LOWER MINNESOTA RIVER
WATERSHED DISTRICT

Executive Summary for Action

Lower Minnesota River Watershed District Board of Managers Meeting
Wednesday, April 16, 2025

Agenda Item
Item 7. D. – Study Area #3

Prepared By
Linda Loomis, Administrator

Summary
Action is required to finalize the project's design so that construction bids can be solicited. Inter-Fluve, the firm collaborating with the LMRWD on this project, has informed the LMRWD that due to unforeseen permitting delays, they are unable to proceed further.

The attached Technical Memorandum from Young Environmental Consulting Group, dated April 11, 2025, outlines the measures taken by the LMRWD to advance this project.

It is recommended that the Board approve Barr Engineering to provide final design and construction administration services for the Project at a not-to-exceed fee of $257,900.

Other outstanding items for this project include the replat and re-zoning of the property. Legal Counsel has sent a letter to the Huelers, informing them that legal action will be taken if they do not provide the required signature for the city to proceed with the proposed land use changes and regulatory measures.

Attachments
Technical Memorandum – Area #3 Minnesota Riverbank Stabilization Project Recommendation dated April 11, 2025, and Proposal from Barr Engineering

Recommended Action
Motion to approve Barr Engineering to provide final design and construction administration services for the Project at a total not-to-exceed fee of $257,900 and authorize execution of a Professional Services Agreement or equivalent, subject to review by legal counsel.

Technical Memorandum

Young Environmental Consulting Group, LLC

To: Linda Loomis, Administrator
Lower Minnesota River Watershed District

From: Jennifer Mocol-Johnson, Water and Natural Resources Program Manager
Della Schall Young, CPESC, PMP, CTF, Principal Scientist

Date: April 11, 2025

Re: Area 3 Minnesota Riverbank Stabilization Project Recommendation

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In 2023, the Area 3 Minnesota Riverbank Stabilization Project (Project), led by Inter-Fluve, advanced to 60% design but was subsequently delayed due to permitting requirements. Since that time, all permitting and associated coordination have been completed, positioning the Project to move toward construction.

On February 28, 2025, Young Environmental Consulting Group, LLC (Young Environmental), on behalf of the Lower Minnesota River Watershed District (LMRWD), issued a Request for Information (RFI) to identify a consulting firm to carry the Project through final design, construction, and completion. The RFI included detailed background information and a tentative project schedule and was distributed via email to firms in the LMRWD's engineering pool: Barr Engineering, ISG, Geosyntec Consultants, and Bolton & Menk.

By the extended submission deadline of March 26, 2025, Young Environmental received one proposal from Barr Engineering. Two firms, Geosyntec Consultants and Bolton & Menk, submitted responses declining to propose. Geosyntec Consultants provided no reason for their decision. Bolton & Menk cited concerns related to the current design stage and scheduling conflicts preventing their participation.

Submittal Review and Evaluation

Young Environmental reviewed the proposal submitted in response to the RFI for the Area 3 Minnesota Riverbank Stabilization Project. Evaluation criteria included the following:

- Demonstrated understanding of the project and site conditions
- Technical approach and methodology
- Qualifications and experience of the project team
- Cost reasonableness and responsiveness to the scope

To ensure objectivity, Young Environmental staff conducted independent reviews of the submittal and subsequently met to discuss key elements and reach a consensus on the evaluation.

Barr Engineering Proposal Summary

Barr Engineering's submittal demonstrated a clear understanding of the urgency and complexity of addressing the riverbank erosion in Area 3. Their proposed scope of work reflects industry-standard practices and includes validation of existing conditions and refinement of the 60% design toward final construction.

Barr Engineering's approach includes the following key elements:

- Reviewing prior studies and conceptual designs
- Obtaining and incorporating existing digital files (e.g., hydraulic models, CAD data)
- Conducting a bathymetric survey to assess recent erosion and grade changes
- Revisiting and refining hydraulic, civil, and geotechnical analyses as needed
- Developing a 90% design package and facilitating a stakeholder review meeting
- Finalizing a 100% bid-ready design package based on LMRWD and partner feedback
- Managing the contractor bidding process
- Providing construction administration services

Cost Proposal

Barr Engineering's cost proposal included a detailed breakdown of design and construction administration tasks.

