

## AGENDA

Tuesday, April 9, 2013

**3:00 PM**

Prior Lake City Hall

### BOARD OF MANAGERS:

**Bill Kallberg, President; Bill Schmokel, Vice President; Bruce Thorsen, Treasurer  
Marianne Breitbach, Secretary; Curt Hennes, Manager**

Note: Indicated times are estimates; actual times may vary considerably. Individuals with items on the agenda or who wish to speak to the Board are encouraged to be in attendance when the meeting is called to order.

3:00 – 3:05 PM **BOARD MEETING CALL TO ORDER, PLEDGE OF ALLEGIANCE**

3:05 – 3:10 PM **PUBLIC COMMENT**

If anyone wishes to address the Board of Managers on an item not on the agenda or on the consent agenda please come forward at this time, turn on the microphone and state your name and address. (The Chair may limit your time for commenting.)

3:10 – 3:25 PM **APPROVAL OF AGENDA** (Additions/Corrections/Deletions)

3:25 – 3:30 PM **CONSENT AGENDA**

The consent agenda is considered as one item of business. It consists of routine administrative items or items not requiring discussion. Items can be removed from the consent agenda at the request of the Board member, staff member, or a member of the audience. Please state which item or items you wish to remove for separate discussion.

- Minutes
  - 2/12/13 Regular Meeting
  - 2/27/13 Special Meeting
  - 3/12/13 Regular Meeting

3:30 – 3:40 **Treasurer's Report** (Claims List Tab)

Cash & Investments  
Claims list  
Annual budget and tax levy

3:40 – 5:00 **OTHER OLD/NEW BUSINESS**

1. Fund Transfer from Bond Fund to MOA/JPA – Resolution 13-268 (tab A)(Action)
2. FEMA Floodplain Update (Action) (tab B)
3. Lower Prior Diagnostic Study Approval (Action) (tab C)
4. Buck Lake Injection System Feasibility (Action) (tab D)
5. Consider Board Meeting Time Change (Action) (tab E)
6. Fish and Pike Lake Sediment Core Proposal (Action) (tab F)
7. Programs and Projects Update (Discussion)
8. Arctic Lake Sediment Core (Discussion) (tab G)
9. Ferric Chloride Feed System Construction Update (Discussion) (tab H)
10. Manager Presentations: (items submitted by individual managers for discussion to include meeting reports)
11. Misc. Administrative items

### UPCOMING MEETING/EVENT SCHEDULE

- CAC meeting – April 25<sup>th</sup> 6:30 – 8:00 PM, Prior Lake City Hall
- April 30<sup>th</sup> Special Board Meeting / CAC meeting: alum presentation – 6:00 pm Prior Lake City Hall



**Tuesday, February 12, 2013**  
**Prior Lake City Hall**  
**3:00 PM**

Members Present: William Schmokel, Bill Kallberg, Curt Hennes & Bruce Thorsen

Members Absent: Marianne Breitbach

Staff Present: Mike Kinney, District Administrator  
Nat Kale, Watershed Planner  
Chuck Holtman, District Attorney, Smith Partners  
Carl Almer, District Engineer

Others Present: Steve McComas, Blue Water Science  
Ray Valley, Contour Innovations LLC  
Paul Nelson, Scott County  
Brad Davis, Scott County  
Kathy Nielsen, Spring Lake Township

1. **CALL TO ORDER/PLEDGE OF ALLEGIANCE:** Meeting called to order by President Bill Kallberg at 3:08 PM.

Chuck Holtman administered the oath of office to newly appointed Manager Curt Hennes.

Manager Hennes introduced himself to the Board and the public in attendance and provided some background information on himself, his education, and his career.

2. **PUBLIC COMMENT:** None

3. **APPROVAL OF AGENDA:** Mike Kinney stated that staff prepared a memo regarding available property and asked to add that discussion to the agenda. Manager Schmokel moved to accept the agenda with above said addition. Second by Manager Hennes. All ayes. Motion passed 4-0.

4. **CONSENT AGENDA:**
  - Minutes (December 2012 and January 2013)

Manager Schmokel moved to approve the consent agenda. Second by Manager Hennes. All ayes. Motion passed 4-0.

5. **TREASURER'S REPORT**

- Cash and Investments
- Claims List
- Annual Budget and Tax Levy

Manager Schmokel moved to approve the first page of the Claims List. Second by Manager Hennes. All ayes. Motion passed 4-0.

Manager Thorsen continued to review the information included in the remainder of the Treasurer's Report, including the investments, levy information, and year to date financial information.

6. **OTHER OLD/NEW BUSINESS**

**VEGETATION MONITORING RESULTS**

Steve McComas presented the results he obtained through the last year in regard to curlyleaf pondweed on Fish Lake, Spring Lake and Upper and Lower Prior Lake. He explained that while early monitoring is done in April, curlyleaf pondweed increases between April and June. He provided the previous conditions, early monitoring results and June monitoring results for the three lakes observed, noting that both Fish Lake and Upper and Lower Prior Lake have areas of heavy curlyleaf pondweed which he will ultimately recommend a treatment plan for in 2013. He stated that although Spring Lake had been treated for curlyleaf pondweed, the last treatment occurring in 2007, he did not see a reason for treatment at this time. He reported that an aquatic plants survey was completed for Pike Lake and noted that the lake is very shallow and does not contain many plants, with the exception of a few areas where an abundance of natural plants are found. He advised that Eurasian Water Milfoil (EWM) was found in the lake and the proper notification was provided. He recommended that scouting occur on all three lakes, with potential treatment then proposed for Fish Lake and Upper and Lower Prior Lake.

Mike Kinney explained that Mr. McComas is a consultant for the District and is otherwise not associated with the District or the DNR. He advised that Mr. McComas simply completes this aquatic plant survey and develops the report for the District. He reported that staff met in late January with Lake Restoration Inc., as well as members of the Prior Lake Association, in regard to possible treatment on Prior Lake. He explained the benefit to early treatment, compared to treatment in June when the seeds for the next season have already developed. He stated that staff is open to working with the Lake Association to develop a treatment plan for the lakeshore area of Prior Lake. He confirmed that staff would also like to develop a potential treatment plan for Fish Lake in 2013.

President Kallberg suggested obtaining an additional bid for the job from another business as well, for comparison purposes.

Mike Kinney confirmed the consensus of the Board to direct staff to prepare potential 2013 treatment plans for Upper and Lower Prior Lake and Fish Lake.

### **CiBioBase PRESENTATION AND PROPOSAL**

Ray Valley, Contour Innovations LLC, provided background information on himself and his organization. He explained the different stages and conditions of lakes and the effects on those lakes that can cause impairment. He stated that there is a delicate balance of management once an invasion takes over in a lake, as you do not want to kill off the natural plants while attempting to remove the invasive species. He stated that his company focuses on a system of monitoring that can be easily repeated. He explained that his company empowers local citizens to monitor their own lake and reviewed the different types of equipment offered to assist in the process. He displayed an example where monitoring was conducted before and after an herbicide treatment. He presented the results from a Case Study that was completed on Paradise Lake in Carp Lake Michigan.

Mike Kinney stated that this equipment could assist homeowners and the Lake Associations that have expressed interest in applying herbicide treatments. He noted that one of the Lake Associations has volunteered to donate \$700 towards the cost of purchasing one of the monitoring units and will also assist in organizing volunteers to collect the data. He explained that the District does not have a boat and believed that this equipment could assist in the District obtaining information through this new method. He stated that staff recommends that the Board approve the purchase of two monitoring units and the software.

President Kallberg confirmed that the cost would be higher this year because of the purchase of the monitoring units and the software, with the fees reduced in future years to simply the subscription cost.

Ray Valley explained that the equipment would allow the District to more precisely identify areas that need treatment and to determine whether the treatment is effective.

Manager Thorsen suggested that further discussion be deferred to allow additional time to review the information.

Manager Schmokel stated that he would like to see this brought forward at a workshop.

Manager Thorsen made a motion to defer this request to allow additional time for review. Second by Manager Hennes. All ayes. Motion passed 4-0.

### **COUNTY COMPREHENSIVE LAND USE PLAN UPDATE AND THE PLSLWD**

Paul Nelson, Scott County, discussed the Scott County 2030 Comprehensive Plan Update. He provided background information on the previous Comprehensive Plan of the County and the differences between the 2020 and 2030 Plans.

Brad Davis continued to discuss the differences in land use identified on the 2020 Comprehensive Plan and the 2030 Comprehensive Plan for Scott County.

Kathy Nielsen explained that the development of the 2030 Comprehensive Plan has been a collaborative effort between the County, the Watershed Districts, and the Cities and Townships.

Paul Nelson continued to review information in regard to the County stormwater requirements, runoff volume, and phosphorus. He explained that the 2003 Study completed by the District had effect on the land use planning process and the creation of the 2030 Comprehensive Plan.

Manager Schmokel stated that he liked that the concept was moving to volume rather than velocity.

#### **PROPOSAL FROM SPRING LAKE TOWNSHIP**

Kathy Nielsen explained an annexation that took place last year in regard to the Sunset project, where a portion of Spring Lake Township was annexed into the City of Prior Lake. She reported that the Township has donated a portion of the land to the City of Prior Lake to assist with the road project. She advised that the Township has discovered that they now own a strip of lakeshore that is fully within the City of Prior Lake, and for which they will be assessed if they keep the property. She explained that the Township has no interest in owning property within Prior Lake and asked the District to determine if they would have an interest in the property. She noted that a decision would not need to occur at this time but asked that further discussion occur at a future Board meeting.

President Kallberg directed staff to obtain additional information in regard to the possible acquisition of this property.

Manager Schmokel asked that the City of Prior Lake also be included in the discussions.

Kathy Nielsen clarified that if the District is not interested in the land for District purposes, the decision to sell to a private buyer would be the Township's.

#### **AWARD CONTRACT FOR FERRIC CHLORIDE FEED SYSTEM**

Nat Kale noted that a recommendation was included in the Board packet to award the ferric chloride feed project. He reported that two bids were received, with a range of almost \$55,000 between the two bids. He explained that the lower bidder is located in Jordan and therefore has lower mobilization costs. He advised that staff recommends the contract be awarded to the low bidder.

Chuck Holtman provided additional information on the timing specified in the bid documents and awarding of the contract.

Manager Thorsen asked what the hurry is and believed that the action should be delayed.

Mike Kinney noted that construction was to occur during frozen conditions.

Chuck Holtman noted that there is a special meeting, public hearing, to be held on February 27<sup>th</sup>.

Manager Thorsen stated that he would like to see this done conservatively and believed that everything should be obtained prior to the contract being awarded.

Mike Kinney explained that during the time that the permits are being obtained, the contractor can be submitting their necessary documents and insurance information. He explained that this is a side-by-side process that is often done.

Nat Kale explained that the bid received is calculated from the date the bid is opened and not the date the bid is awarded. He explained that waiting through the 45-day period does not grant any type of extension on the bid submitted.

Chuck Holtman explained that once a bid is awarded, the contractor has ten days to submit its necessary paperwork and insurance documentation. By awarding the contract today, the Board could allow the paperwork to be completed before the public hearing on February 27<sup>th</sup>, allowing the notice to proceed to be issued directly thereafter rather than waiting an additional ten days.

