

elm creek Watershed Management Commission

ADMINISTRATIVE OFFICE
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www.elmcreekwatershed.org

January 5, 2022

Members
Technical Advisory Committee
Elm Creek Watershed Management Commission
Hennepin County, MN

Dear Members:

A meeting of the Technical Advisory Committee of the Elm Creek Watershed Management Commission will be held on **Wednesday, January 12, 2022, at 9:30 a.m.** This will be a virtual meeting.

To join the meeting, click <https://zoom.us/j/990970201> or go to www.zoom.us and click **Join A Meeting**. The meeting ID is **990-970-201**. The password is **water**.

If your computer is not equipped with audio capability, you need to dial into one of these numbers:

| | |
|-------------------------------|------------------------------|
| +1 929 205 6099 US (New York) | +1 312 626 6799 US (Chicago) |
| +1 669 900 6833 US (San Jose) | +1 346 248 7799 US (Houston) |
| +1 253 215 8782 US | +1 301 715 8592 US |

Meeting ID: 990 970 201. Passcode: 579973

The meeting is open to the public via the instructions above.

Thank you.



Judie A. Anderson
Administrator
JAA:tim
Encls:

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AGENDA Technical Advisory Committee January 12, 2022 | 9:30 a.m.

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Meeting ID: 990 970 201. Passcode: 579973

1. Call to Order.
 - a. Approve agenda.*
 - b. Approve Minutes of November 30, 2021, meeting.*
2. Third Party Review of Preliminary HUC-8 Model.
 - a. Next Steps.
3. Conformity of City and Commission Rules and Standards
 - a. Low floor and impervious (MS4) rule changes
 - 1) Which structures are subject to low floor rules
 - b. Conformity to new MS4 rule changes – implementation timelines
4. Cost share policy.*
 - a. Subwatersheds.
 - 1) Rice Lake Subwatershed Application.*
 - b. Maximum CIP levy.
 - 1) Current CIP.*
4. O&M Agreements.*
5. 2022 Work Plan.
6. Other Business.
7. Next TAC meeting date _____.
8. Adjourn meeting

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*in meeting packet

**available at meeting

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Technical Advisory Committee Meeting Minutes November 30, 2021

I. A virtual meeting of the **Technical Advisory Committee (TAC)** of the Elm Creek Watershed Management Commission was convened at 10:30 a.m., Tuesday, November 30, 2021.

In attendance: Heather Nelson, Champlin; Kevin Mattson, Corcoran; Nico Cantarero, Wenck/Stantec, Dayton; Derek Asche, Maple Grove; Matt Danzl, Hakanson-Anderson, Medina; Ben Scharenbroich, Plymouth; Andrew Simmons, Rogers; Ross Mullen, Ed Matthiesen, and Diane Spector, Wenck/Stantec; James Kujawa, Surface Water Solutions; Brian Vlach, Three Rivers Park District (TRPD); Kevin Ellis, Hennepin County Dept. of Environment and Energy (HCEE); and Amy Juntunen and Judie Anderson, JASS.

II. Motion by Scharenbroich, second by Simmons to approve the **agenda**.* *Motion carried unanimously.*

III. Motion by Scharenbroich, second by Simmons to approve the **minutes*** of the August 26, 2021, meeting. *Motion carried unanimously.*

IV. **Cost Share Policy.***

Motion by Asche, second by Scharenbroich to strike the words, "Identified in areas outside of the Municipal Urban Service Area (MUSA)." from the policy. *Motion carried unanimously.* Formatting will be adjusted; all other language will remain the same. This action will be considered by the Commission at its December 8, 2021, meeting.

Motion by Scharenbroich, second by Asche to refer the language within the policy regarding subwatershed assessments to a future TAC meeting for consideration and possible modification. *Motion carried unanimously.*

V. **MPCA Compliance.***

Cantarero presented the Minnesota Pollution Control Agency **MCM 5 Compliance Flowchart** and **Off-Site Treatment Sequence**. Staff will review the new draft rules and both the low floor and impervious (MS4) rule change information will be included in the materials for the January TAC meeting.

Motion by Scharenbroich, second by Cantarero to include conforming language as an amendment to the Third Generation Plan in advance of the MS4 schedule. *Motion carried unanimously.*

VI. **MPCA Resilience Grants.***

This is a new grant program providing financial assistance to undertake planning for increased resilience to the impacts of Minnesota's changing climate (warmer and wetter with more damaging rains and cold weather warming, and more extreme heat and drought in the future) within any of the following three focus areas: stormwater, wastewater, community resilience.

Stormwater planning activities that can be funded through this grant include:

1. Vulnerability assessment using hydrologic/hydraulic modeling to identify areas (e.g., stream corridors, bridges, intersections, etc.) that are at increased risk for flooding, including assessing potential scenarios of short- and long-term changes to precipitation.
2. Inventory of infrastructure issues to identify critical impacts (e.g., number of structures flooded, frequency of flooding, social vulnerability, local environmental impacts, etc.), resulting in a prioritized list of critical areas needing infrastructure improvements to increase resilience.

The Commission could use the current HUC model to run scenarios where flood risks are likely in the future and identify critical infrastructure within the future floodplain.

The program requires a 10% match. It was agreed not to make application this year, but to do so next year after the new HUC-8 model is completed.

VII. Other Business.

A. Staff noted from the August minutes that the TAC has not completed its business regarding **conformity of City and Commission Rules and Standards**. This will be added to the agenda for the next meeting. (See B., below.)

B. Topics for future TAC meetings.

1. Conformity of City and Commission Rules and Standards
 - a. Low floor and impervious (MS4) rule changes (V., above)
 - b. Conformity to new MS4 rule changes.
2. Cost share policy language regarding subwatersheds.
3. 2022 Work Plan (need by February 2022).
4. Review and recommend approval of Rice Lake subwatershed application.
5. Convene meeting, FY22-23 Watershed-based Implementation Funding (WBIF) program.
6. Consider projects for 2022 Stormwater, Wastewater and Community Resilience Planning Grants.
7. HOAs being responsible for O&M plans within their developments.
8. Update CIP (need by March 2022).
9. Consider projects/programs as line items in 2023 Operating Budget (need by April 2022).
10. Review Project Review Fee Schedule.
11. Others?

VIII. There being no further business, the meeting was adjourned at 11:37 a.m.

Respectfully submitted,



Judie A. Anderson
Recording Secretary
JAA:tim

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To: Elm Creek Watershed Management Commission Member Cities

From: ECWMC Technical Staff

cc: Ross Mullen, PE, CFM

Date: December 22, 2021

Subject: Third Party Review of the Preliminary HUC-8 Model of the Elm Creek Watershed

INTRODUCTION AND PURPOSE

Member cities of the Elm Creek Watershed Management Commission (ECWMC) have noted significant differences between the flood elevations in their community hydrologic and hydraulic (e.g., XPSMWM) models and the 2016 Federal Emergency Management Agency (FEMA) Hennepin County Flood Insurance Study (FIS) verses those included in the preliminary Elm Creek Floodplain Modeling and Mapping HUC-8 study (Preliminary HUC-8 Study). In some instances, especially in the upper watershed, the Preliminary HUC-8 model simulates a base flood elevation (100-year or 1%-annual-exceedance-probability event) that is seven (7) to eight (8) feet higher than the 2016 FIS.

The hydrologic and hydraulic analyses used to create the 2016 FIS were created, with modifications submitted as FEMA Letters of Map Revision, are dated:

- Champlin 1975-1977
- Corcoran: 1980-1981
- Dayton: 1976-1977
- Maple Grove:1976-1977
- Medina:1978-1980
- Plymouth: 1977-1982
- Rogers: 1990-1993.

Significant development has occurred in these member cities of the Elm Creek Watershed Management Commission since the publication of the above studies, using the results of those studies to limit flood risk in the watershed (e.g., land use planning and requiring structures to be elevated). Such significant increases in the base flood elevation will place numerous structures in the regulatory floodplain and are cause for concern as the communities continue to develop using best practices to reduce flood risk.

The MNDNR provided ECWMC technical staff the Preliminary HUC-8 hydrologic and hydraulic models to review and the memorandum documenting the methodology used to create the hydrologic and hydraulic models, "*Elm Creek Narrative and QAQC Documentation*" (Barr Engineering Co., 2021). ECWMC technical staff also reviewed the web-based interactive map published by the MNDNR titled "*Elm Creek Watershed District Draft Flood Risk Review Map*".

HYDROLOGY

A hydrologic analysis (e.g., model) calculates the water cycle process that occur, including infiltration, evaporation, transpiration (plant absorption), and runoff. Hydrologic analyses are then used to estimate the peak streamflow in a watercourse, which can be used for planning and infrastructure design.

