

## VLAWMO TECHNICAL COMMISSION MEETING

7:30 AM February 12<sup>th</sup>, 2021

Meeting will be held by Zoom teleconference. Meeting link:

<https://us02web.zoom.us/j/82609413241?pwd=Qy9rcURGb2VPdjB4UkV3VDVyWHA2UT09>

Meeting ID: 826 0941 3241

Passcode: 874971

Dial by location: +1 312-626-6799 US (Chicago)

### Action items: ✎

- I. Call to Order – 7:30am –Chair Gloria Tessier
- II. Approval of Agenda
- III. Approval of Minutes (January 8<sup>th</sup>, 2021)
- IV. Administration & Operations
  - A. Financial Report for February & authorization for Payment – Phil ✎
  - B. February TEC Report to the Board – Phil ✎
  - C. Update Engineering Services- Phil
  - D. WCA - Island Field Replacement Plan – Brian ✎
- V. Programs
  - A. Education & Outreach – Nick
    - 1. Previews: 2020 lake data and upcoming events
    - 2. Annual Reporting update
  - B. Cost Share Program – Tyler
    - 1. 2020 Landscape Level 1 Grant Extensions ✎
    - 2. Soil Health Grant Application: Smith SHG 2021-1 ✎
- VI. Projects
  - A. Lambert Lake update - Dawn
  - B. Phragmites checks – Dawn
  - C. 319 update, Nine Key Element (NKE) Document – Dawn ✎
  - D. Community-Engaged Learning Spring Semester – Dawn
  - E. Pleasant Lake planning for 2021 – Dawn
  - F. Swan Update at Sucker Channel – Dawn
  - G. Update on East Goose ALM – Phil
  - H. 2021-2023 BWSR Watershed Based Implementation Funding Grant (WBIF) – Tyler
- VII. Commissioner Reports
- VIII. NOHOA
- IX. Ramsey Soil & Water Conservation Division
- X. St. Paul Regional Water Services
- XI. Public Comment
- XII. Next Meetings: TEC: March 12<sup>th</sup>, Regular Board Meeting: February 24<sup>th</sup>, 2021
- XIII. Adjourn

**Upcoming Events:** [vlawmo.org/events](http://vlawmo.org/events)

Cost-share open-house: February 23<sup>rd</sup>

WAV meeting: March 17<sup>th</sup>

AIS Detectors Training: March 30<sup>th</sup>

GreenSteps Cities webinars:

<https://www.eventbrite.com/o/minnesota-greenstep-cities-and-tribal-nations-18017175524>



The Vadnais Lake Area Water Management Organization  
800 County Road E East, Vadnais Heights, 55127 651-204-6070  
Website: [www.vlawmo.org](http://www.vlawmo.org); Email: [office@vlawmo.org](mailto:office@vlawmo.org)

Vadnais Lake Area Water Management Organization  
Technical Commission Minutes  
January 8, 2021

Zoom Teleconference Open Meeting:

<https://us02web.zoom.us/j/83828772829?pwd=RzhmTEFRSGdkYnh6ZHd4cW9vNDc3Zz09>

Join by phone: +1-312-626-6799; meeting ID: 838 2877 2829; password: 234257

**Commission Members Present:**

Gloria Tessier	Chair, Gem Lake (GL)
Jesse Farrell	Vice Chair, Vadnais Heights (VH)
Bob Larson	Treasurer, North Oaks (NO)
Paul Duxbury	White Bear Township (WBT)
Andy Nelson	Lino Lakes (LL)
Terry Huntrods	White Bear Lake (WBL)

**Commission Members Absent:** none.

**Others in attendance:** Phil Belfiori, Brian Corcoran, Dawn Tanner, Nick Voss, Tyler Thompson (VLAWMO); Tom Watson, Diane Gorder, Kara Ries (North Oaks), Ed Shapland (VLAWMO MWS); Justine Roe (SPRWS); Justin Townsend (RCSWCD); Connie Tailon (City of White Bear Lake)

- I. **Call to Order** Chair Tessier called the meeting to order at 7:31 am. A roll call was made for attending Commissioners of the electronic meeting: Farrell: present Larson: present Duxbury: present Huntrods: present Nelson: present Tessier: present.
- II. **Approval of Agenda**  
The agenda for the January 8, 2021 Technical Commission Meeting was presented for approval. It was moved by Farrell and seconded by Huntrods to approve the January 8, 2021 TEC agenda, as presented. Vote: Tessier: aye Larson: aye Duxbury: aye Nelson: aye Huntrods: aye. Motion passed.
- III. **Approval of Minutes**  
It was moved by Larson and seconded by Farrell to approve the December 11, 2020 meeting minutes, as presented. Vote: Tessier: aye Farrell: aye Larson: aye Duxbury: aye Nelson: aye. Motion passed.
- IV. **Administration & Operations**
  - A. **Election of 2021 TEC Officers**  
Belfiori announced the 2020 officers and opened the group up for 2021 TEC nominations. Farrell nominated Tessier for Chair, Tessier nominated Farrell for 2021 Vice Chair, Duxbury nominated Larson as 2021 Treasurer. Larson noted that he would appreciate being more involved with the finances. Belfiori noted that he will schedule a meeting with the TEC Treasurer before the TEC meeting to review the financial report and review the bills included in the TEC packet. Farrell nominated Duxbury as VLAWMO Board Liaison.  
  
2021 TEC Chair nomination: It was moved by Farrell to nominate Tessier as 2021 TEC Chair. Vote: Tessier: aye Farrell: aye Larson: aye Duxbury: aye Nelson: aye. Motion passed.  
  
2021 TEC Vice Chair nomination: It was moved by Tessier to nominate Farrell as 2021 TEC Vice Chair. Vote: Tessier: aye Farrell: aye Larson: aye Duxbury: aye Nelson: aye. Motion passed.  
  
2021 TEC Treasurer nomination: It was moved by Duxbury to nominate Larson as 2021 TEC Treasurer. Vote: Tessier: aye Farrell: aye Larson: aye Duxbury: aye Nelson: aye. Motion passed.

2021 TEC to Board Liaison nomination: It was moved by Farrell to nominate Duxbury as 2021 TEC Liaison to the Board. Vote: Tessier: aye Farrell: aye Larson: aye Duxbury: aye Nelson: aye. Motion passed.

**B. Financial Report for January & Authorization for Payment**

Belfiori presented the January 2021 Financial Report for review and authorization of payments. He noted that most of the bills were administrative, but project costs for Lambert Lake will be ramping up soon. Staff is recommending approval of the January Finance Report and authorization for payment.

It was moved by Huntrods and seconded by Larson to approve the January Treasurer's Report and authorization of payments. Vote: Tessier: aye Farrell: aye Larson: aye Duxbury: aye Nelson: aye. Motion passed.

**V. Programs**

**A. Education & Outreach**

**1. Community Blue update: Upstream/WB Center for the Arts**

Voss reviewed the 2020 Community Blue grants and updates, moving into 2021. The WBCA project has been postponed until 2021 with modification made to adapt to COVID-19 conditions. An updated budget and objectives will be submitted in spring 2021.

**2. Newsletter naming: options and voting**

Voss proposed naming the VLAWMO newsletter, and opened up polling during the TEC. 7 names were proposed for the newsletter, and the VLAWMO Chronicle was polled for the winning name. Voss will implement the new brand name on the newsletter.

**3. Educate the group: Raingarden studies summary**

Voss shared links and a summary of several studies on rain garden effectiveness and longevity, and provided interesting insight into similar projects that are employed within VLAWMO. The studies emphasized the importance of maintenance to keep BMPs functioning, as designed.

**B. Cost Share Program – 2020 Cost Share Program results and 2021 update**

Thompson gave a 2020 summary of the VLAWMO Cost Share Program. Farrell asked about expanding project funding to Gem Lake and Lino Lakes, and a way of reserving a percentage of annual funding for grants that may come in. Duxbury noted that the 2020 summary was helpful and asked if there was somewhere on the website to post this.

**VI. Projects**

**A. Lambert Lake update and invasive Phragmites ID'd**

Tanner updated on the LL project, including area landowner structure surveys, 2 of which took advantage of this. On site, a small boat and free-standing deer stand were moved out of the construction area. Construction has yet to begin, but is anticipated to begin soon.

**B. Great River Greening update**

Tanner noted that additional funds for ENRTF will be voted on by the legislature this year, so additional funding may be coming.

**C. Completed Vegetation Surveys for 2020 (linked)**

The RCSWCD has completed and submitted reports for shoreline vegetation surveys on East Vadnais and Sucker Lakes. The reports can be found on VLAWMO's website.

**D. 319 update**

VLAWMO staff continues to work with the MPCA on 319 grant materials for possible project funding within the Wilkinson, Tamarack and Birch subwatersheds.

**E. Pleasant Lake planning for 2021**

Tanner touched on the various efforts for Pleasant Lake, including curly leaf PW removal in the west bay, along with planning for working with WSB for carp removal proposal for 2021.

**F. Otter Spotter project live and StoryMap share**

Tanner has completed project reporting and has submitted it to the MnDNR and the MN Zoo, as a funding partner. The Otter project StoryMap is now complete and can be viewed online. Otter monitoring will be on-going at the Lambert Lake site.

**VII. Commissioner Reports:**

Farrell gave some insight into snowplowing difficulties and efforts with past storms, and connection with the use of chlorides and keeping a balance of safety and implementing best practices for our water resources. Voss noted that he's coordinating with RCWD & RWMWD smart salting MS4 communication and assistance.

**VIII. NOHOA**

Gorder asked Voss & Tanner if a picture post on the west bay that could document curly leaf pondweed treatment progress.

**IX. Ramsey Soil & Water Conservation Division (RCSWCD) Report**

Townsend gave a few updates: no starry stonewort found in Deep Lake, but will continue to monitor. Ramsey County has been working on a water reuse analysis for the County. 10 priority sites will be identified and implementation will be pursued.

**X. St. Paul Regional Water Service (SPRWS) Report**

Roe noted that Steve Schneider, General Manager is retiring and the position is posted.

**XI. Public Comment**

Tom Watson introduced himself for the TEC, and offered his help in connecting VLAWMO staff to his contacts.

**XII. Next Meetings**

TEC: February 12<sup>th</sup>, 2021; Board: February 24<sup>th</sup>, 2021

**XII. Adjourn**

It was moved by Farrell and seconded by Larson to adjourn at 8:52 am. Vote: Tessier: aye Farrell: aye Larson: aye Duxbury: aye Nelson: aye. Motion passed.

Minutes compiled and submitted by Tyler Thompson.

## **TEC Staff Memo – February 2021**

### **IV. Administration & Operations**

#### **A. Financial Report for February & authorization for Payment**

#### **B. February TEC Report to the Board**

#### **C. Update Engineering Services Proposals**

Pursuant to Minnesota Statute 103B.227, staff noticed and advertised a Request for Proposal (RFP) for general engineering services for 2021 and 2022. This program (general engineering) was started two years ago by the Board of Directors. The purpose of the program is to establish a dedicate fund to provide general technical and engineering services by a qualified engineering firm in circumstances when specific engineering expertise is needed. The advertisement for the RFP was placed in the LMC marketplace from January 6-13, in the White Bear Press on January 6 and 13, noticed at the offices and place on the VLAWMO web page. Closing date to receive proposes was January 22, 2021.

The RFP identified work that might include civil or water resource engineering, modeling, analysis, surveying or water resource science. Six proposals were received: Barr Engineering, Houston Engineering, S.E.H., Reliant Resilience, LimnoTech, Young Environmental. A staff team then reviewed and scored the proposal for the following experience factors: familiarity with VLAWMO, stormwater BMPs, feasibility studies, project design, grant knowledge and assistance, stormwater standards knowledge.

At the time of writing of this TEC staff memo, staff has schedule a Board Subcommittee meeting on Feb. 10 to discuss and provide a recommendation to the Full VLAWMO Board on the general engineering proposals on Feb. 10. Due to the timing of this previously scheduled Board subcommittee meeting, staff anticipates providing an additional update at the Feb. 12 TEC meeting. Note that the 2021 -22 RFP for Legal services is currently being noticed and out for solicitation and staff anticipates an update to TEC in coming months.

#### **D. WCA – Island Field Replacement Plan**

North Oaks Company is proposing a 21.94-acre multi-family residential development that will include two buildings of condominiums known as Island Field. The project will include a street and utilities. The site does not include any existing structures. Stormwater management practices will provide treatment of runoff before discharge to wetlands after development.

Island Field will require 0.1757 acre of permanent impact to one wetland. The need for a safe, efficient and functional site access street consistent with land use guidance and accepted engineering practices renders proposed wetland impacts unavoidable. The project has been designed to minimize wetland impacts to the extent practicable and includes construction practices to reduce or eliminate secondary wetland impacts. Permanent

wetland impacts will be replaced by withdrawing 0.3514 acre of wetland credit from the North Oaks Company wetland bank, Account #170. This wetland bank is owned by the Applicant and located within the same County, Major Watershed, and Bank Service Area as the wetland impact.

Some areas of buffer will be disturbed with project grading activities. A 5 year disturbed buffer plan has been submitted.

Staff recommends approval for Board consideration of the proposed impacts of 0.1757 acre of permanent wetland impact and replacement at 2:1 via wetland bank credits 0.3514 acres.

## V. Programs

### A. Education and Outreach:

#### 1. 2020 graphs preview:

Nick will preview several graphs that illustrate 2020 lake data, and will accompany the 2020 water monitoring report. These graphs and charts will also be part of the 2020 annual report.

Spring updates: Upcoming events for spring, 2020 include:

- Cost-share open house: Feb 23<sup>rd</sup>
- WAV planning meeting: March 17<sup>th</sup>
- AIS detectors training: March 30<sup>th</sup>

#### 2. 2020 Annual Report update

The 2020 Annual Report is underway. The document is pending on the 2020 audit for final financial information, and is scheduled to be approved at the February, 2021 VLAWMO BOD meeting. The 2020 water monitoring report and other staff reviews will also inform the final document. The template is continued from previous years' Annual Reports, and an additional 2020 water monitoring summary will accompany the full report.

### B. Cost Share Program

#### 1. 2020 Landscape Level 1 Grant Extensions

At the start of the 2021 grant year, 5 2020 Landscape Level 1 grant have yet to be completed. Two of those grants are nearing the expiration of their completion and closeout date. This is fairly common from year to year, and both grants LL1 2020-02 & LL1 2020-04 have not yet been completed due to timing, construction, and material constraints. Tyler is requesting that the TEC grants agreement extensions for project completion of both grants to September 30<sup>th</sup>, 2021. This should be ample time for both projects to be completed, closed out, and reimbursed. The other outlying 3 grants were approved late in 2020, and are expected to be completed before expiration of their agreement terms. **Staff is requesting the TEC extend the project completion and closeout deadlines for grants LL1 2020-02 & LL1 2020-04 to September 30<sup>th</sup>, 2021.**

**2. Soil Health Grant: Smith SHG 2021-1**

Staff has received its first Cost Share grant application for 2021 for a Soil Health Grant (attached in ePacket). The applicants received a prior Landscape Level 1 grant in 2019, which is closed and is in good standing. The Smiths' property is located within the Targeted Habitat Priority Zone (THPZ) and their application proposes turning their back lawn from turf into a bee/pollinator lawn, with sand & rock soil amendments, native seed mix from Mother Earth Gardens, and planting of 5 native Winterberry shrubs. The applicants will be performing the work themselves and have included rental costs for a sod cutter and skid steer from White Bear Rental. Their total estimated project is \$1,120, and they are requesting \$840 in Soil Health Grant funds (requests up to \$1,000 are allowable for Targeted Priority Zones. **Staff has reviewed and revised the Soil Health Grant application with the applicant, with clarifications, and is recommending approval of SHG 2021-1 in the amount of \$840.**

**VI. Projects**

**A. Lambert Lake Update**

Construction is underway. At the time of packet preparation, sheetpile replacement and meander construction have both been initiated. SEH is conducting site and progress monitoring. Initial vibration survey results show that sheetpile work is well within guidelines.

The biochar portion of the project remains behind schedule. UMN researchers have provided additional information from lab testing and pilot testing. Draft plans and specs have been provided to VLAWMO. SEH is working to provide missing data to complete plans and specs. VLAWMO staff will be holding a Board committee meeting to provide guidance on plans forward for this portion of the project. An MPCA meeting is also scheduled for the week of Feb. 1 to make sure possible plans are within the current grant contract.

Sheetpile replacement is underway at Lambert Pond.	The meander is looking really nice. Notice the sinuosity and erosion control blanket, protecting the new bends of what will be the new stream.
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### **B. Phragmites check and update**

At the January TEC meeting, VLAWMO staff described a new site on private property with suspected invasive Phragmites on the edge of the Lambert construction and restoration area. VLAWMO, RWSWCD, and UMN conducted site visits during January to visit that suspected site, other possible sites along Centerville Road, and 3 sites that had been reported by Barr as part of their Wilkinson feasibility study. Coordination was provided by North Oaks Company for the Wilkinson sites. The Centerville Road and Wilkinson sites were all native Phragmites. The County Road F site was confirmed to be invasive. So far, it has not spread into Lambert Lake. While onsite, we were able to meet with the landowner, pick up a signed landowner agreement for treatment, and RCSWCD has added this site to the list for treatment during 2021. The EDDMapS entry has also been updated so this site is visible in the database.

This photo shows the invasive Phragmites stand on the edge of Lambert Lake (wetland complex). Notice the “sea” of native Phragmites in the distance. Detecting this site at this time and working with the landowner to treat it is especially important because the invasive strain would otherwise likely expand into Lambert and be a much larger issue to treat in the future. We appreciate the involvement of local residents and their willingness to work with us on these kind of invasive-species issues.





### **C. 319 update**

VLAWMO has received approval from the MPCA on our Nine Key Element (NKE) Document, which is a required prerequisite needed to allow us to apply for funding during our priority small watershed round coming up during spring 2021. The NKE document is included in this month's packet. The NKE needs to be approved by the EPA prior to proposal submission. That approval process is now underway with MPCA and EPA. Barr Engineering, working closely with North Oaks Company, is continuing to develop a first batch of projects and a phasing plan for the first two rounds of the grant program.

Staff request support from the TEC to bring the NKE forward to the Board as part of the regular Feb. meeting and to continue to consider a suite of projects for the first-round, 319 priority small-watershed proposal at the April regular Board meeting.

### **D. Community-Engaged Learning Spring Semester**

Staff presented to the Ethics in Natural Resources course at the UMN on Jan. 26, 2021. So far, 6 students have signed up to work on restoration projects during spring semester. We will be focusing on City Hall and Vadnais-Sucker Park areas, continuing with buckthorn removal and breaking down brush piles. We may have some smaller planting projects, including continuing to transplant natives to supplement seeding efforts at 4<sup>th</sup> and Otter. We appreciate the time and efforts put in by the students to help advance these restoration projects.

### **E. Pleasant Lake planning for 2021**

As presented in January, VLAWMO staff have been working on plans for 3 carp-related projects on Pleasant Lake (and connected waterbodies) for 2021. These projects together constitute a comprehensive internal load reduction plan.

A proposal is now in from WSB to provide assistance to VLAWMO during 2021 and help facilitate carp removal this fall. That work includes:

- Coordinate with commercial fishers and work to prioritize harvest in Pleasant
- Coordinate with transport, holding if needed, and shipping to get fish to market
- Assist in implanting radio transmitters to make a harvest more efficient
- Provide vegetation control recommendations to increase success of a harvest

WSB has provided a proposal with itemized components for 2021. VLAWMO recommends allocating ~\$20,572 for carp removal with WSB (see quote included in the packet; this would include Tasks 1-6). This recommendation is contingent on the amount of partnership funding available. Note that depending upon the size of the haul, including Bigmouth buffalo, costs may be lower. VLAWMO also has \$3,884.60 remaining on the Carp Solutions, Inc. contract from 2021 to continue antenna monitoring between Deep and Wilkinson Lakes, as was done in 2020. SPRWS was able to allocate funds for work on Pleasant and has offered that those funds could be applied toward carp work. VLAWMO has requested support from SPRWS for carp work in 2021.

VLAWMO staff also seek support to the Board for a demonstration Curly-leaf treatment in partnership with NOHOA in Pleasant Lake. This would be a trial treatment to reduce nutrients released by Curly-leaf into the water column early in the summer. It is a next step that was identified and recommended as part of the sedimentation and internal loading study completed in 2020. This would be a demonstration only at this time. The location has been selected to support the carp removal and was also requested by the commercial fisher to make the removal process easier and likely more successful. The total cost for the Curly-leaf treatment in the west bay area is \$11,700 to treat 19.41 acres. NOHOA has allocated \$8,500 for the treatment and requests \$3,510 from VLAWMO to fund this demonstration effort. An additional \$1,500 (from VLAWMO) may be needed to expand the area slightly based on the commercial fisher recommendation.

This proposal will be presented to the Board Policy and Personnel Subcommittee on Feb. 10. Recommendations expressed at that meeting will be shared with the TEC.

Contingent upon the Board subcommittee recommendations:

- 1) Staff request a recommendation to the Board to sign a contract with WSB for \$20,572, with the understanding that a reduced amount may be needed depending upon the size of the carp and Bigmouth buffalo harvest. Pending financial partnership on this portion of the project that has been requested from SPWRS.
- 2) Staff request a recommendation to the Board to support a demonstration Curly-leaf treatment in the west bay of Pleasant with NOHOA at 30% of the total cost plus a possible extension area for optimal carp harvest. The total VLAWMO cost would be \$3,510-\$5,000.

#### **F. Swan Update at Sucker Channel**

A dead Trumpeter swan was reported by a resident at Sucker Channel on January 26, 2021. The location is consistent with previous swan deaths in the watershed. The swan was retrieved by VLAWMO staff on January 27, 2021, and brought to the UMN Veterinary Diagnostic Clinic for testing for suspected lead poisoning with partnership from the MN DNR, as has been done during 2019 and 2020.

Representative Fischer and Senator Wiger have proposed companion bills in the House and Senate to phase our lead sinkers and tackle as a response to the swan deaths. The House bill is HF 157 and Senate SF 247.

The photo below shows the dead juvenile Trumpeter swan that was retrieved at Sucker Channel and is currently being testing at the UMN-VDL.



## **G. Update on East Goose Adaptive Lake Management (ALM) Engagement process**

As a follow-up from the December 1, 2020 East Goose Lake Neighborhood Conversation meeting, each landowner on East Goose Lake was sent a Neighborhood Conversation response form which ask them to provide written feedback and input on the same set of questions discussed the Dec. 1 meeting. Staff is currently in the process of reviewing and complying the information received in these forms.

VLAWMO and the City staff also collaborated with the White Bear Lake Environmental Advisory Commission (EAC) to develop a community engagement survey for East Goose Lake. This survey was approved by the EAC at their January meeting. The link to the survey will be sent to TEC members on apx. Feb 10. To better publicize the community engagement survey, the EAC also developed and approved an announcement that will be placed in the February 10 White Bear Press newspaper. The survey will close on March 31, 2021.

Information collected from the community survey will be compiled with the information from the lakeshore owner response forms and synthesized into an engagement report. The next step in the engagement process is to continue development of the web site resources for the ALM program.