Manager Schmokel made a motion to approve Resolution 13-623. Second by Manager Hennes. All ayes. Motion passed 4-0.

Nat Kale stated that the District has successfully negotiated for the purchase of two easements needed, which will satisfy the land easements required for this project.

Manager Schmokel made a motion to approve Resolution 13-624. Second by Manager Hennes. All ayes. Motion passed 4-0.

Manager Hennes made a motion to approve Resolution 13-625. Second by Manager Schmokel. All ayes. Motion passed 4-0.

### **COST SHARE FRAMEWORK**

Nat Kale noted that a memo was included in the Board packet explaining the cost share framework. He explained that this will incorporate the existing program with additional detail and clarification.

Manager Schmokel made a motion to approve the cost share framework. Second by Manager Hennes. All ayes. Motion passed 4-0.

Manager Thorsen departed at 5:30 p.m.

### **CITY OF PRIOR LAKE – CENTER FOR URBAN AND REGIONAL ASSISTANCE (CURA) PROPOSAL**

Nat Kale informed the Board that the City of Prior Lake is applying to CURA to host a “Resilient Cities” project, which was piloted last year with the City of Minnetonka and involves CURA and related resources brought to bear to coordinate and improve sustainability of city elements and activities, including water resource matters. Prior Lake has asked for the District’s support. If the application is accepted, Prior Lake may ask for more active District engagement including funding participation. Support at this time involves no financial obligation.

Manager Hennes made a motion to support the Prior Lake application and authorize staff assistance in its submittal. Second by Manager Schmokel. All ayes. Motion passed 3-0.

### **STORMWATER RULE**

Nat Kale discussed the progress of the Rules Technical Advisory Committee (TAC) thus far. He advised the Board that the technical group has expressed serious reservations about any rewrite of the stormwater rule that requires greater stormwater volume mitigation than the present rule. He recommended bringing a stormwater rule to the TAC that maintains the same stormwater runoff and water quality standards as the current rule, and revises the stormwater volume requirement to be equivalent, but written as a pre-development/post-development standard, rather than an infiltration/abstraction over new impervious standard. Paul Nelson suggested that a 0.5-inch abstraction requirement does reduce volume; the question for the Board is whether it sees a need for greater reduction. The other question, to his mind, is whether the standard should prescribe a certain amount of abstraction, or a proportion of abstraction.

Mr. Kale also discussed a proposed volume banking concept. Since all runoff in the District flows to Prior Lake, there is a wide scope for banking. Managers Schmokel and Kallberg encouraged developing the concept, but said that more exploration and careful consideration are needed.

The managers concurred that staff should continue to explore both the shift to a pre-/post-development standard and a volume banking concept.

### **SPRING LAKE CORES SUMMARY**

Mr. Kale advised that the St. Croix Watershed Research Station and University of St. Thomas have done sediment sampling of Upper Prior, Lower Prior and Spring Lakes. Staff believes that the TMDL target of 40 milligrams phosphorus per liter for Spring Lake may be low in light of a pre-development phosphorus level that may have been higher. Staff is talking with the Minnesota Pollution Control Agency as to what further data might support revising the TMDL. Mr. Kinney added that Spring Lake is classified as a deep lake, but is close to the standard for a shallow lake, which would be assigned a higher TMDL target of 60 milligrams per liter.

### **PROGRAMS AND PROJECTS UPDATE**

Nat Kale provided an update on District programs and projects.

**MANAGER PRESENTATIONS AND MEETINGS ATTENDED**

None. President Kallberg remarked that he would prefer managers' items to be submitted before the meeting.

**MISCELLANEOUS ADMINISTRATIVE ITEMS**

Written report provided in Board material.

**UPCOMING MEETINGS**

President Kallberg noted a February 27 special meeting to be held at the District office and a February 28 meeting of the Citizens' Advisory Committee at Prior Lake City Hall.

**ADJOURNMENT**

Meeting adjourned at 6:20 p.m.

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Marianne Breitbach, Secretary

# PRIOR LAKE – SPRING LAKE

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## WATERSHED DISTRICT

*Wednesday, February 27, 2013*  
*Prior Lake-Spring Lake Watershed District Office*  
*3:00 PM*

Members Present: Marianne Breitbach, William Schmokel, Bill Kallberg, Curt Hennes & Bruce Thorsen

Members Absent: None.

Staff Present: Mike Kinney, District Administrator  
Emily Javens, District Engineer  
Nat Kale, District Planner

Others Present: None.

1. **CALL TO ORDER/PLEDGE OF ALLEGIANCE:** Meeting called to order by President Bill Kallberg at 3:05 PM.
2. **PUBLIC COMMENT:** None
3. **APPROVAL OF AGENDA:** Manager Thorsen asks to add Treasury Report to the agenda. Manager Hennes motions to accept agenda with changes. Second by Manager Thorsen. All ayes.

### **Treasury Report**

Manager Thorsen informed all Managers they are required to sign a new bank card with Prior Lake State Bank for purposes of signing checks and access to Safety Deposit Box. Managers signed the new card handed out by Manager Thorsen. Manager Hennes will go directly to the Prior Lake State Bank for signature since he is a new Manager to the Board.

Motion made by Manager Schmokel to open the Public Hearing. Second by Manager Hennes. All ayes. Motion passed 5-0. President Kallberg suspends Special Meeting and opens Public Hearing for the Ferric Chloride Feed System Construction Project at 3:20 PM.

Emily Javens explains that the District is required to hold a Public Hearing for the expenditure of public funds. No one from the public was present to ask questions. Ms. Javens proceeds to update Board that bids were solicited, two were received, and one was accepted, easements have all been

taken care of, permit applications are in review with some in hand, and a preconstruction meeting will take place Friday, March 1, 2013 at the District office.

Motion made by Manager Thorsen to close meeting. Second by Manager Hennes. All Ayes. Motion passed 5-0. President Kallberg closes Public Hearing. Public Hearing closed at 3:29 PM.

President Kallberg reopens Special Meeting.

### **Ferric Chloride Ordering Resolution 13-266.**

Manager Thorsen moves to accept Resolution 13-266, Ordering Modifications of the Ferric Chloride Water Quality Treatment Facility. Second by Manager Breitbach. All ayes. Motion passed 5-0

### **Meeting Schedule**

Mike Kinney shared he has received several requests from members of the community requesting the District consider changing the meeting start time to later in the day to accommodate those individuals who work a traditional daytime schedule so they could attend the scheduled monthly meetings. Manager Thorsen suggests asking the Citizens Advisory Committee for their feedback and what day/time of the month would work best for them to attend the meetings. Mr. Kinney is attending the next CAC meeting and will bring up the topic with them at that time. Discussion to continue at next meeting.

### **Plan Update**

Mike Kinney shared that staff has been reviewing and providing suggested edits to the Water Resources Management Plan (WRMP) that was approved in 2010.

Nat Kale offered that the draft WRMP amendment was ready to go out for a 60 day comment period to public, local governments, cities, etc. to incorporate comments. Staff will then bring the plan back to the board for consideration and then to BWSR for 90 day review. There are three sections of the Plan that are being updated; Goals and Policies, Management Plan, & the Implementation Plan. Mr. Kale suggested that projects need to be separated into funded and unfunded to eliminate some confusion about project expenses budgeted for and future projects not budgeted for.

Manager Thorsen added that the last levy was less than the budgeted expenses and this is a concern going forward. Money should be spent on projects to improve water resources. The Watershed District needs to look at its levy as it relates to the projects in the WRMP.

Mike Kinney reminded the Board this it is the District's responsibility to go through the WRMP annually. For a WRMP amendment, the District needs to send the Plan out for comment and it needs to be approved in order to get some new projects moving forward. Staff recommended that the Board direct staff to send the WRMP out for the 60 day review. Manager Breitbach made a motion to direct staff to move forward with the 60 day review. Second by Manager Schmokel. All ayes. Motion passed 5-0.

### **Alum Application in Spring Lake**

Staff has been working with the University of St. Thomas and the St. Croix Watershed Research Station on packaging their research for a site-specific standard request for Spring Lake. Nat Kale proposed that the District ask the St. Croix Watershed Research Station to summarize the research they have completed into a final report so it is ready for use in making this requested change.

Administrator Kinney added that mandated reductions laid out in the TMDL report go to the City of Prior Lake, Spring Lake Township, Scott County & MNDOT and as such would likely offer to each entity to provide some input as the end result would have a large impact on future related expenditures.

The City of Prior Lake would like to see a series of public meetings regarding the alum treatment before making a final decision. Mr. Kinney also added that the City of Prior Lake would like to see a feasibility study. Barr Engineering will be putting a proposal together for this study. The Board directed staff to bring the proposal to the March board meeting.

### **CiBioBase Update**

Mike Kinney shared that the District will be inquiring as to which local lake and community residents might have the appropriate equipment that was discussed at the February Board meeting so as to expand the options for using this service. Adding, funds had been budgeted for related activities and we will begin to work with them to collect data for 2013 aquatic plant management efforts. It will also be a great way to work with the area lake association members and lake residents.

### **Manager Presentations**

None

### **MAWD Legislative Day**

Written information provided.

Adjournment at 4:58 PM

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Marianne Breitbach, Secretary

**Tuesday, March 12, 2013**  
**Prior Lake City Hall**  
**3:00 PM**

Members Present: William Schmokel, Bill Kallberg, Curt Hennes & Bruce Thorsen

Members Absent: Marianne Breitbach

Staff Present: Mike Kinney, District Administrator  
Nat Kale, Watershed Planner  
Emily Javens, Watershed Engineer

Louis Smith, District Attorney, Smith Partners  
Carl Almer, District Engineer  
Meghan Jackson, District Employee

Others Present: Paul Nelson, Scott County  
Mayor Kenneth Hedberg, Prior Lake  
Pete Young, City of Prior Lake  
Jim Weninger, Citizens Advisory Committee

1. **CALL TO ORDER/PLEDGE OF ALLEGIANCE:** Meeting called to order by President Bill Kallberg at 3:05 PM.
2. **PUBLIC COMMENT:** None
3. **APPROVAL OF AGENDA:** Mike Kinney noted that the minutes from the February 27, 2013 were not complete and asked that the item be removed from the agenda. President Kallberg asked that an item regarding the Spring Lake parcel also be included under New Business. Manager Hennes moved to accept the agenda with above said changes. Second by Manager Thorsen. All ayes. Motion passed 4-0.
4. **CONSENT AGENDA:**
  - ~~Minutes – Special Meeting 2/27/13~~
  - Cost Share

Manager Schmokel confirmed the amount the District would be paying for the well sealing cost share application and also confirmed that the property owner had already paid for the expenses.

Manager Schmokel moved to accept the consent agenda. Second by Manager Hennes. All ayes. Motion passed 4-0.

5. **TREASURER'S REPORT**

- Cash and Investments
- Claims List
- Annual Budget and Tax Levy

Manager Thorsen briefly reviewed the Treasurer's Report. He advised that some of the Managers recently visited Prior Lake State Bank safe deposit box and asked that an update be provided.

Mike Kinney confirmed that original easements were included and advised of which signed easements were found in the box. He confirmed that the safe deposit box could be closed out with the signature of two Managers.