- Design-related services (through final design): $131,300
- Construction administration: $126,600
- Total proposed fee: $257,900

This cost estimate is within the available budget for the project and reflects a comprehensive scope of services.

Recommendation

Based on our review, Barr Engineering submitted a responsive and qualified proposal that aligns with the technical needs and schedule for the Area 3 Minnesota Riverbank Stabilization Project. The proposal demonstrates the firm's understanding of site-specific challenges and offers a logical and technically sound path toward implementation.

Recommendation: Young Environmental recommends that the LMRWD Board approve Barr Engineering to provide final design and construction administration services for the Project at a total not-to-exceed fee of $257,900.

Attachments

- Attachment 1—Barr Engineering Proposal to Provide Design Services: Area 3 Minnesota Riverbank Stabilization Project

Proposal to provide

Design services: Area 3 Minnesota Riverbank Stabilization Project

Prepared for
Lower Minnesota River Watershed District

Submitted by
Barr Engineering Co.

March 26, 2025

BARR

March 26, 2025

Linda Loomis, District Administrator
Lower Minnesota River Watershed District
112 E 5th Street, #102
Chaska, Minnesota 55318
Sent by email: admin@lowermnriverwd.org

Re: Design services: Area 3 Minnesota Riverbank Stabilization Project

Dear Linda:

On behalf of Barr Engineering Co. (Barr), we're pleased to present our proposal to provide design services for the Area 3 Minnesota Riverbank Stabilization Project. We're excited about the opportunity to continue our involvement in this important work—we believe that our team is well-suited to help the Lower Minnesota River Watershed District (LMRWD) see this project to completion because:

A sound and streamlined design benefits from prior site knowledge and project support. Brent Theroux, PE, and Tom MacDonald, PE, led the geotechnical and hydraulic analyses for Barr's Area 3 slope stability assessments. They will be key team members for the final design, adding valuable staff continuity and site knowledge—particularly regarding the stability of the upper slope.

Regional experience seeing fast-paced stabilization projects through construction will minimize delays. We understand that the LMRWD would like to have a final design by August 2025. We've assembled a team of professionals with experience working together on fast-paced riverbank stabilization projects in the region for watershed management organizations and the U.S. Army Corps of Engineers St. Paul District. These projects are summarized in our proposal. Leveraging this experience, we feel confident in our ability to help the LMRWD finish this project efficiently and as envisioned.

Thank you for the opportunity to propose our design services. If you have any questions about our proposal, please get in touch with Jim (jherbert@barr.com, 952-832-2784) or Matt (mpeterson@barr.com, 952-832-2949).

Sincerely,

Jim Herbert, PE
Vice President, Senior Civil Engineer
Principal in Charge

Matt Peterson, PE
Senior Civil Engineer
Project Manager

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Project understanding and approach

Project understanding

The Lower Minnesota River Watershed District (LMRWD) seeks to stabilize approximately 1,500 feet of riverbank along the Minnesota River. The project area is referred to as “Area 3” and is located south of the intersection of Riverview Road and Janine Place in Eden Prairie, Minnesota. Over the last several years, LMRWD has retained several consultants to study the area and create conceptual stabilization designs. The latest design (60%) was completed by Inter-Fluve, Inc. in early 2023.

Building on previous studies and conceptual designs, LMRWD’s next objectives are to finalize the design and construct the project. Barr has extensive experience designing and overseeing the construction of bank stabilization projects (summaries are provided in **Appendix A**); our team is qualified and looks forward to completing this project for LMRWD.

We understand that the existing riverbank instability is caused by fluvial erosion and groundwater seepage along the riverbank. Homes above the bluff may be impacted if the erosion and riverbank instability are not addressed.

