MINNEHAHA CREEK
WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

Meeting: Board of Managers
Meeting date: 3/28/2024
Agenda Item #: 11.1
Request for Board Action

Title:	Ordering the County Road 6 Pond Retrofit Project and Authorizing Request for Proposals for Design and Engineering Services
Resolution number:	24-018
Prepared by:	Name: Kailey Cermak Phone: 952.641.4501 kcermak@minnehahacreek.org
Reviewed by:	Name/Title: Michael Hayman, Project Planning Director; Chuck Holtman, Smith Partners
Recommended action:	The Board of Managers formally orders the County Road 6 (CR-6) Pond Retrofit Project and authorizes the release of a request for proposals (RFP) for design and engineering services.
Schedule:	March 2024: Release RFP for design and engineering services May 2024: Award contract for design and engineering services Summer/Fall 2024: project design Fall/Winter 2024: Bid solicitation and construction contracting
Budget considerations:	Fund name and code: CR-6 6 Pond Retrofit (3159) Fund budget: $525,000 Expenditures to date: $0 Requested amount of funding: Not applicable

Past Board action:	Res # 23-018	Authorization to Execute a Contract for the County Road 6 Stormwater Pond Retrofit Feasibility Study
	Res # 19-039	Authorization to Release RFP for Long Lake Creek Subwatershed Assessment
	Res # 18-084	Authorization to Apply for BWSR CWF Competitive Grant Funding for Long Lake Creek Subwatershed Assessment.
	Res # 18-066	Resolution of Support for the Long Lake Creek Subwatershed Partnership

Background:
In 1989, the Minnehaha Creek Watershed District (MCWD) with assistance from the Minnesota Pollution Control Agency (MPCA), through a Clean Water Partnership (CWP) grant, conducted a diagnostic study of Long Lake that characterized and quantified the causes contributing to the decline in water quality in the lake, developed numerical water quality goals, and determined performance standards for a plan to improve water quality and achieve the desired goals. This study, done with the support of local municipalities, laid the foundation for the projects undertaken by MCWD in the Long Lake area in the 1990s.

As a result of this study, the CR-6 pond, along with MCWD's Deerhill pond, were identified as regional treatment opportunities to reduce sediment and nutrient loading to Long Lake. The CR-6 pond was constructed in 1998 and captures the drainage from two northern tributaries, treating 3,370 acres of runoff. The 2.5-acre pond was designed to remove approximately 50% of the total phosphorus load, when considered in conjunction with Deerhill pond, which was constructed upstream of the CR-6 pond in 1996. An easement, encompassing the full pond footprint, was obtained from the private landowner to ensure long-term maintenance, monitoring, and/or retrofits to the pond could be conducted.

Long Lake Creek Roadmap

Since 2018, MCWD, Long Lake Waters Association, and the cities of Long Lake, Medina, and Orono have been working together toward a common goal of addressing nutrient impairments in the Long Lake Creek Subwatershed. To support this mutual effort, MCWD obtained state grant funding in 2018 and led a subwatershed assessment to (1) provide a scientific understanding of the system, (2) identify cost-effective projects and strategies, and (3) develop an actionable roadmap for implementation for the municipal partners.

The roadmap identified 34 projects for advancement based on their cost-effectiveness and ability to implement. To prioritize these projects, a three-tiered strategy was developed:

1. Regional Stormwater Treatment
2. Landscape Projects
3. Internal Load Management

The enhancement or addition of regional stormwater facilities is recommended as the top priority due its ability to immediately and cost-effectively treat a large drainage area, while localized projects can continue to be implemented over time. The CR-6 pond was identified as one of two top-priority projects for near-term implementation.

Supporting the Roadmap's inclusion of the CR-6 pond as a priority opportunity, is the recent monitoring data that indicates the CR-6 pond has not been performing as originally designed. Despite being constructed 25 years ago, the pond has never required dredging and is currently approximately 16% full, suggesting a sediment accumulation rate of around 0.5% per year. Additionally, analysis of water quality sampling results suggests that, on average, the CR-6 pond is removing 30% of the incoming phosphorus load, with high concentrations of particulate phosphorus entering and exiting the system versus settling out in the pond. These datapoints underscore the necessity to assess the CR-6 pond for potential retrofit opportunities aimed at more effectively removing the fine particulate phosphorus.

Feasibility:

In April 2023, the Board authorized a contract with Stantec to conduct a feasibility study to evaluate potential retrofit opportunities. The scope of work included the refinement of the area's P8 model, on-site data collection, the identification of project concepts, and modeling of the project concepts. Retrofit methods explored through feasibility focused on maximizing particulate phosphorus removal, while maintaining the current easement footprint.

The study was completed in September 2023, in which 12 initial concepts were considered, with five concepts carried forward for full evaluation, modeling, and cost development. An evaluation matrix was established to support a shared understanding of the strengths and weaknesses of each retrofit option and provide a clear recommendation. Key evaluation metrics included phosphorus reduction potential, capital costs and cost-effectiveness, operations and maintenance, and regulatory considerations. The final report (attachment A) identified the implementation of a gravity sand filter bench as the most cost-effective solution. The report estimated the filter bench to cost $664,000 for design and construction with the opportunity to reduce loading to Long Lake by 67 pounds (lbs) of Total Phosphorus (TP) per year. In follow-up conversations with the Stantec, it was acknowledged that implementing the earthen berm in concert with the filter bench would greatly reduce the berm's estimated construction cost from $206,00 down to $68,000 , while providing an additional 4-6 lbs of removal annually. Therefore, staff have recommended that these projects be pursued in combination, to provide stacked water quality benefits in a cost-effective manner.

In total, these retrofits are projected to remove 52-73 lbs of total phosphorus annually. The feasibility study estimates a total design and construction cost for the filter bench and berm of approximately $738,000. The 2024 project budget, estimated and set prior to feasibility completion, was $525,000, to be funded by means of the District ad valorem tax levy. Feasibility also indicated that both projects can be constructed inside MCWD's existing easement boundary and no additional property or property rights are needed. Furthermore, early regulatory screening has not indicated any insurmountable obstacles for the project being constructed.

At its March 14, 2024 Operations and Programs Committee meeting, the Board received an update from staff on the outcomes of the feasibility study and the recommendation of pursuing a combination of two concepts for stacked water quality benefit. Staff also outlined the estimated project budget of $738,000 and anticipated next steps, which included project ordering and the release of an RFP for design and engineering services. In preparation for the Board's consideration for formal ordering, on March 11, 2024, MCWD staff presented to the Orono City Council, who approved a resolution of support for the CR-6 Pond Retrofit Project (attachment B).

Summary

In accordance with Minnesota Statutes §103B.251, MCWD staff have provided for notice of public hearing on March 28, 2024. The hearing will afford an opportunity for the public to address the Board on the ordering of the CR-6 Pond Retrofit Project. Absent comment that warrants further consideration, MCWD staff recommends that the Board formally order the CR-6 Pond Retrofit Project and advance the project into the design phase through release of an RFP for design and engineering services (attachment C).

Supporting documents (list attachments):

- Attachment A: County Road 6 Pond Retrofit Feasibility Study
- Attachment B: Resolution of Support for the Long Lake Creek Subwatershed Partnership and the County Road 6 Pond Retrofit Project
- Attachment C: Request for Proposals for Engineering and Design Services for the County Road 6 Pond Retrofit (DRAFT)

MINNEHAHA CREEK
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RESOLUTION

Resolution number: 24-018

Title: Ordering the County Road 6 Pond Retrofit Project and Authorizing Request for Proposals for Design and Engineering Services

WHEREAS in 1998, the Minnehaha Creek Watershed District (MCWD) constructed the Country Road 6 pond as a result of the Long Lake diagnostic study to reduce sediment and nutrient loading to Long Lake; and

WHEREAS a regional partnership was formed in 2018 among the Cities of Medina, Long Lake and Orono, and the Long Lake Waters Association, to pursue water quality improvements in the Long Lake Creek Subwatershed;

WHEREAS in 2018, with support from the partnership, MCWD obtained state grant funding and led a subwatershed assessment to provide a scientific understanding of the system as a whole, identify cost-effective projects and strategies, and develop an actionable roadmap for implementation;

WHEREAS this work resulted in what is formally referred to as the Long Lake Creek Roadmap (Roadmap);

WHEREAS the Roadmap identified 34 projects for advancement based on their cost-effectiveness and feasibility to implement. These projects were further categorized based on an implementation strategy, which includes (1) regional stormwater treatment, (2) landscape projects, and (3) internal load management;

WHEREAS the enhancement and addition of regional treatment is recommended as the first priority due to the ability to cost-effectively treat a large drainage area while localized projects are implemented over time;

WHEREAS the MCWD 2018-27 Watershed Management Plan (WMP), at Table 3.11, identifies for capital project implementation the construction of infiltration or filtration basins and devices within the Long Lake Creek Subwatershed to reduce nutrient loadings to Long Lake;

WHEREAS the roadmap identified the County Road 6 Pond, located in the city of Orono on an easement already held by MCWD, as a regional stormwater opportunity that looks to retrofit the existing pond to enhance its performance (Project). The Project has since been included in the MCWD's Capital Improvement Plan (CIP) and budget to reduce nutrient loading to Long Lake;

WHEREAS on April 13, 2023, the MCWD Board of Managers ("Board") approved a contract with Stantec to conduct a feasibility study to explore retrofit opportunities;

WHEREAS in September 2023, Stantec delivered its final report to MCWD, assessing five project concepts that target particulate phosphorus removal, and identified the addition of a gravity sand filter bench as the most feasible and cost-effective opportunity to reduce phosphorus loading to downstream Long Lake;

WHEREAS follow-up conversations with Stantec revealed that implementing the earthen berm in concert with the filter bench would greatly reduce the berm's estimated construction cost, while providing additional water quality benefit;

WHEREAS on March 11, 2024, the Orono City Council adopted a resolution of support for the Long Lake Creek Subwatershed Partnership and the Project;

WHEREAS on March 14, 2024 the Board's Operations and Programs committee reviewed the feasibility study and staff's recommendation to pursue the two project concepts in combination for stacked water quality benefits;

WHEREAS in accordance with Minnesota Statutes §103B.251, the MCWD held a duly noticed public hearing on ordering of the County Road 6 Pond Retrofit Project on March 28, 2024, at which time all interested parties had an opportunity to address the Board on the County Road 6 Pond Retrofit Project;

WHEREAS the Board of Managers finds that the Project will be conducive to public health and promote the general welfare, and is in compliance with Minnesota Statutes §103B.205 to 103B.255 and the WMP adopted pursuant to §103B.231;

NOW, THEREFORE, BE IT RESOLVED that pursuant to Minnesota Statutes §103B.251 and the WMP, the Minnehaha Creek Watershed District Board of Managers orders the County Road 6 Pond Retrofit Project;

BE IT FURTHER RESOLVED that the MCWD Board of Managers authorizes the District Administrator, on advice of counsel, to release a request for proposals for engineering design services.

Resolution Number 24-018 was moved by Manager _____________, seconded by Manager ____________. Motion to adopt the resolution ___ ayes, ___ nays, ___abstentions. Date: 3/28/2024

____ Date: ___________________________
Secretary

Attachment A: County Road 6 Pond Retrofit Feasibility Study

Stantec

Memo

To:	Josh Wolf, Project and Land Program Manager (MCWD)	From:	Chris Meehan (PE), Tom Beneke, Sylvia Doerr, Nick Wyers (PE), Rena Weis Stantec
Project/File:	227706022	Date:	September 25, 2023

Reference: County Road 6 Pond Retrofit Feasibility Study

1 Introduction

Minnehaha Creek Watershed (MCWD) identified the Long Lake Creek – County Road 6 Pond (CR6 Pond) in Orono, MN as a candidate for performance improvements via engineered retrofits, based on nutrient and sedimentation monitoring. The CR 6 Pond is downstream from Holy Name and Wolsfeld Lakes, and upstream from Long Lake. All three lakes are impaired by excess nutrients. The CR6 Pond is strategically located in the subwatershed, with recent monitoring and analysis of the pond and subwatershed indicating opportunities for further improvements in the pond's effectiveness in total phosphorus load reduction. MCWD Research & Monitoring has shown that Long Lake requires a 62% reduction in phosphorus (742 lbs.) to meet state water quality standards, which includes 411 lbs/yr from watershed sources. Due to the significant load reductions required to progress towards Long Lake's goal, this study sought to consider retrofit practices and sizes that would maximize TP removals.

This study seeks to identify and evaluate retrofit opportunities at the CR6 pond, with a primary focus on total phosphorus (TP) removal potential. The study evaluates opportunities based on water quality benefits, water quantity benefits, ecological integrity, project costs, regulatory hurdles, site constraints, and project complexity.

2 Water Quality (P8) Modeling Updates

2.1 Streamflow Calibration

The combined P8 model detailed in Stantec's March 27, 2023, Memo to Brian Beck (MCWD) was first re-calibrated for streamflow after updating live storage volume values in upstream ponds. Updates to streamflow calibration parameters focused on better matching the following aspects of observed and simulated streamflow:

- Storm event magnitude
- Storm event timing
- Baseflow magnitude

Figure 1 below demonstrates the P8 model fit described in the March 27, 2023, Memo. While this model meets general performance criteria for total flow volume percent bias (PBIAS) during the growing season (0.2%), the timing and magnitude of simulated events does not accurately describe the observations.

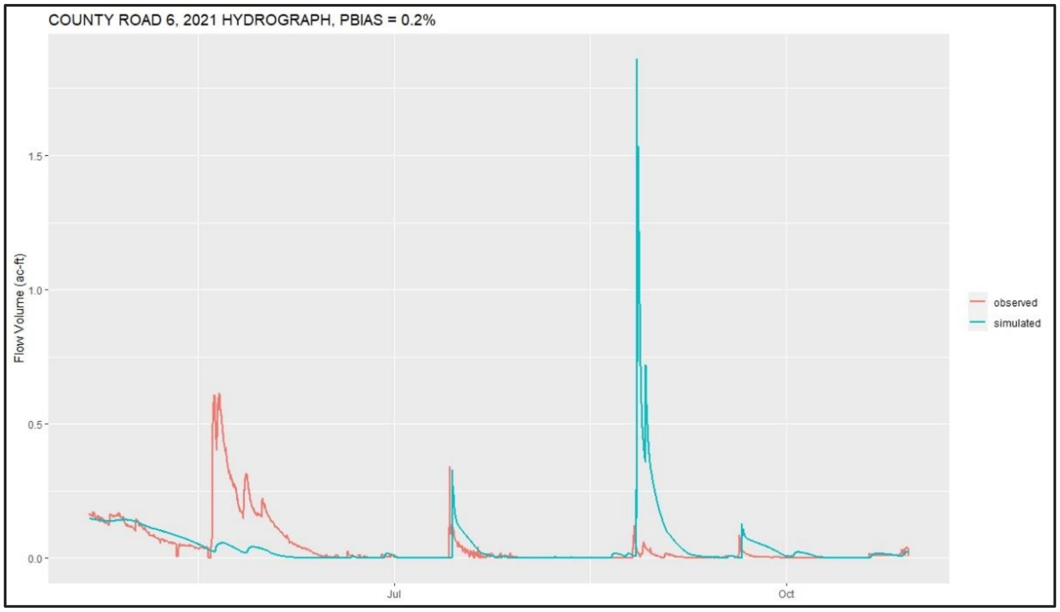


Figure 1. Streamflow hydrograph results from the March 2023 P8 model. Hydrograph demonstrates hourly observed and simulated flow volume at the County Road 6 pond inlet for the 2021 growing season.

Figure 2 below demonstrates the P8 model fit after updating the previous model in Figure 1 with more accurate upstream live storage volumes, but prior to re-calibration (i.e., the March 2023 version plus updated live storage). This hydrograph, again illustrating the same 2021 growing season, demonstrates a poor model fit for storm event magnitude, storm event timing, and baseflow magnitude. As shown, the most notable change is a large increase in baseflow.

Reference: County Road 6 Pond Retrofit Feasibility Study

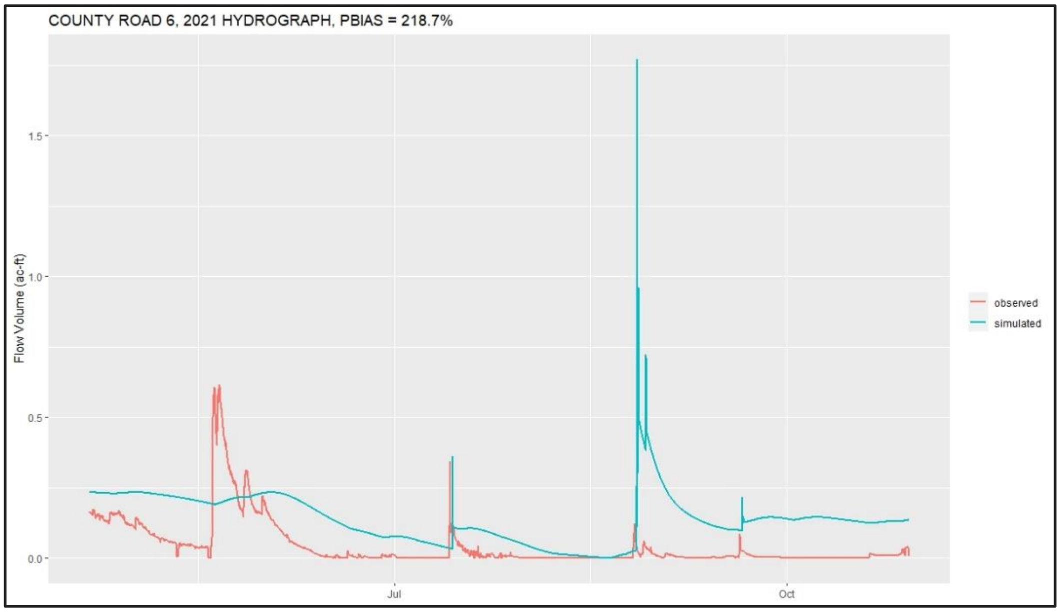


Figure 2. Streamflow hydrograph results from the March 2023 P8 model with updated live storage pond volumes (prior to re-calibration). Hydrograph demonstrates hourly observed and simulated flow volume at the County Road 6 pond inlet for the 2021 growing season.

To address these issues, P8 model parameters for antecedent moisture condition, connected impervious extent, evapotranspiration, and aquifer device time of concentration were adjusted. Table 1 below summarizes parameters adjusted in the re-calibrated P8 model.

Table 1. P8 streamflow parameter adjustments made to re-calibrated model.

