



Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 5A – Consider Approval of 90% Design Plans for 2021 Bryn Mawr Meadows Water Quality Improvement Project (2020 CIP Project BC-5) - BCWMC March 17, 2022 Meeting Agenda
Date: March 10, 2022
Project: 23271887.00

5A Consider Approval of 90% Design Plans for 2021 Bryn Mawr Meadows Water Quality Improvement Project, Minneapolis (2021 CIP Project BC-5)

Summary:

Proposed Work: 2021 Bryn Mawr Meadows Water Quality Improvement Project, Minneapolis (2021 CIP Project BC-5)

Basis for Commission Review: 90% Design Plans Review

Change in Impervious Surface: N.A.

Recommendations:

- 1) Consider approval of 90% drawings (first recommendation) or, options for revising the project to reduce costs
- 2) Authorize Commission Engineer to continue working with MPRB and the City to complete final plans and design documents

The Bassett Creek Watershed Management Commission (BCWMC) is funding the initially estimated \$912,000 "Water Quality Improvements in Bryn Mawr Meadows Project" (Main Stem Watershed) (2021 CIP Project BC-5). Funding for this project was originally planned as:

- \$512,000 funded through a combination of CIP levies collected in tax years 2020 – 2021,
- Remaining \$400,000 funded through a Clean Water Fund grant from the Minnesota Board of Water and Soil Resources.

Unlike most CIP projects where the BCWMC enters into an agreement with a member city to design and construct the project, the BCWMC is designing and overseeing construction management of this project, in close coordination with the Minneapolis Park and Recreation Board (MPRB) and the City of Minneapolis (City). The water quality improvements project will be bid and constructed as part of Phase I of the MPRB's Bryn Mawr Meadows Park Improvements project. At their November 2020 meeting, the Commission approved a timeline for implementation and directed the Commission Engineer to prepare a scope of work for project design and engineering. The Commission approved the engineering scope and

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budget at their June 2021 meeting. Fifty percent design plans for the project were approved at the Commission's January 2022 meeting. Since that time, the Commission Engineer completed 90% designs. Pursuant to the approved work scope, the Commission must review and approve the 90% design plans.

Feasibility Study and Selected Project

The BCWMC's *Feasibility Report for Bryn Mawr Meadows Water Quality Improvement Project* (Barr Engineering, January 2019) considered three concepts for diverting stormwater from City of Minneapolis storm sewer into Bryn Mawr Meadows Park, and directing the water into new stormwater treatment ponds to achieve above-and-beyond water quality improvements. The Commission approved the *Bryn Mawr Meadows Water Quality Improvement Project Feasibility Study* in January 2019 and selected implementation of Concept #3 – Northwest Neighborhood Diversion and Penn Pond Low Flow Diversion. The approved concept would capture and divert stormwater runoff from 45.1 acres of residential area west of Bryn Mawr Meadows Park and low flows that discharge from the Minnesota Department of Transportation's (MnDOT's) Penn Pond. Stormwater runoff from the residential area currently flows to Bassett Creek untreated.

The concept included the construction of two new stormwater ponds within Bryn Mawr Meadows Park and the diversion of stormwater runoff through the installation of two storm sewer system retrofits: 1) the installation of a low-diversion weir within an existing City of Minneapolis manhole located south of the intersection at Morgan Avenue South and Laurel Avenue West; and 2) the rerouting of an existing storm sewer connection at the intersection of Laurel and Morgan Avenues, to divert flows from the Northwest Neighborhood into the new stormwater ponds. The feasibility study concept for these two retrofits included the installation of a new 12-inch pipe to capture and direct flow from the low flow diversion into the stormwater ponds. The rerouting of flows at the Laurel and Morgan Avenues intersection involved combining the flow from 4 existing catch basins into a 15-inch pipe, which would then transmit the stormwater under Morgan Avenue and into the ponds at the park. The installation of two new catch basins near the intersection was also included.

The feasibility study estimated that the project would remove an average of 30 pounds of total phosphorus each year; keeping these pollutants from entering Bassett Creek and ultimately the Mississippi River.

The feasibility report for the project formed the basis for the project design. The feasibility report and further project information can be found online at <https://www.bassettcreekwmo.org/projects/all-projects/bryn-mawr-meadows-water-quality-improvement-project>.

