Memorandum

To: Bassett Creek Watershed Management Commission (BCWMC)
From: Barr Engineering Co. (Stephanie Johnson, PhD, PE; Dan Tix; Alexander Reimers, PG)
Subject: Item 5B – Consider Approval of Scope of Work and Budget for Wirth/Eloise Butler Wetland Hydrology Study
BCWMC October 22, 2026 Meeting Agenda
Date: October 14, 2026

5B. Consider Approval of Scope and Budget for Wirth / Eloise Butler Wetland Hydrology Study

Recommendations

i. Consider approving the proposed scope of work with a budget of $78,200, plus a contingency of $14,900 as presented in this memorandum for Commission Engineers to complete the Wirth / Eloise Butler Wetland Hydrology Study utilizing Special Project Funds.

Background

The Wirth / Eloise Butler wetland area is located within Theodore Wirth Park, south of Wirth Lake and bordered to the north by Glenwood Avenue and to the south and west by the Eloise Butler Wildlife Garden. The wetland area drains to the north under Glenwood Avenue toward Wirth Lake, and includes an ephemeral pond that Eloise Butler referred to as the “Mallard Pond”. The wetland is bisected by an elevated trail built on a berm/dike that divides the wetland into two areas. A culvert through the berm/dike connects the two open water portions (see Figure 1).

The MN Board of Water and Soil Resources (BWSR) has indicated there was historic peatland in the Wirth / Eloise Butler wetland. Peatland resources in Minnesota are declining, especially in southern Minnesota and the metropolitan area. BWSR has also noted the importance of peatlands in capturing and retaining greenhouse gases which aides in addressing climate change. The Minneapolis Park and Recreation Board (MPRB) and BWSR are partnering on a project to address concerns with the degradation of this historic peatland area. This is part of a larger initiative being led by the MPRB to advance ecological improvements within the wetland, including the removal and control of invasive vegetation throughout the wetland area, restoration of native species, and work related to the safe passage of turtles between the wetland area and Wirth Lake during hatching season.

The MPRB and BWSR are concerned that the peatland areas within the wetland are degrading, leading to subsidence (gradual lowering of the ground surface) and a loss of viable native wetland vegetation. BWSR staff believe that changes to the historic hydrology of the area over many decades of park and community development may be contributing to the peatlands degradation. BWSR has conceptualized engineering design solutions for the peatland restoration but more information is needed about the historic and existing hydrology.

BWSR has allocated funding through its peatland restoration program to support the design and installation of water control structures within the wetland, with a plan for construction and additional restoration work to begin in 2028. To deepen their understanding of the current amount and sources of

water entering the wetland and to support the design of their proposed water control structures, BWSR and the MPRB have requested the BCWMC to perform a hydrology study of the Wirth / Eloise Butler wetland area. The 2026 Bassett Creek Watershed Management Plan includes this study S-14: Theodore Wirth Hydrology Study (Table 4-5) slated for 2027 with cost estimate of $70,000, recommended to come from the BCWMC Special Projects Fund. The purpose of this hydrology study is to quantify the proportional influence of groundwater, surface water, and stormwater that supports the Wirth / Eloise Butler wetland under current conditions.

It is believed that the Wirth / Eloise Butler wetland area was historically primarily groundwater fed, with several documented, historic springs surrounding the study area and a small surface water drainage area. Under current conditions, the Wirth / Eloise Butler wetland continues to receive groundwater and also has surface drainage ditches that drain water into it – most notably, one prominent ditch that drains into the wetland from the west in the area of the historic Great Medicine Spring. The wetland area drains out toward the north, through a concrete pipe extending under Glenwood Avenue, and into a bordering wetland complex which then discharges to Wirth Lake.

Work on this project is proposed to begin in fall of 2026, extending through the end of 2027. The first phase of work is focused on gathering site-specific data including wetland characterization, identifying contributing surface water features, and beginning to collect groundwater hydrology information. Shallow monitoring wells and piezometers will be installed beginning in the fall of 2026 to collect hydrologic measurements through the end of 2027. Data loggers will be installed within the open water areas of the wetland and flow monitoring equipment installed to collect surface water measurements over the course of the 2027 monitoring season. Results from the field assessment and monitoring efforts will be used to complete a water balance model for the wetland and to quantify the major sources of water flowing into and out of the wetland areas. The study's findings will be presented in a technical memo and are expected to inform design of the restoration work, to be completed by BWSR and their partners.

