



LOWER MINNESOTA RIVER WATERSHED DISTRICT

July 2019 Administrator report
From: Linda Loomis, Administrator
To: LMRWD Board of Managers

In addition to items on the meeting agenda, work continues on the following District projects and issues:

Other Work

USACE Mississippi River Dam Disposition Study

Upper St. Anthony Falls Lock and Dam was closed to navigation on June 9, 2015. The lock is currently being operated to mitigate flood damage. The USACE began a disposition study for Upper and Lower St. Anthony Falls Locks and Dams, and Lock & Dam #1 (Ford Dam) in April 2018. Public meetings were held in July 2018. A disposition study examines the benefits and costs of continuing to operate federal projects which are no longer serving their authorized purpose.

In October 2018, the Water Resources and Development Act of 2018 (WRDA 2018) directed that the disposition study for Upper St. Anthony Falls Lock and Dam was to be completed separately from the other two sites. As such, the study was re-scoped to focus just on Upper St. Anthony Falls Lock and Dam. A separate study for Lower St. Anthony Falls Lock and Dam and Lock and Dam #1 will be conducted at a later time.

The study will result in a report containing recommendations take no action or to de-authorize and dispose of all or part of the federal property at Upper St. Anthony Falls Lock and Dam. A draft report will be made available for public comment in spring 2020.

The St. Paul District Corps of Engineers is planning to conduct public meetings for the Upper St. Anthony Falls Lock and Dam Disposition study in August 2019.

The first public meeting will be on Tuesday, August 13th, from 6:00-8:00 p.m. at the Mill city Museum, 704 S. 2nd Street, Minneapolis, MN.

The second public meeting will be Monday, August 19th, from 6:00-8:00 p.m. at Michael Dowling school, 3900 W. River Parkway, Minneapolis, MN.

More information can be found on the St. Paul District's [website](#). The LMRWD commented previously to ask what impact disposition of the Lock and Dam would have on sedimentation impacting navigation at the confluence of the Mississippi and Minnesota Rivers.

Minnesota River Basin TMDL Studies

The LMRWD was notified by the MPCA that it intends to release four TMDL studies for public comment July 22nd. The studies include the Minnesota River/Greater Blue Earth TSS TMDL, the Lower Minnesota River Watershed TMDL, the Watonwan River Watershed TMDL and the Minnesota River – Mankato Watershed TMDL.

The MPCA asked the LMRWD to help to organize a tour of the Minnesota River to show the impact of sedimentation from upstream sources. The MPCA was invited to participate in the tour we have been planning with the Savage Chamber of Commerce. The MPCA's intent is to make the tour a media event. They are currently assisting the Chamber and the LMRWD. (see item below related to MN River Tour).

MCES Drinking Water Protection Project

I have been asked to be a member of a focus group to discuss future concerns about drinking water in the Metro area and what management practices can be put in place to ensure a safe, adequate and affordable supply of drinking water to communities in the Metro area. The first focus group met at the Met Council offices in St. Paul on June 28th. Emerging contaminants and increasing demand on aquifers were the focus of the discussion.

Xcel Energy Emergency Work

The DNR received a call from a concerned citizen and contacted the LMRWD about some trees that had been removed and grading that had occurred in Chaska, next to the river. The City of Chaska said Xcel Energy had been in the area to make some emergency repairs to their distribution system. I checked out the area and the area has been graded and seeded. Erosion control measures were in place and appeared to be in good shape.

USACE Minnesota River Basin Integrated Watershed study

The LMRWD received a notice from the USACE that Minnesota River Basin Integrated Watershed Study is ready for public review. This study is a collaborative effort, and the Corps requested that partners review and comment on the report.

Since this is the end of this study, the Corps will not be able to initiate new research or modeling efforts. The Corps will be looking at potential spin-off studies and projects. The LMRWD Board may remember that the LMRWD provided some suggestion as potential studies.

