RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

November 2022 Board Packet

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Agenda

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RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

Regular Board Meeting Agenda

Wednesday, November 2, 2022

6:30 PM

This month's meeting will be held at the District office (2665 Noel Drive, Little Canada, MN) but also via the video conferencing platform Zoom. Board members, staff, consultants, and general public will be able to join in person OR via video and/or phone. In order to continue to be sensitive to the COVID-19 pandemic, we may need to limit the number of public in the board room. The public will be able to listen to meeting but not participate with the exception of the visitor comments portion of the agenda. Instructions for joining in on the Zoom meeting can be found after the agenda.

1. Call to Order – 6:30 PM
2. **Approval of Agenda *(pg. 3)***
3. **Consent Agenda: To all be approved with one motion unless removed from consent agenda for discussion.**
    A. Approval of Regular Meeting Minutes October 5, 2022 *(pg. 8)*
    B. Treasurer's Report and Bill List *(pg. 17)*
    C. Permit Program
        i. 22-29 Villas of Gervais Lake, Little Canada *(pg. 26)*
        ii. 22-30 Wells Fargo Redevelopment, Woodbury *(pg. 32)*
        iii. 22-31 White Bear Lake Apartments II, White Bear Lake *(pg. 37)*
        iv. 22-32 Oakdale Elementary Demolition, Oakdale *(pg. 41)*
        v. 22-33 Ram Cty WBA – Larpenteur Improvements, Maplewood/St. Paul *(pg. 48)*
        vi. 22-34 Pioneer Park Improvements, Little Canada *(pg. 51)*
        vii. 22-35 Rosedale Estates Temporary Parking, Roseville *(pg. 55)*
    D. Stewardship Grant Program
        i. 22-31 CS Adkins, Native habitat restoration *(pg. 60)*
        ii. 22-32 CS Green, Porous driveway *(pg. 62)*
        iii. 22-33 CS Hutchinson, Rain garden *(pg. 63)*
    E. Lake Owasso Shoreline Restoration Project – Change Order No. 1 *(pg. 65)*
4. Visitor Comments (limited to 4 minutes each)
5. Permit Program
    A. Applications – See consent agenda
    B. Enforcement Action Report *(pg. 69)*
6. Stewardship Grant Program
    A. Applications – See consent agenda
    B. Budget Status Update *(pg. 73)*
7. Action Items
    A. **2023 CIP Maintenance and Repair Project Approval of Plans and Authorization to Advertise for Bid *(pg. 75)***
    B. **2022 Targeted Retrofits Projects – Change Order No. 4 *(pg. 110)***
8. Attorney Report

9. Board Issues, Policies and Operation (for discussion at meeting)
    A. Board Action Log: Additions, deletions
    B. Metro MAWD Updates
    C. BWSR Grants
    D. Awards: BWSR and MAWA
    E. Stormwater Research Council
    F. Manager Topics
10. New Reports and/or Presentations
    A. Internal Load Reduction Cost Benefit – Presentation by Keith Pilgrim, Barr *(pg. 121)*
    B. Pioneer Park Stormwater Reuse Project Scope Summary *(pg. 196)*
11. Administrator's Report *(pg. 205)*
    A. Meetings Attended
    B. Upcoming Meetings and Dates
    C. Ongoing Project Update
    D. MAWD Annual Meeting
    E. Conference Highlights
12. Project and Program Status Reports *(pg. 211)*

    Project Feasibility Studies
    A. Interim Emergency Response Planning
    B. Kohlman Creek Flood Risk Feasibility Study
    C. Kohlman Creek/Wakefield Lake Diversion Feasibility Study
    D. County Ditch 17 Improvements Feasibility Study
    E. Phalen Village Feasibility Study
    F. Ames Lake Area Flood Risk Reduction Planning Study
    G. Owasso Basin/North Star Estates Improvements
    H. Double Driveway Pond Optimization Study
    I. Carver Ponds Improvement Study
    J. South Metro Mississippi River TSS TMDL

    Monitoring Water Quality and Special Projects
    K. Annual Water Quality Report Assistance

    Research Projects
    L. Kohlman Permeable Weir Test System
    M. Shallow Lake Aeration Study

    Capital Improvements
    N. Target Store Stormwater Retrofit Projects
    O. Targeted Retrofit Projects
    P. Stewardship Grant Program – Street Sweeping
    Q. Lake Emily Subwatershed Regional BMP

    CIP Project Repair and Maintenance
    R. Beltline Five Year Inspection
    S. District Inspection Standardization
    T. 2023 CIP Maintenance and Repair Project

Program Updates

U. Natural Resources Program
V. Public Involvement and Education Program
W. Communications Program and Website
X. Citizen Advisory Committee

13. Manager Comments and Next Month's Meeting
    A. Board Action Log *(pg. 231)*

14. Adjourn

RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

NOTICE OF BOARD MEETING
Wednesday, November 2, 2022
6:30 PM
Hybrid Meeting: In-Person and Web Conference

This month's meeting will be held at the District office (2665 Noel Drive, Little Canada, MN) AND via the video conferencing platform Zoom. Board members, staff, consultants, and general public will be able to join in person OR via Zoom. In order to continue to be sensitive to the COVID-19 pandemic, we may need to limit the number of public in the board room area. The public will be able to listen to meeting but not participate with the exception of the visitor comments portion of the agenda. Visitor comment may be given in person or via Zoom. Instructions for joining in on the Zoom meeting can be found below.

To access the meeting via webcast, please use this link: https://us02web.zoom.us/j/86137563510?pwd=THNGVHZyN2pCdlFYSy9UbVA5elZQUT09

The meeting room will open at 6:20 pm with the meeting starting at 6:30 pm. To connect to audio you may choose to use your computer audio options or you may use your mobile device to call. The phone access number is **(312) 626-6799**. The Meeting ID is **861 3756 3510**. The meeting password is **334164**. If you have any questions, please contact Tina Carstens at tina.carstens@rwmwd.org.

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Consent Agenda

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Ramsey-Washington Metro Watershed District
Minutes of Regular Board Meeting
October 5, 2022

The Regular Meeting of October 5, 2022, was held at the District Office Board Room, 2665 Noel Drive, Little Canada, Minnesota, and via Zoom web conferencing, at 7:00 p.m. A video recording of the meeting can be found at https://youtu.be/slMwmvscoKo. Video time stamps included after each agenda item in minutes.

PRESENT:
Larry Swope, President
Dianne Ward, Vice President
Dr. Pam Skinner, Secretary
Val Eisele, Treasurer

ABSENT:
Matt Kramer, Manager

ALSO PRESENT:
Tina Carstens, District Administrator
Brandon Barnes, Barr Engineering
Nicole Soderholm, Permit Inspector
Laurann Kirschner, Attorney for District
Kristin Seaman, Woodbury Environmental Coordinator
Paige Ahlborg, Project Manager
Tyler Olsen, Barr Engineering
Dave Vlasin, Project Coordinator
Evan Sieben, Woodbury Street Sweeping Manager

1. CALL TO ORDER
The meeting was called to order by President Swope at 7:00 p.m.

2. APPROVAL OF AGENDA (00:15)
Motion: Manager Skinner moved, Manager Ward seconded, to approve the agenda as presented.

A roll call vote was conducted:

Manager Skinner	aye
Manager Eisele	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

3. CONSENT AGENDA (00:38)
A. ~~Approval of Minutes from September 7, 2022~~
B. Treasurer's Report and Bill List
C. Permit Program
   i. 22-26: 3M Avenue R Maintenance, Maplewood
   ii. 22-27: 3M Lake Culvert Replacement, Maplewood
   iii. 22-28: Pioneer Commons, Little Canada

D. Stewardship Grant Program

i. 22-39 CS: Washington County Community Development Agency Budget Extension Request

ii. 22-08 CS: Battle Creek Middle School Budget Extension Request

Motion: Manager Ward moved, Manager Skinner seconded, to approve the consent agenda as presented.

Further discussion: Laurann Kirschner stated that she has a correction for the minutes and asked that they be pulled.

Manager Eisele asked about the process that is involved when more money than was budgeted is spent in a specific category. Tina Carstens provided further detail on reallocation of funds. He referenced the wetland restoration projects and asked if that money is earmarked to be spent. Tina Carstens replied that there are not projects at this time, therefore those funds will carry over.

President Swope asked for clarification on Davey Resources. Paige Ahlborg replied that most of that cost was site maintenance, and some for the office patio.

The Board voted on the amended consent agenda.

Manager Skinner	aye
Manager Eisele	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

A. Approval of Minutes from September 7, 2022

Laurann Kirschner stated that on page 12 of the packet, the roll call vote should be amended to state motion passed 3-1 rather than unanimously. Tina Carstens stated that she believes that Manager Skinner did end up voting in favor but would go back to review the recording.

Motion: Manager Eisele moved, Manager Ward seconded, to approve the minutes from September 7, 2022 with the noted change.

A roll call vote was conducted:

Manager Skinner	aye
Manager Eisele	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

4. VISITOR COMMENTS (6:13)

No comments.

5. PERMIT PROGRAM (7:03)

A. Applications

Permit #22-25: Xcel Energy Maplewood Gas Plant Variance – Maplewood

Nicole Soderholm stated that the Board approved the permits for the existing gas plant for Xcel but tabled the variance request related to concern over loss of buffer and requested to see what else could be done in terms of

enhancing vegetation to mitigate for that loss. She stated that the applicant proposes to remove invasive species and enhance the existing buffer area. She noted that the tree preservation plan was included as well.

Manager Eisele commented that he was happy to see some of the changes made. He noted that this pond is meant to contain spilled propane. Nicole Soderholm stated that hopefully it would never have to be used for that purpose as that is an emergency plan. She explained that this project will provide runoff pretreatment that does not currently existing onsite.

Manager Skinner stated that she also has questions related to the minimum and average buffers. She asked if the loss of buffer could be added in another area. Nicole Soderholm stated that the applicant is not proposing to add buffer to the west side of wetland three as the applicant does not own that land. She commented that the buffer loss has been minimized to the extent possible.

Brandon Barnes stated that the aerial overview helps to show how the facility is located relative to the wetland and also shows the native vegetation area between the facility and wetland. He commented that the opportunity to add additional native area is very limited and therefore they looked to improve the native area that exists by removal of invasives and replacing that with enhanced vegetation.

Manager Skinner commented that it appears that the minimum/average buffer is already not met on this site as it was constructed prior to the District rules. Nicole Soderholm stated that there will be additional buffer loss because of the added water quality treatment, therefore there is benefit that will be gained in return for the loss. She stated that given the project purpose and need the water quality treatment that will be provided, there is benefit in this project.

Manager Skinner asked the consequence of not approving the variance. Nicole Soderholm replied that would be problematic as there are safety issues that exist with the gas plant. Tina Carstens stated that if the water quality pond is not built, the wetland will not receive the benefit of the BMP. She stated that the buffer is being disturbed in order to provide the additional water quality treatment. She noted that the plan to enhance the buffer, which is currently not high quality, will also be a benefit from what currently exists.

Manager Skinner commented that she is still a bit troubled by this and the continuance of net loss throughout the district.

Manager Ward commented that she likes the changes that were made. She commented that this includes a lot of improvements, and the balance appears to be as good as it can be.

President Swope commented that he believes that the applicant did a good job of responding to the comments from the Board at the last meeting. He commented that it is not a loss of wetland, and these safety improvements are needed.

Manager Eisele commented that while the buffer will be smaller, it will seem to be more efficient.

Nicole Soderholm stated that while it may seem that the Board considers a lot of buffer impacts, the vast majority are temporary disturbance and not permanent loss. She stated that this is a unique project with unique conflicts.

Manager Skinner commented that she does appreciate the benefits.

Motion: Manager Ward moved, Manager Eisele seconded, to approve the wetland variance for Permit #22-25 with the proposed tree preservation plan and buffer vegetation enhancement plan which will include invasive species removal and supplemental planting/seeding.

A roll call vote was conducted:

Manager Skinner	aye
Manager Eisele	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

B. Monthly Enforcement Report

During September, 15 notices were sent to address: install/maintain inlet protection (2), install/maintain perimeter control (3), install/maintain construction entrances (1), stabilize exposed soils (3), contain/dispose of liquid and solid wastes (1), remove discharged sediment (1), implement proper dewatering (1), maintain/protect permanent BMPs (1), and complete required site inspections (2).

6. STEWARDSHIP GRANT PROGRAM (26:05)

A. Applications

Permit #22-29 CS: Woodbury Enhanced Street Sweeping

Paige Ahlborg stated that staff is currently working with Barr Engineering to develop a pilot enhanced street sweeping program, noting that a potential grant program will come to the Board in December. She stated that other entities have completed similar studies. She stated that South Washington Watershed District has completed its study and that information was provided in the packet. She noted that the request from Woodbury has also provided more information on costs and how the District could develop its grant program. She commented on the cost effectiveness of enhanced street sweeping and explained that the entire city of Woodbury is within a priority area for the District. She noted the other benefits of enhanced street sweeping, such as reduced maintenance of BMPs and flood reduction. She provided details on the plan for enhanced street sweeping and explained that data will continue to assist the District in developing its grant program as well.

Tina Carstens stated that this would be a mini research project because the city will provide the data that can be used by the District to more specifically develop its own program.

Manager Eisele stated that he supports this and is interested in the data sharing.

President Swope commented that his issue would be that the Board has not decided whether it would like to endorse street sweeping. He stated that there is also not a policy on how the funding would be allocated and there is not currently a budget for this item. He asked what other cities would be told that perhaps would have liked to be part of the test. Paige Ahlborg stated that the District has a prioritization study and there are a number of priority ponds and impaired waters in Woodbury, whereas, for example, Shoreview does not fall into the same priority ranking. She stated that the District has received other requests from cities such as an iron enhanced pond filter in Shoreview, therefore there are different unique requests that have been honored in other communities. She commented that there are available funds in the stewardship grant program that could be used for this purpose.

President Swope commented that the District is still in the process of review and his concern would be to jump in with one city. His concern would be with the other cities.

Manager Skinner commented that 30 years ago, Oakdale did studies on street sweepers and even then, it was shown to be a very cost-effective method to reduce phosphorus. She commented that this is very cost effective, and the District could be prepared to move forward with this type of program in the future.

Manager Ward agreed with those statements but noted that before embarking on this, she would like to see information from the other cities; their policies and frequency of sweeping, as well as the benefit to this priority area. She was unsure that she was ready to move forward just because one city came to the District first. She asked how much has been spent on this process already. Tina Carstens stated that the District has not spent anything on this project specifically. Paige Ahlborg noted that another entity has already completed a study that the District has reviewed.

Manager Eisele commented that he sees this differently as he believes that this is an opportunity with a willing participant that will help to inform and provide more data to a program the District will be starting. He stated that this is an opportunistic investment that will provide data the District can use to make more informed decisions.

Manager Ward commented that she agrees but believes that the District should have been the lead in this pilot.

Manager Eisele agreed that would have been preferred but this is a willing participant that would like to involve the District.

President Swope commented that the District does not have a structure to work with at this point and asked what would happen if the District received a request from another community.

Manager Eisele asked if that request would be similar in detail, including a 50-page report with very detailed information.

Paige Ahlborg stated that staff has gathered existing sweeping data from all the cities, so they are aware that the District is looking into this. She commented that any city could have made a request, but Woodbury had already completed their study and brought this information and request forward. She commented that the other cities will appreciate this data that will be gained and could use that data to model their own programs in the future.

Manager Skinner commented that this is a time sensitive opportunity to cheaply remove phosphorus from impaired areas.

Manager Eisele stated that there is over $150,000 available in the stewardship grant program and this request would only be $50,000 of this. He again stated that he finds it helpful to work with a willing party.

President Swope commented that he would want to have a context in place for the program prior to providing funding. Tina Carstens stated that the board could look at this as a proven water quality BMP in a priority area that is eligible for up to $100,000 in funding for BMPs.

President Swope asked if street sweeping is described as a BMP. Manager Skinner thought it was mentioned in the plan as such. Tina Carstens stated that street sweeping is a water quality BMP but unsure if it is called out specifically in the plan.

Brandon Barnes commented that they are working on the study to present the results to the Board in December. He stated that the study will indicate that there will be high priority areas in multiple municipalities. He stated that there are impaired waters that these areas drain to in Woodbury.

Manager Eisele stated that he believes that this will be beneficial, and this is a logical approach that can help to inform the policy that will be developed. He believes that this investment will be worth it and recognized that perhaps this is not funding that is eligible each year for a municipality. He stated that he feels comfortable trying this at a fairly low investment.

Manager Skinner agrees that this may be the cart before the horse, but the District does have time to figure out its program over the next year. She stated that she supports increased street sweeping in every community.

President Swope stated that he does not disagree that there would be benefit but does not like the process.

Manager Skinner commented that this does fit into the context of the grant program.

President Swope agreed that it basically would but asked why this is just coming forward now and not in the past. Tina Carstens stated that there has been a lot of talk about it, but the modeling exercise had not been completed that Woodbury and South Washington Watershed completed. She commented that it is important to sweep the drainage areas that go into priority water bodies.

President Swope stated that he found it odd that they swept the streets before the leaves fell and now want money to sweep the streets again after the leaves fall. He asked why they did not wait to sweep until after the leaves fell. Tina Carstens replied that they cannot be everywhere without additional work hours and equipment.

Evan Sieben stated that they have never pursued aggressive street sweeping like this because it has never been budgeted for. He commented that with the benefit that South Washington County has shown, they want to pursue this in order to improve the water quality in Woodbury.

Manager Eisele stated that they are attempting to show cost benefit through periodic street sweeping to address trash, lawn clippings, and pollutants. He agreed that the most benefit would be after the leaves fall.

Motion: Manager Skinner moved, Manager Eisele seconded, to approve application #22-29 CS.

A roll call vote was conducted:

Manager Skinner	aye
Manager Eisele	aye
Manager Ward	aye
President Swope	nay

Motion carried 3 - 1.

B. Budget Status Update

No comments.

7. ACTION ITEMS (52:40)

A. Watershed Excellence Award Winners

Motion: Manager Skinner moved, Manager Ward seconded, to approve proposed Watershed Excellence Award winners.

Further discussion: Manager Eisele commented that the CAC was very thorough in its discussion of the candidates and noted that there was very strong agreement about those proposed. He commended the group for their review process.

A roll call vote was conducted:

Manager Skinner	aye
Manager Eisele	aye
Manager Ward	aye

President Swope aye

Motion carried unanimously.

8. ATTORNEY REPORT (56:47)

Laurann Kirschner highlighted work that she completed for the District in the past month including meeting notices and the street sweeping agreement for Woodbury that was just approved.

9. BOARD ISSUES, POLICIES, AND OPERATION (FOR DISCUSSION AT MEETING) (57:49)

A. Action Log: Additions, Deletions

No comments.

B. Manager Topics

Manager Skinner commented on an intersection in Oakdale that has a large pipe with a high flow of water after storm events. She asked if that would be a safety issue and whether something could be done to reduce the risk of injury. She also referenced another location that has construction going on adjacent to a wetland. Tina Carstens confirmed that staff could follow up on those items.

President Swope referenced the MAWD newsletter and the awards for staff and administrators.

Manager Skinner stated that she would like to nominate Tina Carstens for the best administrator and noted that perhaps Tina can provide guidance to nominate the best staff member for the year as well. She believed that the Board should be nominating staff members each year. Tina Carstens explained how the Board could draft and submit a nomination. She noted that she has nominated staff members in the past and could do that.

Laurann Kirschner provided input on the process that should be followed to avoid violation of the open meeting laws. She confirmed that two members could be designated to work together on the nomination.

Manager Eisele commented that he could work with President Swope on the nomination.

Manager Eisele stated that perhaps a member of staff could work with them as well. Tina Carstens confirmed that the Communications Coordinator could assist.

10. NEW REPORTS AND/OR PRESENTATIONS (1:07:53)

A. District Inspection Standardization and Mobile Data Collection Update

Tyler Olsen explained the purpose of the tool to standardize the inspection process and to create a prioritization framework for the CIP maintenance projects. He reviewed the methodology, different types of inspections, category development, criteria development, and scoring system.

Dave Vlasin provided input on testing of the tool and different sites that staff did when completing inspections while developing the tool and the process that was followed once the tool was developed and sites were inspected this fall.

Manager Eisele asked how this tool has changed the inspections. Dave Vlasin stated that perhaps it added one day to complete inspections this fall but believed that over time this would save time for him over the course of the year.

Tyler Olsen stated that once the framework was built, they put the data into Field Maps and highlighted the different features within the application.

Manager Ward asked if the past inspections would be available. Tina Carstens replied that the inspection history would be available to staff.

Manager Eisele asked if there would be ongoing maintenance of the tool. Tyler Olsen confirmed that they could add things into the tool as they go and provided additional details.

Manager Eisele commented that typically applications have ongoing maintenance costs and asked if that has been included. Tyler Olsen confirmed that there are some ongoing maintenance recommendations for the tool.

Tyler Olsen provided a live demonstration of the tool for the Board.

Manager Eisele commented that this might be of value and shared at conferences.

Manager Eisele asked if this information and ranking would be used in the development of the CIP projects. Tina Carstens confirmed that they do plan to use this information in the CIP development.

Manager Eisele asked if there is criteria for blockage such as fallen trees or debris. Tyler Olsen commented that there is blockage criteria. Dave Vlasin provided additional details, noting dropdown menus and the option to add photographs and mark the location.

Manager Skinner recognized that fallen trees can provide benefit to fish and wildlife in certain scenarios and asked if that would always be removed or whether it would remain in some scenarios. Dave Vlasin confirmed that they do recognize benefit of fallen trees in different scenarios and therefore they do not always remove those things. He stated that if there were blockage, they would try to address that as minimally as possible.

Tyler Olsen explained that once the data is collected it is then prioritized by the scores. He stated that every year there will be a threshold score to determine which sites should be reviewed for maintenance, other than those that are marked for review already. He provided an overview of the 2022 annual inspection and highlighted the future updates that are recommended.

B. Woodbury Target Store Retrofit Scope Summary

Tina Carstens stated that the scope summary was included in the packet and welcomed any questions the Board may have.

11. ADMINISTRATOR'S REPORT (1:42:55)

A. Meetings Attended

No comments.

B. Upcoming Meetings and Dates

Tina Carstens highlighted upcoming meetings and events. She provided additional details on the annual MAWD meeting and different events included.

C. Ongoing Project Update

No comments.

D. WEFTEC Conference

Tina Carstens confirmed that she will provide an update to the Board after the conference.

12. PROJECT AND PROGRAM STATUS REPORTS (1:48:40)

Project Feasibility Studies

A. Interim Emergency Response Planning

B. Kohlman Creek Flood Risk Feasibility Study
C. Kohlman Creek/Wakefield Lake Diversion Feasibility Study
D. County Ditch 17 Improvements Feasibility Study
E. Phalen Village Feasibility Study
F. Ames Lake Area Flood Risk Reduction Planning Study
G. Owasso Basin/North Star Estates Improvements
H. Double Driveway Pond Optimization Study
I. Carver Ponds Improvement Study
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Monitoring Water Quality and Special Projects

K. Annual Water Quality Report Assistance

Research Projects

L. Kohlman Permeable Weir Test System
M. Shallow Lake Aeration Study

Capital Improvements

N. Target Store Retrofit Projects
O. Targeted Retrofit Projects
P. Stewardship Grant Program – Street Sweeping
Q. Lake Emily Subwatershed Regional BMP

CIP Project Repair and Maintenance

R. Beltline Five Year Inspection
S. District Inspection Standardization

New Technology Report

T. Miyawaki Mini-Forest Assessment

Program Updates

U. Natural Resources Program Update
V. Public Involvement and Education Program Update
W. Communications Program and Website Update
X. Citizen Advisory Committee Update

Manager Eisele referenced the Ames Lake item and asked for explanation on the acronym.

Brandon Barnes replied that stands for Saint Paul Water Resources Working Group and provided details on the work that group does and how frequently they meet. He stated that Barr met with them to gauge their interest in working with the District on different parcels in order to minimize flooding in an around Ames Lake. He stated that they are willing to move to the next step on a feasibility study and provided additional details on that process.

President Swope referenced Item T, noting that it was a fabulous report. He stated that it also seems that is a viable tool the District should have in its tool chest. He also stated that the website has turned out well and commented on features that he enjoys, such as the meeting announcement. He also enjoyed the lake level integration page information that was sent out today.

Manager Skinner commented that she also enjoys the website updates.

13. MANAGER COMMENTS AND NEXT MONTH'S MEETING

No comments.

14. ADJOURN

Motion: Manager Skinner moved, Manager Eisele seconded, to adjourn the meeting at 8:25 p.m. Motion carried unanimously.

RWMWD BUDGET STATUS REPORT
Administrative & Program Budget
Fiscal Year 2022
10/31/2022

Budget Category	Budget Item	Account Number	Original Budget	Budget Transfers	Current Month Expenses	Year-to-Date Expenses	Current Budget Balance	Percent of Budget
Manager	Per diems	4355	$8,500.00	-	-	1,409.10	$7,090.90	16.58%
	Manager expenses	4360	4,000.00	-	-	-	4,000.00	0.00%
Committees	Committee/Bd Mtg. Exp.	4365	3,500.00	-	557.60	3,681.60	(181.60)	105.19%
	Sub-Total: Managers/Committees:		**$16,000.00**	**$0.00**	**$557.60**	**$5,090.70**	**$10,909.30**	**31.82%**
Employees	Staff salary/taxes/benefits	4010	1,660,000.00	-	124,191.04	1,384,149.37	275,850.63	83.38%
	Employee expenses	4020	15,000.00	-	542.56	6,147.73	8,852.27	40.98%
	District training & education	4350	75,000.00	-	4,438.55	26,948.86	48,051.14	35.93%
	Sub-Total: Employees:		**$1,750,000.00**	**$0.00**	**$129,172.15**	**$1,417,245.96**	**$332,754.04**	**80.99%**
Administration/ Office	GIS system maint. & equip.	4170	10,000.00	-	428.00	3,134.02	6,865.98	31.34%
	Data Base/GIS Maintenance	4171	40,000.00	-	-	98.94	39,901.06	0.25%
	Equipment maintenance	4305	3,000.00	-	-	152.69	2,847.31	5.09%
	Telephone	4310	4,000.00	-	59.34	593.40	3,406.60	14.84%
	Office supplies	4320	7,000.00	-	610.63	5,768.35	1,231.65	82.41%
	IT/Internet/Web Site/Software Lic.	4325	75,000.00	-	6,360.40	64,840.01	10,159.99	86.45%
	Postage	4330	3,000.00	-	-	962.62	2,037.38	32.09%
	Printing/copying	4335	5,000.00	-	294.00	3,960.40	1,039.60	79.21%
	Dues & publications	4338	11,000.00	-	-	11,188.94	(188.94)	101.72%
	Janitorial/Trash Service	4341	15,000.00	-	1,483.15	8,677.54	6,322.46	57.85%
	Utilities/Bldg.Contracts	4342	30,000.00	-	261.52	8,632.62	21,367.38	28.78%
	Bldg/Site Maintenance	4343	150,000.00	-	1,088.31	96,020.37	53,979.63	64.01%
	Miscellaneous	4390	5,000.00	-	-	-	5,000.00	0.00%
	Insurance	4480	55,000.00	-	-	53,156.00	1,844.00	96.65%
	Office equipment	4703	150,000.00	-	2,229.40	13,817.19	136,182.81	9.21%
	Vehicle lease, maintenance	4810-40	20,000.00	-	820.63	6,386.24	13,613.76	31.93%
	Sub-Total: Administration/Office:		**$583,000.00**	**$0.00**	**$13,635.38**	**$277,389.33**	**$305,610.67**	**47.58%**
Consultants/ Outside Services	Auditor/Accounting	4110	70,000.00	-	1,856.62	51,170.80	18,829.20	73.10%
	Engineering-administration	4121	125,000.00	-	6,873.00	65,255.50	59,744.50	52.20%
	Engineering-permit I&E	4122	10,000.00	-	816.50	4,143.00	5,857.00	41.43%
	Engineering-eng. review	4123	60,000.00	-	4,383.00	57,250.00	2,750.00	95.42%
	Engineering-permit review	4124	55,000.00	-	3,861.00	41,900.50	13,099.50	76.18%
	Project Feasibility Studies	4129	410,000.00	-	45,821.02	280,554.00	129,446.00	68.43%
	Attorney-permits	4130	10,000.00	-	-	-	10,000.00	0.00%
	Attorney-general	4131	40,000.00	-	1,440.00	15,929.70	24,070.30	39.82%
	Outside Consulting Services	4160	20,000.00	-	-	-	20,000.00	0.00%
	Sub-Total: Consultants/Outside Services:		**$800,000.00**	**$0.00**	**$65,051.14**	**$516,203.50**	**$283,796.50**	**64.53%**
Programs	Educational programming	4370	75,000.00	-	7,010.79	37,013.46	37,986.54	49.35%
	Communications & Marketing	4371	50,000.00	-	1,446.00	30,146.05	19,853.95	60.29%
	Events	4372	46,000.00	-	3,926.19	50,763.41	(4,763.41)	110.36%
	Water QM-Engineering	4520-30	180,000.00	-	18,573.14	201,937.59	(21,937.59)	112.19%
	Project operations	4650	200,000.00	-	447.49	127,033.08	72,966.92	63.52%
	SLMP/TMDL Studies	4661	125,000.00	-	7,294.50	24,051.50	100,948.50	19.24%
	Natural Resources/Keller Creek	4670-72	120,000.00	-	4,547.83	98,479.82	21,520.18	82.07%
	Outside Prog.Support/Weed Mgmt.	44683	57,000.00	-	3,369.33	20,738.66	36,261.34	36.38%
	Research Projects	4695	225,000.00	-	11,565.92	87,867.19	137,132.81	39.05%
	Health and Safety Program	4697	3,000.00	-	-	3,663.18	(663.18)	122.11%
	Sub-Total: Programs:		**$1,081,000.00**	**$0.00**	**$58,181.19**	**$681,693.94**	**$399,306.06**	**63.06%**
GENERAL FUND TOTAL			**$4,230,000.00**	**$0.00**	**$266,597.46**	**$2,897,623.43**	**$1,332,376.57**	68.50%
CIP's	CIP Project Repair & Maintenance	516	1,500,000.00	-	76,828.75	1,074,073.26	425,926.74	71.60%
	Targeted Retrofit Projects	518	1,500,000.00	-	30,838.02	362,639.81	1,137,360.19	24.18%
	Flood Risk Reduction Fund	520	5,200,000.00	-	403.26	25,315.20	5,174,684.80	0.49%
	Debt Services-96-97 Beltline/MM/Battle Creek	526	394,710.00	-	-	393,040.40	1,669.60	99.58%
	Stewardship Grant Program Fund	529	1,000,000.00	-	115,697.76	310,667.59	689,332.41	31.07%
	Wetland Restoration Projects	540	500,000.00	-	-	-	500,000.00	0.00%
CIP BUDGET TOTAL			**$10,094,710.00**	**-**	**$223,767.79**	**$2,165,736.26**	**$7,928,973.74**	21.45%
TOTAL BUDGET			**$14,324,710.00**	**$0.00**	**$490,365.25**	**$5,063,359.69**	**$9,261,350.31**	**35.35%**

Current Fund Balances:

Fund:	Beginning Fund Balance @ 12/31/21	Fund Transfers	Year to date Revenue	Current Month Expenses	Year to Date Expense	Fund Balance @ 10/31/22
101 - General Fund	$2,382,780.20	-	1,751,181.64	266,597.46	2,897,623.43	1,236,338.41
516 - CIP Project Repair & Maintenance	162,659.00	-	1,348,062.95	76,828.75	1,074,073.26	436,648.69
518 - Targeted Retrofit Projects	948,555.00	-	-	30,838.02	362,639.81	585,915.19
520 - Flood Damage Reduction Fund	3,415,744.00	-	894,542.92	403.26	25,315.20	4,284,971.72
526 - Debt Services-96-97 Beltline/MM/Beltline-Battle Creek Tunnel Repair	944,949.00	-	-	-	393,040.40	551,908.60
529 - Stewardship Grant Program Fund	854,750.00	-	181,199.96	115,697.76	310,667.59	725,282.37
536 - Stormwater Impact Fund	309,837.00	-	-	-	-	309,837.00
540 - Wetland Restoration Projects	498,036.00	-	-	-	-	498,036.00
580 - Contingency Fund	1,465,487.00	-	-	-	-	1,465,487.00
Total District Fund Balance	**$10,982,797.20**	**$0.00**	**$ 4,174,987.47**	**$ 490,365.25**	**$5,063,359.69**	**$10,094,424.98**

Ramsey Washington Metro Watershed Dist.
Check Register
For the Period From Oct 1, 2022 to Oct 31, 2022

Check #	Date	Payee ID	Invoice #	Payee	Description	Amount
EFT	10/01/22	met008	Oct 2022	MetLife-Group Benefits	Employee Benefits	$1,813.91
EFT	10/06/22	hea002	Nov 2022	HealthPartners	Employee Benefits	12,563.83
73235V	10/12/22	sca001	2750	Scales Advertising	Natural Resources Project	(675.00)
73316	10/13/22	aws001	S1335957-100122	AWS Service Center	Janitorial/Trash Service	295.15
73317	10/13/22	ben002	111546	Benefit Extras, Inc.	Employee Benefits	90.00
73318	10/13/22	car007	RWMWD_9_30_22	Carp Solutions, LLC	Natural Resources Project	3,830.00
73319	10/13/22	gil001	222710	Gilbert Mechanical Contractors, Inc.	Bldg./Site Maintenance	169.52
73320	10/13/22	hom001	4010117	Home Depot Credit Services	Water QM Staff	90.95
73321	10/13/22	inc001	20189NA-04	In Control, Inc.	Construction Imp.-Maint & Rep.	1,117.50
73322	10/13/22	inn002	IN3951496	Innovative Office Solutions LLC	Office Supplies	208.39
73323	10/13/22	int003	199229	Intereum, Inc.	Office Equipment	754.00
73324	10/13/22	jad001	200220929	Anita Jader Photography	Communications & Marketing	1,350.00
73325	10/13/22	lea003	15-1001	L. Tracy Leavenworth	Educational Program	4,352.14
73326	10/13/22	mid003	592125	Roseville Midway Ford	Vehicle Maintenance	82.64
73327	10/13/22	min008	36273	Minnesota Native Landscapes, Inc.	Construction Imp.-Maint & Rep.	6,640.00
73328	10/13/22	pre003	318986764	Premium Waters, Inc.	Utilities/Bldg. Contracts	36.99
73329	10/13/22	rmb001	B006775	RMB Environmental Laboratories	Water QM Staff	4,461.00
73330	10/13/22	sai001	3687	Saint Paul Media	Communications & Marketing	50.00
73331	10/13/22	sca001	2750	Scales Advertising (re-issue)	Natural Resources Project	675.00
73332	10/13/22	stu001	2019644	Studio Lola	Natural Resources Project	567.00
73333	10/13/22	usb005	483734208	US Bank Equipment Finance	Printing Expense	294.00
73334	10/13/22	van001	85580	Vanguard Cleaning Systems of Minnesota	Janitorial/Trash Service	594.00
73335	10/25/22	ahl001	10/17/22	Paige Ahlborg	Employee Reimbursement	506.78
73336	10/25/22	ass001	21-38 CS	Association Team Management	Stewardship Grant Fund	4,765.00
73337	10/25/22	bak001	22-16 CS	Luke Baker	Stewardship Grant Fund	3,900.00
73338	10/25/22	bal002	Oct 2022	Darcy Ballantyne	Employee Reimbursement	25.03
73339	10/25/22	bar001	9/17-10/14/22	Barr Engineering	September/October Engineering	153,309.42
73340	10/25/22	bau001	21-01 MTN	Paul Bauer	Stewardship Grant Fund	557.00
73341	10/25/22	blo001	Oct 2022	Simba Blood	Employee Reimbursement	394.93
73342	10/25/22	cad001	18883397	Allstream	Water QM Staff	139.28
73343	10/25/22	cas001	22-23 CS	Will Castellanos	Stewardship Grant Fund	5,335.00
73344	10/25/22	chi002	19-05 MTN	Linda Chimzar	Stewardship Grant Fund	148.58
73345	10/25/22	cit001	007734-001	City of Little Canada	Utilities/Bldg. Contracts	143.03
73346	10/25/22	cit011	231295	City of Roseville	IT/Website/Software	6,264.21
73347	10/25/22	cit024	22-20 CS	City of Vadnais Heights	Stewardship Grant Fund	5,000.00
73348	10/25/22	com004	10/16/22	Comcast	Utilities/Bldg. Contracts	81.50
73349	10/25/22	dav003	147161	Davey Resource Group, Inc.	Construction Imp.-Maint & Rep.	6,934.90
73350	10/25/22	don001	Oct 2022	Matthew Doneux	Employee Reimbursement	615.93
73351	10/25/22	fac001	22-03 CS	Kim Facile	Stewardship Grant Fund	3,497.38
73352	10/25/22	fit002	Oct 2022	Mary Fitzgerald	Employee Reimbursement	439.83
73353	10/25/22	gal001	10/19/22	Galowitz Olson, PLLC	October Legal Expense	1,440.00
73354	10/25/22	gru001	01-20580	Gruber's Power Equipment	Natural Resources Project	118.78
73355	10/25/22	hai001	21-37 CS	Deon Haider	Stewardship Grant Fund	1,080.37
73356	10/25/22	hof003	22-12 CS	Rosemary Hoffman	Stewardship Grant Fund	12,750.00
73357	10/25/22	ins001	4471	Instrumental Research, Inc.	Water QM Staff	110.00
73358	10/25/22	int001	W22090488	Office of MN, IT Services	Telephone Expense	59.34
73359	10/25/22	int003	192507	Intereum, Inc.	Office Equipment	1,200.00
73360	10/25/22	kor001	04/22/22	Eric Korte	Employee Reimbursement	428.48
73361	10/25/22	kub001	Aug-Oct 2022	Kyle W. Kubitza	Employee Reimbursement	178.53
73362	10/25/22	lan003	KEL01769	Lancer Catering	Events	3,926.19
73363	10/25/22	lan009	1473	Landbridge Ecological, Inc.	Stewardship Grant Fund	59,741.69
73364	10/25/22	loe001	21-33 CS	Jacob Loewen	Stewardship Grant Fund	5,554.38
73365	10/25/22	mel001	Oct 2022	Michelle L. Melser	Employee Reimbursement	293.59
73366	10/25/22	ncp001	Oct 2022	NCPERS Group Life Ins.	Employee Benefits	16.00
73367	10/25/22	nsp001	799946831	Xcel Energy	Proj.Oper./Bldg/Water QM	1,311.30
73368	10/25/22	pac001	22100389942	Pace Analytical Services, Inc.	Water QM Staff	12,080.00
73369	10/25/22	pas002	10/18/22	Carol Passi	Employee Reimbursement	934.08
73370	10/25/22	pet001	50082	Peterson Companies, Inc.	Construction Imp.-Maint & Rep.	27,562.00
73371	10/25/22	qwe001	10/10/22	CenturyLink	Project Operations	270.39
73372	10/25/22	ram002	COR-003634	Ramsey County	Construction Imp.-Maint & Rep.	88.00
73373	10/25/22	red002	150473151	Redpath & Company	September Accounting Services	1,716.52
73374	10/25/22	res003	IN31615	Resource Environmental Solutions, LLC	Construction Imp.-Maint & Rep.	3,764.07
73375	10/25/22	sim001	Oct 2022	Emily Simmons	Employee Reimbursement	46.44

Ramsey Washington Metro Watershed Dist.
Check Register
For the Period From Oct 1, 2022 to Oct 31, 2022

Check #	Date	Payee ID	Invoice #	Payee	Description	Amount
73376	10/25/22	sod001	Oct 2022	Nicole Soderholm	Employee Reimbursement	529.26
73377	10/25/22	til002	Oct 2022	Joseph S. Tillotson	Employee Reimbursement	40.83
73378	10/25/22	tim002	M27695	Timesaver Off-Site Secretarial, Inc.	Committee/Board Meeting Expj.	228.75
73379	10/25/22	tro002	22-10	Cathy Troendle	Educational Program	2,632.67
73380	10/25/22	usb002	Oct 2022	U.S. Bank	October Credit Card Expense	5,202.20
73381	10/25/22	van001	Nov 2022	Vanguard Cleaning Systems of Minnesota	Janitorial/Trash Service	594.00
73382	10/25/22	vos001	21-40 CS	Nick Voss	Stewardship Grant Fund	543.86
73383	10/25/22	was002	5798/5788/5766	Washington Conservation District	Stewardship/Prog.Supp/Water QM	4,708.08
73384	10/25/22	wis002	21-12 MTN	Wayne Wise	Stewardship Grant Fund	1,000.00
Total						**$381,568.62**
EFT	10/14/22	myp001	10/14/22	October 14th Payroll Fees	4110-101-000	70.05
EFT	10/28/22	myp001	10/28/22	October 28th Payroll Fees	4110-101-000	70.05
Dir.Dep.	10/14/22	---	Payroll Expense-Net	October 14th Payroll	4010-101-000	30,283.97
EFT	10/14/22	int002	Internal Rev.Serv.	October 14thFederal Withholding	2001-101-000	11,077.68
EFT	10/14/22	mnd001	MN Revenue	October 14th State Withholding	2003-101-000	1,964.10
EFT	10/14/22	per001	PERA	October 14th PERA	2011-101-000	6,319.13
EFT	10/14/22	emp002	Empower Retirement	Employee Def. Comp. Contributions	2016-101-000	3,170.00
EFT	10/14/22	emp002	Empower Retirement	Employee IRA Contributions	2018-101-000	400.00
Dir.Dep.	10/28/22	---	Payroll Expense-Net	October 28th Payroll	4010-101-000	30,266.58
EFT	10/28/22	int002	Internal Rev.Serv.	October 28th Federal Withholding	2001-101-000	11,088.35
EFT	10/28/22	mnd001	MN Revenue	October 28th State Withholding	2003-101-000	1,963.37
EFT	10/28/22	per001	PERA	October 28th PERA	2011-101-000	6,520.73
EFT	10/28/22	emp002	Empower Retirement	Employee Def. Comp. Contributions	2016-101-000	3,170.00
EFT	10/28/22	emp002	Empower Retirement	Employee IRA Contributions	2018-101-000	400.00
					Payroll/Benefits:	**$106,764.01**
Total					**Accounts Payable/Payroll/Benefits:**	**$488,332.63**

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From October 1, 2022 - October 31, 2022

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail
10/01/22	EFT	met008	MetLife-Group Benefits	4040-101-000	Employee Benefits-General	$1,813.91	
10/06/22	EFT	hea002	HealthPartners	4040-101-000	Employee Benefits-General	12,563.83	
10/12/22	73235V	sca001	Scales Advertising	4670-101-000	Natural Resources Project-General	(675.00)	
10/13/22	73316	aws001	AWS Service Center	4341-101-000	Janitorial/Trash Service	295.15	
10/13/22	73317	ben002	Benefit Extras, Inc.	4040-101-000	Employee Benefits-General	90.00	
10/13/22	73318	car007	Carp Solutions	4670-101-000	Natural Resources Project-General	3,830.00	
10/13/22	73319	gil001	Gilbert Mechanical Contractors, Inc.	4343-101-000	Bldg./Site Maintenance	169.52	
10/13/22	73320	hom001	Home Depot Credit Services	4530-101-000	Water QM Staff-General	90.95	
10/13/22	73321	inc001	In Control, Inc.	4630-516-000	Construction Imp.-Maint. & Repair	1,117.50	
10/13/22	73322	inn002	Innovative Office Solutions, LLC	4320-101-000	Office Supplies-General	208.39	
10/13/22	73323	int003	Intereum, Inc.	4703-101-000	Office Equipment-General	754.00	
10/13/22	73324	jad001	Anita Jader Photography	4371-101-000	Communications & Marketing	1,350.00	
10/13/22	73325	lea003	L. Tracy Leavenworth	4370-101-000	Educational Program-General	4,352.14	
10/13/22	73326	mid003	Roseville Midway Ford	4820-101-000	Vehicle Maintenance-General	82.64	
10/13/22	73327	min008	Minnesota Native Landscape, Inc.	4630-516-000	Construction Imp.-Maint. & Repair	6,640.00	
10/13/22	73328	pre003	Premium Waters, Inc.	4342-101-000	Utilities/Bldg. Contracts	36.99	
10/13/22	73329	rmb001	RMB Environmental Laboratories	4530-101-000	Water QM Staff-General	4,461.00	
10/13/22	73330	sai001	St. Paul Media	4371-101-000	Communications & Marketing	50.00	
10/13/22	73331	sca001	Scales Advertising (re-issue)	4670-101-000	Natural Resources Project-General	675.00	
10/13/22	73332	stu001	Studio Lola	4670-101-000	Natural Resources Project-General	567.00	
10/13/22	73333	usb005	US Bank Equipment Finance	4335-101-000	Printing-General	294.00	
10/13/22	73334	van001	Vanguard Cleaning Systems of Minnesota	4341-101-000	Janitorial/Trash Service	594.00	
10/25/22	73335	anc001	Paige Ahlberg			506.78	
				4020-101-000	Employee Expenses-General		100.40
				4040-101-000	Employee Benefits-General		40.00
				4350-101-000	Training & Education-General		366.38
10/25/22	73336	ass001	Association Team Management	4682-529-000	Stewardship Grant Fund	4,765.00	
10/25/22	73337	bak001	Luke Baker	4682-529-000	Stewardship Grant Fund	3,900.00	
10/25/22	73338	bal002	Darcy Ballantyne	4020-101-000	Employee Expenses-General	25.03	
10/25/22	73339	bar001	Barr Engineering			153,309.42	
				4121-101-000	Engineering Admin-General Fund		6,873.00
				4123-101-000	Engineering-Review		4,383.00
				4129-101-000	Project Feasability-General		1,748.00
				4129-101-000	Project Feasability-General		437.00
				4129-101-000	Project Feasability-General		9,467.50
				4129-101-000	Project Feasability-General		2,489.00
				4129-101-000	Project Feasability-General		4,516.50
				4129-101-000	Project Feasability-General		595.00
				4129-101-000	Project Feasability-General		646.00
				4129-101-000	Project Feasability-General		4,212.02
				4129-101-000	Project Feasability-General		408.00
				4129-101-000	Project Feasability-General		21,302.00
				4170-101-000	GIS System Maint. & Equipment		28.00
				4520-101-000	Engineering-WQM		180.00
				4520-101-000	Engineering-WQM		758.13
				4122-101-000	Engineering-Permit I&E		816.50
				4124-101-000	Engineering-Permit Review		3,861.00

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From October 1, 2022 - October 31, 2022

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail
				4661-101-000	SLMP/TMDL Studies		24.00
				4661-101-000	SLMP/TMDL Studies		7,270.50
				4695-101-000	Research Projects-General		260.00
				4695-101-000	Research Projects-General		1,524.00
				4695-101-000	Research Projects-General		9,781.92
				4650-101-000	Project Operations-General		105.00
				4128-518-000	Engineering-Targeted Retrofit		58.00
				4128-518-000	Engineering-Targeted Retrofit		405.00
				4128-518-000	Engineering-Targeted Retrofit		949.50
				4128-520-000	Engineering-Flood Damage		154.00
				4128-518-000	Engineering-Targeted Retrofit		11,763.76
				4682-529-000	Engineering-Stewardship Grant Program		9,918.00
				4128-518-000	Engineering-Targeted Retrofit		17,661.76
				4128-516-000	Engineering-Maint. & Repair		27,269.33
				4128-516-000	Engineering-Maint. & Repair		270.00
				4128-516-000	Engineering-Maint. & Repair		2,406.00
				4128-516-000	Engineering-Maint. & Repair		768.00
10/25/22	73340	bau001	Paul Bauer	4682-529-000	Stewardship Grant Fund	557.00	
10/25/22	73341	blo001	Simba Blood			394.93	
				4040-101-000	Employee Benefits-General		40.00
				4020-101-000	Employee Expenses-General		35.74
				4350-101-000	Training & Education-General		319.19
				4372-101-000	Events		
10/25/22	73342	cad001	Allstream	4530-101-000	Water QM Staff-General	139.28	
10/25/22	73343	cas001	Will Castellanos	4682-529-000	Stewardship Grant Fund	5,335.00	
10/25/22	73344	chi002	Linda Chimzar	4682-529-000	Stewardship Grant Fund	148.58	
10/25/22	73345	cit001	City of Little Canada	4342-101-000	Utilities/Bldg. Contracts	143.03	
10/25/22	73346	cit011	City of Roseville	4325-101-000	IT/Website/Software	6,264.21	
10/25/22	73347	cit024	City of Vadnais Heights	4682-529-000	Stewardship Grant Fund	5,000.00	
10/25/22	73348	com004	Comcast	4342-101-000	Utilities/Bldg. Contracts	81.50	
10/25/22	73349	dav003	Davey Resource Group, Inc.	4630-516-000	Construction Imp.-Maint & Repair	6,934.90	
10/25/22	73350	don001	Matthew Doneux			615.93	
				4020-101-000	Employee Expenses-General		9.95
				4040-101-000	Employee Benefits-General		240.00
				4350-101-000	Training & Education-General		365.98
10/25/22	73351	fac001	Kim Facile	4682-529-000	Stewardship Grant Fund	3,497.38	
10/25/22	73352	fit002	Mary Fitzgerald			439.83	
				4020-101-000	Employee Expenses-General		46.39
				4040-101-000	Employee Benefits-General		58.25
				4350-101-000	Training & Education-General		335.19
10/25/22	73353	gal001	Galowitz Olson, PLLC	4131-101-000	Attorney General-General	1,440.00	
10/25/22	73354	gru001	Gruber's Power Equipment	4670-101-000	Natural Resources Project-General	118.78	
10/25/22	73355	hai001	Dean Haider	4682-529-000	Stewardship Grant Fund	1,080.37	
10/25/22	73356	hof003	Rosemary Hoffman	4682-529-000	Stewardship Grant Fund	12,750.00	
10/25/22	73357	ins001	Instrumental Research, Inc.	4530-101-000	Water QM Staff-General	110.00	
10/25/22	73358	int001	Office of MN, IT Services	4310-101-000	Telephone-General	59.34	
10/25/22	73359	int003	Intereum, Inc.	4703-101-000	Office Equipment-General	1,200.00	
10/25/22	73360	kor001	Eric Korte			428.48	
				4040-101-000	Employee Benefits-General		192.52
				4530-101-000	Water QM Staff-General		235.96

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From October 1, 2022 - October 31, 2022

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail
10/25/22	73361	kub001	Kyle W. Kubitza			178.53	
				4020-101-000	Employee Expenses-General		13.46
				4040-101-000	Employee Benefits-General		120.00
				4530-101-000	Water QM Staff-General		45.07
10/25/22	73362	lan003	Lancer Catering	4372-101-000	Events	3,926.19	
10/25/22	73363	lan009	Landbridge Ecological, Inc.	4682-529-000	Stewardship Grant Fund	59,741.69	
10/25/22	73364	loe001	Jacob Loewen	4682-529-000	Stewardship Grant Fund	5,554.38	
10/25/22	73365	mel001	Michelle Melser			293.59	
				4040-101-000	Employee Benefits-General		240.00
				4020-101-000	Employee Expenses-General		53.59
10/25/22	73366	ncp001	NCPERS Group Life Insurance	4040-101-000	Employee Benefits-General	16.00	
10/25/22	73367	nsp001	Xcel Energy			1,311.30	
				4650-520-000	Project Operations-Flood		249.26
				4343-101-000	Bldg./Site Maintenance		918.79
				4530-101-000	Water QM Staff-General		143.25
10/25/22	73368	pac001	Pace Analytical Services, Inc.	4530-101-000	Water QM Staff-General	12,080.00	
10/25/22	73369	pas002	Carol Passi			934.08	
				4020-101-000	Employee Expenses-General		179.60
				4040-101-000	Employee Benefits-General		40.00
				4682-529-000	Stewardship Grant Fund		688.50
				4370-101-000	Educational Program-General		25.98
10/25/22	73370	pet001	Peterson Companies, Inc.	4630-516-000	Construction Imp.-Maint. & Repair	27,562.00	
10/25/22	73371	qwe001	CenturyLink	4650-101-000	Project Operations-General	270.39	
10/25/22	73372	ram002	Ramsey County	4630-516-000	Construction Imp.-Maint. & Repair	88.00	
10/25/22	73373	red002	Redpath & Company, Ltd.	4110-101-000	Auditor/Accounting	1,716.52	
10/25/22	73374	res003	Resource Environmental Solutions, LLC	4530-101-000	Water QM Staff-General	3,764.07	
10/25/22	73375	sim001	Emily Simmons			46.44	
				4020-101-000	Employee Expenses-General		6.44
				4040-101-000	Employee Benefits-General		40.00
10/25/22	73376	sod001	Nicole Soderholm			529.26	
				4020-101-000	Employee Expenses-General		63.18
				4040-101-000	Employee Benefits-General		40.00
				4350-101-000	Training & Education-General		426.08
10/25/22	73377	til001	Joseph Tillotson			40.83	
				4670-101-000	Natural Resources Project-General		32.05
				4020-101-000	Employee Expenses-General		8.78
10/25/22	73378	tim002	Timesaver Off-Site Secretarial, Inc.	4365-101-000	Committee/Board Meeting Expense	228.75	
10/25/22	73379	tro002	Cathy Troendle			2,632.67	
				4370-101-000	Educational Program-General		2,581.25
				4370-101-000	Educational Program-General		51.42
10/25/22	73380	usb002	U.S. Bank			5,202.20	
				4630-516-000	Construction Imp.-Maint. & Repair		8.95
				4325-101-000	IT/Website/Software		96.19
				4320-101-000	Office Supplies-General		122.91
				4365-101-000	Committee/Board Meeting Expense		48.25
				4350-101-000	Training & Education-General		(215.00)
				4350-101-000	Training & Education-General		478.60
				4350-101-000	Training & Education-General		399.56
				4350-101-000	Training & Education-General		259.60
				4320-101-000	Office Supplies-General		43.22
				4320-101-000	Office Supplies-General		97.00
				4350-101-000	Training & Education-General		375.00

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From October 1, 2022 - October 31, 2022

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail
				4350-101-000	Training & Education-General		100.00
				4350-101-000	Training & Education-General		85.00
				4530-101-000	Water QM Staff-General		188.50
				4530-101-000	Water QM Staff-General		20.25
				4320-101-000	Office Supplies-General		39.98
				4703-101-000	Equipment		275.40
				4350-101-000	Training & Education-General		459.00
				4350-101-000	Training & Education-General		459.00
				4371-101-000	Communications & Marketing		12.00
				4320-101-000	Office Supplies-General		97.19
				4365-101-000	Committee/Board Meeting Expense		16.17
				4371-101-000	Communications & Marketing		34.00
				4365-101-000	Committee/Board Meeting Expense		239.43
				4350-101-000	Training & Education-General		224.97
				4170-101-000	GIS System Maint. & Equipment		400.00
				4365-101-000	Committee/Board Meeting Expense		15.00
				4365-101-000	Committee/Board Meeting Expense		10.00
				4820-101-000	Vehicle Maintenance-General		680.63
				4650-101-000	Project Operations-General		72.10
				4840-101-000	Vehicle Miscellaneous Expense		57.36
				4320-101-000	Office Supplies-General		1.94
10/25/22	73381	van001	Vanguard Cleaning Systems of Minnesota	4341-101-000	Janitorial/Trash Service	594.00	
10/25/22	73382	vos001	Nick Voss	4682-529-000	Stewardship Grant Fund	543.86	
10/25/22	73383	was002	Washington Conservation District			4,708.08	
				4682-529-000	Stewardship Grant Fund		1,218.00
				4683-101-000	Outside Program Support		3,369.33
				4530-101-000	Water QM Staff-General		120.75
10/25/22	73384	wis002	Wayne Wise	4682-529-000	Stewardship Grant Fund	1,000.00	
			Accounts Payable Total:			**$381,568.62**	
EFT	10/14/22	myp001	Payroll Fees	4110-101-000	October 14th Payroll Fees	70.05	
EFT	10/28/22	myp001	Payroll Fees	4110-101-000	October 28th Payroll Fees	70.05	
Dir.Dep.	10/14/22	---	Payroll Expense-Net	4010-101-000	October 14th Payroll	30,283.97	
EFT	10/14/22	int002	Internal Rev.Serv.	2001-101-000	October 14th Federal Withholding	11,077.68	
EFT	10/14/22	mnd001	MN Revenue	2003-101-000	October 14th State Withholding	1,964.10	
EFT	10/14/22	per001	PERA	2011-101-000	October 14th PERA	6,319.13	
EFT	10/14/22	emp002	Empower Retirement	2016-101-000	Employee Def. Comp. Contributions	3,170.00	
EFT	10/14/22	emp002	Empower Retirement	2018-101-000	Employee IRA Contributions	400.00	
Dir.Dep.	10/28/22	---	Payroll Expense-Net	4010-101-000	October 28th Payroll	30,266.58	
EFT	10/28/22	int002	Internal Rev.Serv.	2001-101-000	October 28th Federal Withholding	11,088.35	
EFT	10/28/22	mnd001	MN Revenue	2003-101-000	October 28th State Withholding	1,963.37	
EFT	10/28/22	per001	PERA	2011-101-000	October 28th PERA	6,520.73	
EFT	10/28/22	emp002	Empower Retirement	2016-101-000	Employee Def. Comp. Contributions	3,170.00	
EFT	10/28/22	emp002	Empower Retirement	2018-101-000	Employee IRA Contributions	400.00	
			Payroll/Benefits			**$106,764.01**	
			TOTAL:			**$488,332.63**	

BARR

Summary of Professional Engineering Services During the Period
September 17, 2022 through October 14, 2022

	Total Engineering Budget (2022)	Total Fees to Date (2022)	Budget Balance (2022)	Fees During Period	District Accounting Code	Plan Implementation Task Number
Engineering Administration						
General Engineering Administration	$80,000.00	$65,255.50	$14,744.50	$6,873.00	**4121-101**	DW-13
RWMWD Health and Safety/ERTK Program	$2,000.00	$540.00	$1,460.00	$0.00	**4697-101**	DW-13
Educational Program/Educational Forum Assistance	$20,000.00	$2,847.50	$17,152.50	$0.00	**4129-101**	DW-11
Topical Workshop, Education, and Planning	$25,000.00	$0.00	$25,000.00	$0.00	**4129-101**	DW-13
Engineering Review						
Engineering Review	$60,000.00	$57,250.00	$2,750.00	$4,383.00	**4123-101**	DW-13
Project Feasibility Studies						
Interim emergency response plan funds for top priority District flooding areas	$30,000.00	$23,603.00	$6,397.00	$1,748.00	**4129-101**	DW-19
Groundwater/Surface Water Next Steps	$50,000.00	$0.00	$50,000.00	$0.00	**4129-101**	DW-10, DW-16
Hillcrest Golf Course	$20,000.00	$72.00	$19,928.00	$0.00	**4129-101**	DW-6
Kohlman Creek flood damage reduction feasibility study	$75,000.00	$6,503.50	$68,496.50	$437.00	**4129-101**	DW-9, KC-2, BELT-3
Kohlman Creek- Wakefield Lake Diversion Planning and Design	$111,600.00	$61,214.00	$86,010.00	$9,467.50	**4129-101**	DW-9, KC-2, BELT-3
Improvements to County Ditch 17	$20,000.00	$33,135.00	-$13,135.00	$2,489.00	**4129-101**	DW-9, BELT-3
Improvements to Phalen Village	$20,000.00	$22,952.00	-$2,952.00	$4,516.50	**4129-101**	DW-9, BELT-3
Ames Lake Technical Assisstance and Project Planning with St. Paul	$25,000.00	$15,677.00	$9,323.00	$595.00	**4129-101**	DW-9, BELT-3
694/494/94 WQ treatment feasibility study	$30,000.00	$0.00	$30,000.00	$0.00	**4129-101**	BCL-3
Double Driveway Optimization Study	$25,000.00	$5,117.50	$19,882.50	$646.00	**4129-101**	FC-2
Carver Pond Improvements Study (Fish Creek Subwatershed)	$25,000.00	$19,360.53	$5,639.47	$4,212.02	**4129-101**	FC-2
Evaluate compliance with South Metro Mississippi River TSS TMDL	$30,000.00	$2,472.00	$27,528.00	$408.00	**4129-101**	MR-2
Owasso Basin area/North Star Estates improvements (with City of Little Canada)	$50,000.00	$82,875.97	-$32,875.97	$21,302.00	**4129-101**	GC-3
Wetland Restoration Workshop, Education, and Planning	$5,000.00	$2,969.00	$2,031.00	$0.00	**4129-101**	DW-8
Contingency*	$45,000.00	$0.00	$45,000.00	$0.00	**4129-101**	
GIS Maintenance						
GIS Maintenance	$5,000.00	$1,047.00	$3,953.00	$28.00	**4170-101**	DW-13
Monitoring Water Quality/Project Monitoring						
Lake Water Quality Monitoring (Misc QA/QC)	$10,000.00	$34.50	$9,965.50	$0.00	**4520-101**	DW-2
Annual WQ Report Assistance	$10,000.00	$13,306.00	-$3,306.00	$180.00	**4520-101**	DW-2
Special Project BMP Monitoring	$25,000.00	$10,242.80	$14,757.20	$758.13	**4520-101**	DW-12
Grass Lake Berm Wetland Monitoring	$10,000.00	$8,893.08	$1,106.92	$0.00	**4520-101**	DW-5
Permit Processing, Inspection and Enforcement						
Permit Application Inspection and Enforcement	$10,000.00	$4,143.00	$5,857.00	$816.50	**4122-101**	DW-7
Permit Application Review	$55,000.00	$41,900.50	$13,099.50	$3,861.00	**4124-101**	DW-7
Lake Studies/TMDL Reports						
2022 Grant Applications	$40,000.00	$2,005.50	$37,994.50	$0.00	**4661-101**	DW-13
WMP Updates - Including Implementation Plan Updates if needed	$20,000.00	$5,333.00	$14,667.00	$0.00	**4661-101**	DW-13
Prioritization of water quality projects from subwatershed feasibility studies	$5,000.00	$957.00	$4,043.00	$24.00	**4661-101**	DW-13
Cost/Benefit Analysis of Treatment Options for Bennett and Wakefield in 2020 Internal Load Analysis	$35,000.00	$13,686.00	$21,314.00	$7,270.50	**4661-101**	WL-3, BeL-3
Phalen Chain of Lakes Changes in Water Quality	$2,500.00	$2,070.00	$430.00	$0.00	**4661-101**	DW-2, DW-12
Contingency for Lake Studies	$22,500.00	$0.00	$22,500.00	$0.00	**4661-101**	
Research Projects						
New Technology Mini Case Studies (average 6 per year)	$12,000.00	$4,174.50	$7,825.50	$260.00	**4695-101**	DW-12
Kohlman Permeable Weir Test System - Implement Monitoring Plan	$50,000.00	$17,342.13	$32,657.87	$1,524.00	**4695-101**	DW-12
Shallow Lake Aeration Study	$90,000.00	$66,350.56	$23,649.44	$9,781.92	**4695-101**	DW-12
Project Operations						
2022 Tanners Alum Facility Monitoring	$15,000.00	$19,691.77	-$4,691.77	$105.00	**4650-101**	TaL-3
Capital Improvements						
North St. Paul Target	$160,000.00	$158,012.30	$1,987.70	$58.00	**4128-518**	DW-6
East St Paul and North St. Paul Target Retrofit Projects	$5,000.00	$4,607.00	$393.00	$405.00	**4128-518**	DW-6
Woodbury Target Stormwater Retrofit	$46,900.00	$949.50	$45,950.50	$949.50	**4128-518**	DW-6
Ryan Drive-Keller Parkway Conveyance	$194,000.00	$226,516.20	-$32,516.20	$154.00	**4128-520**	DW-9. GC-3
2022 Targeted Retrofit Projects	$191,000.00	$164,446.04	$26,553.96	$11,763.76	**4128-518**	DW-6
Stewardship Grant Program: Gen'l BMP Design Assistance and Review (cases where Dist is approached by landowner, or landowner is not commercial, school, church).	$75,000.00	$46,546.31	$28,453.69	$9,918.00	**4682-529**	DW-6
Kohlman Creek Storage and Detention	$200,000.00	$0.00	$200,000.00	$0.00	**4128-520**	KC-2
Wetland Restoration	$100,000.00	$0.00	$100,000.00	$0.00	**4128-529**	DW-8
South Owasso Boulevard East WQ Pond	$150,000.00	$0.00	$150,000.00	$0.00	**4128-520**	GC-3
West Industrial Park Berm and associated improvements	$150,000.00	$0.00	$150,000.00	$0.00	**4128-520**	GC-3
Lake Emily Subwatershed Regional BMP	$160,000.00	$44,388.76	$115,611.24	$17,661.76	**4128-518**	LE-3
CIP Project Repair & Maintenance						
Routine CIP Inspection and Unplanned Maintenance Identification	$125,000.00	$107,515.03	$17,484.97	$27,269.33	**4128-516**	DW-5
Beltline 5-year Inspection	$70,000.00	$68,962.45	$1,037.55	$270.00	**4128-516**	BELT-2
District Inspection Standardization	$34,200.00	$35,577.26	-$1,377.26	$2,406.00	**4128-516**	DW-5
2022 CIP Maintenance and Repairs	$150,000.00	$94,533.92	$55,466.08	$768.00	**4128-516**	DW-5
2023 CIP Maintenance and Repairs (planning, bidding, and project setup)	$40,000.00	$0.00	$40,000.00	$0.00	**4128-516**	DW-5
				$153,309.42		

Barr declares under the penalties of Law that this Account,
Claim, or Demand is just and that no part has been paid.

Bradley J. Lindaman, Vice President

Galowitz Olson, PLLC
10390 39th Street North
Lake Elmo, Minnesota 55042
Office: (651) 777-6960
Fax: (651) 777-8937

Ramsey-Washington Metro Watershed District
C/O Tina Carstens
2665 Noel Drive
Little Canada **MN** 55117

October 19, 2022
File No: 9M

	Balance
General Account	$1,440.00

Permit Application Coversheet

Date November 02, 2022

Project Name Villas of Gervais Lake Project Number 22-29

Applicant Name Sean Keatts, Cara Builders, LLC

Type of Development Residential

Property Description

This project is located west of Edgerton Street, south of Gervais Mill Park in the City of Little Canada. The applicant is proposing to construct 7 single-family homes with associated cul-de-sac and stormwater facilities. The total site area is 2.9 acres. A wet stormwater pond and iron-enhanced filtration basin are proposed to meet stormwater treatment requirements for downstream water quality and runoff rate control. Pretreatment method is a sumped manhole upstream of the filtration basin. The applicant received a Wetland Conservation Act (WCA) no wetland designation on 12/15/21 (#21-21 WCA). A low area on the north side of the site is mapped within the District's 100-year floodplain. The applicant has submitted calculations to demonstrate the proposed grading will result in no net fill in the floodplain and thus no net loss of flood storage on the landscape.

Watershed District Policies or Standards Involved:

- ☐ *Wetlands*
- ☑ *Erosion and Sediment Control*
- ☑ *Stormwater Management*
- ☑ *Floodplain*

Water Quantity Considerations

The proposed stormwater management plan is sufficient to handle the runoff from the site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ Project Location Map
- ☑ Project Grading Plan

#22-29 Villas of Gervais Lake

Wetlands
- Manage A
- Manage B
- Manage C
- Lake
- Sediment
- Pond

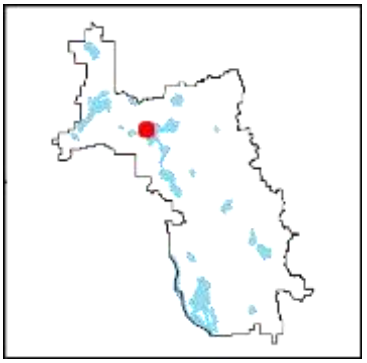
Not

- Flow Arrows
- Major Flow
- Arrows
- Subwatersheds
- Creeks

Highlighted Areas Represent Active Permit

0 125 250
Feet

0 0.025 0.05
Miles



22-29

Special Provisions

1. The applicant shall submit the final, signed plans set.

2. The applicant shall submit the signed stormwater maintenance agreement.

3. The applicant shall submit a site-specific BMP Operations & Maintenance Plan.

4. The applicant shall submit a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit coverage for the project.

5. The applicant shall submit contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

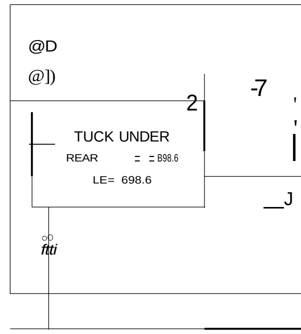
6. The applicant shall submit the escrow fee of $14,500.

