



LOWER MINNESOTA RIVER WATERSHED DISTRICT

Executive Summary for Action

Lower Minnesota River Watershed District Board of Managers Meeting

Wednesday, August 18, 2021

Agenda Item

Item 6. B. - Burnsville Ravine Stabilization Cost Share

Prepared By

Linda Loomis, Administrator

Summary

At the July Board meeting, the Board was informed that the City of Burnsville has asked the LMRWD to consider financial contribution to the cost of a ravine stabilization project. The project is located in the Black Dog WMO near Glenview Drive and is approximately 300 feet upstream of the LMRWD.

The City has not requested a specific dollar amount for a contribution. Staff reviewed the project to determine the value this project might have for the LMRWD. Young Environmental prepared a technical memorandum, which is attached, for the Board to consider. Funds for this project could come from the CIP fund. Funds were collected on several projects that either were not done or had excess funds once the project was complete. Once a dollars amount has been determined, the Board will have the opportunity to approve the recommended contribution and a cooperative agreement between the LMRWD and the City will need to be prepared and executed. Jen Desrude, City Engineer, will be at the meeting to answer any questions the Board may have.

Attachments

Technical Memorandum dated August 13, 2021 - Burnsville 2021 Slope Project - Funding Request Review

[Current pictures of site](#)

Recommended Action

Motion to authorize LMRWD staff to continue to coordinate with the City to better understands the financial needs associated with the project.

Technical Memorandum

To: Linda Loomis, Administrator
Lower Minnesota River Watershed District

From: Katy Thompson, PE, CFM
Della Schall Young, CPESC, PMP

Date: August 13, 2021

Re: Burnsville 2021 Slope Project—Funding Request Review

In 2018, the City of Burnsville (City) performed a slope stability analysis as part of its asset management program. This analysis identified and estimated the risk of unstable slopes on public and private properties within the City's political boundaries. In its first phase, the analysis involved the development of a slope vulnerability model, followed by a second phase of field verifications to develop recommendations for slope mitigation, further study, or no further action. The City's analysis was similar to the Lower Minnesota River Watershed District (LMRWD) *2021 Gully Inventory and Condition Assessment*, which also relied on desktop methods to identify potential gullies and conduct field surveys to verify their condition. The City has many steep ravines in various states of erosion and the slope stability analysis was used to target which ravines are most in need of maintenance. The City funds its repairs through a biannual Ravine Restoration and Slope Stabilization project included in its annual budget. In 2019, four slopes were stabilized. For 2021, one site, located in a large gully behind 3104 Glenview Drive (see attached memo from WSB and Figure 1), has been selected for repair in the fall of 2021. The severity of the erosion is threatening the home at 3104 Glenview Drive and a 72-inch storm sewer parallel to the ravine. The ravine itself flows under County Road 34 (Williams Drive) and enters the LMRWD, where it eventually discharges into the Minnesota River.

The project location is within the Black Dog Watershed Management Organization (WMO) boundary; however, it is approximately 300 feet upstream of the boundary with the LMRWD and is tributary to the Minnesota River. While not located within the LMRWD, the LMRWD managers have established precedent in funding projects outside of the District boundaries to leverage resources to protect, preserve, and manage water and natural resources within the District. Most recently, the LMRWD partnered with the Riley Purgatory Bluff Creek Watershed District to provide funding for a feasibility study

in 2016 that identified opportunities to improve Riley Creek's water quality and reduce annual sediment transport to the Minnesota River, as well as \$150,000 in funding for the construction of the Lower Riley Creek Ecological Restoration Project in 2019.

As part of the *2021 Gully Inventory and Condition Assessment*, on July 21, 2021, Young Environmental Consulting Group (Young Environmental) staff visited the ravine behind 3104 Glenview Drive and confirmed the instability of the site (see attached survey report. In response to the City's request, Young Environmental completed an initial funding review. Additionally, the City found the homeowners in this area to be receptive to the project and is therefore considering expanding the original scope of the project to stabilize additional failing banks within the same ravine system to maximize the benefits of the project.