Barr Engineering Co. (Barr) completed a slope stability analysis of the overall bluff slopes in this area in 2022 and concluded that the overall bluff slope has an acceptable factor of safety, confirming the previous assumptions that the drivers of the riverbank instability are fluvial erosion and groundwater seepage rather than geotechnical instability. These conclusions were updated with additional geotechnical investigations and analysis and confirmed in 2024.

The current 60% design applies a launchable riprap toe designed to mitigate the existing erosion and protect the bluff toe to an estimated 100-year scour depth. We understand that LMRWD has completed state and federal permitting for this design, and therefore, LMRWD would like to avoid significant changes to the design that would require additional or new permitting. We understand that LMRWD intends to prepare and submit a watershed district permit application and city grading and right-of-way permit applications after the 90% design is completed.

Project approach

Barr’s approach to completing the project will include:

- Coordinating with LMRWD and Young Environmental Consulting Group, LLC (Young Environmental) throughout the project as necessary.
- Reviewing in detail the previous studies and conceptual designs completed for this area.
- Obtaining digital files (hydraulic model, CAD files, etc.) for work previously completed by other consultants. We assume LMRWD will assist with obtaining these files.
- Performing a bathymetric survey of the project extent to understand how erosion has impacted the grades since the most recent survey and determine how that may impact the design.
- Reviewing the 60% design and updating and revising analyses as needed from hydraulic, civil, and geotechnical approaches. We assume that the final design concept will be similar to the 60% design. If significant changes are needed based on our review and analysis, we will revisit the scope, schedule, and budget with LMRWD.
- Preparing a 90% design package for LMRWD and partners' review and hosting a 90% review meeting.
- Incorporating feedback from LMRWD and partners review and develop a 100% final bid package.

- Hosting and managing the contractor bidding process for LMRWD.
- Completing construction administration, including serving as the primary point of contact for the contractor, reviewing documents from the contract, hosting meetings, and providing onsite construction observation.
- Preparing and providing record drawings and coordinating project closeout with the contractor and LMRWD.

The following work plan describes in detail how we will provide our services.

Project work plan

Task 1: Project management

1.1 **Kickoff meeting:** Barr staff will meet virtually with LMRWD to discuss and initiate the final design and construction of this project. It is assumed up to four Barr team members will attend this meeting, which will last up to one hour. Barr will prepare and distribute an agenda prior to the meeting and minutes after the meeting.

1.2 **Design review meetings:** We will conduct design review meetings at the completion of 90% and 100% designs. We have assumed up to four Barr team members will attend design review meetings, which will last up to two hours.

1.3 **General day-to-day project management and administration:** Barr will develop and manage the project schedule, coordinate tasks, and manage the project budget. The scope includes periodic internal project meetings prior to key delivery dates. We will establish ongoing project coordination with LMRWD.

1.4 **Optional Task: Periodic meetings with LMRWD:** Although not part of the scope, we recognize the project schedule is aggressive. To accommodate the project schedule and facilitate communication, Barr recommends bi-weekly or other periodic project meetings with LMRWD during the final design phase of the project. Barr will prepare and distribute agendas prior to the meetings and minutes after the meetings. We will provide a budget for this task if LWRWD is interested.

Task 1 deliverables:

- Agendas and meeting minutes for all project meetings.

Task 2: Final Design (90 Percent)

2.1 **Bathymetric survey:** Barr will complete a bathymetric survey of the project area to confirm if river elevations have changed since previous surveys, and how that may impact the design.

- This will be completed using a Jon Boat with sonar equipment and two Barr staff.
- Data will be collected at cross sections every 25-50 feet for 2,000 feet in the immediate project area for use in hydraulic modeling and the final design modifications/layout. We will also collect bathymetric approximately 4,000 feet upstream and downstream of the project area, with cross sections at approximately 100 feet for use in confirming hydraulic modeling.
- We assume that the survey will require up to 1.5 days for data collection.

2.2 **Geotechnical design:** Barr will confirm the final geotechnical design. Additional slope stability modeling of areas outside of the stabilization limits is not included. A geotechnical engineer will review the Plans and Specifications and conceptually review the proposed stabilization.

