Item 5H.
BCWMC 12-21-23
See TAC Recommendations on page 5

Main Stem Lagoon Dredging Project
2021 CIP Project BC-7

FINAL REPORT
December 2023

I. Project Overview

This Bassett Creek Watershed Management Commission (BCWMC) Capital Improvement Project in Theodore Wirth Park dredged accumulated sediment from Lagoons D, E, and F. The project is located on property owned by the Minneapolis Park and Recreation Board (MPRB) within the City of Golden Valley. The lagoons are located along the Main Stem of Bassett Creek and were originally constructed in the 1930's by the Civilian Conservation Corps (CCC). The intent of the project was to restore the lagoon extents and depth closer to the original design. Lagoon E (2.8 acres), also named Ski Jump Pond, is a Minnesota Department of Natural Resources (MNDNR) public water basin. Lagoons D and F (1.2 and 1.5 acres respectively) are not MNDNR public water basins, although the entire creek is a MNDNR public watercourse. Lagoons E and F are located north of Plymouth Ave. N, and Lagoon D to the south (see Figure 1). Land adjacent to the lagoons consists of open grassy areas used for golf and other recreation, wooded uplands, and various wetland communities. The lagoons are bordered along the eastern edge by a recreational trail and the BNSF railroad. The project design called for dredging all three lagoons (D, E, and F) to a depth of 6 feet, and removing approximately 39,600 cubic yards of accumulated, contaminated sediment. The project was designed to provide significant water quality improvements by removing an estimated 600 lbs/year total phosphorus and 156,000 lbs/year total suspended solids, which currently flow downstream through the Bassett Creek Valley and into the Mississippi River. The project was also designed to improve flow capacity, floodplain storage, and habitat. Construction started in January of 2023 and pond dredging was completed in March of 2023. Restoration was completed in summer of 2023.

II. Project Description and Outcomes

The BCWMC implemented this project using the Commission Engineer to (Barr Engineering Co.) to design the project and provide construction oversight. The BCWMC contracted with Fitzgerald Excavating & Trucking (Fitzgerald) to construct the dredging project.

The project required the completion of multiple assessments and permits including:

State Historic Preservation Office review
Wetland Conservation Act permitting
Environmental Assessment Worksheet
404 permit and section 401 certification
DNR work in public waters permit
MPRB permits including pre and post-construction pavement impact analyses
City of Golden Valley stormwater permit

Public input and outreach for this project included a public open house during the feasibility study process (poorly attended); input from a few residents during the design process resulting in considerable communication, considerations, and explanations among the Commission staff and engineers, the MPRB, and concerned residents; signage, FAQs document, and project flyer at the site; coordination with Loppet through MPRB.

Dredging of the lagoons faced significant challenges due to warm winter weather and rainfall / runoff events that hindered mechanical dredging operations. Due to its contamination levels,

the dredged material was disposed of at a landfill in accordance with local laws and regulations. This is consistent with the results of environmental investigations and sediment sampling completed during the feasibility study, which showed that the dredged material could not be reused as unregulated fill. The completed project resulted in an average depth of approximately 4 feet below the normal water level, rather than the design dredging depth of 6 feet, which resulted in a total sediment removal of approximately 25,650 CY. This removal was 13,950 CY less than the 39,600 CY called for in the design.

Although the project did not achieve the full dredging depth as designed, the project will achieve significant water quality benefits, by reducing the total phosphorus load by an estimated 390 pounds per year and the total suspended solids load by an estimated 101,000 pounds per year (approximately $210/lb total phosphorus/year).

III. Timeline and Key Documents

At their meeting in April 2019, the Commission approved the 5-year Capital Improvement Program (CIP) which included the Main Stem Lagoon Dredging Project (BC-7). The implementation process for this project generally followed that of a typical BWCMC CIP project except that the BCWMC designed and constructed this project rather than entering an agreement with a member city for design and construction. Key milestones and documents are listed here. Documents can be found on the project webpage: https://www.bassettcreekwmo.org/projects/all-projects/bassett-creek-main-stem-lagoon-dredging-project.

- Final Feasibility study approved May 2020
- Project officially ordered September 2020
- 50% Design Plans approved December 2021
- Environmental Assessment Worksheet Findings of Fact January 2022
- 90% Design Plans approved June 2022
- Construction began January 2023
- Dredging completed March 2023
- Site restoration completed spring/summer 2023

IV. Project Budget and Funding

This project was funded primarily through an ad valorem tax of $2,234,000 levied on watershed residents across three years: 2021, 2022, and 2023. Originally, the project budget was set much higher at $3,259,000 but was lowered to $2,759,000 because engineering costs were projected to be lower than originally budgeted and the winning construction bid was lower than expected.

