Item 4G.
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Memorandum

To: Bassett Creek Watershed Management Commission (BCWMC)
From: Barr Engineering Co.
Subject: Item 4G. Final Feasibility Report for Plymouth Creek Restoration Project (2017CR-P)
BCWMC March 17, 2016 Meeting Agenda
Date: March 9, 2106
Project: 23270051.36 PLY

4G. Final Feasibility Report for Plymouth Creek Restoration Project (2017CR-P)

The BCWMC Commissioners reviewed and discussed the Draft Feasibility Report for Plymouth Creek Restoration Project at the February 2016 BCWMC meeting, and the draft report was approved with minor suggested revisions. This memorandum summarizes the changes made to the report based on the discussion and comments. Where appropriate, full paragraphs or sections are included for context, and added language is underlined.

1. The Table of Contents was updated to reflect new page numbering caused by additional text.
2. Section 1.4 – Project impacts and estimated costs; first paragraph (added text underlined):

   Potential impacts from the stabilization project are discussed in Section 6.0 and include temporary impacts to wetlands, disc golf course usage, tree loss, and bat habitat. Of these, the most significant consideration for the project is the need to manage disc golf course usage to achieve the desired establishment of ground cover vegetation along the stabilized stream banks and riparian corridor. <u>This will require continued coordination with the Plymouth Parks and Recreation Department to develop a final plan</u>.

3. Section 2.2.2.4 – Other impairments; entire section is new.

   #### 2.2.2.4 <u>Other Impairments</u>

   <u>Plymouth Creek is currently listed by the MPCA as impaired for chloride and *E. coli*, and downstream impairments include mercury in fish tissue and eutrophication for Medicine Lake, and chloride, fish bioassessments, and fecal coliform for the Bassett Creek Main Stem (Reference (3)).</u>

   <u>In 2015, the BCWMC Engineer completed a biotic index monitoring study that evaluated water quality, the macroinvertebrate community and habitat at several locations including one on Plymouth Creek approximately two miles downstream of the study reach in this report (Reference (6)). The monitoring data on Plymouth Creek found that Macroinvertebrate Index of Biotic Integrity (M-IBI) score was low enough for the creek to potentially be considered impaired for macroinvertebrates. The monitoring data also confirmed the impairment for chloride as the water quality data exceeded MPCA standards for specific conductance, which is often correlated with chloride concentrations.</u>

Due to the results of this monitoring data, the Minnesota Pollution Control Agency's (MPCA) Stream Habitat Assessment (MSHA) was completed for the study area to provide a quick qualitative assessment of the stream habitat within the study reach. The MSHA collects information on watershed land use, riparian quality, bank erosion, stream substrate type and quality, in-stream cover, and several channel morphology characteristics of an identified reach (Reference (7)). The results found all reaches of the study area to be lacking in key habitat components. Habitat features that are lacking and are possible to change through a project include in-stream cover, channel embeddedness, channel dimensions, bank erosion, and diversity in flow, velocity and depth. Other components are not possible to change, such as the fact that the study area is in a suburban landscape rather than a pristine forest.

4. Section 3.2.1 – Surrounding land use; first paragraph (new text underlined):

   Reaches 1 and 2 are within Plymouth Creek Park, a city park that includes ballfields, an event center, and a disc golf course adjacent to the creek. The park also includes a large wetland upstream of the project area. Plymouth Creek flows through the wetland from northwest to southeast. Land use surrounding the park is primarily single-family residential on the north, commercial on the west, and apartment complexes on the south. In Reaches 1 and 2, the disc golf course is present immediately adjacent to the creek and has a direct impact on the creek. Relatively mature trees are present adjacent to the creek; however typical understory vegetation (young trees, shrubs, and shade tolerant grasses and forbs) is often absent or sparse due to traffic from disc golf users.

5. Section 4.1 – Public Stakeholder meetings; second paragraph added:

   A public stakeholder meeting was held at Plymouth City Hall on October 26, 2015, at 7:00 p.m. During the meeting, preliminary design concepts were presented to local residents and users of the Plymouth Creek Park disc golf course. Attendees asked questions and provided some of their observations of the creek. There were no significant concerns raised about the project. Some attendees did indicate a strong desire to have the disc golf course remain in place, although the need for some disruption in access to the course during construction was acknowledged. One long-time resident, who lives adjacent to the creek, was able to validate the findings of historical images—that the tight meander upstream of Annapolis Lane has been in that pattern for many years.

