

Technical Memorandum

To: Linda Loomis, Administrator
Lower Minnesota River Watershed District

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

Date: November 13, 2020

Re: 77th Street Underpass Permit Review (LMRWD No. 2020-132)

The City of Richfield (City) is proposing construction of the 77th Street Underpass connecting 77th Street underneath Cedar Avenue (TH 77) to Fort Snelling. The portion of the project east of Cedar Avenue falls within the Lower Minnesota River Watershed District (LMRWD or District), while the west segment falls within the Richfield–Bloomington Watershed Management Organization (RBWMO; [Figure 1](#)). The project was previously approved by LMRWD at the January 2019 board meeting but was put on hold because of a lack of funding.

Because of changes to the original design, including the removal of proposed stormwater BMPs, the City's engineer, WSB & Associates (WSB), submitted a new permit application on October 21, 2020. The project proposes an increase of 1.1 acres of impervious surface, triggering District Rules B – Erosion and Sediment Control and D – Stormwater Management. The project is not located in any of the District's special overlay districts (High-Value Resources Area, Floodplain, or Steep Slopes Overlay Districts).

The proposed removal of the dry ponds does not meet the District's volume-reduction and water-quality requirements under Rule D. Additionally, the project appears to involve changing watershed boundaries and redirecting additional area from RBWMO to LMRWD ([Figure 1](#)). District staff have been working with WSB to clarify the project design and ascertain if alternatives were considered to meet the District's requirements.

November 6, 2020, Meeting with Applicant

Young Environmental and the administrator met with WSB on November 6, 2020, to discuss the following concerns:

- construction schedule
- project lead and owner
- capacity constraints of the downstream I-494 storm sewer system
- removal of dry ponds
- alternatives to dry ponds

Following the discussion, WSB provided a memo clarifying these concerns on November 9, 2020, and their responses and staff notes from the meeting are summarized below.

Construction Schedule

The permit application indicated an anticipated start date of November 23, 2020. WSB clarified that the project will be going out for bids this winter and will be constructed in the spring or summer of 2021.

Project Lead

WSB clarified that the City is the project lead and owner. The Minnesota Department of Transportation (MnDOT) is a project partner in the design process as a plan reviewer and will be leading the construction administration.

I-494 Storm Sewer Capacity Constraints

The project design team worked with MnDOT to incorporate flood storage into the design of the 77th Street Underpass, given that the I-494 system is over its design capacity. Constructing an underground storage chamber in the northwest quadrant of the I-494 and TH 77 cloverleaf would provide an additional flood-storage volume of 0.20 acre-feet. This increase is approximately the same as the difference in runoff volume between the 10-year event from existing and proposed conditions.

The proposed storm sewer contains a flap gate that will prevent backflows from the I-494 system from flooding the 77th Street Underpass, as well as reduce peak flows from 77th Street entering the I-494 system. When closed, the 77th Street storm sewer has the capacity to retain a 100-year event with six inches of standing water at the low point of 77th Street until the I-494 system gains the capacity to receive the water. The City finds this intentional flooding of 77th Street to be acceptable.

Removal of Dry Ponds from Project

The proposed dry ponds were removed from the project because the 2019 design mistakenly assumed that MnDOT owned the property and, therefore, did not account for the right-of-way costs. MnDOT and the City, together, were involved in the design change discussions and determined that the minimal improvements to water quality and flood storage provided by the ponds would not justify the \$6.7 million cost to acquire the additional right-of-way.

Alternatives Considered

Alternative locations for stormwater management right-of-way in the LMRWD were considered, but because of the close proximity to the proposed and existing roadways, existing infrastructure constraints, and FAA and MAC requirements, the project team concluded there were no viable options for water-quality treatments in the District.

Project Summary

- Project Name: 77th Street Underpass
- Purpose: To connect 77th Street east and west of Cedar Avenue and improve traffic and transit problems along I-494
- Project Size: 16.00-acre project area; 14.95 acres disturbed, 5.85 acres of existing impervious surface, and 7.12 acres of new impervious surface; net increase 1.1 acres of new impervious surface
- Location: Northeast quadrant of the TH 77 and I-494 quadrant in Bloomington, MN
- Applicable LMRWD Rules: Rule B—Erosion and Sediment Control
Rule D—Stormwater Management
- Recommended Board Action: See recommendations

Permit Application Review

The District has received the following documents for review:

Document Name	Author	Document Date	Date Received; Revised
LMRWD Individual Project Permit Application	WSB	10/21/2020	10/21/2020
77th Street Underpass Memorandum	WSB	10/21/2020	10/21/2020
77th Street Underpass Drainage Plans	WSB	10/19/2020	10/21/2020
Existing Conditions – LMRWD – 77th Street	WSB	10/20/2020	10/21/2020

Document Name	Author	Document Date	Date Received; Revised
Underpass HydroCAD Model			
77th Street Underpass – Drainage Overview Map – LMRWD Permit	WSB	10/20/2020; revised 11/11/2020	10/21/2020; 11/11/2020
Proposed Conditions – LMRWD – 77th Street Underpass Richfield Underground System – 24” orifice outlet discharge HydroCAD Model	WSB	10/20/2020; revised 11/11/2020	10/21/2020; 11/11/2020
Stormwater Pollution Prevention Plan and Erosion Control Plan	WSB	10/19/2020	10/21/2020
77th Street Underpass DWSMA Overview Map	WSB	11/27/2018	10/21/2020
77th Street Underpass; Response to LMRWD Comments	WSB	11/10/2020	11/9/2020

Rule B—Erosion and Sediment Control

Under Rule B, the District regulates land-disturbing activities affecting one acre or more. The proposed project disturbs 14.95 acres, only a portion of which lies within the LMRWD. While the total new impervious surface within the LMRWD has not been provided, an estimate of the area confirms it would exceed one acre. The County has provided an erosion and sediment control plan and Stormwater Pollution Prevention Plan (SWPPP).

An NPDES permit will be required for a District permit.

Rule D—Stormwater Management

The District requires stormwater management for projects that would create one acre or more of new impervious surface. This project proposes a net increase of 1.1 acres, which, under Rule D, would require reducing the volume by 3,993 cubic feet, meeting existing discharge rates, and demonstrating no net increase in total phosphorus or total suspended solids would result from the project.

The 2019 design included two dry ponds east of TH 77 on MAC property to provide flood storage and to meet the volume and water-quality requirements. However, as stated in WSB’s memorandum on October 21, 2020, the dry ponds have been removed because of the increased right-of-way costs and proximity to the Minneapolis–St. Paul International Airport. An underground storage chamber on the west side of TH 77 (currently within RBWMO but proposed to be redirected to LMWRD) will provide flood storage and rate control. Runoff from the project will discharge into the existing NE Loop stormwater pond in the northeast quadrant of the TH 77–I-494 interchange, which overflows into the I-494 storm sewer (**Figure 1**). An underground infiltration system in Washington Park will reduce volume and improve water quality for the proposed

impervious surface. However, stormwater treated by this system flows west, within the RBWMO boundary, and, thus, would not benefit the LMRWD.

The proposed underground storage vault would reduce discharge rates into the existing MnDOT stormwater pond (**Table 1**).

Table 1. 77th Street Underpass Peak Stormwater Discharge from HydroCAD Modeling

EVENT	EXISTING (CFS)	PROPOSED (CFS)	CHANGE (CFS)
2-YR / 24-HR	4.46	2.47	-1.99
10-YR / 24-HR	9.77	6.02	-3.75
100-YR / 24-HR	22.14	16.75	-5.39

Section 4.4.2 of Rule D requires reducing post-construction stormwater runoff volume for projects that create one acre or more of impervious surface. The project no longer includes the dry ponds proposed in the 2019 design because of concerns about the right-of-way costs, the Drinking Water Supply Management Area (DWSMA), and standing water near the airport.

Additionally, the DWSMA boundaries currently shown online by the Minnesota Department of Health (**Figure 2**) do not show the Richfield DWSMA indicated by WSB in their October 21, 2020, memorandum. The District asked WSB for clarification, and WSB confirmed the project no longer falls within the high-vulnerability DWSMA boundary.

Without the dry ponds or other volume-reduction measures, the project modeling indicates there will be an increase in stormwater runoff from the proposed 77th Street Underpass Project (**Table 2**).

Table 2. 77th Street Underpass Stormwater Runoff Volume

EVENT	EXISTING (AC-FT)	PROPOSED (AC-FT)	CHANGE (AC-FT)
2-YR / 24-HR	0.380	0.506	+0.126
10-YR / 24-HR	0.791	1.001	+0.210
100-YR / 24-HR	1.935	2.283	+0.348

In a discussion on November 6, 2020, WSB indicated that the impervious area within the LMRWD would be offset by the treatment provided by the Washington Park infiltration gallery, which provides 5,662 cubic feet of volume reduction and water-quality treatment in excess of the 3,993 cubic feet required by the rules. Unfortunately, this infiltration system does not directly benefit the LRMWD because it flows west, within the RBWMO boundary.