President Kallberg stated that he and Manager Hennes visited Prior Lake State Bank and opened the safe deposit box. He advised of the items that were included in the box and noted that he and Manager Hennes brought the items to the office of Mike Kinney. He advised that at that time they discussed that there was no need to pay the annual fee to keep the safe deposit box and instead those documents will be scanned into the system and archived in the protected fireproof cabinet with the other original documents.

Manager Thorsen moved to approve the Claims List and accept the Treasurer's Report. Second by Manager Hennes. All ayes. Motion passed 4-0.

6. **OTHER OLD/NEW BUSINESS:**

**CONSIDER APPROVAL OF THE SCOTT COUNTY LOCAL WATER MANAGEMENT PLAN – RESOLUTION 13-267**

Nat Kale reported that staff did have a chance to review the Scott County Local Water Management Plan and noted that the presented Resolution 13-267 would show that the District finds the Plan sufficient in meeting the District's requirements. He stated that part of the Plan update is demonstrating equivalency with the Watershed Rules. He explained that because the District is in the process of reviewing and updating their rules, county ordinances will be reviewed for equivalency once the District Rules process is complete.

Manager Hennes made a motion to approve Resolution 13-267. Second by Manager Thorsen. All ayes. Motion passed 4-0.

### **CONSIDER APPROVAL OF JEFFERS PASS STORM SEWER ADDITIONS PERMIT APPLICATION**

Megan Jackson noted that the District recently received a permit application from the City of Prior Lake to improve the storm sewer at Jeffers Pass in order to accommodate high level storm events. She recommended approval of the request and confirmed that this would not have any cost implications for the District.

Manager Schmokel made a motion to approve the Jeffers Pass Storm Sewer Additions Permit Application. Second by Manager Hennes. All ayes. Motion passed 4-0.

### **CONSIDER APPROVAL OF BARR ALUM TREATMENT FEASIBILITY PROPOSAL**

Nat Kale provided an update on alum treatment and discussions with Barr Engineering. He stated that the proposal for Alum Treatment Feasibility Study has a cost of \$9,500, which would also include the Board presentation. He advised that additional meetings would have a cost of \$900 each, and noted that staff recommends that the Feasibility Proposal be approved.

Manager Hennes made a motion to approve the Alum Treatment Feasibility proposal from Barr Engineering in the amount of \$9,500. Second by Manager Schmokel. All ayes. Motion passed 4-0.

### **CONSIDER BOARD MEETING TIME CHANGE**

Manager Thorsen stated that since there were not answers from all the members of the CAC, and he also believed that Managers should be polled, he suggested that additional information be gathered. He also suggested that Mondays and Thursdays be included.

Manager Thorsen stated that the group could meet in another room and suggested that additional analysis be done.

President Kallberg stated that the ability to record and broadcast the meeting would provide an ability to reach more residents in the District than the few residents that actually attend the meeting and therefore should be held in the Council chambers to provide that ability.

Manager Hennes made a motion to table the discussion considering changing the Board meeting time and giving staff until the May meeting to collect additional information as needed. Second by Manager Schmokel. All ayes. Motion passed 4-0.

### **DISTRICT PROGRAMS & UPDATES**

Emily Javens provided both written and verbal updates on current projects, showing current progress and impending actions. She advised that bids opened today for the Hwy 12/17 project as it relates to the Clean Water Fund Grant – Upper Watershed Volume Reduction and noted that staff would meet the following day to review those bids. She advised that the final cost estimate for the project was quite a bit higher than initial estimates and would report back as to whether more funds from the Watershed District would need to be allocated.

Manager Thorsen asked for input from Mayor Hedberg and Paul Nelson.

Mayor Hedberg stated that the City of Prior Lake has been delighted with the process, the project and the cooperation of the District.

Paul Nelson confirmed that Scott County is also satisfied with the process.

Manager Thorsen questioned why the cost came out higher than expected.

Emily Javens explained that a full survey had not been completed with the preliminary estimate and the final plan quantities required a larger volume of excavation than initially anticipated. She explained that if the cost is too high, there were other options that could be explored, such as removing the project from the larger County Road 12 Reconstruction project and rebid it, focusing on the smaller scale local contractors.

Mike Kinney noted that the Miller agreement has been received and will be signed by the necessary Managers today for the Jackson Trail culvert replacement.

Megan Jackson provided an update on the education and outreach efforts.

Nat Kale continued to provide updates on the District projects and programs. He noted that the District will soon post for an intern to assist in erosion control efforts and inspections. He hoped that the intern could be hired within the next month to forty five days.

#### **SPRING LAKE TOWNSHIP PROPERTY**

Manager Schmokel stated that at the previous meeting that the clerk from Spring Lake Township presented a parcel that they would like to sell. He identified the strip of land that was created in about 1970 and is about 120 feet wide by 320 feet long and is mostly steep slope. He stated that the land was proposed to be assessed by the City of Prior Lake and noted that he obtained very rough numbers for a potential assessment. He stated that the proposed assessment for the parcel is \$7,000. He stated that while the process the City of Prior Lake follows for assessment seems to be reasonable, the cost for a long parcel gets to be costly. He stated that benefit must be provided by the project and he did not feel that benefit would be provided. He noted that the ultimate assessment would be determined after the project is complete. He stated that the City of Prior Lake and Spring Lake Township would need to work out this matter.

Mike Kinney noted that the clerk from Spring Lake Township did ask that the Board to research the matter and make a decision on whether they would like the property in exchange for paying the proposed assessment.

Mayor Hedberg explained the steps that were followed to determine the original assessment amount of \$7,000. He stated that the City deliberated this parcel, the process of using front footage rather than lot size for assessment, and advised that the City has good engineering estimates. He stated that the City would have to prove that there is benefit equal to the assessment. He stated that he was unsure whether the specific parcel was assessed. He advised

that the owner of the parcel could appeal the assessment to undergo a special assessment process to determine cost benefit.

Louis Smith questioned the purpose of the Watershed owning the property.

Manager Schmokel stated acknowledged that the strip of land is narrow and did not think a structure could be built on the property. He believed that if the assessment was going to be nominal, there could be things done on the property to improve the lake.

Mike Kinney confirmed that the strip could remain natural to provide a habitat to the fish in the lake. He also acknowledged the comment made by Louis Smith as to the purpose of the District owning the property and that it could serve as a demonstration site as well for shoreline restoration projects.

Mayor Hedberg clarified that the properties along the roadway will be assessed for the road improvement project on a frontage foot basis. He again stated that the property could be reviewed prior to the assessment hearing in April in attempt to hold a special assessment review.

Mike Kinney noted that Spring Lake Township would like a decision to be made from the District as soon as possible and noted that additional information can be gathered and a decision could be made at the next Board meeting.

Manager Schmokel did not think that the assessment would ultimately be \$7,000. He recommended that he speak with the Spring Lake Township clerk in regard to the possible environmental benefit the property could provide.

Mike Kinney stated that staff feels that the property would be worth acquisition. He noted that additional information could be gathered and a recommendation could be made at the next meeting.

Mayor Hedberg urged the District to reach out to the City of Prior Lake to determine if a special benefit appraisal had been made for this property in order to obtain more accurate information on the proposed assessment.

Manager Hennes made a motion to table the discussion regarding the Spring Lake Township acquisition until the March 26, 2013 meeting and direct staff to gain additional information regarding special benefit appraisal for the property. Second by Manager Thorsen. All ayes. Motion passed 4-0.

Louis Smith asked that staff also research what would occur if the District were to do nothing in order to compare the two outcomes.

Mike Kinney noted that the Township has expressed intent to approach the property owner across the street to obtain their interest in the parcel.

### **MANAGER PRESENTATIONS AND MEETINGS ATTENDED**

President Kallberg stated that he, Manager Breitbach and Meghan Jackson attended a meeting earlier this week to hear a presentation in regard to communicating with the news media in a crisis situation.

### **MISCELLANEOUS ADMINISTRATIVE ITEMS**

Written report provided in Board material.

### **CITIZENS ADVISORY COMMITTEE (CAC) MANDATE – JIM WENINGER**

Meghan Jackson stated that the CAC is wondering how they can be better involved and what assistance they can provide to the Board. She noted that some recommendations were included in the Board packet.

Jim Weninger stated that the CAC is very active and interested in different aspects of water quality including agricultural input, staff support, and resident knowledge of the area. He stated that the CAC has learned from each other and staff and wants to ensure that they are meeting the needs and desires of the Board of Managers. He questioned what the Board would like or could ask the CAC to do in order to better assist the Managers. He stated that the CAC would like to do more than meet monthly to discuss water quality and would like to be more involved and effective.

Manager Hennes stated that their hands are somewhat tied outside of regular meetings because of the open meeting laws and wanted the CAC to provide input or ideas and thoughts from the general public.

Jim Weninger believed that the CAC should have more access to project information in order to better inform residents. He questioned if the CAC should be involved in the development review process. He confirmed that it would be preferential for a member of the Board to attend the CAC meetings.

Manager Thorsen discussed the District's fiscal status and a review that could be done by the CAC of the projects listed. He explained that perhaps the tax levy would need to be increased to meet the demands of future water quality projects identified thus far and believed that the input and cooperation of the CAC would be an important part of that process.

Mike Kinney noted that suggestions for involvement were included in the Board packet and reviewed some of those suggestions.

Manager Hennes moved to convene in closed session to discuss the performance review of Administrator Mike Kinney and salary survey results at 5:00 p.m. Manager Schmokel seconded. Motion passed 4-0.

The meeting convened in closed session.

The meeting reconvened in open session.

No action was taken during the closed session. President Kallberg asked each manager to study the material provided further and be prepared to discuss at a later date. Furthermore, President Kallberg intends to discuss the performance review and salary study process with HR specialist, Ellen Hinrichs and will report back to the Board.

**ADJOURNMENT**

Meeting adjourned at 5:50 p.m.