The report was provided through the Army's AMRDEC website, which I was not able to access. I have contacted the Corps about getting us a copy of the report.

The Corps plans to schedule an in-person Inter-Agency Study Team meeting for later this year. At that meeting, the Corps will provide a venue to discuss the study outputs, the report, and potential next steps.

For more information about this study you can visit the project website at:

<https://www.mvp.usace.army.mil/Home/Projects/Article/571150/minnesota-river-basin-integrated-watershed-study/>

1099 reports for Managers

At the June Board meeting managers mentioned that 1099s that were received for 2018 included amounts for expenses. I asked Carver County about that and I was provided with a report they used to prepare the 1099s. The information in the report shows that only per diem for Managers was included on the 1099. One thing to note is that the 2nd half of 2017 and 1st half of 2018 is what was included on the 1099. I will bring a copy of the report for Managers to review to make sure the 1099 received match the report.

MN River Tour with Savage Chamber of Commerce

We have confirmed a date for a Minnesota River Tour this summer - August 28th. The Padelford Packet Boat Company has a boat available on the date and CHS is able to accommodate loading. I am in the process of confirming the boat for August 28. The plan is to begin loading the boat at 3:30. Invitations will be sent out using the spreadsheet that was used for last year's tour and adding to it.

Invasive Carp confirmed in MN waters

The DNR has confirmed that invasive carp were found in Minnesota waters. Complete information can be found on the [DNR website](#).

River Navigation

Here is a link to the most recent newsletter from the [Upper Mississippi Waterway Association](#).

Watershed Plan Projects

Eden Prairie Area #3 Stabilization: Braun Intertech has been asked to provide the raw data from the monitoring of the inclinometers. Once the raw has been received, Barr Engineering will review the data for QA/QC.

Riley Creek Cooperative project/Lower Riley Creek restoration - Legal Counsel for the LMRWD reviewed the cooperative agreement that came before the LMRWD Board of Managers at the June 2019 meeting. Legal Counsel for the LMRWD reviewed the cooperative agreement and had no issue with the agreement. Attorney John Kolb requested that Young Environmental Consulting Group review the project, to make sure it accomplished the goals of the LMRWD and justified LMRWD participation in the project. Project website: <http://www.rpbcwd.org/whats-happening/projects/lower-riley-creek-ecological-restoration>

Seminary Fen ravine stabilization project: The city of Chaska has been notified that BWSR declined payment of the second half of the grant. At the June meeting the LMRWD Board requested that a letter be sent to the BWSR Board requesting they reconsider the decision to not fund the final portion of the project. A letter was sent electronically to the BWSR Board, July 9th and a hard copy of the letter was sent the same day. The LMRWD offered to meet with the BWSR Board. The LMRWD has not received any response from BWSR. Project website: <http://lowermnrivewd.org/projects/bwsr-clean-water-fund-grant-administration>

East Chaska Creek: (Carver County Watershed Based Funding): The 60% design will be ready to share with the city of Chaska in the next couple of weeks. Project website: <http://lowermnrivewd.org/projects/east-chaska-creek-bank-stabilization>

Schroeder Acres Park (Scott County Watershed Based Funding): This project has not begun and staff developing a cooperative agreement between the city and the LMRWD. Project website: <http://lowermnrivewd.org/projects/schroeder-acres-parkeagle-creek-sub-watershed-stormwater-study>

Shakopee Downtown BMO Retrofit (Scott County Watershed Based Funding): This project has not begun and staff developing a cooperative agreement between the city and the LMRWD. Project website: <http://lowermnrivewd.org/projects/targeted-bmps-downtown-shakopee>

PLOC (Prior Lake Outlet Channel) Restoration (Scott County Watershed Based Funding): This project has not begun and staff developing a cooperative agreement between the city and the LMRWD. Project website: <http://lowermnrivewd.org/projects/prior-lake-outlet-channel-realignmentwetland-restoration>

Dakota County Fen Gap Analysis and Conceptual Model (Dakota County Watershed Based Funding): The LMRWD will be moving ahead with the first phase of the relevés. LMRWD staff is coordinating work with Keylor Andrews of the DNR and also working with Doug Norris for additional funding. Project website: <http://lowermnrivewd.org/projects/dakota-county-fen-study-management-plan>

Hennepin County Chloride Project (Hennepin County Watershed Based Funding): No new information to share since last update.

