks following installation.
7	Estimate costs are reported to nearest ten dollars.



PREPARED BY: BARR ENGINEERING COMPANY

REV 1 SHEET: 1 OF 4

BY: MEK2 DATE: 3/13/2019

CHECKED BY: GDF DATE: 3/13/2019

APPROVED BY: DATE:

ENGINEER'S OPINION OF PROBABLE PROJECT COST
PROJECT: Duck Lake Subwatershed WQ Improvement
LOCATION: City of Eden Prairie, MN
PROJECT #: 23/27-0053.14-025

ISSUED: DATE:

ISSUED: DATE:

ISSUED: DATE:

ISSUED: DATE:

Engineer's Opinion of Probable Project Cost Tree Plantings

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization	LS	1	\$ 1,600	\$1,600.00	1,2,3,4,5
B	Shredded Hardwood Mulch	CY	15	\$ 65	\$975.00	1,2,3,4
C	#20 Container Tree	EA	50	\$ 280	\$14,000.00	1,2,3,4
D	Tree Gator	EA	50	\$ 15	\$750.00	1,2,3,4
CONSTRUCTION SUBTOTAL					\$17,300.00	1,2,3,4,5,7
CONSTRUCTION CONTINGENCY (10%)					\$1,700.00	1,4,7
ESTIMATED CONSTRUCTION COST					\$19,000.00	1,2,3,4,5,7
ESTIMATED CONSTRUCTION COST		-20%		\$16,000.00		5,8,9
ACCURACY RANGE		50%		\$29,000.00		5,8,9
PLANNING, ENGINEERING & DESIGN					\$3,800.00	1,2,3,4,5,7
ESTIMATED TOTAL PROJECT COST					\$22,800.00	1,2,3,4,5,6,7
ESTIMATED TOTAL PROJECT COST		-20%		\$18,300.00		4,6,7
ACCURACY RANGE		50%		\$34,200.00		4,6,7

Notes

¹ Limited design work completed (30% - 70%).

² Quantities based on previous similar projects.

³ Unit prices based on information available at this time.

⁴ This feasibility-level (Class 2, 30% - 70% design completion per ASTM E 2516-06) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

⁵ Mobilization based on a single contractor installing 50 trees.

⁶ Estimate costs include identifying suitable locations, sourcing, and installing 50 trees. The estimated costs do not include maintenance, monitoring or additional tasks following installation.

⁷ Estimate costs are reported to nearest hundred dollars.



PREPARED BY: BARR ENGINEERING COMPANY

REV 1 SHEET: 1 OF 4

BY: MEK2 DATE: 3/13/2019

CHECKED BY: GDF DATE: 3/13/2019

APPROVED BY: DATE:

ENGINEER'S OPINION OF PROBABLE PROJECT COST
PROJECT: Duck Lake Subwatershed WQ Improvement
LOCATION: City of Eden Prairie, MN
PROJECT #: 23/27-0053.14-025

ISSUED: DATE:

ISSUED: DATE:

ISSUED: DATE:

ISSUED: DATE:

Engineer's Opinion of Probable Project Cost Rain Barrels

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Rain Barrel	LS	60	\$ 79	\$4,740.00	1,2,3
	CONSTRUCTION SUBTOTAL				\$4,700.00	1,2,3,4
	CONSTRUCTION CONTINGENCY (10%)				\$470.00	1,2,3,4
	ESTIMATED CONSTRUCTION COST				\$5,170.00	1,2,3,4
	ESTIMATED TOTAL PROJECT COST				\$5,200.00	1,2,3,4
ESTIMATED ACCURACY RANGE			-10%		\$4,700.00	3,4
			10%		\$5,800.00	3,4

Notes

¹ Unit prices based on Estimate #1001 provided to RPBCWD by Recycling Association of Minnesota on 3/7/2019.

² Assumes that rain barrels are distributed at a central location and installed by the end user.

³ This feasibility-level (Class 1, 70% - 100% design completion per ASTM E 2516-06) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -10% to +10%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

⁴ Estimate costs are reported to nearest hundred dollars.

