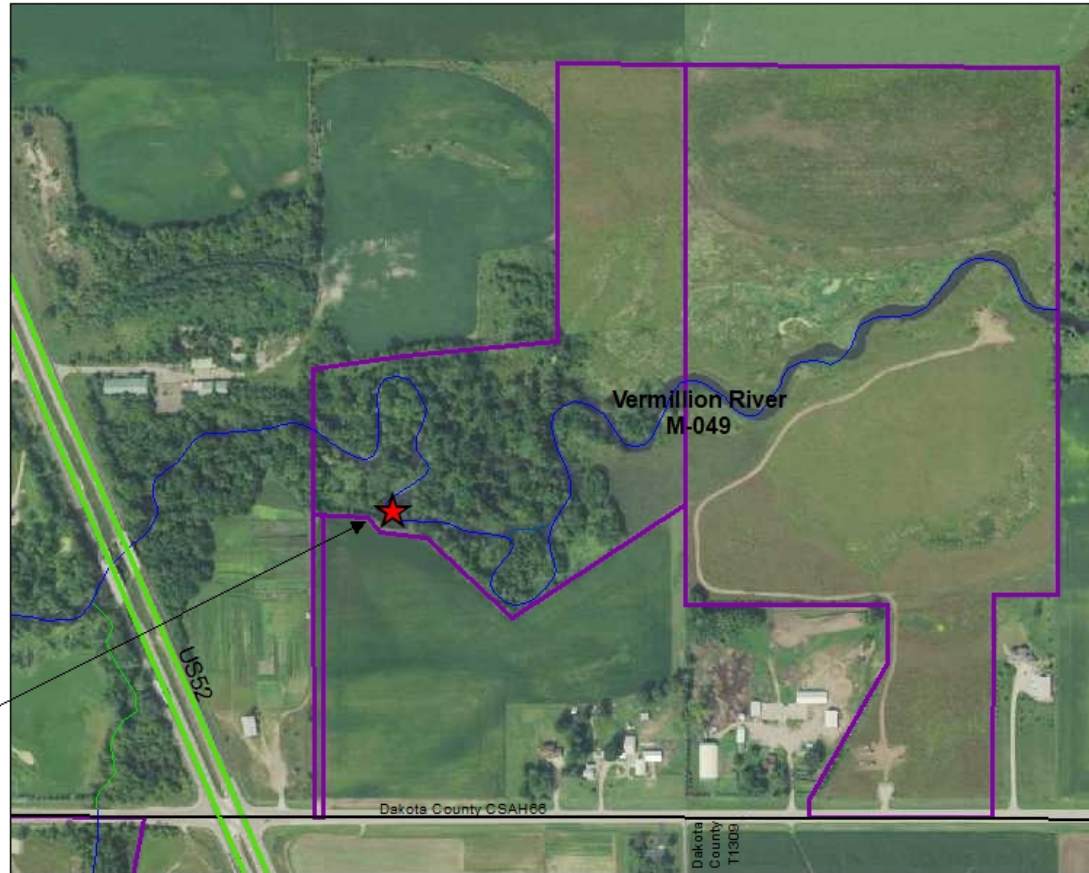
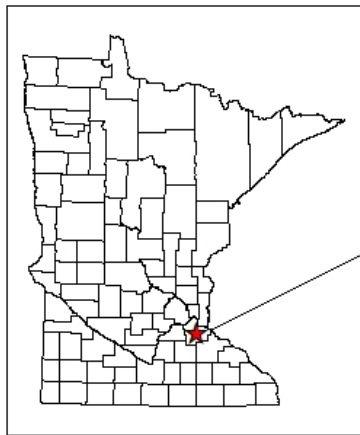


Vermillion River AMA
(Petrofske Parcel)
Dakota County, Minnesota
TWP 114N, R 18W, S 20
2019 Bank Stabilization
Project Location



Plan: Location Map



Symbol Legend

-  Vermillion River State Aquatic Management Area
-  Project Location

Figure 1. County map showing the project location.

Vermillion River AMA
(Petrofske Parcel)
Dakota County, Minnesota
TWP 114N, R 18W, S 20
2020 Bank Stabilization
U.S. Geological Survey
(7.5 Minute Quadrangle)

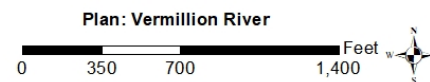
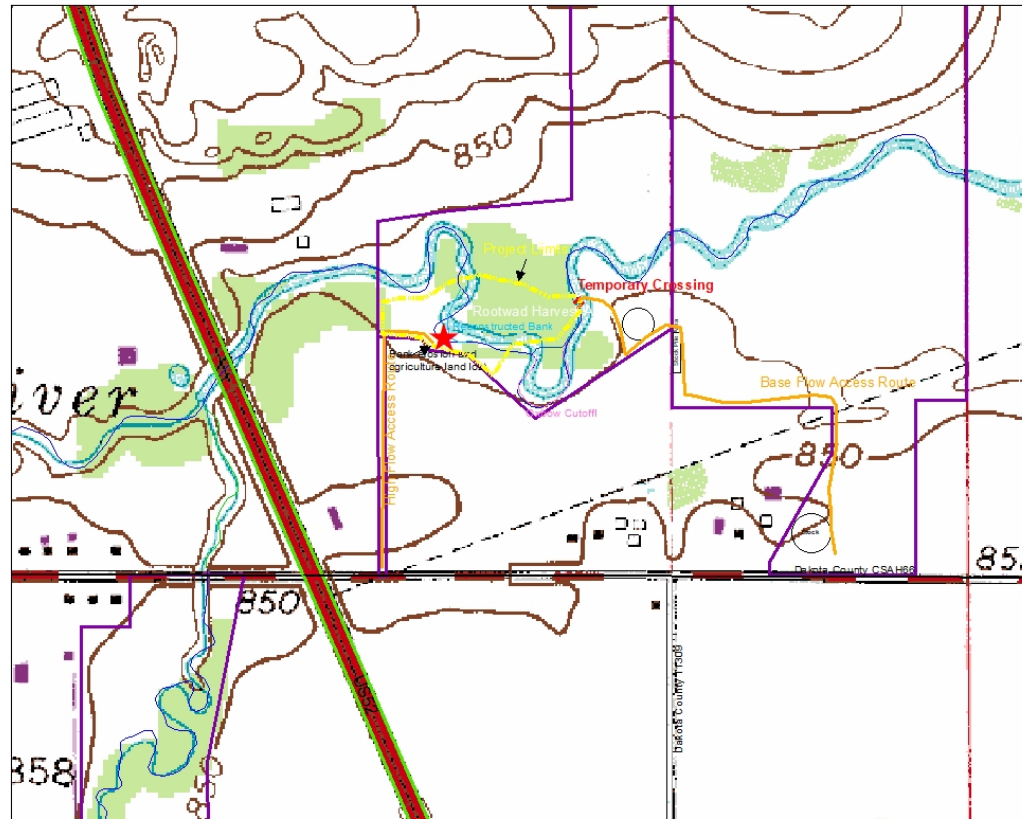
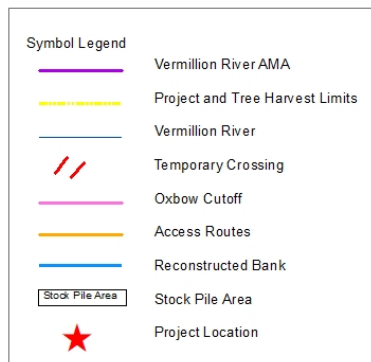
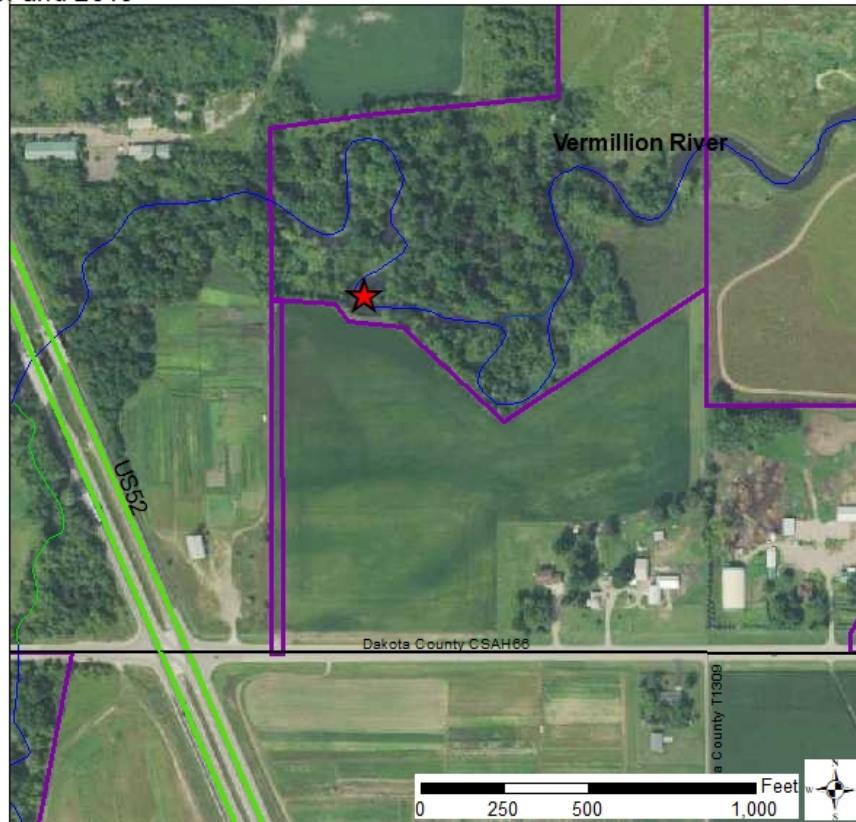
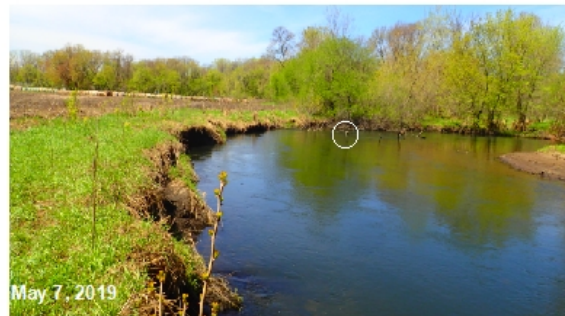