Peak Streamflow Review

A comparison of the peak streamflow rates between the 2016 FIS and Preliminary HUC-8 is included in Table 1. The percent changes are symbolized with arrow markers indicating a greater than 10% increase, within 10% (approximately unchanged), and a 10% or greater decrease in peak streamflow. A general discussion of the peak streamflow rates is discussed below.

- **Elm Creek:** At the upper end of Elm Creek, near the Medina-Plymouth city limits, the Preliminary HUC-8 model peak discharge rates are approximately 43-72% higher than the 2016 FIS. Farther downstream, the peak discharge rates in the Preliminary HUC-8 model vary between 3-36% lower than the 2016 FIS. Because it is the policy of the ECWMC to require all culvert and bridge crossings to show no-rise for the base flood event, the floodplain for the downstream portions is expected to be lower than that shown in the 2016 FIS due to the decrease in estimated peak discharge.
- **North Fork Rush Creek:** The peak discharge rates in the Preliminary HUC-8 model on North Fork Rush Creek are approximately 20-35% lower than the 2016 FIS. Because it is the policy of the ECWMC to require all culvert and bridge crossings to show no-rise for the base flood event, the floodplain is expected to be lower for the entirety of North Fork Rush Creek than that shown in the 2016 FIS due to the decrease in estimated peak discharge.
- **Rush Creek:** Upstream of County Road 116 on Rush Creek, peak discharge rates published in the Preliminary HUC-8 model are generally lower the 2016 FIS by 15-61%. The estimated discharge at the outlet of Jupert Lake during the 10-year increases by 22%; however, the absolute amount is only 11-cfs. Downstream the Preliminary HUC-8 model peak discharge rates are approximately 31-40% higher than the 2016 FIS.

Based on several conversations ECMWC technical staff have had with MNDNR floodplain group staff, we understand that the 2016 FIS model of Elm Creek reflects republished 1970's and 1980's analyses discussed in the *Introduction and Purpose* Section. It is also our understanding that those analyses were based on fully developed planned use in the watershed, as expected in the 1970's and 1980's using Technical Paper 40 hydrology (statistically derived design storm depths based on the period of record from late 1800's to 1961).

The fully developed planned use of the 2016 FIS (1970's and 1980's analyses) hydrologic models was expected to generate extremely conservative peak streamflows. The increase in peak streamflows is surprising because of the land use assumption in combination with the policy of the ECWMC that new and re-development of more than 1-acre must not increase the site peak runoff rates for the 2-, 10-, and 100-year events. While design rainfall depths have increased as published in Atlas 14 Volume 8 (reflecting statistically derived design storm depths based on the late 1800's to 2013), the land use assumptions used in the 2016 FIS in combination with the Commission's policy limiting rate control from developed site, should limit the increases in peak streamflow rates.

Hydrologic Model Review

The Preliminary HUC-8 hydrologic model uses the Muskingham-Cunge hydrologic routing method across the entirety of the watershed. The Muskingham-Cunge hydrologic routing method simulates the channel as a simplified trapezoidal cross section and routes a hydrograph through a watercourse (reach). The simplified trapezoidal cross section used throughout the model reflects the apparent channel width (i.e., distance between the banks). All modeled storage is accounted for using these shortened simplified trapezoidal cross sections except the most upstream watershed within a reach and at major named lakes (i.e., Rice Lake, Mud Lake, and Fish Lake) are modeled as *Reservoirs*.

This hydrologic routing method may be appropriate for the downstream channelized reaches of Elm Creek, Rush Creek, and North Fork Rush Creek or for modeling low flows; however, the upper watershed consists of series of large ponds, wetlands, and lakes connected by ephemeral streams, culverts, and bridges with appreciable flood storage outside of the channel banks. In these locations there is significant flood storage outside of the channel that is not included using the Muskingham-Cunge routing method with a shortened simplified trapezoidal cross section. Instead, the HEC-HMS model simulates a channel that is analogous to an incised channel without floodplain connectivity, which produces large peak flood flows with a faster time of concentration. In some cases, the Preliminary HUC-8 model simulates a several thousand-foot-wide floodplain as a channel with a width of ten to twenty feet. For example, Lake Medina is simulated as 10-foot-wide trapezoidal channel when the apparent floodplain width approaches 2,400-feet.

Table 2 highlights a few locations where the modeled approach is significantly undercounting for a significant flood storage volume as it only simulates on-channel storage for most of the watershed. The locations identified in Table 2 are not meant to be exclusive and are provided for illustrative purposes only. An annotated figure showing the locations where the Preliminary HUC-8 uses only channel storage or does not reflect any modeled storage is included as Figure 1.

Table 1 Difference in Peak Streamflow between the 2016 FIS and the Preliminary HUC-8 at Key Locations

| Location | 10% Annual Chance Exceedance Probability | | | 2% Annual Chance Exceedance Probability | | | 1% Annual Chance Exceedance Probability | | | 0.2% Annual Chance Exceedance Probability | | |
|-------------------------------------|--|----------------|----------------|---|----------------|--------------|---|----------------|--------------|---|----------------|--------------|
| | Preliminary HUC-8 | 2016 Effective | Difference (%) | Preliminary HUC-8 | 2016 Effective | % Difference | Preliminary HUC-8 | 2016 Effective | % Difference | Preliminary HUC-8 | 2016 Effective | % Difference |
| Elm Creek | | | | | | | | | | | | |
| Conf. with Mississippi River | 1,099 | 1,380 | ↓ -20% | 1,700 | 2,300 | ↓ -26% | 1,999 | 2,780 | ↓ -28% | 2,790 | 4,350 | ↓ -36% |
| Elm Creek Above Rush Creek | 429 | 450 | ⇒ -5% | 666 | 690 | ⇒ -3% | 783 | 860 | ⇒ -9% | 1086 | 1345 | ↓ -19% |
| Elm Creek Medina-Plymouth Limits | 201 | 185 | ⇒ 9% | 329 | 230 | ↑ 43% | 394 | 245 | ↑ 61% | 568 | 330 | ↑ 72% |
| North Fork Rush Creek | | | | | | | | | | | | |
| N. Fork Rush Creek Cain Road | 219 | 340 | ↓ -36% | 333 | 485 | ↓ -31% | 391 | 530 | ↓ -26% | 542 | 700 | ↓ -23% |
| N. Fork Rush Creek Trail Haven Road | 193 | 280 | ↓ -31% | 295 | 435 | ↓ -32% | 347 | 495 | ↓ -30% | 482 | 700 | ↓ -31% |
| Rush Creek | | | | | | | | | | | | |
| Rush Creek Conf. with Elm Creek | 1,010 | 770 | ↑ 31% | 1,575 | 1,170 | ↑ 35% | 1,857 | 1,330 | ↑ 40% | 2,587 | 2,000 | ↑ 29% |
| Rush Creek Downstream of Co. Rd 116 | 185 | 285 | ↓ -35% | 285 | 420 | ↓ -32% | 336 | 470 | ↓ -29% | 465 | 680 | ↓ -32% |
| Rush Creek at Jubert Lake Outlet | 34 | 40 | ⇒ -15% | 61 | 50 | ↑ 22% | 76 | 150 | ↓ -49% | 118 | 300 | ↓ -61% |

Table 2 Non-exclusive List of Locations where the Muskingham-Cunge Shortened Simplified Trapezoidal Cross Sections Significantly Undercount Floodplain Storage