Section 4.4.3 of Rule D requires projects creating one acre or more of impervious surface to provide evidence that no net increase would result in total phosphorus or total suspended solids in the receiving waters. Without the dry ponds or other BMPs in the LMWRD, no water quality benefits are being provided to the District.

Recommendations

We recommend that the board obtain legal counsel on the approval options for this project because, as presented, it does not meet the District rules and would set a precedent for future permit approvals.

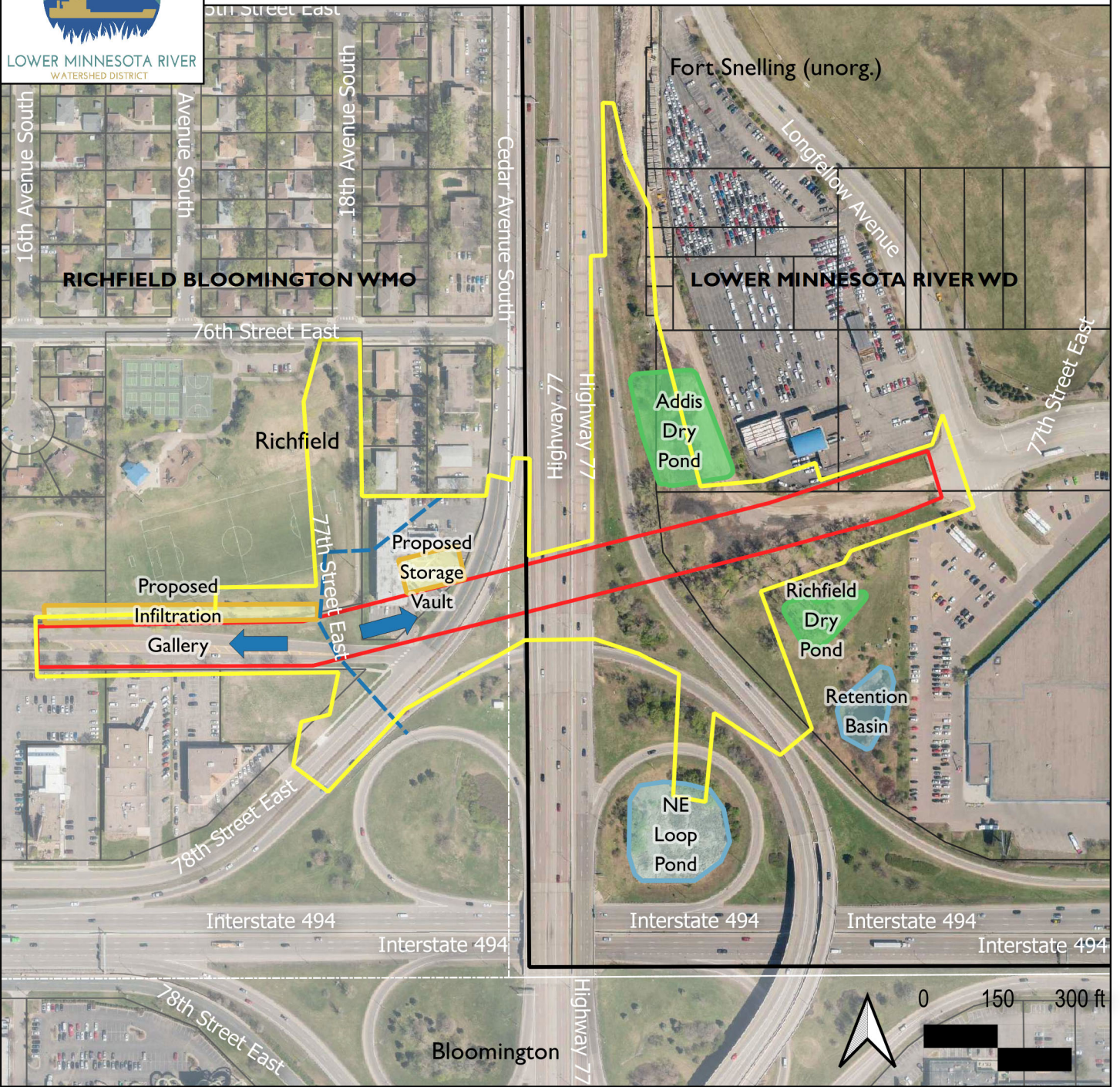
Representatives from the City, MnDOT, and WSB have been invited to attend the board meeting scheduled for November 18, 2020, to answer questions from the board members.