Figure 2. U.S. Geological Survey 7.5 Minute, 1:24,000 scale map indicating project boundaries.

Vermillion River AMA: Dakota County, Minnesota TWP 114N, R 18W, S 20,
2020 Bank Stabilization
Project Site Images from 2012, 2013, and 2019



Symbol Legend

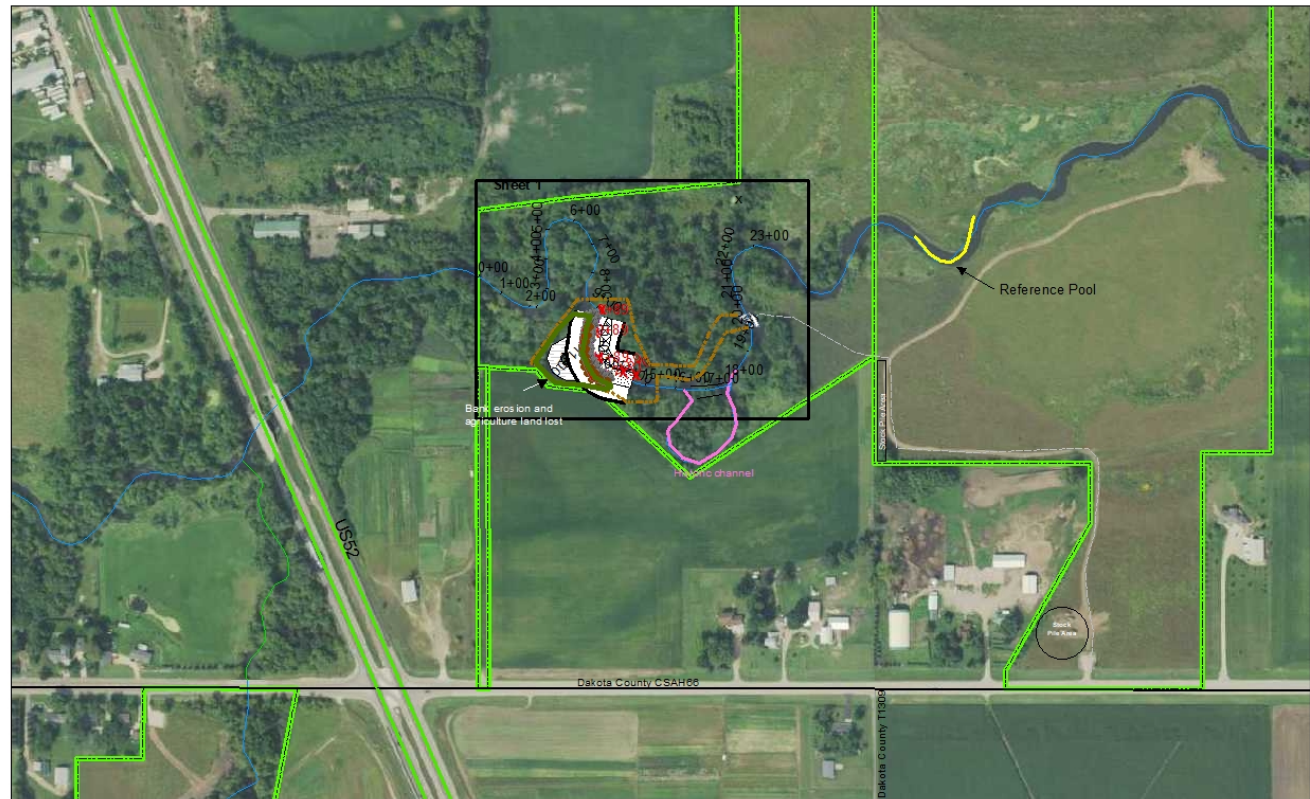
- Vermillion River State Aquatic Management Area
- ★ Project Location

Figure 3. Project site images from 2012, 2013, and 2019.

Vermillion River AMA
(Petrofske Parcel)
Dakota County, Minnesota
TWP 114N, R 18W, S 20
2019 Bank Stabilization
Sheet 1

Project Overview

Symbol Legend	
	Vermillion River AMA
	Project Limits and Tree Harvest
	Vermillion River
	Historic Channel
	Access
	Proposed Channel
	Stock Pile Area
	Plug, Grade and Seeding
	Existing Riffle
	Grading/Seeding
	Bankfull Bench
	Sill
	Access Riffle
	Rootwad
	Reference Pool



Plan: Vermillion River Petrofske Parcel: Plan Existing Condition



Figure 4. Project Overview with reference pool.