| Elm Creek HEC-HMS Model Feature Name | Common Name | Location Description | City | Preliminary HUC-8 | | | Apparent Floodplain Width (feet) as Measured in Aerial Imagery |
|--------------------------------------|---|---|--------------------|-------------------|---------------------|--------------------|--|
| | | | | Simplified Shape | Bottom Width (feet) | Side Slopes (H:1V) | |
| EC30R | Lake Medina | Medina North of Highway 55 | Medina | Trapezoid | 10 | 2 | 300-2,400 |
| EC26R & EC26R22 | Elm Creek Pond | Elm Creek Headwaters & Elm Creek floodplain upstream of Hamel Road | Medina | Trapezoid | 10 | 2 | 50-1,500 (with significant offline storage) |
| EC19R & EC19R2 | Elm Creek Greenway | Elm Creek floodplain downstream (east) of Peonly Lane | Plymouth | Trapezoid | 20 | 2 | 200-2,700 |
| EC16R | Elm Creek floodplain | Elm Creek floodplain in Nottingham Park | Maple Grove | Trapezoid | 30 | 2 | 500-2,000 |
| EC22R | County Ditch 16 | Upstream (west) of Brockton Lane | Corcoran | Trapezoid | 0 | 2 | 100-2,000 |
| EC2R & EC3R | Elm Creek Park Reserve | --- | Maple Grove/Dayton | Trapezoid | 40 | 2 | 500-1,000 |
| DC1R & DC1R2 | Diamond Creek | Diamond Creek Downstream of French and Diamond Lakes to the Confluence with Elm Creek | Dayton | Trapezoid | 20 | 2 | 150-2,000 |
| RC1R & EC3R2 | Rush Creek | Rush Creek between County Road 81 and its confluence with Elm Creek | Dayton | Trapezoid | 40 | 2 | 25-600 |
| RC5R | North Fork Rush Creek | North Fork Rush Creek downstream of Fletcher Lane | Dayton & Corcoran | Trapezoid | 30 | 2 | 2100 |
| RC13R, RC12R2, RC12R, RC11R, RC8 | North Fork Rush Creek | North Fork Rush Creek between County Road 10 and Fletcher Lane | Corcoran | Trapezoid | 10-25 | 2 | 100-3,800 |
| SFRC1R | Rush Creek | Rush Creek between Brockton Lane and 97th Avenue | Maple Grove | Trapezoid | 20 | 2 | 100-2,000 |
| SFRC1R2 | Rush Creek | Rush Creek between County Road 10 and Schutte Road | Corcoran | Trapezoid | 20 - 30 | 2 | 300-6,500 |
| SFRC14 | County Ditch 7 | Upstream of Trail Haven Road | Corcoran | Trapezoid | 15 | 2 | 50-2,000 |
| RSRC13R3, SFRC13R2, RSRC13R | County Ditch 3 (Rush Creek downstream of Jupert Lake) | Between Jupert Lake and Kalk Road | Corcoran | Trapezoid | 15 - 20 | 2 | 40-2,000 |

Map of the Elm Creek Watershed Management Council (WMC) boundary in the Lake Superior region. The map displays 48 model watersheds, categorized into three groups: DC (Ditch Creek, purple boxes), RC (River Creek, yellow boxes), and EC (Elm Creek, yellow boxes). The watersheds are labeled with their respective codes (e.g., DC1, RC1, EC1). The map also shows the Elm Creek WMC Boundary (red line) and the Lake Superior shoreline (blue line). A legend in the bottom right corner defines the symbols for Model Watersheds and the Elm Creek WMC Boundary, and includes a scale bar (0 to 10,000 feet) and a north arrow.

HYDRAULICS

The Minnesota Department of Natural Resources (MNDNR) proposed to complete extensive surveys of all hydraulic structures (bridges, culverts, and weirs) within the effective (FEMA mapped) floodplain as part of the Twin Cities HUC-8 pass-through FEMA grant; however, the MNDNR was unable to complete these surveys with limited budgets.

Approximately 80 hydraulic structures, representing approximately half of the total hydraulic structures in the Elm Creek Preliminary HUC-8 model, were simulated based on assumptions made from review of aerial imagery as shown in Table 3 of the *Elm Creek Narrative and QAQC Documentation* (Barr Engineering Co., 2021).

To ensure that the Preliminary HUC-8 Study reflects the best available data, ECWMC technical staff reviewed:

1. Publicly available data sources, such as the Minnesota Department of Transportation's (MNDOT) *BridgeInfo3* map, which was developed by MNDOT to assist local State Aid agencies, to complete bridge and culvert inspections. This application includes bridge and culvert dimensions for many county roads.
2. The cities of Corcoran, Champlin, Plymouth, and Maple Grove provided ECWMC technical staff data for this review, including existing hydrologic and hydraulic models, construction plans, as-builts, and survey information.
3. Technical staff consulted with the city of Medina, who provided ECWMC technical staff references to FEMA Letters of Map Revision based on survey and as-builts.
4. The cities of Dayton and Rogers did not provide updated data to ECWMC technical staff and indicated the proposed base flood elevations shown in the Preliminary HUC-8 model were not concerning to their communities.
 - a. Note that Stantec staff reviewed the city of Dayton's utility network as part of this review, which was provided to Stantec as part of other project work.

The review is summarized in Table 3. Based on a conversation with MNDNR staff in December 2021 we understand that concurrent to this review, the MNDNR has completed a thorough review of the road overflows in the hydraulic model, so this review focuses on the culverts and bridge openings.

MAPPING

We understand that as part of the mapping process, the MNDNR staff are completing a review of the inundation maps that includes processes such as removing mapped islands within the base floodplain extents where the LiDAR data erroneously reflects that reflect vegetation (e.g., cattails) in large wetland complexes.

Exhibit A includes example figures from the *Elm Creek Watershed District Draft Flood Risk Review Map* showing the Preliminary HUC-8 floodplain and locations where Elm Creek technical staff identified mapping irregularities that may be caused by the hydrologic or hydraulic issues identified above. These locations should be reviewed closely in both the modeling and mapping. At some streamflow confluences, the base flood elevation differs by up to several feet. The MNDNR should review these locations to ensure that appropriate boundary conditions were chosen for the model.

RECOMMENDATIONS

Following the above review, we recommend the MNDNR make the following revisions to the Preliminary HUC-8 models:

1. We recommend the MNDNR update the hydrologic HEC-HMS model with an alternative modeling approach, such as *Reservoir Routing*, in the upper watershed to account for all the off-channel flood storage on the landscape.
2. We recommend the MNDNR update the hydraulic HEC-RAS model with the best available information for each of the hydraulic structures in the model.
3. We recommend the MNDNR review the boundary conditions for each of the stream sections as the mapped base flood elevations differ at stream confluences.
4. We recommend the MNDNR remap the floodplain after the above changes are made to the hydrologic and hydraulic models.