Design Features – 90% Plans

The water quality improvement project (i.e., Water Quality Project) 90% plan set continues to reflect the base components of the feasibility study's Concept #3, including two new stormwater ponds within Bryn Mawr Meadows Park and the installation of both a low flow diversion and diversion of flows from the Northwest Neighborhood area.

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The 90% plans reflect several changes since the 50% plan set, based on feedback from the City and MPRB and additional design work performed by the Commission Engineer. Draft 90% design plans, cost estimates and specifications for the Water Quality Project were submitted to the City and MPRB for review and comment in February 2022. Comments received include a requirement to modify pipe materials and pavement cross-sections within City right-of-way, the need to reconfigure and modify the design of catch basins at the Morgan and Laurel Avenues intersection to allow for the addition of a pedestrian crossing at that location, and the relocation of the downstream pond's outlet structure to increase the flow path through the pond to allow for additional settling of sediment. Other design changes since the 50% design include: using additional piles to support storm sewer infrastructure within the park, upsizing of pipes extending from the low flow diversion structure, and updating site grading in the areas immediately surrounding the stormwater ponds. The grading change, provided by MPRB, includes the addition of a graded bench along the southern pond's edge to allow for installation of a seating area. Also, between the 50% and 90% design milestones, the MPRB informed the Commission Engineer that an existing 12-inch storm sewer pipe, which extends through the area of the stormwater treatment ponds, was not planned for removal or relocation as part of the park reconstruction project. It is believed this pipe is connected to an upgradient drainage system and drain tiles within the park, and will need to be re-routed around the proposed ponds as part of the Water Quality Project. The Commission Engineer added the re-routed pipe to the 90% design plans and cost estimate. Some uncertainty remains as to the ultimate alignment, functionality and ownership of this pipe post-park reconstruction. Any further adjustments needed to the pipe design or inclusion of it within the Water Quality Project, will be coordinated with the City and MPRB as we progress from 90% to final design.

As the project design has progressed, we have obtained additional information on the Bryn Mawr area storm sewer infrastructure and stormwater flow patterns in the area of I-394 and Penn Pond. This information shows a portion of the area that was previously assumed to flow into Penn Pond to instead flow around the pond and toward the park. These changes have minimal impacts on the design of the Water Quality Project, but have been accounted for in the stormwater modeling used to predict pollutant removal efficiencies. The model results reported below are based on the most up-to-date information available to the Commission Engineer at the time of this memorandum.

A summary of estimated benefits for the Bryn Mawr Meadows Water Quality Project – Concept #3, at the feasibility study stage and at 90% design is summarized below:

	Estimated TSS Removal (lbs/year)	Estimated TP Removal (lbs/year)	Est. Annualized Cost per Pound of TP Removal (\$/lb TP/year)
Feasibility Study (January 2018)	10,469	30	\$1,540-\$2,060
90% Design Plans	12,566	37	\$2,552

Site Environmental Considerations

Environmental impacts and subsurface debris from previous filling and historical site use were identified in the park during investigations completed at the site between 2017 and 2020. These investigations were completed through a grant from Hennepin County on behalf of the City, BCWMC and MPRB in preparation for the project, and with funding from the City in preparation for the sanitary sewer replacement project extending through the Project area. The investigations identified fill with debris and petroleum-related contamination in site soils. The petroleum contamination was identified in the subsurface soils within a depth range of 1 to 10 feet below ground at variable thicknesses along the historical roadway that ran west – east across the site, between the two proposed stormwater pond locations. Debris and historical foundations in the subsurface are also present in a former residential area on the west side of the park as a result of demolition of former homes and filling. Since the time of the 2017 and 2020 investigations, the proposed water quality pond sizes and locations have changed, so limited information is available in the current planned pond areas regarding contamination, but it is anticipated a portion of the on-park stormwater pipe trenches and pond areas have contaminated soils or debris. Metals and petroleum-related contamination were also identified in a groundwater sample at the site.

The scope of work for engineering services for the Bryn Mawr Meadows Water Quality project includes the preparation of a Response Action Plan (RAP) to address soil and groundwater contamination during construction of the project. Barr is also developing a RAP on behalf of MPRB to address contamination that may be encountered during construction of park features. Because the overall larger park project will be implemented by one contractor, the two RAPs will be developed as a single document, with MPRB funding those portions of the document that address park features. The MPRB will submit the RAP to the MPCA for technical review and approval for the project. The RAP will propose the following actions:

- Excavated soils with petroleum impacts or debris will be segregated and disposed of at a RCRA subtitle D non-hazardous waste landfill. If petroleum contamination is identified at the bottom or sides of the excavations, additional over-excavation will be performed to remove the contaminated soil and

replace it with clean soil from onsite to provide a minimum 4-foot clean soil cover between the ponds and contaminated soils. In any areas where a heavy petroleum sheen is observed on soils, a 20-foot buffer is planned.