Additional funding resources included a $250,000 Clean Water Fund grant from the Board of Water and Soil Resources (2021 Watershed Based Implementation Funding) and a $74,743 Opportunity Grant from Hennepin County. BCWMC Closed Project Account funds were also slated for use.

Project Budget: $2,759,000

Project Income:

Funding Source	Amount
Ad valorem tax levy on watershed residents	$2,234,000
Hennepin County Opportunity Grant	$74,743
Watershed Based Implementation Funds (Clean Water Fund grant)	$250,000
BCWMC Closed Project Account	$200,257
TOTAL	**$2,759,000**

Two Pay Applications from the construction contractor were approved for payment totaling $1,249,592 (February and March 2023). However, after a dispute regarding the total amount of material dredged, the Commission and the contractor approved a settlement agreement resulting in the contractor waiving retainage fees, waiving site restoration costs, and returning $60,000 to the BCWMC (October 2023), resulting in the total construction cost shown in the following table.

Project Expenses:

Description	Amount	Notes
Feasibility Study	$73,995	Final
CIP Administration (2% of levy)	$44,680	Final
Legal	$15,187	Through 9/30/23; some additional expenses expected
Engineering, Design, Construction Oversight, Permitting	$197,944	Through 10/27/23; some additional expenses expected
Construction (contractor)	$1,189,592	Net, final
Pavement Analysis (reimbursed to MPRB)	$19,321	Final
Pavement Rehabilitation (2024)	$7,684	Estimated
TOTAL (to date + estimated)	**$1,548,403**	

Total project expenses will be less than the funding collected. Any funding received but not spent on this project will become part of the BCWMC Closed Project Account. Funds in Closed Project Account are used for future CIP projects and will reduce the levy funds needed for those future projects.

V. Lessons Learned

Performing mechanical dredging beneath the water surface ("in the wet") with excavators poses several challenges as compared to traditional excavation "in the dry." For this project dredging was performed in the wet without dewatering of the lagoons, thus there was typically several feet of water depth between the water surface and the bottom of the lagoon excavations. Visual observation of the work in progress was not feasible. Ice and debris at the water surface, as well as frozen conditions, prevented safe access for staff to perform verification surveys to confirm dredging depths during the dredging operations. Additionally, the sequence of dredging operations, warm weather, substantial completion date, and implementation of road restrictions prevented access to any areas that required correction and additional dredging.

Following the completion of this project, the Technical Advisory Committee (TAC) discussed lessons learned and recommendations for future dredging projects at their September, October, and December 2023 meetings. Following is the final list of recommendations approved at the December 2023 TAC meeting.

- Final design, construction drawings and quantities should be based on recent (ideally within one year) bathymetric surveys to establish existing (pre-dredge) sediment depths; depending on schedule, the bathymetric survey could be performed again, immediately before construction/dredging.
- Do not perform surveys or accept contractor surveys performed in dewatered frozen conditions, due to ice and frost heave. Increase level of effort of survey required (licensed surveyor, grid size, tolerances) in the specs both to deter contractors and assure quality if they want to dispute bid quantities.
- Use sonar or extra wide foot on the survey rod because normal foot will sink in soft sediment.
- During sediment exploration, as part of the feasibility study or design, designer could obtain several samples to determine in-situ unit weight of sediment and include that information in the bid documents.
- Consider requiring interim surveys by a licensed surveyor for progress payments, when feasible.
- Assuming adequate surveys have been performed, measurement and payment based on plan quantity Cubic Yards (CY) is the preferred method for dredging projects to avoid paying for hauling and disposal of water/ice.
- Consider requiring as-built/record surveys at project completion, and add specifications that allow for reduction of plan quantity if contractor is outside of allowable tolerances.
- When feasible, remove water from basin so dredging is performed in the dry.

The Commission will consider completing the project to attain the original design depth and sediment removal through a separate/future CIP project.