| Municipality | Name | FEMA ZONE | Preliminary HUC-8 HEC-RAS Model | | | | | | | | | Data Review | | | | |
|--------------|--------------------|-----------|---------------------------------|--------------|------------|-------------------------------------|-----------------------------|-------------------|-------------------|----------------------|--|---|-------------------|-------------------|----------------------|-----------------------|
| | | | River | Reach | HEC-RAS XS | HEC-RAS XS Structure Size and Shape | Bridge Opening Area (sq ft) | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source | Structure Size and Shape | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source |
| Dayton | Zanzibar Lane | A | DiamondCreek | DiamondCreek | 25012 | Bridge | 173 | 896.0 | 896.2 | 906.6 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Dayton | Diamond Lake Road | A | DiamondCreek | DiamondCreek | 16591 | 4' Circular | | 882.4 | 882.5 | 897.8 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Dayton | Diamond Lake Road | A | DiamondCreek | DiamondCreek | 13849 | 4' Circular | | 877.0 | 876.9 | 882.4 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Dayton | 129th Aven N | A | DiamondCreek | DiamondCreek | 7018 | 4' Circular | | 866.8 | 866.1 | 872.8 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Dayton | Trail Crossing | A | DiamondCreek | DiamondCreek | 721 | 1' Circular | | 854.4 | 854.3 | 856.8 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | Prairie Drive | A | Elm Creek | ElmCreek | 130575 | 3' Circular | | 995.2 | 993.7 | 1003.5 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | Hwy 55 | A | Elm Creek | ElmCreek | 129606 | 4' Circular | | 987.4 | 986.5 | 996.3 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | Arrowhead Drive | A | Elm Creek | ElmCreek | 129406 | 4' Circular | | 986.4 | 985.1 | 994.8 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | Meander Road | A | Elm Creek | ElmCreek | 128820 | 2' Circular | | 983.7 | 982.2 | 985.0 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | Shorewood Trail | A | Elm Creek | ElmCreek | 123228 | Double 5' Circular | | 979.5 | 978.9 | 989.0 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | Meander Road | A | Elm Creek | ElmCreek | 122340 | 6' Circular | | 976.6 | 976.0 | 985.9 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | Hwy 55 | AE | Elm Creek | ElmCreek | 120239 | 3.5' Circular | | 972.4 | 972.4 | 983.1 | Effective Model MapleGrv-7 Bridge #19 and assumed from aerial imagery | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Medina | CP RR | AE | Elm Creek | ElmCreek | 120115 | 4' Circular | | 972.4 | 972.4 | 983.3 | Effective Model MapleGrv-7 Bridge #18 and assumed from aerial imagery | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Medina | Hamel Road | AE | Elm Creek | ElmCreek | 118483 | 5' x 6.5' Box | | 973.9 | 973.9 | 987.7 | DNR 2020 Survey - ELM_101 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Medina | Private Road | AE | Elm Creek | ElmCreek | 116126 | 3' Circular | | 970.4 | 970.4 | 975.2 | Effective Model MapleGrv-7 Bridge #16 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Medina | Elm Creek Drive | AE | Elm Creek | ElmCreek | 114930 | 3.5' Circular | | 968.7 | 967.5 | 975.4 | DNR 2020 Survey - ELM_394 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Medina | Hamel Road | AE | Elm Creek | ElmCreek | 114599 | 5' x 7' Box | | 967.0 | 967.3 | 976.2 | DNR 2020 Survey - ELM_390 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Medina | CP RR | AE | Elm Creek | ElmCreek | 113790 | 5.5' Circular | | 965.4 | 965.1 | 982.9 | Effective Model MapleGrv-7 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Medina | Private Road | AE | Elm Creek | ElmCreek | 113604 | 5' Circular | | 963.6 | 963.6 | 970.6 | Medina Plan Sheet | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Medina | Private Road | AE | Elm Creek | ElmCreek | 112622 | 4.5' Circular | | 960.8 | 960.8 | 973.7 | Medina Plan Sheet | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Medina | Co. Rd. 101 | AE | Elm Creek | ElmCreek | 111746 | 6' x 7.5' Box | | 958.6 | 958.0 | 972.1 | DNR 2020 Survey - ELM_391 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Plymouth | Hwy 55 | AE | Elm Creek | ElmCreek | 110895 | 8' x 10' Box | | 956.3 | 956.3 | 973.3 | DNR 2020 Survey - Elm_07 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Plymouth | Peony Lane | A | Elm Creek | ElmCreek | 101787 | Bridge | 34 | 930.0 | 930.0 | 938.6 | Effective Model MapleGrv-7 Bridge #8 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Plymouth | Co. Rd. 47 | A | Elm Creek | ElmCreek | 94969 | Double Box | 228 | 914.0 | 914.0 | 924.2 | Effective Model MapleGrv-1 Bridge #7. Side slopes from aerial imagery. | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Maple Grove | Elm Road | AE | Elm Creek | ElmCreek | 90404 | Double 8' x 8' Box | | 912.7 | 912.5 | 923.5 | DNR 2020 Survey - ELM_381 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Maple Grove | Private Road | AE | Elm Creek | ElmCreek | 86376 | Bridge | 198 | 906.6 | 904.6 | 916.4 | DNR 2020 Survey - ELM_15 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Maple Grove | Bass Lake Road | AE | Elm Creek | ElmCreek | 82661 | Double 10' x 10' Box | | 902.4 | 902.0 | 931.8 | DNR 2020 Survey - ELM_393 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Maple Grove | Trail Crossing | AE | Elm Creek | ElmCreek | 78645 | Bridge | 761 | 899.0 | 898.8 | 914.1 | ENO_(S_ELM_CREEK_TRAIL_BRIDGE)_P0.PDF | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Maple Grove | Nottingham Parkway | AE | Elm Creek | ElmCreek | 74483 | Bridge | 534 | 896.1 | 895.4 | 917.8 | DNR 2020 Survey - ELM_400 MapleGrv-7 Bridge #3 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Maple Grove | Trail Crossing | AE | Elm Creek | ElmCreek | 74162 | Bridge | 365 | 895.0 | 894.0 | 906.3 | DNR 2020 Survey - Elm_62 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |
| Maple Grove | Weaver Lake Rd | AE | Elm Creek | ElmCreek | 68167 | Double 8' x 10' Ellipse | | 889.0 | 888.7 | 903.3 | DNR 2020 Survey - ELM_385 Maple Grv-7 Bridge #2 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | |

| | | | Preliminary HUC-8 HEC-RAS Model | | | | | | | | | | Data Review | | | | | |
|-----------------------|----------------------------|-----------|---------------------------------|--------------|------------|-------------------------------------|-----------------------------|-------------------|-------------------|----------------------|---|---|-------------------|-------------------|----------------------|--------------------------------|--|--|
| Municipality | Name | FEMA ZONE | River | Reach | HEC-RAS XS | HEC-RAS XS Structure Size and Shape | Bridge Opening Area (sq ft) | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source | Structure Size and Shape | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source | | |
| Maple Grove | Trail Crossing | AE | Elm Creek | ElmCreek | 66093 | Bridge | 468 | 886.6 | 886.5 | 897.5 | Effective Model Maple Grv-7 Bridge #1 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | I-94 | AE | Elm Creek | ElmCreek | 63269 | Bridge | 1119 | 886.4 | 884.8 | 908.0 | DNR 2020 Survey - Elm_63 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | 93rd Ave N | AE | Elm Creek | ElmCreek | 55968 | Bridge | 1170 | 884.5 | 884.6 | 906.4 | DNR 2020 Survey - ELM_380 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Rice Lake Dam | AE | Elm Creek | ElmCreek | 53103 | 60ft wide spillway Dam | | N/A | N/A | N/A | DNR 2020 Survey | 60 ft wide spillway at 891.0' | | | | As-Built | | |
| Maple Grove | Trail Crossing | AE | Elm Creek | ElmCreek | 52158 | Bridge | 2100 | 877.3 | 877.5 | 884.3 | DNR 2020 Survey - Elm_64 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Regional Trail | AE | Elm Creek | ElmCreek | 49922 | Bridge | 7083 | 873.0 | 872.7 | 908.5 | Assumed from aerial imagery | 80' Span Length | | | | MNDOT-Bridgenfo3 App. ID R1024 | | |
| Maple Grove | BNSF RR | AE | Elm Creek | ElmCreek | 49134 | Bridge | 210 | 871.3 | 871.3 | 886.5 | DNR 2020 Survey - ELM_66 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Co. Rd. 81 | AE | Elm Creek | ElmCreek | 49010 | Bridge | 436 | 872.0 | 872.7 | 886.6 | DNR 2020 Survey - ELM_382 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Hwy 610 | AE | Elm Creek | ElmCreek | 48906 | Bridge | 376 | 872.5 | 872.4 | 885.0 | Assumed from upstream bridge configuration | No Additional Information Available | | | | | | |
| Maple Grove | Hwy 610 | AE | Elm Creek | ElmCreek | 48820 | Bridge | 403 | 873.2 | 872.2 | 884.8 | Assumed from upstream bridge configuration | No Additional Information Available | | | | | | |
| Maple Grove | Co. Rd. 81 | AE | Elm Creek | ElmCreek | 48703 | Bridge | 441 | 871.9 | 872.4 | 885.3 | DNR 2020 Survey - ELM_389 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Private Road | AE | Elm Creek | ElmCreek | 48346 | Bridge | 163 | 869.1 | 869.0 | 881.4 | DNR 2020 Survey - ELM_69 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Trail Crossing | AE | Elm Creek | ElmCreek | 46341 | Bridge | 1731 | 868.6 | 868.6 | 881.0 | DNR 2020 Survey - ELM_70 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Trail Crossing | AE | Elm Creek | ElmCreek | 42894 | Bridge | 145 | 866.1 | 866.1 | 875.5 | DNR 2020 Survey - ELM_71 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Dayton | Private Road | AE | Elm Creek | ElmCreek | 33604 | Bridge | 1279 | 855.3 | 855.3 | 868.4 | Champlin effective model Bridge 5 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Dayton | Elm Creek Road | AE | Elm Creek | ElmCreek | 25578 | Bridge | 236 | 851.6 | 853.0 | 862.6 | DNR 2020 Survey - ELM_397 Dayton-2 Bridge #1 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Champlin | French Lake Road | AE | Elm Creek | ElmCreek | 9161 | Bridge | 3348 | 846.4 | 847.3 | 865.2 | LOMR Case 13-05-8011R | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Champlin | Cartway Road | AE | Elm Creek | ElmCreek | 4072 | 15' x 24' CMP Arch | | 839.0 | 839.0 | 856.2 | DNR 2020 Survey - ELM_396 LOMR Case 13-05-8011R | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Champlin | US Hwy 169 | AE | Elm Creek | ElmCreek | 1044 | Bridge | 517 | 838.5 | 838.5 | 856.2 | LOMR Case 13-05-8011R | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Champlin | Osseo Road | AE | Elm Creek | ElmCreek | 650 | Dam | | N/A | N/A | N/A | Dam is Not Modeled | Dam- see as-bults | N/A | N/A | N/A | Record Plans | | |
| Medina | Medina Road | A | Elm Creek | ElmCreek_BR1 | 4766 | 3' Circular | | 981.5 | 981.4 | 986.3 | Assumed from aerial imagery | No Additional Information Available | | | | | | |
| Medina | Blackfoot Trail | A | Elm Creek | ElmCreek_BR2 | 4121 | 3' Circular | | 977.5 | 977.1 | 980.6 | Assumed from aerial imagery | No Additional Information Available | | | | | | |
| Medina | Private Road | AE | Elm Creek | ElmCreek_BR2 | 215 | 3' Circular | | 973.9 | 973.6 | 976.7 | Assumed from aerial imagery | No Additional Information Available | | | | | | |
| Plymouth | Hwy 55 | AE | Elm Creek | ElmCreek_BR3 | 939 | 4' Circular | | 965.8 | 965.5 | 974.7 | Assumed from aerial imagery | No Additional Information Available | | | | | | |
| Plymouth | CP RR | AE | Elm Creek | ElmCreek_BR3 | 741 | 4' Circular | | 966.2 | 963.4 | 992.8 | Assumed from aerial imagery | 3' (Material Not Listed) | Not Listed | 962.9 | | Record Plans | | |
| Plymouth | Trojan Trail/ Wayzata High | A | Elm Creek | ElmCreek_BR3 | 226 | 6' Circular | | 960.5 | 955.4 | 975.2 | Assumed from aerial imagery | 5' RCP | 962.15 | 957.05 | | Record Plans | | |
| Corcoran | Private Road | A | Elm Creek | ElmCreek_BR4 | 11620 | 2' Circular | | 980.4 | 979.9 | 987.1 | Assumed from aerial imagery | No Additional Information Available | | | | | | |
| Corcoran/ Medina | Hackamore Road | A | Elm Creek | ElmCreek_BR4 | 10363 | 3' Circular | | 971.7 | 970.6 | 977.6 | Assumed from aerial imagery | 2' Circular RCP | 970.96 | 970.11 | 977.48 | City of Corcoran Survey 2021 | | |
| Corcoran/ Medina | Hackamore Road | A | Elm Creek | ElmCreek_BR4 | 9555 | 3' Circular | | 964.6 | 964.0 | 974.1 | Assumed from aerial imagery | 2' Circular RCP | 964.05 | 963.37 | 973.76 | City of Corcoran Survey 2021 | | |
| Maple Grove/ Corcoran | Brockton Ln | A | Elm Creek | ElmCreek_BR4 | 9394 | 3' Circular | | 964.0 | 961.4 | 974.4 | Assumed from aerial imagery | OCS draining to Pond to the SE | 956.00 | Not Listed | | Record Plans | | |
| Maple Grove/ Plymouth | Hackamore Road | A | Elm Creek | ElmCreek_BR4 | 8966 | 3' Circular | | 959.6 | 958.3 | 965.7 | Assumed from aerial imagery | 3' RCP | Not Listd | Not Listed | | Record Plans | | |
| Plymouth | Troy Ln | A | Elm Creek | ElmCreek_BR4 | 4858 | Double 3' x 6' Box | | 940.7 | 938.3 | 944.4 | Assumed from aerial imagery | Double 3' x 6' Box Culvert | 940.37 | 939.79 | | Record Drawing | | |
| Plymouth | 58th Circle | A | Elm Creek | ElmCreek_BR4 | 3392 | Double 5' Circular | | 934.9 | 934.1 | 942.5 | Assumed from aerial imagery | Twin 54x88" Arch Pipes | 934.45 | 933.61 | | City of Plymouth GIS | | |

