Memorandum

To: Bassett Creek Watershed Management Commission  
From: Barr Engineering Co.  
Subject: Item 5C: BCWMC DeCola Ponds B & C Improvement Project Feasibility Study Summary  
Date: April 11, 2018

Recommendations:
1. For discussion.

1.0 Introduction
The Bassett Creek Watershed Management Commission’s (BCWMC) current Capital Improvement Program (CIP) includes the DeCola Ponds B & C Improvement Project, a project identified as part of the Medicine Lake Road and Winnetka Avenue Area Long-Term Flood Mitigation Plan (Barr, 2016) developed by the Cities of Golden Valley, New Hope, and Crystal. The DeCola Ponds B & C Improvement Project (2019 CIP Project BC-2, BC-3 & BC-8) builds on the Liberty Crossing flood mitigation project that was completed in 2017 by the City of Golden Valley to help alleviate flooding at the low point along Medicine Lake Road to allow for the passage of emergency vehicles, reduce the number of structures at-risk of flooding around this area, and reduce flood elevations on the DeCola Ponds. At their October 2017 meeting, the BCWMC approved the proposal from for the BCWMC Engineer to prepare a feasibility study for the DeCola Ponds B & C Improvement Project. The complete feasibility study report will be presented at the May BCWMC meeting.

DeCola Ponds B and C and the Pennsylvania Woods area are located in the City of Golden Valley, east of Rhode Island Avenue and south of Medicine Lake Road, and receive runoff from the Cities of Golden Valley, New Hope, and Crystal. Discharge from the ponds ultimately drains to the Main Stem of Bassett Creek. DeCola Ponds B and C are listed as Public Water Inventory Basins and are Minnesota Department of Natural Resources (MnDNR) public waters (MnDNR #27-0647P). DeCola Ponds B and C are located within Pennsylvania Woods Park, a public, urban, walking park consisting of deciduous forest, wooded knolls, and various wetland communities. The portion of the Pennsylvania Woods Park area directly north of DeCola Pond B is located on property owned by Dover Hill Apartments, LLC and the City of Golden Valley secured a drainage and utility easement for this area in 2015.

2.0 Feasibility Design Concepts and Impacts
Three (3) conceptual flood mitigation designs were investigated during this feasibility study. The major difference between each concept is the amount of additional flood storage developed, the area of
disturbance (and resulting tree removal), and the additional water quality treatment volume that can be
developed. The three concepts are generally summarized below and are shown on the attached graphics.

- **Concept 1: Maximize Flood Storage** (resulting in the most significant disturbance area and tree removal)
- **Concept 2: Maximize Tree Preservation** (minimizing disturbance area and tree removal while developing flood storage)
- **Concept 3: Hybrid of Concepts 1 & 2** (balancing the need for flood storage with tree preservation)

The attached figures summarize the components of the three feasibility concepts. There are several shared components between each concept, including: 1) the box culvert connection to the Liberty Crossing site; 2) a sediment forebay; and 3) modifications to the DeCola Pond C outlet structure, including the lowering of the normal water level and the raising of the overflow form DeCola Pond C to DeCola Pond D.

We evaluated the design concepts using the BCWMC Phase 2 XP-SWMM and P8 model to quantify the impacts of each concept on flood reduction and water quality improvement. We also quantified habitat impacts, including estimated tree removals, and wetland and upland restorations, based on the proposed concepts.

The attached matrix summarizes the estimated impacts of each of the three concepts, including the planning level cost estimates. Also attached is a summary of public feedback received at the public open house held in November 2017 and the response to these comments.

### 3.0 Recommended Concept

Based on review of the project impacts for each of the three concepts, the recommended concept is Concept 3, which balances the development of flood migration volume with tree preservation. However, we also recommend that during the design process, the city pursue opportunities to increase the flood mitigation volume within the general concept disturbance footprint, with the goal to maximize the impact on flood elevation reductions around the low point on Medicine Lake Road and the downstream DeCola Ponds.

