US Army Corps of Engineers®
St. Paul District

Appendix G – Clean Water Act Compliance

Riverbank Stabilization Project Feasibility Report and Integrated Environmental Assessment

Section 203 Tribal Partnership Program

2023

This Page is Intentionally Left Blank

Appendix G – Clean Water Act Compliance

Contents

1 Project Description

1.1 Location and General Description

The Study area is in Redwood County, Minnesota, along the right descending bank of the Minnesota River within the Lower Sioux Indian Community (LSIC). The Federally recognized community is located 95 miles southwest of Minneapolis Minnesota and two miles south of Morton Minnesota.

Approximately 1,500 feet of riverbank is actively eroding along the outer bend of the Minnesota River. Aerial imagery indicated that the bank has eroded approximately 180 feet since 1992 (Figure 9 of the Main Report). The eroded face of the bank varies throughout the 1,500 feet, but at its maximum is approximately 15 feet in height from the ground surface to the channel bottom. The sandy silt material is highly erodible and will continue to encroach on the tribal land without remediation. The severity of the erosion varies along the bank. Some portions are lined with trees and some portions are exposed. The exposed section is riddles with concave vertical face slope failures that are caused by the routine rise and fall of the river. For the period 2018 – 2019, there have been approximately 200 days of out-of-bank flows within the project area.

The objectives of the proposed project are to:

1. To reduce erosion and land loss related to high flows and velocity of Minnesota River.
2. Preservation of natural resources, including the finite tribal resource of Lower Sioux lands susceptible to continued erosion and wetlands adjacent to the Minnesota Riverbank.
3. Improved access to the Minnesota River to support cultural practices.

To accomplish the above objectives, four alternatives were evaluated to prevent further erosion along the Minnesota River within the LSIC. Alternatives included measures such as riprap protection, bank cut back, longitudinal stone toe and bendway weirs. A description of each alternative can be found in Section 3. All four alternatives include a temporary access road and staging area as well as stairs to the river in Reach 3 to allow for easier access to the bedrock for fishing.

1.2 Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R)

An OMRR&R manual will be drafted following project construction. The LSIC would be responsible for conducting periodic inspections and maintenance for the project to remain functional. There are no operable features in this project and the project would be designed to be stable with normal maintenance and repair. Although detailed project specific OMRR&R activities will be developed after feasibility, common causes of stream bank protection disrepair include the formation of scour holes, riprap instability caused by excessive stream velocities, ice, erosion or sloughing and surface erosion. In each of these situations, additional riprap would need to be placed in a manner consistent with design plans and specifications. Rock materials used for repair would meet the original project requirements. Control and removal of herbaceous and woody vegetation in the rip rap would also be completed. The placement of riprap would result in a discharge which is anticipated could be authorized under Nationwide Permit 3 – Maintenance.

2 Authority and Purpose

2.1 Overall Project Purpose

The overall project purpose is to protect and preserve cultural and natural resources (lands and river access) destabilization and loss along the Minnesota River in Redwood County, Minnesota.

2.2 Water Dependency

The activity does not require access or proximity to or siting within a special aquatic site to fulfill its basic purpose; therefore, the activity is not water dependent.

2.3 Basic Project Purpose

The basic project purpose is to protect the streambank from further destabilization and loss.

2.4 Authority

This feasibility study (Study) is being carried out under Section 203 of the Water Resources Development Act (WRDA) of 2000, as amended (33 U.S.C. § 2269). Section 203 authorizes the Secretary of the Army to carry out the Tribal Partnership Program (TPP), consisting of water–related planning activities, and activities related to the Study, design, and construction of water resource development projects that substantially benefit federally recognized Indian tribes. Authorized activities include projects for flood damage reduction, environmental restoration and protection, and preservation of cultural and natural resources; watershed assessments and planning activities; and other projects the secretary, in cooperation with Indian tribes and the heads of other federal agencies, determines to be appropriate. Section 203 of the WRDA of 2000 provides the U.S. Army Corps of Engineers (USACE) with the authority to plan, design, and construct. This Study evaluates actions to address streambank erosion and the protection of cultural and natural resources at risk due to such erosion.

3 Project Alternatives

Sections 2 and 3 of the Main Report describe the planning process and outline the various measures and alternatives that were identified to address the project objectives. Four alternative plans were identified and compared in addition to the No Action Alternative. Table 1 summarizes the aquatic impacts of each alternative. None of the impacts would result in a permanent loss of waters.