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Marianne Breitbach, Secretary

**Prior Lake-Spring Lake Watershed District**

March 2013 - Paid April 2013

Vendor	Invoice	Description	Amount
BMK	85648	Office Supplies	\$ 72.19
Alsea Geospatial, Inc.	2013027	Monitoring Equipment	\$ 1,219.00
Bufflehead	31313	PC Purchase - On Site Work	\$ 1,537.12
City of Prior Lake	13-020	Street Sweeping Grant Study Year 3	\$ 787.55
Dunlop Holdings		Rent	\$ 1,950.00
EOR	00758-0013	General Engineering	\$ 3,861.25
EOR	00758-0023	2013 Permit/Plan Review	\$ 262.00
EOR	00758-0032	2013 PLOC JPA/MOA	\$ 1,102.38
EOR	00758-0040	Rule Revisions	\$ 304.94
EOR	00758-0062	2011 Monitoring Assistance	\$ 588.50
EOR	00758-0068	2012 Monitoring Assistance	\$ 113.00
EOR	00758-0072	Prior Lake FEMA Model Update	\$ 184.50
EOR	00758-0074	2013 Monitoring Assistance	\$ 961.75
H S A Bank		March Health Savings	\$ 669.22
HealthPartners	42881705	Health Insurance	\$ 3,994.31
Mediacom		Monthly Charge	\$ 301.27
Meghan Jackson		Clean Water Media Campaign Reimbursement	\$ 25.00
Messerli & Schadow	32513	March charges	\$ 5,795.00
MN Dept of Natural Resources	215925	Culvert Work Segment 4A	\$ 150.00
NCPERS	9400313	Life Insurance	\$ 80.00
Reliance Standard	9053250001	STD/LTD Insurance	\$ 785.08
Ricoh		Copy Machine Lease	\$ 244.69
Ricoh USA	5025405400	Copy Overage	\$ 431.19
S.M. Hentges & Sons, Inc.	Est #1	Ferric Chloride System	\$ 55,340.83
Select Account		Health Savings Account	\$ 923.04
Smith Partners	35201	General Ledger & Meetings	\$ 205.00
Smith Partners	35202	General Admin & Legal Services	\$ 285.00
Smith Partners	35203	Water Resources Plan	\$ 247.00
Smith Partners	35204	Permitting	\$ 45.50
Smith Partners	35205	Prior Lake Outlet Channel	\$ 760.00
Timesaver	M19671	March 12 Board Meeting	\$ 192.90
VISA		Monthly Charges	\$ 65.99
VISA		Monthly Charges	\$ 1,259.35
Waterdrop Innovations, LLC	133	100 copies of Blue Thumb Raingarden Guide	\$ 900.00
Wells Fargo		March Health Savings	899.98

**TOTAL**

**\$ 86,544.53**

Larry E. Messerli, CPA  
Chris M. Schadow, CPA

Andrea R. Kulig, CPA  
Cora E. Leland, CPA  
Kathrine S. Simonson, CPA



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April 3, 2013

Prior Lake Spring Lake Watershed District  
Board of Managers  
Prior Lake, MN

Board of Managers:

I am writing at the request of District Administrator Mike Kinney to request certain actions by the board. These actions support the current financial and programmatic activities of the District. The actions are documented below as well as a brief explanation of why the request is being made.

BOARD RESOLUTION 13-268:

Action

The board approves total transfers of \$80,520 from the Bond fund to the MOA/JPA group of funds as explained below effective December 31, 2012:

Earlier in the MOA/JPA project, the District advanced funds from the 910 Bond fund to the MOA/JPA group of funds. At the time this created a receivable in the Bond fund because not all of the money transferred was expended in those earlier years by the MOA/JPA. No funds were transferred in 2012 for the District's portion of the MOA/JPA expenditures because transfers in the past were sufficient to cover the 2012 expenses.

To properly reflect the amount now receivable in the Bond fund from the MOA/JPA group of funds and to fund the District's portion of 2012 costs, two transactions are requested to be approved. First, a transfer needs to be made and a corresponding reduction in the Bond fund receivable in the amount of \$14,943. This will satisfy the remaining receivable from the 910 Bond fund to the MOA/JPA group of funds. In addition a transfer of \$65,577 (80,520 -14,943) from the 910 Bond fund to the MOA/JPA group of funds is requested to satisfy the District's remaining portion of the MOA/JPA costs for 2012.

Approved this 9th day of April, 2013 upon motion by \_\_\_\_\_ and second  
by \_\_\_\_\_ by the following vote:

Respectfully Submitted,

Chris Schadow  
District Accountant

William Kallberg \_\_\_\_\_  
D. Bruce Thorsen \_\_\_\_\_  
William Schmokel \_\_\_\_\_  
Marianne Breiltbach \_\_\_\_\_  
Curt Hennes \_\_\_\_\_

The Chair determined the resolution adopted.

\_\_\_\_\_  
William Kallberg, President

PRIOR LAKE - SPRING LAKE  
WATERSHED DISTRICT

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**MEMORANDUM**

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**TO:** PLSLWD BOARD OF MANAGERS  
**FROM:** NAT KALE, WATERSHED PLANNER  
**SUBJECT:** PRIOR LAKE FEMA FLOODPLAIN UPDATE  
**DATE:** APRIL 9, 2013

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FLOOD ELEVATION AND INSURANCE BACKGROUND

Flooding is a widespread risk, and one that is difficult for insurance companies to predict and protect against. Because private flood insurance is generally difficult to obtain and expensive, the US Congress established the National Flood Insurance Program (NFIP), directed by the Federal Emergency Management Agency (FEMA). The NFIP dictates that if local governments adopt ordinance(s) that reduce the risk of flooding, the federal government will provide flood insurance to their citizens. This is important, because frequently mortgage companies require mortgage recipients to acquire and maintain flood insurance in flood prone areas.

In order to participate in the NFIP in Minnesota, a local government has to establish a map of the 100-year floodplain; this floodplain is used to determine the Regulatory Flood Protection Elevation (RFPE), which is set at the 100-year floodplain + the additional water elevation that would be caused by filling in the floodplain + 1 foot of "freeboard", or additional protection. Any new (habitable) construction within the floodplain is required to have the lowest floor at or above the RFPE.

In the mid-1990s the US Army Corps of Engineers created a HEC-1 model of Prior Lake that determined the 100-year floodplain to be at an elevation of 908.9' above sea level; thus the RFPE was set at 909.9'. However, this model did not account for the Prior Lake Outlet operated by the District. The outlet was not included because the District did not have the legal authority to discharge water during any and all flooding conditions; downstream recipients could require that the outlet be closed.

In 2006 the District, along with the cities of Shakopee and Prior Lake and the Shakopee Mdewakanton Sioux Community, revised the Joint Powers Agreement / Memorandum of Agreement that establishes the rights and responsibilities of each organization respective to the Prior Lake Outlet Channel. Among other changes, this update established the District's right to discharge water whenever the elevation of Prior Lake rises above 902.5' (and, in certain conditions, when the elevation rises above 902.0'), up to 65 cubic feet per second.

# PRIOR LAKE - SPRING LAKE

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## WATERSHED DISTRICT

### PROGRESS TO DATE

Because of the change in legal status, the staffs of the Watershed District and the City of Prior Lake proposed working together to update the US Army Corps of Engineers modeling to account for the lake outlet, under the assumption that revised modeling will lower the 100-year flood elevation and RFPE, and therefore reduce the number of people required to purchase flood insurance. At their August 12, 2012 meeting, the Board of Managers authorized a scope of work drafted by EOR, Inc. to update the 1990s-era HEC-1 model.

EOR has now completed that update to the satisfaction of City and District staff. In addition, City and District staff have met with the statewide floodplain coordinator from the DNR (Suzanne Jiwani), and discussed the results of the model; the DNR sees no technical concerns with the work that has been done, and feels it is ready to submit to FEMA for review.

### RAINFALL CHANGES

For this model update the same rainfall and runoff data were used as the original 1995 model. However, a study to update the rainfall frequency throughout the United States, known as Atlas 14, is in its final stages in Minnesota (though not yet released). District and City staff have been keeping up to date on the progress of this study and its potential impact on the floodplain update.

While FEMA has not yet approved a floodplain study in Minnesota based off of the new rainfall data, it is important to consider that draft revisions have shown an approximately 30% increase in the 24-hour, 100-year event. This increase is primarily due to the increased likelihood of intense events, *not* to an overall increase in the volume of rainfall; that is to say, as the likelihood of short, intense bursts of precipitation has increased, the likelihood of less-intense precipitation has decreased.

FEMA floodplain revisions are based on a 10-day, 100-year event, not the 1-day, 100-year event. Because the overall precipitation has remained relatively constant, it is likely that for longer durations (such as the 10-day event) the difference in precipitation volume between the current and the proposed precipitation maps will be significantly less than the difference for the 1-day event. Therefore, it is appropriate to continue to use the 1995 rainfall and runoff data for this model update.

### STUDY OUTCOME

The revised HEC-1 model shows that an elevation of 907.7' is a more accurate 100-year flood elevation, incorporating both outflow from the outlet and anticipated filling in the floodplain. This number has the added advantage of being 0.1' higher than the highest recorded elevation on Prior Lake (which predated the installation of the outlet structure). If adopted, this would lower the RFPE by 1.2 feet, to 908.7'.

### FISCAL IMPACT

There are two potential courses of action. The District and City could pursue a Letter of Map Revision, in which case model review charges of \$5,000 could apply, but the

14070 Commerce Ave NE, Suite 300, Prior Lake, MN 55372 • (952) 447-4166 (phone)  
(952) 447-4167 (fax) • [www.plslwd.org](http://www.plslwd.org) • [info@plslwd.org](mailto:info@plslwd.org)

PRIOR LAKE - SPRING LAKE  
WATERSHED DISTRICT

changes could be adopted as soon as this fall; alternatively, the update could be appended to the currently ongoing Scott County map revision, in which case no charges would apply (fiscal impact \$0), but the soonest the revised map would be adopted would be summer of 2014. The City of Prior Lake would prefer to pursue a Letter of Map Revision.

STAFF RECOMMENDATION

District Staff recommends submitting the attached report and associated HEC-1 model to the City of Prior Lake, which will take the lead in working with FEMA to update the 100-year floodplain elevation to 907.7'.

# PRIOR LAKE - SPRING LAKE

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## WATERSHED DISTRICT

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### MEMORANDUM

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**TO:** PLSLWD BOARD OF MANAGERS  
**FROM:** NAT KALE, WATERSHED PLANNER  
**SUBJECT:** LOWER PRIOR DIAGNOSTIC STUDY  
**DATE:** APRIL 9, 2013

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#### BACKGROUND

In 2011 the District's proposal to the MPCA for a grant to help fund a diagnostic and feasibility study of Lower Prior Lake was approved. Over the summer of 2011 EOR collected numerous water quality samples at a variety of locations in Lower Prior Lake and at various stormwater discharge points to the lake, conducted a shoreline survey, and compiled the data they had collected. In 2012 EOR put together P8 models of likely sources of phosphorus loading to Lower Prior Lake, and together with District staff conducted field surveys of all of the subwatersheds tributary to the lake and drafted an implementation plan.

The Lower Prior Lake Diagnostic Study and Implementation Plan is now complete. The District has received input from the public at two open meetings in 2012, and worked closely with the City of Prior Lake to incorporate their concerns and comments. With stakeholder input received and the work completed, as well as the expiration of the grant contract coming up on June 30, 2013, it is time to finalize the project with the MPCA.

#### PROJECT RESULTS

Lower Prior Lake is not an impaired water, but it is close in terms of algae growth. This study sets a goal of up to 10% improvement in phosphorus, chlorophyll, and transparency over ten years.

**Table I: Lower Prior Lake Water Quality**

	Total Phosphorus (ug/L)	Chlorophyll (ug/L)	Transparency (meters)
Present Condition	26	13	2.8
Goal Condition	23	12	3.1
State Standard	40	14	1.4

The study has revealed some characteristics of Lower Prior Lake that were previously unknown. Two of the more interesting characteristics are:

# PRIOR LAKE - SPRING LAKE

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## WATERSHED DISTRICT

- Lower Prior Lake water quality is influenced by Upper Prior Lake, but only just near the Wagon Bridge. As you travel further northeast, the quality of water in the lake is more heavily influenced by phosphorus loading from the direct watershed and some internal sediment release.
- Candy Cove is likely permanently stratified; that is, there is a warm upper layer and a colder lower layer that likely never mix, due to the topography and bathymetry of the area. Because of this, it exhibits an unusual layer of algae growth several feet below the surface of the water.

