Memorandum

To: Bassett Creek Watershed Management Commission (BCWMC)
From: Barr Engineering Co. (Stephanie Johnson, PhD, PE; Gabby Campagnola, EIT; Greg Wilson, PE)
Subject: Item 5C – Consider Approval of Scope of Work and Budget for Lost and Northwood Lakes Subwatershed Assessment
BCWMC November 18, 2026 Meeting Agenda
Date: November 12, 2026

5C. Consider Approval of Scope and Budget for Lost and Northwood Lakes Subwatershed Assessment

Recommendations

i. Consider approving the proposed scope of work and $82,600 budget presented in this memorandum and direct the Commission Engineers to complete the Lost and Northwood Lakes Subwatershed Assessment. Funding is proposed to come from the BCWMC Special Projects Fund.

Background

The Bassett Creek Watershed Management Commission (BCWMC) has identified a goal of completing subwatershed assessment studies for several priority subwatersheds and drainage areas to priority waterbodies over the next ten years. The intent for these subwatershed assessments is to identify and evaluate opportunities for water quality improvements within the study areas. Outcomes from subwatershed assessment studies will be used to inform future capital project planning and grant applications for the area. Lost and Northwood Lake subwatersheds are amongst those that have been identified for study (Activities S-1 and S-2 in Table 4-5 of 2026 Watershed Management Plan).

Lost and Northwood Lakes are identified by the BCWMC as priority waterbodies within their 2026-2035 Watershed Management Plan. The Lost Lake subwatershed covers approximately 60-acres; while the Northwood Lake subwatershed includes nearly 1,300 acres. Both lakes are included on the Minnesota Pollution Control Agency's (MPCA) impaired waters list for excess nutrients. The MPCA is currently working to complete Total Maximum Daily Load (TMDL) studies for the lakes; study results will be completed later this year. Results from the TMDL studies will include an estimate of the maximum amount of total phosphorus that Lost and Northwood Lakes can receive each year without violating water quality standards. The study will also provide an estimate of the amount of phosphorus load reduction that's needed for each of the lakes to achieve state standards.

Draft results from the Lost and Northwood Lakes TMDLs show that the majority of excess phosphorus currently entering the lakes originates from stormwater flows from the contributing subwatersheds. As a result of the TMDLs, each of the cities and other stormwater permit holders discharging to the lakes will be assigned a waste load allocation (WLA), establishing a goal for phosphorus load reductions from the watershed.

The proposed Lost and Northwood Lakes Subwatershed Assessment is focused on identifying and assessing potential opportunities for stormwater retrofits and best management practices (BMPs) to be implemented within the Lost and Northwood Lakes subwatersheds. Opportunities for improvements may include structural BMPs, improvements to source controls (such as enhanced street sweeping), or stormwater retrofits to existing infrastructure.

Another goal of the Lost and Northwood Lake subwatershed assessment study will be to identify opportunities for reducing chloride loading within the targeted subwatersheds. The BCWMC has identified reducing chloride pollution into its waterbodies as a high priority. Chlorides can readily move through waterbodies and be easily transported downstream, once introduced into the environment. Several waterbodies within the BCWMC are either listed as impaired for chloride pollution or have elevated chloride levels.

Barr previously updated the BCWMC's stormwater pollutant loading (P8) models for the Lost and Northwood Lake subwatersheds as part of the TMDL study effort. The BCWMC also completed an enhanced street sweeping study in September 2025 to identify opportunities and estimate the benefits of enhanced sweeping across the Bassett Creek watershed. As part of that study, the Commission Engineer requested information from the MS4 permit holders within the watershed on their winter street maintenance practices, including what types of chloride reduction strategies they were using and estimates of chloride use per lane mile. The proposed project will build off of this previous work, using the updated P8 and street sweeping models and information related to winter street maintenance practices to help identify and inform the potential for stormwater improvements within the targeted subwatersheds, as well as to estimate pollutant removal benefits.

The following scope of work describes the proposed project in more detail.

Scope of Work

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

1. Background Information Review and Project Kickoff

To begin the project, Barr will review the updated Lost and Northwood Lake subwatershed P8 models and results from the 2025 street sweeping analysis. Using the modeling results, we will map and identify existing pollutant loading hot spots throughout the study area for total phosphorus (TP) and total suspended solids (TSS), review study areas currently lacking stormwater treatment, make note of existing stormwater management practices, and areas for potential stormwater retrofits and priority areas for pollutant load reduction.

Following this initial review, we will host a project kickoff meeting with staff from the MS4 permit holders within the study area; invitees will include staff from the Cities of Plymouth and New Hope, Hennepin County, and the Minnesota Department of Transportation (MnDOT). At this meeting, we will review results from the modeling, including areas shown to be hot spots for pollution, areas without existing treatment, and discuss potential locations and opportunities to be considered for stormwater retrofits and improvements. In addition, we will also ask for updated information on road salt application rates and salt pile/brine storage locations within the watershed.

Deliverables:

- Project kickoff meeting agenda, meeting materials, and notes.