| | | | Preliminary HUC-8 HEC-RAS Model | | | | | | | | | | Data Review | | | | |
|----------------------|------------------|-----------|---------------------------------|-----------------|------------|-------------------------------------|-----------------------------|-------------------|-------------------|----------------------|---|---|-------------------|-------------------|----------------------|----------------------------------|--|
| Municipality | Name | FEMA ZONE | River | Reach | HEC-RAS XS | HEC-RAS XS Structure Size and Shape | Bridge Opening Area (sq ft) | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source | Structure Size and Shape | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source | |
| Plymouth | Peony Ln | AE | Elm Creek | ElmCreek_BR4 | 1891 | 6' x 6' Box | | 926.0 | 927.3 | 938.1 | Assumed from aerial imagery | 6' x 5' Box Culvert | 926.96 | 925.69 | | Record Drawing | |
| Maple Grove/Corcoran | Co. Rd. 101 | A | Elm Creek | ElmCreek_BR5 | 11191 | 4' Circular | | 958.9 | 957.9 | 968.1 | Assumed from aerial imagery | 4.5' Circular CSP | 957.84 | 957.84 | | Construction Drawings | |
| Maple Grove | Private Road | A | Elm Creek | ElmCreek_BR5 | 10648 | 7' Circular | | 957.2 | 957.2 | 972.0 | Assumed from aerial imagery | 5' Circular RCP | 957.7 | 957.4 | | Record Drawing | |
| Maple Grove | Vagabond Court | A | Elm Creek | ElmCreek_BR5 | 9049 | 6' Circular | | 955.5 | 955.5 | 967.4 | Assumed from aerial imagery | 5' Diameter RCP . The routing of this is under the Vagabond Court not through the pond | 954.93 | 954.67 | | Construction Drawings | |
| Maple Grove | Co. Rd. 10 | A | Elm Creek | ElmCreek_BR5 | 8529 | 5' Circular | | 960.0 | 956.0 | 966.3 | Assumed from aerial imagery | Does not exist, the creek is not routed in this direction. | N/A | N/A | | Maple Grove GIS | |
| Maple Grove | Private Road | A | Elm Creek | ElmCreek_BR5 | 8223 | 5' Circular | | 953.4 | 951.6 | 966.8 | Assumed from aerial imagery | 6' Circular RCP | 951.83 | 950.48 | | Construction Drawings | |
| Maple Grove | Trail Crossing | A | Elm Creek | ElmCreek_BR5 | 6707 | 5' Circular | | 941.5 | 941.1 | 947.2 | Assumed from aerial imagery | 1.25' RCP beneath recreational trail | Not Listd | Not Listed | | Maple Grove GIS | |
| Maple Grove | 74th Ave N | A | Elm Creek | ElmCreek_BR5 | 5192 | 6' Circular | | 929.6 | 927.4 | 942.0 | Assumed from aerial imagery | 10x6' Precast Concrete Box | 929.41 | 927.93 | | Construction Drawings | |
| Maple Grove | Lawndale Ln | A | Elm Creek | ElmCreek_BR5 | 3072 | 6' Circular | | 919.6 | 918.1 | 927.4 | Assumed from aerial imagery | 10x6' Precast Concrete Box | Approx 917.5 | Approx 917.5 | | As-Built | |
| Maple Grove | Inland Ln | A | Elm Creek | ElmCreek_BR5 | 2092 | 6' Circular | | 911.6 | 911.4 | 920.9 | Assumed from aerial imagery | 10' x 6' Box Culvert | 909.64 | 909.01 | Approx. 921.5' | As-Built | |
| Maple Grove | Private Road | A | Elm Creek | ElmCreek_BR5 | 1422 | 10' x 4' Box | | 908.9 | 908.8 | 913.1 | Assumed from aerial imagery | No Additional Information Available | | | | | |
| Corcoran | Co. Rd. 116 | A | NFRushCreek | NFRushCreek_BR1 | 5112 | 5' Circular | | 914.7 | 914.7 | 920.8 | Assumed from aerial imagery | 3' Circular CMP | 913.04 | 912.96 | 921.15 | City of Corcoran Survey 2021 | |
| Rogers | Trail Haven Lane | AE | NFRushCreek | NFRushCreek_BR2 | 17732 | 3' Circular | | 935.5 | 935.4 | 940.9 | Assumed from aerial imagery | No Additional Information Available | | | | | |
| Rogers | Tucker Road | AE | NFRushCreek | NFRushCreek_BR2 | 16178 | 4' Circular | | 934.4 | 934.3 | 940.0 | Assumed from aerial imagery | No Additional Information Available | | | | | |
| Rogers | Tilton Trail | AE | NFRushCreek | NFRushCreek_BR2 | 9928 | Double 6' Circular | | 925.0 | 925.0 | 933.3 | Assumed from aerial imagery | No Additional Information Available | | | | | |
| Rogers | Private Road | AE | NFRushCreek | NFRushCreek_BR2 | 4022 | 4' Circular | | 922.1 | 922.1 | 928.6 | Assumed from aerial imagery | No Additional Information Available | | | | | |
| Rogers | Private Road | AE | NFRushCreek | NFRushCreek_BR2 | 3658 | 4' Circular | | 921.9 | 921.8 | 926.4 | Assumed from aerial imagery | No Additional Information Available | | | | | |
| Rogers | Valley Drive | AE | NFRushCreek | NFRushCreek_BR2 | 3558 | 5' Circular | | 921.5 | 920.8 | 932.8 | Assumed from aerial imagery | No Additional Information Available | | | | | |
| Rogers | Private Road | AE | NFRushCreek | NFRushCreek_BR2 | 3017 | 3' Circular | | 920.2 | 919.7 | 923.5 | Assumed from aerial imagery | No Additional Information Available | | | | | |
| Corcoran | Co. Rd. 50 | AE | NFRushCreek | NorthFrkRushCrk | 73093 | 2.5' Circular | | 1001.9 | 1001.2 | 1009.0 | Assumed from aerial imagery | 2.5' Circular CMP | 1000.53 | 1000.18 | 1009.29 | City of Corcoran Survey 2021 | |
| Corcoran | Strehler Road | AE | NFRushCreek | NorthFrkRushCrk | 67362 | 2.5' Circular | | 996.3 | 996.1 | 1003.1 | DNR 2020 Survey - ELM_473 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Co. Rd. 19 | AE | NFRushCreek | NorthFrkRushCrk | 64849 | 5' x 5' Box | | 992.2 | 992.2 | 1007.7 | Effective Model Corcoran-2 Bridge #9 and aerial imagery | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Private Road | AE | NFRushCreek | NorthFrkRushCrk | 60629 | 5' Circular | | 986.1 | 986.1 | 991.0 | DNR 2020 Survey - ELM_55 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Co Rd. 10 | AE | NFRushCreek | NorthFrkRushCrk | 60324 | 10' x 5' Box | | 985.5 | 985.5 | 994.3 | Effective Corcoran-2, Bridge #7 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Private Road | AE | NFRushCreek | NorthFrkRushCrk | 59917 | 5' Circular | | 984.0 | 984.0 | 991.3 | DNR Survey 2020 - ELM_92 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Co. Rd. 30 | AE | NFRushCreek | NorthFrkRushCrk | 55164 | 7' x 7' Box | | 968.6 | 968.3 | 979.6 | DNR 2020 Survey - ELM_476 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Rush Creek Blvd | AE | NFRushCreek | NorthFrkRushCrk | 53017 | 4' Circular | | 962.7 | 962.5 | 970.7 | DNR 2020 Survey - ELM_477 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Sundance Road | AE | NFRushCreek | NorthFrkRushCrk | 49447 | 4' Circular | | 955.4 | 955.4 | 962.0 | DNR 2020 Survey - ELM_93 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Oakdale Drive | AE | NFRushCreek | NorthFrkRushCrk | 41884 | 5' Circular | | 938.8 | 938.3 | 946.0 | DNR 2020 Survey - ELM_468 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Bechtold Rd. | AE | NFRushCreek | NorthFrkRushCrk | 38901 | 6' x 8' Box | | 932.0 | 931.9 | 940.5 | DNR 2020 Survey - ELM_469 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran/ Rogers | Co. Rd 117 | AE | NFRushCreek | NorthFrkRushCrk | 35228 | 6' x 8' Box | | 921.9 | 921.5 | 934.4 | DNR 2020 Survey - ELM_570 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Co. Rd 117 | AE | NFRushCreek | NorthFrkRushCrk | 31427 | 6.5' x 8' Ellipse | | 918.8 | 918.7 | 930.0 | DNR 2020 Survey - ELM_571 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Trail Haven Road | AE | NFRushCreek | NorthFrkRushCrk | 27701 | 84" x 132" Arch | | 918.4 | 917.9 | 927.6 | DNR 2020 Survey - ELM_474 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Cain Road | AE | NFRushCreek | NorthFrkRushCrk | 19638 | 7' x 10.5' Box | | 905.6 | 905.1 | 914.9 | DNR 2020 Survey - ELM_475 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran | Private Road | AE | NFRushCreek | NorthFrkRushCrk | 18133 | Double 4' Circular | | 907.4 | 907.4 | 912.7 | DNR 2020 Survey - ELM_94 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Corcoran/ Rogers | 109th Ave N | AE | NFRushCreek | NorthFrkRushCrk | 14546 | 8' Circular | | 902.6 | 902.5 | 913.0 | DNR 2020 Survey - ELM_471 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | |
| Rogers | Fletcher Lane | A | NFRushCreek | NorthFrkRushCrk | 10707 | 15' x 6' Box | | 905.1 | 905.1 | 915.0 | Assumed from aerial imagery | 8x14' Precast Concrete Box | | | | MNDOT- BridgeInfo3. App ID 27152 | |
| Dayton/ Rogers | Brockton Lane | A | NFRushCreek | NorthFrkRushCrk | 5258 | Bridge | 189 | 903.8 | 903.9 | 910.7 | Assumed from aerial imagery | 41.7' Span Bridge (207sq ft conveyance) | | | | MNDOT- BridgeInfo3. App ID 27887 | |

