

WATER PERMIT NO. FC34A-3

Name of Applicant: **Upper Minnesota River Watershed District**

Address: **211 2nd Street SE, Ortonville MN 56278** Phone: **320-839-3411**

Amount of Water Claimed: **No Add'l** Total Acres: **N/A**

Source of Water Supply: **Surface**

Water to be used for: **Revision to Flood Control** County: **Roberts**

Type of Waste Disposal System:

Location: **Approx. 10 miles southeast of Sisseton**

PRIORITY Date Received: **09-25-25** Application/License Fee: **\$300.00**

Corrected Application Received: **09-29-25** Period of Annual Use: **January 1 – December 31**

Remarks: **Revisions to flood control project which includes rock arch rapids through the diversion channel and revisions to a weir structure, resulting in minor changes in flow through the city of Brown Valley.**

Diversion Point: **SW 1/4 SE 1/4 Sec 31-T125N-R49W**

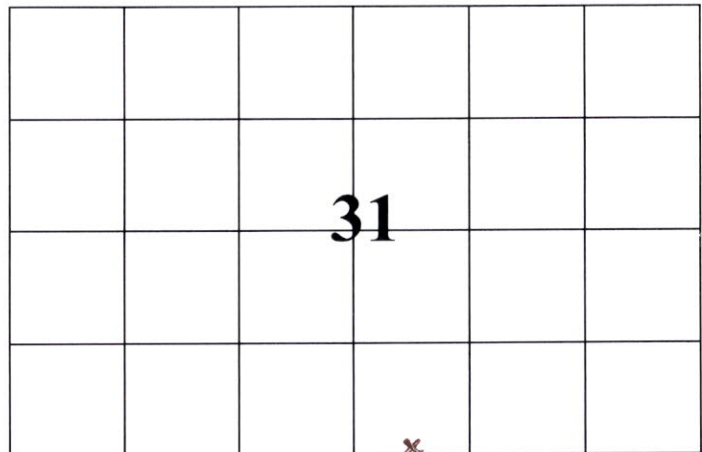
Land to be Irrigated: **N/A**

Depth of Well:

Well Driller:

Remarks:

Type of Map: **aerial**



Reviewed and the Number Assigned on: **09-30-25**

By: **Rachel Rodriguez**

Notice of Hearing - date to intervene: _____

SOUTH DAKOTA

FLOOD CONTROL PERMIT NO. FC34A-3

Date of first receipt of application September 25, 2025.

Date of return to applicant for corrections, amendments or changes September 25, 2025.

Date of receipt of corrected application September 29, 2025.

The Acting Chief Engineer, on behalf of the Water Management Board, issues Flood Control Permit No. FC34A-3 to Upper Minnesota River Watershed District, 211 2nd Street SE, Ortonville MN 56278, subject to the following limitations, conditions and qualifications:

1. Flood Control Permit No. FC34A-3 modifies an existing flood control project authorized by Flood Control License No. FC34-3, to increase fish migration through the project. Flood Control License No. FC34-3 protects the City of Browns Valley, Minnesota from the 100-year flood event on the Little Minnesota River by conveying flood waters around the city by means of an inlet channel, diversion dam, and floodway. The diversion dam (with no permanent storage) placed across the Little Minnesota River, in the SW 1/4 SE 1/4, Section 31, T125N-R49W, has a concrete box culvert installed through the diversion dam allowing flow to remain in the Little Minnesota River main channel while flood flows exceeding the box culvert capacity overtop a weir structure (crest elevation of 985.14 feet mean sea level [fmsl]) (NAVD 1988) enter the floodway. This permit modifies the existing structures for better fish passage. The modifications include lowering the existing sheet pile weir (current controlling section), excavating the inlet to the diversion channel, and installing rock arch rapids downstream of the modified controlling section. The design includes a low flow channel which will be 2 feet wide with an invert elevation of 980.4 fmsl (NAVD 1988), which will increase the frequency that the diversion channel can be utilized by fish. This site is located approximately ten miles southeast of Sisseton SD.
2. This project will prevent flood flow inundation of portions of the city of Browns Valley, Minnesota resulting in increased public safety. It will also reduce costly flood damage.
3. The date of approval of Permit No. FC34A-3 is January 30, 2026.
4. All construction is to be completed on or before January 30, 2031.

QUALIFICATIONS

- 1) The Permit Holder must take the following measures to negate the potential 0.4 feet increase in Big Stone Lake.
 - Normal summer operating pool elevation of 966.4 feet NAVD88 on Big Stone Lake shall be reduced by 0.2 feet from the 966.4 feet summer pool elevation to 966.2 feet, through the use of the UMRWD's gate operation to offset the increased flood risk.
 - The permit holder will use information from the National Water Prediction Service (NWPS), North Central River Forecast Center, including the U.S. Geological Survey Gage at Peever, SD, in development of an advanced flood forecast for the Upper Minnesota River.
 - The permit holder will use NWPS, or best available, hydrologic and hydraulic models of the entire drainage area upstream of Big Stone Lake (including the major tributaries of the Whetstone River and the Little Minnesota River), as well as NWPS provided elevation forecasts for Big Stone Lake, using antecedent conditions including snowpack and soil moisture. These forecasts include probable rainfall within the drainage area (Quantitative Precipitation Forecasts). Inputs and observations made by the Upper Minnesota River Watershed District (UMRWD), working cooperatively with the NWS, will be used to refine the forecast results.
 - The permit holder will adjust gate operation based on these forecasts in advance of a potential flood event on Big Stone Lake to lower the lake elevation by 0.2 feet in anticipation of a flood event.

- In the event the permit holder adjusts the gate operation in advance of a potential flood event, the permit holder shall notify the SD DANR Water Rights Program of actions taken to negate the effects of the additional water in Big Stone Lake. The reported information shall consist of daily data including date(s), time(s), of adjusted gate operation, gaged river inflow reading(s) in cfs, gate(s) opening height(s), 24-hour precipitation, and any additional information or comments the permit holder feels necessary (i.e., ice jams, open water, etc.).
- 2) The permit holder is responsible for operation and maintenance of the flood control works.
 - 3) During low flow conditions, the permit holder must maintain streamflow through the City of Browns Valley by either raising the boulder weir through the controlling cross section or adding rip rap, or both, to direct flow through the City of Browns Valley.
 - 4) If approved, the Water Management Board will retain jurisdiction of Flood Control Permit Nos. FC34A-3 and FC34-3 if conditions change that affect permit qualifications, such as completion of the proposed Whetstone River diversion project.

WATER MANAGEMENT BOARD

By: Adam Mathiowetz
Adam Mathiowetz, PE
Acting Chief Engineer
Water Rights Program
Department of Agriculture and Natural Resources

MAR 02 2026

date



FORM 2: Application for uses other than irrigation
(type or print)

Mail to: SD DANR, Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	No. <u>FC34A-3</u> Hydrologic Unit <u>07020001</u> Basin <u>Minnesota Whetstone</u> Newspaper <u>Sisseton Courier</u> <u>Watertown Public Opinion</u> (office use only)
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SEP 25 2025

Water Rights
Program

Application for Permit to Appropriate Water in South Dakota

Check use(s) of water:

☐ Municipal	☐ Water Distribution System	☐ Recreational	☐ Institutional
☐ Rural Water System	☐ Commercial	☐ Fish & Wildlife	☐ Geothermal
☐ Domestic (over 18 gpm)	☐ Industrial	☒ Other <u>Revision to Flood Control</u>	

Type of Application:
(check one)

☐ New	☐ Vested Right (Use predates Mar 2, 1955)	☐ Future Use Reservation
☒ Place to Beneficial Use Water Reserved by Future Use Permit No. _____		
☒ Amendment/Correction to Permit No. <u>FC34-3</u>		

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.)

A partial diversion of the Little Minnesota River has resulted in diminished fish passage upstream. Our project proposes to revise a weir structure and add fish ladders

1. Name to Appear on Water Permit Upper Minnesota River Watershed District
Mailing Address 211 2nd St SE Ortonville MN 56278
(Address) (City) (State) (Zip Code)

Phone 320-839-3411 Mobile 320-815-7255 Email amber@umrwd.org

2. Amount of water claimed N/A *CFS or **GPM and ***AF or Gallons
Flow rate and volume are both required. (*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use)

3. Source of water supply Little Minnesota River SW 1/4 SE 1/4 Sec 31-T125N-R49W

4. Location of point of diversion 31-125N-49W - change in previous flood control project County Roberts
(example - 3 wells in SW 1/4 NE 1/4 section 12-T104N-R53W)

If not a public water supply (e.g. municipal), will water be used outside of the area described above? ☐ Yes ☐ No

If "Yes," where will water be used? _____

5. County or counties where water will be used Roberts, SD Traverse Big Stone, MN
(example - NW 1/4 section 12-T104N-R53W)

6. Annual period during which water is to be used Jan 1 - Dec 31

7. Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

Please see attached 90% Design Report

Our project proposes to increase fish migration through revisions to a previous flood control project. This includes rock arch rapids through our diversion channel and revisions to a weir structure which results in minor changes in flow through the City of Browns Valley, MN.

I, Amber Maschadis Administrator, the applicant, certify under
Name of Person Title (if applicable)

penalty of perjury that I have read this application, examined the attached map, and that the matters stated are true. I further certify, if acting on behalf of an entity or individual other than myself, that I am authorized to submit this application.

2021-08

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Also, attach map and any other technical information. (see instructions)

note: The project looks to lower the breakover elevation on the control weir by up to 2 ft.

Supplemental Information
(type or print)

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**Water Rights
Program**

- 1. Well Information** (check one or both as applicable) ☐ Drilling new well(s) ☐ Using existing well(s)
- a) If new wells, how many _____ Have test holes been drilled? ☐ Yes ☐ No Drilled by _____
(if yes, please provide copies of logs)
- b) If existing wells, how many _____ Provide copy of log(s), if available. Drilled by _____

For either existing or proposed wells:

- c) Well Depth (required) _____ Depth to Top of Water Bearing Material _____ Depth to Water from Surface _____
- d) Distance to nearest domestic well on applicant's property _____ Property owned by others _____

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) _____
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of _____ Sanitary System

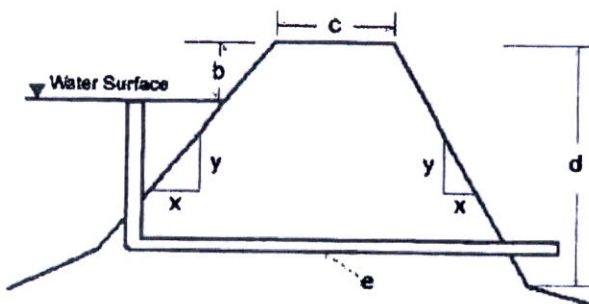
3. Dugout Information

- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:



- b) Freeboard _____
- c) Crest Width _____
Crest Length _____
- d) Height _____
- e) Primary Outlet Capacity _____
If pipe, diameter _____
- f) Secondary Spillway Capacity _____
Spillway Width _____
- g) X & Y Slope (e.g. 3 to 1 is a typical slope)
Upstream _____
Downstream _____
- h) Area of Impoundment _____
- i) Storage _____ Acre Feet
- j) Drainage Area Above Dam _____ Acres

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SEP 25 2025

Water Rights
Program

Browns Valley Fish Passage - General Location

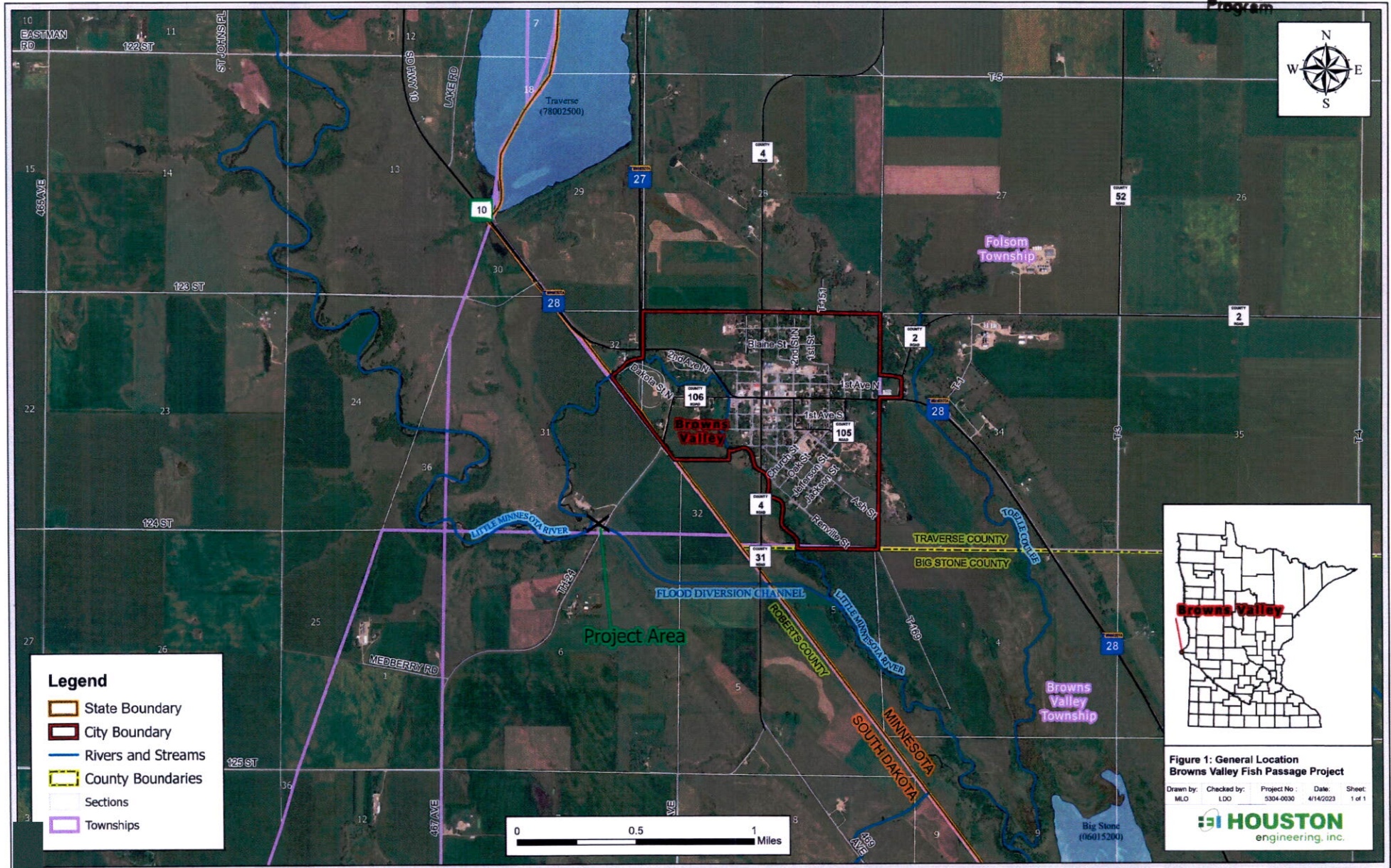
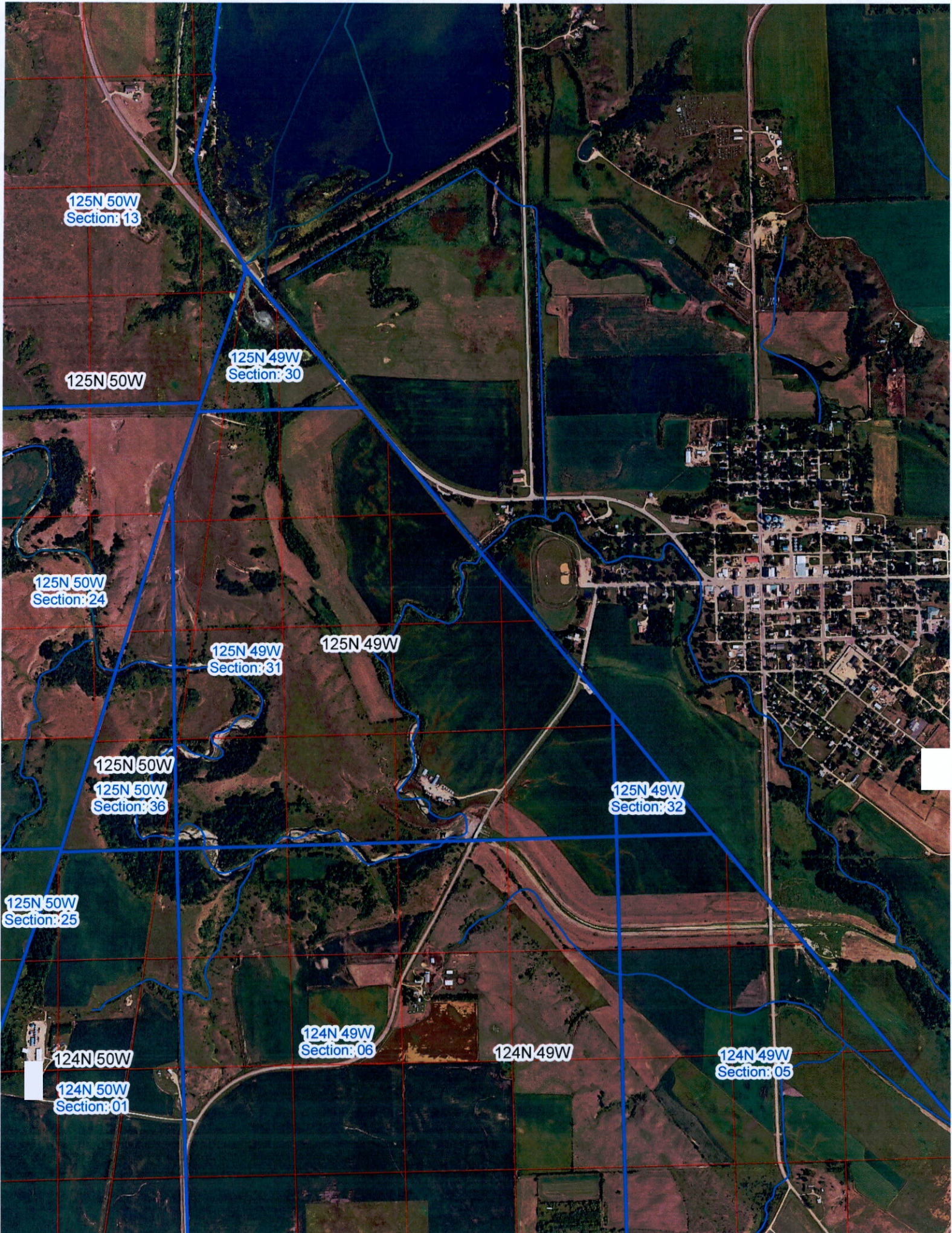


Figure 1: General Location
Browns Valley Fish Passage Project

Drawn by: MLO Checked by: LDO Project No: 5304-0030 Date: 4/14/2023 Sheet: 1 of 1

HOUSTON
engineering, inc.



INVOICE

SD Agriculture and Natural Resources
Water Rights Program
Attn: Rachel Rodriguez
523 East Capitol Ave.
Pierre SD 57501

DATE: SEPTEMBER 25, 2025
INVOICE

TO SD Game, Fish & Parks for
Upper Minnesota River Watershed District
211 2nd Street SE
Ortonville MN 56278

N06609J007

SALESPERSON	JOB	PAYMENT TERMS	DUE DATE
		Due upon receipt	

QTY	DESCRIPTION	UNIT PRICE	LINE TOTAL
1	Application Fee (\$100.00) plus Inspection Fee (\$200.00)	\$300.00	\$300.00

SUBTOTAL \$300.00

SALES TAX

TOTAL \$300.00

Make all checks payable to DANR/Water Rights

APPL. AREA	34	VOUCHER #: N06609J007
DATE	09/29/2025	
NUMBER		
DATA TYPE	1	

FROM: Game Fish and Parks
TO: DANR

LINE	COMP	ACCOUNT	CENTER	DESC	AMOUNT	DR CR
1	3122	52049600	0610600696	0008LMBV26WA	300.00	DR
2				DANR	300.00	CR
3						CR
4						DR
5						DR
6						DR
7						DR
8						DR
9						DR
10						DR
TOTAL					300.00	DR
TOTAL					300.00	CR
VOUCHER TOTAL					600.00	

Description of service, product, or transfer

I declare and affirm under the penalties of perjury that this claim has been examined by me, and to the best of my knowledge and belief, is in all things true and correct. I further agree to comply with the provisions of the Civil Rights Act of 1964 and regulations issued thereunder relating to non-discrimination in federally assisted programs.

AUTHORIZATION	JEREMY TENTINGER	09/29/2025
	AUTHORIZATION	

CR
10/02/25

APPL. AREA	34	VOUCHER #:
DATE	09/29/2025	N06609J007
NUMBER		
DATA TYPE	1	

FROM: Game Fish and Parks
TO: DANR

LINE	COMP	ACCOUNT	CENTER	DESC	AMOUNT	DR
1	3122	52049600	0610600696	0008LMBV26WA	300.00	DR
2	3050	4299802		DANR	300.00	CR
3					10000	CR
4	3050	4299803		0370000800	200.00	DR
5						DR
6						DR
7						DR
8						DR
9						DR
10						DR
TOTAL					300.00	DR
TOTAL					300.00	CR
VOUCHER TOTAL					600.00	

Description of service, product, or transfer

I declare and affirm under the penalties of perjury that this claim has been examined by me, and to the best of my knowledge and belief, is in all things true and correct. I further agree to comply with the provisions of the Civil Rights Act of 1964 and regulations issued thereunder relating to non-discrimination in federally assisted programs.

AUTHORIZATION

JEREMY TENTINGER

09/29/2025

AUTHORIZATION



BROWNS VALLEY FISH PASSAGE PHASE I

90% Design Report



BROWNS VALLEY FISH PASSAGAE PHASE 1

90% Design Report

September 8, 2023

Revised: October 7, 2025



Houston Engineering, Inc.
7550 Meridian Cir N, Suite 120
Maple Grove, MN 55369
Phone # 763.493.4522

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Engineer under the laws of the State of South Dakota.

Lisa Odens

Digitally signed by Lisa Odens
DN: C=US, E=lodens@houstoneng.com,
O=Houston Engineering, OU=Maple Grove,
CN=Lisa Odens
Location: Maple Grove, MN
Reason: I agree to the terms defined by the
placement of my signature on this document
Contact Info: lodens@houstoneng.com
Date: 2025.10.08 09:20:51-05'00'

Lisa D Odens
Reg. No. 15261

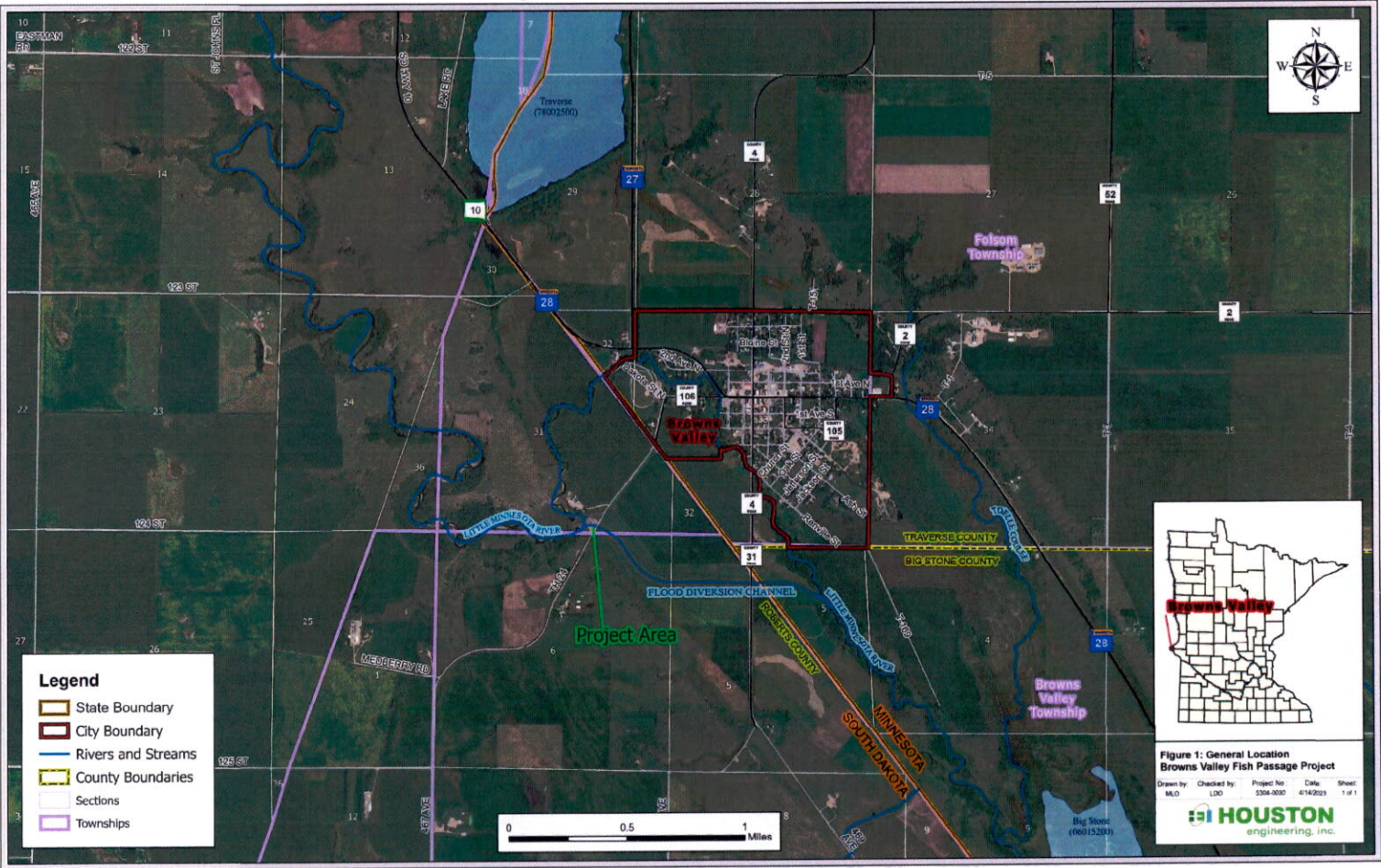
9-8-2023
Date

Revised: October 7, 2025

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Browns Valley Fish Passage - General Location



This report was revised October 7, 2025. Additions are shown in bold, blue, italics.

1 PROJECT BACKGROUND

The Browns Valley Flood Mitigation Project was constructed by the Upper Minnesota River Watershed District (UMRWD) in 2011 and included a diversion and floodway inlet structure (box culvert and embankment) to control discharges allowed through the City of Browns Valley. Since then, upstream interests have reported decreased fish migration on the Little Minnesota River. The USACE (St. Paul) studied fish migration in a report, "Little Minnesota River Assessment of Fish Migration" Dated April 2019. This report identified modifications to the Browns Valley Flood Mitigation Project to increase fish migration. The proposed modifications were developed further through coordination between US Fish & Wildlife Service (USFWS), South Dakota Game, Fish and Parks (GFP) and the Minnesota Department of Natural Resources (DNR).

Upper Minnesota River Watershed District partnered with South Dakota (GFP), and the Minnesota DNR to restore fish passage through the Browns Valley Flood Mitigation Project. Houston Engineering was contracted to provide engineering services to the project.

The purpose of this report is to document the design process and decision points, while providing project stakeholders with the data and methodologies used to develop the Browns Valley Fish Passage 90% Design. This report contains description of the project background, goals, hydrology and hydraulics, alternatives considered, preferred concept description, overview of potential regulatory requirements and opinion of probable construction costs. 90% Draft Plans and Technical Specifications are also proved in the appendices. Project stakeholders are expected to utilize the plans and specifications to pursue funding opportunities. Requirements of potential grants may dictate revisions to the plans and specifications. It is anticipated that project stakeholders would provide feedback on the design and grant requirements which will be incorporated into the final bidding documents.

1.1 PROJECT LOCATION

The project site is located on UMRWD property in Section 31 of T125N-R49W in Roberts County, SD. The project is approximately 0.8 miles southwest of Browns Valley, MN. The diversion channel outlets to the Little Minnesota River and eventually Bigstone Lake and the Minnesota River. The proposed project extents are shown in **Figure 1**.

1.2 EXISTING RESOURCES

Several existing resources were utilized during development of the project concepts:

- Browns Valley Flood Mitigation Project Engineers Report, Houston Engineering Inc, dated January 2008 (BVFMP, 2008)
- Environmental Assessment Worksheet, UMRWD, date June 30, 2008 (BVDMG EAW, 2008)
- Browns Valley Flood Mitigation Project, Record Drawings. Houston Engineering Inc, dated 12-19-2013 (BVFMP RD, 2013)
- Little Minnesota River Assessment of Fish Migration, USACE St Paul District, Dated April 2019 (USACE, 2019)
- Fish Passage Concepts, Aadland, Developed in 2019 (Aadland, 2019)

1.3 PROJECT GOALS AND DESIGN CRITERIA

Project goals were established during development of the Little Minnesota River Assessment of Fish Migration Project (USACE, 2019) and refined during the kick-off meeting with stakeholders. The project goals are listed below.

- 1) Allow for fish passage for both walleye and other critical species including sturgeon and shiner during spring migration period.
- 2) Improve passage for full range of recorded April flow conditions (i.e. approx. 2500-cfs and below.
- 3) Maintain flood risk reductions to the City of Browns Valley.
- 4) Allow for suitable passage both through the dam (12'x5' RCB) and through the diversion channel.
- 5) Minimize or limit need for gate operation, active flow monitoring and normally scheduled or irregular maintenance.

Discussion on development of the project design criteria is described below.

1. Currently fish passage is eliminated in the window during which velocities through the existing box culvert become too high while discharges are low enough that the flood diversion channel is not passable. The proposed project should reduce this window by facilitating lower velocities through the culvert during higher flows while creating passable conditions through the diversion channel during lower flows.
 - a. The box culvert was defined as passable when the average flows through the culvert are 2.0 feet/second or less. It was noted that some species can pass during higher average velocities and may be able to burst through isolated locations with higher velocity, such as the inlet.
 - b. The diversion channel was defined as passable when the depth of flow is greater than 1.0 feet deep and 2.0 feet wide.

2. It is required to maintain channel forming discharges through the City of Browns Valley to maintain the channel and limit sedimentation. The BVFMP EAW stated that:

Through formal consultation, the Minnesota DNR indicated a minimum in-stream flow of 450 cfs is preferred in the Little Minnesota River during non-flood periods, which equates to roughly a 1.4 year recurrence interval discharge. This discharge is believed by the DNR to be adequate for in-stream flow, aquatic life, and geomorphic considerations.

Evaluation of the channel forming flow required through the city was given much discussion during project coordination meetings (3-2-2023, 3-10-2023, 3-22-2023). Designing a project to pass 100% of flow through town at 450 cfs results in a wide and flat weir, which is not advantageous for concentrated flow at lower flows through the diversion channel. The MnDNR indicated that newer research shows that the channel forming discharge can be as low as the 1.1-year event or as high as the 1.8-year event. Evaluations of altered hydrology at the USGS gage at Peever also indicate that the 1.1 to 1.8-year discharge in historic periods may be less than the current period, likely a result of multiple factors. It was determined that it was acceptable to pass a minimum of 250 cfs through town during the 1.4-year event (450 cfs) to maintain channel forming discharge.

3. The BVFMP EAW stated that:

The inlet was designed to achieve the project goals of providing flood protection to Browns Valley by transferring Little Minnesota River flow to the diversion channel. The Little Minnesota River minimum capacity through town was determined to be about 1,100 – 1,200 cfs. A design goal of 500 - 750 cfs was targeted for the 100-year peak flow through Browns Valley, which

equates to a factor of safety of 2.3 and 1.5, respectively. The design provides some reserve capacity in the Little Minnesota River to offset potential reduction in conveyance due to blockages in the channel from ice and debris.

Refined modeling indicated that the As-built condition resulted in a 100-year discharge through town of 852 cfs and the current condition (includes sediment in diversion channel) results in a 100-year discharge of 866 cfs; thus the 100-year discharge through the city should be limited to 866 cfs unless the project includes significant removal of sediment in the diversion channel.

2 EXISTING CONDITIONS

2.1 SURVEY

Survey data was collected via drone flight on 11/29/2022. All survey data collected by HEI utilizes the Traverse County Coordinate System and North American Vertical Datum 1988 (NAVD88). (Note: Unless otherwise noted, all elevations provided herein are based on NAVD88 vertical datum).

Topographic survey information was collected in late June of 2023, following the spring flood event. This information was used to adjust the CAD surfaces to improve the accuracy of the developed project quantities.

2.2 HYDROLOGY

Flow frequency statistics were developed during the design of the Browns Valley Flood Mitigation Project. The development of the flow frequency analysis is described in greater detail in the 2008 Engineers Report. The analysis was performed on 55 years of record (1940-1981, 1990-2002). The flow frequency analysis was not updated to include published data from 2009-2021, which may be considered during future analysis.

Table 1: Results of Flow Frequency Analysis for USGS Gage Near Peever, SD (BVFMP, 2008)*

Chance Exceedance (%)	Recurrence Interval (year)	Discharge (cfs)
0.2	500	16,100
0.5	200	11,900
1	100	9,300
2	50	7,070
5	20	4,660
10	10	3,200
20	5	2,020
50	2	822
80	1.25	326
90	1.11	199
95	1.05	131
99	1.01	60

* For design purposes, the effects of ice and debris were assessed using an unsteady hydraulic HEC-RAS model for historic floods caused by ice and debris conditions and periods of non-ice and debris conditions

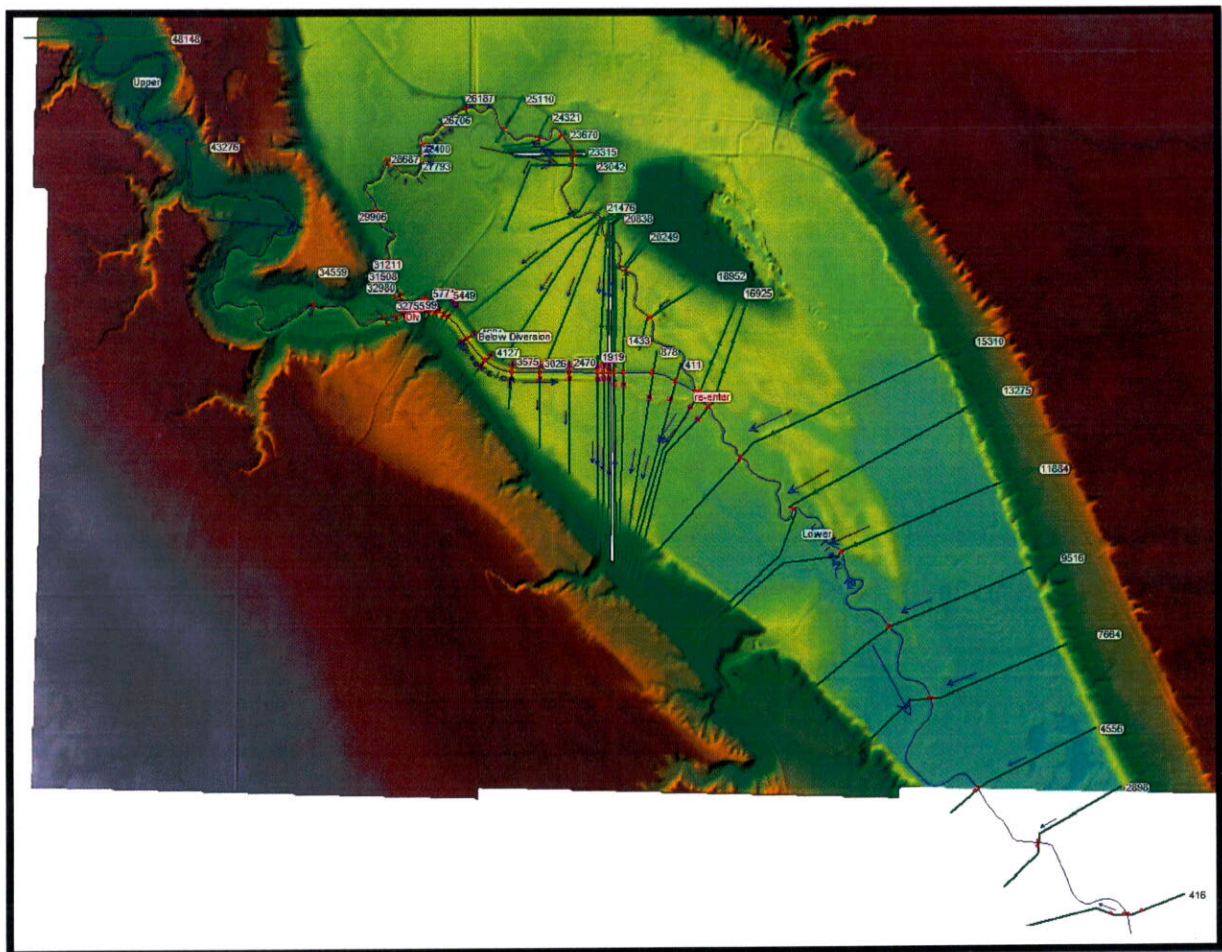
2.3 HYDRAULICS

A HEC-RAS model was developed during the design of the Browns Valley Flood Mitigation Project. The development of the HEC-RAS model was described in greater detail in the 2008 Engineers Report. The following updates were made to the model to create the current and as-built models:

- The box culvert and weir elevations were updated using the 2013 record drawings.
- Additional cross sections were added, and cross sections were realigned to add greater detail near the junctions.
- Minor revisions to ineffective flow areas.
- Station elevation data was updated based on the November 2022 LiDAR flight.
- The model version used was changed to 6.3.1.
- “As-built” and “current condition” geometries were created. The difference in these geometries is the incorporation of sediment in the diversion channel in the “current condition” geometry.
- Discharges for a wider range of flows were added.
- The downstream boundary condition was switched to normal depth due to known water surface elevations not being calculated for the full range of flows. This should be reevaluated if the model is being utilized outside the purpose of calculating flow splits at the junction.

Figure 2 shows a schematic of the HEC-RAS model.

Figure 2: HEC-RAS Current Conditions Model Schematic



3 PROJECT DESIGN

3.1 ALTERNATIVES CONSIDERED

The following paragraphs will describe the alternatives considered.

3.1.1 AADLAND 2019

Prior to this design effort, the MnDNR was consulted to develop alternatives for fish passage through the diversion channel. This alternative consisted of three rock riffles downstream of the Highway 24 bridge at elevations 977.0, 978.0, and 979.0. The existing weir was proposed to have two 2-foot by 2-foot notches cut into the crest with two fish ladders created with boulders to provide access from the notches to the bridge.

During development of this concept, it was assumed that no change could be made to the existing diversion weir structure and thus no change to the overall slope. During the project kick-off meeting (3-2-2023) it was determined that a single channel rock arch rapids with a reduced slope should be explored.

This option was not considered further.

3.1.2 ALTERNATIVE 1: ROCK ARCH RAPIDS @ 982.0

In this alternative, a rock arch rapids would be constructed with the controlling cross section upstream of the existing weir such that a slope of 3% can be established. The controlling cross section would have a 5' wide bottom with a runout elevation of 982.0 and 5-1 side slopes until 983.0 at which point the slope would vary at a relatively flat slope until tying into the existing riprap. The controlling cross section would transition into a 20' bottom with 5-1 side slopes to create a 50' channel with a 3' depth. From the edge of the channel the slope would vary at a relatively flat slope until tying into the existing riprap. All rocks placed within the 50' channel would be rounded field stone. The weir would be cut down to match the elevation of the rapids. Boulder weirs would be placed in approximately 20' intervals within the 50' channel, and small pools would be excavated between the boulder weirs to provide anchoring and variation. Chinking material would be added throughout the rock arch rapids and under the bridge to reduce the likelihood of fish being stranded as the diversion flows reduce and to force water to flow over the rock arch rapids. The UMRWD is currently pursuing a project to excavate sediment from the low flow channel, therefore the project assumes the entirety of the low flow channel has been restored to the as-built condition.

An alternative was considered similar to alternative 1 except a rock riffle added downstream of the existing box culvert with the purpose of creating a backwater to reduce velocities through the culvert. To have a significant effect on the desired range of flows, a downstream rock riffle with a crest elevation near 982.0 would be required. Since this elevation is so similar to the rock arch rapids elevation, this would result in a split flow for almost all events, thus this alternative was not considered further.

3.1.3 ALTERNATIVE 2: ROCK ARCH RAPIDS WITH MAX DIVERSION FISH PASSAGE

Alternative 2 is similar to alternative 1 except a "low flow" channel is added to the controlling cross section to increase the frequency at which the diversion channel can be utilized. This low flow channel is 2' wide

at an elevation of 980.4 and includes excavation upstream and downstream at a flat grade until it ties into the stream on the upstream side and the rock arch rapids on the downstream side.

A concept layout of this alternative is shown in **Appendix A – 90% Design Plans**.

3.2 EVALUATION OF THE PREFERRED ALTERNATIVE

Alternative 2 is the preferred alternative. The resultant alignment, profile, and cross sections are shown in more detail in **Appendix A – 90% Design Plans**.

3.2.1 HYDRAULICS

The 3 alternatives were modeled in HEC-RAS. Table 2 shows the results of the HEC-RAS modeling.

Table 2: Hydraulic Data by Alternative

	As-Built	Current Condition	Alt 1	Alt 2 (Preferred)
Box Culvert Size	5'h x 12'w	5'h x 12'w	5'h x 12'w	5'h x 12'w
Box Culvert Elevation	979.17	979.17	979.17	979.17
Diversion invert elevation	985.14	985.14	5' wide @ 982.0	2' wide @ 980.4
Flow Upstream when Rock Arch Starts Flowing	400	400	132	40
Flow upstream when velocity in Diversion Channel at Velocity = 2.0 ft/sec	683	761	542	497
Flow Upstream when Rock Arch is functional (1 foot depth)	1000	1000	225	61
Flow upstream when velocity through Culvert at Velocity = 2.0 ft/sec	45	45	45	45
Fish Passage Gap	>45	>45	45-225; >542*	45-61; >497*
100-year Through town	852	866	858	857
1.4 year Through town	409	412	287	258
Flow through town (100cfs)	100	100	100	95

*Assuming fish cannot pass when velocities in the diversion channel are greater than 2.0 fps indicates that the as-built and current condition have no fish passage when upstream discharges exceed 45 cfs. Fish have been observed passing through the diversion channel during large events, so this is likely an overly conservative assumption. The preferred alternative will virtually eliminate the fish passage gap; since within the diversion channel fish can continue to pass when velocities exceed 2.0 feet per second, likely due to the variation in topography and substrate. The preferred alternative also meets the constraints for the 100-year and 1.4 year discharges through Browns Valley.