GENERAL NOTES

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF EXISTING UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO TYPE AND LOCATION OF UTILITIES AS NECESSARY TO AVOID DAMAGE TO THESE UTILITIES.
2. CALL "BII" FOR EXISTING UTILITIES LOCATIONS PRIOR TO ANY EXCAVATIONS.
3. THE CONTRACTOR SHALL FIELD VERIFY SIZE, ELEVATION, AND LOCATION OF EXISTING UTILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO THE START OF INSTALLATIONS.
4. INSTALLATIONS SHALL CONFORM TO THE CITY STANDARD SPECIFICATIONS AND DETAIL PLATES (MOST CURRENT EDITION) AND MNDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION (MOST CURRENT EDITION).
5. STORAGE OF MATERIALS OR EQUIPMENT SHALL NOT BE ALLOWED ON PUBLIC STREETS OR WITHIN PUBLIC RIGHT-OF-WAY.
6. NOTIFY CITY OF EAST BETHEL A MINIMUM OF 48 HOURS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
8. All ELECTRIC, TELEPHONE, AND GAS EXTENSIONS INCLUDING SERVICE LINES SHALL BE CONSTRUCTED TO THE APPROPRIATE UTILITY COMPANY SPECIFICATIONS. ALL UTILITY DISCONNECTIONS SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY.

FINISHED GRADE AT REAR OF HOUS_J:
- 0.5–FT BELOW LF. FOR WALKOUTS
- 0.7-FT BELOW LO. FOR FVII BASEMENTS AND LOOKOUTS

HOUSE TYPE
W.O.- WALKOUT
I.O.- LOOKOUT
'= DROP ONE COURSE
"= DROP TV.'O COURSES

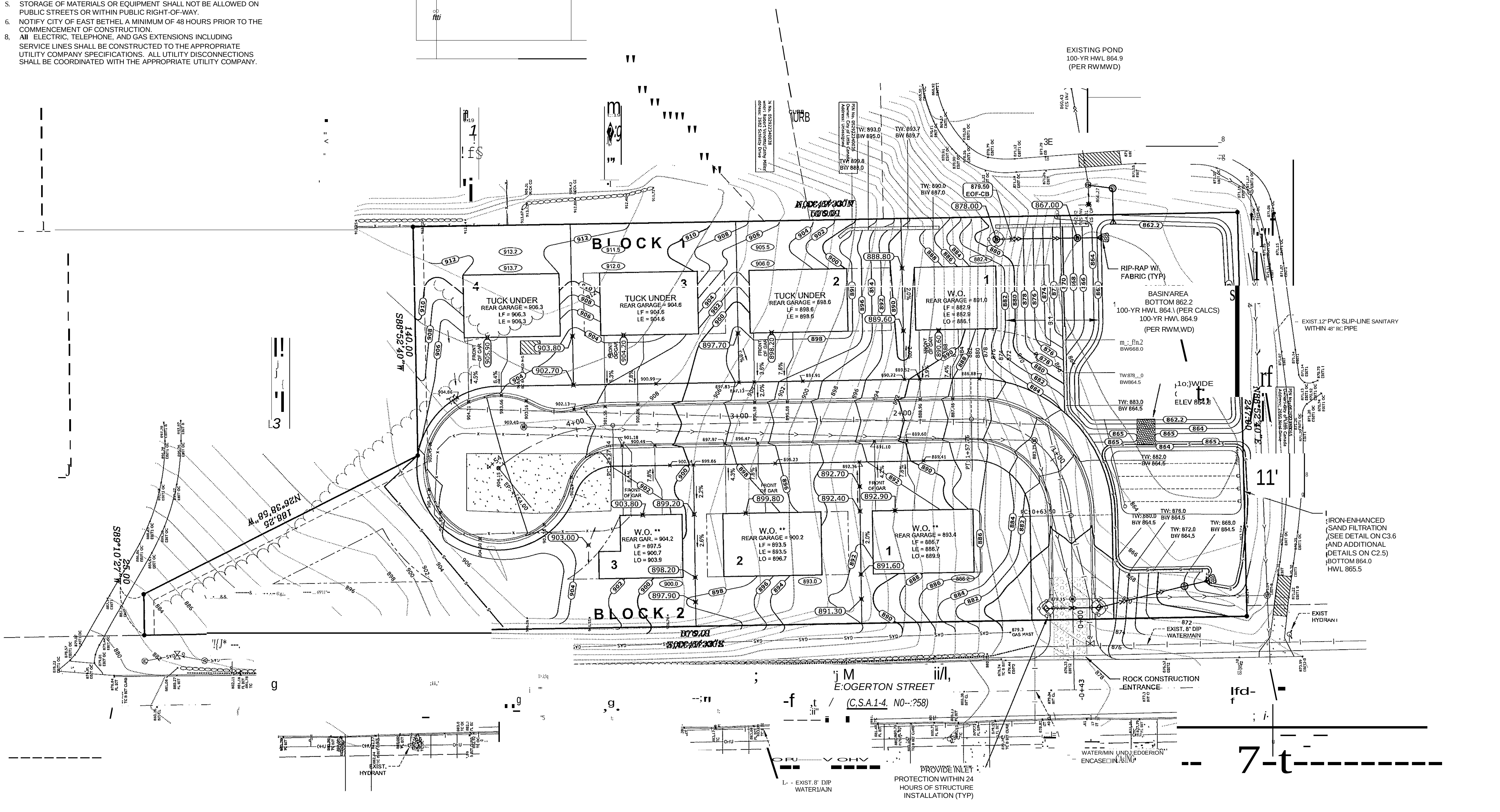


LF = LOW FLOOR
LE= LOW ENTRY
LO= LOOK-OUT ELEVATION

ADDITIONAL NOTES

1. NOTIFY NICOLE SODERHOLM, RAMSEY-WASHINGTON METRO WATERSHED DISTRICT, AT (651) 792-7976 PRIOR TO BEGINNING AfN CONSTRUCTION ACTIVITY IN ORDER TO SCHEDULE AN INITIAL S'.-VPPP INSPECTION.
2. NOTIFY NICOLE SODERHOLM, RAMSEY-WASHINGTON METRO WATERSHED DISTRICT, AT (651) 792.7975 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION OF THE STORMWATER BASIN.
3. THE SPECIFIED EROSION AND SEDIMENT CONTROL MEASURES ARE THE MINIMUM. CONTRACTOR TO PROVIDE ADDITIONAL PRACTICES IF REQUIRED DURING THE COURSE OF CONSTRUCTION.

1 INCH = 30 FEET
HORIZONTAL
(22'X34')



SITE PLANNING
SITEPLANNING
&ENGINEERING
PLOWE
ENGINEERING, INC.
6776 LAKE DRIVE
SUITE 110
LINO LAKES, MN 55014
PHONE: (651) 361-8210
FAX: (651) 361-8701

DRAWN BY:	CHECK BY:
AG	CMP
JOB NO:	DATE:
22-2039	07/25/22

SHEET
C1.1

22-2039

S:\PLOWE\CAD\22PROJ\2039 LITTLE ... Office\DA\1039 CAD\2039 r.r sE 7.DWG

BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit: Ramsey-Washington Metro Watershed District (RWMWD) **County:** Ramsey
Applicant Name: Ashley Dalessandro (Centra North, LLC) **Applicant Representative:** Will Effertz (Kjolhaug Environmental Services)
Project Name: Edgerton Street No Wetland Determination **LGU Project No. (if any):** 21-21 WCA
Date Complete Application Received by LGU: 11/11/2021
Date of LGU Decision: 12/13/2021
Date this Notice was Sent: 12/15/2021

WCA Decision Type - check all that apply

☒**Wetland Boundary/Type**	☐**Sequencing**	☐**Replacement Plan**	☐**Bank Plan (not credit purchase)**
☐**No-Loss (8420.0415)**		☐**Exemption (8420.0420)**	
Part: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G** ☐ **H**		**Subpart:** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7** ☐ **8** ☐ **9**	

Replacement Plan Impacts (replacement plan decisions only)

Total WCA Wetland Impact Area:
Wetland Replacement Type: ☐ Project Specific Credits: ☐ Bank Credits:
Bank Account Number(s):

Technical Evaluation Panel Findings and Recommendations (attach if any)

☐ Approve ☐ Approve w/Conditions ☐ Deny ☒ No TEP Recommendation

LGU Decision

☐ Approved with Conditions (specify below)[1] List Conditions:	☒ Approved[1]	☐ Denied
Decision-Maker for this Application: ☒ Staff ☐ Governing Board/Council ☐ Other: **Decision is valid for:** ☒ 5 years (default) ☐ Other (specify):		

[1] *Wetland Replacement Plan approval is not valid until BWSR confirms the withdrawal of any required wetland bank credits. For project-specific replacement a financial assurance per MN Rule 8420.0522, Subp. 9 and evidence that all required forms have been recorded on the title of the property on which the replacement wetland is located must be provided to the LGU for the approval to be valid.*

LGU Findings – Attach document(s) and/or insert narrative providing the basis for the LGU decision[1].

☐ Attachment(s) (specify):

☒ Summary: **A field review of the site was completed on 11/30/21. Field observations were consistent with the report's findings that there are no wetlands within the evaluation area.**

[1] *Findings must consider any TEP recommendations.*

Attached Project Documents

☒ Site Location Map ☐ Project Plan(s)/Descriptions/Reports (specify):

Appeals of LGU Decisions

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Director along with a check payable to BWSR for $500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail. The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to why the decision is in error. Send to:

Appeals & Regulatory Compliance Coordinator
Minnesota Board of Water & Soils Resources
520 Lafayette Road North
St. Paul, MN 55155
travis.germundson@state.mn.us

Does the LGU have a local appeal process applicable to this decision?

☐ Yes[1] ☒ No

[1]*If yes, all appeals must first be considered via the local appeals process.*

Local Appeals Submittal Requirements (LGU must describe how to appeal, submittal requirements, fees, etc. as applicable)

Notice Distribution (include name)

Required on all notices:

☒ SWCD TEP Member: **Emily Deering (Ramsey County)**	☒ BWSR TEP Member: **Ben Meyer**
☐ LGU TEP Member (if different than LGU contact):	
☒ DNR Representative: **Leslie Parris**	
☐ Watershed District or Watershed Mgmt. Org.:	
☒ Applicant (notice only):	☐ Agent/Consultant (notice only):

Optional or As Applicable:

☒ Corps of Engineers: **Samantha Coungeris**	
☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only):	
☐ Members of the Public (notice only):	☒ Other: **Mark Kjolhaug (Kjolhaug Environmental Services)**

Signature: Nicole Soderholm	**Date:** 12/15/2021

This notice and accompanying application materials may be sent electronically or by mail. The LGU may opt to send a summary of the application to members of the public upon request per 8420.0255, Subp. 3.

Permit Application Coversheet

Date November 02, 2022

Project Name Wells Fargo Redevelopment Woodbury Project Number 22-30

Applicant Name Dan Regan, Launch Properties

Type of Development Commercial/Retail

Property Description

This project is located off Valley Creek Road and Bielenberg Drive in the City of Woodbury. The applicant is proposing to demolish an existing bank and redevelop the site to include a grocery store, smaller bank branch with drive-thru, parking lot, and associated utilities. The total site area is 5.15 acres. Three underground filtration systems are proposed to meet stormwater treatment requirements. Filtration is being proposed due to poor soils. Pretreatment will included sumped inlets. A rain garden was constructed on this site in 2016 through the District's targeted retrofit program (BMP ID #16-01 TR). District staff requested the applicant avoid or relocate the garden, however the applicant determined it was infeasible to meet the goals of the development. In order to impact the rain garden, the applicant will pay the District a fee of $10,940, a prorated amount calculated based on construction costs and the intended remaining life cycle of the BMP.

Watershed District Policies or Standards Involved:

- ☐ *Wetlands*
- ☑ *Erosion and Sediment Control*
- ☑ *Stormwater Management*
- ☐ *Floodplain*

Water Quantity Considerations

The proposed stormwater management plan is sufficient to handle the runoff from the site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ Project Location Map
- ☑ Project Grading Plan

#22-30 Wells Fargo Redevelopment Woodbury

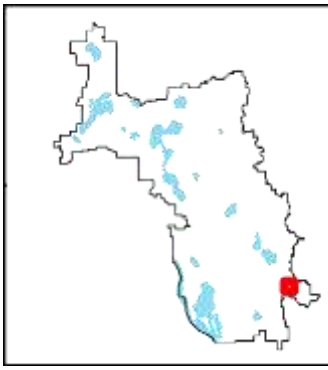
Wetlands
- Manage A
- Manage B
- Manage C
- Lake
- Sediment
- Pond

- Flow Arrows
- Major Flow
- Arrows
- Subwatersheds
- Creeks
- Permits

Highlighted Areas
Represent Active Permit

0 200 400
Feet

0 0.04 0.08
Miles



22-30

Special Provisions

1. The applicant shall submit the $25,750 escrow fee.

2. The applicant shall submit the rain garden replacement cost of $10,940.

3. The applicant shall submit the final, signed plans set.

4. The applicant shall submit an executed stormwater maintenance agreement for the proposed treatment facilities.

5. The applicant shall submit a site-specific BMP Operations & Maintenance Plan for the proposed treatment facilities.

6. The applicant shall provide contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

7. The applicant shall submit a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit coverage for the project.

EXISTING UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THE PLAN ARE BASED ON AVAILABLE RECORDS. THE CONTRACTOR MUST FIELD DETIERMINE THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION. REPORT DISCREPANCIES AND POTENTIAL CONFLICTS \TH PROPOSED UTILITIES TO ENGINEER PRIOR TO

INSTALLATION OF ANY PIPING.

LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- CENTIER LINE
- EASEMENT LINE
- FLOW LINE
- R RIDGE LINE
- PROPOSED STORM MANHOLE (SOLID CASTING)
- PROPOSED STORM MANHOLE (ROUND INLET CASTING)
- PROPOSED STORM MANHOLE/CATCH BASIN (CURB INLET CASTING)
- PROPOSED STORM SEWER CLEANOUT
- PROPOSED STORM SEWER

VALLEY CREEK RD

G: 1053.56
HP: 1053.80
G: 1053.64
G: 1052.84
G: 1052.98
LP: 1052.79
1053.17
1053
1053.84
G:1053.46
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T/G: 1052.89
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G: 1051.91
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TW: 1052.29
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BW: 1051.48
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GRAPHIC SCALE IN FEET
0 10 20 40

SHEET NUMBER
C-40

EXISTING UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THE PLAN ARE BASED ON AVAILABLE RECORDS. THE CONTRACTOR MUST FIELD DETERMINE THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION. REPORT DISCREPANCIES ANO POTENTIAL CONFLICTS WITH PROPOSED UTILITIES TO ENGINEER PRIOR TO INSTALLATION OF ANY PIPING.

LEGEND

- PROPERTY LINE
- -- RIGHT-OF-WAY LINE
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- PROPOSED STORM MANHOLE/CATCH BASIN (CURB INLET CASTING)
- el PROPOSED STORM SEWER CLEANOUT
- PROPOSED STORM SEWER

BIELENBERG DR

AOS STORMTECH SC 740 OR APPROVED EQUIVALENT
TOTAL VOLUME:0.28 AC-FT
TTOOP OF STONE:1047.8
OF PIPE:10473
HWL:1046.27
CHAMBER IE:1044.8

AOS STORM 6H 2SC 740, OR
TOTAL VOLUME EQUIVALENT
TOP OF STONE:1043.8
TOP OF PIPE:1043.3
HWL:1041.89
CHAMBER IE:1040.8
FILTRATION MEDIA IE:1038.8

53.20 FFE

54.00 FFE

CURRELL ROAD

GRAPHIC SCALE IN FEET
0 10 2_0 41

C-41

Permit Application Coversheet

Date November 02, 2022

Project Name White Bear Lake Apartments II Project Number 22-31

Applicant Name Peter Orth, Schafer Richardson/ WBL Land, LLC

Type of Development Residential

Property Description

This project is located off County Road E in the City of White Bear Lake. The applicant is proposing to demolish existing structures including a single family home and restaurant in order to construct an apartment building with associated parking. The total site area is 6.3 acres. An underground infiltration system is proposed to meet stormwater treatment requirements. Pretreatment method(s) include isolator pipes and weir plates.

Watershed District Policies or Standards Involved:

- ☐ *Wetlands*
- ☑ *Erosion and Sediment Control*
- ☑ *Stormwater Management*
- ☐ *Floodplain*

Water Quantity Considerations

The proposed stormwater management plan is sufficient to handle the runoff from the site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ Project Location Map
- ☑ Project Grading Plan

#22-31 White Bear Lake Apartments II

Note: Shaded area is outside RWMWD

Wetlands
- *Manage A*
- *Manage B*
- *Manage C*
- *Lake*
- *Sediment*
- *Pond*

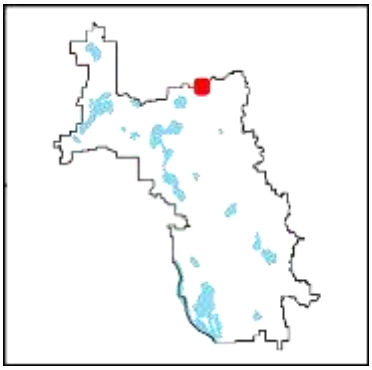
Not

- *WMU*
- *Flow Arrows*
- *Major Flow*
- *Arrows*
- *Subwatersheds*
- *Creeks*
- *Permits*

Highlighted Areas Represent Active Permit

0 150 300
Feet

0 0.0325 0.065
Miles



22-31

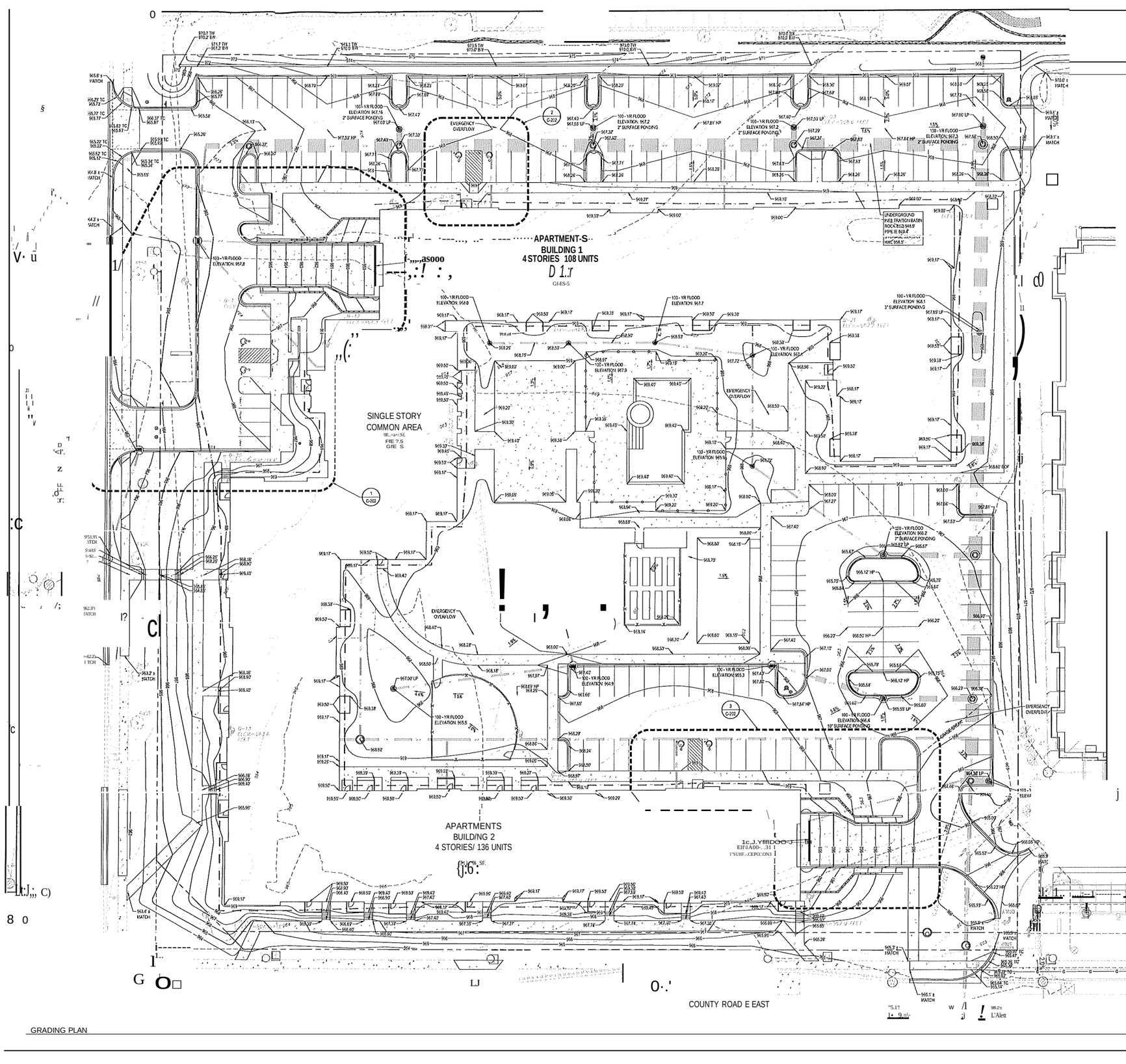
Special Provisions

1. The applicant shall submit the escrow fee of $31,310.

2. The applicant shall submit the final, signed plans set.

3. The applicant shall submit the executed stormwater maintenance agreement for the proposed facilities.

4. The applicant shall submit a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit coverage for the project.



LEGEND

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GRADING NOTES

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NPDES AREA SUMMARY

DINGPLAN

GRADING PLAN

C-201

PROJECT NO.
M1C22D02

!SSUES/REVIS!OTS

GRADING PLAN

Permit Application Coversheet

Date November 02, 2022

Project Name Oakdale Elementary Demolition Project Number 22-32

Applicant Name Mike Boland, ISD 622

Type of Development Grading

Property Description

This project is located at the existing Oakdale Elementary School off Glenbrook Avenue North in the City of Oakdale. The applicant is proposing to demolish the existing school and regrade the site with new topsoil and seed. The total site area is 6.5 acres. The proposed demolition activity is part of a larger phased redevelopment of the adjacent Tartan High School campus. No impervious surface is proposed as part of this phase, thus Rule C for stormwater management does not apply. Due to some grading within the 100-year floodplain, the applicant has submitted calculations to demonstrate no net loss of flood storage on the landscape. Wetlands were delineated adjacent to the site in 2020 with boundaries approved on 8/19/20 (#20-12 WCA). No wetland/buffer impacts are proposed as part of this permit.

Watershed District Policies or Standards Involved:

- ☑ *Wetlands*
- ☑ *Erosion and Sediment Control*
- ☐ *Stormwater Management*
- ☑ *Floodplain*

Water Quantity Considerations

The proposed grading plan results in no net loss of floodplain storage.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

There are no long term water quality considerations.

Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ Project Location Map
- ☑ Project Grading Plan

#22-32 Oakdale Elementary Demolition

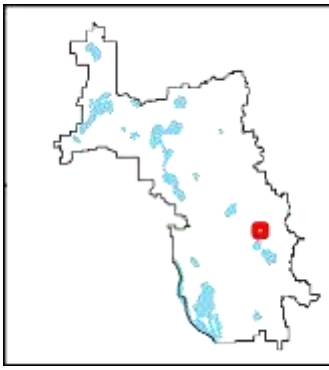
Wetlands
- Manage A
- Manage B
- Manage C
- Lake
- Sediment
- Pond

- WMU
- Flow Arrows
- Major Flow
- Arrows
- Subwatersheds
- Creeks
- Permits

Highlighted Areas
Represent Active Permit

0 150 300
Feet

0 0.0325 0.065
Miles



22-32

Special Provisions

1. The applicant shall provide contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

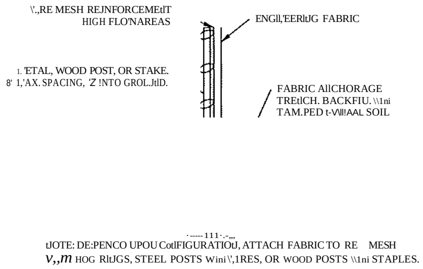
2. The applicant shall specify temporary soil stabilization methods.

3. The applicant shall submit a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit coverage for the project.

OAKDALE ELEMENTARY DEMOLITION

821 Glenbrook Ave. N.
Oakdale, MN 55128

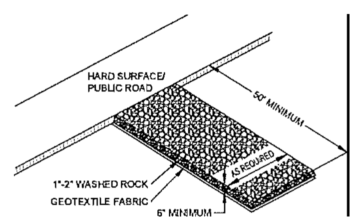
INDEPENDENT SCHOOL DISTRICT #622
2520 12th Ave. E.
North St. Paul, MN 55109



MN

SILT FENCE INSTALLATION DETAIL

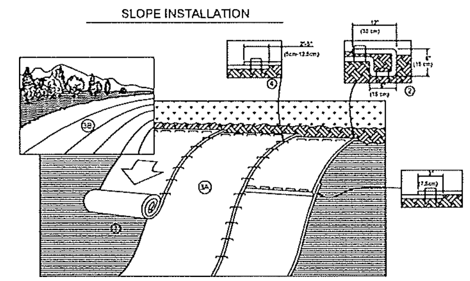
1 / C0.3 — NOT TO SCALE



ROCK CONSTRUCTION ENTRANCE

C0.30 — NOT TO SCALE

PROTECT BAU. FIELD AREA. NO CONSTRUCTION TRAFFIC OR STAGING/LAYDOWN. MATERIALS. SEE ARCHITECTURAL PLAN FOR PROJECT LIMITS.



EROSION CONTROL BLANKET

NOT TO SCALE

FILTER/MIT	5.G5 FT
OVERFLOW/RATE	
MAXIMUM FLOW RATE	
MAXIMUM SOLID FLOW	
MSr. F.f	

SYMBOL LEGEND

- EXISTING CONTOURS
- 950 — PROPOSED CONTOURS — MAJOR INTERVAL
- 949 — PROPOSED CONTOURS. MINOR INTERVAL
- GRADE BREAK LINE
- GRADE SLOPE
- SILT FENCE, DETAIL 1/C0.300
- RIP-RAP / ROCK CONST. ENTRANCE DETAIL 2/C0.300
- EROSION CONTROL BLANKET DETAIL 3/C0.300
- INLET PROTECTION DETAIL 4/C0.300

GRADING NOTES

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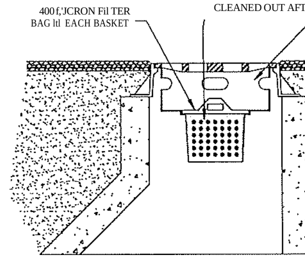

INFRASAFE INLET PROFILE

(OR APPROVED EQ)

EROSION CONTROL NOTES

1. Or ... and Contractor shall obtain MPCA-HPDES perml. Contractor shall be responsible for ... fees pertaining to th.'s perml. The SWPPP will be ... eplonsile at aHtimi'S.
2. InsbD temporary erosion coni'ol measuies (inlet protection, dit fence, and rock construction entrances) prior to beginning any exeavati ordemof'tion ... 0'ik at lhe s e.
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4. All construdion site entrances shall b9 surfa d r,-lhcrushed rock ac1oss the entire Tridlh ofthe entranceandfromtheenlrar,cetoapointSO'Intothecontructionzone.
5. The l.;e ofthedtfenceshal balrenchiH:lilla minimumofo". The trench Wekfillshalbe ... mpact,,d:Til:havibfalor.platecompactor.
6. AD grading operationsshal be conducted In a marvie:r to m!n!m!,ce the potential for sil'e erosbn. Sed'ment control practices must be esbbbh-ed on all d,,...m grad',ent perim..te1s before any up grade land disturbing activities begin.
7. A.!le posiH:l ... must be stabil-.zed as on as possibl9 to TmlSO'lerosIon but In ... no cases later than 14 days after the construction activity ... portion of the site has temporarily or permanently ceased. Temporary stockpiles Vlithouts ... Wyof ... components (e.g. concrete and aggregate ...) ... and the ... slmbr surfaces are nempl from this requirement.
8. The norrnal wetted perim,.ter of any temporary or pe1ma.nent draNge !itch or swale that d1alns wale1from any portion of the construction site, or lfverts meter around the de, mL1Si b9 slabifzed ... Stabilization of the 13st 200 linealfeet must be completed within 24 hours after connecting to a surface water. Stabilization of the remaining portions of any temporary or permanent ditches or swales must be complete within 14 days after connecting to a surface water and construction in that portion of the ditch has temporarily or permanently ceased.
9. Pipe oll!el5. must 00 pro·1ided with energy dissipation within 24 hows of connection to surface 1,-ater.
10. A.Jl riprap ... be Ulsb.li.-d wlha filter malarial or soi separation fabric, and comply with the L;ru-esota Departml!nl of Transportation Standard Speckations.
11. Allstormset,ers If charg'.ng into 'l'rl!llands or ,rater boc,es ... olAR tetor below the normal w-ater level of the mpectr.v Y,elfand or water body al an elevation r.t,ere the downstream slope is 1 percent or flatter. The normal mter lel·el shill ba the ilr1er1 elevation of the oul/.et of the =tarldorraterbocly.
12. AJlsto1msey,,-e1eal ... must be protected ... sewer system. Catch basins necessary for site drainage du.ingw l'Vctionshallt9ptoVlOOdITTlhinletprotecfun..
13. InareasY,-t.eveooconcentrated!lo1noceUJ(sueheasswralesaOOa1eesI1frontofslormc.atchbasins andrlt:ales)lheerosl.lneonlrolfacllitieus.tuHbeb3.ek bystabT,zationstructureIoprotectlhose facitltiastromtheroncenlratedflo;s.
14. Inspect the construction sile once every seven days during adive construction end with In 24 hours after a rain event of 1 later than D.S Inch,i.s D1 24 hours. AD Inspections shall be rec-ord'ld DltheSVPPP.
15. A.Jl BMPll m1 b9 rep:inld, lepbced, orsuppkmented ... the become nonfunctional or the sediment reaches 1/3 the capacity of the B.U.P. These repairs must be made within 24 hours of ... Allrepa'nW!!berecordedinthe SWPPP.
16. tis<-J<-fement escapes the construction site, off-site ... must be removed In ... manner ... fi1lier,cysuffie!entor!tinim1n.eoN-sleimpacts,
17. AD soik tracked onto pavement shall be removed daily.
18. All Inra!rafun ereas must ... d to erul.LJ9 that rn,setfment from OflSOil'og ... construction ... during ... inf'ilration a1ea.
19. Temporary soil stockpiles must have sit fence or other effective sediment controls, and cannot be placed in surface water, including stormwater conveyances such as curb and gutter systems, or conduits and ditches unless there is 1r1pass D1 pbceforthe stonm,-ater.
20. Cclected sed'ment, asphalt aOO concrete mill&,gs, floatir.g debris, paper, plastic, fabric, construction 1100 demolition debris and other wastes must b9 chpos of properly and must comply with MPCA disposal reqlirements.
21. O:t,gaS,OUle, paint: aOO any hazardous substances must be proper/ stored ... including secondary containment, to prevent spills, leaks or other discharge. Restricted access to storage areas L151 be provided to prevent vandalism. SlDrage and dispos.alofhuatdo 1Vaste must be in ... compliance with MPCA regulations.
22. E.>:te1/L1I m,shing of trucls aOO o!het constructic ... vehicles ml.1Si be fm_ted to e de lined area of the sb. Runoff must be contained and nsla propertJ ... Noeng'.ne degreasing Is allowed or,sile.
23. AD (qi.rid and sold ... wastes generated by concrete eras ut operations m t be ... nlalned In a leak-proof ... containment facility or impermeable liner. A COITIpacled ... that does not do1Y wash ... in contact with ground water Is consUlred an impenneable & ... The Fqlid and sofd ... wastes must not contact the ground, and there ml.15 be ... from the OOftCIete washout operations or areas. liquid and ... wastes mus..t bo C..posed of propc1t1aOO 11 compf.1.,ce r.ih MPCA. regulations. A sign must b9 Insblled a ... to each ... facility to in ... concrete equipment operators to utilize the proper facilities.
24. Upon completion of the project and stabilization of an graded a1eas. aD temporary erosion control ... (silt forKes, ha D3 s, etc.) shall be removed from the site.
25. A.Jl permanent sil ... ponds ... must be restored to their design condition immed-atelf ... sbbk.afion of the sfo.
26. Contractor shall submit Notice of Termination for LWCA.-t.'POES permit within 30 days after Fanal Stab.Tzatn.
27. J-bfy If ... Soderholm, Ramse -Wash'.nglon Matro WaterWd District, ... pric,1 to begM.ng any end all OOftStrucion activity for an in.itill S\VPPP inspection.

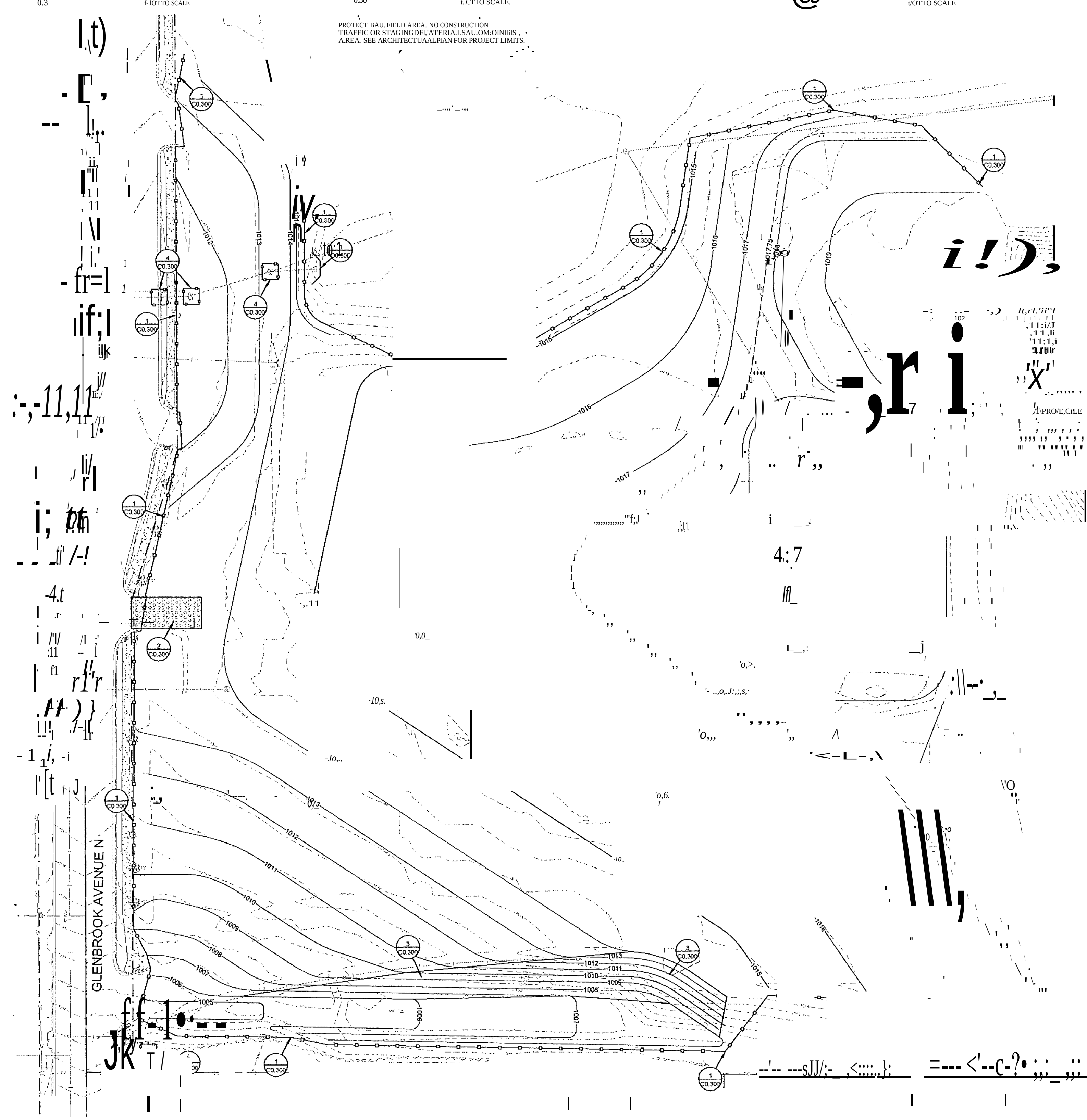
WOLD ARCHITECTS AND ENGINEERS

Larson
Engineering, Inc.
3524 Labore Road
White Bear Lake, MN 55110
651.481.9120 (f)651.481.9201
www.larsonengr.com

NORTH

0 15 30 60

Greg A. B'Ichi P.E.



Comm
Date
Drawn
Ch...tt

EB

GRADING AND EROSION CONTROL PLAN

C0.300

BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit: Ramsey-Washington Metro Watershed District (RWMWD)	**County:** Washington
Applicant Name: Randy Anderson (ISD 622)	**Applicant Representative:** Kaci Fisher (Hakanson Anderson)
Project Name: Tartan High School	**LGU Project No. (if any):** 20-12 WCA
Date Complete Application Received by LGU: 7/20/2020	
Date of LGU Decision: 8/18/2020	
Date this Notice was Sent: 8/19/2020	

WCA Decision Type - check all that apply

☒Wetland Boundary/Type ☐Sequencing ☐Replacement Plan ☐Bank Plan (not credit purchase)
☐No-Loss (8420.0415) ☐Exemption (8420.0420)
Part: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H Subpart: ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Replacement Plan Impacts (replacement plan decisions only)

Total WCA Wetland Impact Area:
Wetland Replacement Type: ☐ Project Specific Credits: ☐ Bank Credits:
Bank Account Number(s):

Technical Evaluation Panel Findings and Recommendations (attach if any)

☐ Approve ☒ Approve w/Conditions ☐ Deny ☐ No TEP Recommendation

TEP members Ben Meyer (BWSR) and Nicole Soderholm (RWMWD-LGU) completed a field review of the site on 8/7/2020 and observed unusual topography and vegetation for some of the areas marked wetland in the delineation report. For additional information, see enclosed Findings of Fact and memo describing subsequent wetland boundary revisions.

LGU Decision

☐ Approved with Conditions (specify below)[1] ☒ Approved[1] ☐ Denied
List Conditions:

Decision-Maker for this Application: ☒ Staff ☐ Governing Board/Council ☐ Other:

Decision is valid for: ☒ 5 years (default) ☐ Other (specify):

[1] *Wetland Replacement Plan approval is not valid until BWSR confirms the withdrawal of any required wetland bank credits. For project-specific replacement a financial assurance per MN Rule 8420.0522, Subp. 9 and evidence that all required forms have been recorded on the title of the property on which the replacement wetland is located must be provided to the LGU for the approval to be valid.*

LGU Findings – Attach document(s) and/or insert narrative providing the basis for the LGU decision[1].

☒ Attachment(s) (specify): **Findings of Fact, Wetland Revisions memo**
☐ Summary:

[1] *Findings must consider any TEP recommendations.*

Attached Project Documents

☒ Site Location Map ☐ Project Plan(s)/Descriptions/Reports (specify):

Appeals of LGU Decisions

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Director along with a check payable to BWSR for $500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail. The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to why the decision is in error. Send to:

Appeals & Regulatory Compliance Coordinator
Minnesota Board of Water & Soils Resources
520 Lafayette Road North
St. Paul, MN 55155
travis.germundson@state.mn.us

Does the LGU have a local appeal process applicable to this decision?

☐ Yes[1] ☒ No

[1]*If yes, all appeals must first be considered via the local appeals process.*

Local Appeals Submittal Requirements (LGU must describe how to appeal, submittal requirements, fees, etc. as applicable)

Notice Distribution (include name)

Required on all notices:

☒ SWCD TEP Member: **Jay Riggs (Washington Conservation District)**	☒ BWSR TEP Member: **Ben Meyer**
☐ LGU TEP Member (if different than LGU contact):	
☒ DNR Representative: **Leslie Parris**	
☐ Watershed District or Watershed Mgmt. Org.:	
☒ Applicant (notice only):	☒ Agent/Consultant (notice only): **Kaci Fisher, Barry Wagner**

Optional or As Applicable:

☒ Corps of Engineers: **Daryl Wierzbinski**	
☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only):	
☐ Members of the Public (notice only):	☐ Other:

Signature:	**Date:**
Nicole Soderholm	8/19/2020

This notice and accompanying application materials may be sent electronically or by mail. The LGU may opt to send a summary of the application to members of the public upon request per 8420.0255, Subp. 3.

Permit Application Coversheet

Date November 02, 2022

Project Name Ramsey County WBA-Larpenteur Improvement Project Number 22-33

Applicant Name Alan Maxwell, Ramsey County Public Works

Type of Development Linear

Property Description

This project is located generally at White Bear Avenue and Larpenteur Avenue in the cities of Maplewood and St. Paul. The applicant is proposing to complete pavement rehabilitation for a portion of the corridor while other areas will be fully reconstructed. Additional improvements will include retaining walls, signal updates, ADA upgrades, utility replacements, and associated stormwater treatment. The total site area is 12.9 acres. Two underground filtration systems are proposed to partially meet stormwater treatment requirements. Filtration is being proposed due to poor soils. The proposed treatment falls short of the overall volume reduction requirements due to spatial limitations and poor soils. The applicant is proposing to pay into the Stormwater Impact Fund for the remainder of the required volume, not to exceed the linear cost cap, for a total of $49,113. The project will result in a slight reduction in impervious area over existing conditions.

Watershed District Policies or Standards Involved:

- ☐ *Wetlands*
- ☑ *Erosion and Sediment Control*
- ☑ *Stormwater Management*
- ☐ *Floodplain*

Water Quantity Considerations

There are no water quantity considerations.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan with a payment into the Stormwater Impact Fund is sufficient to protect the long term quality of downstream water resources.

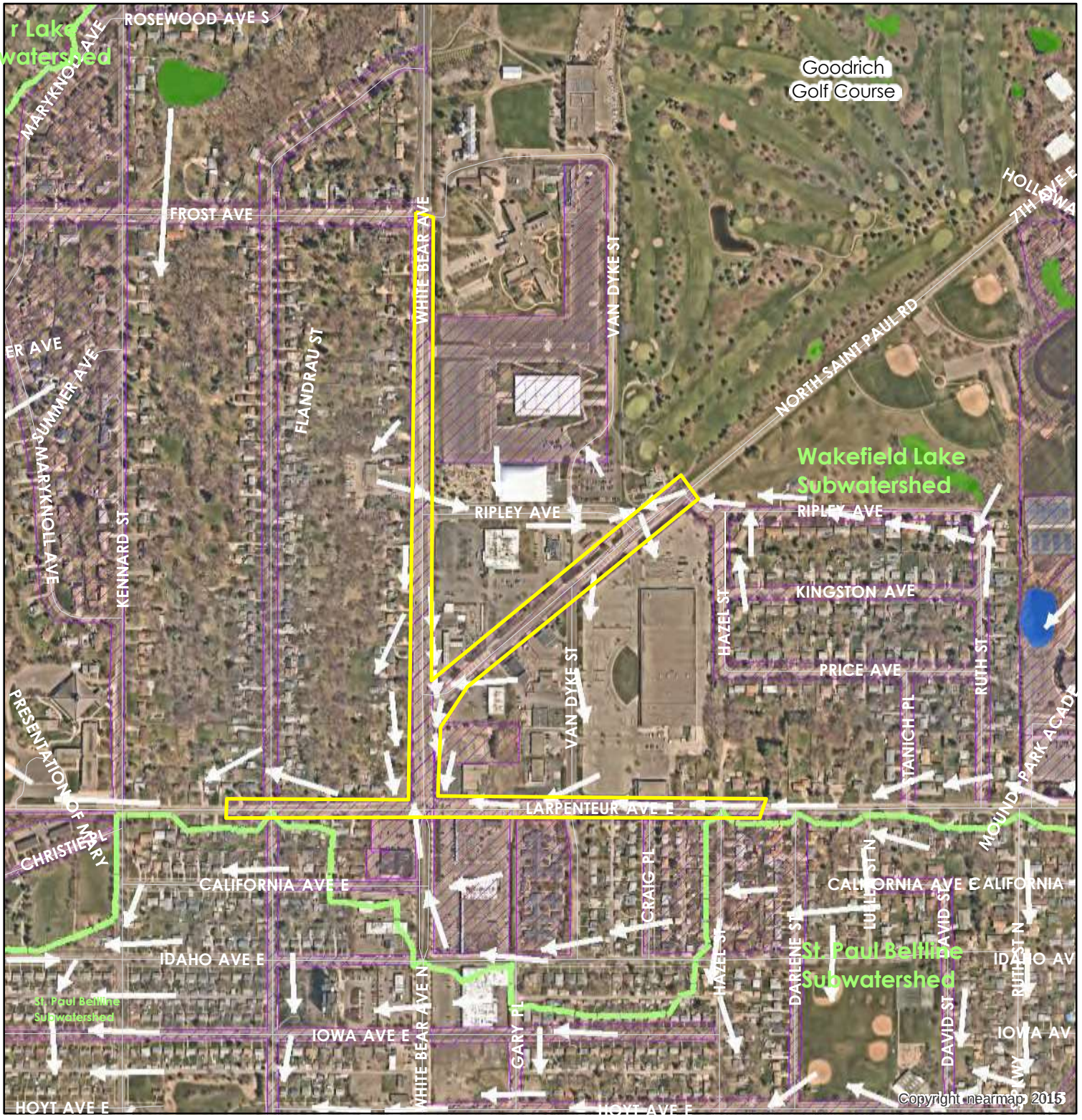
Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ Project Location Map
- ☐ Project Grading Plan

#22-33 Ramsey County WBA - Larpenteur Improvements



Wetlands
- Manage A
- Manage B
- Manage C
- Lake
- Sediment
- Pond

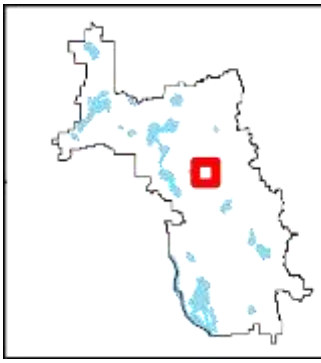
Not

- Flow Arrows
- Major Flow Arrows
- Subwatersheds
- Creeks

Highlighted Areas
Represent Active Permit

0 450 900
Feet

0 0.1 0.2
Miles



22-33

Special Provisions

1. The applicant shall add notes to the plans:
   A. Notify Nicole Soderholm, Ramsey-Washington Metro Watershed District, at 651-792-7976 prior to beginning construction activity in order to schedule an initial site inspection.
   B. Notify Nicole Soderholm, Ramsey-Washington Metro Watershed District, at 651-792-7976 at least 48 hours prior to construction of the underground stormwater treatment systems.
   C. The specified erosion and sediment control practices are the minimum. Additional practices may be required during the course of construction.

2. The applicant shall denote location(s) of proposed construction entrance(s) on the erosion control plan. Add symbology to the legend.

3. The applicant shall submit details for the specified erosion and sediment control practices.

4. The applicant shall submit the final, signed plans set.

5. The applicant shall provide contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

6. The applicant shall submit a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit coverage for the project.

7. The applicant shall submit the Stormwater Impact Fund payment of $49,113.

Permit Application Coversheet

Date November 02, 2022

Project Name Pioneer Park Improvements Project Number 22-34

Applicant Name Eric Seaburg, City of Little Canada

Type of Development Park/Green Space

Property Description

This project is located at Pioneer Park off Centerville Road in the City of Little Canada. The applicant is proposing to construct a new playground with interactive water feature and naturalized play area. Work will also include the mill-and-overlay of existing trails and a new trail section connection. The total site area is 1.6 acres. Four filtration basins are proposed to meet stormwater treatment requirements. Filtration is being proposed due to poor soils. Pretreament will include vegetated swales.

Watershed District Policies or Standards Involved:

- ☐ *Wetlands*
- ☑ *Erosion and Sediment Control*
- ☑ *Stormwater Management*
- ☐ *Floodplain*

Water Quantity Considerations

The proposed stormwater treatment plan is sufficient to handle the runoff from the site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

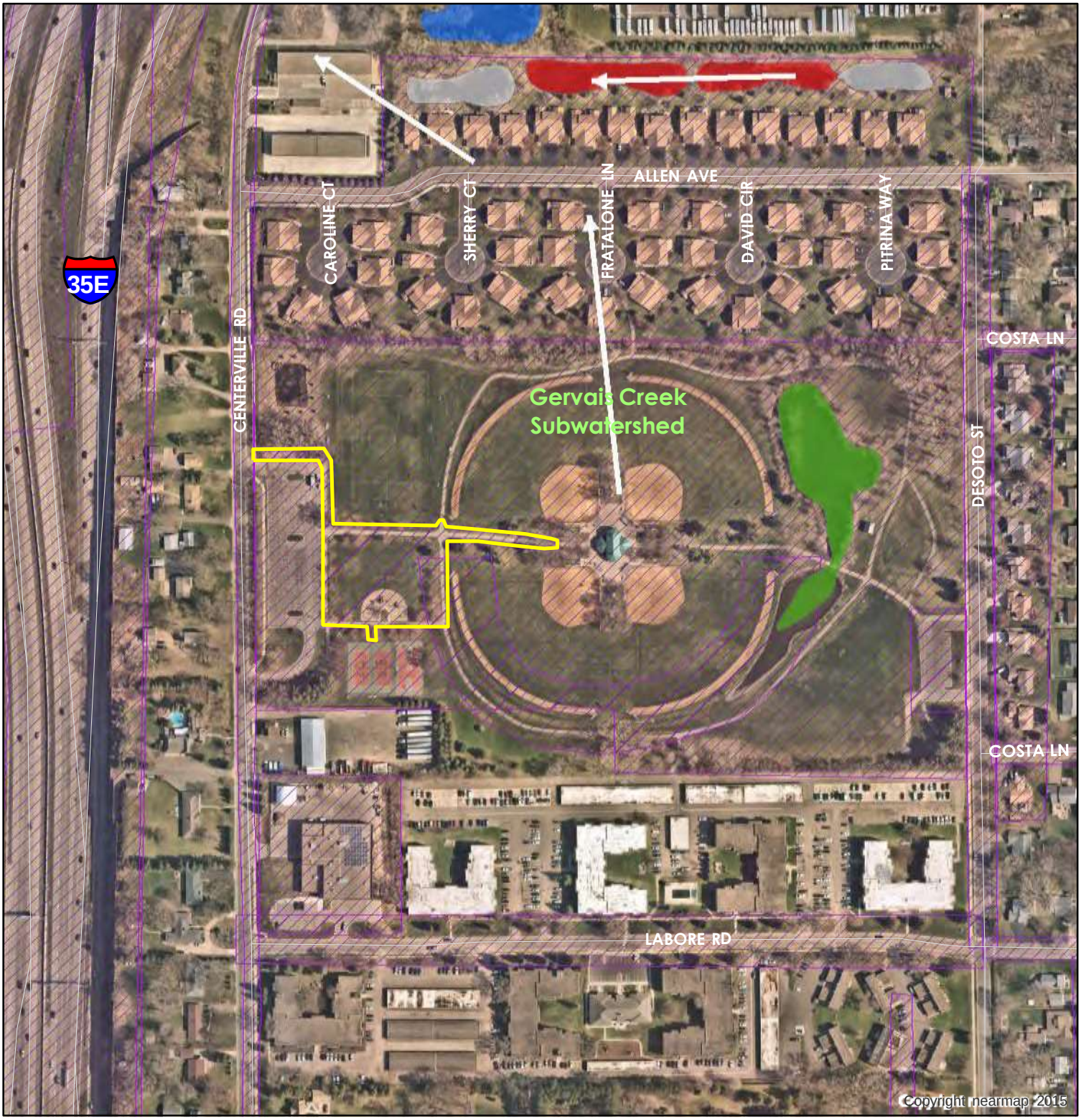
Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ Project Location Map
- ☑ Project Grading Plan

#22-34 Pioneer Park Improvements



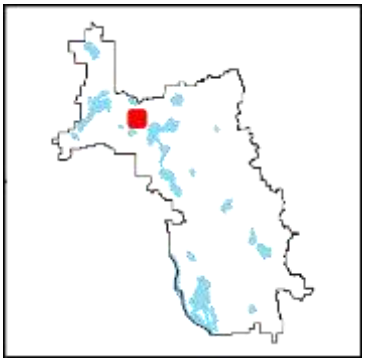
Wetlands
- Manage A
- Manage B
- Manage C
- Lake
- Sediment
- Pond
- Not

- Flow Arrows
- Major Flow
- Arrows
- Subwatersheds
- Creeks

Highlighted Areas
Represent Active Permit

0 225 450
Feet

0 0.05 0.1
Miles



22-34

Special Provisions

1. The applicant shall add notes to the plans:
   A. Notify Nicole Soderholm, Ramsey-Washington Metro Watershed District, at 651-792-7976 prior to beginning construction activity in order to schedule an initial site inspection.
   B. Notify Nicole Soderholm, Ramsey-Washington Metro Watershed District, at 651-792-7976 at least 48 hours prior to construction of the filtration basins.
   C. The specified erosion and sediment control practices are the minimum. Additional practices may be required during the course of construction.

2. The applicant shall label the BMP 100-year High Water Levels on the plans.

3. The applicant shall submit the final, signed plans set.

4. The applicant shall provide contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

5. The applicant shall submit the approved Minnesota Pollution Control Agency's NPDES Construction Permit coverage for the project.

SEE TRAIL CONNECTION INSET

SEE CONCRETE PEDES;RIAN RAMP!":_SET

SEE CONCRETE PEDESTRIAN RAMP INSET

CONNECTTOEXISTINGDRAINTILE-- INV.=897.3
CONTR CTORTOFIELDVERIFY

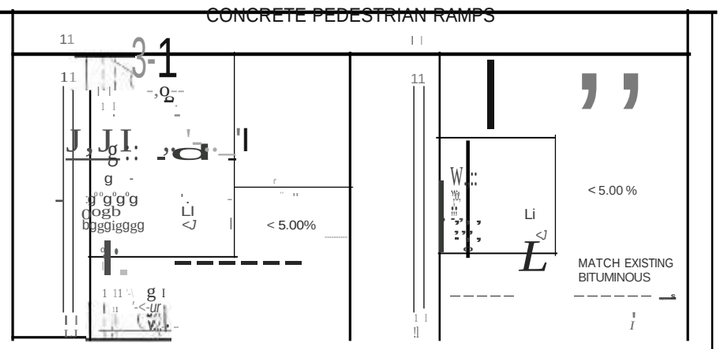
SEE C3.03

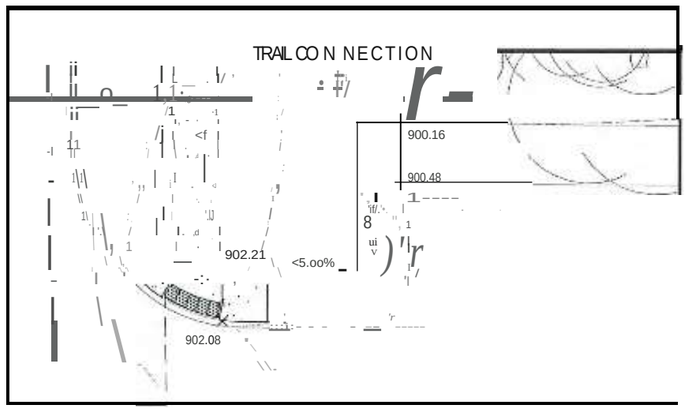
SHE TINGINS ON C3.

SEE C3.02

HORZ. 0 25 50
SCALE FEET

CONCRETE PEDESTRIAN RAMPS





GENERAL NOTES:

1. TRAIL REPAIR TO MATCH EXISTING GRADES; CROSS SLOPE ALONG BACK OF CURB .5% MIN/2% MAX TOWARDS PARKING LOT.
2. PEDESTRIAN RAMPS SHALL BE CONSTRUCTED PER CITY'S STANDARD DETAIL STR-5, SHEET C8.01.
3. CONTRACTOR RESPONSIBLE FOR REMOVAL, RE-CONSTRUCTION AND ASSOCIATED COSTS OF NEWLY CONSTRUCTED TRAIL EXCEEDING 5% RUNNING SLOPEAND/OR 2% CROSS SLOPE.
4. NOTIFY AND COORDINATEWITH OWNER'S REPRESENTATIVE IN THE EVENT THAT IN FIELD CONDITIONS VARY SIGNIFICANTLY FROM SURVEYED CONDITION.

@ BOLTON & MENK

111WASHINGTONAVES,SUITE650
MINNEAPOLIS,MINNESOTA 55401
Phone: (612)376-9226
Email: Minneapolis@bolton-menk.com
www.bolton-menk.com

LITTLE CANADA MINNESOTA

PIONEER PARK IMPROVEMENTS

GRADING PLAN

SHEET C3 01

Permit Application Coversheet

Date November 02, 2022

Project Name Rosedale Estates Temporary Parking Project Number 22-35

Applicant Name Matt Katzenmaier, Sterling Management, LLC

Type of Development Parking Lot

Property Description

This project is located off Rice Street, north of County Road C in the City of Roseville. The applicant is proposing to construct a temporary gravel parking lot due to a parking structure that is structurally failing. The total site area is 2.1 acres. A temporary infiltration basin is proposed to meet stormwater treatment requirements in the interim condition to prevent adverse water quality and runoff impacts downstream. A final parking plan is expected as a subsequent Phase 2 of the project. At that time, the final stormwater management plan will be reviewed again to ensure the proposed basin meets stormwater treatment requirements in the final condition.

Watershed District Policies or Standards Involved:

- ☐ *Wetlands*
- ☑ *Erosion and Sediment Control*
- ☑ *Stormwater Management*
- ☐ *Floodplain*

Water Quantity Considerations

The proposed stormwater management plan is sufficient to handle the runoff from the site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

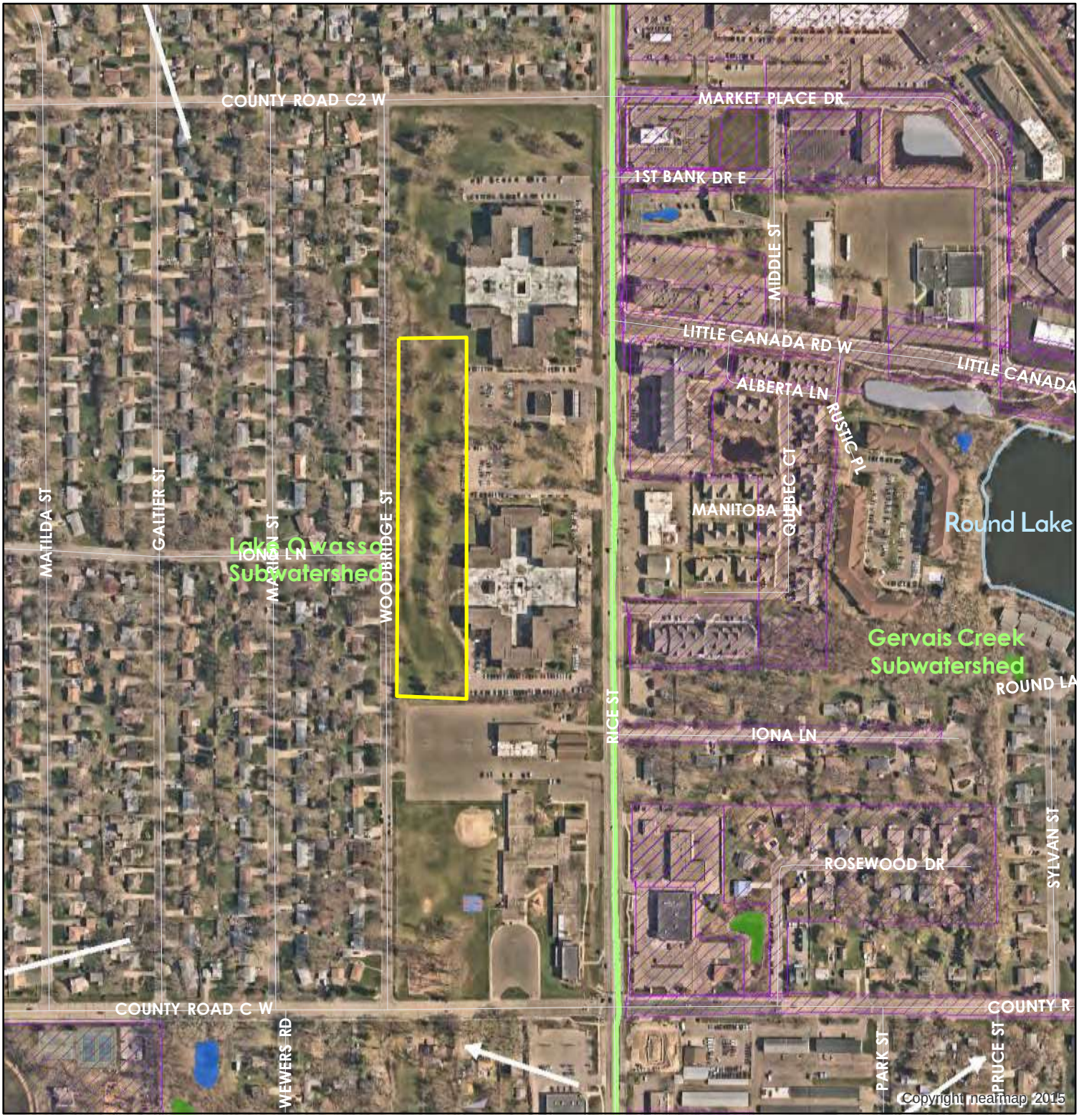
Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ Project Location Map
- ☑ Project Grading Plan

#22-35 Rosedale Estates Temporary Parking



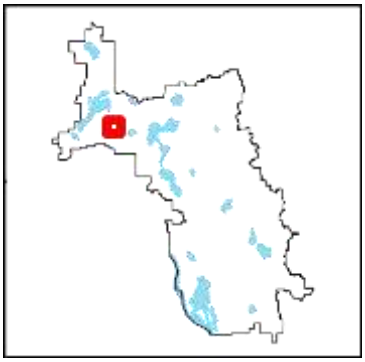
Wetlands
- Manage A
- Manage B
- Manage C
- Lake
- Sediment
- Pond
- Not

- Flow Arrows
- Major Flow
- Arrows
- Subwatersheds
- Creeks

Highlighted Areas Represent Active Permit

0 250 500
Feet

0 0.05 0.1
Miles



22-35

Special Provisions

1. The applicant shall submit the geotechnical report with onsite soil borings.

2. The applicant shall submit the escrow fee of $10,550.

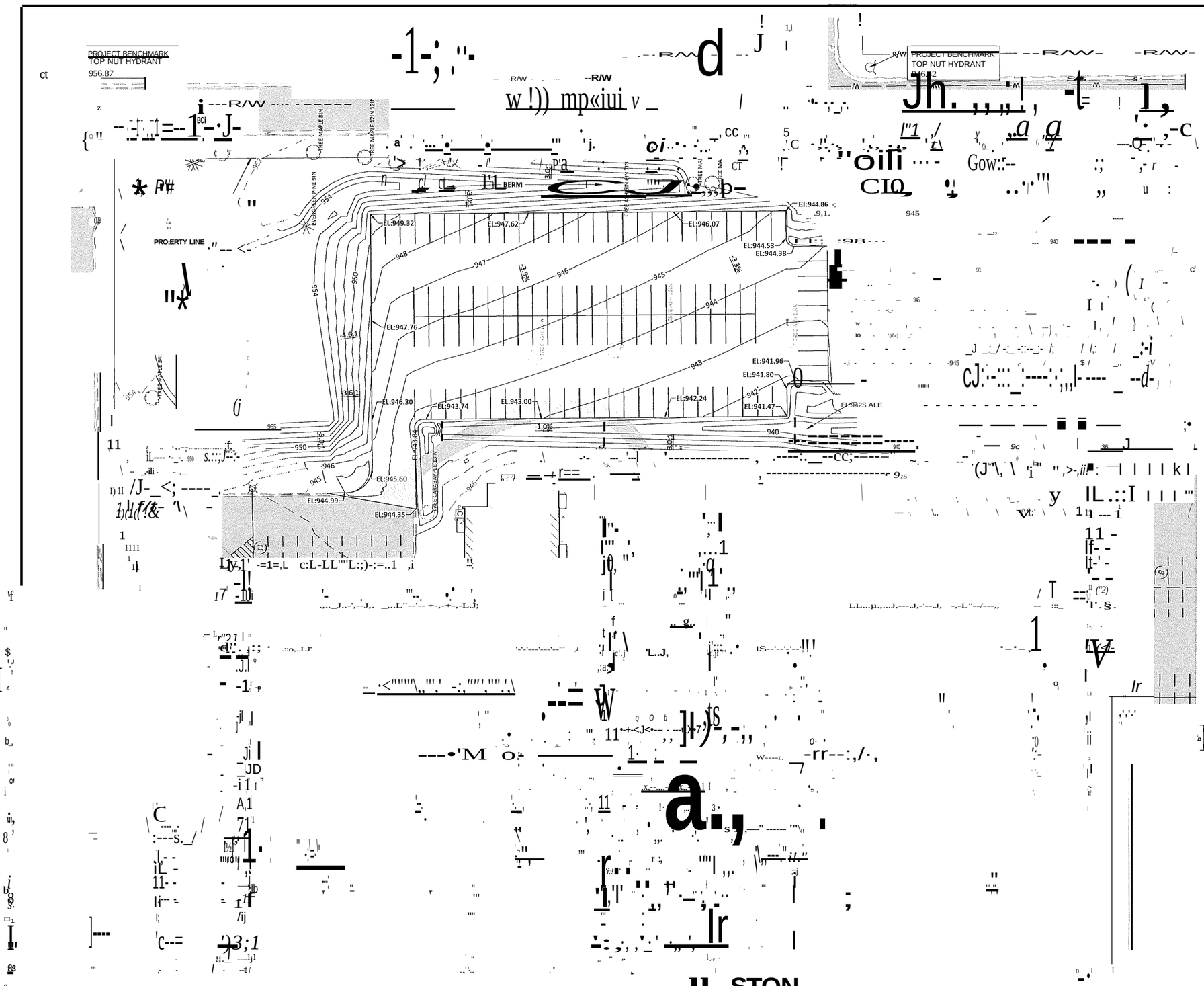
3. The applicant shall submit the revised erosion control plan that includes location(s) of proposed stabilized construction entrance(s).

4. The applicant shall submit the final, signed plans set.

5. The applicant shall submit the joint stormwater maintenance agreement with the City of Roseville.

6. The applicant shall provide contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

7. The applicant shall submit a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit coverage for the project.



r=== z--i.===-

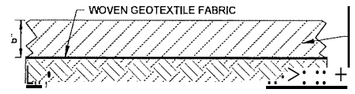
30 0 30 GO
Scale Feet

LEGEND	EXISTING	NEW
WATER MAIN	--W-------	
SANITARY SEWER MAIN / STORM SEWER MAIN	SS -STS----	
STORM INLET	S1	
SANITARY MANHOLE / STORM MANHOLE		
FIRE HYDRANT	D	
GATE VALVE / ACUNIT	[..] [ill	
GAS METER	[G]	
TRANSFORMER	[T]	
UTILITY POLE	0	
W /GUY WIRE	0---3	
LIGHT POLE	if	
OVERHEAD POWER	-OHP- - - -	
DECIDUOUS TREE	0	
CONIFEROUS TREE		
GUARD POST		
CHAIN-LINK FENCE	-,x,-,x,-,x,-	
SPOT ELEVATION		/. EI: 943.99
STANDARD CURB & GUTTER		
BITUMINOUS EDGE		
CONCRETE		
BUILDING		
GRAVEL PARKING LOT		
EDGE OF GRAVEL		
DRAINAGE DIRECTION		
IRON MONUMENT FOUND	●	
IRON MONUMENT SET	0	

COORDINATE SYSTEM: NAO 83 RAMSEY COUNTY (US FOOT)

NOTES:

1, COORDINATE All TREE REMOVA15 WITH OWNER PRIOR TO DEMOLITION.



GRAVEL SECTION
NOT TO SCALE

I hereby cify that thi lan, specification, or report was prepared by me or under my direct supervlSlon, a nd that J am a duly Licensed Professional Engineer unde r the laws of the State of Minnesota.
10-21-2022
Christophj,rC.Otterness
License No. 41961
Date

N R . .
o evlslon Date By

HOUSTON engineering, InC.

Drawn by AMZ | Date 10-21-2022
Checked by JEN | Scale AS SHOWN

ROSEDALE ESTATES TEMPORARY PARKING LOT
STERLING MANAGEMENT LLC
ROSEVILLE, MINNESOTA

PARKING LOT GRADING PLAN
PROJECT NO. 8369-0016

SHEET 1

30 0 30 60
Scale Feet

LEGEND

	EXISTING	NEW
WATER MAIN	—W—	
SANITARY SEWER MAIN	SS	
STORM SEWER MAIN	-STS-	
STORM INLET		
SANITARY MANHOLE		
STORM MANHOLE		
FIRE HYDRANT		
GATE VALVE		
AC UNIT		
GAS METER		
TRANSFORMER		
UTILITY POLE		
W /GUY WIRE		
LIGHT POLE		
OVERHEAD POWER	-OHP-	
DECIDUOUS TREE		
CONIFEROUS TREE		
GUARD POST		
CHAIN-LINK FENCE	-cXc-cXc-cXc-	
SPOT ELEVATION		EL:943.99
STANDARD CURB & GUTTER		
BITUMINOUS EDGE		
CONCRETE		
BUILDING		
GRAVEL PARKING LOT		
EDGE OF GRAVEL		
DRAINAGE DIRECTION		
IRON MONUMENT FOUND		
IRON MONUMENT SET		

COORDINATE SYSTEM: NAD 83 RAMSEY COUNTY (US FOOT)

NOTES:

1. COORDINATE ALL TREE REMOVALS WITH OWNER PRIOR TO DEMOLITION.

No.	Revision	Date	By

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.