| | | | Preliminary HUC-8 HEC-RAS Model | | | | | | | | | | Data Review | | | | | |
|----------------------|--------------------|-----------|---------------------------------|---------------|------------|-------------------------------------|-----------------------------|-------------------|-------------------|----------------------|--|---|-------------------|-------------------|----------------------|----------------------------------|--|--|
| Municipality | Name | FEMA ZONE | River | Reach | HEC-RAS XS | HEC-RAS XS Structure Size and Shape | Bridge Opening Area (sq ft) | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source | Structure Size and Shape | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source | | |
| Corcoran | Rolling Hills Rd | AE | RushCreek | RushCreek | 101719 | 4.5' x 7' Box | | 962.0 | 961.7 | 967.8 | DNR 2020 Survey - ELM_401 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Corcoran | Kalk Road | AE | RushCreek | RushCreek | 94540 | 4.5' Circular | | 958.1 | 957.7 | 966.0 | DNR 2020 Survey - ELM_402 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Corcoran | Co. Rd. 50 | AE | RushCreek | RushCreek | 91926 | 6' x 10' Box | | 954.6 | 954.9 | 966.1 | DNR 2020 Survey - ELM_403 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Corcoran | Co. Rd. 10 | AE | RushCreek | RushCreek | 84354 | 102' x 88" Arch | 66 | 939.0 | 939.0 | 949.7 | DNR 2020 Survey - ELM_405 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Corcoran | Co. Rd. 116 | AE | RushCreek | RushCreek | 77126 | 88" Circular | | 930.9 | 930.7 | 938.2 | DNR 2020 Survey - ELM_406 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Corcoran | Schutte Road | AE | RushCreek | RushCreek | 66735 | Bridge | 83 | 926.5 | 926.0 | 933.3 | DNR 2020 Survey - Elm_409 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Corcoran | Shannon Lane | AE | RushCreek | RushCreek | 64465 | 7' x 10' Box | | 926.2 | 925.8 | 938.1 | DNR 2020 Survey - ELM_407 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove/Corcoran | Brockton Lane | AE | RushCreek | RushCreek | 63595 | 7.17' x 14' Box | | 926.2 | 925.9 | 935.6 | DNR 2020 Survey - ELM_410 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Co. Rd. 30 | AE | RushCreek | RushCreek | 54230 | Double 8' x 8' Box | | 918.9 | 919.0 | 933.4 | DNR 2020 Survey - ELM_408 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | 101st Ave N | AE | RushCreek | RushCreek | 46409 | Double 7' x 7.5' Box | | 910.8 | 910.6 | 924.1 | DNR 2020 Survey - ELM_404 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | I-94 | AE | RushCreek | RushCreek | 36608 | Double 10' x 10' Box | | 900.2 | 899.7 | 920.9 | Rush River CLOMR Model Bridge #8 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | 105th Ave N | AE | RushCreek | RushCreek | 36346 | Bridge | 787 | 899.2 | 899.0 | 919.0 | Assumed from aerial imagery | 379.3' Span Bridge over I-94 and Rush Creek | | | | MNDOT- BridgeInfo3. App ID 27251 | | |
| Maple Grove | Private Road | AE | RushCreek | RushCreek | 36188 | Bridge | 276 | 897.5 | 897.5 | 910.9 | Rush River CLOMR Model Bridge #7 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | 105th Ave N | AE | RushCreek | RushCreek | 34065 | Double 8' x 10' Box | | 898.7 | 898.0 | 906.8 | DNR 2020 Survey - ELM_483 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Dunkirk Ln | AE | RushCreek | RushCreek | 31456 | Double 8' x 10' Box | | 899.5 | 899.3 | 912.0 | DNR 2020 Survey - ELM_48 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | BNSF RR | AE | RushCreek | RushCreek | 29989 | Bridge | 1918 | 898.3 | 897.0 | 924.5 | DNR 2020 Survey - ELM_96 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Co. Rd. 81 | AE | RushCreek | RushCreek | 29857 | Triple 10' x 10' Box | | 898.4 | 898.4 | 920.5 | DNR 2020 Survey - ELM_27 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Territorial Road | AE | RushCreek | RushCreek | 25437 | Bridge | 731 | 895.2 | 894.7 | 912.0 | DNR 2020 Survey - ELM_480 Dayton-1 Bridge #2 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Fernbrook Ln | AE | RushCreek | RushCreek | 12903 | Double 10' x 10' Box | | 876.2 | 876.1 | 890.2 | DNR 2020 Survey - ELM_482 Dayton-1 Bridge #1 | Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed) | | | | | | |
| Maple Grove | Trail Crossing | AE | RushCreek | RushCreek | 12657 | Bridge | 229 | 874.7 | 874.3 | 886.7 | Assumed from aerial imagery | No Additional Information Available | | | | | | |
| Corcoran | Horseshoe Trail | A | RushCreek | RushCreek_BR1 | 13676 | 3' Circular | | 974.3 | 973.1 | 975.1 | Assumed from aerial imagery | Size Unspecified, CMP | 972.63 | 972.62 | | City of Corcoran Survey 2021 | | |
| Corcoran | Willow Drive | A | RushCreek | RushCreek_BR1 | 8595 | 3' Circular | | 966.4 | 966.7 | 973.2 | Assumed from aerial imagery | 2.5' Circular PVC | 965.65 | 965.24 | | City of Corcoran Survey 2021 | | |
| Corcoran | Horseshoe Trail | A | RushCreek | RushCreek_BR1 | 6626 | 2' Circular | | 965.5 | 965.4 | 966.9 | Assumed from aerial imagery | 1.25' Circular PVC | 965.64 | 965.05 | | City of Corcoran Survey 2021 | | |
| Corcoran | Private Road | A | RushCreek | RushCreek_BR1 | 4157 | 1.5' Circular | | 965.1 | 965.0 | 967.0 | Assumed from aerial imagery | Two, 2.5' Circular RCP's | 963.74, 963.46 | 963.37, 963.42 | 967.9 | City of Corcoran Survey 2021 | | |
| Corcoran | Homestead Trail | A | RushCreek | RushCreek_BR1 | 2142 | 4' x 3' Box | | 963.9 | 963.7 | 968.2 | Assumed from aerial imagery | 4.5' Circular CIP | 963.63 | 963.56 | | City of Corcoran Survey 2021 | | |
| Corcoran | Co. Rd. 50 | A | RushCreek | RushCreek_BR2 | 4251 | 5' Circular | | 980.2 | 974.7 | 987.7 | Assumed from aerial imagery | 2' Circular CPP | 986.89 | 986.46 | 993.79 | City of Corcoran Survey 2021 | | |
| Corcoran | Rolling Hills Road | A | RushCreek | RushCreek_BR2 | 3066 | 4' Circular | | 964.2 | 964.2 | 966.4 | Assumed from aerial imagery | 2' Circular RCP | 963.01 | 962.66 | 967.31 | City of Corcoran Survey 2021 | | |
| Corcoran | Private Road | A | RushCreek | RushCreek_BR2 | 1717 | 4' Circular | | 961.6 | 961.5 | 968.3 | Assumed from aerial imagery | 5' Circular CRP | 961.35 | 961.05 | | City of Corcoran Survey 2021 | | |
| Corcoran | Trail Haven Road | A | RushCreek | RushCreek_BR3 | 5809 | 6' Circular | | 969.3 | 970.5 | 979.9 | Assumed from aerial imagery | 24" Circular CMP | 969.68 | 967.98 | 980.43 | City of Corcoran Survey 2021 | | |
| Corcoran | Settlers Road | A | RushCreek | RushCreek_BR4 | 9019 | 2' Circular | | 975.4 | 974.0 | 981.0 | Assumed from aerial imagery | 1.5' Circular PVC | 974.21 | 973.83 | 981.59 | City of Corcoran Survey 2021 | | |
| Corcoran | Private Road | A | RushCreek | RushCreek_BR4 | 8256 | 2' Circular | | 973.1 | 972.9 | 978.7 | Assumed from aerial imagery | 3.5' Circular PVC | 972.24 | 971.51 | 977.55 | City of Corcoran Survey 2021 | | |
| Corcoran | Larkin Road | A | RushCreek | RushCreek_BR4 | 6938 | 3' Circular | | 970.3 | 970.3 | 984.1 | Assumed from aerial imagery | 3.5' Circular RCP | 969.83 | 968.56 | 984.49 | City of Corcoran Survey 2021 | | |