The proposed modifications are not anticipated to alter peak elevations in Big Stone Lake during large events as the flow splits during the 100-yr are essentially unchanged. Flow volumes are not changed during any events; however, the timing of flows to Big Stone Lake may shift slightly for baseflow and very small events due to increased utilization of the diversion channel for routing

lower flows. *Changes in flow splits for larger events (lesser recurrence intervals) are generally less than 5% and diminish to less than 1% for 50-year and larger events. No impact to water surface elevations on Big Stone Lake are anticipated during the 100-year event. The project does not impact the originally designed flood protection.*

While the original project estimated that 500-700 cfs will be maintained in the Little Minnesota River through Browns Valley during the 100-yr event, the most recent modeling shows 852 cfs through town under the current (as-built condition) and 857 cfs under the proposed project (see Table 2). This signifies an insignificant effect on the 100-yr flows through town due to the project. No other potential revisions to the original permit are noted, other than the addition of project plans and construction timelines.

If sedimentation or other issues arise in the Little Minnesota River during baseflow events, the rock arch rapids has been designed with a low flow channel, which can be modified by placing more riprap if sedimentation or other issues arise in the Little Minnesota River channel. This modification would bring the flow splits during flow flows to closer alignment to the as built flood control project.

3.2.2 SEDIMENT TRANSPORT

During the current condition, when large events occur and the diversion is utilized, large amounts of sediments are deposited in the diversion channel. This obscures the low flow channel in the downstream portion of the diversion and drowns out vegetation growth. It is anticipated that with the diversion channel accessed more frequently, the low flow channel will re-establish with dimensions appropriate for the channel forming flow. This will likely establish a smaller channel than the as-constructed low flow channel; but large enough to provide fish passage for a broad range of fish species. Excavation of deposited sediments in the diversion channel may still be necessary following large events. The UMRWD is currently pursuing a separate project to remove sediment from the low flow channel.

3.2.3 MAINTENANCE AND OPERATIONS

It is recommended to monitor the Little Minnesota River channel through town for sedimentation related to changes in the flow distribution. If necessary, the controlling cross section of the rock arch rapids (i.e., the low flow channel) may be revised to push more flow through town during small events. This revision would involve raising the boulder weir through the controlling cross section and adding riprap; resulting in more flow going through town during small (channel forming) events. These revisions can be made without significant modeling. The inset channel in the controlling section could be eliminated (controlling section invert at 983.0) and the 100-year discharge (assuming as-built downstream geometry, ie no sediment) would increase from 852 cfs to 854 cfs.

Post project monitoring of the downstream diversion channel should be completed after the fish passage modifications have been made to ensure the channel forming geomorphology resulting from more frequent flows are consistent with fish passage.

The low flow channel at the rock arch rapids entrance may occasionally be blocked with debris but larger flows will typically flush any debris downstream. The UMRWD owns the property and thus has access to perform maintenance.

3.2.4 OTHER CONSIDERATIONS

The proposed preferred alternative will result in a 3% slope which is consistent with successful fish passage projects throughout Minnesota. HEC-RAS modeling indicates that Alternative 2 will almost completely close the fish passage gap, eliminating the need for a future costly modification to the box culvert. The preferred alternative significantly improves fish passage for flows ranging from 45 cfs to ~500 cfs and higher.

The preferred alternative meets all the project goals. The other considered alternatives also make significant progress towards closing the fish passage gap; however, ultimately the preferred alternative was chosen because it almost completely closes the fish passage gap, despite changes to the channel forming hydrology through town. Consensus was reached that modifications to raise the boulder weir in the controlling section of the rock arch rapids could be completed relatively cost-effectively, making the preferred alternative worth-while to pursue to avoid very high-cost modifications to the existing box culvert.

Other project features to further increase fish passage were considered during design. The rock riffle downstream of the culvert (Alternative 2) was modeled in HEC-RAS and was found to improve fish passage only slightly during a small range of lower flows. A series of rock riffles downstream of the bridge were also considered, but the existing downstream diversion channel's capacity would be greatly reduced, resulting in lower flows utilizing the floodplain more frequently, possibly increasing the chances of fish being stranded. Maintaining a 3% slope and modifying the riprap downstream of the bridge to contain the same capacity as the downstream diversion channel is preferred. These features may be considered in the future if continued monitoring deems further improvements necessary.

Other features to increase migration through the diversion channel itself may also be considered, with consideration of sedimentation that occurs during large events and maintenance of the channel.

4 REGULATORY

Projects that affect water resources are often regulated by a variety of local, state, and federal agencies. Regulated activities may be authorized with or without an individual permit and with or without conditions. The following identifies the probable regulatory approvals that may be necessary for this project.

4.1 FEDERAL

4.1.1 SECTION 404/401

Section 404 of the Clean Water Act requires a permit from the US Army Corps of Engineers (USACE) for the discharge of dredged or fill material, within waters of the U.S., including wetlands. The USACE utilizes general permits and nationwide permits to authorize specific categories of work that have minor impact to "waters of the U.S.". If a permit is needed, it is likely this project would qualify for a Nationwide permit, such as Nationwide permit 27 for Stream Restoration or an applicable General Permit. In order to receive a 404 permit the project must comply with the EPA's Section 404(b)(1) guidelines, which require activities to be the least environmentally damaging practicable alternative (LEDPA), adverse impacts are avoided, minimized, and then compensated for through mitigation. Activities also must be determined to be in the public interest. The USACE may require a wetland delineation be completed within the project footprint. It is likely Section 404 would be administered out of the Omaha office.



The project will also need to meet the Section 401 of the Clean Water Act. This provision requires any applicant for a federal license or permit to conduct an activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification from the State in which the discharge originates that the discharge complies the applicable water quality standards. The 401 certification becomes a condition of the U.S. Army Corps of Engineers (Corps) Section 404 permit but is issued by the Minnesota Pollution Control Agency and South Dakota Department of Environment and Natural Resources.

4.1.2 SECTION 408

The project will need to be reviewed to determine whether there are any potential affects to other federally authorized projects requiring approval under Section 408 authorities. The USACE will be consulted, and a determination requested. Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of projects they carry out, approve, or fund on historic properties. The USACE as the lead federal permitting agency will be consulted to assure compliance with Section 106 as part of their Section 404 permitting and/or Section 408 actions. Since the 100-year flow splits are not effective and other discharges are not effective downstream of the tie-in of the Diversion Channel to the Little Minnesota River, it is unlikely a Section 408 permit is needed.

4.1.3 NEPA

Lastly, the project will need to be reviewed for compliance with the National Environmental Policy Act (NEPA). A federal Environmental Assessment will likely not be required for the project. There are provisions for conducting joint federal and state environmental review and the state and federal processes will be coordinated to reduce duplication of data collection and public meetings.

4.2 STATE

4.2.1 MN PUBLIC WATERS

The project is proposed to modify baseflow discharges within a designated public watercourse (Little Minnesota River). Public waters are regulated by the Department of Natural Resources in accordance with M.S. 103G and MN Rules Chapter 6115. Activities below the Ordinary High Water Mark (OHWM) that would change the course, current, or cross section of public waters are subject to public waters permit authority. There are specific exemptions from permitting requirements that may apply to portions of the project. In addition, MNDNR has issued general permits for some activities. Since no work is being done within a Public Water in Minnesota, it is unlikely a public waters permit is necessary, however the Minnesota DNR should be notified during the public comment period of other permit processes.

4.2.2 MINNESOTA WETLAND CONSERVATION ACT (WCA)

Any impacted aquatic resources outside the OHWM of Minnesota Public Waters would require a review by the acting local government until in Traverse County which is the Traverse County SWCD in accordance with the Minnesota Wetland Conservation Act (Minnesota Rule Chapter 8420). The rule regulates activities that drain, fill, or excavated wetlands. Since no work is being done within wetlands in Minnesota, it is unlikely that a WCA permit is necessary.

4.2.3 MINNESOTA ENVIRONMENTAL POLICY ACT (MEPA)

Although the project construction activities are in South Dakota, the project will need to be reviewed by the board to determine if a Minnesota environmental review (EAW) is triggered by any mandatory categories under Minnesota's Environmental Policy Act (MEPA). The responsible government unit (RGU) for these two categories is the DNR and the local government respectively. The DNR will need to be consulted on who ultimately is designated as the RGU, but it is anticipated that the UMRWD would assume the role of RGU.

4.2.4 SD WATER RIGHTS/FLOOD CONTROL

A Water Rights Permit (Specifically Flood Control) (South Dakota Department of Environment and Natural Resources) was required during construction of the Browns Valley Diversion project. 100-year flow splits are not proposed to be significantly altered; therefore, it is unlikely a SD Flood Control permit will be required; however, coordination with the South Dakota Department of Agriculture and Natural Resources should take place to confirm. A permit may be issued only if there is a reasonable probability that unappropriated water is available; the proposed diversion can be developed without unlawful impairment of existing rights; the proposed use is a beneficial use; and the proposed use is in the public's interest. It is anticipated that the project can meet these requirements.

The project alternatives also include the modification of a weir that is likely classified as a regulated dam which also falls under the Water Rights Permit. Dam safety requirements are subject to additional provisions based on the hazard classification.

4.2.5 GENERAL PERMIT FOR STORMWATER DISCHARGE

Stormwater discharges are regulated under the National Pollution Discharge Elimination System (NPDES) permit program of the Pollution Control Agency and South Dakota Department of Environment and Natural Resources. NPDES permits are generally required for any construction activity disturbing one acre or more of soil; or if an area is less than one acre, if it is part of a larger common plan of development that is greater than one acre. Most construction activities are covered by a general NPDES stormwater permit for construction activity, but some construction sites need individual permit coverage. It is anticipated that the project activities would not require an individual permit and that a Stormwater Pollution Prevention Plan (SWPPP) will be developed as part of the final project plans.

4.3 LOCAL

Local governments that may have regulatory oversight of the project include the Roberts County South Dakota, Big Stone County Minnesota, Upper Minnesota River Watershed District (UMRWD). The project has been reviewed and consistent with the watershed management plan.

4.3.1 FLOODPLAIN

The proposed project works within the Zone A floodplain in Roberts County SD. Because 100-yr flow split will be matched to the previous project, downstream base flood elevation (BFE) on the published Flood Insurance Rate Map (FIRM) will not be modified. Zone A floodplains are administered locally. Roberts County South Dakota administers a floodplain ordinance. The project will be evaluated on whether the sites within Roberts County are located within an area of special flood hazard and comply with any

requirements outlined for work within a floodplain. The Roberts County floodplain administrator should be contacted regarding required submittals.

4.3.2 UMRWD

The UMRWD also manages a permitting program for certain activities including activities related to bridges, culverts, and drains. It is not anticipated that a permit from UMRWD will be required for the project.

4.4 SUMMARY

Permitting the project the project will require obtaining all of the above mentioned permits as well as federal and state environmental review. The project will cover two state jurisdictions and two county jurisdictions, effectively doubling the amount of permits necessary to complete the project. To complete these permits the following additional work may be required; wetland and threatened and endangered species field review, and a cultural resources field review.

5 OPINION OF PROBABLE COSTS

The estimated construction project costs for the project described in this report are as follows:

Table 3 – Opinion of Probable Construction Costs

	Total
Construction Costs	\$600,000
Construction Contingency (20%)	\$120,000
Other Costs (Administration, Final Engineer, Construction Administration, staking, and observation, Permitting)	\$120,000
Total Project Costs	\$840,000

A detailed breakdown of the project costs is included as **Exhibit B** to this report, Project Itemized Cost Estimate.

6 RECOMMENDATION AND NEXT STEPS

The proposed preferred alternative meets all the identified project goals.

It is anticipated that the stakeholders will use the 90% plans and technical specifications to pursue funding and permitting. Other portions of the project specifications can be completed following identification of requirements related to project funding mechanisms. The 90% plan set will be used for permitting submittals and applications for grants. Any necessary revisions that arise during regulatory review will be incorporated prior to construction. Prior to finalizing the plans, the MN DNR Floodplain Management Division should review the project to confirm it complements the Browns Valley Flood Mitigation Project.

The UMRWD, GFP, and MnDNR are encouraged to hold a public information meeting to discuss the project components and expectations.

7 SUMMARY OF PUBLIC OUTREACH

There have been several public meetings which provided public information about the proposed project. These meetings were typically noticed with mailers to residents of the City of Browns Valley and notifications on water bills. These public meetings occurred on:

- 6/26/2025
- 4/4/2024

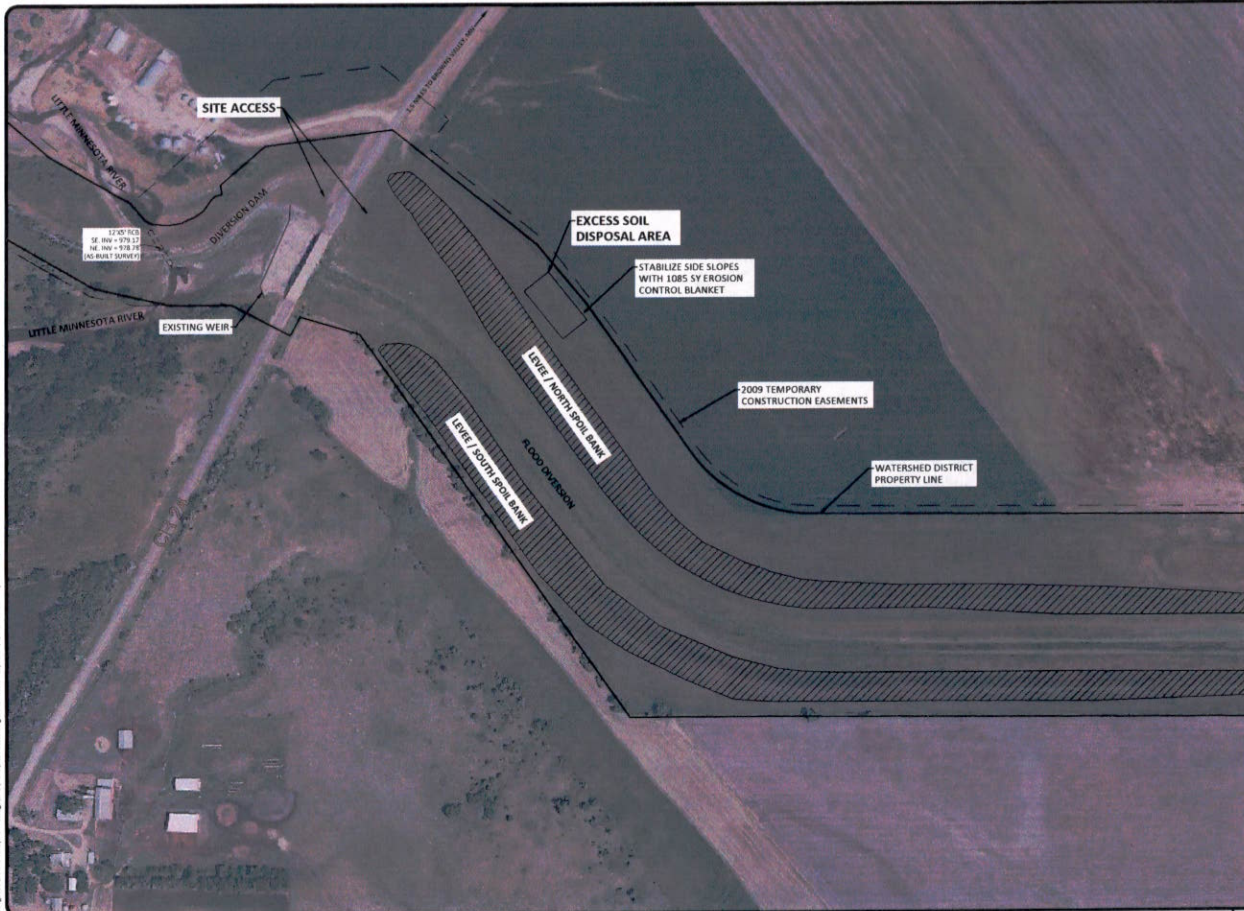
These publicly noticed meetings occurred at the American Legion in Browns Valley.

Project updates have also been provided during regularly occurring Upper Minnesota River Watershed District meetings and one Sisseton Wahpeton Oyate (SWO) Tribal Council meeting.

Public feedback was generally supportive of the project, though concern was expressed that any alterations to the project should maintain the flood control benefits. No changes to the flood control benefits are proposed. Those attending the SWO Tribal Council meeting were very supportive of the project.



APPENDIX A – 90% DESIGN PLANS



NOTES:

1. ACCESS ROAD SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND RESTORED TO AS-GOOD-OR-BETTER CONDITIONS THAT EXISTED PRIOR TO CONSTRUCTION. ALL COSTS FOR ACCESS ROAD IMPROVEMENTS, MAINTENANCE, AND RESTORATION SHALL BE INCIDENTAL TO OTHER BID ITEMS.
2. NO HEAVY EQUIPMENT TO BE DRIVEN ON EXISTING LEVEES.
3. WITHIN EXCESS SOIL DISPOSAL AREA, CONTRACTOR SHALL PROVIDE DRAINAGE BY SLOPING TOWARD EXISTING FLOWPATHS. THE SPOIL WILL BE LEVELED AT A MAXIMUM HEIGHT OF 6 FEET WITH 3:1 SIDE SLOPES.

PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By

HOUSTON
engineering, inc.

Drawn by: NJD
Date: 9/8/2023
Checked by: LDO
Scale: AS SHOWN

BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

SITE ACCESS
PROJECT NO. 5304-0030

SHEET
3

No.	Item	Unit	Quantity
1	Mobilization	LS	1
2	Common Excavation (P)	CY	2,929
3	Common Embankment (P)	CY	41
4	Floating Silt Curtain	LF	50
5	Remove Existing Sheetpile	SF	1,415
6	Salvage and Reinstall SDDOT Class D Riprap (P)	CY	919
7	SDDOT Class C Riprap (P)	CY	1,683
8	Random Riprap Class C (P)	CY	1,306
9	Rock Weir (36" to 60" Diameter Boulders)	LF	576
10	Rock Boulders (36" to 60" Diameter)	EA	10
11	Flat Rock Boulders (48" to 72" Diameter)	EA	4
12	Erosion Control Blanket	SY	1,305
13	Silt Fence	LF	50
14	Seeding and Mulching	LS	1

GENERAL NOTES

- A. ALL MATERIAL NOT UTILIZED ON THIS PROJECT WILL BECOME THE PROPERTY OF THE CONTRACTOR.
- B. CONTRACTOR SHALL WORK WITH ROAD AUTHORITIES TO MAINTAIN ACCESS FOR RESIDENTS AND EMERGENCY TRAFFIC AT ALL TIME FOLLOWING THE SDDOT SPECS.

SURVEY DATUM:

HORIZONTAL DATUM: NAD83 MN COUNTY COORDINATE SYSTEM, TRAVERSE COUNTY, US FOOT

VERTICAL DATUM: NAVD88

ALL EXISTING SURFACE ELEVATIONS ARE BASED ON LIDAR FLIGHT DECEMBER 2022.

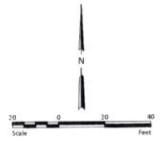
PRELIMINARY
NOT FOR CONSTRUCTION

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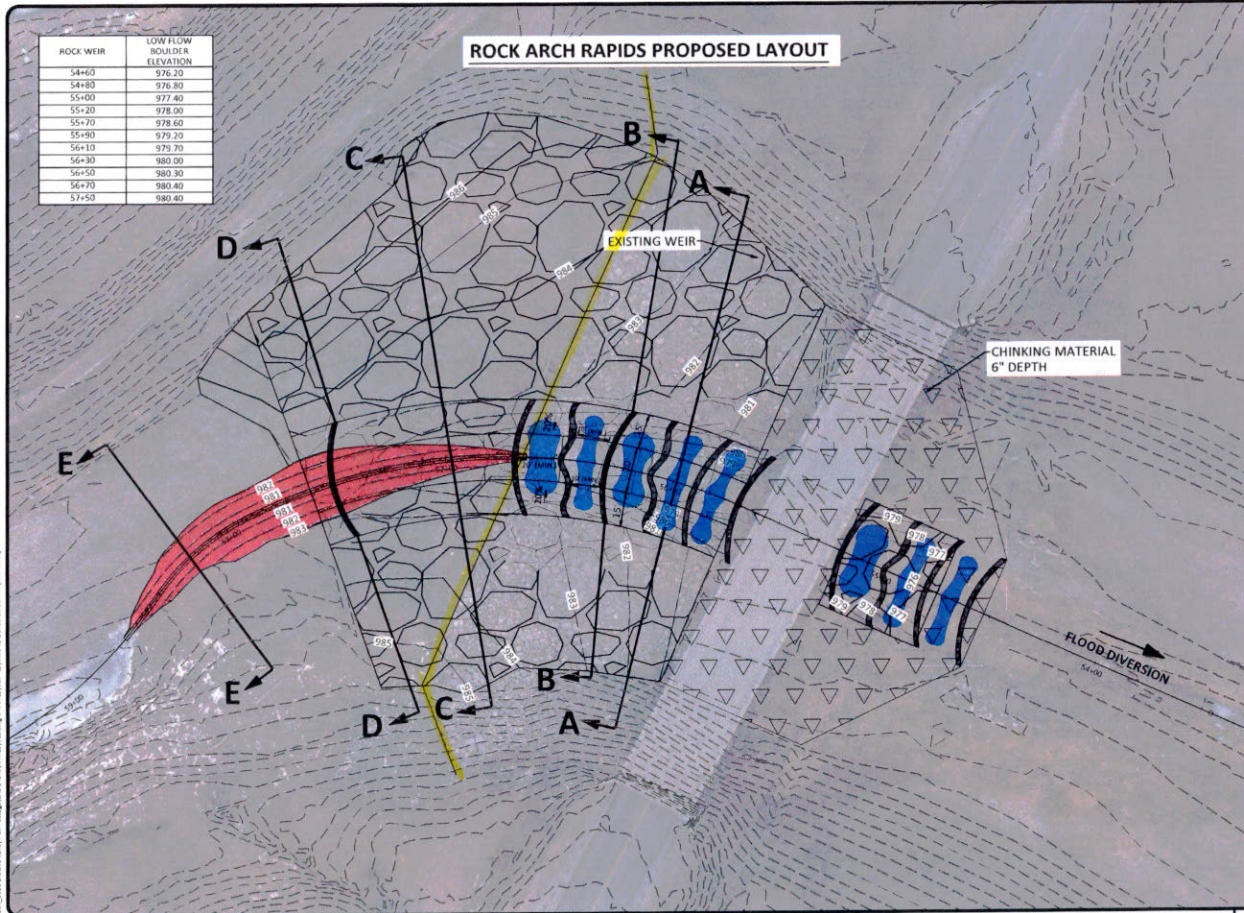
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No.	Revision	Date	By		Checked By: LDO	Scale: AS SHOWN			

ROCK WEIR	LOW FLOW BOULDER ELEVATION
54+60	976.20
54+80	976.80
55+00	977.80
55+20	978.00
55+70	978.60
55+90	979.20
56+10	979.70
56+30	980.00
56+50	980.30
56+70	980.40
57+50	980.40

ROCK ARCH RAPIDS PROPOSED LAYOUT



- █ LOW FLOW CHANNEL
- █ ROCK WEIR
- ROCK ARCH RAPIDS
- █ POOL
- CHINKING MATERIAL TRANSITION



PRELIMINARY
NOT FOR CONSTRUCTION



Drawn by: NJD
Date: 9/8/2023
Checked by: LDO
Scale: AS SHOWN

BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

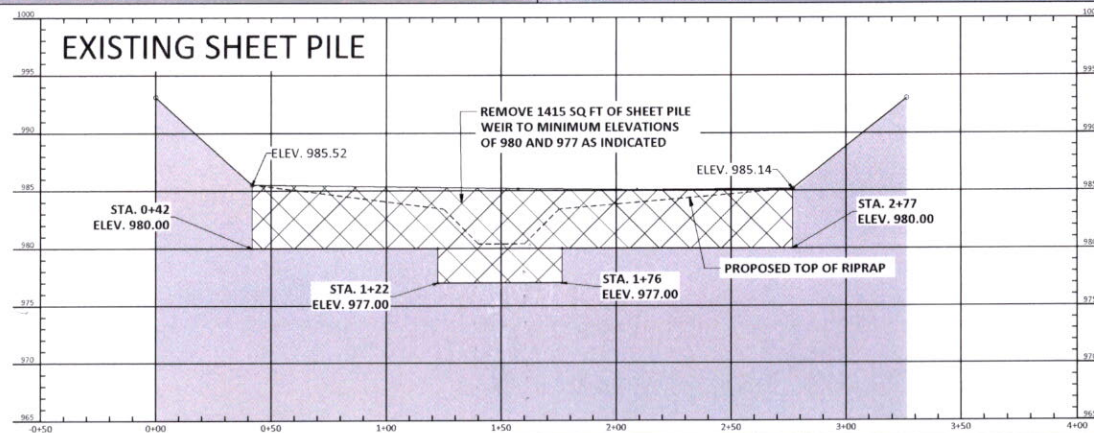
ROCK ARCH RAPIDS
LAYOUT
PROJECT NO. 5304-0030

SHEET
5



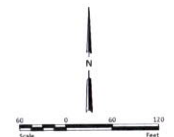
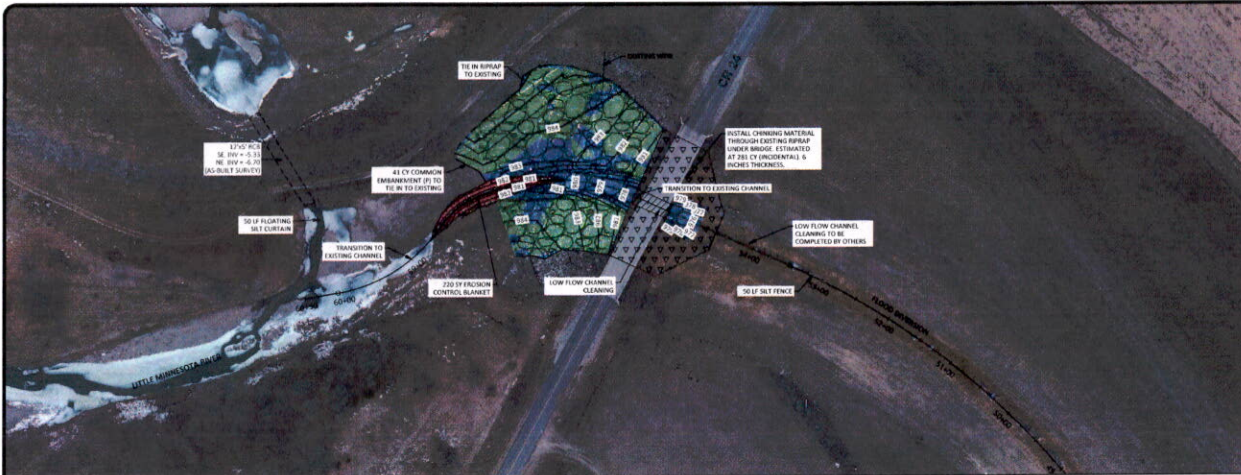
NOTES:

1. ALL REMOVED SHEET PILE MUST BE DISPOSED OF OFF-SITE BY THE CONTRACTOR (INCIDENTAL TO BID ITEM REMOVE EXISTING SHEET PILE).
2. ALL PLANT, LABOR, MATERIALS, EQUIPMENT, TOOLS, DISPOSAL, HAULING, AND OTHER ITEMS NECESSARY TO COMPLETE THE REMOVAL SHALL NOT BE PAID FOR SEPARATELY BUT INSTEAD BE INCIDENTAL TO BID TIME REMOVE EXISTING SHEET PILE.
3. SHEET PILE WILL BE FULLY BURIED.



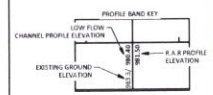
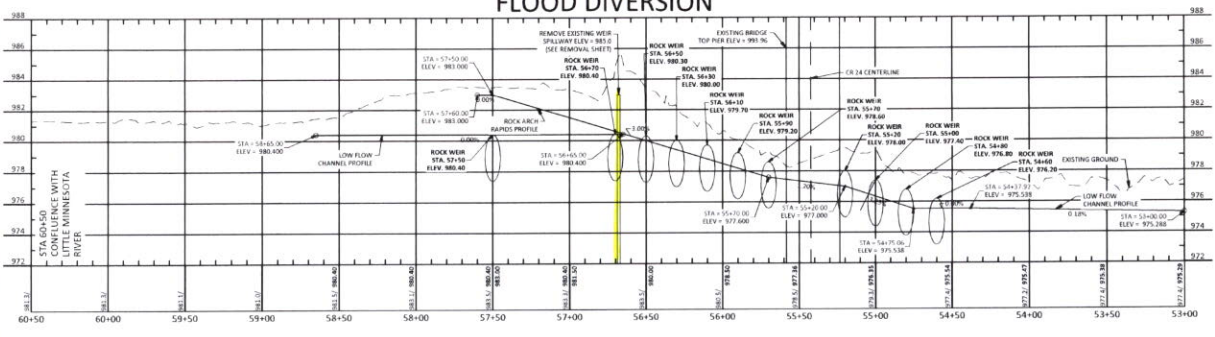
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NOT FOR CONSTRUCTION

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No.	Revision	Date	By		Checked by LDO	Scale AS SHOWN		PROJECT NO.: S304-0030	8



- █ EXCAVATION
- █ FILL
- █ LOW FLOW CHANNEL

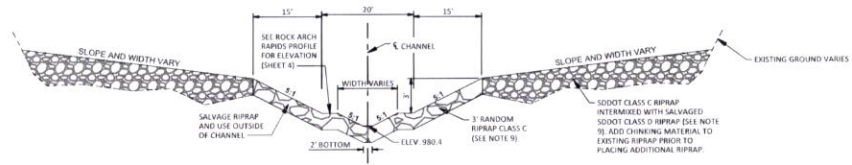
FLOOD DIVERSION



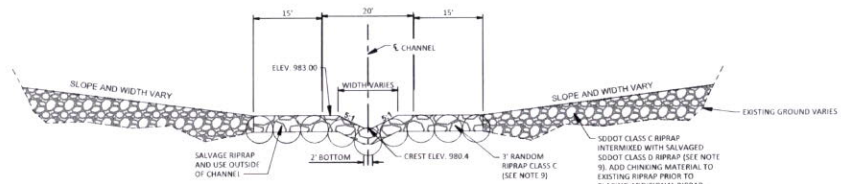
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NOT FOR CONSTRUCTION

					Drawn by NID	Date 9/8/2023	BROWNS VALLEY FISH PASSAGE UPPER MINNESOTA RIVER WATERSHED DISTRICT ROBERTS COUNTY, SD	PLAN AND PROFILE	SHEET
No.	Revision	Date	By		Checked by LDO	Scale AS SHOWN		PROJECT NO. 5304-0030	4

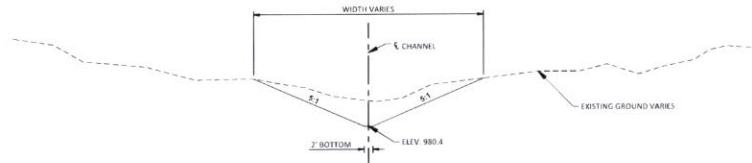
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TYPICAL SECTION C - C
STA 56+67 TO STA 57+50
(NOT TO SCALE)



ROCK WEIR SECTION D - D
STA 57+50
(NOT TO SCALE)



TYPICAL SECTION E - E
STA 57+50 TO STA 59+00
(NOT TO SCALE)

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No.	Revision	Date	By



Drawn by: NID
Date: 9/8/2023
Checked by: TDR
Scale: AS SHOWN

BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

ROCK ARCH RAPIDS
DETAILS
PROJECT NO. 5304-0030

SHEET
7



- NOTES:
1. NUMBER OF BOLLARDS FOR EACH ROCK ARCH SHALL BE DEPENDENT ON SIZE AND SPACING OF BOLLARDS.
 2. ROCK WEIRS SHALL CONSIDER 36" TO 60" BOLLARDS. TOP OF BOLLARD SHALL BE AT LEAST 18" ABOVE WATER SURFACE. CLASS AS SHOWN ON THE PROJECT TO RESULT IN NOT LESS THAN APPROXIMATELY 20% TO CRUSH.
 3. BOLLARD WEIRS ARE TO BE FILLED WITH RANDOM RAMP CLASS 1.5A GRAVEL. AGGREGATE SHALL BE MIXED IN PLACE & APPLIED AS A SINGLE, WELDED MATERIAL TO REDUCE LAUNCH AND DEBATE TOTE.
 4. ADDITIONAL BOLLARDS WILL BE ADDED RANDOMLY TO ADD TO AESTHETICS AS DIRECTED BY THE ENGINEER OR REPRESENTATIVE IN THE FIELD. ESTIMATED AT 30 TOTAL. ADDITIONAL BOLLARDS ARE TO BE PLACED IN THE CHANNEL. BOLLARDS SHALL BE MEASURED AS EACH AND PAID FOR ON THE BASIS OF "PER ROCK" (BOLLARD) REGARDLESS OF DIAMETER. BOLLARDS MAY BE PLACED ANYWHERE WITHIN THE ROCK ARCH RAMP AREA.
 5. THE WEIRS FUNCTION TO PROVIDE ADDITIONAL STABILITY TO THE RAMP AND ARE NOT TO BE USED AS A MEANS OF FLOW, DIRECTING FLOW TOWARDS OR AWAY FROM THE WEIR. CREATING STREAMS AND POOLS AND IMPROVING SAFETY BY CREATING LOW VELOCITY NARROWS.
 6. WEIRS ARE TO BE INTEGRATED INTO THE CONSTRUCTED BANKS. THE GAPS BETWEEN BOLLARDS SHALL TYPICALLY BE 12" TO 12". CAPTURE THE 24" GAPS WITHIN THE 24" GAPS BETWEEN BOLLARDS. THIS IS TO IMPROVE FISH PASSAGE FOR LARGE STRUCTURE AND OTHER LARGE FISH SPECIES.
 7. ALL FILL MATERIAL UNDER RIPRAP RAMP TO BE RANDOM RIPRAP. EITHER THE 18" OR 24" CLASS. THE 18" AND 24" CLASS RIPRAP INTERMIXED WITH THE SALVAGE 50AL CLASS RIPRAP OUTSIDE OF THE 50' CHANNEL.
 8. ALL MATERIAL TO BE PLACED AND MIXED ON SITE. CHANNEL EXCAVATION WITH ENGINEERS APPROVAL.
 9. RIPRAP TO BE MIXED WITH A WELL GRADED MIX OF 1/2" TO 3/4" SAND. THE SAND SHALL BE PLACED IN 6-8 INCH STRIPS AND APPLIED AS A SINGLE, WELL-MIXED, BLENDED MATERIAL TO REDUCE LAUNCH AND DEBATE TOTE. THE MIX OF AGGREGATE SHOULD BE SUCH THAT IT NOT BLOWN OUT OF THE RIPRAP BY THE RIVERS CURRENT BUT NOT BLOWN INTO THE LOW FLOW AREA.
 10. CONTRACTORS HAVE ESTIMATED THE QTY TO BE NEARLY 1% OF THE TOTAL QTY OF AGGREGATE. THE CONTRACTOR'S ENGINEER MAY REQUIRE ADDITIONAL AGGREGATE MIX TO BE PLACED IN THE WELL LOCATED AREAS OF AGGREGATE IS CONSIDERED INSUFFICIENT TO RIPRAP.
 11. SALVAGE CLASS RIPRAP LOCATED WITHIN THE 50' CHANNEL AND REINSTALL AT OTHER LOCATIONS. 50AL WITH NEARLY 1% OF AGGREGATE. THE CONTRACTOR'S ENGINEER MAY REQUIRE ADDITIONAL AGGREGATE MIX TO BE PLACED IN THE WELL LOCATED AREAS OF AGGREGATE IS CONSIDERED INSUFFICIENT TO RIPRAP.
 12. POOLS WITHIN THE ROCK ARCH RAMP CLASS WILL EXTEND BELOW THE 50' CHANNEL.

					Drawn By NJD	Date 9/8/2023	BROWNS VALLEY FISH PASSAGE UPPER MINNESOTA RIVER WATERSHED DISTRICT ROBERTS COUNTY, SD	BV TYPICAL SECTIONS DETAILS A AND B PROJECT NO. 5304-0030	SHEET 6
No.	Revision	Date	By		Checked by LDO	Scale AS SHOWN			

ROBERTS COUNTY, SD
SEPTEMBER 2023



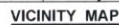
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|------|--------------------------|
| 1 | COVER SHEET |
| 2 | NOTES AND QUANTITIES |
| 3 | SITE ACCESS |
| 4 | PLAN AND PROFILE |
| 5 | ROCK ARCH RAPIDS LAYOUT |
| 6-7 | ROCK ARCH RAPIDS DETAILS |
| 8 | REMOVALS |
| 9-12 | SWPPP NARRATIVE |
| 13 | EROSION CONTROL DETAILS |

GOVERNING SPECIFICATIONS:

STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, ADOPTED BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION, SHALL APPLY TO ALL STANDARD DRAWINGS CURRENTLY IN EFFECT AND OTHER CONTRACT PROVISIONS SUBMITTED HEREIN:

UTILITY NOTE:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION, AS BEST MAPS AS PROVIDED BY MUNICIPALITIES OR UTILITY COMPANIES, AND/OR EXISTING DRAWINGS. THERE IS NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN INDICATE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. NOR IS THERE A GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION LOCATED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY RESULT FROM THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES.



PRELIMINARY
NOT FOR CONSTRUCTION

STORMWATER POLLUTION PREVENTION PLAN CHECKLIST
(The numbers left of the title headings are reference numbers to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES (Stormwater Permit))

5.3 (2): STAFF TRAINING/SWPPP IMPLEMENTATION

To promote stormwater management awareness specific for this project, the Contractor's Erosion Control Supervisor should provide correspondence of how the SWPPP will be implemented. The Contractor's Erosion Control Supervisor is responsible for providing this information at the preconstruction meeting, and subsequently completing an attendance log, which should identify site-specific implementation of the SWPPP and the names of the personnel who attended the preconstruction meeting. Documentation of the preconstruction meeting will be filed with the SWPPP documents.

5.3 (3): DESCRIPTION OF CONSTRUCTION ACTIVITIES

- 5.3 (3a): Project Limits (See Title Sheet)
- 5.3 (3a): Project Description (See Title Sheet)
- 5.3 (4): Site Map(s) (See Title Sheet and Plans)
- Major Soil Disturbing Activities (check all that apply)
 - ☒ Clearing and grubbing
 - ☒ Excavation/borrow
 - ☒ Grading and shaping
 - ☒ Filling
 - ☐ Other (describe):
- 5.3 (3b): Total Project Area 1.5 acres
- 5.3 (3b): Total Area to be Disturbed 1.5 acres
- 5.3 (3c): Maximum Area Disturbed at One Time 1.5 acres
- 5.3 (3d): Existing Vegetative Cover (%) 60%
- 5.3 (3d): Description of Vegetative Cover Mix of grasses and riparian vegetation
- 5.3 (3e): Soil Properties: Predominantly lean clay and lean clay with sand (CL and CUOL)
- 5.3 (3f): Name of Receiving Water Body/Bodies Little Minnesota River
- 5.3 (3g): Location of Construction Support Activity Areas North of bridge and east and west sides of CR 24

5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES

The Contractor will enter the Estimated Start Date.

Description	Estimated Start Date
Install perimeter protection where runoff may exit site	
Install perimeter protection around stockpiles.	
Stabilize disturbed areas.	
Final grading.	
Removal of protection devices.	
Reseed areas disturbed by removal activities.	

5.3 (5): DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES

All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report. Include the technical reasoning for selecting each control (check all that apply)

Perimeter Controls (See Detail Plan Sheets)

Description	Estimated Start Date
☐ Natural Buffers (within 50 ft of Waters of State)	
☒ Silt Fence	
☐ Erosion Control Watties	
☐ Temporary Berm / Windrow	
☒ Floating Silt Curtain	
☐ Stabilized Construction Entrances	
☐ Entrance/Exit Equipment Tire Wash	
☐ Other:	

Structural Erosion and Sediment Controls

Description	Estimated Start Date
☒ Silt Fence	
☐ Temporary Berm/Windrow	
☐ Erosion Control Watties	
☐ Temporary Sediment Barriers	
☐ Erosion Bales	
☐ Temporary Slope Drain	
☐ Turf Reinforcement Mat	
☒ Riprap	
☐ Gabions	
☐ Rock Check Dams	
☐ Sediment Traps/Basins	
☐ Culvert Inlet Protection	
☐ Transition Mats	
☐ Median/Area Drain Inlet Protection	
☐ Curb Inlet Protection	
☐ Interceptor Ditch	
☐ Concrete Washout Facility	
☐ Work Platform	
☐ Temporary Water Barrier	
☐ Temporary Water Crossing	
☐ Permanent Stormwater Ponds	
☐ Permanent Open Vegetated Swales	
☐ Natural Depressions to allow for Infiltration	
☐ Sequential Systems that combine several practices	
☐ Other:	

Stabilization Practices (See Detail Plan Sheets)

(Stabilization measures will begin the following work day whenever earth disturbing activity on any portion of the site has temporarily or permanently ceased. Temporary stabilization will be completed as soon as practicable but no later than 14 days after initiating soil stabilization activities (3.16))

Description	Estimated Start Date
☐ Vegetation Buffer Strips	
☐ Temporary Seeding (Cover Crop Seeding)	
☒ Permanent Seeding	
☐ Sodding	
☐ Planting (Woody Vegetation for Soil Stabilization)	
☒ Mulching (Grass Hay or Straw)	
☐ Fiber Mulching (Wood Fiber Mulch)	
☐ Soil Stabilizer	
☐ Bonded Fiber Matrix	
☐ Fiber Reinforced Matrix	
☒ Erosion Control Blankets	
☐ Surface Roughening (e.g. tracking)	
☐ Other	

Wetland Avoidance

Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☐ No ☒ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.