## **H. 2021-2023 BWSR Watershed Based Implementation Funding Grant (WBIF)**

The '21-'23 Board of Water & Soil Resources (BWSR) Watershed-Based Implementation Funding Grant (WBIF) is a set pot of grant funds, split up between major watersheds throughout the state. VLAWMO is located within the East Mississippi River watershed, and within it, all of the watersheds and water management organizations agreed to split up funding based upon land area. VLAWMO's split of funding was a total of \$93,042.

For this funding, each watershed was required to submit a funding request detailing how grant funding would be used, and it would need to be approved by BWSR. VLAWMO submitted its funding request to allocate \$60,000 of funding towards the Landscape Cost Share Program for implementation in 2021-2023, and \$33,042 towards a BMP or project implementation within the Gillfillan-Tamarack-Black-Wilkinson-Amelia subwatershed, Birch Lake subwatershed, or the Goose Lake subwatershed. The Cost Share funding may be used simply to boost funding for the program, and the subwatershed project will be determined using prior or to-be completed feasibility studies.

At this point, VLAWMO's budget request has been approved by BWSR, and staff will be completing a grant work plan, to be approved by BWSR, and will be brought to the Board for approval at their February 24<sup>th</sup> meeting. Staff is anticipating the grant agreement will be signed and executed in April, following the 4/28 Board meeting.

February-21		Actual 2/1/21	Actual to Date	2021 Budget	2020 carry over/Grants	Remaining in Budget	2021 Available	Act vs. Budget
BUDGET #	<b>INCOME</b>							
5.11	Storm Water Utility	\$20,739	\$20,739	\$935,340	\$0	\$914,601	\$935,340	2%
5.12	Service Fees	\$0	\$0	\$200	\$0	\$200	\$200	0%
5.13	Interest + mitigation acct	\$23	\$46	\$3,000	\$0	\$2,954	\$3,000	2%
5.14	Misc. income - WCA admin & other	\$0	\$0	\$3,000	\$0	\$3,000	\$3,000	0%
5.15	Other Income Grants/ <u>loan</u>	\$0	\$0	\$894,679	\$0	\$894,679	\$894,679	0%
5.16	Transfer from reserves	\$0	\$0	\$192,840	\$14,000	\$206,840	\$206,840	0%
	<b>TOTAL</b>	<b>\$20,762</b>	<b>\$20,785</b>	<b>\$2,029,059</b>	<b>\$14,000</b>	<b>\$2,022,274</b>	<b>\$2,043,059</b>	<b>1%</b>

<b>EXPENSES</b>								
<b>3.1</b>	<b>Operations &amp; Administration</b>							
3.110	Office - rent, copies, post tel supplies	\$2,004	\$4,017	\$26,214	\$0	\$22,197	\$26,214	15%
3.120	Information Systems	\$1,660	\$2,619	\$22,365	\$4,000	\$23,746	\$26,365	10%
3.130	Insurance	\$0	\$0	\$7,000	\$0	\$7,000	\$7,000	0%
3.141	Consulting - Audit	\$0	\$0	\$7,728	\$0	\$7,728	\$7,728	0%
3.142	Consulting - Bookkeeping	\$0	\$0	\$1,500	\$0	\$1,500	\$1,500	0%
3.143	Consulting - Legal	\$0	\$398	\$4,000	\$0	\$3,602	\$4,000	10%
3.144	Consulting - Eng. & Tech.	\$0	\$0	\$30,000	\$0	\$30,000	\$30,000	0%
3.150	Storm Sewer Utility	\$0	\$4,686	\$13,000	\$0	\$8,314	\$13,000	36%
3.160	Training (staff/board)	\$0	\$0	\$8,750	\$0	\$8,750	\$8,750	0%
3.170	Misc. & mileage	\$347	\$462	\$6,300	\$0	\$5,838	\$6,300	7%
3.191	Administration - staff	\$26,616	\$53,232	\$370,307	\$0	\$317,075	\$370,307	14%
3.192	Employer Liability	\$8,511	\$16,187	\$102,376	\$10,000	\$96,189	\$112,376	14%
<b>3.2</b>	<b>Monitoring and Studies</b>							
3.210	Lake and Creek lab analysis	\$0	\$0	\$18,000	\$0	\$18,000	\$18,000	0%
3.220	Equipment	\$0	\$78	\$3,000	\$0	\$2,922	\$3,000	3%
3.230	Wetland assessment & management	\$0	\$0	\$0	\$0	\$0	\$0	#DIV/0!
<b>3.3</b>	<b>Education and Outreach</b>							
3.310	Public Education	\$2,000	\$2,000	\$8,500	\$0	\$6,500	\$8,500	24%
3.320	Marketing	\$260	\$260	\$7,500	\$0	\$7,240	\$7,500	3%
3.330	Community Blue Ed Grant	\$0	\$0	\$10,000	(\$4,500)	\$5,500	\$5,500	0%
<b>Total Core functions: Ops, Monitoring, Education</b>		<b>\$41,398</b>	<b>\$83,939</b>	<b>\$646,540</b>	<b>\$9,500</b>	<b>\$572,101</b>	<b>\$656,040</b>	<b>13%</b>

<b>Capital Improvement Projects and Programs</b>								
<b>3.4</b>	<b>Subwatershed Activity</b>							
3.410	Gem Lake	\$0	\$0	\$0	\$0	\$0	\$0	
3.420	Lambert Creek	\$6,562	\$18,312	\$222,100	\$0	\$203,788	\$222,100	8%
3.425	Goose Lake	\$0	\$1,125	\$124,200	\$0	\$123,075	\$124,200	1%
3.430	Birch Lake	\$637	\$637	\$0	\$0	(\$637)	\$0	#DIV/0!
3.440	Gilf Black Tam Wilk Amelia	\$0	\$0	\$16,000	\$0	\$16,000	\$16,000	0%
3.450	Pleasant Charley Deep	\$0	\$0	\$22,500	\$0	\$22,500	\$22,500	0%
3.460	Sucker Vadnais	\$15,488	\$16,408	\$12,500	\$0	(\$3,908)	\$12,500	131%
<b>3.48</b>	<b>Programs</b>							
3.480	Soil Health Grant	\$0	\$0	\$4,500	\$0	\$4,500	\$4,500	0%
3.481	Landscape 1	\$0	\$0	\$16,000	\$0	\$16,000	\$16,000	0%
3.482	Landscape 2	\$0	\$0	\$28,000	\$0	\$28,000	\$28,000	0%
3.483	Project Research & feasibility	\$0	\$0	\$0	\$0	\$0	\$0	#DIV/0!
3.485	Facilities Maintenance	\$0	\$0	\$46,540	\$0	\$46,540	\$46,540	0%
<b>3.5</b>	<b>Regulatory</b>							
3.510	Engineer Plan review	\$0	\$0	\$0	\$0	\$0	\$0	#DIV/0!
<b>Total CIP &amp; Program</b>		<b>\$22,687</b>	<b>\$36,482</b>	<b>\$492,340</b>	<b>\$0</b>	<b>\$455,858</b>	<b>\$492,340</b>	<b>7%</b>
<b>Total of Core Operations &amp; CIP</b>		<b>\$64,084</b>	<b>\$120,421</b>	<b>\$1,138,880</b>	<b>\$9,500</b>	<b>\$1,027,959</b>	<b>\$1,148,380</b>	<b>10%</b>

Fund Balance	1/1/2021	2/1/2021
4M Account	\$558,445	\$519,538
4M Plus Savings	\$324,091	\$324,104
<b>Total</b>	<b>\$882,536</b>	<b>\$843,643</b>

Restricted funds	2/1/2021
Mitigation Savings	\$21,036
Term Series	\$0

**Vadnais Lake Area Water Management Orga**  
**Profit & Loss**  
 January 9 through February 12, 2021

10:37 AM

02/03/2021

Cash Basis

Jan 9 - Feb 12, 21

Ordinary Income/Expense

Income

Mitigation Interest 0.17

5.1 · Income

5.11 · Storm Water Utility 20,738.97

5.13 · Interest 22.54

**Total 5.1 · Income 20,761.51**

**Total Income 20,761.68**

**Gross Profit 20,761.68**

Expense

3.1 · Administrative/Operations

3.110 · Office

Copies 15.22

Phone/Internet/Machine Overhead 290.00

Postage 35.45

Rent 1,615.00

Supplies 48.17

**Total 3.110 · Office 2,003.84**

3.120 · Information Systems

GIS web hosting 254.26

IT Support 1,203.91

Website & email hosting 201.38

**Total 3.120 · Information Systems 1,659.55**

3.170 · Misc. & mileage 346.69

3.191 · Employee Payroll

payroll 26,616.04

**Total 3.191 · Employee Payroll 26,616.04**

3.192 · Employer Liabilities

Admin payroll processing 44.92

Administration FICA 1,924.03

Administration PERA 1,996.20

Insurance Benefit 4,546.05

**Total 3.192 · Employer Liabilities 8,511.20**

**Total 3.1 · Administrative/Operations 39,137.32**

3.3 · Education and Outreach

3.310 · Public Education 2,000.00

3.320 · Marketing 260.40

**Total 3.3 · Education and Outreach 2,260.40**

3.4 · Capital Imp. Projects/Programs

3.420 · Lambert Creek Restoration

LL VLAWMO cash match 6,561.51

**Total 3.420 · Lambert Creek Restoration 6,561.51**

3.430 · Birch Lake

4th & Otter project	637.07
Total 3.430 · Birch Lake	<u>637.07</u>
3.460 · Sucker Vadnais	15,488.00
Total 3.4 · Capital Imp. Projects/Programs	<u>22,686.58</u>
Total Expense	<u>64,084.30</u>
Net Ordinary Income	<u>-43,322.62</u>
Net Income	<u><u>-43,322.62</u></u>

# Vadnais Lake Area Water Management Organization

## Check Detail

10:35 AM

02/03/2021

January 9 through February 12, 2021

Type	Num	Date	Name	Item	Account	Paid Amount	Original Amount
Check	eft	01/23/2021	Reliance Standard		Checking - 1987		-202.29
				Insurance Benefit		-202.29	202.29
TOTAL						-202.29	202.29
Check	eft	01/25/2021	Reliance Standard		Checking - 1987		-88.50
				Insurance Benefit		-88.50	88.50
TOTAL						-88.50	88.50
Check	eft	02/05/2021	further		Checking - 1987		-5.00
				Insurance Benefit		-5.00	5.00
TOTAL						-5.00	5.00
Check	5084	02/12/2021	City Of Roseville		Checking - 1987		-1,203.91
				IT Support		-1,203.91	1,203.91
TOTAL						-1,203.91	1,203.91
Check	5085	02/12/2021	Dawn Tanner		Checking - 1987		-31.36
				3.170 · Misc. & mileage		-31.36	31.36
TOTAL						-31.36	31.36
Check	5086	02/12/2021	Brian Corcoran		Checking - 1987		-28.42
				3.170 · Misc. & mileage		-28.42	28.42
TOTAL						-28.42	28.42
Check	5087	02/12/2021	Tyler J Thompson		Checking - 1987		-66.53
				3.170 · Misc. & mileage		-66.53	66.53
TOTAL						-66.53	66.53
Check	5088	02/12/2021	Innovative Office Solutions		Checking - 1987		-48.17
				Supplies		-48.17	48.17
TOTAL						-48.17	48.17
Check	5089	02/12/2021	Ramsey County - Plato		Checking - 1987		-15,488.00
				3.460 · Sucker Vadnais		-15,488.00	15,488.00
TOTAL						-15,488.00	15,488.00



	<b>Check 5090 02/12/2021 Kennedy &amp; Graven, Chartered</b>	<b>Checking - 1987</b>	<b>-238.80</b>
		LL VLAWMO cash match	-238.80 238.80
TOTAL			<u>-238.80 238.80</u>
	<b>Check 5091 02/12/2021 Metro WaterShed Partners</b>	<b>Checking - 1987</b>	<b>-2,000.00</b>
		3.310 · Public Education	-2,000.00 2,000.00
TOTAL			<u>-2,000.00 2,000.00</u>
	<b>Check 5092 02/12/2021 Press Publications</b>	<b>Checking - 1987</b>	<b>-220.38</b>
		3.170 · Misc. & mileage	-138.54 138.54
		3.170 · Misc. & mileage	-81.84 81.84
TOTAL			<u>-220.38 220.38</u>
	<b>Check 5093 02/12/2021 City of White Bear Lake</b>	<b>Checking - 1987</b>	<b>-35,722.78</b>
		payroll	-26,616.04 26,616.04
		Administration FICA	-1,924.03 1,924.03
		Administration PERA	-1,996.20 1,996.20
		Insurance Benefit	-4,250.26 4,250.26
		Admin payroll processing	-44.92 44.92
		4th & Otter project	-637.07 637.07
		GIS web hosting	-254.26 254.26
TOTAL			<u>-35,722.78 35,722.78</u>
	<b>Check 5094 02/12/2021 HDR Engineering, Inc.</b>	<b>Checking - 1987</b>	<b>-201.38</b>
		Website & email hosting	-201.38 201.38
TOTAL			<u>-201.38 201.38</u>
	<b>Check 5095 02/12/2021 SEH</b>	<b>Checking - 1987</b>	<b>-6,322.71</b>
		LL VLAWMO cash match	-1,169.06 1,169.06
		LL VLAWMO cash match	-5,153.65 5,153.65
TOTAL			<u>-6,322.71 6,322.71</u>
	<b>Check 5096 02/12/2021 City of Vadnais Heights</b>	<b>Checking - 1987</b>	<b>-1,955.67</b>
		Rent	-1,615.00 1,615.00
		Phone/Internet/Machine Overhead	-290.00 290.00
		Postage	-35.45 35.45
		Copies	-15.22 15.22
TOTAL			<u>-1,955.67 1,955.67</u>

**Vadnais Lake Area Water Management Organization**  
**Custom Transaction Detail Report**  
 December 1, 2020 through February 2, 2021

10:32 AM

02/03/2021

Accrual Basis

Type	Date	Num	Name	Memo	Account	Clr	Split	Amount	Balance
<b>Dec 1, '20 - Feb 2, 21</b>									
Credit Card Charge	12/02/2020		Google*SVCAPPS_VLAWM		US Bank CC	√	WEB	36.00	36.00
Credit Card Charge	12/09/2020		adobe *photography plan		US Bank CC		Software	9.99	45.99
Credit Card Charge	12/10/2020		mn Department of Agriculture	pest 2021 license	US Bank CC		3.160 · Training (staff/board)	10.22	56.21
Credit Card Charge	12/14/2020		Galeton	hard hats	US Bank CC		3.220 · Equipment	77.62	133.83
Transfer	12/22/2020			Funds Transfer	US Bank CC		Checking - 1987	-347.55	-213.72
Credit Card Charge	12/28/2020		Adobe "Creative Cloud		US Bank CC		Software	32.20	-181.52
Credit Card Charge	12/28/2020		Zoom	subscription	US Bank CC		3.320 · Marketing	16.09	-165.43
Credit Card Charge	12/29/2020		Galeton	hard hat	US Bank CC		3.220 · Equipment	11.85	-153.58
Credit Card Charge	01/04/2021		Google*SVCAPPS_VLAWM		US Bank CC		WEB	36.00	-117.58
Credit Card Charge	01/19/2021		Survey Monkey	survey monkey premium	US Bank CC		3.320 · Marketing	260.40	142.82
								<b>142.82</b>	<b>142.82</b>
<b>Dec 1, '20 - Feb 2, 21</b>									

TEC Report to the Board  
February 2021

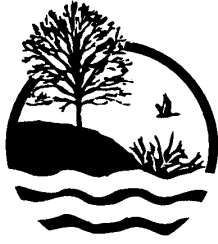
Programs & Projects	Effort Level	Completion Date	Comments
	LOW		
	MED		
	HIGH		
<b>Projects</b>			
Lambert Pond /Meander Project		2021/22	Construction of Meander and Sheet Pile ongoing.
East Goose Lk Adaptive Mgnt.		2021- ongoing	Neighborhood meeting with East Goose Lk. Shoreline residents completed 12/1/20. Community Survey will available on apx. 2/10/21 and will be open until 3/31/21.
Ditch 14 Maintenance project		2021/22	Phase I project complete, working to schedule initial "walk thru" on Phase II later in the Winter.
Birch Lake		2017-20	Project complete, with grant closeout complete, along with full grant reimbursement fulfilled.
MPCA 319 Planning		2021	Currently developing 9 element plan and preparing for discussions with partners before submission on draft to EPA.
21-23 BWSR WBF		2023	21-23 BWSR Watershed Based Funding grant workplan under develop and anticipated to be brought to the 2/24/21 Board meeting for consideration
<b>Programs</b>			
Outreach		Feb-April	East Goose Lake Community Engagement Survey live. East Goose shoreline homeowners response forms collected, analyzing taking place for summary report. Social media Jan-March highlighting neighborhood cost-share spotlights and Lambert Pond and Meander construction.
Education		April	2020 Annual report and water monitoring summary in progress. New MS4 programming underway in collaboration with neighboring watersheds.
Website		March	Working to build East Goose Lake ALM Web Hub resources within the VLAWMO Website. Lambert Lake project page updated monthly. New projects pages for Lambert Creek dredging, Co Rd F raingardens. 2021 cost-share program reflected on grants page and under news.
WAV		Jan-May	WAV Planning meeting March 17th. MN Water Stewards engaging in training with Freswater (2). Community-engaged U of MN volunteers beginning in March.
Cost Share		ongoing	Continue to plan with municipalities for 2021 grant projects. 2020 grant extensions in process, along with 2021 landowner site visits beginning.
GIS		ongoing	Working to provide data to Ramsey County stormwater reuse inventory process
Monitoring		ongoing	Data analysis and report complete
WCA		ongoing	administering WCA as needed

TEC Report to the Board  
February 2021

Administration & Operation			
Audit		2021	Working with Auditors on 2020 Audit - Will be brought to April Board meeting for consideration.
Budget		2020-21	High level 2022 budget discussion with the VLAWMO Board will begin in March /April with the final 2022 budget consideration at the June Board meeting.
Personnel		Oct 2020	Ongoing administrative work to update benefits paperwork based on December Board approval
SSU		ongoing	Parcel redefinitions have been reviewed as they are submitted.
Administration/ HR		ongoing	Year end employee performance review have been completed.

FINANCIAL SUMMARY as of 2/1/2021			CD's	4M Term Series	
				Maturity	Rate
4M Account (1.10)	4M Plus (1.23)	Total	Term series		
\$519,538	\$324,104	\$843,642			

Budget Summary	Actual Expense YTD	2021 Budget amended	Remaining in Budget	% YTD
Operations	\$83,939	\$656,040	\$572,101	13%
CIP	\$36,482	\$492,340	\$455,858	7%
Total	\$120,421	\$1,148,380	\$1,027,959	10%



## **KJOLHAUG** ENVIRONMENTAL SERVICES COMPANY

*Providing Sound, Balanced, Comprehensive Natural Resource Solutions*

### **Memorandum**

**Date:** January 26, 2021

**To:** Brian Corcoran, VLAWMO  
Eric White, U.S. Army Corps of Engineers (USACE)

**From:** Melissa Barrett, Kjolhaug Environmental Services Company (KES)

**CC:** Gary Eagles, North Oaks Company  
Eric Johnson, Sathre-Berquist

**Re:** Replacement Plan Addendum & Disturbed Buffer Plan  
Island Field Project, North Oaks, MN  
KES#2020-198; MVP-2018-03631

---

This memo provides information regarding revised wetland impacts and the revised replacement plan for the Island Field project. This memo also provides a seeding and management plan for buffers areas disturbed with construction.

#### **Wetland Impact**

The originally submitted wetland permit application proposed a total of 6,296 sf (0.1445-ac) of impact to Wetland 1 (**Figure 1**) for the site access roadway.

In discussions with the project engineers, it was determined that due to poor soil conditions where the roadway and underlying utilities are to be installed, wider roadway side slopes (15-foot along each side) will be needed to provide a stable base for the proposed roadway materials.

With the revised plan (**Figure 2**), fill has been minimized to the extent possible by creating 3:1 side slopes along the edge of wetland fill while still meeting engineering needs of 15-ft wide roadway shoulders. Revised proposed wetland fill totals 7,655 sf (0.1757-ac) requiring 0.3514 acres/credits of mitigation.

#### **Revised Mitigation Plan and Supplemental Information**

The primary comment from the TEP regarding the originally submitted replacement plan application was to provide information regarding wetland hydrology post-development for the wetland area that was to be restored (**Wetland 1a – Figure 1**). This information is included in **Attachment A**. In summary, post-development HWLs do not change significantly from pre-

project HWLs; therefore, no changes to wetland hydrology are expected with the proposed development (no secondary/indirect impacts will occur).

However, these numbers do not indicate that wetland hydrology could be significantly increased (restored), even with the implementation of a ditch plug/berm as previously proposed. Therefore, to meet mitigation obligations the applicant proposes to replace wetland impacts via the debiting of 0.3514 credits from the North Oaks Wetland Bank (#170) located in the same major watershed and Bank Service Area (BSA7) as the proposed project.

**Table 1. Wetland Bank and Credit Summary – Island Field**

<b>Bank #</b>	<b>County &amp; Major Watershed</b>	<b>BSA</b>	<b>Credit Subgroup</b>	<b>Credit Type</b>	<b>Credit Amount</b>
170	Ramsey & 20	7	B	Type 4	0.3514
<b>Total</b>					<b>0.3514</b>

**Disturbed Buffer Plan**

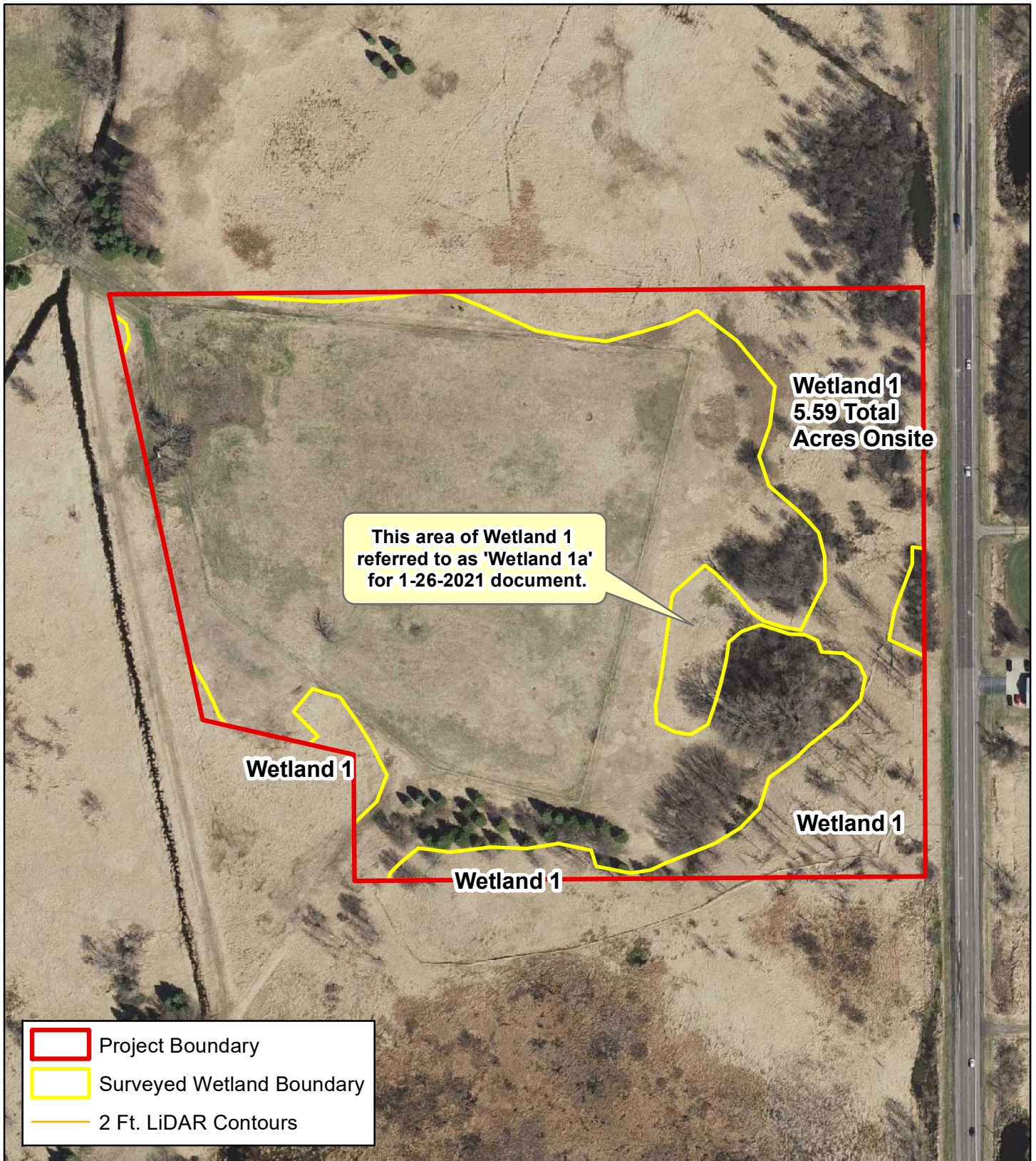
Some areas of wetland buffer will be disturbed with project grading activities. Disturbed buffer areas are illustrated on **Figure 2**, and details regarding seeding and management of disturbed buffer areas are included in **Attachment B**.