Funding Request Evaluation

LMRWD continues to receive requests from municipalities and other partners for project funding support. Historically, because these requests were infrequent and appeared to compete with other requests and priorities, decisions to provide financial assistance were not supported by documented criteria or scoring. Recently, in response to the request from the City of Carver for the levee project, Young Environmental developed the following scoring system, which was applied to the Burnsville 2021 Slope request.

The goal of the scoring system is to establish an impartial and fair evaluation of all District funding requests based on the project's alignment with the goals, policies, and strategies of the LMRWD Watershed Management Plan. Projects are scored on nine different metrics, detailed below, for a possible 82 points.

- 1. Project Type (Maximum 24 points):** The Project Type Score considers whether a proposed project is tributary to an impaired waterway, if it solves an issue previously identified by the community or LMRWD plans, and whether the project is explicitly included in the community or LMRWD plans. Points are awarded based on how well the project aligns with the community or LMRWD plans.
- 2. Plan Goals (Maximum 9 points):** The Plan Goals Score gives credit depending on how well-aligned a proposed project is with the goals of the LMRWD Watershed Plan. Projects are assigned a score of 0 through 9 based on how many of the District's goals are addressed.
- 3. Water Capture (Maximum 7 points):** The Water Capture Score gives credit to projects that meet or exceed the standards for stormwater runoff volume management. Projects are assigned a score of 0 to 7 based on the amount of volume reduction that the proposed project provides.
- 4. Pollutant Management (Maximum 7 points):** The Pollutant Management Score gives credit to projects that meet or exceed the amount of water quality treatment provided beyond what is required for regulatory purposes. Projects without a

pollutant reduction component will receive a score of 0, whereas those that reduce pollutant loading to downstream resources can receive a score of up to 7.

5. **Habitat Restoration (Maximum 7 points):** The Habitat Restoration Score gives credit to projects that provide habitat benefits. Projects with no habitat benefit receive a score of 0. Projects likely to achieve habitat benefits as a secondary project benefit receive a score of 3. Projects that include a replacement of the existing habitat with an improved habitat receive a score of 5. Projects that include habitat creation or enhancement as the primary purpose of the project receive a score of 7.
6. **Bank Stabilization (Maximum 7 points):** The Bank Stabilization Score gives credit to projects that restore or stabilize degraded stream banks or shorelines. A project is assigned a bank stabilization score based on the length of the stream bank or shoreline restored or stabilized and the level of existing degradation. This metric is only applied to projects with a designed restoration component (versus indirect benefits). Projects without a designed stream bank or shoreline restoration component are assigned a score of 0.
7. **Watershed Benefits (Maximum 7 points):** The Watershed Benefits Score gives credit to projects that provide benefits beyond the immediate site location. Scores are based on where the proposed project is located within the watershed, giving greater weight to those near headwaters.
8. **Partnership Opportunities (Maximum 7 points):** The Partnership Opportunity Score gives credit to projects that allow the District to partner with other organizations. The District is interested in being a project partner with its member communities. A project receives the maximum score of 7 if one or more of the partners is a financial contributor to the project.
9. **Public Education (Maximum 7 points):** The Public Education Score gives credit to projects that spread awareness of the District’s projects and their benefits to the public. The score is based on the accessibility of the final project, giving the greatest weight to those on public lands with public access.

Using the total points scored, projects fit into one of four priority categories (low, low-to-moderate, moderate-to-high, and high), as shown in Table 1.

Table 1. LMRWD Funding Request Scoring Priority

Project Score	Priority	Recommended Action
0–19	Low	Do not recommend funding requests at this time; additional information may be needed to evaluate the potential project more fully.

20–40	Low-to-Moderate	Work with project sponsors to incorporate more District goals, policies, or strategies.
41–61	Moderate-to-High	Consider partial funding requests with funding amount and design components that align with District priorities.
62–82	High	Recommend full funding request as presented.

The detailed scoring of the Burnsville 2021 Slope Project is provided in Table 2, below.