2.3 **Hydraulic design**: Barr will confirm the final hydraulic design. We assume Barr will be provided the hydraulic model from the 60% design and that we will update the model with the new bathymetric data and current design geometry.

2.4 **Prepare Final Plans:** We will use the preliminary Plans from the previous consultant to update and reflect the final design and prepare Final Plans (90%).

2.5 **Prepare specifications:** Barr will prepare technical specifications as well as "front-end" or Division 00 Specifications for the project.

2.6 **Construction cost estimate:** We will prepare an engineer's opinion of probable construction cost of the final design. We will submit the estimate to LMRWD for comment and respond to one round of comments.

Task 2 deliverables:

- Updated bathymetric survey data
- Revised design calculations (if applicable)
- Revised technical design memorandum
- 90% design Final Plans
- 90% Specifications (front-end and technical)
- 90% engineer's opinion of probable construction cost

Task 3: Bid documents and bidding administration

3.1 **Finalize bidding documents:** We will use feedback on the 90% design from the LMRWD and partners to revise the 90% design package and prepare the 100% design package for bid. Documents will incorporate EJCDC general conditions.

3.2 **Post on Quest CDN:** We will post the bidding documents on Quest CDN, including paying any applicable fees, and we will monitor the site for any questions from prospective bidders (see below).

3.3 **Host virtual pre-bid meeting:** We will host a virtual pre-bid meeting with the potential bidders interested in the project. We will review the key elements of the Plans and Specifications to help better inform the potential bidders about the project.

3.4 **Monitor bid site and respond to questions:** We will monitor the Quest CDN site and respond to bidder questions as they arise. We will prepare the bid addenda if needed. We assume that a maximum of two minor addenda will be necessary.

3.5 **Bid review letter:** We will review the bids received for the project, prepare a bid tabulation, and help the LMRWD select the lowest responsive and responsible bidder.

Task 4: Construction administration

4.1 **Preconstruction meeting:** Barr will host a one-hour preconstruction meeting, attended virtually by up to three Barr staff members. Barr will prepare and distribute an agenda prior to the meeting and minutes following the meeting.

4.2 **On-site observation:** Barr will provide on-site construction administration support. For budgeting purposes, we assume we will have one construction observer on site for eight hours per day from November 3, 2025, until January 30, 2026 (three months) for substantial completion; and then one construction observer onsite for three hours per day from March 1, 2026 until May 1, 2026 (two months) for final completion. The exact timing of construction observation is likely to vary based on weather, the contractor's schedule and working hours, and the complexity of work.

4.2 **Submittal review:** We will review requested submittals from the selected contractor to confirm conformance with the contract documents.

4.3 **RFI responses:** We will review and respond to Request for Information (RFI) and questions from the contractor during construction.

4.4 **Weekly meetings:** During construction, we will host weekly meetings with the contractor, owner, and engineer. We assume the meetings will last 30 minutes, and two Barr staff members will attend. Barr will prepare an agenda prior to the meetings and minutes following the meetings.

4.5 **Record drawings:** We will document changes made during construction and incorporate those changes into a set of updated AutoCAD record drawings.

Task 4 deliverables:

- Meeting agendas and minutes
- Construction daily observation reports
- Punchlist for contractor final completion
- Record drawings
- Final construction cost estimate
- Management of bid posting
- Bid review letter

Project schedule

Below is a proposed project schedule. We recognize that some decisions may require approval at LMRWD board meetings, which typically occur on the third Wednesday of each month. Thus, some milestone dates may need to be shifted to accommodate these meetings.

