

Northwood Lake Improvement Project DRAFT Clean Water Fund Grant Application

Project Abstract

Northwood Lake is an impoundment of the North Branch of Bassett Creek located in the City of New Hope within the Bassett Creek Watershed Management Commission (BCWMC). Northwood Lake is a shallow lake with a fully developed watershed of 1,341 acres that provides very little stormwater treatment. The lake is used for aesthetic viewing, boating, and fishing, and is home to the City of New Hope's premier park, Northwood Park.

Northwood Lake is impaired due to nutrients and is included in the MPCA's impaired waters 303(d) list. The lake is classified as a Priority 1 lake by the BCWMC and City of New Hope. The BCWMC has developed strategies to improve Northwood Lake's water quality dating back to the 1996 Northwood Lake Management Plan and continuing into the 2015 BCWMC Watershed Management Plan. The components of this proposed project were analyzed and fully described in the Feasibility Study for the Northwood Lake Improvement Project (November 2014).

The proposed Northwood Lake Improvement Project will treat storm water runoff from over 110 acres of currently untreated urban land through a variety of practices at two different locations adjacent to the lake. The project includes rainwater gardens, underground stormwater collection and re-use, a structural pretreatment device, and a wet ponding basin. These practices will maximize storm water treatment while minimizing the amount of land removed from useable park space. These practices will combine to reduce phosphorus loading by 22 lbs per year, significantly increasing the regularity with which the lake meets applicable BCWMC and State water quality standards. Secondary benefits of the project will include water conservation (through stormwater re-use for irrigation), stormwater volume reduction, habitat improvements, open space preservation, development of innovative technologies, and education.

The project will be completed in partnership with the City of New Hope.

What organization will serve as the Fiscal Agent for this grant?

Bassett Creek Watershed Management Commission

Did your organization receive CWF grant dollars in FY 2013, FY 2014 and/or FY 2015? If less than 50% of the total grant amount awarded from FY 2013, FY 2014 and FY 2015 grants have been spent, please explain your organization's capacity to effectively implement additional Clean Water Fund grant dollars.

No, the Bassett Creek Watershed Management Commission last received a Clean Water Fund grant in FY2012.

Project Description: 1. (5 points) Identify the resource of concern for the proposed project. What nonpoint pollution problem(s) will be addressed with this project? Describe the public benefits of this project to the resource of concern from a local and state perspective, including how the resource of

concern aligns with at least one of the statewide priorities referenced in the “Projects and Practices” section of the RFP.

This project will improve the water quality of Northwood Lake and the North Branch of Bassett Creek while conserving drinking water and preserving open space. Northwood Lake is an impoundment of the North Branch of Bassett Creek. The lake and the creek flow into Bassett Creek’s main stem which enters the Mississippi River in Minneapolis. Northwood Lake is a shallow lake with a fully developed watershed of 1,341 acres. The shoreline is developed with single family homes and the lake is used for aesthetic viewing, boating, and fishing. A popular community park, Northwood Park, is located on the lake. This is the City of New Hope's premier park hosting multiple community events and attracting residents from around the area.

Northwood Lake is included on the State's Impaired Waters List due to nutrients; the North Branch of Bassett Creek is impaired due to bacteria. This project aligns with the statewide priority to “restore and protect water resources for public use and public health, including drinking water.” Pollutants including nutrients, bacteria, solids, chlorides, PAHs, etc. enter the lake from the fully developed watershed, much of which has little or no stormwater treatment.

The project includes practices adjacent to the lake that will maximize storm water treatment while minimizing the amount of land removed from useable park space and conserving drinking water. Project components include a structural treatment device for pre-treatment of runoff, underground storm water re-use chamber (160,000 ga.), distribution system to irrigate adjacent ball fields, and a series of raingardens to treat system overflow prior to discharging into Northwood Lake. Additionally, a wet ponding basin will be constructed to treat runoff from rear yard areas and Jordan Avenue on the west end of the lake. This project will treat runoff from 110 acres, reduce annual phosphorus loads to the lake by 22 lbs, and conserve up to 3.8 million gallons of drinking water each year.