Additionally, the study lays out a number of implementation actions to pursue the goals stated, including installation of infiltration areas and raingardens, impervious disconnection, lawn management, and more. A clear direction that we received from the two public meetings we held was that education and outreach should be central to our efforts to improve Lower Prior Lake.

### FISCAL IMPACT

The total cost of this project was estimated at \$96,834. As a 50:50 matching grant, the MPCA provided \$48,417, and the District provided \$48,417 as well, with \$11,481 of that money as “in-kind”, or District staff time, and \$36,936 as “local cash”, or payments to EOR. As of April 2013, the entire budget has been spent. The District levied and budgeted for its share in 2011 and 2012; no dollars were levied for this project in 2013. Approval of the recommended action will have no impact on the 2013 budget.

**Table 2: Lower Prior Lake Diagnostic Study and Implementation Plan Finances**

MPCA Grant	District (cash)	District (in-kind)	Total
\$48,417	\$36,936	\$11,481	\$96,834

### RECOMMENDATION

District Staff recommends that the Board approve the Lower Prior Diagnostic Study and Implementation Plan as written, and work with the MPCA to close out the project and the grant, including making minor changes to the Study as requested by the MPCA.

PRIOR LAKE - SPRING LAKE  
WATERSHED DISTRICT

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**MEMORANDUM**

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**TO:** PLSLWD BOARD OF MANAGERS  
**FROM:** NAT KALE, WATERSHED PLANNER  
**SUBJECT:** BUCK LAKE CHEMICAL INJECTION FEASIBILITY CONSULTANT SELECTION  
**DATE:** APRIL 9, 2013

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BACKGROUND

The Total Maximum Daily Load study of Spring and Upper Prior lakes identified both internal and watershed loading as important sources of phosphorus to the lakes, and therefore as contributors to the nutrient impairment of the lakes. Monitoring by the PLSLWD has identified that the second greatest watershed source of phosphorus to Spring Lake (after County Ditch 13) is the Buck Lake Channel, which passes under Highway 13 near the intersection with 180<sup>th</sup> Street and through the Ducks Unlimited wetland before it enters Spring Lake.

District staff performed a desktop review of the topography of the lower Buck Lake Channel area, and determined that the most likely candidate for treatment of the channel is a parcel currently owned by the Prior Lake Kingdom Hall, immediately south of Highway 13. Initial meetings with the parcel owners in the summer of 2012 were positive and indicated a willingness to work with the District on a water quality project.

At its January 29, 2013 meeting, the Board of Managers directed PLSLWD staff to distribute a Request for Proposals to draft a report on the feasibility of installing a chemical injection system for the Buck Lake Channel on the Kingdom Hall parcel. The District received two proposals, one from WSB & Associates, Inc., and one from Barr Engineering Company.

PROPOSAL REVIEW PROCEDURE

In the Request for Proposals the District indicated that it would review each proposal for the following criteria (not necessarily in the order presented here):

1. Completeness of the proposal;
2. Experience with similar projects;
3. Cost of the submitted proposal; and
4. References, particularly clients with similar projects.

The Watershed Planner and Watershed Engineer have reviewed the proposals per these four criteria, with input from the District Administrator and the District Engineer.

# PRIOR LAKE - SPRING LAKE

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## WATERSHED DISTRICT

Of the numerous issues that should be addressed before the Board decides whether or not to proceed with a Buck Lake chemical injection system, a sub-set can be considered “blockers”; that is, issues that make the project completely impossible. These blockers are 1) whether there is sufficient footprint on site for a project; 2) the ability to work around future MN-DOT and Spring Lake Township plans for the site; and 3) the impact of the downstream Ducks Unlimited wetland on phosphorus loading to Spring Lake. Both proposals are structured so that blockers are addressed in the initial phases, at which point there is a “break point” where the District may elect to end the study if one or more of the issues addressed makes construction of the project impossible. If the blockers are all surmountable, the District may decide to complete the feasibility (developing cost estimates, exploring alternatives, etc.).

### PROPOSAL REVIEW

#### Completeness

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Both the WSB and Barr proposals mentioned addressed all of the elements referenced in the scope. However, the WSB proposal in numerous locations incorrectly referred to the project as the “Crystal Lake Project” and the District as the “City of Robbinsdale”, which gave the proposal a rushed, unfinished tone.

The Barr proposal includes monitoring the Ducks Unlimited wetland through summer 2013 and a draft feasibility report October 2013, with a final feasibility study completed in January of 2014; the WSB proposal includes monitoring the wetland through May and a draft feasibility study in June 2013, with a final feasibility report by the end of July 2013. Staff feels that while the WSB timeline stays closer to the timeline distributed in the RFP, the Barr timeline more accurately reflects the monitoring needs of this project.

#### Experience

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Both WSB and Barr have proposed to include as members of the project team professionals with experience designing and installing chemical injections systems. Their levels of experience appear similar.

#### Cost

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WSB proposes a total project cost of \$39,750; Barr proposes a total cost of \$40,740, at a difference of \$990, or about 2%. The proposals put the “break point” mentioned above in very different locations. With the WSB proposal the total expenditure upon arriving at the breakpoint would be \$31,918, whereas with Barr the total expenditure would be \$7,715. A lower breakpoint value lessens the fiscal risk to the District if one or more of the blockers identified above proves to be insurmountable.

# PRIOR LAKE - SPRING LAKE

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## WATERSHED DISTRICT

**Table I: Proposal Cost Comparison (\$)**

	Breakpoint Expenditure	Total Expenditure
WSB	31,918	39,750
Barr	7,715	40,740

An additional consideration is that the WSB proposal breaks down their time by task, then hours by role (Principal, GIS Specialist, etc.). The Barr proposal breaks down their time by task, then by subtask, which is generally preferable.

### References

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One reference for WSB, one reference for Barr, and one reference for both entities were contacted. Barr designed & installed an alum injection system for the Ramsey Washington Metro Watershed District at Tanners Lake that is still running, and has very significantly improved water quality in the lake. Ramsey Washington retains Barr as their District Engineer, and is extremely pleased with their work. WSB installed an alum injection system for Richfield at Adams Hill Park, and is in the process of designing a new system around Taft Lake. The Adams Hill Park system was only in place for a few months, but made a significant difference in the pond during that time. WSB is the contracted engineer for Richfield, and they are pleased with their work.

Both companies cited their experience with a ferric chloride hypolimnetic withdrawal system<sup>1</sup> in Burnsville. WSB's staff was involved in installing the system initially, whereas Barr was called in later to make some modifications to improve the system. While it did clean up the lake that received the treated water, it never had the intended effect on the target lake, and has not been run for the past four years due to odor and effectiveness issues.

### RECOMMENDATION

District staff recommends that the Board authorize the District Administrator to sign a contract with Barr Engineering for an amount not to exceed \$7,715, with an option to extend the contract by \$33,025 to a total of \$40,740 upon review and approval of a draft study by the Board of Managers, per the attached Resolution.

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<sup>1</sup> In a lake that stratifies in the summer and winter, the warmer upper layer of water is the "epilimnion", the "hypolimnion" is the cooler, bottom layer, and the "thermocline" is where the two meet. Thus, a "hypolimnetic withdrawal system" pumps water out of the bottom of a lake when it is stratified, generally in the summer; in this case, the pumped water is also treated with ferric chloride to remove phosphorus.

# PRIOR LAKE – SPRING LAKE

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## W A T E R S H E D   D I S T R I C T

### **Resolution 13-269**

Authorizing a Contract with Barr Engineering Company for the  
Buck Lake Chemical Injection Feasibility Study

WHEREAS, the Prior Lake-Spring Lake Watershed District (PLSLWD) is established and authorized under Minnesota Statutes Chapters 103B and 103D; and

WHEREAS, the PLSLWD has an approved management plan under Minnesota Statutes Section 103B.231 and is a local water management organization; and

WHEREAS, in 2011 the US Environmental Protection Agency (EPA) and Minnesota Pollution Control Agency (MPCA) accepted the Phosphorus Total Maximum Daily Load (TMDL) Study for the nutrient impairments of Spring and Upper Prior Lakes; and

WHEREAS, the 2011 TMDL Study identified 4,947 lb/year, or 47%, of the total Phosphorus load to the lake as originating in stormwater runoff from the watershed; and

WHEREAS, a primary goal of the District as identified in the approved management plan is to achieve pollutant load levels at or below standards as dictated by Federal and State Impaired Waters threshold levels; and

WHEREAS, the District distributed a request for proposals to study the potential effect of alum application and oversee, if desired, said application to a number of consultants with a submittal deadline of February 28, 2013; and

WHEREAS, the District received and reviewed two fully qualified proposals; and

WHEREAS, Barr Engineering Company has submitted a proposal with a draft feasibility at a cost of \$7,715 and a final feasibility at a total cost of \$40,740.

THEREFORE BE IT RESOLVED that the Administrator, with advice of counsel, is authorized to execute a contract with Barr Engineering Company for a draft feasibility study, for an amount not to exceed \$7,715.

Adopted this 9<sup>st</sup> day of April, 2013, upon motion by \_\_\_\_\_ and second by \_\_\_\_\_ by the following vote:

William Kallberg \_\_\_\_\_  
William Schmokel \_\_\_\_\_  
D. Bruce Thorsen \_\_\_\_\_

Curtis Hennes \_\_\_\_\_  
Marianne Breitbach \_\_\_\_\_

The Chair determined the resolution adopted.

\_\_\_\_\_  
William Kallberg, President

Attest to:

I, Marianne Breitbach, Secretary of the Prior Lake-Spring Lake Watershed District, do hereby certify that the above resolution 13-269 was duly passed by the Board of Managers at a duly called meeting on the 9<sup>st</sup> day of April, 2013.

\_\_\_\_\_  
Marianne Breitbach, Secretary

PRIOR LAKE - SPRING LAKE  
WATERSHED DISTRICT

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**MEMORANDUM**

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**TO:** PLSLWD BOARD OF MANAGERS  
**FROM:** MEGHAN JACKSON, DISTRICT OUTREACH SPECIALIST  
**SUBJECT:** PLSLWD REGULAR BOARD MEETING TIME CHANGE  
**DATE:** APRIL 9, 2013

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District staff conducted a survey of evening availability for relevant parties who could be affected by a PLSLWD Regular Board meeting time change. Based on the results from the survey, District staff recommends the regular PLSLWD Board meeting time be changed to 6:00pm on the second Tuesday of every month in order to accommodate the greatest number of individuals from all parties.

Please note that if the Board meeting time is changed to 6:00pm on the second Tuesday of every month, the meetings could still be housed in the Prior Lake City Hall Council Chambers. Additionally, the Board could have the opportunity to have the regular meetings recorded and then broadcasted on the Prior Lake Public Access Channel.