The planning level estimated cost for the recommended Concept 3 is $3.8 million (-20%/+30%). The BCWMC CIP budget for this project is $1.6 million. The BCWMC CIP funding (ad valorem tax levied by Hennepin County on behalf of the BCWMC), is not the sole source of funding for this project. The remainder of the funding will come from a variety of sources, including the City of Golden Valley, Hennepin County, Minnesota Department of Natural Resources (MnDNR) Flood Damage Reduction Grant program, and other sources (e.g. other grants, as appropriate).
3.1 Permitting Requirements

The proposed project is expected to require the following permits/approvals for the selected concept:

- Clean Water Act Section 404 Permit from the U.S. Army Corps of Engineers
- Public Waters Work Permit from the MnDNR
- Section 401 Water Quality Certification from the Minnesota Pollution Control Agency (MPCA)
- Construction Stormwater General Permit from the MPCA
- Compliance with the MPCA's guidance for managing dredged material
- Compliance with the MPCA's guidance for managing contaminated material and debris-containing fill, managed in accordance with the MPCA-approved Response Action Plan and Site Contingency Plan (Barr, 2015)
- Compliance with the Minnesota Wetland Conservation Act
Concept 1: Maximize Flood Storage
Estimated Cost (-20%/+30%) = $5.7 Million

Concept Summary
Flood Mitigation Volume:
33 acre-ft

Open Water Expansion:
2.7 Acres

Increase in Phosphorus Removal:
10.5 lbs/year

Restored Wetland & Upland:
4.0 acres

Medicine Lake Road 100-Year Flood Depth
1.7 Feet

DeCola Ponds B&C Improvement Project Feasibility Study

Key
- Project Grading Extents
- Expanded Open Water Area
- Wetland Habitat
- Upland Habitat
- Tree Preservation Area
- Existing Pond Footprint
- 14’x4’ Box Culvert
- Proposed Paved Trail
- Proposed Boardwalk/Floating Trail
- Modified Outlet Structure
- Proposed Contour
- Existing Contour
- Existing Storm Sewer
- Existing Sanitary Sewer
- Existing City Trail
- Existing Rail

Project Features
- Connect Existing Storm Sewer Box Culvert
- Forebay for Water Quality Treatment
- Proposed Trail
- Proposed ADA Boardwalk/Floating Trail
- Expansion of Open Water Area
- Wetland Habitat Restoration
- Expansion of Open Water Area
- Native Upland Habitat Restoration
- Preservation of Existing Trees Outside Project Grading Extents
- Provide Signage, Fencing or Landscaping as Barrier
- Installation of 14’x4’ Box Culvert with Inlet Weir at 896.0
- Remove Accumulated Sediment in DeCola Pond B
- Modification of Outlet Structure (Lower NWL to 893.5 and Raise Overflow to 901.5) and Add Maintenance Access
- Installation of 14’x4’ Box Culvert

DeCola Ponds B&C Improvement Project Feasibility Study
DeCola Ponds B&C Improvement Project Feasibility Study

Concept 2: Maximize Tree Preservation
Estimated Cost (-20%/+30%) = $3.5 Million

- Connect Existing Storm Sewer Box Culvert
- Installation of 14’x4’ Box Culvert with Inlet Weir at 896.0
- Remove Accumulated Sediment in DeCola Pond B
- Forebay for Water Quality Treatment
- Expansion of Open Water Area
- Proposed Trail
- Proposed Paved Trail
- Proposed Boardwalk/Floating Trail
- Native Upland Habitat Restoration
- Wetland Habitat Restoration
- Preserved Existing Trees Outside Project Grading Extents
- Provide Signage, Fencing or Landscaping as Barrier
- Modify Outlet Structure (Lower NWL to 893.5 and Raise Overflow to 901.5) and Add Maintenance Access

Key
- Project Grading Extents
- Expanded Open Water
- Wetland Habitat
- Upland Habitat
- Tree Preservation Area
- Existing Pond Footprint
- 14’x4’ Box Culvert
- Proposed Paved Trail
- Proposed Boardwalk/Floating Trail
- Modified Outlet Structure
- Proposed Contour
- Existing Contour
- Existing Storm Sewer
- Existing Sanitary Sewer
- Existing City Trail
- Existing Rail