**Requested Approval**

**Attachment C** of this memo includes a revised Joint Application Form for Activities Affecting Water Resources in Minnesota, which includes the revised wetland impact amount and wetland banking details.

This memo requests WCA wetland replacement plan approval from the VLAWMO, and approval under Nationwide Permit (NWP) 29 – Residential Development – from the U.S. Army Corps of Engineers (USACE).

Thank you.



**Figure 1 - Existing Conditions**



**KJOLHAUG** ENVIRONMENTAL SERVICES COMPANY

Source: MNGEO Spatial Commons

N



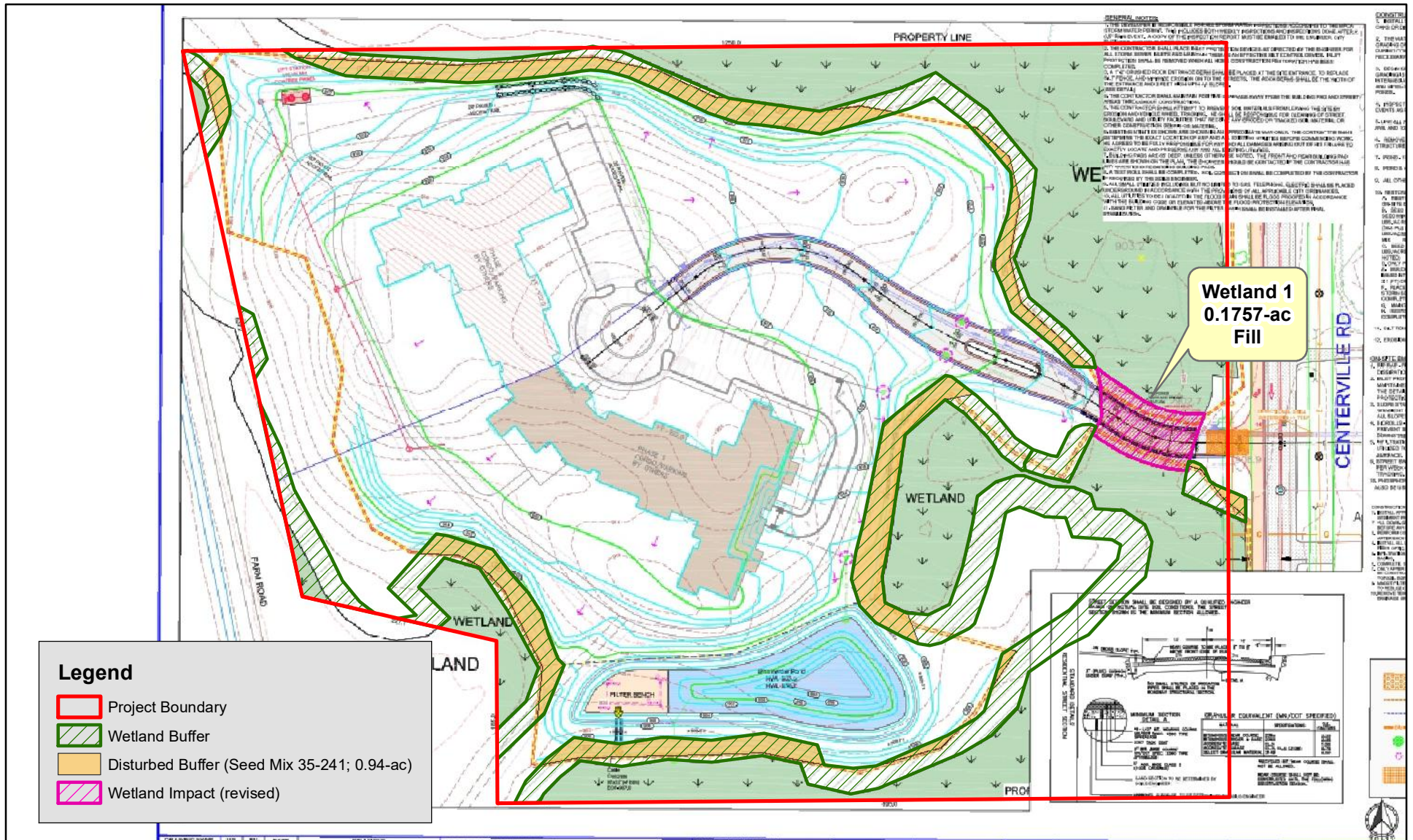
0      200



Feet

**Island Field Project (KES 2020-198)**  
**North Oaks, Minnesota**

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.





**Replacement Plan Addendum & Disturbed Buffer Plan  
Island Field Project, North Oaks, MN**

**ATTACHMENT A**

## Wetland 1a - Hydraulic Review Summary Tables, Island Field, North Oaks

**Table 1. 1-year Storm Event Comparison for Wetland**

Scenario	NWL	HWL	Inflow rate (cfs)	Inflow Volume (af)
Existing	904.0	904.7	1.4	0.13
Proposed	904.0	904.5	1.6	0.10
Change	0	-0.2	+0.2	-0.03

**Table 2. 2-year Storm Event Comparison for Wetland**

Scenario	NWL	HWL	Inflow rate (cfs)	Inflow Volume (af)
Existing	904.0	904.8	1.9	0.18
Proposed	904.0	904.6	2.0	0.12
Change	0	-0.2	+0.1	-0.06

**Table 3. 10-year Storm Event Comparison for Wetland**

Scenario	NWL	HWL	Inflow rate (cfs)	Inflow Volume (af)
Existing	904.0	905.3	4.8	0.38
Proposed	904.0	904.9	3.6	0.21
Change	0	-0.4	-1.2	-0.17

**Table 4. 100-year Storm Event Comparison for Wetland**

Scenario	NWL	HWL	Inflow rate (cfs)	Inflow Volume (af)
Existing	904.0	905.7	13.9	1.00
Proposed	904.0	905.4	7.9	0.44
Change	0	-0.3	-6.0	-0.66

**Replacement Plan Addendum & Disturbed Buffer Plan  
Island Field Project, North Oaks, MN**

**ATTACHMENT B**

## **Seeding & Vegetation Management/Maintenance for Island Field Disturbed Buffer Areas**

### **Construction**

1. Silt fence shall be installed prior to construction and maintained until viable cover has established. Silt fence shall be removed upon final acceptance by the engineer.
2. Silt fence that is initially installed above wetland areas for grading shall be moved and reinstalled at the limits of the buffer after buffer areas are graded (where applicable) and accepted. Any soil ridge left at the initial silt fence location shall be removed.
3. Contractor shall verify or confirm graded elevations within disturbed buffer areas prior to initiating seeding.
4. Excess excavated soil shall be disposed of outside of wetlands.

### **Seed Mixture Suppliers and Approval**

1. Contractor shall submit seed tags or written certification of seed mix contents and suppliers for approval by the wetland consultant prior to installation.
2. Substitutions of seed mixes or seed mix components must be approved by the wetland consultant.

### **Seedbed Preparation**

1. After completion of final grading, soils will be decompacted to a depth of 18 inches, and organic matter will be incorporated into soils.
2. Prior to seeding, the contractor shall kill and plow or disc vegetation that covers more than 20 percent of the ground in the area to be seeded.
3. Areas of existing vegetation that are not plowed or disced should be killed by spraying 2 quarts/acre of glyphosate herbicide and 1-2 quarts/acre of 2,4-D herbicide.
4. The seedbed shall be prepared by loosening topsoil to a minimum depth of 3 inches.
5. Seeding shall not be conducted between June 30 and October 15.

### **Seeding Methods**

1. A map of disturbed buffer areas is attached.
2. Seed mixes shall be installed in accordance with the Minnesota Board of Water and Soil Resources Native Vegetation Establishment and Enhancement Guidelines (2016, [http://www.bwsr.state.mn.us/native\\_vegetation/seeding\\_guidelines.pdf](http://www.bwsr.state.mn.us/native_vegetation/seeding_guidelines.pdf)).
3. Seed mixes ([http://www.bwsr.state.mn.us/native\\_vegetation/state\\_seed\\_mixes.pdf](http://www.bwsr.state.mn.us/native_vegetation/state_seed_mixes.pdf)) shall be acquired from a reputable native seed supplier and the native seed supplier shall be subject to approval by the wetland consultant.
4. Seed mixes shall be installed at the rate intended for each particular mix, as listed in the seed mix tables provided in BWSR guidance.

5. Seed mix 35-241 (Mesic Prairie General) or similar may be broadcast or seeded with a native grass drill, seeded by hand or by use of a mechanical “cyclone” seeder, or hydroseeded.
6. All seeded areas shall be firmed with a rolling-type packer within two days after seeding. Packing will be considered adequate when only a slight footprint is left in the soil after walking across the area.
7. Seeded areas shall be mulched with MN/DOT Type 3 (MICA certified weed free grain straw) mulch at a rate of 2 tons per acre and the mulch shall be anchored with a disc or tackifier.

## **2. VEGETATION MANAGEMENT**

Disturbed upland buffer areas will be seeded with seed mixes as specified (or similar) in this document. Disturbed buffer areas will be assessed during multiple annual monitoring site visits for the presence of noxious weeds and invasive species. If noxious weeds and/or invasive species are identified within the buffer areas, efforts will be made to control these species using appropriately timed herbicide applications or other methods. The following steps will be considered for treatment of invasive species during the five years after seeding, with the intention of developing plant communities with a predominance of non-invasive species.

### **Year 1 Maintenance**

1. Where possible, the seeded buffer areas shall be mowed at a height of 4 to 6 inches a minimum of two times during the first growing season and before September 30.
2. Purple loosestrife shall be pulled by hand if it comprises less than 5% of cover, and spot sprayed with Rodeo herbicide during late August or September if it covers 5% or more.
3. Invasive species in the buffer shall be spot sprayed twice annually at times that are particularly effective given the problem species.
4. Stands of reed canary grass in buffer areas shall be treated with Rodeo or Roundup herbicide in late October and again early the following spring before desirable species emerge.
5. Herbicide treatments shall be applied according to label instructions.

### **Year 2 Maintenance**

1. Areas of invasive species such as reed canary grass and thistles shall be treated with herbicide early in spring prior to the emergence of desirable species.
2. Where possible, the seeded buffer areas shall be mowed to a height of 6 to 8 inches between June 1 and July 15 to allow for light penetration to seeded species and prevent seed set on weedy species.
3. Purple loosestrife shall be pulled by hand if it comprises less than 5% of cover, and spot sprayed with Rodeo herbicide during late August or September if it covers 5% or more.

4. Other invasive species in buffer areas shall be spot sprayed twice annually at times that are particularly effective for problem species.
5. Stands of reed canary grass in any buffer area shall be treated with Rodeo or Roundup herbicide in late October.
6. Herbicide treatments shall be applied according to label instructions.

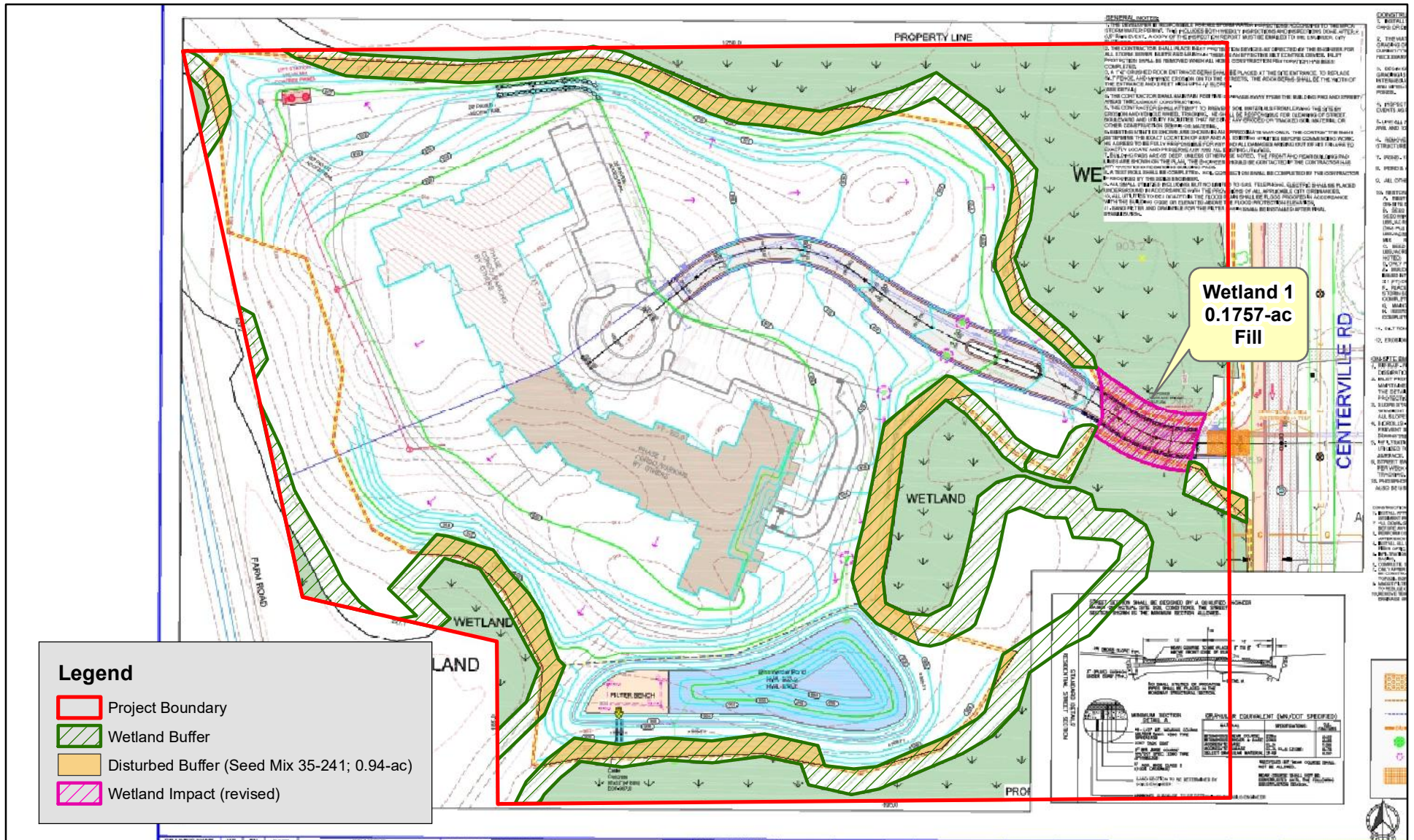
### **Year 3 to 5 Maintenance**

1. Areas of bare ground or dead vegetation of more than 20 square feet shall be reseeded (Year 3 only).
2. Spot spray perennial weeds as necessary.
3. Patches of problem species that represent more than 5% cover of buffer areas should be spot mowed to prevent seed set and treated with herbicide at an appropriate time.
4. If possible and reasonably feasible, a controlled burn should be conducted once between the third and fifth year.

## **3. MONITORING**

The applicant will submit an annual Wetland Buffer Inspection Report to VLAWMO for up to 5 years following vegetation establishment. The report shall include:

1. A site plan with locations of disturbed buffer areas;
2. Areas of bare or eroded soils;
3. Areas of invasive/noxious vegetation;
4. Location and type of encroachments on the buffer;
5. Color photos of the disturbed buffer areas taken during the growing season;
6. Description of the buffer vegetation including a list of dominant species and their estimated percent cover, and a comparison of the species present to the approved planting/seeding plan.
7. If necessary, the monitoring report will include management strategies that will be utilized to manage invasive species, improve percent vegetation cover and species diversity, and/or mitigate encroachment on the buffer.



N  
0 250 Feet

**KJOLHAUG ENVIRONMENTAL SERVICES COMPANY**  
Source: MNGEO Spatial Commons

**Island Field Project (KES 2020-198)**  
North Oaks, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

**Replacement Plan Addendum & Disturbed Buffer Plan  
Island Field Project, North Oaks, MN**

**ATTACHMENT C**



## PART ONE: Applicant Information

If applicant is an entity (company, government entity, partnership, etc.), an authorized contact person must be identified. If the applicant is using an agent (consultant, lawyer, or other third party) and has authorized them to act on their behalf, the agent's contact information must also be provided.

**Applicant/Landowner Name:** Gary Eagles, North Oaks Company LLC  
**Mailing Address:** 5959 Centerville Road, Suite 200, North Oaks MN 55127  
**Phone:** 651-484-3361  
**E-mail Address:** gary@northoaks.com

**Authorized Contact (do not complete if same as above):**

**Mailing Address:**  
**Phone:**  
**E-mail Address:**

**Agent Name:** Adam Cameron  
**Mailing Address:** 2500 Shadywood Road #130, Orono MN 55331  
**Phone:** 952-401-8757 Ext. #106  
**E-mail Address:** Adam@kjolhaugenv.com

## PART TWO: Site Location Information

**County:** Ramsey **City/Township:** North Oaks  
**Parcel ID and/or Address:** 093022240004  
**Legal Description (Section, Township, Range):** S:9 T:30N R:22W  
**Lat/Long (decimal degrees):** -  
**Attach a map showing the location of the site in relation to local streets, roads, highways.**  
**Approximate size of site (acres) or if a linear project, length (feet):** 20.7

If you know that your proposal will require an individual Permit from the U.S. Army Corps of Engineers, you must provide the names and addresses of all property owners adjacent to the project site. This information may be provided by attaching a list to your application or by using block 25 of the Application for Department of the Army permit which can be obtained at:

[http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform\\_4345\\_2012oct.pdf](http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform_4345_2012oct.pdf)

## PART THREE: General Project/Site Information

If this application is related to a delineation approval, exemption determination, jurisdictional determination, or other correspondence submitted *prior to* this application then describe that here and provide the Corps of Engineers project number.

Describe the project that is being proposed, the project purpose and need, and schedule for implementation and completion. The project description must fully describe the nature and scope of the proposed activity including a description of all project elements that effect aquatic resources (wetland, lake, tributary, etc.) and must also include plans and cross section or profile drawings showing the location, character, and dimensions of all proposed activities and aquatic resource impacts.

Please see attached permit narrative regarding the Island Field Residential Development Project.

## PART FOUR: Aquatic Resource Impact<sup>1</sup> Summary

If your proposed project involves a direct or indirect impact to an aquatic resource (wetland, lake, tributary, etc.) identify each impact in the table below. Include all anticipated impacts, including those expected to be temporary. Attach an overhead view map, aerial photo, and/or drawing showing all of the aquatic resources in the project area and the location(s) of the proposed impacts. Label each aquatic resource on the map with a reference number or letter and identify the impacts in the following table.

Aquatic Resource ID (as noted on overhead view)	Aquatic Resource Type (wetland, lake, tributary etc.)	Type of Impact (fill, excavate, drain, or remove vegetation)	Duration of Impact Permanent (P) or Temporary (T) <sup>1</sup>	Size of Impact <sup>2</sup>	Overall Size of Aquatic Resource <sup>3</sup>	Existing Plant Community Type(s) in Impact Area <sup>4</sup>	County, Major Watershed #, and Bank Service Area # of Impact Area <sup>5</sup>
Wetland 1	Wetland	Fill	P	0.1757	N/A	Type 2 PEM1Bd	Ramsey, 20, 7

<sup>1</sup>If impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".

<sup>2</sup>Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).

<sup>3</sup>This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".

<sup>4</sup>Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3<sup>rd</sup> Ed. as modified in MN Rules 8420.0405 Subp. 2.

<sup>5</sup>Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

If any of the above identified impacts have already occurred, identify which impacts they are and the circumstances associated with each:

## PART FIVE: Applicant Signature

Check here if you are requesting a pre-application consultation with the Corps and LGU based on the information you have provided. Regulatory entities will not initiate a formal application review if this box is checked.

By signature below, I attest that the information in this application is complete and accurate. I further attest that I possess the authority to undertake the work described herein.

Signature: North Oaks Company LLC  
Ray M. Eagle VP Date: 12/10/2020

I hereby authorize Kjolhaug Environmental to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this application.

<sup>1</sup> The term "impact" as used in this joint application form is a generic term used for disclosure purposes to identify activities that may require approval from one or more regulatory agencies. For purposes of this form it is not meant to indicate whether or not those activities may require mitigation/replacement.

## Attachment C

### Avoidance and Minimization

**Project Purpose, Need, and Requirements.** Clearly state the purpose of your project and need for your project. Also include a description of any specific requirements of the project as they relate to project location, project footprint, water management, and any other applicable requirements. Attach an overhead plan sheet showing all relevant features of the project (buildings, roads, etc.), aquatic resource features (impact areas noted) and construction details (grading plans, storm water management plans, etc.), referencing these as necessary:

Please reference the attached wetland permit application narrative.

**Avoidance.** Both the CWA and the WCA require that impacts to aquatic resources be avoided if practicable alternatives exist. Clearly describe all on-site measures considered to avoid impacts to aquatic resources and discuss at least two project alternatives that avoid all impacts to aquatic resources on the site. These alternatives may include alternative site plans, alternate sites, and/or not doing the project. Alternatives should be feasible and prudent (see MN Rules 8420.0520 Subp. 2 C). Applicants are encouraged to attach drawings and plans to support their analysis:

Please reference the attached wetland permit application narrative.

**Minimization.** Both the CWA and the WCA require that all unavoidable impacts to aquatic resources be minimized to the greatest extent practicable. Discuss all features of the proposed project that have been modified to minimize the impacts to water resources (see MN Rules 8420.0520 Subp. 4):

Please reference the attached wetland permit application narrative.