Table 2. City of Burnsville 2021 Slope Project Funding Request Scoring

Scoring Metric	Project Comment	Project Score	Max Points
1. Project Type	Although the Burnsville 2021 Slope Project is located within the Black Dog WMO, it is a tributary of the Minnesota River. In addition, the need to address steep slopes and ravine restoration is included in the City’s five-year Capital Improvement Plan, 2040 Comprehensive Plan, and 2017 Water Resources Management Plan.	24	24
2. Plan Goals Addressed	<p>The project addresses three of the District’s goals:</p> <ul style="list-style-type: none"> • Goal 2—Surface Water Management: The project proposes to stabilize an actively eroding slope that is contributing sediment and phosphorus to the Minnesota River, meeting the intent of the goal, which is to protect, improve, and restore surface water quality. • Goal 4—Unique Natural Resources Management: The project proposes to stabilize an eroding ravine, characteristic of the unique bluff and steep slopes landscape within the LRMWD, meeting the intent of the goal. • Goal 7—Erosion and Sediment Control: The project proposes to prevent further erosion of the slope and restore failed banks, addressing this goal. 	3	9
3. Water Capture	The project does not provide any stormwater runoff volume management, so no points were awarded in	0	7

Scoring Metric	Project Comment	Project Score	Max Points
	this category.		
4. Pollutant Management	In its funding request, the City of Burnsville provided water quality calculations demonstrating that the project would remove large-scale erosion areas and stabilize the banks of the ravine, and would provide an annual reduction in the LMRWD of 22.25 pounds of total phosphorus and 44,500 pounds of total suspended solids.	7	7
5. Habitat Restoration	Although the planting plans have not been provided for the site, by stabilizing and revegetating the ravine, there is opportunity to improve the quality of the area's existing habitat.	5	7
6. Bank Stabilization	The primary purpose of the 2021 Burnsville Slope Project is to stabilize an existing eroded bank and ravine. The site has been evaluated by both the City and its consultants, as well as by LMRWD staff members, all of whom concur that the site is unstable and in need of restoration.	7	7
7. Watershed Benefits	The 2021 Burnsville Slope Project is located slightly above the midpoint of the subwatershed, with approximately 70 percent of the subwatershed located downstream.	5	7
8. Partnership Opportunities	The City of Burnsville has a recurring line item in its annual budget for ravine restoration projects and is a committed partner to the construction of the 2021 Slope project. The City also has a \$500,000 biannual budget item to fund these projects.	7	7
9. Public Education	The 2021 Burnsville Slope Project is located almost entirely on private lands, with a small portion of the project on public lands adjacent to County Road 34 (Williams Drive). There do not appear to be any trails or other public access to the site, which presents limited visibility of the project for the public and therefore limited opportunities for public education as part of this project.	1	7

Scoring Metric	Project Comment	Project Score	Max Points
Total Score		59	82

Project Scoring

Based on the presented information, the 2021 Burnsville Slope Project received a score of 59 points out of a maximum of 82, placing it at the top of the moderate-to-high priority category, three points short of high priority status.

Funding Recommendation

Based on the observations made on July 21, 2021, if the project were located within the LMRWD boundaries, it would be ranked as having moderate erosion probability and the recommendation to monitor the site for future study and collaboration opportunities would be put forward. Because the City has requested a potential partnership with the LMRWD and is looking to maximize the restoration opportunities in the area, we recommend providing funding assistance for the development of the preliminary engineering designs for the expanded footprint and/or contributing to the cost of the construction for the overall project. Because the City has not requested a specific monetary amount from the LMRWD, staff members will continue to coordinate with the City to better understand the financial needs associated with the unfunded portion of the project to provide a funding recommendation.