Parameter Name	Value	Unit
Growing Season Month (start)	6	Month Index
Growing Season Month (end)	10	Month Index
Antecedent Moisture Condition II (growing season)	4	Inches
Antecedent Moisture Condition III (growing season)	4.5	Inches
Antecedent Moisture Condition II (non-growing season)	0.02	Inches
Antecedent Moisture Condition III (non-growing season)	0.11	Inches
Connected Impervious Fraction	0	Percent
Evapo-Transpiration Calibration Factor	1.4	Unitless
Time of Concentration (aquifers)	Increased by a factor of 4 for all aquifer devices	Unitless

The results of the re-calibrated P8 model are illustrated in Figure 3. Storm event timing, storm event magnitude, and baseflow magnitude are an improvement from the prior iteration of the model, while also meeting low percent bias model performance criteria for total flow volume. The re-calibrated P8 model under simulates total flow volume for the 2021 growing season by approximately 5%.

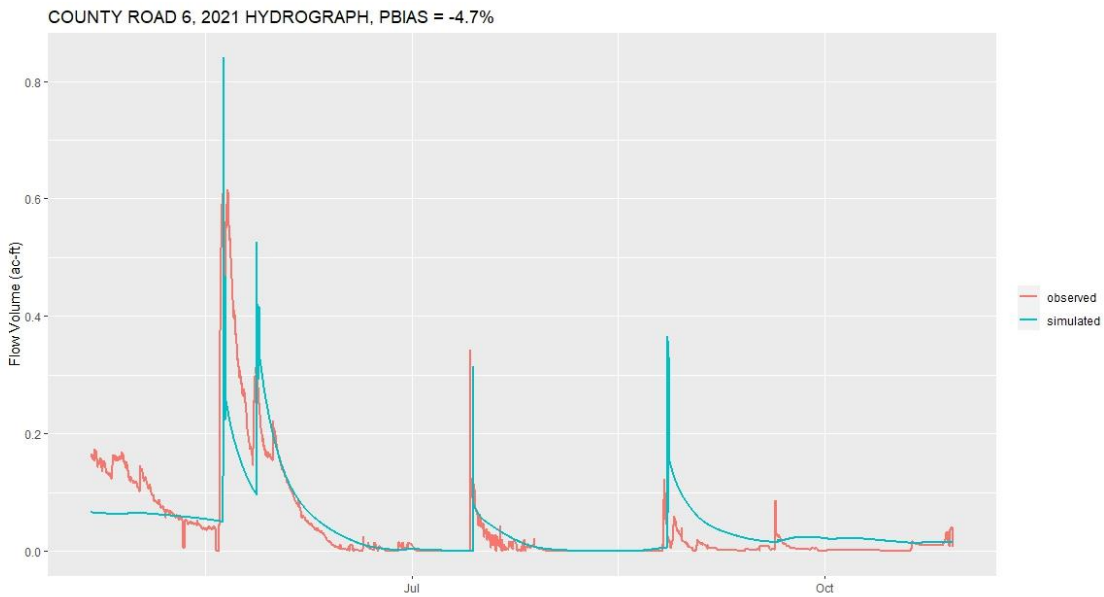


Figure 3. Streamflow hydrograph results from the re-calibrated model. Hydrograph demonstrates hourly observed and simulated flow volume at the County Road 6 pond inlet for the 2021 growing season.

2.2 Pollutant Calibration

The P8 model that was re-calibrated for streamflow was then calibrated for total suspended solids (TSS) and total phosphorus (TP). Initial attempts at calibration demonstrated that sediment and particulate phosphorus at the County Road 6 pond inlet were low. Particulate phosphorus loads were so low that this configuration of the model could not be adjusted to accurately describe observed conditions.

Based on model sensitivity analysis, it is Stantec’s view that the upstream ponds in the P8 model are overestimating pollutant removals, resulting in a very small particulate pollutant load at the County Road 6 inlet. Stantec developed an additional version of the P8 model with zero pond or pipe devices upstream of the County Road 6 inlet, where all watersheds were combined to a single upstream basin using the same streamflow calibration parameters from the full model version (Figure 3). This was done to calibrate the pollutant load entering the County Road 6 pond more accurately and facilitate more realistic estimates of the various engineered pollutant removal scenarios.

Table 2 summarizes load estimates at the County Road 6 inlet and outlet. These loads were estimated using the USGS LOADEST regression software, from observed streamflow and TP concentration data for the 2021 and 2022 growing seasons. Based on this analysis, the County Road 6 ponds remove approximately 28% of the TP on an annual basis.

Table 2. Annual TP loads at the Country Road 6 Inlet and Outlet.

Year	Annual TP Load (lbs)		% Removal
	Inlet	Outlet	
2021	235.5	198.7	15.6%
2022	301.1	189.1	37.2%
Average	268.4	193.9	27.8%

In practice, applying these observed reductions under the current (baseline) condition meant adjusting the “Scale Factor” for TSS and TP until the incoming pollutant concentrations closely matched the observed pollutant concentrations at the inlet. For the 2021 growing season the observed and simulated TSS concentrations at the County Road 6 inlet were 91.6 mg/L and 91.8 mg/L, respectively. The observed and simulated TP concentrations were 0.365 mg/L and 0.363 mg/L, respectively.

Once pollutant loads at the inlet were accurately simulated the “Particle Removal Scale Factor” was adjusted globally for both pond segments/devices. This value was adjusted to 0.1 for both devices, resulting in a TP removal of 34% from inlet to outlet (compared with the estimated average of ~28% in Table 2).

3 Existing Pond Conditions

The existing pond is a 2-acre, dual-celled system, with a submerged berm separating the cells. The existing pond outlet is comprised of a sheet pile weir with five 1x2 ft rectangular orifices that control the normal water level.

Survey was completed to inform critical elevations at the pond, as well as to document utility locations.

MCWD’s Research & Monitoring (R&M) Program has monitored influent and effluent phosphorus concentrations at the CR6 pond. Results have indicated that particulate phosphorus dominates the effluent TP. Therefore, the primary goal of the retrofit feasibility study it to identify solutions to improve removal of particulate phosphorus, while providing enhanced dissolved phosphorus removal.

4 Opportunity Identification

A comprehensive list of wet pond retrofit types was developed and reviewed in collaboration with MCWD staff to select preferred project types. Each of the retrofit types is listed below, with justification for either continuing or discontinuing evaluation of each retrofit type.

4.1 Retrofit Types Selected for Further Analysis

The following five alternatives were selected by Stantec and MCWD staff for evaluation within this study.

4.1.1 GRAVITY SAND FILTER BENCH

Gravity sand filter benches utilize vertical depth capacity (head) available in ponds between the normal water level and the overflow outlet (live storage) to filter water through a filter media along a portion of a pond's perimeter, before discharging filtered water downgradient. Filter benches can be active or passive, utilizing pumps or gravity, which drives cost and the quantity of water that can be treated. Gravity systems rely on rainfall events to pass water through filters, while active systems regularly direct water through filters regardless of precipitation patterns. The CR6 pond has sufficient head difference available to make a gravity filter bench a feasible option. Additionally, the existing access corridor along the east side of the pond would provide for less intrusive construction and operations & maintenance of a filter bench located on the eastern perimeter of the southern cell. Water quality treatment capacity is driven by the surface area of a filter; therefore, encroachment of the conceptual filter bench footprint into the existing water surface area of the pond was considered, to maximize treatment potential within existing land access rights agreements.

4.1.2 WEIR ACROSS EXISTING BERM

The CR6 pond is a two-celled system, with the cells separated by a submerged earthen berm. Physical separation between cells has the potential to concentrate sedimentation within the first cell, while continuing to utilize the full residence time that the second cell provides to maximize fine particulate sedimentation. Since the CR6 pond is already configured as a two-celled system, modifications to reinforce functionality as a multi-celled system were considered. Modifications to raise the elevation of the separation between cells has the potential to maximize settling capability in the upgradient cell, before water flows into the downgradient cell. This would also maximize ponding within the existing easement area. Two types of weirs were considered: (1) sheet pile weir and (2) earthen berm with riprap reinforced overflow. The material selected will drive the cost associated with the this retrofit alternative.

4.1.3 PUMPED SAND FILTER BENCH W/ FLOAT SWITCH

Pumped sand filters provide the same benefits as gravity filter benches, except they are able to overcome limitations that gravity filters experience. Pumped sand filters can be located at higher elevations than the water storage system that is used as source water and pumped filters do not need to rely on natural storm events to route water through the filter. This alternative considers the use of a float switch, which would activate pumping between specific, programmed water levels. This allows periodic treatment of pond water via filtration, as the pond fills with stormwater runoff and/or baseflow. The existing access corridor along the east side of the pond would provide for less intrusive construction and operations & maintenance of a filter bench located on the eastern perimeter of the southern cell. Water quality treatment capacity is driven by the surface area of a filter; therefore, encroachment of the conceptual filter bench footprint into the existing water surface area of the pond was considered, to maximize treatment potential within existing land access rights agreements.

4.1.4 PUMPED SAND FILTER BENCH W/ REAL TIME SENSOR

Pumped sand filters provide the same benefits as gravity filter benches, except they are able to overcome limitations that gravity filters experience. Pumped sand filters can be located at higher elevations than the water storage system that is used as source water and pumped filters do not need to rely on natural storm events to route water through the filter. This alternative considers the use of a real time sensor, which would activate pumping between specific, programmed water levels and in advance of rainfall events forecasted by the National Weather Service. This allows periodic treatment of pond water via filtration, as the pond fills with stormwater runoff and/or baseflow. The predictive nature of the real time sensor allows further system manipulation, such as drawing down water levels in a pond prior to a runoff event, to maximize available storage capacity in the pond and maximize capacity for settling and sedimentation of storm runoff within the pond. The existing access corridor along the east side of the pond would provide for less intrusive construction and operations & maintenance of a filter bench located on the eastern perimeter of the southern cell. Water quality treatment capacity is driven by the surface area of a filter; therefore, encroachment of the conceptual filter bench footprint into the existing water surface area of the pond was considered, to maximize treatment potential within existing land access rights agreements. Real time sensors for stormwater management are an emerging technology, which allow water resource managers to leverage facilities at a system scale to maximize water quality and quantity benefits.

4.1.5 ALUM DOSING STATION WITH INTERCEPTION OF GOLF COURSE RUNOFF

Alum is a coagulant which binds to dissolved phosphorus. Its most common use in surface water resource management is to apply alum to waterbodies that are experiencing high dissolved phosphorus load from sediment (internal load). The dissolved phosphorus load is then bound to the alum in a layer at the bottom of the waterbody. The internal load in CR6 pond is unknown, so the applicability of alum dosing the sediment is not well defined at this time.

Another method of using alum to bind and settle dissolved phosphorus is to construct a dosing station that pumps water out of an upstream storage reservoir, injects the water with alum, and allows the floc of alum-bound-phosphorus to settle in a second storage / settling reservoir. The alum injection is ongoing, as water is routinely or continuously pumped out of the first reservoir as the it fills with stormwater runoff and/or baseflow.

The CR6 pond is a candidate for an alum dosing station due to its existing physical configuration as a two-celled system. Modifications to the pond’s existing submerged berm would be required, to create a more distinct separation between pond cells. Once floc settles in the downgradient cell, clean water would discharge from the pond’s outlet.

MCWD Research & Monitoring (R&M) data indicates that there is significant phosphorus load from the Spring Hill Golf Club east of the CR6 pond and north of County Road 6. The golf course does not naturally drain to the CR6 pond, and instead directly drains to Long Lake without water quality treatment. Assessment of this alternative considered the additional load generated from the golf course and project components that would be required to convey water from the golf course to the CR6 pond. Note that the data provided by MCWD consisted of 12 grab samples collected in 2018, and further monitoring is recommended prior to further pursuing interception of golf course runoff.

This alternative represents the most aggressive feasible option evaluated, and serves to represent an upper limit of phosphorus load reductions that could be achieved by retrofits at and near the CR6 Pond. The interception of golf course runoff was not paired with other retrofit alternatives in the scope of this study, but could be paired with any of the other evaluated options such as filter benches.

4.2 Retrofit Types Not Selected for Further Analysis

4.2.1 DEAD POOL VOLUME MODIFICATIONS TO ALTER RESIDENCE TIME

Dead pool volume of ponds impacts the residence time of ponds and subsequently, the settling of particulates within the water column. Significant changes to the grading and bathymetry of CR6 pond were deemed infeasible due to land rights restrictions and the existing easement footprint. Dead pool volume modifications were instead considered within the retrofit type of weir modifications.

4.2.2 OUTLET MODIFICATIONS TO ALTER RESIDENCE TIME

The outlet control structure of a pond controls the normal water level and spillway elevations of the basin. It was decided that outlet modifications would not be considered as an alternative for this study, but would instead be considered as a component of other evaluated options including the sand filter benches and weir modifications.

4.2.3 ADDITION OF PRE-TREATMENT

CR 6 pond sits just downstream of the confluence of two streams, which convey discharge from Wolsfeld Lake and Holy Name Lake. Depending on the condition of the streams upstream of CR6 pond, runoff may experience sediment and phosphorus loading from the erosion of the streams. Relatively low sediment accumulation rates observed in CR6 pond during routine pond sedimentation surveys indicates that this is likely not a primary issue. However, the incorporation of pre-treatment practices at the influent of stormwater management facilities, such as ponds, is a strategy that is shown to reduce nutrient and sediment accumulation within the ponds themselves. Pre-treatment can include construction of wet forebays, manhole sumps with or without energy dissipation or floatable material capture devices, etc. Due to the lack of space on site to construct a pre-treatment forebay, and lack of storm sewer infrastructure to retrofit a manhole sump, the addition or pre-treatment devices was not pursued further at CR6 ponds.

4.2.4 ALUM APPLICATION TO POND SEDIMENTS

The application of alum is an established practice within lakes, to chemically bind dissolved phosphorus that is released by lake sediments, to stop internal loading. Alum application to pond sediments is a potentially emerging technology that is being considered by practitioners in the state of Minnesota. Alum applications rely on site access to facilitate access of alum application equipment, which is problematic at many ponds. CR6 pond has existing access via the easement to the east of the pond. However, data does not exist to indicate whether the CR6 pond experiences internal loading significant enough to warrant alum applications. Furthermore, alum applications essentially “lock” phosphorus from being released from sediments within the sediment surface layer. Since ponds are designed to experience sediment loading and settle those loads, the longevity of alum applications within ponds is dependent on the rate of sediment accumulation within ponds. For these reasons, alum application to the sediments of the CR6 pond were not further explored.

4.2.5 IRON FILINGS APPLICATION TO POND SEDIMENTS

The application of iron filings to lake sediments is an emerging technology that is being explored by researchers, to chemically bind dissolved phosphorus that is released by lake sediments, to stop internal loading. Alum application to pond sediments is a potentially emerging technology that is being considered by practitioners in the state of Minnesota. Alum applications rely on site access to facilitate access of alum application equipment, which is problematic at many ponds. CR6 pond has existing access via the easement to the east of the pond. However, data does not exist to indicate whether the CR6 pond experiences internal loading significant enough to warrant alum applications. Furthermore, alum applications essentially "lock" phosphorus from being released from sediments within the sediment surface layer. Since ponds are designed to experience sediment loading and settle those loads, the longevity of alum applications within ponds is dependent on the rate of sediment accumulation within ponds. For these reasons, alum application to the sediments of the CR6 pond were not further explored.

4.2.6 AERATION

Aeration is most commonly employed in stormwater ponds for aesthetic purposes, which are not a priority at the CR6 Pond. However, the stormwater management industry has recently posed the question of whether mechanical aeration (i.e. fountain or bubbler) can limit or prevent ponds from experiencing dissolved oxygen (DO) stratification, and in turn, reduce sediment P loads. The impacts of aeration on controlling sediment P loads in ponds are not well understood by the industry, and MCWD has a lack of information about the significance of internal sediment loading of P within the CR6 Pond, therefore, aeration was not further evaluated within this study.

4.2.7 PROPRIETARY CARTRIDGE FILTER SYSTEM; PUMPED

Proprietary cartridge filters, such as Jellyfish, StormFilter, etc.; are a relatively new technology that are being implemented more widely within the landscape. With regular maintenance, data shows that they are capable of removing 50% of TP from the water that is directed to them. These systems can be either gravity fed or receive water pumped from a storage area. A proprietary cartridge filter system could be leveraged at CR6 Pond, paired with a pump to overcome pressure head. Due to the watershed size draining to the CR6 pond, a significant quantity of cartridge filters would be required to collect a majority of discharge from the pond during water quality events and/or to maximize TP removal. The cost of cartridge filter systems is primarily driven by the quantity of filters and cartridge filters require regular (typically 1-2 times per year) maintenance or replacement of cartridges. Due to the significant costs and maintenance required support proprietary cartridge filter systems, this retrofit type was not selected for further analysis.

5 Alternatives Assessment

Concept design, water quality modeling, and planning level opinion of probable cost was completed for each alternative. This information is used to evaluate cost efficiency of TP removal associated with each alternative, as well as to provide insight into the physical configuration and operations & maintenance requirements of each alternative. Itemized opinion of probable cost and concept design schematics for each alternative are included in the appendix. The alternatives evaluated could be implemented in an a-la-carte type manner, whereas a weir further defining separation between the two pond cells could be paired with a gravity or pumped filter bench, interception of golf course runoff could be paired with any of the evaluated alternatives, etc. The opinion of probable costs and estimated phosphorus load removals are generally additive at the feasibility level, when considering implementation of a combination of options.

5.1.1 CONCEPT DESIGN

Concept design and sizing was completed for each alternative, utilizing understanding of physical space constraints, informed by survey data. Concept design was used to inform key parameters for water quality modeling, preparation of opinion of probable cost, and to provide a visual understanding of retrofit size and extent.

5.1.1.1 Gravity Sand Filter Bench

The following assumptions and design choices were made for the concept design of a gravity sand filter bench:

- Bench would be located on the eastern portion of the southern cell, with access for construction & maintenance via the existing access corridor within the easement.
- Bench would be graded into the pond, to ensure it is contained within the limits of the existing easement. Therefore, some wet detention area will be lost within the pond.
- Clean sand (not iron enhanced) was assumed, to target particulate phosphorus.
- Outlet modifications to change normal water level (NWL) from 949.3 ft to 951.5 ft.
- Top of filter bench at elevation 951.5 ft.
- 14,000 sf filter bench area.

5.1.1.2 Weir (Sheet Pile or Earthen)

The following assumptions and design choices were made for the concept design of a weir:

- Top of weir at 952 ft, with overflow notch at 951.5 ft.
- Outlet modifications to change normal water level (NWL) from 949.3 ft to 951.5 ft.