Drawn by
NJD
Checked by
TDR
Date
9/8/2023
Scale
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BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

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- Inspections will be conducted at least once every 7 days.
- All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
- Silt fence will be inspected for depth of sediment and for tears to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches $\frac{1}{2}$ of the height of the silt fence.
- Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
- Check dams will be inspected for stability. Sediment will be removed when depth reaches $\frac{1}{2}$ the height of the dam.
- All silt fence and check dam basins, traps, and washouts, and vigorous growth free of significant weed infestations.
- Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection. This form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
- The SDDOT Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance and repairs are the responsibility of the Contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

Stormwater management will be handled by temporary controls outlined in "DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES" above, and any permanent controls needed to meet permanent stormwater management needs in the post construction period will be shown in the plans and noted as permanent.

5.3 (8a): Spill Prevention and Response Procedures

Material Management

- Housekeeping

- Only needed products will be stored on-site by the Contractor
 - Except for bulk materials the Contractor will store all materials under cover and/or in appropriate containers
 - Products must be stored in original containers and labeled
 - Material mixing will be conducted in accordance with the manufacturer's recommendations.
 - When possible, all products will be completely used before properly disposing of the container off-site
 - The manufacturer's directions for disposal of materials and containers will be followed
 - The Contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal
 - Dust generated will be controlled in an environmentally safe manner.
- Hazardous Materials**
- Products will be kept in original containers unless the container is not resealable and provide secondary containment as applicable.
 - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
 - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.

- Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during rain events to prevent the release of contaminants onto the ground.
- Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any stormwater system or stormwater treatment system.
- Potential pH-modifying materials such as: bulk cement, cement dust, ash, new concrete curbs, concrete pumping residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of stormwater runoff.

➤ Spill Control Practices

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill cleanup will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the Contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kity litter, sand, sawdust, and plastic and metal trash containers specifically for cleanup purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Once a spill is released, the contractor will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The Contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator.

- **Spill Response**

Spill Response
The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into stormwater runoff and conveyance systems. If the release has impacted on-site stormwater, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens stormwater or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.

- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SODANR
- Personnel with primary responsibility for spill response and cleanup will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities

➤ Waste Disposal

Waste Disposal
At the time

- All liquid waste materials will be collected and stored in approved sealed containers. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal and notices stating proper practices will be posted. The Contractor is responsible for ensuring waste disposal procedures are followed.

➤ **Hazardous Waste**

- All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the Contractor will be responsible for seeing that these practices are followed.

➤ **Sanitary Waste**

- Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units which must be secured to prevent tipping and serviced in a timely manner by a licensed waste management Contractor or as required by any local regulations.

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5.3 (9): CONSTRUCTION SITE POLLUTANTS

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the heading "POLLUTION PREVENTION PROCEDURES" (check all that apply).

- ☐ Concrete and Portland Cement
- ☐ Detergents
- ☐ Paints
- ☒ Metals
- ☐ Bituminous Materials
- ☒ Petroleum Based Products
- ☐ Diesel Exhaust Fluid
- ☐ Cleaning Solvents
- ☐ Wood
- ☐ Cure
- ☐ Texture
- ☐ Chemical Fertilizers
- ☐ Other:

Product Specific Practices

• Petroleum Products

All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.

• Fertilizers

Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to stormwater. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.

5.3 (10): NON-STORMWATER DISCHARGES

The following non-stormwater discharges are anticipated during the course of this project (check all that apply).

- ☐ Discharges from water line flushing
- ☐ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred
- ☐ Uncontaminated ground water associated with dewatering activities.

5.3 (11): INFEASIBILITY DOCUMENTATION

If it is determined to be infeasible to comply with any of the requirements of the Stormwater Permit, the infeasibility determination must be thoroughly documented in the SWPPP.

7.0: SPILL NOTIFICATION

In the event of a spill, the Contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to SDDANR immediately if any one of the following conditions exists:
 - The release or spill threatens or is able to threaten waters of the state (surface water or ground water)
 - The release or spill causes an immediate danger to human health or safety
 - The release or spill exceeds 25 gallons
 - The release or spill causes a sheen on surface water
 - The release or spill of any substance that exceeds the ground water quality standards of ARSD Chapter 74:54.01
 - The release or spill of any substance that exceeds the surface water quality standards of ARSD Chapter 74:51.01
 - The release or spill of any substance that harms or threatens to harm wildlife or aquatic life
 - The release or spill is required to be reported according to Superfund Amendments and Reauthorization Act (SARA) Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.
- To report a release or spill, call SDDANR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231. Reporting the release to SDDANR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, you must also contact local authorities to determine the local reporting requirements for releases. A written report of the unauthorized release of any regulated substance, including quantity discharged, and the location of the discharge will be sent to SDDANR within 14 days of the discharge.

5.4: SWPPP CERTIFICATIONS

➤ Certification of Compliance with Federal, State, and Local Regulations

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➤ SWPPP Designer

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature (See the General Permit, Section 7.4 (1))

➤ Prime Contractor

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature



Drawn by: NJO
Date: 9/9/2023
Checked by: TDR
Scale: AS SHOWN

BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

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CONTACT INFORMATION

The following personnel are duly authorized representatives and have signatory authority for modifications made to the SWPPP.

➤ Contractor Information:

• Prime Contractor Name: _____
• Contractor Contact Name: _____
• Address: _____
• _____
• City: _____ State: _____ Zip: _____
• Office Phone: _____ Field: _____
• Cell Phone: _____ Fax: _____

➤ Erosion Control Supervisor

• Name: _____
• Address: _____
• _____
• City: _____ State: _____ Zip: _____
• Office Phone: _____ Field: _____
• Cell Phone: _____ Fax: _____

➤ Upper Minnesota River Watershed District (Owner)

• Name: Amber Doschadis (Administrator)
• Business Address: 211 2nd St SE
• City: Ortonville State: MN Zip: 56278
• Office Phone: 320-839-3411
• Fax: 320-839-3313

➤ Design of Construction SWPPP

• Name: Lisa Odens
• Business Address: 7750 Meridian Circle North
• City: Maple Grove State: MN Zip: 55369
• Office/Cell Phone: 763-493-6667

➤ SDDANR Contact Spill Reporting

- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➤ SDDANR Contact for Hazardous Materials.

- (605) 773-3153

➤ National Response Center Hotline

- (800) 424-8802.

➤ SDDANR Stormwater Contact Information

- SDDANR Stormwater (800) 737-8676
- Surface Water Quality Program (605) 773-3351

5.5: REQUIRED SWPPP MODIFICATIONS

➤ 5.5 (1): Conditions Requiring SWPPP Modification

The SWPPP must be modified, including the site map(s), in response to any of the following conditions:

- When a new operator responsible for implementation of any part of the SWPPP begins work on the site.
- When changes to the construction plans, sediment and erosion control measures, or any best management practices on site that are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions triggered by inspections.
- To reflect areas on the site map where operational control has been transferred (including the date of the transfer) or has been covered under a new permit since initiating coverage under this general permit.
- If inspections by site staff, local officials, SDDANR, or U.S. EPA determine that SWPPP modifications are necessary for compliance with the Stormwater Permit.
- To reflect any revisions to applicable federal, state, or local requirements that affect the control measures implemented at the site.
- If approved by the Secretary, to reflect any changes in chemical water treatment systems or controls, including the use of a different water treatment chemical, age rates, different areas, or methods of application.

➤ 5.5 (2): Deadlines for SWPPP Modification

Any required revisions to the SWPPP must be completed within 7 calendar days following any of the items listed above.

➤ 5.5 (3): Documentation of Modifications to the Plan

All SWPPP modification records are required to be maintained showing the dates of when the modification occurred. The records must include the name of the person authorizing each change and a brief summary of all changes.

➤ 5.5 (4): Certification Requirements

All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

➤ 5.5 (5): Required Notice to Other Operators

If there are multiple operators at the site, the Contractor's Erosion Control Supervisor must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

When modifications as described above occur, the SWPPP will be modified to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP using the DOT 298 form and drawings on the plan will be modified to reflect the needed changes. Copies of the DOT 298 forms and the SWPPP will be retained on site in a designated place for review throughout the course of the project. A copy of the DOT 298 form will be given to the Contractor Erosion Control Supervisor and a copy will be emailed to the SDDOT Environmental Section in accordance with the DOT 298 Form.

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN (EXCERPTS OF 2009 PLANS)		
DESCRIPTION	TITLE	LOCATION
SUMMARY OF PROPOSED AND EXISTING	SWPPP	SHEET 9
RECORDING SURFACE WATERS	SWPPP	SHEET 9
FINAL STABILIZATION	SWPPP	SHEET 9
EROSION AND SEDIMENT CONTROL MEASURES	SWPPP	SHEET 9
EROSION AND SEDIMENT CONTROL DETAILS	SWPPP	SHEET 9

EROSION AND SEDIMENT CONTROL QUANTITY SUMMARY		
DESCRIPTION	UNITS	QUANTITY
Seeding and Mow	LS	1
Stake Pile	Linear Foot	50
Planting Staked Out	Linear Foot	50
Erosion Control Barrier	Square Yard	100



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GENERAL NOTES:

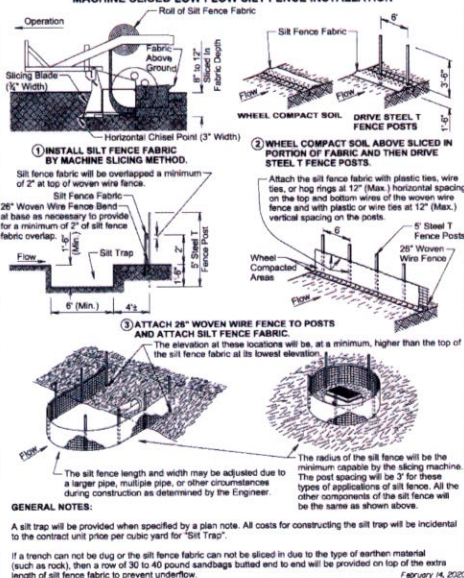
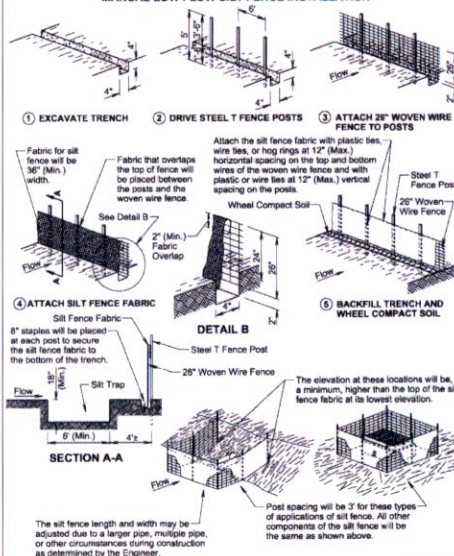
Prior to placement of the erosion control blanket, the areas will be properly prepared, shaped, seeded, and fertilized.

Erosion control blanket will be unrolled in the direction of the flow of water when placed in ditches and on slopes. The upslope end of the erosion control blanket will be buried in a trench 8" wide by 6" deep. There will be at least a 1' overlap whenever one roll of erosion control blanket ends and another begins, with the upslope erosion control blanket placed on top of the downslope erosion control blanket.

The erosion control blanket will be pinned to the ground according to the manufacturer's installation recommendations.

After the placement of the erosion control blanket, the Contractor will firm grade along all edges of the blankets to maintain a uniform slope adjacent to the blanket and level any low spots which might prevent uniform and unrestricted flow of side drainage directly over the erosion control blanket.

All ditch sections will be shaped when installing the erosion control blanket. All costs for shaping the ditches will be added to the contract unit price per foot for "Shaping for Erosion Control Blanket".



GENERAL NOTES:

A silt trap will be provided when specified by a plan note. All costs for constructing the silt trap will be incidental to the contract unit price per cubic yard for "Silt Trap".

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags buttled end to end will be provided on top of the extra length of silt fence fabric to prevent underflow.

February 14, 2020

		February 14, 2020			February 14, 2020	length of silt fence fabric to prevent underflow			February 14, 2020		
S D D O T	S D D O T	PLATE NUMBER 734.01	S D D O T	PLATE NUMBER 734.01	S D D O T	PLATE NUMBER 734.01	S D D O T	PLATE NUMBER 734.01	S D D O T		
		EROSION CONTROL BLANKET								LOW FLOW SILT FENCE AND SILT TRAP	LOW FLOW SILT FENCE AND SILT TRAP
		Sheet 1 of 1								Sheet 1 of 2	Sheet 2 of 2
Published Date: 1st Oct. 2023		Published Date: 1st Oct. 2023		Published Date: 1st Oct. 2023		Published Date: 1st Oct. 2023		Published Date: 1st Oct. 2023			



APPENDIX B – PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

OPINION OF PROBABLE COST
Browns Valley Rock Arch Rapids
Upper Minnesota River Watershed District, Ortonville, MN
September 8, 2023

No.	Item	Unit	Quantity	Unit Price	Total Costs
1	Mobilization	LS	1	\$ 50,000.00	\$ 50,000.00
2	Common Excavation (P)	CY	2,929	\$ 10.00	\$ 29,290.00
3	Common Embankment (P)	CY	41	\$ 10.00	\$ 410.00
4	Floating Silt Curtain	LF	50	\$ 30.00	\$ 1,500.00
5	Remove Existing Sheetpile	SF	1,415	\$ 15.00	\$ 21,225.00
6	Salvage and Reinstall SDDOT Class D Riprap (P)	CY	919	\$ 60.00	\$ 55,140.00
7	SDDOT Class C Riprap (P)	CY	1,683	\$ 120.00	\$ 201,960.00
8	Random Riprap Class C (P)	CY	1,306	\$ 130.00	\$ 169,780.00
9	Rock Weir (36" to 60" Diameter Boulders)	LF	576	\$ 80.00	\$ 46,080.00
10	Rock Boulders (36" to 60" Diameter)	EA	10	\$ 800.00	\$ 8,000.00
11	Flat Rock Boulders (48" to 72" Diameter)	EA	4	\$ 1,200.00	\$ 4,800.00
12	Erosion Control Blanket	SY	1,305	\$ 4.00	\$ 5,220.00
13	Silt Fence	LF	50	\$ 4.00	\$ 200.00
14	Seeding and Mulching	LS	1	\$ 5,000.00	\$ 5,000.00
CONSTRUCTION COSTS					\$ 598,605.00
Contingency (20%)					\$ 119,695.00
TOTAL CONSTRUCTION COSTS					\$ 718,300.00
Final Design and Construction Administration					\$ 89,800.00
Administrative Costs					\$ 29,900.00
TOTAL PROJECT COSTS					\$ 838,000.00



APPENDIX C – DRAFT TECHNICAL SPECIFICATION

PART 5
TECHNICAL SPECIFICATIONS

SECTION 5.1 - RIPRAP

5.1.01 SCOPE

This section of the specifications covers the work related to furnishing all plant, labor, equipment, appliances, and materials and in performing all operations in connection with the installation of riprap where shown on the plans or where directed by the Engineer.

5.1.02 APPLICABLE SPECIFICATIONS

- a. The latest editions of the standards listed below but referred to hereinafter by basic designation only, form a part of this section of the specifications.
 1. The 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges" and the Supplemental Specifications

5.1.03 MATERIALS

- a. Random Riprap: Stone for random riprap will be durable field stone and shall be sound, hard, and free from cracks or seams. The gradation of the supplied stone shall conform to SDDOT 830 for the class listed in the proposal. The stones will be generally round in shape and conform to the size range indicated in the gradation table. Copies of such certification shall be furnished to the Engineer. Stone used for random riprap shall not have a fractured face.
- b. Riprap: Stone for riprap will be durable field or quarry stone and shall be sound, hard, and free from cracks or seams. The gradation of the supplied stone shall conform to SDDOT 830 for the class listed in the proposal. Copies of such certification shall be furnished to the Engineer.
- c. Rock Weir Boulders: Stones used to construct the Rock Weir Boulders, as indicated on the Construction Plans, will be durable field stone and shall be sound, hard, and free from cracks or seams. The stones will be generally round in shape and conform to the size range indicated on the Construction Plans.
- d. Flat Rock Boulders: Stones used to construct the Flat Rock Boulders, as indicated on the Construction Plans, will be durable field stone and shall be sound, hard, and free from cracks or seams. The stones will be generally flat on one side and conform to the size range indicated on the Construction Plans.

5.1.04 METHOD OF CONSTRUCTION

- a. Rock Riprap: The foundation for the riprap will be compacted and shaped to the cross-section as shown on the plans or as directed by the Engineer. The riprap will be placed approximately to the thickness shown on the plans and the stones will be firmly embedded in the foundation material. The stones will be laid so that the weight of the stones will be carried by both the foundation material and the adjacent stones. Riprap placed on slopes of banks shall generally be placed from toe to crest. Stones shall not be allowed to roll or slide down slope. Riprap shall not be dropped from a height greater than 3 feet. Riprap will be placed as indicated in the Construction Plans. Riprap to be mixed with a well graded mix of aggregate varying from the No. 40 sieve up to 6-inch stones and applied as a single, well-mixed building material to form a solid, no-void ramp. The mix of aggregate should be such that it is not blown out of the riprap by the rivers current and forces river flow over the riprap.
- b. Rock Weir Boulders: The location of the Rock Arch will be as indicated on the Construction Plans and verified by the engineer or the authorized on-site representative. Boulders for the Rock Arches are to be integrated into the constructed channel banks. Gaps between boulders shall typically range from 0 to 12 inches. Two 24-inch gaps shall be created in each Rock Arch as indicated in the Plans or as directed by the Engineer. The riprap material moved to allow placement of boulders will be placed to fill the remaining voids between the Rock Weir Boulders as directed by the engineer. Excavated channel material will be placed as noted on the Construction Plans or as instructed by the engineer or on-site representative.
- c. Flat Rock Boulders: The location of the Flat Rock Boulders will be as directed by the engineer or the authorized on-site representative. The riprap material moved to allow placement of boulders will be placed to fill the remaining voids between the Rock Weir Boulders. Excavated channel material will be placed as noted on the Construction Plans or as instructed by the engineer or on-site representative.
- d. Placement in Water: Material to be placed under water shall be placed in a systematic manner to ensure a continuous uniform layer of well-graded stone of the required thickness. The Contractor shall minimize the drop height of material placed under water to avoid particle segregation during placement. Material to be placed under water shall not be cast across the surface of the water.

5.1.06 MAINTENANCE

- a. Rock Riprap: The Contractor shall be responsible for maintenance of the riprap for a period of 1 year following completion of the project. Maintenance shall include placing additional well graded mix of aggregate varying from the No. 40 sieve up to 6-inch stones to fill any remaining voids, replacement of riprap sections that have been washed out, or placement of salvaged riprap that has been misplaced. Maintenance requirements for riprap shall be at the discretion of the Engineer.
- b. Rock Weir Boulders: The Contractor shall be responsible for maintenance of boulders placed for the rock weirs for a period of 1 year following completion of the project. Maintenance shall include moving any misplaced boulders to a location specified by the Engineer. Maintenance requirements for the boulders shall be at the discretion of the Engineer.

5.1.05 MEASUREMENT AND PAYMENT

- a. General: All measurements and payment will be based on completed and accepted work. The payments listed below shall be full compensation for all plant, labor, materials, equipment, tools, and incidental items necessary to complete the work.
1. Foundation Preparation: Foundation preparation, including the placement of salvaged channel excavated material, and disposal of waste material will not be measured for separate payment but shall be considered incidental to other bid items.
 2. Random Riprap: Random Riprap will be measured in units of cubic yards in place by multiplying the area covered by the surfacing times the specified thickness as shown in the plans. Aggregate material used to fill voids in the random riprap will be considered part of the installed random riprap section. Payment will be made at the contract unit price per cubic yard for the item "Random Riprap" of the size and class listed in the proposal. Truck load tickets will not be used for payment. Unless extenuating conditions exist, which can be documented by the Contractor, the Contractor will not be compensated for overruns in random riprap quantities. No separate measurement or payment will be made for aggregate material used to fill voids in the random riprap.
 3. Riprap: SDDOT Riprap will be measured in units of cubic yards in place by multiplying the area covered by the surfacing times the specified thickness as shown in the plans. Aggregate material used to fill voids in the riprap will be considered part of the installed riprap section. Payment will be made at the contract unit price per cubic yard for the item "SDDOT Riprap" of the size and class listed in the proposal. Truck load tickets will not be used for payment. Unless extenuating conditions exist, which can be documented by the Contractor, the Contractor will not be compensated for overruns in riprap quantities. No separate measurement or payment will be made for aggregate material used to fill voids in the riprap.
 4. Rock Weir Boulders: Rock Arch Boulders will be measured in units of linear feet along the centerline of the Rock Arches placed. Payment will be made at the contract unit price per linear foot for the item "Rock Weir (36" to 60" Diameter Boulders)" as listed in the proposal.
 5. Rock Boulders: Additional boulders placed randomly between the weirs will be measured on the unit basis of each (EA) for each rock boulder installed. The additional boulders will be paid at the contract unit price under the bid item "Rock Boulders (36" to 60" Diameter Boulders)" for each boulder installed.
 6. Flat Rock Boulders: 48" – 72" Flat Rock Boulders installed in rock riffles will be measured on the unit bases of each (EA) for each flat rock boulder installed. The flat rock boulders will be paid at the contract unit price under the bid item "Flat Rock Boulders (48" to 72" Diameter)" for each boulder installed.
 7. Salvaged Riprap: Riprap salvaged will be measured in units of cubic yards. Payment will be made at the contract unit price per cubic yard for the item "Salvage and Reinstall SDDOT Class D Riprap" of the size and class listed in the proposal. Truck load tickets will not be used for payment. Unless extenuating conditions exist, which can be documented by the Contractor, the Contractor will not be compensated for overruns in salvaged riprap quantities.

END OF SECTIONSECTION 5.2 -CHANNEL EXCAVATION

5.2.01 SCOPE

The Contractor shall furnish all plant, labor, equipment, appliances, and materials required in performing all operations in connection with excavation as shown on the plans.

5.2.02 APPLICABLE SPECIFICATIONS

- b. The latest editions of the standards listed below but referred to hereinafter by basic designation only, form a part of this section of the specifications.
 1. The 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges" and the Supplemental Specifications

5.2.03 EXCAVATION

Excavation operations will be conducted as necessary to facilitate installation of the Rock Arch Rapids as defined in the Construction Plans. Excavation shall be completed in an orderly manner. **Channel excavation should be limited to constructing the Rock Arch Rapids as indicated in the Construction Plans and transitioning to the existing channel cross section.** The Contractor shall employ the type of equipment best suited to the site conditions. Some excavated material will be placed as indicated in the Construction Plans. Excess excavated material shall be wasted at the direction of the engineer.

Heavy machinery may not be driven across the existing levees, so the integrity of the levees will not be compromised. A Haul Route is marked on the site plan.

Excavation activities will maintain river access for waterways and other drainage structures. The Contractor shall protect from damage all culvert or tile ditch inlets. Any structures damaged by construction operations shall be repaired by the Contractor to the satisfaction of the Engineer at the Contractor's expense.

5.2.04 UTILITIES

The Contractor will be responsible to protect all utilities within the construction limits whether or not shown on the plans. It is the Contractor's responsibility to notify utilities for locates by contacting the South Dakota 811: phone: 800-781-7474 or 811, website: www.sdonecall.com.

5.2.05 CLEANUP

The Contractor shall remove all materials and debris from the construction area as work progresses in order that the property owner can have the use of the land at the earliest possible date.

Spoils shall be free of large branches and debris and placed in a manner traversable by wheeled equipment. Large debris shall be placed at the back of the spoil pile. Contractor shall provide drainage by sloping towards existing flowpaths. The spoil will be leveled at a maximum of 6 feet depth with 3:1 side slopes. Final spreading and smoothing of spoils shall occur during non-frozen conditions. The Contractor has the option to remove excess spoil from the site at NO COST to the OWNER. Compaction of the spoil shall be obtained by the "Quality Compaction" method described in MNDOT 2106.3F2.

5.2.06 MEASUREMENT AND PAYMENT

- a. All measurements and payments will be based on completed and accepted work. The payments listed below shall be full compensation for all plant, labor, materials, equipment, tools, and incidental items necessary to complete the work.

1. Channel Excavation: will be measured in units of cubic yards. Payment will be made at the contract unit price per cubic yard for the item "Common Excavation" listed in the proposal. Truck load tickets will not be used for payment. Unless extenuating conditions exist, which can be documented by the Contractor, the Contractor will not be compensated for overruns in common excavation.
2. Placement of Excavated Material: All excavated materials shall either be placed as salvaged material beneath the design select granular layer of the rock ramp or disposed of as waste material. The placement of all excavated material, salvaged or wasted will not be measured for separate payment, rather will be incidental to other bid items.
3. Hauling: Any loading, hauling and unloading of excavated materials for placement will not be measured for separate payment, rather will be incidental to other bid items.

END OF SECTION

SECTION 5.3 - SEEDING AND MULCHING

5.3.01 SCOPE

The work covered by this section of the specifications consists of furnishing all necessary plant, equipment, labor, and materials, and performing all work in connection with the seeding and mulching of all areas as designated on the plans: including but not limited to; constructed berms and other disturbed areas, unless they are located on agricultural lands used for crop production.

5.3.02 MATERIALS

A. Grass Seed: Grass seed will be new, clean, crop seed, and shall be certified by the vendor. Copies of such certification shall be furnished to the Engineer. Seeding for turf establishment shall be performed in accordance with SDDOT 730.

- i. Areas within the road right-of-way shall be seeded with agricultural roadside seed mix (SDDOT Type B Permanent Seed Mixture).
- ii. Seed mixture outside the right-of-way shall conform to the following or **an approved equal**.

PERMANENT SEED MIXTURE				
GRASS SPECIES	VARIETY	PURE LIVE SEED (PLS) (POUNDS/ACRE)	MINIMUM BULK RATE (POUND/ACRE)	PERCENT OF MIX COMPONENT
BROME GRASS, SMOOTH	LINCOLN, CARLTON, SAC, SIGNAL, MANCHAR	7.5	9.8	14.0
BLUEGRASS, KENTUCKY – PARK	CERTIFIED PARK ONLY	15.8	20.3	29.0
BLUEGRASS, CANADA	COMMON, REUBENS, TALON	7.6	9.8	14.0
SWITCHGRASS	DACOTAH, FORESTBURG, NEBRASKA 28, PATHFINDER, SUMMER, SUNBURST, TRAILBLAZER	1.4	2.1	3.0
WHEATGRASS, SLENDER	REVENUE	1.7	2.8	4.0
RYE-GRASS, PERENNIAL	--	9.8	14.7	21.0
TIMOTHY	--	1.8	2.1	3.0
REDTOP	--	1.6	2.1	3.0
ALFALFA, CREEPING	RAMBLER, VICTORIA, TETON, TRAVOIS, SPREDOR 2	3.5	4.2	6.0
WHITE CLOVER	--	1.8	2.1	3.0
TOTAL:		52.5	70	100

- B. Fertilizer: Fertilizer will not be required for this project. If used, commercial fertilizers shall conform to the applicable laws of the State of South Dakota and be supplied conforming to SDDOT Specification 731. They shall be delivered to the site in suitable containers labeled with the manufacturer's guaranteed analysis. They shall be dry and free

from lumps which would interfere with obtaining uniform distribution with standard spreading equipment.

- C. Mulch: Mulch shall be supplied conforming to SDDOT Specifications 732. Mulch shall be grass hay or straw mulch. The mulch material shall be air dry and shall not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds will not be permitted. The mulch shall be blown, or hand applied at the rate of 3,000 to 4,000 lbs. per acre. The contractor shall provide certified weight of mulch furnished.

5.3.03 APPROVAL OF MATERIALS

- A. Seed: At least ten (10) days prior to contemplated use, the Contractor shall furnish duplicate copies of invoices and duplicate copies of a statement from the vendor certifying that each container of seed delivered is fully labeled in accordance with the Federal Seed Act and is at least equal to the requirements specified. If required by the Engineer, the Contractor shall also furnish samples of each lot of seed.

5.3.04 CLEARING

Prior to or during grading, topsoiling and tilling operations, the ground surface shall be cleared of all brush, stumps, roots, stones larger than one (1) inch in diameter, wire or any other material which may hinder proper grading, tilling, planting, or subsequent maintenance operations and any accumulated debris shall be disposed of as directed.

5.3.05 SEEDING LOCATIONS

Seeding will only be completed along disturbed areas that result from the installation of the project bid items. Disturbed areas shall be returned to vegetated condition prior to construction. Determination of seeding areas will be at the discretion of the Engineer or the authorized on-site representative.

5.3.06 TILLING

After areas to be seeded have been brought to the proper grade, they shall be thoroughly tilled to a depth of three (3) inches by disking, or by other approved methods until the condition of the soil is sufficiently pulverized for planting. A firm seed bed should be created by packing. The work shall be performed only during periods when satisfactory results are likely to be obtained. When conditions are such, by reason of drought, excessive moisture, or other factors that results are not likely to be satisfactory, the Engineer may stop the work and it shall be resumed only when, in his opinion, the desired results are likely to be obtained. Any undulations or irregularities in the surface resulting from tilling or other operations shall be leveled out before planting operations are begun.

5.3.07 FERTILIZER

Application of fertilizer will not be required on this project.

5.3.08 SEEDING

- A. All areas to be seeded are to be planted to the specified permanent seed mixture between the dates of April 1 and June 1 for spring planting, or between August 15 and September 15 for fall planting, except as otherwise approved in writing. Seeding shall be accomplished only after approval of the prepared seed bed. When areas are completed to the seeding stage at other seasons of the year or when delays in operations carry the work beyond the most favorable planting seasons for the species designated, seeding shall be postponed until the next seeding season and temporary protection procedures as specified shall be followed to hold the areas until they can be permanently seeded. When conditions are such, by reason of drought, high winds, excessive moisture, or other

factors, that satisfactory results are not likely to be obtained, the Engineer may stop the work and it shall be resumed only when, in his opinion, conditions are again favorable or when approved alternative or corrective measures and procedures have been adopted.

B. Seeding Methods: The Contractor shall employ a method of seeding as hereinafter specified, making use of approved mechanical power-driven machines, mechanical hand seeders, or other approved methods. When mechanical equipment is used, provision shall be made by markers or other means to assure that successive planted strips will overlap or be separated by a space not greater than 2 inches. If inspection, either during the planting operation or after, indicates that strips wider than the space between disks of the drill have been left or other areas skipped, the Contractor shall plant additional seed in those areas. The Contractor shall have the option of either or both of the following or other approved methods of application of seed.

- 1) Broadcast Seeding: Grass seed mixtures as specified shall be broadcast by hand and/or by approved sowing equipment at the rate specified. The seed shall be uniformly distributed over the designated areas. Half of the seed shall be sown when the sower is moving in one direction and the remainder when the sower is moving at right angles to the first sowing. Immediately after sowing, the seed shall be covered to a depth of 1/4 inch to 1/2 inch for spring planting and 1/8 inch to 1/4 inch for fall planting by means of a spike-tooth harrow, chain harrow, or other approved device. Broadcast seeding shall not be done during windy weather.
- 2) Drill Seeding: Drill seeding of grasses shall be done with approved equipment with drills not more than 6 1/2 inches apart. The seed shall be sown uniformly over the designated areas to an average depth of 1/2 inch for spring planting and 1/4 inch for fall planting and at the rate specified. A precision seeder, or equivalent, may be used for drill seeding, in which case the operation of compacting after seeding will be eliminated.

5.3.09 MULCHING

Where seeding and mulching are specified, all areas shall be mulched immediately after seeding. No more seed shall be sown on any day than can be mulched on the same day. In any event, the lag time between seeding and mulching shall not exceed 24 hours when the seeding is done prior to mulching. Should mulch application be delayed more than 24 hours, the Engineer may order the area reseeded at the Contractor's expense. If Erosion Control Blanket is installed on an area within 24 hours of seeding, no mulching is required for the blanketed area.

The mulch shall grass hay or straw. The mulch material shall be air dry and shall not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds will not be permitted. The mulch shall be blown, or hand applied at the rate of 3,000 to 4,000 lbs. per acre. The contractor shall provide certified weight of mulch furnished.

Grass hay or straw mulch shall be anchored by passing over with a Finn Krimper or equal, operated at right angles to the slope. The disk blade spacing shall be between 4 inches and 12 inches with an 8-inch spacing most suitable. Penetration shall be sufficient to press the mulch into the seedbed to a depth of 2-3 inches. The use of an anchoring device with concave disks will not be permitted.

5.3.10 PROTECTION OF PLANTED AREAS

The Contractor shall protect all planted areas against traffic or other use by placing warning signs of an approved type and erecting all necessary barricades immediately after planting is completed. Any damage that may occur prior to final acceptance of the work shall be repaired to re-establish the condition and/or grade of the soil prior to injury, and shall then be replanted by the Contractor as hereinbefore specified for the applicable planting.

5.3.11 CLEANUP AND REPAIR OF DAMAGE

- A. Cleanup of planting sites and work areas shall include the removal of excess earth or other waste materials during the progress of the work.
- B. Repair of Damage: Any existing turf areas disturbed or damaged as a result of operations of the Contractor, other than areas to be graded under this Contract, shall be cultivated, regraded, top-dressed, seeded and/or sodded as the situation requires or as directed to repair the damage and re-establish the condition prior to construction as directed by the Engineer and at the Contractor's expense.

5.3.12 MAINTENANCE

The Contractor will be responsible for maintenance for a period of 1 year after planting at which time the grass must be growing to the satisfaction of the Engineer. Maintenance shall include mowing grass level at 6 to 8 inches every 30 days after planting (June – September) and reseeding as necessary to produce a completely established and acceptable stand of grass.

5.3.13 MEASUREMENT AND PAYMENT

- a. All measurements and payments will be based upon completed and accepted work for those items listed in the Proposal. The payments listed below will be based on completed and accepted work and will be full compensation for all plant, labor, materials, equipment, tools and incidental items necessary to complete the work.
 - 1. Seeding and Mulching will not be measured for payment but will be paid for at the contract lump sum price for "Seeding and Mulching."
 - 2. Maintenance of the seeded area will not be measured for payment as a separate item but shall be considered incidental to the "Seeding and Mulching" bid item.
 - 3. Repair of Damage and restoration of disturbed areas will not be measured for payment as a separate item but shall be considered incidental to the "Seeding and Mulching" bid item.

END OF SECTION

SECTION 5.4 - CLEARING AND GRUBBING

5.4.01 SCOPE

This section of the specifications covers the work related to furnishing all plant, labor, equipment, appliances, and materials, and in performing all operations in connection with clearing and grubbing and tree removal as shown on the plans or as needed to complete the required work items.

5.4.02 METHODS OF CONSTRUCTION

Extensive/deliberate clearing and grubbing is not anticipated for this project. Small shrubs, bushes, and volunteer trees may exist in the project area. These materials shall be removed only as necessary to complete the work described in the contract documents. The Contractor shall visit the site to familiarize themselves with the size and number of trees that need to be removed to complete the project.

Before clearing activities begin, the Contractor shall contact the Engineer to verify the maximum limits of clearing for the project. The Contractor will conduct all clearing and grubbing operations in a manner that will not damage the surrounding plant life and property.

Clearing and grubbing materials (woody plant material) may be disposed of offsite or burned on site. Burning of materials will be allowed within the working area if all necessary permits are secured by the Contractor and landowners who may be effected by smoke are notified.

All grading activities shall be completed within the work limits shown on the plans. Contractor is responsible for all costs associated with restoration activities outside of the defined work limits.

5.4.03 MEASUREMENT AND PAYMENT

- a. All measurements and payments will be based on completed and accepted work. The payments listed below shall be full compensation for all plant, labor, materials, equipment, tools, and incidental items necessary to complete the work.
 1. Clearing and grubbing of all brush, roots, windfall, and plant life, required for site access or constructing project features will not be measured for payment, but will be paid for at the contract lump sum price for "Clearing and Grubbing".
 2. Tree removal and disposal, required for site access or constructing project features, will not be measured for separate payment, but shall be considered incidental to the "Clearing and Grubbing" bid item.

END OF SECTION

SECTION 5.5 - WATER CONTROL

5.5.01 SCOPE

The work covered by this section of the specifications consists of furnishing all plant, equipment, labor, and materials, and performing all operations in connection with channel diversion and/or dewatering necessary to proceed with the construction.

5.5.02 GENERAL

Excavation shall be completed in dry conditions. As necessary, the contractor shall provide earthen berms on the upstream and downstream sides of the excavation area to block potential flow from entering the work area. The contractor shall provide a means for baseflow water, if necessary, to bypass the work area. The contractor may utilize pumps to facilitate this requirement.

The contractor shall plan work accordingly to ensure functionality of the diversion channel to convey stormwater flows during construction. The Contractor shall construct and maintain all necessary cofferdams, channels, flumes, drains, sumps, casings, wellpoints, and/or other temporary diversion, dewatering and protective works; shall furnish all materials required therefor, and shall furnish, install, maintain, and operate all necessary pumping and other equipment for removal of water from the various parts of the work. Unless otherwise specified, a diversion must discharge into the same drainageway in which its headworks are located. Foundations, cutoff trenches, and other parts of the construction site shall be dewatered and kept free of standing water or excessively muddy conditions as needed for proper execution of the construction work. After having served their purpose, all cofferdams, casings, wellpoints, or other protective works shall be removed or leveled to the satisfaction of the Engineer.

The Contractor shall be responsible for and shall repair at his expense any damage to the foundations, structures, or any other part of the work caused by floods, water, or failure of any part of the diversion or protective works.

5.5.03 PLAN FOR WATER CONTROL DURING CONSTRUCTION

The Contract Documents do not identify specific methodology to manage water within the construction zone. The Contractor shall develop and implement a site specific plan to manage water within the work zone to allow for construction of project features under dry conditions. The Contractor's plan for water control during construction shall be subject to approval.

5.5.04 MEASUREMENT AND PAYMENT

- a. General: All measurements and payments will be based on completed and accepted work. The payments listed below shall be full compensation for all plant, labor, materials, equipment, tools, and incidental items necessary to complete the work.
 1. Water control (including installation and removal of all cofferdams, dikes, temporary stream crossings, channels, flumes, casings, well points or other diversion and dewatering works as may be required for the job) will not be measured for separate payment but shall be considered subsidiary to the removal and/or installation of other bid items.
 - 2.

END OF SECTION

SECTION 5.6 - EROSION CONTROL

5.6.01 SCOPE

The Contractor shall furnish all plant, labor, equipment, appliances and materials required in performing all operations in connection with erosion control measures which are shown on the drawings, included in these specifications, required to meet permit requirements, or as directed by the Engineer or representative in the field.

5.6.02 APPLICABLE STANDARDS

Erosion control shall be in accordance with the 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges".

- a. Flotation Silt Curtain: As per SDDOT Specification 734.3B3.
- b. Silt Fence: As per SDDOT Specifications 734.2B1 and 734.3B1.
- c. Temporary Rolled Erosion Prevention Products (Erosion Control Blanket): As per SDDOT Specifications 734.2C1 and 734.3C3.

5.6.03 INSTALLATION AND MAINTENANCE

- a. General: Installation techniques shall be in accordance with the 2015 Edition of the SDDOT "Standard Specifications for Roads and Bridges". Prior to commencing any site or demolition work, the Contractor shall install all erosion control systems as shown on the plans. As the work progresses, the Contractor shall install and maintain the erosion control measures as indicated in the following implementation schedule:

<u>Item</u>	<u>Installation</u>	<u>Removal</u>
Silt Fence	Prior to Any Construction	By Contractor
Floating Silt Curtain	Prior to Any Construction	By Contractor
Erosion Control Blanket	As Final Channel Cross-Sections have been Constructed and Seeded.	No Removal

The Contractor shall inspect and make repairs to all erosion control systems after each rainfall greater than 0.5 inches. They shall remove all accumulated silt and repair wash-out areas.

- b. Erosion and Sediment Control During Construction
 - 1. Erosion Control
 - a) The Contractor shall use, where possible, horizontal slope grading, construction phasing, and other construction practices that minimize erosion.
 - b) Unless precluded by snow cover, all exposed soil areas* with a continuous positive slope within 200 lineal feet from a water of the state, or from a curb, gutter, storm sewer inlet, temporary or permanent drainage ditch or other storm water conveyance system, which is connected to a water of the state, shall have temporary protection or

permanent cover for the exposed soil areas within the following time frames:

Type of Slope	Temporary protection or permanent cover required
Steeper than 3:1	Within 7 days of being worked
10:1 to 3:1	Within 14 days of being worked
Flatter than 10:1	Within 21 days of being worked

*For the purposes of this provision, exposed soil areas do not include stockpiles or surcharge areas of sand, gravel, aggregate, concrete or bituminous.

- c) The bottom of any temporary or permanent drainage ditch constructed to drain water from a construction site must be stabilized within 200 lineal feet from a water of the state. Stabilization must be initiated within 24 hours of connecting the drainage ditch to a water of the state, existing gutter, storm sewer inlet, drainage ditch, or other storm water conveyance system which discharges to waters of the state and completed within five calendar days.
- d) Prior to connecting any pipe to a water of the state or drainage ditch, the pipe's outlet must be provided with temporary or permanent energy dissipation to prevent erosion.
- e) Cutting vegetation near the bank shall be kept to the minimum possible to conduct construction and the area shall be revegetated after construction.

2. Sediment Control

- a) Sediment control best management practices (BMPs), which prevent sediment from entering a water of the state, gutter, storm sewer inlet, ditch or other storm water conveyance system, shall be established on all down-gradient perimeters before any up-gradient land disturbing activities begin, and shall remain in place until final stabilization has been established.
- b) The Contractor shall minimize vehicle tracking of sediment or soil off site at locations where vehicles exit the construction site onto paved surfaces.

c. Inspections and Maintenance

- 1. Except where work has been suspended due to frozen ground conditions, the Contractor shall inspect the construction site once every seven (7) days and within 24 hours after every rain event greater than 0.5 inches. The Contractor shall investigate and comply with the following inspection and maintenance requirements:
 - a) Inspection Requirement: All erosion and perimeter sediment control BMPs to ensure integrity and effectiveness.

Maintenance Requirement: All nonfunctional perimeter sediment control BMPs shall be repaired, replaced, or supplemented with functional BMPs when the sediment reaches 1/3 of the height, within 24 hours of discovery. All nonfunctional erosion control BMPs shall be repaired, replaced, or supplemented with functional BMPs as soon as field conditions allow access. Repair costs are incidental to each perimeter control BMP bid item.

- b) Inspection Requirement: Drainage ditches and other waters of the state for evidence of sediment leaving the site.