Table 1. Aquatic resource impacts for each alternative.

Alternative	Impact Duration	Wetland Impacts (acres)	River Impacts (acres)
No Action	Permanent	0	0
1	Permanent	0	1 longitudinal stone toe, bank shaping, placement of riprap, bendway weirs, stairs
2	Permanent	0	1.06 placement of riprap, stairs
3	Permanent	0	1.22 placement of riprap, bendway weirs, stairs
4	Permanent	0.7 bank reshaping	1.8 bank shaping, placement of riprap, stairs
1, 2, 3, 4	Temporary	1.0 staging area 1.1 access road	0

3.1 Alternative 1

Alternative 1 consists of sixteen bendway weirs spaced approximately 100 feet apart and a longitudinal stone toe at the bank along Reaches 1 and 2. The vertical bank in Reach 3 would be cut back to a 3H:1V slope, geotextile would be placed on the bare soil followed by bedding and riprap protection. No action is proposed for Reach 4, as there is no evidence of erosion in this reach (Figure 1).

- *Longitudinal Stone Toe*: The longitudinal stone toe would provide stability to the toe of Reaches 1 and 2, allowing for a naturally stable angle to be reached can be vegetated by seeds present within the water as well as by willows present at the study area and by vegetation that is culturally significant to the LSIC. By offsetting the longitudinal stone toe and carefully spacing the tiebacks stilling basins could be created between the stone and that bank that would naturally fill with sediment, creating a vegetated planting bench. This measure would require minimal disturbance to the project area, as most of the material will be placed at the toe of the bank.

- *Bendway Weirs*: Twelve bendway weirs would be included in Reach 1, and four bendway weirs would be included in Reach 2. These bendway weirs would alter the flow pattern of the channel, pushing the energy away from the bank and toward the center of the channel. This measure has also been shown to provide habitat for numerous fish species.

- *Bank Cutbacks:* The vertical banks in Reach 3 would be cut to a 3H:1V slope, providing the bank stability needed for the success of this alternative given the soil variability. This cutback would impact a number of trees at the upstream end of Reach 3, but the long-term result of stabilizing the bank would prevent further erosion and uncontrolled loss of forest ecosystem. There may be an opportunity to extend the riprap protection onto the

bedrock outcrop in Reach 3 to minimize impacts to the forested overbank in that area. This will be explored in more depth during plans and specifications.

- *Riprap Protection:* Riprap has been shown to effectively protect against flow velocities and would be used to protect Reach 3. The riprap would extend from the toe of the bank to the top of the bank at a 3H:1V slope.