5.1.1.3 Pumped Sand Filter Bench w/ Float Switch

The following assumptions and design choices were made for the concept design of a pumped sand filter bench with float switch:

- Bench would be located on the eastern portion of the southern cell, with access for construction & maintenance via the existing access corridor within the easement.
- Bench would be graded into the pond, to ensure it is contained within the limits of the existing easement. Therefore, some wet detention area will be lost within the pond.
- Clean sand (not iron enhanced) was assumed, to target particulate phosphorus.
- Outlet modifications to change normal water level (NWL) from 949.3 ft to 951.5 ft.
- Top of filter bench at elevation 953.5 ft.
- 14,000 sf filter bench area.
- Electrical service to tie-in at County Road 6, to run along existing access corridor.

5.1.1.4 Pumped Sand Filter Bench w/ Real Time Sensor

The following assumptions and design choices were made for the concept design of a pumped sand filter bench with float switch:

- Bench would be located on the eastern portion of the southern cell, with access for construction & maintenance via the existing access corridor within the easement.
- Bench would be graded into the pond, to ensure it is contained within the limits of the existing easement. Therefore, some wet detention area will be lost within the pond.
- Clean sand (not iron enhanced) was assumed, to target particulate phosphorus.
- Outlet modifications to change normal water level (NWL) from 949.3 ft to 951.5 ft.
- Top of filter bench at elevation 953.5 ft.
- 14,000 sf filter bench area.
- Electrical service to tie-in at County Road 6, to run along existing access corridor.

5.1.1.5 Alum Dosing w/ Golf Course Interception

- Construction of lift station south of County Road 6 at existing culvert, with new directionally drilled 6-inch HDPE forcemain to convey water west to CR6 Pond.
- First cell of CR6 pond used as reservoir for water prior to treatment.
- Weir construction to better define distinction between pond cells.
- Alum dosing building located on east side of CR6 pond, between cells.
- Second cell of CR6 pond used as settling basin for alum-bound P floc.

- Electrical service to tie-in at County Road 6, to run along existing access corridor.

5.1.2 WATER QUALITY MODELING

TP removals were estimated in the pollutant calibrated P8 for the following scenarios:

- The current/baseline scenario
- Weir improvement at the outlet of the north cell
- Gravity filter bench addition to the south cell
- Pumped filter bench addition to the south cell

Generally, these scenarios were simulated by applying the hydraulically-relevant design specifications to the simulated devices in P8. These elements can include pond elevation, permanent pool area and volume, flood pool area and volume, infiltration rate, outlet type, and weir length/discharge coefficient. Table 3 summarizes how each scenario was simulated in P8.

A fifth scenario, automated alum dosing, was estimated outside of P8, using an assumed annual TP removal of 75% based on research outlined in Wagner (2017). Under this scenario, runoff originating from the 61-acre Spring Hill Golf Course drainage (north of County Road 6) would be piped to the inlet of the north cell of the ponds for treatment. This additional TP load was estimated from the 2018 monitoring record (12 samples). For each grab sample, a daily TP load was calculated from measured streamflow and TP concentration. Then, the median daily load across all samples was multiplied by 365, yielding an estimated annual load delivered to the north cell of the pond. It is estimated that 22.7 pounds of TP would be added to the County Road 6 pond under this scenario.

Table 3. Summary of P8 device conceptualization for pollutant removal scenario analysis.

Option ID	Scenario	Device Type		Description
		North Cell	South Cell	
--	Baseline	Pond	Pond	Pond dimensions reflect current pond design specs.
1	Gravity Filter Bench	Pond	General	P8 infiltration rate set to filter bench estimated infiltration rate (1.6-3.0 in/hr), upon activation. Normal spillway outflow set to HydroCAD simulated outflows.
2A & 2B	Weir	Pond	Pond	Adjusted weir dimensions based on engineering spec.
3 & 4	Pumped Filter Bench	Pond	General	P8 infiltration rate set to filter bench estimated infiltration rate (1.6-3.0 in/hr), pumping continuously. Normal spillway outflow set to HydroCAD simulated outflows.

The removal estimates for these scenarios are summarized below in Table 4. Note the tables distinguishes between the annual TP removal (total removal) and the annual TP removal gained from each scenario (total removal – baseline removal).

Table 4. TP removal scenarios.

Option ID	Scenario	TP (lbs/year)		Annual TP Removal	Annual TP Removal (Gained)	
		Inlet (north cell)	Outlet (south cell)	%	lbs/yr	%
--	Baseline	273	180	34%	0	0%
1	Gravity Filter Bench (1.6 - 3.0 in/hr)	273	113-132	52-59%	48-67	27-37%
2A & 2B	Weir (sheet pile or earthen)	273	174-176	36%	4-6	2-4%
3	Pumped Filter Bench w/ Float Switch (1.6 - 3.0 in/hr)	273	96-122	55-65%	58-84	32-47%
4	Pumped Filter Bench w/ Real Time Sensor (1.6 - 3.0 in/hr)	273	90-122	55-67%	58-90	32-50%
5	Alum Dosing Station*	296	51-102	66-83%	102-152	50-75%

*Total inlet load calculated as [273 lbs (current condition) + 23 lbs (golf course drainage)]

5.1.3 CONCEPT-LEVEL OPINION OF PROBABLE COST

Concept-level opinion of probable cost was prepared for each evaluated alternative. Itemized opinion of probable cost is included in the appendix, for reference and understanding of drivers of cost within each alternative. General and alternative specific assumptions made for each alternative are also detailed in the appendix.

5.1.3.1 Capital Costs

Capital costs were estimated for each alternative, including 30% contingency and 30% for engineering, legal, admin, and finance. Results are tabulated below.

Option ID	Alternative	Capital Cost *(construction, contingency, legal, admin, finance)*
1	Gravity Sand Filter Bench	$664,000
2A	Weir – Sheet Pile	$956,000
2B	Weir – Earthen	$206,000
3	Pumped Sand Filter Bench w/ Float Switch	$1,011,000
4	Pumped Sand Filter Bench w/ Real Time Sensor	$1,349,000
5	Alum Dosing	$3,628,000

5.1.3.2 Operations & Maintenance Costs

Operations & maintenance (O&M) costs were estimated for each evaluated alternative, considering key activities required to ensure functionality over an assumed 30-year project lifecycle. The cost of regular inspections was not included. Itemized estimates are included in Table 5 below, which show components and frequency of maintenance activities. Assumptions are also included in the Appendix.

Table 5. O&M OPC

(1) GRAVITY FILTER BENCH OPERATIONS AND MAINTENANCE COST SCHEDULE

NO.	ITEM DESCRIPTION	FREQUENCY		UNIT PRICE	30 YEAR COST
O&M COST SCHEDULE					
1	FILTER MEDIA REPLACEMENT	10	YEARS	$ 200,000	$ 600,000
	30 YEAR MAINTENACE COST TOTAL				$ 600,000

(2A and 2B) WEIR/BERM OPERATIONS AND MAINTENANCE COST SCHEDULE

ASSUME NO OPERATIONS AND MAINTENACE COSTS

(3) PUMPED FILTER BENCH W/ FLOAT SWITCH OPERATIONS AND MAINTENANCE COST SCHEDULE

NO.	ITEM DESCRIPTION	FREQUENCY		UNIT PRICE	30 YEAR COST
O&M COST SCHEDULE					
1	FILTER MEDIA REPLACEMENT	10	YEARS	$ 200,000	$ 600,000
2	PUMP REPLACEMENT	10	YEARS	$ 100,000	$ 300,000
	30 YEAR MAINTENACE COST TOTAL				$ 900,000

(4) PUMPED FILTER BENCH W/ REAL TIME SENSOR OPERATIONS AND MAINTENANCE COST SCHEDULE

NO.	ITEM DESCRIPTION	FREQUENCY		UNIT PRICE	30 YEAR COST
O&M COST SCHEDULE					
1	FILTER MEDIA REPLACEMENT	10	YEARS	$ 200,000	$ 600,000
2	PUMP REPLACEMENT	10	YEARS	$ 100,000	$ 300,000
3	OPTI-RTC SYSTEM MAINTENANCE	10	YEARS	$ 30,000	$ 90,000
	30 YEAR MAINTENACE COST TOTAL				$ 990,000

(5) ALUM DOSING FACILITY OPERATIONS AND MAINTENANCE COST SCHEDULE

NO.	ITEM DESCRIPTION	FREQUENCY		UNIT PRICE	30 YEAR COST
O&M COST SCHEDULE					
1	ALUM FACILITY MAINTENANCE	1	YEAR	$ 30,000	$ 900,000
2	LIFT STATION PUMP REPLACEMENT (GOLF COURSE INTERCEPTION)	10	YEARS	$ 60,000	$ 180,000
	30 YEAR MAINTENACE COST TOTAL				$ 1,080,000

5.1.3.3 Lifecycle Costs

Lifecycle costs were estimated by summing estimated project capital costs and O&M costs and are shown in Table 6. Inflation and discount rates were not considered. A 30-year lifecycle was assumed for all retrofit types.

Table 6. Lifecycle Costs

Option ID	Alternative	Capital Cost	Maintenance Cost (30-year)	Lifecycle Cost
1	Gravity Sand Filter Bench	$ 664,000	$ 600,000	$ 1,264,000
2A	Weir - Sheet Pile	$ 956,000	$ -	$ 956,000
2B	Weir - Earthen	$ 206,000	$ -	$ 206,000
3	Pumped Sand Filter Bench w/ Float Switch	$ 1,011,000	$ 900,000	$ 1,911,000
4	Pumped Sand Filter Bench w/ Real Time Sensor	$ 1,349,000	$ 990,000	$ 2,339,000
5	Alum Dosing Station w/ Golf Course Drainage	$ 3,628,000	1,080,000	$ 4,708,000

6 Evaluation of Alternatives

Qualitative and quantitative evaluation criteria were considered to compare the alternatives and inform recommendations.

6.1 Evaluation Criteria

Criteria were discussed and prioritized, in collaboration with MCWD staff. Potential project options were evaluated against criteria including: the ability of the project to achieve MCWD goals, estimated project capital and operation & maintenance costs, permitting needs and hurdles, site constraints, data needs for final design, and engineering complexity. Criteria are outlined in more detail below.

6.1.1 TOTAL PHOSPHORUS REMOVALS

The ability of alternatives to remove total phosphorus and reduce the effluent load from the CR6 Pond was identified as the primary goal of the feasibility study, and a overarching goal of MCWD. To address this goal, concept design of alternatives sought to maximize TP removal capacity of each evaluated option. Evaluation of TP removal capacity was completed via P8 water quality modeling, using a refined version of the District's P8 model for the CR6 Pond.

6.1.2 DISCHARGE RATE AND FLOOD CONTROL

To address MCWD's goals for water quantity management, this study looked at the potential to manage and maintain discharge rates, and the estimated impact on upstream and downstream flood elevations. Potential project alternatives were evaluated qualitatively for impact on discharge rate and flooding.

6.1.3 ECOLOGICAL INTEGRITY

The ability of project alternatives to support MCWD's goal to maintain and build ecological integrity through habitat restoration and preservation was evaluated qualitatively.

6.1.4 PROMOTING THRIVING COMMUNITIES

Promoting thriving communities is one of MCWD's goals. MCWD staff indicated that this goal is not a priority or applicable at the CR6 site. The pond exists on private property, with an easement that grants MCWD the ability to own and operate the pond; promoting public access at the site is not feasible under the current agreement. Furthermore, the site does not have space for safe public access or incorporation of amenities, and public access to the pond itself is not desired due to the risk of damage to engineered infrastructure and safety risks to the public due to the pond not being intended for swimming or boating. Implementing projects that will reduce TP loads to Long Lake are anticipated to have a cascade effect and improve the quality of water for the users of Long Lake.

6.1.5 CAPITAL COSTS

The capital cost to build each project alternative is a key factor in determining which project option to install so that District funds are targeted effectively to projects with the highest impact for the cost. Capital costs for each alternative were estimated based on recent bids Stantec has reviewed from similar projects in nearby geographies and further supported by engineering judgement and/or discussions with local contractors. Capital costs assumed constant percentages for Contingency (30%) and Legal, Engineering, Admin & Finance (30%). The appendix includes a summary of assumptions made to estimate costs for each project alternative.

6.1.6 OPERATION & MAINTENANCE COSTS

The operation and maintenance costs are another key factor in determining which project option to install as operation and maintenance costs can vary widely across different types of projects. Operation and maintenance costs for each alternative were estimated based on filtration media replacement costs and schedules. The appendix includes a summary of assumptions made to estimate costs for each project alternative.

6.1.7 LIFE CYCLE COSTS

The life cycle cost of a project totals expenditures over the life of the project to reflect the total cost of a project. Project lifecycles were assumed to be 30 years.

6.1.8 PERMITTING NEEDS AND HURDLES

Permitting needs and hurdles for each project were estimated based on the project site location on a public waterway and based on the proposed activity or potential impact for each alternative.

6.1.9 SITE CONSTRAINTS

Project site constraints include land rights, site access, and utilities. These site factors were evaluated for each project option.

6.1.10 ENGINEERING COMPLEXITY & DATA NEEDS

Engineering complexity and challenges as well as the level of additional data needed to move a project to final design were evaluated for each project alternative.

6.2 Evaluation Matrix

Table 7. Alternatives Evaluation Matrix

Option ID	Retrofit	Water quality benefit (TP lbs/yr)	Rate & Flood Control	Capital Costs ($)	O&M Costs ($/lifespan)	Lifecycle Cost ($/lifespan)	Cost Efficiency ($/lb TP)	O&M Requirements	Potential Regulatory Considerations	Site Constraints	Design complexity & Data needs
1	Gravity sand filter bench	48-67	Decreased pond storage & outlet modifications could impact rates and flood elevations	$664,000	$600,000	$1,264,000	$600-900	• Raking & replacement of media	- Public Waters Work Permit - May require No-Rise Certification	- Expands basin area	Low
2A	Weir (sheet pile)	4-6	Weir could impact rates and flood elevations	$956,000	$0	$956,000	$5,300-8,000	• Inspections & general maintenance	- Public Waters Work Permit - Floodplain No-Rise Certification	- Ponding area limited to existing easement	Medium
2B	Weir (earthen)	4-6	Weir could impact rates and flood elevations	$206,000	$0	$206,000	$1,100-1,700	• Inspections & general maintenance	- Public Waters Work Permit - Floodplain No-Rise Certification	- Ponding area limited to existing easement	Medium
3	Pumped sand filter bench w/ float switch	58-84	Decreased pond storage & outlet modifications could impact rates and flood elevations	$1,011,000	$900,000	$1,911,000	$800-1,100	• Raking & replacement of media • Maintenance of pump	- Public Waters Work Permit - Floodplain No-Rise Certification	- Expands basin area - Electrical service to pump	Medium
4	Pumped sand filter bench w/ real time sensor	58-90	Decreased pond storage & outlet modifications could impact rates and flood elevations	$1,349,000	$990,000	$2,339,000	$900-1,300	• Raking & replacement of media • Maintenance of pump • Setup and programming of sensor • Maintenance of sensor	- Public Waters Work Permit - Floodplain No-Rise Certification	- Expands basin area - Electrical service to pump	High
5	Alum dosing station	102-152	No impact	$3,628,000	$1,080,000	$4,708,000	$1,000-1,500	• Operation of alum station • Removal of settled floc • Maintenance of golf course interception pump	- Public Waters Work Permit - NPDES/SDS permit with renewals required every 5 years - Road authority permit	- Coordination with Road Authority and Golf Course - Electrical service to dosing station	High

7 Recommendations

The goal of this study was to define retrofit options for implementation at the County Road 6 Pond, to maximize TP removal prior to discharge to Long Lake. A suite of retrofit options was considered, some of which can be combined to create additional options. Construction of a gravity sand filter bench would be the most cost effective in terms of $/lb TP, but the gravity bench has lower TP removal potential than either of the two pumped filter bench options and the alum dosing station. The pumped filter bench provides a median option in terms of cost and removal potential, compared to the gravity filter bench and the alum dosing station. The alum dosing station provides the highest TP removal potential but requires extensive operations & maintenance efforts.

Construction of a more defined berm between the two pond cells is anticipated to remove 4-6 lb/yr of TP by increasing the separation between cells, forcing more sedimentation in the northern cell. Addition of a berm and focusing sedimentation within the northern cell has the potential to streamline future sediment maintenance efforts.

Implementation of a pumped sand filter bench at CR6 Pond is expected to provide 10-17 lb/yr of additional TP removal, compared to a gravity sand filter bench, due to the ability of the pump to circulate more water through the filter media, without relying on natural rain events to drive runoff through the system. Utilization of a real time sensor to control pump operations is not recommended at this time, as pre-storm drawdown and flood mitigation is not a priority in this location, and real time sensors introduce significant complexity to design and operation of a pumped system.

A blend of the gravity and pumped filter bench options is suggested, such that a pumped filter bench is designed and constructed in a way that the system would continue to function via gravity in the event the pump needs to be repaired or replaced, or if future upstream load reduction projects are completed upstream of the CR6 project and the pump is deemed unnecessary. This approach limits the risk of owning and operating a pumped stormwater system, as this site is particularly well suited for an organizational pilot of pump ownership due to the lack of risk to surrounding infrastructure and the ability to implement a system that can continue to operate effectively without a pump. Note that a concept schematic representing this blended solution of a gravity bench supplemented by pumping is not provided in the attached figures, nor were load removal estimates of the exact proposed configuration developed, though load removals are expected to be consistent with the “pumped sand filter bench w/ float switch” option, which is Option 3 as presented in Table 7. Selection of this option is dependent on MCWD’s organizational preferences and capabilities to manage a pumped system, and if a pumped system is deemed undesirable, a gravity system would also provide progress towards subwatershed goals.

Concept design for a pumped sand filter assumes a submersible pump would be located on the east side of the pond near the convergence of the two cells. The pump and controls would be housed within a 5-8 ft diameter manhole. The pump would draw water from the southern cell, lowering the water level below the normal water level, and apply the water over the surface area of the filter bench. Concept design assumes that the pump flow rate would be equivalent to the filtration rate of the filter media, between 230 and 440 gpm. The pump would require an initial investment of District staff time to gain familiarity with the functionality of the pump and to establish monitoring and maintenance protocols. In general, staff should routinely confirm functionality of the pump, either via physical site visits or remote monitoring. The system would need to be winterized (i.e. remove pump), and pump replacement is anticipated to be required approximately every 8-12 years.

