

Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 6C. Review of the Draft Feasibility Study for 2016 Northwood Lake Storm Water Improvements (CIP NL-1)
BCWMC September 18, 2014 Meeting Agenda
Date: September 10, 2014
Project: 23270051 2014 633

6C. Review of the Draft Feasibility Study for 2016 Northwood Lake Storm Water Improvements, New Hope (CIP NL-1)

Summary:

Proposed Work: 2016 Northwood Lake Stormwater Improvements

Basis for Commission Review: Draft Feasibility Study Review

Recommendations:

- 1) Consider approval of the draft feasibility study, with recommended changes, and provide direction to the City of New Hope regarding which concept BMPs should be implemented.

The 2016 Northwood Lake Storm Water Improvement project will be funded by the BCWMC's ad valorem levy (via Hennepin County). The City of New Hope provided the draft feasibility study to the BCWMC Engineer for review, as directed by the Commission at their February 20, 2014 meeting. The following is a summary of the draft feasibility study and the Commission Engineer's recommended revisions for the study.

Draft Feasibility Study Summary

The City of New Hope's draft *Feasibility Report for Northwood Lake Storm Water Improvements* (Stantec, September, 2014) examines the feasibility of constructing several stormwater improvements at Northwood Lake. The city's consultant (Stantec) identified three conceptual stormwater best management practices (BMPs) at two locations in the Northwood Lake watershed that will reduce the phosphorus and sediment loads to Northwood Lake. Northwood Lake is currently on the Minnesota Pollution Control Agency's (MPCA) 303(d) Impaired Waters List for excess nutrients.

The three potential BMPs include:

- 1) Concept A – A stormwater reuse system (160,000 gallons) located in Northwood Park (on northeast side of Northwood Lake) that would be used to irrigate baseball and soccer fields (6.4 acres) located on the east side of Boone Avenue. Additionally, bioretention basins would be used to treat overflows from the stormwater reuse system, providing approximately 0.37 acre-ft of runoff storage.
- 2) Concept B – A traditional wet retention pond located in Northwood Park (0.34 acre pond with 1.2 acre-ft of dead storage for water quality treatment).
- 3) Concept C – A traditional wet retention pond located on a City-owned parcel west of Jordan Avenue (0.23 acre pond with 0.7 acre-ft of dead storage for water quality treatment).

Figure 1 from the draft feasibility study (attached) shows the location of the concept BMPs.

Several stakeholder feedback meetings were held in July and August 2014, including two neighborhood meetings and a New Hope City Council meeting. Feedback from these meetings was incorporated into the conceptual designs. In general, the neighborhood residents and the City Council indicated a preference for Concepts A and C. There was concern that Concept B (wet retention pond) would take up a significant amount of usable park space in Northwood Park. Additionally, the stakeholders favored the stormwater reuse for irrigation to reduce city water costs.

Table 1 summarizes the estimated cost, estimated annual total phosphorus removal, and the annualized cost per pound of phosphorus removed for each of the conceptual designs, as presented in the draft feasibility study. The annualized costs were calculated using a 30-year time frame and an interest rate of 5%.

Table 1. Summary of the Northwood Lake Storm Water Improvements Conceptual BMP Designs

Scenario	Capital Cost (\$)	Annual Total Phosphorus Removal (lbs/year)	Annualized Cost/Benefit (\$/lb Phosphorus Removed/year)
Concept A	\$1,200,872	16.3	\$5,607
Concept B	\$134,264	15.4	\$993
Concept C	\$150,456	5.7	\$2,639
Concepts A and C	\$1,351,328	22.0	\$4,838
Concepts B and C	\$284,720	21.1	\$1,438

The feasibility report recommends the implementation of Concept A and Concept C.

The Northwood Lake Storm Water Improvement project is included the BCWMC's 2016-2020 CIP. The accompanying fact sheet for the Northwood Lake stormwater improvements indicated the construction of

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two BMPs, one at the Jordan Avenue outlot location (Concept C) and in Northwood Park (Concepts A & B). At the time the project was added to the BCWMC's CIP, the estimated project costs were \$595,000.

The draft feasibility report notes the following required permits/approvals for the project:

- 1) MPCA NPDES Construction Stormwater Permit (Concept A only)
- 2) City of New Hope Grading Permit
- 3) BCWMC Review