RESOLUTION NO. 19-014
RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
BOARD OF MANAGERS

ORDERING THE WETLAND RESTORATION AND FLOOD MITIGATION PROJECT
AT 101 AND PIONEER TRAIL PROPERTY ACQUISITION

Manager _____ offered the following resolution and moved its adoption, seconded by
Manager _____:

WHEREAS the Riley Purgatory Bluff Creek Watershed District's (District) 2018 10-Year Watershed Management Plan (Plan) identified the Wetland Restoration and Flood Mitigation at 101 and Pioneer Trail as a Proposed Project in the Bluff Creek Watershed (Plan, Section 6, Table 6-2);

WHEREAS on March 1, 2019, the District Board of Managers adopted a resolution approving the District's role as legal sponsor for the Wetland Restoration and Flood Mitigation Project at 101 and Pioneer Trail Project (Project) and authorized the District administrator to apply for the Minnesota Department of Resources (MN DNR) Flood Damage Reduction Grant Assistance Program;

WHEREAS on March 12, 2019, the District submitted a Flood Damage Reduction Grant Assistance Program application to the MN DNR for the Project;

WHEREAS the District is proposing, in partnership with the City of Chanhassen and the MN DNR through the Flood Damage Reduction Grant Assistance Program, a collaborative wetland restoration Project that involves acquiring a total of three properties at 730, 750, and 770 Pioneer Trail for a total of 7.35 acres on which structures will be removed;

WHEREAS the District Engineer has deemed the Project site feasible and beneficial for wetland restoration and flood mitigation purposes;

WHEREAS the City of Chanhassen has served as the lead agency to acquire 770 Pioneer Trail and the District proposes to be the lead agency to acquire two remaining properties at 730 and 750 Pioneer Trail;

WHEREAS the total estimated cost of the acquisition of the three properties at 730, 750, and 770 Pioneer Trail is \$959,900.00, of which fifty percent (50%) will be funded by the DNR Flood Assistance Grant Program and fifty percent (50%) will be funded by the District and the City of Chanhassen, with the District's share of the funding for property acquisition not to exceed \$350,000;

WHEREAS the District's share for the project is proposed to be funded through the District's ad valorem property tax levy to implement its watershed management plan pursuant to Minnesota Statutes Section 103B.241, 77% of which is paid by District property taxpayers in Hennepin County, and 23% in Carver County;

WHEREAS once the properties are acquired and structures removed, the City and Riley Purgatory Bluff Creek watershed district plan to collaborate on a wetland restoration project; while the District staff and engineer have deemed the project site feasible and beneficial for wetland restoration and flood mitigation purposes, the wetland restoration phase will be the subject of a separate and future public hearing;

WHEREAS on April 3, 2019, the District held a duly noticed public hearing on the acquisition of the properties at 730 and 750 Pioneer Trail for the Project, consistent with Minnesota Statutes Section 103B.251, subdivision 3, to give interested members of the public an opportunity to comment on the Project;

NOW THEREFORE BE IT RESOLVED that the Board of Managers finds that the acquisition of the properties at 730 and 750 Pioneer Trail for the Project is consistent with the wetland restoration and flood mitigation objectives of the District for the Bluff Creek Watershed, and that the proposed property acquisition for the project will be conducive to public health, will promote the general welfare, and complies with the Watershed Law, the Metropolitan Water Management Planning Law, and the District's Plan;

BE IT FURTHER RESOLVED that the Board of Managers hereby orders that the properties at 730 and 750 Pioneer Trail be acquired for the Project, and that the Administrator proceed, with the advice of legal counsel, to develop a cooperative agreement for the Project with the City of Chanhassen, and any necessary and appropriate agreements for the acquisition of the properties at 730 and 750 Pioneer Trail for the due consideration and approval by the Board of Managers;

The question was on the adoption of the resolution and there were _____ yeas and _____ nays as follows:

<u>Yea</u>	<u>Nay</u>	<u>Abstain</u>	<u>Absent</u>
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CRAFTON
KOCH
PEDERSON
WARD
ZIEGLER

Upon vote, the president declared the resolution _____.

Dated: April ____, 2019.

David Ziegler, Secretary

* * * * *

I, David Ziegler, 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 the District and find the same to be a true and correct transcription thereof.