Vermillion River AMA
(Petrofske Parcel)
Dakota County, Minnesota
TWP 114N, R 18W, S 20
2019 Bank Stabilization
Sheet 1

Project Overview

Symbol Legend

- Vermillion River AMA
- Project Limits and Tree Harvest
- Vermillion River
- Historic Channel
- Access
- Proposed Channel
- Stock Pile Area
- Plug, Grade and Seeding
- Existing Riffle
- Grading/Seeding
- Bankfull Bench
- Sill
- Access Riffle
- Rootwad

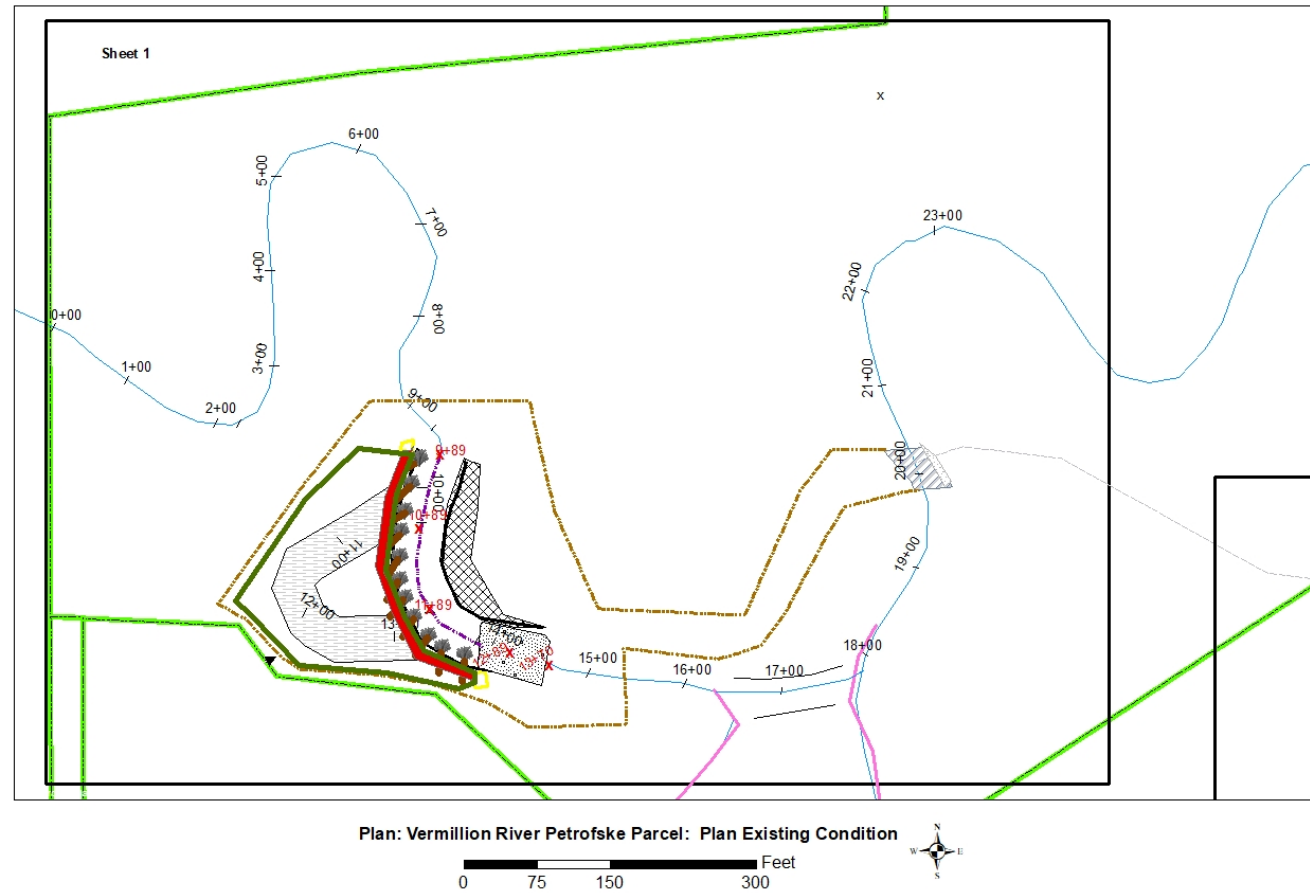


Figure 5. Project Overview.

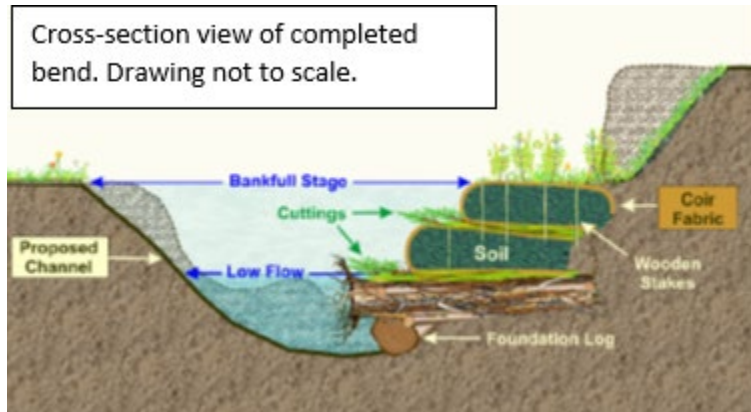


Figure 6. Typical wood bank stabilization.

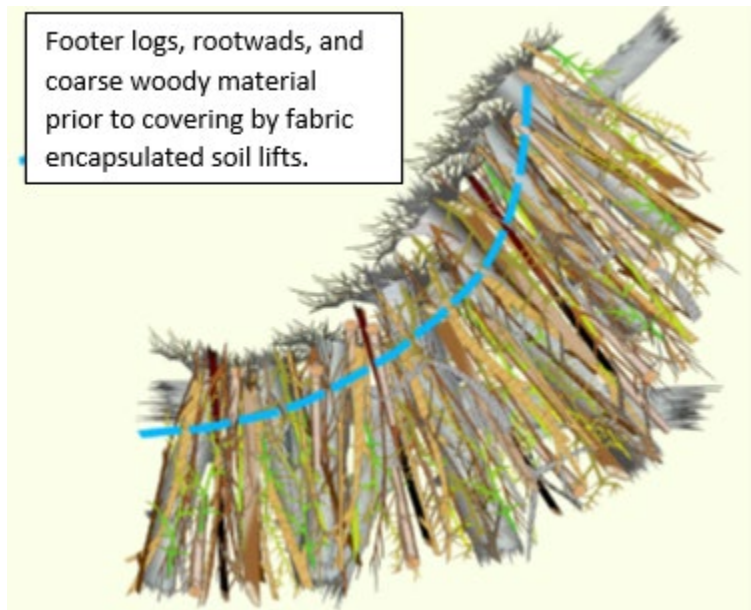


Figure 7. Footer logs, rootwads, and coarse woody material prior to covering by fabric encapsulated soil lifts.



Figure 8. Toewood bank stabilization with encapsulated soil lift.