Vegetation Management Plan: This project is currently on hold while staff works on other projects.

Sustainable Lake Management Plan - Trout Lakes: This project is currently on hold while staff works on other projects.

Geomorphic Assessment of Trout Streams: Interns have collected data on Assumption Creek and Eagle Creek. Partial data has been collected on Ike's Creek. Interns are monitoring water levels of the Minnesota River in order to collect data on other creeks. They will begin to prepare a report of the data that has been collected.

Spring Creek Cost Share: No new information to report on this project since the last update.

West Chaska Creek Re-meander: No new information to report on this project since the last update.

Project Reviews

Metropolitan Airport Commission - Environmental Assessment Worksheet for MSP Concourse G Infill - The LMRWD received an EAW for the proposed MSP Concourse G Infill project. Staff is reviewing the EAW.

City of Burnsville - Quarry Property, LLC - The City of Burnsville notified the LMRWD that they had received an application from Quarry Property, LLC for a Planned Unit Development Amendment to extend the timeframe to allow outdoor storage of materials including cement crushing, as an Interim Use in the Minnesota River Floodway located at 1001 Black Dog Road. LMRWD staff reviewed the submittal and responded that we had no comments on the project.

MnDOT TH 5 - MnDOT will be completing a preservation project on TH 5 between 34th Avenue and Mississippi River Bridge. The project is scheduled for 2020 construction. The project generally includes concrete pavement rehabilitation; unbonded concrete overlay; bituminous mill and overlay; drainage replacement/preservation; bridge approach panels; guardrail replacement; and erosion control/turf establishment. The project adds 0.4 acre of new impervious for minor shoulder widening to meet current design standards.

The project is not located in a High Value Resource Area, but is located in a Steep Slope area. MnDOT will be replacing existing pipe flumes (total of five locations) on the TH 5 eastbound embankment within the Steep Slope area. MnDOT will also be plugging and abandoning existing pipe flumes (total of six locations). The work is being completed to address failing pipes and existing erosion issues. There are no changes to drainage area for each discharge point. Erosion control and turf establishment are provided following MnDOT standards.

The LMRWD asked MnDOT to explain how they will meet the LMRWD standards with respect to steep slope. MnDOT provided plans to the LMRWD. Staff is reviewing the plans.

City of Carver - Levee rehabilitation - The LMRWD met with the City of Carver and WSB who is a consultant for the City on this project. The goal of this project is to have a levee that meets the certification standards of the US Army Corps of Engineers and the Federal Emergency Management Agency (FEMA). At the meeting WSB presented its initial estimate of the project, the work that needs to be done to certify the Levee and an estimated timeline for the project. The city plans to request State funding under the Flood Damage Reduction program. Typically this program is funded in bonding years.

The City is looking for LMRWD assistance with the project. The estimated cost is \$10,000,000. LMRWD staff asked the city to put together the rationale for LMRWD participation in the project and to come to a Board of Manager meeting to present the project to the Board. The LMRWD should consider supporting the project at the 2020 legislative session.

City of Carver - Jonathan Parkway upgrades - This is a Carver County Project. The County has narrowed down the proposed stormwater management to Alternative 2 & 5. Alternative #2 involves constructing stormwater basins on the City's Community Park property while Alternative #5 involves constructing a new outfall pipe down CSAH 11 that would discharge to Carver Creek.

The consultant for the project is refining cost estimates of each alternative and continuing discussions with the City relative to ponding.