Christopher C. Otterness 10-21-2022
License No. 41961 Date

HOUSTON engineering, inc.

Drawn by AMZ | Date 10-21-2022
Checked by JEN | Scale AS SHOWN

ROSEDALE ESTATES TEMPORARY PARKING LOT
STERLING MANAGEMENT LLC
ROSEVILLE, MINNESOTA

INFILTRATION BASIN GRADING PLAN
PROJECT NO. 8369-0016

SHEET 2

Stewardship Grant Application Summary

Project Name: Adkins

Application Number: 22-31 CS

Board Meeting Date: 11/2/2022

Applicant Name: Ron Adkins

Residential ☑ Commercial/Government ☐

Project Overview:

This project is located off Sunrise Drive in the City of Little Canada. The applicant's back yard has been over run with buckthorn and other invasive species which they will be removing this fall and winter. They are requesting grant funds to plant native grasses and wildflowers to help stabilize the cleared area, introduce more pollinator habitat, and prevent invasive species from returning. They plan to work with the contractor for ongoing maintenance on the project as well.

This project is eligible for 50% grant coverage up to $15,000.

BMP type(s):

Native Habitat Restoration(1)

Grant Request:
$7,100.00

Recommendation:

Staff recommends approval of this application.

Subwatershed:

Gervais Lake

Location Maps:

Mona Lackore and Ron Adkins

Stewardship Grant Application Summary

Project Name: Green Application Number: 22-32 CS

Board Meeting Date: 11/2/2022

Applicant Name: Kristi Green

Residential ☑ Commercial/Government ☐

Project Overview:

This project is located off South Owasso Boulevard on the east side of Lake Owasso in the City of Shoreview. The applicant currently experiences drainage issues and erosion concerns in their yard. They are proposing to add a stretch of pervious pavers to the end of their driveway and will regrade a portion of the yard so that runoff filters through the pervious pavers before draining into Lake Owasso.

This project is eligible for 75% coverage up to $15,000.

BMP type(s):

Porous Pavers(1)

Grant Request:

$6,100.00

Recommendation:

Staff recommends approval of this application.

Subwatershed:

Lake Owasso

Location Maps:

Stewardship Grant Application Summary

Project Name: Hutchinson Application Number: 22-33 CS

Board Meeting Date: 11/2/2022

Applicant Name: Josh Hutchinson

Residential ☑ Commercial/Government ☐

Project Overview:

This project is located off Cedarwood Drive and Parkwood Drive in the City of Woodbury. The applicant is proposing to install a rain garden to help capture and filter stormwater. They are also interested in adding native plants to increase pollinator habitat and decrease the amount of turf grass on their property.

This project is eligible for 75% coverage up to $15,000.

BMP type(s):

Rain Garden(1)

Grant Request:
$6,500.00

Recommendation:

Staff recommends approval of this application.

Subwatershed:

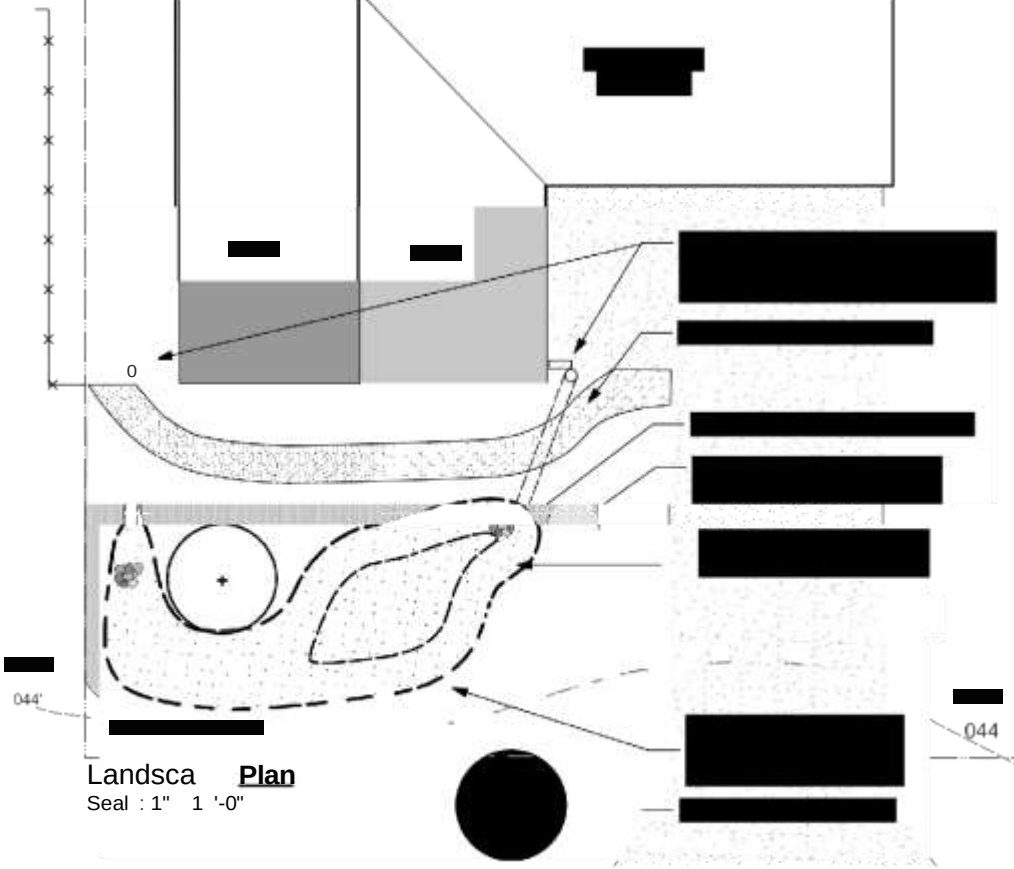
Carver Lake

Location Maps:

PHASE II RAIN GARDEN----------
[SEE SHEET 3]

DIRECT OVERFLOW AWAY FROM STRUCTURES BERM AS NEEDED

DIRECT DOWNSPOUT TO RAIN GARDEN, ADD DRAIN ROCK AT OUTFALL



Landsca **Plan**
Seal : 1" 1 '-0"

PHASE II - RAIN GARDEN (60 ft²)

RAIN GARDEN DESIGN --
60 ft² RAIN GARDEN
10 ft² MEDIA S.A.
-6" DEPTH
- NO UNDERDRAIN
-TREATS 125 ft² of IMPERVIOUS SURFACES

PERFORMANCE GOALS --
-TP (PHOSPHORUS): 0.005 lbs/yr
-TSS (SEDIMENT): .9 lbs/yr
-GALLONS: 2,052/ yr

PHASE I - RAING ARDEN (350 ft²) AND NATIVE PLANTING (550 ft²)

RAIN GARDEN DESIGN --
-350 ft² RAIN GARDEN
-80 ft² BASIN
-6" - 1' DEPTH
- NO UNDERDRAIN
-TREATS 800 ft² of IMPERVIOUS SURFACES

PERFORMANCE GOALS --
-TP (PHOSPHORUS): 0.033 lbs/yr
-TSS (SEDIMENT): 6 lbs/yr
-GALLONS OF WATER: 13,000/yr

NATIVE PLANTING DESIGN--
- STAGGERED BLOOM TIMES FOR SUSTAINED POLLINATOR HABITAT.
- RELIANCE ON NATIVE SPECIES.
- VISUALLY CONNECT TO EXISTING TREES AND BEDS.

PERFORMACE GOALS --
- CREATE HABITAT TO SUPPORT POLLINATORS AND OTHER WILDLIFE.

Washington Conservation District
455 Hayward Ave N
Oakdale, MN 55128
(651) 330-8230
www.mnwcd.org

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT
2665 Noel Drive - Little Canada, MN 55117-1634
Tel: (651) 792-7950 www.rwmwd.org

Date
8/11/2020

Sht-1
-of-
3

Consent Agenda Action Item

Board Meeting Date: November 2, 2022 **Agenda Item No:** 3E

Preparer: Tina Carstens, Administrator
Paige Ahlborg, Watershed Project Manager

Item Description: Change Order No. 1 for Lake Owasso Shoreline Restoration Project

Background:
Attached is change order number 1 for the Lake Owasso Shoreline Restoration Project. The attached change order lists the items needed to provide additional grading and rip rap to stabilize slopes on one of the properties. The total change in cost with this change order is $6,730.

Applicable District Goal and Action Item:

Goal: Achieve healthy ecosystems- The District will manage water and related natural resources to create and preserve healthy ecosystems.

Action Items: Lead ecological restoration projects to improve water resources and associated upland habitat.

Staff Recommendation:
Approve Change Order No. 1.

Financial Implications:
This change order increases the total contract price by $6,730.

Board Action Requested:
Approve Change Order No. 1.

Chang,e Order No. 1- Lake Owasso Shoreline Restoration Project
Ramsey-Washington Metro Watershed District
2022 Stewardship Grant Program

Date of Issuance: October 2, 2022

Owner: Ramsey-Washington Metro Watershed District
2665 Noel Drive
Little Canada, MN 55117
Attn: Lawrence Swope

Contractor: Landbridge Ecological
670 Vandalia St
St. Paul$_1$ MN 55114
Attn: Erin O'Leary

Designer': Ramsey County Parks & Recreation
2015 Van Dyke St
Maplewood, MN 55109
Attn: Brian Olsen

Summary:

All items within this change order apply to the Lake Owasso Shoreline Restoration Project. This work was requested by the owner's Watershed Project Manager to provide additfonal grading and rip rap installation at one of the shoreline restoration project properties. Further removaI of the existing root structure was requi red due to the reshaping of the shoreline that was required to achieve desired slope grades. The contractor completed the work, in good faith, under verbal author,ization and direction by the owner's representative.

Total Impact on Contract Price:

45 LF of rip Tap, including 6 ton @ $150/ton (1.5" washed angular rock) for a total cost of $900.

13 ton @$310/ton (natural field stone 6-24// diameter) for a total cost of $4,030

40CY @$45/CY Contract value of grading (shoreline shaping) for a total cost of $1,800.

Change in Contract Time:

These changes do not affect the contract time.

Total Impact on Contract Price:

The change increases the total contract price by $6,730.

This Change Order No. 1 is:

Submitted by:
(OWNER) Paige Ahlborg Date: 10/27/22

Paige Ahlborg, Watershed Project Manager
RWMWD

Authorized by:
{OWNER) _____ Date: _____

Lawrence Swope, President
RWMWD

Approved by:
(CONTRACTOR) [illegible] Date: 01 f. :ii 20 22

Erin O'Leary, Installation Services Coordinator
Landbridge Ecological

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Permit Program

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RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

MEMORANDUM

Date: November 2, 2022

To: Board of Managers and Staff

From: Nicole Soderholm, Permit Coordinator
Mary Fitzgerald, District Inspector

Subject: October Enforcement Action Report

During October 2022:

Number of Violations:	12
Install/Maintain Inlet Protection	4
Install/Maintain Perimeter Control	4
Contain/Dispose of Liquid and Solid Wastes	2
Install/Maintain Construction Entrance	1
Implement Temporary Soil Stabilization	1

Activities and Coordination Meetings:

Collaboration with private developers and public entities, miscellaneous resident inquiries, ongoing ESC inspections/reporting, non-compliance follow-up inspections and enforcement, WCA administration/procedures, new permit review with Barr Engineering, permit closure/final walk-throughs, vegetation establishment and 48-hour rainfall inspections, closed permit routine BMP inspections, initial erosion control walk-throughs, WEFTEC Conference in New Orleans, Hillcrest Golf Course wetland meetings, CAC presentation on permit program, Ford Site/Highland Bridge development tour with Capitol Region Watershed District, District rules update discussion

Project Updates:

#21-12 Tartan High School Phase 2 (Oakdale)

Tartan High School's multi-year redevelopment project continues through the month of October. Phase 1 consisted of updating ballfields, recreation areas and stormwater treatment onsite. Phase 2 is underway consisting of two building additions, sidewalks and parking lot reconfiguration. Staff conduct routine inspections jointly with the City of Oakdale's inspector to collaborate on findings and streamline inspection results. Both inspectors inspected the site on October 3rd and found action items needed including construction entrance maintenance, inlet protection maintenance, concrete washout cleanup, and stabilization of inactive exposed soils. District and city inspectors joined together for another inspection on October 24th and found concrete washout to be cleaned up and stabilization in progress, however inlet protection and construction entrance maintenance was still needed. Staff communicated these findings to site contacts and provided timeframes in which these repairs needed to be completed. Staff will continue to inspect this site through the various phases of the project.

#22-28 Pioneer Commons (Little Canada)

Work has begun at Pioneer Commons in Little Canada, a residential subdivision that will feature 178 townhome units, parking, street connections, and stormwater treatment areas when complete. Staff attended an initial erosion control walk-through on October 21st with the site's general contractor. Topics discussed during this meeting included silt fence maintenance, rock entrance maintenance, temporary soil stabilization requirements, and RWMWD's inspection process. The site manager inquired if RWMWD will be inspecting through the duration of building homes, and staff clarified that inspections would be continuous through the entire project until all work is complete and the site is stabilized. This will likely be a multi-year project with grading activity and utility work to begin this fall. Depending on project scheduling the site may go inactive through winter and pick back up again in the spring.

#20-22 Maplewood Elementary (Maplewood)

The previous school known as Maplewood Middle School has taken on a much different appearance now that site work is significantly complete, creating Justice Alan Page Elementary. This multi-year project constructed an entire new school building with associated sidewalks, parking, ballfields, and stormwater treatment BMPs. The old building was recently demolished, and will now be the space for new ballfields and other green space. Staff inspected the site on October 21st and found final stabilization underway in many areas throughout the site. Existing rain gardens that were installed through the District's Stewardship Grant program still remain onsite, and will act as additional treatment in addition to the school's newly installed permitted BMPs.

Single Lot Residential Permits Approved by Staff:

None

Permits Closed:

20-32	MnDOT Highway 61 Drainage Infrastructure (Maplewood)
21-30	Roseville Area High School Baseball Field (Roseville)

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Stewardship Grant Program

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Stewardship Grant Program Budget Status Update

November 2, 2022

Homeowner	Coverage	Number of Projects: 21	Funds Allocated
Habitat Restoration and rain garden w/o hard surface drainage	50% Cost Share $15,000 Max	13	$43,900*
Rain garden w/hard surface drainage, pervious pavement, green roof	75% Cost Share $15,000 Max	7	$60,725*
Master Water Steward Project	100% Cost Share $15,000 Max	0	$051
Shoreland Restoration	100% Cost Share $15,000 Max	1	$15,000

Commercial, School, Government, Church, Associations, etc.	Coverage	Number of Projects: 12	Funds Allocated
Habitat Restoration	50% Cost Share $15,000 Max	3	$25,500
Shoreland Restoration (below 100-year flood elevation w/actively eroding banks)	100% Cost Share $100,000 Max	1 (Lake Owasso)	$160,000
Priority Area Projects	100% Cost Share $100,000 Max	5	$378,540
Non-Priority Area Projects	75% Cost Share $50,000 Max	1	$50,000
Public Art	50% Cost Share $15,000 Max	0	$0
Aquatic Veg Harvest/LVMP Development	50% Cost Share $15,000 Max	2	$12,430

Maintenance	50% Cost Share $5,000 Max for 5 Years	73	$51,375
Consultant Fees			$32,766
Total Allocated			**$834,036**

2022 Stewardship Grant Program Budget	
Budget	$1,000,000
Total Funds Allocated	$834,036
Total Available Funds	**$165,964**

**Includes $19,700 pending approval at the November 2, 2022 board meeting.*

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Action Items

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Request for Board Action

Board Meeting Date: November 2, 2022 **Agenda Item No:** 7A

Preparer: Tina Carstens, Administrator

Item Description: 2023 CIP Maintenance and Repair Project Authorization to Finalize Design and Prepare the Bidding Documents and Advertise for Bids.

Background:
Annually, the District completes a project to maintain the existing infrastructure owned and operated by the District, and to assist and facilitate stormwater pond cleanouts to allow other public entities to meet their municipal separate storm sewer system (MS4) requirements.

Staff has put together the 2023 CIP Maintenance/Repair project preliminary design and are seeking authorization from the board at the November 2 meeting to proceed with the bidding process. Attached are select pages of the plan set and information on the new inspection process and records. The proposed cost will be presented at the board meeting.

If the board deems it appropriate they should consider a motion that "approves the preliminary design, estimate of probable costs, and expected schedule, and directs the staff to prepare the bidding documents and advertise the project for bid". Staff will present bids for the work at the December board meeting and a January construction start is expected.

Applicable District Goal and Action Item:

Goal: Achieve quality surface water – The District will maintain or improve surface water quality to support healthy ecosystems and provide the public with a wide range of water-based benefits.

Action Items: Maintain District projects and consider opportunities to support the maintenance activities of others.

Goal: Manage Risk of Flooding – The District will reduce the public's risk to life and property from flooding through programs and projects that protect public safety and economic well-being.

Action Item: Maintain District flood storage facilities and storm sewer systems.

Staff Recommendation:
Staff recommends that the Board approve the preliminary design, estimated costs, and proposed project schedule, and direct staff to finalize the design and bidding documents and advertise the project for bid.

Financial Implications:

The CIP Maintenance and Repair project is included in the 2022 preliminary budget. Staff will present the engineer's cost estimate for this upcoming project at the meeting.

Board Action Requested:

Approve the preliminary design, estimated costs, and proposed project schedule, and direct staff to finalize the design and bidding documents and advertise the project for bid.

CONTRACT DOCUMENTS

CAPITAL IMPROVEMENT PROJECT MAINTENANCE/REPAIRS 2023
RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

TABLE OF CONTENTS

Drawings

Appendices

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

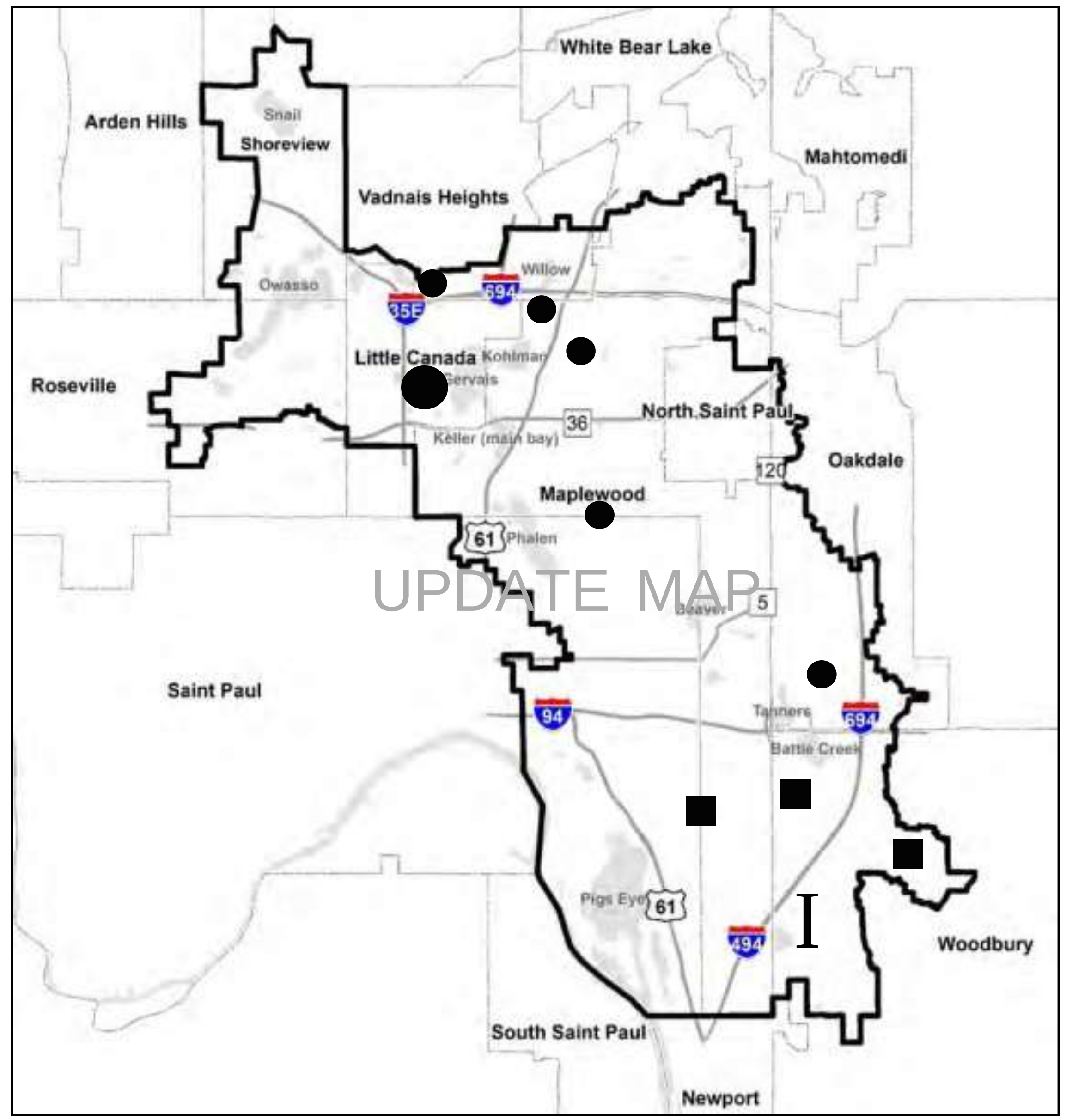
CAPITAL IMPROVEMENT PROJECT (CIP)

MAINTENANCE/REPAIRS 2023

LITTLE CANADA, MINNESOTA

AREA REFERENCE

SITE NO.	SITE NAME	SHEET NO.
G)	TAMARACK SWAMP WOODBURY	C-01
@	TANNERS WETLAND OAKDALE	C-02
G)	5TH STREET WETLAND OAKDALE	C-03
©	GERVAIS MILL PARK LITTLE CANADA	C-04 & C-08
®	LOWER AFTON ROAD MAPLEWOOD	C-05
®	KOHLMAN BASIN MAPLEWOOD	C-06
0	LAKE GERVAIS COUNTY PARK LITTLE CANADA	C-07
®	WOODWINDS DRIVE WOODBURY	C-09 & C-10
®	CENTURY AVE SOUTH WOODBURY	C-11
@	ASPEN CIRCLE LITTLE CANADA	C-12



VICINITY MAP 0

SHEET INDEX

G-GENERAL
C-CIVIL

SHEET NO.	TITLE
G-01	SITE LOCATION AND SHEET INDEX
G-02	STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
G-03	STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
G-04	EROSION CONTROL DETAILS
C-01	PFS BASINS PAVER CLEANING/SWEEPING
C-02	TANNERS WETLAND WEIR MAINTENANCE
C-03	5TH STREET WETLAND WEIR MAINTENANCE
C-04	GERVAIS MILL POND FILTER MAINTENANCE
C-05	LOWER AFTON ROAD TREATMENT BAY AND SEDIMENT REMOVAL
C-06	KOHLMAN BASIN WEIRS UPFLOW TREATMENT SYSTEM
C-07	GERVAIS BEACH STORMWATER POND BERM REPAIR
C-08	GERVAIS MILL POND STEEP SLOPE REPAIR
C-09	WOODBURY POND CLEANOUT- SC846 & SC847
C-10	WOODBURY POND CLEANOUT - SC190
C-11	WOODBURY POND CLEANOUT - SC275
C-12	LITTLE CANADA POND CLEANOUT - ASPEN POND

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

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPiuR:e: 16RNEf 6 !iI OARD EL C i ECT
PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
PRINTED NAME BRADLEY J. LINDAMAN
SIGNATURE
DATE ____ LICENSE# 22178

CLIENT / BID / CONSTRUCTION
RELEASED TO/FOR

10/26/22
A B 0 2 3 4
DATE RELEASED

Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952)832-2601
www.barr.com

Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	GGN
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP)
MAINTENANCE/REPAIRS 2023
SITE LOCATIONS AND SHEET INDEX

BARR PROJECT No. 23/62-0282.38
CLIENT PROJECT No.
DWG. No. G-01
REV. No. A

1.0 GENERAL CONSTRUCTION ACTIVITY INFORMATION: UPDATE THIS PAGE

THIS STORMWATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN PREPARED IN COMPLIANCE WITH THE MINNESOTA GENERAL STORMWATER PERMIT FOR CONSTRUCTION ACTIVITY NO. MNR100001 (GENERAL PERMIT), AS REQUIRED BY THE MINNESOTA POLLUTION CONTROL AGENCY (MPCA) UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM/STATE DISPOSAL SYSTEM (NPDES/SDS) PROGRAM.

THE PROJECT IS "CAPITAL IMPROVEMENT PROJECT (CIP) MAINTENANCE/REPAIRS 2023" FOR THE RAMSEY WASHINGTON METRO WATERSHED DISTRICT. THE PURPOSE OF THE PROJECT IS TO MAINTAIN EXISTING FACILITIES AND STRUCTURES AND PROTECT THE SURFACE WATER WITHIN THE WATERSHED. THE PROJECT INCLUDES A TOTAL OF 13 SITES LOCATED THROUGHOUT THE RAMSEY WASHINGTON METRO WATERSHED DISTRICT WITHIN RAMSEY COUNTY AND WASHINGTON COUNTY IN THE CITIES OF LITTLE CANADA, MAPLEWOOD, OAKDALE, VANAIS HEIGHTS, WHITE BEAR LAKE, AND WOODBURY, MINNESOTA. PROPOSED CONSTRUCTION ACTIVITIES WILL TAKE PLACE WITHIN THE SITES LISTED BELOW:

PROJECT SITES:

1) Tamarack Swamp; Located in Woodbury, MN in the SE 1/4 of Section 8, T28N, R21W Latitude: 44.925, Longitude: -92.948.
2) Tanners Wetland; Located in Oakdale, MN in the NW 1/4 of Section 31, T29N, R21W Latitude: 44.960, Longitude: -92.982.
3) Garvais Mill Park; Located in Little Canada, **MN** in the SW 1/4 of Section 8, T29N, R22W Latitude: 45.022, Longitude: -92.079.
4) Lower Afton Road; Located in Maplewood, **MN** in the NE 1/4 of Section 11, T28N, R21W Latitude: 44.933, Longitude: -93.010.
5) Kohlman Basin; Located in Maplewood, MN in the SW 1/4 of Section 3, T29N, R22W Latitude: 45.027, Longitude: -93.045.
6)
7) Gervais Creek; Located in Little Canada, MN in the SW 1/4 of Section 5, T29N, R22W Latitude: 45.022, Longitude: -93.083.
8)

LOCATION MAP
SEE TITLE SHEET G-01 OF THE CONSTRUCTION PLANS, SITE LOCATIONS MAP AND SHEET INDEX OF SITE LOCATIONS.

THE PROJECT WORK INCLUDES MOBILIZATION AND DEMOBILIZATION AT MULTIPLE SITES, CONTROL OF WATER AND DEWATERING TO PERFORM THE WORK; EXCAVATION WITH OFF SITE DISPOSAL OF SEDIMENT/MUCKNEGETATION FROM STORM WATER DETENTION PONDS, EXCAVATION WITH OFF-SITE DISPOSAL OF SEDIMENT/MUCKNEGETATION FROM STORM WATER MODULAR BLOCK PAVER BASINS; DEBRIS CLEARING ALONG AND BETWEEN SLOTS OF TIMBER WEIRS; REMOVE AND REPLACE EXISTING FILTER ROCK AND NETTING FROM WEIR; GENERAL SITE WORK, EARTHWORK AND GRADING; RIPRAP AND FILTER FABRIC INSTALLATION AT POND INLETS/OUTLETS; CLEAN OUT ENERGY DISSIPATION STRUCTURE AND REMOVE AND REPLACE FILTER MEDIA WITH NEW MATERIALS; REMOVAL OF EXISTING SPENT LIME FILTER MEDIA AND REPLACE WITH GRANITE SAND MEDIA AND CLEAN OUT SEDIMENT AND DEBRIS FROM INLET STRUCTURES; REPAIR OF TWO WASHED OUT RAVINE ADDING STORM SEWER PIPING, STRUCTURES, GRADING AN OVERFLOW CHANNEL DOWN SLOPE WITH HP-TRM, HP-FGM AND ROCK GRADE CONTROL CHECK DAMS; EXCAVATION OF THREE POND DISPOSAL OF SEDIMENT TO AN APPROVED LAND FILL, INSTALLATION OF PREFABRICATED GRATE ON CREEK INLET STRUCTURE, REPAIR OF SINK HOLE AROUND MANHOLE STRUCTURE, SITE RESTORATION WITH NATIVE SEED MIXES; WOODLAND SEED **MIX,** AND INSTALLATION OF EROSION CONTROL BLANKET AND MULCH, TEMPORARY AND PERMANENT EROSION CONTROLS. EROSION PREVENTION MEASURES ARE REQUIRED TO PREVENT SEDIMENT FROM BEING TRANSPORTED OFF SITE OR TO NEARBY SURFACE WATERS. REFER TO PROJECT DRAWINGS FOR FURTHER DETAILS.

1.1 PROJECT SIZE AND CUMULATIVE IMPERVIOUS SURFACE:

THE ANTICIPATED AREA OF DISTURBANCE INCLUDING POND DREDGING AREAS IS APPROXIMATELY 4.08 ACRES.
THE TOTAL AREA OF PRE-CONSTRUCTION IMPERVIOUS AREA IS APPROXIMATELY 0.148 ACRES.
THE TOTAL AREA OF POST-CONSTRUCTION IMPERVIOUS AREA IS APPROXIMATELY 0.00 ACRES.

1.2 DATES OF CONSTRUCTION:

ANTICIPATED START DATE: JANUARY 2, 2023 ANTICIPATED END DATE: JUNE 23, 2023

1.3 CONTACT INFORMATION:

OWNER: RAMSEY WASHINGTON METRO WATERSHED DISTRICT
MAILING ADDRESS: 2665 NOEL DRIVE.
LITTLE CANADA, MN 55117
CONTACT PERSON: TINA CARSTENS TITLE: ADMINISTRATOR
PHONE NUMBER: 651-792-7960 EMAIL ADDRESS: tina.carstens@rwmwd.org
ALTERNATE CONTACT PERSON: DAVID VLASIN TITLE: WATERSHED PROJECT MANAGER
PHONE NUMBER: 651-792-7972 EMAIL ADDRESS: david.vlasin@rwmwd.org

OPERATOR/ GENERAL CONTRACTOR (WILL OVERSEE IMPLEMENTATION OF THE SWPPP): [INSERT NAME]
MAILING ADDRESS: [INSERT ADDRESS)
CONTACT PERSON: [INSERT NAME] TITLE: [INSERT TITLE)
PHONE NUMBER: [INSERT NUMBER) EMAIL ADDRESS: [INSERT ADDRESS)

PARTY RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PERMANENT STORMWATER MANAGEMENT SYSTEM:

RAMSEY WASHINGTON METRO WATERSHED DISTRICT, 2665 NOEL DRIVE, LITTLE CANADA, MN. 55117.

2.0 RECEIVING WATERS: UPDATE

WATERS WITHIN ONE MILE (NEAREST STRAIGHT LINE DISTANCE) THAT ARE LIKELY TO RECEIVE STORMWATER RUNOFF FROM THE PROJECT SITE INCLUDE:

NAME OF WATER BODY	TYPE	WATER BODY ID	SPECIAL WATER?	IMPAIRED WATER?(1)	PUBLIC WATER WITH WORK IN WATER RESTRICTIONS
GARVAIS LAKE	LAKE	62-0007	NO	YES-Non/Construction	NO
GARVAIS CREEK	STREAM	Not Listed	NO	NO	NO
WAKEFIELD LAKE	LAKE	62-0011-00	NO	YES	NO
WILLOW LAKE	LAKE	62-0040-00	NO	NO	NO
KOHLMAN	LAKE	62-0278-00	NO	YES	NO
BATTLE CREEK	STREAM	70-0206	NO	YES	NO
BATTLE CREEK LAKE	LAKE	82-0091-00	NO	YES	NO
FISH CREEK	STREAM	70-10206	NO	YES	NO
CARVER LAKE	LAKE	82-0166-00	NO	YES	NO

(1) REFER TO CSW PERMIT SECTION 23. IMPAIRED WATER FOR THE FOLLOWING POLLUTANT(S) OR STRESSOR(S): PHOSPHORUS (NUTRIENT EUTROPHICATION BIOLOGICAL INDICATORS), TURBIDITY, TOTAL SUSPENDED SOLIDS (TSS), DISSOLVED OXYGEN, OR AQUATIC BIOTA (FISH BIOASSESSMENT, AQUATIC PLANT BIOASSESSMENT, AND AQUATIC MACROINVERTEBRATE BIOASSESSMENT)

2.1 SPECIAL AND IMPAIRED WATERS: THE MPCA'S SPECIAL AND IMPAIRED WATERS SEARCH TOOL WAS USED TO LOCATE SPECIAL AND IMPAIRED WATERS WITHIN ONE MILE (AERIAL RADIUS MEASUREMENT) OF THE PROJECT SITE. BLUFF CREEK HAS AN EPA-APPROVED IMPAIRMENT FOR: FISHES BIOASSESSMENTS; TURBIDITY. THESE IMPAIRMENTS ARE CONSIDERED TO BE CONSTRUCTION RELATED PARAMETERS AND REQUIRE ADDITIONAL BEST MANAGEMENT PRACTICES (BMPS) FOUND IN ITEMS 23.9 AND 23.10 OF THE PERMIT IF THE PROJECT HAS A DISCHARGE POINT ON THE PROJECT WITHIN 1 MILE (AERIAL RADIUS MEASUREMENT) OF, AND FLOWS TO THE IMPAIRED STREAM.

THIS PROJECT DOES NOT INCLUDE ANY ADDITIONAL BMPS OR OTHER SPECIFIC CONSTRUCTION RELATED IMPLEMENTATION ACTIVITIES IDENTIFIED IN AN APPROVED TOTAL MAXIMUM DAILY LOAD (TMDL).

2.2 PUBLIC WATERS WITH WORK IN WATER RESTRICTIONS: THIS PROJECT DOES NOT INCLUDE WORK IN PUBLIC WATERS.

2.3 WETLAND IMPACTS: THIS PROJECT WILL REQUIRE WORKING WITHIN WETLAND AREA AND WILL RESULT IN IMPACTS TO THE WETLANDS, INCLUDING EXCAVATION, REMOVAL OF FILL, AND REMOVAL OF DEBRIS.

2.4 ENVIRONMENTAL REVIEW AND OTHER REQUIRED REVIEWS: STORMWATER MITIGATION MEASURES ARE NOT REQUIRED AS A RESULT OF AN ENVIRONMENTAL REVIEW (E.G., EAW OR EIS), ENDANGERED OR THREATENED SPECIES REVIEW, ARCHEOLOGICAL SITE REVIEW, OR OTHER LOCAL, STATE, OR FEDERAL REVIEW CONDUCTED FOR THE PROJECT.

2.5 KARST AREAS OR DRINKING WATER SUPPLY MANAGEMENT AREAS: THIS PROJECT DOES NOT INCLUDE ANY KARST OR DRINKING WATER SUPPLY MANAGEMENT AREAS.

3.0 PROJECT PLANS AND SPECIFICATIONS:

REQUIRED FEATURE	SHEET NUMBER
PROJECT LOCATION AND CONSTRUCTION LIMITS	~~G-01,C-01-C-15~~
EXISTING AND FINAL GRADES, INCLUDING DRAINAGE AREA BOUNDARIES, DIRECTIONS OF FLOW AND ALL DISCHARGE POINTS WHERE STORMWATER IS LEAVING THE SITE OR ENTERING A SURFACE WATER	C-01 -C-15
SOIL TYPES AT THE SITE	
LOCATIONS OF IMPERVIOUS SURFACES	C-01-C-15
LOCATIONS OF AREAS NOT BE DISTURBED (E.G., BUFFER ZONES, WETLANDS, ETC.)	C-01-C-15
LOCATIONS OF AREAS OF STEEP SLOPES	C-07 - C-10
LOCATIONS OF AREAS WHERE CONSTRUCTION WILL BE PHASED TO **MINIMIZE** DURATION OF EXPOSED SOILS	C-07 - C-10
PORTIONS OF THE SITE THAT DRAIN TO A PUBLIC WATER WITH DNR WORK IN WATER RESTRICTIONS FOR FISH SPAWNING TIMEFRAMES	C-01-C-10
LOCATIONS OF ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL BMPS AS REQUIRED IN PERMIT SECTIONS 8 THROUGH 10 AND 14 THROUGH 19	C-01-C-15
BUFFER ZONES AS REQUIRED IN PERMIT ITEMS 9.17 AND 23.11	C-01 -C-10
LOCATIONS OF POTENTIAL POLLUTION-GENERATING ACTIVITIES IDENTIFIED IN PERMIT SECTION 12	C-01 - C-10
STANDARD DETAILS FOR EROSION AND SEDIMENT CONTROL BMPS TO BE INSTALLED AT THE SITE	G-04

4.0 BEST MANAGEMENT PRACTICES (BMPS):

4.1 EROSION PREVENTION PRACTICES:

1. BEFORE LAND DISTURBING ACTIVITIES BEGIN, THE LIMITS OF THE AREAS TO BE DISTURBED DURING CONSTRUCTION WILL BE DELINEATED WITH FLAGS, STAKES, SIGNS, SILT FENCE, ETC.
2. TEMPORARY STABILIZATION OF SOILS AND SOIL STOCKPILES:
   a. AREAS OF EXPOSED SOIL WILL BE STABILIZED WITH EROSION CONTROL BLANKET, PRESERVATION OF MATURE VEGETATION, OR EQUIVALENT MEASURES.
   b. IF PRESENT, SOIL STOCKPILES WILL BE STABILIZED WITH MULCH, STRAW, OR PLASTIC SHEETING, OR EQUIVALENT MEASURES.
   c. TEMPORARY STOCKPILES WITHOUT SIGNIFICANT SILT, CLAY, OR ORGANIC COMPONENTS (E.G., CLEAN AGGREGATE STOCKPILES, DEMOLITION CONCRETE STOCKPILES, SAND STOCKPILES) AND THE CONSTRUCTED BASE COMPONENTS OF ROADS, PARKING LOTS, AND SIMILAR SURFACES ARE EXEMPT FROM THESE STABILIZATION REQUIREMENTS.
2. STABILIZATION OF DITCH AND SWALE WETTED PERIMETERS:
3. IF SOILS WITHIN EXISTING STORMWATER DITCHES OR SWALES ARE DISTURBED, THEY WILL BE STABILIZED WITH EROSION CONTROL BLANKET, RIPRAP, OR EQUIVALENT MEASURES.
   d. MULCH, HYDROMULCH, TACKIFIER, POLYACRYLAMIDE, OR SIMILAR EROSION PREVENTION PRACTICES WILL NOT BE USED TO STABILIZE ANY PART OF AN EXISTING STORMWATER DITCH OR SWALE WITH A CONTINUOUS SLOPE OF GREATER THAN 2 PERCENT.
   e. THE LAST 200 LINEAL FEET OF LENGTH OF THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DITCH OR SWALE THAT DRAINS WATER FROM ANY PORTION OF THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE SITE, WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE, OR FROM THE POINT OF DISCHARGE INTO ANY SURFACE WATER WILL BE STABILIZED WITHIN 24 HOURS AFTER CONNECTING TO A SURFACE WATER OR PROPERTY EDGE.
   f. STABILIZATION OF THE REMAINING PORTIONS OF ANY TEMPORARY OR PERMANENT DITCHES OR SWALES WILL BE COMPLETED WITHIN 14 CALENDAR DAYS AFTER CONNECTING TO A SURFACE WATER OR PROPERTY EDGE AND CONSTRUCTION IN THAT PORTION OF THE DITCH HAS TEMPORARILY OR PERMANENTLY CEASED.
3. ENERGY DISSIPATION AT PIPE OUTLETS: ENERGY DISSIPATION AT PIPE OUTLETS WILL BE PROVIDED FOR WITH RIP RAP OR EQUIVALENT MEASURES.
4. EROSION PREVENTION IMPLEMENTATION TIMELINES:
   a. STABILIZATION OF EXPOSED SOIL AREAS (INCLUDING STOCKPILES) WILL BE INITIATED IMMEDIATELY TO LIMIT SOIL EROSION WHENEVER ANY CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS.
   b. IF THE EXPOSED SOIL AREAS DRAIN TO A DISCHARGE POINT THAT IS WITHIN ONE MILE (AERIAL RADIUS MEASUREMENT) OF A SPECIAL OR IMPAIRED WATER (SEE SECTION 2.0), STABILIZATION OF EXPOSED SOIL AREAS (INCLUDING STOCKPILES) WILL BE INITIATED IMMEDIATELY TO LIMIT SOIL EROSION WHENEVER ANY CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 7 CALENDAR DAYS.
   c. THE FOLLOWING ACTIVITIES CAN BE TAKEN TO INITIATE STABILIZATION: PREPPING-THE SOIL FOR VEGETATIVE OR NON-VEGETATIVE STABILIZATION, APPLYING MULCH OR OTHER NON-VEGETATIVE PRODUCT TO THE EXPOSED SOIL AREA, OR SEEDING OR PLANTING THE EXPOSED AREA.
5. ADDITIONAL EROSION PREVENTION MEASURES: THE FOLLOWING ADDITIONAL EROSION PREVENTION METHODS WILL BE IMPLEMENTED AT THE SITE DURING CONSTRUCTION:
   a. CONSTRUCTION PHASING WILL BE UTILIZED TO MINIMIZE THE AREA OF SOIL EXPOSED AT ANY ONE TIME.
   b. SOIL DISTURBANCE WILL BE MINIMIZED WHEREVER POSSIBLE TO AID IN EROSION PREVENTION.
   c. EXISTING VEGETATION WILL BE PRESERVED WHEREVER POSSIBLE TO LIMIT EXPOSED SOIL AND THUS WILL SERVE AS NATURAL VEGETATIVE BUFFERS.
   d. EXPOSED SOIL ON STEEP SLOPES (S3H:1V) WILL BE STABILIZED USING EROSION CONTROL BLANKET HP-TRM.

4.2 SEDIMENT CONTROL PRACTICES:

1. DOWNGRADIENT PERIMETER CONTROLS:
   a. SEDIMENT CONTROL PRACTICES WILL BE ESTABLISHED ON ALL DOWNGRADIENT PERIMETERS AND LOCATED UPGRADIENT OF ANY BUFFER ZONES. PERIMETER SEDIMENT CONTROLS WILL INCLUDE: SILT FENCE, SEDIMENT CONTROL LOGS, RETAIN EXISTING VEGETATION WHERE POSSIBLE, BERMS, AND ROCK CHECKS, OR EQUIVALENT MEASURES.
   b. PERIMETER SEDIMENT CONTROL PRACTICES MUST BE INSTALLED BEFORE ANY UPGRADIENT LAND-DISTURBING ACTIVITIES BEGIN AND REMAIN IN PLACE UNTIL PERMANENT COVER HAS BEEN ESTABLISHED.
   c. IF SEDIMENT CONTROL PRACTICES HAVE BEEN ADJUSTED OR REMOVED TO ACCOMMODATE SHORT-TERM ACTIVITIES (SUCH AS CLEARING, GRUBBING, OR PASSAGE OF VEHICLES), THE CONTROLS MUST BE RE-INSTALLED IMMEDIATELY AFTER THE SHORT-TERM ACTIVITY HAS BEEN COMPLETED. SEDIMENT CONTROL PRACTICES MUST BE RE-INSTALLED BEFORE THE NEXT PRECIPITATION EVENT, EVEN IF THE SHORT-TERM ACTIVITY IS NOT COMPLETE.
   d. IF THE DOWNGRADIENT SEDIMENT CONTROLS ARE OVERLOADED (BASED ON FREQUENT FAILURE OR EXCESSIVE MAINTENANCE REQUIREMENT), INSTALL ADDITIONAL UPGRADIENT SEDIMENT CONTROL PRACTICES OR REDUNDANT BMPS TO ELIMINATE THE OVERLOADING AND AMEND THE SWPPP TO IDENTIFY THESE ADDITIONAL PRACTICES.
2. SOIL STOCKPILE PERIMETER CONTROLS: TEMPORARY SOIL STOCKPILES WILL BE SURROUNDED BY: SILT FENCE, SEDIMENT CONTROL LOGS, PLASTIC SHEETING, OR EQUIVALENT MEASURES, AND SHALL NOT BE PLACED IN ANY NATURAL BUFFERS OR SURFACE WATERS.
3. STORM DRAIN INLET PROTECTION:
   a. INLET PROTECTION BMPS WILL BE INSTALLED AROUND ALL STORM DRAIN INLETS DOWNGRADIENT OF CONSTRUCTION ACTIVITIES.
   b. STORM DRAIN INLETS WILL BE PROTECTED UNTIL ALL SOURCES WITH POTENTIAL FOR DISCHARGING TO THE INLET HAVE BEEN STABILIZED.
   c. INLET PROTECTION BMPS WILL BE: FILTER SILT FENCE BOX, SEDIMENT CONTROL LOGS, OR EQUIVALENT MEASURES.
4. VEHICLE TRACKING BMPS:
   a. VEHICLE TRACKING BMPS WILL BE INSTALLED TO MINIMIZE THE TRACKING OUT OF SEDIMENT FROM THE CONSTRUCTION AREA AND WILL INCLUDE: ROCK OR WOODCHIP PADS, MUD MATS, OR AN EQUIVALENT SYSTEM.
   b. IF SUCH VEHICLE TRACKING BMPS ARE NOT ADEQUATE TO PREVENT SEDIMENT FROM BEING TRACKED ONTO THE PAVED ROAD, STREET SWEEPING WILL ALSO BE EMPLOYED. SEDIMENT WILL BE REMOVED BY SWEEPING WITHIN 24 HOURS.
5. MINIMIZATION OF SOIL COMPACTION AND PRESERVATION OF TOPSOIL: SOIL COMPACTION WILL BE MINIMIZED AND TOPSOIL WILL BE PRESERVED WHERE POSSIBLE.
6. PRIORITIZATION OF ONSITE INFILTRATION AND SEDIMENT REMOVAL:
   a. PRIOR TO OFFSITE DISCHARGE, INFILTRATION AND SEDIMENT REMOVAL WILL BE IMPLEMENTED ONSITE WHERE POSSIBLE.
   b. DISCHARGES FROM BMPS WILL BE DIRECTED TO VEGETATED AREAS OF THE SITE (INCLUDING ANY NATURAL BUFFERS) IN ORDER TO INCREASE SEDIMENT REMOVAL AND MAXIMIZE STORMWATER INFILTRATION. IF EROSION IS NOTED TO OCCUR AS THE RESULT OF SUCH A DISCHARGE, VELOCITY DISSIPATION BMPS WILL BE CONSIDERED AND INSTALLED AS NECESSARY TO PREVENT EROSION.
8. BUFFER ZONE OR REDUNDANT SEDIMENT CONTROLS TO PROTECT SURFACE WATERS:
   a. A 50-FOOT NATURAL BUFFER WILL BE PRESERVED IN CONSTRUCTION AREAS DISCHARGING TO A NON-SPECIAL/NON-IMPAIRED SURFACE WATER OR WETLAND. IF A NON-SPECIAL/NON-IMPAIRED SURFACE WATER OR WETLAND IS LOCATED WITHIN 50 FEET OF THE PROJECT'S EARTH DISTURBANCES AND STORMWATER FLOWS TO THE SURFACE WATER, OR WHEN A BUFFER IS INFEASIBLE, REDUNDANT SEDIMENT CONTROLS WILL BE PROVIDED.
   b. REDUNDANT PERIMETER CONTROLS WILL BE INSTALLED AT LEAST 5 FEET APART UNLESS LIMITED BY LACK OF AVAILABLE SPACE.
9. SEDIMENTATION TREATMENT CHEMICALS: NOT APPLICABLE; USE OF SEDIMENTATION TREATMENT CHEMICALS (E.G., POLYMERS, FLOCCULANTS, ETC.) IS NOT ANTICIPATED AS PART OF THE PROJECT.
10. TEMPORARY SEDIMENT BASIN(S): THE PROJECT WILL NOT INCLUDE 10 OR MORE ACRES OF DISTURBED SOIL DRAINING TO A COMMON LOCATION OR 5 OR MORE ACRES DRAINING TO A COMMONLOCATION WITHIN 1 MILE OR A SPECIAL OR IMPAIRED WATER THEREFORE TEMPORARY SEDIMENT BASINS ARE NOT REQUIRED.

4.3 DEWATERING AND BASIN DRAINING:

a. THE FOLLOWING WILL BE USED TO TREAT/DISPOSE OF TURBID OR SEDIMENT-LADEN WATER DURING DEWATERING: FILTER BAGS, OR EQUIVALENT MEASURES.
b. THE FOLLOWING WILL BE USED TO PREVENT EROSION OR SCOUR OF DISCHARGE POINTS DURING DEWATERING OR BASIN DRAINING: RIPRAP OR TURF REINFORCEMENT MAT, OR EQUIVALENT MEASURES.
c. FILTERS FOR BACKWASH WATER WILL BE MANAGED ON THE SITE OR PROPERLY DISPOSED OF BY: HAULING OFF SITE OR EQUIVALENT MEASURES.

4.4 BMP DESIGN FACTORS: THE FOLLOWING BMP DESIGN FACTORS HAVE BEEN CONSIDERED IN DESIGNING THE TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL BMPS:

1. EXPECTED AMOUNT, FREQUENCY, INTENSITY, AND DURATION OF PRECIPITATION: APPROXIMATELY 2.4 INCHES OF PRECIPITATION FROM THE 1-YEAR, 24 HOUR STORM EVENT (ATLAS 14).
2. NATURE OF STORMWATER RUNOFF AND RUN-ON AT THE SITE, INCLUDING FACTORS SUCH AS EXPECTED FLOW FROM IMPERVIOUS SURFACES, SLOPES, AND SITE DRAINAGE FEATURES: RUN OFF FROM EXISTING PAVED ROAD DITCHES.
3. STORMWATER VOLUME, VELOCITY, AND PEAK FLOW RATES TO MINIMIZE DISCHARGE OF POLLUTANTS IN STORMWATER AND TO MINIMIZE CHANNEL AND STREAMBANK EROSION AND SCOUR IN THE IMMEDIATE VICINITY OF DISCHARGE POINTS: RIPRAP PROTECTION AT RUN OFF DISCHARGE POINTS.
4. RANGE OF SOIL PARTICLE SIZES EXPECTED TO BE PRESENT: CLAY, SANDY CLAY, SANDY SILT, SILTY SAND, SAND, AND GRAVEL.

(SEE PAGE 2 OF 2)

ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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
PRINTED NAME BRADLEY J. LINDAMAN
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DATE LICENSE# 22178

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DATE RELEASED

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Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	GGN
Designed	JNB
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP) MAINTENANCE/REPAIRS 2023

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PAGE 1 OF 2

BARR PROJECT No.	23/62-0282.38
CLIENT PROJECT No.	
DWG. No.	G-02
REV. No.	A

4.5 BMP QUANTITIES: ANTICIPATED EROSION PREVENTION AND SEDIMENT CONTROL BMP QUANTITIES NEEDED FOR THE LIFE OF THE PROJECT: APPROXIMATELY 490 FEET OF A COMBINATION OF SILT FENCE AND SEDIMENT LOGS, 525 FEET OF FLOTATION SILT CURTAIN, 2 ROCK CHECK, 4,860 SQUARE YARDS OF SEED AND BLANKET, 10 INLET PROTECTIONS, (SEE PROJECT BID FORM FOR MORE DETAILS).

5.0 PERMANENT STORMWATER MANAGEMENT SYSTEM:

A PERMENANCT STORMWATER MANAGEMENT SYSTEM IS REQUIRED IF THE PROJECT RESULTS IN ONE ACRE OR MORE OF NEW IMPERVIOUS SURFACES OR RESULTS IN A NET INCREASE OF ONE OR MORE ACRES OF CUMMULATIVE NEW IMPERVIOUS SURFACES IN TOTAL OR IF THE PROJECT IS PART OF A LARGER PLAN OF DEVELOPMENT.

A PERMANENT STORMWATER TREATMENT SYSTEM IS NOT REQUIRED FOR THIS PROJECT, THERE WILL BE NO INCREASE IMPERVIOUS SURFACE.

lITHIS PROJECT DOES NOT DISCHARGE TO A TROUT STREAM (OR A TRIBUTARY TO A TROUT STREAM).

6.0 INSPECTION AND MAINTENANCE ACTIVITIES:

6.1 PERSONS WITH REQUIRED TRAINING: TRAINED INDIVIDUALS INCLUDE THOSE PARTIES RESPONSIBLE FOR INSTALLING, SUPERVISING, REPAIRING, INSPECTING, AND MAINTAINING EROSION PREVENTION AND SEDIMENT CONTROL BMPS AT THE SITE. TRAINED INDIVIDUALS ARE ALSO RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND COMPLIANCE WITH THE GENERAL PERMIT UNTIL THE CONSTRUCTION ACTIVITIES ARE COMPLETE, PERMANENT COVER HAS BEEN ESTABLISHED, AND A NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED.

THESE INDIVIDUALS WILL BE TRAINED IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL PERMIT, INCLUDING THE REQUIREMENT THAT THE CONTENT AND EXTENT OF TRAINING WILL BE COMMENSURATE WITH THE INDIVIDUAL'S JOB DUTIES AND RESPONSIBILITIES.

BELOW IS A LIST OF PEOPLE RESPONSIBLE FOR THIS PROJECT WHO ARE KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BMPS.

TRAINED INDIVIDUAL	RESPONSIBILITY	TRAINING ENTITY•	TRAINING DATE
JACOB N. BURGGRAFF BARR ENGINEERING CO. 4300 MARKETPOINTE DR. BLOOMINGTON, MN 55435 OFFICE: 952-832-2743 CELL: 612-991-0042 JBURGGRAFF@BARR.COM	REPARATION OF THE SWPPP	DESIGN OF CONSTRUCTION SWPPPS U OF MN, APRIL 2008, UPDATED NOV. 2010, MARCH 2014, MAY 2017 EXPIRES MAY 31, 2024	MAY 2018
GREG NELSON BARR ENGINEERING CO. 4300 MARKETPOINTE DR. BLOOMINGTON, MN 55435 OFFICE: 952-832-2770 CELL: 612-599-8889 EMAIL TBD	OVERSIGHT OF SWPPP IMPLEMENTATION, REVISION, AND AMMENDMENT	CONSTRUCTION SITE MANAGEMENT BARR ENGINEERING	MAY 2024
[INSERT NAME]	PERFORMANCE OF SWPPP INSPECTIONS	[INSERT ENTITY]	[INSERT DATE]
[INSERT NAME]	PERFORMANCE OR SUPERVISION OF INSTALLATION, MAINTENANCE, AND REPAIR OF BMPS	[INSERT ENTITY]	[INSERT DATE]

•TRAINING DOCUMENTATION AVAILABLE UPON REQUEST.

6.2 FREQUENCY OF INSPECTIONS: A TRAINED PERSON WILL ROUTINELY INSPECT THE ENTIRE CONSTRUCTION SITE.

AT LEAST ONCE EVERY 7 DAYS DURING ACTIVE CONSTRUCTION
WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS

INSPECTION FREQUENCY MAY BE ADJUSTED UNDER THE FOLLOWING CIRCUMSTANCES:
WHERE PARTS OF THE CONSTRUCTION AREAS HAVE PERMANENT COVER, BUT WORK REMAINS ON OTHER PARTS OF THE SITE, INSPECTIONS OF THE AREAS WITH PERMANENT COVER MAY BE REDUCED TO ONCE PER MONTH.
WHERE CONSTRUCTION AREAS HAVE PERMANENT COVER AND NO CONSTRUCTION ACTIVITY IS OCCURRING ON THE SITE, INSPECTIONS CAN BE REDUCED TO ONCE PER MONTH AND, AFTER 12 MONTHS, MAY BE SUSPENDED COMPLETELY UNTIL CONSTRUCTION ACTIVITY RESUMES.
WHERE CONSTRUCTION ACTIVITY HAS BEEN SUSPENDED DUE TO FROZEN GROUND CONDITIONS, THE INSPECTIONS MAY BE SUSPENDED. THE REQUIRED INSPECTIONS AND MAINTENANCE SCHEDULE MUST BEGIN WITHIN 24 HOURS AFTER RUNOFF OCCURS AT THE SITE OR UPON RESUMING CONSTRUCTION, WHICHEVER COMES FIRST.

6.3 INSPECTION REQUIREMENTS: EACH CONSTRUCTION STORMWATER SITE INSPECTION WILL INCLUDE INSPECTION OF THE FOLLOWING AREAS:
ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPS AND POLLUTION PREVENTION MANAGEMENT MEASURES
SURFACE WATERS FOR EVIDENCE OF EROSION AND SEDIMENT DEPOSITION
CONSTRUCTION SITE VEHICLE EXIT LOCATIONS FOR EVIDENCE OF OFFSITE SEDIMENT TRACKING
STREETS AND OTHER AREAS ADJACENT TO THE PROJECT FOR EVIDENCE OF OFF SITE ACCUMULATIONS OF SEDIMENT

6.4 MAINTENANCE REQUIREMENTS: MAINTENANCE OF THE FOLLOWING AREAS AND BMPS WILL BE PERFORMED AS FOLLOWS:
NONFUNCTIONAL BMPS WILL BE REPAIRED, REPLACED, OR SUPPLEMENTED WITH FUNCTIONAL BMPS BY THE END OF THE NEXT BUSINESS DAY AFTER DISCOVERY OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.
PERIMETER CONTROL DEVICES WILL BE REPAIRED, REPLACED, OR SUPPLEMENTED WHEN THEY BECOME NONFUNCTIONAL OR THE SEDIMENT REACHES 1/2 OF THE HEIGHT OF THE DEVICE.
TEMPORARY AND PERMANENT SEDIMENTATION BASINS WILL BE DRAINED AND THE SEDIMENT REMOVED WHEN THE DEPTH OF SEDIMENT COLLECTED IN THE BASIN REACHES 1/2 THE STORAGE VOLUME.
DELTAS AND SEDIMENT DEPOSITED IN SURFACE WATERS WILL BE REMOVED, AND THE AREAS WHERE SEDIMENT REMOVAL RESULTS IN EXPOSED SOIL WILL BE RE-STABILIZED. THE REMOVAL AND STABILIZATION WILL BE COMPLETED WITHIN 7 CALENDAR DAYS OF DISCOVERY UNLESS PRECLUDED BY LEGAL, REGULATORY, OR PHYSICAL ACCESS CONSTRAINTS. IF PRECLUDED DUE TO ACCESS CONSTRAINTS, REASONABLE EFFORTS TO OBTAIN ACCESS WILL BE USED. REMOVAL AND STABILIZATION WILL TAKE PLACE WITHIN 7 CALENDAR DAYS OF OBTAINING ACCESS.
TRACKED SEDIMENT ON PAVED SURFACES WILL BE REMOVED WITHIN 1 CALENDAR DAY OF DISCOVERY.
AREAS UNDERGOING STABILIZATION WILL BE RESTABILIZED AS NECESSARY TO ACHIEVE REQUIRED COVER.

6.5 RECORDKEEPING REQUIREMENTS:
1. ALL INSPECTIONS AND MAINTENANCE ACTIVITIES WILL BE RECORDED IN WRITING WITHIN 24 HOURS OF BEING CONDUCTED AND THESE RECORDS WILL BE RETAINED WITH THE SWPPP. RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY WILL INCLUDE THE DATE AND TIME; NAME OF INSPECTOR(S); FINDINGS OF INSPECTIONS; CORRECTIVE ACTIONS (INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES); AND DATE OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCHES IN 24 HOURS AND THE AMOUNT OF RAINFALL FOR EACH EVENT.
   a. IF ANY DISCHARGE IS OBSERVED DURING THE INSPECTION, THE LOCATION AND APPEARANCE OF THE DISCHARGE (I.E., COLOR, ODOR, SETTLED OR SUSPENDED SOLIDS, OIL SHEEN, AND OTHER OBVIOUS INDICATORS OF POLLUTANTS) WILL BE DOCUMENTED AND A PHOTOGRAPH WILL BE TAKEN.
2. THE SWPPP WILL BE AMENDED TO INCLUDE ADDITIONAL OR MODIFIED BMPS TO CORRECT PROBLEMS OR ADDRESS SITUATIONS WHENEVER THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE, WEATHER, OR SEASONAL CONDITIONS THAT HAS A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR GROUNDWATER.
   a. THE SWPPP WILL BE AMENDED WHEN INSPECTIONS OR INVESTIGATIONS BY THE SITE OWNER, OPERATOR, OR CONTRACTORS OR BY USEPNMPCA OFFICIALS INDICATE THAT THE SWPPP IS NOT EFFECTIVE IN ELIMINATING OR MINIMIZING THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR GROUNDWATER; THE DISCHARGES ARE CAUSING WATER QUALITY STANDARD EXCEEDANCES; OR THE SWPPP IS NOT CONSISTENT WITH A USEPA APPROVED TMDL.
   b. ANY AMENDMENTS TO THE SWPPP PROPOSED AS A RESULT OF THE INSPECTION WILL BE DOCUMENTED AS REQUIRED WITHIN 7 CALENDAR DAYS.
   c. AMENDMENTS WILL BE COMPLETED BY AN APPROPRIATELY TRAINED INDIVIDUAL. CHANGES INVOLVING THE USE OF A LESS STRINGENT BMP WILL INCLUDE A JUSTIFICATION DESCRIBING HOW THE REPLACEMENT BMP IS EFFECTIVE FOR THE SITE CHARACTERISTICS.
3. RECORDS RETENTION: THE SWPPP, INCLUDING ALL CHANGES TO IT, AND INSPECTION AND MAINTENANCE RECORDS WILL BE KEPT AT THE SITE DURING CONSTRUCTION BY THE PERMITTEE WHO HAS OPERATIONAL CONTROL OF THE SITE. THE SWPPP CAN BE KEPT IN EITHER A FIELD OFFICE OR IN AN ON SITE VEHICLE DURING NORMAL WORKING HOURS.
4. RECORD AVAILABILITY: THE PERMITTEES WILL MAKE THE SWPPP, INCLUDING INSPECTION REPORTS, MAINTENANCE RECORDS, AND TRAINING RECORDS, AVAILABLE TO FEDERAL, STATE, AND LOCAL OFFICIALS WITHIN THREE DAYS UPON REQUEST FOR THE DURATION OF THE PERMIT COVERAGE AND FOR THREE YEARS FOLLOWING THE NOTICE OF TERMINATION.
5. COPIES OF INSPECTION RECORDS FOR THE TIME PERIOD OF THAT PAYMENT APPLICATION SHALL ACCOMPANY THE PAYMENT APPLICATION TO THE RAMSEY-WASHINGTON METRO WATERSHED DISTRICT.

7.0 POLLUTION PREVENTION MEASURES:

1. ANY CONSTRUCTION PRODUCTS AND LANDSCAPE MATERIALS THAT HAVE THE POTENTIAL TO LEACH POLLUTANTS WILL BE STORED UNDER COVER (E.G., PLASTIC SHEETING OR TEMPORARY ROOFS) TO PREVENT DISCHARGE OF POLLUTANTS THROUGH MINIMIZATION OF CONTACT WITH STORMWATER. STORAGE OF SUCH MATERIALS WITHIN THE PROJECT AREA WILL BE MINIMIZED TO THE EXTENT POSSIBLE.
2. PESTICIDES, FERTILIZERS, AND TREATMENT CHEMICALS WILL BE STORED UNDER COVER (E.G., PLASTIC SHEETING, TEMPORARY ROOFS, WITHIN A BUILDING, OR IN WEATHER-PROOF CONTAINERS) TO PREVENT DISCHARGE OF POLLUTANTS THROUGH MINIMIZATION OF CONTACT WITH STORMWATER. STORAGE OF SUCH MATERIALS WITHIN THE PROJECT AREA WILL BE MINIMIZED TO THE EXTENT POSSIBLE.
3. HAZARDOUS MATERIALS AND TOXIC WASTE (E.G., OIL, DIESEL FUEL, GASOLINE, HYDRAULIC FLUIDS, PAINT SOLVENTS, PETROLEUM-BASED PRODUCTS, WOOD PRESERVATIVES, ADDITIVES, CURING COMPOUNDS, AND ACIDS) WILL BE STORED AND DISPOSED OF IN COMPLIANCE WITH MINNESOTA RULES CHAPTER 7045, INCLUDING SECONDARY CONTAINMENT (AS APPLICABLE). HAZARDOUS MATERIALS WILL BE PROPERLY STORED IN SEALED CONTAINERS TO PREVENT SPILLS, LEAKS, OR OTHER DISCHARGES AND PREVENT PRECIPITATION FROM FALLING ONTO THE CONTAINERS OR STORED HAZARDOUS MATERIALS.
4. SOLID WASTE WILL BE COLLECTED, STORED, AND DISPOSED OF PROPERLY IN COMPLIANCE WITH MINNESOTA RULES CHAPTER 7035. THIS INCLUDES STORAGE WITHIN COVERED TRASH CONTAINERS AND DAILY REMOVAL OF LITTER AND DEBRIS. STORAGE OF SOLID WASTE WITHIN THE PROJECT AREA WILL BE MINIMIZED TO THE EXTENT POSSIBLE.
5. PORTABLE TOILETS WILL BE LOCATED AWAY FROM SURFACE WATERS AND POSITIONED AND SECURED TO THE GROUND SO THEY WILL NOT BE TIPPED OR KNOCKED OVER. SANITARY WASTE WILL BE DISPOSED OF IN ACCORDANCE WITH MINNESOTA RULES, CHAPTER 7041. PORTABLE TOILETS WILL BE PERIODICALLY EMPTIED AND THE WASTE HAULED OFF-SITE BY A LICENSED HAULER.
6. VEHICLE FUELING WILL ONLY OCCUR IN DESIGNATED AREAS. SPILL KITS SIZED APPROPRIATELY FOR THE AMOUNT OF REFUELING TAKING PLACE WILL BE LOCATED. SPILL KITS WILL BE CLEARLY LABELED AND CONTAIN MATERIALS TO ASSIST IN SPILL CLEANUP INCLUDING ABSORBENT PADS, BOOMS FOR CONTAINING SPILLS, AND HEAVY-DUTY PROTECTIVE GLOVES. SPILLS WILL BE REPORTED TO THE MINNESOTA DUTY OFFICER AS REQUIRED BY MINNESOTA STATUTES, SECTION 115.061.
   a. ANY FUEL TANKS BROUGHT ON-SITE WILL HAVE PROPERLY SIZED CONTAINMENT AND WILL NOT BE TOPPED OFF TO AVOID SPILLS FROM OVERFILLING. FUEL TANKS WILL MEET INDUSTRY STANDARDS (DESIGNED TO HOLD FUEL TYPE, PROPERLY MAINTAINED, NOT ILLEGALLY MODIFIED, NOT MISSING LEAK INDICATOR FLOATS FOR DOUBLE WALLED TANKS, SIGHT GAUGES NOT USED, ETC.) OR BE REMOVED FROM THE WORK AREA.
   b. GUIDELINES FOR SPILL PREVENTION AND RESPONSE INCLUDE:
      TAKE REASONABLE STEPS TO PREVENT THE DISCHARGE OF SPILLED OR LEAKED CHEMICALS, INCLUDING FUEL, FROM ANY AREA WHERE CHEMICALS OR FUEL WILL BE LOADED OR UNLOADED, INCLUDING THE USE OF DRIP PANS OR ABSORBENTS UNLESS INFEASIBLE;
      PERFORM REGULAR PREVENTATIVE MAINTENANCE ON TANKS AND FUEL LINES;
      INSPECT PUMPS, CYLINDERS, HOSES, VALVES, AND OTHER MECHANICAL EQUIPMENT ON-SITE FOR DAMAGE OR DETERIORATION;
      DO NOT WASH OR RINSE FUELING AREAS WITH WATER;
      MAINTAIN ADEQUATE SUPPLIES TO CLEAN UP DISCHARGED MATERIALS AND PROVIDE AN APPROPRIATE DISPOSAL METHOD FOR RECOVERED SPILLED MATERIALS;
      REPORT AND CLEAN UP SPILLS IMMEDIATELY AS REQUIRED BY MINNESOTA STATUTES, SECTION 115.061, USING DRY CLEAN UP MEASURES WHERE POSSIBLE; AND
      MAINTAIN COPIES OF SAFETY DATA SHEETS (SDSS) FOR HAZARDOUS MATERIALS ON-SITE IN LOCATIONS READILY AVAILABLE TO EMERGENCY RESPONDERS.
7. IF VEHICLE AND EQUIPMENT WASHING IS NECESSARY, A VEHICLE WASH STATION WILL BE LOCATED IN A DESIGNATED AREA. RUNOFF FROM THE WASHING AREA WILL BE CONTAINED IN A SEDIMENT BASIN AND WASTE FROM THE WASHING ACTIVITY WILL BE PROPERLY DISPOSED OF. ANY SOAPS, DETERGENTS, OR SOLVENTS WILL BE PROPERLY USED AND STORED. ANY DETERGENTS AND OTHER CLEANERS NOT PERMITTED FOR DISCHARGE WILL NOT BE USED.
8. THE PROJECT WILL RESULT IN CONCRETE OR OTHER WASHOUT ACTIVITIES, CONCRETE SUPPLIERS SHALL HAVE SELF CONTAINMENT WASH OUT EQUIPMENT AND A DESCRIPTION OF THE STORAGE AND DISPOSAL OF CONCRETE AND OTHER WASHOUT WASTES SO THAT WASTES DO NOT CONTACT THE GROUND.
9.