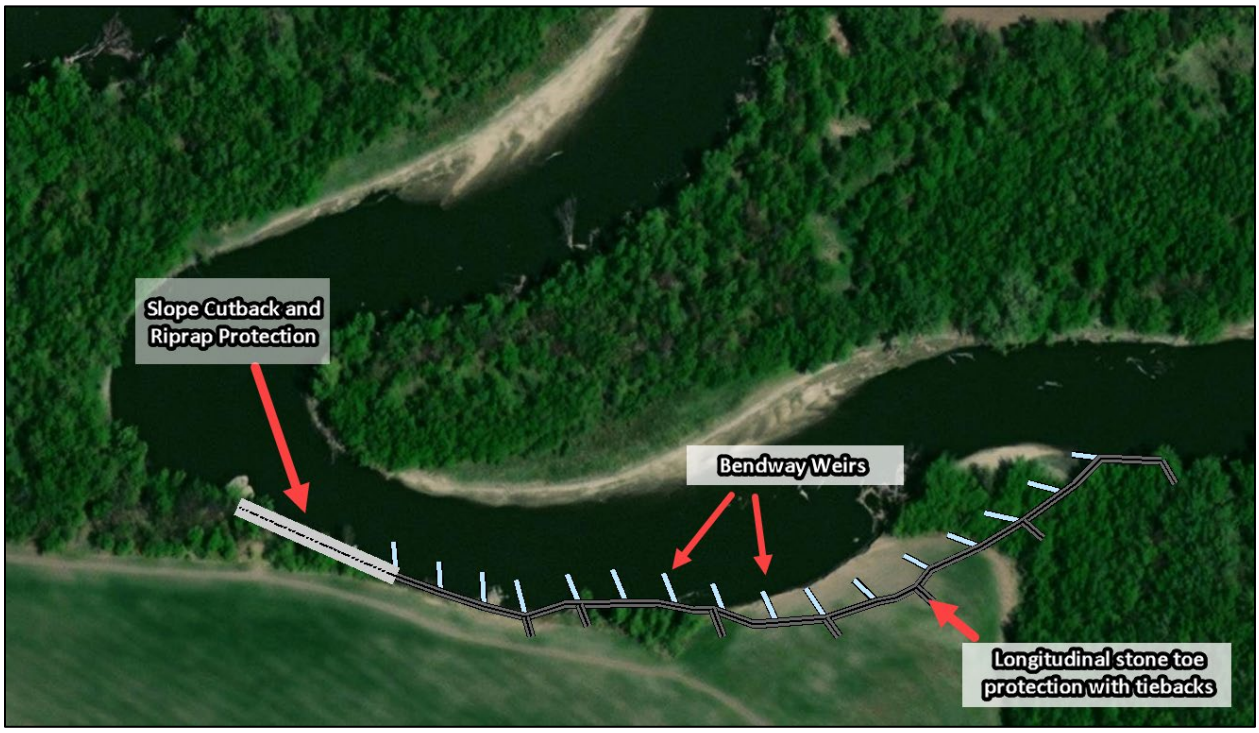

Figure 1. Alternative 1 project features (2015 aerial imagery)

3.2 Alternative 2

Alternative 2 consists of riprap built out into the river from the bank of Reaches 1, 2, and 3 at a 2H:1V slope. No grading, bedding, or geotextile is proposed for this alternative. No action is proposed for Reach 4 (Figure 2).

- *Riprap Protection:* Riprap has been shown to effectively protect against flow velocities and would be used to protect Reaches 1, 2, and 3. The riprap would extend from the toe of the bank to the top of the bank in Reach 1, Reach 2, and Reach 3 at a 2H:1V slope. The rock would be placed at the toe of the bank and built up without any grading of the existing vertical banks to minimize cost. This would reduce the amount of vegetation that could be incorporated into the design.

Figure 2. Alternative 2 project features (2015 aerial imagery)

3.3 Alternative 3

Alternative 3 consists of riprap built out into the river from the bank in Reaches 1, 2, and 3. This alternative would include three bendway weirs in Reach 1 and four bendway weirs in Reach 2 (Figure 3).

- *Riprap Protection:* Riprap has been shown to effectively protect against flow velocities and would be used to protect Reaches 1, 2, and 3. The riprap would extend from the toe of the bank to the top of the bank in Reach 1, Reach 2, and Reach 3 at a 2H:1V slope. The rock would be placed at the toe of the bank and built up without any grading of the existing vertical banks to minimize cost. This would reduce the amount of vegetation that could be incorporated into the design.

- *Bendway Weirs*: Three bendway weirs would be included in Reach 1, and four bendway weirs would be included in Reach 2. These bendway weirs would alter the flow pattern of the channel, pushing the energy away from the bank and toward the center of the channel. This measure has also been shown to provide habitat for numerous fish species.

