To:             Board of Managers
From:          Mike Kinney
Subject:       Bone Lake Outlet Wetland Restoration Study

Date: June 13, 2019

Background/Discussion
The 2019 budget contains $30,000 for line item 5-225-D3: (Little Comfort) Phosphorus Source Implementation - Bone Lake Outlet Wetland Assessment. The enclosed scope of work from Emmons & Olivier Resources (EOR) provides further detail on the proposed activity for this year.

Recommended Action
Proposed Motion: Manager _______________ moves to authorize the administrator, on advice of counsel, to enter into an agreement with EOR in accordance with the June 7, 2019 scope of work and in an amount not to exceed $6,183.

Attached: Bone Lake Outlet Wetland Restoration Study Scope of Work
This memo details a proposed scope of work for project feasibility and planning to be completed in 2019 to reduce phosphorus loads from the Bone Lake Outlet wetland (also called the Birch Lake wetland). The 2018 Little Comfort Phosphorus Source Assessment report included management recommendations based on monitoring data collected over the past 10 years in the Little Comfort Lake drainage area. The Bone Lake Outlet wetland complex is located upstream of Manning Trail. The Manning Trail monitoring location on the Bone-Birch-School-Little Comfort (BBSL) Tributary stream has moderate flow-weighted mean phosphorus concentrations, and was identified as medium priority in the 2018 Little Comfort Phosphorus Assessment report. This scope of work includes additional water quality monitoring and assessment of the fish rearing ponds located upstream of the Manning Trail monitoring location, a review of historical hydrologic conditions based on aerial photography and land survey records, and preliminary feasibility and assessment of a potential wetland restoration project.

This work addresses the 2019 Budget Item 5-225-D3: (Little Comfort) Phosphorus Source Implementation - Bone Lake Outlet Wetland Assessment, approved for $30,000 in 2019, for preliminary monitoring and assessment of the Bone Lake Outlet wetland complex.

**Task 1. Fisheries Pond Assessment**

A group of fish rearing ponds are located just upstream of the Manning Trail monitoring location. The purpose of this task is to investigate whether the rearing ponds are contributing to the elevated phosphorus concentrations in the Bone-Birch-School-Little Comfort (BBSL) Tributary stream at Manning Trail. This task includes correspondence with MN DNR Fisheries to discuss the permitting and operation of this facility, and collection of water quality grab samples at four locations (upstream and downstream of the rearing pond discharge location, the Bone Lake Outlet and Manning Trail) following up to 6 rainfall events.

**Deliverables**

- Summary of existing DNR Fisheries Pond Permit
- Water quality grab samples and lab results for 4 locations and 6 events

**Schedule**

June - September 2019

**Estimated Hours and Cost**

43 hours = $4,943; Mileage, equipment and lab expenses = $1,240; Total cost = $6,183
Figure 1. Fish rearing ponds located upstream of the Manning Trail monitoring location.

Task 2. Historic Conditions Review

The purpose of this task is to investigate the current and historic hydrologic conditions of the Moody Lake outlet, Bone Lake outlet, and Bone Lake Outlet wetland complex. This task includes a review of old historical aerial photographs and land survey records to investigate how water levels and flow paths may have changed over time. In addition, current parcel boundaries and LiDAR data will be mapped to determine current hydrologic conditions. Findings from this task will be used to inform the feasibility of a water quality improvement project as part of Task 3.

Deliverables

- Historical aerial photographs and land survey records
- Current parcel boundary and LiDAR map

Schedule

June - July 2019

Estimated Hours and Cost

25 hours = $3,061

Task 3. Birch Lake Wetland Restoration Project Feasibility

The purpose of this task is to re-assess the feasibility of the Birch Lake Wetland restoration project identified in the 2007 Capital Improvement Plan. The stream between Bone and Birch Lakes is almost entirely within channelized wetlands. Release of phosphorus in this 125 acre wetland may be due to fluctuating wetland water levels and subsequent wetting and drying of wetland soils, which accelerates dissolved phosphorus release. The 2007 CIP recommends installing a sheet pile weir to
maintain wetted soils in this wetland. The project was expected to reduce phosphorus by 130 lb/yr at a total cost of $650,000 (in 2010 dollars, including $400,000 for land/easements) for a 20 year cost-benefit of $400 per pound of phosphorus removed. The project feasibility should be re-assessed to consider the impacts of a beaver dam located on the channelized wetland stream and recent high water levels in the wetland upstream of the dam that has been impacting several properties.

This task includes a survey of the channel between Bone Lake and Manning Trail, a wetland vegetation assessment, and wetland soil borings with representative samples analyzed for phosphorus. Wetland water levels will be analyzed based on a review of the surveyed channel profile. As part of this task, EOR may make recommendations for future H&H modeling needs to determine the impacts of a potential project on upstream impacted parcels.

**Deliverables**
- Survey of channel between Bone Lake and Manning Trail
- Wetland vegetation assessment and soil borings
- Feasibility memo and board presentation

**Schedule**
June - September 2019

**Estimated Hours and Cost**
152 hours = $19,380; Mileage, equipment and lab expenses = $1,020; Total cost = $20,400

![Figure 2. Birch Lake Wetland Restoration project location](image)

**Recommended Motion**

We recommend the Board approve a motion to complete Tasks 1-3 in 2019 of the proposed scope of work for 2019 Budget Item 5-225-D3: Bone Lake Outlet Wetland Feasibility, at a total cost of $29,644.