Maintenance Requirement: Unless the project has received approval or certification for depositing fill into water of the state, the Contractor shall remove all deltas and sediment deposited in drainage ways, catch basins, or waters of the state, and restabilize the areas where sediment removal results in exposed soil. The removal and stabilization shall take place within seven (7) days of discovery unless precluded by legal, regulatory, or physical access restraints. If precluded, removal and stabilization must take place within seven calendar days of obtaining access. The Contractor is responsible for contacting all local, regional, state and federal authorities prior to working in waters of the state and receiving any applicable permits. No additional compensation will be made for removing deposited sediment.

- c) Inspection Requirement: Construction site vehicle exit locations for evidence of off-site sediment tracking onto paved surfaces.

Maintenance Requirement: Tracked sediment shall be removed from paved surfaces, which do not drain back into the construction site, within 24 hours of discovery and with no additional compensation.

2. Where parts of the construction site have undergone final stabilization, but work remains on other parts of the site, inspections of the stabilized areas may be reduced to once per month.
3. Where work has been suspended due to frozen ground conditions, the inspections and maintenance required in Part 5.6.03 c.1. shall take place as soon as weather conditions warrant or prior to resuming construction.
4. Unless required to remain in place by the owner or local permitting authority, all temporary synthetic, structural, and nonbiodegradable erosion and sediment control BMPs shall be removed after the site has undergone final stabilization.
5. The Contractor is responsible for the maintenance of water quality management BMPs until construction is complete, the site has undergone final stabilization, and a notice of termination has been submitted to the South Dakota Department of Agricultural and Natural Resources.

5.6.04 CLEANUP

Silt fence and any other temporary erosion control BMPs shall be removed when they have served their useful purpose, but not before the upward sloping area has been permanently stabilized with vegetation. If the upward sloping area is to be exposed longer than six (6) months, that area shall be covered with temporary vegetation when first exposed.

5.6.05 MEASUREMENT AND PAYMENT

- a. All measurements and payments will be based on completed and accepted work and based off invoices presented by the contractor that reflect actual costs. Payments listed will be full compensation for all plant, labor, materials, including delivery and staging, equipment, tools, and incidental items necessary to complete work as shown on drawings or as specified herein. Payment will be made at the contract lump sum or unit price for the item listed in the Proposal. In the absence of a Contract bid price, any other measures deemed necessary for compliance will be considered incidental to other bid items.

1. Flotation Silt Curtain: Flotation Silt Curtain will be measured in units of lineal feet in place, and payment will be made at the contract unit price per lineal foot installed for the item "Flotation Silt Curtain" as listed in the Proposal. 75% of payment will be paid after installation and the remaining 25% will be paid when removed.

2. Silt Fence: Silt Fence will be measured in units of lineal feet in place, and payment will be made at the contract unit price per lineal foot installed for the item "Silt Fence" as listed in the Proposal. 75% of payment will be paid after installation and the remaining 25% will be paid when removed.

3. Erosion Control Blanket: Erosion Control Blanket will be measured in units of Square Yards in place, measured by the Engineer as a 2D area. No payment will be made for overlap. Payment will be made at the contract unit price per square yard installed for the item "Erosion Control Blanket" as listed in the Proposal.

4. Subsidiary Pollution Control: The following items will not be measured for payment but shall be considered incidental to other bid items.

- a. Water Management Plan - The contractor shall provide to the OWNER at least five days prior to beginning any construction operation, a water management plan. This plan shall include a schedule for the sequencing of construction of operations for the management and control of ground water and surface water from the site. The contractor is solely responsible for the preparation of and the implementation of the plan. This plan is in addition to any plan or plans that may be required in the General Requirements of the Construction Contract and at a minimum must take into account the following:

1. The pre-construction outlet must not change the outlet for drainage of waters from or through the site.
2. Diversions and the construction of temporary dikes to divert water around construction operations shall be done as necessary to facilitate construction. Diversions and temporary dikes constructed will be restored to the pre-constructed elevations or as shown in the Construction Plans.
3. Temporary river crossings not included in the plan shall have sufficient capacity to convey expected flows and shall be removed and the river restored to the pre-construction or planned cross section with the completion of the project.
4. The construction site shall be maintained in a clean and sanitary condition during construction operations.

5. Trash generated at the site shall be collected, removed from the site and disposed of properly.
6. All waste oils and other chemicals shall be collected, removed from the sites and disposed of properly.
7. All haul roads shall be watered or treated with a dust palliative to control dust raised by hauling equipment and other vehicles. Haul roads shall be removed at the completion of construction and graded to the pre-construction elevations.
8. Implementing the Storm Water Pollution Prevention Plan prepared for this project if applicable. This includes becoming a co-signer on the National Pollutant Discharge Permit (NPDES), keeping the required records, and making the required reports.
9. No separate payment will be made for Pollution Control. Pollution control will be considered incidental to other bid items.

b. Temporary Rock Construction Entrances

1. This item shall consist of temporary rock entrances constructed from all paved roads that provide access to the construction site. These rock entrances shall be at locations approved by the Engineer and shall be removed upon final stabilization.
2. Payment for temporary construction entrances will not be measured for separate payment but will be considered a subsidiary item to other bid items.

END OF SECTION

SECTION 5.7 - INVASIVE SPECIES PREVENTION

5.7.01 SCOPE

This section of the specifications covers the Best Management Practices (BMPs) for the prevention of noxious and invasive plants, for work related to furnishing all plant, equipment, labor, appliances, and materials, and performing all work in connection with all areas as designated on the plans under this Contract.

The State of South Dakota requires active steps to prevent or limit the introduction, establishment, and spread of invasive species when working on or entering into state land. All parties involved in the project shall prevent invasive species from entering into or spreading within the project site by cleaning equipment prior to arriving at the project site and after completion of the project.

5.7.02 METHODS OF CONSTRUCTION

- a. Minimize Soil Disturbance: With the ability of invasive plant species to rapidly colonize areas of disturbed soil, it is essential to minimize areas to be disturbed. The contractor shall avoid creating soil conditions that promote weed growth and establishment. Soil disturbance will be minimized wherever practical, but in keeping with the project scope and objectives. Seeding and mulching of disturbed areas shall take place as soon as possible, to aid in the establishment of the desired species' over noxious weeds.
- b. Equipment Cleaning: If equipment, vehicles, gear, or clothing arrives at the project site with soil, aggregate material, mulch, vegetation (including seeds) or animals, it shall be cleaned by Contractor furnished tool or equipment (brush/broom, compressed air or pressure washer) at the staging area. The Contractor shall dispose of the material cleaned from the equipment and clothing at a location determined by the DNR Wildlife Area Manager. If the material cannot be disposed of onsite, secure material prior to transport (sealed container, covered truck, or wrap with tarp) and legally dispose of offsite.

The Contractor shall ensure that all equipment and clothing used for work in infested waters has been adequately decontaminated for invasive species (ex. zebra mussels) prior to being used in non-infested waters. All equipment and clothing including but not limited to waders, tracked vehicles, barges, boats, turbidity curtain, sheet pile, and pumps that come in contact with any infested waters must be thoroughly decontaminated.

Equipment shall not be cleaned with herbicide chemicals.

- c. Weed Free Gravel, Rock, and Mulch: Prior to delivery of offsite materials such as rock, gravel, and mulch, the Contractor shall provide proof to the Owner that all materials are certified weed free.

Materials taken from within the project limits shall be exempt from this requirement.

5.7.03 MEASUREMENT AND PAYMENT

- a. All measurement and payment for compliance with invasive species prevention shall be incidental to other bid items.

END OF SECTION

SECTION 5.8 - SITE ACCESS

5.8.01 SCOPE

This section of the specifications covers the work related to furnishing all plant, labor, equipment, appliances, and materials and in performing all operations in connection with the installation of temporary entrances and placement of temporary aggregates for access as shown on the plans or as directed by the Engineer.

5.8.02 APPLICABLE STANDARDS

- a. The latest editions of the standards listed below but referred to hereinafter by basic designation only, form a part of this section of the specifications.
 - 1. 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges"

5.8.03 MATERIALS

- a. Fill Material: The suitability of fill material used for temporary entrances and temporary access shall be approved by the Engineer and meet SDDOT requirements.
- b. Drainage Structure: Drainage structures shall be suitable for use and approved by the Engineer. Minimum diameter of pipe will be determined by the Engineer. Pipe material shall be approved by the Engineer and meet SDDOT requirements.
- c. The Contractor is responsible for all equipment and trucking necessary to install temporary entrances and access.

5.8.04 METHOD OF CONSTRUCTION

- a. No work shall begin until the Contractor meets with Upper Minnesota River Watershed District personnel on site to determine exact placement of temporary entrances and access routes and to determine additional standards and safety requirements of these temporary entrances.
- b. This work shall consist of constructing any necessary temporary entrances for access and removal and replacement of wooden bollards for access.
- c. The fill surface shall be compacted until the surface is tightly bound and shows no undue rutting or displacement under the operation of the compacting equipment.
- d. Temporary entrances shall provide a radius sufficient to prevent vehicle tires from tracking off the entrance when entering or leaving site.
- e. A drainage structure shall be installed under temporary entrance to allow for proper drainage through the area if required. The contractor will be responsible for keeping drainage structures free of debris. Minimum diameter of pipe shall meet SDDOT requirements.
- f. The contractor is responsible for maintenance of access routes and temporary entrances until construction is complete. Access roads and entrances shall be removed completely after construction is complete.
- g. Contractor is responsible for restoring any disturbed areas due to site access. All damages including, but not limited to rutting, and damage to grass areas and existing parking areas

shall be restored by the contractor to the condition of or exceeding the preconstruction conditions as determined by the Engineer. Areas within the road right-of-way shall be seeded with agricultural roadside seed mix (SDDOT Type B Permanent Seed Mixture).

5.8.05 MEASUREMENT AND PAYMENT

a. General: All required to complete site access as shown in the plans and specified in the specification will not be measured for separate payment but shall be considered incidental to other bid items. This includes but is not limited to the following work:

1. Furnishing and installing temporary traffic control signage, barricades and other controls shall not be measured for separate payment but shall be considered incidental to other bid items.
2. Aggregate/fill material used for constructing temporary entrances and access routes shall not be measured for separate payment but shall be considered incidental to other bid items.
3. Drainage structures necessary to provide flow through temporary entrances shall not be measured for separate payment but shall be considered incidental to other bid items.
4. Removal of temporary entrances and temporary access roads shall not be measured for separate payment but shall be considered incidental to other bid items.
5. Restoration of disturbed areas due to site access will not be measured for separate payment but shall be considered incidental to other bid items.

END OF SECTION

SECTION 5.9 - MOBILIZATION

5.9.01 SCOPE

- a. This work consists of preparatory work and operations that include the movement of personnel, equipment, supplies, and incidentals to the project site. This work may also include obtaining bonds, insurance, permits, and demobilizing.

5.9.02 MEASUREMENT AND PAYMENT

- a. Mobilization required to complete the project as shown in the plans and specified in these specifications will be made as a lump sum payment at the contract unit price for the item "Mobilization."
- b. The Engineer will provide partial payments for mobilization in accordance with SSDOT Specification 9.10.
- c. The Engineer will not pay more than the original contract unit price for the mobilization item, even if the Contractor shuts down work on the project or moves equipment away from the project and then back again.

END OF SECTION

SECTION 5.10 – REMOVALS AND PROTECTIONS

5.10.01 SCOPE

This section of the specifications covers the work related to furnishing all plant, labor, equipment, appliances, and materials in performing all operations in connection with removal of various items shown in the plans or as directed by the Engineer.

5.10.02 APPLICABLE STANDARDS

- a. The latest editions of the standards listed below but referred to hereinafter by basic designation only, form a part of this section of the specifications.
 1. The 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges" and the Supplemental Specifications

5.10.03 MATERIALS

- a. Removals shall be as defined in SDDOT Standard Specification 110.

5.10.04 CONSTRUCTION

- a. Removals shall be performed in accordance with SDDOT Standard Specification 110 and all other applicable SDDOT Standard Specifications.
- b. A number of items within the work limits are designated to be protected within this section. The condition of protection items will be thoroughly documented by the OWNER, prior to initiation of construction operations. Damage to noted protection items shall be repaired by the Contractor at no charge to the Owner. Items to be protected include, but are not limited to: Existing levees, TH 24 Bridge, Existing signage adjacent to TH 24, TH 24 Pavement and aggregate shoulder, Field accesses adjacent to TH 24, Existing Underground & Overhead Utilities.

5.10.05 MEASUREMENT AND PAYMENT

- a. General: All measurements and payments will be based on completed and accepted work. Payment shall be full compensation for all plant, labor, equipment, appliances, materials, and incidental items necessary to complete the work.
 1. Remove Existing Sheet Pile: Modifications and removals of the existing sheetpile weir will be measured and paid for by the square yard for the item "Remove Existing Sheetpile". The Contractor must haul and dispose of the discarded sheetpile. All off-site transportation and disposal costs will be incidental.
 2. Costs associated with repair of items/areas identified as "protect" are solely the responsibility of the CONTRACTOR.

END OF SECTION



BROWNS VALLEY FISH PASSAGE PHASE I

90% Design Report



BROWNS VALLEY FISH PASSAGAE PHASE 1

90% Design Report

September 8, 2023



Houston Engineering, Inc.
7550 Meridian Cir N, Suite 120
Maple Grove, MN 55369
Phone # 763.493.4522

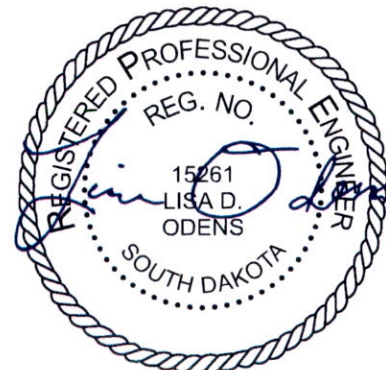
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Engineer under the laws of the State of South Dakota.

Lisa Odens

Digitally signed by Lisa Odens
DN: C=US, E=lodens@houstoneng.com, O=Houston Engineering, OU=Maple Grove, CN=Lisa Odens
Location: Maple Grove, MN
Reason: I agree to the terms defined by the placement of my signature on this document
Contact Info: lodens@houstoneng.com
Date: 2023.09.08 13:41:39-05'00'

Lisa D Odens
Reg. No. 15261

9-8-2023
Date



1 PROJECT BACKGROUND

The Browns Valley Flood Mitigation Project was constructed by the Upper Minnesota River Watershed District (UMRWD) in 2011 and included a diversion and floodway inlet structure (box culvert and embankment) to control discharges allowed through the City of Browns Valley. Since then, upstream interests have reported decreased fish migration on the Little Minnesota River. The USACE (St. Paul) studied fish migration in a report, "Little Minnesota River Assessment of Fish Migration" Dated April 2019. This report identified modifications to the Browns Valley Flood Mitigation Project to increase fish migration. The proposed modifications were developed further through coordination between US Fish & Wildlife Service (USFWS), South Dakota Game, Fish and Parks (GFP) and the Minnesota Department of Natural Resources (DNR).

Upper Minnesota River Watershed District partnered with South Dakota (GFP), and the Minnesota DNR to restore fish passage through the Browns Valley Flood Mitigation Project. Houston Engineering was contracted to provide engineering services to the project.

The purpose of this report is to document the design process and decision points, while providing project stakeholders with the data and methodologies used to develop the Browns Valley Fish Passage 90% Design. This report contains description of the project background, goals, hydrology and hydraulics, alternatives considered, preferred concept description, overview of potential regulatory requirements and opinion of probable construction costs. 90% Draft Plans and Technical Specifications are also provided in the appendices. Project stakeholders are expected to utilize the plans and specifications to pursue funding opportunities. Requirements of potential grants may dictate revisions to the plans and specifications. It is anticipated that project stakeholders would provide feedback on the design and grant requirements which will be incorporated into the final bidding documents.

1.1 PROJECT LOCATION

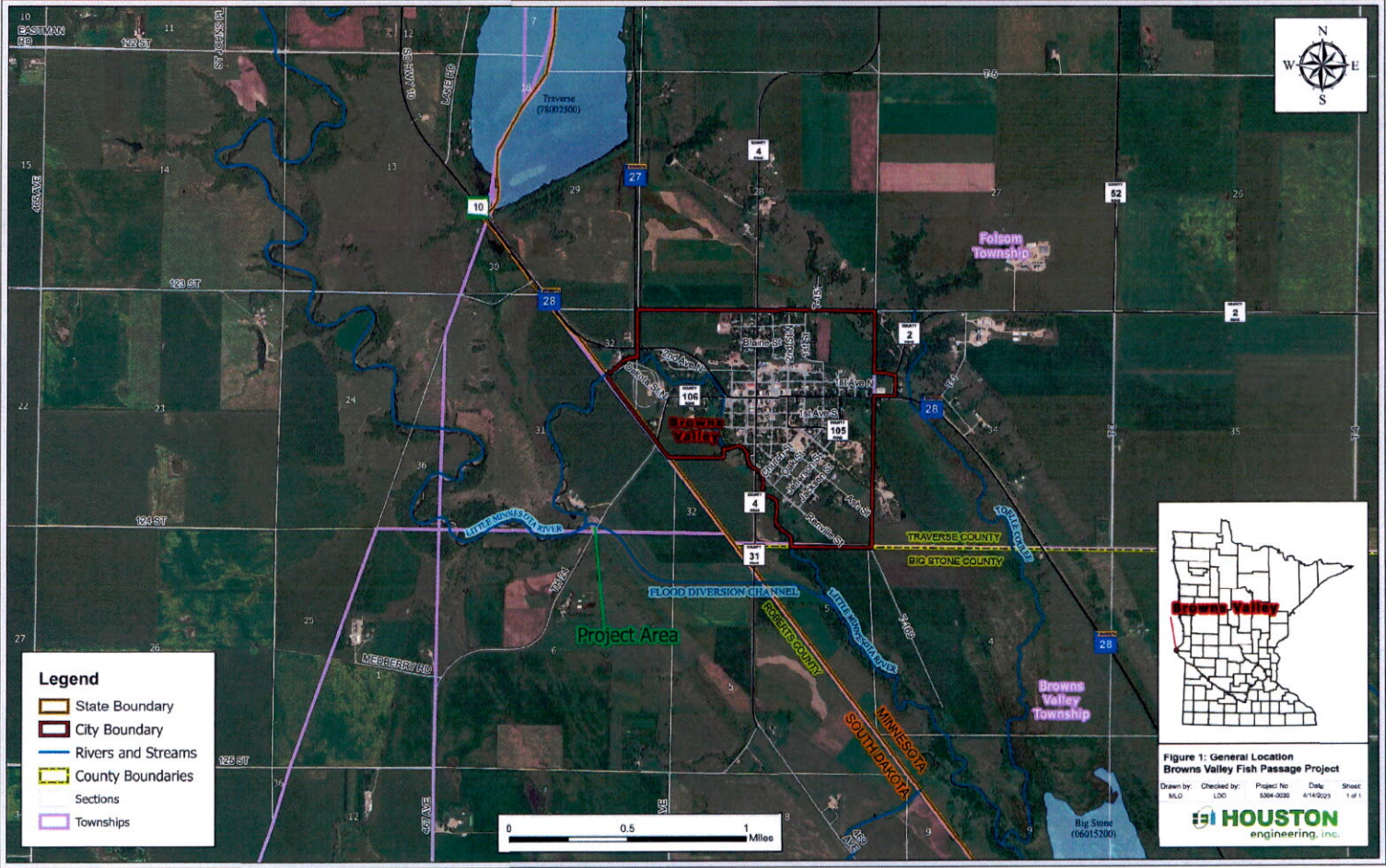
The project site is located on UMRWD property in Section 31 of T125N-R49W in Roberts County, SD. The project is approximately 0.8 miles southwest of Browns Valley, MN. The diversion channel outlets to the Little Minnesota River and eventually Bigstone Lake and the Minnesota River. The proposed project extents are shown in **Figure 1**.

1.2 EXISTING RESOURCES

Several existing resources were utilized during development of the project concepts:

- Browns Valley Flood Mitigation Project Engineers Report, Houston Engineering Inc, dated January 2008 (BVFMP, 2008)
- Environmental Assessment Worksheet, UMRWD, date June 30, 2008 (BVDMG EAW, 2008)
- Browns Valley Flood Mitigation Project, Record Drawings. Houston Engineering Inc, dated 12-19-2013 (BVFMP RD, 2013)
- Little Minnesota River Assessment of Fish Migration, USACE St Paul District, Dated April 2019 (USACE, 2019)
- Fish Passage Concepts, Aadland, Developed in 2019 (Aadland, 2019)

Browns Valley Fish Passage - General Location



1.3 PROJECT GOALS AND DESIGN CRITERIA

Project goals were established during development of the Little Minnesota River Assessment of Fish Migration Project (USACE, 2019) and refined during the kick-off meeting with stakeholders. The project goals are listed below.

- 1) Allow for fish passage for both walleye and other critical species including sturgeon and shiner during spring migration period.
- 2) Improve passage for full range of recorded April flow conditions (i.e. approx. 2500-cfs and below.
- 3) Maintain flood risk reductions to the City of Browns Valley.
- 4) Allow for suitable passage both through the dam (12'x5' RCB) and through the diversion channel.
- 5) Minimize or limit need for gate operation, active flow monitoring and normally scheduled or irregular maintenance.

Discussion on development of the project design criteria is described below.

1. Currently fish passage is eliminated in the window during which velocities through the existing box culvert become too high while discharges are low enough that the flood diversion channel is not passable. The proposed project should reduce this window by facilitating lower velocities through the culvert during higher flows while creating passable conditions through the diversion channel during lower flows.
 - a. The box culvert was defined as passable when the average flows through the culvert are 2.0 feet/second or less. It was noted that some species can pass during higher average velocities and may be able to burst through isolated locations with higher velocity, such as the inlet.
 - b. The diversion channel was defined as passable when the depth of flow is greater than 1.0 feet deep and 2.0 feet wide.

2. It is required to maintain channel forming discharges through the City of Browns Valley to maintain the channel and limit sedimentation. The BVFMP EAW stated that:

Through formal consultation, the Minnesota DNR indicated a minimum in-stream flow of 450 cfs is preferred in the Little Minnesota River during non-flood periods, which equates to roughly a 1.4 year recurrence interval discharge. This discharge is believed by the DNR to be adequate for in-stream flow, aquatic life, and geomorphic considerations.

Evaluation of the channel forming flow required through the city was given much discussion during project coordination meetings (3-2-2023, 3-10-2023, 3-22-2023). Designing a project to pass 100% of flow through town at 450 cfs results in a wide and flat weir, which is not advantageous for concentrated flow at lower flows through the diversion channel. The MnDNR indicated that newer research shows that the channel forming discharge can be as low as the 1.1-year event or as high as the 1.8-year event. Evaluations of altered hydrology at the USGS gage at Peever also indicate that the 1.1 to 1.8-year discharge in historic periods may be less than the current period, likely a result of multiple factors. It was determined that it was acceptable to pass a minimum of 250 cfs through town during the 1.4-year event (450 cfs) to maintain channel forming discharge.

3. The BVFMP EAW stated that:

The inlet was designed to achieve the project goals of providing flood protection to Browns Valley by transferring Little Minnesota River flow to the diversion channel. The Little Minnesota River minimum capacity through town was determined to be about 1,100 – 1,200 cfs. A design goal of 500 - 750 cfs was targeted for the 100-year peak flow through Browns Valley, which

equates to a factor of safety of 2.3 and 1.5, respectively. The design provides some reserve capacity in the Little Minnesota River to offset potential reduction in conveyance due to blockages in the channel from ice and debris.

Refined modeling indicated that the As-built condition resulted in a 100-year discharge through town of 852 cfs and the current condition (includes sediment in diversion channel) results in a 100-year discharge of 866 cfs; thus the 100-year discharge through the city should be limited to 866 cfs unless the project includes significant removal of sediment in the diversion channel.

2 EXISTING CONDITIONS

2.1 SURVEY

Survey data was collected via drone flight on 11/29/2022. All survey data collected by HEI utilizes the Traverse County Coordinate System and North American Vertical Datum 1988 (NAVD88). (Note: Unless otherwise noted, all elevations provided herein are based on NAVD88 vertical datum).

Topographic survey information was collected in late June of 2023, following the spring flood event. This information was used to adjust the CAD surfaces to improve the accuracy of the developed project quantities.

2.2 HYDROLOGY

Flow frequency statistics were developed during the design of the Browns Valley Flood Mitigation Project. The development of the flow frequency analysis is described in greater detail in the 2008 Engineers Report. The analysis was performed on 55 years of record (1940-1981, 1990-2002). The flow frequency analysis was not updated to include published data from 2009-2021, which may be considered during future analysis.

Table 1: Results of Flow Frequency Analysis for USGS Gage Near Peever, SD (BVFMP, 2008)*

Chance Exceedance (%)	Recurrence Interval (year)	Discharge (cfs)
0.2	500	16,100
0.5	200	11,900
1	100	9,300
2	50	7,070
5	20	4,660
10	10	3,200
20	5	2,020
50	2	822
80	1.25	326
90	1.11	199
95	1.05	131
99	1.01	60

* For design purposes, the effects of ice and debris were assessed using an unsteady hydraulic HEC-RAS model for historic floods caused by ice and debris conditions and periods of non-ice and debris conditions

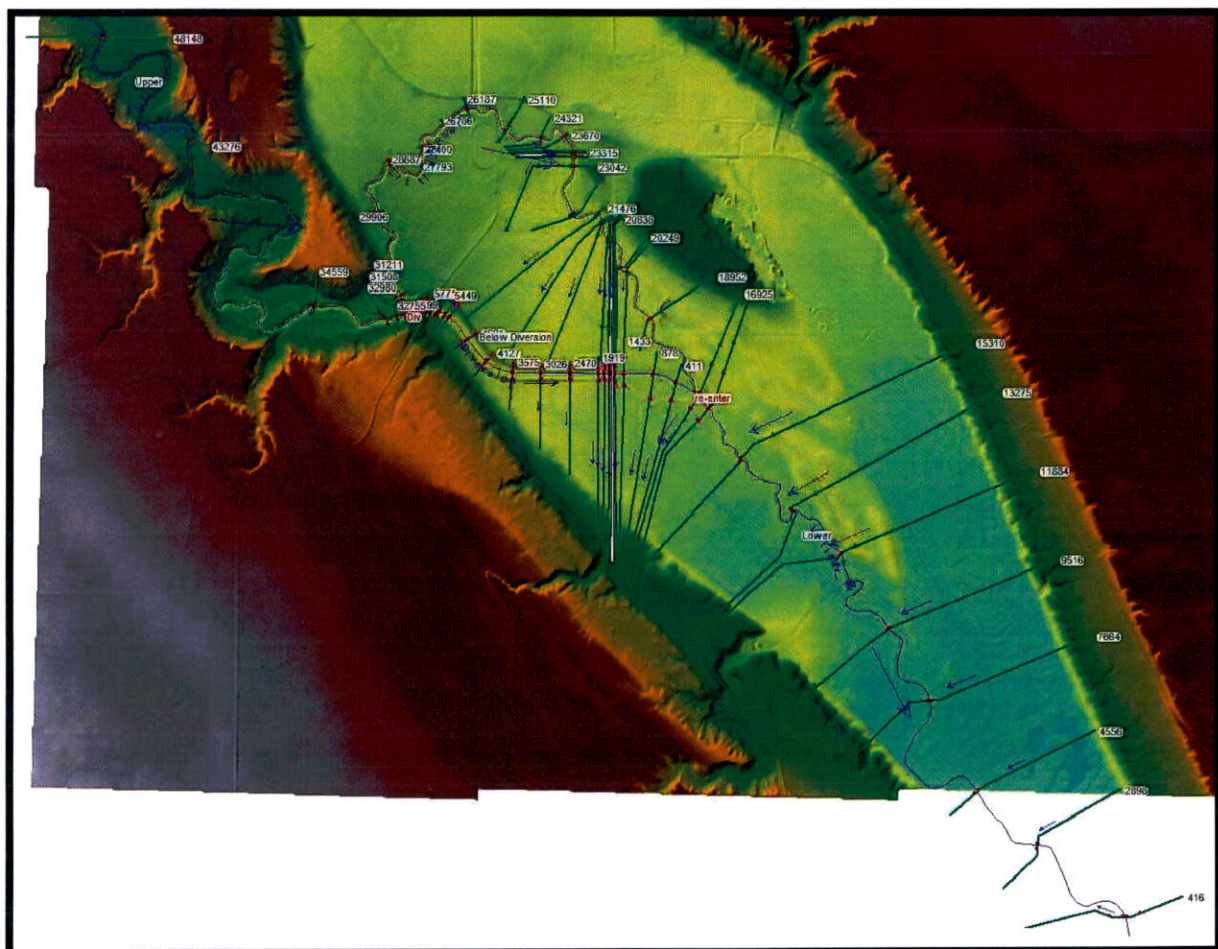
2.3 HYDRAULICS

A HEC-RAS model was developed during the design of the Browns Valley Flood Mitigation Project. The development of the HEC-RAS model was described in greater detail in the 2008 Engineers Report. The following updates were made to the model to create the current and as-built models:

- The box culvert and weir elevations were updated using the 2013 record drawings.
- Additional cross sections were added, and cross sections were realigned to add greater detail near the junctions.
- Minor revisions to ineffective flow areas.
- Station elevation data was updated based on the November 2022 LiDAR flight.
- The model version used was changed to 6.3.1.
- "As-built" and "current condition" geometries were created. The difference in these geometries is the incorporation of sediment in the diversion channel in the "current condition" geometry.
- Discharges for a wider range of flows were added.
- The downstream boundary condition was switched to normal depth due to known water surface elevations not being calculated for the full range of flows. This should be reevaluated if the model is being utilized outside the purpose of calculating flow splits at the junction.

Figure 2 shows a schematic of the HEC-RAS model.

Figure 2: HEC-RAS Current Conditions Model Schematic



3 PROJECT DESIGN

3.1 ALTERNATIVES CONSIDERED

The following paragraphs will describe the alternatives considered.

3.1.1 AADLAND 2019

Prior to this design effort, the MnDNR was consulted to develop alternatives for fish passage through the diversion channel. This alternative consisted of three rock riffles downstream of the Highway 24 bridge at elevations 977.0, 978.0, and 979.0. The existing weir was proposed to have two 2-foot by 2-foot notches cut into the crest with two fish ladders created with boulders to provide access from the notches to the bridge.

During development of this concept, it was assumed that no change could be made to the existing diversion weir structure and thus no change to the overall slope. During the project kick-off meeting (3-2-2023) it was determined that a single channel rock arch rapids with a reduced slope should be explored.

This option was not considered further.

3.1.2 ALTERNATIVE 1: ROCK ARCH RAPIDS @ 982.0

In this alternative, a rock arch rapids would be constructed with the controlling cross section upstream of the existing weir such that a slope of 3% can be established. The controlling cross section would have a 5' wide bottom with a runout elevation of 982.0 and 5-1 side slopes until 983.0 at which point the slope would vary at a relatively flat slope until tying into the existing riprap. The controlling cross section would transition into a 20' bottom with 5-1 side slopes to create a 50' channel with a 3' depth. From the edge of the channel the slope would vary at a relatively flat slope until tying into the existing riprap. All rocks placed within the 50' channel would be rounded field stone. The weir would be cut down to match the elevation of the rapids. Boulder weirs would be placed in approximately 20' intervals within the 50' channel, and small pools would be excavated between the boulder weirs to provide anchoring and variation. Chinking material would be added throughout the rock arch rapids and under the bridge to reduce the likelihood of fish being stranded as the diversion flows reduce and to force water to flow over the rock arch rapids. The UMRWD is currently pursuing a project to excavate sediment from the low flow channel, therefore the project assumes the entirety of the low flow channel has been restored to the as-built condition.

An alternative was considered similar to alternative 1 except a rock riffle added downstream of the existing box culvert with the purpose of creating a backwater to reduce velocities through the culvert. To have a significant effect on the desired range of flows, a downstream rock riffle with a crest elevation near 982.0 would be required. Since this elevation is so similar to the rock arch rapids elevation, this would result in a split flow for almost all events, thus this alternative was not considered further.

3.1.3 ALTERNATIVE 2: ROCK ARCH RAPIDS WITH MAX DIVERSION FISH PASSAGE

Alternative 2 is similar to alternative 1 except a "low flow" channel is added to the controlling cross section to increase the frequency at which the diversion channel can be utilized. This low flow channel is 2' wide

at an elevation of 980.4 and includes excavation upstream and downstream at a flat grade until it ties into the stream on the upstream side and the rock arch rapids on the downstream side.

A concept layout of this alternative is shown in **Appendix A – 90% Design Plans**.

3.2 EVALUATION OF THE PREFERRED ALTERNATIVE

Alternative 2 is the preferred alternative. The resultant alignment, profile, and cross sections are shown in more detail in **Appendix A – 90% Design Plans**.

3.2.1 HYDRAULICS

The 3 alternatives were modeled in HEC-RAS. Table 2 shows the results of the HEC-RAS modeling.

Table 2: Hydraulic Data by Alternative

	As-Built	Current Condition	Alt 1	Alt 2 (Preferred)
Box Culvert Size	5'h x 12'w	5'h x 12'w	5'h x 12'w	5'h x 12'w
Box Culvert Elevation	979.17	979.17	979.17	979.17
Diversion invert elevation	985.14	985.14	5' wide @ 982.0	2' wide @ 980.4
Flow Upstream when Rock Arch Starts Flowing	400	400	132	40
Flow upstream when velocity in Diversion Channel at Velocity = 2.0 ft/sec	683	761	542	497
Flow Upstream when Rock Arch is functional (1 foot depth)	1000	1000	225	61
Flow upstream when velocity through Culvert at Velocity = 2.0 ft/sec	45	45	45	45
Fish Passage Gap	>45	>45	45-225; >542*	45-61; >497*
100-year Through town	852	866	858	857
1.4 year Through town	409	412	287	258

*Assuming fish cannot pass when velocities in the diversion channel are greater than 2.0 fps indicates that the as-built and current condition have no fish passage when upstream discharges exceed 45 cfs. Fish have been observed passing through the diversion channel during large events, so this is likely an overly conservative assumption. The preferred alternative will virtually eliminate the fish passage gap; since within the diversion channel fish can continue to pass when velocities exceed 2.0 feet per second, likely due to the variation in topography and substrate. The preferred alternative also meets the constraints for the 100-year and 1.4 year discharges through Browns Valley.

3.2.2 SEDIMENT TRANSPORT

During the current condition, when large events occur and the diversion is utilized, large amounts of sediments are deposited in the diversion channel. This obscures the low flow channel in the downstream portion of the diversion and drowns out vegetation growth. It is anticipated that with the diversion channel accessed more frequently, the low flow channel will re-establish with dimensions appropriate for the



channel forming flow. This will likely establish a smaller channel than the as-constructed low flow channel; but large enough to provide fish passage for a broad range of fish species. Excavation of deposited sediments in the diversion channel may still be necessary following large events. The UMRWD is currently pursuing a separate project to remove sediment from the low flow channel.

3.2.3 MAINTENANCE AND OPERATIONS

It is recommended to monitor the Little Minnesota River channel through town for sedimentation related to changes in the flow distribution. If necessary, the controlling cross section of the rock arch rapids (i.e., the low flow channel) may be revised to push more flow through town during small events. This revision would involve raising the boulder weir through the controlling cross section and adding riprap; resulting in more flow going through town during small (channel forming) events. These revisions can be made without significant modeling. The inset channel in the controlling section could be eliminated (controlling section invert at 983.0) and the 100-year discharge (assuming as-built downstream geometry, ie no sediment) would increase from 852 cfs to 854 cfs.

Post project monitoring of the downstream diversion channel should be completed after the fish passage modifications have been made to ensure the channel forming geomorphology resulting from more frequent flows are consistent with fish passage.

The low flow channel at the rock arch rapids entrance may occasionally be blocked with debris but larger flows will typically flush any debris downstream. The UMRWD owns the property and thus has access to perform maintenance.

3.2.4 OTHER CONSIDERATIONS

The proposed preferred alternative will result in a 3% slope which is consistent with successful fish passage projects throughout Minnesota. HEC-RAS modeling indicates that Alternative 2 will almost completely close the fish passage gap, eliminating the need for a future costly modification to the box culvert. The preferred alternative significantly improves fish passage for flows ranging from 45 cfs to ~500 cfs and higher.

The preferred alternative meets all the project goals. The other considered alternatives also make significant progress towards closing the fish passage gap; however, ultimately the preferred alternative was chosen because it almost completely closes the fish passage gap, despite changes to the channel forming hydrology through town. Consensus was reached that modifications to raise the boulder weir in the controlling section of the rock arch rapids could be completed relatively cost-effectively, making the preferred alternative worth-while to pursue to avoid very high-cost modifications to the existing box culvert.

Other project features to further increase fish passage were considered during design. The rock riffle downstream of the culvert (Alternative 2) was modeled in HEC-RAS and was found to improve fish passage only slightly during a small range of lower flows. A series of rock riffles downstream of the bridge were also considered, but the existing downstream diversion channel's capacity would be greatly reduced, resulting in lower flows utilizing the floodplain more frequently, possibly increasing the chances of fish being stranded. Maintaining a 3% slope and modifying the riprap downstream of the bridge to contain the same capacity as the downstream diversion channel is preferred. These features may be considered in the future if continued monitoring deems further improvements necessary.

Other features to increase migration through the diversion channel itself may also be considered, with consideration of sedimentation that occurs during large events and maintenance of the channel.

4 REGULATORY

Projects that affect water resources are often regulated by a variety of local, state, and federal agencies. Regulated activities may be authorized with or without an individual permit and with or without conditions. The following identifies the probable regulatory approvals that may be necessary for this project.

4.1 FEDERAL

4.1.1 SECTION 404/401

Section 404 of the Clean Water Act requires a permit from the US Army Corps of Engineers (USACE) for the discharge of dredged or fill material, within waters of the U.S., including wetlands. The USACE utilizes general permits and nationwide permits to authorize specific categories of work that have minor impact to "waters of the U.S.". If a permit is needed, it is likely this project would qualify for a Nationwide permit, such as Nationwide permit 27 for Stream Restoration or an applicable General Permit. In order to receive a 404 permit the project must comply with the EPA's Section 404(b)(1) guidelines, which require activities to be the least environmentally damaging practicable alternative (LEDPA), adverse impacts are avoided, minimized, and then compensated for through mitigation. Activities also must be determined to be in the public interest. The USACE may require a wetland delineation be completed within the project footprint. It is likely Section 404 would be administered out of the Omaha office.

The project will also need to meet the Section 401 of the Clean Water Act. This provision requires any applicant for a federal license or permit to conduct an activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification from the State in which the discharge originates that the discharge complies the applicable water quality standards. The 401 certification becomes a condition of the U.S. Army Corps of Engineers (Corps) Section 404 permit but is issued by the Minnesota Pollution Control Agency and South Dakota Department of Environment and Natural Resources.

4.1.2 SECTION 408

The project will need to be reviewed to determine whether there are any potential affects to other federally authorized projects requiring approval under Section 408 authorities. The USACE will be consulted, and a determination requested. Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of projects they carry out, approve, or fund on historic properties. The USACE as the lead federal permitting agency will be consulted to assure compliance with Section 106 as part of their Section 404 permitting and/or Section 408 actions. Since the 100-year flow splits are not effective and other discharges are not effective downstream of the tie-in of the Diversion Channel to the Little Minnesota River, it is unlikely a Section 408 permit is needed.

4.1.3 NEPA

Lastly, the project will need to be reviewed for compliance with the National Environmental Policy Act (NEPA). A federal Environmental Assessment will likely not be required for the project. There are provisions for conducting joint federal and state environmental review and the state and federal processes will be coordinated to reduce duplication of data collection and public meetings.

4.2 STATE

4.2.1 MN PUBLIC WATERS

The project is proposed to modify baseflow discharges within a designated public watercourse (Little Minnesota River). Public waters are regulated by the Department of Natural Resources in accordance with M.S. 103G and MN Rules Chapter 6115. Activities below the Ordinary High Water Mark (OHWM) that would change the course, current, or cross section of public waters are subject to public waters permit authority. There are specific exemptions from permitting requirements that may apply to portions of the project. In addition, MNDNR has issued general permits for some activities. Since no work is being done within a Public Water in Minnesota, it is unlikely a public waters permit is necessary, however the Minnesota DNR should be notified during the public comment period of other permit processes.

4.2.2 MINNESOTA WETLAND CONSERVATION ACT (WCA)

Any impacted aquatic resources outside the OHWM of Minnesota Public Waters would require a review by the acting local government until in Traverse County which is the Traverse County SWCD in accordance with the Minnesota Wetland Conservation Act (Minnesota Rule Chapter 8420). The rule regulates activities that drain, fill, or excavated wetlands. Since no work is being done within wetlands in Minnesota, it is unlikely that a WCA permit is necessary.

4.2.3 MINNESOTA ENVIRONMENTAL POLICY ACT (MEPA)

Although the project construction activities are in South Dakota, the project will need to be reviewed by the board to determine if a Minnesota environmental review (EAW) is triggered by any mandatory categories under Minnesota's Environmental Policy Act (MEPA). The responsible government unit (RGU) for these two categories is the DNR and the local government respectively. The DNR will need to be consulted on who ultimately is designated as the RGU, but it is anticipated that the UMRWD would assume the role of RGU.

4.2.4 SD WATER RIGHTS/FLOOD CONTROL

A Water Rights Permit (Specifically Flood Control) (South Dakota Department of Environment and Natural Resources) was required during construction of the Browns Valley Diversion project. 100-year flow splits are not proposed to be significantly altered; therefore, it is unlikely a SD Flood Control permit will be required; however, coordination with the South Dakota Department of Agriculture and Natural Resources should take place to confirm. A permit may be issued only if there is a reasonable probability that unappropriated water is available; the proposed diversion can be developed without unlawful impairment of existing rights; the proposed use is a beneficial use; and the proposed use is in the public's interest. It is anticipated that the project can meet these requirements.

The project alternatives also include the modification of a weir that is likely classified as a regulated dam which also falls under the Water Rights Permit. Dam safety requirements are subject to additional provisions based on the hazard classification.