| Preliminary HUC-8 HEC-RAS Model | | | | | | | | | | | | Data Review | | | | |
|---------------------------------|-------------------|-----------|-----------|---------------|------------|-------------------------------------|-----------------------------|-------------------|-------------------|----------------------|-----------------------------|-------------------------------------|-------------------|-------------------|----------------------|---|
| Municipality | Name | FEMA ZONE | River | Reach | HEC-RAS XS | HEC-RAS XS Structure Size and Shape | Bridge Opening Area (sq ft) | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source | Structure Size and Shape | U/S Invert (feet) | D/S Invert (feet) | Road Overflow (feet) | Structure Data Source |
| Corcoran | Private Road | A | RushCreek | RushCreek_BR4 | 4999 | 1.5' Circular | | 962.5 | 961.9 | 964.4 | Assumed from aerial imagery | 1.5' Circular PVC | 961.86 | 961.34 | 964.68 | City of Corcoran Survey 2021 |
| Corcoran | Private Road | A | RushCreek | RushCreek_BR4 | 4523 | 2' Circular | | 962.1 | 962.0 | 964.7 | Assumed from aerial imagery | 2' Circular CMP | 959.23 | 959.16 | 961.5 | City of Corcoran Survey 2021 |
| Corcoran | Co. Rd. 50 | A | RushCreek | RushCreek_BR4 | 1774 | 5' Circular | | 946.0 | 946.0 | 952.7 | Assumed from aerial imagery | 4' Circular CMP | 944.74 | 944.49 | 953.12 | City of Corcoran Survey 2021 |
| Medina | Pioneer Trail | A | RushCreek | RushCreek_BR5 | 32629 | 3' Circular | | 989.9 | 988.2 | 996.9 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | CP RR | A | RushCreek | RushCreek_BR5 | 28947 | 3' Circular | | 983.1 | 983.0 | 991.9 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | Hwy 55 | A | RushCreek | RushCreek_BR5 | 28819 | 3' Circular | | 983.7 | 983.3 | 992.3 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Medina | Mohawk Drive | A | RushCreek | RushCreek_BR5 | 27773 | 3' Circular | | 982.9 | 981.6 | 989.9 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Corcoran | Horseshoe Trail | A | RushCreek | RushCreek_BR5 | 17557 | 5' Circular | | 973.2 | 973.0 | 979.7 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Corcoran | Settlers Road | A | RushCreek | RushCreek_BR5 | 16293 | 5' Circular | | 973.7 | 974.1 | 981.4 | Assumed from aerial imagery | 3' Circular PVC | 974.39 | 973.73 | | City of Corcoran Survey 2021 |
| Corcoran | Private Road | A | RushCreek | RushCreek_BR5 | 13795 | 5' Circular | | 972.1 | 972.0 | 978.2 | Assumed from aerial imagery | Two, 3' Circular PVC Pipes | 974.33, 972.78 | 972.28, 972.72 | 978.31 | City of Corcoran Survey 2021 |
| Corcoran | Blue Bonnet Drive | A | RushCreek | RushCreek_BR5 | 12050 | 2' Circular | | 968.5 | 968.5 | 972.6 | Assumed from aerial imagery | 4' Circular CMP | 968.55 | 967.52 | 973.45 | City of Corcoran Survey 2021 |
| Corcoran | Abilene Lane | A | RushCreek | RushCreek_BR5 | 9192 | 5' Circular | | 961.0 | 961.0 | 967.0 | Assumed from aerial imagery | 2.25' Circular PVC | 961.74 | 961.55 | 967.48 | City of Corcoran Survey 2021 |
| Corcoran | Buckskin Trail | A | RushCreek | RushCreek_BR5 | 8494 | 5' Circular | | 959.8 | 959.7 | 966.1 | Assumed from aerial imagery | 3' Circular PVC | 960.39, 960.45 | 960.07, 960.34 | 966.6 | City of Corcoran Survey 2021 |
| Corcoran | Larkin Road | A | RushCreek | RushCreek_BR5 | 8110 | 5' Circular | | 959.6 | 959.3 | 966.4 | Assumed from aerial imagery | 5' Circular CMP | 959.25 | 958.72 | | City of Corcoran Survey 2021 |
| Corcoran | Co. Rd. 50 | A | RushCreek | RushCreek_BR5 | 5079 | 6' Circular | | 951.9 | 950.0 | 959.8 | Assumed from aerial imagery | 5' Circular CMP | 951.58 | 950.26 | 960.11 | City of Corcoran Survey 2021 |
| Corcoran | Private Road | A | RushCreek | RushCreek_BR5 | 3967 | 3.5' Circular | | 948.2 | 947.9 | 953.6 | Assumed from aerial imagery | 5' Circular CPP | 947.81 | 947.53 | 954.16 | City of Corcoran Survey 2021 |
| Corcoran | Co. Rd. 10 | A | RushCreek | RushCreek_BR5 | 654 | Bridge | 101 | 938.4 | 938.6 | 947.8 | Assumed from aerial imagery | 10x6' Precast Concrete Box | 938.98 | 938.79 | 947.98 | City of Corcoran Survey 2021 & MNDOT- Bridgeinfo3. App ID 90462 |
| Dayton | Co. Rd. 81 | A | RushCreek | RushCreek_BR6 | 2369 | 3.5' Circular | | 923.9 | 923.8 | 934.3 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Dayton | BNSF RR | A | RushCreek | RushCreek_BR6 | 2214 | 3.5' Circular | | 923.8 | 921.9 | 931.7 | Assumed from aerial imagery | No Additional Information Available | | | | |
| Dayton | Holly Ln | A | RushCreek | RushCreek_BR6 | 1787 | 3' Circular | | 918.0 | 913.3 | 919.7 | Assumed from aerial imagery | 3' Culvert | 917.75 | 911.65 | | Dayton Municipl GIS |
| Dayton | Holly Ln | AE | RushCreek | RushCreek_BR6 | 768 | 3' Circular | | 909.6 | 907.5 | 914.4 | Assumed from aerial imagery | 3' Circular RCP | 908.72 | 907.49 | | Dayton Municipl GIS |
| Dayton | Territorial Road | A | RushCreek | RushCreek_BR7 | 355 | 6' Circular | | 898.1 | 898.0 | 911.2 | Assumed from aerial imagery | 2' Circular RCP | 908.18 | 907.78 | | Dayton Municipl GIS |