**Off-Site Alternatives.** An off-site alternatives analysis is not required for all permit applications. If you know that your proposal will require an individual permit (standard permit or letter of permission) from the U.S. Army Corps of Engineers, you may be required to provide an off-site alternatives analysis. The alternatives analysis is not required for a complete application but must be provided during the review process in order for the Corps to complete the evaluation of your application and reach a final decision. Applicants with questions about when an off-site alternatives analysis is required should contact their Corps Project Manager.

N/A

## Attachment D

### Replacement/Compensatory Mitigation

Complete this part *if* your application involves wetland replacement/compensatory mitigation not associated with the local road wetland replacement program. Applicants should consult Corps mitigation guidelines and WCA rules for requirements.

**Replacement/Compensatory Mitigation via Wetland Banking.** Complete this section if you are proposing to use credits from an existing wetland bank (with an account number in the State wetland banking system) for all or part of your replacement/compensatory mitigation requirements.

Wetland Bank Account #	County	Major Watershed #	Bank Service Area #	Credit Type (if applicable)	Number of Credits
170	Ramsey	20	7	Type 4	0.3514

Applicants should attach documentation indicating that they have contacted the wetland bank account owner and reached at least a tentative agreement to utilize the identified credits for the project. This documentation could be a signed purchase agreement, signed application for withdrawal of credits or some other correspondence indicating an agreement between the applicant and the bank owner. *However, applicants are advised not to enter into a binding agreement to purchase credits until the mitigation plan is approved by the Corps and LGU.*

**Project-Specific Replacement/Permittee Responsible Mitigation.** Complete this section if you are proposing to pursue actions (restoration, creation, preservation, etc.) to generate wetland replacement/compensatory mitigation credits for this proposed project.

WCA Action Eligible for Credit <sup>1</sup>	Corps Mitigation Compensation Technique <sup>2</sup>	Acres	Credit % Requested	Credits Anticipated <sup>3</sup>	County	Major Watershed #	Bank Service Area #

<sup>1</sup>Refer to the name and subpart number in MN Rule 8420.0526.

<sup>2</sup>Refer to the technique listed in *St. Paul District Policy for Wetland Compensatory Mitigation in Minnesota*.

<sup>3</sup>If WCA and Corps crediting differs, then enter both numbers and distinguish which is Corps and which is WCA.

Explain how each proposed action or technique will be completed (e.g. wetland hydrology will be restored by breaking the tile.....) and how the proposal meets the crediting criteria associated with it. Applicants should refer to the Corps mitigation policy language, WCA rule language, and all associated Corps and WCA guidance related to the action or technique:

Attach a site location map, soils map, recent aerial photograph, and any other maps to show the location and other relevant features of each wetland replacement/mitigation site. Discuss in detail existing vegetation, existing landscape features, land use (on and surrounding the site), existing soils, drainage systems (if present), and water sources and movement. Include a topographic map showing key features related to hydrology and water flow (inlets, outlets, ditches, pumps, etc.):

Attach a map of the existing aquatic resources, associated delineation report, and any documentation of regulatory review or approval. Discuss as necessary:

For actions involving construction activities, attach construction plans and specifications with all relevant details. Discuss and provide documentation of a hydrologic and hydraulic analysis of the site to define existing conditions, predict project outcomes, identify specific project performance standards and avoid adverse offsite impacts. Plans and specifications should be prepared by a licensed engineer following standard engineering practices. Discuss anticipated construction sequence and timing:

For projects involving vegetation restoration, provide a vegetation establishment plan that includes information on site preparation, seed mixes and plant materials, seeding/planting plan (attach seeding/planting zone map), planting/seeding methods, vegetation maintenance, and an anticipated schedule of activities:

For projects involving construction or vegetation restoration, identify and discuss goals and specific outcomes that can be determined for credit allocation. Provide a proposed credit allocation table tied to outcomes:

Provide a five-year monitoring plan to address project outcomes and credit allocation:

Discuss and provide evidence of ownership or rights to conduct wetland replacement/mitigation on each site:

Quantify all proposed wetland credits and compare to wetland impacts to identify a proposed wetland replacement ratio. Discuss how this replacement ratio is consistent with Corps and WCA requirements:

By signature below, the applicant attests to the following (only required if application involves project-specific/permittee responsible replacement):

- All proposed replacement wetlands were not:
  - Previously restored or created under a prior approved replacement plan or permit
  - Drained or filled under an exemption during the previous 10 years
  - Restored with financial assistance from public conservation programs
  - Restored using private funds, other than landowner funds, unless the funds are paid back with interest to the individual or organization that funded the restoration and the individual or organization notifies the local government unit in writing that the restored wetland may be considered for replacement.
- The wetland will be replaced before or concurrent with the actual draining or filling of a wetland.
- An irrevocable bank letter of credit, performance bond, or other acceptable security will be provided to guarantee successful completion of the wetland replacement.
- Within 30 days of either receiving approval of this application or beginning work on the project, I will record the Declaration of Restrictions and Covenants on the deed for the property on which the replacement wetland(s) will be located and submit proof of such recording to the LGU and the Corps.

Applicant or Representative:

Title:

Signature: \_\_\_\_\_

Date:

### Applicant Landowner Information

Name: <b>Laura / Neal smith</b>
Address of property where project will be implemented: <b>2205 Randy Ave</b>
City, State, Zip: <b>White Bear Lake, MN, 55110</b>
Phone: <b>651-407-7010</b>
Email address: <b>ftpt_m0m@yahoo.com</b>

### Grant Specifics

ESTIMATED TOTAL COST OF YOUR PROJECT:

**\$ 1,120**

AMOUNT OF GRANT REQUESTED:  
(\$750 MAXIMUM)

**\$ 840**

(\$1,000 Maximum if within Targeted Priority Zone)

*2/5/21*

WHEN DO YOU PLAN TO COMPLETE YOUR PROJECT?

*Yes, THP2-8* **Oct '21/May '22**

PROJECT TYPE:

Raingarden

Native Restoration/Pollinator Planting

Turf Replacement

Other

If other, please describe proposed project:

### Project Background

Describe your property: Does your property connect to a lake, stream, ditch, or wetland in VLAWMO? What is the purpose of your project?

**See attached**

Describe how your project will support the goals of the Soil Health Grant Program (see guidance page for more information). Does your proposed project directly reduce, capture, or treat stormwater?

**See attached**

Please briefly describe anticipated maintenance activities of your project:

See attached

### Project Specifications

In order to determine the water quality benefit of your project (amount of stormwater and pollutants captured), specific information is required for VLAWMO staff to perform the calculations. If you are working with a professional landscaper, they should be able to provide you with this information.

TOTAL PROPERTY AREA  
(Acres):

10,336 sq ft

TOTAL PROJECT  
SIZE (SQ.FT.):

3,150 sq ft

IMPERVIOUS AREA  
DRAINING TO PROJECT  
(SQ.FT.):

\_\_\_\_\_

PERVIOUS AREA  
DRAINING TO  
PROJECT (SQ.FT.):

\_\_\_\_\_

IF YOUR PROJECT **INCLUDES INFILTRATION**, PLEASE PROVIDE THE FOLLOWING INFORMATION

SOIL INFILTRATION  
RATE (INCHES/HR):

\_\_\_\_\_

DEPTH OF RAINGARDEN BASIN  
(INCHES):

\_\_\_\_\_

### Additional Required Attachments

To complete your application, please include:

- Detailed drawing or plan of the proposed project, drafted by either the landowner or a contractor.
- Detailed project budget estimate with clear cost and material breakouts that equate to your total project cost estimate.

**\*\*This information, along with the application, may be scanned and emailed to VLAWMO GIS Watershed Technician, Tyler Thompson (tyler.thompson@vlawmo.org\*\***

Opting in to the education incentives would allow reapplying for Soil Health Grant funds the consecutive year after being awarded grant funding. Incentives entail committing to three of the following four options for 2 years:

1. Documenting seasonal photos, organizing them, and sending them to VLAWMO via jump drive or email, to show the progress and growth of the project.
2. Provide a neighborhood spotlight article featuring a photo of participants posing in front of the project, as well as a mini-interview 1-2 years after the project was installed to speak to their experience in install, maintenance, any problems, and enjoyment for others to learn from.
3. Participate as a host site for VLAWMO's annual neighborhood BMP tour working in conjunction with VLAWMO Master Water Stewards.
4. Help coordinate VLAWMO's annual native plant swap with Master Water Stewards. This entails saving seeds, dividing and potting mature plants for sharing with other residents or public raingardens, or taking plants from the plant swap for the home project as needed.

VLAWMO Soil Health Grant Operations & Maintenance Requirements:

Projects must be maintained for a minimum of 5 years, and applicants must be willing to participate in VLAWMO's Education & Outreach and project sharing efforts. The applicant is responsible for Project maintenance items referenced in the Soil Health Grant Guidance document for a 5 year period, after Project completion. VLAWMO is not responsible for completing maintenance activities, but will assist with staff guidance. A project may be visited and inspected by VLAWMO staff during the 5 year maintenance period. Please inform VLAWMO if you move within the 5 years of project implementation so we may provide the new owners with information and guidance on Project.

Are you willing to commit to the following Soil Health Grant requirements:

- **Maintain the project for at least 5 years after its implementation?**  YES  NO
- **Participate in VLAWMO's outreach and project sharing efforts?**  YES  NO
- **Do you understand that your Project may be visited and Inspected by a VLAWMO representative during the 5 year Project maintenance period?**  YES  NO

Print Name Laura Smith

Signature  Date 2-3-21



### Property description:

Back yard. (2205 Randy Ave, WBL)

Slopes gently from South to North.

The purpose of this project is to create a low maintenance yard; ~~free~~ with little to no chemical/fertilizer additives, that is environmentally and habitat friendly.

### Project Support:

This project will ~~to~~ use native plants to encourage the health and well being of a variety of pollinators and wild life.

### ~~Maintenance:~~

With the use of low/no mow seed mix in addition to pollinator <sup>ground cover</sup> plants the goal is to mow as little as possible and use no chemicals. This will improve ~~chemical~~ ground water quality by eliminating chemical run off and promote a better natural water filtration. There will be little to no additional water of the lawn

needed. Low/no mow adds  
to less resources used for maintenance.

### Maintenance:

The goal in this project is to  
have little maintenance.

We plan to up keep the lawn by  
basic plant care/pruning.

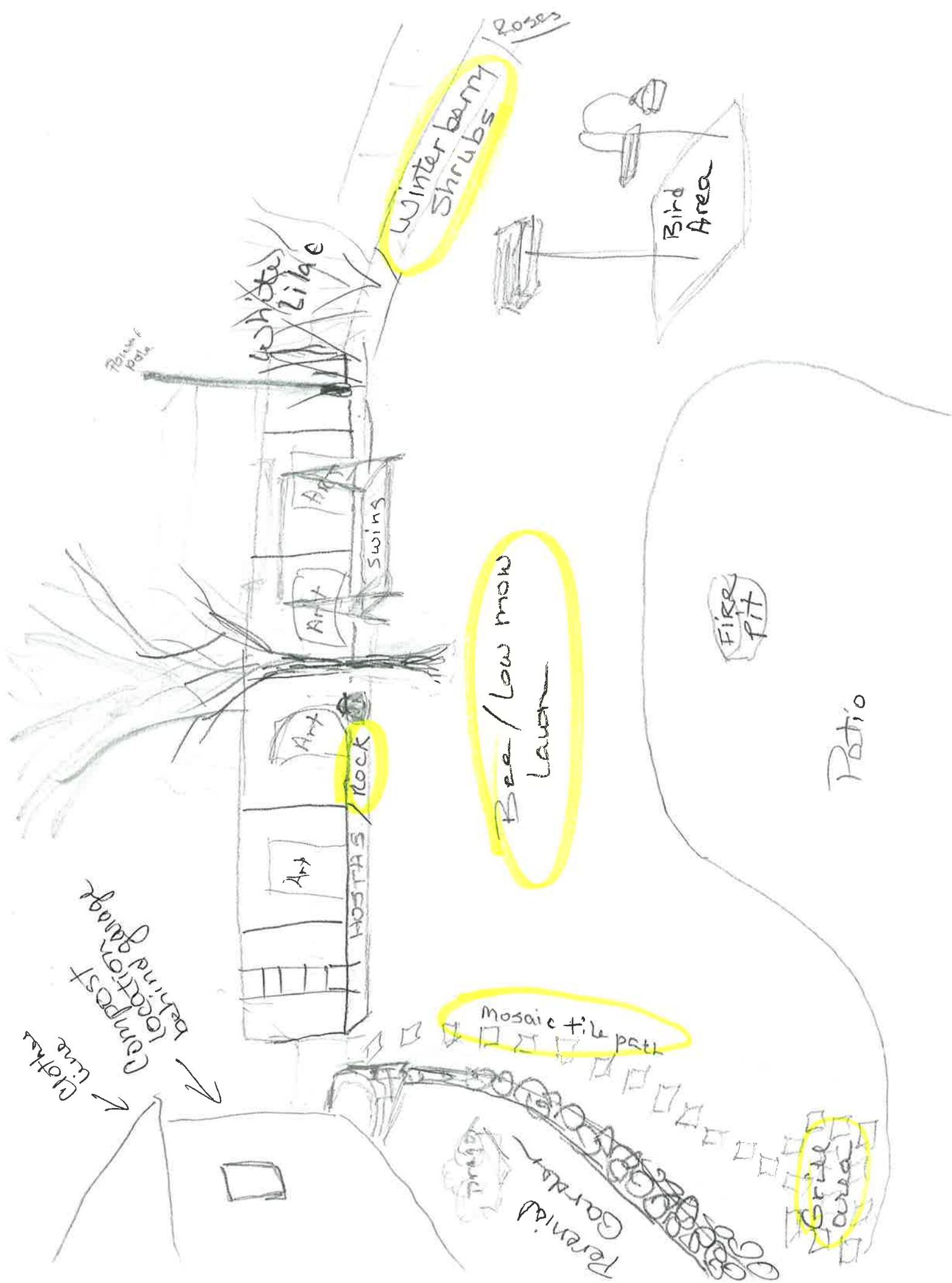
Reseeding and manual weeding  
and pruning will take place when  
needed.

# Cost Est.

Removal of soil - sod cutter rental - <sup>24 hrs</sup> WB rental	125
Skidder rental - 8 hrs @ WB Rental	300
Seed / ground cover - Mother Earth Gardens: Lawn Poll, mix	<del>200</del> 300
Winter berry shrubs - M.E.G - Q of 5	<del>140</del> 180
Rock	75
Sand - clay soil amendment	40
Delivery	110

# ~~990~~

\$1,120 ~~8~~  
2/5/21



Winter berry Shrubs

Bee / Low mow Lawn

Rock

Mosaic tile path

Grill

Patio

Fire Pit

Bird Area

Swins

White Lilac

Roses

Art

Art

Art

Art

HOSTAS

Porch

Compost location  
behind garage

clothes line

Perennial Garden

January 2021

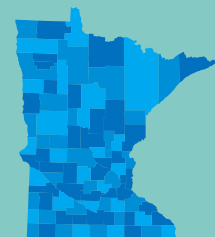
# Vadnais Lake Area Watershed Management Organization Nine Key Element Document for Birch, Tamarack, and Wilkinson Lakes

This document provides a summary of the EPA's nine key elements information for Birch, Tamarack, and Wilkinson Lakes.



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## **Contributors**

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Management Organization

## **Photo credit**

Dawn Tanner

## **Minnesota Pollution Control Agency**

520 Lafayette Road North | Saint Paul, MN 55155-4194 |

651-296-6300 | 800-657-3864 | Or use your preferred relay service. | [Info.pca@state.mn.us](mailto:Info.pca@state.mn.us)

This report is available in alternative formats upon request, and online at [www.pca.state.mn.us](http://www.pca.state.mn.us).

**Document number:** xxx-xx-xxxxx

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# Executive summary

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The Vadnais Lake Area Water Management Organization's (VLAWMO) mission is "to protect and enhance the water and natural resources within the watershed through water quality monitoring, education and outreach projects, wetland protection, and water quality enhancement projects and programs." (VLAWMO, 2020, p. 6).

The VLWAMO has a long history of working with its member cities, watershed citizens, and many other partners in protecting and enhancing the water resources within the watershed. The VLAWMO was formed in 1983 using a Joint Powers Agreement (JPA) under the authority of Minn. Stat. chs. 471.59 and 103B.201. The watershed encompasses the City of North Oaks, along with portion of the Cities of White Bear Lake, Gem Lake, Vadnais Heights, Lino Lakes, and White Bear Township, and includes 17 lakes, 1 creek, and over 1,000 wetlands. The history of watershed planning for VLAWMO extends back to water management planning required for watershed management organizations in the seven-county Twin Cities metropolitan area by the Minnesota Legislature in 1987. Water management organizations are required to develop a Plan at least every 10 years under Minn. Stat. ch. 103B.231 and Minn. R. ch. 8410. The plans must contain information which describes the natural resources within the watershed, establish measurable goals that address priority issues, devise and implement strategies to reach the goals, and a procedure to evaluate progress. The preferred approach by the locals for planning is to include what can be reasonably accomplished in 10 years.

The VLAWMO Comprehensive Watershed Management Plan (Plan) is the fourth generation of their Plan and describes how VLAWMO will manage activities in the watershed from the years 2017 through 2026. The Plan describes the natural resources and core activities of the watershed, the issues and goals that VLAWMO will focus on for the next ten years, and the implementation strategies and subwatershed activities that will be utilized to meet those goals. The VLAWMO has also conducted specific studies, including retrofit analysis and sustained lake management plans, for Wilkinson, Birch, and Tamarack Lakes.

Development of a nine key element (NKE) plan in conjunction with the existing Plan presented a complex challenge to mesh all of the varied programmatic requirements. Water and watershed plans in Minnesota are generally developed on a 10-year timeline with specific activities and projects that will be reasonably achieved within the current funding and capacity of the watersheds. The EPA requires that the 10-year timeline identify and adaptively work to implement activities and projects that will be required to meet the reductions needed to meet water quality standards. Part of the NKE plan is to work to identify and adaptively implement means to achieve these goals.

The Plan, along with individual Sustainable Lake Management Plans (SLMP), use an adaptive management approach. The Plan and SLMPs, Ramsey County retrofit reports, and feasibility studies, combined with the documentation described in this memorandum, fully provide the NKEs identified by EPA as critical in a watershed plan for achieving improvements in water quality for the three lakes. This NKE document summarizes the details required to meet the NKEs and the VLAWMO planning processes. The NKE plan (in collaboration with VLAWMO's other reports and documentation) is addressing pollutants, sources and solutions in the watershed. For the purposes of the Section 319 grant program, only practices and activities eligible for funding under the EPA 2014 Section 319 program guidance and Minnesota's Nonpoint Source Pollution Program Management Plan (NPSPPMP) are eligible for Section 319 funding. All match activities must be eligible for Section 319 funding, except where noted in the NPSPPMP.



While it may not appear to be a significant difference, in practice it becomes difficult to mesh the Watershed's requirements under State statute for watershed planning with the NKE. It is the goal of the VLAWMO and the MPCA to successfully marry these two approaches by focusing on Birch, Tamarack, and Wilkinson subwatersheds within the Vadnais Lake HUC12. It is the desire and intent of the WMO to achieve the measurable outputs described in this document and the spreadsheet. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.

In preparation for this grant program, the VLAWMO and partners conducted specific feasibility studies focused on the Wilkinson subwatershed to further identify and design projects that would be pursued. The VLAWMO engineers conducted additional analysis in the Wilkinson subwatershed during 2020 in preparation for this grant program to further analyze the feasibility of achieving goals specified in the Plan. Small, disconnected projects are unlikely to make a difference to water quality in the lake. A large, connected network of projects is necessary in this largely developed area with substantial habitat buffers and designated protected areas. Working with the major landowner in the area, the North Oaks Company (NOC), is crucial to make measurable differences and work to achieve the goals set out in the Plan. To build the framework for these projects, an additional feasibility study was undertaken by North Oaks Company in late 2020, in collaboration with VLAWMO, to identify large, connected projects focused on NOC-owned land. The large, connected projects have been identified and designed by Barr Engineering as part of this feasibility study. Results of that work are recently available (Dec. 2020), and development for a phasing plan for those projects is currently underway. This connected suite of projects, forming a stormwater spine, is intended to be a major focus for project implementation for at least the initial grant rounds.

# Water quality condition summary

The Plan and SLMPs are extensive plans that are actively used by the VLAWMO. These documents include specific plans for each lake and subwatershed. Birch Lake is assessed as not being impaired and should be managed for protection. Tamarack and Wilkinson Lakes are listed as impaired for eutrophication (high concentrations of phosphorus) (Table 1). A TMDL was completed for Wilkinson Lake in 2014. A TMDL is scheduled for Tamarack Lake in 2024.

**Table 1. Impairment status and needed reductions for Birch, Tamarack, and Wilkinson Lakes.**

Waterbody	Impairment	Action	Reduction (lbs/yr)	% reduction
Birch Lake	No impairment	Protect	25	--
Tamarack Lake	Nutrient impairment	Restore	~40	--
Wilkinson Lake	Nutrient impairment	Restore	544.9	63

Birch and Tamarack Lakes are upstream of Wilkinson Lake. Wilkinson Lake outlets to Deep Lake and the rest of the Vadnais Chain of Lakes. Gilfillan and Black Lakes are also located in the Wilkinson Lake subwatershed, but are not included as part of the NKE focus at this time. Gilfillan Lake is listed as impaired for nutrients, but it is usually a land-locked basin that does not have an outflow that will affect Wilkinson Lake. Black Lake is a very small lake that is surrounded by thick wetland vegetation and is not impaired. As such, VLAWMO will address the management of Birch, Tamarack, and Wilkinson in the NKE document for the Section 319 Small Watershed Focus Program and continue management of Gilfillan and Black Lakes through the VLAWMO Plan and the individual SLMPs.

The shallow lake eutrophication criteria for the North Central Hardwood Forest ecoregion are for summer average concentrations to be less than 60 µg/L for TP and 20 µg/L for Chl-a and Secchi transparency to be greater than 1 meter. Table 2 provides the summary of the water quality data for the three lakes. A more detailed graph and trends over time is shown in the specific subwatershed sections of this document for each lake.

**Table 2. Summary of water quality data from 2000-2019, for Wilkinson, Birch, and Tamarack Lakes**

Lake	TP (µg/L)	Chl A (mg/m <sup>3</sup> )	Secchi (m)	Chloride (mg/l) (2011-2019)
Birch Lake	30	5	2.2	93
Tamarack Lake (500)	143	70	.5	38
Wilkinson Lake 1100 acres	126	22	1.3	56

# Implementation strategies

The implementation strategies, schedules, goals, milestones, and measurement criteria are described in the following tables for each of the Lakesheds. The estimated reductions will meet the estimated needed reduction to either restore (Tamarack and Wilkinson Lakes) or improve the trend for protection (Birch Lake). These tables are intended to illustrate meeting of Elements b., c., f., g., and h. Note: It is the desire and intent of the WMO to achieve the measurable outputs listed below. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.