Encapsulated soil lift installation details

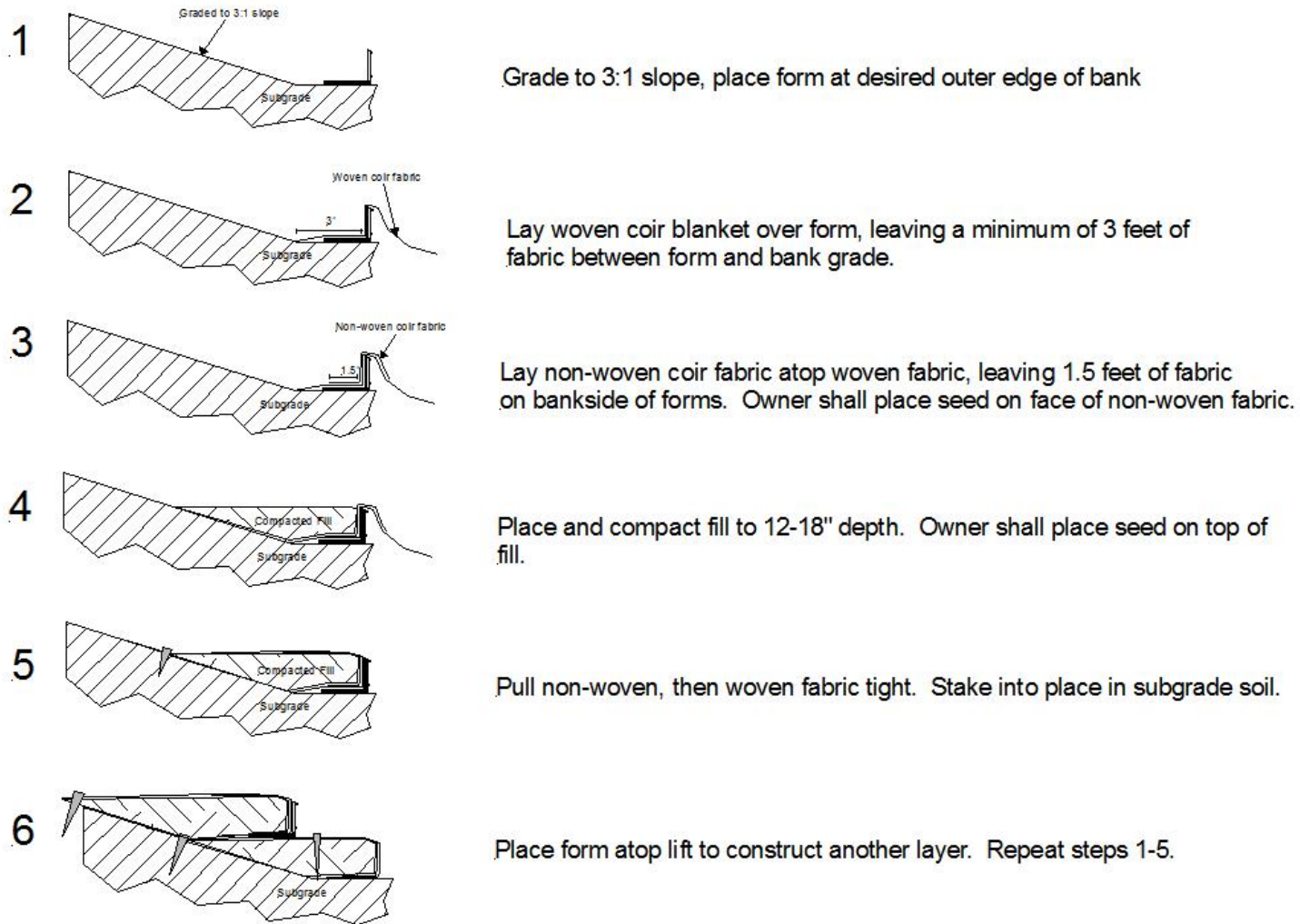
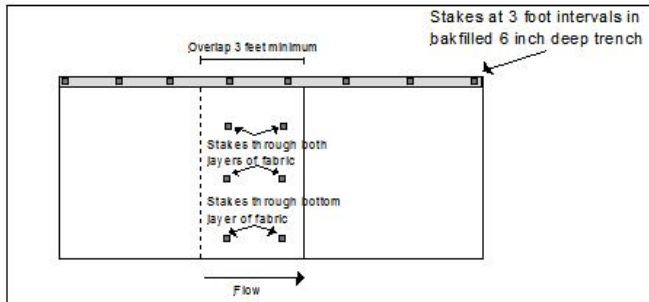
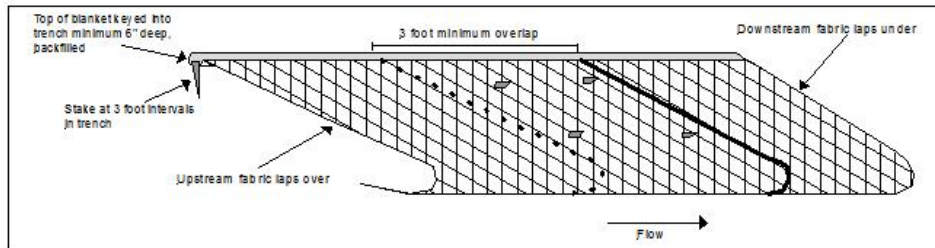
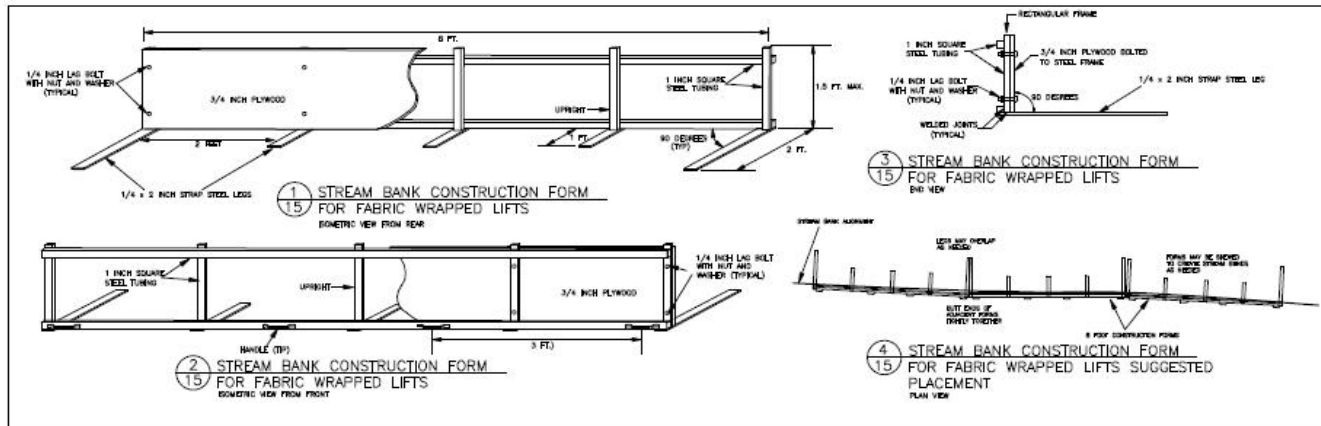


Figure 9. Encapsulated soil lift installation details.