IN TESTIMONY WHEREOF, I set my hand this _____ day of _____, 2019.

David Ziegler, Secretary

MEMORANDUM

TO: Board of Managers
FROM: Terry Jeffery, Permit Coordinator and Scott Sobiech, PE, District Engineer
DATE: April 03, 2019
RE: Improving Regulatory Program Implementation

INTRODUCTION

At the January 9th Workplan and Visioning Exercise workshop, the Board of Managers expressed a desire to focus on three main things in 2019. Those items involved implementing the 10-year plan, planning to the next level by looking for innovative and unique opportunities, and improving collaboration with the cities in the District.

The purpose of this memo is to provide the Board and update and request feedback from the Managers on strategies to improve the application of the Districts Regulatory as outlined in staff's potential action plan below to work toward enhancing the regulatory programs implementation and collaboration with cities.

There is no official action needed for this item although feedback is welcome.

STATEMENT OF ISSUES

Over the last couple of months Administrator Bleser, Permit Coordinator Jeffery, and Engineer Sobiech have had additional discussions with several individual managers expressing a desire to simplify the regulatory program and highlight the many other aspects of the resource protection work the District undertakes rather than emphasizing the regulatory program. Again, last week at the joint workshop with the city of Eden Prairie Council member, managers and district staff heard concerns about the District's interpretation of the RPBCWD rules, too much detail in development review comments, and reviewers requesting too much information. Permit Coordinator Jeffery has also heard similar concerns expressed during an individual meeting with Eden Prairie's Public Works Director as well as concerns that similar projects in Nine Mile Creek Watershed District (NMCWD) do not receive the same level of detailed review comments.

Some of the concerns raised are similar to those expressed during the Districts reinstatement of the regulatory program. Since the reinstatement of the program, District staff, engineer, and legal counsel have worked to improve the administering of the rules on city projects by incorporating some of the requested changes into the 2018 will rule refresh (e.g., incorporating exemptions for dredging when a no loss determination and regional stormwater

management options), working to develop standardized, overarching maintenance agreements, and seeking increased authority for administrative permit approvals.

The definitive criteria written into the regulatory program, established and adopted by the Board to protect water resources, allow the rules to be applied with consistency and uniformity regardless of the applicant. In addition, prior Boards provided feedback to staff, engineer, and counsel to implement the regulatory program in a thorough, detailed, and comprehensive manner to maximize resource protection, minimize variances, and maintain a complete comprehensive file. One example is Scheels project (permit 2017-069) where through comprehensive detailed review the applicant incorporated several underground stormwater infiltration areas and extensive reuse of rainwater to serve as a water supply for interior non-potable purposes. Other examples involving significant staff and/or engineer dialogs with applicants to minimize variances and achieve the maximum extent practicable abstraction include, but are not limited to, Elevate at SW Station, Mission Hills Senior Living, Avienda, and Preserve Boulevard Reconstruction. This rather exhaustive dialogue can consume a considerable amount of time.

BRIEF COMPARISON OF RPBCWD AND NMCWD STORMWATER RULES

With regard to the concerns expressed by Eden Prairie's Public Works Director's that a project in RPBCWD is handled differently than it is in NMCWD, here is a brief explanation provided by the District Engineer. Because the District Engineer for NMCWD is also Barr Engineering, Engineer Sobiech was able to discuss the NMCWD permit review process directly with the engineer who has conducted the reviews for NMCWD for over 40 years, Bob Obermeyer. NMCWD engineer Obermeyer indicated that since 2014 NMCWD has had maybe a half dozen or so permits for the city of Eden Prairie. Those permits were all straight forward and lacked the complexities inherent with the Preserve Boulevard or Duck Lake Road reconstruction projects such as fill within a public water or a stormwater lift station being constructed to address flooding. The main comment NMCWD received from Dave Modrow, former Water Resources Engineer for Eden Prairie, during NMCWD's recent rule revisions was related to pond cleanout project needing to go to the Board for approval, thus NMCWD rules were revised to allow some administrative approvals.