8.0 PERMANENT COVER AND PERMIT TERMINATION CONDITIONS:

1. THE AREAS DISTURBED DURING CONSTRUCTION WILL BE STABILIZED WITH PERMANENT COVER UPON COMPLETION OF WORK. PERMANENT COVER MAY BE VEGETATIVE OR NON-VEGETATIVE, AS APPROPRIATE. ESTABLISHMENT OF PERMANENT COVER MAY INCLUDE THE FOLLOWING ACTIVITIES: A COMBINATION OF SEEDING AND EROSION CONTROL BLANKET.
2. FOR A CONSTRUCTION-SITE TO ACHIEVE "PERMANENT COVER", THE FOLLOWING REQUIREMENTS MUST BE COMPLETED PRIOR TO TERMINATION OF PERMIT COVERAGE:
   a. ALL SOIL DISTURBING CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED AND PERMANENT COVER HAS BEEN INSTALLED OVER ALL AREAS. VEGETATIVE COVER CONSISTS OF A UNIFORM PERENNIAL VEGETATION WITH A DENSITY OF 70% OF ITS EXPECTED FINAL GROWTH. VEGETATION IS NOT REQUIRED WHERE THE FUNCTION OF A SPECIFIC AREA DICTATES NO VEGETATION (SUCH AS IMPERVIOUS SURFACES OR THE BASE OF A SAND FILTERS).
   b. ALL SEDIMENT HAS BEEN REMOVED FROM CONVEYANCE SYSTEMS, INCLUDING CULVERTS.
   c. ALL TEMPORARY SYNTHETIC EROSION PREVENTION AND SEDIMENT CONTROL BMPS HAVE BEEN REMOVED. BMPS DESIGNED TO DECOMPOSE ON-SITE MAY BE LEFT IN PLACE.

WITHIN 30 DAYS AFTER THE TERMINATION CONDITIONS ARE COMPLETE, A NOTICE OF TERMINATION (NOT) FORM WILL BE SUBMITTED TO THE MPCA.

ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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
PRINTED NAME BRADLEY J. LINDAMAN
SIGNATURE
DATE LICENSE# 22178

	10/26/2	-	-	-	-	--
BID	-	-	-	-	-	--
CONSTRUCTION	-	-	-	-	-	--
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	-	-	-	-	-	--

RELEASED TO/FOR: A B 0 2 3 4 — DATE RELEASED

BARR
Project Office
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Corporate Headquarters: Minneapolis, Minnesota
Ph: 1-800-632-2277

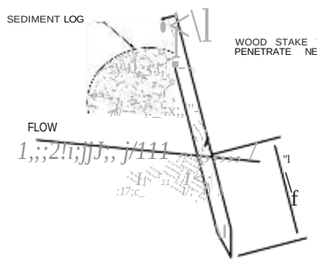
Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	GGN
Designed	JNB
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

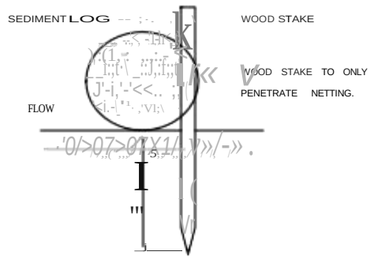
CAPITAL IMPROVEMENT PROJECT (CIP) MAINTENANCE/REPAIRS 2023

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PAGE 2 OF 2

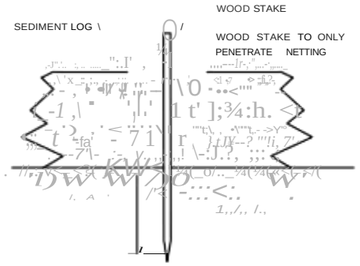
BARR PROJECT No.	23/62-0282.38
CLIENT PROJECT No.	
DWG. No.	G-03
REV. No.	A



SIDE VIEW ON SLOPE



SIDE VIEW FLAT



FRONT VIEW

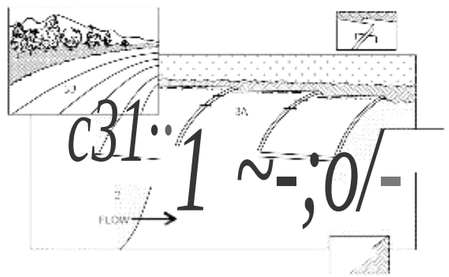
TOP VIEW

NOTES:

1. SEDIMENT LOG SHOULD BE INSTALLED ALONG CONTOURS (CONSTANT ELEVATION).
2. NO GAPS SHALL BE PRESENT UNDER SEDIMENT LOG. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN REACHING 1/2 OF LOG HEIGHT.
4. SEDIMENT LOG SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIRED OR REPLACED AS REQUIRED.

V/1'\ DETAIL: SEDIMENT LOG - STAKING
NOTTO SCALE

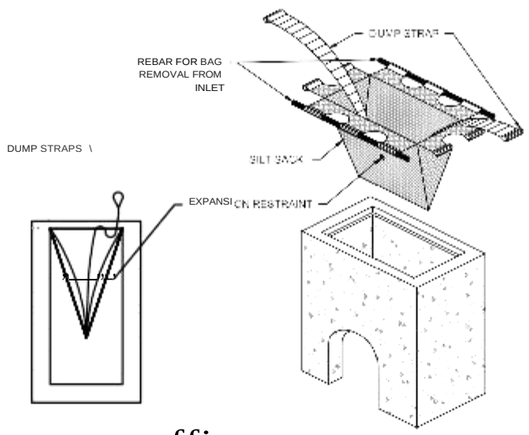
SLOPE INSTALLATION



NOTES:

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

Vffi. DETAIL: EROSION CONTROL BLANKET - INSTALLATION
NOTTO SCALE



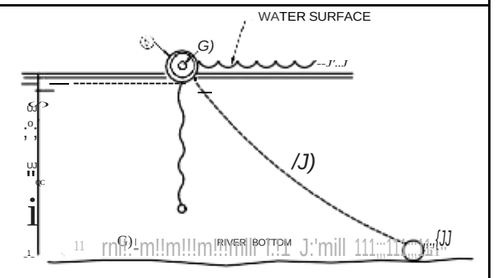
NOTES:

1. INLET PROTECTION SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED OR IMMEDIATELY FOLLOWING CATCHBASIN INSTALLATION, AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
2. MATERIALS SHALL BE SUFFICIENT TO ALLOW FLOW WHILE BLOCKING SEDIMENT. NO HOLES OR GAPS SHALL BE PRESENT IN/AROUND FILTER SACK.
3. FILTER SACK SHOULD BE CLEANED AS REQUIRED TO ALLOW FLOW INTO CATCHBASIN.
4. MATERIALS AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.

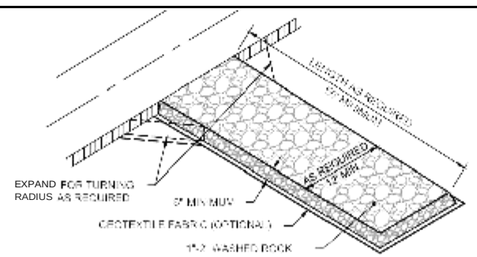
Vffi DETAIL: INLET PROTECTION - FILTER SACK
NOT TO SCALE

NOTES:

1. 6" MAXIMUM FOR WATER DEPTHS UP TO 3'-0" DEEP AND 1'-0" MAXIMUM FOR DEPTHS OVER 3'-0".
2. 24 LB (MIN.) ANCHOR@ 100'-0" O.C. SPACING (MAX.) ELIMINATE ANCHOR AND ANCHOR CABLE FOR WATER DEPTHS LESS THAN 3'-0" OR DISTANCE BETWEEN SHORE ANCHORS FOR TENSION CABLE OF LESS THAN 100'-0".
3. 5/16"0 (MIN.) TENSION CABLE. ANCHOR TENSION CABLE AT BOTH SIDES WITH STEEL POSTS OF DIAMETER AND LENGTH TO PREVENT BENDING AND PULL-OUT.
4. 22 OZ VINYL COATED NYLON FABRIC CURTAIN.
5. FLOAT - 8" MINIMUM DIAMETER PLASTIC SEGMENTS.
6. 5/16"0 (MIN.) OR SEGMENTS OF 5/16"0 STEEL CABLE 24" LONG@ CURTAIN WEIGHT - CONTINUOUS GALVANIZED STEEL CHAIN 12" O.C. BETWEEN PIECES. CURTAIN WEIGHT TO BE HEAVY ENOUGH TO HOLD CURTAIN VERTICAL IN CURRENT AND WAVES FOR TYPICAL SITE.
7. 5/16"0 (MIN.) GALVANIZED CABLE. ATTACH CABLE TO TENSION CABLE AND ANCHOR.



Vffi DETAIL: FLOTATION SILT CURTAIN
NOTTO SCALE



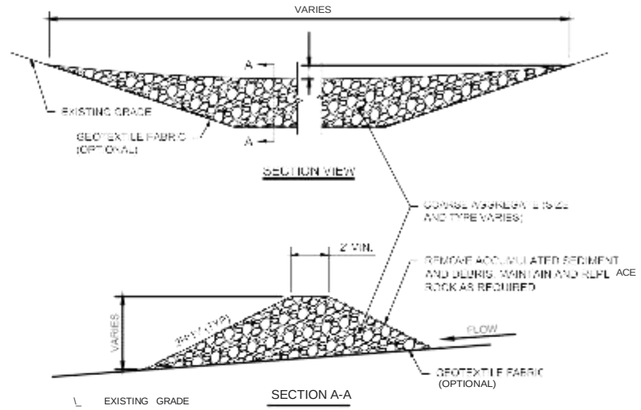
NOTES:

1. ENTRANCE SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIRED OR REPLACED AS REQUIRED TO PREVENT TRACKING OFFSITE.
2. ENTRANCE SHALL BE REMOVED IN CONJUNCTION WITH FINAL GRADING AND SITE STABILIZATION.
3. PROTECTION OF CURB & GUTTER, TRAILS AND SIDEWALKS DUE TO CONTRUCTION ENTRANCE LOCATION SHALL BE CONSIDERED INCIDENTAL.

V– & **DETAIL: ROCK CONSTRUCTION ENTRANCE**
NOTTO SCALE

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

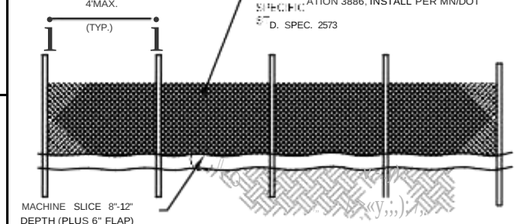
CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.



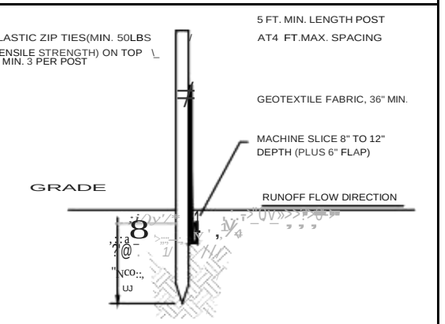
NOTES:

1. AGGREGATE SIZE MAY VARY AND DEPENDING ON CHANNEL SIZE, FLOW, SEDIMENT LOAD OR OTHER SITE CONDITIONS. AGGREGATE USED SHOULD BE RELATIVELY FREE OF SEDIMENT PRIOR TO INSTALLATION.
2. ROCK FILTER DIKE SHALL BE CLEANED OR REPLACED WHEN SEDIMENT BUILD UP REACHES 1/2 OF THE DIKE HEIGHT. ALTERNATIVELY A SECOND ROCK FILTER DIKE MAY BE INSTALLED DOWNSTREAM OF THE EXISTING DIKE AT A SUITABLE DISTANCE.
3. ROCK FILTER DIKE SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. ROCK, GEOTEXTILE AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.

Vffi DETAIL: ROCK FILTER DIKE
NOT TO SCALE



DOWNSTREAM VIEW



SECTION VIEW

NOTES:

1. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. SILT FENCE AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
2. SILT FENCE INSTALLATION AND MATERIALS SHALL MEET THE REQUIREMENTS OF MN/DOT SPECIFICATIONS 2573 AND 3886.
3. NO HOLES OR GAPS SHALL BE PRESENT IN/UNDER SILT FENCE. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
4. WHEN SEDIMENT BUILD UP REACHES 1/3 OF FENCE HEIGHT, THE SILT FENCE SHOULD BE REMOVED OR A SECOND SILT FENCE INSTALLED UPSTREAM OF THE EXISTING FENCE AT A SUITABLE DISTANCE.
5. WHEN SPLICES ARE NECESSARY MAKE SPLICE AT POST ACCORDING TO SPLICE DETAIL. PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE. ROTATE BOTH POSTS TOGETHER AT LEAST 180 DEGREES TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL. CUT THE FABRIC NEAR THE BOTTOM OF THE POSTS TO ACCOMMODATE THE 6 INCH FLAP. THEN DRIVE BOTH POSTS AND BURY THE FLAP. COMPACT BACKFILL.

Vill DETAIL: SILT FENCE - MACHINE SLICED
NOTTO SCALE

ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

I THEREBY 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

BRADLEY J. LINDAMAN

SIGNATURE

DATE _____ LICENSE# 22178

CLIENT	10/20	/22-						
BID			-11/09/2					
CONSTRUCTION								
RELEASED TO/FOR	A	B	0	1	2	3	4	
	DATE RELEASED							

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www.barr.com

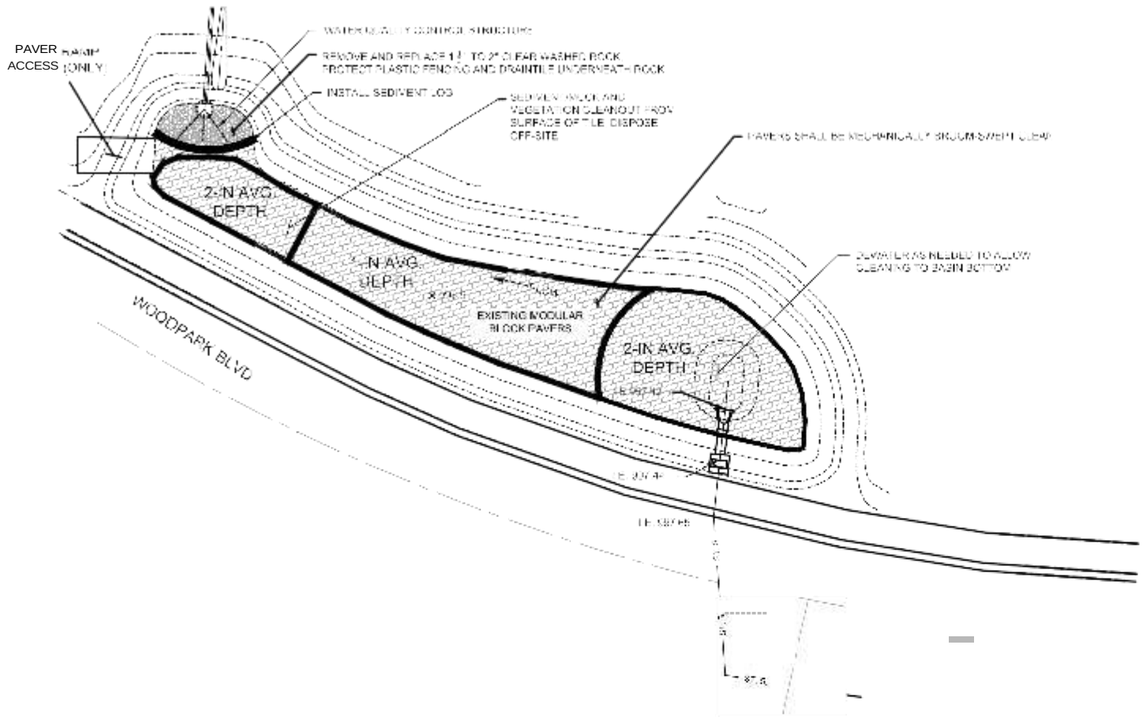
Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	GGN
Designed	BARR
Approved	BJL

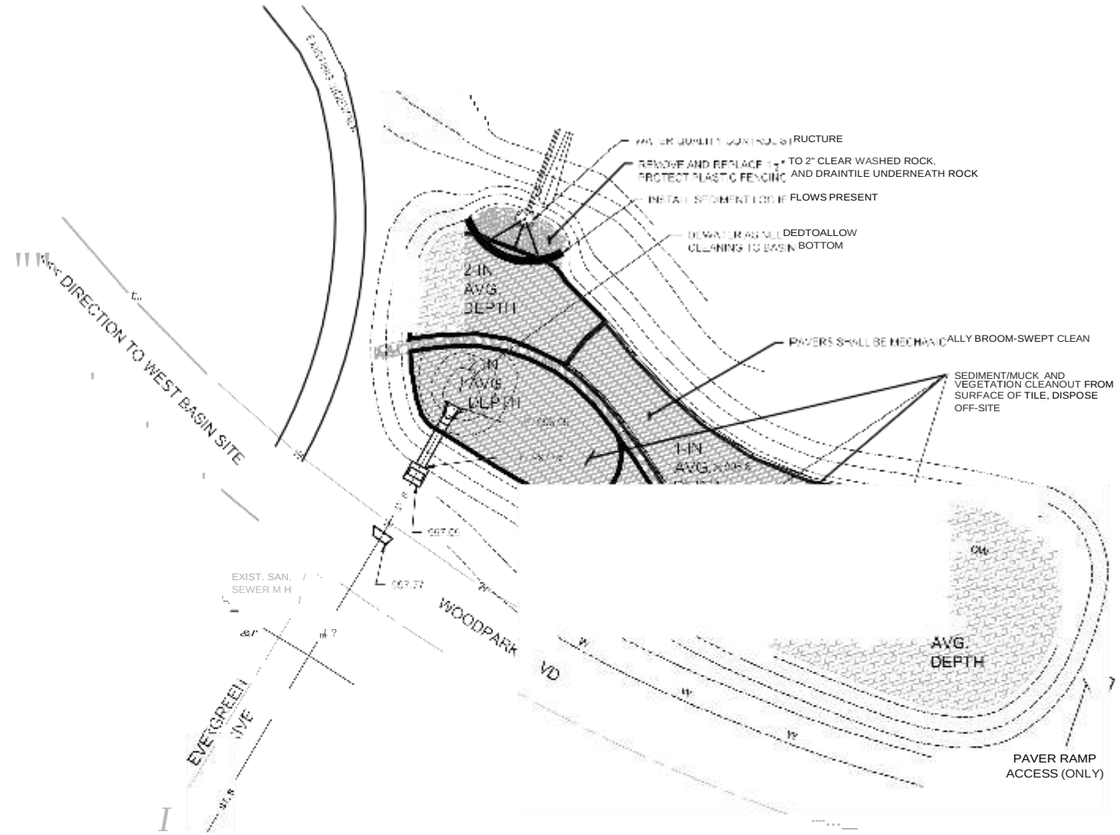
RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP)
MAINTENANCE/REPAIRS 2023

EROSION CONTROL DETAILS

BARR PROJECT No.	23/62-0282.38
CLIENT PROJECT No.	
DWG. No.	G-04
REV. No.	A





0 PLAN: EXISTING WEST BASIN SITE
0 20 40
SCALE IN FEET

NOTES:

1. NOTIFY DAVE VLASIN, RAMSEY WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7972 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION ACTIVITIES TO INSPECT EROSION/SEDIMENT CONTROL PRACTICES.
2. SPECIFIED EROSION/SEDIMENT CONTROL PRACTICES SHOWN ARE THE MINIMUM. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.
3. ALL NATIVE VEGETATION SURROUNDING BASINS SHALL BE PROTECTED. DAMAGE TO NATIVE RESTORATION AREAS SHALL BE REPAIRED IN-KIND AND MAINTAINED AT THE COST OF THE CONTRACTOR.
4. PIPE DISCHARGE BASIN POOLS TO BE CLEANED TO DEPTHS SHOWN ON PLANS.
5. ROCK OUTFALL STRUCTURES TO BE PROTECTED. DRAIN TILES EXIST ADJACENT TO PAVERS AND SHALL BE PROTECTED.
6. DISTURBANCE TO TURF TO BE RESTORED WITH SEED AND MULCH BLANKET AS DIRECTED BY THE OWNER.

N

2 PLAN: EXISTING EAST BASIN SITE
0 20 40
SCALE IN FEET

ISSUED FOR APPROVAL

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

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

NO.	BY	CHK'D	APP'D	DATE	REVISION DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR 0
DUU EL C ECT
PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
PRINTED NAME BRADLEY J. LINDAMAN
SIGNATURE
DATE LICENSE# 22178

RELEASED TO/FOR	DATE RELEASED
CLIENT	10/20 122-
BID	-11 19/21-
CONSTRUCTION	
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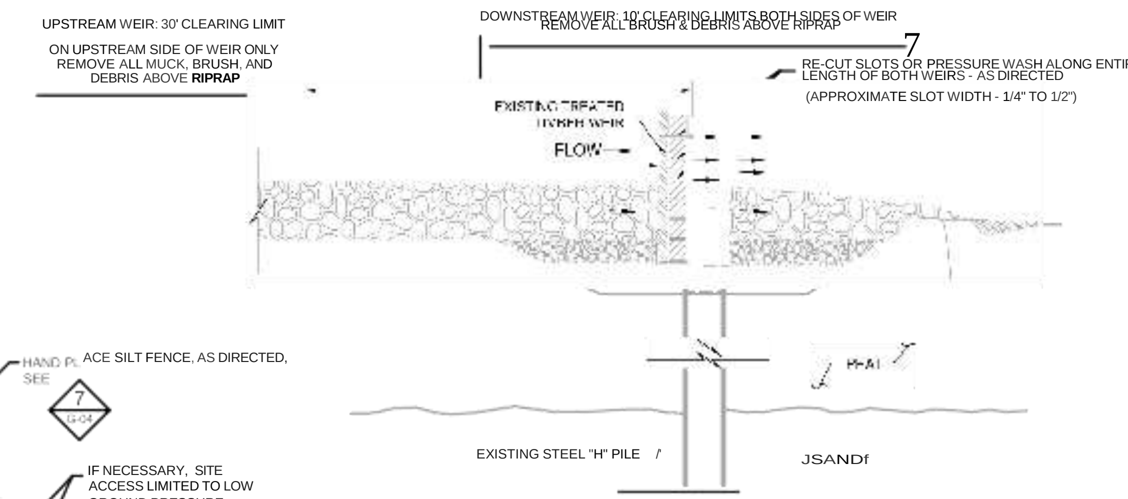
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

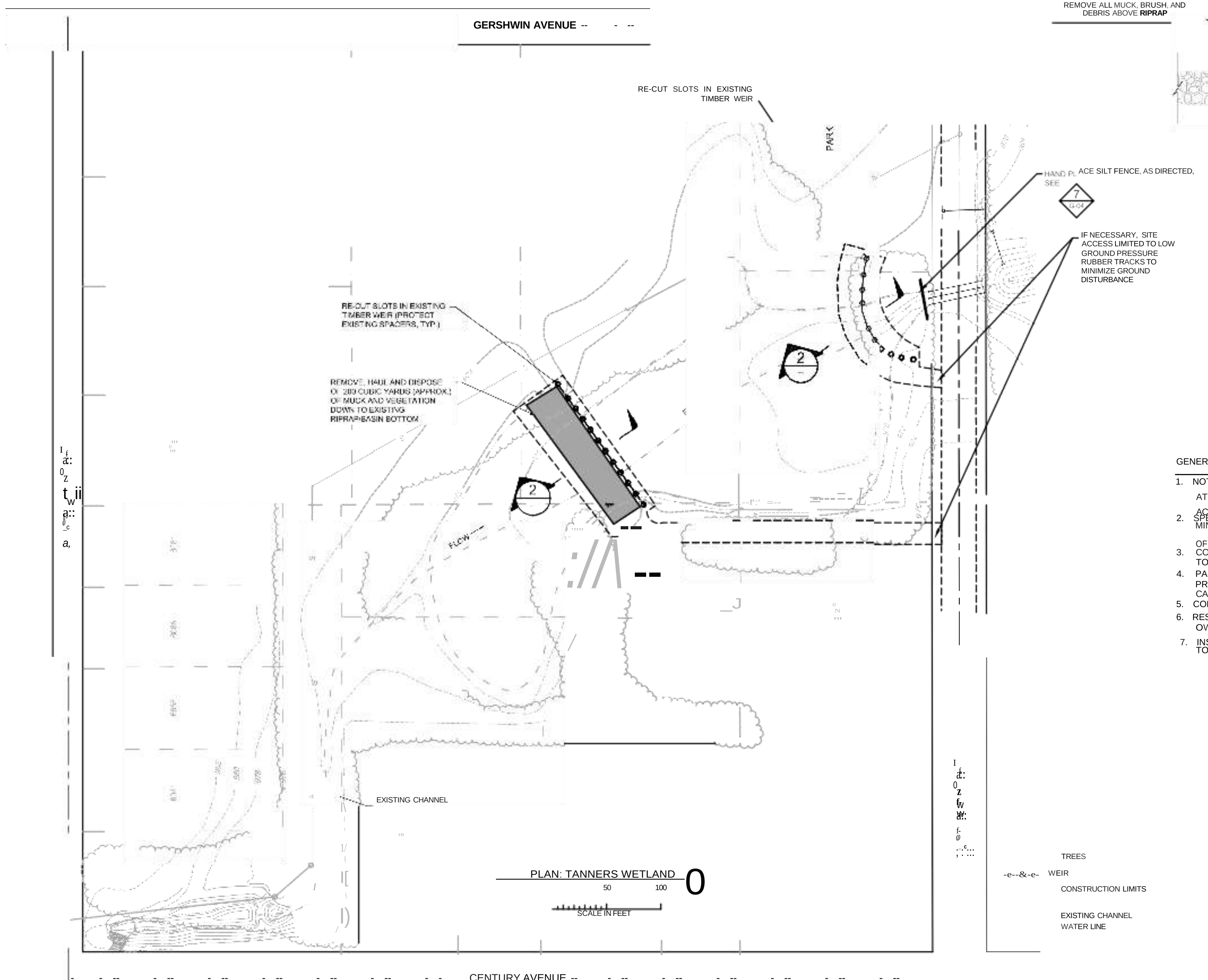
CAPITAL IMPROVEMENT PROJECT (CIP)
MAINTENANCE/REPAIRS 2023

SITE 1
PFS BASINS PAVER CLEANING/SWEEPING

BARR PROJECT No.	
23/62-0282.38	
CLIENT PROJECT No.	
DWG. No.	REV. No.
C-01	A



EB ... ON: EXISTING TIMBER WEIR AND RIPRAP ACCESS PAD



PLAN: TANNERS WETLAND

0 50 100

SCALE IN FEET

GENERAL NOTES:

1. NOTIFY DAVE VLASIN, RAMSEY WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7972 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION ACTIVITIES TO INSPECT EROSION/SEDIMENT CONTROL PRACTICES.
2. SPECIFIED EROSION/SEDIMENT CONTROL PRACTICES SHOWN ARE THE MINIMUM. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.
3. CONSTRUCTION LIMITS TO BE STAKED BY ENGINEER PRIOR TO MOBILIZATION TO THIS SITE.
4. PARKING LOT, PATHWAYS AND ALL ASSOCIATED FACILITIES MUST BE PROTECTED. CONTRACTOR RESPONSIBLE FOR REPAIRING ALL DAMAGED CAUSED.
5. CONTRACTOR RESPONSIBLE TO LOCATE ALL EXISTING UTILITIES.
6. RESTORE ALL DISTURBANCE AREAS WITH NATIVE SEED (AS DIRECTED BY OWNER) AND EROSION CONTROL BLANKET.
7. INSTALLATION OF EROSION CONTROL DEVICES SHALL BE CONDUCTED PRIOR TO ALL WORK INSIDE THE WATER BODY.

GOPHER STATE ONE CALL

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

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

ISSUED FOR APPROVAL

CADD USER: Greg Nelson FILE: M:\DESIGN\23620282\23620282_2023_CIP_TANNERSWEIRS.DWG PLOT SCALE: 1:2 PLOT DATE: 10/25/2022 3:13 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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

PRINTED NAME BRADLEY J. LINDAMAN
SIGNATURE
DATE ______ LICENSE# 22178

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CLIENT	10/26	122-					
BID							
CONSTRUCTION							
	DATE RELEASED						

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Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277

Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	GGN
Designed	BARR
Approved	BJL

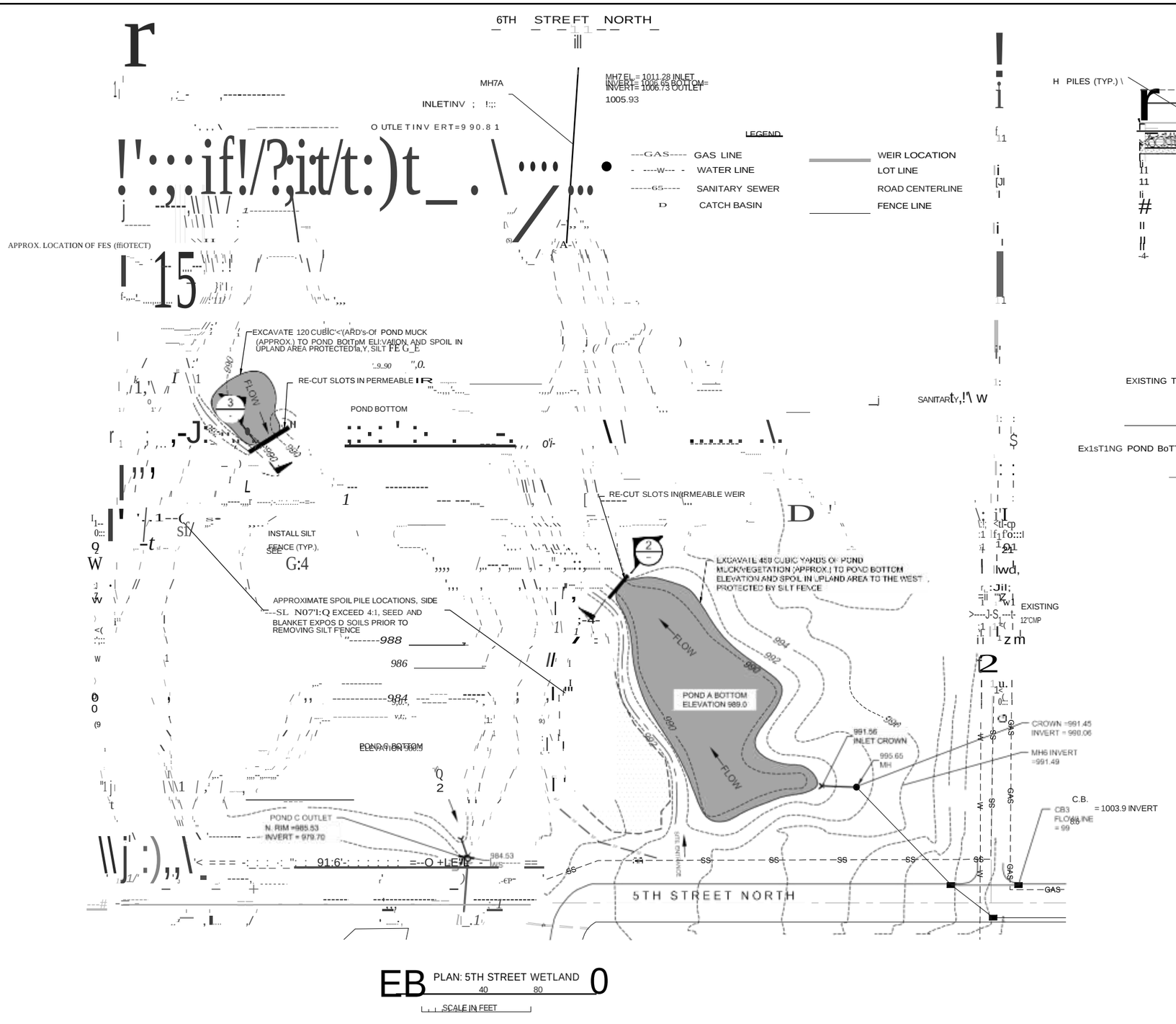
RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP) MAINTENANCE/REPAIRS 2023

SITE2

TANNER'S WETLAND WEIR **MAINTENANCE**

BARR PROJECT No. 23/62-0282_38
CLIENT PROJECT No.
DWG. No. C-02
REV. No. A



LEGEND

---GAS---	GAS LINE		WEIR LOCATION
---W---	WATER LINE		LOT LINE
---SS---	SANITARY SEWER		ROAD CENTERLINE
D	CATCH BASIN		FENCE LINE

PLAN: 5TH STREET WETLAND

0 40 80
SCALE IN FEET

PROFILE: 5TH STREET WETLAND PERMEABLE WEIR

NOT TO SCALE

SECTION: 5TH STREET WETLAND PERMEABLE WEIR

0 2 3 4 5
SCALE IN FEET

GENERAL NOTES:

1. NOTIFY DAVE VLASIN, RAMSEY WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7972 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION ACTIVITIES TO INSPECT EROSION/SEDIMENT CONTROL PRACTICES.
2. SPECIFIED EROSION/SEDIMENT CONTROL PRACTICES SHOWN ARE THE MINIMUM. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.
3. PARKING LOT, PATHWAYS AND ALL ASSOCIATED FACILITIES MUST BE PROTECTED. CONTRACTOR RESPONSIBLE FOR REPAIRING ALL DAMAGED CAUSED.
4. INSTALLATION OF EROSION CONTROL DEVICES SHALL BE CONDUCTED PRIOR TO ALL WORK IF WATER FLOWING THROUGH WEIRS.
5. ACCESS TO WEIRS BY FOOT ONLY.

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

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ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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PRINTED NAME BRADLEY J. LINDAMAN
SIGNATURE
DATE LICENSE# 22178

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CLIENT	10/20/22						
BID							
CONSTRUCTION							
DATE RELEASED							

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office
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4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952)832-2601
www.barr.com

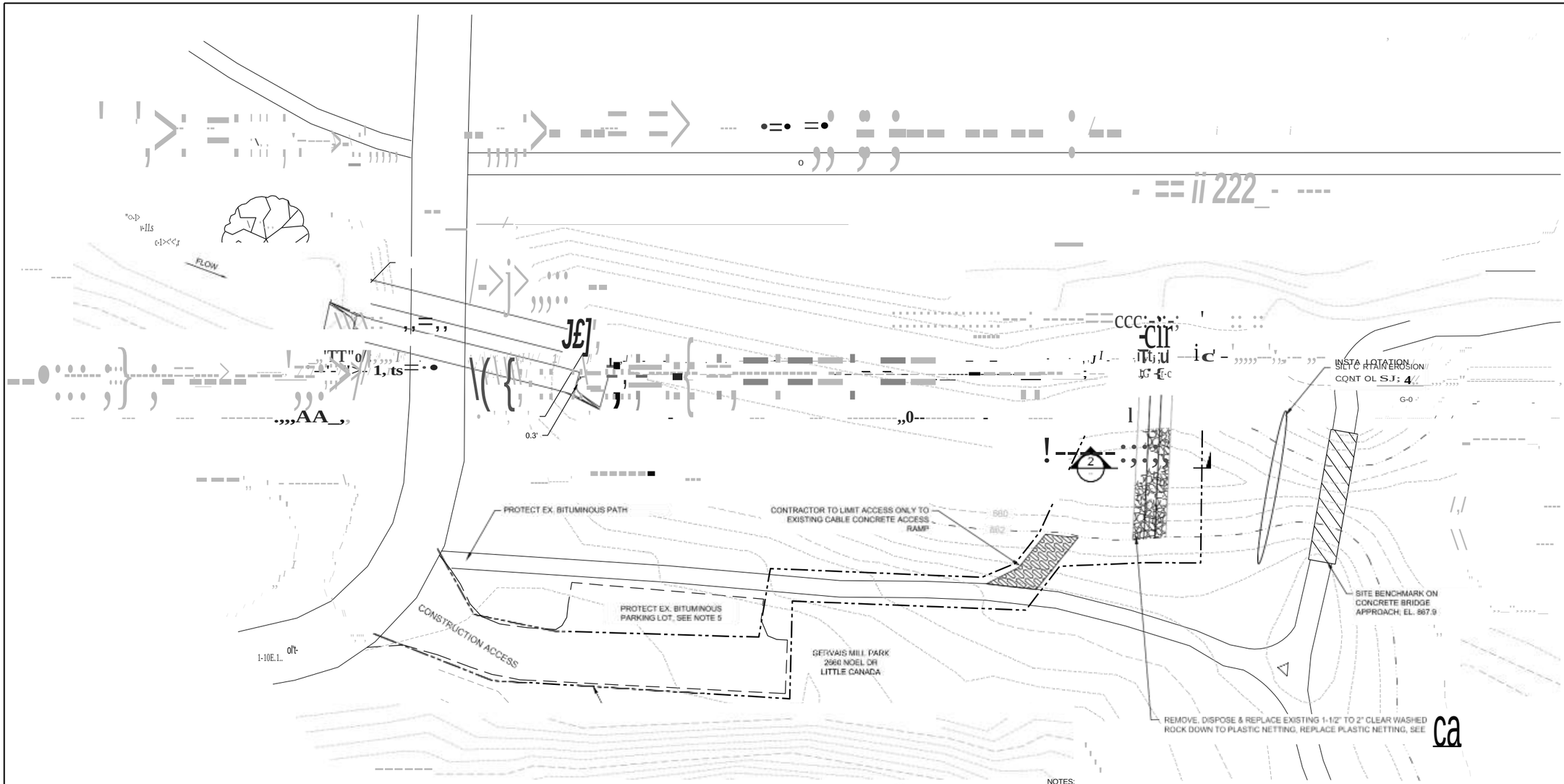
Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	JNB
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP)
MAINTENANCE/REPAIRS 2023

SITE2
5TH STREET WETLAND WEIR MAINTENANCE

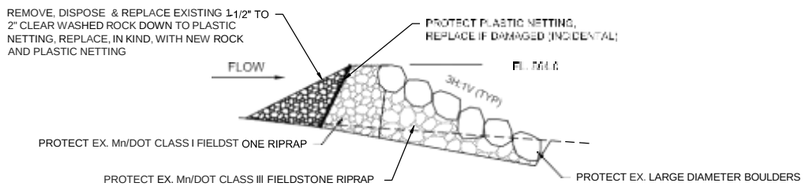
BARR PROJECT No. 23/62-0282.38
CLIENT PROJECT No.
DWG. No. C-03
REV. No. A



PLAN: EXCAVATION AND SITE WORK

0 20 40

SCALE IN FEET



SECTION: EX. PERMANENT SEDIMENT CONTROL DIKE

0 4 a

SCALE IN FEET

NOTES:

1. NOTIFY DAVE VLASIN, RAMSEY WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7972 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION ACTIVITIES TO INSPECT EROSION/SEDIMENT CONTROL PRACTICES.
2. INSTALLATION OF EROSION CONTROL DEVICES SHALL BE CONDUCTED PRIOR TO ALL WORK INSIDE THE WATER BODY.
3. CONTRACTOR RESPONSIBLE FOR RESTORING ALL DISTURBED AREAS OUTSIDE OF CONSTRUCTION LIMITS. ONLY AREAS WITHIN LIMITS WILL BE CONSIDERED FOR PAYMENT.
4. RESTORE ALL DISTURBED AREAS WITH SEED AND EROSION CONTROL BLANKET AS DIRECTED BY OWNER.
5. NO PARKING ON NOEL DRIVE WITHOUT APPROVAL FROM THE CITY OF LITTLE CANADA PUBLIC WORKS DEPT.
6. EXISTING BITUMINOUS PARKING LOT RESURFACED IN 2018. CURB & GUTTER, BITUMINOUS PARKING LOT, AND WALKING PATH TO BE PROTECTED DURING WORK. CONTRACTOR RESPONSIBLE FOR ANY DAMAGE FOUND, INCLUDING SURFACE SCUFFING AND SCRAPING.
7. SITE IS LOCATED IMMEDIATLY NORTHEAST OF THE RAMSEY WASHINGTON METRO WATERSHED DISTRICT OFFICES AT 2665 NOEL DRIVE, LITTLE CANADA, MN.

GOPHER STATE ONE CALL

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

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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

PRINTED NAME BRADLEY J. LINDAMAN

SIGNATURE

DATE LICENSE# 22178

CLIENT	10/26/22-								
BID				11/19/22					
CONSTRUCTION									
RELEASED TO/FOR	A	B	0	1	2	3	4		
DATE RELEASED									

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Corporate Headquarters: Minneapolis, Minnesota
Ph: 1-800-632-2277

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4300 MARKETPOINTE DRIVE
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www.barr.com

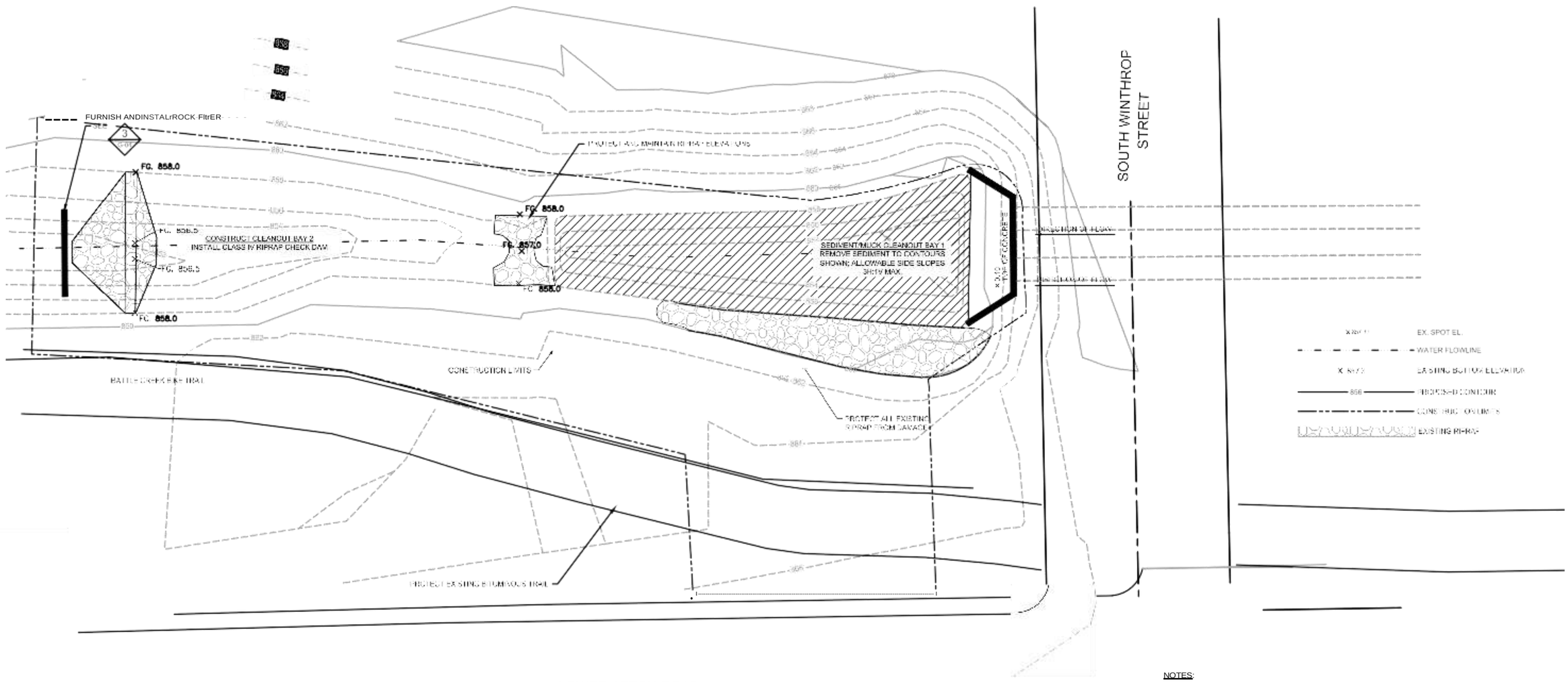
Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	GGN
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP) MAINTENANCE/REPAIRS 2023

SITE 3
GERVAIS MILL POND FILTER MAINTENANCE

BARR PROJECT No.	23/62-0282.38
CLIENT PROJECT No.	
DWG. No.	C-04
REV. No.	A



LOWER AFTON ROAD

STATE CALL

GOPHER STATE ONE CALL:
CALL BEFORE YOU DIG.

1-800-252-1166

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

PLAN: LOWER AFTON ROAD DRAINAGEWAY SEDIMENT EXCAVATION

0 10 20
SCALE IN FEET

NOTES:

1. NOTIFY DAVE VLASIN, RAMSEY WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7972 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION ACTIVITIES TO INSPECT EROSION/SEDIMENT CONTROL PRACTICES.
2. IED EliISIOIIILSEDIMEI>II-CON1:gm,..J>AA=I,g SI-IGWN-ARE THE MINIMUM. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR LOCATING AND FIELD VERIFYING ALL UTILITITES.
4. CONTRACTOR IS RESPONSIBLE FOR RESTORING ALL DISTURBED AREAS. ONLY RESTORATION
5. ONLY AREAS WITHIN THE CONSTRUCTION LIMITS WILL BE CONSIDERED FOR PAYMENT.
6. RESTORE DISTURBED SLOPES WITH NATIVE SEED (AS DIRECTED BY OWNER) AND STRAW MULCH BLANKET.

ISSUED FOR APPROVAL

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

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PRINTED NAME BRADLEY J. LINDAMAN

SIGNATURE

DATE LICENSE# 22178

CLIENT	10/2	/22-						
BID								
CONSTRUCTION								
RELEASED TO/FOR	A	B	0		2	3	4	
	DATE RELEASED							

BARR
Corporate Headquarters: Minneapolis, Minnesota
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MINNEAPOLIS, MN 55435
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Fax: (952) 832-2601
www.barr.com

Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	GGN
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP)
MAINTENANCE/REPAIRS 2023

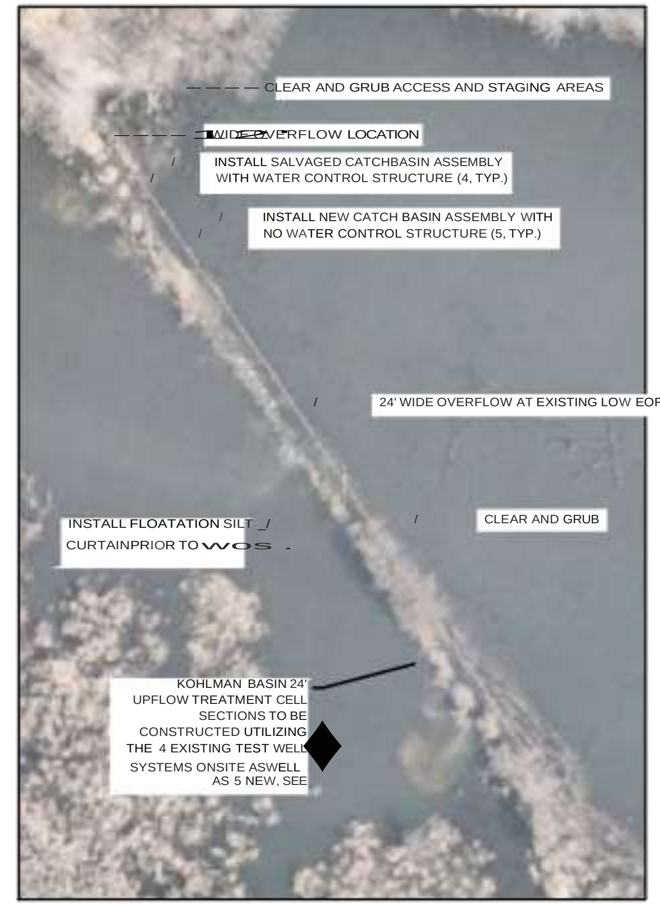
SITE 5 - LOWER AFTON ROAD
DRAINAGEWAY SEDIMENT REMOVAL

BARR PROJECT No. 23/62-0282.38
CLIENT PROJECT No.
DWG. No. C-05
REV. No. A

IMAGE DATE: APRIL 2020
HORZ. PROJ.: RAMSEY CO. FEET

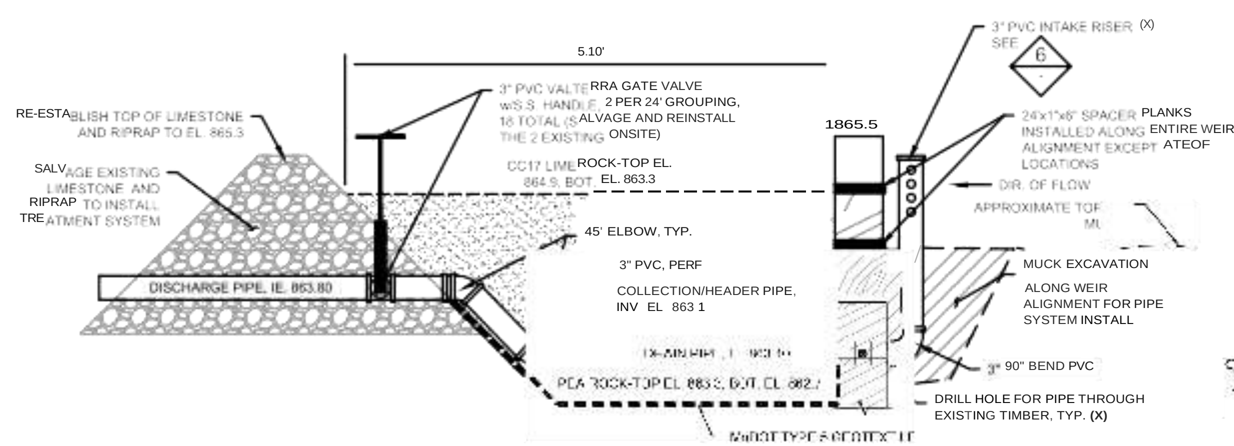
PLAN: KOHLMAN BASIN

150 300
SCALE IN FEET



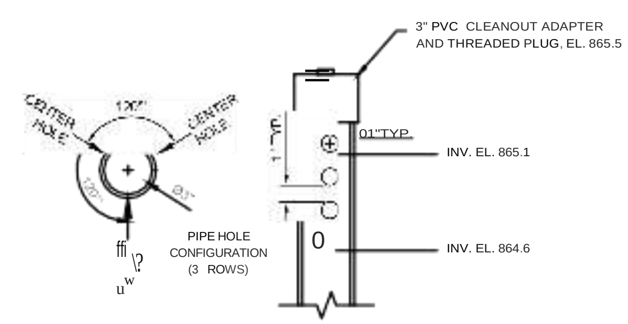
PLAN: KOHLMAN BASIN

30 60
SCALE IN FEET



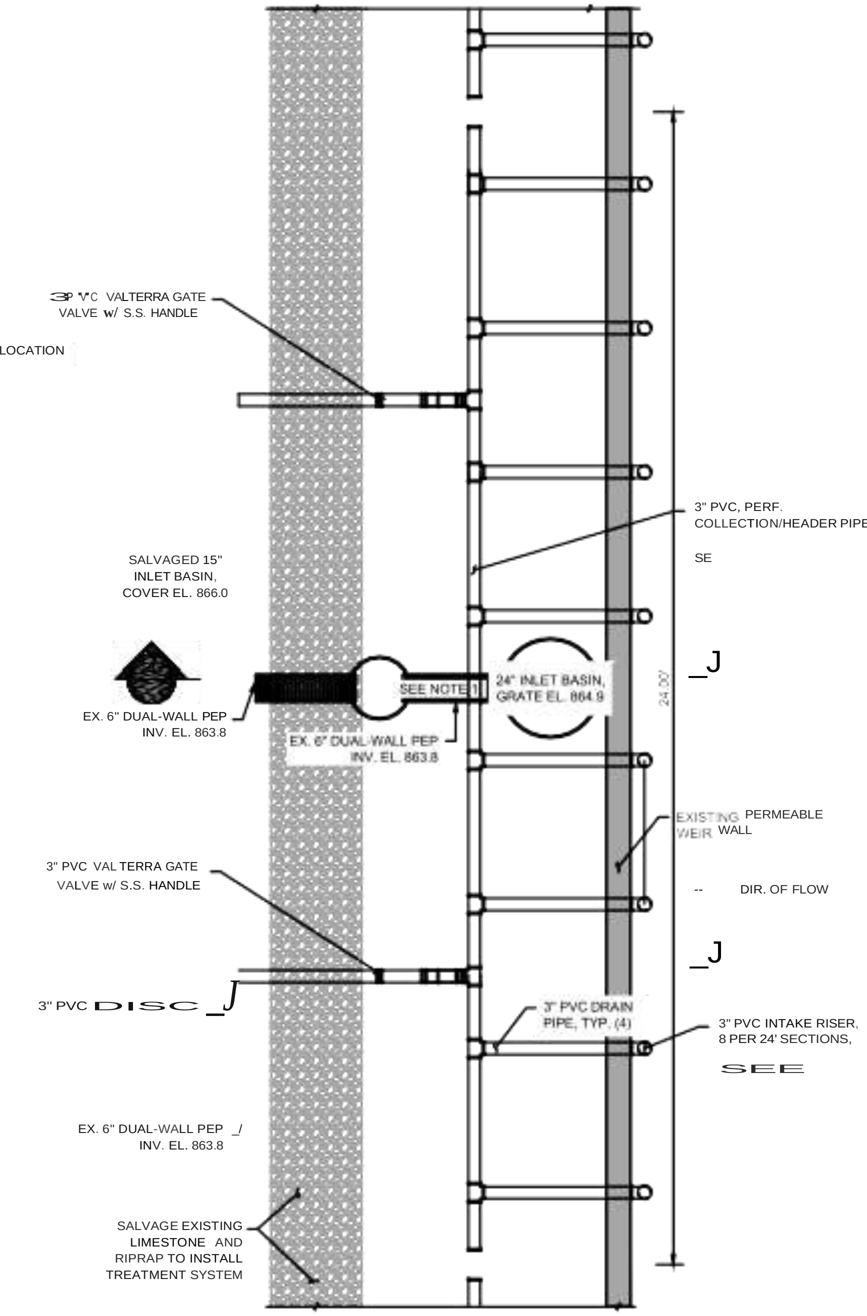
SECTION: TREATMENT COLLECTION SYSTEM

SCALE IN FEET



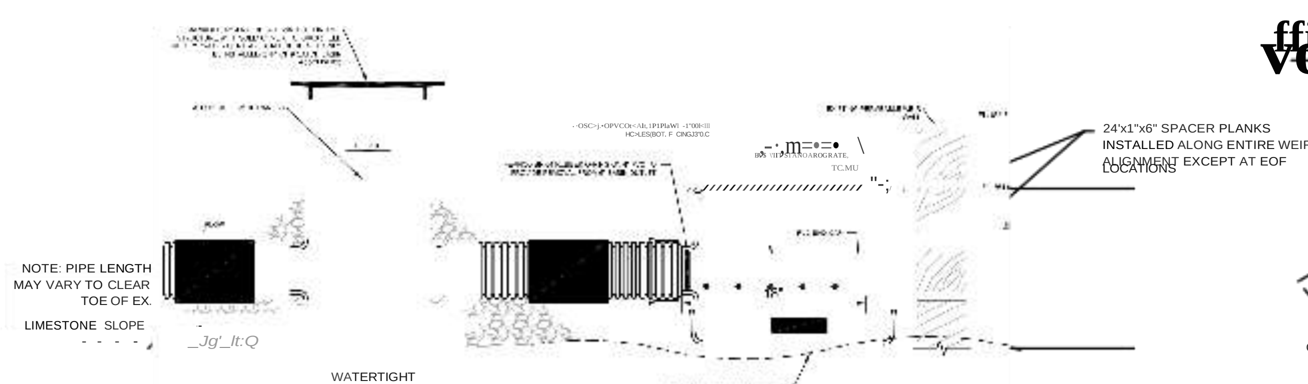
DETAIL: PVC INTAKE RISER

1 2 3 4
SCALE IN FEET



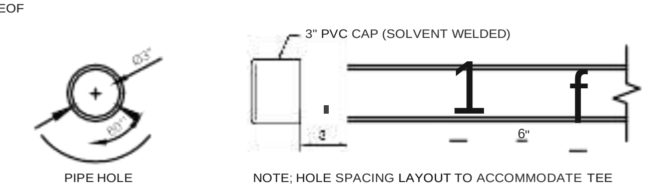
DETAIL: SYSTEM LAYOUT

1 2
SCALE IN FEET



SECTION: TREATMENT DISCHARGE SYSTEM

SCALE IN FEET



DETAIL: PVC COLLECTOR/HEADER PIPE

1 2 3 4
SCALE IN FEET

NOTE:

1. EXISTING TEST WELL SYSTEM ASSEMBLY CONSTRUCTED IN 2021. SYSTEM TO BE REMOVED, SALVAGED AND REINSTALLED IN CONJUNCTION WITH NEW PVC UP-FLOW TREATMENT SYSTEM. EXISTING SYSTEM BASINS AND PIPES TO BE CLEANED AND ADJUSTED AS DIRECTED BY THE ENGINEER.
2. PROPOSED WORK CONSISTS OF TWO (9) SIDE-BY-SIDE SYSTEMS, 24' WIDE EACH, WITH TWO OVERFLOW WEIR SECTIONS 3" LOWER THAN ADJACENT CELLS.

GENERAL NOTES:

1. NOTIFY DAVE VLASIN, RAMSEY WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7972 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION ACTIVITIES TO INSPECT EROSION/SEDIMENT CONTROL PRACTICES.
2. SPECIFIED EROSION/SEDIMENT CONTROL PRACTICES SHOWN ARE THE MINIMUM. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.
3. ALL NATIVE VEGETATION SHALL BE PROTECTED. DAMAGE TO NATIVE RESTORATION OUTSIDE CONSTRUCTION ACCESS LIMITS/AREAS SHALL BE REPAIRED IN-KIND AND MAINTAINED AT THE COST OF THE CONTRACTOR.

ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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BRADLEY J. LINDAMAN

SIGNATURE ____ DATE ____ LICENSE# 22178

RELEASED TO/FOR: BID, CONSTRUCTION

A	B	0	1	2	3	4

DATE RELEASED

BARR

Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277

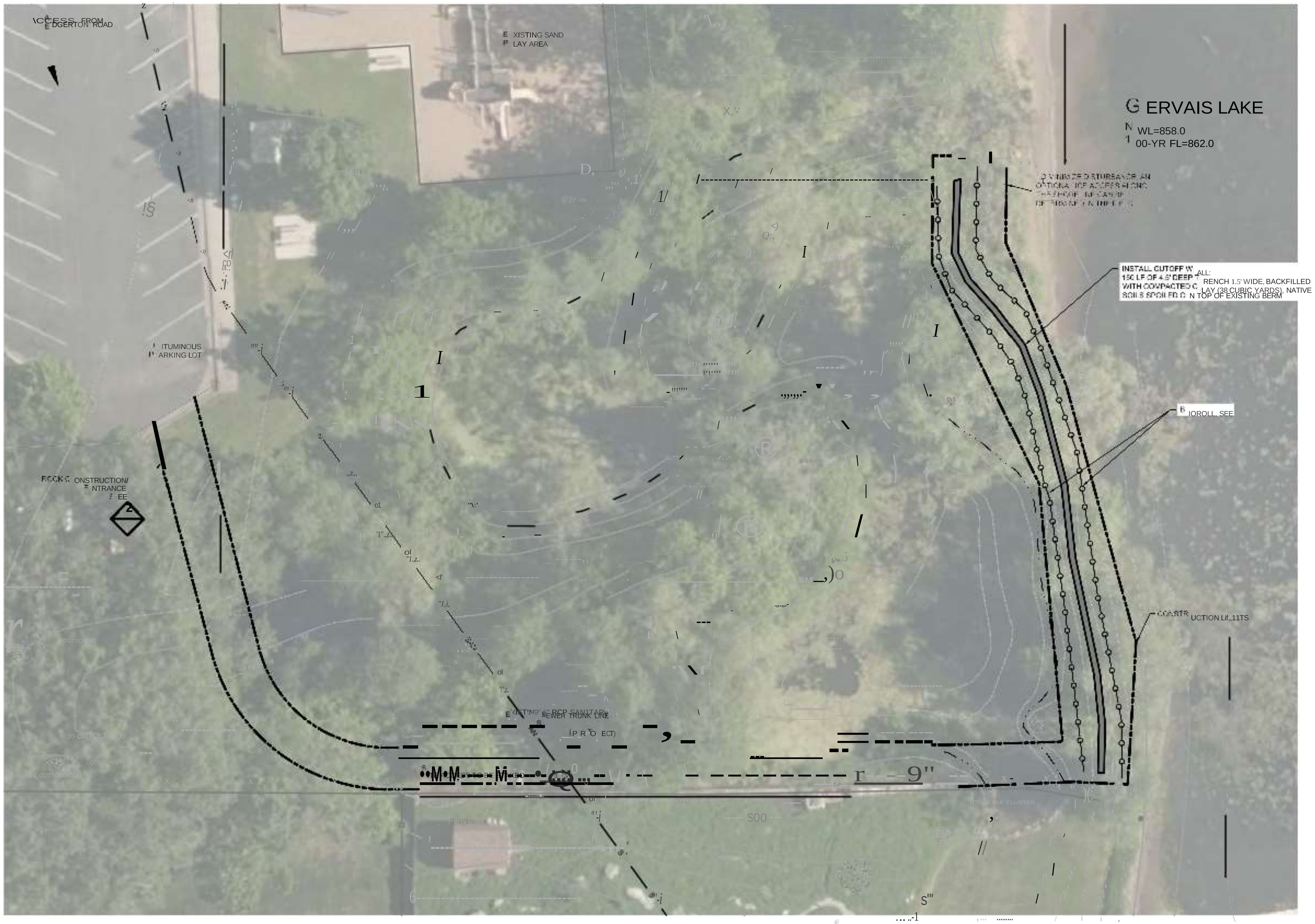
Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435 Ph: 1-800-632-2277 Fax: (952)832-2601 www.barr.com

Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	KMP
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP)
MAINTENANCE/REPAIRS 2023
KOHLMAN BASIN PERMEABLE WEIRS
UPFLOW TREATMENT SYSTEM

BARR PROJECT No. 23/62-0282.38
CLIENT PROJECT No.
DWG. No. C-06
REV. No. A



1 PLAN: GERVAIS LAKE WETLAND SEDIMENT REMOVAL

SCALE IN FEET

ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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PRINTED NAME BRADLEY J. LINDAMAN
SIGNATURE
DATE LICENSE #

RELEASED TO/FOR: A B C 0 1 2 3 — DATE RELEASED

BARR

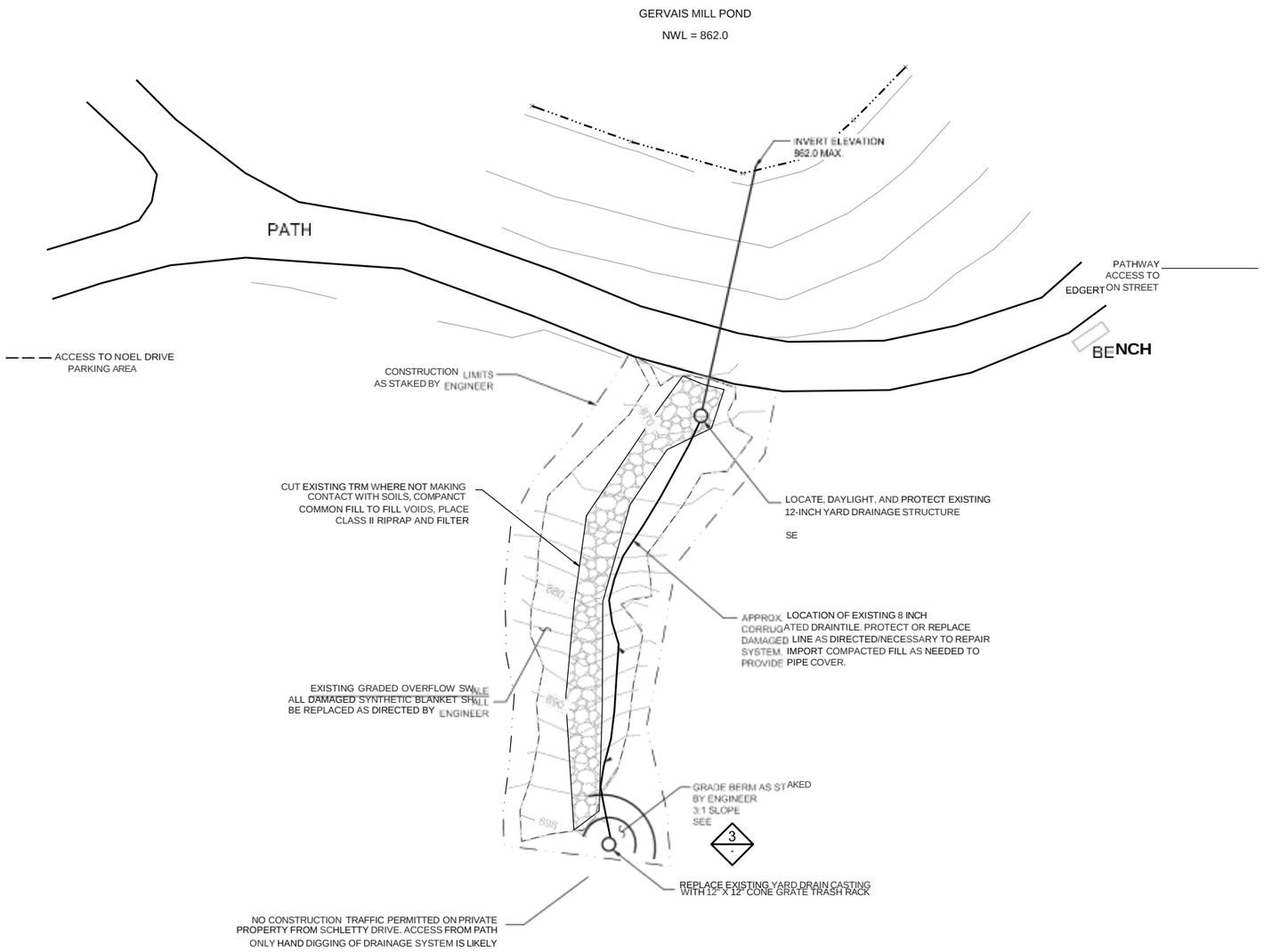
Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952) 832-2601
Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277

Scale: AS SHOWN
Date: 0/25/2023
Drawn: WP
Checked:
Designed: ABB
Approved: BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP) MAINTENANCE/REPAIRS 2023
GERVAIS BEACH WETLAND SEDIMENT REMOVAL

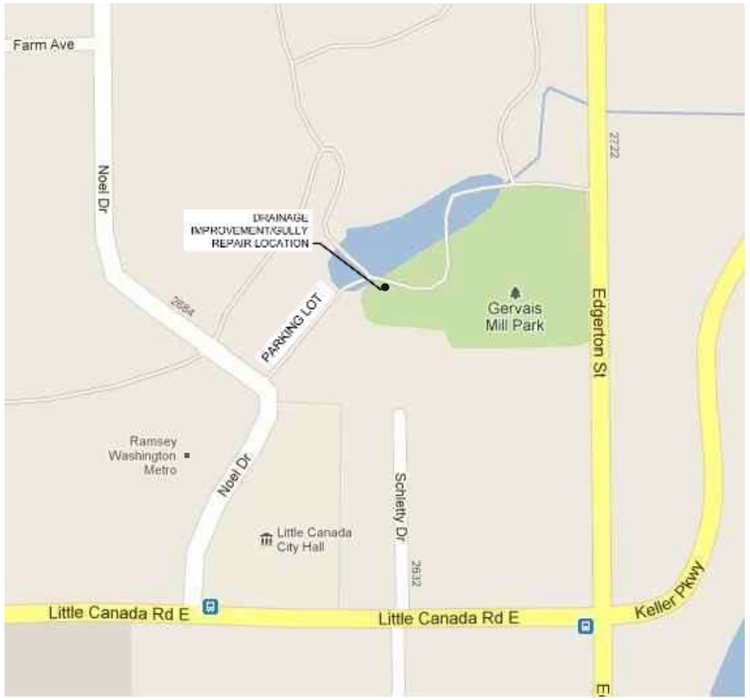
BARR PROJECT No. 23/62-0282.00
CLIENT PROJECT No.
DWG. No. C-07
REV. No. A



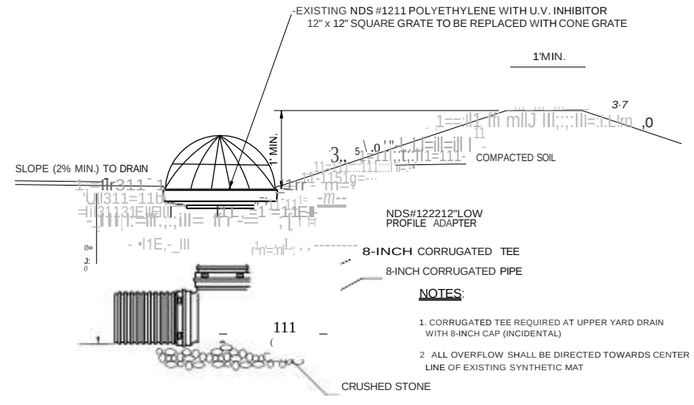
C) PLAN: GERVAIS MILL POND 0

0 10 20

SCALE IN FEET



0 PLAN: SITE LOCATION MAP 0



V & DETAIL: EXISTING 12-INCH YARD DRAINAGE STRUCTURE

NOTTO SCALE

GOPHER STATE ONE CALL

CALL BEFORE YOU DIG.
1-800-252-1166

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

NOTES:

1. PARKING LOT, PATHWAYS AND ALL ASSOCIATED FACILITIES MUST BE PROTECTED. CONTRACTOR RESPONSIBLE FOR REPAIRING ALL DAMAGE CAUSED.
2. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITY LOCATIONS.
3. CONTRACTOR IS RESPONSIBLE FOR RESTORING ALL DISTURBED AREAS. ONLY RESTORATION AREAS WITHIN THE CONSTRUCTION LIMITS WILL BE CONSIDERED FOR PAYMENT.
4. CONTRACTOR SHALL SEED AND MULCH DISTURBED AREA WITHIN THE CONSTRUCTION LIMITS. SEED SHALL BE PROVIDED BY OWNER. ALL SLOPES 3H TO 1V OR GREATER SHALL HAVE STRAW MULCH BLANKET INSTALLED (NORTH AMERICAN GREEN S75BN OR EQUAL).
5. ACCESS TO CONSTRUCTION LIMITS SHALL BE COORDINATED WITH THE OWNER AND THE CITY OF LITTLE CANADA.