In combination, Options 2B (earthen weir) and 3 (pumped sand filter bench with float switch) are anticipated to facilitate retention of between 62 and 90 lb of TP per year within CR6 Pond. Assuming construction in 2024, capital costs, including soft costs, for the project are estimated at about $1.2M based at this feasibility stage of the project. Total lifecycle cost, assuming a 30-year project lifespan, is estimated at about $2.1M. Therefore, cost-benefit of the suggested project is between $700 and $1,130/lb TP.

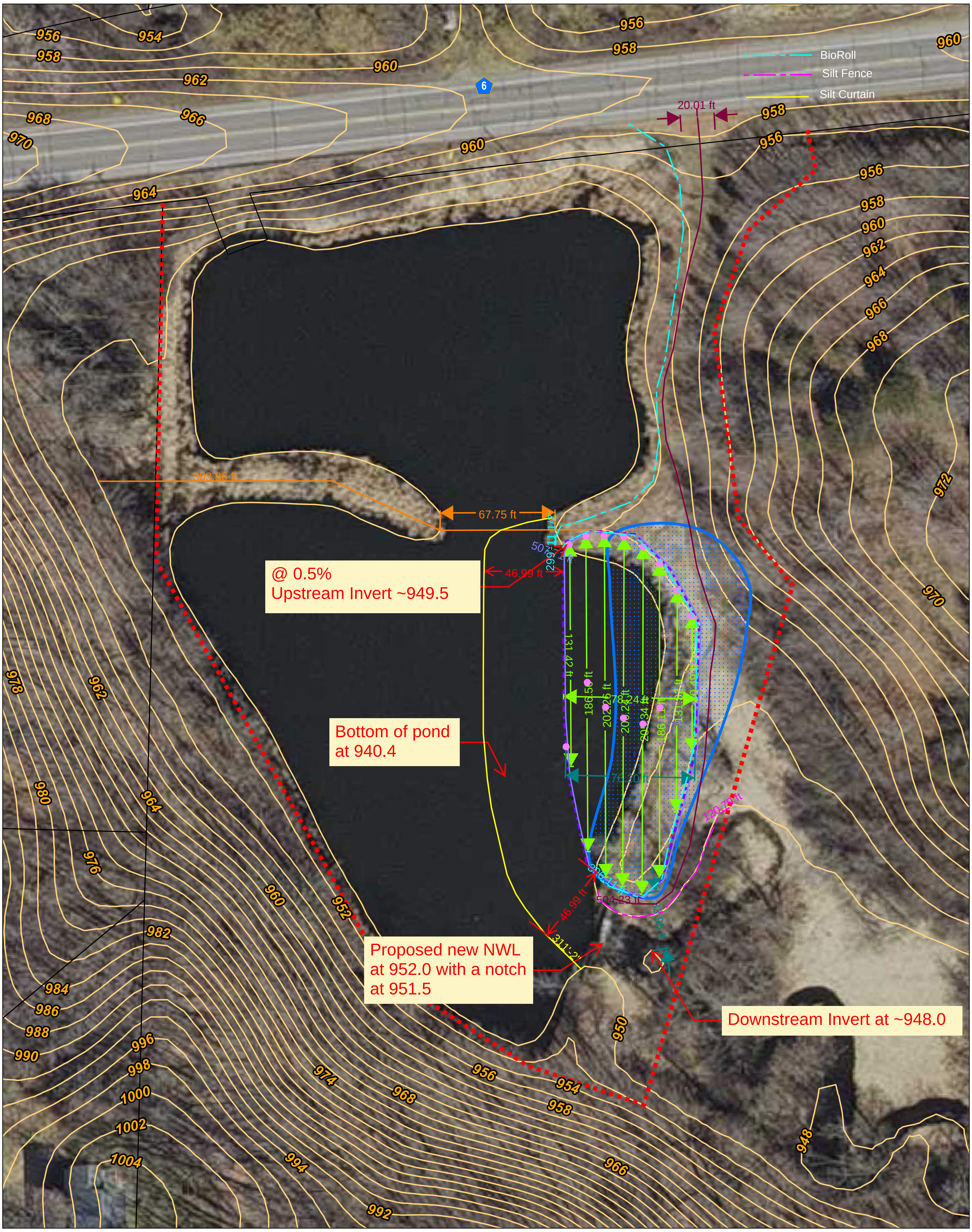
Construction of a sand filter bench with earthen berm between pond cells could be completed at any time throughout the year, with rain presenting the most significant risk to site management and construction schedule. Therefore, it is recommended that the construction window include winter months, so the selected contractor has the option to complete the work under frozen winter conditions. If construction occurs in the summer, dewatering will be required.

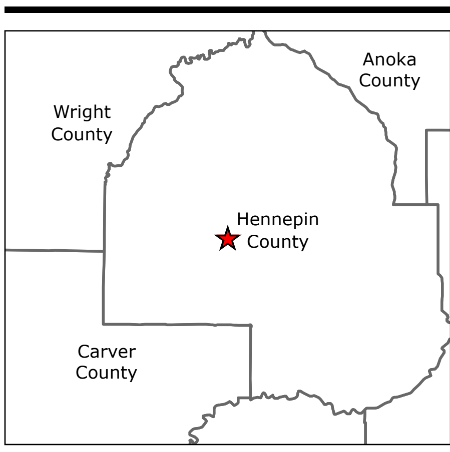
Based on cost-benefit and ease of implementation, a filter bench paired with an earthen berm to better define the two cells is the recommended retrofit for the CR6 Pond.

Future efforts to address sources of unaddressed loads in the Long Lake watershed include stabilization of bank erosion in Wolsfeld creek and interception and treatment of runoff from Spring Hill Golf Club. Stabilization of the Wolsfeld creek has the potential to significantly reduce nutrient loads to the CR6 Pond and subsequently, Long Lake, but substantial regulatory hurdles exist that make stabilization infeasible in the immediate future.

Additional monitoring may be completed to further inform TP loads from the Spring Hills Golf Course, at which time interception of golf course nutrient loads could be further pursued via development of a lift station and forcemain to route runoff along CR6 to the CR6 Pond for treatment. Both opportunities have the potential to measurably impact the loading to Long Lake and should continue to be pursued.

OPTION 1: Gravity Sand Filter Bench





Legend

- Proposed Filter Bench Footprint (14,000 sqft)
- Easement Boundary
- Contours (2ft)
- Hennepin Co. Parcels

0 30 60 Feet

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N

Notes
1. Coordinate System: NAD 1983 HARN Adj MN Hennepin Feet
2. Data Sources: Stantec, Hennepin Co.
3. Background: 2020 color 7-county

Stantec

Project Location
T118N, R23W, S26
Orono, Hennepin Co., MN

Prepared by KJM on 2022-04-15

Client/Project
22770xxxx
Minnehaha Creek Watershed District
CR6 Pond Easement

Figure No.
1

Title
CR6 Pond Easement

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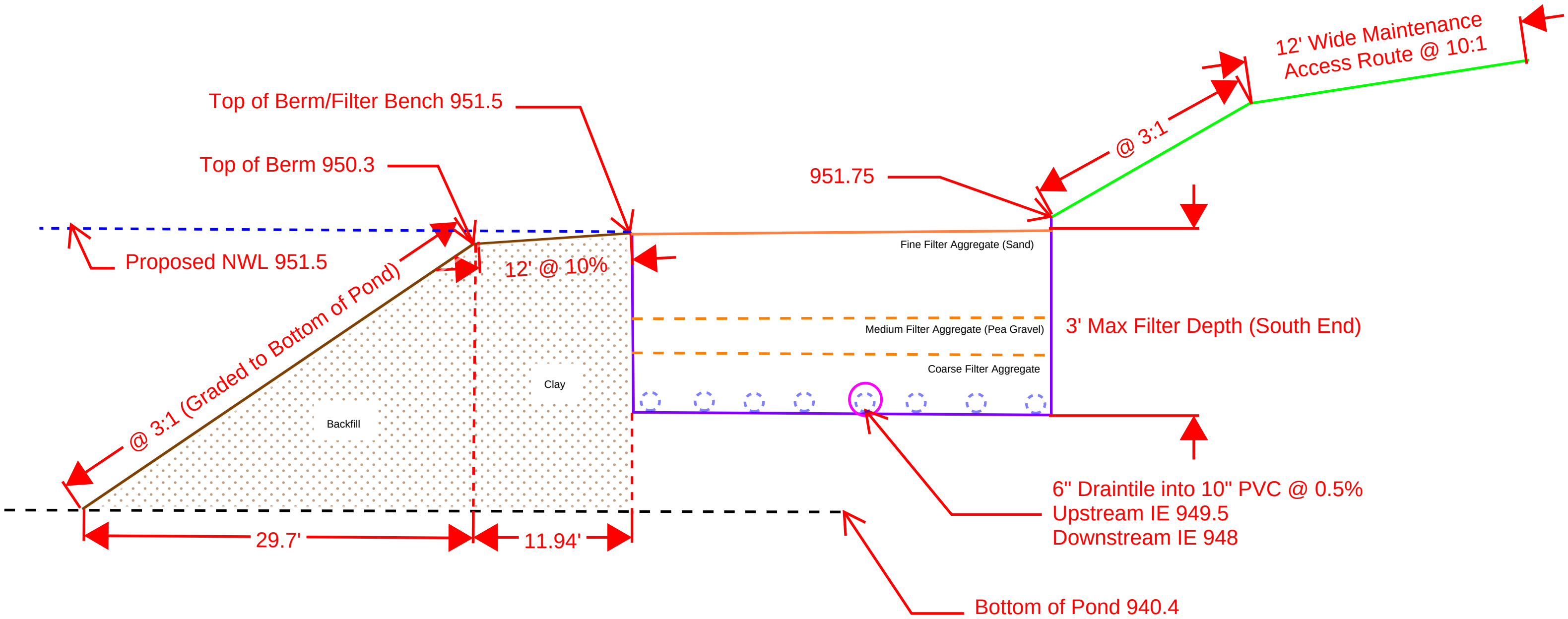
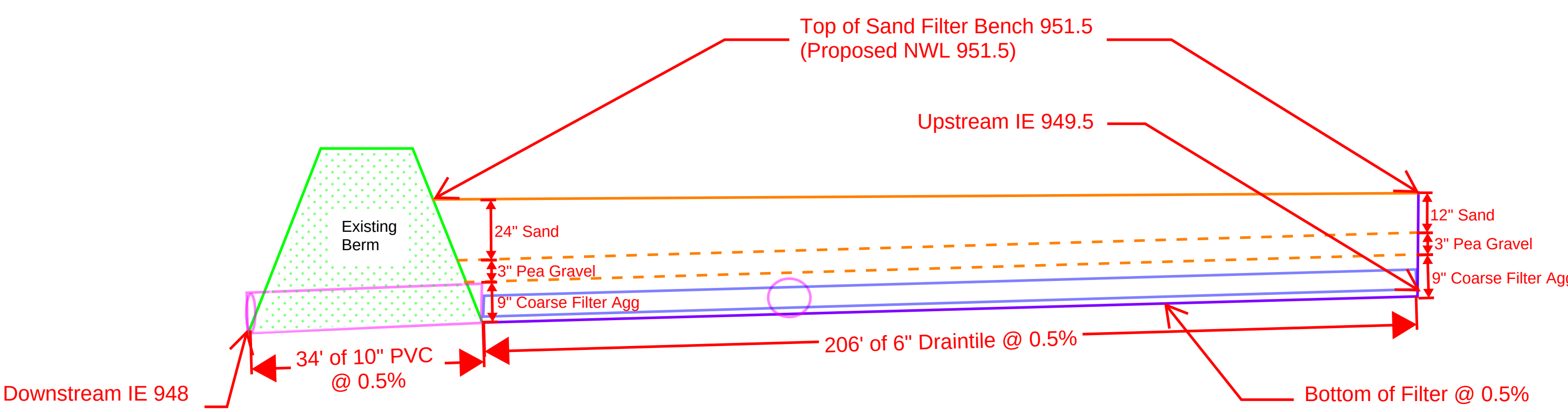
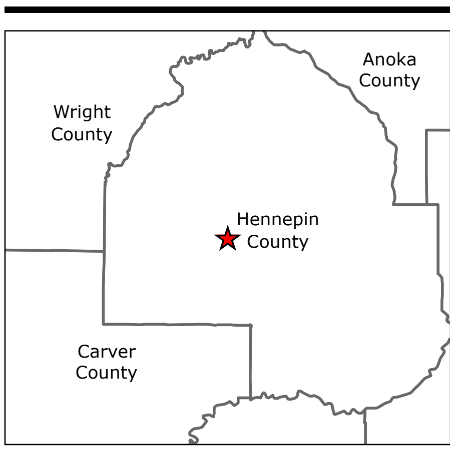
OPTION 1: Gravity Sand Filter Bench





OPTION 2: Weir Across Existing Berm



Legend

- Proposed Filter Bench Footprint (14,000 sqft)
- Easement Boundary
- Contours (2ft)
- Hennepin Co. Parcels

0 30 60 Feet

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Project Location — Prepared by KJM on 2022-04-15
T118N, R23W, S26
Orono, Hennepin Co., MN

Client/Project — 22770xxxx
Minnehaha Creek Watershed District
CR6 Pond Easement

Figure No.
1

Title
CR6 Pond Easement

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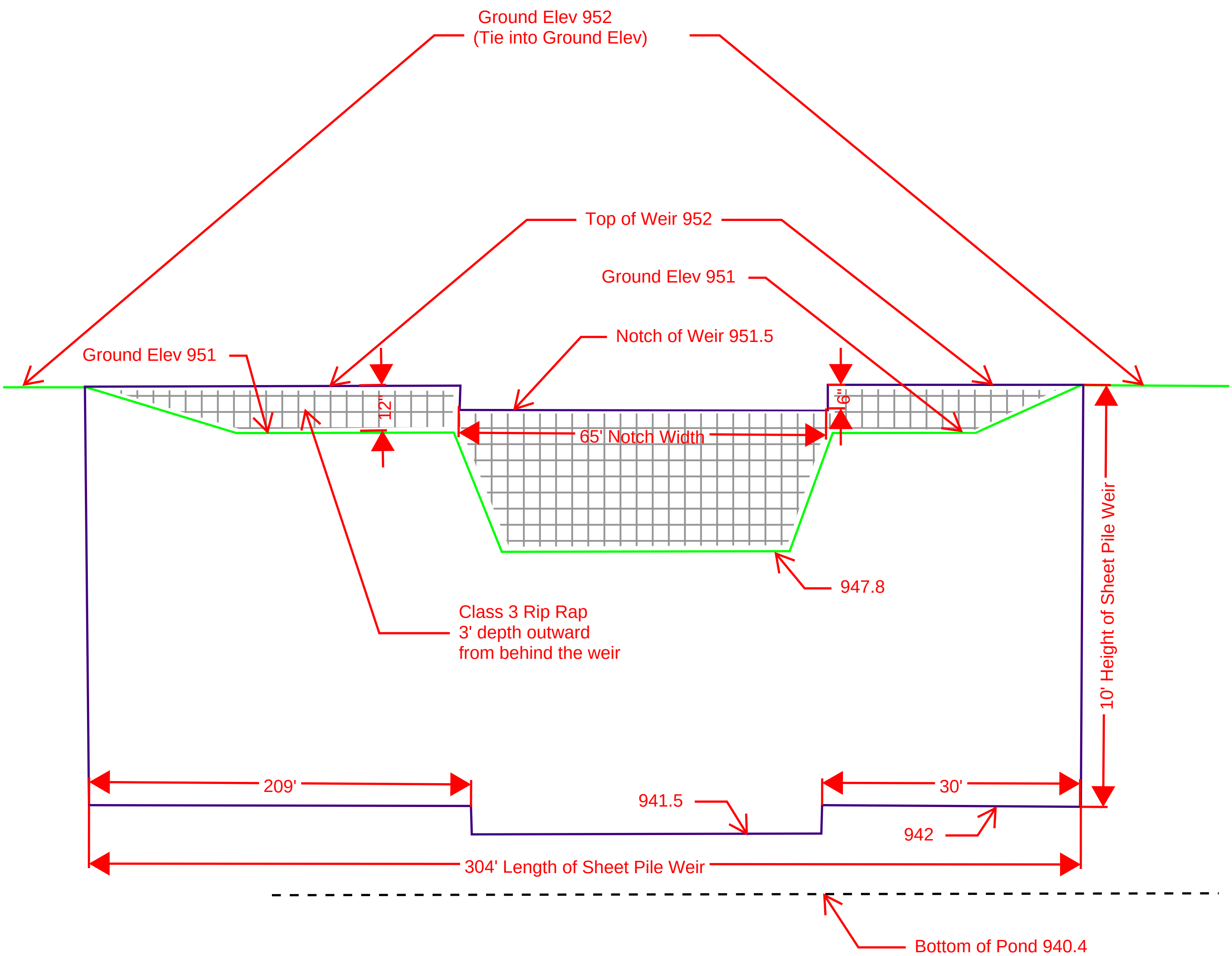
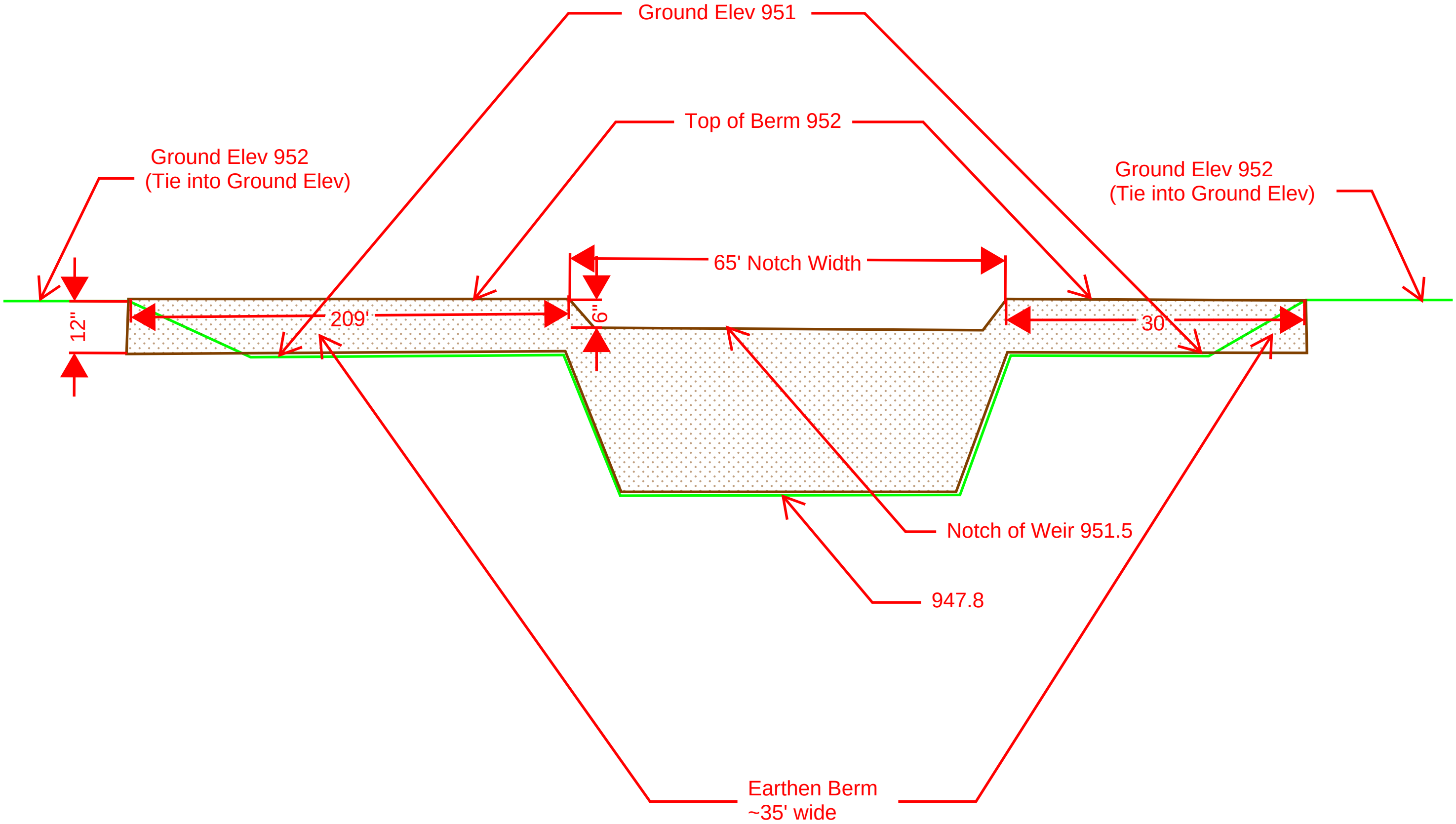
OPTION 2a: Sheet Pile Weir Across Existing Berm