During the discussion, NMCWD's engineer pointed out that the NMCWD's stormwater rules for linear projects are different than RPBCWD. NMCWD's threshold is much higher than RPBCWD's and the area requiring treatment once triggered is also different.

- NMCWD only requires permits for linear projects "if the project entails construction or reconstruction, including mill and overlay or other maintenance, creating less than 1 acre of new or additional impervious surface. For linear projects creating **more than 1 acre of new or additional impervious surface**, the criteria of section 4.3.3 or 4.3.2, as applicable, will **apply only to the net new or additional impervious surface.**"
- RPBCWD only requires permits for linear projects "if the project entails construction or reconstruction creating less than 5,000 square feet of new and/or fully reconstructed impervious surface. For linear projects creating **5,000 square feet or more of new and/or fully reconstructed impervious surface**, stormwater management in accordance with the criteria of subsection 3.2 must be provided."

Because of the differences, the RPBCWD stormwater rule gets triggered more frequently, has greater requirements, and requires more demonstration of compliance, thus Eden Prairie's Public Works Director's comment does have merit.

BRAINSTORMING ALTERNATIVES

Over the last couple of months Administrator Bleser, Permit Coordinator Jeffery, and Engineer Sobiech have been brainstorming ideas on how to address the slight shift in suggested from some managers, reducing regulatory burden on applicants and district, and improving collaboration with cities, all while maintaining a high level of water resource protection. Below is a summary list of potential ideas followed by a draft action plan on which staff is seeking Board feedback.

- The regulatory program is being administered based on Board adopted rule language
- Revise the regulatory program
 - Conduct comprehensive criteria review
 - Simplify rules with less criteria and focus on high value items
 - Revise the rules to allow staff more flexibility – risks inconsistent application
 - Incorporate a Modified MIDS flow chart into rule for restricted sites
 - Develop rule guidance documents
 - Replace maximum extent practicable (MEP), which takes a lot of time and back/forth with applicant, with extended detention on restricted sites
 - Establish fee in- lieu
 - Consider stormwater maximum cost by % of project
- Establish submission check list and make part of required submissions
- Develop a variance request form to be completed by applicant and applicant presents to the Board. Legal reviews variance requests with limited staff/engineer involvement
- Consider having only permits with variances go to legal for review
- Simplify staff report to background description, Rule table and recommendation – might not save much time however
- Require a pre-submission meeting
- Include a lot of conditions in the permit review reports present to the Board rather than focusing on providing as clean of report as possible – pushes application through faster but still requires back and forth after approval
- Handle all communication with applicant via in person meeting and phone. Only provide written comments for incomplete items.
- Permit Coordinator has all communication with the applicants and Barr only provides technical comments to Permit Coordinator
- Cities take over regulatory program via memo of understanding with District as outlined in section 9.4.2 of RPBCWDs Plan.
- Developer listening session
- TAC meeting
- Workshop on linear project framework n RPBCWD rule

POTENTIAL ACTION PLAN

If the Board agree, Staff would like to continue proactively addressing the concerns raised to identify solutions as soon as possible. Staff is requesting Board feedback on the following draft action plan.

1. Meet again with Mr. Ellis, to focus on Eden Prairie's concerns while working together to listen and collaborate on the city's ideas to resolve concerns.
2. Meet individually with other cities to solicit direct feedback
3. Begin requiring pre-application meetings
4. Develop submission check list
5. Develop variance request form
6. Conduct a Regulatory Listening session with stakeholders (Cities, developers, and developer engineers). This session is tentatively scheduled for April 23, 2019.
7. Provide an opportunity for feedback and comment on the District web site.
8. Conduct comprehensive review of regulatory criteria
9. Work toward potential rule revision based on input gathered. Among others, this might include:
 - Simplify rules with less criteria focusing on high value items
 - Incorporate a Modified MIDS flow chart into rule for restricted sites
 - Develop rule guidance documents
 - Replace maximum extent practicable (MEP), with extended detention or required filtration on restricted sites
 - Establish fee in- lieu for volume and/or water quality
 - Consider stormwater maximum cost by % of project
10. Hold a TAC meeting to solicit input from a broader range of stakeholder on potential revision.
11. Provide Board progress updates via monthly staff report.