- Storm sewer trenches in contaminated areas will be backfilled with bentonite collars on the outer ends of the contaminated areas to prevent preferential flow through the sewer trench materials of contaminated water. Contaminated soils will not be used to backfill utility trenches.
- Field screening and additional soil sampling will be performed by Barr with test excavations performed by the contractor to further delineate the extent of contamination in the planned excavation areas prior to pond construction. Field observations during the sanitary sewer construction prior to the BCWMC pond construction will also be used to inform the extent of contamination expected during the pond and storm sewer excavations and assist the contractor with proper management and disposal of the soils.
- Buried footings or debris will also be removed and disposed of offsite as needed to implement the project.
- Dewatering water will be discharged to the sanitary sewer under a Metropolitan Council Environmental Services (MCES) Special Discharge Permit.

Opinion of Cost

The table below summarizes our Engineer’s Opinion of Probable Costs, based on the 90% design plans. The detailed Opinion of Probable Costs is included as an attachment.

Table 1 Summary of Estimated Costs – Concept #3, 90% Design

Description		Estimated Cost
Mobilization / Demobilization		\$ 70,000
Traffic Control		\$ 10,000
Removals: Curb & Gutter, Pavement, Storm Sewer		\$ 53,708
Earthwork: Excavation, Hauling, Disposal, Backfill, and Compaction		\$ 688,693
Environmental Response Contingency		\$ 102,000
Storm Sewer: Piping, Structures, Collars, and Riprap		\$ 410,985
Roadway Restoration: Class 5, Curb & Gutter, Paving		\$ 58,320
Vegetation: Seed & Mulch, Plugs, Shrubs, and 3-Year Establishment		\$ 43,900
Record Survey		\$10,000
Construction Subtotal ¹		\$ 1,448,000
Construction Contingency (10%)		\$ 145,000
Total w/Construction Contingency		\$ 1,593,000
ESTIMATED ACCURACY RANGE	-15%	\$ 1,434,000
	20%	\$ 1,832,000

¹ Estimate costs are reported to nearest thousand dollars.

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The total estimated project costs, including design and engineering, are currently over the overall budget allowed for this project. The feasibility study estimated the opinion of probable construction costs at \$611,000. Estimated construction costs at the 90% design are \$1,593,000.

As discussed at the 50% design project milestone, there are several reasons for the difference between estimated costs at the feasibility stage compared to the 90% design, including:

- Unprecedented inflation in construction unit costs, in the 3.5 years since the completion of the project feasibility study.
- Investigations at the site were performed prior to site design. Based on the limited environmental data in the planned excavation areas, the cost opinion reflects this uncertainty by using a conservative estimate of the volume of contaminated or debris-impacted soil requiring landfill disposal, and a contingency for unexpected subsurface environmental impacts.
- Additional street removal and reconstruction is required to capture as much of the low flow as possible.
- Recommendations for landscaping along the pond edges and storm sewer designs have matured. Updates are aligned with requirements of the project partners and will help with erosion prevention, aesthetics and project performance long-term.

Several cost saving alternatives were investigated and discussed during the presentation to the Commission of the 50% design. Alternatives included the following options:

- Alternative #1: Remove Pond A and the Northwest Neighborhood Diversion.
- Alternative #2: Remove Pond A and the Northwest Neighborhood Diversion. Make Pond C 2 feet deeper.
- Alternative #3: Remove Pond C and the Penn Pond Low Flow Diversion.
- Alternative #4: Remove Pond C and the Penn Pond Low Flow Diversion. Make Pond A 2 feet deeper.
- Alternative #5: Remove the Northwest Neighborhood Diversion.
- Alternative #6: Remove the Northwest Neighborhood Diversion. Move the Low Flow Diversion to the North, Expand Pond A and Remove Pond C.
- Alternative #7: Reduce Pond Depths in Base Design by 1 Foot.