Attachments

Figure 1. Project Location Map

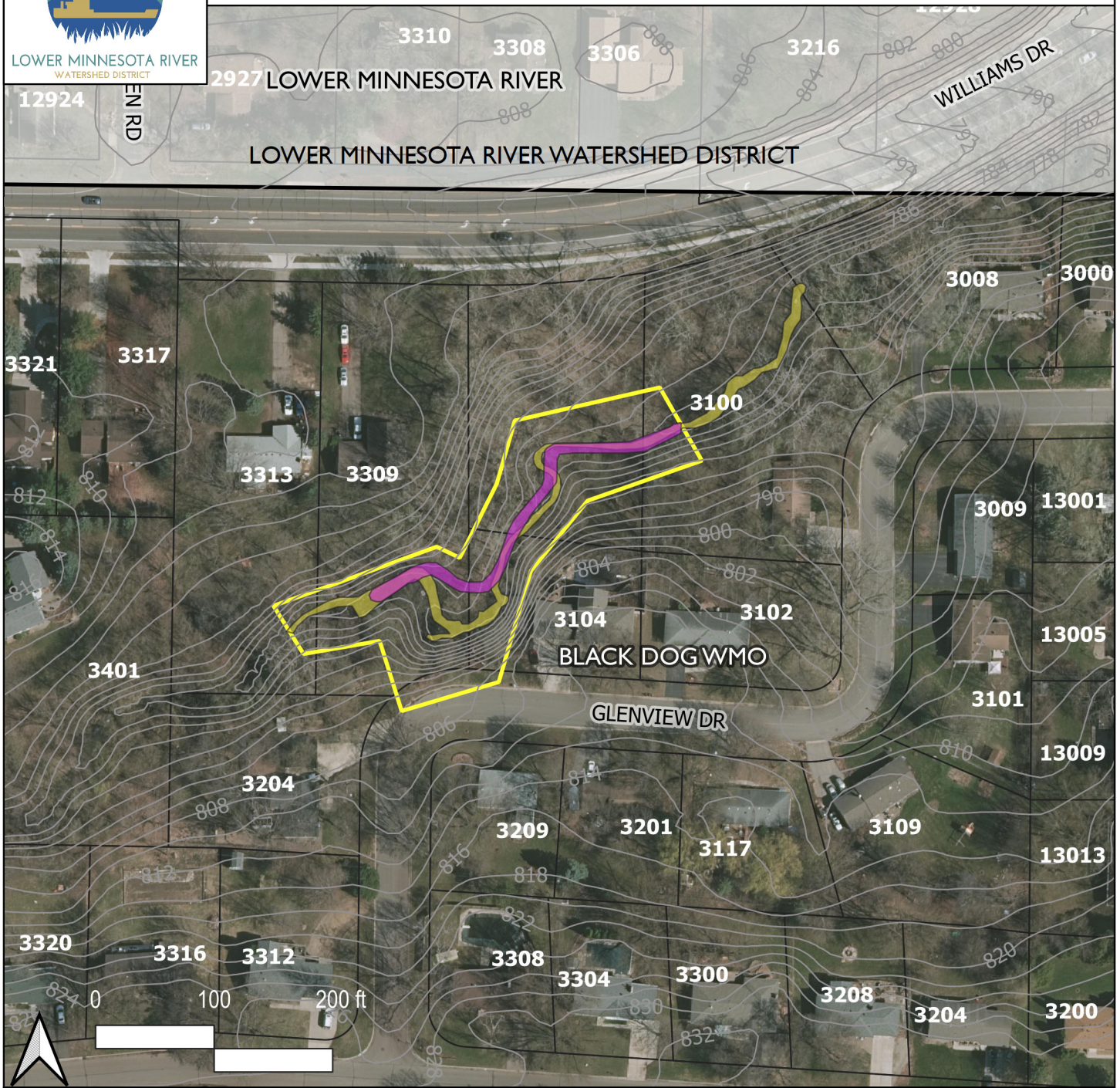
2021 Ravine Stabilization Project Memo from WSB

LMRWD 2021 Gully 07:21–01:33 Survey Report



LOWER MINNESOTA RIVER
WATERSHED DISTRICT

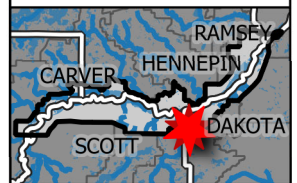
Figure I: 2021 Bursville Slope Project Location