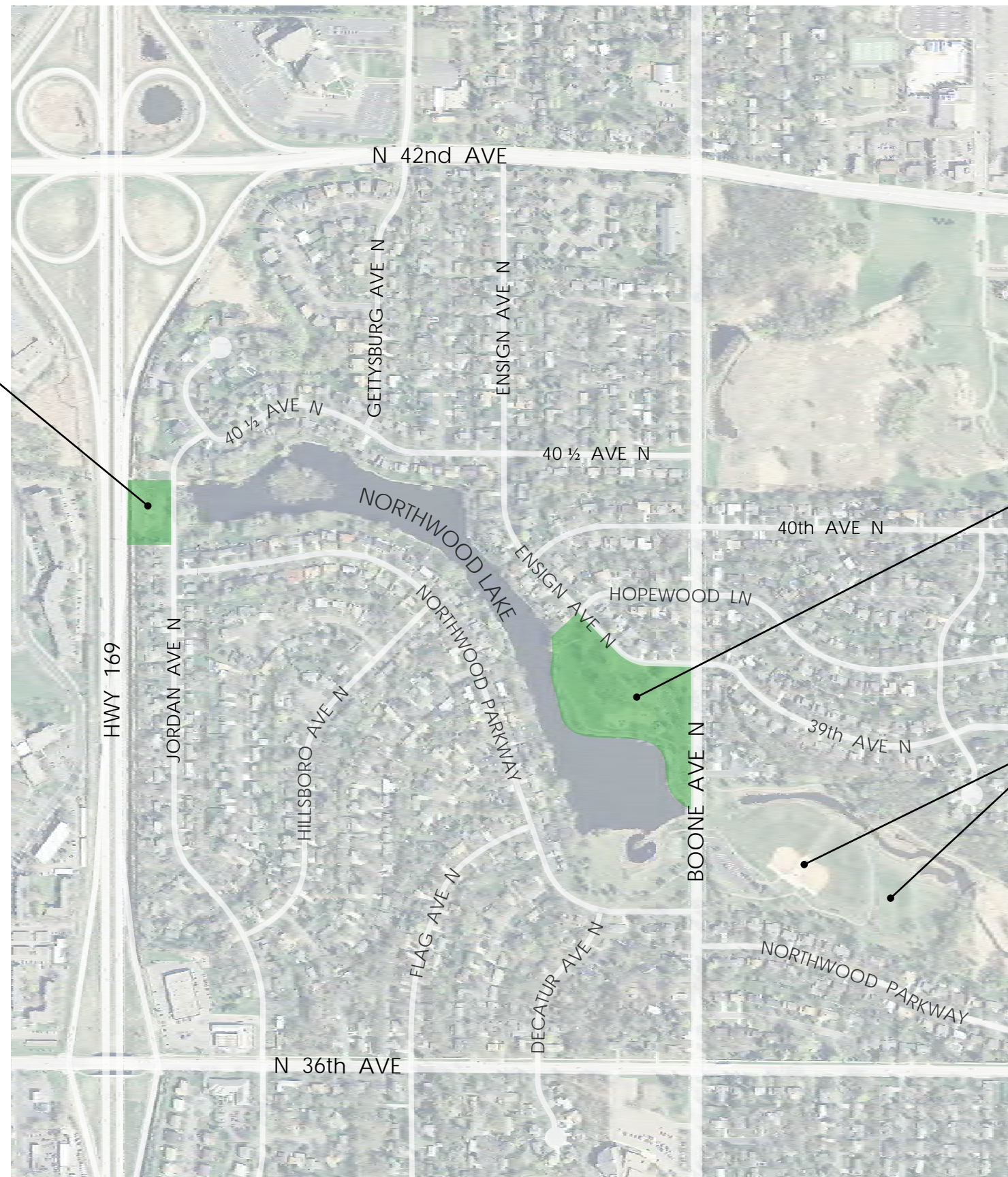
Recommendations

The Commission Engineer recommends the following revisions to the draft *Feasibility Report for Northwood Lake Storm Water Improvements*:

- The Concept A Improvements section on page 7 should include the expected separation from the groundwater to the bottom of the proposed bioretention basins based on the soil borings.
- Although the feasibility study indicates that the impact of the stormwater reuse system (Concept A) on Northwood Lake will be minimal, the impact on Northwood Lake water levels should be quantified during final design, should the Commission select Concept A for implementation. The BCWMC has collected lake level data for Northwood Lake since the early 1990's and the BCWMC's P8 model includes the Northwood Lake watershed. Both sources of information are available for use in this evaluation.
- The proposed reuse of 10.2 acre-ft/year (3.3 million gallons per year) reuse may trigger a Minnesota Department of Natural Resources' (MDNR) water appropriations permit. If the MDNR would require an appropriations permit for Concept A, this permit requirement needs to be incorporated into the Permit Requirements section (page 16) of the feasibility study.
- For Concept Design A, the potential public health concerns related to stormwater reuse need to be summarized, and the potential mitigation measures that will be considered during final design need to be discussed (including working with City of New Hope plumbing code reviewers, UV disinfection, timing of irrigation to minimize contact with athletic field users, and signs indicating that stormwater is being used for irrigation).

The revised (final) feasibility study must be submitted to the Commission Engineer for review and to the Commission for approval.

Jordan Avenue Site
* Concept C



Northwood Park Site
* Concept A
* Concept B

Concept A Irrigation Area
* 2 Baseball Fields
* 1 Soccer Field

LOCATION MAP

CITY OF NEW HOPE, MINNESOTA
2016 NORTHWOOD LAKE IMPROVEMENTS

FIGURE 1