City of Burnsville - CenterPoint Energy Training Facility - No new information on this project since last update.

City of Burnsville -5337 Properties, LLC - No new information on this project since last update.

City of Burnsville - Freedom Enterprises, LLC - No new information on this project since last update.

City of Burnsville - Industrial Equities - 250 River Ridge Circle North: - No new information on this project since last update.

City of Burnsville - United Properties - 12400 Dupont Avenue North: No new information on this project since last update.

CenterPoint Energy - sign replacement: No new information to report since last update.

City of Burnsville - Kraemer Mining: No new information to report since last update.

Dakota County - MN River Greenway No new information to report since last update. Project website: <https://www.co.dakota.mn.us/parks/About/TrailPlanning/Pages/minnesota-river.aspx>

City of Shakopee - Jackson Township AUAR: No new information to report since last update.

City of Burnsville - CenterPoint Energy Lyndale Valve Replacement Project: No new information to report since last update.

City of Eden Prairie - C. H. Robinson: No new information to report since last update.

City of Burnsville - Burnsville Sanitary Landfill: No new information to report since last update.

City of Eden Prairie - Peterson Wetland Bank: No new information to report since last update.

City of Chanhassen - TH 101 Improvements: The LMRWD has been informed by Ron Leaf, Kimley-Horn (consultants for the project) that a meeting of the watershed districts is being planned. The City has submitted a wetland permit application to the USACE. Project website:

<https://www.highway101improvements.com/>

City of Savage - 12113 Lynn Avenue: No new information to report since last update.

Cities of Richfield/Bloomington - TH 77 & 77th Street underpass: No new information to report since last update.

MNDOT - I494 Brush removal: No new information to report since last update.

MNDOT - TH 5 Signage projects: No new information to report since last update.

MPCA - MN River TSS TMDL: This TMDL Study is one of the four studies that the MPCA intends to release to the public for comment on July 22nd. See the item above titled **Minnesota River Basin TMDL Studies**.

City of Bloomington - MN Valley State Trail: No new information to report since last update. Project website: https://www.dnr.state.mn.us/state_trails/minnesota_valley/plans.html

Hennepin County - CSAH 61/Flying Cloud Drive: The most recent inspection report is attached.

MNDOT - I494/TH 5/TH 55 Mill & Overlay project: No new information to report since last update. Project website: <https://www.dot.state.mn.us/metro/projects/i494invergroveheights/>

MNDOT - I35W Bridge Replacement: No new information to report since last update. Project website: <https://www.dot.state.mn.us/metro/projects/i35wbloomington/index.html>

MNDOT - I494 from TH169 to Minnesota River: The latest information the LMRWD has received from MnDOT on this project will not need any storage of water in the floodplain. MnDOT has worked with Barr Engineering to place a series of subsurface detention structures that would phase the conveyance of stormwater to the MN River, eliminating the need for increased flood storage in the floodplain. Staff is waiting for the engineering reports before preparing a resolution to rescind the LMRWD Board's 2007 resolution.

Scott County - TH 41/169/78 Interchange: No new information to report since last update. Project website <https://www.scottcountymn.gov/1778/Highways-1694178-Interchange?PREVIEW=YES&PREVIEW=YES&PREVIEW=YES&PREVIEW=YES>

City of Shakopee - Amazon Fulfillment Center drainage: - LMRWD conducted a field inspection of the ravine to the Minnesota River that the city is planning to divert the water to. Staff has put together a proposal to stabilize the slope of the ravine and stabilize area where head-cutting was observed. This item is included in the 2020 Budget. The LMRWD has shared this with the City of Shakopee and is waiting to hear more from the City.

MAC/LMRWD/MCWD boundary realignment: No new information to report since last update.

Fort Snelling - Dominion Housing: Staff received an updated storm water management plan for this project. Staff comments are attached.