**Table 3. Wilkinson Lake implementation activity, measure, assessment, status, schedule, and estimated load reductions**

Implementation Activity	Goal	Milestone	Assessment	2021-2023	2024-2026	2027-2029	2030-2032	Estimated Load Reduction (P) lbs/yr	Estimated Load Reduction (TSS) lbs/yr
<b>Current projects underway/ongoing</b>									
Ongoing biweekly monitoring and reporting (May-Sept)	Gain an understanding of water quality conditions and trends for Wilkinson Lake	EQuIS/MPCA reporting completed on time annually; Annual monitoring report included on website and provided to BWSR	# data entered in EQuIS annually # annual reports filed with BWSR/MPCA # reports posted on website	X	X	X	X		
Digital communications and social media outreach	Develop meaningful relationships with community and further their understanding of water quality	Page views per year, new page likes per year, email opens per year	# website views annually # social media page likes annually # email opens/yr	X	X	X	X		
Large BMP (stormwater spine) in development with North Oaks Company and Barr Engineering Step 1: Completion of feasibility and stakeholder input for proposed regional project	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Wilkinson Lake	Feasibility study completed Input from stakeholders gathered, understood and used to inform the study	# stakeholders participated Feasibility study	X					
Invasive species control efforts: Purple loosestrife	Establish appropriate native plants and mitigate the presence of invasive species	Invasive species extent documented and reduced, Purple loosestrife mapped, analysis/comparison of	# acres of purple loosestrife reduced # beetles introduced # maps	X	X				

Implementation Activity	Goal	Milestone	Assessment	2021-2023	2024-2026	2027-2029	2030-2032	Estimated Load Reduction (P) lbs/yr	Estimated Load Reduction (TSS) lbs/yr
		maps							
<b>Future planned projects</b>									
Invasive species control efforts: Yellow iris, Eurasian watermilfoil, Curly-leaf pondweed	Mitigate the presence of invasive species and reduce nutrient contribution by AIS to the lake	Invasive species extent documented and reduced for Yellow iris Eurasian watermilfoil Curly-leaf pondweed	# species reduced # maps # estimated pounds TP reduced		X	X	X	20	
Subwatershed neighborhood raingarden projects	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Wilkinson Lake	2-3 completed raingardens over the full grant program timeframe through cost share projects annually	# raingardens # cost share projects # estimated pounds TP reduced	X	X	X	X	1.5	
BMP from 2020 feasibility study focused on upgrading storm ponds in WB Township and NO	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Wilkinson Lake	1-2 pond upgrades constructed as identified from retrofit analysis/report	# ponds upgraded # estimated pounds TP reduced		X	X	X	1.5	

Constructed wetland project as identified in 2020 feasibility study	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Wilkinson Lake	Build constructed wetland as identified from retrofit analysis/report and subsequently enhanced in footprint if amenable with North Oaks Company	# acres wetland # acres treated # estimated pounds TP reduced	X	X	X		1.5	
Large BMP (possible stream meander) in development with North Oaks Company and Barr Engineering: This would require a separate feasibility phase to go forward.	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Wilkinson Lake	1 large meander constructed in partnership with North Oaks Company and others	# feet of meander constructed # estimated pounds TP reduced			X	X	429	
Alum treatment feasibility to quantify internal load and dosing study	Decrease internal phosphorus load to decrease lake water TP concentrations and decreased algal blooms	Feasibility study completed and dosing calculated	# pounds alum needed # estimated pounds TP reduction			X	X		
Alum treatment to address internal load	Decrease internal phosphorus load to decrease lake water TP concentrations and decreased algal blooms	Alum treatment applied	# alum applications # pounds alum applied # estimated pounds TP reduced			X	X	35	
Bathymetry & vegetation surveys	Decrease internal phosphorus load to decrease lake water TP concentrations and decreased algal blooms	Lake contours included in VLAWMO/ESRI online GIS resource; veg survey report included on Wilkinson Lake page on VLAWMO website	Schedule created # bathymetry updates # vegetation survey updates		X				
Barr Project: Detailed erosion inventory and targeted erosion control and bank stabilization along agricultural ditch on North Oaks Company/MLT easement	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Wilkinson Lake	Erosion survey of entire ditch length; Efforts to reduce erosion completed along the ditch corridor	Survey completed # (and length or volume - ?) of sites restored # estimated pounds TP reduced			X	X	7	19,000

Barr Project: "Treatment Spine" of a series of wetlands along the agricultural ditch on North Oaks Company/MLT easement that removes pollutants being transported through the ditch flows	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Wilkinson Lake	Phased plan and design and specifications completed, construction completed	# wetlands created # estimated pounds TP reduced	X	X	X	X	42	64,000
Barr Project: Regional filter (i.e. iron-enhanced sand, spent lime, or proprietary device) to treat agricultural ditch flows	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Wilkinson Lake	Design and specifications completed, construction completed	Regional filter installed # estimated pounds TP reduced		X	X	X	8.4	5,000
<b>Completed projects</b>									
Carp control efforts including large fish barrier	Keep internal phosphorus load from increasing and increasing lake water TP concentrations and algal blooms	Carp not detected in fish surveys	# surveys without carp						
Biological monitoring (remote cameras and frog call survey)	Evaluate faunal condition of the watershed landscape	Monitoring complete, reports posted, and maps available for future comparison and evaluation (especially for restoration projects)	# native species Frequency of presence						
Minnesota Land Trust easement for ~900 acres, the largest in the metro area	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Wilkinson Lake	Easement in place	MLT annual site inspection, survey, report						
<b>Total estimated reductions</b>								<b>546</b>	<b>88,000</b>

**Table 4. Birch Lake implementation activity, measure, assessment, status, schedule, and estimated load reductions**

Implementation Activity	Goal	Milestone	Assessment Criteria	2021-2023	2024-2026	2027-2029	2030-2032	Estimated Load Reduction P lbs/yr	Estimated Load Reduction (TSS) lbs/yr
<b>Current/ underway projects</b>									
Ongoing biweekly monitoring and reporting (May-Sept)	Gain an understanding of water quality conditions and trends for Birch Lake	EQuIS/MPCA reporting completed on time annually; Annual monitoring report included on website and provided to BWSR	# data entered in EQuIS annually # annual reports filed with BWSR/MPCA # reports posted on website	X	X	X	X		
Use existing educational materials and/or create materials for homeowners about chloride, raking leaves, and other water friendly yard management techniques	Develop meaningful relationships with community and further their understanding of water quality	Chloride brochure, notice/ad placed in local paper, coordination with member cities to provide information at central locations, training for key employees to reduce salt application, 1 newspaper article or ad per year; 1 webpage on municipality website	# articles # webpage/ municipality website # salt trainings for key employees # coordination events with municipalities	X	X	X	X		
Digital communications and social media outreach	Develop meaningful relationships with community and further their understanding of water quality	Website page views, social media engagement, email newsletter engagement	# website views annually # social media page likes annually # email opens/yr	X	X	X	X		

Implementation Activity	Goal	Milestone	Assessment Criteria	2021-2023	2024-2026	2027-2029	2030-2032	Estimated Load Reduction P lbs/yr	Estimated Load Reduction (TSS) lbs/yr
Subwatershed neighborhood raingarden projects	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Birch Lake to protect from impairment	1-3 completed raingardens through cost share projects annually	# raingardens completed # cost share dollars # estimated pounds TP reduced	X	X	X	X	2	4555
Partner with BLID to reduce Eurasian watermilfoil in areas identified in veg survey/delineation. This would be an extension of a current project. The current project is done by BLID and includes a general harvest, not only focused on invasives	Establish appropriate native plants and mitigate the presence of invasive species to decrease internal P loading	Reduced contribution of organic matter to P loading in the lake; area of Eurasian watermilfoil and hybrid watermilfoil	# acres Eurasian milfoil reduced # pounds hybrid watermilfoil removed # plant surveys # estimated pounds TP reduced	X	X	X	X	10	
<b>Future planned projects</b>									
4th and Otter Lake Road reconstruction incorporating infiltration and/or filtration BMPs Step 1: Completion of feasibility	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Birch Lake	Feasibility study completed	Feasibility/design phase completed		X	X	X		
4th and Otter Lake Road reconstruction incorporating infiltration and/or filtration BMPs Step 2: Upon completion of feasibility study, proceed with implementation of "project"	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Birch Lake	Construction of project, completion of project	Construction of project begun Project completed # estimated pounds TP reduced Maintenance plan in place		X	X	X	4	
Neighborhood retrofit continued implementation (curb-cut raingardens) as identified in Ramsey County SWCD retrofit study (previously completed)	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Birch Lake	Additional raingardens added using VLAWMO cost-share program and stakeholder/City partnerships	# raingardens completed # estimated pounds TP reduced Amount of drainage area treated		X	X	X	3	1000



Implementation Activity	Goal	Milestone	Assessment Criteria	2021-2023	2024-2026	2027-2029	2030-2032	Estimated Load Reduction P lbs/yr	Estimated Load Reduction (TSS) lbs/yr
Rotary Nature Preserve restoration to support improved wetland function	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Birch Lake	Restoration completed and maintenance plan in place	# acres restored wetland # estimated pounds TP reduced		X	X	X		900
<b>Completed projects</b>									
Bathymetry & vegetation surveys	Decrease internal phosphorus load to decrease lake water TP concentrations and decreased algal blooms	Lake contours included in VLAWMO/ESRI online GIS resource; veg survey report included on Birch Lake page on VLAWMO website	Schedule created # bathymetry updates # vegetation survey updates						
Support BLID efforts	Develop meaningful relationships with community and further their understanding of water quality	TEC representation from BLID member and continued collaboration	# BLID activities supported	X	X	X	X		
4th and Otter Lake Road project development and implementation (iron-enhanced sand filter)	Reduce TP loading from stormwater runoff at 4th and Otter Lake Road	1 CIP constructed at location identified from retrofit analysis/report	# maintenance	X	X	X	X	8.1	1245
Shoreline restoration on north shore	Reduce TP loading through erosion control from shoreline erosion activities.	Restoration of 850 acres (150 initial and 700 added) completed and maintenance plan in place	# acres maintained # estimated pounds TP reduced	X	X	X	X	1	2200
Native plantings; restoration underway to support iron-enhanced sand filter	Restore ecological function of the watershed	Restoration completed and maintenance plan in place	# acres maintained	X	X	X	X		45

Implementation Activity	Goal	Milestone	Assessment Criteria	2021-2023	2024-2026	2027-2029	2030-2032	Estimated Load Reduction P lbs/yr	Estimated Load Reduction (TSS) lbs/yr
Picture Post (U.S. Phenology Network) installed and photos utilized to report on phenology	Increase awareness of the native landscape in the watershed	Picture Post installed, digital article published on VLAWMO website, and coordination with other PP sites	# coordination with Picture Post sites	X	X	X	X		
Biological monitoring (remote cameras and frog call survey)	Evaluate faunal condition of the watershed landscape	Monitoring complete, reports posted, and maps available for future comparison and evaluation (especially for restoration projects)	# native species Frequency of presence						
Engage partner on additional street sweeping & chloride management	Reduce TP and chloride loading through street management practices	E&O outreach workshops, and cohost for annual salt symposium	# workshops # salt symposium	X	X	X	X		
<b>Total estimated reductions</b>								<b>28</b>	<b>9,945</b>

**Table 5. Tamarack Lake implementation activity, measure, assessment, status, schedule, and estimated load reductions**

Implementation Activity	Goals	Milestones	Assessment criteria	2021-2023	2024-2026	2027-2029	2030-2032	Estimated Load Reduction (P) lbs/yr	Estimated Load Reduction (TSS) lbs/yr
<b>Current /underway projects</b>									
Ongoing biweekly monitoring and reporting (May-Sept)	Gain an understanding of water quality conditions and trends for Tamarack Lake	EQuIS/MPCA reporting completed on time annually; Annual monitoring report included on website and provided to BWSR	# data entered in EQuIS annually # annual reports filed with BWSR/MPCA # reports posted on website	X	X	X	X		
Subwatershed neighborhood raingarden projects, including a large raingarden and pervious pavers at Tamarack Nature Center	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Tamarack Lake	4 completed raingardens over the grant program through cost-share projects	# raingardens completed # cost share funds # estimated pounds TP reduced	X	X	X	X	6	1017
Digital communications and social media outreach	Develop meaningful relationships with community and further their understanding of water quality	Website page views, social media engagement, email newsletter engagement	# website views annually # social media page likes annually # email opens/yr	X	X	X	X		
Woodland restoration (underway by RCSWCD with CPL grant, 18 acres)	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Tamarack Lake	18 acres of restoration completed	# acres restored # maintenance plan	X					

Implementation Activity	Goals	Milestones	Assessment criteria	2021-2023	2024-2026	2027-2029	2030-2032	Estimated Load Reduction (P) lbs/yr	Estimated Load Reduction (TSS) lbs/yr
Wetland restoration project at Teal Pond in partnership with RCSWCD (in progress ~3.37 acres)	Reduce phosphorus loading from the watershed and decreasing TP and TSS concentrations in Tamarack Lake	3.37 acres of restoration complete	# acres wetland restored # maintenance plan # estimated pounds TP reduced	X				1	800
<b>Future/planned project</b>									
1-3 CIP projects constructed		1-3 CIP constructed at location identified from retrofit analysis/report. Projects include curb-cut raingardens of 3 different possible types (simple bioretention, moderately complex bioretention, and complex bioretention).		X	X	X	X	7	
Alum treatment feasibility to quantify internal load and dosing study	Decrease internal phosphorus load to decrease lake water TP concentrations and decreased algal blooms	Feasibility study completed and dosing calculated	Feasibility and plan for alum application		X	X			
Alum treatment to address internal load	Decrease internal phosphorus load to decrease lake water TP concentrations and decreased algal blooms	Alum treatment applied	# alum treatments applied # estimated pounds TP reduced			X	X	28	
Bathymetry & vegetation surveys	Increase understanding of internal loading of Tamarack Lake	Lake contours included in VLAWMO/ESRI online GIS resource; veg survey report included on Tamarack Lake page on VLAWMO website	# survey updates	X					
<b>Completed projects</b>									

Implementation Activity	Goals	Milestones	Assessment criteria	2021-2023	2024-2026	2027-2029	2030-2032	Estimated Load Reduction (P) lbs/yr	Estimated Load Reduction (TSS) lbs/yr
Prairie restoration (done by Tamarack and RCSWCD, previously completed, ~80 acres)	Improve habitat for wildlife	Restoration of ~80 acres completed and maintenance is ongoing	# acres restored						
Floating island experimental site and educational signage	Evaluated feasibility of floating islands for nutrient treatment of waterbodies	Floating island in place, monitoring conducted by UMN scientist and students, reporting complete, load reductions reported.	Report completed Reductions estimated						
Biological monitoring (remote cameras and frog call survey)	Evaluate faunal condition of the watershed landscape	Monitoring complete, reports posted, and maps available for future comparison and evaluation (especially for restoration projects)	# native species Frequency of presence						
<b>Total estimated reductions</b>								<b>42</b>	<b>1,817</b>

## Element a. Sources identified

*An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed-based plan (and to achieve any other watershed goals identified in the watershed-based plan), as discussed in item (b) immediately below. Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed (e.g., X numbers of dairy cattle feedlots needing upgrading, including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded streambank needing remediation).*

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### Wilkinson Lake

The sources of phosphorus to Wilkinson Lake are shown in Table 6. The load estimates represent the baseline phosphorus loads for Wilkinson Lake when the TMDL was completed. As explained in Element b, the loads are likely overestimated because the subwatershed size used in the TMDL was larger than is currently understood to be accurate and because natural wetlands and ponds were not included in the modelling.

**Table 6. Existing (baseline) TP loads and TMDL by source for Wilkinson Lake (adapted from Wenck, 2014, p. 6-12)**

Source	Existing TP Load		TP TMDL		Load Reduction	
	(lbs/year)	(lbs/day)	(lbs/year)	(lbs/day)	(lbs/year)	%
<b>Drainage Areas</b>	740.4	2.027	179.4	0.491	561.0	76%
<b>Atmosphere</b>	23.3	0.064	23.3	0.064	0.0	0%
<b>Groundwater</b>	1.4	0.004	1.4	0.004	0.0	0%
<b>Internal Load</b>	51.8	0.142	51.8	0.142	0.0	0%
<b>Upstream Lakes</b>	49.8	0.136	49.8	0.136	0.0	0%
<b>MOS</b>			16.1	0.044		
<b>TOTAL</b>	<b>866.7</b>	<b>2.373</b>	<b>321.8</b>	<b>0.881</b>	<b>544.9</b>	<b>63%</b>

The estimated phosphorus loads from the drainage areas represents loads from the watershed area downstream of Birch, Tamarack, and Black Lakes and upstream of Wilkinson Lake given that the lakes act as phosphorus sinks that discharge a small amount of phosphorus to the streams leading to Wilkinson Lake.

The primary sources within this area are lawn runoff and wetland discharges. The area is comprised of single family, residential homes with relatively large lots; 37% wetlands, 10% impervious areas, and 24% of parks. The estimated phosphorus loading by land uses are also listed.

**Table 7. Sources of pollutant loading by land use in the Wilkinson Lake Subwatershed. The subcatchment area is 1,112 acres.**

Land use	Acres	% of subwatershed	Estimated P load	% of drainage area P load
Wetlands (includes Wilkinson open water basin)	414	37%	--	--
Impervious area	114	10%	210.8 lbs	28.46%
Parks (1 park/ recreational area and 1 preserve area)	264	24%	45.2 lbs	6.10%

Loading estimates were calculated using VLAWMO subwatershed, Metropolitan Council 2010 land use, Ramsey County impervious surface, and 2019-updated NWI GIS data. Estimate P loadings were calculated using the VLAWMO TMDL, MIDS, and the MPCA TMDL loading estimator. P exports were not available for wetlands.

The subwatershed area consists of primarily large residential parcels. Most areas have lower density development with buffers along wetlands and waterways. There are some areas of higher density development, but these are still primarily single-family homes. Large lawns contribute nutrient loading. Stormwater also flows into Wilkinson from upstream sources in White Bear Township and the City of White Bear Lake. These areas contain higher-density development. Consequently, continued efforts to improve stormwater treatment into Tamarack and Birch Lakes will also be beneficial to Wilkinson Lake.

## Birch Lake

The source of TP for Birch Lake is primarily runoff from the subwatershed. Many TP sources are anthropogenic, including waste (primarily animal/avian), soil erosion, SSTS, and stormwater runoff (Birch Lake SLMP). The contribution by the three catchments is summarized in Table 8.

**Table 8. Contribution by catchment in the Birch Lake Subwatershed (Tanner & Thompson, 2020)**

Drainage Area	Total TP (lbs)/ Year	Acres	TP (lbs)/Acre/Year
South	81	111	0.73
West	146	202	0.72
East	110	179	0.61

Urban areas were broken down into example neighborhoodsheds in the WinSLAMM model to account



for the impervious source areas as illustrated in Figure 1.

**Figure 1. An example a neighborhoodshed and the source areas that are entered into WinSLAMM (RCD, 2013, p. 7)**

Critical source and loading areas will be discussed in Section Element c.

**Table 9. Sources of pollutant loading by land use in the Birch Lake Subwatershed. The subcatchment area is 575 acres.**

Land use	Acres	% of subwatershed	Estimated P load	% of drainage area P load
Wetlands (includes Birch open water basin)	147	26%	--	--
Impervious area	177	31%	327.3 lbs	66.54%
Parks (2 parks, recreational or preserve area)	16	3%	2.8 lbs	0.57%

Loading estimates were calculated using VLAWMO subwatershed, Metropolitan Council 2010 land use, Ramsey County impervious surface, and 2019-updated NWI GIS data. Estimate P loadings were calculated using MIDS and the MPCA TMDL loading estimator, with calculations using the 2009 Birch Lake Retrofit Study using WinSLAMM modeling. P exports were not available for wetlands.

## Tamarack Lake

**Table 10. Sources of pollutant loading by land use in the Tamarack Lake Subwatershed. The subcatchment area is 1231 acres.**

Land use	Acres	% of subwatershed	Estimated P load	% of drainage area P load
Wetlands (includes open water)	387	31%	--	--
Impervious area	211	17%	390.1 lbs	81.83%
Parks (5 parks, recreational or preserve area)	504	41%	78.8lbs	16.53%

Loading estimates were calculated using VLAWMO subwatershed, Metropolitan Council 2010 land use, Ramsey County impervious surface, and 2019-updated NWI GIS data. Estimate P loadings were calculated using MIDS and the MPCA TMDL loading estimator. MIDS used to calculate P loading for subwatershed at 476.7 lbs per year. P exports were not available for wetlands.



## Element b. Estimated reductions

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*An estimate of the load reductions expected for the management measures described under paragraph (c) below (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time). Estimates should be provided at the same level as in item (a) above (e.g., the total load reduction expected for dairy cattle feedlots; row crops; or eroded stream banks).*

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### Wilkinson Lake

Wilkinson Lake has a TMDL that was written in 2014. The TMDL is summarized in Table 1. The estimated load reductions planned and recent implementation for Wilkinson Lake are summarized in Table 3. With the load reductions from the activities planned in the Wilkinson Lake Watershed, it is expected that the VLAWMO has identified and will adaptively work to implement projects described. Table 3 shows identified projects. If all were successfully implemented, these projects together have the potential to meet the reductions needed as identified in the TMDL in 10 years.

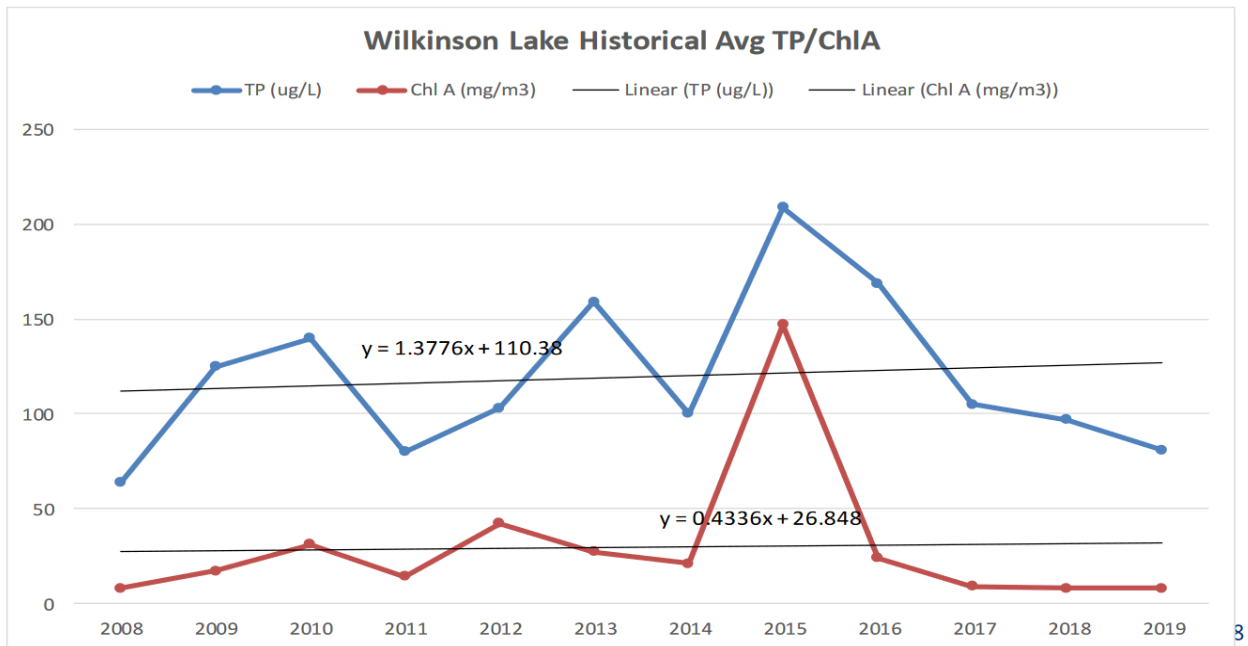
However, the VLAWMO, through analysis completed by their engineering team, has evidence that the load reduction identified in the TMDL is an overestimate compared to what will be needed to meet the requirements. The TMDL reduction that was determined to require a 544 lbs/yr reduction; however, the TMDL was determined using a much larger subwatershed of almost 3,000 acres. The VLAWMO has delineation of the subwatershed that is approximately 1,100 acres. At this point, there is not a firm reduced number for the number of pounds as a required reduction. The modelling done for the TMDL also did not simulate any natural ponds or wetlands (wetland d) and their treatment of water in this system. There are many factors that would influence this load and the expected reductions planned in Table 3 will address the reduction determined by the TMDL.