NOTES:

1. CORRUGATED TEE REQUIRED AT UPPER YARD DRAIN WITH 8-INCH CAP (INCIDENTAL)
2. ALL OVERFLOW SHALL BE DIRECTED TOWARDS CENTER LINE OF EXISTING SYNTHETIC MAT

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NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

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BRADLEY J. LINDAMAN

SIGNATURE

DATE LICENSE# 22178

CLIENT	BID	CONSTRUCTION
10/2 /22-		-11/29/22

RELEASED TO/FOR: A B O 2 3 4 — DATE RELEASED

BARR
Corporate Headquarters:
Minneapolis, Minnesota
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MINNEAPOLIS, MN 55435
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www.barr.com

Scale	AS SHOWN
Date	10/18/2022
Drawn	GWB
Checked	GGN
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP) MAINTENANCE/REPAIRS 2023

SITE 7
GERVAIS MILL POND STEEP SLOPE REPAIR

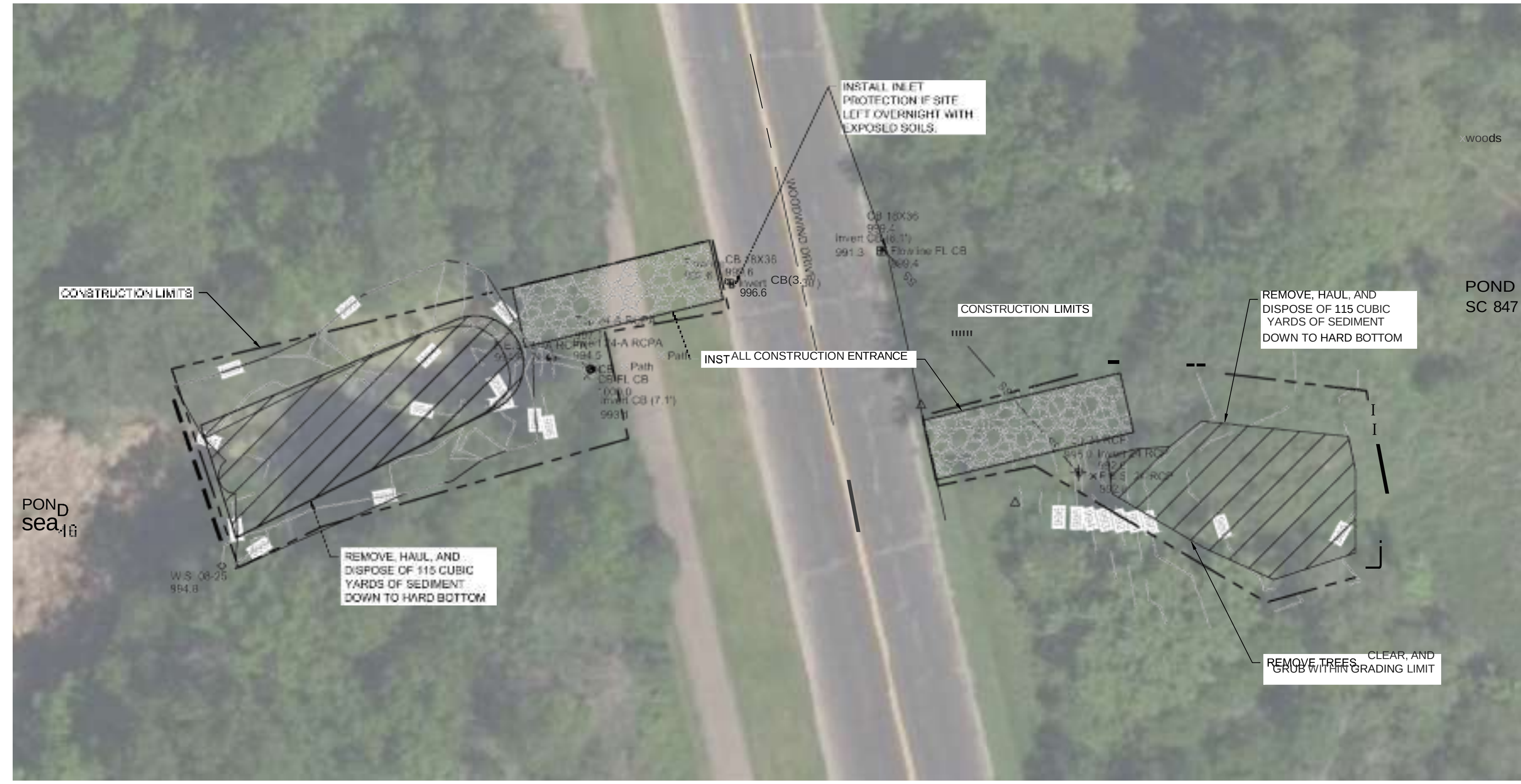
BARR PROJECT No.	
23/62-0282.38	
CLIENT PROJECT No.	
DWG. No.	REV. No.
C-08	A

CADD USER: Greg Nelson FILE: M:\CIVIL\DESIGN\23\62\0282.38\CIVIL\0282_2023_C08_MILL POND SLOPE REPAIR.DWG PLOT SCALE: 1 / 2 PLOT DATE: 10/25/2022 3:15 PM

PLAN: VACINITY MAP

100 200

SCALE IN FEET



PLAN: DELTA REMOVAL

20 40

SCALE IN FEET

LEGEND

GPS CONTROL POINT		SANITARY MANHOLE	
VERTICAL BENCHMARK		CATCH BASIN	
CONTROL HUB/ LATH		STORM SEWER MANHOLE	
POWER POLE		ELECTRICAL MANHOLE	
GUY WIRE		WATER MANHOLE	
LIGHT POLE		COMMUNICATIONS BOX	
HYDRANT		PROPERTY LINE	
GATE VALVE		BACK OF CURB LINE	
SIGN POST		FLOW LINE	
DECIDUOUS TREE		STORM SEWER LINE	
CONIFEROUS TREE		MAJOR CONTOUR	
		MINOR CONTOUR	
		WATER'S EDGE	
		SWALES	
		CATTAIL EDGE	

GOPHER STATE ONE CALL

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

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ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	10/2_/22-						
BID							
CONSTRUCTION	-	-					
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BARR

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Minneapolis, Minnesota
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Scale	AS SHOWN
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Drawn	BARR
Checked	GGN
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP) MAINTENANCE/REPAIRS 2023

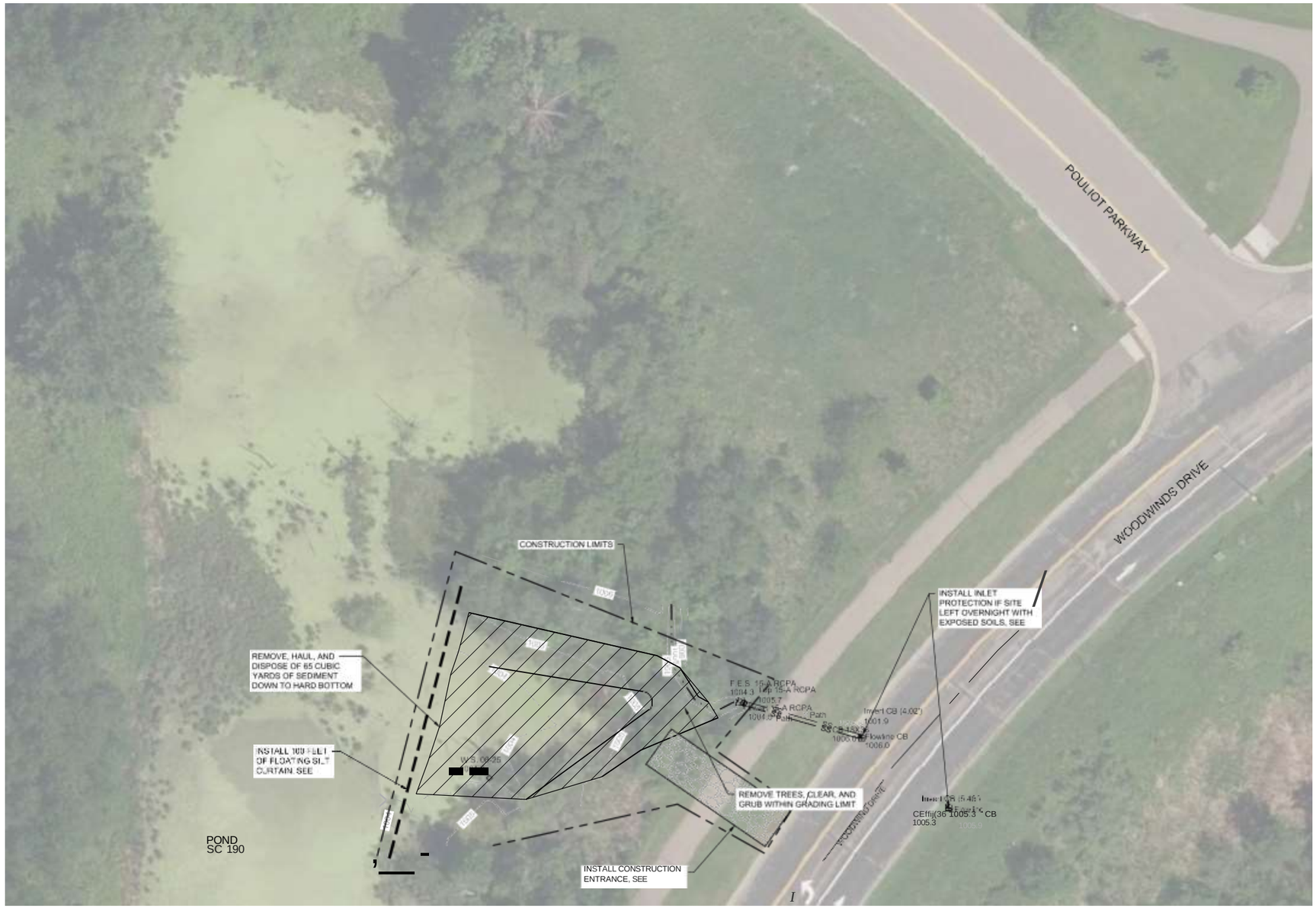
WOODBURY POND CLEANOUT
SC846 & SC847

BARR PROJECT No. 23/62-282.38

CLIENT PROJECT No.

DWG. No. C-09

REV. No. A



LEGEND

t,	GPS CONTROL POINT		
$	VERTICAL BENCHMARK	0	SANITARY MANHOLE
□	CONTROL HUB I LATH	@	CATCH BASIN
0	POWER POLE	@	STORM SEWER MANHOLE
	GUY WIRE LIGHT POLE	0	ELECTRICAL MANHOLE
0	HYDRANT GATE VALVE	@	WATER MANHOLE
	SIGN POST		
	DECIDUOUS TREE	III	COMMUNICATIONS BOX
♦	CONIFEROUS TREE		

PROPERTY LINE
BACK OF CURB LINE
FLOW LINE
-- SS -- SS --
STORM SEWER LINE
900
901
MAJOR CONTOUR
MINOR CONTOUR
WATER'S EDGE
SWALES
CATTAIL EDGE

GENERAL NOTES

1. NOTIFY DAVE VLASIN, RAMSEY WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7972 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION ACTIVITIES TO INSPECT EROSION/SEDIMENT CONTROL PRACTICES.
2. SPECIFIED EROSION/SEDIMENT CONTROL PRACTICES SHOWN ARE THE MINIMUM. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.
3. RESTORE DISTURBED AREAS WITH SEED AND STRAW MULCH BLANKET AS DIRECTED BY THE OWNER.
4. ONLY TREES MARKED FOR REMOVAL BY THE CITY OF WOODBURY PERMITTED.

GOPHER STATE ONE CALL

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

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER

EB PLAN: DELTA REMOVAL 0
20 40
SCALE IN FEET

ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

CLIENT
BID
CONSTRUCTION
RECORD
RELEASED TO/FOR

A	B	C	0	1	2	3
DATE RELEASED						

BARR
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Checked	GGN
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP)
MAINTENANCE/REPAIRS 2023

WOODBURY POND CLEANOUT
SC190

BARR PROJECT No. 23/62-282.38
CLIENT PROJECT No.
DWG. No. C-10
REV. No. A

LEGEND

t,	GPS CONTROL POINT	0	SANITARY MANHOLE
$	VERTICAL BENCHMARK	®	CATCH BASIN
□	CONTROL HUB I LATH	@	STORM SEWER MANHOLE
0	POWER POLE	0	ELECTRICAL MANHOLE
	GUY WIRE	@	WATER MANHOLE
0	LIGHT POLE		
⊳⊲	HYDRANT		
	GATE VALVE		
	SIGNPOST		
	DECIDUOUS TREE		COMMUNICATIONS BOX
♦	CONIFEROUS TREE		

PROPERTY LINE
MAJOR CONTOUR 800
MINOR CONTOUR 801
STORM SEWER LINE
MAJOR CONTOUR 900
MINOR CONTOUR 901
WATER'S EDGE
SWALES
CATTAIL EDGE

GENERAL NOTES

1. NOTIFY DAVE VLASIN, RAMSEY WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7972 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION ACTIVITIES TO INSPECT EROSION/SEDIMENT CONTROL PRACTICES.
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3. RESTORE DISTURBED AREAS WITH SEED AND STRAW MULCH BLANKET AS DIRECTED BY THE OWNER.
4. ONLY TREES MARKED FOR REMOVAL BY THE CITY OF WOODBURY PERMITTED.

PLAN: DELTA REMOVAL
0 20 40
SCALE IN FEET

GOPHER STATE ONE CALL

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

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

ISSUED FOR APPROVAL

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

RELEASED TO/FOR: CLIENT 10/2612- | BID - | CONSTRUCTION -

DATE RELEASED: A B C 0 1 2 3

BARR
Project Office
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952)832-2601
www.barr.com
Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277

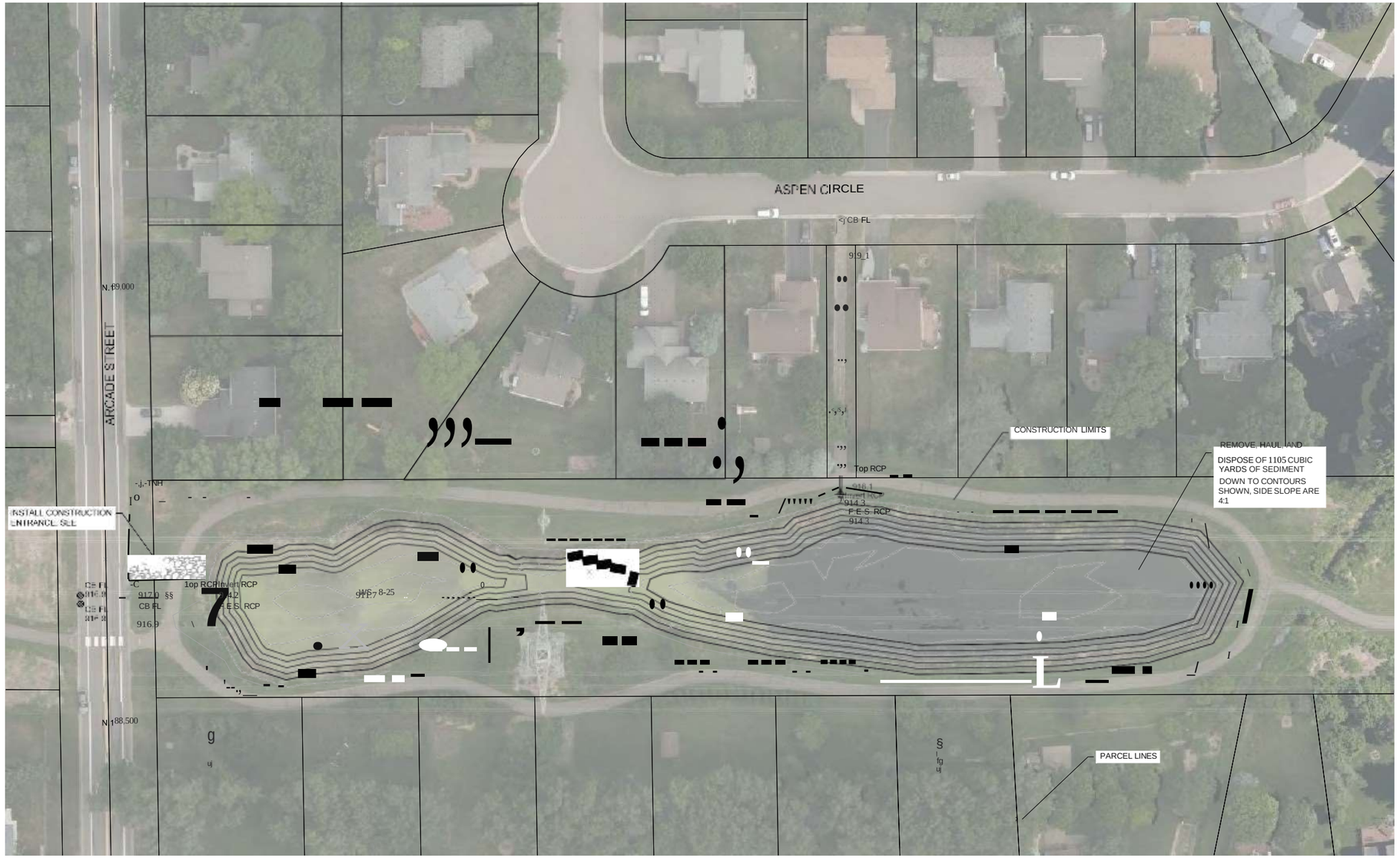
Scale	AS SHOWN
Date	10/15/2022
Drawn	BARR
Checked	GGN
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP)
MAINTENANCE/REPAIRS 2023

WOODBURY POND CLEANOUT
SC 275

BARR PROJECT No. 23/62-282.38
CLIENT PROJECT No.
DWG. No. C-11
REV. No. A



LEGEND

- GPS CONTROL POINT
- VERTICAL BENCHMARK
- CONTROL HUB I LATH
- POWER POLE
- GUY WIRE
- LIGHT POLE
- HYDRANT
- GATE VALVE
- SIGN POST
- DECIDUOUS TREE
- CONIFEROUS TREE
- SANITARY MANHOLE
- CATCH BASIN
- STORM SEWER MANHOLE
- ELECTRICAL MANHOLE
- WATER MANHOLE
- COMMUNICATIONS BOX

800 — MAJOR CONTOUR
801 — MINOR CONTOUR
SS -- SS -- STORM SEWER LINE
900 - MAJOR CONTOUR
901 — MINOR CONTOUR
WATER'S EDGE
SWALES
CATTAIL EDGE

GENERAL NOTES

1. NOTIFY DAVE VLASIN, RAMSEY WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7972 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION ACTIVITIES TO INSPECT EROSION/SEDIMENT CONTROL PRACTICES.
2. SPECIFIED EROSION/SEDIMENT CONTROL PRACTICES SHOWN ARE THE MINIMUM. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.
3. RESTORE DISTURBED AREAS WITH SEED AND STRAW MULCH BLANKET AS DIRECTED BY THE OWNER.
4. ONLY TREES MARKED FOR REMOVAL BY THE CITY OF LITTLE CANADA PERMITTED.

GOPHER STATE ONE CALL

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

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

PLAN: POND CLEANOUT

EB 20 40 0
SCALE IN FEET

ISSUED FOR REVIEW

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

CLIENT CONSTRUCTION
RELEASED TO/FOR RECORD

A	B	C	0	1	2	3

DATE RELEASED

BARR
Project Office: MARKETPTNTE DRIVE
BARR ENGINEERING CO.
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952) 832-2601
www.barr.com
Corporate Headquarters: Minneapolis, Minnesota
Ph: 1-800-632-2277

Scale Drawn	AS SHOWN BARR
Date	10/15/2022
Checked	GGN
Designed	BARR
Approved	BJL

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

CAPITAL IMPROVEMENT PROJECT (CIP)
MAINTENANCE/REPAIRS 2023

LITTLE CANADA POND CLEANOUT
ASPEN POND

BARR PROJECT No.
CLIENT PROJECT No. 23/62-282.38
DWG. No. C-12
REV. No. A

resourceful. naturally.
engineering and environmental consultants

BARR

Technical memorandum

To: Ramsey-Washington Metro Watershed District Board of Managers
From: Tyler Olsen
Subject: 2023 CIP Project Inspection Results
Date: October 26, 2022
Project: 23-62/0282.39

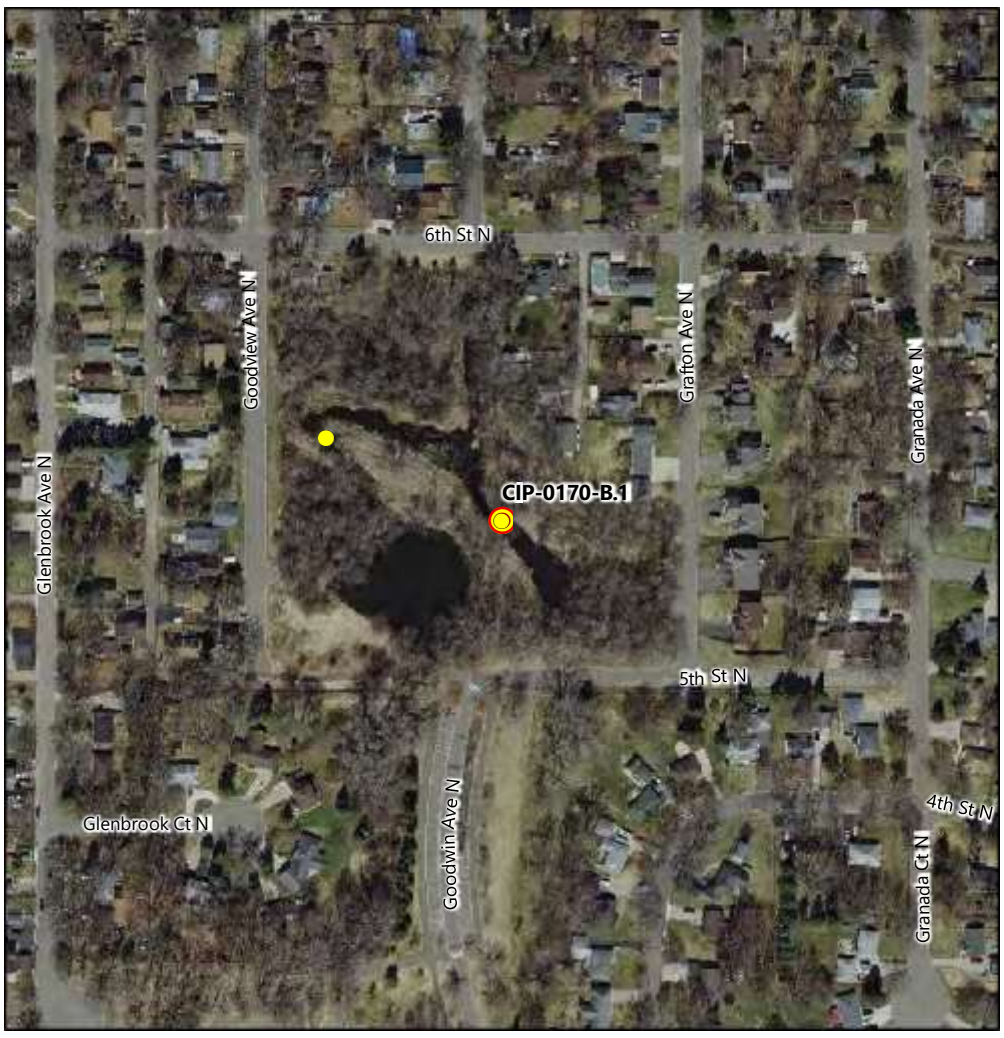
The Ramsey-Washington Metro Watershed District (RWMWD) and Barr Engineering Co. (Barr) developed a tool in 2022 to be used during its annual capital improvements projects (CIP) inspections of district owned facilities. Proper maintenance is critical to operating stormwater infrastructure to ensure public safety as well as increase the longevity of the infrastructure's lifecycle. The tool standardizes the district's facilities inspection process and prioritization of capital improvements project maintenance items. The tool consists of a mobile application and back-end scoring and prioritization system using data collected in the field including conditional assessment, recommended maintenance frequency, photographs, and other engineering judgements. The methodology for the tool development and scoring/prioritization system is included in a memo dated September 28, 2022 by Barr that was presented to the RWMWD board of managers. Overall, this effort provides more transparency to the public, improves efficiency of the annual inspection process, and reduces risk associated with delaying needed maintenance.

In August 2022, the four RWMWD and Barr staff members completed the full annual CIP inspection using the inspection tool. The 2022 CIP inspection took course over three and a half days and was overall successful. After, the data was downloaded and processed. Data from several of the sites were reviewed post-inspection for inclusion in the 2023 CIP bid package for maintenance. Normalized scores for the 2022 CIP inspection ranged from 1 to 8.5. The sites that were selected received high normalized scores compared to the rest of the infrastructure that was inspected (i.e. greater than a 2). These sites and their recommended maintenance are listed below:

- PFS Basins Paver Cleaning/Sweeping
- Tanners Wetland Weir Maintenance
- 5th Street Wetland Weir Maintenance
- Gervais Mill Pond Filter Maintenance
- Lower Afton Road Treatment Bay and Sediment Removal
- Kohlman Basin Weirs Upflow Treatment System
- Gervais Beach Stormwater Pond Berm Repair
- Woodbury Pond Cleanout (this is not a district owned facility, and was not inspected)
- Little Canada Pond (Aspen Pond) Cleanout (this is not a district owned facility, and was not inspected)

The one-page summaries (including inspection data, scores, and photographs) for the 2023 selected CIP projects are included in appendix A of this memo.

Appendix A: One-Page Summaries for 2023 CIP Projects



Unique_ID: CIP-0170-B.1
Site ID:
Section: Tanners Lake
Name: 5th Street Wetland Weirs - east

Inspection Date: 8/15/2022 1:54:00 PM
Inspector Name: Vlasin
Category: Weir
Structural Damage Ranking Description: 1. 0-3 cracks, bends, or dings on structure
Structural Damage Ranking Value: 1
Structural Damage Time Frame Value: 1
Structural Damage Notes:
Blockages Ranking Description: 2. 1-25% of slots in permeable weir or weir structure
Blockages Ranking Value: 2
Blockages Time Frame Value: 1
Blockages Notes: Water the same on both . But there is about 2ft of much on upstream side
Last Known Survey Notes:

District_Owned: Yes
Flag for Further Review: Yes
Inspection Notes: Clean upstream of weir. Do not clean down strea
Total Score: 3
Normalized_Score: 1.5

Inspection Indicator
Inspection Location
RWMWD Boundary

0 200 400
Feet

Image Source: Met Council (2020)

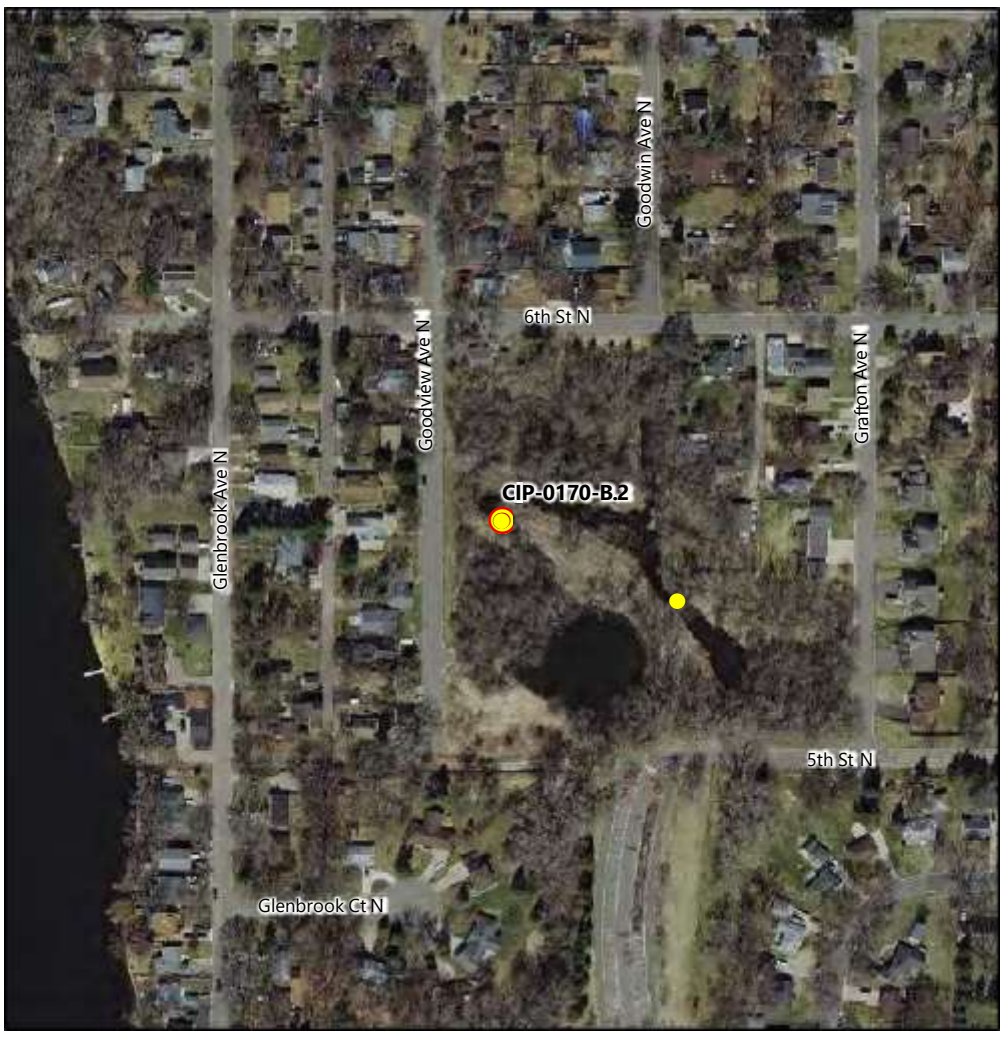
WEIRS
INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

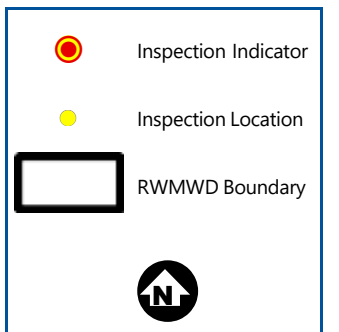
UNIQUE ID: **CIP-0170-B.1**

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT





WEIRS
INSPECTION SUMMARY - 2022
Ramsey-Washington Metro
Watershed District

UNIQUE ID: **CIP-0170-B.2**

Unique_ID: CIP-0170-B.2
Site ID:
Section: Tanners Lake
Name: 5th Street Wetland Weirs - west

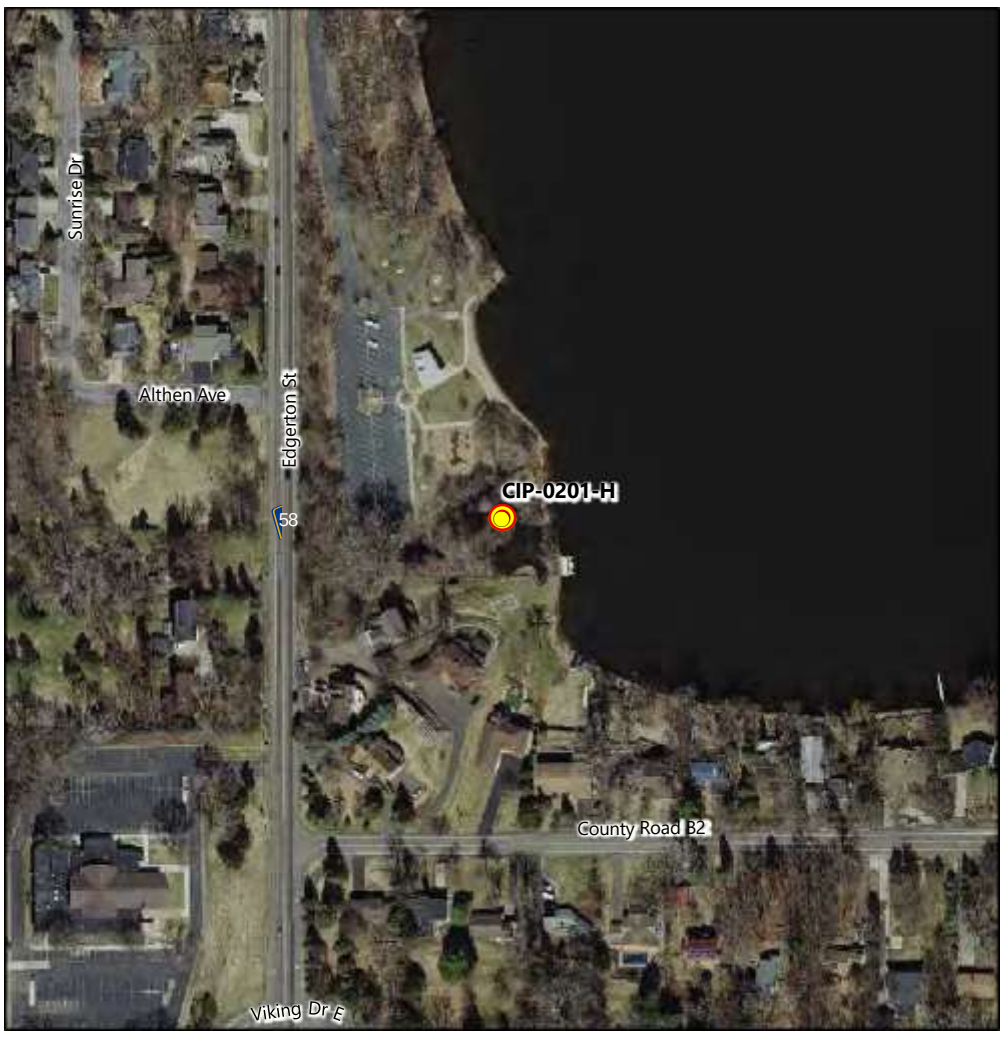
Inspection Date: 8/15/2022 1:38:00 PM
Inspector Name: Vlasin
Category: Weir
Structural Damage Ranking Description: 1. 0-3 cracks, bends, or dings on structure
Structural Damage Ranking Value: 1
Structural Damage Time Frame Value: 1
Structural Damage Notes:
Blockages Ranking Description: 3. 26-50% of slots in permeable weir or weir structure
Blockages Ranking Value: 3
Blockages Time Frame Value: 2
Blockages Notes:
Last Known Survey Notes:

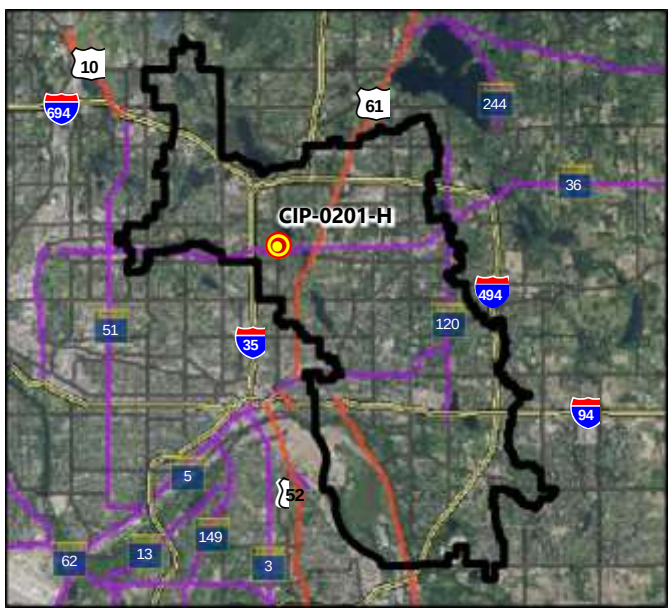
District_Owned: Yes
Flag for Further Review: Yes
Inspection Notes: Clean upstream side of downstream weir— sed is 18inches below top of weir in pool 2. maybe remove 50yard?
Total Score: 7
Normalized_Score: 3.5

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT





Inspection Indicator

Inspection Location

RWMWD Boundary

0 200 400

Feet

Image Source: Met Council (2020)

BERM/EARTHEN SYSTEMS INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

UNIQUE ID: **CIP-0201-H**

Unique ID: CIP-0201-H
Site ID: 201
Section: Gervais Creek
Name: Gervais Beach stormwater pond

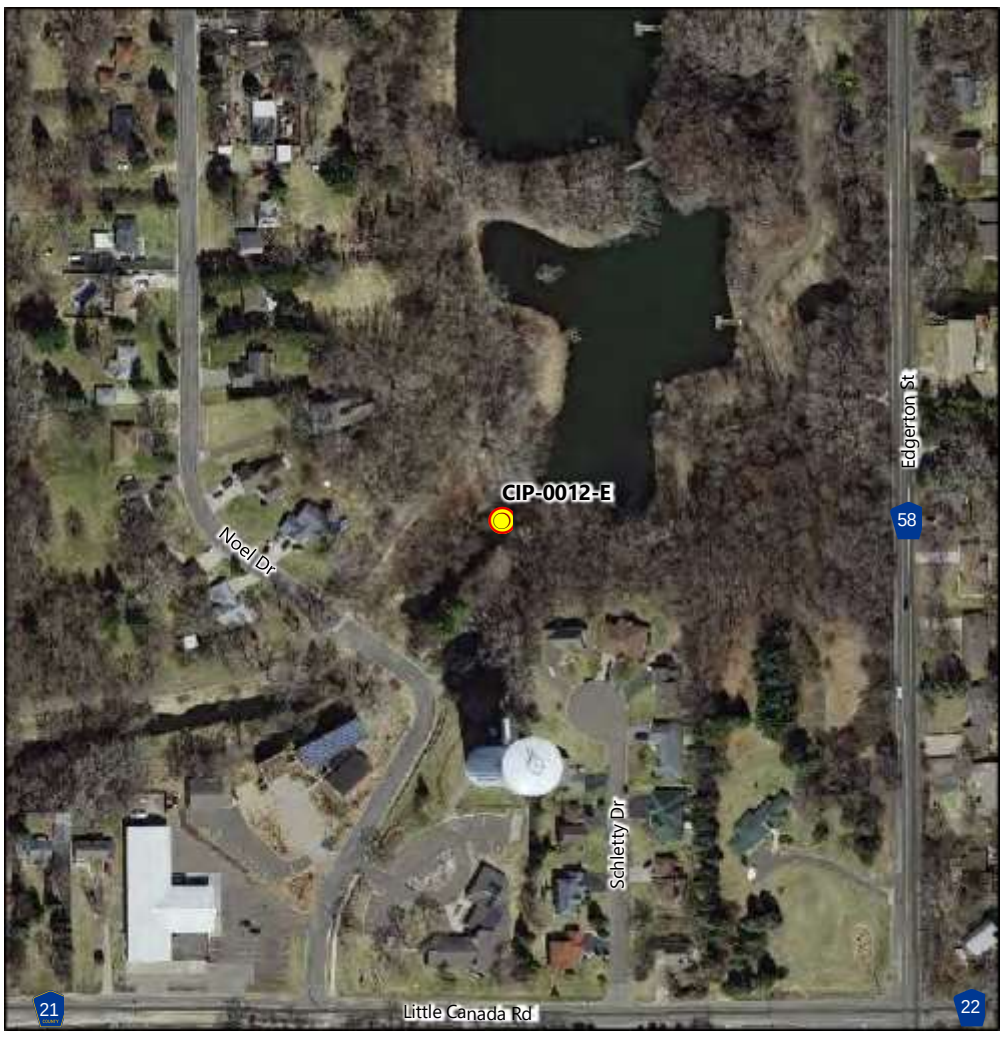
Inspection Date: 8/12/2022 2:31:00 PM
Inspector Name: Vlasin
Category: Berm/Earthen Systems
Vegetation Establishment Ranking Description: 1. Over 90%
Vegetation Establishment Ranking Value: 1
Vegetation Establishment Time Frame Value: 1
Vegetation Establishment Notes:
Erosion Ranking Description: 1. None
Erosion Ranking Value: 1
Erosion Time Frame Value: 1
Erosion Notes:
Tree, Brush, or Animal Hole Removal Required Ranking Description: 1. None
Tree, Brush, or Animal Hole Removal Required Ranking Value: 1
Tree, Brush, or Animal Hole Removal Required Time Frame Value:
Tree, Brush, or Animal Hole Removal Required Notes:
Signs of Failure Ranking Description: 3. High probability seepage or overtopping. Sink hole 5-10 square foot area
Signs of Failure Ranking Value: 3
Signs of Failure Time Frame Value: 2
Signs of Failure Notes: Signs seepage. Small delta.
Blockages Ranking Description: 1. None
Blockages Ranking Value: 1
Blockages Time Frame Value: 1
Blockages Notes:
Last Known Survey Notes:

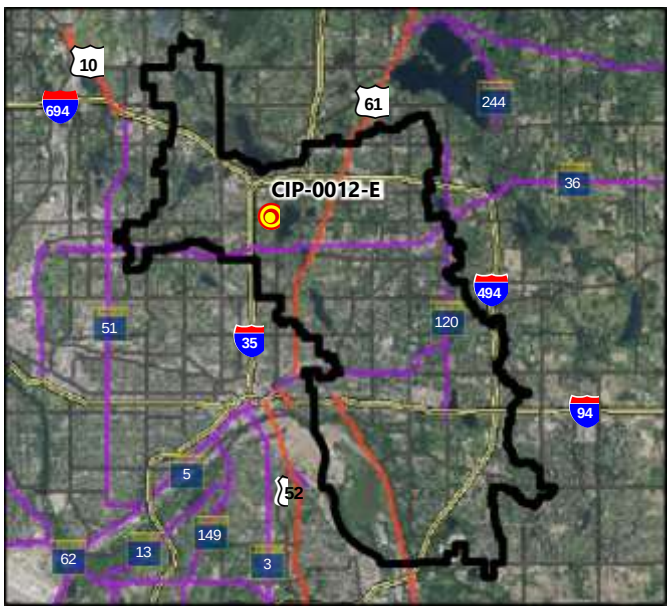
District Owned: Yes
Flag for Further Review: Yes
Inspection Notes: Short cut under berm — Garett bouncing on top and can feel shake
Total Score: 10
Normalized Score: 2

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT





Inspection Indicator

Inspection Location

RWMWD Boundary

0 200 400

Feet

Image Source: Met Council (2020)

ENGINEERED FILTER MEDIA INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

UNIQUE ID: **CIP-0012-E**

Unique_ID: CIP-0012-E
Site ID: 12
Section: Gervais Creek
Name: Gervais Mill Pond, Noel Drive culvert cross, filter strip

---

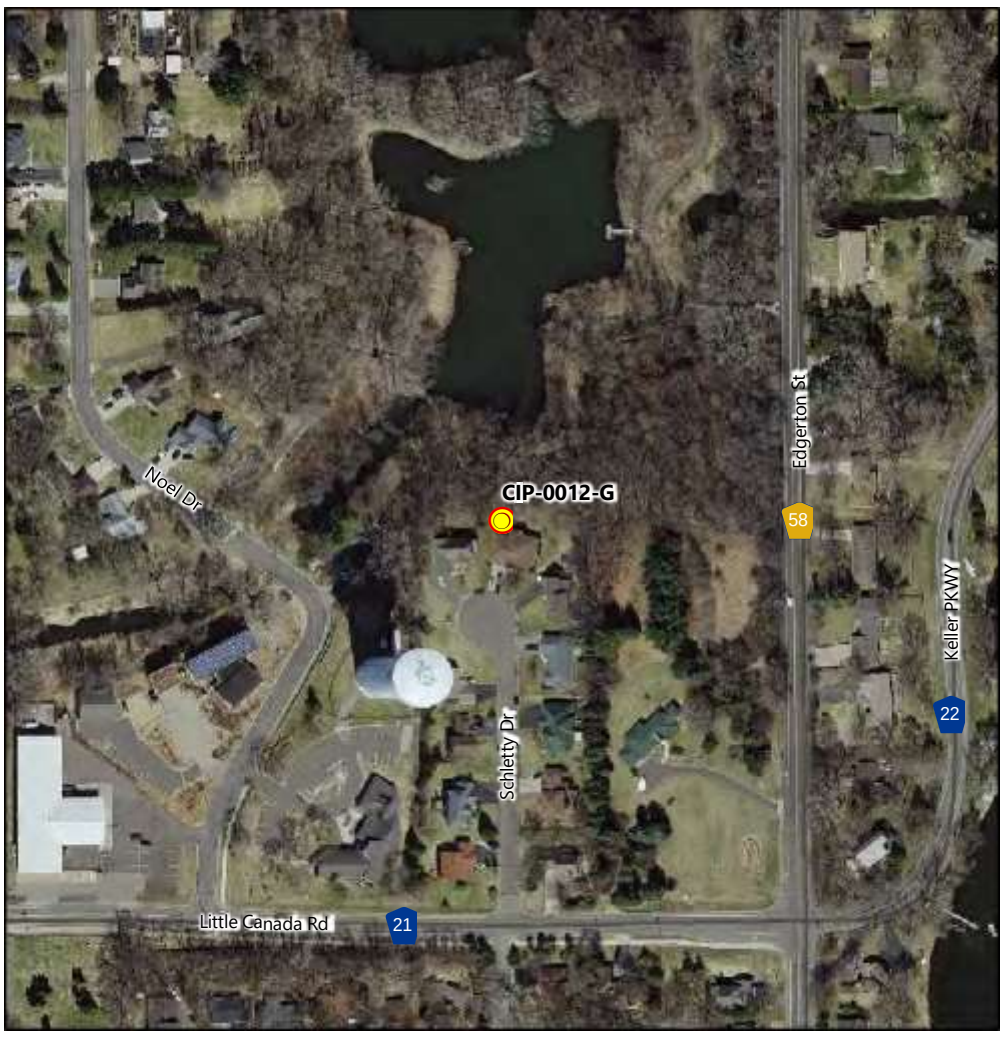
Inspection Date: 8/12/2022 1:44:00 PM
Inspector Name: Vlasin
Category: Engineered Filter Media/System
Sediment/Silt Buildup on Media Description: 1. None
Sediment/Silt Buildup on Media Ranking Value: 1
Sediment/Silt Buildup on Media Time Frame Value: 1
Sediment/Silt Buildup on Media Notes:
Structure Condition Ranking Description: 1. 0-5 cracks, bends, or dings on structure
Structure Condition Ranking Value: 1
Structure Condition Time Frame Value: 1
Structure Condition Notes:
Sediment/Silt Build Up on Bottom of Filter System Ranking Description: 1. None
Sediment/Silt Build Up on Bottom of Filter System Ranking Value: 1
Sediment/Silt Build Up on Bottom of Filter System Time Frame Value: 1
Sediment/Silt Build Up on Bottom of Filter System Notes: Possible survey from Noel dr to filter to see if sed built up in creek
Last Known Survey Notes:

District_Owned: Yes
Flag for Further Review: Yes
Inspection Notes: Clean/replace filter rock … every year thing. —- is it time to rebuild the filter strip. Should we keep cleaning the filter or let clog up and serve as an overflow
Total Score: 4
Normalized_Score: 1

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT



Unique_ID: CIP-0012-G
Site ID: 12
Section: Gervais Creek
Name: Gervais Mill Pond, steep slope repair by watertower

Inspection Date: 8/12/2022 1:57:00 PM
Inspector Name: Vlasin
Category: Turf reinforcement mat
Vegetation Establishment Ranking Description: 4. Under 50%
Vegetation Establishment Ranking Value: 4
Vegetation Establishment Time Frame Value: 3
Vegetation Establishment Notes:
Proper Location Ranking Description: 1. Properly installed/functioning
Proper Location Ranking Value: 1
Proper Location Time Frame Value: 1
Proper Location Notes:
Last Known Survey Notes:

District_Owned: Yes
Flag for Further Review: Yes
Inspection Notes: Some erosion under TRM. Pipe visible about 1/4 way down. Should repair add soil .... Complete redo?
Total Score: 13
Normalized_Score: 6.5

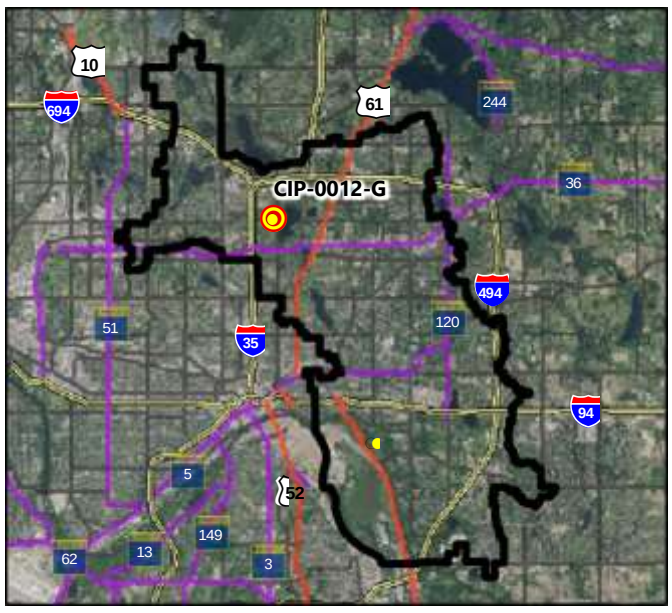
Inspection Indicator
Inspection Location
RWMWD Boundary

0 200 400
Feet

Image Source: Met Council (2020)

TURF REINFORCEMENT MATS INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

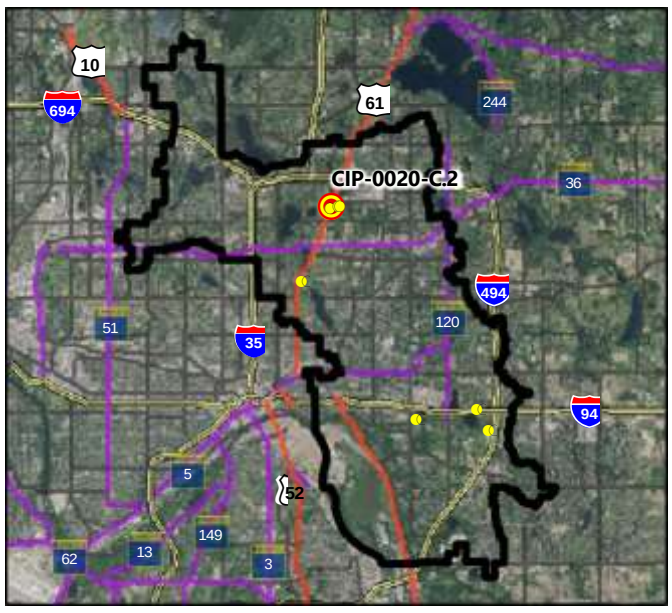
UNIQUE ID: **CIP-0012-G**



Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT



Inspection Indicator

Inspection Location

RWMWD Boundary

N

0 200 400

Feet

Image Source: Met Council (2020)

WEIRS
INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

UNIQUE ID: **CIP-0020-C.2**

Unique_ID: CIP-0020-C.2
Site ID:
Section:
Name: Kohlman Basin Outlet Weir

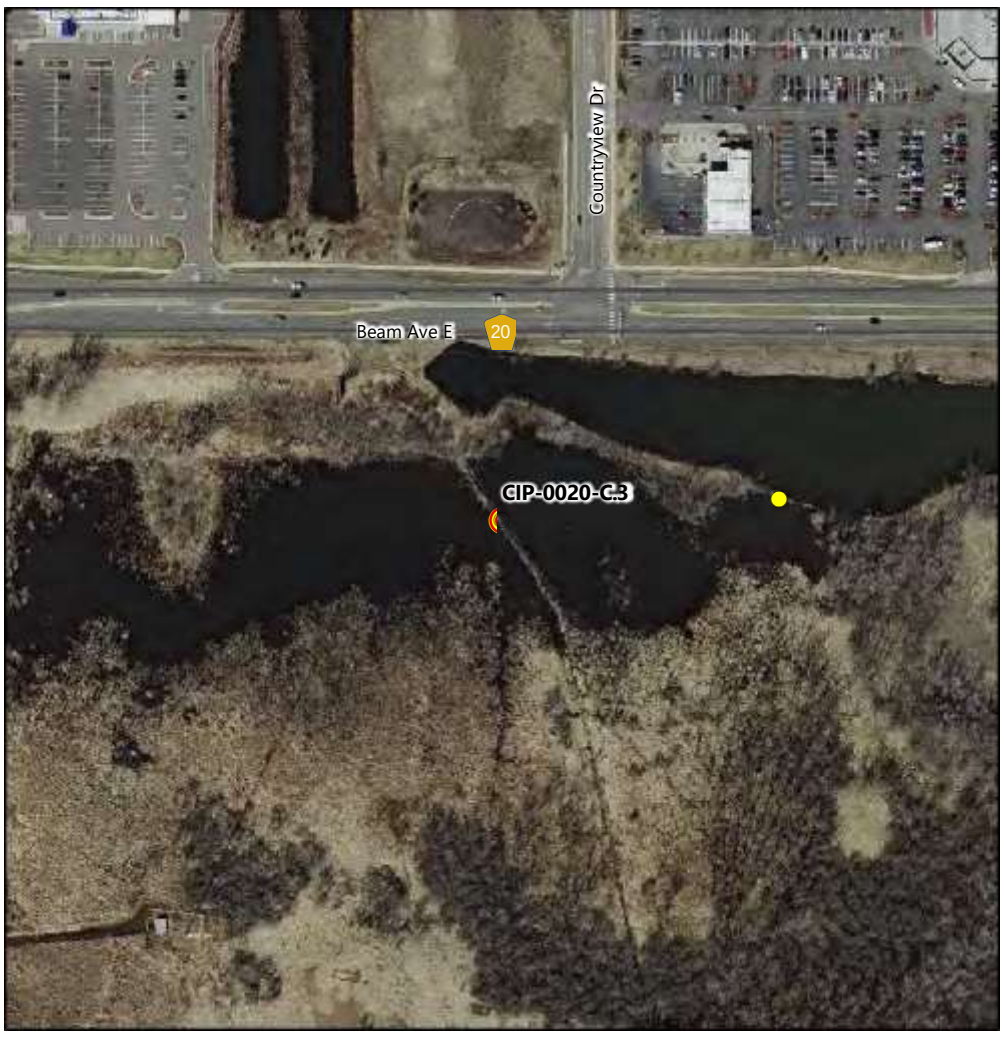
Inspection Date: 8/12/2022 2:58:00 PM
Inspector Name: Vlasin
Category: Weir
Structural Damage Ranking Description: 1. 0-3 cracks, bends, or dings on structure
Structural Damage Ranking Value: 1
Structural Damage Time Frame Value: 1
Structural Damage Notes:
Blockages Ranking Description: 1. None
Blockages Ranking Value: 1
Blockages Time Frame Value: 1
Blockages Notes:
Last Known Survey Notes:

District Owned: Yes
Flag for Further Review: No
Inspection_Notes:
Total Score: 5
Normalized_Score: 1

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT



Unique_ID: CIP-0020-C.3
Site ID:
Section:
Name: Kohlman Basin Weirs and test cells

Inspection Date: 8/12/2022 3:14:00 PM
Inspector Name: Vlasin
Category: Weir
Structural Damage Ranking Description: 1. 0-3 cracks, bends, or dings on structure
Structural Damage Ranking Value: 1
Structural Damage Time Frame Value: 1
Structural Damage Notes:
Blockages Ranking Description: 1. None
Blockages Ranking Value: 1
Blockages Time Frame Value: 1
Blockages Notes:
Last Known Survey Notes:

District Owned: Yes
Flag for Further Review: No
Inspection Notes: Test cells could use a little work. — did Keith get good info?
Total Score: 5
Normalized_Score: 1

Inspection Indicator
Inspection Location
RWMWD Boundary

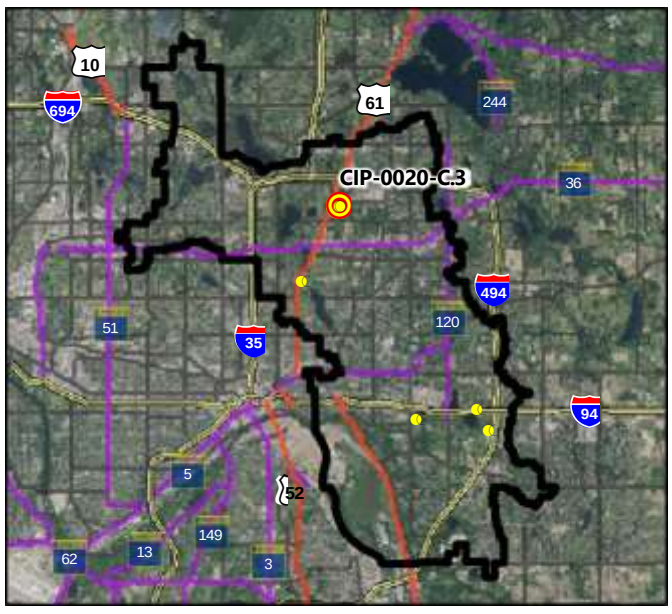
N

0 200 400
Feet

Image Source: Met Council (2020)

WEIRS
INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

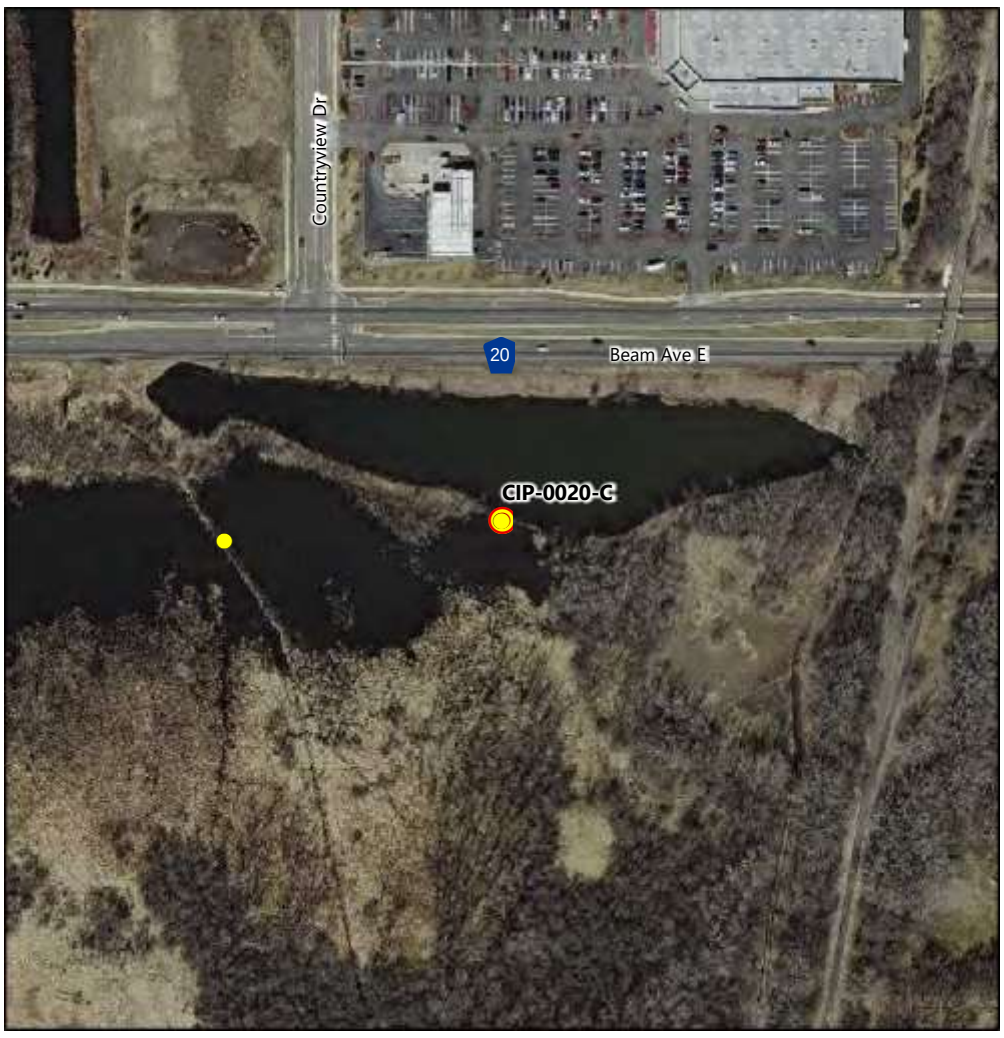
UNIQUE ID: **CIP-0020-C.3**



Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT



Unique_ID: CIP-0020-C
Site ID: 20
Section: Kohlman Creek
Name: Kohlman Basin, permeable weirs and concrete weir

Inspection Date: 8/12/2022 3:22:00 PM
Inspector Name: Vlasin
Category: Weir
Structural Damage Ranking Description: 1. 0-3 cracks, bends, or dings on structure
Structural Damage Ranking Value: 1
Structural Damage Time Frame Value: 1
Structural Damage Notes:
Blockages Ranking Description: 2. 1-25% of slots in permeable weir or weir structure
Blockages Ranking Value: 2
Blockages Time Frame Value: 1
Blockages Notes: Willows and veg growing in rocks

Last Known Survey Notes:

District Owned: Yes
Flag for Further Review: No
Inspection_Notes:
Total Score: 5
Normalized_Score: 1

Inspection Indicator
Inspection Location
RWMWD Boundary

N

0 200 400
Feet

Image Source: Met Council (2020)

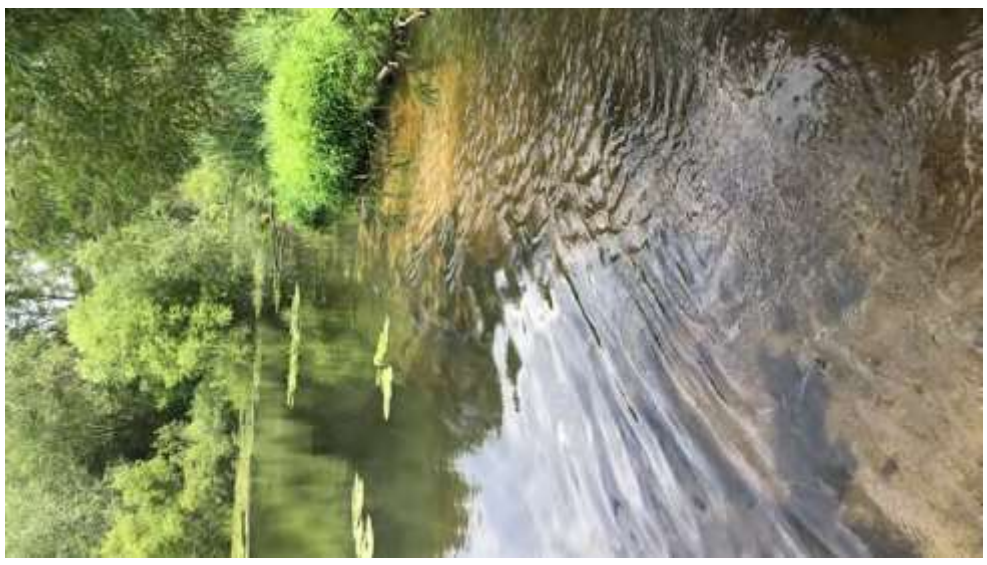
WEIRS
INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

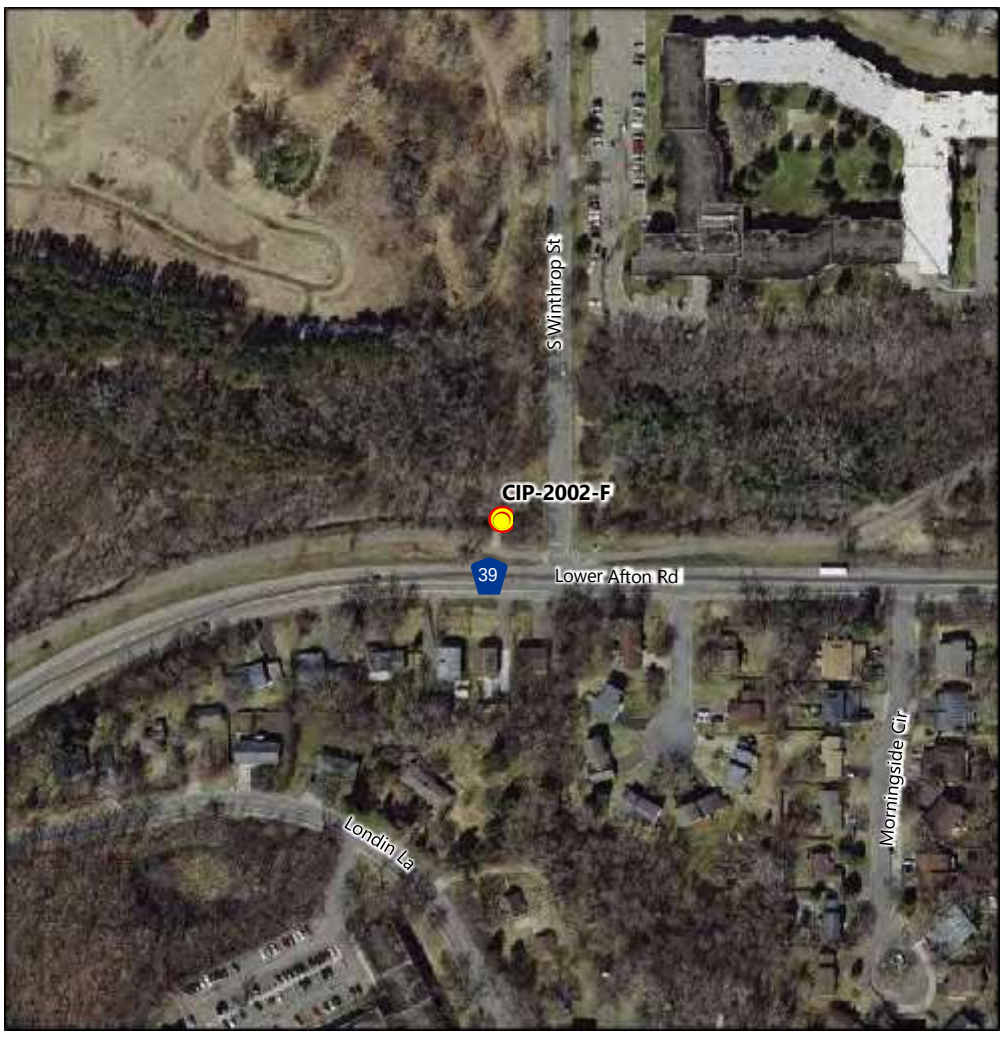
UNIQUE ID: **CIP-0020-C**

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT





Inspection Indicator

Inspection Location

RWMWD Boundary

0 200 400

Feet

Image Source: Met Council (2020)