Scope of Work

The scope of work for this project includes the following tasks:

1. Project meetings and collaboration

To begin the effort, we will hold a project kickoff meeting with BWSR, BCWMC, and MPRB staff to discuss this project in detail and describe specific steps for assessing the project area hydrology and vegetation. It is expected that this meeting will occur in person on site or at a mutually agreed upon location and will include at least three Barr staff: a wetland ecologist, hydrogeologist, and water resources engineer. This meeting will allow BWSR and MPRB staff to provide background information to Barr and identify specific information and data needed for this project.

We anticipate three additional team meetings with project partners. One meeting will be completed in the winter 2026-27 to review data collected in 2026. The second meeting will be held in the summer of 2027 to review conditions and discuss the status of design, planning, and data collection; it is assumed that this meeting will be held in-person and on-site. The third meeting will occur after the draft report is provided to the project partners for their review and discussion before finalizing the report.

Deliverables:

- Project kickoff meeting agenda, meeting materials, and notes.
- Up to three additional project coordination meetings with project partners; including one in-person on-site meeting and two virtual meetings.

2. Field assessment and monitoring equipment installation

Barr scientists will review the site to better understand drainage patterns, the soils, hydrology, and vegetation. We will complete some initial site investigations to collect data including the following:

- Assess the vegetation and plant communities within and near the wetland, specifically identifying the vegetation on areas with peat soils.
- Soil information, primarily within the wetland to assess the peat quality and depth, where practical.
- Where possible, identify the historic spring locations and characterize any infrastructure remaining.

In parallel to the initial site visit, Barr will install monitoring equipment to observe the wetland's hydrology. For the fall / early winter monitoring of 2026, this will include nested shallow piezometers for shallow groundwater and stilling wells for monitoring wetland water surface elevations. During the 2027 monitoring season, this will also include a flow meter at the culvert under Glenwood Ave and a weir for monitoring flow within the main ditch draining into the wetland system.

For this proposal we assume the following for the initial assessment and monitoring set-up (to be completed fall 2026):

i. One wetland ecologist on site for one full day to assess the wetland vegetation and plant communities and collect soil and vegetation data.
ii. Installation of three pairs of nested water level piezometers that will be completed by hand auger or hand driving wells into the peat. If the deeper piezometer of the pair cannot be installed by hand into mineral soil or needs to exceed 15 ft depth, other methods may be considered (see Alternative 1 – Mechanized well drilling).
    a. Each piezometer (6 total) will have a data logger that will collect hourly water level data
iii. Barr will collect 3 soil samples near the edge of the delineated wetland with a Shelby Tube and conduct a Permeability Test for each sample through a certified local laboratory. The holes from the sampling will be backfilled to ground surface. The permeability testing will estimate in-situ vertical hydraulic conductivity of the soil beneath and surrounding the wetland.
iv. Installation of two stilling wells in the wetland, one on either side of the trail.
    a. Each stilling well will have a data logger that will collect hourly water level data.
v. One surveyor for ½ day to record elevations of installed piezometers, stilling wells, and inverts and diameters of culverts draining the wetland.

The data loggers installed in the fall of 2026 may need to be removed before winter freeze-up to avoid damage to the equipment. Early spring 2027, the equipment will be re-installed and monitoring commenced. At this time, in addition to the above, we will also install two flow monitoring stations at the following locations:

i. Installation of an area-velocity meter within the culvert draining to the north under Glenwood Avenue.
ii. Installation of a weir and data logger to monitor flow within the ditch draining into the northern wetland from the area near the Great Medicine Spring.
iii. One surveyor for ½ day to re-survey wells and piezometers after the winter season and record monitoring weir elevations.

The proposed budget includes the purchase of the necessary data loggers, materials, laboratory testing and fabrication of the nested groundwater piezometers, wetland stilling wells, and weir. It is assumed that the area-velocity meter will be rented for the 2027 monitoring season.

Following the initial survey and monitoring equipment set-up, data will be processed and summary data sheets compiled for future reporting and communication. This data will be reviewed internally for quality control purposes and will be made available to project partners.

Deliverables:

- Monitoring equipment, including fabricated weir, stilling wells, piezometers, and data loggers for monitoring elevations.
- Summary of wetland vegetation and soil sampling results.
- Laboratory results from Permeability Testing.