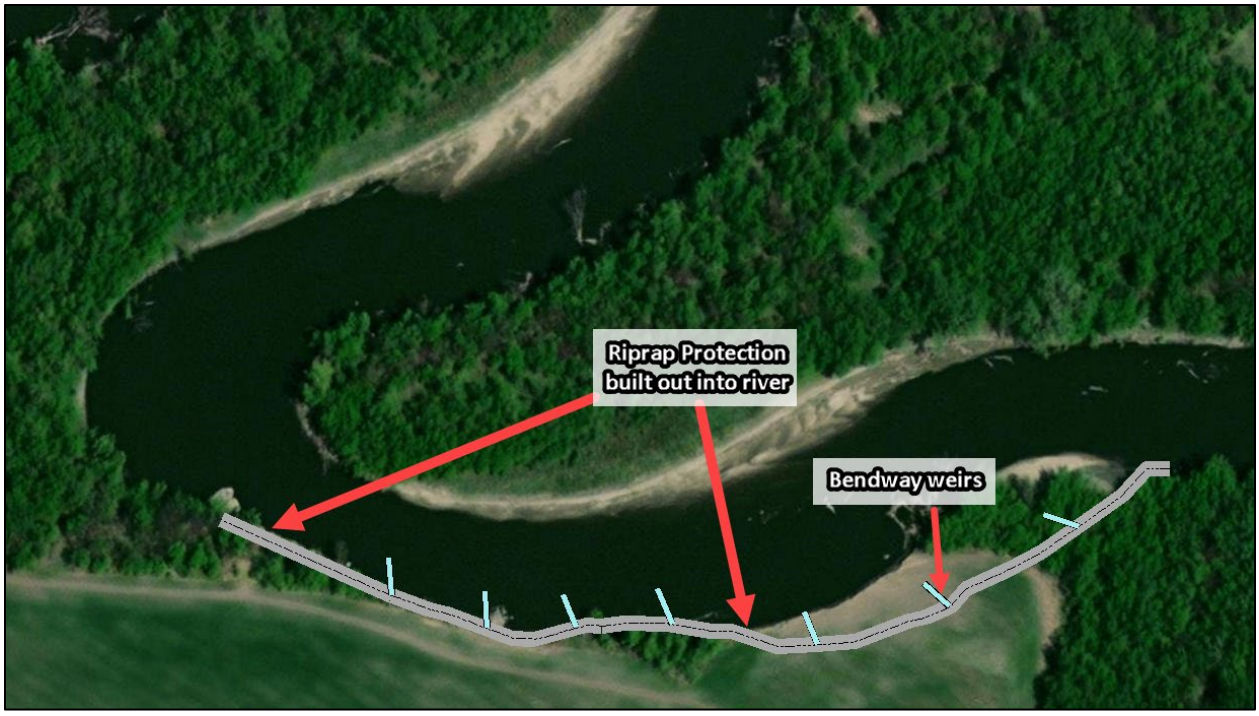

Figure 3. Alternative 3 project features (2015 aerial imagery)

3.4 Alternative 4

Alternative 4 consists of cutting back the vertical banks in Reaches 1, 2 and 3 and protecting the bank with riprap. Riprap would extend to the top of the bank. No action is proposed for Reach 4, as there is no evidence of erosion in this reach. This design would result in the loss of wetlands from bank reshaping (Figure 4).

- *Bank Cutbacks:* The vertical banks in Reaches 1, 2 and 3 would be cut to create a 3V:1H slope, providing the bank stability needed for the success of this alternative. This cutback would impact a number of trees at the downstream end of Reach 1 and upstream end of Reach 3, but the long-term result of stabilizing the bank would prevent further erosion and uncontrolled loss of forest ecosystem.

- *Riprap Protection:* Riprap has been shown to effectively protect against flow velocities and would be used to protect Reaches 1, 2, and 3. The riprap would extend from the toe of the bank to the top of the bank.