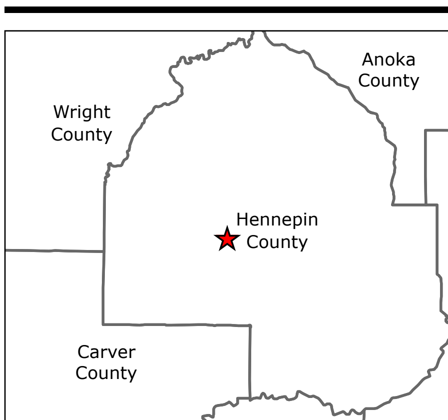
OPTION 2b: Earthen Embankment



OPTION 3: Pumped Sand Filter Bench
w/ floater to engage pump at set water elevation

&

OPTION 4: Pumped Sand Filter Bench
w/ real time sensor to engage pump before storm event



Legend

- Proposed Filter Bench Footprint (14,000 sqft)
- Easement Boundary
- Contours (2ft)
- Hennepin Co. Parcels

0 30 60 Feet

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T118N, R23W, S26
Orono, Hennepin Co., MN

Client/Project 22770xxxx
Minnehaha Creek Watershed District
CR6 Pond Easement

Figure No.
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Notes
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2. Data Sources: Stantec, Hennepin Co.
3. Background: 2020 color 7-county

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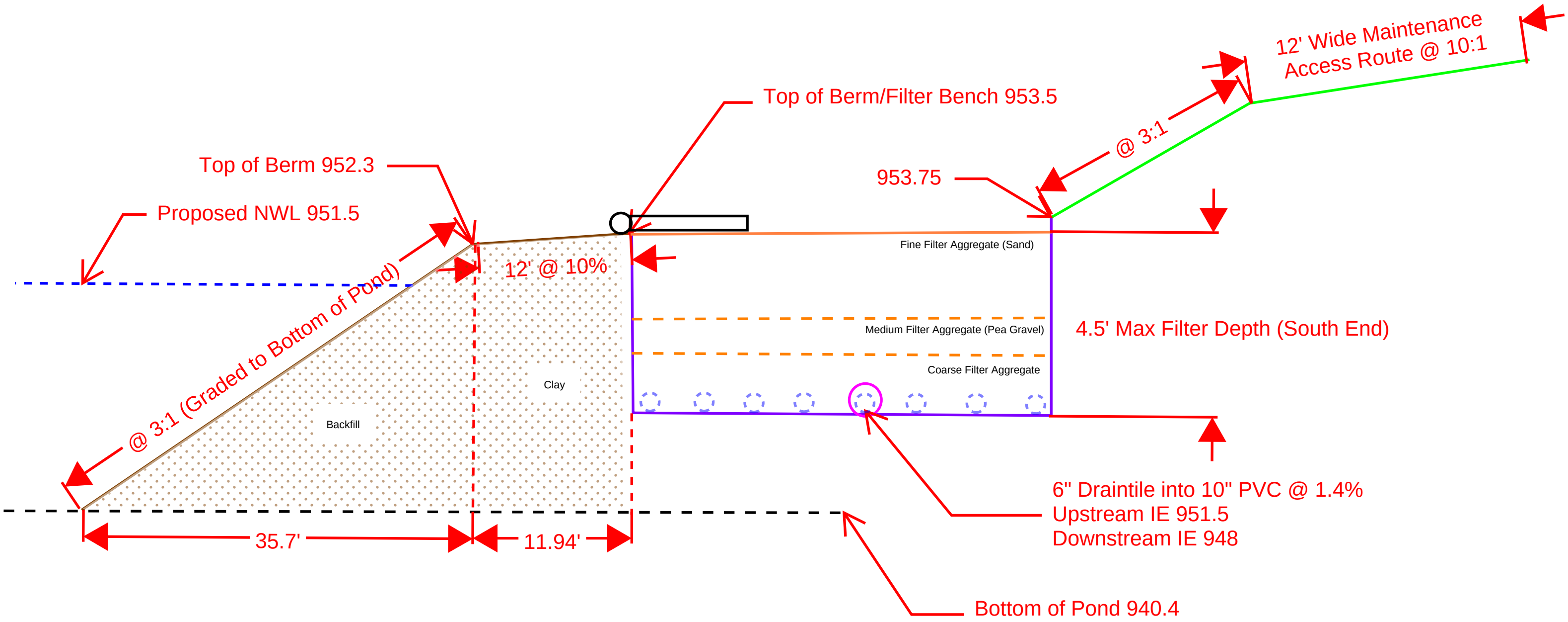
OPTION 3: Pumped Sand Filter Bench

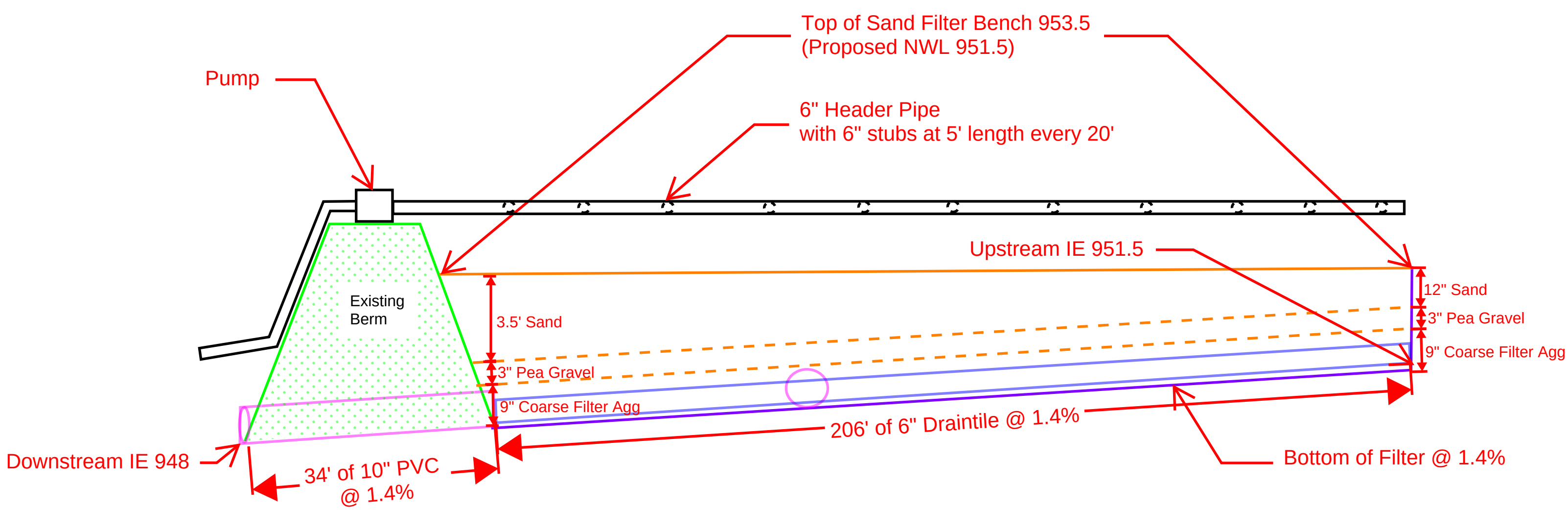
w/ floater to engage pump at set water elevation

&

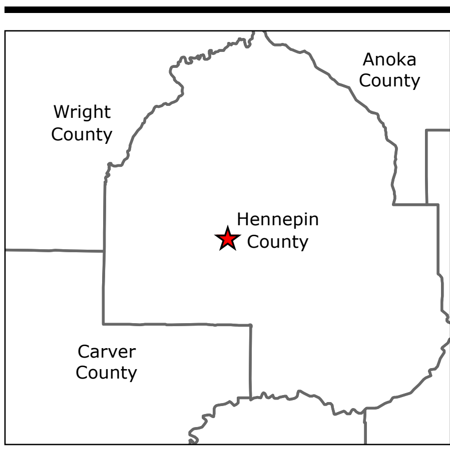
OPTION 4: Pumped Sand Filter Bench

w/ real time sensor to engage pump before storm event





OPTION 5: Alum Dosing Station



Legend
- Proposed Filter Bench Footprint (14,000 sqft)
- Easement Boundary
- Contours (2ft)
- Hennepin Co. Parcels

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Stantec

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Minnehaha Creek Watershed District
CR6 Pond Easement

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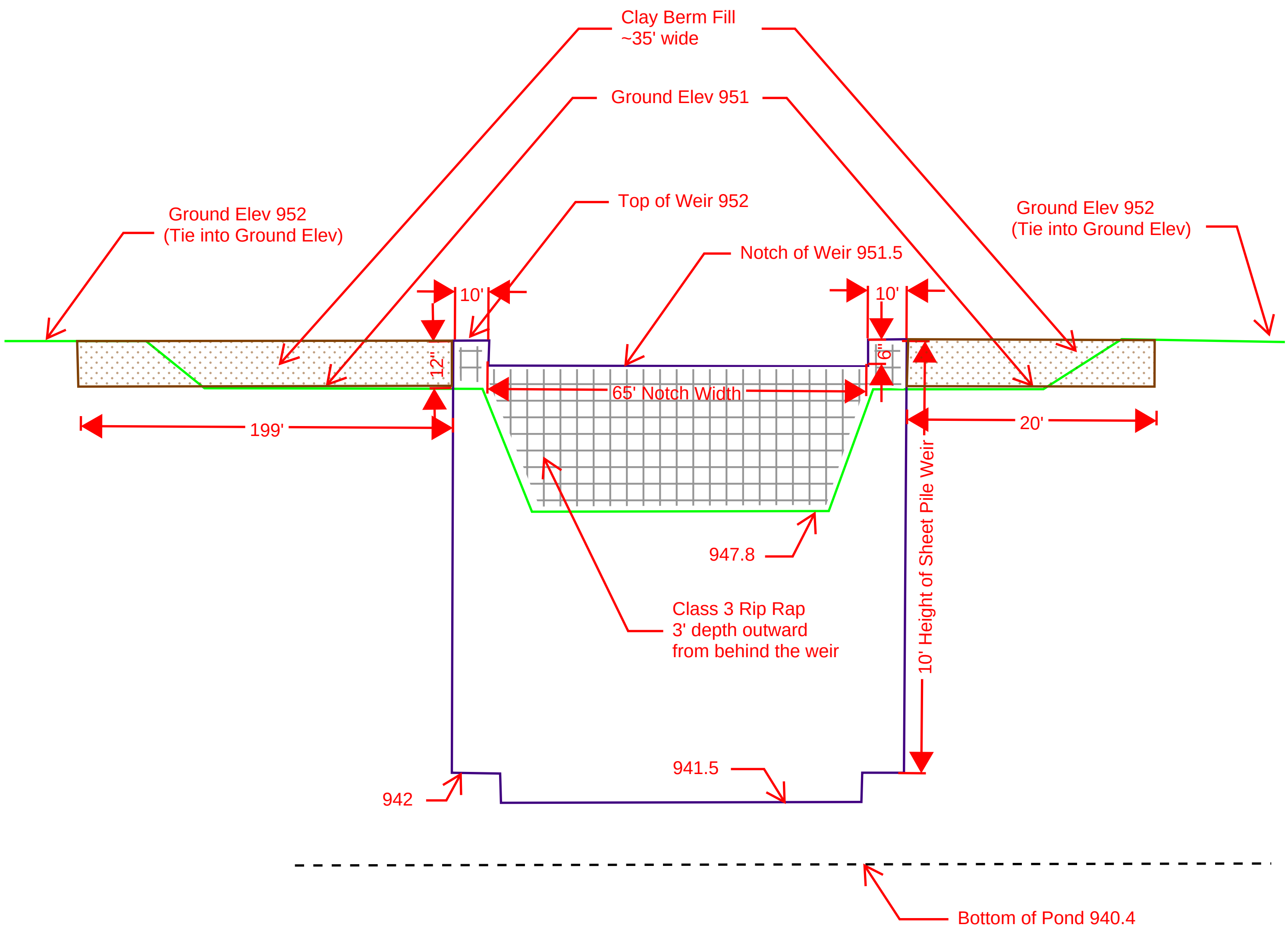
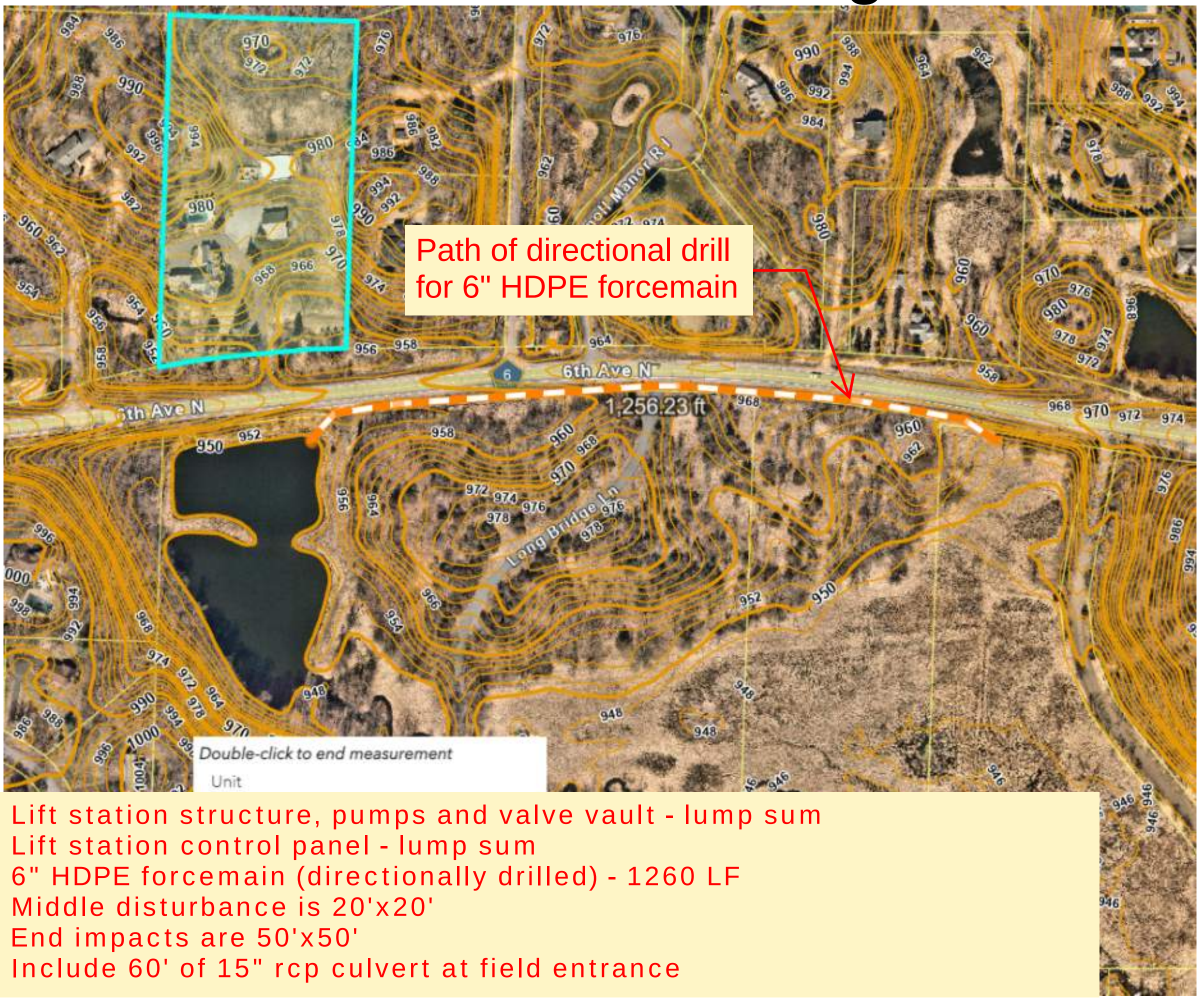
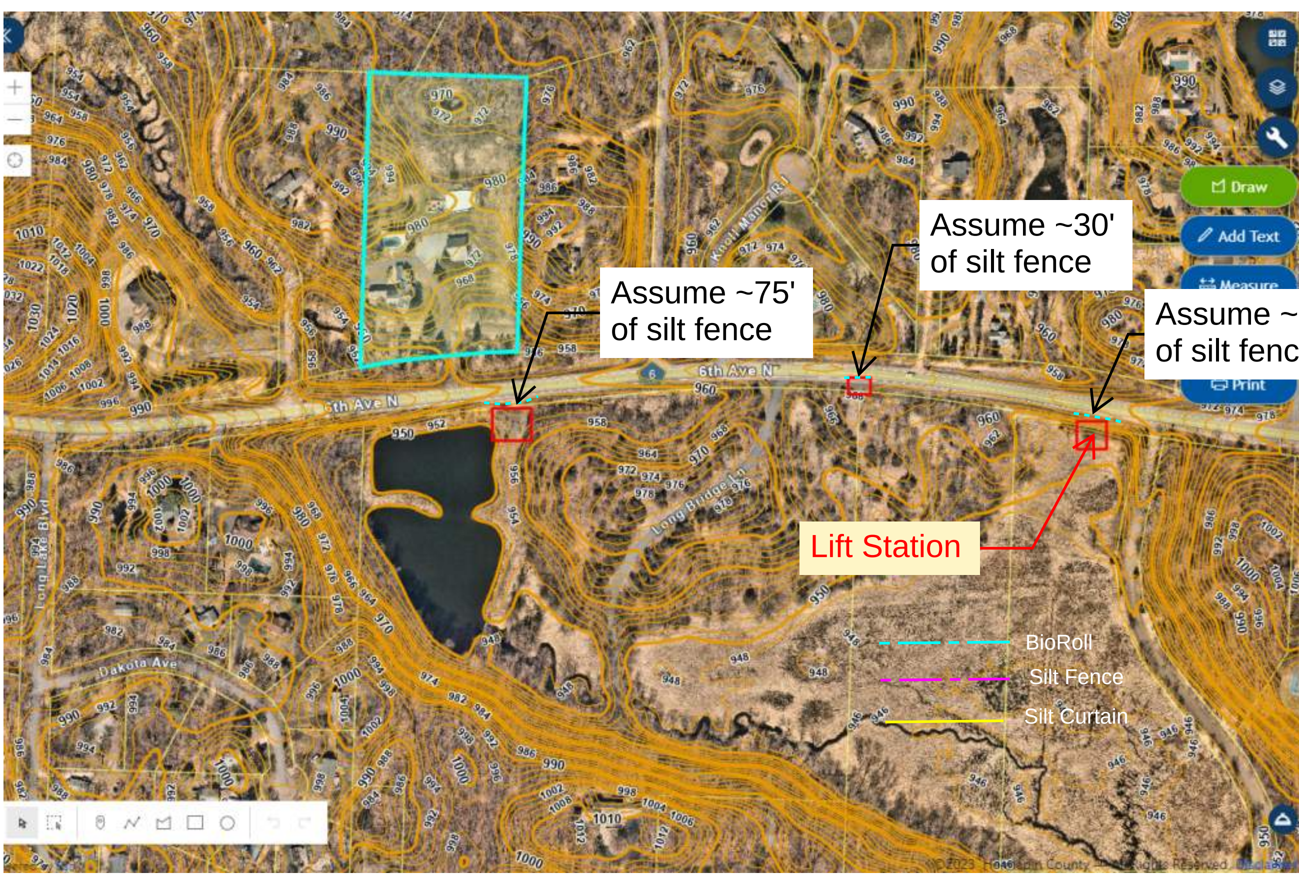
OPTION 5: Alum Dosing Station