2. Developing BMP Concepts and Estimating Load Reductions

Using the information developed in Task 1 and input received from the project partners, we will review and conceptualize opportunities for stormwater improvements and retrofits within the Lost and Northwood Lake subwatersheds. Opportunities for stormwater improvements will be focused on practices that reduce TSS and TP loading, and may include the addition of structural BMPs, improvements to source control practices (such as enhanced street sweeping), and/or stormwater retrofits to existing infrastructure. The goal for the stormwater improvements that we identify will be to meet the watershed-based load reduction identified in the Lost and Northwood Lake TMDLs to meet state water quality standards.

The BCWMC's existing P8 models will be updated to reflect the conceptualized BMPs and to estimate phosphorus load reductions. Any conceptualized changes to street sweeping practices will be evaluated and phosphorus load reductions calculated using the model developed for the BCWMC's street sweeping analysis.

Following completion of the initial concepts and model updates, we will meet with project partner staff to share the initial results of the stormwater improvement concepts. At this meeting, we will talk through the initial concepts and summarize and share results from the modeling of estimated pollutant load reductions. We will summarize estimated benefits of the initial concepts compared to the required reductions to satisfy the TMDL and solicit feedback from the project partners.

This scope assumes that the concept designs can all be presented at a single meeting.

As part of this task, Barr may also conduct a one-day field visit to perform reconnaissance and observe critical information within the field for developing the conceptual BMPs. The proposed budget assumes up to 2 staff would participate in the field visit.

Deliverables:

- Draft stormwater management and treatment concepts.
- Estimated phosphorus load reductions.
- Meeting agenda, meeting materials, and notes.

3. Refining Concepts for TP/TSS Reductions and Computing Cost- Benefits

The stormwater concepts developed in Task 2 will be refined based on the feedback received from the project partners. The P8 and street sweeping analysis models will also be updated to reflect the feedback and any revisions to the concepts.

Within this task, we will then develop planning-level cost estimates and compute the planning-level estimated cost-benefit for the final concepts. Again, the goal for the identified stormwater treatment concepts will be to identify sufficient improvements to satisfy as much of the watershed-based load reduction needed to meet the TMDLs as possible.

Deliverables:

- Updated stormwater management and treatment concepts.
- Estimated phosphorus load reductions.
- Estimated planning-level costs and cost-benefit analysis.

4. Chloride Source Load Assessment and Modeling

Using the road salt information developed in Task 1 and input received from the project partners, we will develop GIS water quality modeling for the Lost and Northwood Lake subwatersheds to conduct a source load assessment. Using available data on the lake conditions, we will also develop a simple spreadsheet-based in-lake chloride mass balance model for each of the waterbodies. The subwatershed source load assessment and modeling will be informed with input from each MS4 on existing deicing methods and salt application rates and will be based on parcel-scale land use/land cover inputs, associated with each responsible party (each MS4 and the private sector). Parcel-scale modeling results will be reported for each source area-responsible party combination and shown in GIS figures depicting areal chloride loading rates and annual flow-weighted mean chloride concentration.

The lake mass balance modeling will then be used to complete planning-level estimates of the amount of chloride load reduction needed to meet the lake chloride standards. Concepts for source reduction measures or management strategies within the contributing subwatersheds will be identified based on these relative loading estimates.

Results of this analysis and recommendations related to potential chloride source control measurements to be considered will be presented and discussed with project partner staff in a virtual meeting.

Deliverables:

- Tabulated parcel-scale modeling results for each source area-responsible party combination and GIS figures showing chloride loading rates and annual flow-weighted mean chloride concentration.
- Planning level-estimates of chloride source load reductions needed to meet lake standards and management concepts for each of the major sources of chloride deicers.
- Meeting agenda, meeting materials, and notes.

5. Project Reporting

We will prepare a draft and final project report summarizing results from Task 1-3. The project report will address the following topics:

- Summary of concept designs including key assumptions.
- Estimated total phosphorus removals by concept and totals for each subwatershed, as compared to identified requirements.
- Planning-level costs for management concepts focused on TP and TSS load reductions and cost-benefit analyses.
- Modeling results related to hot spots for chloride loading within the subwatersheds.

- Planning-level estimates of necessary chloride reductions and recommendations related to source control strategies.
- Summary of potential future management alternatives and recommendations for the Lost and Northwood Lake subwatersheds.

The scope of work assumes one round of review comments will be provided by BCWMC and city staff. The budget includes one meeting with BCWMC and city staff to discuss feedback, if needed, before incorporating into the final report.

Results from the final report will be summarized and presented to the BCWMC TAC at a regularly scheduled meeting. Following that presentation, Barr will also develop a presentation summarizing findings and present the information to the BCWMC Board of Commissioners at a regularly scheduled meeting.

Deliverables:

- Draft project report and final report.
- Meeting with BCWMC and city staff to discuss comments, if needed.
- PowerPoint presentation summarizing study results.

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. Background Review and Project Kickoff	$10,500	December 2026
2. Developing BMP Concepts and Estimating Load Reductions	$27,400	March 2027
3. Refining Concepts for TP/TSS Reductions and Computing Cost- Benefits	$8,800	May 2027
4. Chloride Source Load Assessment and Modeling	$13,500	April 2027
5. Project reporting and final presentation	$23,200	June 2027
Total	**$83,400**	