Attachments:

- Figure 1. Proposed 77th Street Underpass Project Location Map
- Figure 2. Minnesota Department of Health DWSMA Map



Figure 1: 77th Underpass Project Location



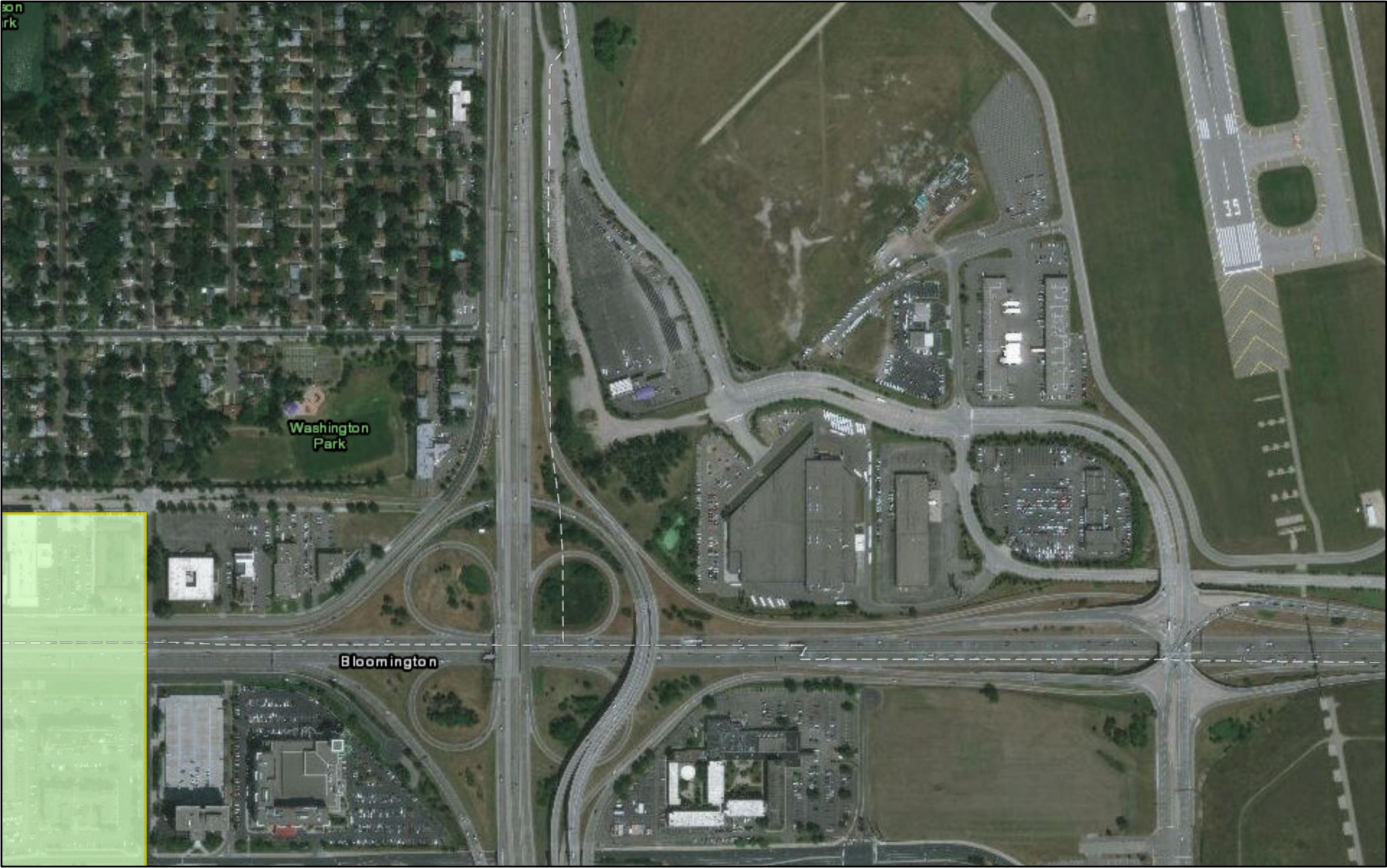
LEGEND

- Approximate Construction Limits
- 77th Street Underpass
- Existing Stormwater Pond
- 2019 Dry Ponds
- 2020 Proposed BMPs
- Watershed Management Districts & Organizations
- LMRWD Boundary
- Hennepin Co. Parcel Data
- Proposed Watershed Divide
- Flow Direction

LMRWD Watershed Location Map

Young Environmental Consulting Group, LLC

Figure 2. 77th Street Underpass DWSMA - 11/5/2020



November 5, 2020