OPTION 5: Alum Dosing Station



Lift station structure, pumps and valve vault - lump sum
Lift station control panel - lump sum
6" HDPE forcemain (directionally drilled) - 1260 LF
Middle disturbance is 20'x20'
End impacts are 50'x50'
Include 60' of 15" rcp culvert at field entrance



OPINION OF PROBABLE COST
Minnehaha Creek Watershed District (MCWD)
County Road 6 Pond - Retrofit Study
227706022
CONCEPT DESIGN - Gravity Sand Filter Bench
June 13th, 2023

NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
BASE BID SCHEDULE					
1	MOBILIZATION	LUMP SUM	1	$ 19,000.00	$ 19,000.00
2	TRAFFIC CONTROL	LUMP SUM	1	$ 4,000.00	$ 4,000.00
3	CLEARING AND GRUBBING	TREE	10	$ 800.00	$ 8,000.00
4	CONSTRUCTION ENTRANCE	LUMP SUM	1	$ 5,000.00	$ 5,000.00
5	INLET PROTECTION	EACH	0	$ 300.00	$ -
6	FLOTATION SILT CURTAIN	LIN FT	320	$ 40.00	$ 12,800.00
5	SEDIMENT CONTROL LOG TYPE STRAW (OR BIOROLL)	LIN FT	910	$ 5.00	$ 4,550.00
7	SILT FENCE - MAINTAINED	LIN FT	250	$ 5.00	$ 1,250.00
9	TEMPORARY SEED MIX (MnDOT 21-111 OATS COVER CROP)	SQ YD	490	$ 0.30	$ 147.00
10	PERMANENT SEED MIX (MnDOT 33-261 STORMWATER SOUTHWEST MIX)	SQ YD	490	$ 0.50	$ 245.00
11	CATEGORY 3N TYPE 2S EROSION CONTROL BLANKET	SQ YD	490	$ 2.00	$ 980.00
12	DEWATERING AND TEMPORARY STORMWATER MANAGEMENT	LUMP SUM	1	$ 45,000.00	$ 45,000.00
13	COMMON EXCAVATION AND OFFSITE DISPOSAL (P) (CV)	CU YD	80	$ 30.00	$ 2,400.00
11	COMMON EXCAVATION - ONSITE (P) (CV)	CU YD	1310	$ 25.00	$ 32,750.00
12	TOPSOIL BORROW (CV)	CU YD	0	$ 45.00	$ -
13	COMMON BORROW - IMPORT (CV)	CU YD	2550	$ 30.00	$ 76,500.00
14	GEOTEXTILE FABRIC TYPE 4 NON-WOVEN	SQ YD	570	$ 5.00	$ 2,850.00
15	FINE FILTER AGGREGATE	CU YD	780	$ 100.00	$ 78,000.00
16	MEDIUM FILTER AGGREGATE	CU YD	130	$ 75.00	$ 9,750.00
17	COARSE AGGREGATE	CU YD	390	$ 85.00	$ 33,150.00
18	6" DRAINTILE	LIN FT	1340	$ 30.00	$ 40,200.00
19	10" PVC PIPE	LIN FT	120	$ 60.00	$ 7,200.00
20	6" PVC CLEANOUT	EACH	13	$ 600.00	$ 7,800.00
21	10" PVC CLEANOUT	EACH	1	$ 1,500.00	$ 1,500.00
	SUBTOTAL				$ 393,080.00
	[30%] CONTINGENCY				$ 117,930.00
	TOTAL CONSTRUCTION COST				$ 511,010.00
	30% LEGAL, ENGINEERING, ADMIN, FINANCE				$ 153,310.00
	TOTAL PROJECT COSTS				$ 664,320.00

OPINION OF PROBABLE COST
Minnehaha Creek Watershed District (MCWD)
County Road 6 Pond - Retrofit Study
227706022
CONCEPT DESIGN - Sheet Pile Weir
June 13th, 2023

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NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
BASE BID SCHEDULE					
1	MOBILIZATION	LUMP SUM	1	$ 27,000.00	$ 27,000.00
2	TRAFFIC CONTROL	LUMP SUM	1	$ 6,000.00	$ 6,000.00
3	CLEARING AND GRUBBING	TREE	3	$ 800.00	$ 2,400.00
4	CONSTRUCTION ENTRANCE	LUMP SUM	1	$ 5,000.00	$ 5,000.00
5	INLET PROTECTION	EACH	0	$ 300.00	$ -
6	FLOTATION SILT CURTAIN	LIN FT	290	$ 40.00	$ 11,600.00
5	SEDIMENT CONTROL LOG TYPE STRAW (OR BIOROLL)	LIN FT	570	$ 5.00	$ 2,850.00
7	SILT FENCE - MAINTAINED	LIN FT	180	$ 5.00	$ 900.00
9	TEMPORARY SEED MIX (MnDOT 21-111 OATS COVER CROP)	SQ YD	230	$ 0.30	$ 69.00
10	PERMANENT SEED MIX (MnDOT 33-261 STORMWATER SOUTHWEST MIX)	SQ YD	230	$ 0.50	$ 115.00
11	CATEGORY 3N TYPE 2S EROSION CONTROL BLANKET	SQ YD	230	$ 2.00	$ 460.00
12	DEWATERING AND TEMPORARY STORMWATER MANAGEMENT	LUMP SUM	1	$ 45,000.00	$ 45,000.00
13	COMMON EXCAVATION AND OFFSITE DISPOSAL (P) (CV)	CU YD	0	$ 30.00	$ -
14	COMMON BORROW - IMPORT (CV)	CU YD	0	$ 30.00	$ -
15	SHEET PILE WEIR (304')	SQ FT	3040	$ 150.00	$ 456,000.00
16	RANDOM RIPRAP CLASS III	CU YD	60	$ 140.00	$ 8,400.00
	SUBTOTAL				$ 565,800.00
	[30%] CONTINGENCY				$ 169,740.00
	TOTAL CONSTRUCTION COST				$ 735,540.00
	30% LEGAL, ENGINEERING, ADMIN, FINANCE				$ 220,670.00
	TOTAL PROJECT COSTS				$ 956,210.00

OPINION OF PROBABLE COST
Minnehaha Creek Watershed District (MCWD)
County Road 6 Pond - Retrofit Study
227706022
CONCEPT DESIGN - Earthen Berm
June 13th, 2023

NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
BASE BID SCHEDULE					
1	MOBILIZATION	LUMP SUM	1	$ 25,000.00	$ 25,000.00
2	TRAFFIC CONTROL	LUMP SUM	1	$ 5,000.00	$ 5,000.00
3	CLEARING AND GRUBBING	TREE	3	$ 800.00	$ 2,400.00
4	CONSTRUCTION ENTRANCE	LUMP SUM	1	$ 5,000.00	$ 5,000.00
5	INLET PROTECTION	EACH	0	$ 300.00	$ -
6	FLOTATION SILT CURTAIN	LIN FT	290	$ 40.00	$ 11,600.00
5	SEDIMENT CONTROL LOG TYPE STRAW (OR BIOROLL)	LIN FT	570	$ 5.00	$ 2,850.00
7	SILT FENCE - MAINTAINED	LIN FT	180	$ 5.00	$ 900.00
9	TEMPORARY SEED MIX (MnDOT 21-111 OATS COVER CROP)	SQ YD	230	$ 0.30	$ 69.00
10	PERMANENT SEED MIX (MnDOT 33-261 STORMWATER SOUTHWEST MIX)	SQ YD	230	$ 0.50	$ 115.00
11	CATEGORY 3N TYPE 2S EROSION CONTROL BLANKET	SQ YD	230	$ 2.00	$ 460.00
12	DEWATERING AND TEMPORARY STORMWATER MANAGEMENT	LUMP SUM	1	$ 45,000.00	$ 45,000.00
13	COMMON EXCAVATION AND OFFSITE DISPOSAL (P) (CV)	CU YD	0	$ 30.00	$ -
14	COMMON EXCAVATION-ONSITE (P) (CV)	CU YD	0	$ 25.00	$ -
15	COMMON BORROW - IMPORT (CV)	CU YD	630	$ 30.00	$ 18,900.00
16	TURF REINFORCEMENT MAT (MNDOT CAT 76, GRASS PAVE 2)	SQ YD	100	$ 45.00	$ 4,500.00
	SUBTOTAL				$ 121,800.00
	[30%] CONTINGENCY				$ 36,540.00
	TOTAL CONSTRUCTION COST				$ 158,340.00
	30% LEGAL, ENGINEERING, ADMIN, FINANCE				$ 47,510.00
	TOTAL PROJECT COSTS				$ 205,850.00

OPINION OF PROBABLE COST
Minnehaha Creek Watershed District (MCWD)
County Road 6 Pond - Retrofit Study
227706022
CONCEPT DESIGN - Pumped Sand Filter Bench w/ and w/o real time sensor
June 13th, 2023

NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
BASE BID SCHEDULE					
1	MOBILIZATION	LUMP SUM	1	$ 29,000.00	$ 29,000.00
2	TRAFFIC CONTROL	LUMP SUM	1	$ 6,000.00	$ 6,000.00
3	CLEARING AND GRUBBING	TREE	10	$ 800.00	$ 8,000.00
4	CONSTRUCTION ENTRANCE	LUMP SUM	1	$ 5,000.00	$ 5,000.00
5	INLET PROTECTION	EACH	0	$ 300.00	$ -
6	FLOTATION SILT CURTAIN	LIN FT	320	$ 40.00	$ 12,800.00
5	SEDIMENT CONTROL LOG TYPE STRAW (OR BIOROLL)	LIN FT	910	$ 5.00	$ 4,550.00
7	SILT FENCE - MAINTAINED	LIN FT	250	$ 5.00	$ 1,250.00
9	TEMPORARY SEED MIX (MnDOT 21-111 OATS COVER CROP)	SQ YD	490	$ 0.30	$ 147.00
10	PERMANENT SEED MIX (MnDOT 33-261 STORMWATER SOUTHWEST MIX)	SQ YD	490	$ 0.50	$ 245.00
11	CATEGORY 3N TYPE 2S EROSION CONTROL BLANKET	SQ YD	490	$ 2.00	$ 980.00
12	DEWATERING AND TEMPORARY STORMWATER MANAGEMENT	LUMP SUM	1	$ 45,000.00	$ 45,000.00
13	COMMON EXCAVATION AND OFFSITE DISPOSAL (P) (CV)	CU YD	90	$ 30.00	$ 2,700.00
11	COMMON EXCAVATION - ONSITE (P) (CV)	CU YD	1680	$ 25.00	$ 42,000.00
12	TOPSOIL BORROW (CV)	CU YD	0	$ 45.00	$ -
13	COMMON BORROW - IMPORT (CV)	CU YD	2340	$ 30.00	$ 70,200.00
14	GEOTEXTILE FABRIC TYPE 4 NON-WOVEN	SQ YD	580	$ 5.00	$ 2,900.00
15	FINE FILTER AGGREGATE	CU YD	1170	$ 100.00	$ 117,000.00
16	MEDIUM FILTER AGGREGATE	CU YD	130	$ 75.00	$ 9,750.00
17	COARSE AGGREGATE	CU YD	390	$ 85.00	$ 33,150.00
18	6" DRAINTILE	LIN FT	1340	$ 35.00	$ 46,900.00
19	10" PVC PIPE	LIN FT	120	$ 60.00	$ 7,200.00
20	6" PVC CLEANOUT	EACH	13	$ 600.00	$ 7,800.00
21	10" PVC CLEANOUT	EACH	1	$ 1,500.00	$ 1,500.00
22	6" PVC PIPE	LIN FT	310	$ 40.00	$ 12,400.00
23	SUBMERSIBLE PUMP WITH CONTROLS	EACH	1	$ 80,000.00	$ 80,000.00
24	ELECTRICAL SERVICE	LIN FT	500	$ 100.00	$ 22,000.00
25	PUMP MANHOLE STRUCTURE (5' DIAMETER)	EACH	1	$ 30,000.00	$ 30,000.00
	SUBTOTAL				$ 598,480.00
	[30%] CONTINGENCY				$ 179,550.00
	TOTAL CONSTRUCTION COST				$ 778,030.00
	30% LEGAL, ENGINEERING, ADMIN, FINANCE				$ 233,410.00
	TOTAL PROJECT COSTS				$ 1,011,440.00

NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
ALTERNATE BID SCHEDULE					
A.1	OPTI RTC SYSTEM	EACH	1.00	$ 200,000.00	$ 200,000.00
	SUBTOTAL				$ 200,000.00
	[30%] CONTINGENCY				$ 60,000.00
	TOTAL CONSTRUCTION COST				$ 260,000.00
	30% LEGAL, ENGINEERING, ADMIN, FINANCE				$ 78,000.00
	TOTAL ALTERNATE BID				$ 338,000.00

	TOTAL BASE + ALTERNATE BID	$ 1,349,440.00

OPINION OF PROBABLE COST
Minnehaha Creek Watershed District (MCWD)
County Road 6 Pond - Retrofit Study
227706022
CONCEPT DESIGN - Alum Dosing w/ Interception of Golf Course Load
June 13th, 2023

NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
BASE BID SCHEDULE					
1	MOBILIZATION	LUMP SUM	1	$ 102,000.00	$ 102,000.00
2	TRAFFIC CONTROL	LUMP SUM	1	$ 21,000.00	$ 21,000.00
3	CLEARING AND GRUBBING	TREE	3	$ 800.00	$ 2,400.00
4	CONSTRUCTION ENTRANCE	LUMP SUM	1	$ 5,000.00	$ 5,000.00
5	INLET PROTECTION	EACH	0	$ 300.00	$ -
6	FLOTATION SILT CURTAIN	LIN FT	290	$ 40.00	$ 11,600.00
5	SEDIMENT CONTROL LOG TYPE STRAW (OR BIOROLL)	LIN FT	570	$ 5.00	$ 2,850.00
7	SILT FENCE - MAINTAINED	LIN FT	180	$ 5.00	$ 900.00
9	TEMPORARY SEED MIX (MnDOT 21-111 OATS COVER CROP)	SQ YD	430	$ 0.30	$ 129.00
10	PERMANENT SEED MIX (MnDOT 33-261 STORMWATER SOUTHWEST MIX)	SQ YD	430	$ 0.50	$ 215.00
11	CATEGORY 3N TYPE 2S EROSION CONTROL BLANKET	SQ YD	430	$ 2.00	$ 860.00
12	DEWATERING AND TEMPORARY STORMWATER MANAGEMENT	LUMP SUM	1	$ 45,000.00	$ 45,000.00
13	COMMON EXCAVATION AND OFFSITE DISPOSAL (P) (CV)	CU YD	0	$ 30.00	$ -
14	COMMON BORROW - IMPORT (CV)	CU YD	430	$ 30.00	$ 12,900.00
15	SHEET PILE WEIR (75')	SQ FT	850	$ 150.00	$ 127,500.00
16	RANDOM RIPRAP CLASS III	CU YD	30	$ 140.00	$ 4,200.00
17	ELECTRICAL SERVICE	LIN FT	220	$ 100.00	$ 22,000.00
18	LIFT STATION - STRUCTURE, PUMPS, AND VALVE VAULT	LUMP SUM	1	$ 160,000.00	$ 160,000.00
19	LIFT STATION CONTROL PANEL	LUMP SUM	1	$ 40,000.00	$ 40,000.00
20	6" HDPE FORCEMAIN (DIRECTIONALLY DIRLLED)	LIN FT	1260	$ 65.00	$ 81,900.00
21	18" CM PIPE CULVERT	LIN FT	60	$ 100.00	$ 6,000.00
22	ALUM DOSING FACILITY	LUMP SUM	1	$ 1,500,000.00	$ 1,500,000.00
	SUBTOTAL				$ 2,146,460.00
	[30%] CONTINGENCY				$ 643,940.00
	TOTAL CONSTRUCTION COST				$ 2,790,400.00
	30% LEGAL, ENGINEERING, ADMIN, FINANCE				$ 837,120.00
	TOTAL PROJECT COSTS				$ 3,627,520.00

Assumptions for All Alternatives

- **Mobilization** was assumed to be 5% of the subtotal, with the subtotal excluding traffic control and mobilization.
- **Traffic Control** was assumed to be 1% of the subtotal because the access road to the site already exists, with the subtotal excluding traffic control and mobilization.
- **Contingency** was assumed to be 30% of the subtotal, with the subtotal including traffic control and mobilization.
- **Legal, Engineering, Admin & Finance** were lumped together and assumed to be 30% of the subtotal, with the subtotal including traffic control, mobilization, and contingency.
- **Clearing and Grubbing** was estimated based on the number of trees to be removed for access and construction. Aerial imagery and Google Earth were used to roughly estimate the number of trees to be removed. The number of trees to be removed varies across alternatives.
- **Dewatering** was assumed to be able to construct within the pond and the lump sum cost was based on dewatering for similar ponds. Extent or purpose of dewatering is variable across alternatives but a constant value was assumed.