Relationship to Plan: 2. (15 points) Describe how the resource of concern was prioritized. For the proposed project, identify the specific water management plan reference by plan organization, plan title, section and page number. In addition to the plan language, provide a brief narrative description of the impact of the action or objective cited. Provide web links to all referenced plans.

Northwood Lake is a priority lake for the BCWMC and the City of New Hope and has been the focus of monitoring and planning for decades. The BCWMC’s 1996 Northwood Lake Watershed and Lake Management Plan identified BMPs to help improve water quality. The lake has been regularly monitored by the BCWMC and through the Citizen Assisted Monitoring Program since 1977. Once every 4 years the BCWMC collects data on water quality, zooplankton, phytoplankton, and aquatic plants.

The BCWMC 2015-2025 Watershed Management Plan (Plan) includes lake prioritization methods in Section 2.7.2.2 and Appendix C. Priority 1 lakes (like Northwood) are MDNR-designated Public Waters Lakes, >10 acres with public access or adjacent public land. The Plan includes this project to address water quality in Northwood Lake in its Capital Improvement Program in Table 5-3. The Plan also includes policies 1, 2, 4-6, and 9-11 in Section 4.2.1 regarding waterbody prioritization, water quality goals/standards, project implementation, and monitoring (see www.bassettcreekwmo.org). These policies work to ensure that water quality goals are in place and actions will be taken to protect and restore waterbodies for public use and aquatic health.

The City of New Hope first identified needed water quality improvements for Northwood Lake in their 1996 Surface Water Management Plan. In 2008 the City adopted a Local Water Management Plan that identifies the need for water quality improvements for discharges to the lake in Table 6.2 (pg 31). Table 8.2 (pg 52) identifies water quality improvements within the drainage area tributary to Northwood Park as a “priority system improvement project” and Table 8.5 identifies water quality improvements at this location as “Implementation Activity #8”.

Project timing coincides with city plans to redevelop Northwood Park where the BMPs will be located. Construction mobilization, earthwork, traffic disruptions, and park closures are hence limited to one timeframe.

Targeting: 3. (18 points) Describe the methods and results of inventory and source targeting done to date or that will be completed prior to project implementation. How was this used to identify the root cause of the most critical pollution sources or threats to surface and/or groundwater quality?

In 1996 the BCWMC completed the Northwood Lake Watershed and Lake Management Plan to establish implementation priorities and provide guidelines for the Cities of New Hope and Plymouth and the BCWMC. A P8 water quality model was used to estimate both the water and phosphorus loads introduced from the various inflow points to Northwood Lake. The annual runoff volumes in the model were calibrated to monitoring data collected from a previous study on the Minneapolis Chain of Lakes. The model was calibrated assuming the “average year” climatic data and the phosphorus loading values for various land uses were based on Bannerman (1983). The lake management plan resulted in specific recommendations and preliminary cost estimates for structural BMPs for multiple lake drainage areas.

In 2014, a feasibility study for this project was completed using the Minimal Impact Design Standards (MIDS) Calculator (Version 2: June 2014) to estimate the water quality treatment performance of the project components. The project will treat storm water runoff from over 110 acres of currently untreated urban land through the installation of a variety of practices at two different locations adjacent to the lake, including rainwater gardens, underground storage, a structural pretreatment device, and a wet pond. These practices will maximize storm water treatment while minimizing the amount of land removed from useable park space. These project components were analyzed and fully described in the Feasibility Study for the Northwood Lake Improvement Project (November 2014). In preparing the feasibility study, existing site conditions (including soil borings and infiltration conditions) were surveyed and analyzed to determine the best BMP options, their location, size, and pollutant removal effectiveness.