At its January 2022 meeting, the Commission approved advancing the Bryn Mawr Water Quality Project 50% design, as presented, and to not pursue the cost saving alternatives above. It was noted that the base design continued to offer the maximum amount of pollutant removal. The possibility of securing additional funds for the project was also discussed at the meeting.

Due to additional significant increases in the estimated project cost since the 50% designs, staff again analyzed cost saving alternatives for the Commission's consideration. Upon our further review of the alternatives listed above, we prioritized the three alternatives which provide the most savings while still providing significant water quality treatment. These three alternatives have been updated to reflect unit

costs and the integration of City and MPRB project comments at the 90% design stage. The following table summarizes these alternatives and the estimated cost savings of each. Estimated pollutant removal efficiencies of each of these alternatives will be presented at the Commission meeting. The Commission Engineer will also review the potential of a hybrid option between the base design and Alternative 6 for presentation at the Commission meeting.

The Commission Administrator and Engineers recommend approval of the 90% designs for the base (original) project. Implementation of the full project will maximize our opportunity to realize water quality improvements during the park reconstruction project and, while high, the cost per pound pollutant removal is within the realm of other recent projects.

If the Commission feels the cost of the original design is too high (i.e., would require increasing the levy to an unacceptable level), we recommend approval of one of the cost-saving alternatives. Our order of preference/recommendation of the alternatives listed above is #6, #2, #1. We will provide additional information on the hybrid base-Alternative 6 option at the Commission meeting.

Alternative	Est. Construction Cost	Est. Construction Cost Savings
6: Remove the Northwest Neighborhood Diversion. Move the Low Flow Diversion to the North, Expand Pond A and Remove Pond C. (most preferred alternate)	\$846,000	\$747,000
2: Remove Pond A & the NW Neighborhood Diversion. Make Pond C 2-feet deeper. (second preferred alternate)	\$678,000	\$915,000
1: Remove Pond A & the NW Neighborhood Diversion. (least preferred alternate)	\$662,000	\$931,000

Pursuit of a project cost saving alternative would require additional project engineering and design. The identified alternatives have not been optimized to target maximum pollutant removals. We recommend performing this optimization, if one of the cost-saving alternatives were pursued.

Schedule

The MPRB will construct the Bryn Mawr Meadows Water Quality Project as part of their larger park redevelopment project. Park construction is planned to take place in 2022-2023. The table below summarizes the anticipated schedule.

Tasks and milestones	Estimated Schedule
Design – complete 90% plans and opinion of cost for Commission review and approval	March 2022 Commission meeting
Permitting (overseen by MPRB)	Ongoing through Spring/Summer 2022
Design – complete 100% plans specifications, and opinion of cost. Project will be bid with MPRB park redevelopment project.	Tentatively planning for April 2022
Bidding	April-May 2022
Construction	Summer 2022 – Spring 2023
Record drawings, final restoration, project closeout	Spring/Summer 2023

Approvals/Permit Requirements

MPRB and their consultants are leading the permitting work for the Water Quality Project, as part of the overall park reconstruction project. The following permitting and approvals are required.

- 1) Minnesota Pollution Control Agency (MPCA) permitting. Because the CIP project features will be constructed as part of the larger park reconstruction project, which will result in more than one-acre of land disturbance, a Construction Stormwater General Permit will be required.
- 2) MPRB construction permit. This permit is required for all construction-related activities taking place on MPRB parkland.
- 3) City of Minneapolis Soil Erosion and Sediment Control Permit. Because construction of the CIP project features will result in more than 500-square feet of land disturbance, a Soil Erosion and Sediment Control permit will be required.
- 4) City of Minneapolis Stormwater Management Plan. Because the CIP project features will be constructed as part of the larger park reconstruction project, which will result in more than one-acre of land disturbance, a Construction Stormwater General Permit will be required.
- 5) MCES Special Discharge Permit. In order to comply with the project’s RAP, groundwater will be discharged to the sanitary sewer, which requires issuance of a Special Discharge Permit from MCES.

In addition to the above, BCWMC review and approval of the overall park reconstruction project is required.

Recommendations

- A) Consider approval of 90% drawings (first recommendation) or, options for revising the project to reduce costs
- B) Authorize Commission Engineer to continue working with MPRB and the City to complete final plans and design documents

Attachments

Figure 1 – Project Area Map – 90% Design

Figure 2 – Engineer’s Opinion of Probable Costs – 90% Design