1) Gravity Filter Sand Bench

- **Erosion Control**
    - One construction entrance was assumed at the site entrance to prevent track out. The lump sum cost was based on construction entrances for similar projects.
    - Inlet protection was not included in the cost estimate because no catch basins were seen in the aerial imagery along County Rd 6 near the site.
    - One row of silt curtain was assumed to be installed along the berm that borders the filter.
    - Two rows of bio roll along the access road to protect the water body and one row of bio roll the perimeter of the filter along the bank. It was assumed two rows of bio roll were required to protect the water body.
    - Two rows of silt fence were assumed to be installed along the south end of the filter, extending from the edge of the pond to the easement boundary. It was assumed two rows of silt fence were required to protect the water body.
- **Restoration**
    - Temporary and permanent seed were assumed to cover the access road and the excavation limits of the outlet pipe south of the filter. Erosion control blanket was also assumed to cover these areas.
- **Excavation**
    - Total excavation volume was calculated from the filter volume excavated from the bank and the volume excavated to install the outlet pipe south of the filter. No contamination was assumed.
    - The backfill required onsite was assumed to be the backfill required to construct the berm bordering the filter. The excavated backfill volume to be disposed off-site was calculated from the difference between the excavation volume and the backfill required onsite.

- The common borrow volume was calculated from the clay required to construct the berm bordering the filter and the clay required to fill the shelf underneath the filter. The shelf was assumed to be necessary because the filter will extend outward into the pond but does not extend to the bottom of the pond.

- **Filter**
  - Assuming the bottom of the filter will be sloped at 0.5%, the depth of fine aggregate in the filter would range from 1 ft to 2 ft. To calculate the volume of fine aggregate required, the filter footprint area of 14,000 sf was multiplied by an average fine aggregate depth of 1.5 ft. To calculate the volume of medium aggregate and the volume of coarse aggregate required, the filter footprint area was multiplied by the medium aggregate depth of 0.25 ft and the coarse aggregate depth of 0.75 ft, respectively.
  - Geotextile fabric was assumed to cover the bottom of the filter, assumed to be 14,000 sf, and the sides of the filter, assumed to be an average of total depth of 2.5 ft around a 508 ft perimeter.
- **Pipes**
  - 6 in PVC drain tile was assumed to run north to south along the filter footprint. Each run was spaced approximately 10 ft apart. A 6 in PVC cleanout was assumed to be installed at the upstream end of every pipe run and spaced every 100 ft from the downstream end for pipes greater than 150 ft long.
  - One 10 in PVC cross pipe was assumed across the maximum width of the filter, plus an additional 10 in PVC pipe as an outlet pipe. The outlet pipe was assumed to extend from the south end of the filter to the stream. One 10 in PVC cleanout was assumed to be installed at the upstream end of the 10 in cross pipe.
- **Operations & Maintenance**
  - Filter media was assumed to be replaced once every 10 years. The cost of replacement was estimated to be $200,000 based on filter media replacement for similar projects.

2a) Sheet Pile Weir Across the Existing Berm

- **Erosion Control**
  - One construction entrance was assumed at the site entrance to prevent track out. The lump sum cost was based on construction entrances for similar projects.
  - Inlet protection was not included in the cost estimate because no catch basins were seen in the aerial imagery along County Rd 6 near the site.
  - One row of silt curtain was assumed to be installed along the south side of the existing berm.
  - Two rows of bio roll were assumed to be installed along the access road and two rows of bio roll were assumed to be installed along south side of the eastern end of the existing berm. It was assumed two rows of bio roll were required to protect the water body.
  - Two rows of silt fence were assumed to be installed along the north and south side of the western end of the existing berm. It was assumed two rows of silt fence were required to protect the water body.
- **Restoration**
  - Temporary and permanent seed were assumed to cover the access road. Erosion control blanket was also assumed to cover these areas.

- **Excavation**
  - Total excavation volume was assumed to be zero because it was assumed that no additional excavation would be needed to construct the weir.
  - The common and topsoil borrow volumes were assumed to be zero because it was assumed that the sheet pile weir would extend across the entire length of the berm.
- **Weir**
  - Sheet pile was assumed to extend an average of 10 ft down across the entire length of the berm.
  - Rip rap was assumed to fill 3' outward from the south side of the sheet pile weir across the entire length of the sheet pile. The area of the sheet pile weir covered by rip rap was assumed to the area of the sheet pile weir exposed above ground.
- **Operations & Maintenance**
  - No operations and maintenance costs were assumed.

2b) Earthen Embankment

- **Erosion Control**
  - One construction entrance was assumed at the site entrance to prevent track out. The lump sum cost was based on construction entrances for similar projects.
  - Inlet protection was not included in the cost estimate because no catch basins were seen in the aerial imagery along County Rd 6 near the site.
  - One row of silt curtain was assumed to be installed along the south side of the existing berm.
  - Two rows of bio roll were assumed to be installed along the access road and two rows of bio roll were assumed to be installed along south side of the eastern end of the existing berm. It was assumed two rows of bio roll were required to protect the water body.
  - Two rows of silt fence were assumed to be installed along the north and south side of the western end of the existing berm. It was assumed two rows of silt fence were required to protect the water body.
- **Restoration**
  - Temporary and permanent seed were assumed to cover the access road. Erosion control blanket was also assumed to cover these areas.
- **Excavation**
  - Total excavation volume was assumed to be zero because it was assumed that no additional excavation would be needed to construct the earthen embankment.
  - The topsoil borrow volume was assumed to zero because it was assumed that the earthen embankment would be constructed entirely of common borrow.
- **Earthen Embankment**
  - Common borrow was assumed to fill from the existing ground elevation to the proposed top of embankment elevation. The common borrow fill was assumed to be an average width of 35 ft, based on the average width of the existing berm, and extend along the entire length of the existing berm.
  - Turf reinforcement mat was assumed across the notch of the earthen embankment, plus an additional 5 ft at each end of the notch. The width of the turf reinforcement mat was assumed to match the 35 ft average width of the existing berm.

- **Operations & Maintenance**
  - No operations and maintenance costs were assumed.

3) Pump and Filter

- **Erosion Control**
  - One construction entrance was assumed at the site entrance to prevent track out. The lump sum cost was based on construction entrances for similar projects.
  - Inlet protection was not included in the cost estimate because no catch basins were seen in the aerial imagery along County Rd 6 near the site.
  - One row of silt curtain was assumed to be installed along the berm that borders the filter.
  - Two rows of bio roll along the access road to protect the water body and one row of bio roll the perimeter of the filter along the bank. It was assumed two rows of bio roll were required to protect the water body.
  - Two rows of silt fence were assumed to be installed along the south end of the filter, extending from the edge of the pond to the easement boundary. It was assumed two rows of silt fence were required to protect the water body.
- **Restoration**
  - Temporary and permanent seed were assumed to cover the access road and the excavation limits of the outlet pipe south of the filter. Erosion control blanket was also assumed to cover these areas.
- **Excavation**
  - Temporary and permanent seed were assumed to cover the access road and the excavation limits of the outlet pipe south of the filter. Erosion control blanket was also assumed to cover these areas.
  - The backfill required onsite was assumed to be the backfill required to construct the berm bordering the filter. The excavated backfill volume to be disposed off-site was calculated from the difference between the excavation volume and the backfill required onsite.
  - The common borrow volume was calculated from the clay required to construct the berm bordering the filter and the clay required to fill the shelf underneath the filter. The shelf was assumed to be necessary because the filter will extend outward into the pond but does not extend to the bottom of the pond.
- **Filter**
  - Assuming the bottom of the filter will be sloped at 1.4%, the depth of fine aggregate in the filter would range from 1 ft to 3.5 ft. To calculate the volume of fine aggregate required, the filter footprint area of 14,000 sf was multiplied by an average fine aggregate depth of 2.25 ft. To calculate the volume of medium aggregate and the volume of coarse aggregate required, the filter footprint area was multiplied by the medium aggregate depth of 0.25 ft and the coarse aggregate depth of 0.75 ft, respectively.

  - Geotextile fabric was assumed to cover the bottom of the filter, assumed to be 14,000 sf, and the sides of the filter, assumed to be an average of total depth of 3.25 ft around a 508 ft perimeter.
- **Pipes**
  - 6 in PVC drain tile was assumed to run north to south along the filter footprint. Each run was spaced approximately 10 ft apart. A 6 in PVC cleanout was assumed to be installed at the upstream end of every pipe run and spaced every 100 ft from the downstream end for pipes greater than 150 ft long.
  - One 10 in PVC cross pipe was assumed across the maximum width of the filter, plus an additional 10 in PVC pipe as an outlet pipe. The outlet pipe was assumed to extend from the south end of the filter to the stream. One 10 in PVC cleanout was assumed to be installed at the upstream end of the 10 in cross pipe.
- **Pump System**
  - The cost for a submersible pump with controls was based on pump costs for similar projects.
  - The manhole structure for the pump was assumed to be 5 ft diameter.
  - The electrical service was assumed to run from the access road entrance, along the access road, and connect to the pump, located at the berm north of the filter.
  - It was assumed one main 6 in PVC header pipe would extend from the pump to the south end of the filter. It was assumed 6 in diameter, 5 ft long stubs would be placed every 20 ft along the main header pipe. The inlet pipe for the pump to draw water from the pond was assumed to be 6 in PVC with a length of 40 ft.
- **Operations & Maintenance**
  - Filter media was assumed to be replaced once every 10 years. The cost of replacement was estimated to be $200,000 based on filter media replacement for similar projects.
  - Pump was assumed to be replaced every 10 years. The cost of replacement was estimated to be $100,000 based on pump replacement for similar projects.

4) Pump and Filter with Real Time Sensor

- **Erosion Control**
  - One construction entrance was assumed at the site entrance to prevent track out. The lump sum cost was based on construction entrances for similar projects.
  - Inlet protection was not included in the cost estimate because no catch basins were seen in the aerial imagery along County Rd 6 near the site.
  - One row of silt curtain was assumed to be installed along the berm that borders the filter.
  - Two rows of bio roll along the access road to protect the water body and one row of bio roll the perimeter of the filter along the bank. It was assumed two rows of bio roll were required to protect the water body.
  - Two rows of silt fence were assumed to be installed along the south end of the filter, extending from the edge of the pond to the easement boundary. It was assumed two rows of silt fence were required to protect the water body.

- **Restoration**
  - Temporary and permanent seed were assumed to cover the access road and the excavation limits of the outlet pipe south of the filter. Erosion control blanket was also assumed to cover these areas.
- **Excavation**
  - Temporary and permanent seed were assumed to cover the access road and the excavation limits of the outlet pipe south of the filter. Erosion control blanket was also assumed to cover these areas.
  - The backfill required onsite was assumed to be the backfill required to construct the berm bordering the filter. The excavated backfill volume to be disposed off-site was calculated from the difference between the excavation volume and the backfill required onsite.
  - The common borrow volume was calculated from the clay required to construct the berm bordering the filter and the clay required to fill the shelf underneath the filter. The shelf was assumed to be necessary because the filter will extend outward into the pond but does not extend to the bottom of the pond.
- **Filter**
  - Assuming the bottom of the filter will be sloped at 1.4%, the depth of fine aggregate in the filter would range from 1 ft to 3.5 ft. To calculate the volume of fine aggregate required, the filter footprint area of 14,000 sf was multiplied by an average fine aggregate depth of 2.25 ft. To calculate the volume of medium aggregate and the volume of coarse aggregate required, the filter footprint area was multiplied by the medium aggregate depth of 0.25 ft and the coarse aggregate depth of 0.75 ft, respectively.
  - Geotextile fabric was assumed to cover the bottom of the filter, assumed to be 14,000 sf, and the sides of the filter, assumed to be an average of total depth of 3.25 ft around a 508 ft perimeter.
- **Pipes**
  - 6 in PVC drain tile was assumed to run north to south along the filter footprint. Each run was spaced approximately 10 ft apart. A 6 in PVC cleanout was assumed to be installed at the upstream end of every pipe run and spaced every 100 ft from the downstream end for pipes greater than 150 ft long.
  - One 10 in PVC cross pipe was assumed across the maximum width of the filter, plus an additional 10 in PVC pipe as an outlet pipe. The outlet pipe was assumed to extend from the south end of the filter to the stream. One 10 in PVC cleanout was assumed to be installed at the upstream end of the 10 in cross pipe.
- **Pump System**
  - The cost for a submersible pump with controls was based on pump costs for similar projects. An additional cost of $200,000 was assumed for the real time sensor, such as an OptiRTC system.
  - The manhole structure for the pump was assumed to be 5 ft diameter.
  - The electrical service was assumed to run from the access road entrance, along the access road, and connect to the pump, located at the berm north of the filter.

- It was assumed one main 6 in PVC header pipe would extend from the pump to the south end of the filter. It was assumed 6 in diameter, 5 ft long stubs would be placed every 20 ft along the main header pipe. The inlet pipe for the pump to draw water from the pond was assumed to be 6 in PVC with a length of 40 ft.

- **Operations & Maintenance**
  - Filter media was assumed to be replaced once every 10 years. The cost of replacement was estimated to be $200,000 based on filter media replacement for similar projects.
  - Pump was assumed to be replaced every 10 years. The cost of replacement was estimated to be $100,000 based on pump replacement for similar projects. Real time sensor, such as OptiRTC, maintenance was assumed to occur every 10 years at a cost of $30,000.

5) Alum Dosing Facility

- **Erosion Control**
  - One construction entrance was assumed at the site entrance to prevent track out. The lump sum cost was based on construction entrances for similar projects.
  - Inlet protection was not included in the cost estimate because no catch basins were seen in the aerial imagery along County Rd 6 near the site.
  - One row of silt curtain was assumed to be installed along the south side of the existing berm.
  - Two rows of bio roll were assumed to be installed along the access road and two rows of bio roll were assumed to be installed along south side of the eastern end of the existing berm. It was assumed two rows of bio roll were required to protect the water body. One row of bio roll was assumed to be installed on the down gradient side of each drilling disturbance area.
  - Two rows of silt fence were assumed to be installed along the north and south side of the western end of the existing berm. It was assumed two rows of silt fence were required to protect the water body.
- **Restoration**
  - Temporary and permanent seed were assumed to cover the access road, as well as the one middle and two end drilling disturbances. The middle drill disturbance was assumed to be 20 ft by 20 ft and the two end disturbances were assumed to be 50 ft by 50 ft each. Erosion control blanket was also assumed to cover these areas.
- **Excavation**
  - Total excavation volume was assumed to be zero because it was assumed that no additional excavation would be needed to construct the earthen embankment.
  - The topsoil borrow volume was assumed to zero because it was assumed that the earthen portion of weird would be constructed entirely of common borrow.
- **Weir**
  - Sheet pile was assumed to extend an average of 10 ft down across the notch of the weir, plus an additional 5 ft at each end of the notch.
  - Common borrow was assumed to fill from the existing ground elevation to the proposed top of embankment elevation. The common borrow fill was assumed to be an average width of 35 ft, based on the average width of the existing berm, and extend from each

end of the sheet pile notch to the western and eastern ends of the existing berm, respectively.
    - Rip rap was assumed to fill 3' outward from the south side of the sheet pile notch across the length of the sheet pile notch. The area of the sheet pile notch covered by rip rap was assumed to the area of the sheet pile notch exposed above ground.
- **Lift Station & Force Main**
    - The assumed cost for the lift station cost included the cost of the structure, pumps and valve vault. The lump sum cost was based on lift station costs for similar projects.
    - The lift station control panel was considered separately. The lump sum cost was based on lift station control panel costs for similar projects.
    - Force main connecting the lift station to the pond was assumed to run from the lift station to the northeast corner of the pond, a total distance of 1,260 ft. Force main was assumed to be 6 in HDPE and directionally drilled.
    - One 18 in corrugated metal pipe culvert was assumed to be installed under the entrance to the access road. The culvert was assumed to be 60 ft long based on the 1997 plan set.
- **Alum Dosing Facility**
    - The electrical service was assumed to run from the access road entrance, along the access road, and to the alum dosing facility, located at the eastern end of the berm.
    - The assumed cost of the alum dosing facility included the cost of the structure and all internal components. The lump sum cost was based on a similar 1997 project, Tanners Lake Alum Treatment Facility. The costs from the 1997 project were projected to present-day costs.
- **Operations & Maintenance**
    - Maintenance costs for the alum dosing facility was assumed to be $30,000 each year based on the present-day maintenance costs for the Tanners Lake Alum Treatment Facility.
    - Pump was assumed to be replaced every 10 years. The cost of replacement was estimated to be $60,000 based on pump replacement for similar projects.