- Notice to proceed with final design: April 28, 2025
- Submit 90% design documents for LMRWD review: June 27, 2025
- Finalize Issue for bid documents: August 22, 2025
- Advertise project for contractors: September 2, 2025
- Bids due: September 30, 2025
- Award bid: October 20, 2025
- Construction substantial completion: March 30, 2026
- Construction final completion: May 1, 2026

Project team

Our team will be led by **Jim Herbert, PE**, who brings 40 years of experience leading the design and construction of water resources projects. Jim will oversee the quality of Barr's service and deliverables so they meet LMRWD standards and expectations, coordinating closely with **Matt Peterson, PE**, project manager, who will oversee day-to-day project execution. Matt will monitor the schedule and budget of the project in consultation with Jim. **Karen Chandler, PE** will serve as senior advisor, offering Jim and Matt her project knowledge from supporting Barr's previous work on Area 3 as well as decades of experience supporting Minnesota watershed organizations. **Brent Theroux, PE** will lead our geotechnical work, and **Tom MacDonald, PE** will lead hydrologic and hydraulic (H&H) analysis—both Brent and Tom supported Barr's previous work on Area 3 and will provide important service continuity. Our leads will be supported by **Paul Orban, EIT**, H&H modeler, and **Rachel Bateman, PE**, who will provide civil design, plan preparation, and construction observation. The bathymetric survey will be led by **Jim Staberg**, senior survey technician.

Below are short bios for each key personnel member; detailed resumes can be provided upon request. **Appendix A** provides examples of similar projects demonstrating our relevant experience and qualifications.

Capacity

At Barr, project managers are given latitude to select the staff with the experience and availability best suited to the scope, budget, and timeline for a given project. Matt Peterson has confirmed our team's commitment to completing this project according to LMRWD's desired schedule. Should an unexpected event pose a risk to the schedule, Matt will be able to quickly draw from Barr's deep bench of water resources engineers, civil engineers, and geotechnical engineers to add support.

Team bios and billing rates

2025 billing rate: $235

Principal in Charge
Jim Herbert, PE

Vice President, Senior Civil Engineer
BS, Civil Engineering

Jim Herbert has 40 years of experience, primarily in water resources management. He has managed projects related to urban stormwater management, construction administration and management, environmental compliance, dam and tunnel rehabilitation, and waste management. Serving as principal in charge, Jim has overseen many channel and bluff stabilization projects for municipalities, local and state government agencies, and watershed management organizations in the Twin Cities metro area. In addition to serving LMRWD as a subconsultant to Young Environmental Consulting Group, Jim provides ongoing engineering services to the Bassett Creek Watershed Management Commission and Capital Region Watershed District.

2025 billing rate: $195

Project Manager
Matt Peterson, PE

Sr. Civil Engineer
BS, Civil Engineering

Matt has 17 years of experience as a project engineer and project manager. He specializes in work in and around rivers including riverbank stabilizations, dam removals and replacements, flood control systems, and landslide repairs. He's dedicated his career to work on these types of projects, and his work has included feasibility studies, detailed design, preparation of plans and specifications, and construction cost estimating. Beyond his design experience, Matt has also spent an extensive portion of his career focusing on the construction phase of these types of projects. Examples of his work include serving as project manager for the Crow River bank stabilization project (see Appendix A), project manager and design lead for the Lake Alvin spillway replacement in South Dakota, design lead and engineer of record for the Karey Dam rehabilitation project in North Dakota, and design engineer and construction administrator for the Albert Lea Lake outlet modifications project in Minnesota.

2025 billing rate: $225

Advisor
Karen Chandler, PE

Vice President, Sr. Water Resources Engineer
MS, Civil Engineering

Karen's 43 years of experience include 38 years at Barr working with watersheds, cities, and other public clients to develop and implement watershed and stormwater management plans; conduct H&H and water quality analyses; manage water quality monitoring programs; and complete feasibility assessment, design, and construction of stormwater projects. She also assists clients with community relations, public presentations, and facilitation of public processes. Karen provides ongoing engineering services to the Bassett Creek WMC and Black Dog WMO. Serving as principal in charge, she provided and oversaw engineering services to the LMRWD through Barr's previous professional services agreement, including Barr's previous work on Area 3.