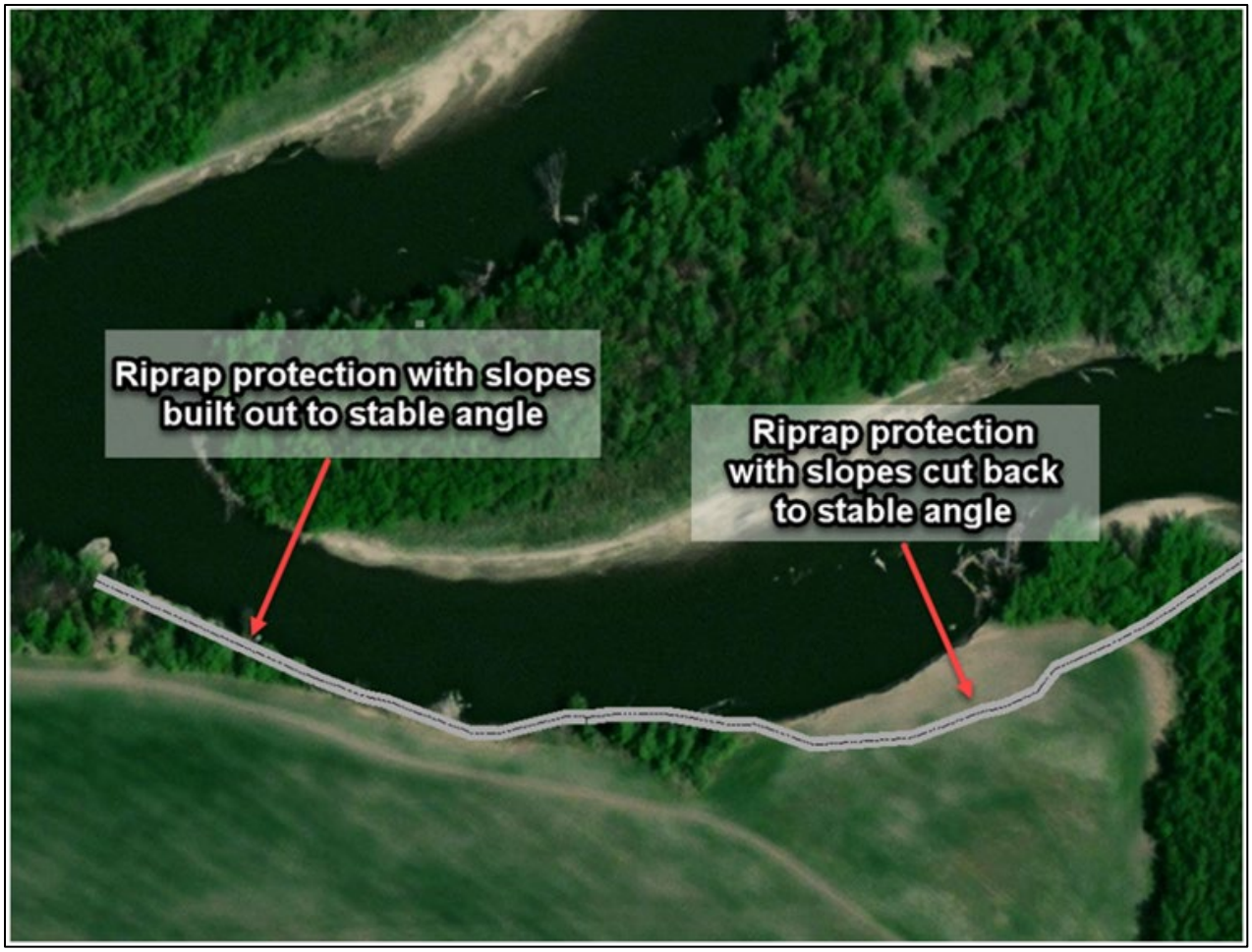

Figure 4. Alternative 4 project features (2015 aerial imagery)

3.5 Practicable Alternative Carried Forward for Further Evaluation

Alternative 4 has the greatest river impacts (1.8 acres) and permanent wetland impacts (0.7 acre). Therefore, Alternative 4 was not carried forward for further evaluation. Continued erosion under Alternative 1 would continue until a stable slope is achieved as well as cutting back the bank in Reach 3. Alternative 1 was not carried forward for further evaluation as this alternative would result in additional loss of tribal lands and would not meet objectives 1 and 2 listed in Section 1.1.

Both Alternatives 2 and 3 would include riprap protection resulting in 1.06 acres of river impacts. Alternative 3 includes bendway weirs which would result in an additional 0.16 acre of river impacts. Although Alternative 3 has slightly greater fill to the Minnesota River, the inclusion of bendway weirs would add resiliency under future hydraulic and climate conditions by pushing the main energy flow towards the center of the channel which would reduce the amount of energy being exerted upon the toe of the bank. This would reduce potential for major maintenance and associated impacts to aquatic resources in the future. Additionally, Alternative 3 provides aquatic habitat benefits with the inclusion of the seven bendway weirs. Bendway weirs create both slack water aquatic habitat within the eddies downstream of weirs and low-

flow habitat at scour holes that form at the tips of the structures[1]. Research has also found that reaches with bendway weir structures support significantly higher population densities of large fish than other treatments[2]. Alternative 2 does have a smaller fill footprint but does not provide the additional resiliency needed to address future hydraulic and climate conditions or any habitat benefits within the river itself. Therefore, Alternative 3 is carried forward for further evaluation.

4 General Description of Dredged or Fill Material

4.1 General Characteristics

Final determinations for the source of material have not been made, but general characteristics of each type of fill material are listed below.

Riprap: Riprap would be used as erosion protection and bendway weirs in locations dictated by hydraulic study of stream velocities. Feasibility level design includes R20 at a depth of 2 to 9 feet placed on the streambank. Riprap size, weight gradation, vertical extent and layer thickness will be finalized in the development of plans and specifications.