Targeting: 4. (5 points) How does this application fit into an overall watershed protection and/or restoration strategy implemented by your organization and your partners in the watershed? Listing in a plan does not necessarily constitute an overall strategy. Describe activities other than those funded by this application that affect the resource of concern including but not limited to other financial assistance or incentive programs, easements, regulatory enforcement, or community engagement activities that are indirectly related to this proposal.

This project is part of a comprehensive and robust Capital Improvement Program (CIP) implemented by the BCWMC in cooperation with its member cities and other partners. The BCWMC CIP includes

projects that improve water quality and/or alleviate flooding in all areas of the watershed, while incorporating additional secondary benefits where possible.

Although the CIP addresses multiple BCWMC goals, it is only one component of the larger BCWMC plan to restore and protect waterbodies, reduce flooding and the effects of development, use the opportunity of redevelopment to improve conditions, engage and educate residents, cooperate with multiple partners, and continue to assess resources (along with the effects of climate change).

There are multiple strategies the BCWMC uses to accomplish these goals. In addition to structural BMPs installed through the CIP, the BCWMC uses requirements for development and redevelopment to achieve water quality and rate control goals including the MPCA's Minimal Impact Design Standards and buffer requirements.

The BCWMC also educates the public about water quality and their role in improving waterbodies in their communities. Specifically, an active lake group - the Friends of Northwood Lake cooperates with the BCWMC and disseminates educational materials and information to its members and local residents, including hosting BCWMC and city staff speakers at annual meetings. The BCWMC also participates in the West Metro Water Alliance, sponsors multiple education programs (such as the Children's Water Festival and the Clean Water MN campaign, Non-Point Education for Municipal Officials), hosts watershed tours, and participates in several local events each year.

Targeting: 5. (2 points) Newsletters, signs and press releases are standard communication tools. Beyond those basics, describe any additional project activities that would be added to the grant work plan aimed at engaging your local community on the need, benefits and long term impacts of this project.

There has already been much public input and support for the project, including letters of support from the Friends of Northwood Lake and the City of New Hope and testimony at public meetings and BCWMC meetings. The BCWMC and the City of New Hope will build on that support and will keep the Friends of Northwood Lake and other residents engaged in the project and its outcomes through presentations, written materials, signage, and participation in events at Northwood Park and other venues.

Measureable Outcomes: 6. (10 points) What is the pollutant(s) of concern, such as dissolved phosphorus, nitrogen, sediment, etc., that is specifically being addressed by this project? Has there been a specific pollutant reduction goal set in relation to the pollutant of concern or the resource of concern that is the subject of this application? If so, what is that goal and what process was used to set this goal? If no pollutant reduction goal has been set, describe the water quality trends or other management goals that have been established.

Total phosphorus reduction is the primary goal of this project as the lake is officially impaired for nutrients. It is expected that significant sediment loading reductions will also be achieved. The BCWMC's water quality goal is consistent with State water quality standards for shallow lakes: 60 ug/L total phosphorus as a summer average. Although a TMDL has not been completed for Northwood Lake, the 1996 management plan included watershed and lake water quality modeling that estimated the total phosphorus loading capacity (and necessary load reductions) to meet lake water quality goals. The BCWMC and local residents have been monitoring and collecting data on Northwood Lake since 1977. In the last ten years, the average of all June-September observations show total phosphorus

concentrations of 215 ug/L, average chlorophyll a concentrations of 25 ug/L, and average Secchi depth measurements of 0.99 m. The latest monitoring data from 2013 confirms that Northwood Lake is still impaired for excess nutrients and not meeting State water quality standards for shallow lakes. However, chlorophyll-a and Secchi transparency levels have been quite close to the shallow lake eutrophication standards since 2000, with average annual chlorophyll-a and Secchi depth levels meeting the standards six and nine times, respectively, during the fourteen year period.