# PRIOR LAKE - SPRING LAKE

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## WATERSHED DISTRICT

Legal Counsel				
Contact	Mon. Evening Conflict?	Tues. Evening Conflict?	Wed. Evening Conflict?	Thurs. Evening Conflict?
Chuck Holtman	None	None, but prefers 7pm start time	Yes, but will attend with notice	Yes
Louis Smith	None	None	None	Yes

District Staff & Consultants				
Contact	Mon. Evening Conflict?	Tues. Evening Conflict?	Wed. Evening Conflict?	Thurs. Evening Conflict?
Carl Almer	None	None	Yes, on 2 <sup>nd</sup> Wed.	Yes
Emily Javens	Yes	None	None	None
Nat Kale	None	None	Yes, but will attend with notice	None
Jaime Rockney	Yes, but will attend with notice	Yes, but will attend with notice	None	None
Mike Kinney	None	None	None	None
Amy Tucci	None	None	None	None
Meghan Jackson	None	None	None	None
Pete Young	Yes, City Council meetings	None	None	None

CAC Members				
Contact	Mon. Evening Conflict?	Tues. Evening Conflict?	Wed. Evening Conflict?	Thurs. Evening Conflict?
Christian Morkeberg	None	None	None	None
Kim Silvernagel	None	Yes	None	None
Steve Pany	None	None	None	Yes
Jim Weninger	Yes	None	Yes	None
Larry Rundell	None	None	None	None
Paul Krueger	None	None	Yes	Yes
Roger Wahl	None	Yes	None	None

# PRIOR LAKE - SPRING LAKE WATERSHED DISTRICT

PLSLWD Board Members				
Contact	Mon. Evening Conflict?	Tues. Evening Conflict?	Wed. Evening Conflict?	Thurs. Evening Conflict?
Bill Kallberg	None	None	None	None
Bill Schmokel	Yes	None	None	None
Curt Hennes	None	None	None	None
Bruce Thorsen	None	None	Yes	None
Marianne Breitbach	None	Yes, but only on 3rd Tues.	Yes	None

Current Partners with Afternoon & Evening Meeting Times				
	Monday	Tuesday	Wednesday	Thursday
<b>Week 1</b>	City of PL Council, 7pm (Jan-June)	City of Shakopee Council, 7pm	--	--
	Prior Lake Association, 7pm			
	City of Savage Council, 7pm			
<b>Week 2</b>	City of PL Council, 7pm (July-Dec)	--	--	Spring Lake Township, 7pm
<b>Week 3</b>	City of PL Council, 7pm (Jan-June)	LAC, 4:30pm	LMRWD, 7pm	--
	City of Savage Council, 7pm			
<b>Week 4</b>	Scott WMO Plan Comm., 4pm	--	--	CAC, 6:30pm
	City of PL Council, 7pm (July-Dec)			

PRIOR LAKE - SPRING LAKE  
WATERSHED DISTRICT

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**MEMORANDUM**

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**TO:** PLSLWD BOARD OF MANAGERS  
**FROM:** NAT KALE, WATERSHED PLANNER  
**SUBJECT:** PIKE AND FISH LAKE SEDIMENT ANALYSIS  
**DATE:** APRIL 9, 2013

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BACKGROUND

Pike and Fish lakes are on the 303(D) impaired waters list for nutrients, and are slated for TMDL<sup>1</sup> studies beginning in 2014. The District has planned to take the lead on these studies, while the MPCA will provide funding for some water quality sampling and study writing.

An important element of a TMDL study is determining what proportion of the phosphorus load is internal vs. external; that is, how much phosphorus is coming from the lake bottom vs. coming from the watershed. The MPCA does not pay for the acquisition and analysis of sediment cores, which is the most accurate method for determining internal load.

The St. Croix Watershed Research Station (SCWRS), in conjunction with the University of St. Thomas, has taken and analyzed sediment cores in Spring, Upper Prior, and Lower Prior lakes from 2011 through 2013. A student at UST, Nicholas Hermann, has aided in these analyses, and has indicated an interest in a summer internship through the SCWRS to continue work in the PLSLWD.

PROPOSAL

Per the attached scope of work, the District will contract with the SCWRS to hire Mr. Hermann to perform supervised analyses of sediment in Pike and Fish lakes. He will focus on phosphorus fractions (similar to the analysis Barr Engineering conducted for the District on Spring Lake), anoxic and oxic<sup>2</sup> phosphorus release rates, and in Fish Lake, analyze one core for sediment settling rates over time.

FINANCES

The overall project cost is \$7,855; see the attached scope for cost breakdowns. In the adopted 2013 budget the PLSLWD has set aside \$20,000 for "Research and Infiltration

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<sup>1</sup> Total Maximum Daily Load

<sup>2</sup> Deoxygenated water and oxygenated water

PRIOR LAKE – SPRING LAKE  
WATERSHED DISTRICT

Pilot Projects” in the 650 – Innovative Water Management fund code. This project fits in the definition of research, so is appropriate for that fund. Thus far this year none of the funds for research and infiltration pilot projects have been allocated to a specific project. This project will not alter the overall 2013 budget amount.

**Table I: Fiscal Impact**

	Budgeted 2013	Spent YTD	Proposed Expenditure	End Balance
650 (Overall Fund Code)	190,000	2,121	7,855	180,024
650 Research and Infiltration Pilot	20,000	0	7,855	12,145

RECOMMENDATION

District Staff recommends that the Board direct the District Administrator to contract with SCWRS (or amend an existing contract) for the attached scope of work.

## **Analysis of Fish and Pike Lake Sediment Phosphorus Release Rates**

### **Background**

A primary goal of the Prior Lake – Spring Lake Watershed District is to improve the quality of the water in the lakes and streams in the District. Two PLSLWD lakes are on the Minnesota Pollution Control Agency 303(d) list of impaired waters for excess nutrients, and are slated for Total Maximum Daily Load studies in 2014: Fish Lake and Pike Lake.

Pike Lake has little recorded monitoring data, apart from two years of data in 2002-2003 through the CAMP program, lake level readings, and three sediment grab samples acquired by Blue Water Science in 2012. More extensive water quality monitoring is planned in 2013.

Fish Lake has been more extensively studied, including CAMP monitoring since 2003 and Three Rivers monitoring since 2004. Plans for the lake have also been developed, including the Fish Lake Aquatic Vegetation Management Plan in 2005 and the Sustainable Lake Management Plan for Fish Lake (which includes an estimate of internal loading) in 2006.

### **Goals**

This project will seek to accomplish the following:

- Estimate internal phosphorus release rates for Fish and Pike lakes using the approach established by Pilgrim et al. (2007. Water Research 41:1215).
- Estimate sediment accumulation rates in Fish lake.
- Create & present useful data for the 2014 TMDL studies.
- Recommend further data collection and study, or alterations to the current monitoring regime.

### **Project Elements**

The PLSLWD will retain Nicholas Hermann to perform the following tasks:

- Take 8 – 10 “short core” sediment samples per lake in Pike and Fish lakes, spatially distributed and representative of shallow and deeper areas;
- Analyze all cores taken for total phosphorus, the calcium-, iron-, and aluminum-bound fractions of phosphorus, as well as organic phosphorus;
- Analyze 2-3 cores taken for anoxic and oxic phosphorus release rates;
- Analyze a core from Fish Lake for age and sediment accumulation rate;
- Write draft and final reports of the analyses conducted.

# PRIOR LAKE - SPRING LAKE

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## WATERSHED DISTRICT

This project will take place during the summer of 2013, beginning in May and ending early September, with deliverables due September 27<sup>th</sup>.

The PLSLWD will supply any and all relevant materials, including water quality samples, plans, and reports. PLSLWD staff may also be available to assist with fieldwork on an as-needed basis. The University of St. Thomas will provide lab spaces for the duration of the project. The St. Croix Watershed Research Station will provide oversight and review of all analyses performed, as well as the administrative functions necessary to employ Nick for the duration of the project.

### **Finances**

The PLSLWD will pay the St. Croix Watershed Research Station up to \$7,855 upon completion of the project, receipt of all deliverables, and receipt of an invoice detailing expenses.

**Table I: Project Cost Breakdown (\$)**

Internship	4,000
Administrative Costs	1,855
Sediment Core Dating	2,000
<hr/> Total	<hr/> 7,855

# PRIOR LAKE - SPRING LAKE

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## WATERSHED DISTRICT

### Active Project Updates – April 2013

PROJECT	CURRENT PROGRESS	NEXT STEPS
<b>Ferric Chloride Feed System Project</b> <i>Ferric Chloride System (Class 620)</i>	<ul style="list-style-type: none"> <li>• Weir constructed</li> <li>• Manhole, culvert, berm in place</li> <li>• Negotiations with MnDOT underway</li> </ul>	<ul style="list-style-type: none"> <li>• Install ferric chloride feed line</li> <li>• Install new pump</li> <li>• Order ferric chloride, fill tank</li> <li>• Begin operations</li> </ul>
<b>CR 12/17 Wetland Restoration</b> <i>Upper Watershed Volume Reduction Grant (741)</i>	<ul style="list-style-type: none"> <li>• Bids received, additional funding approved by City, WD, and County</li> <li>• Met with contractor to discuss potential cost saving measures</li> <li>• Project was deemed “no loss” status</li> </ul>	<ul style="list-style-type: none"> <li>• Review current design for possibility of hauling out less material (saving construction dollars) given the removal of the requirement we were held to previously to replace the wetland areas that were being filled with the berms that separated the three pools.</li> <li>• Construction in late summer or fall</li> </ul>
<b>Upper Prior Retrofit BMP Rain Gardens</b> <i>Upper Prior Retrofit Grant (Class 742)</i>	<ul style="list-style-type: none"> <li>• Submitted final report to BWSR for Clean Water Funds utilized on project</li> <li>• Request for additional documentation received from BWSR</li> </ul>	<ul style="list-style-type: none"> <li>• Finish submittals to BWSR</li> <li>• Check for plant establishment this spring/summer</li> <li>• Work with City of Prior Lake and the Minnesota Conservation Crew on maintenance (weeding, etc.)</li> </ul>
<b>Spring Lake Alum Treatment</b> <i>In-Lake Mgmt (Class 617)</i>	<ul style="list-style-type: none"> <li>• Feasibility study in progress</li> <li>• Initial contact w/ City of Prior Lake</li> </ul>	<ul style="list-style-type: none"> <li>• April 30 public meeting &amp; presentation of feasibility study</li> <li>• Followup public meetings w/ CAC</li> </ul>
<b>FEMA Floodplain Analysis- Prior Lake</b> <i>In-Lake Mgmt (Class 617)</i>	<ul style="list-style-type: none"> <li>• Model completed</li> <li>• DNR meeting held</li> </ul>	<ul style="list-style-type: none"> <li>• Model update to be submitted to FEMA and DNR for comment, approval (this meeting)</li> </ul>
<b>Rules Revisions</b> <i>Permitting (Class 660)</i>	<ul style="list-style-type: none"> <li>• TAC in agreement with Board’s direction on Wetland Rule</li> <li>• Staff working on Stormwater Rule with TAC</li> </ul>	<ul style="list-style-type: none"> <li>• Next TAC meeting on April 26</li> </ul>
<b>Lower Prior Lake Diagnostic Study</b> <i>LPDS Grant (Class 743)</i>	<ul style="list-style-type: none"> <li>• Final revisions complete</li> </ul>	<ul style="list-style-type: none"> <li>• Board approval of final document (this meeting)</li> <li>• Review &amp; project close-out with MPCA</li> </ul>
<b>Buck Lake Treatment</b> <i>Innovative Water Management (Class 650)</i>	<ul style="list-style-type: none"> <li>• Two feasibility proposals received in response to RFP</li> </ul>	<ul style="list-style-type: none"> <li>• Selection of proposal (this meeting)</li> <li>• Execution of contract</li> <li>• Monitoring of DU wetland, preliminary feasibility work</li> </ul>