Encapsulated soil lifts installation details



General Notes on Encapsulated Soil Lifts

- 1) A minimum of 3 forms must be used during installation, but a greater number will speed construction.
- 2) Holes for stakes should not be cut. Drive stakes breaking the minimum number of strands, leaving 2-3 inches of top of stake exposed.
- 3) Forms may be angled to create bends. Angle shall not exceed 15 degrees. Fold fabric in a downstream direction at angles. Do not cut fabric to create bends.
- 4) Pieces of fabric can be joined as in drawings, overlapping in an upstream to downstream direction 3 feet minimum, staking as shown in drawings.

Figure 10. Encapsulated soil lift installation details continued.

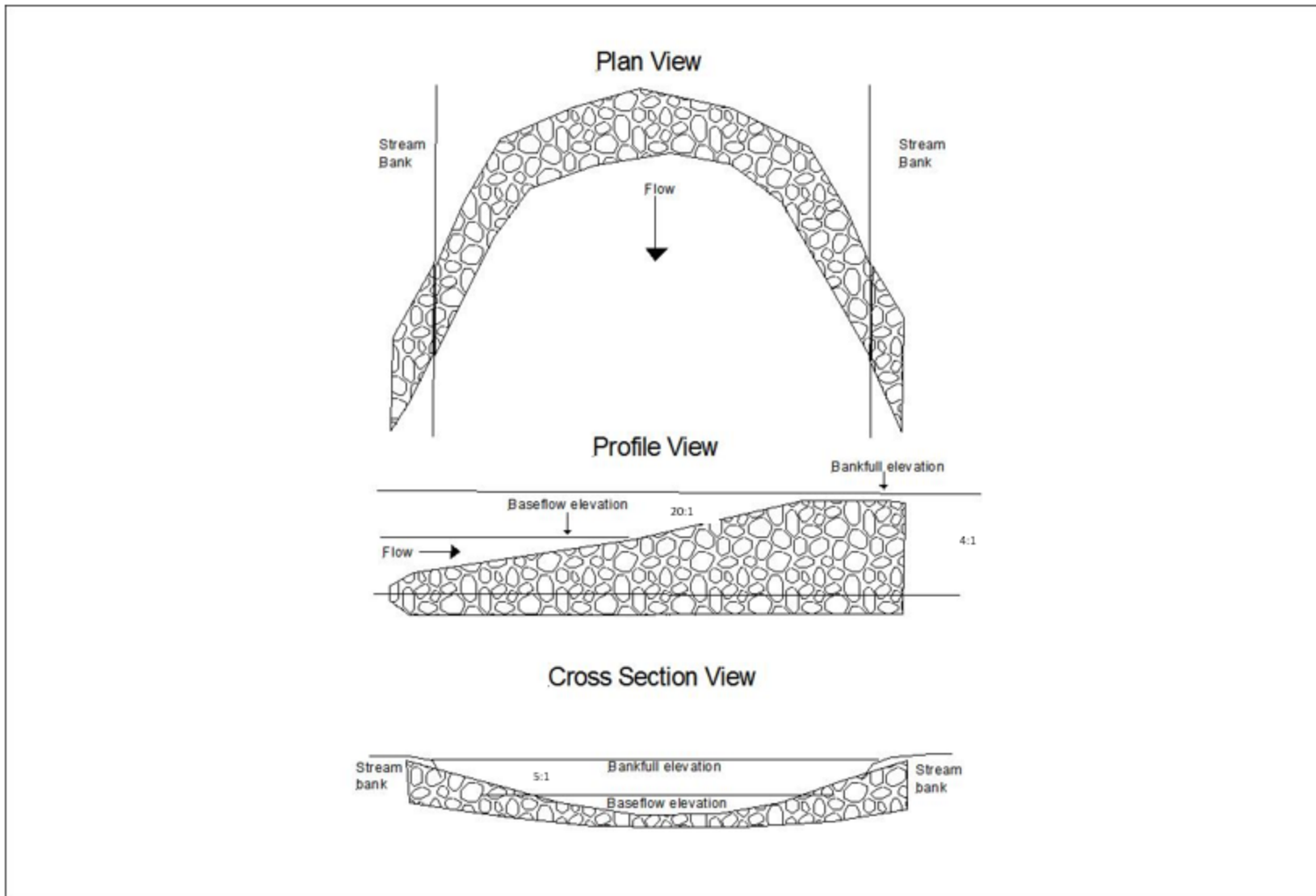


Figure 11. Typical constructed riffle.

Vermillion River AMA

(Petrofske Parcel)

Dakota County, Minnesota

TWP 114N, R 18W, S 20

2020 Bank Stabilization

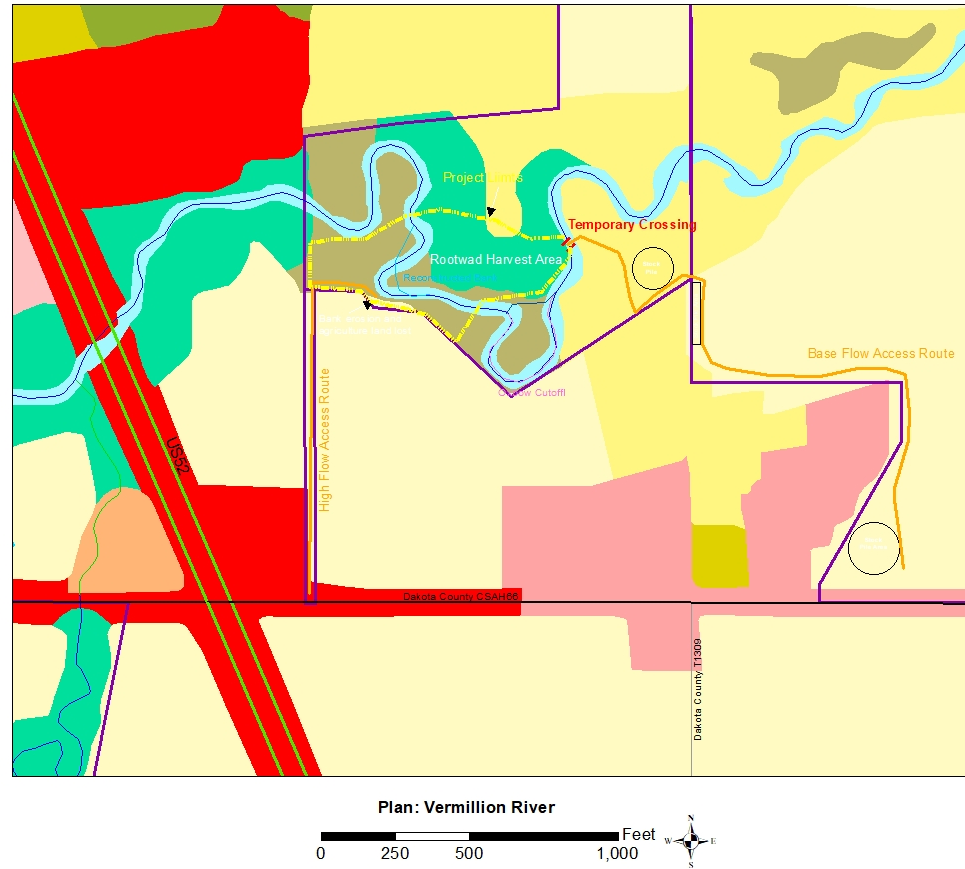
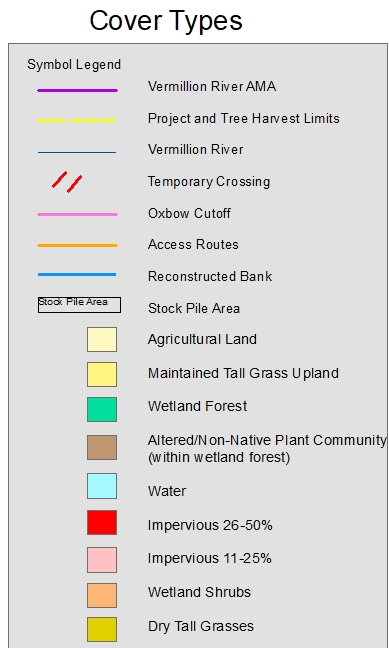


Figure 12. Land cover types within and surrounding the project area.