Access road and staging area: These features would likely be constructed with 10 inches of MNDOT class 5 aggregate.

4.2 Source of Material

Final determinations for the source of material have not been made but riprap and aggregate would likely come from quarries that have limestone and/or dolomite.

4.3 Quantity of Material

Estimated quantities for the Tentatively Selected Plan include 8,689cubic yards of riprap and 1,550 cubic yards of aggregate.

4.4 Description of the Proposed Discharge Site

4.4.1 Location

The project is located on the LSIC, Redwood County, Minnesota. Fill would be discharged into the Minnesota River and adjacent wetlands.

4.4.2 Size

The size of the project area is approximately 5 acres which includes the access road, staging area and approximately 1500 linear feet of streambank. River impacts below the ordinary high-

[1] Kinzi, K-D. and Myrick, C. 2009. *Bendway Weirs: Could They Create Habitat for the Endangered Rio Grande Silvery Minnow.* River Research and Applications. Accessed January 2023, from https://www.fs.usda.gov/rm/pubs_other/rmrs_2009_kinzli_k001.pdf

[2] Shields Jr, FD.; Knight, SS.; Cooper, CM. 2000. *Warmwater Stream Bank Protection and Fish Habitat: A Comparative Study*. Environmental Manager. Accessed January 2023, from https://pubmed.ncbi.nlm.nih.gov/10977884/

water mark are 1.22 acres. Temporary wetland impacts of 2.1 acres would also occur as a result of construction staging and access.

4.4.3 Site and Habitat Description

The LSIC landscape and its adjacent areas have experienced significant changes overtime. Extensive lush native prairies once covered the area; however, the landscape is now dominated by the agricultural industry and ancillary businesses. The Minnesota River and its tributaries continue to experience degradation in both water quality and ecological health due in large part to sediment loading, nutrient pollution, and elevated bacteria levels. The regional land use is predominantly agricultural.

4.4.4 Timing and Duration

The proposed project is anticipated to be constructed in one year.

4.5 Description of Disposal Method

Material would be moved and placed mechanically. Cranes, backhoes, scrapers, dump trucks and other heavy machinery suited to working with rock would be used to deliver and place rock materials during construction. Riprap would generally be placed in a systematic manner to ensure a continuous layer of well-graded rock. Rock placed underwater would not be cast across the water surface.

5 Factual Determinations

5.1 Physical Substrate Determinations

5.1.1 Substrate Elevation and Slope

Existing elevation within the project area is relatively flat on top of the bank but the riverbank itself is steep sided. The riverbank would be reshaped during construction to 1.5H:1V slope. Temporary wetland fills would be removed in their entirety and areas returned to pre-construction elevations.

5.1.2 Sediment Type

Sediments in the project area consist of Du Page loam.

5.1.3 Fill Material Movement

Fill material is not expected to move significantly once placed.

5.1.4 Actions Taken to Minimize Impacts

A number of procedures would be used to minimize impacts where needed. All work performed by a contractor will be subject to adherence with a work plan and applicable agency permits and 401 Water Quality certification. The work plan shall detail the contractor's proposed methods to perform work described by contract drawings. This plan (and other related plans) shall be submitted to Government Representative (Corps COR) for review and acceptance before any site work commences. BMPs could include sediment fencing and floating silt curtain to prevent movement of soil and sediment outside the project area.

5.2 Water Circulation, Fluctuation and Salinity Determination

5.2.1 Water

Some minor, short-term decreases in water clarity are expected from the proposed fill actions. The project would have no effect on salinity, water chemistry, color, odor, taste, dissolved oxygen, nutrients, eutrophication or temperature.

5.2.2 Current Patterns and Circulation

5.2.2.1 Current Velocity and Patterns

The bendway weirs would alter the flow pattern of the channel by pushing the energy away from the bank and toward the center of the channel.

5.2.2.2 Stratification

The proposed project would have no effect on stratification.

5.2.2.3 Hydrologic Regime

The proposed project would have no effect on the hydrologic regime.

5.2.2.4 Normal Water Level Fluctuations

The project would not result in water levels outside the normal seasonal range.

5.2.2.5 Salinity

Not applicable.

5.2.2.6 Actions Taken to Minimize Impacts

No special actions would be taken to minimize the effects of the proposed project on water patterns or circulation.