# PRIOR LAKE - SPRING LAKE

## WATERSHED DISTRICT

### Ongoing Operations Update – April 2013

PROGRAM	CURRENT PROGRESS	NEXT STEPS
<b>Monitoring</b> <i>Monitoring and Data Acquisition (Class 655)</i>	<ul style="list-style-type: none"> <li>• Sampling has begun</li> <li>• Equipment is installed and ready for monitoring</li> <li>• Recruited 4 volunteers to help monitor with Biobase or CAMP</li> </ul>	<ul style="list-style-type: none"> <li>• Install Ott logger on Fish, Pike and Spring Lake</li> <li>• Meet SWCD at sites to discuss monitoring details</li> <li>• Start creating an annual monitoring report</li> <li>• Enter past data into MPCA database</li> <li>• Put reports on website</li> <li>• Analysis of 2012 data.</li> </ul>
<b>Ferric Chloride System Operations</b> <i>Ferric Chloride System (Class 620)</i>	<ul style="list-style-type: none"> <li>• Equipment installed and running</li> <li>• First sample has been taken</li> <li>• Received quote for FeCl solution</li> </ul>	<ul style="list-style-type: none"> <li>• Continue collecting water samples and continuous stage and flow</li> <li>• Investigate monitoring site at CD4 (at new overflow weir) – will be installing logger and taking flow measurements once weir is complete</li> </ul>
<b>Permitting &amp; ESC Inspections</b> <i>Permitting (Class 660)</i>	<ul style="list-style-type: none"> <li>• 14 ESC inspections completed in March</li> <li>• Rec'd permit app for Sunset Ave and CR12/17 projects</li> <li>• Continuing to work with City of Prior Lake and monitor Candy Cove weekly</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to inspect active sites for erosion and soil control; ESC inspections may start to increase as snowmelt occurs</li> <li>• Closing out old permits</li> </ul>
<b>Citizen Advisory Committee</b> <i>Education and Outreach (Class 640)</i>	<ul style="list-style-type: none"> <li>• CAC meeting held on Mar. 28<sup>th</sup></li> <li>• Members discussed permit review process and expressed interest in hosting an Alum informational meeting</li> </ul>	<ul style="list-style-type: none"> <li>• Next CAC meeting scheduled: April 25<sup>th</sup></li> <li>• CAC members plan to review the 5-year project list to start providing feedback</li> </ul>
<b>Education and Outreach</b> <i>Education and Outreach (Class 640)</i>	<ul style="list-style-type: none"> <li>• Putting together an insert for the PLA newsletter</li> <li>• Blue Thumb coordination meeting with City of Prior Lake, SWCD and Scott County</li> <li>• Develop Raingarden in a Box materials and workshop planning</li> </ul>	<ul style="list-style-type: none"> <li>• Planning for Arbor Day event/tree sale in April at Savage Public Works</li> <li>• Meeting with Lower Minnesota River Watershed District Board of Managers to discuss coordination of educational resources</li> <li>• Planning for storm drain stenciling event</li> </ul>
<b>Website and Social Media</b>	<ul style="list-style-type: none"> <li>• Adding content to project pages</li> <li>• Tweeting regularly about projects &amp; news</li> </ul>	<ul style="list-style-type: none"> <li>• Add more photo albums to Facebook</li> </ul>
<b>Cost Share Program</b> <i>Land Mgmt (Class 630)</i>	<ul style="list-style-type: none"> <li>• Framework approved by Board</li> <li>• Outreach for farm nutrient management begun</li> </ul>	<ul style="list-style-type: none"> <li>• Develop cost-share brochures for distribution</li> <li>• Work with residential &amp; ag projects as they appear</li> </ul>

# PRIOR LAKE - SPRING LAKE

## WATERSHED DISTRICT

### Outlet Channel Admin and Operations – April 2013

ACTIVITY	CURRENT PROGRESS	NEXT STEPS
<b>JPA/MOA Admin</b> <i>PLOC Operations and Maintenance (830)</i>	<ul style="list-style-type: none"> <li>Compiled complete list of properties, associated easements, culverts, related documents.</li> </ul>	<ul style="list-style-type: none"> <li>Forwarded to Smith Partners to request quote for resolving final easement issues and development of crossing policy.</li> </ul>
<b>JPA-MOA Technical Advisory Committee</b> <i>PLOC Operations and Maintenance (830)</i>	<ul style="list-style-type: none"> <li>TAC reviewed and commented on final XP-SWMM model calibration results and are considering several monitoring recommendations for 2013 and beyond</li> <li>TAC working on developing a 5-year capital improvement plan</li> </ul>	<ul style="list-style-type: none"> <li>Review and recommend potential model enhancements for 2014-2018</li> <li>Forward recommendations for a 5-year capital improvement and maintenance plan to JPA-MOA Board</li> </ul>
<b>Invasive Species Removal</b> <i>PLOC Operations and Maintenance (830)</i>	<ul style="list-style-type: none"> <li>Fall woody invasive species removal work is completed</li> <li>Removal of cut woody material complete</li> </ul>	<ul style="list-style-type: none"> <li>Spring Foliar Treatment</li> <li>Final closeout by June 30</li> </ul>
<b>PLOC Inspections</b> <i>PLOC Operations and Maintenance (830)</i>	<ul style="list-style-type: none"> <li>No flow from Prior Lake, but small amount of flow within channel in some areas observed</li> <li>First culvert inspection has been completed</li> </ul>	<ul style="list-style-type: none"> <li>Annual spring inspection on entire channel</li> </ul>
<b>Prior Lake Outlet Structure</b> <i>Prior Lake Outlet Structure (725)</i>	<ul style="list-style-type: none"> <li>Final closeout of records</li> </ul>	<ul style="list-style-type: none"> <li>Install Ott logger to monitor lake elevations</li> </ul>
<b>Miller Culvert Washout</b> <i>PLOC Operations and Maintenance (830)</i>	<ul style="list-style-type: none"> <li>DNR and City permits issued</li> <li>Contractor hired, but need to wait until spring road restrictions are lifted before bringing in heavy equipment</li> <li>Temporary easement filed</li> </ul>	<ul style="list-style-type: none"> <li>Construct field crossing</li> </ul>
<b>Gonyea Culvert Washout</b> <i>PLOC Operations and Maintenance (830)</i>	<ul style="list-style-type: none"> <li>Plans completed</li> <li>DNR permit application submitted, comment deadline is April 11th</li> </ul>	<ul style="list-style-type: none"> <li>Construction</li> </ul>
<b>Segment 4a</b> <i>PLOC Operations and Maintenance (830)</i>	<ul style="list-style-type: none"> <li>Interfluvial design work on hold until Miller field crossing is completed and neighbors decide whether or not additional easement area is available for us to create a more natural channel</li> </ul>	<ul style="list-style-type: none"> <li>Resume design work</li> </ul>



To: **Scott Walz**, Hydrologist, Shakopee Mdewakanton Sioux Community (SMSC), Land Department, [scott.walz@shakopeedakota.org](mailto:scott.walz@shakopeedakota.org)

**Mike Kinney**, District Administrator and **Nat Kale**, Watershed Panner, Prior Lake-Spring Lake Watershed District (PLSLWD), 14070 Commerce Ave NE, Suite 300, Prior Lake, MN 55372, [mkinney@plslwd.org](mailto:mkinney@plslwd.org) and [nkale@plslwd.org](mailto:nkale@plslwd.org), (952) 447-4166

**Pete Young**, Water Resources Engineer, City of Prior Lake, 4646 Dakota Street SE, Prior Lake, MN 55372-1714, [pyoung@CityofPRIORLAKE.com](mailto:pyoung@CityofPRIORLAKE.com)

From: **Will Hobbs**, Associate Scientist, St. Croix Watershed Research Station, [whobbs@smm.org](mailto:whobbs@smm.org), 651-433-5953 x12

Date: April 4, 2013

Re: Work Plan: Paleolimnological study of Arctic Lake, within the Spring Lake – Prior Lake Watershed, Scott Co., MN.

**Rationale:**

Initial sediment core investigations of Spring Lake, Scott Co. found evidence of historically elevated TP concentrations and the presence of cyanobacterial blooms prior to settlement and development of the watershed. This has led to an interest in understanding the historical conditions of other lakes within the watershed. Knowledge of the natural state of a lake and an understanding of the timing and magnitude of historical ecological changes become critical components for management and remediation plans. In this work plan, we outline a project using paleolimnological techniques to reconstruct the trophic, sedimentation, and ecological history of Arctic Lake, which is adjacent to Upper Prior Lake in Scott County, Minnesota. We provide costs for a single sediment core investigation and further costs for a supplemental core. Results will provide a history of ecological changes that have occurred in the lake during the last 150 years.

**Project Description:**

With any lake management plan it is important to have a basic understanding of natural fluctuations within the system. Reliable long-term data sets, on the order of 30 - 50 years, are generally not available for most regions of the country. Through the use of paleolimnological techniques and quantitative environmental reconstructions, we can estimate past conditions and natural variability, identify timing of ecological changes, and determine rates of change and recovery.

The primary aim of this project is to use paleolimnological analysis of dated sediment cores to reconstruct ecological histories using biogeochemistry, sediment accumulation, diatom-inferred total phosphorus (DI-TP), and diatoms as biological indicators. In an

effort to further understand presettlement conditions, and historical lake response to land use and past management the proposed paleolimnological study will model changes in water column TP over the last 150 years. Diatoms quite often make up the main type of algae in a lake and therefore changes in diatom community structure are symptomatic of algal changes in response to water quality. Multivariate analyses, diatom-based transfer functions, and comparison of diatom assemblages with an 89 Minnesota lake data set will be used to relate changes in trophic conditions and diatom communities to human impacts in the local watershed. Diatoms have been widely used to interpret environmental conditions in lakes (Dixit *et al.*, 1994). Many species are sensitive to specific water conditions and are useful as bioindicators. Over the past 15 years, statistical methods have been developed to estimate quantitative environmental parameters from diatom assemblages. These methods are statistically robust and environmentally sound. In the state of Minnesota, diatom analysis has been used as one line of evidence for developing nutrient criteria (Heiskary and Wilson 2008) and lake specific nutrient standards (Edlund and Ramstack 2007).

In addition we propose to characterize the changes in whole lake algal communities through time. While diatoms are an important component of the lake algae, other groups of algae can be ecologically important in eutrophic lakes (e.g. blue-green algae). The primary pigments (chlorophylls, carotenoids, and their derivatives) of lake algae are often reliably preserved in lake sediments over time (Leavitt and Hodgson, 2001). The concentration of these pigments is directly proportional to the abundance of each algal group. Whereas the relative percent changes in diatom communities is an effective measure of water quality over time, whole lake algal changes can inform us about the absolute changes in algal production and the historical presence of nuisance algae, such as blue-green algae.