Comparison of the historical water quality, phytoplankton and macrophyte data indicates that the lake has switched into a more stable, plant-dominated system with fewer blue-green algae since 2000. As a result, it is expected that incremental reductions in phosphorus loading will significantly increase the likelihood that water quality standards will be met on a more regular basis. In addition, much of phosphorus load reduction realized from this project will target soluble phosphorus, resulting in disproportionately greater lake water quality benefits than other BMPs that only remove particulate phosphorus.

Measureable Outcomes: 7. (15 points) Describe how this project directly addresses the pollutant(s) of concern and how effective the project will be in solving the pollution problem(s). Describe how this project addresses the root cause of the problem. What is the annual reduction in pollutant(s) that will be achieved for the resource of concern after this project is completed?

This project will treat stormwater runoff from over 110 acres of currently untreated urban land and will reduce annual total phosphorus loads to the lake by 22 lbs. The project includes the installation of a variety of practices at two different locations adjacent to the lake that will maximize stormwater treatment while minimizing the amount of land removed from useable park space. At the east end of the lake project components include a structural treatment device for pre-treatment of runoff, underground storm water re-use chamber (160,000 gallons capacity), pump house, distribution system to irrigate 6.4 acres of adjacent ball fields, and a system overflow directed into a of raingardens prior to discharging into Northwood Lake. At the west end of Northwood Lake, a wet ponding basin will be constructed in a green space area between Trunk Highway 169 and Jordan Avenue. Storm water runoff from rear yard areas and Jordan Avenue draining from the south will be directed into the pond for treatment before discharging into an existing storm sewer pipe tributary to Northwood Lake.

Analysis performed as part of the 1996 management plan indicates that the root cause of high nutrients in Northwood Lake is mostly untreated runoff from residential and commercial land in its 1,341 acre watershed. This project captures and treats runoff from a portion of that land, resulting in a direct reduction of total phosphorus (and other pollutants) entering the lake.

Measureable Outcomes: 8. (10 points) Will the overall project have additional specific secondary benefits, including but not limited to hydrologic benefits, enhancement of aquatic and terrestrial wildlife, drinking water protection, enhancement of pollinator populations, or protection of rare and/or native species? If so, please specifically describe, or quantify if possible, what those benefits will be.

This project has significant secondary benefits. In addition to improving water quality in Northwood Lake and the North Branch of Bassett Creek by removing phosphorus, bacteria and other pollutants, this project will accomplish the following:

Water Conservation: The project will conserve up to 3.8 million gallons of drinking water each year through the use of captured stormwater to irrigate adjacent ballfields.

Volume Reductions: The stormwater reuse and raingarden components will reduce stormwater runoff volumes reaching the lake by 14% (through reuse and infiltration).

Habitat Improvements: Water quality improvements in the lake and creek will result in improved aquatic habitats (less algae, more dissolved oxygen, more sunlight for plants).

Open Space Preservation: This project preserves precious open space by capturing stormwater in underground chambers rather than treating it in a large pond within Northwood Park. The City of New Hope is fully developed and has a relatively low amount of public open space (compared to some neighboring communities). Therefore, the prospect of using valuable parkland for a stormwater pond was not amenable to city officials and residents.

Innovation: The large underground stormwater storage area and use of this stormwater to irrigate ballfields in the park is an innovative approach to stormwater management. As space (and public appetite) for traditional stormwater ponds decreases, innovative practices such as underground storage areas will become important to understand and implement efficiently. The BCWMC is willing and able to share design features and lessons learned about the project with other entities.

Education: This project will educate the public through the installation of a large educational sign describing components of the project and BMPs homeowners can use to help reduce polluted runoff.

Cost Effectiveness: 9. (5 points) What alternatives were considered to achieve the same type and amount of benefit outlined in the proposed project? Describe why the proposed management practice(s) are considered to be the most cost effective and reasonable means to attain water quality improvement or protection benefits. Consider such factors as, but not limited to BMP effectiveness, timing, site feasibility, practicality, and public acceptance.