4.2.5 GENERAL PERMIT FOR STORMWATER DISCHARGE

Stormwater discharges are regulated under the National Pollution Discharge Elimination System (NPDES) permit program of the Pollution Control Agency and South Dakota Department of Environment and Natural Resources. NPDES permits are generally required for any construction activity disturbing one

acre or more of soil; or if an area is less than one acre, if it is part of a larger common plan of development that is greater than one acre. Most construction activities are covered by a general NPDES stormwater permit for construction activity, but some construction sites need individual permit coverage. It is anticipated that the project activities would not require an individual permit and that a Stormwater Pollution Prevention Plan (SWPPP) will be developed as part of the final project plans.

4.3 LOCAL

Local governments that may have regulatory oversight of the project include the Roberts County South Dakota, Big Stone County Minnesota, Upper Minnesota River Watershed District (UMRWD). The project has been reviewed and consistent with the watershed management plan.

4.3.1 FLOODPLAIN

The proposed project works within the Zone A floodplain in Roberts County SD. Because 100-yr flow split will be matched to the previous project, downstream base flood elevation (BFE) on the published Flood Insurance Rate Map (FIRM) will not be modified. Zone A floodplains are administered locally. Roberts County South Dakota administers a floodplain ordinance. The project will be evaluated on whether the sites within Roberts County are located within an area of special flood hazard and comply with any requirements outlined for work within a floodplain. The Roberts County floodplain administrator should be contacted regarding required submittals.

4.3.2 UMRWD

The UMRWD also manages a permitting program for certain activities including activities related to bridges, culverts, and drains. It is not anticipated that a permit from UMRWD will be required for the project.

4.4 SUMMARY

Permitting the project the project will require obtaining all of the above mentioned permits as well as federal and state environmental review. The project will cover two state jurisdictions and two county jurisdictions, effectively doubling the amount of permits necessary to complete the project. To complete these permits the following additional work may be required; wetland and threatened and endangered species field review, and a cultural resources field review.

5 OPINION OF PROBABLE COSTS

The estimated construction project costs for the project described in this report are as follows:

Table 3 – Opinion of Probable Construction Costs

	Total
Construction Costs	\$600,000
Construction Contingency (20%)	\$120,000
Other Costs (Administration, Final Engineer, Construction Administration, staking, and observation, Permitting)	\$120,000
Total Project Costs	\$840,000

A detailed breakdown of the project costs is included as **Exhibit B** to this report, Project Itemized Cost Estimate.

6 RECOMMENDATION AND NEXT STEPS

The proposed preferred alternative meets all the identified project goals.

It is anticipated that the stakeholders will use the 90% plans and technical specifications to pursue funding and permitting. Other portions of the project specifications can be completed following identification of requirements related to project funding mechanisms. The 90% plan set will be used for permitting submittals and applications for grants. Any necessary revisions that arise during regulatory review will be incorporated prior to construction. Prior to finalizing the plans, the MN DNR Floodplain Management Division should review the project to confirm it complements the Browns Valley Flood Mitigation Project.

The UMRWD, GFP, and MnDNR are encouraged to hold a public information meeting to discuss the project components and expectations.



APPENDIX A – 90% DESIGN PLANS

ROBERTS COUNTY, SD
SEPTEMBER 2023



1	COVER SHEET
2	NOTES AND QUANTITIES
3	SITE ACCESS
4	PLAN AND PROFILE
5	ROCK ARCH RAPIDS LAYOUT
6-7	ROCK ARCH RAPIDS DETAILS
8	REMOVALS
9-12	SWPPP NARRATIVE
13	EROSION CONTROL DETAILS

STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, ADOPTED BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION, SHALL APPLY TO ALL STANDARD DRAWINGS CURRENTLY IN EFFECT AND OTHER CONTRACT PROVISIONS SUBMITTED HEREIN.

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION, AS-BUILT MAPS AS PROVIDED BY MUNICIPALITIES OR UTILITY COMPANIES, AND/OR EXISTING DOCUMENTATION. THERE IS NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN INDICATE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. NOR IS THERE A GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY RESULT FROM THEIR FAILURE TO EXPLICITLY LOCATE AND PRESERVE ANY AND ALL UTILITIES.

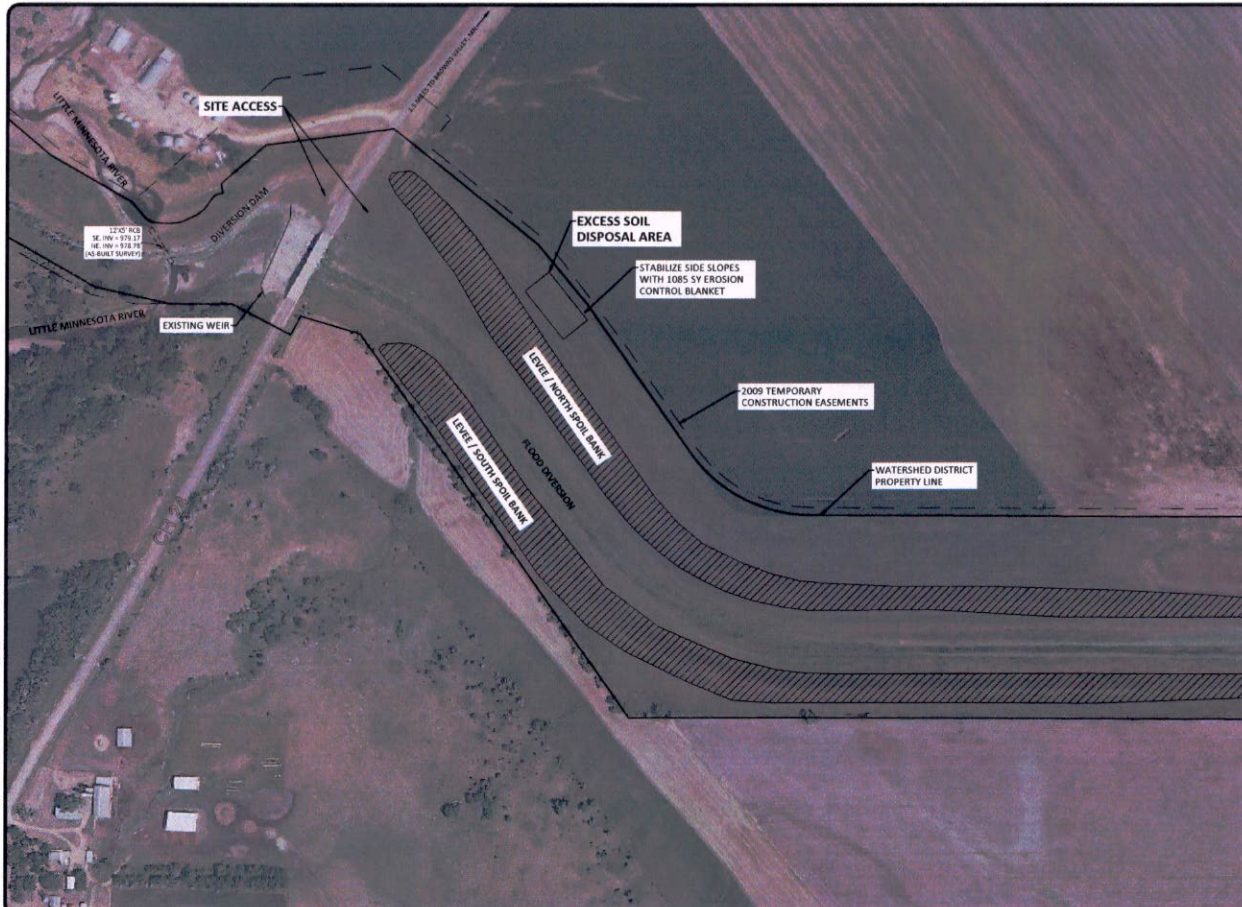


VICINITY MAP



LOCATION MAP

PRELIMINARY
NOT FOR CONSTRUCTION



NOTES:

1. ACCESS ROAD SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND RESTORED TO AS GOOD OR BETTER CONDITIONS THAT EXISTED PRIOR TO CONSTRUCTION. ALL COSTS FOR ACCESS ROAD IMPROVEMENTS, MAINTENANCE, AND RESTORATION SHALL BE INCIDENTAL TO OTHER BID ITEMS.
2. NO HEAVY EQUIPMENT TO BE DRIVEN ON EXISTING LEVEES.
3. WITHIN EXCESS SOIL DISPOSAL AREA, CONTRACTOR SHALL PROVIDE DRAINAGE BY SLOPING TOWARD EXISTING FLOWPATHS. THE SPOIL WILL BE LEVELED AT A MAXIMUM HEIGHT OF 6 FEET WITH 3:1 SIDE SLOPES.

PRELIMINARY
NOT FOR CONSTRUCTION

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No.	Revision	Date	By



Drawn by	NJD	Date	9/8/2023
Checked by	LDO	Scale	AS SHOWN

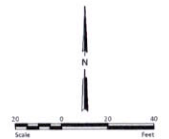
BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

SITE ACCESS
PROJECT NO. 5304-0030

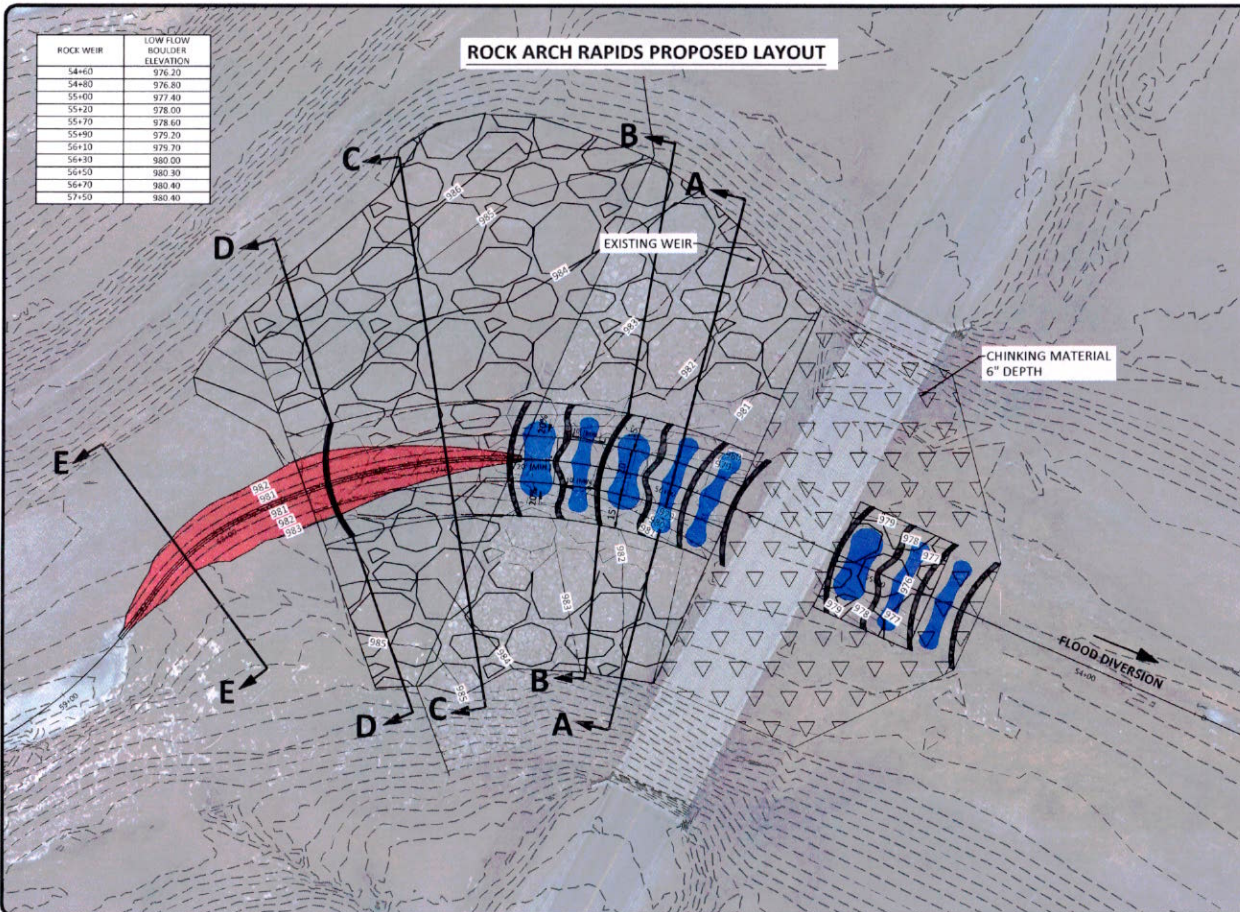
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ROCK WEIR	LOW FLOW BOULDER ELEVATION
54+60	976.20
54+80	976.80
55+00	977.40
55+20	978.00
55+70	978.60
55+90	979.20
56+10	979.70
56+30	980.00
56+50	980.30
56+70	980.40
57+50	980.40

ROCK ARCH RAPIDS PROPOSED LAYOUT



- LOW FLOW CHANNEL
- ROCK WEIR
- ROCK ARCH RAPIDS
- POOL
- CHINKING MATERIAL TRANSITION



PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By



Drawn by	NJD	Date	9/8/2023
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BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

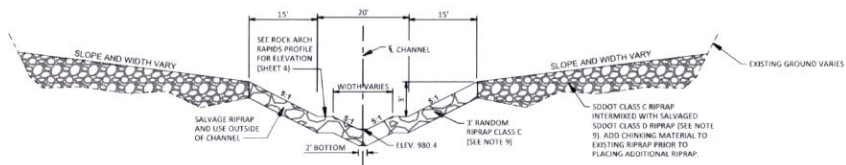
ROCK ARCH RAPIDS
LAYOUT
PROJECT NO.: 5304-0030

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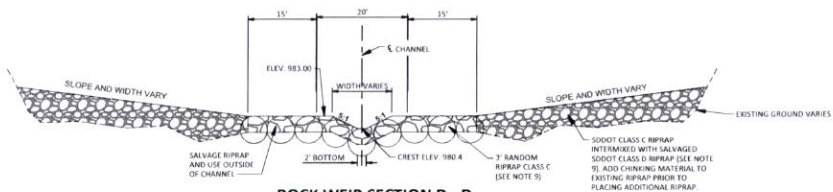


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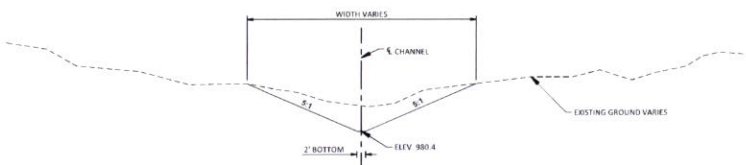
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TYPICAL SECTION C - C
STA 56+67 TO STA 57+50
(NOT TO SCALE)



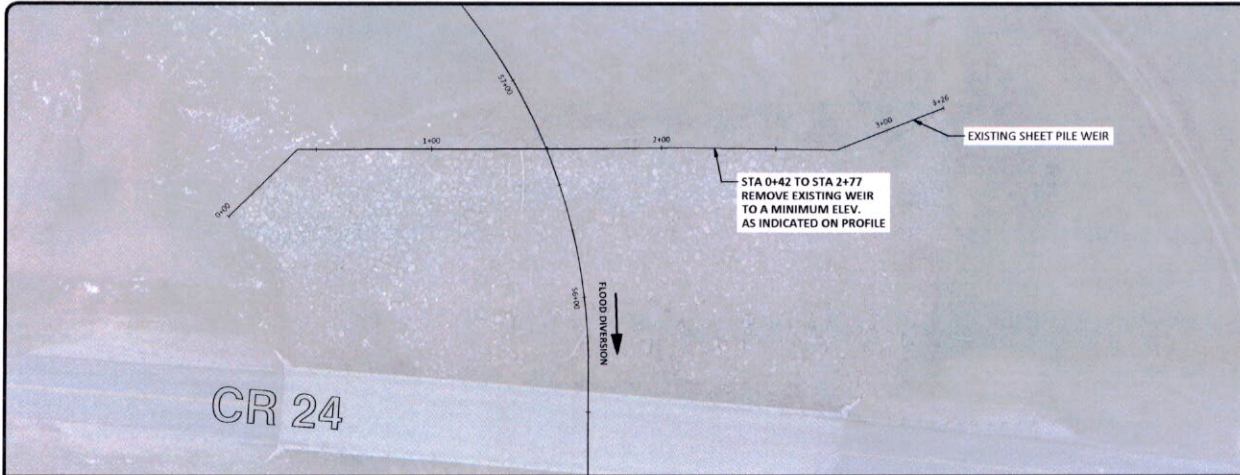
ROCK WEIR SECTION D - D
STA 57+50
(NOT TO SCALE)



TYPICAL SECTION E - E
STA 57+50 TO STA 59+00
(NOT TO SCALE)

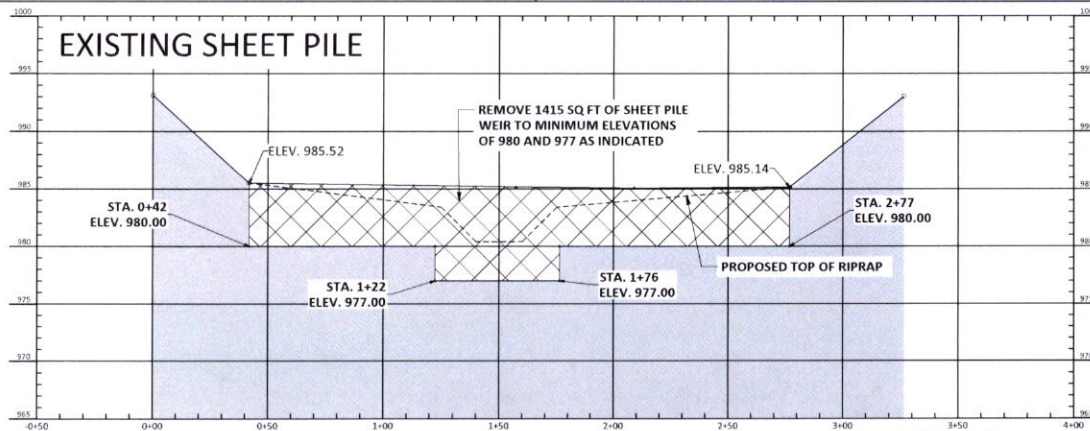
V:\0001\5304\5304-0030.dwg 2023 Browns Valley Fish Passage Project - Upper Minnesota River Watershed District, Roberts County, SD. Scale: C and E are 1"=20'; D and F are 1"=20'; A and B are 1"=40'; and G is 1"=20'. 9/8/2023 1:27:24 PM houston

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No.	Revision	Date	By																		
				Checked by TDR	Scale AS SHOWN																



NOTES:

1. ALL REMOVED SHEET PILE MUST BE DISPOSED OF OFF-SITE BY THE CONTRACTOR (INCIDENTAL TO BID ITEM REMOVE EXISTING SHEET PILE).
2. ALL PLANT, LABOR, MATERIALS, EQUIPMENT, TOOLS, DISPOSAL, HAULING, AND OTHER ITEMS NECESSARY TO COMPLETE THE REMOVAL SHALL NOT BE PAID FOR SEPARATELY BUT INSTEAD BE INCIDENTAL TO BID TIME REMOVE EXISTING SHEET PILE.
3. SHEET PILE WILL BE FULLY BURIED.



PRELIMINARY
NOT FOR CONSTRUCTION

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No.	Revision	Date	By



Drawn by: NID
Checked by: LDO
Date: 9/8/2023
Scale: AS SHOWN

BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

WEIR REMOVAL PLAN
PROJECT NO. 5304-0030

SHEET
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SHEET
9

5.3 (6): PROCEDURES FOR INSPECTIONS

- Inspections will be conducted at least once every 7 days.
- All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
- Silt fence will be inspected for depth of sediment and for tears to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches 1/2 of the height of the silt fence.
- Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
- Check dams will be inspected for stability. Sediment will be removed when depth reaches 1/2 the height of the dam.
- All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
- Inspection and maintenance reports will be prepared on form DOT 286 for each site inspection; this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
- The SDDOT Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance and repair activities are the responsibility of the Contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

5.3 (7): POST CONSTRUCTION STORMWATER MANAGEMENT

Stormwater management will be handled by temporary controls outlined in "DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES" above, and any permanent controls needed to meet permanent stormwater management needs in the post construction period will be shown in the plans and noted as permanent.

5.3 (8): POLLUTION PREVENTION PROCEDURES

5.3 (8a): Spill Prevention and Response Procedures

- **Material Management**
 - **Housekeeping**
 - Only needed products will be stored on-site by the Contractor.
 - Except for bulk materials the contractor will store all materials under cover and/or in appropriate containers.
 - Products must be stored in original containers and labeled.
 - Material mixing will be conducted in accordance with the manufacturer's recommendations.
 - When possible, all products will be completely used before properly disposing of the container off-site.
 - The manufacturer's directions for disposal of materials and containers will be followed.
 - The Contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
 - Dust generated will be controlled in an environmentally safe manner.
 - **Hazardous Materials**
 - Products will be kept in original containers unless the container is not resealable and provide secondary containment as applicable.
 - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
 - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.

- Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
- Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any stormwater system or stormwater treatment system.
- Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of stormwater runoff.

➤ Spill Control Practices

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill cleanup will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the Contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for cleanup purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The Contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator.

➤ Spill Response

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into stormwater runoff and conveyance systems. If the release has impacted on-site stormwater, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens stormwater or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.

- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SDDANR.
- Personnel with primary responsibility for spill response and cleanup will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

5.3 (8b): WASTE MANAGEMENT PROCEDURES

➤ Waste Disposal

- All liquid waste materials will be collected and stored in approved sealed containers. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal and notices stating proper practices will be posted. The Contractor is responsible for ensuring waste disposal procedures are followed.

➤ Hazardous Waste

- All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the Contractor will be responsible for seeing that these practices are followed.

➤ Sanitary Waste

- Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units which must be secured to prevent tipping and serviced in a timely manner by a licensed waste management Contractor or as required by any local regulations.



Drawn by
NJD
9/6/2023
Checked by
TDR
AS SHOWN

BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

SWPPP NARRATIVE
PROJECT NO. 5304-0030

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5.3 (9): CONSTRUCTION SITE POLLUTANTS

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the heading "POLLUTION PREVENTION PROCEDURES" (check all that apply).

- ☐ Concrete and Portland Cement
- ☐ Detergents
- ☐ Paints
- ☒ Metals
- ☐ Bituminous Materials
- ☒ Petroleum Based Products
- ☒ Diesel Exhaust Fluid
- ☐ Cleaning Solvents
- ☐ Wood
- ☐ Cure
- ☐ Texture
- ☐ Chemical Fertilizers
- ☐ Other:

Product Specific Practices

• Petroleum Products

All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.

• Fertilizers

Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to stormwater. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.

5.3 (10): NON-STORMWATER DISCHARGES

The following non-stormwater discharges are anticipated during the course of this project (check all that apply).

- ☐ Discharges from water line flushing.
- ☐ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- ☐ Uncontaminated ground water associated with dewatering activities.

5.3 (11): INFEASIBILITY DOCUMENTATION

If it is determined to be infeasible to comply with any of the requirements of the Stormwater Permit, the infeasibility determination must be thoroughly documented in the SWPPP.

7.0: SPILL NOTIFICATION

In the event of a spill, the Contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to SDDANR immediately if any one of the following conditions exists:
 - The release or spill threatens or is able to threaten waters of the state (surface water or ground water)
 - The release or spill causes an immediate danger to human health or safety
 - The release or spill exceeds 25 gallons
 - The release or spill causes a sheen on surface water
 - The release or spill of any substance that exceeds the ground water quality standards of ARSD Chapter 74:54.01
 - The release or spill of any substance that exceeds the surface water quality standards of ARSD Chapter 74:51.01
 - The release or spill of any substance that harms or threatens to harm wildlife or aquatic life
 - The release or spill is required to be reported according to Superfund Amendments and Reauthorization Act (SARA) Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.
- To report a release or spill, call SDDANR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231. Reporting the release to SDDANR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, you must also contact local authorities to determine the local reporting requirements for releases. A written report of the unauthorized release of any regulated substance, including quantity discharged, and the location of the discharge will be sent to SDDANR within 14 days of the discharge.

5.4: SWPPP CERTIFICATIONS

➤ Certification of Compliance with Federal, State, and Local Regulations

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➤ SWPPP Designer

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature (See the General Permit, Section 7.4 (1))

➤ Prime Contractor

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature



Drawn by
NJD
Checked by
TOR
Date
9/8/2023
Scale
AS SHOWN

BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

SWPPP NARRATIVE
PROJECT NO. 5304-0030

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The following personnel are duly authorized representatives and have signatory authority for modifications made to the SWPPP:

• Prime Contractor Name:

Contractor Contact Name:

- Address:

City: _____ State: _____ Zip: _____

Office Phone: _____ Field: _____

* Cell Phone: _____ Fax: _____

• Name: _____

• Address: _____

• City: _____ State: _____ Zip: _____

• Office Phone:	Field:
-----------------	--------

• Cell Phone: _____ Fax: _____

- Name: Amber Doschadis (Administrator)

- Business Address: 211 2nd St SE

City: Ortonville State: MN Zip: 56278

- Office Phone: 320-839-3411

• Fax: 320-839-3313

- Name: Lisa Odens

- **Business Address:** 7750 Meridian Circle North

• City: Maple Grove State: MN Zip: 55369

- Office/Cell Phone: 763-493-6667

- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

• (605) 773-3153

• (800) 424-8802

- SDDANR Stormwater (800) 737-8676
- Surface Water Quality Program (605) 773-3351

➤ **5.5 (1): Conditions Requiring SWPPP Modification**
The SWPPP must be modified, including the site map(s), in response to any of the following conditions:

- When a new operator responsible for implementation of any part the SWPPP begins work on the site.
- When changes to the construction plans, sediment and erosion control measures, or any best management practices on site that are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions triggered by inspections.
- To reflect areas on the site map where operational control has been transferred (including the date of the transfer) or has been covered under a new permit since initiating coverage under this general permit.
- If inspections by site staff, local officials, SDDANR, or U.S. EPA determine that SWPPP modifications are necessary for compliance with the Stormwater Permit.
- To reflect any revisions to applicable federal, state, or local requirements that affect the control measures implemented at the site.
- If approved by the Secretary, to reflect any changes in chemical water treatment systems or controls, including the use of a different water treatment chemical, age rates, different areas, or methods of application.

5.5 (2): Deadlines for SWPPP Modification
Any required revisions to the SWPPP must be completed within 7 calendar days following any of the items listed above.

All SWPPP modification records are required to be maintained showing the dates of when the modification occurred. The records must include the name of the person authorizing each change and a brief summary of all changes.

5.5 (4). Certification Requirements
All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

3.5 (3). Required Notice to Other Operators
If there are multiple operators at the site, the Contractor's Erosion Control Supervisor must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

When modifications as described above occur, the SWPPP will be modified to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP using the DOT 298 form and drawings on the plan will be modified to reflect the needed changes. Copies of the DOT 298 forms and the SWPPP will be retained on site in a designated place for review throughout the course of the project. A copy of the DOT 298 form will be given to the Contractor Erosion Control Supervisor and a copy will be emailed to the SDDOT Environmental Section in accordance with the DOT 298 Form.

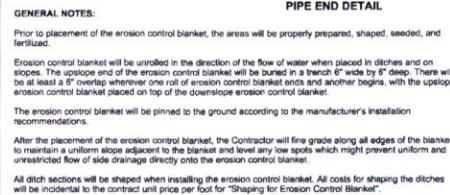
Drawn by NJD	Date 9/8/2023
Checked by TJH	Scale 1:1

BROWNS VALLEY FISH PASSAGE
UPPER MINNESOTA RIVER WATERSHED DISTRICT
ROBERTS COUNTY, SD

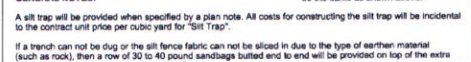
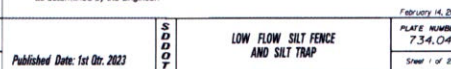
SWPPP NARRATIVE	SHEET
PROJECT NO. 5304-0030	12

DESCRIPTION	TITLE	LOCATION
SUMMARY OF PERMITS AND APPROVALS	summary	SHEET 9
RECENTE SURFACE WATER	summary	SHEET 9
FINAL STABILIZATION	SPR LAYOUT	SHEETS 4-5
EROSION AND SEDIMENT CONTROL MEASURES	summary	SHEET 9
EROSION AND SEDIMENT CONTROL MEASURES	EROSION AND SEDIMENT CONTROL MEASURES	sheet 12

EROSION AND SEDIMENT CONTROL QUANTITY SUMMARY		
DESCRIPTION	UNITS	QUANTITY
Seeding and Muck	LS	1
Silt Fence	Linear Foot	62
Finaling Silt Curtain	Linear Foot	60
Erosion Control Blanket	Square Yard	1100



Published Date: 1st Qtr. 2023	S D D O T	EROSION CONTROL BLANKET	February 14, 2023
			PLATE NUMBER 734.01 Sheet 1 of 1



length of silt fence fabric to prevent underflow.		February 14, 2020
Published Date: 1st Qtr. 2023	S D D O T	LOW FLOW SILT FENCE AND SILT TRAP
		PLATE NUMBER 734.04 Sheet 2 of 2



APPENDIX B – PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

OPINION OF PROBABLE COST
Browns Valley Rock Arch Rapids
Upper Minnesota River Watershed District, Ortonville, MN
September 8, 2023

No.	Item	Unit	Quantity	Unit Price	Total Costs
1	Mobilization	LS	1	\$ 50,000.00	\$ 50,000.00
2	Common Excavation (P)	CY	2,929	\$ 10.00	\$ 29,290.00
3	Common Embankment (P)	CY	41	\$ 10.00	\$ 410.00
4	Floating Silt Curtain	LF	50	\$ 30.00	\$ 1,500.00
5	Remove Existing Sheetpile	SF	1,415	\$ 15.00	\$ 21,225.00
6	Salvage and Reinstall SDDOT Class D Riprap (P)	CY	919	\$ 60.00	\$ 55,140.00
7	SDDOT Class C Riprap (P)	CY	1,683	\$ 120.00	\$ 201,960.00
8	Random Riprap Class C (P)	CY	1,306	\$ 130.00	\$ 169,780.00
9	Rock Weir (36" to 60" Diameter Boulders)	LF	576	\$ 80.00	\$ 46,080.00
10	Rock Boulders (36" to 60" Diameter)	EA	10	\$ 800.00	\$ 8,000.00
11	Flat Rock Boulders (48" to 72" Diameter)	EA	4	\$ 1,200.00	\$ 4,800.00
12	Erosion Control Blanket	SY	1,305	\$ 4.00	\$ 5,220.00
13	Silt Fence	LF	50	\$ 4.00	\$ 200.00
14	Seeding and Mulching	LS	1	\$ 5,000.00	\$ 5,000.00
CONSTRUCTION COSTS					\$ 598,605.00
Contingency (20%)					\$ 119,695.00
TOTAL CONSTRUCTION COSTS					\$ 718,300.00
Final Design and Construction Administration					\$ 89,800.00
Administrative Costs					\$ 29,900.00
TOTAL PROJECT COSTS					\$ 838,000.00



APPENDIX C – DRAFT TECHNICAL SPECIFICATION

PART 5
TECHNICAL SPECIFICATIONS

SECTION 5.1 - RIPRAP

5.1.01 SCOPE

This section of the specifications covers the work related to furnishing all plant, labor, equipment, appliances, and materials and in performing all operations in connection with the installation of riprap where shown on the plans or where directed by the Engineer.

5.1.02 APPLICABLE SPECIFICATIONS

- a. The latest editions of the standards listed below but referred to hereinafter by basic designation only, form a part of this section of the specifications.
 1. The 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges" and the Supplemental Specifications

5.1.03 MATERIALS

- a. Random Riprap: Stone for random riprap will be durable field stone and shall be sound, hard, and free from cracks or seams. The gradation of the supplied stone shall conform to SDDOT 830 for the class listed in the proposal. The stones will be generally round in shape and conform to the size range indicated in the gradation table. Copies of such certification shall be furnished to the Engineer. Stone used for random riprap shall not have a fractured face.
- b. Riprap: Stone for riprap will be durable field or quarry stone and shall be sound, hard, and free from cracks or seams. The gradation of the supplied stone shall conform to SDDOT 830 for the class listed in the proposal. Copies of such certification shall be furnished to the Engineer.
- c. Rock Weir Boulders: Stones used to construct the Rock Weir Boulders, as indicated on the Construction Plans, will be durable field stone and shall be sound, hard, and free from cracks or seams. The stones will be generally round in shape and conform to the size range indicated on the Construction Plans.
- d. Flat Rock Boulders: Stones used to construct the Flat Rock Boulders, as indicated on the Construction Plans, will be durable field stone and shall be sound, hard, and free from cracks or seams. The stones will be generally flat on one side and conform to the size range indicated on the Construction Plans.

5.1.04 METHOD OF CONSTRUCTION

- a. Rock Riprap: The foundation for the riprap will be compacted and shaped to the cross-section as shown on the plans or as directed by the Engineer. The riprap will be placed approximately to the thickness shown on the plans and the stones will be firmly embedded in the foundation material. The stones will be laid so that the weight of the stones will be carried by both the foundation material and the adjacent stones. Riprap placed on slopes of banks shall generally be placed from toe to crest. Stones shall not be allowed to roll or slide down slope. Riprap shall not be dropped from a height greater than 3 feet. Riprap will be placed as indicated in the Construction Plans. Riprap to be mixed with a well graded mix of aggregate varying from the No. 40 sieve up to 6-inch stones and applied as a single, well-mixed building material to form a solid, no-void ramp. The mix of aggregate should be such that it is not blown out of the riprap by the rivers current and forces river flow over the riprap.
- b. Rock Weir Boulders: The location of the Rock Arch will be as indicated on the Construction Plans and verified by the engineer or the authorized on-site representative. Boulders for the Rock Arches are to be integrated into the constructed channel banks. Gaps between boulders shall typically range from 0 to 12 inches. Two 24-inch gaps shall be created in each Rock Arch as indicated in the Plans or as directed by the Engineer. The riprap material moved to allow placement of boulders will be placed to fill the remaining voids between the Rock Weir Boulders as directed by the engineer. Excavated channel material will be placed as noted on the Construction Plans or as instructed by the engineer or on-site representative.
- c. Flat Rock Boulders: The location of the Flat Rock Boulders will be as directed by the engineer or the authorized on-site representative. The riprap material moved to allow placement of boulders will be placed to fill the remaining voids between the Rock Weir Boulders. Excavated channel material will be placed as noted on the Construction Plans or as instructed by the engineer or on-site representative.
- d. Placement in Water: Material to be placed under water shall be placed in a systematic manner to ensure a continuous uniform layer of well-graded stone of the required thickness. The Contractor shall minimize the drop height of material placed under water to avoid particle segregation during placement. Material to be placed under water shall not be cast across the surface of the water.

5.1.06 MAINTENANCE

- a. Rock Riprap: The Contractor shall be responsible for maintenance of the riprap for a period of 1 year following completion of the project. Maintenance shall include placing additional well graded mix of aggregate varying from the No. 40 sieve up to 6-inch stones to fill any remaining voids, replacement of riprap sections that have been washed out, or placement of salvaged riprap that has been misplaced. Maintenance requirements for riprap shall be at the discretion of the Engineer.
- b. Rock Weir Boulders: The Contractor shall be responsible for maintenance of boulders placed for the rock weirs for a period of 1 year following completion of the project. Maintenance shall include moving any misplaced boulders to a location specified by the Engineer. Maintenance requirements for the boulders shall be at the discretion of the Engineer.

5.1.05 MEASUREMENT AND PAYMENT

- a. General: All measurements and payment will be based on completed and accepted work. The payments listed below shall be full compensation for all plant, labor, materials, equipment, tools, and incidental items necessary to complete the work.
1. Foundation Preparation: Foundation preparation, including the placement of salvaged channel excavated material, and disposal of waste material will not be measured for separate payment but shall be considered incidental to other bid items.
 2. Random Riprap: Random Riprap will be measured in units of cubic yards in place by multiplying the area covered by the surfacing times the specified thickness as shown in the plans. Aggregate material used to fill voids in the random riprap will be considered part of the installed random riprap section. Payment will be made at the contract unit price per cubic yard for the item "Random Riprap" of the size and class listed in the proposal. Truck load tickets will not be used for payment. Unless extenuating conditions exist, which can be documented by the Contractor, the Contractor will not be compensated for overruns in random riprap quantities. No separate measurement or payment will be made for aggregate material used to fill voids in the random riprap.
 3. Riprap: SDDOT Riprap will be measured in units of cubic yards in place by multiplying the area covered by the surfacing times the specified thickness as shown in the plans. Aggregate material used to fill voids in the riprap will be considered part of the installed riprap section. Payment will be made at the contract unit price per cubic yard for the item "SDDOT Riprap" of the size and class listed in the proposal. Truck load tickets will not be used for payment. Unless extenuating conditions exist, which can be documented by the Contractor, the Contractor will not be compensated for overruns in riprap quantities. No separate measurement or payment will be made for aggregate material used to fill voids in the riprap.
 4. Rock Weir Boulders: Rock Arch Boulders will be measured in units of linear feet along the centerline of the Rock Arches placed. Payment will be made at the contract unit price per linear foot for the item "Rock Weir (36" to 60" Diameter Boulders)" as listed in the proposal.
 5. Rock Boulders: Additional boulders placed randomly between the weirs will be measured on the unit basis of each (EA) for each rock boulder installed. The additional boulders will be paid at the contract unit price under the bid item "Rock Boulders (36" to 60" Diameter Boulders)" for each boulder installed.
 6. Flat Rock Boulders: 48" – 72" Flat Rock Boulders installed in rock riffles will be measured on the unit bases of each (EA) for each flat rock boulder installed. The flat rock boulders will be paid at the contract unit price under the bid item "Flat Rock Boulders (48" to 72" Diameter)" for each boulder installed.
 7. Salvaged Riprap: Riprap salvaged will be measured in units of cubic yards. Payment will be made at the contract unit price per cubic yard for the item "Salvage and Reinstall SDDOT Class D Riprap" of the size and class listed in the proposal. Truck load tickets will not be used for payment. Unless extenuating conditions exist, which can be documented by the Contractor, the Contractor will not be compensated for overruns in salvaged riprap quantities.

END OF SECTIONSECTION 5.2 -CHANNEL EXCAVATION

5.2.01 SCOPE

The Contractor shall furnish all plant, labor, equipment, appliances, and materials required in performing all operations in connection with excavation as shown on the plans.

5.2.02 APPLICABLE SPECIFICATIONS

- b. The latest editions of the standards listed below but referred to hereinafter by basic designation only, form a part of this section of the specifications.
 1. The 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges" and the Supplemental Specifications

5.2.03 EXCAVATION

Excavation operations will be conducted as necessary to facilitate installation of the Rock Arch Rapids as defined in the Construction Plans. Excavation shall be completed in an orderly manner. **Channel excavation should be limited to constructing the Rock Arch Rapids as indicated in the Construction Plans and transitioning to the existing channel cross section.** The Contractor shall employ the type of equipment best suited to the site conditions. Some excavated material will be placed as indicated in the Construction Plans. Excess excavated material shall be wasted at the direction of the engineer.

Heavy machinery may not be driven across the existing levees, so the integrity of the levees will not be compromised. A Haul Route is marked on the site plan.

Excavation activities will maintain river access for waterways and other drainage structures. The Contractor shall protect from damage all culvert or tile ditch inlets. Any structures damaged by construction operations shall be repaired by the Contractor to the satisfaction of the Engineer at the Contractor's expense.

5.2.04 UTILITIES

The Contractor will be responsible to protect all utilities within the construction limits whether or not shown on the plans. It is the Contractor's responsibility to notify utilities for locates by contacting the South Dakota 811: phone: 800-781-7474 or 811, website: www.sdonecall.com.

5.2.05 CLEANUP

The Contractor shall remove all materials and debris from the construction area as work progresses in order that the property owner can have the use of the land at the earliest possible date.

Spoils shall be free of large branches and debris and placed in a manner traversable by wheeled equipment. Large debris shall be placed at the back of the spoil pile. Contractor shall provide drainage by sloping towards existing flowpaths. The spoil will be leveled at a maximum of 6 feet depth with 3:1 side slopes. Final spreading and smoothing of spoils shall occur during non-frozen conditions. The Contractor has the option to remove excess spoil from the site at NO COST to the OWNER. Compaction of the spoil shall be obtained by the "Quality Compaction" method described in MNDOT 2106.3F2.

5.2.06 MEASUREMENT AND PAYMENT

- a. All measurements and payments will be based on completed and accepted work. The payments listed below shall be full compensation for all plant, labor, materials, equipment, tools, and incidental items necessary to complete the work.

1. Channel Excavation: will be measured in units of cubic yards. Payment will be made at the contract unit price per cubic yard for the item "Common Excavation" listed in the proposal. Truck load tickets will not be used for payment. Unless extenuating conditions exist, which can be documented by the Contractor, the Contractor will not be compensated for overruns in common excavation.
2. Placement of Excavated Material: All excavated materials shall either be placed as salvaged material beneath the design select granular layer of the rock ramp or disposed of as waste material. The placement of all excavated material, salvaged or wasted will not be measured for separate payment, rather will be incidental to other bid items.
3. Hauling: Any loading, hauling and unloading of excavated materials for placement will not be measured for separate payment, rather will be incidental to other bid items.

END OF SECTION

SECTION 5.3 - SEEDING AND MULCHING

5.3.01 SCOPE

The work covered by this section of the specifications consists of furnishing all necessary plant, equipment, labor, and materials, and performing all work in connection with the seeding and mulching of all areas as designated on the plans: including but not limited to; constructed berms and other disturbed areas, unless they are located on agricultural lands used for crop production.

5.3.02 MATERIALS

- A. **Grass Seed:** Grass seed will be new, clean, crop seed, and shall be certified by the vendor. Copies of such certification shall be furnished to the Engineer. Seeding for turf establishment shall be performed in accordance with SDDOT 730.
- i. Areas within the road right-of-way shall be seeded with agricultural roadside seed mix (SDDOT Type B Permanent Seed Mixture).
 - ii. Seed mixture outside the right-of-way shall conform to the following or **an approved equal**.