To prepare for the projects that will be implemented with support from the 319 program, the VLAWMO has worked with partners including the primary landowners in North Oaks, the North Oaks Company (NOC) and others: White Bear Lake Township, Lino Lakes, Ramsey County, and Anoka County. Two feasibility studies were conducted, one that identified smaller projects that could be implemented alone but gave fairly low reductions. That feasibility was conducted in partnership with Ramsey County and completed by SEH engineering in 2020. A second feasibility was conducted by NOC with Barr Engineering. That project identified large and connected networks of projects with a focus on land owned by NOC. NOC is dedicated to improving water quality in Wilkinson Lake and prepared to work with the VLAWMO and others to implement projects that have been identified. At this time, a stormwater spine is being pursued by partners with a phasing plan currently in development to meet the timeframe and intervals in the 319 grant program.

Monitoring is essential in understanding the status of the lake and establishing progress over time. Monitoring for Wilkinson Lake has been ongoing since 1998 and reported to the MPCA. Seasonal average TP (micrograms/L) has fluctuated over the years. TP has ranged from a low of 38 (2000) to a high of 299 (2001). In 2019, the average was 81. A summary graph of the trends through time is shown

below. This graph was taken from the annual monitoring report that is prepared by VLAWMO and available on the VLAWMO website.

**Figure 2. Phosphorus and chlorophyll a trends through time in Wilkinson Lake.** Values have fluctuated over time with varying water levels. Current levels are lower than when the TMDL was prepared and load reductions were established for the lake.



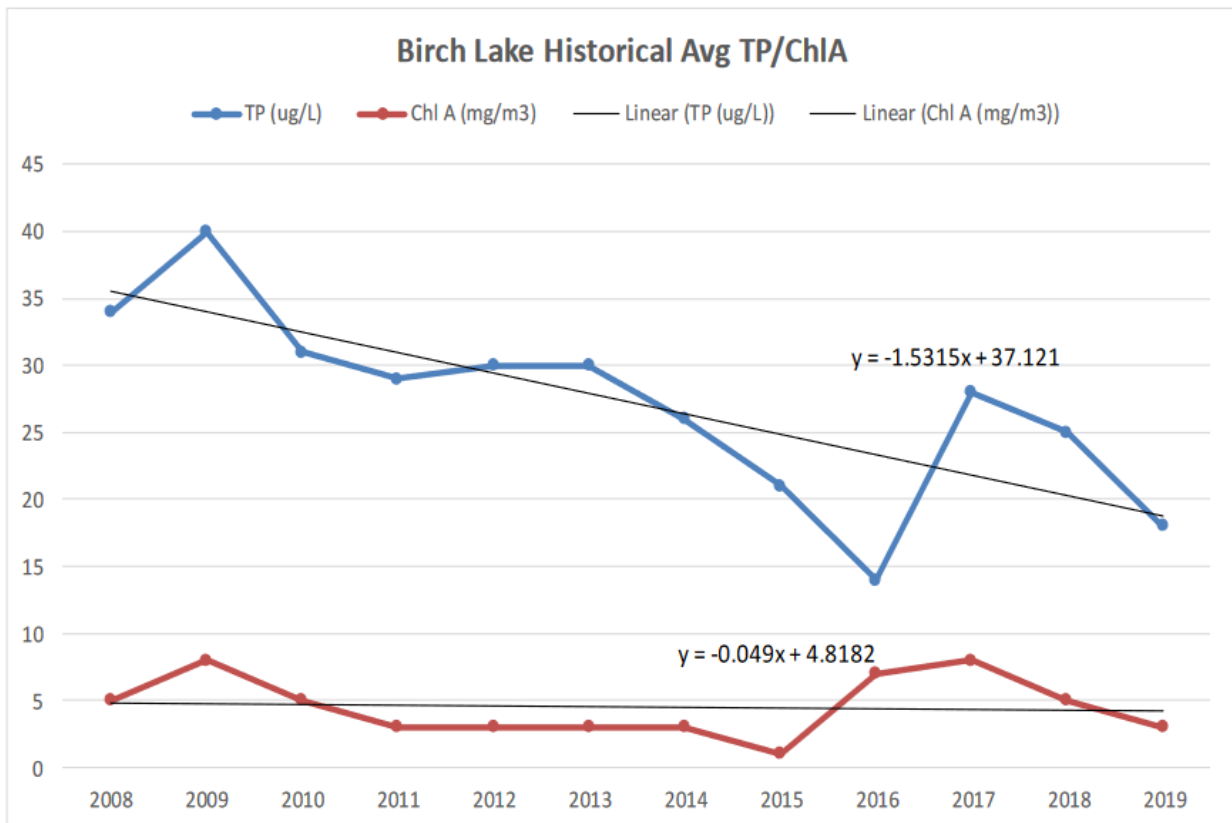
## Birch Lake

The estimated load reductions from planned and recent implementation for Birch Lake are summarized in Table 4. With the load reductions from the activities planned in the Birch Lake Watershed, it is expected that the reductions needed to protect the lake and continue trends that demonstrate improvement in 10 years. Birch Lake has the benefit of an active lake improvement district (the Birch Lake Improvement District, BLID), engaged residents, ongoing projects, and collaboration among many partners, including the City of White Bear Lake.

Active projects support the goal of protecting water quality in Birch Lake. Recently completed projects include an iron-enhanced sand filter that was completed in partnership with the VLAWMO, the City of White Bear Lake, and Ramsey County during 2020. The location was identified through the Retrofit Reports completed by Ramsey County in 2013. Land was donated by a private landowner to the City of White Bear Lake, with support from the VLAWMO, for the project. Funding was provided by a Board of Water and Soil Resources (BWSR) grant. Additional funding and habitat restoration was conducted to support the site and help ensure long-term optimal function of the filter in partnership with the VLAWMO and the City of White Bear Lake. Funding was provided by a Conservation Partners Legacy grant from the Minnesota Department of Natural Resources (MN DNR). Long-term projects that have helped to protect Birch Lake over time include shoreline restoration that has ongoing maintenance provided in partnership with the VLAWMO and the BLID. Additional wetland restoration would continue to support and improve water quality in the lake at the Rotary Nature Preserve, which is a future-planned project identified in Table 4.

Monitoring is essential in understanding the status of the lake and establishing progress over time. Monitoring for Birch Lake has been in place since 1997 and reported to the MPCA. Seasonal average TP (micrograms/L) has fluctuated over the years. TP has ranged from a low of 14 (2016) to a high of 42 (2001). In 2019, the average was 18. A summary graph of the trends through time is shown below. This graph was taken from the annual monitoring report that is prepared by VLAWMO and available on the VLAWMO website.

**Figure 3. Phosphorus and chlorophyll a trends through time in Birch Lake.** Values have fluctuated over time with varying water levels. Current levels show a fairly steady decline in P levels. The dip in 2016 likely corresponded to a fairly wet year and high water levels.



## Tamarack Lake

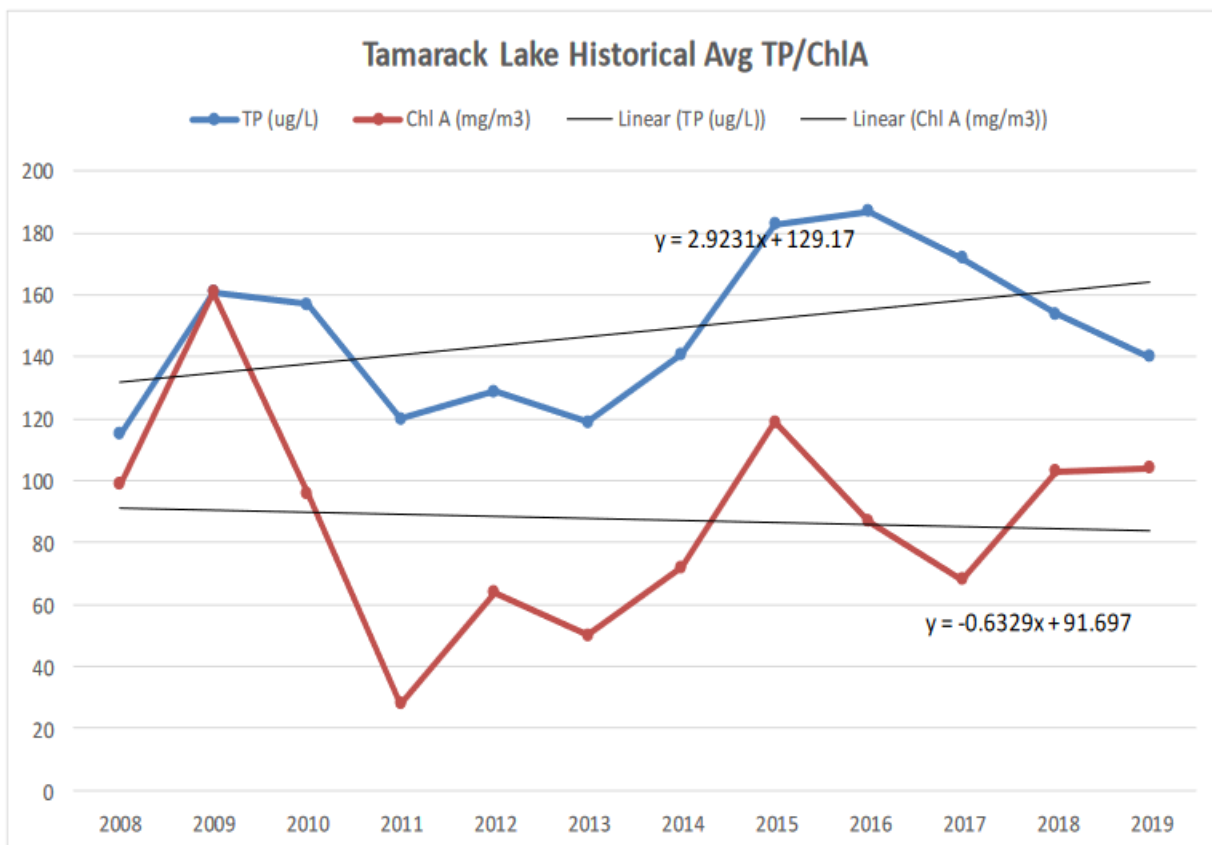
The estimated load reductions from planned and recent implementation for Tamarack Lake are summarized in Table 5. With the load reductions from the activities planned in the Tamarack Lake Watershed, it is expected that projects will be implemented from the Table 5 and adaptively managed over the life of the grant program. If all projects are implemented, it would be possible to achieve the reductions needed to achieve the water quality standard in 10 years.

Tamarack Lake is scheduled for a TMDL in 2024. At that time, additional information will be made available to modify established targets for load reductions. That information will be used adaptively to update Tamarack lake goals during the timeframe of the grant program.

Tamarack Lake is located within Tamarack Nature Center and a park managed by Ramsey County Parks. The County and the VLAWMO have been partnering on habitat improvement projects. These projects usually do not provide substantial load reductions in the model. However, they improve habitat, increase resilience, and help to buffer water resources for climate change. Large-scale projects have been underway for many years and continue. A large invasive species removal project was completed by Ramsey County during 2020, and inter-seeding is underway for that woodland area. A wetland/pond restoration is currently underway. Invasive species were treated in 2020, and seeding/supplemental planting are scheduled for 2021-2022. Additional projects, including an alum treatment if the feasibility study supports that project, have the potential to rapidly improve water quality in a lake that is highly accessible to residents and a valued resource within the nature center land area.

Monitoring is essential in understanding the status of the lake and establishing progress over time. Monitoring for Wilkinson Lake has been ongoing since 1997 and reported to the MPCA. Seasonal average TP (micrograms/L) has fluctuated over the years. TP has ranged from a low of 17, likely an anomaly because it does not fit the general pattern exceeding standards, (1997) to a high of 187 (2016). In 2019, the average was 140. A summary graph of the trends through time is shown below. This graph was taken from the annual monitoring report that is prepared by VLAWMO and available on the VLAWMO website.

**Figure 4. Phosphorus and chlorophyll a trends through time in Tamarack Lake.** Values have fluctuated over time with varying water levels. Current levels show an increase in P levels. This small lake is responsive to changes in lake levels with environmental fluctuation. Consequently, the data are more variable overall than the other two lakes in this document.



## Element c. Best management practices

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*A description of the BMPs (NPS management measures) that are expected to be implemented to achieve the load reductions estimated under paragraph (b) above (as well as to achieve other watershed goals identified in this watershed-based plan), and an identification (using a map or a description) of the critical areas (by pollutant or sector) in which those measures will be needed to implement this plan.*

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### Critical areas and implementation strategy by watershed

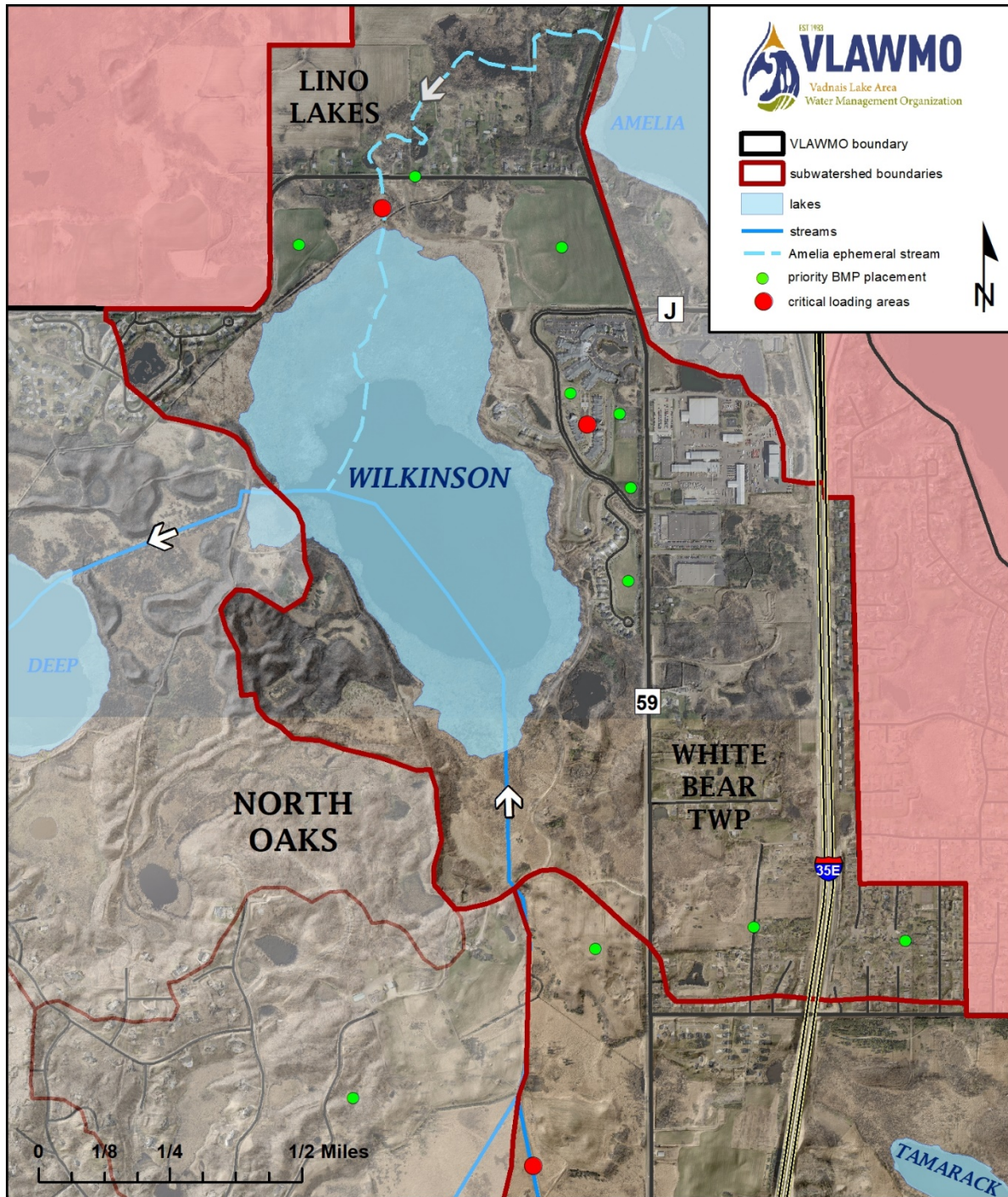
#### Wilkinson Lake Subwatershed critical areas

Pollutant sources in the watershed include stormwater runoff from Interstate Highway 35E and the commercial and industrial area between Centerville Road and the interstate. Pollutant loads to the lake may be attenuated through existing stormwater ponds and natural wetland treatment. Additional sources from the north include a mixture of commercial, residential, and agricultural land. Pollutant contribution from the southern part of the watershed include lower density residential areas. The land surrounding Wilkinson Lake is under a conservation easement and therefore no development directly abuts the lake.

Water quality monitoring conducted in 2016, 2017, and 2018 at four stormwater sites by the VLAWMO indicated that the runoff coming from upstream of County Road J has the highest amount of pollutants in it. These results are not definitive but offer insight into sources of pollutant loading. The feasibility study that the VLAWMO completed in 2020 with SEH engineering focused on these areas and identified areas that are intended to be part of road upgrade projects. As the County, White Bear Township, and the City of White Bear Lake have these road projects scheduled, they will continue to communicate with the VLAWMO so that additional water-quality improvements projects can be included as part of the road upgrade process.

Significant loading also flows into the lake from the southern channel. This area was the focus of the large feasibility analysis by the North Oaks Company (NOC) and Barr Engineering in late 2020. NOC is completing their multi-decade development process over the coming years. NOC and its Board seek to leave a water-quality improvement legacy for Wilkinson Lake. Consequently, they are partnering with the VLAWMO to assist in implementing the stormwater spine series of projects that was identified by Barr Engineering. Barr Engineering is currently working on a phasing plan for the stormwater spine that will be the focus of the VLAWMO's upcoming grant proposal(s). Following the stormwater spine, the VLAWMO will continue to conduct feasibility studies for an alum treatment and a large meander to adaptively continue with water-quality improvements over the life of the grant program. The southern area that has been a focus of the NOC feasibility effort is critical because of the new developments that are currently underway and important opportunities available to implement projects as part of those development projects.

Figure 5. Wilkinson Lake critical loading areas and BMP placement



Initial sediment sampling from the lake indicated that internal loading is unlikely to be a critical source. However, further study is desired. Soil chemistry studies indicate the potential for Curly-leaf pondweed to become a nuisance and a source of phosphorus on Wilkinson Lake is low. Past efforts to remove carp from the lake appear to have been successful, according to recent carp work completed in Pleasant Lake and connected lakes in the chain. Specifically, NOC planned and oversaw the building of a large fish barrier in 1994 from Pleasant and Deep Lake into Wilkinson. They also conducted a drawn-down to kill carp in the lake. Follow-up fish surveys have not detected carp in the lake. Recent biomass and



movement monitoring with Carp Solutions, Inc. supports that this important spawning and nursery area has been cut off for the population. See report [here](#).

### **Wilkinson Lake Subwatershed implementation activities**

Wilkinson Lake benefits from being in the Minnesota Land Trust, which preserves land in its natural conditions. This is augmented by the City of North Oak's requirement to have a 150 foot buffer along the lake edges. Table 3 includes the goals, strategies, milestones, assessments, load reductions, and estimated costs of implementation to protect the water quality of Wilkinson Lake.

The Minnesota Land Trust (MLT) is part of the current plans by NOC. Water-quality, invasive species control efforts, and other habitat improvements fill well within the goals of the MLT. The North Oak's conservation area is the largest metro easement that is part of the MLT protected-area network. MLT is being consulted on projects that are included in the stormwater spine and helping to guarantee habitat protections in accordance with easement requirements.

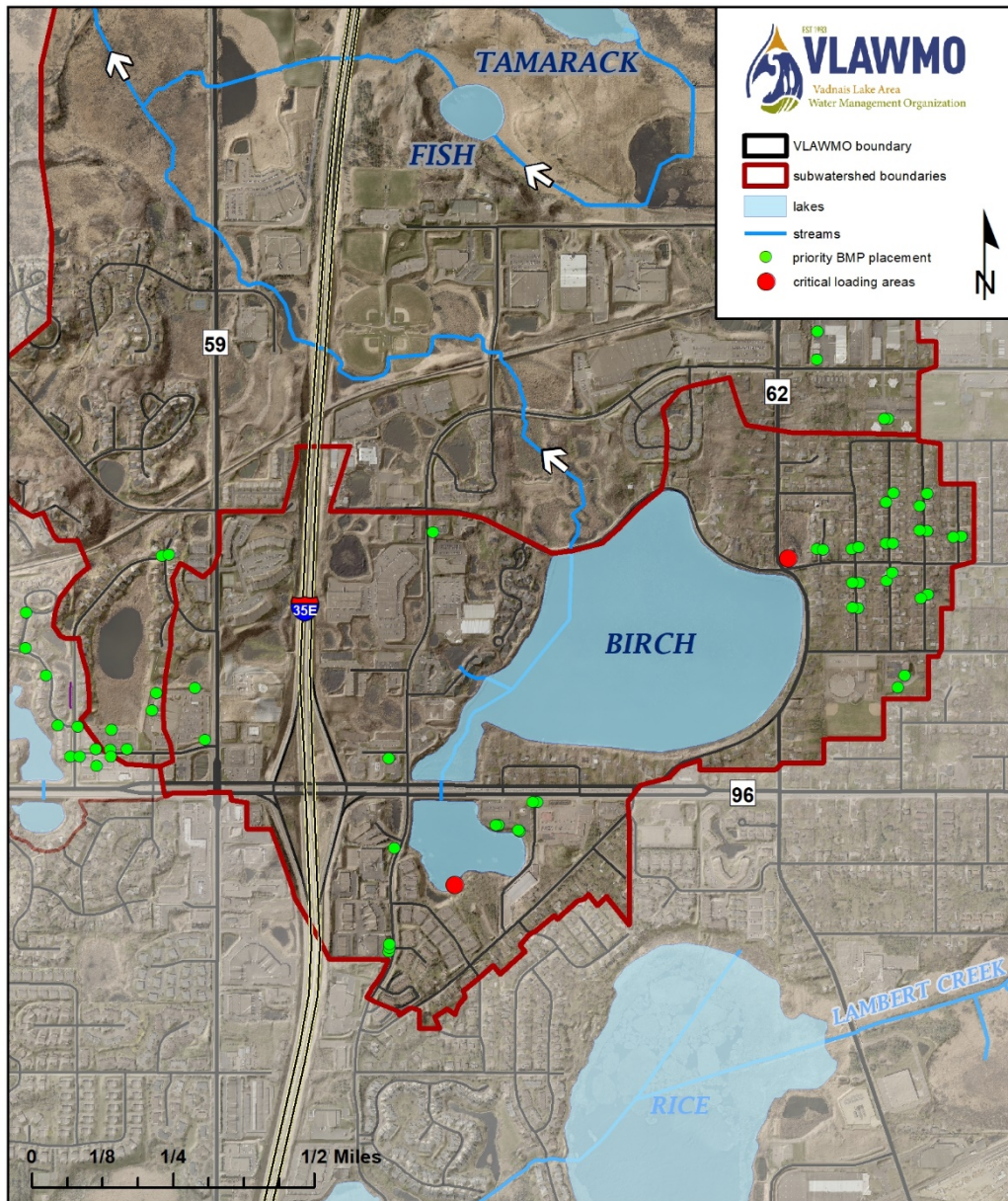
Additionally, as part of remaining development areas currently underway, NOC is working to incorporate treatment including raingardens and possibly larger iron-enhanced or other media filters. The VLAWMO identified stormwater ponds implemented as part of past development projects, with lower water-quality treatment standards, that are suitable for upgrade. NOC has approved those plans and supports the upgrades.