PONDS
INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

UNIQUE ID: **CIP-2002-F**

Unique_ID: CIP-2002-F
Site ID:
Section: Battle Creek, Upper/Lower Ravine
Name: Lower Afton Rd Drainageway at Winthrop; Basin and Rock Channel

---

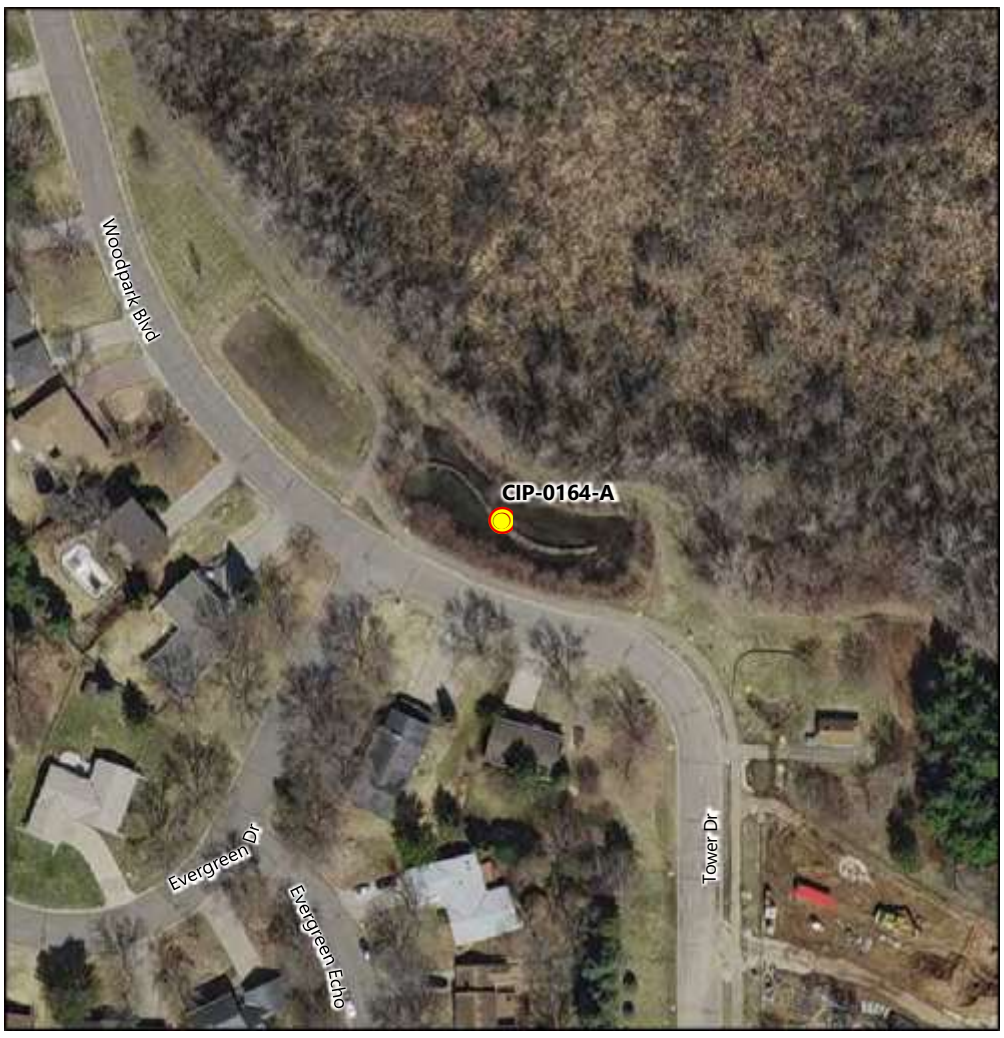
Inspection Date: 8/17/2022 1:44:00 PM
Inspector Name: Vlasin
Category: Ponds
Delta Ranking Description: 4. Delta formation over 50 cubic yards
Delta Ranking Value: 4
Delta Time Frame Value: 4
Delta Notes:
Erosion Ranking Description: 1. None
Erosion Ranking Value: 1
Erosion Time Frame Value: 1
Erosion Notes:
Cattail Ranking Description: 1. None or under 50 square yard area
Cattail Ranking Value: 1
Cattail Time Frame Value: 1
Cattail Notes:
Pond Storage Ranking Description: 4. Over 50% full of sediment
Pond Storage Ranking Value: 4
Pond Storage Time Frame Value: 4
Pond Storage Notes: Needs to be cleaned
Last Known Survey Notes:

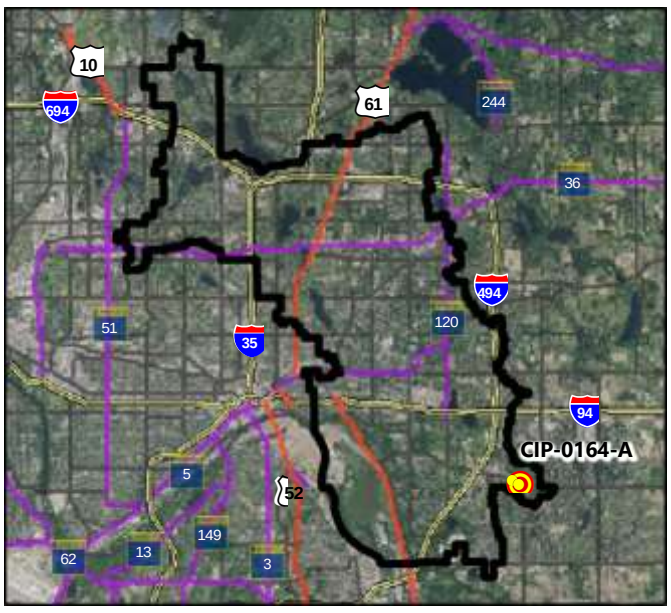
District_Owned: Yes
Flag for Further Review: Yes
Inspection Notes: Adding a "pool 2" in 2923 cip
Total Score: 34
Normalized_Score: 8.5

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT





Inspection Indicator

Inspection Location

RWMWD Boundary

N

0 100 200

Feet

Image Source: Met Council (2020)

INFILTRATION SURFACES INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

UNIQUE ID: **CIP-0164-A**

Unique_ID: CIP-0164-A
Site ID: 164
Section: PFS Basins
Name: PFS Basin East

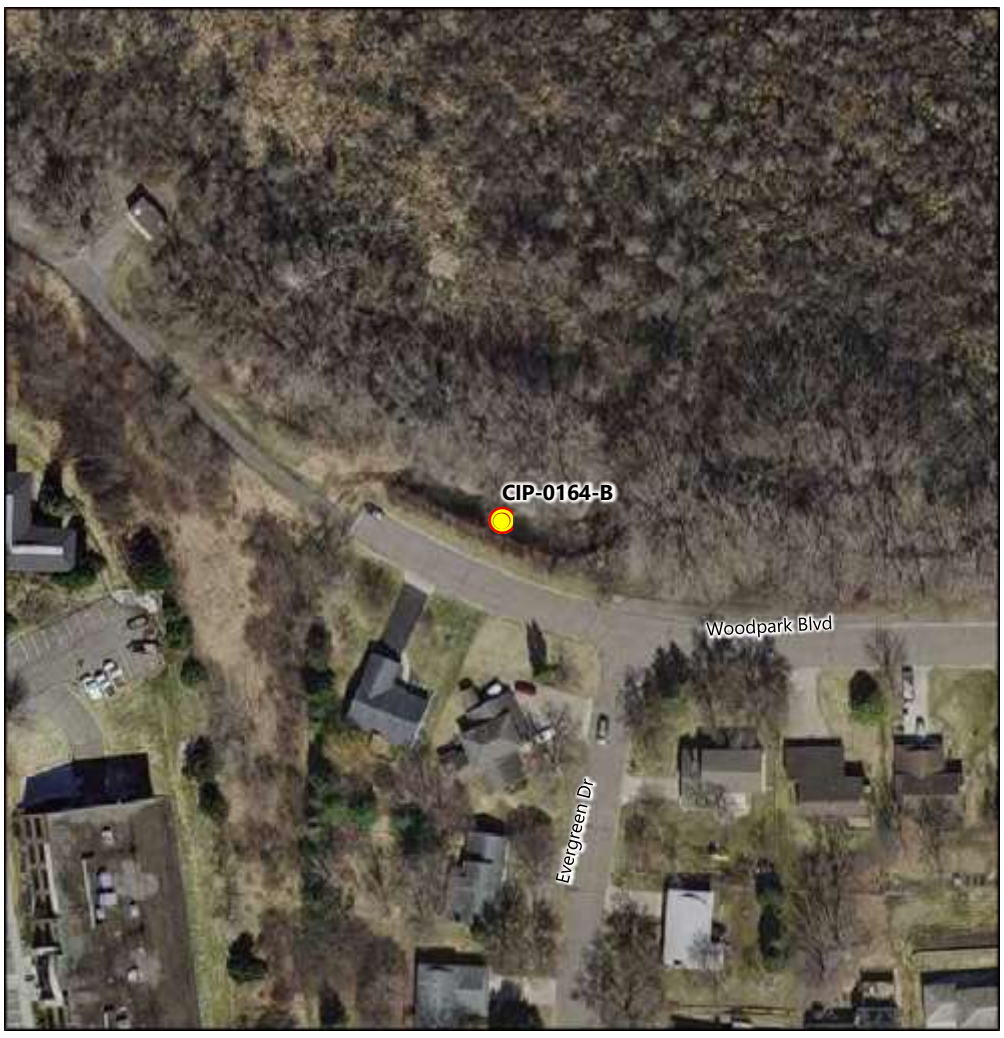
Inspection Date: 8/17/2022 11:57:00 AM
Inspector Name: Vlasin
Category: Infiltration surfaces
Sediment Accumulation Ranking Description: 3. 1-2 inches
Sediment Accumulation Ranking Value: 3
Sediment Accumulation Time Frame Value: 3
Sediment Accumulation Notes:
Mounding Beneath the Surface Ranking Description: 3. 1-2 inches
Mounding Beneath the Surface Ranking Value: 3
Mounding Beneath the Surface Time Frame Value: 3
Mounding Beneath the Surface Notes:
Structural Damage Ranking Description: 1. 0-10 pavers out of place, or 0-10 cracked pavers
Structural Damage Ranking Value: 1
Structural Damage Time Frame Value: 1
Structural Damage Notes:
Last Known Survey Notes:

District_Owned: Yes
Flag for Further Review: Yes
Inspection Notes: Clean pavers just like every year ... clean/replace outlet rock as well
Total Score: 19
Normalized_Score: 6.333333333

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT



Unique_ID: CIP-0164-B
Site ID: 164
Section: PFS Basins
Name: PFS Basin West

Inspection Date: 8/17/2022 12:09:00 PM
Inspector Name: Vlasin
Category: Infiltration surfaces
Sediment Accumulation Ranking Description: 3. 1-2 inches
Sediment Accumulation Ranking Value: 3
Sediment Accumulation Time Frame Value: 3
Sediment Accumulation Notes:
Mounding Beneath the Surface Ranking Description: 3. 1-2 inches
Mounding Beneath the Surface Ranking Value: 3
Mounding Beneath the Surface Time Frame Value: 3
Mounding Beneath the Surface Notes:
Structural Damage Ranking Description: 1. 0-10 pavers out of place, or 0-10 cracked pavers
Structural Damage Ranking Value: 1
Structural Damage Time Frame Value: 1
Structural Damage Notes:
Last Known Survey Notes:

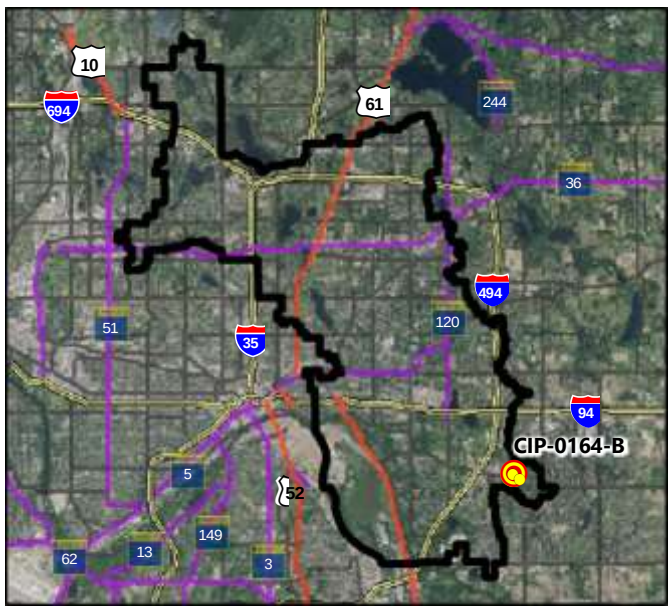
District_Owned: Yes
Flag for Further Review: Yes
Inspection Notes: Clean per usual. Also replace filter Rick at outlet
Total Score: 19
Normalized_Score: 6.333333333

Inspection Indicator
Inspection Location
RWMWD Boundary

N

0 100 200
Feet

Image Source: Met Council (2020)

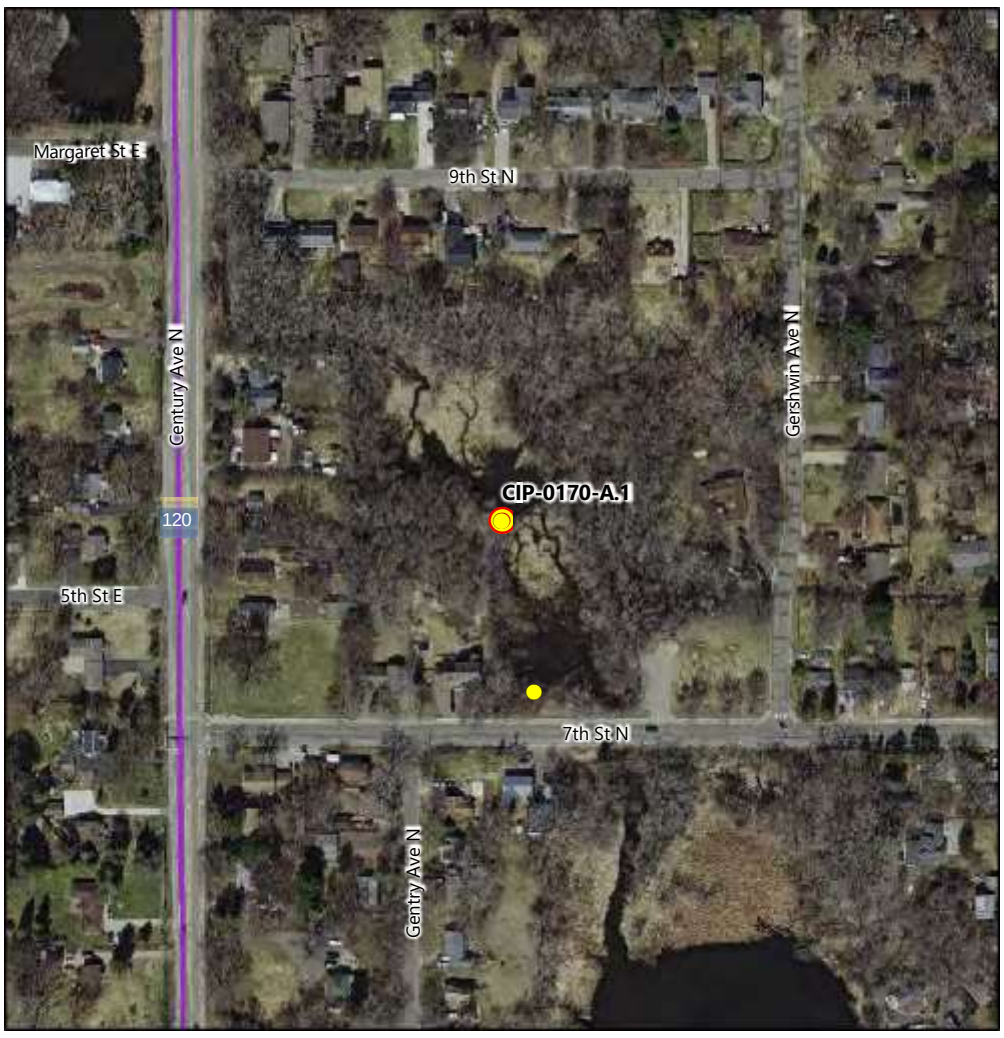


INFILTRATION SURFACES INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District
UNIQUE ID: **CIP-0164-B**

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT



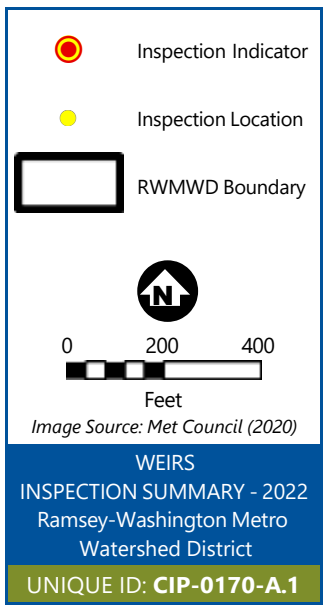
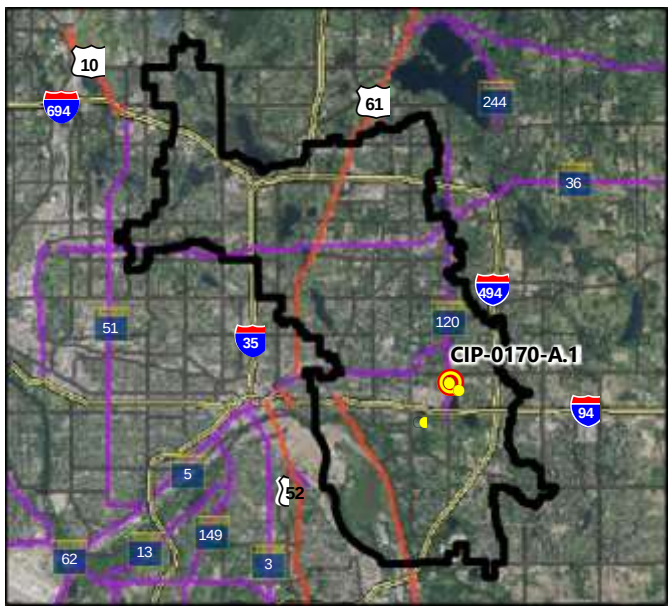


Image Source: Met Council (2020)

WEIRS
INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

UNIQUE ID: **CIP-0170-A.1**

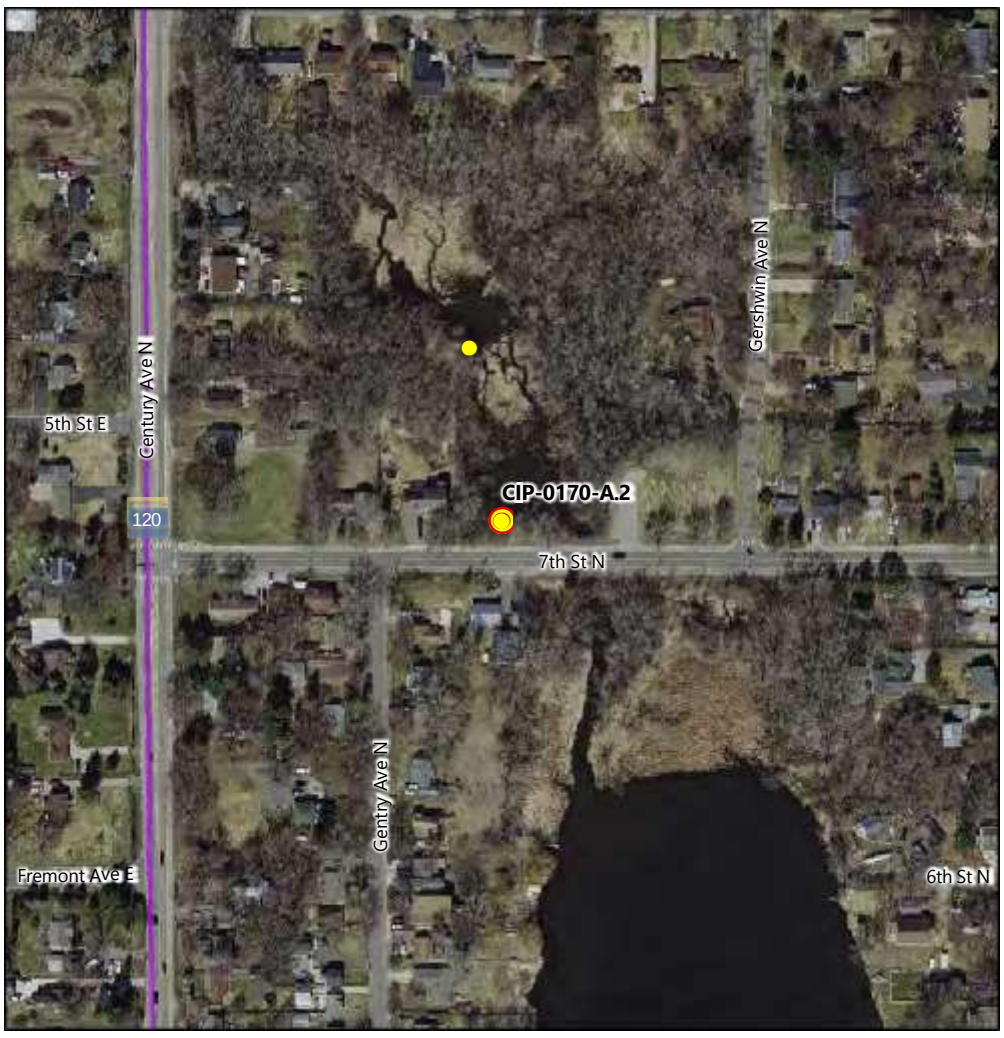


Unique_ID: CIP-0170-A.1
Site ID: 170
Section: Tanners Lake
Name: Wetland - 7th St permeable weirs near horseshoe park

Inspection Date: 8/15/2022 1:28:00 PM
Inspector Name: Vlasin
Category: Weir
Structural Damage Ranking Description: 1. 0-3 cracks, bends, or dings on structure
Structural Damage Ranking Value: 1
Structural Damage Time Frame Value: 1
Structural Damage Notes:
Blockages Ranking Description: 2. 1-25% of slots in permeable weir or weir structure
Blockages Ranking Value: 2
Blockages Time Frame Value: 1
Blockages Notes:
Last Known Survey Notes:

District_Owned: Yes
Flag for Further Review: Yes
Inspection Notes: Slots need to be cut. Sed built up on upstream side. Clean 20ft on upstream side and not the down. Not much sed down stream
Total Score: 3
Normalized_Score: 1.5

Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed



Unique_ID: CIP-0170-A.2
Site ID: 170
Section: Tanners Lake
Name: Wetland - 7th St permeable weirs near horseshoe park

Inspection Date: 8/15/2022 1:19:00 PM
Inspector Name: Vlasin
Category: Weir
Structural Damage Ranking Description: 2. 4-6 cracks, bends, or dings on structure
Structural Damage Ranking Value: 2
Structural Damage Time Frame Value: 1
Structural Damage Notes:
Blockages Ranking Description: 3. 26-50% of slots in permeable weir or weir structure
Blockages Ranking Value: 3
Blockages Time Frame Value: 2
Blockages Notes:
Last Known Survey Notes:

District_Owned: Yes
Flag for Further Review: Yes
Inspection Notes: No to cleaning out either side of weirs but yes to cleaning slot
Total Score: 8
Normalized_Score: 4

Inspection Indicator
Inspection Location
RWMWD Boundary

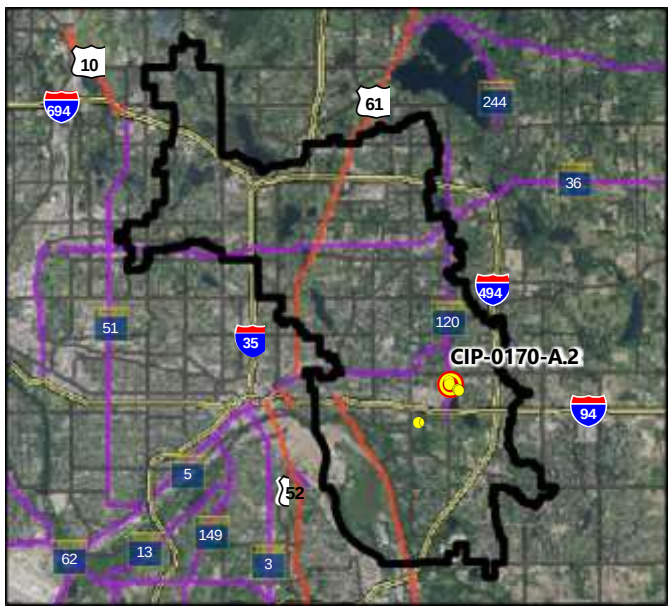
N

0 200 400
Feet

Image Source: Met Council (2020)

WEIRS
INSPECTION SUMMARY - 2022
Ramsey-Washington Metro Watershed District

UNIQUE ID: **CIP-0170-A.2**



Ranking Value (1 - 4): 1 = good condition, 4 = needs attention/repair
Time Frame Value (1 - 4): 1 = no immediate repair needed or repair is not time sensitive, 4 = immediate repair needed

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Request for Board Action

Board Meeting Date: November 2, 2022 **Agenda Item No:** 7B

Preparer: Tina Carstens, Administrator

Item Description: Change Order No. 4 for the 2022 Targeted Retrofit Projects

Background:

Attached is change order number 4 for the 2022 Targeted Retrofit Project. This one in particular is for the St. Pascal Church portion of the project. The attached memo describes the changes in more detail for your review. The total change in contract price with this change order is $30,207.

Applicable District Goal and Action Item:

Goal: Achieve quality surface water – The District will maintain or improve surface water quality to support healthy ecosystems and provide the public with a wide range of water-based benefits.

Action Item: Implement retrofit water quality improvement projects.

Staff Recommendation:
Approve Change Order No. 4.

Financial Implications:
This change order increases the total contract price by $30,207.

Board Action Requested:
Approve Change Order No. 4.

resourceful. naturally.
engineering and environmental consultants

BARR

Technical Memorandum

To: Ramsey-Washington Metro Watershed District Board of Managers
From: Erin Anderson Wenz and Marcy Bean
Subject: Change Order 4 for the St. Pascal's Baylon Church Retrofit Project
Date: October 27, 2022
Project: 23621172.00
c: Brad Lindaman (Barr), Tina Carstens and Paige Ahlborg (RWMWD)

Change Order 4 for the St. Pascal's Baylon Church Project is a detailed one, so we are providing this memo to the managers to help navigate their review. Some of the changes pertain to the topic discussed last August as a part of Change Order 2 for the project (changes to the design that were required to pass the St. Paul Plan Review.) Another change is for a different reason entirely, and relates to an unexpected condition in the field that changed the excavation volume needed for the construction of the tree trenches.

It's important to note that we don't always document changes of quantity formally in change orders. It is typical for quantities to change here and there during the course of a construction project, and most of these changes are handled through the use of the unit prices included in the original bid of the project, as prescribed by our standard contract language. However, when a "significant change" occurs, we do bring it to the Contractor's and the Owner's (RWMWD) attention as these changes have the potential to impact things like unit costs, project timeline, etc. We often follow MnDOT's guidelines on what makes a change "significant". According to MnDOT guidelines, when a particular bid item quantity changes to less than 75% or more than 125% of the quantity listed on the bid form, the change is considered "significant", warranting further discussion between Contractor, Engineer (Barr) and Owner (RWMWD).

The contract changes included in Change Order 4 are described in further detail below, grouped by topic.

CHANGES ASSOCIATED WITH ST. PAUL PLAN REVIEW

After bids were awarded, it was determined that a Plan Review would be required in order to connect to the City of St. Paul storm sewer. Their review required the following changes in the design:

- As discussed with the managers in August, the following stormwater revisions were required:
    - No connection to a public catch basin is allowed, so Plans were revised to connect the pipe leaving the tree trenches to an approved public manhole within the east bound drive lanes of 3rd Street E.
    - All work done within the right-of-way must be done "to City Standards and Specifications by a contractor licensed to work in the City right-of-way under a permit from Public

Works Sidewalk Section." This required hiring from the list of city-approved contractors as a sub-contractor for all pavement and pipe work within the right-of-way.
    - The changes above were discussed with the Board of managers at the August Board meeting, and were formally changed in the Contract documents via Change Orders 1 and 2. The change documented in Change 4 simply formally removes specific bid items (and their associated costs) that became obsolete as a result of Change Orders 1 and 2 (**C.O.4.A Removal of work in the Right-of-Way)**
    - ***C.O.4.A results in a contract price reduction of $8,900.***
- In addition, the area of parking lot retrofitted was required to meet current parking lot code. This required:
    - Perimeter screening, buffer along sidewalk, additional tree and shrub planting
    - Chain link fence is no longer an approved material in the City of St. Paul, and a change to decorative fencing was required (pricing was similar between chain link and decorative fencing). These changes are formally changed in Change Order 4 (**C.O.4.B Additional Bid Items Related to City of St. Paul Zoning Code**).
    - ***C.O.4.B results in a net contract price increase of $11,397***.
- In addition, the footprint of the excavation had to be reduced to less than 10,000 sf in order to not require additional stormwater management to meet rate control requirements.
    - This change meant that the tree trench excavation was made smaller in areal extent, but deeper, requiring a larger limestone wall.
    - This change is formally made in Change Order 4 (**C.O.4.C Changes to Limestone Wall**).
    - ***C.O.4.C results in a contract price increase of $16,560***.

CHANGES ASSOCIATED WITH EXCAVATION VOLUME

During excavation of the tree trench, it was noted by the Contractor and District staff that a larger volume was hauled away than was estimated in the bid form. Barr staff surveyed the final excavation to confirm elevations and footprint were correct. In reviewing bid form quantities, and field observations, the following was noted:

- For pavement removal calculations, it was assumed that 12" of total pavement depth would be removed, including two lifts of asphalt and its aggregate sub-base. This is typically what is observed in parking lot retrofit projects, though some variability is typical. The unit of measurement for this item on the bid form is square yards.
- When excavated, the pavement profile was much thinner, averaging 4" total (even as little as 1" of depth in some areas, according to the Contractor). This thinner pavement section meant that the excavated subsoil section was thicker, accounting for the discrepancy in quantities between the bid form and the quantity actually hauled away by the Contractor.
- This change is formally made in Change Order 4 (**C.O.4.D Changes to Excavation Volume**).
- ***C.O.4.D results in a contract price increase of $11,150***.

In aggregate, the changes described above (those associated with St. Paul plan review and those associated with changes in excavation volume) result in a net change of $30,207 to the contract price, as indicated toward the end of Change Order 4.

CHANGES ASSOCIATED WITH CONTRACT TIME

In the case of this Change Order 4, the contract timeline change is not associated with either of the topics above, but rather more related to the extreme drought conditions we are currently experiencing and its potential impact on fall planting survival. Both Barr and the Contractor agree that it is in the best interest of the project to delay the remaining planting activities until next spring, and so the "substantial completion" date is changed accordingly in the change order.

Change Order No. 4 – St. Pascal Baylon Catholic Church
Ramsey-Washington Metro Watershed District
2022 Targeted Retrofit Sites

DATE OF ISSUANCE: October 27, 2022

Owner: Ramsey-Washington Metro Watershed District
2665 Noel Drive
Little Canada, MN 55117
Attn: Lawrence Swope

Contractor: Shoreline Landscaping
29159 Ivywood Trail
Chisago City, MN 55013
Attn: Stephan McLafferty

Engineer: Barr Engineering Company
4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435
Attn: Marcy Bean, Senior Landscape Architect

All items within this change order apply to the St Pascal Baylon Catholic Church site.

C.O.4.A Removal of work in the Right-of-Way

Description of Change:

Change Order No. 2 approved the funding of the City-Approved Plumbing Subcontractor. Consequently, the following items are hereby removed from the Base Bid due to the work done instead by the subcontractor. Some additional items also had reduction in quantities but not complete removal of the bid items.

Bid Form and Base Bid:
Remove the following from Section 00 41 00 ARTICLE 4.01.A. BID ITEMS:

Bid Item	Description	Unit	Bid Quantity	Unit Price	Estimated Cost
2.H	Remove and Dispose of Concrete Curb and Gutter	LF	10	$10.00	$100.00
2.M	Precast Concrete Catch Basin with Base Slab, Complete	EA	1	$2,500.00	$2,500.00
2.V	Connect new Manhole to existing pipe	EA	1	$3,500.00	$3,500.00
2.CC	Concrete Walks	SF	140	$20.00	$2,800.00

C.O.4.B Additional Bid Items Related to City of St. Paul Zoning Code

Description of Change:

In order to meet City of St. Paul Plan Review requirements, the portion of the parking lot that was modified had to be brought up to current zoning code. This included creation of a landscape buffer adjacent to the right-of-way and upgrading from a chain link fence to decorative fencing.

Bid Form and Base Bid:

Remove the following from Section 00 41 00 ARTICLE 4.01.A. BID ITEMS:

Bid Item	Description	Unit	Bid Quantity	Unit Price	Estimated Cost
2.EE	Chain Link Fence	LF	260	$50.00	$13,000.00

Add the following to Section 00 41 00 ARTICLE 4.01.A. BID ITEMS:

Bid Item	Description	Unit	Estimated Quantity	Unit Price	Estimated Cost
C.O.4.B.1	Decorative Metal Fence	LF	170	$81.20	$13,804.00
C.O.4.B.2	Shrub Planting	EA	13	$75.00	$975.00
C.O.4.B.3	3/8" Gray Trap Rock Mulch	CY	10	$560.00	$5,600.00
C.O.4.B.4	6' Pre-cast Concrete Wheel Stops	EA	8	$281.25	$2,250.00
C.O.4.B.5	6" Topsoil & Seed & Erosion Blanket	SY	27	$50.00	$1,350.00
C.O.4.B.6	Subsoiling Landscape Bed	CY	11	$38.00	$418.00

Measurement and Payment:

Add the following to Section 01 22 00:

C.O.4.B.1 Decorative Metal Fence

1. Method of Measurement: Decorative Metal Fence will be measured on the basis of unit length in linear feet (L.F.) as measured in the field by actual horizontal survey or other measurement by Engineer and rounded to the nearest linear foot.
2. Basis of Payment: Contractor will set a bid amount based on a unit price per linear foot (L.F.) for Decorative Metal Fence, all complete as specified. This unit price shall be payment in full for the costs of all supervision, materials, equipment, labor, supplies, profit and overhead, and performing all operations as are necessary to provide chain link fencing, to match existing - size and type as shown on the drawings - including all posts, rails, footings, and reinforcement at the location as shown on the Drawings and in accordance with manufacturer's recommendations, all complete as specified.

C.O.4.B.2 Shrub Planting

1. Method of Measurement: Shrub Planting shall be measured on the unit basis of plan each (EA) shrub furnished, planted and warranted as specified and as counted on site by Engineer.

2. Basis of Payment: Contractor shall be paid a unit price per each (EA) shrub furnished and planted. This unit price shall be payment in full for the costs of all supervision, materials, equipment, labor, supplies, profit and overhead, and performing all operations as are necessary to furnish, plant, move soil, mulch, anchor stake, and water shrubs, all complete as specified, including warranty.

C.O.4.B.3 3/8" Gray Trap Rock Mulch

1. Method of Measurement: 3/8" Gray Trap Rock Mulch shall be measured on the basis of cubic yards (CY) of angular rock mulch placed. Rock mulch shall be paid for by area and depth as measured in the field. Contractor shall not be paid for more than 3" of depth as measured in the field.

2. Basis of Payment: Contractor shall be paid a unit price per cubic yard (CY) for furnishing and installing 3/8" Gray Trap Rock Mulch material. This unit price shall be payment in full for the costs of all supervision, labor, materials, equipment, overhead and profit, and performing all operations as are necessary to furnishing and installing 3/8" Gray Trap Rock Mulch materials, all complete as specified.

C.O.4.B.4 6' Pre-cast Concrete Wheel Stops

1. Method of Measurement: 6' Pre-cast Concrete Wheel Stops will be measured on the basis of each (EA) 6' pre-cast concrete wheel stops counted onsite by Engineer.

2. Basis of Payment: Contractor will be paid a unit price per each (EA) 6' Pre-Cast Concrete Wheel Stops installed, all complete as specified. This unit price shall be payment in full for the costs of all supervision, materials, equipment, labor, supplies, profit and overhead, and performing all operations as are necessary to furnish and install as shown as directed by Engineer.

C.O.4.B.5 6" Topsoil & Seed & Erosion Blanket

1. Method of Measurement: 6" Topsoil & Seed & Erosion Blanket shall be measured on the basis of unit area in S.Y. installed, as measured in the field by actual horizontal survey or other measurement by the Engineer, rounded to the nearest whole yard. Measurement shall be of the extent, with no allowance for overlapping.

2. Basis of Payment: The Contractor shall be paid a unit price per square yard (S.Y.) for 6" Topsoil & Seed & Erosion Blanket. This unit price shall be payment in full for the costs of all supervision, materials, equipment, labor, supplies, profit and overhead, and performing all operations as are necessary to prepare receiving surface, furnish and install the topsoil, seed and erosion control blanket, and secure erosion control blanket, exclusive of subsequent corrections if disturbed during construction activities, all in accordance with manufacturer's recommendations, as shown on the drawings, all complete as specified.

C.O.4.B.6 Subsoiling Landscape Bed

1. Method of Measurement: Subsoiling Landscape Bed shall be measured on the basis of loosened area in cubic yards (C.Y.) as measured in the field by actual horizontal survey or other measurement by the Engineer, rounded to the nearest whole yard.
2. Basis of Payment: Contractor shall be paid a unit price per cubic yards (C.Y.) for loosening of subsoil in all landscape bed areas as directed by Engineer. This unit price shall be payment in full for the costs of all supervision, materials, equipment, labor, supplies, profit and overhead, and performing all operations as are necessary to loosen existing or placed soils, all complete as specified.

C.O.4.C Changes to Limestone Wall

Description of Change:

The footprint of the tree trench excavation had to be reduced to less than 10,000 sf in order to avoid additional stormwater management to meet rate control requirements. This change resulted in a larger (taller) limestone wall.

Bid Form and Base Bid:
Remove the following from Section 00 41 00 ARTICLE 4.01.A. BID ITEMS:

Bid Item	Description	Unit	Estimated Quantity	Unit Price	Estimated Cost
2.DD	Limestone Retaining Wall	SFF	126	$120.00	$15,120.00

Add the following to Section 00 41 00 ARTICLE 4.01.A. BID ITEMS:

Bid Item	Description	Unit	Estimated Quantity	Unit Price	Estimated Cost
2.DD	Limestone Retaining Wall	SFF	264	$120.00	$31,680.00

C.O.4.D Changes to Excavation Volume

Description of Change:

Due to pavement conditions (depth) that were shallower than assumed in the design phase of the project, the following items required an increase in actual quantity when installed on site.

Bid Form and Base Bid:
Remove the following from Section 00 41 00 ARTICLE 4.01.A. BID ITEMS:

Bid Item	Description	Unit	Estimated Quantity	Unit Price	Estimated Cost
2.I	Excavate, Haul, and Dispose of Materials (P)	CY	654	$25.00	$16,350.00

Add the following to Section 00 41 00 ARTICLE 4.01.A. BID ITEMS:

Bid Item	Description	Unit	Estimated Quantity	Unit Price	Estimated Cost
2.I	Excavate, Haul, and Dispose of Materials (P)	CY	1100	$25.00	$27,500.00

Change in Contract Time:

Description of Change:

Due to completion of construction in October and the current period of drought, Barr staff determined it would be best to wait until Spring 2023 to plant trees at the site to better ensure their viability. As such, 7 trees, 13 shrubs, and 3 tree guards have yet to be installed. This change requires a contract extension to change the substantial completion date for the project to June 15, 2023.

Form of Agreement and Instruction to Bidders:
Remove the following from Section 00 52 00 ARTICLE 3.02.A. Contract Times:

All work at both sites must be substantially completed by October 31, 2022.

Add the following to Section 00 52 00 ARTICLE 3.02.A. Contract Times:

All work at both sites must be substantially completed by June 15, 2023.

Remove the following from Section 00 21 13 ARTICLE 8.04. Contract Time:

All work, including plantings, shall be substantially complete on October 31st, 2022. All plantings shall be warranted for one (1) calendar year after installation, including those planted by others.

Add the following from Section 00 21 13 ARTICLE 8.04. Contract Time:

All work, including plantings, shall be substantially complete on June 15, 2023. All plantings shall be warranted for one (1) calendar year after installation, including those planted by others.

Total Impact on Contract Price:

These changes increase the total contract price by $30,207.00.

This Change Order No. 4 is:

Submitted By: Marcy Bean _____ Date: October 27, 2022
(ENGINEER) Marcy Bean, Senior Landscape Architect
Barr Engineering Company

Authorized By: _____ Date: _____
(OWNER) Lawrence Swope, President
Ramsey-Washington Metro Watershed District

Approved By: _____ Date: _____

(CONTRACTOR) Stephan McLafferty
Shoreline Landscaping

****

New Reports/ Presentations

****

Cost Benefit of Internal Loading Control and Other Water Quality Items

November 2, 2022

Sediment and Phosphorus in Sediment

Sediment and Phosphorus in Sediment

Iron + Phosphorus → Fe-P

Calcium + Phosphorus → Ca-P

Aluminum + Phosphorus → Al-P

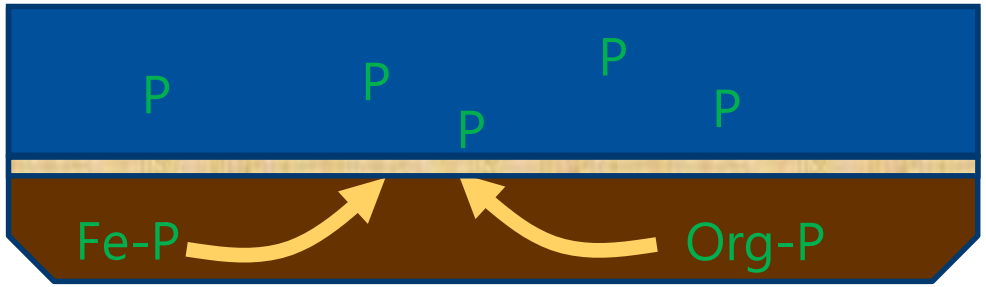
Organic Matter + Phosphorus → Org-P

Sediment and Phosphorus in Sediment

Iron + Phosphorus → Fe-P → Fe-P (insoluble)

when there is oxygen

Fe-P (insoluble) + No Oxygen!! → Fe-- -break- --P (soluble)



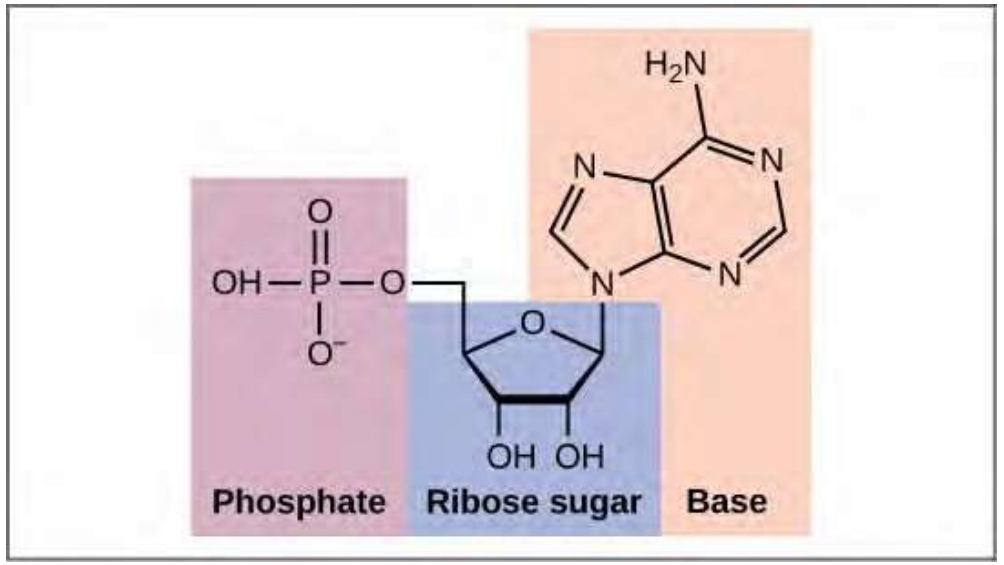
Internal loading

BARR

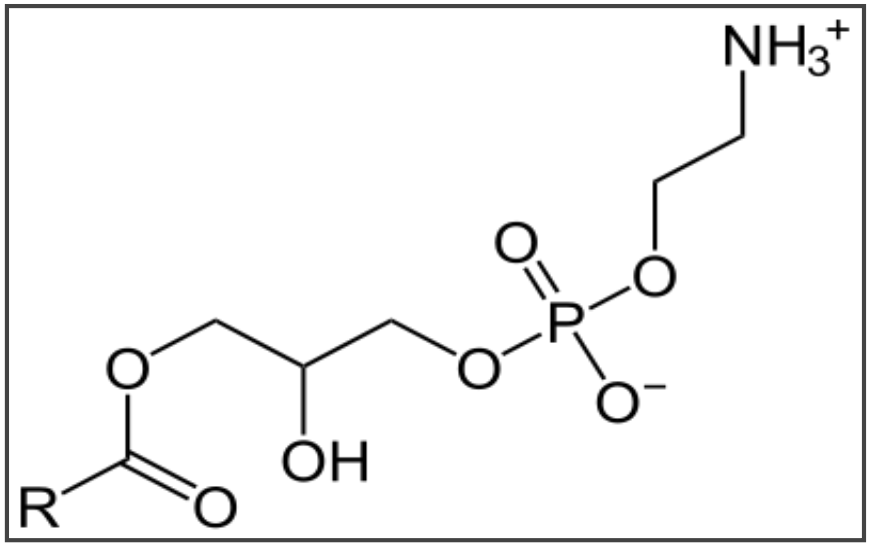
Organic Phosphorus Is Different

$$Fe\text{-}P \quad = \quad Fe\text{-}PO_4 \quad = \quad Fe^{+3} \text{ --- } PO_4^{-3}$$

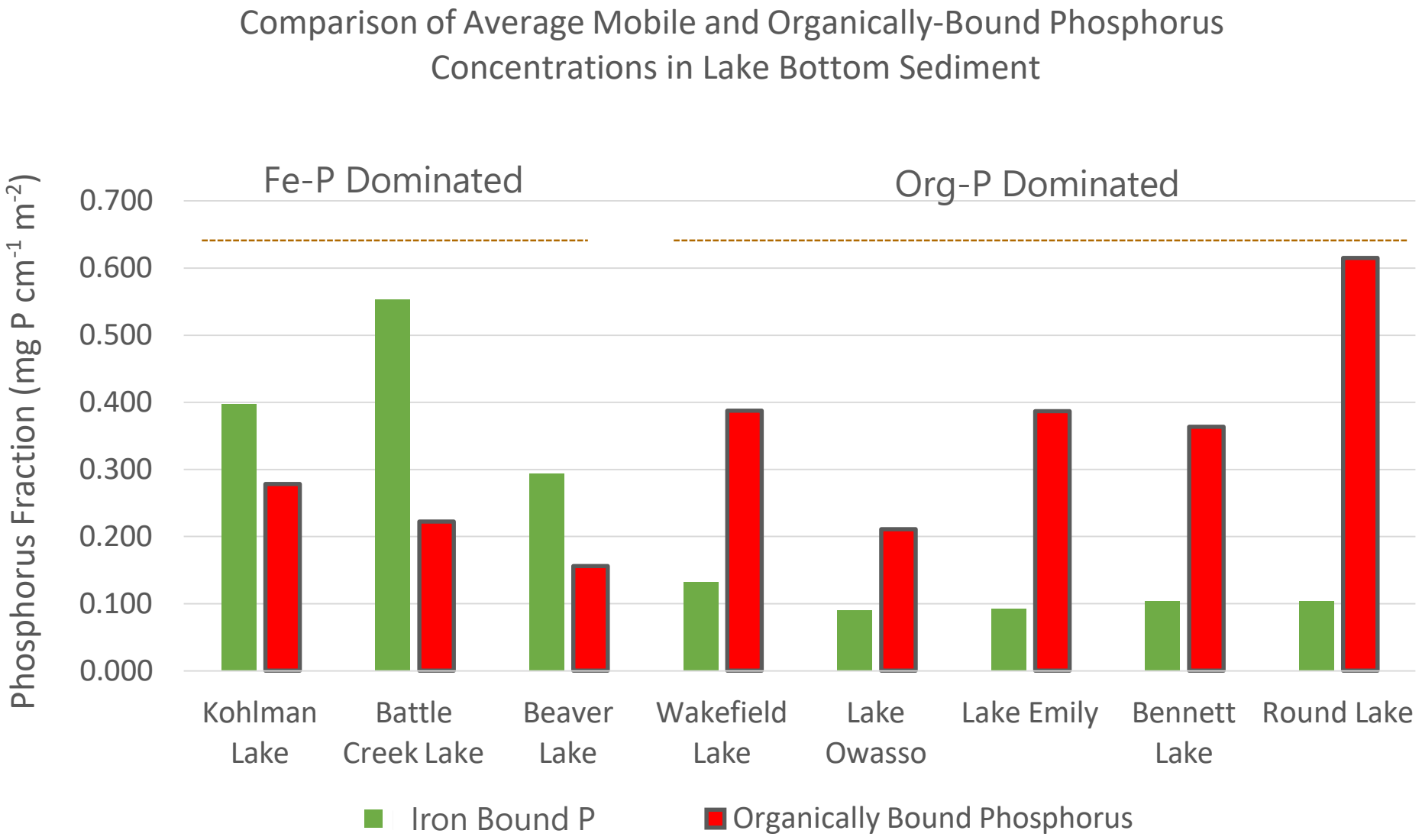
DNA



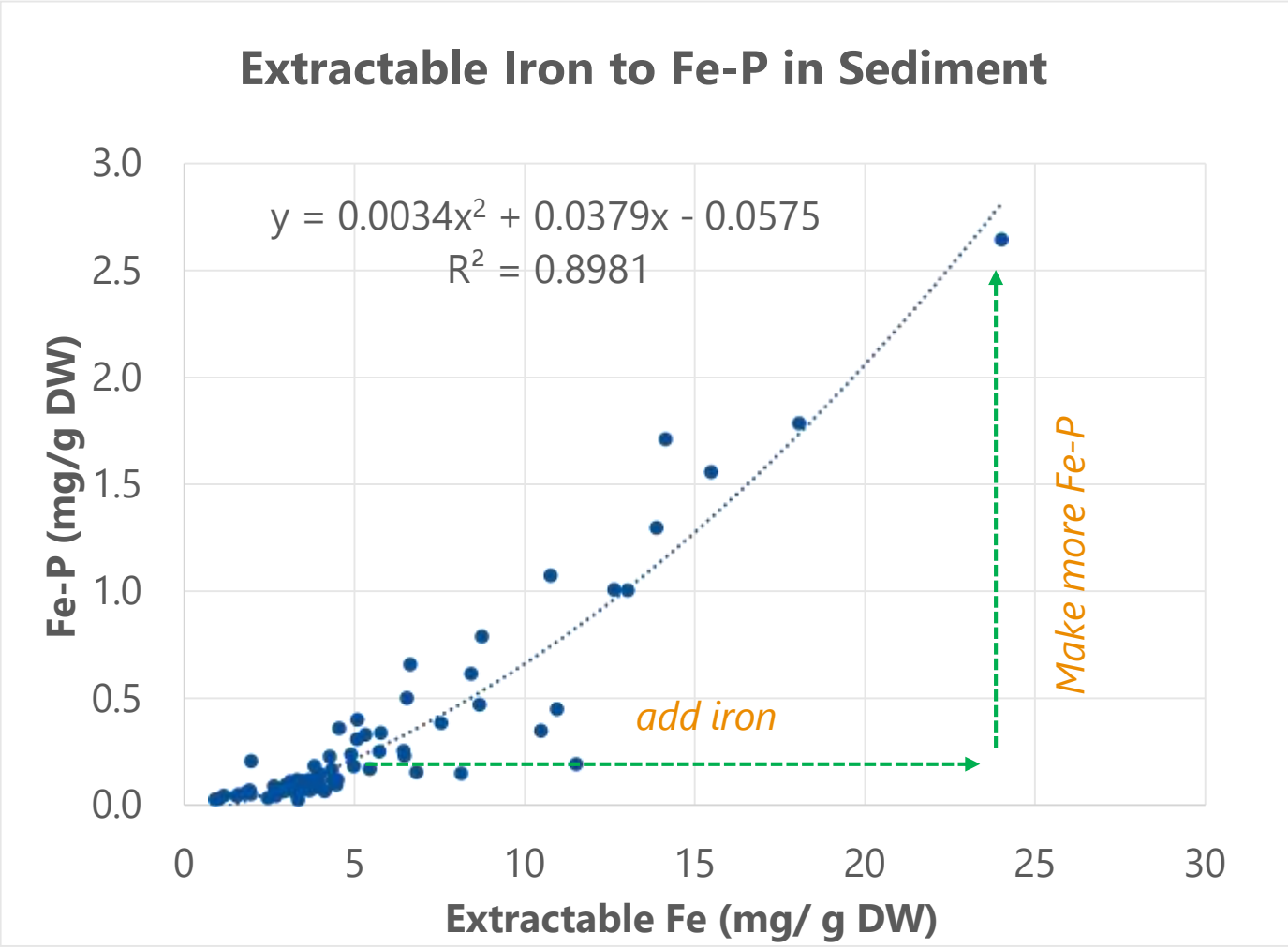
Lipid



Organic P in RWMWD Shallow Lakes



If no Fe (iron) then you get Organic P (Org-P)



If you have enough iron, you can make Fe-P, but you need…

Or—Bind Up Phosphate with Aluminum

"Alum Treatment"

Fe-P + Aluminum (Al) → Al-P

Four Strategies to Control Internal Loading

- Keep oxygen high
  - Aeration to keep Fe-P insoluble
- Convert Fe-P to Al-P or other stable complex
  - Aluminum (alum) / Phoslock treatment
- Remove high phosphorus sediment
  - Dredging
- Aquatic plant harvesting

Cost-Benefit Analysis of Internal Load Control Approaches

1. Dredging
2. Aquatic Plant Harvesting
3. Aluminum (alum) Treatment
4. Phoslock Treatment
5. Forced Air Aeration
6. Direct Oxygen Injection
7. Aeration + Iron Addition
8. Nanobubbles

Objective:

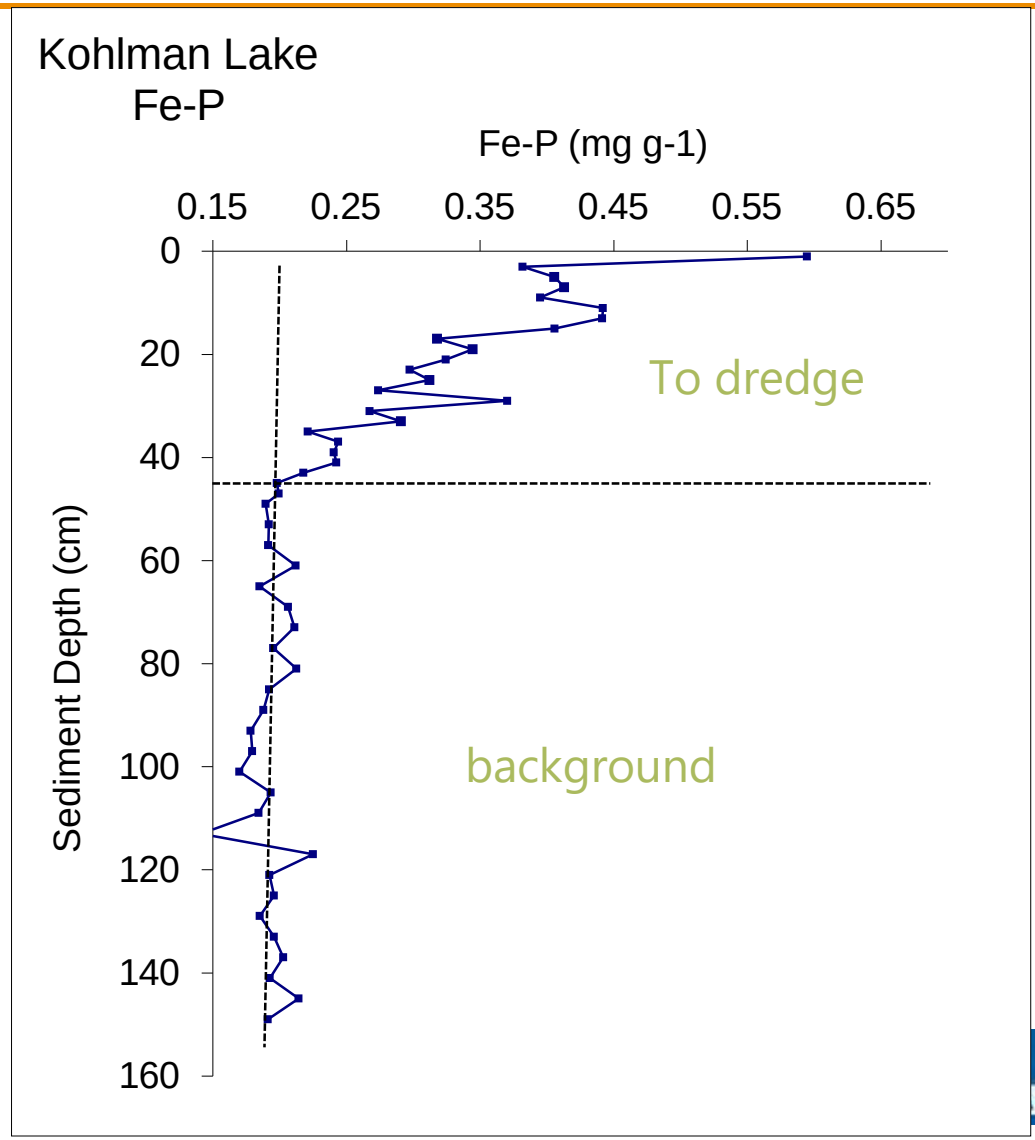
(1) Conduct cost benefit analysis ($/lb TP)

(2) Use characteristics of Wakefield and Bennett Lake as inputs to the analysis

(3) Conduct overall evaluation

BARR

Dredging


Kohlman Lake
Fe-P
Fe-P (mg g-1)
0.15
0.25
0.35
0.45
0.55
0.65
0
20
40
60
80
100
120
140
160
Sediment Depth (cm)
To dredge
background

Dredging

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$521,000	$744,000	$1,116,000
Wakefield	$411,000	$587,000	$881,000

assumptions

- Cost estimate assumes construction of an off-site dewatering facility is not required.
- Dredging depth: 20 cm or 0.66 ft.
- Dredging volume:
  - Bennett:15.2 ac-ft
  - Wakefield: 11.8 ac-ft

Aquatic Plant Harvesting

- Phosphorus in plant material
- Amount of P removed balanced with need to not harm plants
- Will not likely meet internal load reduction requirements of TMDLs.
- Low cost but cost/lb P removed may be higher than other approaches.

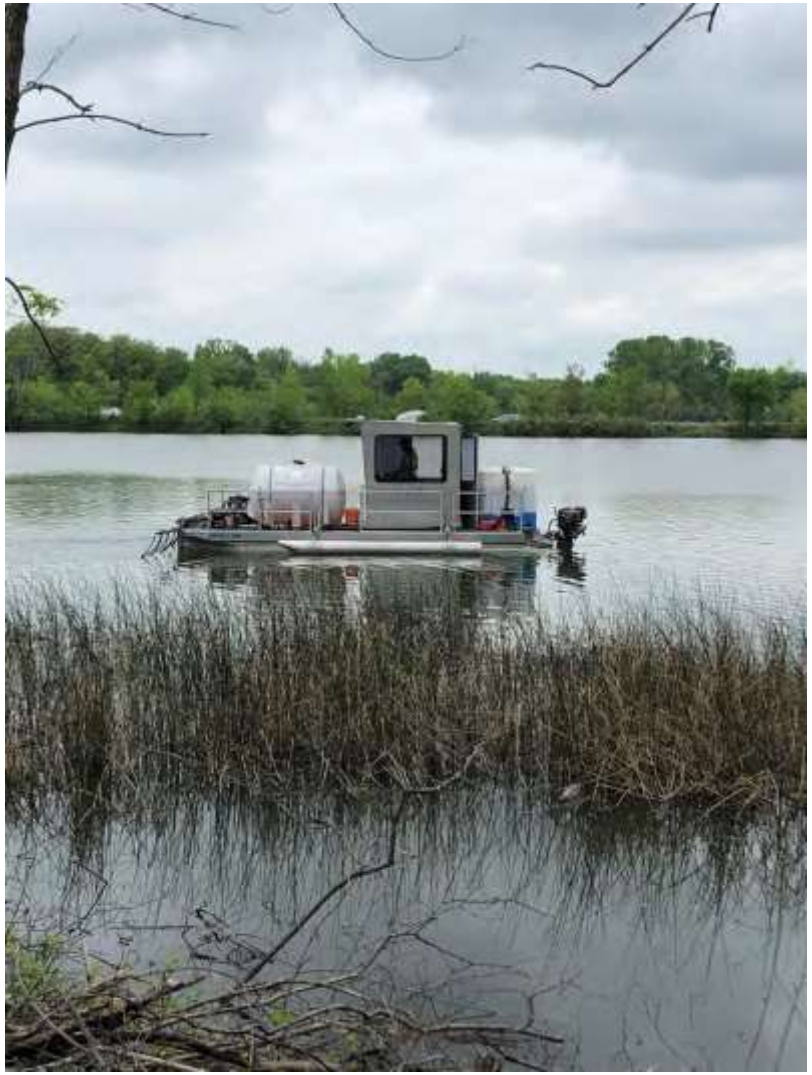
	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$12,000	$17,000	$26,000
Wakefield	$11,000	$15,000	$23,000

assumptions

- 50% of the lake area is harvested: Bennett 14.52 / Wakefield 11.23 (ac)
- Assumed harvestable mass: 0.5 kg wet/m^2

BARR

Aluminum Treatment (Alum)



$$Fe\text{-}P + Aluminum\ (Al) \longrightarrow Al\text{-}P + Fe^{+3}$$

- Amount of alum added (dosed) is based upon the iron-bound (Fe-P) and organically bound phosphorus concentration in sediment.