Project Area

Theodore Wirth Regional Park

N

0 250 500

Feet

Bassett Creek Watershed Management Commission

SITE LOCATION MAP

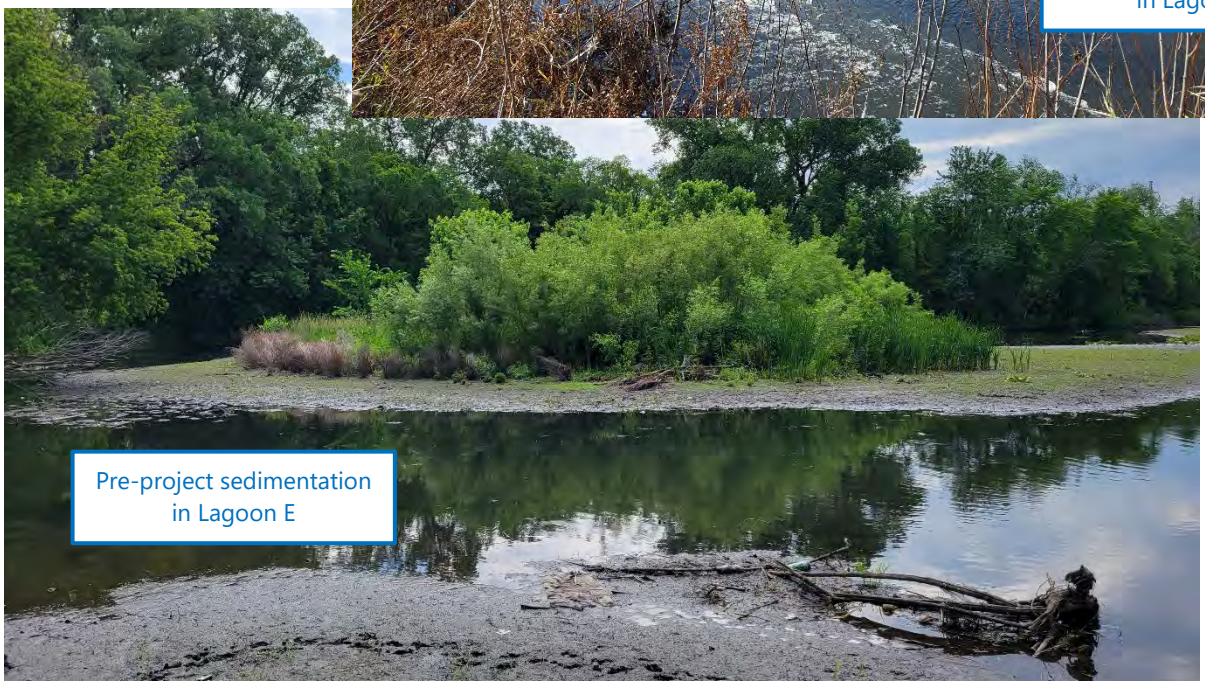
Golden Valley, Minnesota

FIGURE 1

VI. Photos


Pre-project sedimentation
in Lagoon F

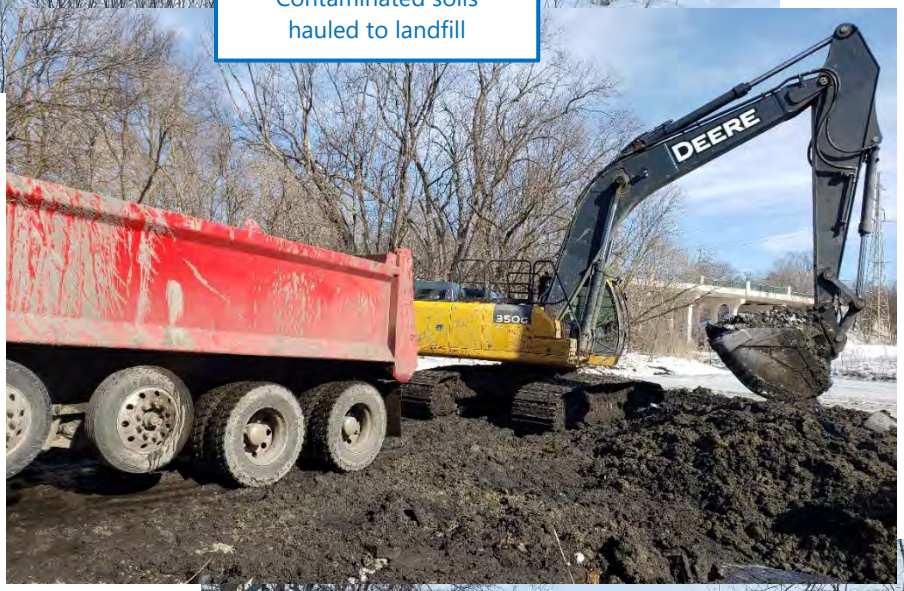

Pre-project sedimentation
in Lagoon D

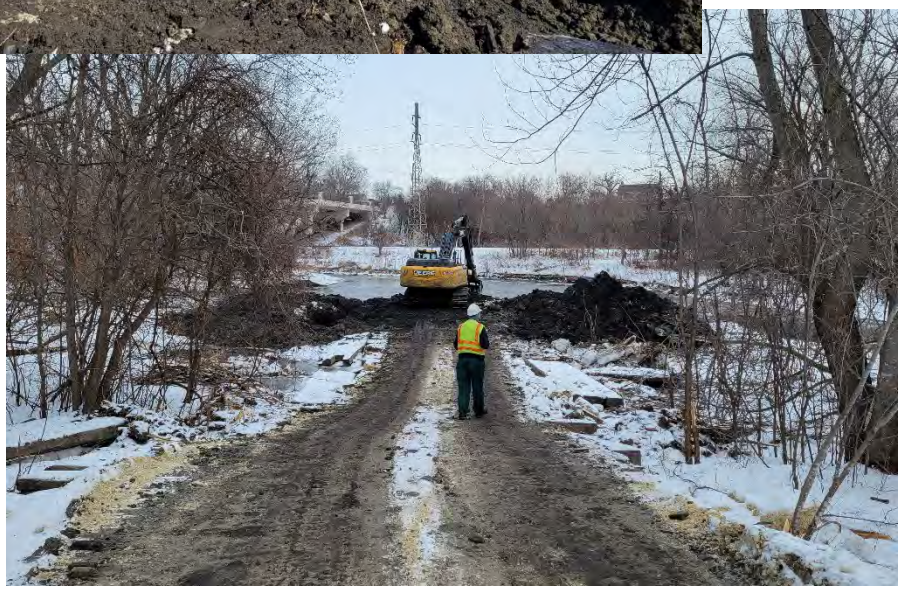

Pre-project sedimentation
in Lagoon E


Construction entrance at Lagoon E