USACOE/USFWS - Bass Ponds, Marsh & Wetland: On June 18th, 2019, at the regular County Board Meeting the Scott County Board of Commissioners declared that the EAW is adequate and an EIS is not needed. Scott County Environmental Services has reviewed the comments received for the Bass Ponds EAW and have found no significant environmental effects that warrant further study. The [record of decision and comments and response](#) can be found on the project website. Project website: <https://www.scottcountymn.gov/1865/Bass-Ponds-EAW>

Upcoming meetings/events

- Metro MAWD - Tuesday, July 18, 2019, 7:00pm, Capitol Region Watershed District, 595 Aldine Street, St. Paul, MN
- Savage Planning Commission meeting - Tuesday, July 18, 2019, 7:00pm, Savage City Hall, 6000 McColl Drive, Savage, MN
- Upper Mississippi River Waterway Association - Thursday, August 22, 2019, 11:30am, Lilydale Pool & Yacht Club, 1600 Lilydale Road, Lilydale, MN
- Minnesota River Tour - August 28, 2019, depart from CHS terminal in Savage (more details will follow)
- Metro MAWD - Tuesday, October 15, 2019, 7:00pm, Capitol Region Watershed District, 595 Aldine Street, St. Paul, MN



Young Environmental Consulting
Group, LLC

Memorandum

DATE: June 26, 2019 *(Email transmittal)*

TO: Linda Loomis – Administrator, LMRWD

FROM: Della Schall Young, PMP, CPESC

SUBJECT: Stormwater Visit Summary
June 26, 2019, 5:13 a.m.–6:12 a.m.
CSAH 61 – Flying Cloud Drive
Owner – Hennepin County and Contractor – Ames Construction

WEATHER: 60°F, clear – per AccuWeather

SITE CONDITIONS/PHASE

Construction was active for road base pylons, retaining walls, bridge, erosion and sediment control, etc. The entire site was open and drivable.

PRESENT

Della Schall Young – Young Environmental Consulting Group

PURPOSE

To observe stormwater management/erosion control techniques being implemented by Ames Construction on the reconstruction of Flying Cloud Drive/County State Aide Highway (CSAH) 61 from Highway 101 to Charlson Road in the cities of Eden Prairie and Chanhassen and in Carver and Hennepin counties.

GENERAL NOTES/OBSERVATIONS

- Tied to check into the construction trailer but the office was closed.
- Crews had not begun work during the site visit.
- Drove through the project area, beginning at the construction trailer, to Lyon's Tapp at Spring Road and Flying Cloud Drive.
- Pictures were taken of the different best management practices (BMPs) being used to prevent and/or minimize sediment and other construction material from reaching adjacent water resources (Rice Lake, Grass Lake, Riley Creek, and Minnesota River).
- Visible signs that BMPs have been applied and/or maintained. Generally, newly graded areas had been hydroseeded and some areas have been hydromulched.
- Extensive use of plastic and rock as BMPs and that appeared generally effective when placed properly and maintained. When BMPs are damaged or no longer useful, they should be discarded and should not litter the site.

Memorandum *(cont'd)*

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RECOMMENDATIONS

- Continue monitoring the sediment-laden discharge passing through the site (photo #15).
- Pay additional attention to newly or graded areas to make sure the proposed stabilization BMPs are effective.
- Care should be used when applying hydromulch to areas near plastic, so it is not applied to the plastic. BMPs applied incorrectly could become a potential pollutant/nuisance source.
- Consider additional BMPs adjacent to Riley Creek to address bank erosion (photos #43 - #45). There appears to be a sediment delta forming within the channel.
- Attend weekly project construction management meetings.
- Continue every other week visits to the project site.