### **Birch Lake Subwatershed critical areas**

The retrofit analysis identifies the critical areas for Birch Lake BMP placement (Figure 6). The three catchments and their total TP base loads are listed in Table 8. The source of TP for Birch Lake is primarily runoff from the subwatershed. Many TP sources are anthropogenic, including waste (primarily animal/avian), soil erosion, SSTS, and stormwater runoff. The contribution by the three catchments is summarized in Table 8. The [Birch Lake SLMP](#) provides additional information.

It is estimated that the West Birch Lake Catchment is producing the most TP load overall at 146 lbs TP per year, and the South Birch Lake Catchment has the highest yield of TP at 0.73 lbs/ac/yr. This information is suggested to be used in prioritizing which catchments should be considered first when efforts are put forth in installing the associated identified retrofits.

Figure 6. Critical areas and BMP placements for Birch Lake Subwatershed (RCD, 2013)



In the Birch Lake Subwatershed Retrofit analysis, the WinSLAMM model, desktop analysis GIS, and field reconnaissance was used to identify critical potential BMP locations. Due to the intense development of the area, significant consideration was given to feasibility of the placement. Several factors and key locations were considered during the desktop analyses to identify these locations. These included areas that are well known for contributing increased polluted runoff (gas stations, sites with large impervious areas, storage facilities, etc.), public land (due to ease of cooperation during the installation process) and areas slated for redevelopment. During the reconnaissance phase, the drainage area and stormwater infrastructure mapping data were verified. Site constraints were assessed to determine the most feasible retrofit options as well as eliminate sites from consideration. Treatment analysis and cost estimates were completed by delineating drainage areas. Loads and load reductions were modeled in

WinnSLAMM using site-specific drainage areas, NRCS soils information, and site information. Extensive information regarding the analyses of the subwatershed is available in [Birch Lake Subwatershed: Urban Stormwater Retrofit Analysis](#) (2013).

The location of the iron-enhanced sand filter that was constructed in 2020 was selected because it was a hotspot for nutrient loading that was identified in the retrofit analysis. These reports completed for the entire watershed have continued to guide project placement and cost-share project support since they were completed in 2013.

## **Birch Lake implementation strategies**

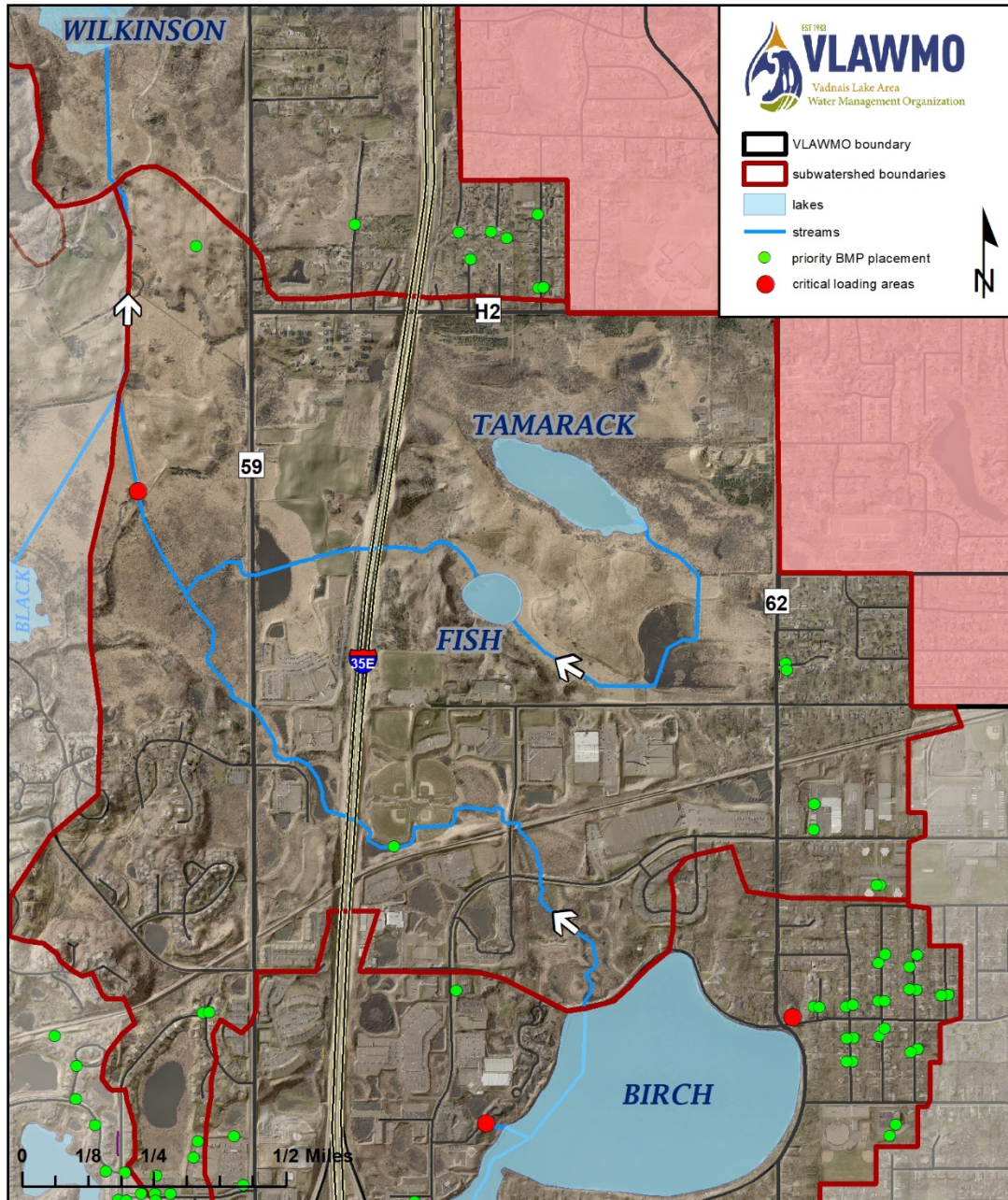
Table 4 includes the goals, strategies, milestones, assessments, load reductions, and estimated costs of implementation to protect the water quality of Birch Lake. If this plan is fully implemented as described over the next ten years, the water quality in Birch Lake will be protected from impairment. The implementation efforts will be targeted to the critical areas identified in the previous sections.

## **Tamarack Lake Subwatershed critical area**

Tamarack Lake ID and describe critical areas – lake surrounded by wetlands and nature center providing little direct runoff and P load to the lake; Highway 35E corridor covers 1.27% % of the watershed and runs north to south in the mid-west center of the watershed. Initial sampling of inflows to the lake indicated elevated TP concentrations with an average concentration of 265 ug/l at the 35E monitoring site.

The nature center is an important resource in the watershed for education, outreach, and habitat protection/restoration. Tamarack Lake is located within the nature center and part of the 320-acre preserve area. The preserve itself is a priority area because of its direct influence on waterbodies within its area and because of its importance as a local protected area with extensive green space. Habitat restoration has been an ongoing effort that is continuing and expanding with partnership from Ramsey County SWCD. Specifically, prairie restoration areas are being expanded and incorporated into larger management units, woodland invasive species areas are being restored, and ponds and wetlands are also being restored. Current identified projects focus within the lake and nature center area. The TMDL, when completed in 2024, will provide additional information to be used adaptively to increase critical areas during the life of the grant program.

Figure 7. Tamarack Lake critical areas and BMP placement



The Subwatershed Retrofit analysis for Tamarack Lake used the WinSLAMM model, desktop analysis GIS, and field reconnaissance was used to identify critical potential BMP locations. Due to the intense development of the area, significant consideration was given to feasibility of the placement. Several factors and key locations were considered during the desktop analyses to identify these locations. These included areas are well known for contributing increased polluted runoff (gas stations, sites with large impervious areas, storage facilities, etc.), public land (due to ease of cooperation during the installation process) and areas slated for redevelopment. During the reconnaissance phase, the drainage area and stormwater infrastructure mapping data were verified. Site constraints were assessed to determine the most feasible retrofit options as well as eliminate sites from consideration. Treatment analysis and cost estimates were completed by delineating drainage areas. Loads and load reductions were modeled in WinnSLAMM using site-specific drainage areas, NRCS soils information, and site information. Extensive

information regarding the analyses of the subwatershed is available in [Gilfillan- Tamarack – Wilkinson Lakes Subwatershed: Urban Stormwater Retrofit Analysis](#) (2012).

These included areas well known for contributing increased polluted runoff (gas stations, sites with large impervious areas, storage facilities, etc.), public land (due to ease of cooperation during the installation process) and areas slated for redevelopment. Redevelopment was reviewed because of the cost savings when installing retrofits in conjunction with other construction. Efforts were put forth discussing future redevelopment projects with VLAWMO contacts and reviewing cities website information for future construction plans. From what was determined, there were no construction projects within the drainage areas that would be conducive to retrofitting BMPs. The field investigation revealed additional retrofit opportunities that were not identified as part of the desktop search. Redevelopment at the nature center itself has provided opportunities for stormwater BMPs that have been implemented since the retrofit report was completed.

### **Tamarack Lake implementation activities**

The retrofit types identified include: simple bioretention, moderately complex bioretention, complex bioretention, dry swales, or permeable asphalt. The Tamarack Lake Subwatershed is well-buffered by the nature center. These two waterbodies are expected to receive minimal influence from the surrounding land. Pollutant loadings are further up the watershed via stormwater runoff. Primary treatment options involve activities tied to infrastructure improvements. Individual property owner activities will also reduce loading. Table 5 includes the goals, strategies, milestones, assessments, load reductions, and estimated costs of implementation to protect the water quality of Tamarack Lake.

## Element d. Expected costs and technical assistance

*An estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement the entire plan (include administrative, Information and Education, and monitoring costs). Expected sources of funding, States to be used Section 319, State Revolving Funds, USDA's Environmental Quality Incentives Program and Conservation Reserve Program, and other relevant Federal, State, local and private funds to assist in implementing this plan.*

It is estimated that it will cost \$10,617,830 to complete all the watershed work and work to meet water quality standards in this small watershed over the next 10-year focal timeframe of this NKE document. This is the [projected budget](#) for the VLAWMO over the 10 years, without additional partner contributions or grant-funded projects. Figure 8 demonstrates the overall breakdown of the VLAWMO budget for the watershed.

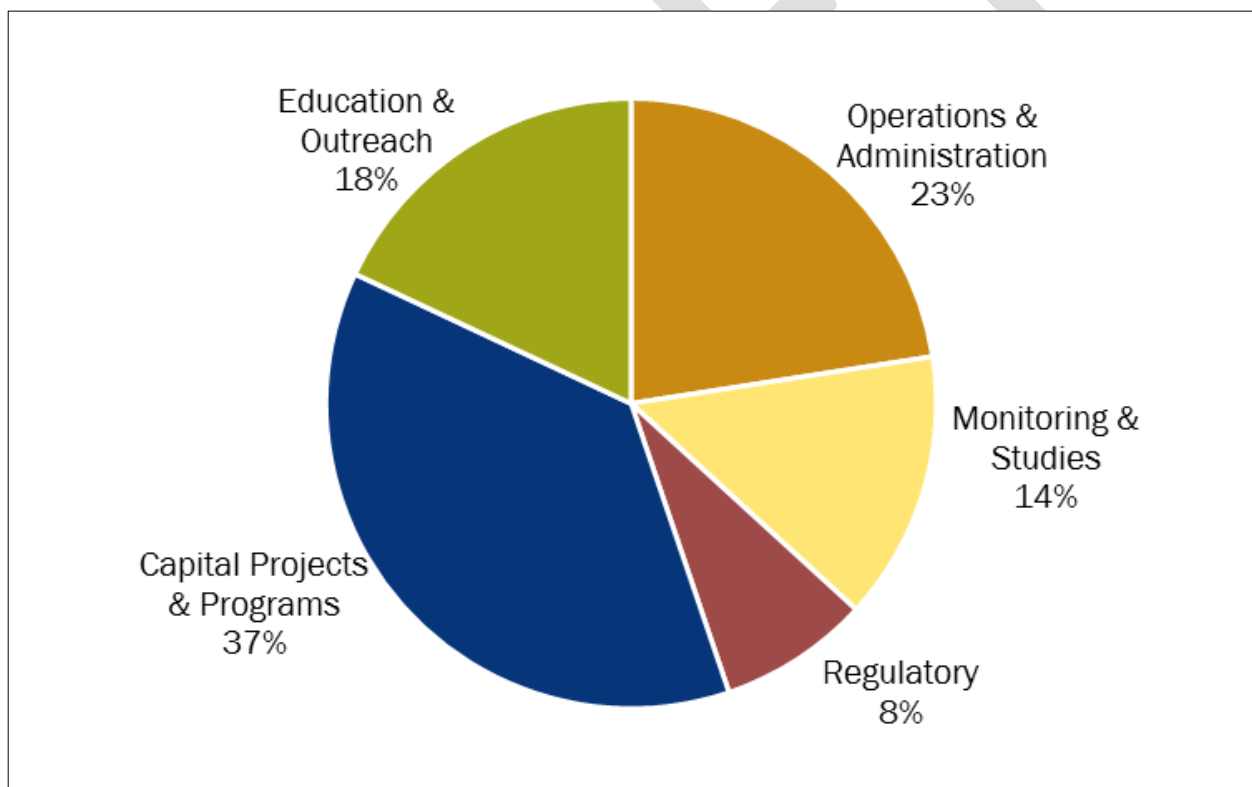


Figure 8. VLAWMO core activities and budget (EOP, 2021, p. 11 Figure 4)

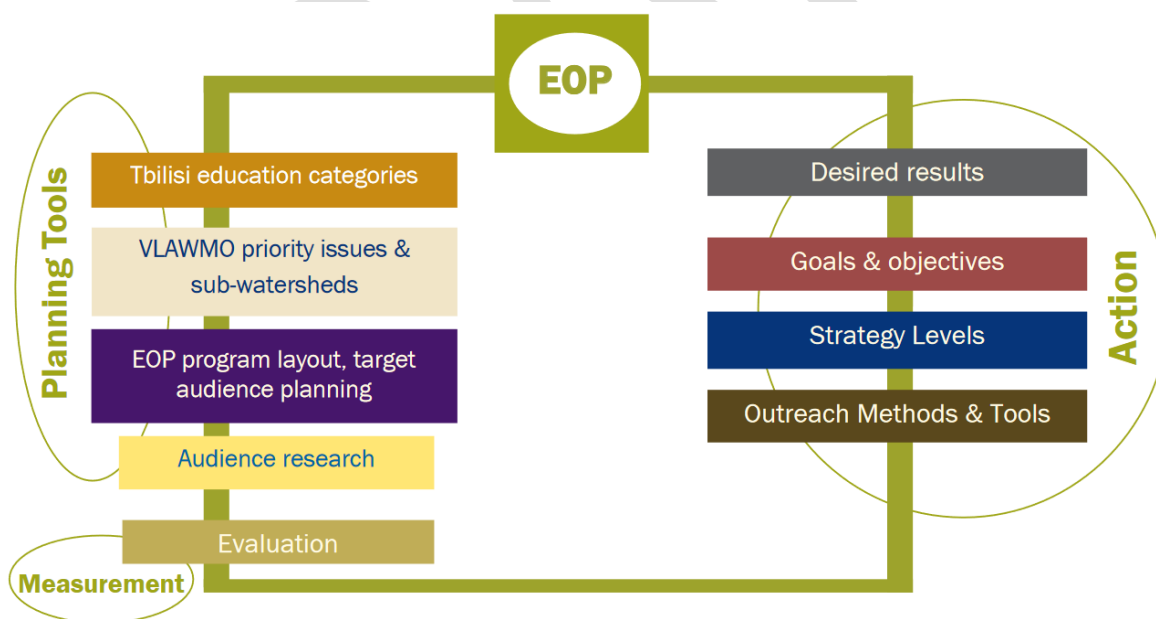
## Element e. Education and outreach

*An information/education component that will be implemented to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, implementing and maintaining the NPS management measures that will be implemented.*

The Education and Outreach Plan (EOP) describes how the VLAWMO will prioritize and organize its education and outreach activities. The EOP for 2021 can be found at: [https://www.vlawmo.org/files/4516/0711/7355/EOP\\_2021.pdf](https://www.vlawmo.org/files/4516/0711/7355/EOP_2021.pdf). The education plan is updated annually. It is the desire and intent of the WMO to achieve the measurable outcomes listed below. However, achievement is highly dependent on partner interest, opportunity, funding, schedule and capacity.

The EOP describes the goals, objectives, target audiences, strategies, and tactics that will be used to support VLAWMO's Comprehensive Watershed Management Plan. Each of these components are situated in a sequence to bring the plan from theory to action. The EOP is an extension of the Comprehensive Watershed Management Plan, particularly Priority Issue 3: Need for education and involvement from citizens and stakeholders. As shown in Figure 6, the EOP includes reference to external support mechanisms as well as internally planned frameworks. (VLAWMO, 2021; p. 7).

**Figure 9. EOP layout (Figure 2 from EOP 2021)**



Each year, the VLAWMO updates its education and outreach plans for the watershed. The activities described in Measurable Outcomes on p. 25 of the 2021 EOP. These measurable outcomes are updated and adapted as the needs and expected results change in the community. Activities are tracked and measured in accordance with the plan. The subwatersheds included in this NKE document represent approximately 25% of the watershed. It is estimated that 18% of the budget will be spend in this area, or approximately \$400,000 over a ten-year period.

The following annual outcomes will apply to all of the planned activities described on Page 25.

**Measurable Outcomes:** *Measured program participation that indicates incremental accomplishment of goals. Objectives attributed to each goal are evaluated through this pool of outcomes.*

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1. Adopt-a-Drain: Observe a minimum of 50 new drain adoptions, exceed 20 reported volunteer hours, maintain 20 active annual volunteers and achieve 50 lbs of debris collected and reported by adopt-a-drain volunteers.
2. Grow email subscriptions and social media following by 75 people annually.
3. Achieve 300 social media engagements annually.
4. Achieve 10,000 website visits annually.
5. 50 new social media followers annually.
6. 500 VLAWMO received and opened email newsletters annually.
7. 20 end-of-year annual survey results or Facebook engagements reporting independent watershed stewardship (goal 2c).
8. Successfully published articles in various newspapers, newsletters, and custom mailings. A minimum of four times annually.
9. Reach 4 classrooms (90-100 students) annually through school programs or use of VLAWMO web resources.
10. A reported increase in Tblisi education categories: Knowledge, awareness, attitude, skills, and behavior. Increases in each category as a result of VLAWMO workshop or tour survey, or annual end-of-year survey.
11. Monthly phenology posts made at each picture post, at least one new participant engaging in program annually.
12. A minimum of 50 watershed residents attending VLAWMO workshops, open houses, tours, and Blue Thumb workshops annually.
13. A minimum of 5 VLAWMO event participants from the past two years will participate in a VLAWMO cost-share or soil health grant.
14. A minimum of 5 VLAWMO cost-share participants from the past two years will also participate in education and outreach through a spotlight article or volunteering with VLAWMO.
15. A minimum of 2 Lawns to Legumes applications in the VLAWMO watershed annually.
16. At least 5 public raingardens are adopted and annually maintained by volunteers under Adopt-a-Raingarden.
17. Achieve over 500 reported volunteer hours through volunteer opportunities such as leading a short-term service projects, citizen science, specific or custom volunteer roles, or utilizing a VLAWMO education display.
18. A minimum of five volunteers will act as educators to their local citizen peers annually.
19. A minimum of three volunteer efforts completed annually, at least 25 participants across all activities.
20. One or more trained AIS volunteers will report and monitor at least once on each lake in VLAWMO annually.
21. At least two schools each year will schedule and complete raingarden maintenance with or without VLAWMO assistance.
22. A minimum of one engagement annually with a resident in Lino Lakes portion of watershed.
23. TEC and BOD quorum met at each meeting.
24. If cost-share best management practices are successfully installed as a result of education and outreach efforts (workshops, events, etc.), VLAWMO will report these as supplementary measurable outcomes.





## Element f. Reasonably expeditious schedule

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*A schedule for implementing the activities and NPS management measures identified in this plan that is reasonably expeditious.*

The schedules for the implementation of activities in the Wilkinson, Birch, and Tamarack Lakes are contained in Table 3, Table 4, and Table 5. It is expected that if this plan is implemented as written in the next 10 years, the estimated loading reductions should meet the required reductions to meet water quality standards. Element e describes the planned, annual activities for the education and outreach for the watershed.

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## Element g. Milestones

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*A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented.*

The VLAWMO has developed milestones to determine the success and progress of their work. These are included in Table 3, Table 4, and Table 5. The milestones will help inform the effectiveness of implemented projects and provide data that will be used as feedback to adjust the plan to measure and report progress toward the goals of the VLAWMO.

Load reductions for the projects will be evaluated with actual implementation designs and reported to the MPCA. As implementation occurs, the final design of the project may increase or decrease the estimated reductions associated with practices. As these adjustments are made, the plan will be updated and data will be shared with the MPCA and project partners.

The VLAWMO utilizes adaptive management on a short-term implementation schedule. Actions will be implemented, then monitored and evaluated for success using the milestones identified in Tables 3, 4, and 5. Depending on the outcomes of those actions, the plan will be reevaluated every three years to develop a new set of actions to be implemented.

To measure the success of actions and the response of each lake (i.e. interim milestones), the VLAWMO will implement monitoring, as is currently conducted with additional focused monitoring on projects to compare post-project water quality data to long-term records of baseline data. Baseline data and long-term monitoring reports are available on the [VLAWMO website](#). Key graphs from the monitoring reports are included in Element b of this NKE document.

## Element h. Assessment criteria

*A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.*

Assessment criteria for implementation are found in Table 3, Table 4, and Table 5. Assessment criteria will be used to determine if the implementations plans are implemented and that they are reaching the expected results.

For each of the three lakes, goals are outlined differently. Birch Lake has a status of protect, and projects are well underway and functioning well to continue to meet this goal. Tamarack Lake is impaired with clear projects determined, extensive habitat restoration that in continuing to expand upon decades-long efforts. Additional projects will be determined when the TMDL is completed in 2024 and adaptively managed to meet additional goals that will likely be part of that process. Wilkinson Lake is impaired and has determined TMDL.