LEGEND

- Approximate Project Extents
- Project Location
- Existing Stream Alignment
- Proposed Stream Alignment
- LMRWD Boundary
- Parcel Boundaries
- LiDAR Contours

LMRWD Watershed Location Map



Young Environmental Consulting
Group, LLC

Attachment 2 -- 2021 Ravine Stabilization Project Memo from WSB

Memorandum

To: Ms. Linda Loomis, Administrator, LMRWD

From: Jen Desrude, PE, City Engineer, City of Burnsville
 Jacob Newhall, PE, WSB
 Laura Cummings, PE, WSB

Date: June 30, 2021

Re: 2021 Ravine Stabilization Project
 WSB Project No. 016830-000

BACKGROUND

In 2018, WSB performed a geohazards evaluation throughout the City of Burnsville to determine the risk of slope failure as part of their asset management program. Several failure types were evaluated including gullying, slides, river migration, and springs. 131 slopes were then ranked using the Slope Risk Matrix previously developed in collaboration with the City. Initial risk ranking results identified 12 of the 131 as mitigation recommended. In further collaboration with the City, two of these 12 slopes were removed from the list and one was added, for a new total of 11 slopes.

In 2019, four of the slopes identified as mitigation recommended were addressed. The City has since identified two additional slopes for review during the 2021 slope project.

A site visit was conducted in September 2020 to review eight slope areas. Of these eight slopes one was selected to be repaired in the fall of 2021. WSB and the City of Burnsville continue to work together to minimize the effects of slope failures including property damage, costly maintenance repairs, and threats to public infrastructure and safety.

2021 SITE

The proposed site is located north and west of 3104 Glenview Drive in the rear yard along a City drainageway. Severe erosion has occurred resulting in very steep slopes adjacent to an existing home and Glenview Drive. The drainageway is not a DNR water. See attached photos for existing conditions. There is an existing 72-inch trunk storm sewer that runs parallel to the stream. The stream drains to City storm sewer and crosses through Williams drive and continues north, ultimately discharging to the Minnesota River. While the boundaries show the project is within Black Dog Watershed Management Commission, the Lower Minnesota River Watershed District is ultimately receiving the drainage from the stream.

OBJECTIVE AND PROJECT DESIGN

The objectives of the project are as follows:

- Reduce the risk of erosion to city road, existing utilities, and adjacent home.
- Increase stability of the channel.
- Erosion reduction and ultimate downstream loading reduction in TSS and TP.

The proposed project will change the alignment to remove large scale erosion areas, and the banks will be stabilized with hard armoring and bioengineering. Gabion retaining walls will also be used along the southern side adjacent to the roadway and home to result in more gradual slopes. Grading and turf reinforcement mats will be installed along the banks to reduce erosion and stabilize the bank slopes. Removal of sloughed material will be done with the location of the new alignment. See **Figure 1** for project location and proposed improvements.

The Board of Water and Soil Resources Pollution Reduction Estimator was used to quantify the TP and TSS reduction from the project. See **Table 1** for water quality reductions made with the proposed improvements.

Table 1: Water Quality Summary

Water Quality	Reduction (pounds/year)
Total Phosphorus	22.25
Total Suspended Solids	44,500

SUMMARY

The proposed improvements will help reduce erosion, benefit downstream water quality, and increase the stability of the creek and streambanks. The City of Burnsville is planning on construction in the fall of 2021. The 60% construction cost estimate is approximately \$400,000. The proposed project will alter the channel alignment, include bioengineering and rock armoring, install gabion walls, grading side slopes, and installation of geofabrics.