PERMANENT SEED MIXTURE				
GRASS SPECIES	VARIETY	PURE LIVE SEED (PLS) (POUNDS/ACRE)	MINIMUM BULK RATE (POUND/ACRE)	PERCENT OF MIX COMPONENT
BROME GRASS, SMOOTH	LINCOLN, CARLTON, SAC, SIGNAL, MANCHAR	7.5	9.8	14.0
BLUEGRASS, KENTUCKY – PARK	CERTIFIED PARK ONLY	15.8	20.3	29.0
BLUEGRASS, CANADA	COMMON, REUBENS, TALON	7.6	9.8	14.0
SWITCHGRASS	DACOTAH, FORESTBURG, NEBRASKA 28, PATHFINDER, SUMMER, SUNBURST, TRAILBLAZER	1.4	2.1	3.0
WHEATGRASS, SLENDER	REVENUE	1.7	2.8	4.0
RYE-GRASS, PERENNIAL	--	9.8	14.7	21.0
TIMOTHY	--	1.8	2.1	3.0
REDTOP	--	1.6	2.1	3.0
ALFALFA, CREEPING	RAMBLER, VICTORIA, TETON, TRAVOIS, SPREDOR 2	3.5	4.2	6.0
WHITE CLOVER	--	1.8	2.1	3.0
TOTAL:		52.5	70	100

- B. **Fertilizer:** Fertilizer will not be required for this project. If used, commercial fertilizers shall conform to the applicable laws of the State of South Dakota and be supplied conforming to SDDOT Specification 731. They shall be delivered to the site in suitable containers labeled with the manufacturer's guaranteed analysis. They shall be dry and free

from lumps which would interfere with obtaining uniform distribution with standard spreading equipment.

- C. Mulch: Mulch shall be supplied conforming to SDDOT Specifications 732. Mulch shall be grass hay or straw mulch. The mulch material shall be air dry and shall not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds will not be permitted. The mulch shall be blown, or hand applied at the rate of 3,000 to 4,000 lbs. per acre. The contractor shall provide certified weight of mulch furnished.

5.3.03 APPROVAL OF MATERIALS

- A. Seed: At least ten (10) days prior to contemplated use, the Contractor shall furnish duplicate copies of invoices and duplicate copies of a statement from the vendor certifying that each container of seed delivered is fully labeled in accordance with the Federal Seed Act and is at least equal to the requirements specified. If required by the Engineer, the Contractor shall also furnish samples of each lot of seed.

5.3.04 CLEARING

Prior to or during grading, topsoiling and tilling operations, the ground surface shall be cleared of all brush, stumps, roots, stones larger than one (1) inch in diameter, wire or any other material which may hinder proper grading, tilling, planting, or subsequent maintenance operations and any accumulated debris shall be disposed of as directed.

5.3.05 SEEDING LOCATIONS

Seeding will only be completed along disturbed areas that result from the installation of the project bid items. Disturbed areas shall be returned to vegetated condition prior to construction. Determination of seeding areas will be at the discretion of the Engineer or the authorized on-site representative.

5.3.06 TILLING

After areas to be seeded have been brought to the proper grade, they shall be thoroughly tilled to a depth of three (3) inches by disking, or by other approved methods until the condition of the soil is sufficiently pulverized for planting. A firm seed bed should be created by packing. The work shall be performed only during periods when satisfactory results are likely to be obtained. When conditions are such, by reason of drought, excessive moisture, or other factors that results are not likely to be satisfactory, the Engineer may stop the work and it shall be resumed only when, in his opinion, the desired results are likely to be obtained. Any undulations or irregularities in the surface resulting from tilling or other operations shall be leveled out before planting operations are begun.

5.3.07 FERTILIZER

Application of fertilizer will not be required on this project.

5.3.08 SEEDING

- A. All areas to be seeded are to be planted to the specified permanent seed mixture between the dates of April 1 and June 1 for spring planting, or between August 15 and September 15 for fall planting, except as otherwise approved in writing. Seeding shall be accomplished only after approval of the prepared seed bed. When areas are completed to the seeding stage at other seasons of the year or when delays in operations carry the work beyond the most favorable planting seasons for the species designated, seeding shall be postponed until the next seeding season and temporary protection procedures as specified shall be followed to hold the areas until they can be permanently seeded. When conditions are such, by reason of drought, high winds, excessive moisture, or other

factors, that satisfactory results are not likely to be obtained, the Engineer may stop the work and it shall be resumed only when, in his opinion, conditions are again favorable or when approved alternative or corrective measures and procedures have been adopted.

- B. Seeding Methods: The Contractor shall employ a method of seeding as hereinafter specified, making use of approved mechanical power-driven machines, mechanical hand seeders, or other approved methods. When mechanical equipment is used, provision shall be made by markers or other means to assure that successive planted strips will overlap or be separated by a space not greater than 2 inches. If inspection, either during the planting operation or after, indicates that strips wider than the space between disks of the drill have been left or other areas skipped, the Contractor shall plant additional seed in those areas. The Contractor shall have the option of either or both of the following or other approved methods of application of seed.

- 1) Broadcast Seeding: Grass seed mixtures as specified shall be broadcast by hand and/or by approved sowing equipment at the rate specified. The seed shall be uniformly distributed over the designated areas. Half of the seed shall be sown when the sower is moving in one direction and the remainder when the sower is moving at right angles to the first sowing. Immediately after sowing, the seed shall be covered to a depth of 1/4 inch to 1/2 inch for spring planting and 1/8 inch to 1/4 inch for fall planting by means of a spike-tooth harrow, chain harrow, or other approved device. Broadcast seeding shall not be done during windy weather.
- 2) Drill Seeding: Drill seeding of grasses shall be done with approved equipment with drills not more than 6 1/2 inches apart. The seed shall be sown uniformly over the designated areas to an average depth of 1/2 inch for spring planting and 1/4 inch for fall planting and at the rate specified. A drill seeder, or equivalent, may be used for drill seeding, in which case the operation of compacting after seeding will be eliminated.

5.3.09 MULCHING

Where seeding and mulching are specified, all areas shall be mulched immediately after seeding. No more seed shall be sown on any day than can be mulched on the same day. In any event, the lag time between seeding and mulching shall not exceed 24 hours when the seeding is done prior to mulching. Should mulch application be delayed more than 24 hours, the Engineer may order the area reseeded at the Contractor's expense. If Erosion Control Blanket is installed on an area within 24 hours of seeding, no mulching is required for the blanketed area.

The mulch shall be grass hay or straw. The mulch material shall be air dry and shall not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds will not be permitted. The mulch shall be blown, or hand applied at the rate of 3,000 to 4,000 lbs. per acre. The contractor shall provide certified weight of mulch furnished.

Grass hay or straw mulch shall be anchored by passing over with a Finn Krimper or equal, operated at right angles to the slope. The disk blade spacing shall be between 4 inches and 12 inches with an 8-inch spacing most suitable. Penetration shall be sufficient to press the mulch into the seedbed to a depth of 2-3 inches. The use of an anchoring device with concave disks will not be permitted.

5.3.10 PROTECTION OF PLANTED AREAS

The Contractor shall protect all planted areas against traffic or other use by placing warning signs of an approved type and erecting all necessary barricades immediately after planting is completed. Any damage that may occur prior to final acceptance of the work shall be repaired to re-establish the condition and/or grade of the soil prior to injury, and shall then be replanted by the Contractor as hereinbefore specified for the applicable planting.

5.3.11 CLEANUP AND REPAIR OF DAMAGE

- A. Cleanup of planting sites and work areas shall include the removal of excess earth or other waste materials during the progress of the work.
- B. Repair of Damage: Any existing turf areas disturbed or damaged as a result of operations of the Contractor, other than areas to be graded under this Contract, shall be cultivated, regraded, top-dressed, seeded and/or sodded as the situation requires or as directed to repair the damage and re-establish the condition prior to construction as directed by the Engineer and at the Contractor's expense.

5.3.12 MAINTENANCE

The Contractor will be responsible for maintenance for a period of 1 year after planting at which time the grass must be growing to the satisfaction of the Engineer. Maintenance shall include mowing grass level at 6 to 8 inches every 30 days after planting (June – September) and reseeding as necessary to produce a completely established and acceptable stand of grass.

5.3.13 MEASUREMENT AND PAYMENT

- a. All measurements and payments will be based upon completed and accepted work for those items listed in the Proposal. The payments listed below will be based on completed and accepted work and will be full compensation for all plant, labor, materials, equipment, tools and incidental items necessary to complete the work.
 - 1. Seeding and Mulching will not be measured for payment but will be paid for at the contract lump sum price for "Seeding and Mulching."
 - 2. Maintenance of the seeded area will not be measured for payment as a separate item but shall be considered incidental to the "Seeding and Mulching" bid item.
 - 3. Repair of Damage and restoration of disturbed areas will not be measured for payment as a separate item but shall be considered incidental to the "Seeding and Mulching" bid item.

END OF SECTION

SECTION 5.4 - CLEARING AND GRUBBING

5.4.01 SCOPE

This section of the specifications covers the work related to furnishing all plant, labor, equipment, appliances, and materials, and in performing all operations in connection with clearing and grubbing and tree removal as shown on the plans or as needed to complete the required work items.

5.4.02 METHODS OF CONSTRUCTION

Extensive/deliberate clearing and grubbing is not anticipated for this project. Small shrubs, bushes, and volunteer trees may exist in the project area. These materials shall be removed only as necessary to complete the work described in the contract documents. The Contractor shall visit the site to familiarize themselves with the size and number of trees that need to be removed to complete the project.

Before clearing activities begin, the Contractor shall contact the Engineer to verify the maximum limits of clearing for the project. The Contractor will conduct all clearing and grubbing operations in a manner that will not damage the surrounding plant life and property.

Clearing and grubbing materials (woody plant material) may be disposed of offsite or burned on site. Burning of materials will be allowed within the working area if all necessary permits are secured by the Contractor and landowners who may be effected by smoke are notified.

All grading activities shall be completed within the work limits shown on the plans. Contractor is responsible for all costs associated with restoration activities outside of the defined work limits.

5.4.03 MEASUREMENT AND PAYMENT

- a. All measurements and payments will be based on completed and accepted work. The payments listed below shall be full compensation for all plant, labor, materials, equipment, tools, and incidental items necessary to complete the work.
 1. Clearing and grubbing of all brush, roots, windfall, and plant life, required for site access or constructing project features will not be measured for payment, but will be paid for at the contract lump sum price for "Clearing and Grubbing".
 2. Tree removal and disposal, required for site access or constructing project features, will not be measured for separate payment, but shall be considered incidental to the "Clearing and Grubbing" bid item.

END OF SECTION

SECTION 5.5 - WATER CONTROL

5.5.01 SCOPE

The work covered by this section of the specifications consists of furnishing all plant, equipment, labor, and materials, and performing all operations in connection with channel diversion and/or dewatering necessary to proceed with the construction.

5.5.02 GENERAL

Excavation shall be completed in dry conditions. As necessary, the contractor shall provide earthen berms on the upstream and downstream sides of the excavation area to block potential flow from entering the work area. The contractor shall provide a means for baseflow water, if necessary, to bypass the work area. The contractor may utilize pumps to facilitate this requirement.

The contractor shall plan work accordingly to ensure functionality of the diversion channel to convey stormwater flows during construction. The Contractor shall construct and maintain all necessary cofferdams, channels, flumes, drains, sumps, casings, wellpoints, and/or other temporary diversion, dewatering and protective works; shall furnish all materials required therefor, and shall furnish, install, maintain, and operate all necessary pumping and other equipment for removal of water from the various parts of the work. Unless otherwise specified, a diversion must discharge into the same drainageway in which its headworks are located. Foundations, cutoff trenches, and other parts of the construction site shall be dewatered and kept free of standing water or excessively muddy conditions as needed for proper execution of the construction work. After having served their purpose, all cofferdams, casings, wellpoints, or other protective works shall be removed or leveled to the satisfaction of the Engineer.

The Contractor shall be responsible for and shall repair at his expense any damage to the foundations, structures, or any other part of the work caused by floods, water, or failure of any part of the diversion or protective works.

5.5.03 PLAN FOR WATER CONTROL DURING CONSTRUCTION

The Contract Documents do not identify specific methodology to manage water within the construction zone. The Contractor shall develop and implement a site specific plan to manage water within the work zone to allow for construction of project features under dry conditions. The Contractor's plan for water control during construction shall be subject to approval.

5.5.04 MEASUREMENT AND PAYMENT

- a. General: All measurements and payments will be based on completed and accepted work. The payments listed below shall be full compensation for all plant, labor, materials, equipment, tools, and incidental items necessary to complete the work.
 1. Water control (including installation and removal of all cofferdams, dikes, temporary stream crossings, channels, flumes, casings, well points or other diversion and dewatering works as may be required for the job) will not be measured for separate payment but shall be considered subsidiary to the removal and/or installation of other bid items.
 - 2.

END OF SECTION

SECTION 5.6 - EROSION CONTROL

5.6.01 SCOPE

The Contractor shall furnish all plant, labor, equipment, appliances and materials required in performing all operations in connection with erosion control measures which are shown on the drawings, included in these specifications, required to meet permit requirements, or as directed by the Engineer or representative in the field.

5.6.02 APPLICABLE STANDARDS

Erosion control shall be in accordance with the 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges".

- a. Flotation Silt Curtain: As per SDDOT Specification 734.3B3.
- b. Silt Fence: As per SDDOT Specifications 734.2B1 and 734.3B1.
- c. Temporary Rolled Erosion Prevention Products (Erosion Control Blanket): As per SDDOT Specifications 734.2C1 and 734.3C3.

5.6.03 INSTALLATION AND MAINTENANCE

- a. General: Installation techniques shall be in accordance with the 2015 Edition of the SDDOT "Standard Specifications for Roads and Bridges". Prior to commencing any site or demolition work, the Contractor shall install all erosion control systems as shown on the plans. As the work progresses, the Contractor shall install and maintain the erosion control measures as indicated in the following implementation schedule:

<u>Item</u>	<u>Installation</u>	<u>Removal</u>
Silt Fence	Prior to Any Construction	By Contractor
Floating Silt Curtain	Prior to Any Construction	By Contractor
Erosion Control Blanket	As Final Channel Cross-Sections have been Constructed and Seeded.	No Removal

The Contractor shall inspect and make repairs to all erosion control systems after each rainfall greater than 0.5 inches. They shall remove all accumulated silt and repair wash-out areas.

- b. Erosion and Sediment Control During Construction
 1. Erosion Control
 - a) The Contractor shall use, where possible, horizontal slope grading, construction phasing, and other construction practices that minimize erosion.
 - b) Unless precluded by snow cover, all exposed soil areas* with a continuous positive slope within 200 lineal feet from a water of the state, or from a curb, gutter, storm sewer inlet, temporary or permanent drainage ditch or other storm water conveyance system, which is connected to a water of the state, shall have temporary protection or

permanent cover for the exposed soil areas within the following time frames:

Type of Slope	Temporary protection or permanent cover required
Steeper than 3:1	Within 7 days of being worked
10:1 to 3:1	Within 14 days of being worked
Flatter than 10:1	Within 21 days of being worked

*For the purposes of this provision, exposed soil areas do not include stockpiles or surcharge areas of sand, gravel, aggregate, concrete or bituminous.

- c) The bottom of any temporary or permanent drainage ditch constructed to drain water from a construction site must be stabilized within 200 lineal feet from a water of the state. Stabilization must be initiated within 24 hours of connecting the drainage ditch to a water of the state, existing gutter, storm sewer inlet, drainage ditch, or other storm water conveyance system which discharges to waters of the state and completed within five calendar days.
- d) Prior to connecting any pipe to a water of the state or drainage ditch, the pipe's outlet must be provided with temporary or permanent energy dissipation to prevent erosion.
- e) Cutting vegetation near the bank shall be kept to the minimum possible to conduct construction and the area shall be revegetated after construction.

2. Sediment Control

- a) Sediment control best management practices (BMPs), which prevent sediment from entering a water of the state, gutter, storm sewer inlet, ditch or other storm water conveyance system, shall be established on all down-gradient perimeters before any up-gradient land disturbing activities begin, and shall remain in place until final stabilization has been established.
- b) The Contractor shall minimize vehicle tracking of sediment or soil off site at locations where vehicles exit the construction site onto paved surfaces.

c. Inspections and Maintenance

- 1. Except where work has been suspended due to frozen ground conditions, the Contractor shall inspect the construction site once every seven (7) days and within 24 hours after every rain event greater than 0.5 inches. The Contractor shall investigate and comply with the following inspection and maintenance requirements:
 - a) Inspection Requirement: All erosion and perimeter sediment control BMPs to ensure integrity and effectiveness.

Maintenance Requirement: All nonfunctional perimeter sediment control BMPs shall be repaired, replaced, or supplemented with functional BMPs when the sediment reaches 1/3 of the height, within 24 hours of discovery. All nonfunctional erosion control BMPs shall be repaired, replaced, or supplemented with functional BMPs as soon as field conditions allow access. Repair costs are incidental to each perimeter control BMP bid item.

- b) Inspection Requirement: Drainage ditches and other waters of the state for evidence of sediment leaving the site.

Maintenance Requirement: Unless the project has received approval or certification for depositing fill into water of the state, the Contractor shall remove all deltas and sediment deposited in drainage ways, catch basins, or waters of the state, and restabilize the areas where sediment removal results in exposed soil. The removal and stabilization shall take place within seven (7) days of discovery unless precluded by legal, regulatory, or physical access restraints. If precluded, removal and stabilization must take place within seven calendar days of obtaining access. The Contractor is responsible for contacting all local, regional, state and federal authorities prior to working in waters of the state and receiving any applicable permits. No additional compensation will be made for removing deposited sediment.

- c) Inspection Requirement: Construction site vehicle exit locations for evidence of off-site sediment tracking onto paved surfaces.

Maintenance Requirement: Tracked sediment shall be removed from paved surfaces, which do not drain back into the construction site, within 24 hours of discovery and with no additional compensation.

2. Where parts of the construction site have undergone final stabilization, but work remains on other parts of the site, inspections of the stabilized areas may be reduced to once per month.
3. Where work has been suspended due to frozen ground conditions, the inspections and maintenance required in Part 5.6.03 c.1. shall take place as soon as weather conditions warrant or prior to resuming construction.
4. Unless required to remain in place by the owner or local permitting authority, all temporary synthetic, structural, and nonbiodegradable erosion and sediment control BMPs shall be removed after the site has undergone final stabilization.
5. The Contractor is responsible for the maintenance of water quality management BMPs until construction is complete, the site has undergone final stabilization, and a notice of termination has been submitted to the South Dakota Department of Agricultural and Natural Resources.

5.6.04 CLEANUP

Silt fence and any other temporary erosion control BMPs shall be removed when they have served their useful purpose, but not before the upward sloping area has been permanently stabilized with vegetation. If the upward sloping area is to be exposed longer than six (6) months, that area shall be covered with temporary vegetation when first exposed.

5.6.05 MEASUREMENT AND PAYMENT

- a. All measurements and payments will be based on completed and accepted work and based off invoices presented by the contractor that reflect actual costs. Payments listed will be full compensation for all plant, labor, materials, including delivery and staging, equipment, tools, and incidental items necessary to complete work as shown on drawings or as specified herein. Payment will be made at the contract lump sum or unit price for the item listed in the Proposal. In the absence of a Contract bid price, any other measures deemed necessary for compliance will be considered incidental to other bid items.
 1. Flotation Silt Curtain: Flotation Silt Curtain will be measured in units of lineal feet in place, and payment will be made at the contract unit price per lineal foot installed for the item "Flotation Silt Curtain" as listed in the Proposal. 75% of payment will be paid after installation and the remaining 25% will be paid when removed.
 2. Silt Fence: Silt Fence will be measured in units of lineal feet in place, and payment will be made at the contract unit price per lineal foot installed for the item "Silt Fence" as listed in the Proposal. 75% of payment will be paid after installation and the remaining 25% will be paid when removed.
 3. Erosion Control Blanket: Erosion Control Blanket will be measured in units of Square Yards in place, measured by the Engineer as a 2D area. No payment will be made for overlap. Payment will be made at the contract unit price per square yard installed for the item "Erosion Control Blanket" as listed in the Proposal.
 4. Subsidiary Pollution Control: The following items will not be measured for payment but shall be considered incidental to other bid items.
 - a. Water Management Plan - The contractor shall provide to the OWNER at least five days prior to beginning any construction operation, a water management plan. This plan shall include a schedule for the sequencing of construction of operations for the management and control of ground water and surface water from the site. The contractor is solely responsible for the preparation of and the implementation of the plan. This plan is in addition to any plan or plans that may be required in the General Requirements of the Construction Contract and at a minimum must take into account the following:
 1. The pre-construction outlet must not change the outlet for drainage of waters from or through the site.
 2. Diversions and the construction of temporary dikes to divert water around construction operations shall be done as necessary to facilitate construction. Diversions and temporary dikes constructed will be restored to the pre-constructed elevations or as shown in the Construction Plans.
 3. Temporary river crossings not included in the plan shall have sufficient capacity to convey expected flows and shall be removed and the river restored to the pre-construction or planned cross section with the completion of the project.
 4. The construction site shall be maintained in a clean and sanitary condition during construction operations.

5. Trash generated at the site shall be collected, removed from the site and disposed of properly.
6. All waste oils and other chemicals shall be collected, removed from the sites and disposed of properly.
7. All haul roads shall be watered or treated with a dust palliative to control dust raised by hauling equipment and other vehicles. Haul roads shall be removed at the completion of construction and graded to the pre-construction elevations.
8. Implementing the Storm Water Pollution Prevention Plan prepared for this project if applicable. This includes becoming a co-signer on the National Pollutant Discharge Permit (NPDES), keeping the required records, and making the required reports.
9. No separate payment will be made for Pollution Control. Pollution control will be considered incidental to other bid items.

b. Temporary Rock Construction Entrances

1. This item shall consist of temporary rock entrances constructed from all paved roads that provide access to the construction site. These rock entrances shall be at locations approved by the Engineer and shall be removed upon final stabilization.
2. Payment for temporary construction entrances will not be measured for separate payment but will be considered a subsidiary item to other bid items.

END OF SECTION

SECTION 5.7 - INVASIVE SPECIES PREVENTION

5.7.01 SCOPE

This section of the specifications covers the Best Management Practices (BMPs) for the prevention of noxious and invasive plants, for work related to furnishing all plant, equipment, labor, appliances, and materials, and performing all work in connection with all areas as designated on the plans under this Contract.

The State of South Dakota requires active steps to prevent or limit the introduction, establishment, and spread of invasive species when working on or entering into state land. All parties involved in the project shall prevent invasive species from entering into or spreading within the project site by cleaning equipment prior to arriving at the project site and after completion of the project.

5.7.02 METHODS OF CONSTRUCTION

- a. Minimize Soil Disturbance: With the ability of invasive plant species to rapidly colonize areas of disturbed soil, it is essential to minimize areas to be disturbed. The contractor shall avoid creating soil conditions that promote weed growth and establishment. Soil disturbance will be minimized wherever practical, but in keeping with the project scope and objectives. Seeding and mulching of disturbed areas shall take place as soon as possible, to aid in the establishment of the desired species' over noxious weeds.
- b. Equipment Cleaning: If equipment, vehicles, gear, or clothing arrives at the project site with soil, aggregate material, mulch, vegetation (including seeds) or animals, it shall be cleaned by Contractor furnished tool or equipment (brush/broom, compressed air or pressure washer) at the staging area. The Contractor shall dispose of the material cleaned from the equipment and clothing at a location determined by the DNR Wildlife Area Manager. If the material cannot be disposed of onsite, secure material prior to transport (sealed container, covered truck, or wrap with tarp) and legally dispose of offsite.

The Contractor shall ensure that all equipment and clothing used for work in infested waters has been adequately decontaminated for invasive species (ex. zebra mussels) prior to being used in non-infested waters. All equipment and clothing including but not limited to waders, tracked vehicles, barges, boats, turbidity curtain, sheet pile, and pumps that come in contact with any infested waters must be thoroughly decontaminated.

Equipment shall not be cleaned with herbicide chemicals.

- c. Weed Free Gravel, Rock, and Mulch: Prior to delivery of offsite materials such as rock, gravel, and mulch, the Contractor shall provide proof to the Owner that all materials are certified weed free.

Materials taken from within the project limits shall be exempt from this requirement.

5.7.03 MEASUREMENT AND PAYMENT

- a. All measurement and payment for compliance with invasive species prevention shall be incidental to other bid items.

END OF SECTION

SECTION 5.8 - SITE ACCESS

5.8.01 SCOPE

This section of the specifications covers the work related to furnishing all plant, labor, equipment, appliances, and materials and in performing all operations in connection with the installation of temporary entrances and placement of temporary aggregates for access as shown on the plans or as directed by the Engineer.

5.8.02 APPLICABLE STANDARDS

- a. The latest editions of the standards listed below but referred to hereinafter by basic designation only, form a part of this section of the specifications.
 - 1. 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges"

5.8.03 MATERIALS

- a. Fill Material: The suitability of fill material used for temporary entrances and temporary access shall be approved by the Engineer and meet SDDOT requirements.
- b. Drainage Structure: Drainage structures shall be suitable for use and approved by the Engineer. Minimum diameter of pipe will be determined by the Engineer. Pipe material shall be approved by the Engineer and meet SDDOT requirements.
- c. The Contractor is responsible for all equipment and trucking necessary to install temporary entrances and access.

5.8.04 METHOD OF CONSTRUCTION

- a. No work shall begin until the Contractor meets with Upper Minnesota River Watershed District personnel on site to determine exact placement of temporary entrances and access routes and to determine additional standards and safety requirements of these temporary entrances.
- b. This work shall consist of constructing any necessary temporary entrances for access and removal and replacement of wooden bollards for access.
- c. The fill surface shall be compacted until the surface is tightly bound and shows no undue rutting or displacement under the operation of the compacting equipment.
- d. Temporary entrances shall provide a radius sufficient to prevent vehicle tires from tracking off the entrance when entering or leaving site.
- e. A drainage structure shall be installed under temporary entrance to allow for proper drainage through the area if required. The contractor will be responsible for keeping drainage structures free of debris. Minimum diameter of pipe shall meet SDDOT requirements.
- f. The contractor is responsible for maintenance of access routes and temporary entrances until construction is complete. Access roads and entrances shall be removed completely after construction is complete.
- g. Contractor is responsible for restoring any disturbed areas due to site access. All damages including, but not limited to rutting, and damage to grass areas and existing parking areas

shall be restored by the contractor to the condition of or exceeding the preconstruction conditions as determined by the Engineer. Areas within the road right-of-way shall be seeded with agricultural roadside seed mix (SDDOT Type B Permanent Seed Mixture).

5.8.05 MEASUREMENT AND PAYMENT

- a. General: All required to complete site access as shown in the plans and specified in the specification will not be measured for separate payment but shall be considered incidental to other bid items. This includes but is not limited to the following work:
1. Furnishing and installing temporary traffic control signage, barricades and other controls shall not be measured for separate payment but shall be considered incidental to other bid items.
 2. Aggregate/fill material used for constructing temporary entrances and access routes shall not be measured for separate payment but shall be considered incidental to other bid items.
 3. Drainage structures necessary to provide flow through temporary entrances shall not be measured for separate payment but shall be considered incidental to other bid items.
 4. Removal of temporary entrances and temporary access roads shall not be measured for separate payment but shall be considered incidental to other bid items.
 5. Restoration of disturbed areas due to site access will not be measured for separate payment but shall be considered incidental to other bid items.

END OF SECTION

SECTION 5.9 - MOBILIZATION

5.9.01 SCOPE

- a. This work consists of preparatory work and operations that include the movement of personnel, equipment, supplies, and incidentals to the project site. This work may also include obtaining bonds, insurance, permits, and demobilizing.

5.9.02 MEASUREMENT AND PAYMENT

- a. Mobilization required to complete the project as shown in the plans and specified in these specifications will be made as a lump sum payment at the contract unit price for the item "Mobilization."
- b. The Engineer will provide partial payments for mobilization in accordance with SSDOT Specification 9.10.
- c. The Engineer will not pay more than the original contract unit price for the mobilization item, even if the Contractor shuts down work on the project or moves equipment away from the project and then back again.

END OF SECTION

SECTION 5.10 – REMOVALS AND PROTECTIONS

5.10.01 SCOPE

This section of the specifications covers the work related to furnishing all plant, labor, equipment, appliances, and materials in performing all operations in connection with removal of various items shown in the plans or as directed by the Engineer.

5.10.02 APPLICABLE STANDARDS

- a. The latest editions of the standards listed below but referred to hereinafter by basic designation only, form a part of this section of the specifications.
 1. The 2015 Edition of the South Dakota Department of Transportation "Standard Specifications for Roads and Bridges" and the Supplemental Specifications

5.10.03 MATERIALS

- a. Removals shall be as defined in SDDOT Standard Specification 110.

5.10.04 CONSTRUCTION

- a. Removals shall be performed in accordance with SDDOT Standard Specification 110 and all other applicable SDDOT Standard Specifications.
- b. A number of items within the work limits are designated to be protected within this section. The condition of protection items will be thoroughly documented by the OWNER, prior to initiation of construction operations. Damage to noted protection items shall be repaired by the Contractor at no charge to the Owner. Items to be protected include, but are not limited to: Existing levees, TH 24 Bridge, Existing signage adjacent to TH 24, TH 24 Pavement and aggregate shoulder, Field accesses adjacent to TH 24, Existing Underground & Overhead Utilities.

5.10.05 MEASUREMENT AND PAYMENT

- a. General: All measurements and payments will be based on completed and accepted work. Payment shall be full compensation for all plant, labor, equipment, appliances, materials, and incidental items necessary to complete the work.
 1. Remove Existing Sheet Pile: Modifications and removals of the existing sheetpile weir will be measured and paid for by the square yard for the item "Remove Existing Sheetpile". The Contractor must haul and dispose of the discarded sheetpile. All off-site transportation and disposal costs will be incidental.
 2. Costs associated with repair of items/areas identified as "protect" are solely the responsibility of the CONTRACTOR.

END OF SECTION



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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**RECOMMENDATION OF ACTING CHIEF ENGINEER FOR FLOOD CONTROL PERMIT
APPLICATION NO. FC34A-3, Upper Minnesota River Watershed District**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the acting Chief Engineer, Water Rights Program, Department of Agriculture and Natural Resources concerning Flood Control Permit Application No. FC34A-3, Upper Minnesota River Watershed District, 211 2nd Street SE, Ortonville MN 56278.

The acting Chief Engineer recommends APPROVAL of Flood Control Permit Application No. FC34A-3 with qualifications because 1) the project will not increase the likelihood or severity of flood damages, 2) the project will not endanger human life or property, 3) the project will not impair existing water rights, 4) the District has acquired property or the necessary easements, and 5) it is in the public interest to provide flood control for the City of Browns Valley while improving fish passage through the project with the following qualifications:

- 1) The Permit Holder must take the following measures to negate the potential 0.4 feet increase in Big Stone Lake.
 - Normal summer operating pool elevation of 966.4 feet NAVD88 on Big Stone Lake shall be reduced by 0.2 feet from the 966.4 feet summer pool elevation to 966.2 feet, through the use of the UMRWD's gate operation to offset the increased flood risk.
 - The permit holder will use information from the National Water Prediction Service (NWPS), North Central River Forecast Center, including the U.S. Geological Survey Gage at Peever, SD, in development of an advanced flood forecast for the Upper Minnesota River.
 - The permit holder will use NWPS, or best available, hydrologic and hydraulic models of the entire drainage area upstream of Big Stone Lake (including the major tributaries of the Whetstone River and the Little Minnesota River), as well as NWPS provided elevation forecasts for Big Stone Lake, using antecedent conditions including snowpack and soil moisture. These forecasts include probable rainfall within the drainage area (Quantitative Precipitation Forecasts). Inputs and observations made by the Upper Minnesota River Watershed District (UMRWD), working cooperatively with the NWS, will be used to refine the forecast results.
 - The permit holder will adjust gate operation based on these forecasts in advance of a potential flood event on Big Stone Lake to lower the lake elevation by 0.2 feet in anticipation of a flood event.
 - In the event the permit holder adjusts the gate operation in advance of a potential flood event, the permit holder shall notify the SD DANR Water Rights Program of actions taken to negate the effects of the additional water in Big Stone Lake. The reported information shall consist of daily data including date(s), time(s), of adjusted gate operation, gaged river inflow reading(s) in cfs, gate(s) opening height(s), 24-hour precipitation, and any additional information or comments the permit holder feels necessary (i.e., ice jams, open water, etc.).

RECOMMENDATION OF ACTING CHIEF ENGINEER FOR FLOOD CONTROL PERMIT APPLICATION NO. FC34A-3, Upper Minnesota River Watershed District

- 2) The permit holder is responsible for operation and maintenance of the flood control works.
- 3) During low flow conditions, the permit holder must maintain streamflow through the City of Browns Valley by either raising the boulder weir through the controlling cross section or adding rip rap, or both, to direct flow through the City of Browns Valley.
- 4) If approved, the Water Management Board will retain jurisdiction of Flood Control Permit Nos. FC34A-3 and FC34-3 if conditions change that affect permit qualifications, such as completion of the proposed Whetstone River diversion project.

See report on application for additional information.



Mark Mayer, PE
Director of Office of Water
January 5, 2026

Report to the Chief Engineer
Flood Control Permit Application No. FC34A-3
Upper Minnesota River Watershed District
12/05/2025

Flood Control Permit Application No. FC34A-3, Upper Minnesota River Watershed District (UMRWD), proposes to modify Flood Control License No. FC34-3 by increasing fish migration through the project. Flood Control License No. FC34-3 protects the City of Browns Valley, Minnesota from the 100-year flood event on the Little Minnesota River by conveying flood waters around the city by means of an inlet channel, diversion dam, and floodway. The diversion dam (with no permanent storage) placed across the Little Minnesota River, in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 31, T125N-R49W, has a concrete box culvert installed through the diversion dam, allowing a portion of the flow to remain in the Little Minnesota River main channel through the box culvert while flood flows overtop a weir structure (crest elevation of 985.14 feet [NAVD88]) entering the floodway. This application proposes to modify the current floodway inlet channel authorized by Flood Control License No. FC34-3 by lowering the existing weir and moving the controlling cross section for the floodway upstream with a two feet wide low flow channel added. This modification is to increase the amount of water flowing through the diversion channel to better accommodate fish passage while still affording flood protection to the City of Browns Valley. This site is located in Roberts County, approximately 10 miles southeast of Sisseton, South Dakota.

The Upper Minnesota River Watershed District shall be further referred to as UMRWD. It is also important to note that the flood control project licensed by FC34-3 was constructed using the North American Vertical Datum of 1988 (NAVD 1988) and all elevations in this report are also referenced to the NAVD 1988 unless stated otherwise.

As part of this application, plans and specifications for the dam/weir modification are subject to approval under dam safety regulations in Administrative Rules of South Dakota (ARSD) 74:02:08.

South Dakota Codified Law (SDCL) 46-2A-11

Flood control works—When permit may be issued. A permit for flood control works may be issued only if the project will reduce the damage from flooding or erosion in the area proposed to be benefited, the project will not increase the likelihood or the severity of flood damages in areas other than the project area or the area proposed to be benefited, the project will not endanger human life or property and the project will not impair existing water rights, except to the extent that such rights are extinguished or compensated through agreement or exercise of the power of eminent domain.

SDCL 46-2A-11 cites the criteria for issuance of a flood control permit. Since there is an existing flood control license in place, any modification of the works authorized by FC34-3 would require an application to modify FC34-3. The same requirements needed to obtain the original permit need to be met before the Water Management Board (WMB) could issue a permit modifying the works constructed under No. FC34-3. This report on the application to modify FC34-3 will detail how the existing works are being modified from what was originally approved and whether the same criteria cited in SDCL 46-2A-11 are met.

Description of existing works authorized by FC34-3

Browns Valley Flood Mitigation Project (BVFMP) licensed by South Dakota FC34-3 is a flood control project by the UMRWD and the City of Browns Valley to convey the bulk of flood waters for the 1% annual exceedance probability storm event (i.e. 100-year) flood from the Little Minnesota River around the city by means of a diversion channel, or floodway. This floodway is located primarily in South Dakota and is designed to divert flood flows around Browns Valley, returning the diverted flows to the Little Minnesota River downstream of the City of Browns Valley. The diversion channel is considered a passive system so not all flood flow will enter the diversion channel. A portion of flows will remain in the Little Minnesota River channel through the city to maintain base flow. **Figure 1** below shows the location of the BVFMP and the project site for this proposed modification.



Figure 1. Overview of the current system authorized by Flood Control License No. FC34-3 and the project site for the proposed modifications. The map is oriented with north facing up. Map modified from Odens (2025).

The project consists of a diversion dam (also called the control dam) placed across the Little Minnesota River, with a 5 feet high and 12 feet wide box culvert (Odens, 2025). The box culvert allows in-stream flows through the Little Minnesota River channel and through the City of Browns Valley, and has an invert elevation of 979.17 feet (Odens, 2025). The top of dam elevation is 998 feet (BVFMP, 2008). On the west side of Medberry Road (CR-24) is a 235-feet long sheet pile weir structure (Odens, 2025) located at the upstream end of the inlet to the diversion channel, that acts as the control structure for the diversion channel. The elevation of the existing sheet pile weir is 985.52 feet on the south end, and 985.14 feet on the north end, which is the breakover and invert elevation (Odens, 2025). The diversion channel is approximately 5,500 feet in length from inlet to outlet, and has an elevation of 998 feet at the top of the channel (BVFMP, 2008). The weir is expected to overtop and floodwater will be conveyed through the diversion channel during a 100-year event (1% per year chance exceedance), which was estimated to be a flow of 9,300 cfs using flow frequency analysis at the Little Minnesota River USGS Gage near Peever, SD (BVFMP, 2008). The analysis was performed using 55 years of record (1940-1981, 1990-2002) of flow data from the Little Minnesota River USGS Gage near Peever, SD (Odens, 2025). According to the 2008 Safety of Dams review on the BVFMP hydraulics, the modeled headwater elevation for a 100-year event is 996.45 feet (Water Rights, 2025). The discharge necessary to overtop the diversion structure (top elevation 998 feet) was estimated to be 12,600 cfs, or an estimated 250-year return period, with an estimated 768 cfs channeled through the City of Browns Valley and a maximum of 11,830 cfs able to be conveyed through the floodway (Water Rights, 2025). **Figure 2** below shows the current BVFMP flood works consisting of the diversion (control) dam and box culvert, the sheet pile weir, and the inlet to the diversion channel.

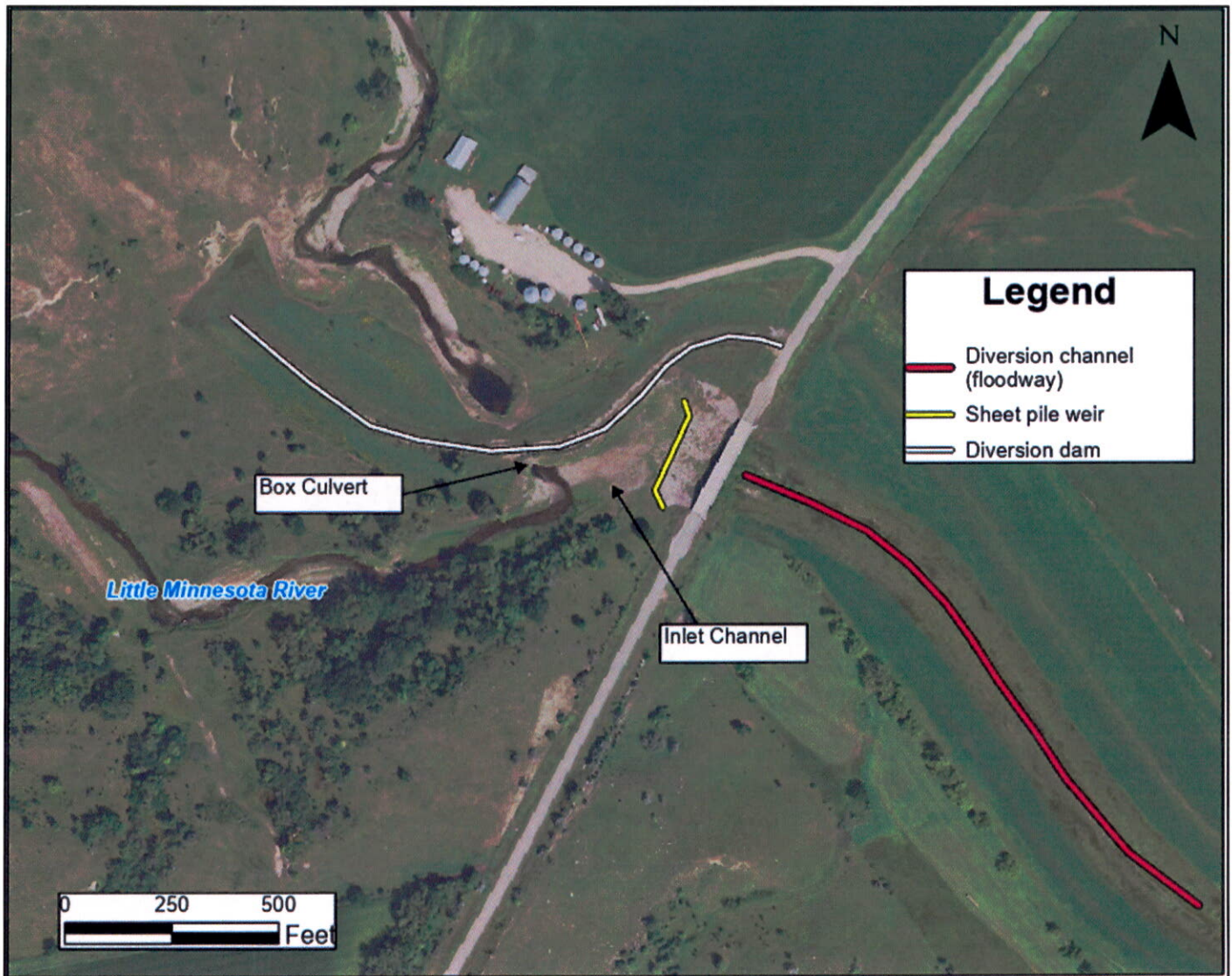


Figure 2. Map showing the current BVFMP flood control works as authorized by FC34-3 (Water Rights, 2025).