2025 billing rate: $210

Geotechnical Lead
Brent Theroux, PE

Sr. Geotechnical Engineer
MS, Geotechnical Engineering

Brent has 24 years of experience conducting geotechnical evaluations and analyses; developing detailed geotechnical investigation and instrumentation programs; and preparing geotechnical reports, designs, and construction plans and specifications. His projects have involved slope stability, seepage, settlement, shallow and deep foundations, earth retention, soil anchors, soft ground improvement, drainage filter media, dewatering, landslide back analysis, pavement support, rock excavation, and rock fall catchment. Brent has experience with alternative project delivery methods, such as design-build and construction manager/general contractor. He served as Barr's geotechnical lead for Barr's previous work on Area 3.

2025 billing rate: $230

H&H Lead
Tom MacDonald, PE

Vice President, Sr. Water Resources Engineer
MS, Civil Engineering

Tom has 33 years of experience with a wide range of H&H projects for watersheds, cities, local and state governments, and industry. His work focuses on river hydraulics, stream classification, monitoring, and restoration, dam removal and modification, stormwater management, and surface water permitting. Tom has conducted feasibility studies and preliminary and final designs for the restoration of streams, rivers, and ravines. He supported the H&H analysis for Barr's previous work on Area 3.

2025 billing rate: $140

H&H Modeler
Paul Orban, EIT

Water Resources Engineer-in-Training
BS, Environmental Engineering

Paul has six years of experience helping clients solve problems related to hydrology and hydraulics. He performs H&H analysis, conducts site evaluations, and writes technical reports. His experience includes river hydraulic modeling, flood mitigation analysis, and erosion mitigation. Paul has supported numerous geohazard projects across the United States, evaluating the potential for stream erosion and mitigation using HEC-RAS. He has also recently completed multiple scour assessments in North Dakota, for which he built two-dimensional SRH-2D models for bridge scour screening.

2025 billing rate: $135

Civil Design, Plan Preparation, Construction Observation
Rachel Bateman, PE

Civil Engineer
BS, Civil Engineering

Rachel, who joined Barr in 2020, provides design services and construction observation for projects involving slope stabilization, tailings management, and dams. For slope stabilization projects, she performs Civil 3D modeling, plan preparation, and quantity and material takeoffs. Rachel was the civil designer for Barr's work on the Colfax WWTP Slope Stabilization Project (see Appendix A) for the U.S. Army Corps of Engineers (St. Paul District).

2025 billing rate: $140

Bathymetric Surveyor
Jim Staberg

Senior Survey Technician
TWIC certified (Transportation Worker Identification Credential)

Jim has over 40 years of experience providing field services in a variety of industries. During his 36 years at Barr, he has worked extensively with conventional and GPS surveying methods, hydrographic sounding systems, laser survey technology, AutoCAD, and Civil 3D modeling. Jim is Barr's lead technician for state-of-the-art remote surveying and bathymetric mapping techniques and equipment. He also performs and coordinates soil testing and analysis; high-resolution surveys (HDS) using 3-D techniques; bridge-scour investigations; record, topographic, control, and construction surveys; construction staking and observation; and cost estimating.

Cost proposal

The cost of services will not exceed the “Estimated Project Total” shown in the following table without LMRWD authorization. The cost of services for Tasks 1-3 will not exceed the lump sum shown for the “design subtotal” in the following table. The scope of Task 4 is less defined, and therefore it will be billed on a time-and-expense basis. Hourly rates for key team members are provided with bios, above.

Task		Estimated hours	Labor subtotal	Expenses	Total estimated cost
1	Project management	177	$35,700	$0	$35,700
2	Final design (90%)	482	$78,800	$2000	$80,800
3	Bid documents (100%) and bidding administration	84	$14,600	$200	$14,800
	Design subtotal	**---**	**---**	**---**	**$131,300**
4	Construction administration	782	$121,100	$5,500	$126,600
	Estimated Project Total	1,525	$250,200	$7,700	$257,900

Appendix A:

Project examples

Appendix A:

Project examples

Area 3 slope stability monitoring and analysis

Client
Young Environmental Consulting Group, LLC and Lower Minnesota River Watershed District

Location
Minnesota

Services provided:

- Geotechnical field instrumentation
- Geotechnical, hydraulic, and slope stability analyses

From 2019 to 2024, Barr helped the LMRWD monitor the slope instability at Area 3 and advise on courses of action.