Attachments

- Site Photos
- Figure 1
- BWSR Water Quality Calculations

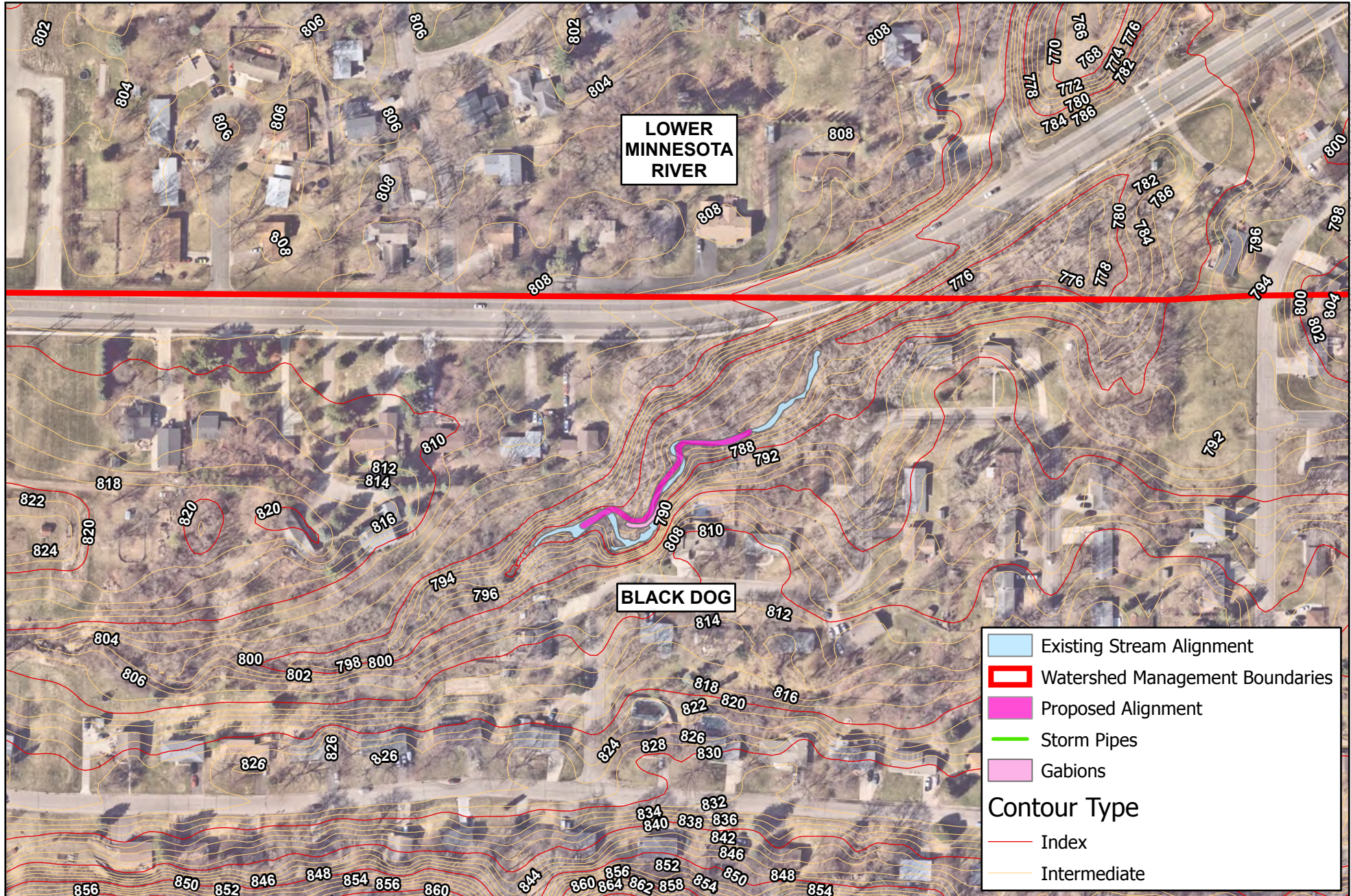
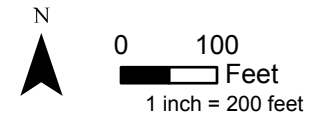


Figure 1 - Streambank Alignments
 Burnsville 2021 Slope Stability Project
 City of Burnsville