The diversion channel has been designed to limit the amount of discharge allowed through the City of Browns Valley during a 100-year flood event to approximately 60% of the minimum channel capacity, to create a margin of safety if an ice or debris jam forms downstream of the box culvert inlet (Deutschman, 2008). FC34-3 was licensed to allow up to 500 to 700 cfs of flow to remain in the channel through the city based on estimations at that time; however, recent modeling for the proposed modification shows 866 cfs through the city under current conditions (the current condition refers to the incorporation of sediment for model geometry) (Odens, 2025). The HEC-RAS model used for the modification design report by Odens (2025) was the same as the 2008 engineers report (BVFMP, 2008) but updated to reflect current conditions of the works and updated elevation data. The updated model uses the same flow frequency analysis as the 2008 engineering report (BVFMP, 2008), and additional information by the applicant shows the flow split for both the modeled current conditions and the modeled modifications would be approximately 850 cfs through the city and 8,600 cfs through the floodway during a 100-year event

(Odens and Hullinger, 2025). If approved, the permit for FC34A-3 will reflect the most recent modeling of flows maintained through Browns Valley during the 100-year event.

The design of the BVFMP required a new bridge on Roberts Co. Rd. 24, which is located approximately 100 feet downstream of the existing weir. The project also consisted of a second new bridge across the diversion channel at Roberts Co. Rd. 4 (Deutschman, 2008).

Description of proposed modification to FC34A-3

Following construction of the BVFMP in 2011 as permitted by FC34-3, it was reported that fish migration in the Little Minnesota River had decreased. Proposed modifications were developed through coordination between the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), SD Game, Fish & Parks (SD GF&P), the MN Department of Natural Resources (MN DNR), and the Sisseton Wahpeton Oyate of the Lake Traverse Reservation (UMRWD, 2025). The proposed project designs are detailed in a 90% design report by Houston Engineering to restore fish passage (Odens, 2025). The modification site is located on UMRWD property in Section 31, T125N-R49W, approximately 0.8 miles southwest of Browns Valley, MN.

Currently, fish passage is eliminated in the window during which flows in the box culvert (primary spillway) become too high, while still low enough that the diversion channel weir is not passable. The box culvert is passable by fish when the average velocity through the culvert is 2 feet per second (ft/sec) or less. The diversion channel is passable by fish when the depth of flow is greater than 1 foot deep and 2 feet wide (Odens, 2025).

To modify the existing structures for better fish passage, the proposed modifications include lowering the existing sheet pile weir (current controlling section), excavating the inlet to the diversion channel, and installing rock arch rapids downstream of the modified controlling section. The modified inlet channel will have approximately a 50 feet width with side slopes of 5H:1V, and will tie into the upstream Little Minnesota River channel at the box culvert. There are no proposed changes to the box culvert invert elevation of 979.17 feet (Odens, 2025).

The proposed design includes a low flow channel which will be 2 feet wide with an invert elevation of 980.4 feet, which will increase the frequency that the diversion channel can be utilized by fish. The low flow channel will begin further upstream than the rock arch rapids, and then will tie into the rock arch rapids structures when they are built to an elevation of 983 feet (modified upper controlling cross section elevation, breakover elevation) at which point the rock arch rapids would be at a relatively flat grade until transitioning with existing riprap. The low flow channel (elevation 980.4 feet) will be continued through the rock arch rapids structures until approximately the location of the existing weir. The rock arch rapids consist of a series of boulder weirs which are placed at 20 feet intervals and small pools will be excavated between the boulder weirs.

According to the 90% design report, the proposed new location of the controlling cross section is to be at D-D' (see **Figure 3**), upstream of the existing weir by approximately 80 feet near the inlet of the rock arch rapids structures, and has a high breakover elevation of 983 feet and the low flow channel (2 feet bottom width) at an invert elevation of 980.4 feet. The low flow section comes up at 5H:1V slope to the higher

flow section at 983 feet. Therefore, the controlling cross section is changing location and its controlling elevation, which will be lowered by approximately 4.74 feet from 985.14 feet (current) to 980.4 feet (proposed). The existing weir will be cut down to where it will tie into the elevation of the rock arch rapids at that location (approximately 980.4 feet), and will be cut to match the slope of the channel (5H:1V). **Figure 3** below shows the new location of the controlling cross section (D-D' from design plans) and the rock arch rapids structures layout (Odens, 2025)

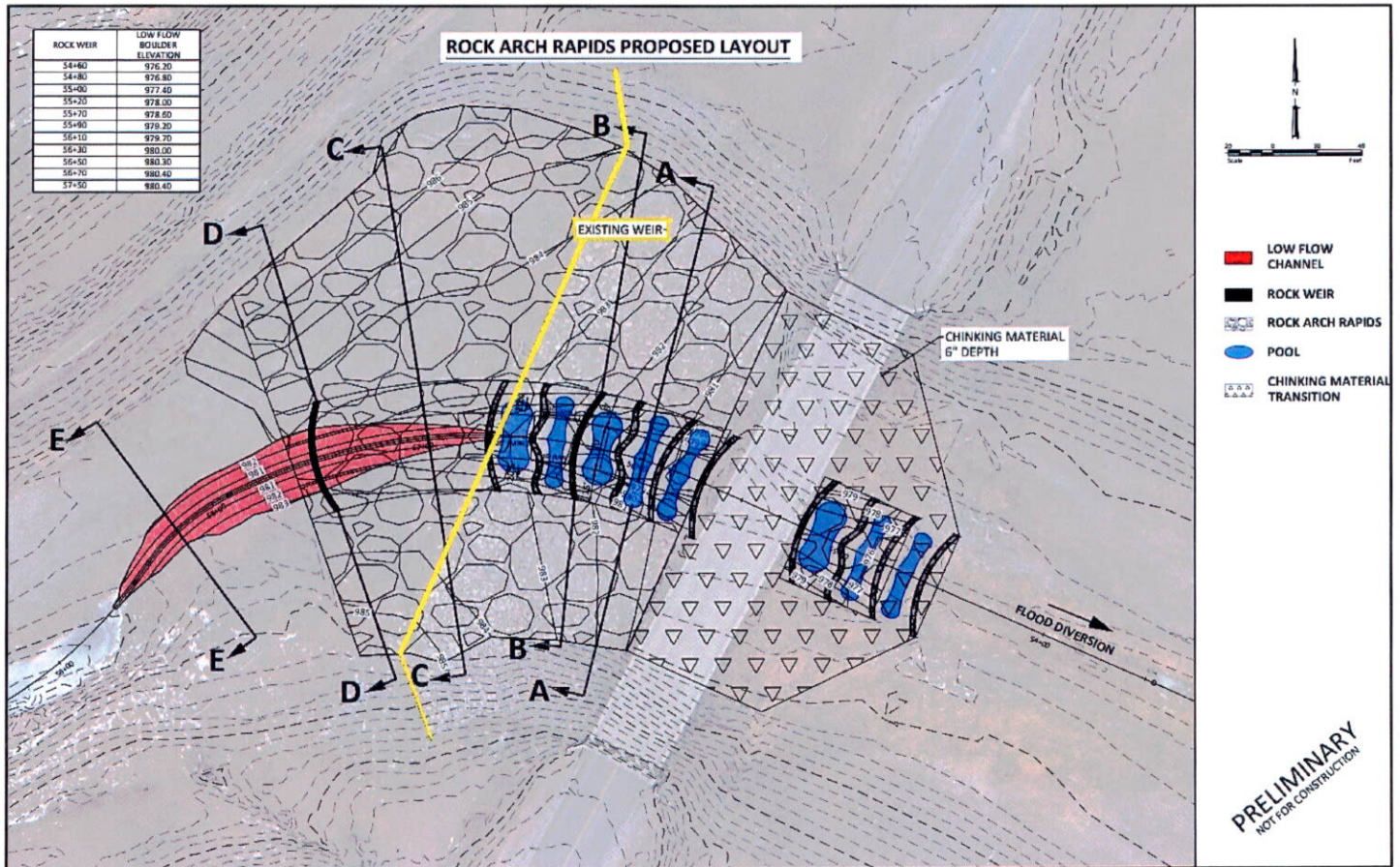


Figure 3. Proposed rock arch rapids layout, modified from Odens (2025).

Currently, the flows of the river upstream of the flood works need to be 761 cfs before the diversion channel flow has a velocity of 2 ft/sec, and 45 cfs before the box culvert has a velocity of 2 ft/sec. With the proposed modification, the flow upstream when the diversion channel has a velocity of 2 ft/sec is 497 cfs, and the flow upstream when the box culvert has a velocity of 2 ft/sec is 45 cfs. The flow upstream when the proposed rock arch rapids are functional (flowing at 1 foot depth) is modeled to be 61 cfs. Therefore, the fish passage gap (flows where fish cannot pass through either outlet structure of the dam) for the current system are flows greater than 45 cfs. The fish passage gap for the proposed modified system are flows between 45 and 61 cfs, and flows greater than 497 cfs.

Discussion on Flood Control Permit Conditions

SDCL 46-2A-11 establishes the following factors as the basis for issuance of a Flood Control Permit by the DANR:

- Reduction in damage from flooding or erosion in the area proposed to be benefitted;
- A change in likelihood or the severity of flood damages in areas other than the project area or the area proposed to be benefitted;
- Risk to human life or property; and
- Impairment of existing water rights

Reduction in damage from flooding or erosion in the area proposed to be benefitted/Risk of human life or property

The original BVFMP for FC34-3 has been successful in protecting the City of Browns Valley from high flows in the Little Minnesota River, and since its implementation the diversion channel has effectively channeled flood waters around the city. Recent crests on Big Stone Lake occurred in the spring of 2019 and 2023 (NWPS, 2025). The diversion channel works so that low flows and small floods will be fully contained within the floodway; however, larger floods (larger than a 10-year flood event) overtop the floodway east of County Road No. 4 within the floodplain of the Little Minnesota River (Water Rights, 2025; BVFMP, 2008). The proposed modification would not change that result from the original FC34-3.

The modeled proposed modifications would result in a 100-year flow through Browns Valley of 857 cfs, compared to the modeled current condition of the project which results in a flow through Browns Valley of 866 cfs (the current condition refers to the incorporation of sediment for model geometry). Therefore, there is expected to be an insignificant effect on 100-year flows through town or the diversion channel due to the modification. The rock arch rapids structures and the modified controlling cross section will continue to convey the bulk of flood waters through the diversion channel, with an insignificant change in the amount of flow likely to be conveyed through the city during a 100-year flood.

An addendum by Houston Engineering FC34-3 addressed three areas that were analyzed for potential flood damages by the BVFMP: Big Stone Lake, Highway 75/MN Valley National Wildlife Refuge, and downstream agricultural lands. The following sections of the report will summarize the potential impacts from the 2008 engineering report (BVFMP, 2008; Deutschman, 2008) and whether the proposed modifications will change those impacts.

Agricultural Impacts, Highway 75 and MN Valley National Wildlife Refuge Impacts

Hydrologic and hydraulic modeling to determine the flood risk to agricultural lands downstream of the floodway outlet were provided to DENR as part of the original flood control permit application for FC34-3. The criteria to determine flood risk was whether there would be an increase of water depth sufficient to cause crop loss or erosion along the Little Minnesota River during 5- and 10-year events. More frequent flood events were used to assess agricultural concerns and potential damage. Modeling results show there is no additional flooding risk to agricultural lands downstream from the floodway outlet, and it wasn't until 10-year event flows were modeled that there was a small increase to inundation depth and duration

over pre-diversion conditions (BVFMP, 2008). This proposed modification would increase the amount of water going through the diversion channel during 5-year events from approximately 1,500 cfs to 1,550 cfs; however, there is only a negligible difference during the 10-year event (Odens and Hullinger, 2025). It was stated in the 90% design report (Odens, 2025) that changes in flow splits for larger events (lesser recurrence intervals) are generally less than 5% and diminish to less than 1% for 50-year and larger events.

The Big Stone National Wildlife Refuge was also analyzed for flood risk during original permitting for FC34-3. The refuge is located approximately 4 miles downstream of Big Stone Lake. Effects to the Big Stone Refuge upstream of the Highway 75 dam from potential increases into Big Stone Lake during a 100-year event are quite small and were deemed negligible during the permitting for FC34-3 (Water Rights, 2025; BVFMP, 2008; Deutschman, 2008). Since the flow split during 100-year event are essentially unchanged from the existing system permitted by FC34-3, the proposed modifications are not expected to cause downstream flood damage to the Big Stone National Wildlife Refuge.

Big Stone Lake Elevations

The Little Minnesota River originates as an intermittent stream in the Prairie Coteau hills of Marshall County, SD and flows generally southeast before emptying into the upper end of Big Stone Lake. Big Stone Lake is a natural, glacial-formed boundary water lake between South Dakota and Minnesota, in northeast South Dakota. The lake is estimated to cover 12,610 acres of surface area, is 26 miles long and averages about 1 mile wide. Both the Little Minnesota River and Big Stone Lake are within the Minnesota River basin, which is the larger of the two watersheds in South Dakota that do not contribute to the Missouri River basin.

The river drops 780 feet in elevation from the Coteau to Big Stone Lake. The Little Minnesota River enters Big Stone Lake from the north and accounts for 90% of the inflow to Big Stone Lake, which influences the entire length of the lake (Water Rights, 2025), where it drains into the Minnesota River on the southern end of the lake. The Whetstone River also contributes water to Big Stone Lake near the outlet through means of a diversion channel.

Analysis was performed as part of BVFMP (2008) to determine the water elevation impact that the 1% chance event on the Little Minnesota River has on Big Stone Lake. The UMRWD operates the control gates of this natural lake, and historically water levels and gate operations have been referenced to an original Project Datum (PD). As of November 2024, the datum used for Big Stone Lake readings is being changed to NAVD88. The transition to NAVD88 does not mean that lake levels and dam operations will change, but is an update to the reporting elevation only. The adjustment to NAVD88 results in elevations being 1.55 feet lower than the original PD (IEM, 2024; UMRWD, 2025). The staff engineer report for BVFMP and the license for Flood Control License No. FC34-3 uses a rounded adjustment of 1.6 feet from the PD to NAVD88, and this rounded value will be used in the Recommended Qualifications section of this report for this modification to FC34-3, if approved (Water Rights, 2025). **Table 1** shows converted lake elevations as referenced from the original PD to NAVD88.

Table 1. Big Stone Lake elevations conversion (IEM, 2024; UMRWD, 2025).

Descriptor	Elevation Project Datum (ft)	Elevation NAVD88 (ft)
Normal Winter Pool	967	965.45
Normal Summer Pool	968	966.45
Minor Flood Stage	971.5	970
Moderate Flood Stage	973	971.5
Major Flood Stage	975	973.5
April 1997 Crest	975.4	973.85
April 2001 Crest	972.8	971.25
March 2010 Crest	973.7	972.15
April 2019 Crest	971.1	969.55

Controls on the Big Stone Lake consist of the operating gates including a low flow gate, and a silt barrier (elevation of 967 ft PD or 965.45 feet NAVD88) which acts as the control outlet when the gates are left open for the winter. These controls are located at the south end of the lake. The gates are operated to attain a summer pool range of 968 to 968.3 ft PD (966.45 to 966.75 feet NAVD88). In the fall, the UMRWD lowers the lake to approximately 967 ft PD (965.45 feet NAVD88).

At the time of permitting for FC34-3, the engineering report showed that the flood control works would increase the amount of water going into Big Stone Lake during a 100-year flood event (BVFMP, 2008). This is because the diversion channel and the natural Little Minnesota River channel through Browns Valley would better transport water to the lake during a flood event, instead of flood water being stored in the floodplain. Study of the potential increase of Big Stone Lake was also dependent on the likelihood of flood flows from the northern floodplain of the Little Minnesota River overflowing into Lake Traverse, i.e. breakout flows through culverts that were built since the dike was built in the 1940s. The location of the BVFMP diversion channel reduces the breakout flow into Lake Traverse, and increases the flow to Big Stone Lake, and ultimately the potential water rise in Big Stone Lake was determined by assuming zero breakout flow to Lake Traverse and by modeling the 1993 summer flood event, which resulted in a 0.39-foot increase to Big Stone Lake with the implementation of BVFMP. This is an increase from approximately 972.1 feet to 972.5 feet for a 100-year flood event for Big Stone Lake elevations based on 1993 flood models (Deutschman, 2008). The historical summer flood of 1993 was chosen in the original analysis because there is less concern for a spring flood due to the additional storage.

Qualification No. 1 on Flood Control Permit No. FC34-3 contained measures to negate the potential 0.4 feet increase in Big Stone Lake, and the same qualifications will be kept on FC34A-3, if approved. The UMRWD was required to adjust gate operation for the control structure on Big Stone Lake as a measure to lower the lake elevation in anticipation of a flood event. This includes maintaining the lake pool elevation during the summer 0.2 feet lower to 967.8 feet PD (966.2 feet) and using forecasting of potential flow events to allow for further lowering of the lake elevation by 0.2 feet when a flood event is anticipated.

The proposed modifications are not expected to alter elevations in Big Stone Lake during a 100-year event from what was originally determined in 2008 for FC34-3 (BVFMP, 2008; Deutschman, 2008; Odens, 2025; Odens and Hullinger, 2025). The proportion of flows channeled through the city during the 100-year event are essentially unchanged based on the most recent modeling (866 cfs current condition → 857 cfs proposed modifications) (Odens, 2025), and will result in essentially the same potential increase to Big Stone Lake. Therefore, the qualifications to mitigate the potential 0.4 feet increase on Flood Control License No. FC34-3 will be kept the same on this permit, if approved. The proposed modifications may change the timing of baseflows and very small events to Big Stone Lake due to the increased utilization of the diversion channel for routing lower flows. Timing is not a parameter on the flood control license FC34-3. Additionally, the gates at the base of Big Stone Lake are operated by the applicant, and so any changes in timing of flows can be accommodated to maintain the mitigated summer pool level of 966.2 feet.

Consideration of Whetstone River Restoration Project (WRRP)

The UMRWD is also the project owner of the Whetstone River Restoration Project, in coordination with USACE, MN DNR, SD DANR, and Houston Engineering Inc. The project is still in the permitting process, and consists of reconnecting a portion of the Whetstone River flows back to its natural channel which historically flowed into the Minnesota River downstream of Big Stone Lake. The Whetstone River was diverted into Big Stone Lake in the 1930s to increase water levels during times of drought.

The Whetstone River diversion channel contributes a substantial amount of water to Big Stone Lake (Water Rights, 2025; BVFMP, 2008). The WRRP had been proposed during the time of permitting for FC34-3; however, the project has since been on hold. Because the potential WRRP would cause less water to be diverted into Big Stone Lake, the project would have mitigated the potential effects of increasing water levels on Big Stone Lake during a 100-year flood as a result of the BVFMP (BVFMP, 2008). As a result, Qualification No. 4 on the license for FC34-3 states that the WMB will retain jurisdiction in the event that the project is completed (Water Rights, 2025). The WRRP still requires a flood control permit from the State of South Dakota and is not currently permitted. Therefore, Qualification No. 4 will remain the same in FC34A-3, if approved.

Existing Water Rights and Uses

One of the criteria listed in SDCL 46-2A-11 to approve a flood control permit states that the project may only be issued if it will not impair existing water rights, except to the extent that such rights are extinguished or compensated through agreement or exercise of the power of eminent domain.

The MN DNR indicated a minimum instream flow of 450 cfs through the City of Browns Valley during non-flood periods, which equates to roughly a 1.4-year recurrence interval discharge. During the planning phase of this proposed modification project, it was deemed acceptable to pass a minimum of 250 cfs through town (Odens, 2025). The hydraulics section for the proposed modifications indicate that during the 1.4 year event or during non-flood periods, minimum instream flows through the City of Browns Valley will be reduced from 412 cfs (modeled current conditions) to 258 cfs with the proposed modifications. As part of the engineering report for the proposed modifications, Houston Engineering held

several public meetings and provided updates to district and tribal councils. Public feedback of the proposed modifications was generally supportive, however there was concern that any alterations to the project should maintain the same flood control benefits. The proposed modifications will not change the flood control benefits as licensed by FC34-3 (Odens, 2025).

The Water Rights Program also requested information about flows through the flood control works during low flow and drought years. The 90% design report (Odens, 2025) did include an analysis of the fraction of low flows distributed through Browns Valley versus the diversion channel. Using a low flow of 100 cfs, the analysis showed that 95 cfs of flows would go through the city. Additionally, the proposed low flow channel can be modified by placing more riprap at the controlling cross section which will bring the flow splits during low flows into closer alignment with the current flood control project, and push more flow through town (Odens, 2025). This mitigation strategy will be included in the Recommended Qualifications section of this report.

There are no other South Dakota water rights/permits appropriating water from the flows of the Little Minnesota River (Water Rights, 2025), and it is unknown how many users there are in Minnesota. Otter Tail Power Company holds the only water rights/permits authorized to divert water from Big Stone Lake in South Dakota. These water rights/permits held by Otter Tail Power Company are both lake elevation and time of year dependent (Water Rights, 2025).

These proposed modifications to the BVFMP will increase the amount of flow that is channeled through the floodway during more frequent flood events and low to normal flows, without significantly impacting the amount of flows being diverted during the 100-year flood event (design flood) (Odens, 2025). It was stated on the 90% design report that timing of flows to Big Stone Lake may shift slightly for baseflow and very small events due to the increased utilization of the diversion channel (Odens, 2025).

Otter Tail Power Company holds two South Dakota water rights/permits, Nos. 1983-3 and 6253-3 to appropriate a maximum of 8,000 acre-feet of water annually from Big Stone Lake. **Table 2** lists the diversion qualifications for Otter Tail Power Company, which were authorized as part of Water Permit No. 6253-3. The lake elevations that qualified the diversion rates for Water Right/Permit Nos. 1983-3 and 6253-3 were made using the original Big Stone Lake PD (Water Rights, 2025).

Table 2. Qualifications for Otter Tail Power Company from staff report for Water Permit No. 6253-3. Elevations are referenced to the original project datum (PD) (Water Rights, 2025).

Qualifications/Diversion Rates		
Time Period	Lake Elevation (Feet)	Diversion Rate
May-September	>967	110 cfs
May-September	≤967	No Diversion Without Permission of SD & MN Boundary Water Commission
October-April	<965	No Diversion Without Permission of SD Water Management Board
October-April	>965 and ≤966	Restricted to 10 cfs or Daily Acre-feet Equivalent
October-April	>966 and <967	35 cfs or Daily Acre-feet Equivalent not Exceeding 460 Acre-feet any Consecutive 7 Day Period
October-April	≥967	110 cfs
Note: Acre-feet/day = cfs x 1.9834 10 cfs = 19.8 Acre-feet/day 35 cfs = 69.4 Acre-feet/day		

To be consistent with the updated use of the NAVD88 datum for Big Stone Lake elevations, the elevations in **Table 2** were converted to NAVD88 in **Table 3** below:

Table 3. Qualifications/Diversion Rates for Otter Tail Power Company Big Stone Lake Water Rights/Permits, with elevations converted from the original project datum (PD) to NAVD88 (Water Rights, 2025).

Time Period	Lake Elevation (PD) (feet)	Lake Elevation (NAVD88) (fmsl)	Diversion Rate
May-September	> 967	> 965.45	110 cfs
May-September	≤ 967	≤ 965.45	No Diversion Without Permission of SD & MN Boundary Water Commission
October-April	< 965	< 963.45	No Diversion Without Permission of SD Water Management Board
October-April	≥ 965 and ≤ 966	≥ 963.45 and ≤ 964.45	Restricted to 10 cfs or Daily Acre-feet Equivalent
October-April	> 966 and < 967	> 964.45 and < 965.45	35 cfs or Daily Acre-feet Equivalent not Exceeding 460 Acre-feet any Consecutive 7 Day Period
October-April	≥ 967	≥ 965.45	110 cfs

Water Rights/Permits held by the Otter Tail Power Company allow for the maximum diversion of 110 cfs during the summer, provided that Big Stone Lake has elevations greater than 965.45 feet. The UMRWD controls the seasonal operating levels of Big Stone Lake to maintain 965.45 feet in the winter (crest of the silt barrier), and 966.2 feet in the summer (as mitigated through Flood Control Permit No. FC34-3). The normal summer operating levels in Big Stone Lake are approximately one foot higher than the elevation set forth by the qualifications for maximum diversion from the lake.

The proposed modifications to the existing BVFMP are not expected to impair existing water rights/permits in South Dakota. Since the proposed modifications to FC34-3 are to the existing flood control works, easements and/or land acquisitions have already been secured.

SD Safety of Dams

The Browns Valley Diversion Dam (National Inventory of Dams [NID] ID Number: SD02691) was initially reviewed and approved for compliance with the South Dakota Safety of Dams Rules in 2008. During that review it was classified as a small sized, category 2 dam. A category 2 dam is defined as a significant hazard dam whose failure may cause damage to buildings, highways, railroads, bridges, or public utilities; loss of a water supply reservoir for a water distribution system; other extensive economic loss; or the reservoir is the only source of water for a water distribution system. The downstream hazard classification of category 2 was given due to the potential for extensive economic loss downstream if the dam should fail. The 2008 breach analysis (Johnson, 2008) showed several residences downstream of the dam which could be inundated in the event of a dam failure but not to the depth and velocity that loss of life would be expected.

Since this application proposes to alter the dam (design by Houston Engineering), the alteration is required to be reviewed and approved by the Chief Engineer pursuant to ARSD 74:02:08:09. Since this is not a typical water storage dam (which is what the State's rules are primarily designed for), certain interpretations were needed to evaluate this structure in relation to the South Dakota Safety of Dams Rules. At the time of original permitting for FC34-3, the primary spillway was considered to be the box culvert and the secondary spillway was considered to be the flood diversion channel (floodway) with the control section being the sheet pile control weir structure.

The alteration proposed by this project moves the control section upstream of the rock rapids arches and lowers the elevation of the control section up to 4.74 ft. The flow information shown on **Figure 4** provided by Houston Engineering indicates that the alteration would retain the spillway capacity required of a small, sized category 2 dam (100-year, 24-hour storm event) and the alteration would only change the distribution of flows between the spillways at smaller events (less than 10 year). No change to the dam height or maximum storage is being proposed, so the size classification will remain small.

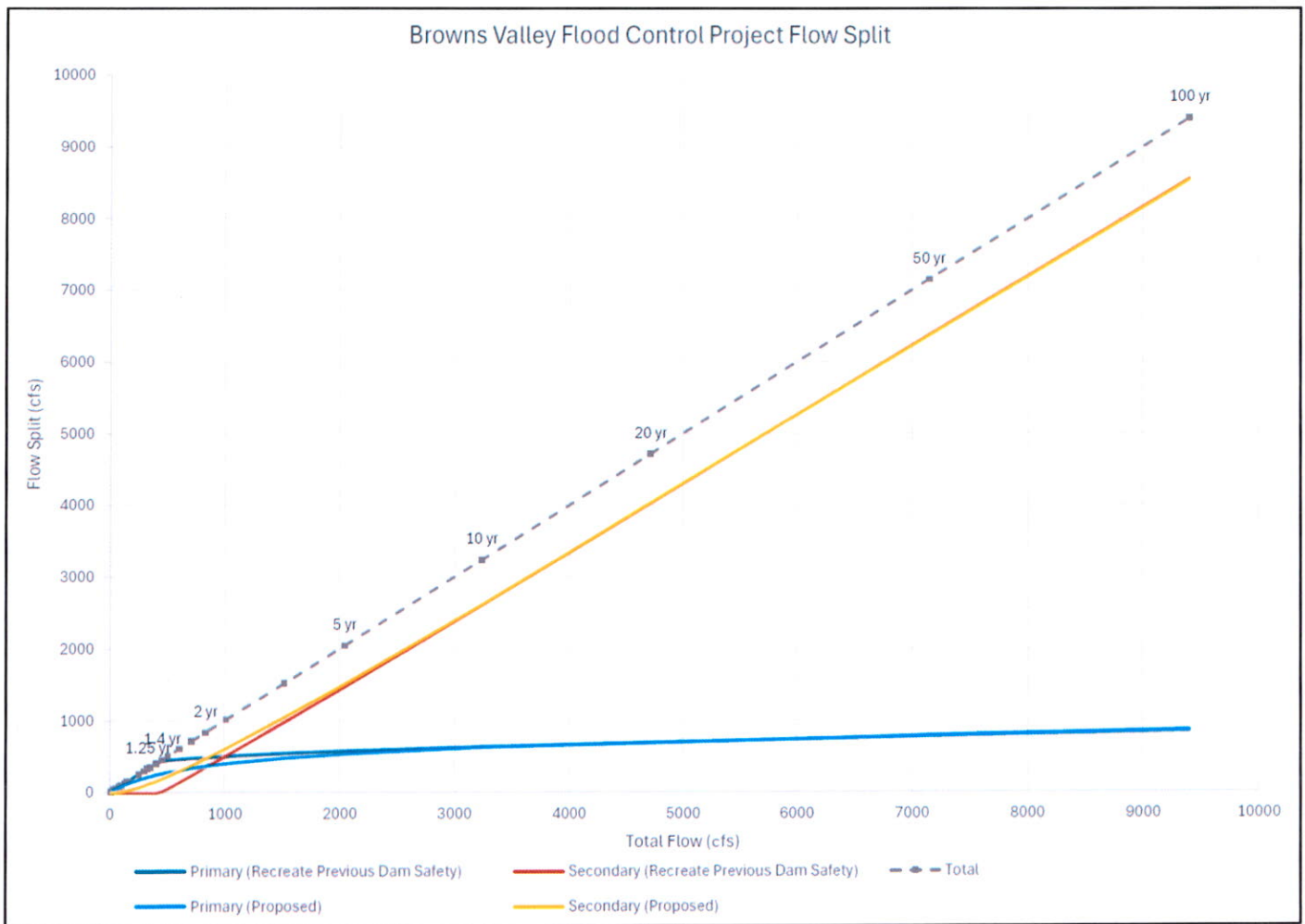


Figure 4. Browns Valley Flood Control Dam Spillway Curves (Odens and Hullinger, 2025).

Recommended Qualifications for FC34A-3

This proposed modification to Flood Control License No. FC34-3 shall maintain the same qualifications that are stated in FC34-3 except those qualifications which require adjustments based on the current conditions of the existing system and low flow requirements for flows through the City of Browns Valley. The qualifications in Flood Control License No. FC34-3 reference elevations to both the Project Datum (PD) and NAVD88. The recommended qualifications listed in this section will reference all elevations to NAVD88 to stay consistent with the vertical datum update by UMRWD (2025) and the National Weather Service (IEM, 2024).

The license for FC34-3 states that up to 500 to 700 cfs of flow will remain in the Little Minnesota River channel through the box culvert during a 100-year flood event. However, updated modeling as part of this application shows that the current conditions of the system would allow 866 cfs to remain in the Little Minnesota River channel and that the proposed modifications would allow 857 cfs to remain in the river channel during the design flood. Therefore, the permit for Application No. FC34A-3 should be modified with updated information, if approved.

The term “flood flows” or “flood waters” as stated in this report and the license for Flood Control Permit No. FC34-3 will be defined here. Flood flows are flows that would otherwise overtop the bank of the Little Minnesota River if not for the existing BVFMP. The full bank capacity of the Little Minnesota River channel through the City of Browns Valley is estimated to be approximately 1,100 to 1,200 cfs, which corresponds to a flood event between the 2- and 5-year recurrence interval (BVFMP, 2008; Odens, 2025).

To uphold the criteria set forth in SDCL 46-2A-11 and the qualifications for License No. FC34-3, the following qualifications are recommended for Application No. FC34A-3:

- 1) The Permit Holder shall be required to take the following measures to negate the potential 0.4-foot increase in Big Stone Lake.
 - i) Normal summer operating pool elevation of 966.4 feet on Big Stone Lake shall be reduced by 0.2-feet from the 966.4 feet summer pool elevation to 966.2 feet, through the use of the UMRWD’s gate operation to offset the increased flood risk.
 - ii) The permit holder will use information from the National Water Prediction Service (NWPS), North Central River Forecast Center, including the U.S. Geological Survey Gage at Peever, SD in the development of an advanced flood forecast for the Upper Minnesota River.
 - iii) The permit holder will use NWPS (or best available) hydrologic and hydraulic models of the entire drainage area upstream of Big Stone Lake (including the major tributaries of the Whetstone River and the Little Minnesota River), as well as NWPS provided elevation forecasts for Big Stone Lake, using antecedent conditions including snowpack and soil moisture. These forecasts include probable rainfall within the drainage area (Quantitative Precipitation Forecasts). Inputs and observations made by the Upper Minnesota River Watershed District (UMRWD), working cooperatively with the NWPS, will be used to refine the forecast results.
 - iv) The permit holder will adjust gate operation based on these forecasts in advance of a potential flood event on Big Stone Lake to lower the lake elevation by 0.2-feet in anticipation of a flood event.
 - v) In the event there is sufficient flow in the Little Minnesota River to cause flood waters to enter the floodway and bypass the City of Browns Valley returning water to the Little Minnesota River, the permit holder shall notify the SD DANR Water Rights Program of actions taken to negate the effects of the additional water in Big Stone Lake. The reported information shall consist of daily data including date(s), time(s), of adjusted gate operation, gaged river inflow reading(s) in cfs, gate(s) opening height(s), 24-hour precipitation, and any additional information or comments the permit holder feels necessary (i.e., ice jams, open water, etc...).
- 2) The permit holder is responsible for operation and maintenance of the flood control works.
- 3) During low flow conditions, the permit holder must maintain streamflow through the City of Browns Valley by either raising the boulder weir through the controlling cross section or adding rip rap to , or both, to direct flow through the City of Browns Valley.

- 4) If approved, the Water Management Board will retain jurisdiction of Flood Control Permit No. FC34A-3 in the event that conditions change that would affect the permit qualifications, such as completion of the proposed Whetstone River diversion project.

Conclusions

1. Flood Control Permit Application No. FC34A-3, Upper Minnesota River Watershed District, proposes to modify existing flood control works as authorized by Flood Control Permit No. FC34-3 which provide protection from the 1% chance (100-year) flood for the City of Browns Valley. The proposed modifications are for improved fish migration through the existing works, with no significant changes to the flood control benefits. The modification site is located on UMRWD property in Section 31, T125N-R49W, approximately 0.8 miles southwest of Browns Valley, MN in Roberts County, SD.
2. Flood Control License No. FC34-3 authorizes the Browns Valley Flood Mitigation Project (BVFMP) which conveys the bulk of flood waters for a 100-year flood from the Little Minnesota River around the city by means of a diversion channel (floodway). The project consists of an inlet channel to a diversion dam (no permanent storage), a box culvert which conveys a portion of flows through Browns Valley during a flood event, and a diversion channel (floodway) which has a sheet pile weir controlling structure. Flood waters in the diversion channel enter back into the Little Minnesota River downstream of Browns Valley. Details of the existing works are specified in the Description of existing works authorized by FC34-3 section of this report.
3. Application No. FC34A-3 to modify the existing flood control works as authorized by FC34-3 proposes the following modifications: lowering the existing sheet pile weir, excavating the inlet to the diversion channel, and installing rock arch rapids downstream of the modified controlling section. A low flow channel will be added upstream of the rock arch rapids structures which will increase the frequency which the diversion channel can be utilized by fish. The controlling cross section will change both location and the controlling elevation, which is proposed to be lowered by approximately 4.74 feet. Details of the proposed modifications are specified in the Description of proposed modification FC34A-3 section of this report.
4. Any modification of the works authorized by FC34-3 requires additional flood control permitting by this application. Therefore, the same requirements needed to obtain the original permit (SDCL 46-2A-11) need to be met before this application can be approved. The criteria cited in SDCL 46-2A-11 that are required to be met are 1) Reduction in damage from flooding or erosion in the area proposed to be benefitted; 2) Not increase the likelihood or the severity of flood damages in areas other than the project area or the area proposed to be benefitted; 3) Not endanger human life or property; and 4) Not impair existing water rights unless exceptions are met.
5. To address the criteria listed in SDCL 46-2A-11, the applicant provided updated modeling and analysis, which showed that the proposed modifications will not alter the original flood control benefits for the 100-year flood event, and that the split of flows between the city and the diversion channel during a 100-year flood event are essentially the same. Therefore, the applicant has shown that this modification will have the same reduction in damage from flooding.

6. The proposed modifications are not expected to increase the flood risk to agricultural lands downstream of the floodway outlet, or the Big Stone National Wildlife Refuge.
7. The proposed modifications are not expected to alter elevations in Big Stone Lake during a 100-year event from what was originally determined in 2008 for FC34-3, which was projected to be a 0.4-foot increase to Big Stone Lake during a 100-year flood. Mitigations to offset the potential increase due to the BVFMP are included in the license for FC34-3 and are preserved in the Recommended Qualifications section of this report. The proposed modifications may change the timing of baseflows and small events to Big Stone Lake; however, timing for baseflows and small events is not a parameter on the flood control license FC34-3.
8. This application proposes to increase utilization of the diversion channel for fish passage, which decreases the amount of flows going through the City of Browns Valley during a 1.4-year event and during normal flows. The applicant has shown that, in the event of low flows, the low flow channel can be modified by placing more riprap at the controlling cross section which will push more water through the city.
9. The proposed modifications to the existing BVFMP are not expected to impair existing water rights/permits in South Dakota. Since the proposed modifications to FC34-3 are to the existing flood control works, easements and/or land acquisitions have already been secured.
10. Application No. FC34A-3 to modify Flood Control License No. FC34-3 can be approved pursuant to SDCL 46-2A-11 with the qualifications listed in the Recommended Qualifications section of this report.
11. The applicant has indicated the intent of applying for a flood control permit for the proposed Whetstone River project which would reroute a portion of the Whetstone River back to its original channel downstream from Big Stone Lake. The Whetstone River project requires future permitting that may negate water level increases to Big Stone Lake (see Qualification No. 1 in the Recommended Qualifications section of this report).



Brittan R. Hullinger

Engineer II

SD DANR Water Rights Program



Whitney Kilts

Engineer III

SD DANR Water Rights Program

References

- BVFMP. 2008. Browns Valley Flood Mitigation Project. Engineer's Report. Dated January 17, 2008. Houston Engineering Inc. Maple Grove, Minnesota.
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- UMRWD. 2025. Upper Minnesota River Watershed District. <<https://umrwd.org>> Accessed November 19, 2025.
- Water Rights. 2025. Water Right/Permit Files. SD DANR Water Rights Program. Joe Foss Building. Pierre, South Dakota.

From: [Lisa Odens](#)
To: [Hullinger, Brittan](#); [Kilts, Whitney \(DENR\)](#); [Duvall, Ron](#); [Dewell, Amanda](#)
Cc: [Amber Doschadis](#); [Jungwirth, Jason](#)
Subject: RE: [EXT] Browns Valley FC34-3 amendment questions
Date: Thursday, November 20, 2025 11:28:47 AM
Attachments: [email-signature-smaller-use_bde80e85-ebb1-4047-8f05-8f8e19d827ba.png](#)
[Change in Flow Distribution.pdf](#)

Good Morning,

Thanks for the comments. The existing controlling section is the weir structure which consists of a 235' long sheet pile at an elevation of ~985.14 (985.52 surveyed on south side, 985.14 surveyed on north side). The proposed controlling cross section is the inlet to the rock arch rapids (cross section D-D) upstream of the weir. This section has a low flow section at an elevation of 980.4 and a 2-foot bottom width. The low flow section comes up at 5h:1v slope to the higher flow section at 983.00. The existing sheet pipe weir will be cut down to accommodate the elevations of the rock arch rapids at its existing location. So the controlling elevation is changing from 985.14 to 980.4, a change of 4.74 feet and the location is changing from the sheet pile weir structure to the inlet of the rock arch rapids. The stream banks and profile through town will be observed by the UMRWD and if sedimentation or issues are observed, the low flow channel may be filled with riprap at the inlet to an elevation up to 983.00 to direct more flow through town during low flows.

If I understand correctly, between Dam Safety Review and final construction 2 lines of 4'x7' box culverts (waterway area of 56 sqft) were replaced with one line of 12'x5' box culvert (waterway area of 60 sqft). Assuming the inverts of the box culvert haven't changed from the 2008 review, I ran a comparison to see how the flow distribution changes (see attached). You can see that for larger events (above the 5-year) the change in flow distribution is negligible. The second page zooms into smaller events showing the change in flow distribution. If you would like me to convert these to curves based on upstream elevation, I can provide those curves.

Let me know if you have any other questions or would like a call to discuss.
Thanks!

Lisa Odens, PE*, CFM

Civil Engineer

📞 763.493.4522 | 📠 763.493.6667



*Licensed in IA, MN, ND, SD

This message shall not be construed as official project information or direction except as expressly provided in the contract documents. This entire message (including all forwards and replies) and any attachments are for the sole use of the intended recipient(s) and may contain proprietary, confidential, trade secret, work-product, attorney-client or privileged information. Any unauthorized review, use, disclosure or distribution is prohibited and may be a violation of law. If you are not the intended recipient, please contact the sender by

reply email and destroy all copies of the original message.

From: Hullinger, Brittan <Brittan.Hullinger@state.sd.us>
Sent: Thursday, November 13, 2025 11:54 AM
To: Lisa Odens <lodens@houstoneng.com>; Jungwirth, Jason <Jason.Jungwirth@state.sd.us>
Cc: Kilts, Whitney (DENR) <Whitney.Kilts@state.sd.us>; Duvall, Ron <Ron.Duvall@state.sd.us>; Dewell, Amanda <Amanda.Dewell@state.sd.us>
Subject: Browns Valley FC34-3 amendment questions

[External Email]

Greetings Lisa and Jason,

A couple of additional questions came up while working through the reviews on the Browns Valley Little Minnesota River Diversion amendment. Since some of these questions overlap between the two staff members doing the review, they were combined into one email.

Flood Control

The second alternative is the preferred alternative for the project and consists of a low flow channel which is added to the controlling cross section. The low flow channel will help facilitate water through the channel and through the controlling cross section. However, looking at Sections C-C, D-D and E-E, there appears to be excavation of the channel at those locations, which are two foot sections at 980.4 fmsl. In the hydraulics section of the report, the diversion invert elevation for the preferred alternative is 2 feet wide at 980.4 fmsl. Looking at the weir removal plans for the existing sheet pile modifications, the controlling section is trapezoidal with a top width of ~54 feet and a bottom width of ~20 feet. These modifications on the existing sheet pile would suggest that the controlling section is changing from an elevation of ~985 fmsl to 980.2 fmsl, which is a greater change than what is written on the application, which is that the breakover elevation on the control weir will be lowered by up to two feet.

Please specify if the controlling section for the diversion channel is different than the existing weir structure, and if information on the application needs to be updated.

Dam Safety

Looks like this dam was classified as a small sized, category 2 (significant) hazard dam in 2008 (National Inventory of Dams (NID) No. 02691). The hazard class was based on the potential for extensive economic damage if the dam fails. The primary spillway was interpreted to be the two 4ft x 7ft bot culverts and the secondary spillway the sheet pile weir. (Interpretation of the sheet pile weir as a secondary spillway appears to have been necessary to meet the spillway capacity requirements of the State's Safety of Dams Rules.) Since this application proposes an alteration to the sheet pile weir (secondary spillway), this triggered a Safety of Dams review since it is an alteration to the dam.