Concept Summary
- Flood Mitigation Volume: 17 acre-ft
- Open Water Expansion: 1.6 Acres
- Increase in Phosphorus Removal: 8.0 lbs/year
- Restored Wetland & Upland: 2.5 acres
- Medicine Lake Road 100-Year Flood Depth: 1.8 Feet

DeCola Pond Feasibility Study

DeCola Pond A
DeCola Pond B
DeCola Pond C

DeCola Ponds B&C Improvement Project Feasibility Study
Concept 3: Hybrid of Concepts 1 & 2
Estimated Cost (-20%/+30%) = $3.8 Million

Key
- Project Grading Extents
- Expanded Open Water
- Wetland Habitat
- Upland Habitat
- Tree Preservation Area
- Existing Pond Footprint
- 14'x4' Box Culvert
- Proposed Paved Trail
- Proposed Boardwalk/Floating Trail
- Modified Outlet Structure
- Proposed Contour
- Existing Contour
- Existing Storm Sewer
- Existing Sanitary Sewer
- Existing City Trail
- Existing Rail

DeCola Ponds B&C Improvement Project Feasibility Study

Concept Summary
- Flood Mitigation Volume: 22 acre-ft
- Open Water Expansion: 1.9 Acres
- Increase in Phosphorus Removal: 9.0 lbs/year
- Restored Wetland & Upland: 2.7 acres
- Medicine Lake Road 100-Year Flood Depth: 1.8 Feet

DeCola Ponds A

- Remove Accumulated Sediment in DeCola Pond B
- Install 14'x4' Box Culvert with Inlet Weir at 896.0
- Connect Existing Storm Sewer Box Culvert

DeCola Pond B

- Expansion of Open Water Area
- Forebay for Water Quality Treatment
- Proposed Trail
- Expansion of Open Water Area
- Wetland Habitat Restoration
- Native Upland Habitat Restoration
- Provide Signage, Fencing, or Landscaping as Barrier
- Preservation of Existing Trees Outside Project Grading Extents
- Modify Outlet Structure (Lower NWL to 893.5 and Raise Overflow to 901.5) and Add Maintenance Access

DeCola Pond C

- DeCola Pond A

- A,B,C
- D
- E,F

Reduction of Flood Level on Ponds
- DeCola Pond A: - 0.5'
- DeCola Pond B: - 0.5'
- DeCola Pond C: - 0.1'

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
## Concept Design: Summary Matrix