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Technical Memorandum

To: Della Schall Young, Young Environmental Consulting Group
From: Jeff Weiss, Barr Engineering
Subject: Highway 101 Ravine Erosion
Date: June 18, 2019
Project: 23101028.04

Background

The city of Shakopee is considering different options to improve stormwater management at an Amazon facility along Trunk Highway 101 (TH 101). One of the options includes routing additional stormwater through a ravine on the east edge of the parking lot for The Landing (Figure 1). If additional stormwater is to be routed to this ravine, there is concern that it could create or exacerbate existing erosion problems. The main goal of the assessment was to develop an understanding of the existing state of the ravine and determine what stabilization measures may be necessary to mitigate existing erosion issues.

Observations

A site visit was completed on May 23, 2019. Those in attendance included Della Schall Young (Young Environmental Consulting Group), Linda Loomis (Lower Minnesota River Watershed District), Kirby Templin (City of Shakopee), and Jeff Weiss (Barr Engineering). A summer intern with the City of Shakopee was also in attendance.

The ravine is located on the east end of the parking lot for The Landing, which is an historical heritage park run by the Three Rivers Park District. The land on the east side of the ravine is owned by Riverland Ag Corporation.

The ravine is narrow and well-vegetated. Buckthorn is growing on the banks in the upper half of the ravine, and in more than one location it was observed growing within the main channel. At the upstream end, the ravine is relatively shallow, with the bottom of the channel being approximately three feet deep relative to the adjacent overbank areas. The width of the channel at the bottom varies, but it was approximately one to two feet wide in most locations. The bottom of the channel was primarily gravel.

There are also two small culverts in the ravine, where former crossings of the ravine were located. The crossings were full of buckthorn so they have not been used for some time.

To: Della Schall Young, Young Environmental Consulting Group
From: Jeff Weiss, Barr Engineering
Subject: Highway 101 Ravine Erosion
Date: June 18, 2019
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Towards the bottom half of the ravine, the gradient appears to change and become less steep. The channel become wider and shows evidence of braiding. The vegetation also changed and buckthorn was no longer the dominant species on the banks.

Remnant garbage and debris was observed in several locations along the ravine.

A headcut and spring were observed approximately 100 feet upstream of the banks of the Minnesota River. At the time of the site visit, the Minnesota River was at flood stage, and the edge of the river was approximately 30 feet away from the headcut. A spring was observed bubbling out of the ravine bed at the location of the headcut. The ravine bed dropped approximately three to four feet at the headcut and spring, and the banks downstream of this location were near vertical. The flow rates was not estimated, but it was a relatively small trickle of flow from the spring. The water downstream of the spring was approximately three to four inches wide and approximately one inch deep.

Assessment

The only notable erosion within the ravine was observed at the headcut and spring. The erosion present was likely caused by a combination of the spring and intermittent flows within the ravine. Springs naturally saturate the ground immediately around them and the saturated soil is easily mobilized by flowing water. Springs often naturally create a channel away from the spring, so some of the erosion that has occurred between the spring and the main channel of the river is likely caused by natural processes.

The creation of the spring's channel to the river also creates a headcut in the ravine. A headcut is a feature in a channel that indicates that the channel bed is dropping in elevation. Downstream of headcuts, the channel becomes deeper and contains more flow, which also contains erosive pressures within the channel. Erosion at the headcut causes the headcut to migrate upstream.

Since this spring is located within a drainageway, the intermittent flows in the ravine have likely helped the headcut migrate upstream; however since ongoing monitoring of this ravine has not been completed, it is not possible to accurately determine how much the headcut has migrated in recent years.

Aside from the headcut, the ravine appears to be stable with the current hydrology.

Photos from the site visit are included at the end of this memorandum.

Potential impacts of altered hydrology

Altering the hydrology to any system has the potential to create instability or exacerbate existing instabilities. Given that the headcut area is the only notable erosion area, that is the location of greatest risk for additional erosion. Increased flow to the ravine will likely accelerate the migration of the headcut upstream. This will result in eroding banks and an increased sediment load to the Minnesota River.