3. Collect monitoring data

Barr scientists will collect data from monitoring equipment during multiple site visits. It is expected that the monitoring equipment will be installed in October 2026 and monitored until freezing conditions. We assume Barr staff will conduct two field visits during this time; with the second occurring in November or December 2026 and including the removal of the data loggers (leaving piezometers, stilling wells, etc. in place over the winter). In the spring of 2027, monitoring equipment will be re-installed (including installation of the two flow monitoring stations). Barr staff will conduct field visits over the course of the monitoring season, through freeze-up in November or December of 2027. The proposed budget assumes up to 14 field visits over the course of the season. Each monitoring visit will include basic site observations, equipment operation checks, manual measurements, and data collection from the monitoring devices. Following each monitoring visit, data will be processed and compiled for future reporting.

Key assumptions for the monitoring cost estimates:

i. Each monitoring visit will be completed by one Barr field technician in approximately six hours including travel time.

ii. The cost estimate assumes that the monitoring equipment will remain operable and undamaged throughout the project. Damage caused by actions out of Barr's control including vandalism, natural events, etc. could require replacement and potentially additional cost.

Deliverables:

- Observed water surface elevations and groundwater levels for fall 2026 and 2027 monitoring season.
- Observed surface water flows and elevations for 2027 monitoring season.

4. Estimate water balance and ditch flow

Within this task, Barr will update the Commission's existing P8 model for the surrounding study area using as-builts, available LiDAR data, and field survey provided by MPRB and BWSR, as well as monitoring results collected in Tasks 1-3. Results of the modeling will be used to estimate surface water and stormwater runoff into the wetland area. Modeling results will then be combined with results from the 2026 / 2027 monitoring to complete and estimate the water balance surrounding the wetland – including contributions from surface, stormwater, and groundwater contributions. Results will include an estimate of the amount and variability of flow coming through the main ditch during the monitored time period.

Results from the groundwater monitoring and permeability testing will establish a groundwater contribution estimate to the wetland and help to verify the results of the P8 modeling. The nested piezometers will verify groundwater vertical gradients and establish groundwater elevations in relation to surface water elevations. Permeability testing results will provide vertical hydraulic conductivity estimates of the shallow subsurface soils beneath and surrounding the wetland that will help quantify the groundwater Darcy flux into or out of the wetland system at each location. If deemed appropriate, the spatial distribution of groundwater flux will be interpolated across the site. Groundwater flux(es) will then be translated into a groundwater volume estimate (independent of the P8 modeling) incorporating the area of the delineated wetland.

Deliverables:

- Updated P8 model for immediate study area.
- Estimated water balance for fall 2026 / 2027 monitoring season.
- Estimated groundwater contribution with reported uncertainty.

5. Project Reporting

A report or technical memorandum will be prepared to document the observed field conditions, summarize monitoring results, and present results from the water balance and groundwater analysis. Barr will provide the draft report to BCWMC, MPRB, and BWSR staff for review and comment. Feedback from the project partners will be provided in writing and in person at a team meeting (Task 1) and incorporated into the final report to be prepared by Barr and provided to the project partners.

Barr will develop a presentation summarizing results from the final report and present the information to the BCWMC Board of Commissioners at a regularly scheduled meeting.

For this proposal we assume one round of comments and review from project partners.

Deliverables:

- Draft project report.
- Final report, including final electronic deliverables.
- PowerPoint presentation summarizing study results.