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$154,000	$220,000	$330,00
Wakefield	$108,000	$154,000	$231,000

Phoslock Treatment

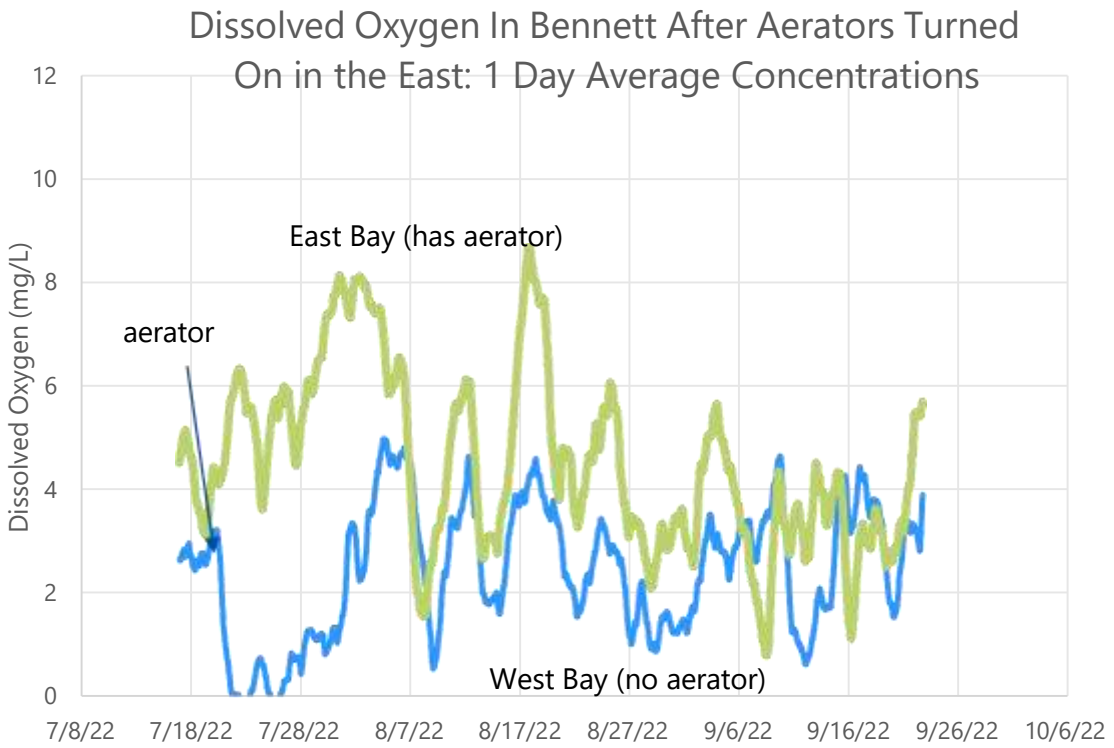
- Clay (bentonite) + Lanthanum (metal)
- Lanthanum binds phosphorus, from the Fe-P pool.
- Similar to aluminum, delivery a bit different
- Marketed as a more natural and safe treatment
- Proprietary (patented)

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$195,000	$278,000	$417,000
Wakefield	$135,000	$192,000	$288,000

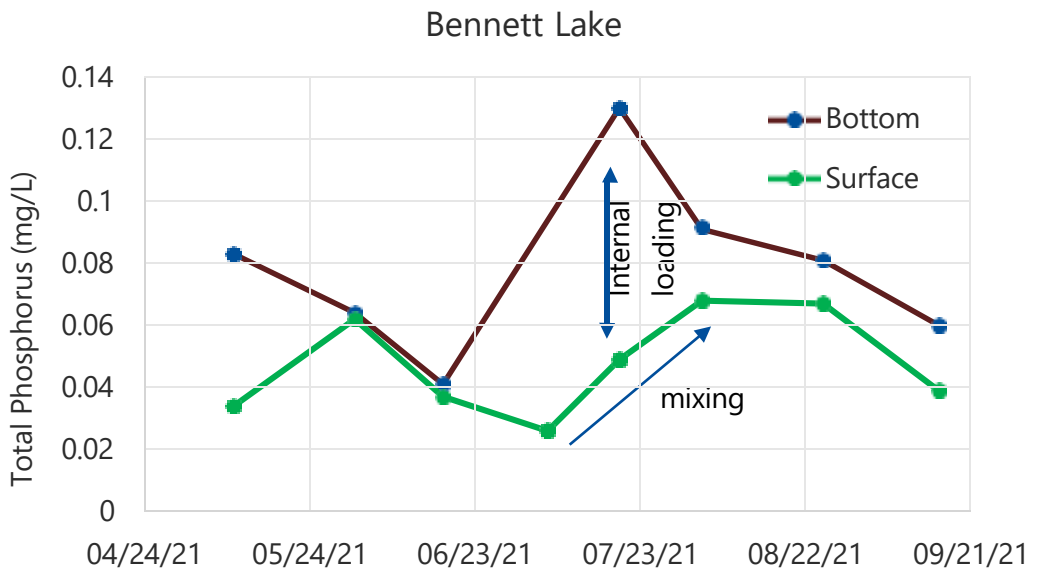
Source: solitudelakemanagement.com

Forced Air Aeration

Iron + Phosphorus → Fe-P when there is oxygen



Forced Air Aeration

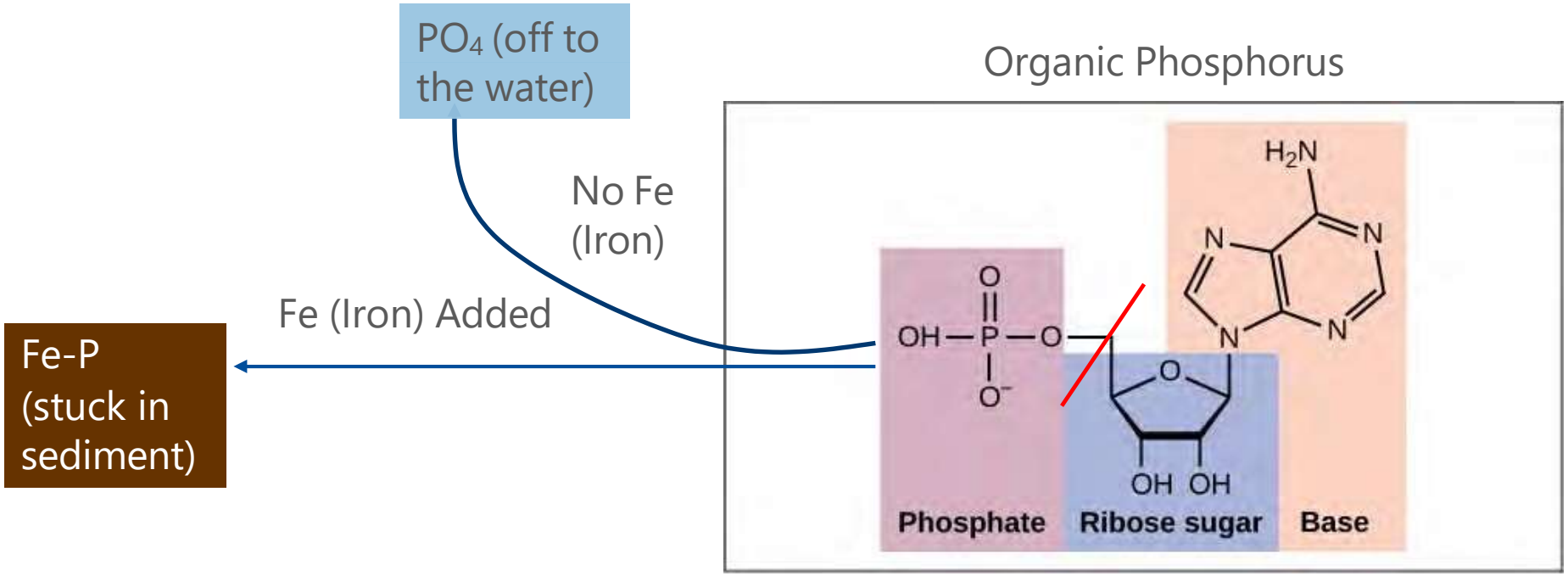


	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett[1]	$94,000	$134,000	$201,000
Wakefield[2]	$60,000	$85,000	$128,000

Iron and Forced Air Aeration

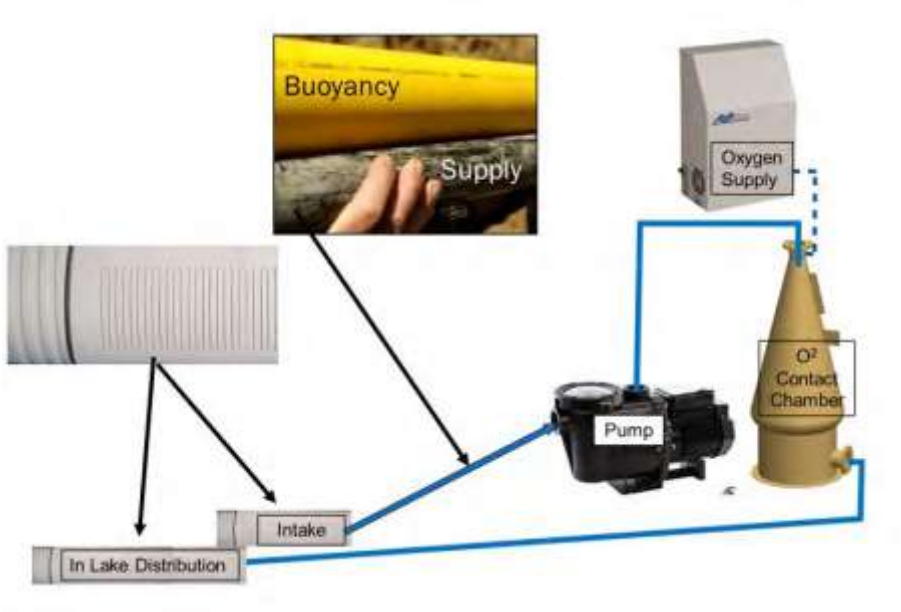
- Bennett is deficient in iron
- Wakefield is less deficient in iron than Bennett, but iron addition is still recommended
- Iron is an acid, so need to buffer the iron with a base (sodium aluminate / calcium hydroxide)

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett[2,4]	$227,000	$324,000	$486,000
Wakefield[3,5]	$141,000	$201,000	$302,000

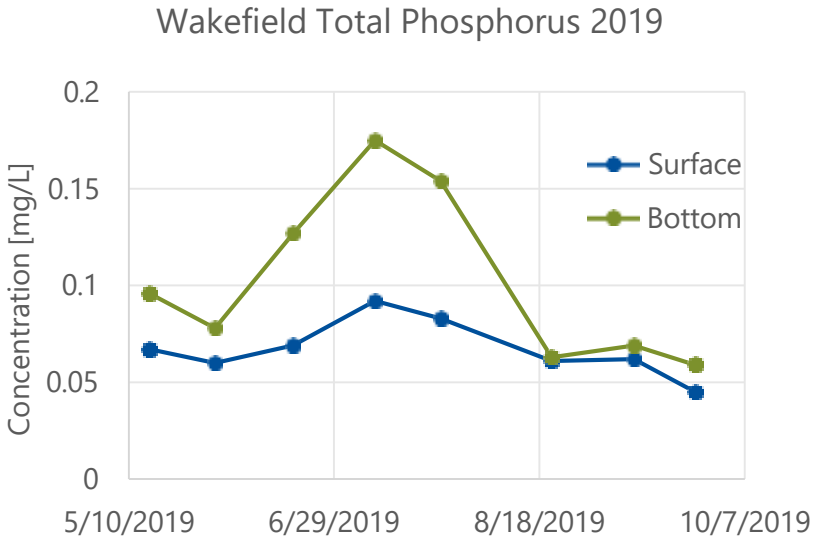


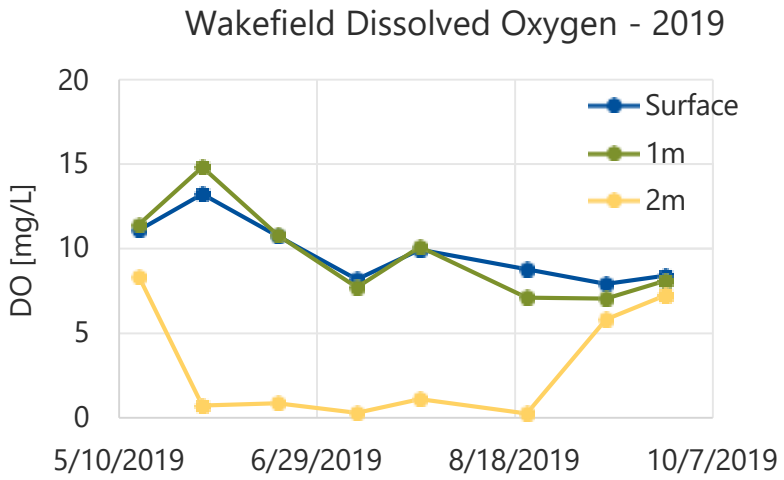
Direct Oxygen Injection

- Useful for deeper lakes (deep hole of 10 ft or more)
- Does not destratify lake, keeping the bottom water cooler

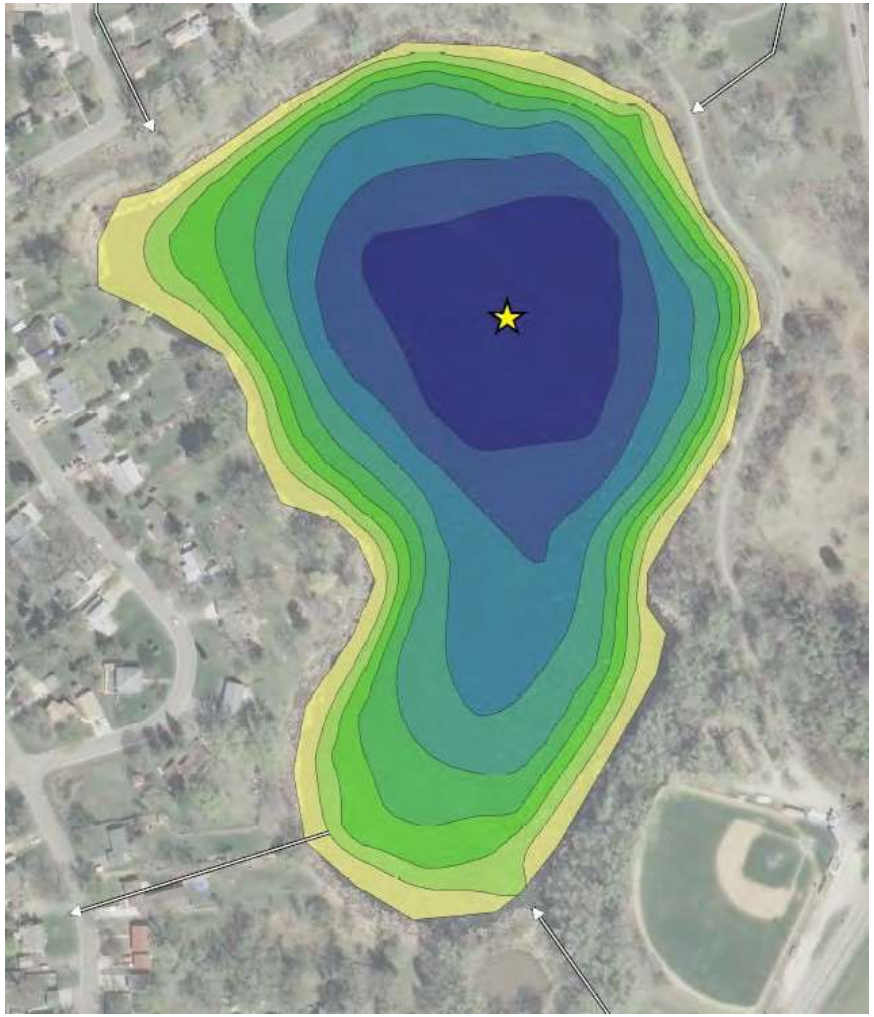


Courtesy of Gantzer Water





Direct Oxygen Injection



	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$128,000	$182,000	$273,000
Wakefield	$110,000	$157,000	$236,000

Nanobubbles

- Potentially promising approach to directly oxygenate lake sediment
- Currently not designed for the scale required by the district

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$288,000	$411,000	$617,000
Wakefield	$240,000	$342,000	$513,000

Cost Benefit Analysis

Method[3]	Bennett- Total Cost[1]	Bennett- Cost per Pound of Total Phosphorus Removed Per Year[4]	Wakefield- Total Cost[1]	Wakefield- Cost per Pound of Total Phosphorus Removed Per Year[4]
Dredging	$744,000	$1,270	$587,000	$1,500
Aquatic Plant Harvesting	$15,000[2]	$840	$12,000[2]	$880
Phoslock	$278,000	$470	$192,000	$490
Alum	$220,000	$380	$154,000	$390
Forced Air Aeration	$134,000	$270	$85,000	$280
Iron Aeration	$324,000	$590	$201,000	$570
Direct Oxygen Injection	$218,000	$370	$170,000	$490
Nanobubbles	$411,000	$750	$342,000	$940

Internal Loading (growing season)

Bennett: 90.3 lbs
Wakefield: 60.4 lbs

Internal Loading Reduction (growing season)

Bennett: 72.2 lbs
Wakefield: 48.3 lbs

Internal Loading After Treatment (growing season)

Bennett: 18.1 lbs
Wakefield: 12.1 lbs

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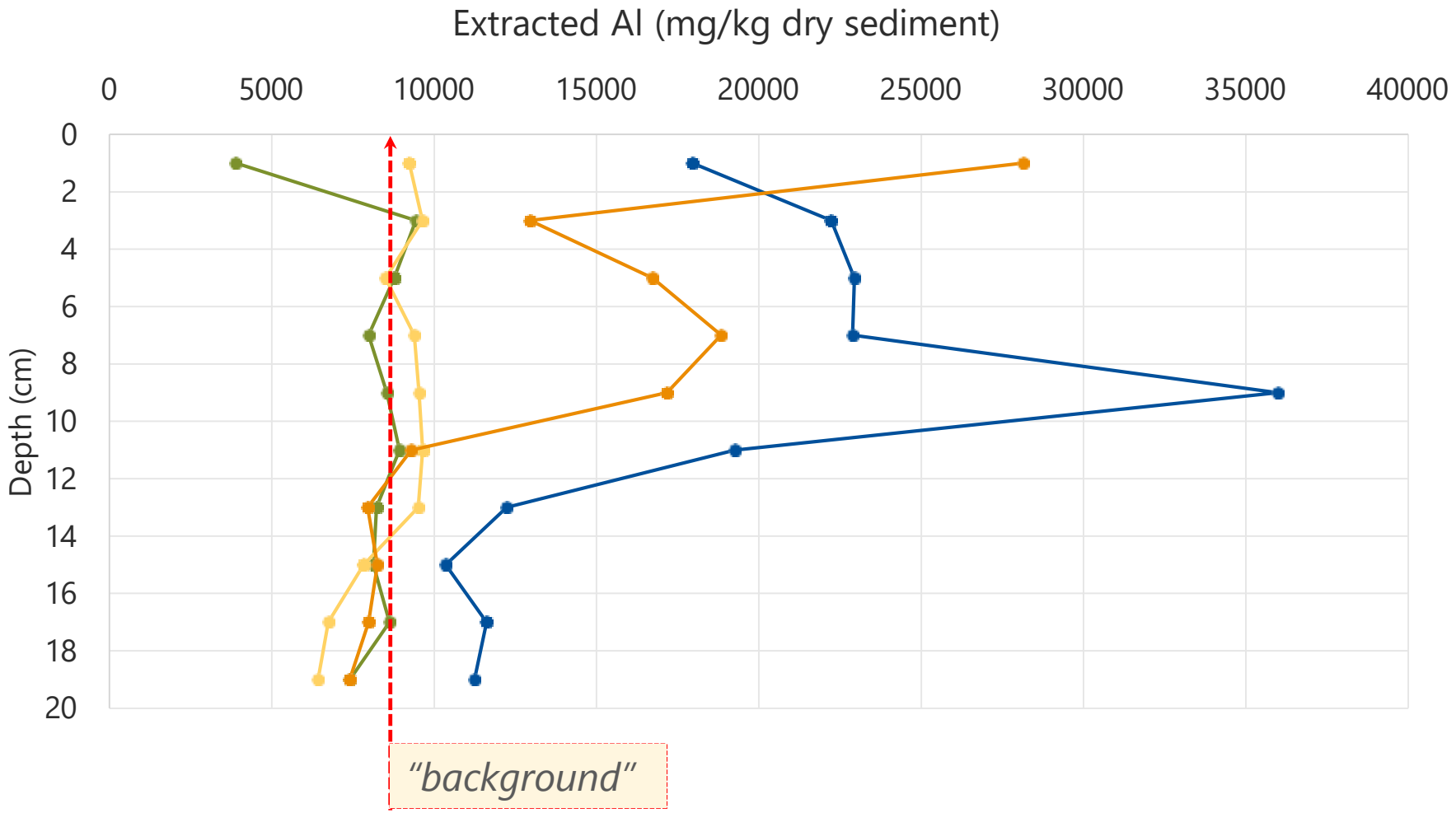
Potential Adverse Effects with Aluminum

General Properties of Aluminum

- Third most abundant element in the earths crust
- Not very soluble
- Most often found in clays and other minerals
- In water its bound to dissolved organic carbon, phosphate, hydroxide---very little aluminum is “free”
- It is naturally found in lake bottom sediments

Example: Aluminum in Kohlman Lake Sediments



Note:
Aluminum
Ageing!

US EPA 2018 Criteria for Aluminum

- "New" criteria recognizing that aluminum availability and toxicity is dependent upon several factors
  - pH
    - Speciation
  - Dissolved organic carbon
    - Binding
  - Hardness (calcium + magnesium)
    - Competition for uptake by aquatic life

Higher or more = less toxicity potential

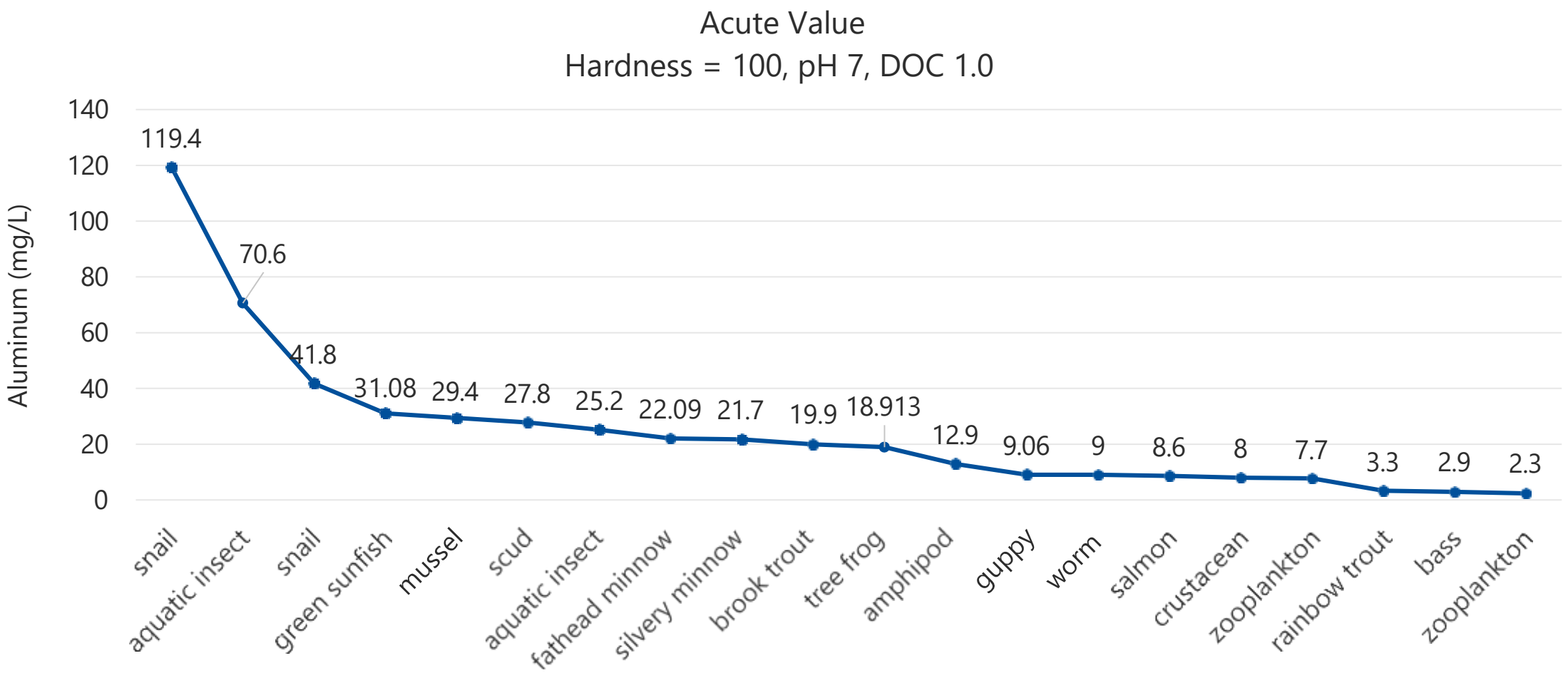
US EPA 2018 Criteria for Aluminum

- Surface water: 0.0009 mg/L to 210 mgL
- Oceans: <0.001 mg/L
- Precipitation: 0.0061 to 0.827 mg/L.
- During an alum treatment: 5-20 mg/L (for 1-3 hours)
- Soil aluminum: 700 to 100,000 mg Al/kg of solid

US EPA 2018 Criteria for Aluminum
Mode of action for aquatic toxicity

- Aluminum has no known biological function
- Not a teratogen / carcinogen / mutagen
- It is an aquatic toxicant (can be harmful to aquatic life)
  - Affects ion regulation
  - Respiratory function
    - Necrosis

US EPA 2018 Criteria for Aluminum
Acute Toxicity



US EPA 2018 Criteria for Aluminum
Acute Toxicity

Table K-9. Freshwater CMC at DOC of 5.0 mg/L and Various Water Total Hardness Levels and pHs.

Total Hardness	Acute Criterion (CMC) (µg/L total aluminum) (DOC=5.0 mg/L)																							
	pH 5.0		pH 5.5		pH 6.0		pH 6.5		pH 7.0		pH 7.5		pH 8.0		pH 8.2		pH 8.5		pH 9.0		pH 9.5		pH 10.0		pH 10.5	
10	*10*	a	*50*	a	180	b	490	d	970	d	1,700	d	2,600	d	3,000	d	*3,300*	d	*2,800*	a	*1900*	a	*980*	a	*400*	a
25	*25*	a	*110*	a	350	d	760	d	1,300	d	2,000	d	3,000	d	3,300	d	*3,500*	d	*2,900*	a	*1,700*	a	*810*	a	*300*	a
50	*47*	a	*190*	a	550	d	1,000	d	1,600	e	2,400	e	3,100	d	3,400	d	*3,700*	d	*2,900*	a	*1,600*	a	*700*	a	*240*	a
75	*69*	a	*260*	a	710	d	1,200	d	1,900	f	2,600	f	3,200	d	3,500	d	*3,700*	d	*2,900*	b	*1,500*	a	*640*	a	*210*	a
100	*91*	a	*330*	a	850	d	1,400	d	2,100	f	2,800	g	3,300	e	3,500	d	*3,700*	d	*2,900*	b	*1,500*	a	*600*	a	*190*	a
150	*130*	a	*460*	a	1,100	d	1,700	e	2,400	g	3,000	g	3,500	f	3,600	e	*3,700*	d	*2,900*	c	*1,400*	a	*550*	a	*160*	a
200	*170*	a	*590*	b	1,300	d	1,900	e	2,600	g	3,200	g	3,600	f	3,700	e	*3,700*	d	*2,900*	d	*1,400*	a	*520*	a	*150*	a
250	*210*	a	*700*	b	1,500	d	2,100	f	2,800	g	3,400	g	3,700	g	3,700	e	*3,700*	d	*2,900*	d	*1,400*	a	*500*	a	*140*	a
300	*260*	a	*820*	i	1,600	d	2,300	f	3,000	g	3,500	g	3,800	g	3,800	f	*3,700*	d	*2,900*	d	*1,400*	a	*480*	a	*130*	a
350	*290*	a	*930*	c	1,800	d	2,500	g	3,100	g	3,600	g	3,800	g	3,800	f	*3,600*	d	*2,900*	d	*1,300*	a	*460*	a	*130*	a
400	*330*	a	*1,000*	c	1,900	d	2,600	g	3,200	g	3,700	g	3,900	g	3,800	g	*3,600*	d	*2,900*	d	*1,300*	a	*450*	a	*120*	a
430	*360*	a	*1,100*	c	2,000	d	2,700	g	3,300	g	3,700	g	3,900	g	3,900	g	*3,600*	d	*2,900*	d	*1,300*	a	*440*	a	*120*	a

Bolded values indicate where the 2018 criteria are lower than the 1988 criteria magnitude within the 1988 pH range applied of 6.5-9.0.
(Italicized and underlined values are outside the pH limits of the empirical data used to generate the MLR models and should be used with caution).
Ranking of four most sensitive genera (Rank 1-Rank 4).

Aluminum Aquatic Life Toxicity Review

Is there a potential for aquatic life toxicity with an aluminum treatment?

- Based upon US EPA Criteria
  - Yes
- Things to consider
  - Aluminum treatment results in a short exposure period (3 hours) versus the duration of the toxicity test (48 hours)
  - Effect is temporary
  - Whole lake is not treated at the same time
  - Effect depends upon the species
    - Adult fish unlikely to be affected (we have never caused a “fish kill”)
    - Can conduct treatment in the fall to avoid affecting young fish
    - Rapidly reproducing species such as zooplankton more sensitive and greater toxicity potential

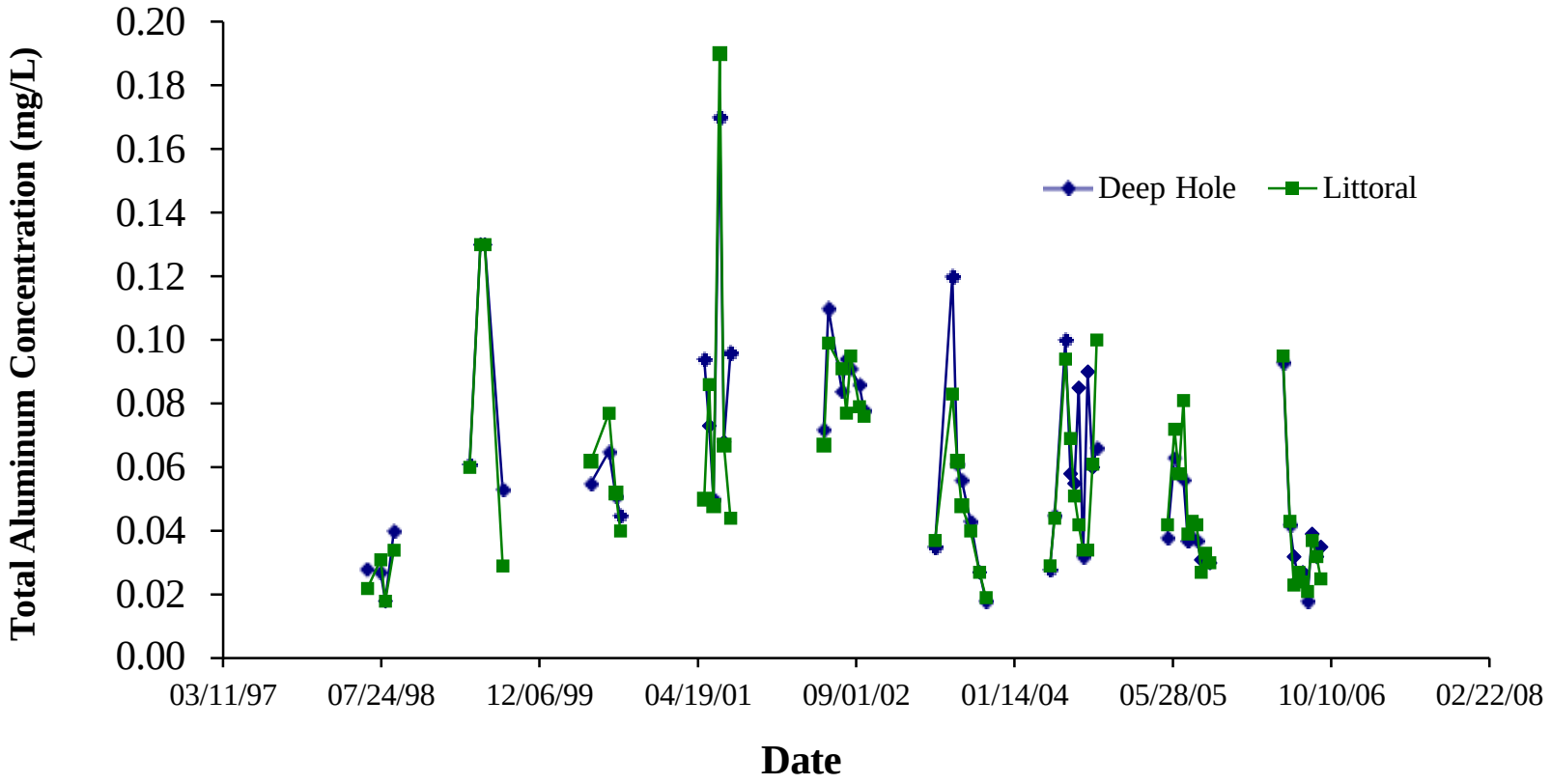
Human Health Toxicity

- Maximum Contaminant Level (MCL)—for drinking water
  - Minnesota and US EPA: none
  - California: 1.0 mg/L
    - Based upon aluminum in blood in humans

Human Health Toxicity
Alzheimers

- Aluminum is a ubiquitously abundant nonessential element. Aluminum has been associated with neurodegenerative diseases such as Alzheimer's disease (AD), amyotrophic lateral sclerosis, and dialysis encephalopathy. Many continue to regard aluminum as controversial although increasing evidence supports the implications of aluminum in the pathogenesis of AD. Aluminum causes the accumulation of tau protein and Aβ protein in the brain of experimental animals. Aluminum induces neuronal apoptosis in vivo and in vitro, either by endoplasmic stress from the unfolded protein response, by mitochondrial dysfunction, or a combination of them. Some, people who are exposed chronically to aluminum, either from through water and/or food, have not shown any AD pathology, apparently because their gastrointestinal barrier is more effective. This article is written keeping in mind mechanisms of action of aluminum neurotoxicity with respect to AD.[1]
- No elevated aluminum in patients with cognitive disfunction.[2]
- Hypericum perforatum extract protects against neurotoxicity caused by Aluminum-maltolate (Al(mal)3) and its effects on APP gene expression.[3]
- Alzheimer’s disease(AD), is a neurodegenerative ailment and the most prevalent cause of dementia. The commonly used synthetic drugs provide temporary and incomplete symptomatic treatment accompanied with severe side effects. The present study aimed at evaluating the therapeutic potential of Ginko Biloba, and/ or Vitamin D, E, C on aluminum chloride (AlCl3)-induced neurotoxicity in rats.[4]

What Exposure Levels Can We Expect Tanners Lake as an Example



Conclusion Regarding Aluminum

- The primary risk with aluminum treatment is short term and likely during the actual treatment.
- According to the US EPA Criteria Document, there is a short term (acute) risk to aquatic life during an aluminum treatment.

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Cost Benefit-Analysis for Internal Loading Control Options for Bennett and Wakefield Lake

DRAFT

Prepared for
Ramsey Washington Metropolitan Watershed District

October 2022

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Cost Benefit Analysis for Internal Loading Control Options for Bennett and Wakefield Lake

October 2022

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Abbreviations

TMDL	Total Maximum Daily Load

1 Introduction

There are several lakes within Ramsey Washington Metropolitan Watershed District (RWMWD) where internal loading of phosphorus is either contributing to an impairment (e.g., currently listed on the Minnesota's 303(d) Impaired Waters List for excess nutrients) or internal loading is likely contributing to summer algal blooms. The District has three shallow Lakes that are currently listed as impaired for excess nutrients: Kohlman (potentially in the process of being delisted), Bennett and Wakefield Lake. Internal phosphorus loading from lake bottom sediments has been determined to be a significant source of phosphorus to these lakes (note that Kohlman Lake was treated with alum (treatment occurred in 2010) but it is likely that internal loading is occurring again). In addition, monitoring data collected from several unimpaired lakes in the District suggest that there are number of lakes that experience internal loading to some degree during the summer. Aluminum, applied as alum and sodium aluminate, is a common treatment to control internal phosphorus loading in lakes. The purpose of this current study is to evaluate several other approaches (other than traditional aluminum treatments) that can be used to control internal phosphorus loading and meet the TMDL requirements for internal loading control. This evaluation includes a cost-benefit analysis for various lake management strategies to reduce internal loading in Bennett and Wakefield Lake, based on the internal load control requirements prescribed by the TMDLs of these lakes.

1.1 Internal Loading

Phosphorus delivered to lakes by stormwater, stream inflows, rain, or dry atmospheric deposition is often sequestered in lake bottom sediments. Phosphorus is deposited in sediment either by settling of particles with phosphorus attached or by the uptake of phosphorus by phytoplankton, bacteria, or plants and the subsequent deposition in lake bottom sediments after these biota die and decompose. Lake bottom sediment acts as a wastewater treatment plant of sorts, decomposing dead biological organic matter and releasing its incorporated phosphorus or chemically altering the inorganic particles that adsorbed phosphorus to the extent that it looses its grip. Ultimately, some fraction of the phosphorus that is deposited in the lake bottom sediments is released back into the lake water column. This is often described as "internal phosphorus loading" or just "internal loading." Internal loading can be a significant contributor to summer algal blooms and control of internal loading can often notably reduce the magnitude of these blooms.

1.2 Background Bennet and Wakefield

Bennett and Wakefield Lake are both shallow lakes that are impaired by excess nutrients (phosphorus) and have been previously evaluated as part of a Total Maximum Daily Load (TMDL) study. As part of the TMDL studies, internal loading was identified as a significant contributor to overall phosphorus loads: Internal loading was estimated to be 48% (78 lbs) of total phosphorus loads to Bennett Lake and 32% (60

lbs) of total phosphorus loads to Wakefield Lake during a typical climatic year[1] with "average" precipitation.

Internal loading for several selected District lakes, including Bennett Lake and Wakefield Lake, was evaluated as part of a 2020 study intended to reassess the status of internal loading (which can change over time as watershed inputs change) in the subject lakes[2]. Sediment cores from lake bottom sediments were collected and analyzed for phosphorus content. Concentrations of phosphorus in lake bottom sediments, dissolved oxygen, and temperature data were used to estimate the rate of internal loading in the study lakes (including Bennett and Wakefield). Results from this work confirmed that internal loading occurs during summer months for Bennett and Wakefield Lake at a rate of approximately 1.3 mg m^{-2} d^{-1} and 1.2 mg m^{-2} d^{-1}. These rates are high enough to notably increase summer phosphorus concentrations.

1.3 Internal Loading Control Methods

Eight internal loading control approaches were evaluated for the purposes of this study:

- Dredging of lake bottom sediments
- Aquatic plant harvesting
- Aluminum treatment (e.g., alum)
- Phoslock
- Aeration
- Iron treatment
- Direct oxygen injection
- Nanobubbles

These methods control internal load by either: (1) eliminating the source (e.g., dredging of lake bottom sediments high in phosphorus), (2) enhancing phosphorus binding elements of sediment (e.g., aluminum and iron treatment), and (3) increasing the oxygen concentration near lake bottom sediment to prevent the release of phosphorus from sediment (e.g., in the presence of oxygen, iron is able to bind phosphorus and prevent it from moving into the lake water column). Aquatic plant harvesting is a unique approach in that aquatic plants and attached filamentous algae contain phosphorus and removal of the plant material also removes phosphorus from within the lake.

There are multiple methods that could be implemented to reduce internal loading which includes traditional methods and newer technologies. As part of this study 7 different methodologies to reduce internal loading were analyzed in terms of the cost and benefits that could be achieved for each lake.

[1] MPCA. 2017. Ramsey-Washington Metro Watershed District Total Maximum Daily Load Study. Quantification of the pollutant reductions necessary to restore aquatic recreation in Bennett Lake, Wakefield Lake and Fish Creek; and to restore aquatic life in Battle Creek.

[2] Barr Engineering, 2020. 2020 Internal Load Analysis of Shallow and Deep Lakes. Prepared for Ramsey Washington Metro Watershed District. December 30, 2020.

2 Methods

Methods developed and employed to estimate potential costs and benefits are described below.

2.1 Cost Analysis Methods

Costs were estimated for this study by either researching costs for the alternative, contacting equipment suppliers, or adjusting previous projects or other fully costed projects adjusted for inflation. For new methods or strategies that have not been implemented in the District, Barr reached out to consultants/companies that provide the product or service. For example, nanobubbles (Section 3.8), a product developed by Moleaer, has not been used in the District. Therefore, Barr contacted Moleaer to determine the number of nanobubbles systems needed and the cost of the nanobubble system.

The other method for estimating costs was using information from prior RWMWD projects. For example, dredging (Section 3.1) was completed on Markham Pond in 2017. Barr used the total project cost from the Markham Pond dredging in 2017 and updated the cost according to dredging volume and average inflation rates

The cost analysis for each alternative will clearly state what methodology was used to estimate the cost and any other associated assumptions made on an alternative basis. In addition, the cost estimate will give a point cost and an accuracy range. The accuracy range is based on professional judgment considering the level of design and research completed. It was assumed a Class 5 opinion of cost with accuracy range of -30% to +50% standards established by the Association for the Advancement of Cost Engineering was applicable to the feasibility level of this study. The opinions of cost include tasks and items related to engineering and design, permitting, and constructing each alternative. The opinions of cost do not include other tasks following construction of each alternative presented such as operations and maintenance. This opinion of probable cost is based on alternative-related information available to Barr Engineering at this time. The opinion of cost may change as further analysis and design of an alternative is completed. In addition, because Barr has 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 analysis. If the RWMWD wishes greater assurance as to the probable project cost, the RWMWD should authorize further investigation and design of a selected alternative. The detailed cost estimate per lake and alternative is presented in Appendix X which includes costs of mobilization, materials, contractor fees, engineering fees, and more.

2.2 Benefit Analysis

The second part of this study included quantifying the benefits of implementing each alternative. With the exception of aquatic plant harvesting, it can be expected, with some caveats discussed below, that each method can be implemented to achieve similar internal load reductions. For example, aluminum treatment can be expected to be the most effecting method immediately after treatment and probably for a few years after treatment. This method can achieve nearly 100 percent control of internal loading in the

immediate years after treatment, however effectiveness does decline over time. An average of 80% removal for aluminum treatment over the lifetime of the treatment is a reasonable assumption. An average of 80% removal for Phoslock treatment over the lifetime of the treatment is also used in this study but this removal is based upon a laboratory experiment[3] and the long-term effectiveness of this new treatment approach is still unknown due to the lack of repeated properly designed experiments or monitoring programs[4]. It can be expected that there will be a wide range of reported performance for aeration, direct oxygen injection and nano-bubbles reported in the literature. However, a few published studies have demonstrated that a properly designed aeration system can achieve high levels of internal loading reduction in the 80% range[5, 6]. The success of dredging is highly dependent upon the depth-distribution of phosphorus in the lake bottom sediment. Meaning, if phosphorus in sediment below a dredge cut is low then internal loading can also be expected to be low. Dredging would not be undertaken unless deep sediment cores of approximately 2 meters or more show low phosphorus below a proposed dredge cut (note that this was the case in Markham Pond where there was sand below accumulated sediment). Dredging has the same limitations as aluminum and Phoslock treatments in that effectiveness declines over time with the input of new sediment from the watershed. However, it is likely that the longevity of internal loading reduction will be lower with dredging as there are no additional phosphorus binding elements (e.g, added aluminum or Phoslock) to bind newly deposited phosphorus. The best example of a successful dredging effort is Lake Trehorningen in Sweden where a 50 percent reduction in total phosphorus in surface samples was achieve by removing the top 0.2 to 1 m of sediment[7]. Note it is possible that internal load reduction was greater than 80 percent as surface water inputs still occurred after dredging, thereby contributing to post-dredging concentrations.

Based upon experience and the literature presented, it is assumed each alternative has at least 80% efficiency in preventing internal loading and can meet the internal loading reduction requirement of the Bennett and Wakefield TMDLs (the exception is aquatic plant harvesting). Table 1 shows the existing internal release, the proposed internal release assuming lake management is used, the necessary reduction outlined in the 2016 TMDL, and percentage of TMDL-prescribed load reductions met with internal loading management for Bennett and Wakefield Lake.

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[7] Sven-Olof Ryding. Lake Trehorningen restoration project. Changes in water quality after sediment dredging. National Swedish Environment Protection Board, Research Department.

Table 1: Internal Loading Existing and Proposed

	Existing Internal Release	Proposed Internal Release with Lake Management	2016 TMDL Load Reduction Necessary	Percent Internal Load Reduction
Bennett	90.3 pounds	18.1 pounds	72.2 pounds	78%
Wakefield	60.4 pounds	12.1 pounds	48.3 pounds	80%

The outcome of assuming that each internal load control approached identified can achieve 80% reduction is that the lowest cost alternative will also provide the greatest cost-benefit. Therefore, it is important to also review non-quantitative benefits such as experience in the District, operation and maintenance, land needs and the appropriate application given the unique condition of each lake. The benefits section for each alternative and summary section of this study will also present the non-quantitative benefits that should be considered when selecting an internal loading management strategy.

3 Internal Load Control Alternatives

Eight different alternatives for reducing internal loading will be presented in this section. A brief overview and background of the strategy or technology is presented. In addition, if the internal load control method has been used in the District before, pictures and a project summary will be provided. A summary of benefits and drawbacks for each alternative will be discussed briefly with further discussion in Section 4. Lastly, a cost estimate for Bennett and Wakefield Lake will be given for each alternative.

3.1 Dredging

3.1.1 Background

Dredging has been commonly used with the intent of reducing internal loading for decades. The purpose of dredging is to remove sediment that contains high concentrations of phosphorus and therefore reduce the potential for internal loading[8]. There are two primary methods to dredge a lake: hydraulic dredging or traditional mechanical dredging. Hydraulic dredging uses a floating barge to remove soft sediment from the bottom of lakes and ponds. Mechanical dredging is typically done by a crane from a boat or by removing water from the target waterbody and excavation of sediment using a backhoe (see Figure 1).

[8] https://conservancy.umn.edu/bitstream/handle/11299/58743/2.2.Klein.pdf?sequence

Figure 1: Dredging of Markham Pond in 2017

Typically, hydraulic dredging may be preferred if dewatering is not feasible and sediment disturbance needs to be minimized. However, hydraulic dredging requires a dewatering facility adjacent to the lake. Both dredging approaches have advantages and the preferred application depends upon site conditions.

3.1.2 Use of Dredging in RWMWD

The District has utilized dredging in the past with the ultimate goal of improving water quality of shallow lakes. In 2017, the District dredged Markham Pond as part of a 319 EPA grant. The goal of dredging was to remove sediment from the pond bottom to create a deep hole in Markham Pond for sunfish refuge during the winter. Although removal of sediment with high phosphorus was not the intent of dredging Markham Pond, the effort is an example where high phosphorus sediment is laden above a low phosphorus substrate (i.e., sand) and it can expected that internal loading would be reduced as an outcome of the dredging activity.

3.1.3 Benefits and Limitations

Dredging is a tool that has been used for many years to reduce internal loading and has been demonstrated to work for some applications. A major contribution to the success of dredging is that dredging directly addresses the source of internal loading, the sediment. Other benefits to dredging include that there is no land acquisition (unless a sediment dewatering facility is required to consolidate sediment prior to transportation off-site), and it may be a one-time construction event if external loads are adequately controlled.

However, there are drawbacks to dredging. Although dredging removes sediment and has the potential to be a one-time event, sediment will begin to reaccumulate and may need to be removed again if external loads are not adequately controlled. The other primary drawback to dredging is that it is an extensive construction project that includes erosion control, the potential construction of a dewatering facility and the need to identify land to house the facility, site stabilization (land and shoreline), and potentially dewatering depending upon the method employed.

3.1.4 Cost Estimate

Table 2 includes the cost estimates for a mechanical dredging project for Bennett and Wakefield. Mechanical dredging (by backhoe) was the approach used for the cost estimate as it has been employed in the District. A literature review suggests that mechanical dredging is more expensive than hydraulic dredging[9]. Hence this cost/benefit analysis encompasses both dredging approaches. For the cost estimate, the Markham Pond dredging project cost was used and was adjusted using an inflation rate of 4%.

Table 2: Cost Estimate for Dredging[1,2]

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$521,000	$744,000	$1,116,000
Wakefield	$411,000	$587,000	$881,000

1. Cost estimate assumes construction of an off-site dewatering facility is not required.
2. Cost estimate includes engineering design (30% of construction costs) and a 10% contingency.

3.2 Aquatic Plant Harvesting

3.2.1 Background

Another method that has the potential to reduce internal loading is aquatic plant harvesting, however, this method will not be able to achieve TMDL requirements as a stand-alone application. The objective of aquatic plant harvesting is to remove excess aquatic plants that store phosphorus and then potentially release phosphorus to the water column when they die and decay. Aquatic plant harvesting is accomplished from a paddle wheel propelled boat. The boat has a large frame that goes under the water and has sickles vertically and horizontally to cut the plants. In addition, the boat has a conveyance belt that carries plants from the frame of the boat (Figure 2).

[9] http://www.epa.state.il.us/water/conservation/lake-notes/lake-dredging/lake-dredging.pdf

Figure 2: Aquatic Plant Harvesting on Casey Lake in 2022

3.2.2 Use of Aquatic Plant Harvesting in RWMWD

The District has on occasion selectively employed aquatic plant harvesting. Harvesting has been regularly conducted on Casey Lake[10] since carp removal. In addition, Kohlman Lake had multiple harvesting events in 2015 as part of an experimental harvesting program. Evaluation of monitoring data for Casey and Kohlman Lake indicate that limited harvesting (e.g., selectively cutting one foot deep) does not adversely affect lake water quality but has potential benefits such as reduced phosphorus loading to lake bottom sediment and potential water quality improvement for downstream lakes by removing phosphorus from the overall system.

3.2.3 Benefits and Limitations

Aquatic plant harvesting has the potential to reduce internal loading over the long term by limiting the deposition of phosphorus on lake bottom sediments originating as dead aquatic plant material.

[10] https://www.apms.org/wp-content/uploads/japm-55-01-26.pdf

Harvesting does not have any land requirements and the only requirement is lake access via a boat launch or other access point.

However, there are a few limitations to aquatic plant harvesting. Harvesting is slow and may need to be conducted for much of the summer to effectively remove a significant mass of biomass. Although aquatic plant harvesting is not as extensive of a construction project such as dredging, harvesting requires management and contractor oversight. Over-harvesting the aquatic plants needs to be avoided as removal of too much plant matter has the potential to degrade water quality. Finally, harvesting alone will not likely achieve internal load reduction goals of most TMDLs.

3.2.4 Cost Estimate

Table 3 includes annual cost estimates for aquatic plant harvesting for Bennett and Wakefield Lake. For the cost estimate, the Kohlman Lake aquatic plant harvesting contractor cost was used and was corrected to today's dollars using an inflation rate of 4%. Costs were also checked against 2022 Casey Lake harvesting costs. Additional costs included in this alternative include plant disposal cost. Plant disposal cost was calculated assuming 1945 kg of wet plants will be harvested per acre of lake (this is based upon an estimated harvestable mass of plants from the Kohlman Lake study[11]). The cost estimate includes construction observation as seen in Appendix X. The cost estimate represents the cost that will be required every year to remove plants.

Table 3: Annual Cost Estimate for Aquatic Plant Harvesting[1]

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$11,000	$15,000	$23,000
Wakefield	$9,000	$12,000	$18,000

1. Cost estimate includes contractor oversight cost of $2,200 for staff time, disposal costs of $45/cubic yard and a 10% contingency.

3.3 Aluminum (Alum) Treatment

3.3.1 Background

The application of aluminum, in the form of liquid alum, to control internal loading is a well-established practice. When alum is added to the surface of a lake, it creates a floc that settles to the bottom of the waterbody. Once on the bottom of the lake, the floc mixes in with the sediment and reacts with phosphorus to create an aluminum-phosphate bond (Al-P). Treatment is conducted by applying liquid chemicals to a water body via a treatment boat (Figure 3). The North American Lake Management Society has developed a position statement on the use of alum for lake management[12]. The statement concludes

[11] https://rwmwd.org/wp-content/uploads/Strategic-Aquatic-Plant-Harvesting-as-a-Multi-Faceted-In-Lake-Management-Tool-Lakeline-V40-No.4-Winter-2020.pdf

[12] https://www.nalms.org/nalms-position-papers/the-use-of-alum-for-lake-management/#:~:text=NALMS%20Positions,of%20protecting%20and%20managing%20lakes.

that "alum is a safe and effective lake management tool." The US EPA has also recently updated water quality criteria for the protection of aquatic life for aluminum[13]. The criteria recognizes that potential acute and chronic aquatic toxicity from aluminum exposure to aquatic life is moderated by circumneutral pH, and the presence of dissolved organic carbon and hardness. The updated criteria, combined with monitoring data, could be used to assess whether the chemical properties of a given lake, for which aluminum (alum) treatment is considered, would result in an unacceptable risk to aquatic life.

Figure 3: Alum Treatment Being Applied on Kohlman Lake (2010)

3.3.2 Alum Treatment in RWMWD

The District's only experience with alum treatment to control internal loading is the treatment of Kohlman Lake. This treatment was successful and has controlled internal loading until only recently (treatment lifespan of approximately 10 years). Combined with carp and watershed management, this treatment was able to notably improve water clarity and reduce phosphorus concentrations. Interpretation of sediment core data collected in 2020 suggest that phosphorus is accumulating at the bottom of Kohlman Lake and the phosphorus concentrations are high enough to cause internal loading.

3.3.3 Benefits and Limitations

The primary benefit of alum treatment is that phosphorus is inactivated by forming Al-P and this directly reduces internal loading potential. Another benefit of alum treatment is that the District has experience

[13] https://www.epa.gov/wqc/aquatic-life-criteria-aluminum

with this method and understands dosing and treatment methodologies. Unlike dredging or aeration, the treatment is not part of a construction project and hence there is minimal disturbance to lake residents.

Water quality improvements can be seen after a single treatment, however, the primary limitation to this alternative is that treatment will need to be repeated after a number of years and depending upon the magnitude of watershed inputs of phosphorus. Therefore, alum treatment, like dredging, Phoslock treatment, and aquatic plant harvesting requires ongoing lake maintenance.

3.3.4 Cost Estimate

To estimate the cost, appropriate aluminum doses for both Bennett and Wakefield Lake were developed. Dosing was estimated from the concentration of the iron-bound phosphorus fraction and 50 percent of the organically-bound phosphorus fraction in the top 6 centimeters of sediment. Prescribed dosing is as follows:

- Bennett Lake
    - Alum: 16,885 gallons liquid alum applied
    - Sodium Aluminate: 8,443 gallons liquid sodium aluminate applied
- Wakefield Lake
    - Alum: 11,745 gallons liquid alum applied
    - Sodium Aluminate: 5,873 gallons liquid sodium aluminate applied

Cost of the chemical was based on a recent Barr project for another client in the Minneapolis metropolitan area. The total cost which includes mobilization, aluminum application, and engineering fees is shown in Table 4. The total cost is for a one-time application of alum and sodium aluminate with an approximate longevity of 10 years.

Table 4: Cost Estimate of Alum Treatment[1]

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$154,000	$220,000	$330,000
Wakefield	$108,000	$154,000	$231,000

1. Engineering and design cost reduced to 20% of project cost as this is not a standard construction project.

3.4 Phoslock

3.4.1 Background

Another newer form of treatment, used in the United States since 2010, is adding a product called Phoslock to lakes. Phoslock is composed of 95% bentonite clay and 5% lanthanum, a rare-earth element. Lanthanum acts by reacting with phosphorus to create a mineral called rhabdophane, an insoluble and largely inert compound.

Typically, Phoslock is applied as a slurry mixture and spreading it over the lake surface. The product can be spread over the lake surface by a boat or using a hose system from the shoreline. After the slurry is

applied to the lake surface, the slurry mixture sinks to the bottom. As the slurry sinks Phoslock will react with some phosphorus in the water column and remove it to form rhabdophane (Figure 4). Once the Phoslock has settled on the lake bottom, the remaining lanthanum can continue to react with phosphorus from the sediment until the lanthanum has been spent. Once the lanthanum has been spent, the reaction process stops, and the treatment is done (note, this is similar to aluminum). The byproduct, rhabdophane, will remain on the lake bottom and keep the phosphorus bound, preventing it from being re-released to the water column.

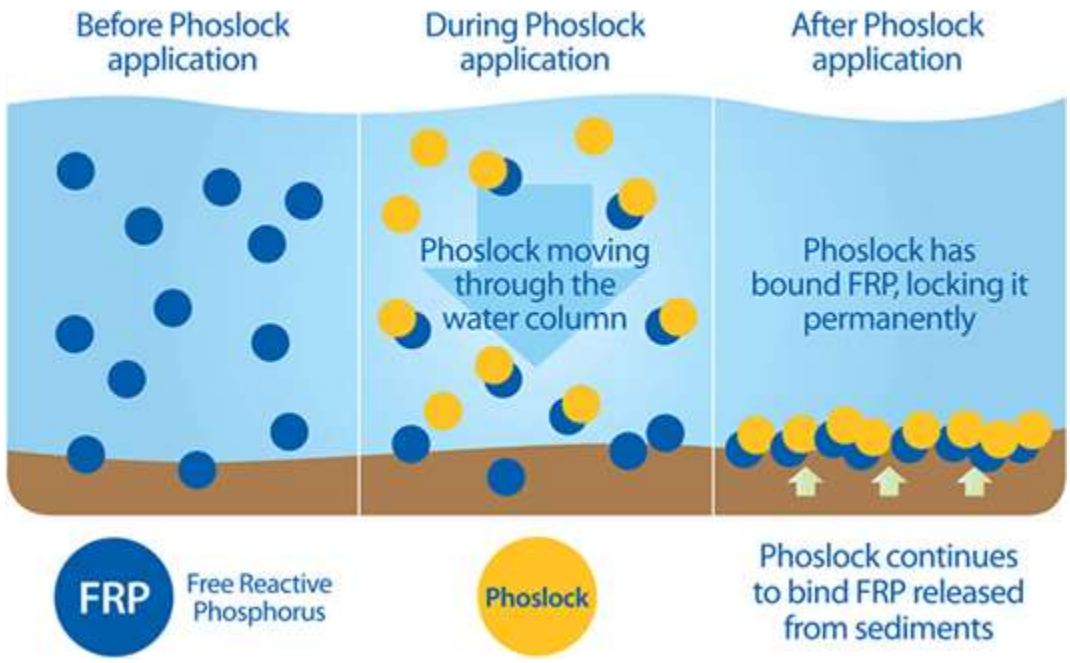

Figure 4: Graphic Depiction of Phoslock Application
(source: https://www.sepro.com/aquatics/phoslock)

3.4.2 Use of Phoslock in RWMWD

Phoslock has not been used on any lakes in the District. Longevity and effectiveness is still being evaluated by the scientific community.

3.4.3 Benefits and Drawbacks

The primary benefit of Phoslock is the perceived potential reduced toxicological risk of Phoslock compared to aluminum. However, this benefit is largely unproven as lanthanum can release from bentonite as it resides in the sediment. A review of the US EPA Ecotox database suggests that the potential lanthanum toxicity to aquatic life is not necessarily less than aluminum.

Phoslock as a treatment has been used more commonly in Europe and has only been used in the United States since 2010. Therefore, the product can still be classified as a newer technology. In addition, Phoslock has not been used to treat any lakes in the District.

3.4.4 Cost Estimate

The first step to develop a cost estimate for Phoslock was to determine the dosing required for Bennett and Wakefield Lake. The Phoslock dose was based upon literature[14] and the concentration of iron-bound and 50 percent of the organically-bound phosphorus in lake bottom sediment. From the literature is it estimated that the mass of Phoslock needed as lanthanum is four times the mass of iron-bound and 50 percent of the organic phosphorus mass in the top 6 cm of lake bottom sediment. The other cost associated with this treatment methodology is the application of the slurry mix to the lakes which is reflected in Table 5.

Table 5: Cost of Phoslock[1]

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$195,000	$278,000	$417,000
Wakefield	$135,000	$192,000	$288,000

1. Cost estimate includes engineering and design costs (20% of construction cost) and 10% contingency.

3.5 Forced Air Aeration

3.5.1 Background

Forced air aeration is a methodology that has been commonly used in deep lakes to destratify the lake and transport low oxygen water from the lake bottom to the surface. Aeration refers to the process of pumping air into a lake. There are a few methods of aeration that can be utilized but this analysis will focus on forced air aeration when atmospheric air is added to a lake bottom. Submerged aeration systems work by placing diffusers, disk shaped equipment consisting of membranes with holes, on the lake bottom. The diffusers are connected to compressors that push air out of the diffuser and into the water column (Figure 5). The objective of aeration is to mix oxygen in a lake and increase oxygen concentrations throughout the water column. As mentioned before, internal loading occurs under anaerobic conditions when iron-phosphate complexes become soluble.

[14] Lurling, M., Waajen, G., F. van Oosterhout. 2014. Humic substances interfere with phosphate removal by lanthanum modified clay in controlling eutrophication. Water Research. 54, 78-88.

Figure 5: Submerged Aerator

3.5.2 Use of For Air Aeration in RWMWD

The District is currently evaluating the benefit of using forced air aeration for internal loading control in shallow lakes. In 2021, the shallow aeration study began. There are two primary purposes of the shallow aeration study. The first was to develop a baseline of water quality for multiple shallow lakes in the District in order to better understand the cause of internal loading in shallow lakes. The second was to install aerators in the shallow lakes and determine if aeration could increase oxygen concentrations throughout the shallow lake water column. Preliminary results indicate that aeration has been a successful method to increase oxygen concentrations in Markham Pond and Bennett Lake (Figure 6).

Figure 6: Forced Air Aeration on Bennett Lake

3.5.3 Benefits and Limitations

The District is gaining experience with aeration technology as part of its effort to control carp in Markham Pond, Bennett Lake and Gervais Mill Pond. These are all shallow water bodies. Monitoring is being conducted to understand how these aeration systems are also affecting oxygen concentrations in the summer and how effective they are at controlling internal loading. The District has been largely responsible for design, siting, sizing, and contractor procurement so expertise is being developed in-house. All lake management approaches require maintenance and maintenance will also be required for forced air aeration. However, as long as the system is operating, effectiveness will be maintained while the sediments have adequate iron available. The aeration system can also be turned off or on depending upon management needs. If adequately sized, aeration has the potential to simultaneously achieve fisheries, nutrient, and aquatic life management goals.

There are still some potential limitations with forced air aeration. As mentioned, the District has used shallow aeration in one location on Markham Pond and Bennett Lake and a system in Gervais Mill Pond has just been installed. There is preliminary data indicating aeration in shallow lakes can increase dissolved oxygen concentrations, but the magnitude of aeration required (e.g., sizing) to reduce internal loading in shallow lakes is still being evaluated. Another important consideration is the need to have on-shore space for equipment and power. Each aeration system requires a concrete slab and cabinet to store the aeration system as well as access to power. Although the land requirement for one aeration system is small (approximately 20 square feet), lakes such Bennett may require more than one on-shore equipment site depending upon the configuration. Aeration involves a mechanical system that includes pumps and generators, so there can be equipment issues that may require maintenance that would need to be addressed by District staff.

3.5.4 Cost Estimate

In order to estimate the cost of aeration several tasks were completed (costs are provided in Table 6). First was research to determine the current cost for aeration equipment including pump, cabinet system, and diffusers. In addition, Barr reviewed receipts from the Markham Pond aeration study for other associated costs of aeration such as price for electrical setup. Finally, preliminary review of Markham Pond dissolved oxygen data was utilized. Markham Pond has a surface area of approximately 17 acres and has one aeration system. Due to Markham Pond being smaller, it was important to view the dissolved oxygen data and understand how far the influence of the aeration system extended. Hence, sizing was based upon the data and scaling for Bennett and Wakefield (note that the current Bennett system is not full scale and the Wakefield system would need to be expanded to be effective across the entire lake).

Table 6: Cost Estimate for Forced Air Aeration

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett[1]	$94,000	$134,000	$201,000
Wakefield[2]	$60,000	$85,000	$128,000

1. The Bennett system consists of 4-1.5 horsepower compressors, 2 sites for electrical installation, 2 cabinets and associated materials. Electricity costs are estimated to be $800 for summer (May through September) operation.
2. The Wakefield system consists of 3-1.5 horsepower compressors, 1 site for electrical installation, 2 cabinets and associated materials. Electricity costs are estimated to be $600 for summer (May through September) operation.

3.6 Iron and Forced Air Aeration

3.6.1 Background

Iron and forced air aeration is the same method as stand-alone aeration (Section 3.5) but includes an iron application (similar to the approach used for aluminum treatment—see Figure 3) to augment iron concentrations in the lake bottom sediment. As mentioned, previously, under oxic conditions phosphorus binds with iron in the lake bottoms sediments thereby preventing release to the overlying water column (e.g., the iron-phosphate compound is insoluble). Therefore, aeration can promote higher oxygen levels and the addition of iron to lake bottom sediments ensures that iron is therefore available to bind phosphorus. This approach is needed when phosphorus in lake bottom sediments is predominantly in the organic-phosphate form.

3.6.2 Iron and Forced Air Aeration in RWMWD

Although aeration has been used in the District, aeration in combination with iron has not been used before.

3.6.3 Benefits and Drawbacks

In general, iron treatment combined with forced air aeration has the same benefits and drawbacks as forced air aeration discussed in Section 3.5.3. The primary difference in terms of benefits is that although iron aeration has not been used in the District before, it is the same technology as aeration with the only difference being the application of iron. With respect to drawbacks, iron treatment combined with forced

air aeration will be more expensive than traditional aeration due to the additional materials and labor required for the iron application. It should be noted however that aeration will not work if there is inadequate iron in the sediment. Hence, addition of iron is necessary to capture phosphorus and form an insoluble iron-phosphate complex under aerated conditions.

3.6.4 Cost Estimate

The cost for this methodology was the same as the forced air aeration estimate plus the additional cost of iron and sodium aluminate application (sodium aluminate is a base that is used to buffer the pH of the treatment, another based can be used if desired). Barr completed an analysis of Bennett and Wakefield Lake to determine the dose of liquid ferric chloride (source of iron) and sodium aluminate (buffer) required for each lake. It is important to note that the cost in Table 7 represent a one-time dose of iron as it is hypothesized that additional iron treatments may not be required in the future to maintain the effectiveness of this approach. Hence, the longevity of this approach can be expected to be longer than aluminum or Phoslock treatment.

Table 7: Cost of Iron Aeration[1]

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett[2,4]	$227,000	$324,000	$486,000
Wakefield[3,5]	$141,000	$201,000	$302,000

1. Engineering and design cost reduced to 20% of project cost as this is not a standard construction project and District staff can implement the aeration installation.
2. Iron dose of 3,852 gallons as liquid ferric chloride (42% Fe w/w) and 7,707 gallons of liquid sodium aluminate (10.4% Al w/w/).
3. Iron dose of 2,477 gallons as liquid ferric chloride (42% Fe w/w) and 4,314 gallons of liquid sodium aluminate (10.4% Al w/w/).
4. Electricity costs are estimated to be $800 for summer (May through September) operation.
5. Electricity costs are estimated to be $600 for summer (May through September) operation.

3.7 Direct Oxygen Injection

3.7.1 Background

Direct oxygen injection, also called oxygen saturation technology, is a newer technology that increases oxygen levels in a lake by directly adding pure oxygen gas to lake water. This is in contrast to forced air aeration which moves water to the lake surface to promote oxygen transfer with the atmosphere. There are several different types of systems. One system that will work for shallow lakes includes an intake pipe near the bottom of a lake. The pump will pull water from the bottom of the lake and direct it through an oxygenation contact chamber. The oxygen contact chamber will add oxygen to the lake water and then the pump will return the oxygenated water to the discharge location (Figure 7).

Figure 7: Direct Oxygen Injection Equipment Setup (courtesy of Gantzer Water).

3.7.2 Use of Direct Oxygen Injection in RWMWD

The District has not used direct oxygen injection treatment before.

3.7.3 Benefits and Limitations

The benefits of direct oxygen injection are similar to forced air aeration. A unique attribute of direct oxygen injection is that pure oxygen is used in this process and water can be supersaturated with oxygen. The supersaturated water then can move about and mix with the lake water column and increase oxygen throughout the lake. This system should minimally affect ice cover in the winter and this may be needed for lakes that are heavily used by residents in the winter. This system will not destratify a lake, meaning, the lake bottom will remain cold and this could benefit fisheries as fish prefer cooler water in the summer. Hence, this system may have additional ecological benefits compared to forced air aeration. Shallow lakes with a deep hole (e.g., approximately 10 feet) may be good candidates for this approach.

Although direct oxygen injection has benefits, there are potential limitations as well. The first drawback is it is a new technology that has not been used in the District. As a consequence, there is no evidence of this system working in the District (however, it has been used in Pleasant Lake just north of the District). In addition, District staff will need to be trained regarding the operation and maintenance of the system. Another important drawback is that the land use requirement to house the system, roughly 60 square feet, is larger than forced air aeration which can be contained in an enclosure rather than a building (forced air aeration may need a building for lakes larger than Wakefield and Bennett). This system may not be suitable for shallow lakes with vegetation potentially clogging a side-stream direct oxygen system and the height of the new in-lake models that are being developed could lead to in-lake obstructions that would not be suitable for lakes with recreation. Hence, this system needs a deeper lake or a shallow lake with a deep hole (e.g., like Wakefield Lake) to avoid operational issues.

3.7.4 Cost Estimate

To estimate the cost of direct oxygen injection, a prior cost estimate was used. In 2019, Barr requested a cost estimate for direct oxygen injection for a lake similar in size to Bennett and Wakefield Lake. The cost of equipment from the quote in 2019 was updated to reflect inflation. The cost for these systems also includes assistance from the manufacturer/consultant to help design an appropriate system, start-up assistance from the manufacturer, and operation and maintenance. The total estimated cost can be seen in Table 8. Note that the cost for Wakefield Lake was modified based upon the size of Wakefield Lake relative to the size of the lake for which the original cost estimate was developed.

Table 8: Cost of Direct Oxygen Injection[1]

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$128,000	$182,000	$273,000
Wakefield	$110,000	$157,000	$236,000

1. This cost estimate includes site preparation and site restoration activities associated with building construction and system installation. These activities were not included in the forced air aeration system cost estimate due to the greater simplicity of the forced air aeration system.

3.8 Nanobubbles

3.8.1 Background

The target of nanobubble technology is similar to direct oxygen injection and aeration, that is to increase oxygen concentrations in the lake water column. The purpose of nanobubble systems is to pump oxygen into a lake. How the technology differs is that nanobubble technology pumps oxygen bubbles that are at the nano scale. Nanobubbles are 70-120 nanometers in size and this is much smaller than ordinary bubbles (Figure 8).

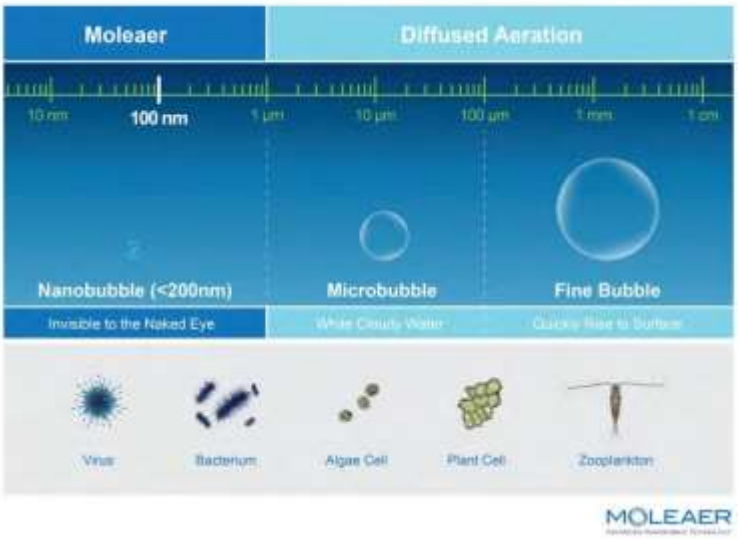

Figure 8: Nanobubbles Compared to Traditional Aeration Bubbles (source: https://www.moleaer.com/nanobubbles).

Due to the small size of the bubbles, they have properties that traditional bubbles from aerators do not have. For example, the bubbles are neutrally buoyant so the bubbles will remain suspended in liquid instead of rising to the surface. This property may allow the bubbles to come into contact with the sediment more readily. Research from a third party had indicated that nanobubbles could achieve over 25 times more efficient oxygen transfer than traditional systems. The shore mounted system includes an intake pipe, pump, generator to take atmospheric air to form the nanobubbles, and an outlet pipe to return air and nanobubbles (Figure 9)[15].

[15] https://www.moleaer.com/nanobubbles

Figure 9: Moleaer Clear Generator Installed on a Pond Bubbles (source: https://www.moleaer.com/nanobubbles)

3.8.2 Use of Nanobubbles in RWMWD

Nanobubbles is a newer technology that has not been used in the Direct before.

3.8.3 Benefits and Limitations

Nanobubble benefits are very similar to those discussed in direct oxygen injection. Nanobubbles is another approach to deliver oxygen to lake bottom sediment and has the potential to be more effective if the bubbles can effectively transfer oxygen to the lake bottom sediments. Moleaer, the company that produces nanobubble generator, claims third party testing shows that nanobubbles have over 85% oxygen transfer efficiency compared to traditional aeration which has 3% oxygen transfer efficiency. This difference in efficiency will be noted in benefits and limitations but was not accounted for in the quantitative cost-benefit analysis in Section 4.1.

Nanobubble technology also has similar drawbacks to direct oxygen injection. Nanobubbles is a new technology that has not been used in the District before. Therefore, some training will be needed for the operation and maintenance of this system. Nanobubble generators will also require land, about 20 square feet per system/generator. However, more land will be needed for this option. As mentioned earlier 2-3 forced air aeration systems will be needed for Bennett and Wakefield and only one direct oxygen injection system per lake. Individual nanobubble technology can treat the least amount of water, therefore 5 or 6 of the nanobubble generators will be needed to treat water in the Bennett and Wakefield. The result of more generators is that more land is needed as the generators will need to be cited at multiple locations around a lake. It is important to spread out the generators such that the entire lake can be treated.

3.8.4 Cost Estimate

To develop a cost estimate, Barr met with a representative from Moleaer, the company that developed nanobubble technology. Moleaer was able to provide a cost estimate for their Clear 150 generator which can treat 20 acre-feet of a water body. In order to treat Bennett and Wakefield Lake, 6 Clear 150 generators will be needed for Bennett and 5 for Wakefield. The cost estimate of nanobubbles is shown in Table 9.