The load reduction criteria developed as part of the Wilkinson Lake TMDL are 85% drainage areas and 6% internal load. Consequently, projects that will be pursued first for this grant program projects will focus on a stormwater spine, discussed previously in this document. The stormwater spine is designed to incorporate a suite of projects that work together to reduce external load coming from the drainage areas. As part of the adaptive management approach, load reduction criteria will be assessed every 3 years. Management actions will be implemented and regularly monitored to evaluation progress at interim milestones so that the direction of the plan can be modified, if needed, to achieve desired goals and objectives.

Monitoring, described in Section Element i. describes the monitoring efforts for this plan. The EOP has specific assessment criteria and measurable outcomes to determine if the plan is progressing. This is summarized in Table 10 and the list following the table.

There is an annual review process to will identify gaps in programmatic and project performances. An example of a subwatershed evaluation for Birch Lake is summarized in Table 11. Adjustments will be made over the next 10 years, based on the assessment information and new scientific information becomes available, in consideration with the VLAWMO’s core activities (VLAWMO, 2019). The VLAWMO also works with the member cities and townships to gain their perspective and to assess the approach to reaching goals.

**Table 10. Example report card for Birch Lake (adapted from, VLAWMO, 2019, p. 55)**

<b>BIRCH LAKE</b>	<b>2019 Activities and Results</b>	<b>Progress in 2020</b>	<b>Plans and Goals for 2021</b>
Monitoring:			
TP (ug/L)			
Chl A (ug/L)			
SDT (m)			

BIRCH LAKE	2019 Activities and Results	Progress in 2020	Plans and Goals for 2021
Support BLID in fish and vegetation surveys			
<b>Education and Outreach:</b>			
Engage partners on additional street sweeping and chloride management			
<b>Capital Projects and Programs:</b>			
Assess potential for stormwater management project at 4th & Otter Lk Rd			
Support stormwater management activities during redevelopment			
Landscape Grant Projects completed			

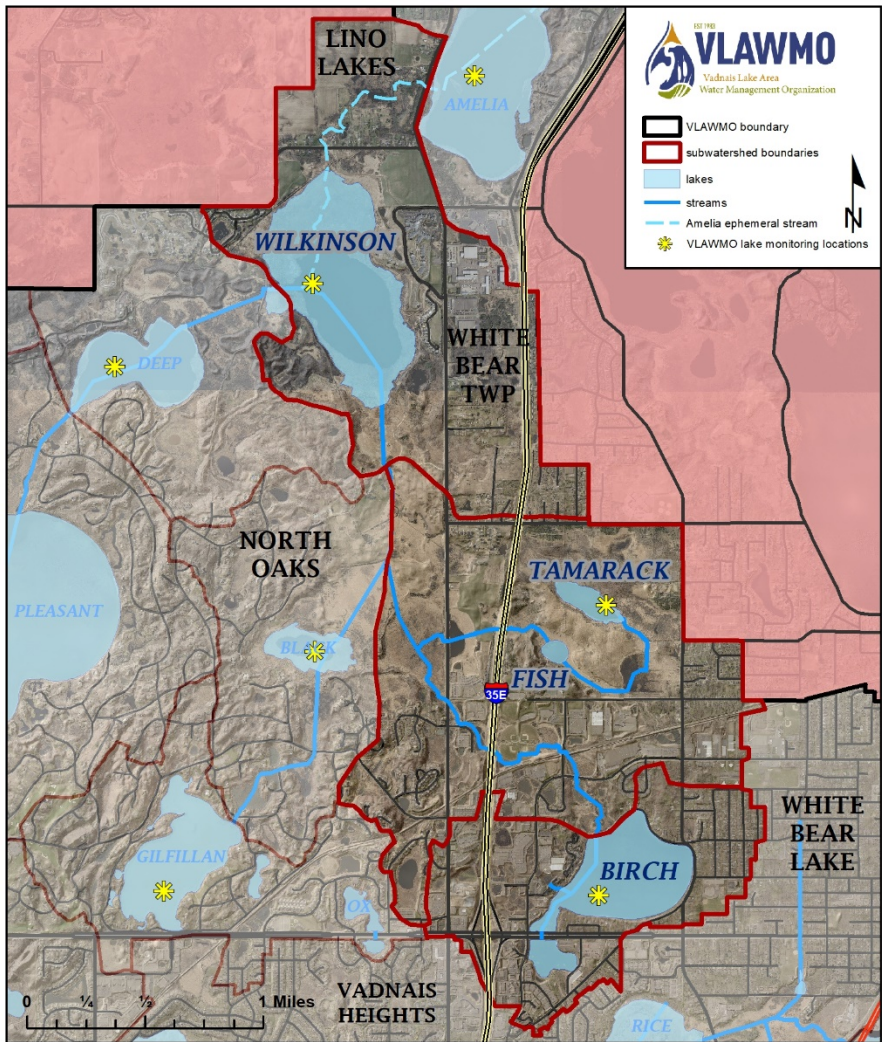
## Element i. Monitoring

*The monitoring & evaluation component to track progress and evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item (h) immediately above.*

VLAWMO operates a robust data collection and analysis program on Wilkinson, Birch, and Tamarack Lakes (Figure 10 and Table 11). Monitoring data and reports are available on the VLAWMO website. The purpose of the monitoring program is to track long-term water quality trends; provide a scientific basis to identify, target, and design programs and projects to meet goals; and to evaluate project and program effectiveness and progress towards water quality goals.

The program prioritizes baseline monitoring by VLAWMO staff, trained volunteers through the Citizen Lake Monitoring Program, and partners such as the St. Paul Regional Water Service, as well as periodic special monitoring for a variety of purposes on an as needed basis. The bulk of the water sample collection season is between May through September each year.

Figure 10. Lake monitoring locations for lakes in the watershed with Wilkinson, Birch, and Tamarack Lakes outlined.



**Table 11. Summary of annual monitoring conducted on Wilkinson, Birch, and Tamarack Lakes (adapted from Table 1 in VLAWMO amendment document, 2020)**

Monitoring location	Station type	Parameters	Sampling period	Frequency
Birch Tamarack Wilkinson	Lake	Secchi depth, lake level (on some), profile for Temp, DO, pH & Conductivity; TP, TN, SRP, ChlA (surface), Total Iron (bottom only)	May-September	Every two weeks
Birch	Lake	Chloride	9-10 months*	Once per month
Birch	Lake	Lake Level	May-September	Every two weeks
Tamarack Wilkinson	Lake	Chloride	Ice out	Once per year

In addition to the chemistry monitoring, there is monitoring conducted for aquatic invasive species on both Birch and Wilkinson Lakes. At the inflow of Wilkinson Lake, there are plans for an automated sampling station. Fish, invertebrate and aquatic plant surveys have been conducted on all three lakes and they have been identified as high priority for additional biological monitoring. Additional biological monitoring has been completed watershed-wide from frogs and toads with call surveys and mammals with remote-camera surveys. The results of this work are summarized in reports and featured in [StoryMaps](#). These data will allow additional pre/post analyses of projects besides standard water-quality monitoring protocols. The VLAWMO either plans to conduct or has already completed bathymetry surveys, including a BioBase Survey, for all three lakes in partnership with Ramsey County Soil and Water Conservation Division (included in Table 3, Table 4, and Table 5).

# References

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January 14, 2021

Ms. Dawn Tanner  
Project Development Coordinator  
Vadnais Lake Area Water Management Organization  
800 East County Road E.  
Vadnais Heights, MN 55127

Re: Proposal for Common Carp Management and Removal Coordination in Pleasant Lake, Ramsey County (ID #62004600)

Dear Ms. Tanner:

Thank you for the opportunity to provide this proposal to work collaboratively with the Vadnais Lake Area Water Management Organization (VLAWMO) to manage the common carp (referred to as carp for the remainder of this document) population in Pleasant Lake.

Carp (an aquatic invasive species in Minnesota) negatively affect water quality and overall ecological integrity of waterbodies by resuspending sediments and nutrients into the water column through feeding and spawning behavior, reducing the abundance of submerged aquatic vegetation, and, to a lesser extent, excretion of waste. Overabundant carp populations can bioengineer the environments they live in and dramatically change the ecology of shallow lake systems.

WSB staff have a combined 29 years of experience in carp research and management. This research and management experience includes over 3,000 hours of high and low frequency radio telemetry surveys, surgical implants on over 300 individual carp and northern pike, removal of over 1,000,000 pounds of carp biomass, age structure removal, preparation, and interpretation, aerial telemetry surveys, PIT tagging and PIT tag station construction, boat, barge, and backpack electrofishing, as well as box, fyke, mini-trap, gill, and seine netting.

WSB staff have designed and installed several nets, vertical wall, electric, and drum barriers as part of carp integrated pest management plans and drafted carp management plans for the Prior Lake Spring Lake Watershed District (Prior Lake, MN), Grand Lake St Mary Restoration Commission (Celina, OH), Minneapolis Park and Recreation Board (Minneapolis, MN), Shel Rock River Watershed District (Albert Lea, MN) and Circle Lake - Lake Improvement District (Millersburg, MN).

In 2019 WSB added the services of FisH2o, a fisheries logistics company, that specializes in the transportation and sustainable use of live rough fish from roughly 36 inland commercial fishing crews across the Midwest. This provides us unequaled access to commercial fishing crews and the ability to time and prioritize our clients' projects for large scale rough fish removal.

Our projects span the upper Midwest and include the states of Minnesota, Wisconsin, Illinois, and Ohio. We have worked with eight (8) separate licensed commercial fishermen in Minnesota, including Jeff Reidemann and Tim Adams who would be the licensed commercial fishing crews for this project.



## **Background**

Pleasant Lake is listed as impaired for nutrients (phosphorous) by the MPCA. Excess phosphorous can lead to algae blooms and reduce or inhibit designated uses such as swimming and boating. Pleasant Lake is also part of the Saint Paul Regional Water Services System that supplies drinking water to the Twin Cities Metro.

A TMDL or other phosphorous loading study has not yet been completed for Pleasant Lake; however, overabundant carp can influence internal phosphorous loading due to bioturbation and indirectly through a reduction in native submerged aquatic vegetation. Bajer (2009) identified an ecological tipping point for carp biomass of 100 kg/ha where this density can significantly impact water quality and ecological integrity.

In 2019, Carp Solutions completed an electrofishing CPUE carp biomass estimate. The estimated carp biomass density for Pleasant lake is 273.4 kg/ha; more than double the threshold value identified above. This would indicate that Pleasant Lake could benefit from carp management; part of which would be removal.

Additional data collected on size structure and spring migration show that the Pleasant Lake carp population is composed of larger adults which may indicate an older population with little recruitment. Passive integrated transponder (PIT) data indicates that a large number of carp attempted to migrate into Wilkinson Lake, a suspected nursery, but a barrier near the outlet of Wilkinson appears to prevent carp from accessing Wilkinson, from which it is assumed that carp are not able to spawn and recruit. No young of year or juvenile carp were collected during electrofishing surveys in 2019 or during a trap netting survey completed in 2017 in Wilkinson Lake; further indicating that carp may not be recruiting and removal be lead to sustainably reducing the adult carp biomass in Pleasant Lake.

## **Approach and Scope**

We propose to facilitate the large-scale removal of carp from Pleasant Lake through the implementation of the following tasks:

- Task 1. Acquire MN DNR Permit
- Task 2. Implant 10 adult carp in Pleasant Lake with high frequency radio tags
- Task 3. Complete telemetry surveys and train VLAWMO staff to complete telemetry surveys
- Task 4. Coordinate commercial fishing crews to complete one (1) netting attempt
- Task 5. Draft technical memo on results of telemetry surveys and carp removal

Optional tasks may be completed to increase the probability of a successful carp removal and supplement the total amount of carp removed from the system through techniques other than large scale commercial seining.

- Task 4a. Include Modified Unified Method
- Task 6. Site Reconnaissance
- Task 7. In-Stream Removals
- Task 8. Baited Box Netting

### **Task 1. Acquire MN DNR Permit**

A Minnesota DNR fisheries research permit will be required to collect and implant carp with radio tags. WSB currently holds a variety of these permits in MN, WI, and other states. WSB will apply for a permit that allows us to collect carp using gear such as boat electrofishing, trap nets, seining, and/or gill nets. Under the permit we will also request the ability to surgically implant up to 12 adult carp with high frequency radio tags. Research permits are valid through the end of each calendar year and require a report be submitted by January 31 the year after the permit is issued. We propose to apply for the permit in early to mid-2021 to allow for the greatest flexibility in scheduled carp collection activities.

### **Task 2. Implant Up to 10 Adult carp in Pleasant Lake with High Frequency Radio Tags**

Using the permit acquired in task 1, WSB will capture and implant up to 10 adult carp with high frequency radio tags. Carp may be captured using the gear listed above, anesthetized, implanted, and released. Ideally capture would not occur during the peak growing season as cooler water temperatures reduce the risk of infection to the surgical site. Late spring and late summer/early fall are ideal periods to collect carp since they should be present in shallower water and water temperatures should be suppressed.

By implanting carp in the spring prior to carp migration periods, staff have the opportunity to track carp during and after the spawning period which can add to the body of knowledge about carp movement in and adjacent to Pleasant Lake, however this will need to be balanced with the ultimate goal of using telemetry to identify winter carp aggregations for removal opportunities. The period for implants whether spring or late summer can be determined in consultation with VLAWMO staff and will be dependent on weather, permitting, and availability of radio tags from the manufacturer.

WSB staff will plan to complete two (2) site visits to Pleasant Lake to deploy nets and/or complete electrofishing transects to capture carp for radio tagging. This is included in the project budget and can be completed during spring and/or fall periods. If completed in late summer/early fall, catch per effort data can be utilized to add to the dataset used to estimate carp abundance.

### **Task 3. Complete Telemetry Surveys and train VLAWMO staff to complete telemetry surveys**

Telemetry surveys will be used to locate radio tagged carp locations and document in GIS. Radio tags will be high frequency 1850 style tags manufactured by Advanced Telemetry Systems, Isanti, MN. WSB utilizes an R410 receiver and understand this is the same receiver that VLAWMO staff have.

Under this proposal, WSB will complete one (1) telemetry survey with VLAWMO staff 2-3 weeks after implants are completed to familiarize staff with basic techniques for tracking carp. VLAWMO staff will be responsible for tracking carp during the project period with an emphasis on surveying in late fall and winter to provide data for scheduling removals.

Once an aggregation of carp has been located and remains in an area identified for removal, WSB staff will complete up to three (3) telemetry surveys to confirm and pinpoint the aggregation distribution and locations for removal.

#### **Task 4. Coordinate commercial fishing crews to complete one (1) netting attempt**

Our understanding of commercial removal of inland rough fish species, relationships with commercial fishing crew members, and experience completing these types of removals gives us a distinct advantage for successfully coordinating large scale carp removals. In addition, WSB owns and manages Fish2o, a fisheries logistics company that specializes in the transport of fish to from commercial fishing crews to markets. This advantage allows to coordinate timing and effort throughout our project area.

Under this proposal, we will coordinate with the licensed commercial fisherman for Area 18; Jeff Riedemann. A variety of factors will influence the potential to complete a removal and the timing of the removal. These factors include tightness of the radio tag aggregation, propensity of fish to stay aggregated in one location, suitability of the aggregation site to be netted, weather, ice thickness (if done during hardwater), permits, and scheduling for fishing crews.

WSB will communicate telemetry data to the commercial crews and coordinate the appropriate time for removal based on the factors listed above. We will also be present the day of removal to track carp, guide fishing crew, and observed netting operations as well as afterward to process captured fish. Processing may include checking for marks and/or radio tags, data collection, or assisting crews to load fish out.

#### **Task 5. Draft technical memo on results of telemetry surveys and carp removal**

The final task under this project will be for WSB staff to draft a technical memo or brief report detailing the implementation and results of the tasks described above. This report will include telemetry data/maps, updated carp abundance estimates from fall electrofishing and removals, and a discussion of next steps.

Tasks 1-5 will be critical components to complete this project. However; there are a number of additional tasks that may be implemented to increase the probability of a successful; large scale removal and add to the amount of carp biomass that is removed from Pleasant Lake if one (1) large scale removal effort does not reduce carp biomass density to VLAWMO's desired goal.

#### **Task 4a. Include Modified Unified Method**

The modified unified method (MUM) is a technique adapted by the USGS from China that utilizes underwater speakers to concentrate carp and move them to an area of a waterbody that is conducive to netting. We have successfully used this technique on Asian carp species in Nebraska and have adapted it to carp removals in the Prior Lake Spring Lake Watershed District.

Under this proposal we would have this equipment available the day of removal to aid in moving carp into or away from a specific area if necessary. While a rapid deployment of the MUM may work to drive carp, a more detailed and measured effort may be an option in the future to further increase netting success. This project budget includes a small amount of time for WSB staff to prepare the necessary equipment. Time to deploy this equipment is captured in task 4, since WSB staff will be present the day of removal. A more large-scale effort can be discussed with VLAWMO staff for future project development if additional removals are necessary.

### **Task 6. Site Reconnaissance**

Bathymetric and vegetation maps along with the diagram for the oxygen diffuser will provide much needed data along with the commercial fisherman's knowledge of the lake, but additional reconnaissance of the lake bottom where aggregations have been known to exist or from telemetry data, can provide critical data as to whether obstructions or bottom contours exist and plans may be developed to mitigate those hindrances to netting. Maps and/or photos along with coordinates and a brief summary will be provided.

### **Task 7. In-stream Removals**

The 2020 Pleasant Lake Carp Management Interim Report suggests that a large percentage of carp migrate from Pleasant Lake through the connecting channel to both Deep and Wilkinson Lakes. This may provide an opportunity to supplement the amount of carp biomass removed through efforts on Pleasant Lake proper.

WSB has completed in-stream carp removal using gill nets, electrofishing, and a "push-trap" design used by the Prior Lake Spring Lake Watershed District in 2020.

While there are many options to completing in-stream removal, we propose to construct and install a push-trap device. WSB will provide staff to complete construction and installation as well complete site checks and carp removal once/week for a period of 4 weeks during the greatest migration activity. From PIT data, this would be generally be the month of May.

### **Task 8. Baited Box Netting**

In addition to in-stream removal and commercial fishing, carp may also be removed using baited box nets in Pleasant Lake. WSB staff have been intimately involved in the development of this technique for many years and have a wealth of experience using baited box nets. Similar to in-stream removal, this technique may not provide an opportunity for large scale carp removal but may supplement other removal efforts furthering VLAWMO towards its goal of lower carp biomass densities.

We would propose to complete baited box netting in phases, each one building on the previous and only implemented through consultation and approval of VLAWMO.

The first phase would be to determine if carp respond to bait and how quickly bait is consumed. Quick consumption may indicate a large number of carp visiting the site. WSB staff would place bait bags (cracked corn) in 1-3 locations around the lake that may be conducive to box netting based on water depth, firmness of the substrate (for walking), and vegetation density. VLAWMO staff would monitor, fill, and report consumption rates to WSB. This would need to be completed each morning (critical) to effectively determine if a site is a good candidate for box netting.

If results indicate heavy feeding for a period of 1-2 weeks, then a box net may be installed at one (1) site. Installation would require 1 day and be completed by WSB staff. WSB charges rental fees for box nets which is reflected in the budget for this item. The rental would be for a period of 3-4 weeks and may be extended if VLAWMO determines box netting is effective beyond this period. Baiting of the box net would resume post-installation for roughly a one (1) week period to habituate carp to feed normally (as reported by VLAWMO staff).

In coordination with VLAWMO, WSB would select an overnight period to "lift" the net and remove carp. Based on the number of carp captured in the initial netting, VLAWMO could then determine

if additional effort is warranted. The budget provides includes time for WSB coordination with VLAWMO, site recon and bait bag installation, box net installation, one (1) lift, disposal of carp, uninstallation of the net, and a brief technical memo summarizing results. Additional lifts can be included at the request of VLAWMO.

**Project Schedule**

Task	2021								2022						
	February	March	April	May	August	September	October	November	December	January	February	March	April	May	June
1	█									█					
2			█	█	█	█									
3			█	█	█	█	█		█	█	█				
4								█	█	█	█				
5									█	█	█				
4a								█	█	█	█				
6		█	█									█	█		
7													█	█	
8															█

This project schedule assumes that the proposal is accepted and authorized by mid-February 2021. Task 2 may be completed in spring 2021 or late summer/early fall 2021 and task 3 would follow after a period of 2 weeks have passed since the initial implants as discussed in the previous section. Task would be planned to be completed either in open water fall 2021 or the winter of 2021/2022 based on the conditions described under task 4 and task 4a would be completed concurrently with task 4. The technical memo would be completed after removal operations.

Task 6 is perhaps the most flexible. Spring 2021 would be an ideal time to complete this since vegetation growth will be minimal and water clarity should be at its greatest during the year. However, reconnaissance may be more focused after initial fall winter telemetry data is available that indicates the location of radio tagged carp. A one (1) day effort is budgeted currently. Additional time could be included if VLAWMO would prefer additional effort for recon during different time periods. This could even be evaluated for spring 2022 after winter removal operations are complete as aggregations sites may be identified outside of the area where carp are eventually removed, and additional removal plans could be made using this recon data if warranted.

Task 7 could occur in either May 2021 or May 2022 based on financial resources. There may be some rationale to wait until 2022 after commercial removal operations are complete in the event that enough carp are removed under these operations, additional removal may be unnecessary.

Similarly, task 8 can be completed during carp feeding periods in 2021 or 2022 and based on the amount of carp biomass removed under commercial fishing operations.

**Project Budget**

<b>Task</b>	<b>Total</b>
Project Management	\$730
Task 1. Permits	\$770
Task 2. Collection and Implants	\$5,192
Task 3. Telemetry and Training	\$1,455
Task 4. Removal and Coordination	\$7,518
Task 5. Reporting	\$1,844
<b>Base Project Total</b>	<b>\$17,509</b>
Optional or Add-on Tasks	
Task 4a. MUM	\$707
Task 6. Recon	\$2,356
Task 7. In-Stream Removals	\$12,840
Task 8. Box Netting	\$10,811

Task 2 includes WSB labor, surgical supplies, and 10 high frequency radio tags valued at \$200/tag.

Task 4 includes WSB labor for coordination and on-site removal operations as well as a lump sum of \$5,000 for commercial fishing crews to net under the ice. This fee may be reduced based on the amount of fish captured that may be saleable and timing of removal operations.

Task 6 includes a one (1) day fee for Jeff Riedemann and WSB labor for a field visit with Jeff and map production.

Task 7 includes WSB labor and materials to build, install, and uninstall the trap, as well as four (4) separate efforts (once/week for four weeks) to remove and dispose of captured carp. This assumes that VLAWMO staff will maintain and check the trap between WSB site visits.

Task 8 includes time for one (1) WSB staff to identify bait sites with VLAWMO staff and install bait stations, and WSB labor for installation and uninstallation of the box net, one (1) "lift", carp disposal, box net rental fee (\$1,500 for a 4-week period) and drafting of a brief memo.

The table above provides a limit not to exceed. Additional hours may be billed only by authorization from VLAWMO.

If you have any questions and would like to discuss further please email me at [thavranek@wsbeng.com](mailto:thavranek@wsbeng.com) or call me at (612)246-9346.

Sincerely,

WSB

Tony Havranek  
Senior Ecologist

Attachments:  
WSB 2021 Rate Table