The existing ravine has a relatively small capacity for flow. Increasing the flows could cause new head cuts to develop and/or cause the channel to become enlarged. The risk for new erosion will likely be reduced if the increased flow is attenuated to the greatest extent possible because a steady, low flow rate has less erosive pressure than a flashy high flow rate. The feasibility study completed by the city of Shakopee did not include a detailed summary of the potential increase in flows, so it is difficult to estimate more detailed impacts. Regardless, if flows to the ravine are increased, then preventative measures should be installed to minimize the potential for additional erosion.

Concept and Cost Estimate

The concept described below and shown in Figure 2 describes a means to stabilize the existing headcut with the existing hydrology. Additional measures that may be needed to prevent erosion in the ravine due to altered hydrology are not part of this concept.

The best way to stabilize headcuts and prevent them from moving upstream is to install a grade control structure at or just downstream of the head cut. In perennial stream systems, a cross vane or a constructed riffle is often used as such a grade control structure. A cross vane can adequately address head cuts of one foot or less. Given the drop in elevation at the spring, a constructed riffle will provide better grade control option. Constructed riffles typically use a granular filter below larger riprap. The riprap is then contoured to keep flows in the center of the channel. The granular filter and riprap will also allow spring water to continue to exit the spring unimpeded. A different filter, such as a geotextile filter, could become clogged with soil materials mobilized by the spring.

A cost estimate for this concept is provided in the following table.

Table 1. Concept level cost estimate

Item	Description	Quantity	Unit	Unit Price	Extension
1	Mobilization	1	LS	\$ 3,133	\$ 3,133
2	Clearing	1	LS	\$ 5,000	\$ 5,000
3	Granular filter	8	Ton	\$ 80	\$ 640
4	Riprap	20	Ton	\$ 100	\$ 2,000
5	Grading	125	CY	\$ 15	\$ 1,875
6	Cross vane	1	Each	\$ 2,500	\$ 2,500
7	Seed	0.2	Acre	\$ 2,500	\$ 500
8	Erosion control blanket	900	SY	\$ 4	\$ 3,150
	Construction Subtotal				\$18,798.00
	Contingency (30%)				\$5,639.40
	Construction Total				\$24,437.40
	Engineering				\$10,000.00
	Project Total				\$34,437.40

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Conclusion and Recommendation

The ravine between The Landing and Riverland Ag Corp. is a mostly stable ravine with its current hydrology. One erosion location was found toward the downstream portion of the ravine. The erosion is likely caused by the spring itself and flows through the ravine.

Additional flows through the ravine will exacerbate the erosion in the ravine and may cause new erosion areas to develop.

We recommend stabilizing the existing erosion area to prevent erosion from migrating upstream. We recommend using a constructed riffle to stabilize the head cut itself. The banks between the headcut and the river should be graded to a 2:1 slope and revegetated.

Minnesota River






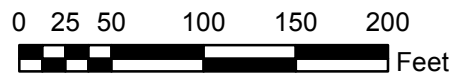
The Landing

Riverland Ag Corporation

TH 101

Legend

-  Culvert
-  Headcut
-  TH 101 Ravine



EXISTING CONDITIONS
TH 101 Ravine Assessment
Lower Minnesota River
Watershed District

FIGURE 1



Minnesota River



The Landing

Grade banks to 3:1 slope between headcut and river

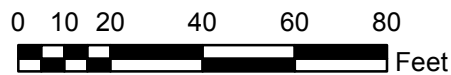
Install Constructed Riffle at Headcut

Riverland Ag Corporation



Legend

- Headcut
- TH 101 Ravine



STABILIZATION CONCEPT
TH 101 Ravine Assessment
Lower Minnesota River
Watershed District

FIGURE 2

Photos



Photo 1. Looking downstream in the lower half of the ravine



Photo 2. Headcut area



Photo 3. Zoom in of headcut. Headcut has migrated upstream of the spring; however brush was too thick for a clear picture of the spring.