Vermillion River AMA

(Petrofske Parcel)

Dakota County, Minnesota

TWP 114N, R 18W, S 20

2020 Bank Stabilization

Generalized Land Use 2016

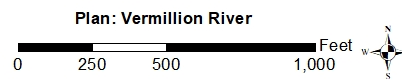
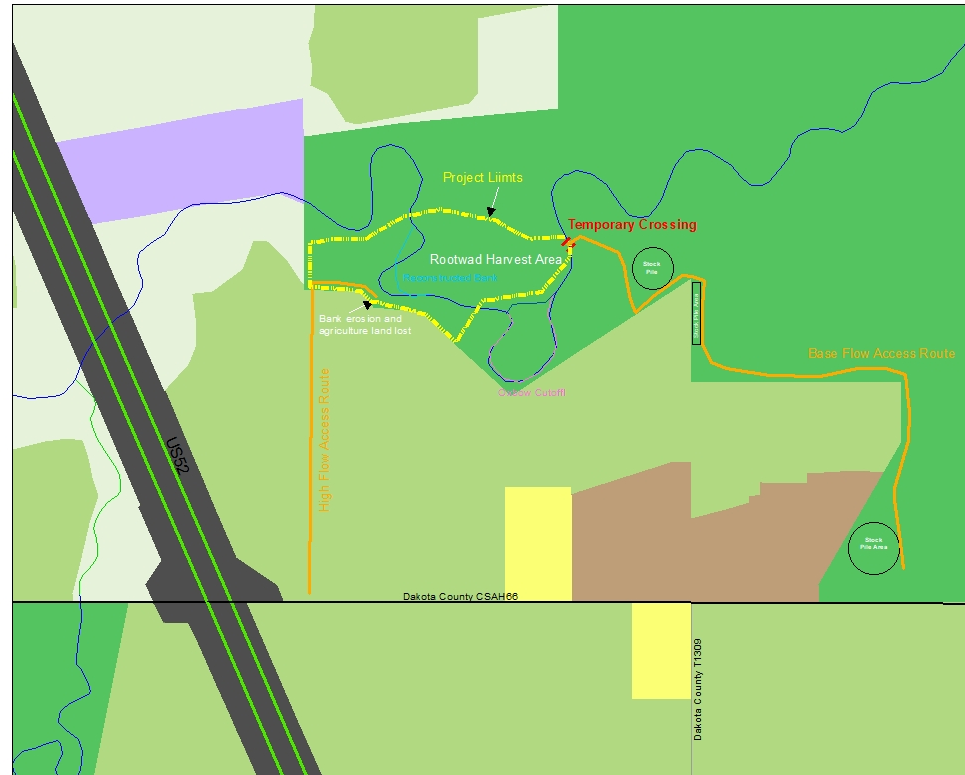
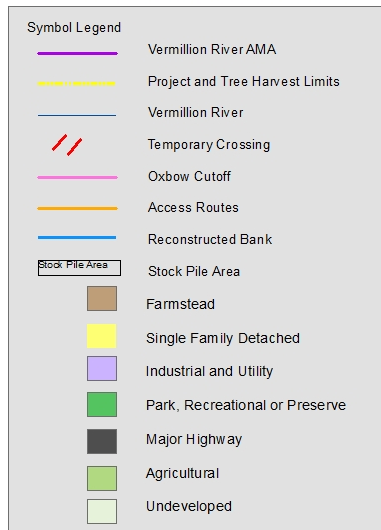


Figure 13. Generalized land use surrounding the project area.

Vermillion River AMA

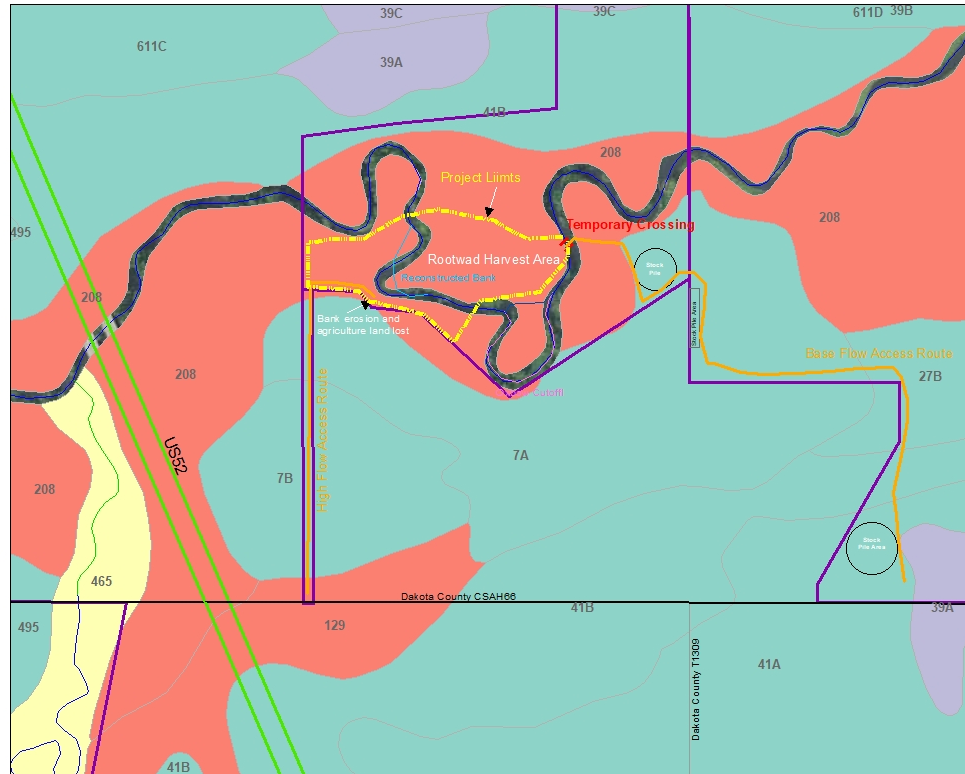
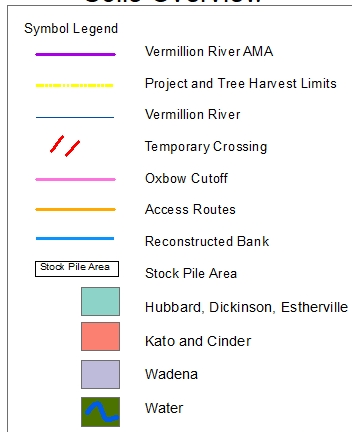
(Petrofske Parcel)

Dakota County, Minnesota

TWP 114N, R 18W, S 20

2020 Bank Stabilization

Soils Overview



Unit Symbol	Map Unit Name	Acres in Area of Interest	% of Area of Interest
7A	Hubbard loamy sand, 0-1% slopes	0.9	13.3%
7B	Hubbard loamy sand, 1-6% slopes	0.3	4.6%
27B	Dickinson sandy loam, 2-6% slopes	0.2	2.5%
39A	Wadena loam, 0-2% slopes	0	0.1%
41A	Estherville sandy loam, 0-2% slopes	0.1	1.8%
41B	Estherville sandy loam, 2-6% slopes	0.1	0.8%
129	Cinder loam, 2-6% slopes	0	0.2%
208	Kato silty clay loam	4.6	67.0%
W	Water	0.7	9.6%
Total		6.8	100.0%

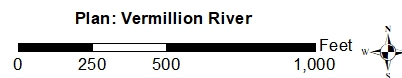







Figure 14. Soils map units for the project area from the Web Soil Survey.