To complete the Safety of Dams review an updated spillway capacity curve will be needed to be submitted to reflect the changes to the secondary spillway, and that a different sized box culvert was installed for the primary than what was approved in the 2008 Safety of Dams review. Additionally, the design report is unclear if the sheet pile weir location will continue to be the control section for the secondary spillway, and the location of the control section will also need to be clarified.

For questions, on the Safety of Dams requirements please direct them to Whitney Kilts (cc'd on this email).

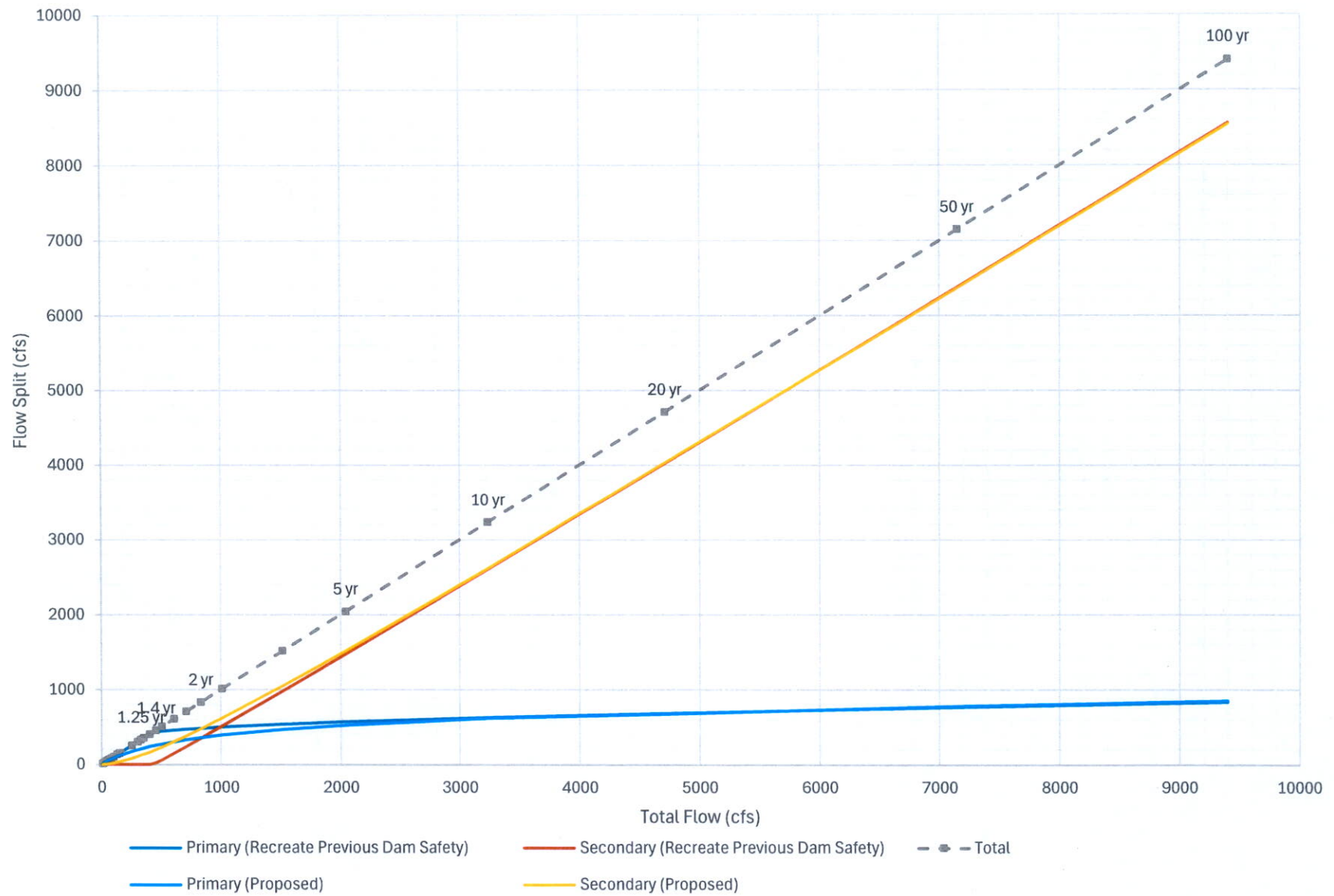
Brittan R. Hullinger

Natural Resources Engineer

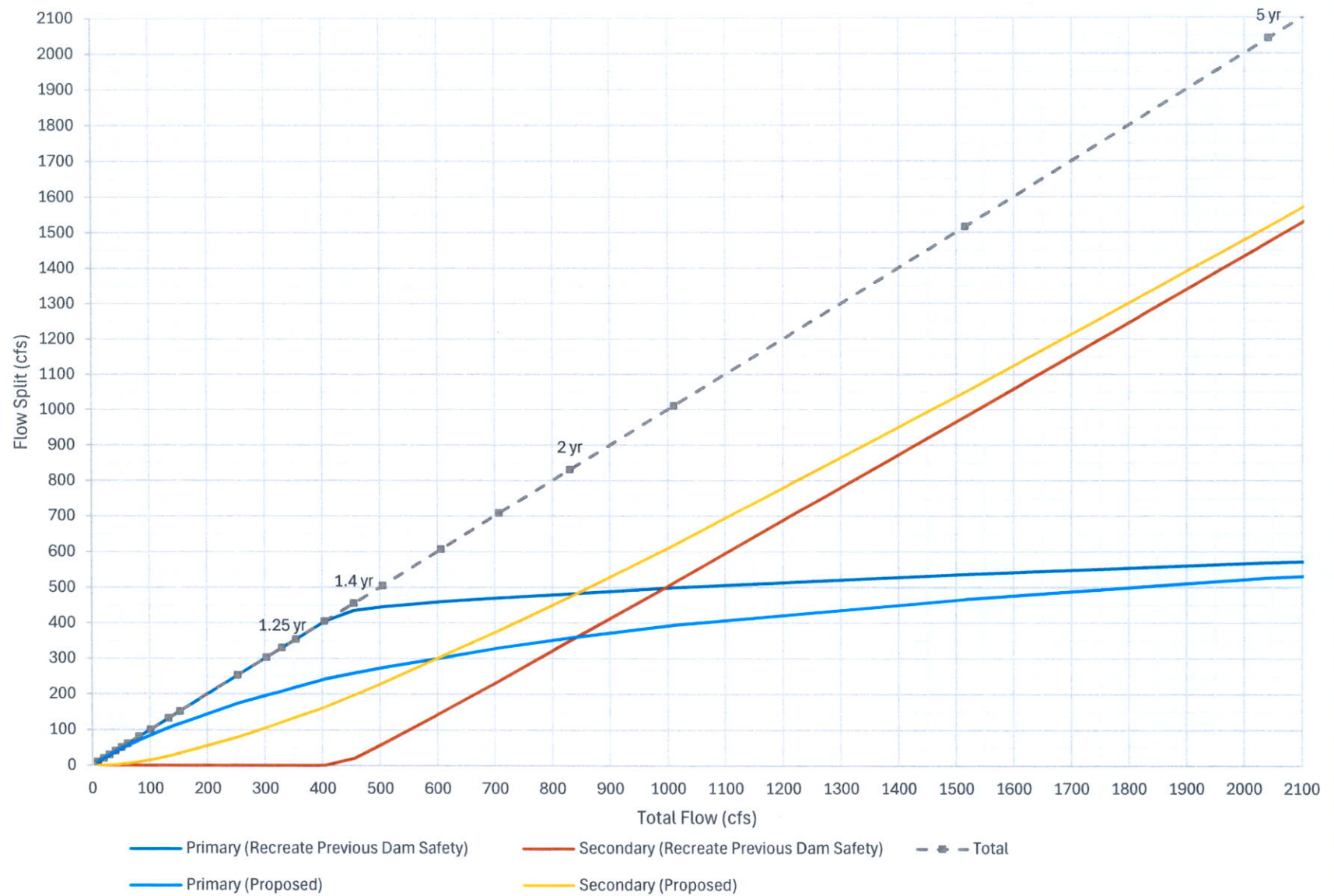
Water Rights Program, SD DANR

(605)-773-3352

Browns Valley Flood Control Project Flow Split



Browns Valley Flood Control Project Flow Split



Rodriguez, Rachel

From: Jungwirth, Jason
Sent: Friday, October 10, 2025 3:53 PM
To: Dewell, Amanda; Hullinger, Brittan; Kilts, Whitney (DENR); Duvall, Ron
Cc: Amber Doschadis; Rodriguez, Rachel
Subject: RE: Browns Valley Little Minnesota River Diversion FC34-3 revision
Attachments: 90pct Design Report Browns Valley Fish Passage 10-7-2025_signed.pdf

All,

Attached is the updated 90% design report that addresses the comments and questions you all asked during our discussion on this project. The updated portions are in blue/bold type throughout the report in the sections where they fit best.

Please let me know of any other questions or needs in the process.

Have a great weekend.

Jason

Jason Jungwirth | *Senior Biologist – Aquatic Habitat and Access*

South Dakota Game, Fish and Parks

20641 SD Hwy 1806 | Ft Pierre, SD 57532

605.223.7610 | Jason.Jungwirth@state.sd.us



From: Dewell, Amanda <Amanda.Dewell@state.sd.us>

Sent: Thursday, September 25, 2025 1:13 PM

To: Jungwirth, Jason <Jason.Jungwirth@state.sd.us>; Hullinger, Brittan <Brittan.Hullinger@state.sd.us>; Kilts, Whitney (DENR) <Whitney.Kilts@state.sd.us>; Duvall, Ron <Ron.Duvall@state.sd.us>

Cc: Amber Doschadis <amber@umrwd.org>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>

Subject: RE: Browns Valley Little Minnesota River Diversion FC34-3 revision

Jason, we've received the application and supplemental attachments. Although it sounds like GF&P is supplying fees for the application, since it's being filed in the name of Upper MN River Watershed Dist., we will have to be in receipt of payment before we can start processing. I believe in the past that's been done via inter-department payments. Beyond that, we'll reach out with any questions once we've started the review.

Thanks!

Amanda Dewell

DANR - Water Rights Program

Permitting Administrator

Main Phone: 605 773-3352

Website: danr.sd.gov



From: Jungwirth, Jason <Jason.Jungwirth@state.sd.us>

Sent: Thursday, September 25, 2025 10:28 AM

To: Hullinger, Brittan <Brittan.Hullinger@state.sd.us>; Kilts, Whitney (DENR) <Whitney.Kilts@state.sd.us>; Dewell, Amanda <Amanda.Dewell@state.sd.us>; Duvall, Ron <Ron.Duvall@state.sd.us>

Cc: Amber Doschadis <amber@umrwd.org>

Subject: Browns Valley Little Minnesota River Diversion FC34-3 revision

All,

Attached is the permit application to modify the FC34-3 permit for the Browns Valley Little Minnesota River diversion channel modification as we discussed. Have also included a map of the location for reference.

I have also attached a copy of the 90% design report for reference, so everything is in one email.

An addendum to the 90% design report is in the process of being completed and should be available next week. The addendum will address the following questions:

1. What is the water split at a low flow event like say 100 CFS between the diversion and through town?
2. A summary of any public meetings and feedback from those meetings.
3. The changes to Big Stone Lake elevations
4. Any water right concerns in MN

Also, GFP is planning to pay the \$300 application fee for this, so please let me know what needs to be done to do process this payment.

Let me know of any other questions or needs on this.

Thanks

Jason

Jason Jungwirth | *Senior Biologist - Aquatic Habitat and Access*

South Dakota Game, Fish and Parks

20641 SD Hwy 1806 | Ft Pierre, SD 57532

605.223.7610 | Jason.Jungwirth@state.sd.us

Rodriguez, Rachel

From: Tentinger, Jeremy
Sent: Monday, September 29, 2025 8:27 AM
To: Jungwirth, Jason
Cc: Keiser, Darcy; Rodriguez, Rachel
Subject: RE: Browns Valley Little Minnesota River Diversion FC34-3 revision payment
Attachments: N06609J007.pdf

Attached is an interagency billing for the enclosed invoice let us know if further information is needed, thanks.

From: Jungwirth, Jason <Jason.Jungwirth@state.sd.us>
Sent: Friday, September 26, 2025 8:13 AM
To: Tentinger, Jeremy <Jeremy.Tentinger@state.sd.us>
Cc: Keiser, Darcy <Darcy.Keiser@state.sd.us>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>
Subject: Browns Valley Little Minnesota River Diversion FC34-3 revision payment

Hello Jeremy,

Can you please process a non-cash voucher payment for the attached invoice? This is a permit application fee for a project we are working on.

The Upper Minnesota River Watershed District is the landowner of the project, and they hold the original permit and needed to fill out the application for the revision. We are in partnership with them and have been working on the permitting.

This is aquatic habitat stamp funds for this project. I also have project code LMBV26Wa set up as well.

Thanks and let me know if you need any other info.

Jason

Jason Jungwirth | *Senior Biologist - Aquatic Habitat and Access*
South Dakota Game, Fish and Parks
20641 SD Hwy 1806 | Ft Pierre, SD 57532
605.223.7610 | Jason.Jungwirth@state.sd.us

Lisa Odens

From: Fladhammer, Erik <efladhammer@otpc.com>
Sent: Monday, December 29, 2025 12:56 PM
To: Amber Doschadis
Subject: RE: Ottertail - Whetstone Acknowledgement

Amber,

Big Stone Plant does not believe this will impact lake level or the ability for us to pull water from the lake per our existing permit. As long as those items are correct then we have no concerns with the project.

Thanks,
Erik

From: Amber Doschadis <Amber@umrwd.org>
Sent: Monday, December 22, 2025 8:24 AM
To: Fladhammer, Erik <efladhammer@otpc.com>
Subject: RE: Ottertail - Whetstone Acknowledgement

This Message Is From an Untrusted Sender

You have not previously corresponded with this sender.

Hi Erik,

Thank you your response regarding the Whetstone River Restoration Project. We appreciate Otter Tail Power's confirmation that there are no concerns related to your water rights permit/ operations on Big Stone Lake.

As a related effort, I wanted to let Ottertail know of another project we have going on: **Fish Passage Improvements within the Browns Valley Flood Mitigation Project (Diversion)** on the Little Minnesota River.

The Browns Valley Flood Mitigation Project (Diversion around Browns Valley) was constructed in 2011 to reduce flood risk to the City of Browns Valley. Since construction, upstream interests have reported reduced fish migration. In response, the *Little Minnesota River Assessment of Fish Migration* was completed in April 2019, which identified targeted modifications to improve fish passage while maintaining the original flood protection intent of the project.

These modifications have been further refined in coordination with USFWS, South Dakota Game Fish and Parks, and the Minnesota DNR.

The proposed fish passage improvements are designed to:

- Improve spring fish migration (including walleye, sturgeon, and shiner),
- Maintain existing flood protection for the City of Browns Valley,
- Preserve existing flow volumes during all events,
- Avoid changes to peak water surface elevations on Big Stone Lake, including during the 100-year flood event.

Modeling shows no meaningful change to lake elevations or flood flows, and flow splits during large events remain essentially unchanged. While minor timing shifts may occur during baseflow or very small events, no impacts to Big Stone Lake levels or Otter Tail's water use are anticipated.

Given Otter Tail Power's water rights on Big Stone Lake, we wanted to confirm whether you have any concerns or comments related to this fish passage improvement effort, similar to our coordination on the Whetstone project.

Since this is a newer project, we would be happy to provide a walkthrough of the project scope with your team.

Thank you again for your time and coordination.

Amber

Amber Doschadis | Director



211 2nd Street SE, Ortonville, MN 56278

Phone: (320) 839-3411

Website: umwrd.org

From: Fladhammer, Erik <efladhammer@otpco.com>

Sent: Monday, December 22, 2025 8:00 AM

To: Amber Doschadis <Amber@umrwd.org>

Subject: RE: Ottertail - Whetstone Acknowledgement

This message may be from an external email source.

Do not click links or open attachments unless you recognize the sender and know the content is safe. Report all suspicious emails to Big Stone County IT.

Amber,

Big Stone Power Plant is aware of the Whetstone River Restoration Project. We have no concerns with the project due to our understanding that it will not change normal lake level, our water use permit, or our ability to draw from the lake in any way. Let me know if you need anything else from the plant on this.

Thank you,



Erik Fladhammer, P.E.

Plant Manager
Big Stone Power Plant

Direct: 605-862-6386
Cell: 605-467-3274

From: Amber Doschadis <Amber@umrwd.org>
Sent: Tuesday, December 9, 2025 7:34 AM
To: Fladhammer, Erik <efladhammer@otpc.com>
Subject: Ottertail - Whetstone Acknowledgement

This Message Is From an Untrusted Sender

You have not previously corresponded with this sender.

Hi Erik,

I hope you're doing well. I'm reaching out regarding our ongoing Whetstone River Restoration Project.

As part of the permitting process, the SD DANR has requested confirmation that Otter Tail Power Company is aware of and <hopefully still> supportive of the proposed project modifications.

To help move this forward, we're hoping to gather any input Ottertail may have on our project. Our Engineers and I would be happy to provide a summary of the project details and/or visit via Teams with Ottertail staff to walk through the scope.

Ultimately, because Ottertail has an existing water permit on BSL, the SD DANR would like a brief statement acknowledging Ottertail's awareness of the proposed work and noting any concerns or support from your perspective.

Please let me know what you need on your end.

Best,

Amber Doschadis

Amber Doschadis | Director



211 2nd Street SE, Ortonville, MN 56278
Phone: (320) 839-3411
Website: umwrd.org

Tentinger, Jeremy

From: Jungwirth, Jason
Sent: Friday, September 26, 2025 8:13 AM
To: Tentinger, Jeremy
Cc: Keiser, Darcy; Rodriguez, Rachel
Subject: Browns Valley Little Minnesota River Diversion FC34-3 revision payment
Attachments: Upper MN River Watershed Invoice.docx

Hello Jeremy,

Can you please process a non-cash voucher payment for the attached invoice? This is a permit application fee for a project we are working on.

The Upper Minnesota River Watershed District is the landowner of the project, and they hold the original permit and needed to fill out the application for the revision. We are in partnership with them and have been working on the permitting.

This is aquatic habitat stamp funds for this project. I also have project code LMBV26Wa set up as well.

Thanks and let me know if you need any other info.
Jason

Jason Jungwirth | *Senior Biologist - Aquatic Habitat and Access*
South Dakota Game, Fish and Parks
20641 SD Hwy 1806 | Ft Pierre, SD 57532
605.223.7610 | Jason.Jungwirth@state.sd.us

Rodriguez, Rachel

From: Jungwirth, Jason
Sent: Thursday, September 25, 2025 2:08 PM
To: Dewell, Amanda
Cc: Rodriguez, Rachel
Subject: RE: Browns Valley Little Minnesota River Diversion FC34-3 revision

Perfect. I was just in the process of sending Jeremy Tentinger, out accountant, an email asking to process a payment for this FC permit application. I will cc Rachel to help with any questions he may have.

Jason

Jason Jungwirth | *Senior Biologist – Aquatic Habitat and Access*
South Dakota Game, Fish and Parks
20641 SD Hwy 1806 | Ft Pierre, SD 57532
605.223.7610 | Jason.Jungwirth@state.sd.us



From: Dewell, Amanda <Amanda.Dewell@state.sd.us>
Sent: Thursday, September 25, 2025 2:03 PM
To: Jungwirth, Jason <Jason.Jungwirth@state.sd.us>
Cc: Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>
Subject: RE: Browns Valley Little Minnesota River Diversion FC34-3 revision

Rachel has previously received payments from GF&P so I'll leave it to her to know how process is initiated.

Amanda Dewell
DANR - Water Rights Program
Permitting Administrator
Main Phone: 605 773-3352
Website: danr.sd.gov



From: Jungwirth, Jason <Jason.Jungwirth@state.sd.us>
Sent: Thursday, September 25, 2025 1:30 PM
To: Dewell, Amanda <Amanda.Dewell@state.sd.us>; Hullinger, Brittan <Brittan.Hullinger@state.sd.us>; Kilts, Whitney (DENR) <Whitney.Kilts@state.sd.us>; Duvall, Ron <Ron.Duvall@state.sd.us>
Cc: Amber Doschadis <amber@umrwd.org>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>
Subject: RE: Browns Valley Little Minnesota River Diversion FC34-3 revision

Amanda,
Sounds good. It has been a while since I have done an inter-department payment, do we initiate that or can you provide an invoice with where the payment needs to go so I can work to get this processed right away.

Thanks

Jason

Jason Jungwirth | *Senior Biologist – Aquatic Habitat and Access*

South Dakota Game, Fish and Parks

20641 SD Hwy 1806 | Ft Pierre, SD 57532

605.223.7610 | Jason.Jungwirth@state.sd.us



From: Dewell, Amanda <Amanda.Dewell@state.sd.us>

Sent: Thursday, September 25, 2025 1:13 PM

To: Jungwirth, Jason <Jason.Jungwirth@state.sd.us>; Hullinger, Brittan <Brittan.Hullinger@state.sd.us>; Kilts, Whitney (DENR) <Whitney.Kilts@state.sd.us>; Duvall, Ron <Ron.Duvall@state.sd.us>

Cc: Amber Doschadis <amber@umrwd.org>; Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>

Subject: RE: Browns Valley Little Minnesota River Diversion FC34-3 revision

Jason, we've received the application and supplemental attachments. Although it sounds like GF&P is supplying fees for the application, since it's being filed in the name of Upper MN River Watershed Dist., we will have to be in receipt of payment before we can start processing. I believe in the past that's been done via inter-department payments. Beyond that, we'll reach out with any questions once we've started the review.

Thanks!

Amanda Dewell

DANR - Water Rights Program

Permitting Administrator

Main Phone: 605 773-3352

Website: danr.sd.gov



From: Jungwirth, Jason <Jason.Jungwirth@state.sd.us>

Sent: Thursday, September 25, 2025 10:28 AM

To: Hullinger, Brittan <Brittan.Hullinger@state.sd.us>; Kilts, Whitney (DENR) <Whitney.Kilts@state.sd.us>; Dewell, Amanda <Amanda.Dewell@state.sd.us>; Duvall, Ron <Ron.Duvall@state.sd.us>

Cc: Amber Doschadis <amber@umrwd.org>

Subject: Browns Valley Little Minnesota River Diversion FC34-3 revision

All,

Attached is the permit application to modify the FC34-3 permit for the Browns Valley Little Minnesota River diversion channel modification as we discussed. Have also included a map of the location for reference.

I have also attached a copy of the 90% design report for reference, so everything is in one email.

An addendum to the 90% design report is in the process of being completed and should be available next week. The addendum will address the following questions:

1. What is the water split at a low flow event like say 100 CFS between the diversion and through town?
2. A summary of any public meetings and feedback from those meetings.
3. The changes to Big Stone Lake elevations
4. Any water right concerns in MN

Also, GFP is planning to pay the \$300 application fee for this, so please let me know what needs to be done to do process this payment.

Let me know of any other questions or needs on this.

Thanks

Jason

Jason Jungwirth | *Senior Biologist - Aquatic Habitat and Access*
South Dakota Game, Fish and Parks
20641 SD Hwy 1806 | Ft Pierre, SD 57532
605.223.7610 | Jason.Jungwirth@state.sd.us



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

**NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPERS RIGHT AWAY.**

January 12, 2026

Upper Minnesota River Watershed District
c/o Amber Doschadis
211 2nd Street SE
Ortonville MN 56278

Dear Ms. Doschadis:

Water Permit Application No. FC34A-3 for flood control use have been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Sisseton Courier printed at Sisseton SD (Ph # 605 698-7642) and the Public Opinion printed at Watertown (see attachment for contact number). You will need to contact the newspapers and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Acting Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspapers to authorize publication of your Notice and to arrange for payment. Early contact with the papers can eliminate delays. Upon receiving authorization from you, the publishers have been instructed to publish your notice. The newspapers have also been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,

Rachel Rodriguez

Rachel Rodriguez
Water Rights Program
(605) 773-3352

enclosures

NOTE: If you plan to contest any part of the Acting Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.

NOTICE OF APPLICATION NO. FC34A-3 to MODIFY FLOOD CONTROL LICENSE NO. FC34-3

Notice is given that Upper Minnesota River Watershed District, 211 2nd Street SE, Ortonville MN 56278, has filed an application for a water permit to modify an existing flood control project authorized by Flood Control License No. FC34-3 to increase fish migration through the project. Flood Control License No. FC34-3 protects the City of Browns Valley, Minnesota from the 100-year flood event on the Little Minnesota River by conveying flood waters around the city by means of an inlet channel, diversion dam, and floodway. The diversion dam (with no permanent storage) placed across the Little Minnesota River, in the SW 1/4 SE 1/4, Section 31, T125N-R49W, has a concrete box culvert installed through the diversion dam allowing flow to remain in the Little Minnesota River main channel while flood flows exceeding the box culvert capacity overtop a weir structure (crest elevation of 985.14 feet mean sea level [fmsl]) (NAVD 1988) entering the floodway. This application proposes to modify the existing structures for better fish passage. The proposed modifications include lowering the existing sheet pile weir (current controlling section), excavating the inlet to the diversion channel, and installing rock arch rapids downstream of the modified controlling section. The proposed design includes a low flow channel which will be 2 feet wide with an invert elevation of 980.4 fmsl (NAVD 1988), which will increase the frequency that the diversion channel can be utilized by fish. . This site is located approximately ten miles southeast of Sisseton SD.

Pursuant to SDCL 46-2A-2, the Acting Chief Engineer recommends APPROVAL of Application No. FC34A-3 with qualifications because 1) the project will not increase the likelihood or severity of flood damages, 2) the project will not endanger human life or property, 3) the project will not impair existing water rights, 4) the District has acquired property or the necessary easements, and 5) it is in the public interest to provide flood control for the City of Browns Valley while improving fish passage through the project. The Acting Chief Engineer's recommendation with qualifications, the application, and staff report are available at <https://danr.sd.gov/public> or contact Ron Duvall for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing this application or recommendation shall allege that the application, upon approval, will cause injury to the person that is unique from any injury suffered by the public in general. The injury must concern a matter either within the regulatory authority found in SDCL 46-2A-9 for approval or denial of the application, or other matter concerning the application within the regulatory authority of the board to act upon as defined by SDCL 46-2-9 and 46-2-11, or both. Any person meeting the petitioner requirements and wishing to be a party of record in a contested case hearing shall file a written petition to oppose the application with BOTH the applicant and Acting Chief Engineer. A petition opposing the application shall be filed on a form provided by the Acting Chief Engineer. The petition form is available online at <https://danr.sd.gov/public> or by contacting the Acting Chief Engineer. The Acting Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501" or call (605) 773-3352. The applicant's mailing address is given above. If contesting the Acting Chief Engineer's recommendation, the applicant shall also file a petition. A petition filed by either an interested person or the applicant must be filed by January 30, 2026.

The petition shall include a statement describing the unique injury upon approval of the application on the petitioner, the petitioner's reasons for opposing the application, and the name and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

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Published once at the total approximate cost of_

Rodriguez, Rachel

From: Gannett Legals Public Notices 4 <ganlegpubnotices4@gannett.com>
Sent: Monday, January 12, 2026 12:30 PM
To: Rodriguez, Rachel
Cc: amber@umrwd.org
Subject: RE: [EXT] 11995918 RE: FC34A-3 Upper Minn River Watershed Dist - Public Notice
Attachments: Order_Confirmation_Liners - 2026-01-12T133011.698.pdf

Revised proof attached.

From: Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>
Sent: Monday, January 12, 2026 1:24 PM
To: Gannett Legals Public Notices 4 <ganlegpubnotices4@gannett.com>
Subject: RE: 11995918 RE: FC34A-3 Upper Minn River Watershed Dist - Public Notice

This is missing the full title at the top "NOTICE OF APPLICATION NO. FC34A-3 to MODIFY FLOOD CONTROL LICENSE NO. FC34-3." Please correct and provide a new proof.

Thank you,

Rachel Rodriguez
DANR | Program Assistant
Rachel.Rodriguez@state.sd.us



From: Gannett Legals Public Notices 4 <ganlegpubnotices4@gannett.com>
Sent: Monday, January 12, 2026 12:10 PM
To: Rodriguez, Rachel <Rachel.Rodriguez@state.sd.us>
Cc: amber@umrwd.org
Subject: [EXT] 11995918 RE: FC34A-3 Upper Minn River Watershed Dist - Public Notice

Please find your order confirmation and proof attached.

Your notice is set to run in the Public Opinion on 1/20. The order cost is \$68.90. Please email before 8am on Thursday with any changes.

Your notice is scheduled to run per your request and will publish unless you reply to this email before the deadline above requesting changes or to cancel.

Our invoicing is done on a monthly basis. You will receive an invoice for this ad after the close of the month.

All orders are subject to a non-refundable 3.99% service fee. As an incentive for customers, we provide a discount off the order cost equal to the 3.99% service fee if you pay by ACH. Pay by ACH and Save! Final order cost provided at time of payment and via a receipt.

Order Confirmation
Not an Invoice

Account Number:	1578963
Customer Name:	Upper Minnesota River Watershed District
Customer Address:	Upper Minnesota River Watershed District 211 2Nd ST SE Ortonville MN 56278-1537
Contact Name:	Amber Doschadis
Contact Phone:	
Contact Email:	amber@umrwd.org
PO Number:	

Date:	01/12/2026
Order Number:	11995918
Prepayment Amount:	\$ 0.00

Column Count:	1.0000
Line Count:	214.0000
Height in Inches:	23.5600

Print

Product	#Insertions	Start - End	Category
WAT The Public Opinion	1	01/20/2026 - 01/20/2026	Public Notices
WAT thepublicopinion.com	1	01/20/2026 - 01/20/2026	Public Notices

As an incentive for customers, we provide a discount off the total order cost equal to the 3.99% service fee if you pay with Cash/Check/ACH. Pay by Cash/Check/ACH and save!

Total Cash Order Confirmation Amount Due	\$69.20
Tax Amount	\$0.00
Service Fee 3.99%	\$2.76
Cash/Check/ACH Discount	-\$2.76
Payment Amount by Cash/Check/ACH	\$69.20
Payment Amount by Credit Card	\$71.96

Order Confirmation Amount
\$69.20

Rodriguez, Rachel

From: Rodriguez, Rachel
Sent: Monday, January 12, 2026 9:48 AM
To: legals@thepublicopinion.com
Subject: FC34A-3 Upper Minn River Watershed Dist - Public Notice
Attachments: FC34A-3 public.short_final.docx; FORM8.FRM.doc

Attached is a notice to be published on January 20, 2026.

Upper Minnesota River Watershed District, c/o Amber Doschadis, 211 2nd Street SE, Ortonville MN 56278, 320-839-3411, Amber@umrwd.org has been notified to contact you to authorize publication and arrange for payment.

Please send the affidavit or return the attached Proof of Publication form ASAP to the Water Rights Program, 523 E Capitol Ave, Pierre SD 57501.

Let me know if you have questions. Please confirm receipt of this email.

Thank you,

Rachel Rodriguez
DANR | Program Assistant
Rachel.Rodriguez@state.sd.us



Rodriguez, Rachel

From: Rodriguez, Rachel
Sent: Monday, January 12, 2026 9:46 AM
To: news@sissetoncourier.com
Subject: FC34A-3 Upper Minn River Watershed Dist - Public Notice
Attachments: FC34A-3 public.short_final.docx; FORM8.FRM.doc

Attached is a notice to be published on January 20, 2026.

Upper Minnesota River Watershed District, c/o Amber Doschadis, 211 2nd Street SE, Ortonville MN 56278, 320-839-3411 has been notified to contact you to authorize publication and arrange for payment.

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Let me know if you have questions. Please confirm receipt of this email.

Thank you,

Rachel Rodriguez
DANR | Program Assistant
Rachel.Rodriguez@state.sd.us



Affidavit of Publication

STATE OF SOUTH DAKOTA
County of Roberts

} ss.

Kevin H. Deutsch of said county, being first duly sworn, on oath says, that he is Editor of THE SISSETON COURIER, a weekly newspaper printed and published in Sisseton, in said county of Roberts, and has full and personal knowledge of all the facts herein stated; that said newspaper is a legal newspaper and has a bonafide circulation of at least two hundred copies weekly, and has been published within said county for 52 successive weeks next prior to the publication of the notice herein mentioned, and was and is printed wholly or in part in an office maintained at said place of publication; that the Notice of Notice Of Application NO. FC34A-3 To Modify, a printed copy of which, taken from the paper in which the same was published, is attached to this sheet, and is made a part of this affidavit, was published in said newspaper at least once in each week for one successive weeks, on the day of each week on which said newspaper was regularly published, to-wit:

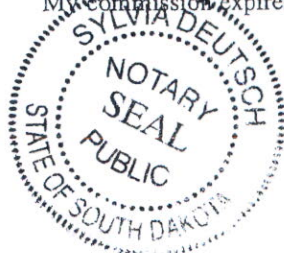
Jan. 20, 2026 ; _____, _____;
_____, _____, _____;
_____, _____, _____;
_____, _____, _____;
_____, _____, _____;

that the full amount of the fee is charged for publication of said Notice insures to the benefit of the publisher of said newspaper; that no agreement or understanding for the division there has been made with any other person, and that no part thereof has been agreed to be paid to any person whomsoever and that the fees charged for the publication there of are \$46.36

Subscribed and sworn to before me this 20th day of

January, A.D., 2026

Notary Public, Roberts County, South Dakota
My commission expires February 3, 2028



NOTICE OF APPLICATION NO. FC34A-3 to MODIFY FLOOD CONTROL LICENSE NO. FC34-3

Notice is given that Upper Minnesota River Watershed District, 211 2nd Street SE, Ortonville MN 56278, has filed an application for a water permit to modify an existing flood control project authorized by Flood Control License No. FC34-3 to increase fish migration through the project. Flood Control License No. FC34-3 protects the City of Browns Valley, Minnesota from the 100-year flood event on the Little Minnesota River by conveying flood waters around the city by means of an inlet channel, diversion dam, and floodway. The diversion dam (with no permanent storage) placed across the Little Minnesota River, in the SW 1/4 SE 1/4, Section 31, T125N-R49W, has a concrete box culvert installed through the diversion dam allowing flow to remain in the Little Minnesota River main channel while flood flows exceeding the box culvert capacity overtop a weir structure (crest elevation of 985.14 feet mean sea level [fmsl]) (NAVD 1988) entering the floodway. This application proposes to modify the existing structures for better fish passage. The proposed modifications include lowering the existing sheet pile weir (current controlling section), excavating the inlet to the diversion channel, and installing rock arch rapids downstream of the modified controlling section. The proposed design includes a low flow channel which will be 2 feet wide with an invert elevation of 980.4 fmsl (NAVD 1988), which will increase the frequency that the diversion channel can be utilized by fish. This site is located approximately ten miles southeast of Sisseton SD.

Pursuant to SDCL 46-2A-2, the Acting Chief Engineer recommends APPROVAL of Application No. FC34A-3 with qualifications because 1) the project will not increase the likelihood or severity of flood damages, 2) the project will not endanger human life or property, 3) the project will not impair existing water rights, 4) the District has acquired property or the necessary easements, and 5) it is in the public interest to provide flood control for the City of Browns Valley while improving fish passage through the project. The Acting Chief Engineer's recommendation with qualifications, the application, and staff report are available at <https://danr.sd.gov/public> or contact Ron Duvall for this information, or other information, at the Water Rights Program address provided below.

Any person interested in opposing this application or recommendation shall allege that the application, upon approval, will cause injury to the person that is unique from any in-

jury suffered by the public in general. The injury must concern a matter either within the regulatory authority found in SDCL 46-2A-9 for approval or denial of the application, or other matter concerning the application within the regulatory authority of the board to act upon as defined by SDCL 46-2-9 and 46-2-11, or both. Any person meeting the petitioner requirements and wishing to be a party of record in a contested case hearing shall file a written petition to oppose the application with BOTH the applicant and Acting Chief Engineer. A petition opposing the application shall be filed on a form provided by the Acting Chief Engineer. The petition form is available online at <https://danr.sd.gov/public> or by contacting the Acting Chief Engineer. The Acting Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501" or call (605) 773-3352. The applicant's mailing address is given above. If contesting the Acting Chief Engineer's recommendation, the applicant shall also file a petition. A petition filed by either an interested person or the applicant must be filed by January 30, 2026.

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Published once at the total approximate cost of \$46.36 and may be viewed free of charge at www.sdpublicnotices.com.

LOCALiQ

Aberdeen News
Watertown Public Opinion

PO Box 630567 Cincinnati, OH 45263-0567

AFFIDAVIT OF PUBLICATION

Water Rights Program
Water Rights Program
523 E Capitol Ave
Pierre SD 57501

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JAN 26 2026

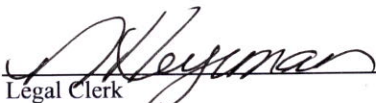
OFFICE OF
WATER

STATE OF SOUTH DAKOTA, COUNTY OF CODINGTON

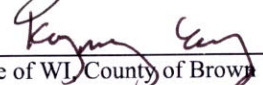
The Watertown Public Opinion is, and during all the times hereafter mentioned was, a daily legal newspaper as defined in SDCL 17-2-2.1 through 17-2-2.4, as amended, published at Watertown, Codington County, South Dakota, by Watertown Public Opinion; that the notice, order or advertisement, a printed copy of which is attached, was published in said newspaper in the issue dated:

01/20/2026

and that the fees charged are legal.
Sworn to and subscribed before on 01/20/2026



Legal Clerk



Notary, State of WI, County of Brown

9-3-28

My commission expires

Publication Cost:	\$69.20	
Tax Amount:	\$0.00	
Payment Cost:	\$69.20	
Order No:	11995918	# of Copies:
Customer No:	1578963	1
PO #:		

THIS IS NOT AN INVOICE!

Please do not use this form for payment remittance.

KONGMENG YANG
Notary Public
State of Wisconsin

RECEIVED

IAN 26 2026

OFFICE OF
WATER

NOTICE OF APPLICATION
NO. FC34A-3 to MODIFY
FLOOD CONTROL LICENSE
NO. FC34-3

Notice is given that Upper Minnesota River Watershed District, 211 2nd Street SE, Ortonville MN 56278, has filed an application for a water permit to modify an existing flood control project authorized by Flood Control License No. FC34-3 to increase fish migration through the project. Flood Control License No. FC34-3 protects the City of Browns Valley, Minnesota from the 100-year flood event on the Little Minnesota River by conveying flood waters around the city by means of an inlet channel, diversion dam, and floodway. The diversion dam (with no permanent storage) placed across the Little Minnesota River, in the SW 1/4 SE 1/4, Section 31, T125N-R49W, has a concrete box culvert installed through the diversion dam allowing flow to remain in the Little Minnesota River main channel while flood flows exceeding the box culvert capacity overtop a weir structure (crest elevation of 985.14 feet mean sea level [fmsl]) (NAVD 1988) entering the floodway. This application proposes to modify the existing structures for better fish passage. The proposed modifications include lowering the existing sheet pile weir (current controlling section), excavating the inlet to the diversion channel, and installing rock arch rapids downstream of the modified controlling section. The proposed design includes a low flow channel which will be 2 feet wide with an invert elevation of 980.4 fmsl (NAVD 1988), which will increase the frequency that the diversion channel can be utilized by fish. This site is located approximately ten miles southeast of Sisseton SD.

Pursuant to SDCL 46-2A-2, the Acting Chief Engineer recommends APPROVAL of Application No. FC34A-3 with qualifications because 1) the project will not increase the likelihood or severity of flood damages, 2) the project will not endanger human life or property, 3) the project will not impair existing water rights, 4) the District has acquired property or the necessary easements, and 5) it is in the public interest to provide flood control for the City of Browns Valley while improving fish passage through the project. The Acting Chief Engineer's recommendation with qualifications, the application, and staff report are available at <https://danr.sd.gov/public> or contact Ron Duvall for this information, or other information, at the Water Rights Program address provided below.

RECEIVED

JAN 26 2026

OFFICE OF
WATER

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RECEIVED

JAN 26 2026

OFFICE OF
WATER

Rodriguez, Rachel

From: Rodriguez, Rachel
Sent: Monday, January 12, 2026 1:41 PM
To: amber@umrwd.org
Subject: FC34A-3 Upper Minn River Watershed Dist - Public Notice
Attachments: FC34A-3 Rec.pdf; FC34A-3 Ltr.pdf; FC34A-3 Rec.pdf; Watertown Info.pdf

Good afternoon,

Attached is a copy of the report, chief engineer's recommendation, and information regarding the public notice for your water permit application. As stated in the letter, please contact the paper(s) as soon as possible to authorize publication and arrange for payment. This information is also being mailed to you today.

Let me know if you have questions. Please confirm receipt of this email.

Thank you,

Rachel Rodriguez
DANR | Program Assistant
Rachel.Rodriguez@state.sd.us





**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

MAR 02 2026

Upper Minnesota River Watershed District
c/o Amber Doschadis
211 2nd Street SE
Ortonville MN 56278

Dear Ms. Doschadis:

Enclosed is Flood Control Permit No. FC34A-3 as approved by the Water Management Board. If you have any questions pertaining to the permit, please contact our office.

Sincerely,

Adam Mathiowetz, PE
Acting Chief Engineer
Water Rights Program

enclosure



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

**Affidavit of Public Notice
Posting on DANR Website**

Pursuant to SDCL § 46-2A-4, public notice of the following application was posted on the DANR web site at <https://danr.sd.gov/public>. The posted public notice is the same notice as published in the pertinent newspaper(s) and a copy of the public notice is maintained in the application file. If the application is contested, the posting is moved to the DANR contested case website at <https://danr.sd.gov/public/ContestedCase.aspx> until final action is taken on the application pursuant to SDCL § 46-2A-4.

Application No.: FC34A-3

Name of Applicant: Upper Minnesota River Watershed District, Amber Doschadis

Date of Posting: 1/20/2026

Date of Removal: 3/2/2026


Amanda Dewell, Permitting Administrator

3/2/2026

Date

Subscribed and sworn to before me, a notary public, this 2nd day of Mar, 2026.


Notary Public - South Dakota
My commission expires: **Rachel Rodriguez**
My Commission Expires
May 16, 2029

(SEAL)