5.3 Suspended Particulate/Turbidity Determination

5.3.1 Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site

Increases in turbidity and suspended particulates would temporarily occur from the discharge of fill material and excavation in the immediate project vicinity; however, levels would return to pre-project conditions upon completion of construction. The discharge and removal of temporary fills would not be expected to have an effect on turbidity levels as the wetlands would not have standing water during construction. Wetlands within the project area only have standing water during flood events.

5.3.2 Effects on Chemical and Physical Properties of the Water Column

Increased turbidity levels during construction would have a short-term and minor effect to light penetration in the immediate project area. The project would have no appreciable effect on dissolved oxygen or pH during or after construction. Temporary wetland impacts would have no effect on the chemical and physical properties of the water column as the wetlands within the project area would not have standing water during construction.

5.3.3 Actions Taken to Minimize Impacts

The discharge of fill material and excavation would result in disturbance to the existing substrate, causing a temporary and localized increase in turbidity and suspended particulates.

As part of the project's plans and specifications, the contractor will develop an environmental protection plan that will include Best Management Practices (BMPs) designed to minimize impacts of the project to the surrounding environment. BMPs could include sediment fencing and floating silt curtain to prevent the movement of soil and sediment. All construction related debris would be managed so that no debris, garbage, or fuel enters the water. Visual monitoring for excessive turbidity, floating debris, trash, or oil sheen would also be continuously performed to ensure water quality is being protected.

5.4 Contaminant Determinations

The use of clean, quarry-run rock riprap for construction would not introduce contaminants into the aquatic system. Neither the materials used, nor the placement method cause relocation or increases of contaminants in the aquatic system.

5.5 Aquatic Ecosystem and Organism Determination

5.5.1 Effects on Plankton

During construction, there may be a temporary increase in turbidity and suspended solids which would locally suppress phytoplankton productivity in the Minnesota River immediately adjacent to the streambank. However, this effect would be minor and short-term. Plankton populations would quickly recover after construction. Impacted wetlands do not have standing water during most of the year; therefore, wetland fill would have no effect on plankton.

5.5.2 Effects on Benthos

Benthos present in the areas where the river would be filled would be destroyed. Benthic organisms, particularly those that favor the use of interstitial voids would recolonize the area after construction. Wetlands within the project area do not support benthos.

5.5.3 Effects on Nekton

During construction, nekton would temporarily avoid the areas where rock would be placed; however, after construction, nekton would return. The addition of bendway weirs would support higher population densities of large fish which would be beneficial to the area. Wetlands within the project area do not support nekton.

5.5.4 Effects on Aquatic Food Web

The impacts on benthos and plankton productivity as described above could cause a short-term minor temporary impact on the local aquatic food web.

5.5.5 Effects on Special Aquatic Sites

Construction access and staging would result in a temporary impact to 2.1 acres of wetland during construction. After construction, temporary fills would be entirely removed and the site restored to pre-existing elevation. These areas would then be reseeded with an appropriate seed mix, such as Minnesota state seed mix 34-261 for riparian areas. A cover crop of oats would be used if construction is completed later in the year.

Indirect effects of the wetland impacts would include the temporary loss of habitat and water quality and flood protection. Wetlands outside of the project area would continue to provide services such as water quality protection and wildlife habitat. Best management practices would be used to minimize effects to wetlands immediately outside the project area by clearly marking construction limits to avoid unnecessary plant loss or ground disturbance as well as installation

of silt fencing. The project would have no effect on sanctuaries and refuges, mud flats, vegetated shallows, coral reefs or riffle and pool complexes.

5.5.6 Threatened and Endangered Species

The Corps has determined that the Tentatively Selected Plan may affect but is not likely to adversely affect the northern long-eared bat and tricolored bat. The Corps concluded the recommended plan would have no effect on the prairie bush clover or monarch butterfly. Informal consultation for the northern long-eared and tricolored bats was initiated on January 12, 2023 and USFWS concurred on January 26, 2023. Consultation documentation can be found in Appendix A.

5.5.7 Other Wildlife

The proposed project would have a minor and temporary effect in terms of avoidance of the area by wildlife during construction. Birds will likely be discouraged from nesting within and adjacent to the project area due to noise during construction. However, after construction is complete birds and other wildlife would return to the area. There are no bald eagle nests within the vicinity of the project area.