Attachment B: Resolution of Support for the Long Lake Creek Subwatershed Partnership and the County Road 6 Pond Retrofit Project

CITY OF ORONO

RESOLUTION OF THE CITY COUNCIL

NO. 7453

RESOLUTION OF SUPPORT FOR THE LONG LAKE CREEK SUBWATERSHED PARTNERSHIP AND THE COUNTY ROAD 6 POND RETROFIT PROJECT

WHEREAS, in 2014, the Minnesota Pollution Control Agency (MPCA) completed a Total Maximum Daily Load (TMDL) Study, which established nutrient budgets for impaired water bodies in the Long Lake Creek Subwatershed, which includes five impaired lakes within the cities of Orono, Long Lake, and Medina; and

WHEREAS, TMDL allocations have been established and the city of Orono, like other parties, is required to show progress towards meeting the established TMDL allocation; and

WHEREAS, in April 2016, the city of Orono passed a resolution to partner with other intergovernmental agencies to pursue grants to improve water quality in the Long Lake Creek Subwatershed, recognizing that pursuing grants and work in partnership would result in more organized and effective efforts; and

WHEREAS, in 2018, with support from this partnership, the Minnehaha Creek Watershed District (MCWD) obtained state grant funding and led a subwatershed assessment to provide a scientific understanding of the system as a whole, identify cost-effective projects and strategies, and develop an actionable roadmap for implementation; and

WHEREAS, in fall 2020, the MCWD presented the preliminary findings and recommendations from this assessment to the city councils of the three cities; and

WHEREAS, this work has now completed and resulted in what is formally referred to as the Long Lake Creek Roadmap (Roadmap); and

WHEREAS, the Roadmap identified 34 projects for advancement based on their cost-effectiveness and feasibility to implement. These projects were further categorized based on an implementation strategy, which includes (1) regional stormwater treatment, (2) landscape projects, and (3) internal load management; and

WHEREAS, the enhancement and addition of regional treatment is recommended as the first priority due to the ability to cost-effectively treat a large drainage area while localized projects are implemented over time; and

WHEREAS, the roadmap identified the County Road 6 Pond, located in the city of Orono on an easement already held by MCWD, as a regional stormwater opportunity that looks to retrofit the existing pond with a filter bench to enhance its performance (Project). The Project has since been

CITY OF ORONO
RESOLUTION OF THE CITY COUNCIL
NO. 7453

included in the MCWD's Capital Improvement Plan (CIP) and budget to reduce nutrient loading to Long Lake; and

WHEREAS, the MCWD commissioned a feasibility study, completed in September 2023, that has identified the addition of a gravity sand filter bench that is estimated to remove 67 pounds of phosphorus annually, in a cost-effective manner; and

WHEREAS, at the March 11, 2024 Council Meeting, the MCWD presented an overview of the partnership history, Roadmap, and proposed Project;

NOW, THEREFORE, BE IT RESOLVED that the City Council hereby accepts the Long Lake Creek Roadmap and supports the ongoing partnership with the MCWD and cities of Medina and Long Lake to advance efforts to improve water quality in the Long Lake Subwatershed; and

BE IT FURTHER RESOLVED that the City Council supports MCWD's plans to implement the County Road 6 Pond Retrofit project.

Adopted by the City Council of the City of Orono, Minnesota at a regular meeting held on March 11, 2024.

ATTEST:

Christine Lusian, City Clerk

Dennis Walsh, Mayor

Attachment C: Request for Proposals for Engineering and Design Services for the County Road 6 Pond Retrofit (DRAFT)

MINNEHAHA CREEK WATERSHED DISTRICT
QUALITY OF WATER QUALITY OF LIFE

REQUEST FOR PROPOSALS

Engineering for County Road 6 Pond Retrofit

835 Long Bridge Lane, Orono, MN 55356

PART 1: BACKGROUND AND PROJECT OVERVIEW

General

The Minnehaha Creek Watershed District (MCWD) is seeking a qualified consultant team to provide engineering design services for the County Road 6 Pond Retrofit (CR-6 pond), which is in the City of Orono and fully within a MCWD held easement. This project will involve design, permitting, cost analysis, plans and specifications, and construction oversight.

Retrofit options have been assessed through feasibility to evaluate potential for increasing the nutrient removal performance of the dual-celled pond. A combination of two design elements were determined to be the most cost-effective solution and are now being advanced into design. The design elements include a gravity sand filter bench and an earthen berm to further define the dual-celled pond.

MCWD will host an optional informational meeting for this RFP on Wednesday April 10, 2024, at 12:30 pm. The meeting will be held at the MCWD office at 15320 Minnetonka Blvd, Minnetonka, MN 55345. If virtual attendance is needed, please use the following meeting link: https://us06web.zoom.us/j/89923457086?pwd=3K2PXCPHI3SyOkyibMvbu6PtDAvpv1.1

You are encouraged to RSVP to Kailey Cermak, MCWD Planner-Project Manager. Any updates relating to the project will be published on the RFP webpage: (link)

Project Background

The CR-6 pond was originally constructed in 1998 to reduce sediment and nutrient loading to Long Lake. This regional stormwater pond captures the drainage from two northern tributaries, treating 3,370 acres of runoff (Exhibit 1). The dual-celled pond is approximately 2.5 acres in size and drains via a constructed weir (Exhibit 2). An easement, that encompasses the full pond footprint, was obtained to ensure long-term maintenance, monitoring, and/or retrofits to the pond could be conducted (Exhibit 3).

Recent water quality monitoring and sediment survey data shows that the CR-6 Pond has not been performing as effectively as originally designed. Despite its construction approximately 25-years ago, the most recent sediment survey indicates it is presently 16% full, suggesting a sediment accumulation rate of around 0.5% per year. Additionally, analysis of water quality sampling results indicates that, on average, the CR-6 pond is removing 30% of the incoming phosphorus load, with high concentrations of particulate phosphorus entering and exiting the system versus settling out. These datapoints underscore the necessity to assess the CR-6 pond for potential retrofit opportunities aimed at more effectively removing the fine particulate phosphorus.

The MCWD pursued feasibility in 2023 to evaluate retrofit opportunities. Project concepts explored through feasibility focused on maximizing particulate phosphorus removal, while maintaining the current easement footprint.

A combination of a gravity sand filter bench and an earthen berm, to further define the two cells of the pond, emerged as the most cost-effective solution. The earthen berm, constructed in conjunction with the gravity filter bench, provides a supplementary cost-effective solution for additional phosphorus reductions.

Project Elements

Work described in this RFP can be categorized into three distinct phases:

30-60-90% Design

The objective of the retrofit is to maximize the amount of water that can be treated through the filter (maximize phosphorus removal) while maintaining the current easement footprint and meeting regulatory requirements. The consultant will be tasked with developing and advancing design through 30-60-90% phases, collaborating and incorporating MCWD feedback, and assisting MCWD staff in obtaining required permits.

Final Plans and Bid Support

To prepare for retrofit construction, the Consultant will work to develop all required bid documentation, including plan drawings and specifications. This work also includes support through MCWD's open bid period and award recommendation.

Construction Oversight

The Consultant will provide construction oversight and management services, in collaboration with MCWD staff. This work will be funded separately and contracted for after final designs are approved and advanced into construction.

Project Team

Kailey Cermak
Planner-Project Manager, MCWD
kcermak@minnehahacreek.org
952-641-4501

PART 2: SCOPE OF SERVICES

The overall project cost, including design, capital project construction, and contingency, is estimated at $728,000. The CONSULTANT will work closely with MCWD staff to complete tasks 1-3 within a projected budget of $167,000.

The CONSULTANT is expected to complete 90% design by September 2, 2024 to allow for review and formal approval at the September 12, 2024 Board of Managers meeting. Approval of 90% design will allow the CONSULTANT to prepare final plans and assist MCWD in bidding the project in October 2024.

The scope of services for this work includes, but is not limited to, the tasks described as follows:

Task 1: 30-60-90% Design

Task 1a: 30% Design

The CONSULTANT will first work through data discovery to familiarize with available datasets, existing models, site constraints, and conduct a site visit with the project manager.

Secondly, the CONSULTANT will develop 30% plans following the design recommendations provided in the 2023 feasibility report. 30% design should consider the space necessary to install a pumped system, ensuring the orientation and placement of the gravity filter bench would allow space for this if a future retrofit is deemed appropriate. 30% design will be vetted by MCWD staff prior to advancing design.

Task 1b: 60% Design

The CONSULTANT will develop 60% plans based on MCWD feedback received during Task 1a. It's understood that to maximize treatment abilities of the filter, various elevations of the existing overflow weir, the filter bench, and berm will need to be explored. 60% plans will be vetted by District staff and the Board of Managers prior to advancing design.

Task 1c: Permitting Support

The CONSULTANT will assist staff by providing materials for all required permits, including permits required by the City, MCWD, DNR, and any other public agencies. Staff will lead in the preparation and submission of the permits, with the consultant supporting through the preparation of required exhibits and calculations. Early regulatory screening has indicated the potential for permits relating to (1) no-rise certification, (2) erosion control, (3) wetland protection, and (4) waterbody crossing.

Task 1d: 90% Design

The CONSULTANT will produce all elements standard to 90% design, including drawings, draft technical specifications (in accordance with MCWD's provided front end specifications template), an opinion of probable costs, and any other needed figures identified by the consultant and client. 90% Design should reflect and acknowledge all feedback obtained during Task 1b.

<u>Task 1 Deliverables:</u>

- Project kick-off meeting
- Design team site visit
- 30% design plans

- 60% design plans
- 90% design plans
- Attendance at up to two Board Meetings

Task 2: Final Plans and Bid Support

Task 2a: 100% Design Plans

The CONSULTANT will prepare plans and technical specifications, which include site plans and all other necessary details to construct the project. The final design will include engineering estimates to accompany the final project design. The CONSULTANT will further develop specification and bid documents for construction contracting using MCWD's draft front end templates for the bid packet. The CONSULTANT will coordinate with MCWD staff on the choice of standard contract documents and specifications to be used on conjunction with MCWD's template.

Task 2b: Bid Period Support

In addition to developing the bid packet, the CONSULTANT will provide support during project bidding. This will include participation at a pre-bid meeting, responding to requests for information from prospective contractors, attending the bid opening, reviewing bid responses, and making an award recommendation.

Task 2 Deliverables:

- Final design plans
- Bid documentation
- Attendance at three meetings

Task 3: Construction Oversight

The CONSULTANT will provide construction oversight and management services in partnership with MCWD staff, including construction administration and observation services. Required tasks will include participation in the pre-construction meeting, site staking, pay application review, submittal review, onsite construction observation of major tasks, responding to requests for information, providing post construction as-builts, and any other construction administration, oversight, and management activities deemed necessary to complete the project as designed.

The CONSULTANT should assume that MCWD will provide some routine on-site observation and will have ultimate approval authority. In preparing the response to the construction oversight task, the CONSULTANT should clearly state all assumptions, including estimated numbers for any tasks requiring the review of submittals, pay applications, etc.

This task will be funded separately from tasks 1 and 2 and is not included in the $167,000 design budget. This task will be negotiated and contracted once final plans and cost estimates have been established through design.

Task 3 Deliverables:

- Construction administration cost-estimate with identified assumptions

PART 3: INSTRUCTION TO PROPOSERS

Submittal Requirements

Responses to the RFP should be submitted via email to Kailey Cermak (kcermak@minnehahacreek.org) and Michael Hayman (mhayman@minnehahacreek.org) no later than 4:00 pm on Monday, April 22, 2024.

No page limit is imposed, however respondents will be evaluated on clarity and conciseness. Each proposal should include the following items:

1. Cover Letter – Please provide a primary point of contact through the transmission of a cover letter.
2. Project understanding – Describe your understanding of the scope of work, the approach to be taken, and your vision for the project. Identify any additional information the MCWD will need to supply or obtain to enhance your understanding of the project and successfully complete the work, and/or any issues you might anticipate in performing the work.
3. Approach and methodology – Provide a detailed description of your approach to the scope of work, including how you will coordinate with MCWD staff. Include a description of all anticipated tasks and deliverables, and any supplemental tasks not described in the RFP. The proposal should include a spreadsheet showing tasks, project team members, and associated estimated hours. The proposal should also include a schedule of milestones identified in this RFP and by the proposer, and a cost proposal showing sub-task level detail. Include major assumptions impacting cost and time allocation with associated rates.
4. Qualifications and experience – Provide an overview of the firm(s) and project team member's qualifications. Include descriptions of projects undertaken by the firm(s) and team members similar in nature to the one being proposed. Speak to the team's ability to deliver the project on time and on budget.
5. References – Provide three recent references for your proposed principal team members, including names, addresses, and phone numbers.
6. District Resources – Include a list of resources, expectations, or requirements which the consultant expects from the MCWD in order to complete the project as proposed.
7. Subcontracting – If the consultant intends to use any subcontracting, identify and describe the subcontractor, describe the intended scope and role of the subcontractor, identify the team members proposed from the firm, and provide the qualifications and experience information requested above for those team members.

Request for Proposal Timeline

A review committee led by the project manager, MCWD Planner-Project Manager Kailey Cermak, along with other select MCWD staff, will evaluate proposals and select proposals to advance for interviews. Following a comprehensive review, the review committee will recommend a consultant to the MCWD Board of Managers.

The anticipated timeline for the proposal review process, which is subject to change, is as follows:

- **RFP issue date:** Friday, March 29, 2024
- **Submit RFP questions:** Friday, April 5, 2024 at 12:00 pm
- **Optional Informational Meeting:** Wednesday, April 10, 2024 12:30 pm (MCWD offices)
- **Deadline for receipt of proposals:** Monday, April 22, 2024 at 4:00pm
- **Expected dates for Interviews:** May 6 and May 7, 2024
- **Anticipated date for consultant selection:** May 23, 2024 (MCWD Board of Managers meeting)

Proposer's Budget for the Project

The requested services under this RFP will be funded by MCWD levied funds. Services will be compensated on an hourly basis with a specified not-to-exceed for the entire project. The Contract Maximum, to be set after determination of the scope of work, is the limit for contractual services including both professional fees and expenses.

Addenda/Clarifications

Any changes to this RFP will be made by MCWD through a written addendum. No verbal modification will be binding.

Contract Award

Issuance of this RFP and receipt of proposals do not commit the MCWD to the awarding of a contract. The MCWD reserves the right to postpone opening for its own convenience, to accept or reject any or all proposals received in response to this RFP, to negotiate with other than the selected consultant should negotiations with the selected consultant be terminated, to negotiate with more than one consultant simultaneously, or to cancel all or part of this RFP.

Joint Offers

Where two or more proposers desire to submit a single proposal in response to this RFP, they should do so on a prime-subconsultant basis rather than as a joint venture. The MCWD intends to contract with a single firm and not with multiple firms doing business as a joint venture.

Proposal Evaluation Procedure

Methodology

1. *Project Understanding*: Does the proposal make it clear that the consultant fully understands the scope, goals, and technical requirements of the project?
2. *Completeness and Specificity*: How fully does the proposal explain what the consultant will do to develop the required deliverables?
3. *Identification of Needs*: Does the proposal carefully consider what resources will be required to complete the tasks, including staff time, additional technical information, etc.?

Experience

1. *Company Experience*: What other projects has the consultant performed that have developed, used and demonstrated the expertise and capacity required for the proposed work (evaluated via the proposer's submittal materials)?
2. *Staff Experience*: What qualifications and work experience do the proposed staff members or sub-consultants bring to the project?
3. *Area Knowledge*: Does the company or any of the project team have specific knowledge about the project area that would aid in the study?

Cost

1. *Fee structure:* The proposal must clearly outline the fees and costs to complete all aspects of this project. Include hourly rates for each project team member along with hours for each task and subtask. The final fee structure and contract price are subject to negotiation.

Contractual Agreement

Enclosed with this RFP is the form of contract that CONSULTANT and MCWD will execute. The MCWD may agree to non-substantive document revisions, but CONSULTANT's proposal should be based on the contract form. The proposal should identify any terms of the form of contract that are unacceptable. The MCWD will negotiate a term where it can preserve the substantive intent of the term but reserves the right to reject a proposal that is conditioned on a material alteration of the contract form. The proposal also should indicate any data or methods of proposer that would be used in performing the work, and that proposer considers to be instruments of service that should be excepted from the intellectual property terms of the contract form. Payments will be based on hourly rates on certification of completion of identified tasks. The payment schedule can be negotiated and finalized through the contract after selection of a Consultant by MCWD.

Contact

Any questions should be directed to Kailey Cermak at 952-641-4501 or kcermak@minnehahacreek.org.

PART 4: DISCLOSURES

Non-Binding

The District reserves the right to accept or reject any or all responses, in part or in whole, and to waive any minor informalities, as deemed in the District's best interests. In determining the most advantageous proposal, the District reserves the right to consider matters such as, but not limited to, consistency with the District's watershed management plan goals, and the quality and completeness of the consultant's completed projects similar to the proposed project.

This RFP does not obligate the respondent to enter into a contract with the District, nor does it obligate the District to enter into a relationship with any entity that responds, or limit the District's right to enter into a contract with any entity that does not respond, to this RFP. The District also reserves the right, in its sole discretion, to cancel this RFP at any time for any reason.

Each respondent is solely responsible for all costs that it incurs to respond to this RFP and, if selected, to engage in the process including, but not limited to, costs associated with preparing a response or participating in any interviews, presentations or negotiations related to this RFP.

Right to Modify, Suspend, and Waive

The District reserves the right to:

- Modify and/or suspend any or all elements of this RFP;
- Request additional information or clarification from any or all respondents;
- Allow one or more respondents to correct errors or omissions or otherwise alter or supplement a proposal;
- Waive any unintentional defects as to form or content of the RFP or any response submitted.

Any substantial change in a requirement of the RFP will be disseminated in writing to all parties that have given written notice to the District of an interest in preparing a response.

Disclosure and Disclaimer

This RFP is for informational purposes only. Any action taken by the District in response to proposals made pursuant to this RFP, or in making any selection or failing or refusing to make any selection, is without liability or obligation on the part of the District or any of its officers, employees or advisors. This RFP is being provided by the District without any warranty or representation, expressed or implied, as to its content, accuracy or completeness. Any reliance on the information contained in this RFP, or on any communications with District officials, employees or advisors, is at the consultant's own risk. Prospective consultants must rely exclusively on their own investigations, interpretations and analysis in connection with this matter. This RFP is made subject to correction of errors, omissions, or withdrawal without notice.

The District will handle proposals and related submittals in accordance with the Minnesota Data Practices Act, Minnesota Statutes §13.591, subdivision 3(b).

Exhibits

- Exhibit 1: Map of pond's location and drainage area
- Exhibit 2: Weir As-built
- Exhibit 3: Map of easement boundary
- Exhibit 4: County Road 6 Pond Retrofit Feasibility Study
- Exhibit 5: MCWD Contract Template

Supplemental Spatial Data

Available via link: (link)

- Filter bench footprint generated through feasibility
- Easement boundary
- Survey data