### **Research Tasks:**

- (1) *Core collection, description and subsampling:* Cores will be retrieved from the ice during the winter of 2013 using a modified piston-type corer (Wright 1991) with a 2.75-cm polycarbonate core barrel and operated from the lake surface by Mg-alloy drive rods. An additional overlapping core will be taken using a square-rod Livingstone corer, to extend the depth of sediment retrieval and ensure sufficient sediment is available for lead-210 dating (see Task 3). Cores will be transported back to the SCWRS and sectioned vertically at 0.5 cm increments for the uppermost sediments and 1 cm thereafter, and stored in polypropylene jars for subsequent analysis of water and organic content and <sup>210</sup>Pb dating. All sediment subsamples will be homogenized and stored at 4°C.
- (2) *Loss-on-ignition:* Dry-density (dry mass per volume of fresh sediment), water content, organic content, and carbonate content of sediments will be determined by standard loss-on-ignition techniques (Dean 1974). Up to 40 core increments will be analyzed.
- (3) *Lead-210:* Sediment cores will be analyzed for <sup>210</sup>Pb activity to determine age and sediment accumulation rates for the past 150 years. Lead-210 will be measured at 16-

20 depth intervals by  $^{210}\text{Po}$  distillation and alpha spectrometry methods, and dates determined according to the c.r.s. (constant rate of supply) model (Appleby and Oldfield 1978, Binford 1990). If necessary, secondary dating to determine the 1963-1964 peak in deposition of  $^{137}\text{Cs}$  will also be run. Freeze-dried samples are measured for  $^{137}\text{Cs}$  at 667 keV using a high-resolution germanium diode gamma detector and multichannel analyzer. Results of  $^{210}\text{Pb}$  will be used in conjunction with loss-on-ignition analysis to determine background and historical sedimentation rates on the cores.

- (4) *Diatom analysis*: A total of fifteen increments will be analyzed for diatom microfossils; ten of the samples will be concentrated in the upper part of the core representing about the last 100 years (ca. 10-year resolution). The remaining five samples will be taken at core intervals representing 10-20 year resolution from pre-European settlement times (pre-1850). Samples will be treated with dilute HCl to remove carbonates followed by addition of 30%  $\text{H}_2\text{O}_2$  and heating for two hours at  $85^\circ\text{C}$ . Following cooling, samples will be rinsed once daily for four days to remove oxidation byproducts, the remaining sample dried onto microscope coverslips, and the coverslips mounted on microslides using Naphrax. Diatoms and chrysophyte cysts will be identified to species level using light microscopes with full immersion optics capable of 1200X magnification at an N.A. of 1.4. A minimum of 400 valves will be counted in each sample. Epilimnetic total phosphorus (TP) will be reconstructed from fossil diatom assemblages using a diatom-phosphorus calibration model. A diatom-TP model developed by Ramstack et al. (2003) and others from a suite of 89 Minnesota Lakes will be available for this study. We note that in hypereutrophic and shallow lakes, TP reconstructions can be problematic. However, diatom analysis will be further used to determine the timing and extent of major ecological changes in each lake including shifts between benthic and planktonic dominance, shifts between diatoms and chrysophytes, and modern analogues based on diatom communities. The techniques will help identify the ecological trajectory of the lake, a useful tool for understanding environmental drivers of change.
- (5) *Microbial Pigment Analysis*: Sediment pigment concentrations will be quantified by Dr. Rolf Vinebrooke at the University of Alberta, Canada, using reverse-phase high-pressure liquid chromatography (HPLC) (Vinebrooke et al. 2002). Pigments are first extracted from freeze-dried sediments using an acetone:methanol solution. Extracts will then be filtered (0.2- $\mu\text{m}$  pore nylon), dried under  $\text{N}_2$ , and reconstituted using a precise volume of injection solution. Chromatographic separation will be performed with an Agilent 1100 Series HPLC equipped with a Varian Microsorb 100A  $^\circ\text{C}18$  column, and pigment detection using in-line diode array and fluorescence detectors. Pigment concentrations will be quantified via calibration equations and an electronic spectral library constructed using standards purchased from DHI Water and Environment, Denmark. Jeffrey et al. (2005) will be consulted as a key reference for taxonomically diagnostic pigments.
- (6) *Data analysis, report and presentation*: A final report will be prepared that includes a review of methodology,  $^{210}\text{Pb}$  dating models, estimation of historical sediment accumulation rates, downcore distribution of major diatom species, and ecological and quantitative interpretation of the timing and extent of algal community change. In

addition the report author will deliver a general audience talk at the request of SMSC and PLSLWD summarizing the results and meeting with community members.

**Budget:**

<b>Project Task</b>	<b>One core</b>
(1) Coring, description, and subsampling.	\$1,000
(2 and 3) Loss-on-ignition and Lead-210 Dating	\$2,000
(4) Diatom Analysis (14 samples, \$550/sample)	\$7,700
(5) Microbial Pigment Analysis (Algae communities; 5 samples, \$110/sample)	\$550
(6) Data Analysis, Report Preparation and Presentation	\$1,500
<b>Subtotal Cost</b>	\$12,750
Science Museum of Minnesota Indirects (rate 25%)	\$3,188
<b>Total Cost</b>	\$15,938

\* Note that dating a second core may not be necessary if we can align the records of sediment composition, relying on a single age-depth model

**Contractor and Billing:**

All work will be completed under the direction of William Hobbs, Joy Ramstack Hobbs, Mark Edlund, and Daniel Engstrom at the St. Croix Watershed Research Station. Dr. William Hobbs is an Associate Scientist at SCWRS with expertise in diatom paleoecology and numerical analysis. Joy Ramstack Hobbs (MSc) is an Associate Scientist at SCWRS with expertise in diatom analysis, and quantitative lake-water nutrient reconstructions. Dr. Edlund is a Senior Scientist at SCWRS and an expert in diatom taxonomy and paleoecology, and Dr. Engstrom is Director of the SCWRS with expertise in paleoecology and core dating. Invoices will be issued at 3-6 month intervals based on completion of project tasks and accompanied by brief interim reports. A final invoice will be sent at project completion and accompanied by the final report.

**Proposed Work Schedule:**

Diatom and pigment analysis, data analysis, and final report preparation are to be completed *one year* after the sediment cores are collected. Some adjustments to the work schedule can be accommodated depending on project needs.

**References:**

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**MEMORANDUM**

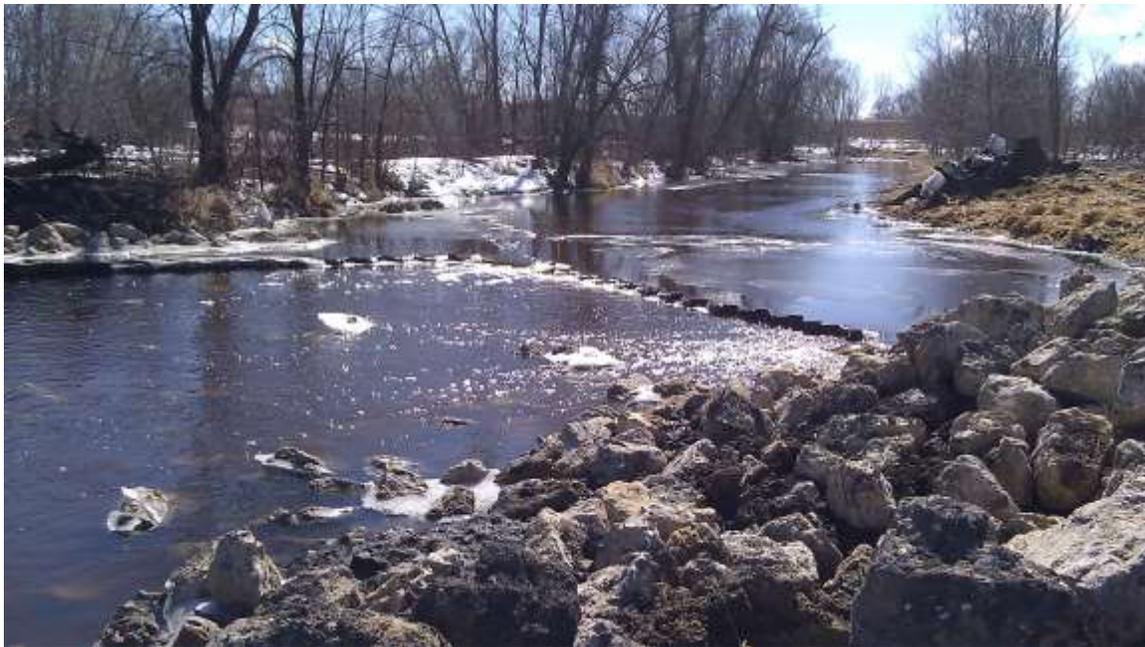
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**TO:** BOARD OF MANAGERS  
**FROM:** EMILY JAVENS, P.E., WATERSHED ENGINEER  
**SUBJECT:** CONSTRUCTION UPDATE FOR THE FERRIC CHLORIDE SYSTEM IMPROVEMENT PROJECT  
**DATE:** APRIL 3, 2013

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S.M. Hentges & Sons, Inc. has completed construction of the high flow bypass, shown below, and installed the culvert and manhole system located at the entry of the desiltation basin.



High Flow Bypass in operation 4-01-2013

Unfortunately, the ferric chloride feed line has not been installed yet due to permitting issues with the Minnesota Department of Transportation (MnDOT). MnDOT staff in the Environmental Compliance division have been resistant to approving our crossing request since they do not have any ferric chloride feed lines in their right-of-way currently and are unsure of the risks. Without protocols in place to handle such a request, they have been developing the criteria as they go. Although WD staff have quickly responded to a lengthy list of requests, starting in January, we have been unable to secure a permit to install the feed line across their right-of-way. Some of the accommodations we have made over the past several months have included lowering the line from a 6' depth to an 8' depth,

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researching adding an alarm system, providing all of our feasibility reports, design notes, and operation and maintenance plans, investigating other piping options, adding secondary containment to the entire line (rather than only in the right-of-way), resubmitting plans that showed all change orders on the same page, agreeing to annual reporting and a 5-year permit renewal, adding annual integrity testing of the feed line, adding automatic shutoff controls if pressure in the line changes too much, and providing written documentation of engineering approval from the MN Pollution Control Agency.

On Monday, April 1, 2013, WD staff met with MnDOT for a second time in St. Paul. This time, we invited the MPCA staff that approved our ferric chloride operations permit. MPCA stated again on the record they feel our design, along with our spill prevention and leak detection efforts are more than adequate to protect MnDOT's right-of-way. MnDOT is still reluctant, however. At the end of the meeting, we understood that with a few more submittals, they will grant us the permission we need to finish construction. We submitted all requested materials and are awaiting feedback.

The impact of this additional work has inevitably impacted our budget. Additional services have been required of our consultant and additional fees will be charged to us from the contractor. Deadlines have also been compromised. The full impact of these setbacks are being evaluated and will be discussed further at future meetings. The good news is that since the final design, along with a competitive bid, resulted in significant cost savings, the additional expenses are still well within our original budget.

Additional information will be provided at the meeting as more details emerge.