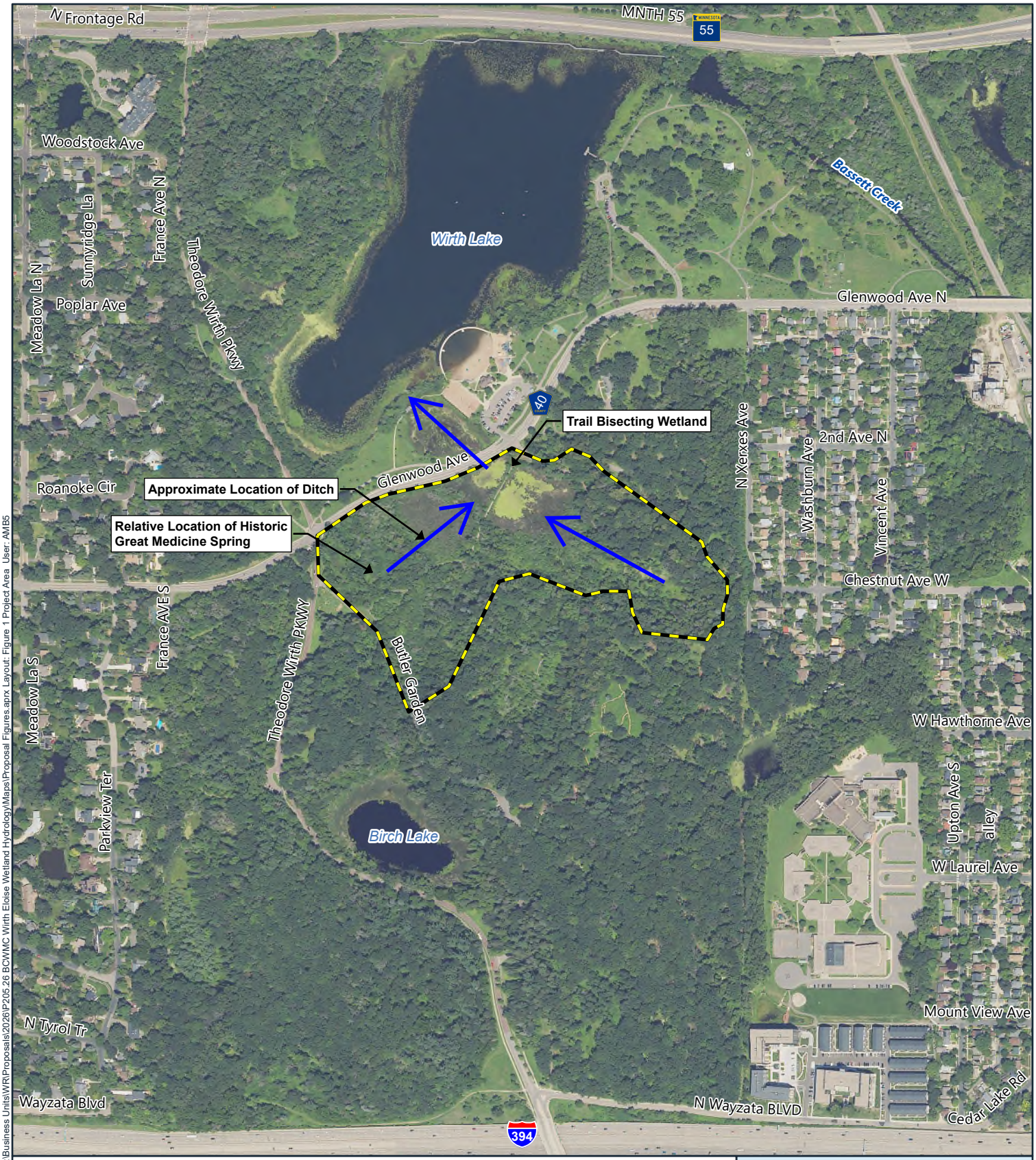
6. Alternative 1 – Mechanized Well Drilling (Contingency Task, Only If Needed)

Task 6 is included within the proposed scope as a contingency item. Within Task 2, Barr proposes to install the groundwater piezometers by hand; however, depending on site conditions, mechanized well drilling of the deeper piezometers may be needed. Potential reasons why mechanized well drilling could be necessary may include: encounters of large boulders, soil cement, buried waste, or groundwater that is deeper than 15 feet. Barr will make every attempt to install the groundwater piezometers by hand, however, if hand augering is not working to install the wells deep enough to obtain the monitoring data needed, Barr will notify the BCWMC administrator of the issue and decide how to proceed. Barr will not proceed with this alternative without the approval of the BCWMC administrator. If mechanized well drilling is chosen, Barr will contact a local licensed well driller to install the remaining groundwater piezometers according to applicable state laws and regulations.

Proposed Timeline and Commission Engineers' Estimated Costs

The following table summarizes the estimated budget and anticipated schedule for Commission Engineers to complete this study.

Task	Estimated Budget	Estimated Schedule
1. Project meetings and collaboration	$7,600	Throughout Project
2. Field assessment and monitoring equipment installation	$32,700	October – November 2026; March 2027
3. Collect monitoring data	$18,600	October 2026 – November 2027
4. Estimate water balance and ditch flow	$6,000	December 2027
5. Project reporting and final presentation	$13,300	February 2028
Total	**$78,200**	
6. Alternative 1 – Mechanized Well Drilling (Contingency Task, Only if Needed)	$14,900	
Total (with Alternative 1, if deemed necessary)	**$93,100**	



Approximate Study Area

Generalized Flow Direction

N

0 300 600

Feet

Bassett Creek Watershed Management Commission

Project Area
Wirth / Eloise Wetland Hydrology Study
Golden Valley, MN

Figure 1

BARR

Bar Footer: ArcGISPro 3.7.1, 2026-10-09 11:33 File: W:\Business Units\WR\Proposals\2026\P205.26 BCWMC Wirth Eloise Wetland Hydrology\Maps\Proposal Figures.aprx Layout: Figure 1 Project Area User: AMB5