Placement of silt curtain downstream of Lagoon E


Construction entrance and excavation at Lagoon F

Contaminated soils hauled to landfill





Construction Access During Work


Dredging Lagoon E


Dredging Lagoon D


Dredging Lagoon E


Dredging Lagoon F

Flood Event
February 15, 2023

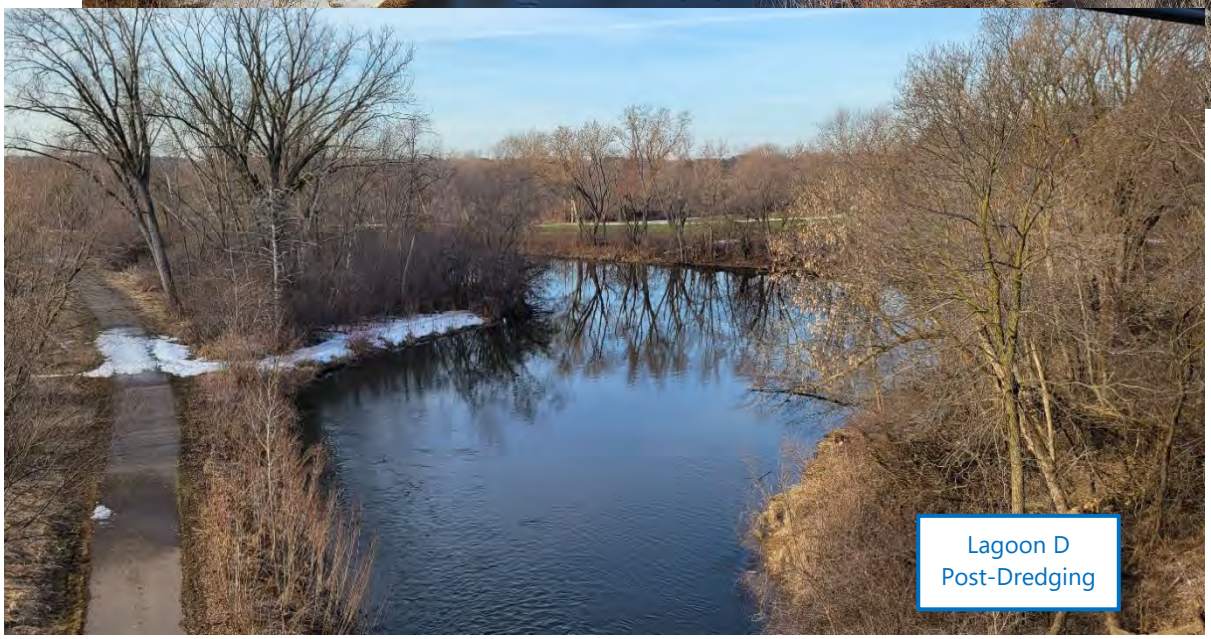
Lagoon D
Access Restoration

Lagoon E
Access Restoration

Lagoon F
Access Restoration


Lagoon F
Post-Dredging


Lagoon E
Post-Dredging


Lagoon D
Post-Dredging