   One user of the disc golf course attended the public stakeholder meeting and was curious about the potential impacts to the course. The BCWMC Administrator made attempts to contact a disc golf league that utilizes the disc golf course in the study area to get input on the project; however calls and emails were not returned. The discussion at the February 2016 BCWMC meeting included recommendations to continue to make efforts to contact the disc golf league and regional disc golf association(s) to discuss the project and find ways to work together to implement a successful project.

6. Section 5.1.3 – Non-site-specific techniques and considerations

   The subsections within this section were changed to have full headings and some additional text was added, as underlined below:

   #### 5.1.3.1 Management of disc golf course and revegetated areas

   Regardless of the specific techniques chosen to stabilize individual sites, there will be areas that will be revegetated during construction. During the development of this study, the Plymouth Parks and Recreation Department staff have described usage of the disc golf course and potential issues with managing foot traffic in revegetated areas, and the City has recommended a discussion with the Commission regarding the extent of revegetation to ultimately be included with this project.

   The concepts developed in this report include a line-item for a project-wide approach to manage foot traffic within the revegetation areas to make the efforts more effective, and it is assumed the project-wide approach will use a combination of fencing (temporary or permanent), signage, designated walking paths, and disc retrieval poles already available on the course. The final design should include close coordination with the Plymouth Parks and Recreation Department to develop a long-term means to manage and/or exclude foot traffic from revegetated areas. The final design should also continue efforts to discuss the project with users of the disc golf course, disc golf leagues that use the course, and regional disc golf associations to seek assistance in educating course users about the importance of protecting riparian vegetation.

   #### 5.1.3.1 Educational signage

   The public setting provides an opportunity to educate park users about riparian ecology and the efforts of the BCWMC and City of Plymouth to improve water quality by stabilizing erosion sites. It will also provide a means to encourage disc golfers to use the retrieval poles and stay out of the revegetation areas.

7. Section 6.4 – Other project impacts; last paragraph, added text is underlined

   Impacts to Plymouth Creek Park

   Due to the proximity of the disc golf course to some of the stabilization sites in Reaches 1 and 2, temporary closures of portions of the course will likely be necessary during construction to ensure the safety of park users. Plymouth Park and Recreation Department staff have indicated that moving holes and/or ~~a~~ temporary closing (up to of a year) specific disc golf holes may be acceptable to achieve initial vegetation establishment in the riparian areas. Multi-year or permanent hole or course closures would not be acceptable and were not considered as part of this project.

8. Section 8.0 – Alternatives assessment and recommendations; new third paragraph added as underlined below:

   The final project will consist of a combination of the alternatives discussed in Appendix G. The costs of the alternatives recommended for the final design are summarized in Table 8-1. Alternatives that could be implemented in combination were chosen if they presented cost-effective TP and TSS loading reductions without producing significant impacts to surrounding land uses. In cases where only one alternative could be implemented, priority was given to options that were innovative, cost-effective, and used natural materials. The ability of alternatives to improve stream habitat and vegetative surroundings (identified as priorities in stakeholder meetings) was also taken into consideration in choosing the final alternatives.

   Stabilization and restoration of stream banks within the project area will provide water quality improvement by 1) repairing actively eroding sites and 2) preventing erosion at other sites by installing preemptive measures to protect existing stream banks.

   <u>The final design process should include continuing to work closely with the Plymouth Parks and Recreation Department to develop a plan to successfully establish riparian vegetation on and near the banks within the project area. The effort may also include a continuation of efforts to coordinate with disc golf course users and local and regional disc golf organizations.</u>

   Using the recommended alternatives, design and construction costs for restoration of this section of Plymouth Creek total approximately $766,000, or about $275 per foot of stabilized stream. This is in the lower third of the range of costs associated with the feasible alternative combinations evaluated in Appendix H (from $506,000 to $1,153,000) and represents cost-effective stream stabilization with an emphasis on bioengineering techniques where possible. Costs for stream stabilization projects of similar scale often range between $250 and $400 per foot; costs associated with the high end of this range are often associated with rapid planning-level cost estimates. Therefore, the anticipated cost for stabilizing this reach of Plymouth Creek is on the lower end of typical price ranges for the recommended work.

   The total estimated project capital cost of $766,000 includes an estimated $479,000 in construction costs, $144,000 in construction contingency, and $144,000 design, permitting, and construction observation costs (all costs rounded to the nearest $1,000). We recommend that these costs be used to develop a levy request for this project and that it proceed to the design and construction phase.

9. Section 9.0 – References
   Two new references were added:

Bassett Creek Watershed Management Commission. *2015 Biotic Index Evaluation of Plymouth Creek and Bassett Creek.* 2016.

Minnesota Pollution Control Agency. *MPCA Stream Habitat Assessment (MSHA) Protocol for Stream Monitoring Sites.* 2014.