5.5.8 Actions Taken to Minimize Impacts

To minimize effects to fish species, no instream work would occur during spawning season (March 1 – June 15). To avoid potential impacts to the northern long-eared and tricolored bats, no tree clearing will occur between March 31 – November 1. These actions are anticipated to ensure compliance with associated laws and regulations, including the Endangered Species Act.

5.6 Proposed Disposal Site Determinations

5.6.1 Mixing Zone Determination

The placement of fill material would cause a minor, temporary increase in turbidity in the immediate vicinity; however, no long-term adverse impacts to water quality would occur from any of the proposed project features.

5.6.2 Determination of Compliance with Applicable Water Quality Standards

It is not anticipated that the proposed project would violate water quality standards for toxicity as all fill material will be free of contaminants. Project related discharges are also not expected to exceed the federal standard of more than a 10 percent increase in turbidity above background levels. If the tribal boundary is determined to not be the centerline of the river, project related discharges are not expected to exceed the Minnesota River (South River Nutrient Region) total suspended solids standard of 65 mg/L. The contractor will be required to prepare a Stormwater Pollution Prevention Plan (SWPPP).

Water quality certification would be obtained from the U.S Environmental Protection Agency. A pre-filing meeting request was sent to U.S. Environmental Protection Agency; however, they did not respond to schedule a meeting.

5.6.3 Potential Effects on Human Use Characteristics

5.6.3.1 Municipal and Private Water Supply

The proposed project would not impact municipal or private water supplies.

5.6.3.2 Recreational and Commercial Fisheries

Recreational fishing within and immediately adjacent to the project area would be temporarily impacted during construction due to noise from construction equipment and limited or no access during construction; however, no long-term negative effects are anticipated. Stairs constructed in Reach 3 would be beneficial as they would provide access to the bedrock outcropping which is an important fishing area for the tribe. Fishing would resume once construction is complete. The addition of bendway weirs would support higher population densities of large fish which would be an added benefit to the area. The proposed project would have no effect on commercial fisheries.

5.6.3.3 Water Related Recreation and Aesthetics

The proposed project would have no appreciable impact on water-related recreation. There would be a long-term but localized effect to aesthetics in the project area due to replacing a natural streambank with riprap. The project area is on a relatively remote stretch of the Minnesota River and riprap would not be visible outside of the immediate area.

5.6.3.4 Cultural Resources

The Corps has determined that the Tentatively Selected Plan has no effect to historic properties. See Section 6.3 of the main report.

5.7 Determination of Cumulative Effects on the Aquatic Ecosystem

The proposed project would cause no significant adverse cumulative impacts on the aquatic ecosystem. Effects of the construction would be minimal and mostly positive in maintaining the quality of the human environment. The proposed action would not affect the biodiversity of the area or permanently fragment the habitat above existing conditions.

5.8 Determination of Secondary Effects on the Aquatic Ecosystem

No significant secondary effects on the aquatic ecosystem would be expected from the proposed action.

6 Mitigation

Although 1.22 acre of riprap would be placed below the OHWM of the Minnesota River, this would not result in a permanent loss of waters, and temporary wetland impacts would be restored to pre-project contours and replanted following construction; therefore, no mitigation would be provided.

7 Finding of Compliance with Restrictions on Discharge

1. No significant adaptations of the guidelines were made relative to this evaluation.
2. The proposed fill activity would comply with the Section 404(b)(1) guidelines of the Clean Water Act. The placement of fill is required to provide the desired benefits.
3. There are no practical and feasible alternatives to the placement of fill in the proposed sites that would meet the objectives and goals of this project. The proposed project is the least environmentally damaging practicable alternative.

4. The proposed fill activity would comply with State water quality standards. The disposal operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.
5. The proposed project would not jeopardize the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, as amended, or result in likelihood of the destruction or adverse modification of critical habitat.
6. The proposed fill activities would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, aquatic habitat, terrestrial habitat, and recreation. The life stages of aquatic life and other wildlife would not be adversely affected. Significant adverse effects on the aquatic ecosystem, and recreational, aesthetic and economic values would not occur.
7. On the basis of this evaluation, I conclude that the proposed discharge complies with the Section 404(b)(1) Guidelines for the discharge of dredged or fill material.

_____
Date

Eric Swenson
Colonel, Corps of Engineers
District Commander