Vermillion River AMA
(Petrofske Parcel)
Dakota County, Minnesota
TWP 114N, R 18W, S 20
2020 Bank Stabilization
Minnesota Public Waters Delineations

Symbol Legend	
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	Project and Tree Harvest Limits
	Access Routes
	Vermillion River
	Protected Tributary to a Designated Trout Stream

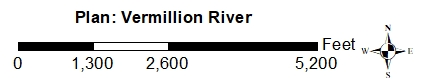
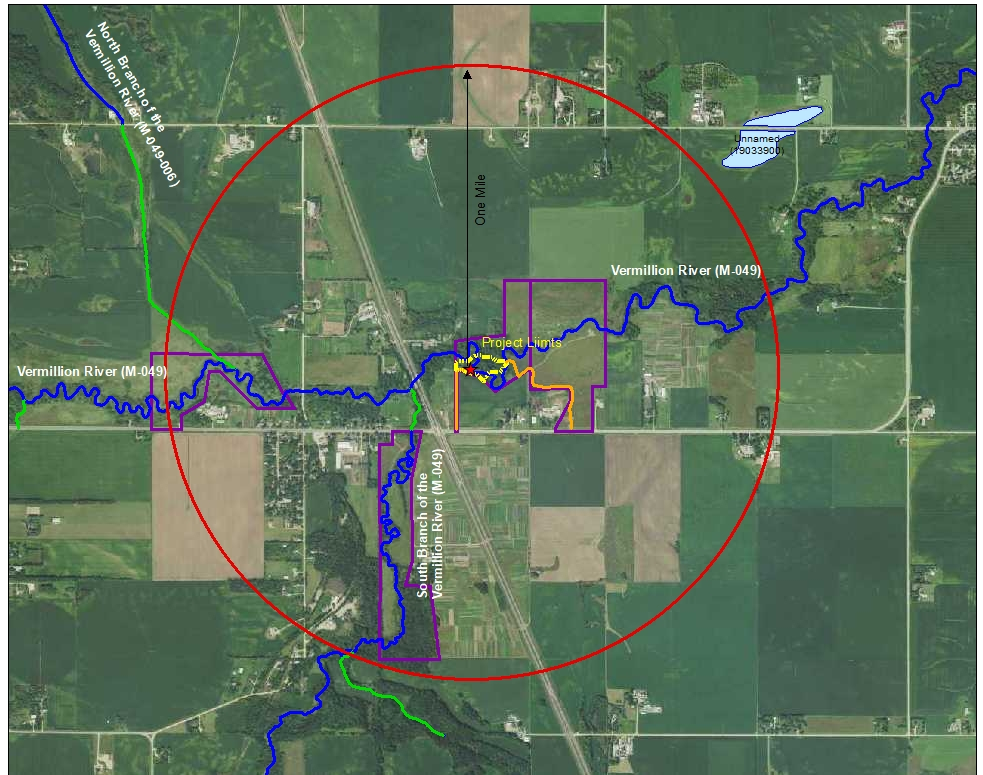


Figure 15. Public water inventory surrounding the project site.

Vermillion River AMA
(Petrofske Parcel)
Dakota County, Minnesota
TWP 114N, R 18W, S 20
2020 Bank Stabilization
FEMA Floodzones

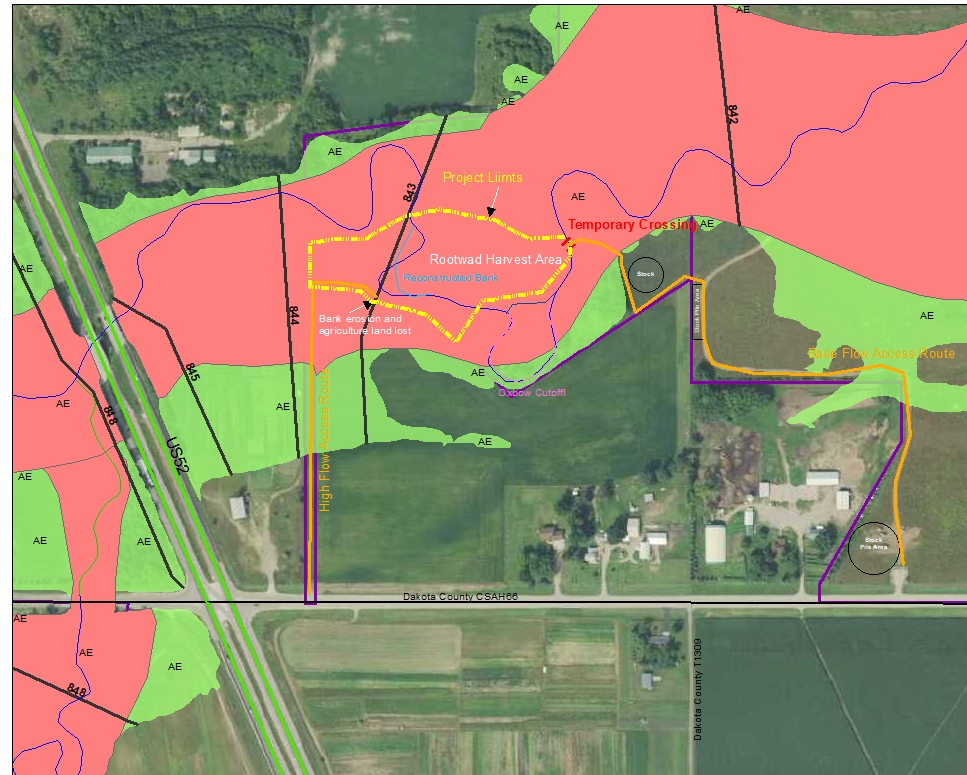
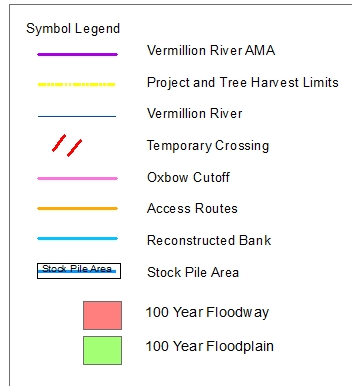


Figure 16. FEMA floodzones for the project area.