The feasibility study for this project included an option for a stormwater pond at the east end of the lake in place of the planned underground stormwater reuse alternative. The BCWMC deliberated at length about the two different options and decided to implement the stormwater reuse option for multiple reasons. The reuse option removes slightly more total phosphorus and has the added benefits of drinking water conservation and stormwater volume reduction. These two options were also analyzed using the Envision rating system. Envision is a project assessment and guidance tool for sustainable infrastructure design, providing an objective framework of criteria and performance achievements that help users identify ways that sustainable approaches can be used to plan, design, construct, and operate infrastructure projects. Envision was useful in comparing the two project options which have different intangible benefits that were difficult to quantify through traditional measures. After analysis, Envision scored the stormwater reuse option higher or more desirable from a sustainability standpoint.

Another important consideration was community acceptance for the project. The stormwater pond option would have used 0.34 acres of precious parkland which was highly unfavorable to city officials and residents. The chosen stormwater reuse option had strong community support from the beginning including that of the Friends of Northwood Lake, the New Hope city council, and other residents. Two

neighborhood meetings were held in June and August 2014 in which participants voiced their strong support for improving lake water quality but WITHOUT installing a stormwater pond within the park.

Finally, cost effectiveness of the project is enhanced because the construction timing coincides with city plans to redevelop Northwood Park where the BMPs will be located. Construction mobilization, earthwork, traffic disruptions, and park closures are hence limited to one timeframe.

Project Readiness: 10. (5 points) Describe steps and actions already taken to ensure that project implementation can begin soon after grant award. Also describe any preliminary discussions with landowners/occupiers, agreements/contracts, contingency plans, and other project development activities to date that will ensure a smooth start to the project and minimize administrative or other critical delays.

A feasibility study for this project was completed and approved by the BCWMC in 2014. The BCWMC entered into an agreement with the City of New Hope to design and construct the project at their August 20, 2015 meeting. The City of New Hope will use its consulting engineering firm to design the project components according to the feasibility study and all necessary State and local permits will be sought. The BCWMC Engineer will review 50% design plans and will make recommendations to the BCWMC regarding approval. This process is repeated for the 90% (final) design plans. The City of New Hope will then submit bid documents, contract with a construction firm, and oversee construction. The City will report back to the BCWMC on construction progress and will prepare a final report at the end of the project. Construction is expected to begin in summer 2016 and should be completed in September 2016.

The BCWMC has managed its capital improvement program following the process described above with great success for over ten years, implementing 1 - 2 projects per year in cooperation with its member cities.

Project Readiness: 11. (5 points) List and provide the status of any permits (federal, state, or local) that may be required for this project (for example, NPDES construction permit applied for on January 1, 2015, archeological surveys, etc.). Describe any preliminary discussions with permitting authorities (if applicable).

The stormwater reuse feature requires a Minnesota Department of Natural Resources' (MDNR) Water Appropriations Permit. This feature will also require an NPDES Construction Storm Water Permit due to disturbance of more than one acre. The City of New Hope will require a permit for grading.

BBR: 12. (5 points) Did your organization submit a Biennial Budget Request (BBR) to BWSR in 2014?

Yes.

The Constitutional Amendment requires that Amendment funding must not substitute traditional state funding. Briefly describe how this project will provide water quality benefits to the State of Minnesota without substituting existing funding.

The BCWMC is committed to the improvement and protection of its lakes, streams, and wetlands and therefore implements a robust and comprehensive capital improvement program (CIP) in partnership

with its member cities. Every year since 2004, the BCWMC has levied, through Hennepin County, the funds needed to implement large-scale projects to improve impaired waterbodies or protect healthy waterbodies. This project is receiving local city funds of \$300,000 and Clean Water Partnership grant funds (from MPCA) of \$300,000. The BCWMC is prepared to fund the remainder of the project through a Hennepin County tax levy, as needed. However, there is a long list of projects in need of BCWMC financial support. Grant funding is sought to offset the BCWMC funds so that other projects can be implemented.

DRAFT