Item 5D.
BCWMC 4-21-22

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Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 5D– Consider Approval of Proposal to Prepare Feasibility Study for the City of Medicine Lake Water Quality Improvement Project (2020 CIP Project ML-21) BCWMC April 21, 2022 Meeting Agenda
Date: April 14, 2022

5D. Consider Approval of Scope and Budget for Analysis of Alternatives to Jevne Park Stormwater Improvement Project, City of Medicine Lake (2020 CIP Project ML-21)

Recommendations:

1. Consider approving the scope of work and $43,000 budget presented in this memorandum and direct the Engineer to complete the analysis of alternatives to the Jevne Park Stormwater Improvement Project (2020 CIP Project ML-21).

Background

As the City of Medicine Lake is nearly all surrounded by Medicine Lake, maintaining and improving the quality of the lake itself is paramount. Medicine Lake is listed as impaired on the Minnesota Pollution Control Agency (MPCA) 303d list for mercury, chlorides, and excess nutrients (e.g. total phosphorus). However, given the city's size and current infrastructure, there are limited opportunities for stormwater management retrofits to help improve runoff, except for the Jevne Park area.

In 2019, the Bassett Creek Watershed Management Commission (BCWMC) completed a feasibility study for a water retention pond in Jevne Park that was intended to:

- improve management of stormwater runoff as the city has no municipal storm sewer system
- increase capacity for stormwater storage within the existing natural pond/wetland and swale in Jevne Park, improving conditions during the smaller (less than 10-year) more frequent rain and snowmelt events,
- improve a route to carry and store excess stormwater to minimize flooding within Jevne Park and on approximately 15 adjacent residential properties
- reduce sediment and phosphorus loading to Medicine Lake
- reduce City of Medicine Lake capital and maintenance expenditures associated with road and culvert repair caused by excessive volumes and rates of runoff
- improve waterfowl and wildlife habitats

At their meeting in September 2019, the Commission officially ordered the project (Concept 1 from feasibility study) and received 2020 levy funds for the project. However, the City of Medicine Lake City

Council decided not to pursue the project and declined to enter into an agreement with the BCWMC to construct the project, citing a low-cost benefit and high maintenance costs.

In January 2022, the City of Medicine Lake submitted a formal request for the Commission to analyze alternatives to the Jevne Project that may have similar benefits to the project. Based on follow-up conversations and direction from the BCWMC, this additional study will include a complete shoreline buffer inventory and analysis along with the evaluation of an enhanced street sweeping program.

This project will serve as an addendum to the previously completed feasibility study for the stormwater improvement project in Jevne Park.

Content and Scope of Study

Below is a summary of the work scope components for this study, which will encompass the entirety of the City of Medicine Lake, with the primary focus on Medicine Lake shoreline properties:

1) Project Meetings

a) We will hold one project kick-off meeting with the BCWMC Administrator and Medicine Lake representatives and will prepare meeting notes.

b) We will hold one additional meeting with Medicine Lake representatives, as needed.

c) We assume all meetings will be virtual (MS Teams).

d) We will prepare and send biweekly updates to the project team providing updates on work completed and upcoming work throughout the project

2) Shoreline Assessment

a) Using current, high resolution aerial photography in combination with the University of Minnesota (U of MN) 2015 Twin Cities metropolitan area land cover dataset, we will develop a map of land cover types within a defined shoreline buffer area. We will perform an initial desktop screening of vegetation and condition within 50 feet of the shoreline. This will include remote mapping of approximately 250 properties. Additional resolution will be added to the U of MN dataset based on review against the aerial photos and will include development of a GIS coverage defining vegetation categories within the buffer zone such as turf, riprap, beach, natural/perennial vegetation, landscaped gardens, tree/forested, emergent wetland zone, and impervious area.