Vermillion River AMA
(Petrofske Parcel)
Bank Stabilization
Dakota County, Minnesota
TWP 114N, R 18W, S 20
2020 Bank Stabilization

MDH
Well Index

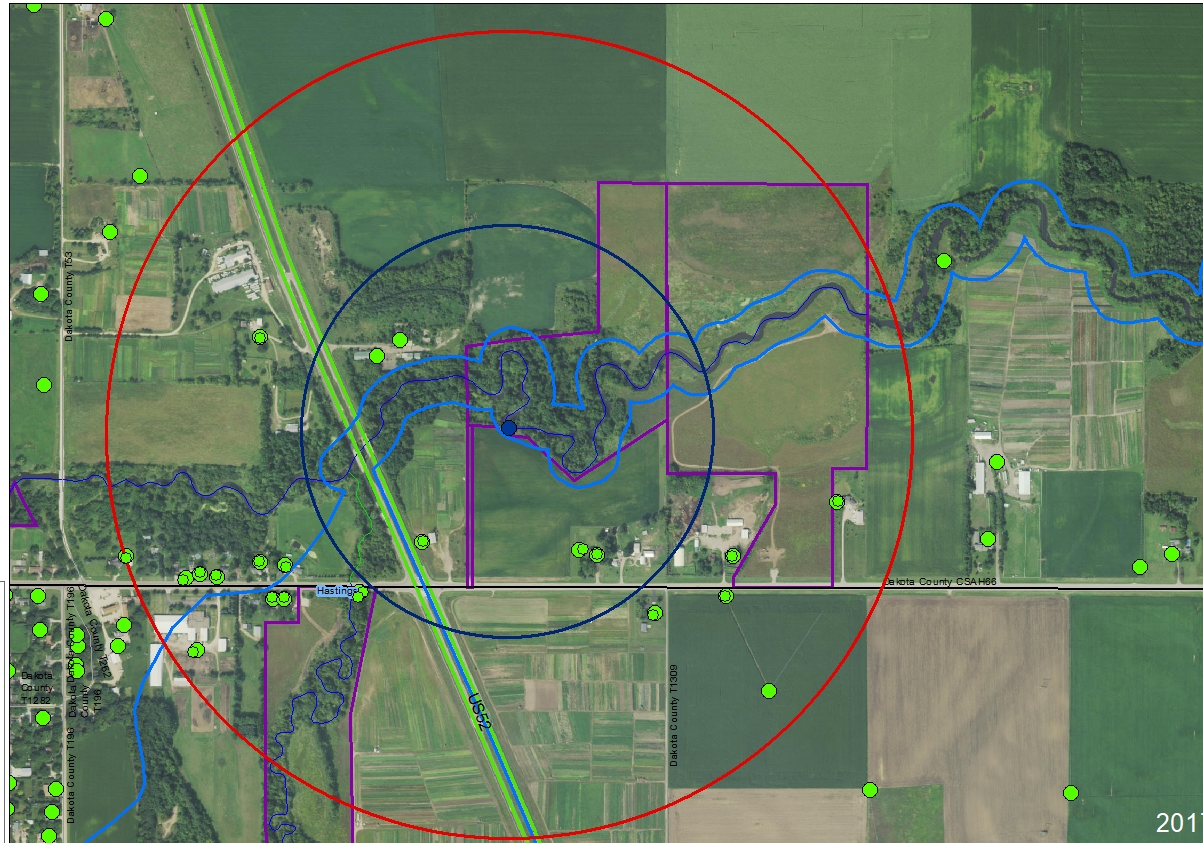
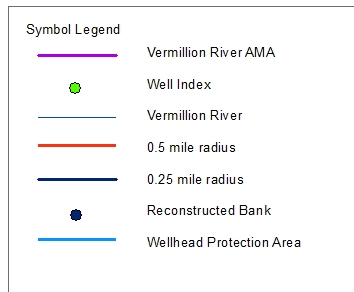


Figure 17. Minnesota Department of Health well index for the project area.

Vermillion River AMA
(Petrofske Parcel)
Dakota County, Minnesota
TWP 114N, R 18W, S 20
2020 Bank Stabilization
National Wetland Inventory
Cowardin Classification

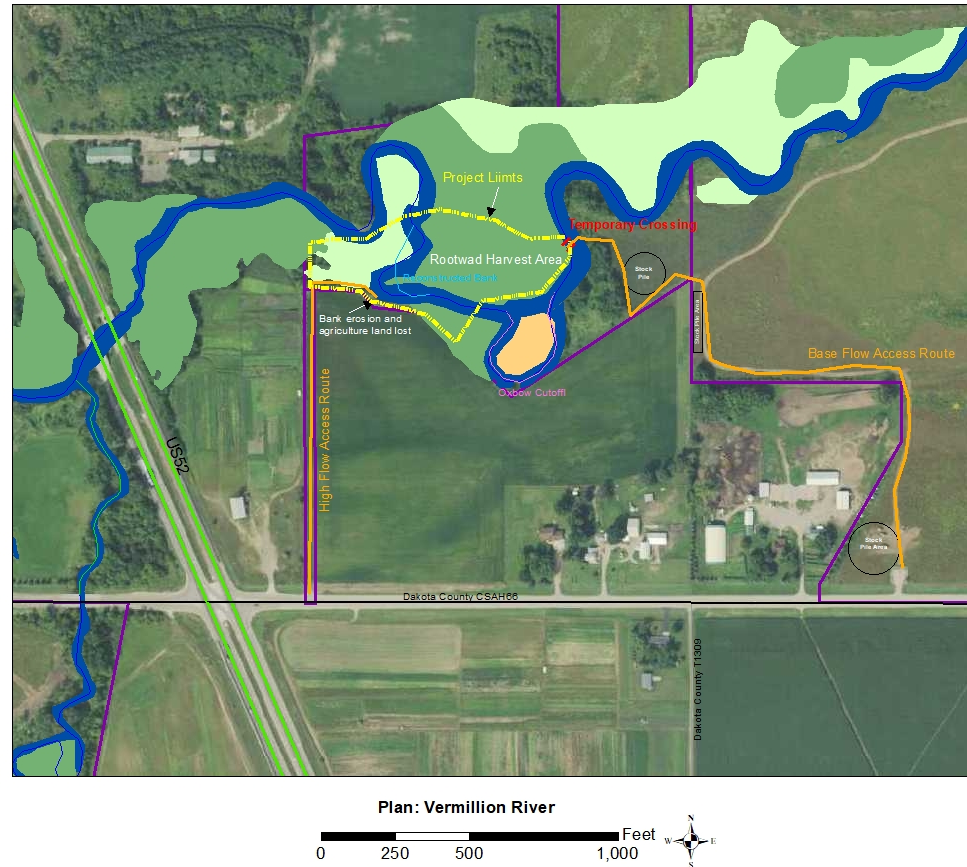
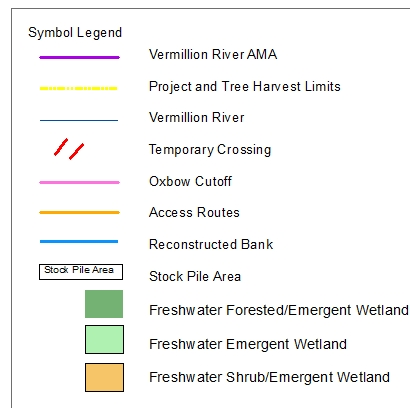


Figure 18. National wetland inventory utilizing the Cowardin classification for the project area.

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United States Fish and Wildlife Service (USFWS) 2015. Northern Long-eared bat *Myotis spetntrionalis*. U.S. Fish and Wildlife Service Midwest Region, Bloomington, MN 55437-1458. 2pp.

Web Soil Survey. 2019. Retrieved from United States Department of Agriculture Natural Resources Conservation Service, <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>