<table>
<thead>
<tr>
<th>Category</th>
<th>Item</th>
<th>Concept 1: Maximize Flood Storage</th>
<th>Concept 2: Maximize Tree Preservation</th>
<th>Concept 3: Hybrid Alternative</th>
</tr>
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<tbody>
<tr>
<td><strong>Flood Mitigation</strong></td>
<td>Increase in Flood Mitigation Volume</td>
<td>33 acre-ft</td>
<td>17 acre-ft</td>
<td>22 acre-ft</td>
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<tr>
<td></td>
<td>100-Year (1% Chance) Depth of Flooding at Medicine Lake Road</td>
<td>1.7 ft</td>
<td>1.8 ft</td>
<td>1.8 ft</td>
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<tr>
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<td>Reduction in 100-Year Flooding at DeCola Ponds A, B, &amp; C</td>
<td>0.6 ft</td>
<td>0.3 ft</td>
<td>0.5 ft</td>
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<td>Reduction in 100-Year Flooding at DeCola Pond D</td>
<td>1.2 ft</td>
<td>0.3 ft</td>
<td>0.5 ft</td>
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<tr>
<td></td>
<td>Reduction in 100-Year Flooding at DeCola Ponds E &amp; F</td>
<td>0.1 ft</td>
<td>0.1 ft</td>
<td>0.1 ft</td>
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<td></td>
<td>Number of Structures No Longer in 100-Year Floodplain</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td><strong>Water Quality</strong></td>
<td>Open Water Expansion</td>
<td>2.7 acres</td>
<td>1.6 acres</td>
<td>1.9 acres</td>
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<td></td>
<td>Expansion of Water Quality Treatment Volume</td>
<td>10.3 acre-ft</td>
<td>6.5 acre-ft</td>
<td>7.5 acre-ft</td>
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<tr>
<td></td>
<td>Increase in Total Phosphorus Removal</td>
<td>10.5 lbs/yr</td>
<td>8.0 lbs/yr</td>
<td>9.0 lbs/yr</td>
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<tr>
<td><strong>Trees</strong></td>
<td>General Tree Preservation</td>
<td>Good</td>
<td>Best (of 3 Concepts)</td>
<td>Better</td>
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<td></td>
<td>Preservation of Hardwood Trees on Knoll &amp; Screening Trees</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td><strong>Other Habitat</strong></td>
<td>Restored Wetlands and Upland Areas</td>
<td>4.0 acres</td>
<td>2.5 acres</td>
<td>2.7 acres</td>
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<td><strong>Trails</strong></td>
<td>Preserve and Expand Trails</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td><strong>Project Costs</strong></td>
<td>Planning Level Cost Estimate (-20%/+30%) (Original Estimate: $4.6 million)</td>
<td>$5.7 million</td>
<td>$3.5 million</td>
<td>$3.8 million</td>
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<td></td>
<td>Flood Mitigation Volume Unit Cost</td>
<td>$174,000/acre-ft</td>
<td>$203,000/acre-ft</td>
<td>$173,000/acre-ft</td>
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DeCola Ponds B&C Improvement Project Feasibility Study
<table>
<thead>
<tr>
<th>Comment Themes</th>
<th>Response</th>
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</thead>
</table>
| **Desire for Trail Accessibility & Maintenance** | New trails will be designed to be ADA-compliant  
Trail locations will consider and optimize maintenance and usability  
Existing trash and debris will be removed as part of project construction  
As part of final design, City will consider locations for trash receptacles, benches, overlooks, signage and other park amenities |
| **Management of Debris, Litter, and Trash**   | The proposed forebay will help capture trash from upstream and will be accessible for inspections and maintenance by City                                                                                     |
| **Management of Invasive Species (e.g. Buckthorn)** | Buckthorn and other invasive plant species within the disturbed areas will be removed/managed  
Disturbed areas will be restored with ecologically beneficial native wetland and upland plant and tree species (pollinator habitat)               |
| **Management of Trees**                      | Trees within the disturbance limits, including downed or dying trees, will be removed  
All trees outside the disturbance limits will be preserved, including those hardwoods on the knolls between Ponds A, B, and C  
Trees providing existing screening of the Liberty Crossing site will remain (along south & east side of Pond B)  
New upland habitat will include native trees and shrubs |
| **Concern about Sedimentation & Stagnant Water** | Accumulated sediment will be removed from Pond B  
The forebay will provide water quality treatment of runoff, including an access for inspection and maintenance by City  
The open water area of Ponds B & C will be expanded and there is an opportunity to deepen the channel connecting Ponds B & C  
The outlet from Pond C will be modified to prevent debris from accumulating on the outlet structure/pipe |
| **Concerns about Safety & Security due to Density of Trees/Undergrowth** | The restored areas will be more open providing more visibility in these areas  
On and around the knoll and along the undisturbed shorelines, the tree density will be the same as existing conditions |
| **Concerns about Pond Safety**                | A 10 foot safety bench will be incorporated along disturbed/expanded shorelines  
Slopes will be designed at 3:1 side slopes (standard)  
Wetland buffer vegetation will be planted along all disturbed shorelines  
Ponds B & C will be ~4 feet deep (same as existing) |
| **Special Assessments to Property Owners**    | No special assessments will be used to fund this project  
Pursuing a variety of funding sources including City of Golden Valley, BCWMC Capital Improvement Project (CIP) Funds, MnDNR Flood Damage Reduction Grants, Hennepin County, and Others |