b) Upon completion of the desktop assessment of the shoreline buffer, we will perform a field review and confirmation of the buffer desktop classifications for the approximately 250 shoreline properties, noting major plant species within the buffer zone areas, and general condition of the buffer area. This will include flagging any areas of shoreline or upland erosion noted within the buffer zone. Photos will be taken to document buffers and buffer conditions. Data will be collected in the field using handheld devices and online GIS maps to streamline the data review and collection process.

c) We assume that we can walk the shoreline to confirm buffer and shoreline condition. We assume that the BCWMC Administrator, in close collaboration with the City, will secure access for the shoreline field assessment, including communications with the City representatives and residents.

d) No wetland delineations will be performed as part of the field assessment.

e) Based on the buffer and condition data developed as part of the desktop and field assessment, we will estimate the average shoreline buffer widths within the City of Medicine Lake, assuming buffers are reflective of non-turf or impervious areas adjacent to the shoreline.

f) We will define the drainage areas directly contributing runoff to the Medicine Lake shoreline using the MnDNR 2011 LiDAR data and the current, high resolution aerial photography. Imperviousness within this area will be determined using the U of MN 2015 Twin Cities metropolitan area impervious coverage dataset. We will review the 2015 data against current aerial photos to confirm watershed impervious conditions.

g) We will use the MIDS calculator to estimate current total phosphorus (TP) and total suspended sediment (TSS) loads to Medicine Lake based on the existing buffer widths.

h) We will develop maps showing the existing buffer area and land cover classification, noting areas of shoreline or upland erosion, and flagging parcels where the average buffer width is not currently achieving the desired buffer width based on MnDNR shoreline guidance. This guidance generally indicates a buffer zone extending 25-50 ft from shoreline is preferable, but that even 10-15 ft provides some benefit.

i) We will estimate planning level costs for shoreline buffer restoration to meet the target buffer widths and to repair of areas of shoreline and upland erosion.

3) Street Sweeping Assessment

a) The City of Medicine Lake relies on the City of Plymouth to perform its street sweeping. The City of Plymouth recently began using a regenerative air street sweeper. We will use the P8 model, other street sweeping calculators (e.g., MPCA), and City of Plymouth and other local street sweeping data (as available) to estimate potential TP removals from improved street sweeping.

4) Public Engagement

a) We will coordinate with the BCWMC Administrator and City representatives to determine the best means to Inform residents about the project and request access to survey properties, as needed. This task assumes development of a project fact sheet for residents but no Commission Engineers' participation at public meetings.

5) Feasibility Memorandum

a) We will prepare a draft summary memorandum (to serve as an addendum to the April 2019 Jevne Park Stormwater Improvement Project Feasibility study) for review by City representatives and the BCWMC administrator. We will revise the memorandum based upon review comments.

b) We will present the draft feasibility study findings at a BCWMC meeting.

c) We will prepare the final memorandum for approval at a BCWMC meeting (consent agenda) and for use at future project public hearing.

d) We assume one presentation to the BCWMC will be sufficient.

Cost Estimate

Table 1 summarizes our cost estimate for the scope of work outlined above.

Table 1. Alternatives to Feasibility Study Costs

Tasks	Estimated Total
1) Project Meetings	$3,100
2) Shoreline Assessment	$25,200
3) Street Sweeping Assessment	$3,000
4) Public Engagement	$2,900
5) Feasibility Memorandum	$8,800
Total	**$43,000**

Schedule

We will complete the tasks and milestones outlined in the scope of work on the following schedule (assuming authorization no later than at the May 2022 BCWMC meeting).

Tasks and milestones	Estimated Schedule
Kick-off meeting with BCWMC Administrator and City of Medicine Lake representatives	June 2022
Coordination of shoreline access	June-July 2022
Shoreline desktop assessment	June-July 2022
Shoreline field assessment	August 2022
Shoreline pollutant loading assessment and restoration cost estimates	September-October 2022
Street sweeping assessment	June – July 2022
Draft memorandum	November 2022
BCWMC meeting	December 2022
Finalize memorandum	January 2023