Photo 4. Eroding banks downstream of the spring

Technical Memorandum

To: Linda Loomis, Administrator

From: Shane Soukup, Water Resources Scientist
Della Schall Young, CPESC, PMP

Date: June 30, 2019

Re: Fort Snelling Redevelopment Project – Stormwater Management Plan and Combined Plan Set (2nd Preliminary Permit Project Review)

Loucks, Inc. (the Company) provided the Lower Minnesota River Watershed District (District) with the March 29, 2019, Stormwater Management Plan (SWMP) and the combined plan set for the Fort Snelling Redevelopment Project (Project). The Company has asked the District to conduct another review of the SWMP and complimentary plan. Young Environmental Consulting Group (Young Environmental) conducted the review on the District's behalf, and the findings are presented below.

The Project is located east of the intersection of Colville and Taylor Aves. The Project proposes to disturb ± 46.8 acres, which are surrounded to the north by Highway 55, to the east by Highway 5, to the west by a golf course and outdoor sports facilities, and to the south by the Minneapolis–St. Paul International Airport. The Project generally consists of renovating historic buildings to provide multifamily housing and constructing associated roads, surface parking, garages, utilities, and stormwater management systems. The Project is within an unincorporated area and therefore requires review of all of its plans, studies, and reports by the District for compliance with applicable watershed management standards, as presented in Appendix K of the District 2018 watershed management plan. General requirements apply because the Project is not located in a high value resource area or in steep slopes overlay districts. The Project increases the impervious surfaces by approximately 8 percent. The disturbed area and net change in impervious surface, which are both greater than one acre, trigger the District's erosion and sediment control and stormwater management standards.

1. Erosion and Sediment Control Standard

- a. Erosion and sediment control plan: The Project's Stormwater Pollution Prevention Plan (SWPPP) notes outline the best management practices (BMPs) to be implemented during construction, including silt fences, vehicle-tracking BMPs, and sedimentation basins. The SWPPP should be updated to include strategies to minimize the intensity and duration of disturbance.
- b. Site stabilization: The Project incorporates stabilization measures that are to be implemented throughout the construction timeline. Vehicle-tracking BMPs and silt fencing will be established before construction commences. Needed in SWPPP notes and/or BMPs strategies are for decompacting compacted soils, as required by the District's standard.
- c. Inspection and maintenance: The Project's SWPPP notes outline plans for inspection and maintenance during construction. These SWPPP notes should be updated to include potential locations of sediment discharges from the site and a strategy for documenting failing, inadequate, and modified BMPs.

2. Stormwater Management Standard

- a. Rate control: The HydroCAD model results for the existing and proposed conditions show that with the three proposed infiltration basins, the Project maintains existing peak runoff rates for the 1-year, 2-year, 10-year, and 100-year 24-hour rainfall events using the Atlas nested 14 distribution.
- b. Volume control: The Project abstracts volumes in excess of the required one inch of runoff from new impervious surfaces. The three infiltration basins proposed in the Project capture 23,342 cubic feet, which is 9,855 cubic feet more than the required volume abstractions. The Company provided Braun Intertec Corporation's geotechnical report to highlight the soil conditions and potential infiltration rate.
- c. Water quality: Using the minimal impact design standards calculator, the Project shows a decrease of 7.6 lbs annually in total phosphorus and 1,372.4 lbs annually of total suspended solids between the existing and proposed conditions.
- d. Maintenance and easement: Given the stage of the Project, maintenance and easement have not been addressed. This requirement must be addressed as part of the final plan submitted for District review and approval.

The information provided on the Project generally addresses the needs of the District's Erosion and Sediment Control and Stormwater Management Standard. There are a few areas, highlighted above, that should be addressed as part of the final submittal for approval. Once the Company has addressed all the outstanding items, please submit the final complete Project documents four weeks before a District Board meeting, which generally takes place on the third Wednesday of each month.