Stream & Ditch Bank Stabilization

SOIL =									
sand (1), silt (2)	2	SD SOIL density	1	110	CF	1	0.85		
clay(3), peat(4)		lbs/ft ³	2	85	P Correction Factor	2	1.00		
		tons/ft ³	3 X			3 X			
			4 X			4 X			

VOLV
volume voided (ft3) 15,704

SLB = SD*VOLV/YR
Soil Loss Before (Tons/yr)
=
SLR Soil Loss Reduction
Tons/yr

SEDR =
SLB*SDR =SLB * 1
(= SLR)
Sediment Reduction
(Tons/yr)

YR
number of years
to erode bank to
current position 30

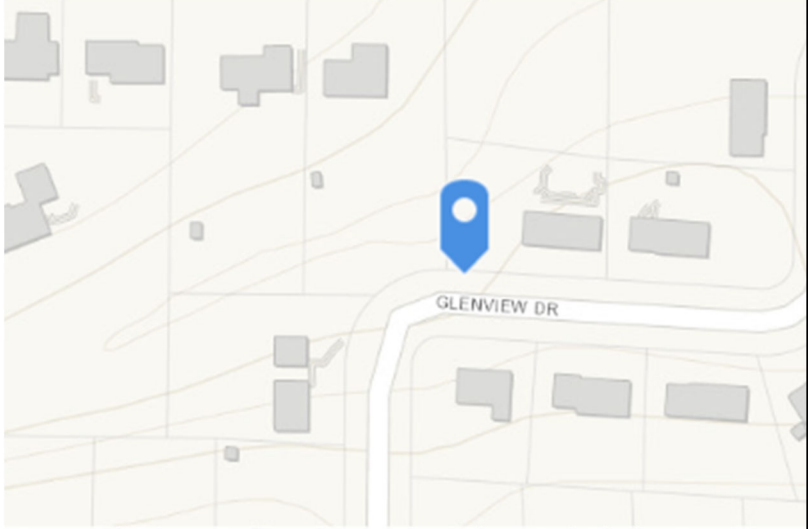
PR =
SEDR *(1.0 Lb/Ton)*CF
P reduction (Lbs/yr)

D = 0 → SDR = 1

 = input
 = calculated value
 = result

ENTER THIS DATA ON eLINK INDICATORS TAB	
SEDIMENT (TSS) T/yr:	22.25
SOIL (estimated savings) T/yr:	22.25
PHOSPHORUS (est. reduction) lbs/yr:	22.25

Attachment 3 -- Gully 07:21--01:33 Survey Report

Gully ID: 07:21-01:33	MAP	
Date & Time: July 21, 2021 1:33 PM		
Location: Burnsville		
Weather: Cloudy Storm/Rainfall Event in the Past 24 Hours? No		
GULLY INFORMATION		
Calculated Erosion Potential:	High	
Approximate Depth:	5-Deep (>15')	
Approximate Bottom Width:	3-Medium (1'-5')	
Approximate Gully Length:	5-Long (>100')	
Condition of Gully Bottom:	5-Bare Soil	
Condition of Gully Banks:	1-Heavy Vegetation	
Gully Bank Angles:	3-Mid-Range (45 to 90 degrees)	
Gully Shape:	5-V-Shaped	
Gully Material:	Silt/Clay	
Seep:	0-No	
Stormwater Runoff:	0-No	
Stormwater Inputs:		
Fallen Trees:	1-Yes	
Degradation:	3-Moderate	

Aggradation:	1-Low
Slumping:	1-Yes
Additional Notes:	<p>Classification? High</p> <p>Presence of Water? Yes</p> <p>Quantity of Water? Puddles/Stagnant</p> <p>Notes/Comments: Large gully outside district, bottom has puddles of water that look like they may be slowly flowing, many fallen trees in gully, could not get down right bank due to safety so pictures may be rough</p>

Photo 1 Image



Photo 1 View Direction

Downstream

Photo 1 Caption

Gully

Photo 2 Image



Photo 2 View Direction

Upstream

Photo 2 Caption

Gully