Table 9: Cost of Nanobubbles[1]

	Low Cost Estimate	Point Cost Estimate	High Cost Estimate
Bennett	$288,000	$411,000	$617,000
Wakefield	$240,000	$342,000	$513,000

1. Cost estimate includes installation, nano-bubble generators, and electrical installation.

4 Comparison Summary

The purpose of this section is to compare the costs and benefits of each method or technology that could be implemented to reduce the internal loading of Bennett and Wakefield Lake such that TMDL requirements for internal loading reduction are met.

4.1 Cost Comparison

In order to view the cost-benefits of each alternative it is important to view the costs in terms of total cost and cost per pound, as seen in Table 10. The pounds of total phosphorus removal was calculated assuming each technology could be implemented such that the TMDL requirement for internal load reduction could be met.

Table 10: Cost Benefit Summary

Method[3]	Bennett- Total Cost[1]	Bennett- Cost per Pound of Total Phosphorus Removed Per Year[4]	Wakefield- Total Cost[1]	Wakefield- Cost per Pound of Total Phosphorus Removed Per Year[4]
Dredging	$744,000	$1,270	$587,000	$1,500
Aquatic Plant Harvesting	$15,000[2]	$840	$12,000[2]	$880
Phoslock	$278,000	$470	$192,000	$490
Alum	$220,000	$380	$154,000	$390
Forced Air Aeration	$134,000	$270	$85,000	$280
Iron Aeration	$324,000	$590	$201,000	$570
Direct Oxygen Injection	$218,000	$370	$170,000	$490
Nanobubbles	$411,000	$750	$342,000	$940

1. Results in this table use the point cost estimate and not the range of costs shown earlier
2. The annual cost for aquatic harvesting
3. The estimated lifespan of each of these methods is 10 years except for aquatic plant harvesting which is an annual activity and annual costs are provided.
4. Costs for the aeration methods include estimated annual electricity costs as well as a fixed cost of $2,000 a year for equipment repairs.

Overall, the most expensive methods to reduce internal loading are dredging and nanobubbles. Dredging is an expensive alternative due to it being an extensive construction project that includes design, dewatering, removal of significant material, and site stabilization. Meanwhile, nanobubbles is more

expensive technology because it is newer, but more importantly because of the number of systems and greater electrical work that would be needed to properly treat Bennett or Wakefield.

The least expensive methods are forced air aeration, and direct oxygen injection, and then alum treatment. It should be noted that forced air aeration and direct oxygen are not the cheapest options if the sediment is lacking adequate iron and iron needs to be added (e.g., see the cost for the iron-aeration option). It is important to note that aquatic plant harvesting cannot achieve TMDL reductions for Wakefield and Bennett Lake as a stand-alone approach. Also note that most shallow lakes, including Bennett and Wakefield, have high organic phosphorus and aluminum and Phoslock are not effective at biding organic phosphorus which can contribute significantly to internal loading. Hence, aeration plus iron addition will be necessary to address internal loading from organic phosphorus.

4.2 Alternative Comparison: Cost, Benefits, and Limitations

Although cost is important, there are other non-quantitative aspects to consider when selecting a method to control internal loading. The purpose of Table 11 is to demonstrate if an alternative has a low or high cost, while highlighting benefits and drawbacks for each method that cannot be quantified.

Table 11: Cost, Benefit, and Limitations Comparison

Method	Cost[1]	Benefits	Limitations
Dredging	$$$	Known method and District experience. Removes source of internal loading. May reduce oxygen demand by lake bottom sediments.	Large construction project. May need to be repeated in future as sediment accumulates on excavated bottom. Off-site/adjacent dewatering facility potentially needed requiring land. May be ineffective if high phosphorus extends deep into the sediment.
Aquatic Plant Harvesting	$$-$$$	Known method and District experience. No land requirement. Manageable by District staff. Potentially provides dual benefit of managing plants and nutrients.	Will need to be repeated annually. Will not fulfill TMDL reduction requirements. Contractor oversite required (District staff).
Aluminum (Alum)	$	Known method and used in district. Effectiveness has been demonstrated in the District. No land requirements. Extensive evidence that method is highly effective at internal loading reduction.	Small construction project. Repeated treatment required approximately every 10 years. May not be very effective when sediment dominated by organic phosphorus.
Phoslock	$$	Seen as an alternative to aluminum treatment as the lanthanum binds to phosphorus similar to aluminum.	Additional treatment often required soon after initial treatment suggesting that dose requirements are not well understood. Effectiveness not as well documented as aluminum. Product is proprietary and sourcing is limited to one supplier in the US. May not be very effective when sediment dominated by organic phosphorus. Treatment longevity potentially similar to aluminum.
Forced Air Aeration	$	Used in District. Increases oxygen concentrations which can reduce internal loading. Experimental evidence suggests method well suited for shallow lakes. Potential fisheries and ecological benefits with summer and winter operation (preventing winter fish kill).	More commonly applied in deep lakes. Land requirements (20+ square feet per lake to house the compressors). Operation and maintenance needs. Still considered experimental for shallow lakes.
Iron Aeration	$$	Used in District. Increases oxygen concentrations which can reduce internal loading. Addresses challenge of internal loading control from organic phosphorus. Potential fisheries and ecological benefits with summer and winter operation (preventing winter fish kill).	More commonly applied in deep lakes. Land requirements (20+ square feet per lake to house the compressors). Operation and maintenance needs. Still considered experimental for shallow lakes. Iron application still considered experimental.
Direct Oxygen Injection	$-$$	Increase oxygen levels Uses concentrated oxygen source May be capable of greater increases in dissolved oxygen compared to forced air aeration.	New technology. Land requirements (60 square feet per lake). Operation and maintenance needs. Technology proven to be effective in deep lakes but not as frequently applied in shallow lakes.
Nanobubbles	$$-$$$	Increase oxygen levels and has the potential to deliver oxygen directly to the sediment bed, thereby reducing internal loading. More efficient than traditional aeration with respect to oxygen transfer per unit of oxygen delivered.	New technology. Land requirements (100 square feet per lake using Bennett as the model lake). Operation and maintenance likely required but degree of maintenance required not clear. Highly experimental and practical application to lakes the size of Bennett and Wakefield not documented.

1. $ is cost per pound per year for Bennet and Wakefield is below $400, $$ is cost per pound for Bennett and Wakefield is between $400 and $900, and $$$ is cost per pound for Bennett and Wakefield is over $900

5 Conclusion and Discussion

Control of internal phosphorus loading is about reducing or eliminating the movement of phosphorus from lake bottom sediments to the lake water column. Internal loading control can be achieved by either: (1) eliminating the source of phosphorus (e.g., dredging of lake bottom sediments high in phosphorus), (2) enhancing phosphorus binding elements of sediment (e.g., aluminum and iron treatment), or (3) by increasing the oxygen concentration near lake bottom sediment to prevent the release of phosphorus from sediment (e.g., in the presence of oxygen, iron is able to bind phosphorus to make an insoluble complex and prevent it from moving into the lake water column). Aquatic plant harvesting is a unique approach in that aquatic plants and attached filamentous algae contain phosphorus and removal of the plant material also removes phosphorus from within the lake, hence this is an internal load reduction.

The methods presented in this study represent internal load control approaches that fall into the three categories identified above. Cost is important, but several factors and goals unique to each lake need to be considered when choosing an appropriate approach. Some of these factors include the type of phosphorus in the sediment (e.g., iron-bound vs. organically-bound phosphorus), the depth distribution of high phosphorus sediment on the lake bottom, the average and maximum lake depth, available land around the lake to site equipment, and recreation considerations for the lake (e.g., thin winter ice for highly used lakes). Hence, it is recommended that the District should retain the use of these varied approaches in order to have the appropriate tools available to control internal loading while recognizing that the high cost approaches such as dredging should be applied only selectively.

Appendix A. Estimates of Probable Cost

Dredging

Bennett Lake	
Dredging	$520,000
Contingency (10%)	$52,000
Dredging Subtotal	$572,000
Engineering and Design (30%)	$172,000
Project Total	$744,000
-30%	$521,000
50%	$1,116,000

Wakefield Lake	
Cost of dredging	$410,000
Contingency (10%)	$41,000
Dredging Subtotal	$451,000
Engineering and Design (30%)	$136,000
Project Total	$587,000
-30%	$411,000
50%	$881,000

Aquatic Plant Harvesting

Bennett Lake				
Aquatic Plant Harvesting				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
Cost of Harvesting	Lump	1	$8,712	$8,712
Disposal Cost	Cubic Yard	50	$45	$2,240
Construction Observation	Hours	20	$110	$2,200
			Subtotal	$13,152
			Construction Contingency (10%)	$1,315
			Construction Subtotal	$14,467
			Project Total	$15,000
			-30%	$11,000
			50%	$23,000

Wakefield Lake				
Aquatic Plant Harvesting				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
Cost of Harvesting	Lump	1	$6,738	$6,738
Disposal Cost	Cubic Yard	39	$45	$1,732.59
Construction Observation	Hours	20	$110	$2,200
			Subtotal	$10,671
			Construction Contingency (10%)	$1,067
			Construction Subtotal	$11,738
			Project Total	$12,000
			-30%	$9,000
			50%	$18,000

Phoslock

Bennett Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$21,000	$21,000
2. Phoslock	Pounds	33,021	$4.23	$139,700
3. Application	Lump	1	$69,900	$69,900
			Subtotal	$209,600
			Construction Contingency (10%)	$21,000
			Construction Subtotal	$230,600
			Engineering and Design (20%)	$47,000
			Project Total	$278,000
			-30%	$195,000
			50%	$417,000

Wakefield Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$15,000	$15,000
2. Phoslock	Pounds	22,808	$4.23	$96,500
3. Application	Lump	1	$48,300	$48,300
			Subtotal	$144,800
			Construction Contingency (10%)	$15,000
			Construction Subtotal	$159,800
			Engineering and Design (20%)	$32,000
			Project Total	$192,000
			-30%	$135,000
			50%	$288,000

Aluminum (Alum) Treatment

Bennett Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$21,000	$21,000
2. Liquid Aluminum Sulfate Application	Gallons	16885	$3.81	$64,332
3. Liquid Sodium Aluminate Application	Gallons	8,443	$9.53	$80,500
			Subtotal	$165,832
			Construction Contingency (10%)	$17,000
			Construction Subtotal	$182,832
			Engineering and Design (20%)	$37,000
			Project Total	$220,000
			-30%	$154,000
			50%	$330,000

Wakefield Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$15,000	$15,000
2. Liquid Aluminum Sulfate Application	Gallons	11745	$3.81	$44,749
3. Liquid Sodium Aluminate Application	Gallons	5873	$9.53	$56,000
			Subtotal	$115,749
			Construction Contingency (10%)	$12,000
			Construction Subtotal	$127,749
			Engineering and Design (20%)	$26,000
			Project Total	$154,000
			-30%	$108,000
			50%	$231,000

Forced Air Aeration

Bennett Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$9,000	$9,000
2. Aeration Materials	Each	3	$3,500	$10,500
3. Cabinet for Aeration	Each	2	$2,500	$5,000
4. Industrial Pump	Each	4	$3,000	$12,000
5. Electricity Install	Lump	2	$28,000	$56,000
			Subtotal	$92,500
			Construction Contingency (10%)	$10,000
			Construction Subtotal	$102,500
			Engineering and Design (30%)	$31,000
			Project Total	$134,000
			-30%	$94,000
			50%	$201,000

Wakefield Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$6,000	$6,000
2. Aeration Materials	Each	3	$3,500	$10,500
3. Cabinet for Aeration	Each	2	$2,500	$5,000
4. Industrial Pump	Each	3	$3,000	$9,000
5. Electricity Install	Lump	1	$28,000	$28,000
			Subtotal	$58,500
			Construction Contingency (10%)	$6,000
			Construction Subtotal	$64,500
			Engineering and Design (30%)	$20,000
			Project Total	$85,000
			-30%	$60,000
			50%	$128,000

Iron and Forced Air Aeration

Bennett Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$16,000	$16,000
2. Aeration Materials	Each	3	$3,500	$10,500
3. Cabinet for Aeration	Each	2	$2,500	$5,000
4. Industrial Pump	Each	4	$3,000	$12,000
5. Iron Dosing	Gallons	3,852	$18.24	$71,000
6. Sodium Aluminate Dosing	Gallons	7,707	$9.53	$74,000
7. Electricity Install	Lump	2	$28,000	$56,000
			Subtotal	$244,500
			Construction Contingency (10%)	$25,000
			Construction Subtotal	$269,500
			Engineering and Design (20%)	$54,000
			Project Total	$324,000
			-30%	$227,000
			50%	$486,000

Wakefield Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$10,000	$10,000
2. Aeration Materials	Each	3	$3,500	$10,500
3. Cabinet for Aeration	Each	2	$2,500	$5,000
4. Industrial Pump	Each	3	$3,000	$9,000
5. Iron Dosing	Gallons	2,477	$18.24	$46,000
6. Sodium Aluminate Dosing	Gallons	4,314	$9.53	$42,000
7. Electricity Install	Lump	1	$28,000	$28,000
			Subtotal	$150,500
			Construction Contingency (10%)	$16,000
			Construction Subtotal	$166,500
			Engineering and Design (20%)	$34,000
			Project Total	$201,000
			-30%	$141,000
			50%	$302,000

Direct Oxygen Injection

Bennett Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$13,000	$13,000
2. Safety, Erosion Control, and Site Prep	Each	1	$23,000	$23,000
3. Aeration Materials	Lump	1	$76,500	$76,500
4. Operation Support	Lump	1	$4,300	$4,300
5. Site Restoration	Lump	1	$22,000	$22,000
			Subtotal	$138,800
			Construction Contingency (10%)	$14,000
			Construction Subtotal	$152,800
			Engineering and Design (30%)	$46,000
			Project Total	$199,000
			-30%	$140,000
			50%	$299,000

Wakefield Lake				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Mobilization/Demobilization	Lump	1	$11,000	$11,000
2. Safety, Erosion Control, and Site Prep	Each	1	$23,000	$23,000
3. Aeration Materials	Lump	1	$60,000	$60,000
4. Operation Support	Lump	1	$4,300	$4,300
5. Site Restoration	Lump	1	$22,000	$22,000
			Subtotal	$120,300
			Construction Contingency (10%)	$13,000
			Construction Subtotal	$133,300
			Engineering and Design (30%)	$40,000
			Project Total	$174,000
			-30%	$122,000
			50%	$261,000

Nanobubbles

Bennett Lake				
Nanobubbles				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Installation	Lump	1	$29,000	$29,000
2. Nanobubble Aeration Materials	Each	6	$19,800	$118,800
3. Electricity Install	Lump	6	$28,000	$168,000
			Subtotal	$286,800
			Construction Contingency (10%)	$29,000
			Construction Subtotal	$315,800
			Engineering and Design (30%)	$95,000
			Project Total	$411,000
			-30%	$288,000
			50%	$617,000

Wakefield Lake				
Nanobubbles				
Item Description	Unit	Estimated Quantity	Unit Cost	Cost
1. Installation	Lump	1	$24,000	$24,000
2. Nanobubble Aeration Materials	Each	5	$19,800	$99,000
3. Electricity Install	Lump	5	$28,000	$140,000
			Subtotal	$239,000
			Construction Contingency (10%)	$24,000
			Construction Subtotal	$263,000
			Engineering and Design (30%)	$79,000
			Project Total	$342,000
			-30%	$240,000
			50%	$513,000

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BARR

Project work plan

Date: October 24, 2022
Project: Pioneer Park Stormwater Reuse System Engineering and Design and Construction Services

Project team
District staff: Paige Ahlborg
Barr staff: Erin Anderson Wenz, Jen Koehler, Katie Wolohan, Louise Heffernan, Mike Burdorf, Gareth Becker, Zach Nesler, BJ Siljenberg, Brian Burgner

Barr team roles
Project management: Jen Koehler
Design: Katie Wolohan, Louise Heffernan, Mike Burdorf, Gareth Becker, Zach Nesler, BJ Siljenberg
Permitting: Brian Burgner
Bidding coordination: Katie Wolohan
Construction services: Louise Heffernan

District staff
District administrator: Tina Carstens
Project manager: Paige Ahlborg

Little Canada staff
Public Works Director: Bill Dircks
Parks and Rec Director: Bryce Shearen

Project Background

In 2021, Barr completed a stormwater reuse assessment for Ramsey County. The objective of the project was to perform a countywide assessment to identify potential opportunities for stormwater reuse for irrigation in order to conserve groundwater and protect/improve surface water quality. This assessment was funded by a Board of Water and Soils Resources (BWSR) Clean Water Fund Watershed Based Funding Grant and Ramsey County. The various parcels across the county were initially prioritized using a desktop assessment approach. Ramsey County then contacted landowners for the highest-ranking sites. Based on landowner interest, conceptual reuse designs were ultimately developed and evaluated for seven sites. These planning level concepts were based on site visits and information provided by the property owners/representatives. Five of the seven sites were located within the Ramsey-Washington Metro Watershed District (RWMWD).

Based on the information compiled as part of the Ramsey County assessment, the projects were input into the RWMWD water quality project prioritization tool and all projects fell within the top 10 projects for the District, scoring points in nearly all of the district's goal categories and providing multiple benefits. One of the highest-ranking parcels for stormwater reuse potential identified by the Ramsey County assessment is Pioneer Park (site), a public site located at 2950 Centerville Rd., in the City of Little Canada (City). A summary of the project-specific results from the RWMWD water quality project prioritization tool in included below.

Pioneer Park is located in the RWMWD, draining to Gervais Creek and ultimately Gervais Lake. During the Beltline Resiliency study, some local structures (non-District) adjacent to the northern boundary of Pioneer Park were determined to be potentially at-risk of flooding during the 100-year storm event. During the growing season, this project will lower water levels on the eastern basins in this area which may or may not affect this flood risk for these structures. Regardless, by providing some additional storage within the basins during the irrigation season does provide some resiliency in the system to accommodate larger, more intense storm events.

The site currently irrigates 11.2 acres, including several athletic fields from an irrigation well, using an average of approximately 2.2 million gallons per year (approximately 0.4 inches per week during the irrigation season). The existing irrigation rate ranges from approximately 80-120 gallons per minute. There are two existing, connected stormwater ponds located on the east side of the site that could be used for stormwater storage for reuse for irrigation. The ponds were constructed in the late 1980's and collect runoff from approximately 39 acres. These ponds are not classified as Minnesota Department of Natural Resources (MnDNR) Public Waters, so utilization of surface water from these water bodies will not require a MnDNR appropriations permit.

The stormwater reuse assessment for Ramsey County conceptualized a stormwater reuse system that could utilize the top one (1) foot of water within the existing two ponds (approximately 470,000 gallons of storage). Assuming this water is used for irrigation, is estimated that stormwater could meet 88% of the annual irrigation demand for Pioneer Park. It is estimated that this project could reduce annual TSS loads by 1,393 pounds per year and annual TP loads by 7.7 pounds per year. The conceptualized stormwater reuse system includes pumping, particulate filtration and disinfection (UV). The system would utilize the

existing well system for irrigation back-up supply. The estimated construction cost range reflects uncertainty based on the American Society for Testing and Materials (ASTM) Class 4 (1-15% concept) design is $380,000 - $810,000 (-30% to +50% uncertainty), with a concept level point estimate of $536,000.

A site visit was performed as part of the Ramsey County assessment on 11/8/2021 with City of Little Canada, RWMWD, and Barr staff. A second meeting was held with RWMWD staff, City of Little Canada (Public Works Director and Parks and Recreation Director), and Barr staff on September 7, 2022. At that time, City staff were still interested in implementing a stormwater reuse project to help offset use of groundwater for irrigation. Also, City staff indicated they are in the process of finalizing design for implementation of components of a park master plan for Pioneer Park that will be constructed in 2023. The master plan had identified a water feature in the park with the potential to collect and direct discharges from this water features to the existing basins on the east site of the park for reuse. However, follow-up response from City staff indicated that it is unlikely we will be able to collect and reuse water from this feature as currently designed.

Engineer's Concept Level Opinion of Cost and Water Quality Treatment Estimate

A summary of the Class 4 project cost and water quality treatment estimate is included in the table below.

Table 1: Summary of concept level opinion of probable costs and water quality treatment estimate

Proposed concept	Engineer opinion of cost for construction	Class 4 Cost Estimate (-30% to +50%)	BMP average annual TP removal (lb/year)	Annualized cost per pound of TP removal[1]
Pioneer Park Stormwater Reuse	$536,000	$380,000 - $810,000	7.7	$5,104 - $6,857

1 – Reflects annualized total capital cost, including estimated annual maintenance with the range reflecting a 20-35-year lifespan on the project.

RWMWD Prioritization Tool

The Pioneer Park project is one of the highest-ranking projects in the RWMWD's current water quality project prioritization list.

Table 2 summarizes the project's scores per each goal in RWMWD's Watershed Management Plan.

Table 2: Summary of RWMWD Prioritization Tool Scores For Pioneer Park Stormwater Reuse

Plan Goal Categories	Scores per Plan Goal Category
	Pioneer Park
1. Water Quality	4.0
2. Ecosystem	0.0
3. Flooding	2.0
4. Groundwater	2.0
5. Community	3.0
6. Manage Organization	5.0

A description of the credits that each project received in the tool under each of RWMWD's Plan Goal categories is included below.

Pioneer Park Prioritization Tool Credits:

RWMWD Goal 1. Achieve quality surface water

- Annual Cost-Benefit of TP and TSS removals ($5,104 - $6,857/lb TP/yr)
- TP removal (lbs/yr) (7.7 lbs)
- TSS removal (lbs/yr) (1393 lbs)

RWMWD Goal 2. Achieve healthy ecosystems

- N/A

RWMWD Goal 3. Manage risk of Flooding

- Potential Flood Storage – Project will result in potentially lowering normal water level of the constructed stormwater ponds during the irrigation/growing season which may help reduce risk of local flooding adjacent to the park and improve overall system resiliency.

RWMWD Goal 4. Support sustainable groundwater

- Project promotes infiltration through irrigation from a stormwater pond
- *Note: Groundwater conservation is a primary driver for the project, reducing dependence on groundwater for irrigation. Additionally, it is worth noting that Pioneer Park is within 5 miles of White Bear Lake. The MnDNR has amended existing groundwater appropriation permits within a five-mile radius of White Bear Lake limiting irrigation when water level of White Bear Lake drops below the target elevation and remains in place until water levels raise.*

RWMWD Goal 5. Inform and empower communities

- Project has the potential to have a significant educational component and visibility, being located within a city park.
- Project fosters collaboration with cities, watershed management organizations, educational institutions, and other stakeholders to develop and implement shared communication and messaging strategies
- *Note: We did not assign points to the project as it relates to District Priority Equity Areas, as the site does not fall within the ACP50 or other district priority areas as used in the water quality prioritization tool. However, the project falls within more vulnerable areas based on the Ramsey County Social Vulnerability Index.*

RWMWD Goal 6. Manage organization effectively

- Project will utilize the existing park irrigation system and existing groundwater well (for any needed back-up water supply)
- Design address changing climate trends/prepare for long-term resiliency by reducing dependence on groundwater for irrigation purposes and also will maintain additional storage capacity within the existing ponds during the irrigation/growing season, helping better manage runoff for more intense or extreme events
- Partner (City of Little Canada) will provide long-term operations and maintenance
- Willing project partners that want to share and educate their parks commission and city council related to groundwater reuse

Scope of Work

The scope of the project described in this work plan is to prepare final plans, technical specifications, and bidding documents for a complete stormwater reuse system at Pioneer Park. Barr will also provide permitting and stakeholder engagement support, bidding support, and construction services.

Budget

Barr will complete the work outlined below on a time-and-expense basis for an estimated **$151,200**.

Schedule

We propose the following schedule, milestones, and deliverables, assuming authorization to proceed at the November 2, 2022 RWMWD board meeting. Based on conversations with RWMWD staff, we anticipate completing design from winter 2022/2023 through spring 2023; However, permitting & bidding may not occur until later 2023 with construction anticipated in 2024.

Task 1 (November 2022 - December 2022): Field Data Collection

Task 1 includes conducting:

- Site topographic, utility, and tree location survey within the anticipated project area footprint

Geotechnical investigations are not proposed as part of final design. The City of Little Canada was able to provide a geotechnical report completed by American Engineering and Testing (AET) in 2020 that includes 4 boring locations within Pioneer Park. Although there is not a boring in the general location of the proposed reuse system, there are borings from locations throughout the park. All borings from around the site generally indicate the presence of fat clay, sandy lean clay, lean clay with sand, or silty clay with sand across the site. These soils all have lower blow counts and higher moisture content, indicating that these soils should be removed prior to construction of any structures or surfaces. Based on this, our design will assume over-excavation and subgrade correction will be required below any storm water structures or concrete pads.

Wetland delineation was completed on 10/10/2022. The draft delineation report is being developed. Approval of the wetland delineation this fall will be dependent on the availability of the Technical Evaluation Panel (TEP) availability for field review.

Task 2 (December 2022 – May 2023): Reuse system engineering and design

Task 2 includes a project kickoff meeting with RWMWD and City staff. Additionally, this task includes design development including construction plans, technical specifications, and cost estimates for a piping, pumping, treatment (filtration/UV disinfection) system and other modifications to the system to accommodate the stormwater reuse system and backup from the existing groundwater well. The task will include virtual design reviews with District and city staff at 60%, 90%, and 100% (ready for issue for bidding/construction). We also anticipate one (1) meeting with the RWMWD board of managers at 100% (ready for issue for bidding/construction) to update the managers on the details of the project (including anticipated project cost), and to request approval to collects bids for the project's construction. This task also includes development of all contract and bidding documents.

The project will include up to three (3) additional coordination meetings with RWMWD and City staff through the design and agreement process. At the request of the city, this task also assumes Barr (along with District staff) will prepare for and attend one (1) meeting with the city parks and recreation commission and one (1) meeting to the city council.

We assume that RWMWD staff will lead in the development of the stakeholder agreement between the City and the RWMWD, but that Barr will provide assistance on any technical information required for the agreement development.

Task 3 (Fall - Winter 2023): Permitting

Task 3 includes all necessary permitting for the project. The ponds on the east side of Pioneer Park are not mapped as MnDNR public waters so appropriations permits will not be required. Construction plans provided by the City, dated 1989, indicate that the pond were constructed as stormwater management/water quality ponds. However, these ponds have since been mapped by the National Wetlands Inventory (NWI) and we expect that the ponds will be mapped as wetlands. Because they were constructed stomwater ponds, we can pursue incidental wetland status as it relates to Wetland Conservation Act (WCA) permitting. Permits from the City may also be needed, depending on the final design of the project.

Task 4 (Winter 2023 – September 2024): Bidding coordination & construction services

If the City and RWMWD Board ultimately approve the final construction plans and specifications, it is possible that the project will be put out to bid in spring 2023 in anticipation of 2023 construction. However, based on conversations with District staff, it is possible that bidding and construction of the Pioneer Park Reuse System may be delayed until 2024.

This task includes facilitating a pre-bid meeting, responding to requests for information from bidders, preparing addenda, bid opening, summary, and recommendation, and assistance with contracting between RWMWD and the recommended contractor.

This task will also include support during reuse system construction, including construction administration (review and management of submittals, requests for information, change orders, payment requests, etc.), facilitation of a weekly construction coordination meeting, onsite construction observation (up to 6 hours total per week), punch list development, and construction closeout support. This assumes construction of the system will be completed over a period of two months (8 weeks).

Task 5 (November 2022 through September 2024): Project management

This task includes overall project management and monthly reporting to RWMWD.

Project tracking

Project milestones

Milestone	Estimated completion date	Actual completion date
Task 1 – Field Data Collection	December 2022	
Task 2 – Reuse System Engineering and Design	--	
60% design (60% plans and cost estimate for RWMWD/City Review)	February 2023	
90% design (90% plans and cost estimate for RWMWD/City Review)	April 2023	
Issue for bidding/construction (100% plans, specifications, and cost estimate for RWMWD/City review)	May 2023	
100% design/Issued for Bid presentation to RWMWD managers	June 2023	
Task 3 – Permitting	Fall/Winter 2023	
Task 4 – Bidding Coordination and Construction Services	Winter 2023 – Summer 2024	
Task 5 – Project Management	September 2024	

Project budget tracking (engineering)

Project objectives	Estimated budget*	Spent to date
Task 1 – Field Data Collection	$7,800	$0
Task 2 – Reuse System Engineering and Design	$92,000	$0
Task 3 – Permitting	$6,000	$0
Task 4 – Bidding Coordination and Construction Services	$33,000	$0
Task 5 – Project Management	$12,400	$0
Total	**$151,200**	**$0**

**Barr budget only. These totals do not include RWMWD project budgets.*

Monthly updates

Month	Budget spent $$/%

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Administrator's Report

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MEMO

TO: Board of Managers and Staff

FROM: Tina Carstens, Administrator

SUBJECT: October Administrator's Report

DATE: October 27, 2022

A. **Meetings Attended**

Tuesday, October 4	9:00 AM	MAWA Executive Committee
	3:00 PM	Doug Snyder (MWMO) Retirement Party
Wednesday, October 5	9:00 AM	Leadership Network Webinar
	2:00 PM	Washington County Water Consortium
	5:00 PM	Board Tour and Meeting
Thursday, October 6	12:00 PM	I94 Culvert Pipe Replacement Meeting
	2:00 PM	Purple Line BRT Project Meeting
Monday, October 10 – Wednesday, October 12		WEFTEC Conference
Tuesday, October 18	ALL DAY	MN Water Resources Conference
Wednesday, October 19	ALL DAY	MN Water Resources Conference
Thursday, October 20	9:00 AM	Street Sweeping Study Update Meeting
Friday, October 21	9:00 AM	Project Updates and Planning with Barr
Tuesday, October 25	1:00 PM	Internal Stewardship Grant Team Meeting
Wednesday, October 26	10:00 AM	Highland Bridge/Ford Redevelopment Site Tour

B. **Upcoming Meetings and Dates**

Watershed Excellence Awards	Tuesday, November 15, 2022
MAWD Annual Meeting	Thursday, Dec 1, 2022 – Saturday, Dec 3, 2022
December Board Meeting	December 7, 2022
January Board Meeting	January 4, 2023

C. **Ongoing Project Update**

Land Acquisition and Use Policy – I'm still working on the information for the board to review and discuss and didn't want to overload this board meeting. More information to come.

Ponds of Battle Creek – I don't have more information on this property at this time.

West Vadnais Lake Boundary Change – Staff have reviewed the proposed changes and it has been sent to BWSR for their comment and review. We have a new BWSR Board Conservationist that I will be meeting with to get her up to speed on this effort.

D. **MAWD Annual Meeting**

I was informed by the interim executive director of MAWD that the annual meeting packet will be sent out next week but ahead of that she sent me the meeting notice and delegate appointment form, which I have attached. When we receive the full packet next week it will also include the proposed 2023 budget, draft strategic plan, proposed bylaw changes, and the resolutions information packet.

Each year the district appoints two managers to serve as delegates and one alternate at the annual meeting. If there are three managers attending, then we can also appoint an alternate. We will need to know who is considering attending the annual meeting so we can designate the managers attending as delegates.

Ahead of the board meeting please try to review the strategic plan, budget and resolutions packet and come prepared to discuss. The district's delegates can then use that discussion as guidance when voting at the annual meeting.

E. **Conference Highlights**

Fall is a busy time of year for conferences for staff. As I mentioned last month, I attended the WEFTEC national conference at the beginning of October. The next week was the annual Minnesota Water Resources Conference where several staff attended and Paige gave a presentation. This week, Bill presented at the BWSR Academy conference. Next month, the national NALMS (North American Lake Management Society) conference will be held in Minneapolis. Lyndsey will be presenting at that conference as well.

At the board meeting, I will give a short presentation with the major takeaways from the conferences attended this fall as well as some overview of the presentations given by District staff.

Minnesota Association of Watershed Districts, Inc.
2022 Annual Conference and Trade Show
December 1-3, 2022
Arrowwood Conference Center, Alexandria, MN

Member Meeting Materials

Enclosed are the following items:

1. Notice of Annual Meeting
2. Delegate Appointment Form
3. *Proposed Fiscal Year 2023 Budget*
4. *Draft Strategic Plan*
5. *Proposed Bylaws Changes*
6. *Resolutions Information Packet*

This packet has been distributed to administrators and managers via email. Please print copies for your organization. No paper copies of this packet will be sent via the U.S. Postal Service.

We are looking forward to seeing you at this year's conference!

PLEASE BRING THE RESOLUTIONS PACKET WITH YOU TO THE CONVENTION.
EXTRA COPIES WILL NOT BE AVAILABLE ON SITE. THANK YOU!!

MN Association of Watershed Districts, Inc.
2022 Annual Meeting Notice

NOTICE IS HEREBY GIVEN that the 2022 Annual Meeting of the Minnesota Association of Watershed Districts, Inc. will be held at the Arrowwood Conference Center, Alexandria, MN, beginning at 8:00 a.m. on Friday, December 2, 2022 for the following purposes:

1. To receive and accept the reports of the President, Secretary, and Treasurer regarding the business of the association of the past year;
2. To receive the report of the auditor;
3. To consider and act upon the Fiscal Year 2023 budget;
4. To consider and act upon the proposed 2023-2032 Strategic Plan;
5. To consider and act upon the proposed Bylaws changes;
6. To consider and act upon proposed resolutions;
7. To elect three directors, one from each region, for terms ending in 2024; and
8. To consider and act upon any other business that may properly come before the membership.

Sincerely,

_____

Ruth Schaefer
Secretary

Minnesota Association of Watershed Districts, Inc.
www.mnwatershed.org

MN Association of Watershed Districts, Inc.
2022 Delegate Appointment Form

The Ramsey-Washington Metro Watershed District **hereby certifies that it is**
name of watershed organization
a watershed district or watershed management organization duly established and in good standing pursuant to Minnesota Statutes 103B or 103D and is a member of the MN Association of Watershed Districts, Inc. (MAWD) for the year 2022.

The Ramsey-Washington Metro Watershed District **hereby further certifies**
name of watershed organization
the following individuals have been appointed as delegates, or as an alternate delegate, all of whom are managers in good standing with their respective watershed district or watershed management organization.

Delegate #1: _____

Delegate #2: _____

Alternate: _____

Authorized by: _____
Signature **Date**

_____
Title

** Please return this form to mnwatershed@gmail.com at your earliest convenience. **

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Project and Program Status Reports

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RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

resourceful. naturally. engineering and environmental consultants BARR

Memorandum

To: Board of Managers and Staff

From: Tina Carstens and Brad Lindaman

Subject: Project and Program Status Report – October 2022

Date: October 27, 2022

Note: The location, brief description, and current status of each project described below can be found on the 2022 RWMWD engineering services story map.

Project feasibility studies

A. Interim emergency response planning for district areas at risk of flooding (Barr project manager: Gareth Becker; RWMWD project manager: Tina Carstens)

The purpose of this project is to provide information and guidance to cities throughout the district about how to protect low-lying habitable structures from flooding during the 100-year storm event. These emergency response plans address areas for which there is 1) not currently a feasible project that has been identified to protect structures or 2) a project that cannot be implemented in the near future due to logistical and/or budgeting reasons. This effort is an outcome of the Beltline resiliency study. This project will extend into 2022.

This month and through the fall, Barr is creating plan sheets for placing emergency flood risk mitigation measures. We anticipate completing the plans this winter and working directly with city representatives to communicate the plans to potentially impacted individuals and answer questions about implementation.

B. Kohlman Creek flood risk reduction feasibility study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this study is to complete a feasibility evaluation of modifications to reduce flood risk along Kohlman Creek to remove structures from the 100-year floodplain. Work includes coordination with the cities of Maplewood and North Saint Paul, evaluation of alternatives to reduce flood risk, preparation of cost estimates for each alternative, and identification of permitting requirements. This project focused primarily on areas surrounding PCU Pond and the wetland complex west of White Bear Avenue. This feasibility study is a follow-up study of flood-prone areas identified in the Beltline resiliency study.

The Kohlman Creek flood risk reduction feasibility study will focus on concept development of the types of system improvements near PCU Pond that the city would support and that would complement North Saint Paul's other ongoing studies. This study is being conducted in parallel with the Kohlman Creek/Wakefield Lake diversion study (upstream of PCU Pond and the North Saint Paul Urban Ecology Center), so system modifications around PCU Pond will not be further developed until next year when the Kohlman Creek/Wakefield Lake diversion concept is better defined and resulting design flows are determined.

Barr has provided the district's stormwater model to the City of North Saint Paul for reference in the city's flood risk reduction study. After learning about the city's planned approach for flood risk mitigation in these areas and better understanding the change in peak flow rates following the Kohlman Creek-Wakefield Lake diversion study, Barr will begin evaluating potential flood risk mitigation options for PCU Pond and the wetland complex west of White Bear Avenue.

Next month and through the end of the year, Barr will continue working with the city to identify flood risk reduction opportunities that accomplish both RWMWD and city goals and objectives.

C. Kohlman Creek/Wakefield Lake diversion feasibility study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this study is to complete a feasibility evaluation of modifications to reduce flood risk on Kohlman Creek by diverting high flows to the historic County Ditch 17. Work includes coordination with stakeholders, evaluation of alternatives to reduce flood risk, preparation of cost estimates for each alternative, and identification of permitting requirements. This feasibility study is a follow-up study of a flood-prone area identified in the Beltline resiliency study.

This month, Barr received comments from Ramsey County and the county's contractor on potential pond locations and sizes. We are revising the stormwater model based on the information provided, as well as updating the diversion from Kohlman Creek to prevent increases to floodplain elevations downstream of Goodrich Golf Course. Following updates to the stormwater model, Barr and the RWMWD will meet with the county to review how changes to the golf course impact the size of the diversion and floodplain elevations on Kohlman Creek and County Ditch 17.

Barr had planned a design charrette with stakeholders for this fall. While we will still reconvene the stakeholder group, discussions with the county are guiding modifications to basin size and location and the size of the diversion pipe that conveys stormwater from Kohlman Creek to Goodrich Golf Course.

Next month, we expect to start reviewing the water quality monitoring data that the RWMWD collected last summer. Water quality information will inform whether additional treatment is required before diverting stormwater from Kohlman Creek into Wakefield Lake. Barr will also update the stormwater model and concept-level plans based on survey information that was collected in October. We will continue evaluating and refining alternatives through the winter. The feasibility study is scheduled to continue through summer 2023.

D. County Ditch 17 improvements feasibility study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this study is to complete a feasibility evaluation of modifications to reduce flood risk northeast of Wakefield Lake along historic County Ditch 17 to remove structures from the 100-year floodplain. Work includes coordination with the City of Maplewood, evaluation of alternatives to reduce flood risk, preparation of cost estimates for each alternative, and identification of permitting requirements. This feasibility study is a follow-up study of a flood-prone area identified in the Beltline resiliency study.

This month, Barr prepared a draft memorandum to document the methodology, alternatives for system modifications for flood risk reduction, and opinions of probable construction cost. We will share a draft memorandum with the RWMWD and the city to confirm that recommended system modifications would have stakeholder support. Following review, Barr will revise the memorandum and provide an updated version to the RWMWD managers later this year.

E. Phalen Village feasibility study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this study is to complete a feasibility evaluation of modifications to reduce flood risk near Phalen Village north of Lake Phalen to remove structures from the 100-year floodplain. Work includes coordination with the City of Maplewood, evaluation of alternatives to reduce flood risk, preparation of cost estimates for each alternative, and identification of permitting requirements. This feasibility study is a follow-up study of a flood-prone area identified in the Beltline resiliency study.

This month, Barr and the RWMWD met with the City of Maplewood to solicit input on potential system modifications. The city suggested evaluating two additional modifications to the storm sewer system, noting that the planned street improvement project for this area includes a complete reconstruction of the road, presenting an opportunity to include a larger modification to the storm sewer system. Following the meeting, Barr completed hydraulic evaluation of the additional two alternatives and began preparing a memorandum that summarizes the methodology, potential system modifications, and opinion of construction costs for each alternative.

This month, Barr prepared a draft memorandum to document the methodology, alternatives for system modifications for flood risk reduction, and opinions of probable construction cost. We will share a draft memorandum with the RWMWD and the city to confirm that recommended system modifications would have stakeholder support. Following review, Barr will revise the memorandum and provide an updated version to the RWMWD managers later this year.

F. Ames Lake area flood risk reduction planning study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose is to complete a planning-level evaluation of modifications to reduce flood risk near Ames Lake, supported by the City of Saint Paul. Work includes coordination discussions with Saint Paul; review of potential pipe alignments, land acquisition costs, utility conflicts, and permitting issues; and related design. If the planning study identifies projects that impact regional drainage, a feasibility study will be completed in 2023. This planning study is a follow-up study that was identified in the Beltline resiliency study.

This month, Barr and the RWMWD met with the Saint Paul Housing and Redevelopment Authority (HRA) about potentially using vacant parcels near Ames Lake for flood risk reduction best management practices (BMPs). Specifically, two HRA-owned parcels south of Ames Lake are primarily located within the 100-year floodplain. As a follow-up to conversations with the Saint Paul Water Resources Working Group (WRWG) last month, Barr, the RWMWD, and the HRA discussed the possibility of using these parcels for flood mitigation infrastructure such as ponds or basins that would provide regional flood risk reduction for the surrounding area. The HRA is currently reviewing the concepts and will determine in October whether further evaluation of conceptual flood risk reductions is desired for this site.

This month, Barr began preparing a memorandum summarizing stakeholder coordination and possible opportunities for flood risk reduction projects near Ames Lake. Following discussions with the Saint Paul Housing and Redevelopment Authority (HRA) in October, two parcels were identified near Ames Lake as potential locations for regional flood risk reduction best management practices (BMPs). The memorandum will summarize stakeholder coordination, opportunities for flood risk reduction projects near Ames Lake, and recommendations for next steps to be completed in 2023. Barr anticipates sharing a draft memorandum with the RWMWD staff in November. Following review, we will revise the memorandum and provide an updated version to the RWMWD managers.

G. Owasso Basin area/North Star Estates improvements (Barr project manager: Sam Redinger; RWMWD project manager: Tina Carstens)

The purpose of this study is to evaluate the benefit-cost of flood risk reduction strategies in the Owasso Basin/North Star Estates area by reviewing potential pipe and berm alignments, land acquisition costs, utility conflicts, permitting issues, and related design as well as construction and long-term maintenance costs associated with each alternative that achieves the project objective of removing habitable structures from the floodplain in this area. Stakeholder outreach with the City of Little Canada is an important part of this effort. This study is a continuation of the Owasso Basin bypass study, which laid out several phases of implementation and areas of further study.

A technical memorandum has been drafted to summarize the flood risk reduction alternatives evaluated in and around North Star Estates and Owasso Basin. The document is in the final stages of review, and cost estimates are being developed. Barr will share the technical memorandum first with the RWMWD staff for review and comment, followed by the City of Little Canada, and then distribute to the RWMWD board.

H. Double Driveway Pond optimization study (Barr project manager: Tyler Olsen; RWMWD project manager: Tina Carstens)

The purpose of this study is to evaluate the benefit-cost of water quality improvements in Double Driveway Pond in the Fish Creek subwatershed. These improvements will be targeted at sediment reduction strategies that will benefit downstream Fish Creek, which is considered impaired by excess sediment. An important part of this study is tying strategies to the findings of a current Department of Agriculture study (currently under review) that is assessing the water quality of runoff from upstream areas.

This month, Barr continued to coordinate with the MDA design team on potential improvements to Double Driveway Pond. The MDA team is planning to collect sediment cores in the coming months to categorize the pond sediment for disposal requirements. The team will also conduct a bathymetric survey of the pond to determine existing conditions for the sediment accumulation. Barr will work with the design team to determine any additional sediment removal that may be above and beyond the MDA's requirements.

Additionally, Barr's team began planning for an erosion inventory of the tributary stream upstream of Double Driveway Pond. This inventory will identify areas of significant erosion that are causing high sediment loads to the pond. Next steps include coordinating with property owners along the tributary. The inventory will likely occur in late November or early December.

I. Carver Ponds improvements study (Barr project manager: Tyler Olsen; RWMWD project manager: Tina Carstens)

The purpose of this study is to characterize the water quality in the Carver Ponds in the Fish Creek subwatershed and to evaluate the benefit-cost of water quality improvements to the ponds. These improvements will be targeted at internal loading of nutrients in the pond, as well as potential external sediment and nutrient loading. The goal will be to inform design solutions to be implemented in the ponds.

This period, Barr provided recommendations to the RWMWD staff for monitoring activity in 2023 for the Carver Avenue ponds. Discussions will continue this month to decide the most appropriate actions.

J. Evaluation of compliance with South Metro Mississippi River total suspended solids (TSS) total maximum daily load (TMDL) (Barr project manager: Tyler Olsen; RWMWD project managers: Eric Korte, Nicole Soderholm)

The purpose of this study is to evaluate the RWMWD's compliance with the South Metro Mississippi River TSS TMDL. As a regulated municipal separate storm sewer system (MS4), the district is required to meet the waste load allocations (WLA) of 154 pounds of TSS per acre per year. The WLA is applicable to the RWMWD for the Saint Paul Beltline Interceptor and its contributing drainage area, as the district owns and operates the infrastructure.

This period, Barr and the RWMWD met with the Metropolitan Council to discuss transfer of the monitoring station to the RWMWD, as well as the data provided in September. After this meeting, the Metropolitan Council provided additional data for use in verification of the Beltline monitoring station rating curve. Moving forward, this data will be documented in the RWMWD's management of the monitoring site. Calculation of TSS loading from the Beltline subwatershed is ongoing for the required 2023 reporting for the South Metro Mississippi River TSS TMDL.

Monitoring water quality and special projects

K. Annual water quality report assistance (Barr project manager: Keith Pilgrim; RWMWD project manager: Eric Korte)

The purpose is to update and report on lake and stream water quality, monitoring of selected best management practices (BMPs), and other water quality improvement projects that highlight district efforts.

The 2021 Water Monitoring Annual report has been finalized and has been posted to the RWMWD website. It is accessible using this link.

Research projects

L. Kohlman permeable weir test system (Barr project manager: Keith Pilgrim; RWMWD project manager: Bill Bartodziej)

The objective of this current investigation is to design a full-scale permeable weir treatment system for installation in the Kohlman Basin.

Barr and the RWMWD are proceeding with broader implementation of the permeable weir pilot project as part of the CIP maintenance and repairs project for 2023. During this period, we submitted a MnDNR Permitting and Reporting System (MPARS~~s~~) application as part of the wetland permitting process. We continue to engage the Minnesota Department of Natural Resources to expedite the process. We have also engaged the U.S. Army Corps of Engineers to determine applicable permitting needs. A draft full-scale design of the permeable barrier has been developed and is submitted as part of the board packet in the CIP maintenance and repairs 2023 draft plans and specification table of contents.

M. Shallow lake aeration study (Barr project manager: Keith Pilgrim; RWMWD project manager: Bill Bartodziej)

The purpose of this study is to evaluate the potential effectiveness of aeration in shallow lakes by studying the effect of aeration in three smaller shallow systems (Markham Pond, Bennett Lake, and

Gervais Mill Pond) in detail during 2021 and 2022. This approach is being pursued as an alternative to whole-lake alum treatments.

Markham Pond, Bennett Lake, and Gervais Mill Pond are serving as the study sites. The aerator in Markham Pond operated all winter and will continue to do so through the fall. The City of Roseville installed a limited aeration system in the east bay of Bennett Lake, and Gervais Mill Pond will have an aerator installed in the north bay in 2022 when equipment is available (currently backordered). Dissolved oxygen meters have been installed, and monitoring is underway. As a reminder, this experimental design will provide comparison of:

- Internal loading in Markham Pond without (2021) and with (2022) aeration
- Internal loading in Gervais Mill Pond for a bay with aeration to a bay without aeration (2022)
- Internal loading in the west bay of Bennett Lake (no aeration) to the east bay of Bennett Lake (with aeration) in 2022

Field activities for this project are now complete, and data are currently being analyzed.

Capital improvements

N. Target store stormwater retrofit projects (Barr project manager: Katie Turpin-Nagel; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to design, provide bid assistance for, and oversee construction of BMP retrofits at two Target retail stores.

The one-year plant warranty expired in June at the East Saint Paul Target site. Some plants were replaced in July, and Barr coordinated with the contractor to complete the outstanding replacements this fall to satisfy the warranty. Barr met the contractor onsite on September 21 to review the plant and tree health. The plants marked for replacement were replaced by the contractor on September 27. This project is now complete, and no further updates are anticipated.

At the Woodbury Target site, Barr developed request for proposal (RFP) letters to subcontract topographic, utility, and tree survey services. The RFP letter was sent to five survey firms. Proposals and quotes are due by the end of the day on October 21. The survey work will be awarded on October 26. Site survey is anticipated to occur in early to mid-November.

O. Targeted retrofit projects (Barr project manager: Marcy Bean; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to design, provide bid assistance for, and oversee construction of BMP retrofits on previously identified commercial, school, and faith-based properties throughout the district.

Construction at St. Pascal Baylon Catholic Church is nearly complete. Final details are being wrapped up, and plants and trees will be planted in spring 2023. During construction, several changes were necessary to comply with St. Paul zoning requirements, work within St. Paul's right-of-way, and other changes encountered during construction, including updating of some bid form quantities. Change Order No. 4 documents these changes in detail and is included in the packet for review.

Design for Roosevelt Homes (owned by the Saint Paul Public Housing Authority) is awaiting a detailed site survey, anticipated in November 2022. Barr and the RWMWD are coordinating with the City of Saint Paul to help inform improvements.

P. Stewardship grant program – street sweeping (Barr project manager: Marcy Bean and Michael McKinney; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to is to a) provide BMP design and review services to cost-share applicants throughout the RWMWD on as-needed basis and b) support development of the stewardship grant program.

Barr coordinated with the RWMWD to review a request for grant support for street sweeping from the City of Woodbury. Utilizing the developed street sweeping model, we performed a cost-benefit analysis and provided recommendations to the RWMWD. In addition to the Woodbury analysis, Barr developed prioritization strategies and a district-wide street sweeping recommendation, which have been shared with the RWMWD. The RWMWD's recommendations and comments are being incorporated into the final street sweeping model and prioritization analysis.

Q. Lake Emily subwatershed regional BMP (Barr project manager: Leslie DellAngelo; RWMWD project manager: Paige Ahlborg

The purpose of this project is to complete final design, plans, and specifications for a regional stormwater BMP in the Lake Emily subwatershed with the purpose of decreasing phosphorus loads to Lake Emily, which is deemed to be at risk of impairment from excess nutrients.

This period, Barr updated conceptual designs for both the Arbogast Street and the Vivian Avenue/Cobb Street sites to a 30-percent design level using additional survey information collected in the field, additional hydrologic and hydraulic modeling, and water quality modeling. Additionally, Barr began updating the engineer's opinion of probable cost and cost-benefit for each project. We will prepare the updated 30-percent engineer's opinion of probable cost for both projects for the December meeting. Some additional background on the designs are presented in more detail below.

Arbogast Street filtration BMP:

In 2016, Barr developed a conceptual design for an underground filtration system in City right-of-way under a paved biking/walking path perpendicular to Arbogast Street. The goal of the underground filtration system is to divert low flows from the storm sewer along Arbogast Street (which conveys outflow from Lake Judy, as well as stormwater runoff from the residential drainage area to the northwest) to a subsurface treatment system for total phosphorus removal before discharging back to the storm sewer and ultimately into Lake Emily.

This year's 30% design configuration of the filter is similar to what was proposed in 2016, with updated elevations based on Barr's 2022 survey. To complete the 30% design, Barr plans to add a forebay and passive form of flow aeration to provide pretreatment to flows prior to being filtered, as well as complete the preliminary structural design calculations for the concrete vault. Previously, Barr proposed to use spent lime as a filtration media in the system. However, after discussions with Barr staff and review of new monitoring results of other spent lime media systems, the design team decided to change the media in the 30% design to iron-enhanced sand.

In October, Barr hired a geotechnical investigation firm to conduct soil borings at the Arbogast Street site and Barr oversaw the drilling. The cost estimate of the underground filtration vault at the Arbogast Street site is dependent on further structural design, which requires the results of the geotechnical investigation. Therefore, the engineer's opinion of probable cost and cost-benefit for each project will not be presented until the December meeting.

Vivian Avenue/Cobb Street basin BMP:

In 2016, Barr developed a conceptual design for a bioretention basin located on a city-owned parcel along Vivian Avenue, south of Lake Judy. The goal of the proposed basin would be to divert flows from storm sewer along Vivian Avenue and treat the flow before it enters Lake Judy. The conceptual design utilized infiltration for treatment of the diverted runoff.

This year, Barr conducted a site survey of the BMP location, including collection of topography and storm sewer information. Upon reviewing the survey information, and reviewing the normal water level of Lake Judy, it was apparent that the proposed site would not support an infiltration feature due to the shallow water table (i.e. the Lake Judy normal water level is approximately 944 ft NAVD88, and the bottom of the proposed basin is approximately 945.7 ft NAVD88). Barr considered a filtration option for the site using CC17 (crushed limestone), but did not find it to be particularly cost-effective, especially given that the site drains to the Lake Judy wetland before reaching Lake Emily.

The site does, however, appear to be a good candidate for a wetland restoration project. This is one of the areas that Barr wetland scientists have identified as having potential for a wetland restoration. Barr staff see an opportunity at this site to improve the City's parcel that will have water quality and habitat enhancement benefits.

CIP project repair and maintenance

R. Beltline five-year inspection (Barr project manager: Sam Redinger, RWMWD project manager: Dave Vlasin)

The purpose of this project is to maintain the existing Beltline and Battle Creek tunnel systems and infrastructure owned and operated by the RWMWD.

Over the next few periods, Barr will evaluate findings to develop the inspection report. The report will likely be complete in early 2023.

S. District inspection standardization (Barr project manager: Tyler Olsen; RWMWD project manager: Tina Carstens)

The purpose of this project is to standardize the district's creek and facilities inspection process, evaluation, and related data collection effort. Work includes review of current methods, development of a scoring system, and implementation of mobile data collection.

This period, Barr presented a comprehensive review of the tool and its high-level results at the October board meeting. Per the managers' request at that meeting, a summary memorandum including single page information sheets are included in this month's packet for each 2023 CIP project.

T. 2023 CIP maintenance and repair project (Barr project manager: Gareth Becker; RWMWD project manager: Dave Vlasin)

The purpose of this project is to maintain existing systems and infrastructure owned and operated by the RWMWD and to assist and facilitate stormwater pond cleanouts to allow other public entities to meet their MS4 requirements.

Recent work was in preparation for the annual CIP maintenance and repair project. The 2023 draft plans and specifications outline are included for the managers' consideration at the November 2 board

meeting. An estimate of probable costs will be presented at the meeting. The board should consider a motion to "accept the draft plans and specifications, estimate of probable costs, and approximate schedule for the CIP maintenance and repairs 2023 project and direct staff to prepare the bidding documents and advertise the project for bidding." If approved by the board, we expect bids to be received prior to the December board meeting for consideration of contractor selection at that meeting.

U. Natural Resources Update – Bill Bartodziej and Matt Doneux

Gervais Mill Pond Aeration

Water Quality Monitoring

As part of the District's water quality monitoring program, select shallow lakes and ponds were sampled in winter (February 15-16, 2022). The primary objective was to assess the dissolved oxygen (D.O) levels in these waterbodies. Gamefish species like largemouth bass and bluegill sunfish require at least 4 mg/L of dissolved oxygen to sustain populations over the winter. Rough fish species like the common carp can survive at lower oxygen levels. Below are data from the sampling event where D.O. and total phosphorus (TP) were measured:

	Markham	Casey	Bennett	Frog	Victoria	Gervais Mill
D.O. (*ug*/L)	9.0	4.9	0.2	0.1	0.2	0.3
TP (*ug*/L)	37	190	230	740	1700	730

Markham Pond and Casey Lake are aerated in the winter to sustain gamefish, especially bluegill sunfish and largemouth bass. These systems were once carp nursery areas that were restored in cooperation with DNR Fisheries. They now provide neighborhood fishing opportunities and have been free of carp for over 5 years. The native bluegill sunfish efficiently eat carp eggs and provide an effective means to limit carp re-introductions. We found that D.O. concentrations were over 4 mg/L, which is suitable for gamefish.

In Gervais Mill Pond, the D.O. level was at 0.3 *u*g/L. Extremely low D.O. levels were also evident in Frog Pond, the Victoria Wetland Complex, and Bennett (an aeration system was installed in Bennett over the summer). These levels were quite concerning and signaled the possibility of winter fish kills.

Fish surveys

During ice-out, NR staff monitored these systems for fish kill. In early April, it was evident that fish had a tough time making it through the winter in Gervais Mill Pond. We observed hundreds of dead juvenile carp (4" to 10") floating on the water surface near the creek inlet on the southwest side of the southern pond lobe. This observation confirmed that Gervais Mill Pond was a carp nursery area.

Hundreds of dead juvenile carp on Gervais Mill Pond.

Public Concern

We fielded several calls regarding the fish kills in Gervais Mill Pond. We worked with Lauren, our Communications Specialist, to get the word out on why fish in certain waters did not make it through the winter. Here is the message that we provided:

Watershed Newsletter and Nextdoor:

Winter fish kills, sometimes termed Winterkills, are a common, if visually unsettling, occurrence in areas where winters are long. They are typically caused by depleted oxygen in the water. A buildup of snow over the ice on shallow lakes and ponds limits the ability of aquatic plants to produce more oxygen via photosynthesis. The available oxygen in the water is slowly depleted until some fish die due to the low oxygen levels. Species like bluegill and largemouth bass are more susceptible to dying of these low oxygen levels, as are fish in poor condition. The fish die over the winter and are only visible as the ice melts and they float to the surface.

Winter fish kills are a natural phenomenon and do not typically pose a threat to the fish population. There are often enough fish in the lake to repopulate to previous numbers. RWMWD monitors the dissolved oxygen of lakes over the winter to anticipate fish kills, but the most surefire way to determine a fish kill has occurred over the winter is after the ice has melted.

Although fish kills are mostly natural incidents, they can also have human causes like chemical runoff. If you observe signs of a fish kill in your local lake or pond, please contact the MN DNR with as many details as you can provide regarding location, time and date, and types and sizes of fish affected.

More information on fish kills is available on the DNR website

Aeration in Gervais Mill Pond

Water quality and fish date were shared with the City of Little Canada and we discussed the possibility of partnering on the installation of an aeration system. After several discussions, it was decided that the Watershed would initially cover the cost of the aeration system, and the City would contribute funding next year. A line item will be added to their 2023 budget. The Watershed will be in charge of the system operation. NR also contacted DNR Fisheries, shared data, and explained the series of events. The regional fisheries manager was happy to partner on the project, and his staff stocked Gervais Mill Pond with adult bluegill sunfish this spring. Here is a summary of the benefits of an aeration system and fish stocking in the pond system:

- Eliminates or reduces winter fish kills and promotes native fish communities
- Sustains bluegill sunfish which controls carp recruitment
- Sustains a neighborhood fishery. There are two fishing docks on Gervais Mill Pond.
- Aeration may reduce phosphorus loading from the lake bottom sediments. Although data is limited, phosphorus concentrations from Casey and Markham, two systems that are aerated, were generally lower than concentrations found in systems with depleted oxygen levels.
- This system will continue to be sampled in order to learn more on the relationship between aeration and lake-bottom sediment chemistry. These data then can be used to better evaluate this tool in water quality management.

Below are a few photos of the NR team installing the aeration system:

Two compressor pumps generate air flow.

Intern Joe is assembling a diffuser head.

Two splitter boxes were installed on the pond shore. Four hose lines exit each box and run air to the diffusers.

The bubble circles are from individual diffusers. The installation went smoothly, and the system is ready for operation this winter.

V. Public Involvement and Education Program – Sage Passi

An October Whirlwind! Hold Onto Your Hat As Our Pace Picks Up!

Left: Dramatizing native plant root lengths helps Lionsgate Academy students understand how they help infiltrate run-off. Right: Master Gardeners put the finishing touches on the planting at the Boys and Girls Club.

L'Etoile du Nord 4th Graders Prepare For Action at Boys and Girls Club

On September 21, before their own planting day, Nick Gasho's students study the plants they will be installing at the Boys and Girls Club in St. Paul.

Lionsgate Academy and L'Etoile du Nord Students Complete Planting Projects

Left: A Lionsgate Academy high school student fills in plants in the pollinator border around their alternative turf playing area next to the rain garden on their campus. Four Lionsgate science classes taught by Brian Johnston planted hundreds of native plants, learned about their water quality benefits and researched individual plants before they helped fill In this large area. Middle: Water Steward Phyllis Webster transplants a little bluestem at Lionsgate Academy. Right: Chalk art by a L'Etoile student next to the Boys and Girls Club garden in East St. Paul.

As school started this fall, we asked Nick Gasho's fourth grade students to assist us with finishing the planting at the Boys and Girls Club on the hillside next to their building. We knew his class could help us get the job done because of Nick's long term commitment to service learning, our successful history of collaboration with this school over many years and the class' previous exposure to native plantings as third graders in Henriette Bissoy's science classes.

After a series of activities the week before, we met up with Nick's fourth grade class on September 27 at the garden site to do a round robin of several activities. Included were a hillside planting, a supplemental planting in the main garden, and an introduction to the benefits of the pervious pavers in the Boys and Girls Club parking lot with the assistance of Paige Ahlborg through a hands-on experiment comparing run-off volume from imperious versus impervious surfaces. Paige also explained why the Watershed District chose to do this project. We also invited Dana Boyle, a Master Naturalist to lead an art activity. Dana is a member of the St. Paul Garden Club who provided funds for this planting project. She invited students to do chalk drawings on the sidewalks to illustrate their awareness of the role of pollinators in the garden and the plants chosen to include in the garden. Three Ramsey County Master Gardeners and a Master Naturalist provided planting assistance for the students. Bette Danielsen and Stuart Knappmiller, two Water Stewards also helped with set-up and planting.

First Sculpture Installed in Memorial Garden at the Boys and Girls Club

Above : The first of two sculptures was installed at the East Side Boys and Girls Club on October in the memorial native garden located in East St. Paul. The second sculpture will be installed in the garden area in the spring. The vision for these sculptures and garden was inspired by Koreena Moua, the director of the Club (right). The sculptures were designed and constructed with the guidance and expertise of artist/teacher, Aloun Phoulavan (above right) who supported the youth artists involved with this large scale Boys and Girls Club memorial garden/public art project.

Achieve Language Academy Explores Issue of Plastics/Micro-Plastics in Lakes

RWMWD has begun a new relationship with a school we previously worked with back in 2002. A middle school science teacher at this school, Emily Vondriska, reached out to us this fall, seeking assistance in engaging her students in studying macro and micro plastics in Beaver Lake. Years ago, Achieve Language Academy's footprint in East St. Paul required a permit project to address the run-off issues from its campus in order to protect Beaver Lake that sits just below this school. We began teaching the students the principles of rain gardens and how they protect waters downstream as these projects went into the ground. The students grew native seedlings to supplement the plants that were being used in two of their newly constructed infiltration basin//storm water BMPs. Then the teacher we had worked with left, interrupting our collaboration. Eventually we made these gardens into educational stops for L'Etoile du Nord students who would stop by them to study the run-off issues in Beaver Lake.

We have now begun re-engaging with a team of middle school science students from this school who will be doing some investigative research and experiments related to plastic pollution in Beaver Lake using some techniques/technology their teacher learned about through her summer lab experiences off the shore of Florida. More to come on this project!

Battle Creek Middle School Classes Join the No Child Left Inside Project

Five ESL and standard eighth grade science classes taught by Josie Grote at Battle Creek Middle School in St. Paul (107 students) had the opportunity to learn how to use binoculars after watching a slide show and doing a practice session at their school led by Tracy, Cathy and Sage in mid-October. The classes then practiced bird-watching across the street from their school along Battle Creek and in their school's adjacent open space. This learning experience was made possible through our DNR No Child Left Inside grant. Our teaching team will return later with these students to offer further hands on education about the history of the creek, investigate the water quality in Battle Creek in the spring and explore bird life along the creek.

Harmony Adult ESL Classes Monitor Water Quality at Maplewood Nature Center

Thank you to Randee Edmundson for inviting our Education Team (Sage, Tracy and Cathy) to help support two Harmony advanced science classes (48 Adult ESL students) on October 4 in a hands-on water quality monitoring experience on the boardwalk at Maplewood Nature Center. We are planning a similar hands-on lesson about drinking water/ground water.

W. Communications and Outreach Program Report – Lauren Hazenson

Content Creation

Recognition Dinner

This month the invitations and the registration form were created, and the Watershed Excellence Award videos are being filmed and edited. The staff team finalized the speakers, and the program script is being drafted. In short, the event planning and content creation is running on schedule.

Education Program

This month Lauren filmed and photographed the Education team working with ESL classes from Harmony Adult Learning Center. Posts about the visit were published on Twitter and Instagram. The Water Steward recruitment social media campaign was also completed with a reach of 528 viewers and 205 video plays.

Water Quality and Natural Resources

These departments have requested a survey to measure how a shallow lakes ecology video impacts the average District audience. This survey will also help us better understand how residents and other District audiences view water quality. This information will assist us in determining if there are opportunities to better reach adult audiences with water quality information.

E-newsletter

Audience: 1,574

Social Media (Facebook, Twitter, Instagram)

Numbers as of 10/25:

Facebook

Reach: 1,207
Engagement (likes, shares, comments): 196
Audience: 1,324

Instagram

Reach: 194
Engagement: 165
Audience: 712

Twitter

Reach: 368
Engagement: 9
Audience: 1,026

Resident Communications/Professional Development/ Public Meetings, Misc.

- October Watershed Partners Meeting (10/12)
- Water Resources Conference (10/22, 10/23)
- Minnesota Association of Government Communicators Conference (10/26)

X. Citizen Advisory Committee Report – Carrie Magnuson

The Citizen Advisory Committee met on October 25th 2022 at 6:30 pm via Zoom

In attendance were 11 CAC members, 4 staff members, and 1 board member. The following initiatives were discussed and further developed

1. **RWMWD Permit Program Overview** – The CAC expressed interest in understanding the roles and responsibilities of the watershed Permit Program. Nicole Soderholm (Permit Coordinator) and Mary Fitzgerald (District Inspector) presented. They discussed the process that permitted projects must go through, as well as their roles, and what state and watershed rules and laws dictate these responsibilities. There were a lot of great questions answered by Mary and Nicole.

2. **CAC Meeting format moving forward** – The group discussed how and when to move the CAC meetings back to in-person. A poll was done and a majority of the members wanted to move to in-person when District policy allowed it. The general consensus was to do a hybrid format like the Board meetings to include those who are not comfortable being in-person (or who are traveling or not wanting to brave inclement weather).

3. **Project, Activity & Event Updates:**
    - **a.** Recognition Dinner planning updates and call for volunteers
    - **b.** Owasso Community Planting event recap (August 2022)
    - **c.** Review of the website update (launched in July 2022)
    - **d.** Rain garden maintenance projects
        - i. Owasso/Casey – Members Karen Wold and Gary N. volunteered time to help maintain rain gardens for homeowners who expressed a need for assistance.
        - ii. Little Canada, Rondeau Park – several members volunteered time last month to clear thick, undesirable brush and invasive plants.

4. **Work Plan -** Each year, the CAC uses their time and expertise to assist several projects that help advance RWMWD projects and programs. Below are the 2022 priorities.
    - a. Education Topics: Invite RWMWD staff or applicable professionals in to share knowledge
    - b. Salt Use Outreach/Education: [in progress]
    - c. Create Invasive Species Education Pieces
    - d. Participate/Support the Carp Fishing Contest – [working to reimagine the event]
    - e. Phalen Water Trail Video Series assistance – [ongoing assistance to Lauren as needed]
    - f. CAC Rain Garden Clean Up Project: [ongoing]
    - g. CAC/LEAP Team Planting [completed July 6th, 2022]
    - h. Buckthorn Removal [incomplete: will carry over to 2023]
    - i. Paddle the Phalen Water Trail as a group [incomplete: will carry over to 2023]
    - j. Develop the idea for an East Side Wetland Stewardship Relationship
    - k. Assist in planning and hosting WaterFest [completed]
    - l. LEAP Program nominations and subcommittee [completed]
    - m. Watershed Excellence Awards & Volunteer Recognition Dinner planning [in progress]

More details on these discussions will be available on the CAC website when meeting minutes are approved. Future meetings: 12/13/22

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Board Action Log

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RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

Board of Managers Action Log

Wednesday, November 2, 2022

Date Added	Item	Anticipated Action Date	Means of Action	Completed
July 2022	PFAS (Per- and polyfluoroalyl substances) in MN and RWMWD's role.	Fall/Winter 2022	Presentation – invite MPCA representative	
July 2022	Miyawaki Mini-Forest Assessment	Fall 2022	Barr new technology report	Oct 2022 PSR
July 2022	Alum use for internal load control along with information on alternative solutions.	Fall/Winter 2022	Memo/Presentation	Nov 2022

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