- Starting in 2019, Barr began collecting field readings from slope inclinometers (previously installed by a different consultant) and advised the LMRWD and Young Environmental on potential decisions resulting from those readings.
- In 2021, Barr conducted a geotechnical and hydraulic review of alternatives for bank restoration, which included a site visit to Area 3 by geotechnical and hydraulic engineers and a memorandum summarizing our observations and comments. Due to the non-creep properties of the slope soils, we recommended abandoning the existing slope inclinometer installations in favor of using conventional surface measurements to track migration of the instability scarp.
- In 2022, Barr geotechnical engineers conducted a preliminary slope stability analysis to assess performance expectations for the bluff slope in relation to private residential lots located farther upslope. We concluded that the existing slopes may perform adequately but recommended additional investigation and monitoring to confirm.
- In 2023, Barr environmental scientists completed a field wetland delineation and threatened and endangered species review. We also coordinated with the local government unit to receive approval for the wetland delineation boundary.
- In 2024, Barr and a subconsultant performed two soil borings to confirm soil and groundwater conditions assumed in the 2022 preliminary slope stability analysis. Results were confirmed that the upper portion of the slope is stable.

Key staff: Karen Chandler, PE; Brent Theroux, PE; Tom MacDonald, PE

Crow River bank stabilization

Client
Engineering & Construction Innovations, Inc.

Location
Minnesota

Services provided:

- Geotechnical investigation and hydraulic modeling for stability analysis
- Slope stabilization design
- Permitting and construction support

The St. Paul District of the U.S. Army Corps of Engineers (USACE) needed to repair an eroding highway embankment along a stretch of the Crow River near Delano, Minnesota. An original repair consisting of a riprap armored toe and geosynthetic reinforced soil slope (GRSS) had been completed in 2013. However, additional repairs were needed to address slope instability at the upstream and downstream GRSS transitions—some as close as 10 feet from the edge of the road.

Barr teamed with Engineering & Construction Innovations, Inc. (ECI) to complete a design–build slope repair for the USACE. Repairs included riprap armoring along the riverbank toe, rock vanes along the riverbank to push the highest river velocities away from the slope, and a soil anchor and mesh reinforcement system (TECCO®) to stabilize the slope, protect against surface erosion, and afford vegetation re-establishment.

Barr performed geotechnical investigation and design for the slope stabilization system. In addition, Barr performed hydraulic modeling and design for the riprap and rock vane placement. Civil design entailed temporary erosion control, removals, site access and staging, drainage control, traffic control, Stormwater Pollution Prevention Plan, and site restoration. Additionally, permitting assistance was provided for Section 404, public waters work, National Pollutant Discharge Elimination System permits, and county and other local permits. Construction was completed in August 2020.

Key staff: Matt Peterson, PE; Brent Theroux, PE; Tom MacDonald, PE

Wastewater treatment plant slope stabilization project

Client
Engineering & Construction Innovations, Inc.

Location
Wisconsin

Services provided:
- Slope stabilization design

In March 2022, the St. Paul District of the U.S. Army Corps of Engineers hired Barr and Engineering & Construction Innovations, Inc. (ECI) to design and construct a slope stabilization project for the Village of Colfax, Wisconsin's wastewater treatment plant (WWTP). The plant's lagoons were perched above an eroding riverbank of the Red Cedar River, presenting concerns about the long-term integrity of these impoundments. On an accelerated schedule due to the project's urgency, Barr completed the design of a riprap bank stabilization. We worked intimately with ECI to confirm the project was constructable and within the overall project budget. We also worked closely with the USACE to confirm the project met their design and technical expectations. The project was constructed in the fall of 2022.

Key staff: Matt Peterson, PE; Brent Theroux, PE; Tom MacDonald, PE; Rachel Bateman