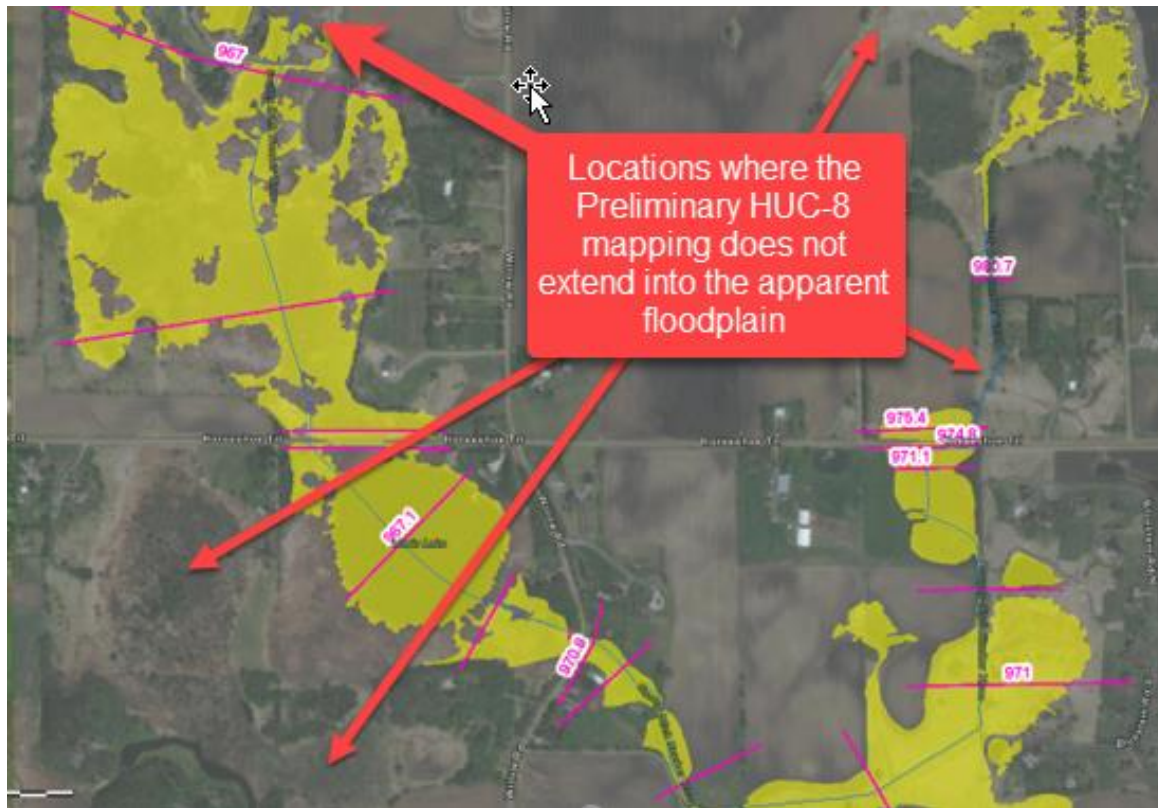
EXHIBIT A


Figure 2 City of Corcoran just east of Jupert Lake and north of municipal boundary with city of Medina. Note how the Preliminary HUC-8 model floodplain does not extend into the apparent floodplain (wetlands) shown in the aerial imagery. (HEC-RAS Reach RushCreek_BR1)

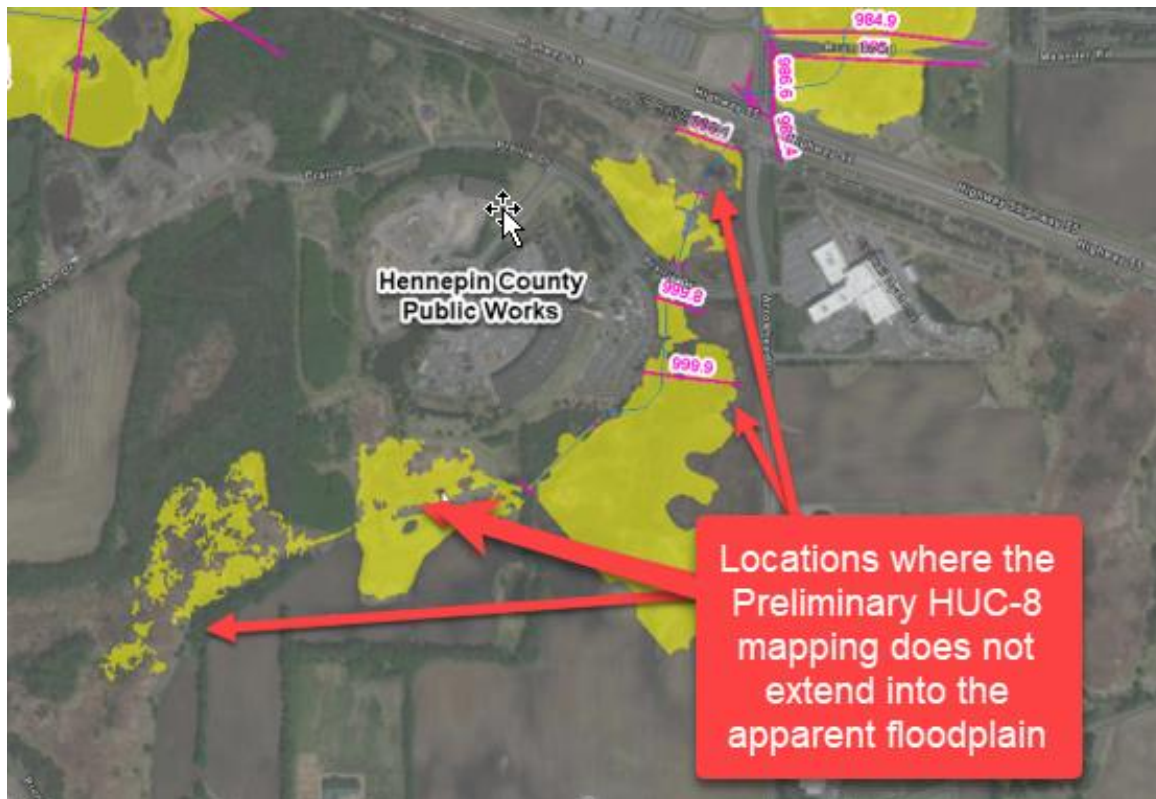


Figure 3 City of Medina near the Hennepin County Public Works facility. Note how the Preliminary HUC-8 model floodplain does not extend into the apparent floodplain (wetlands) shown in the aerial imagery. (HEC-RAS Reach ElmCreek)

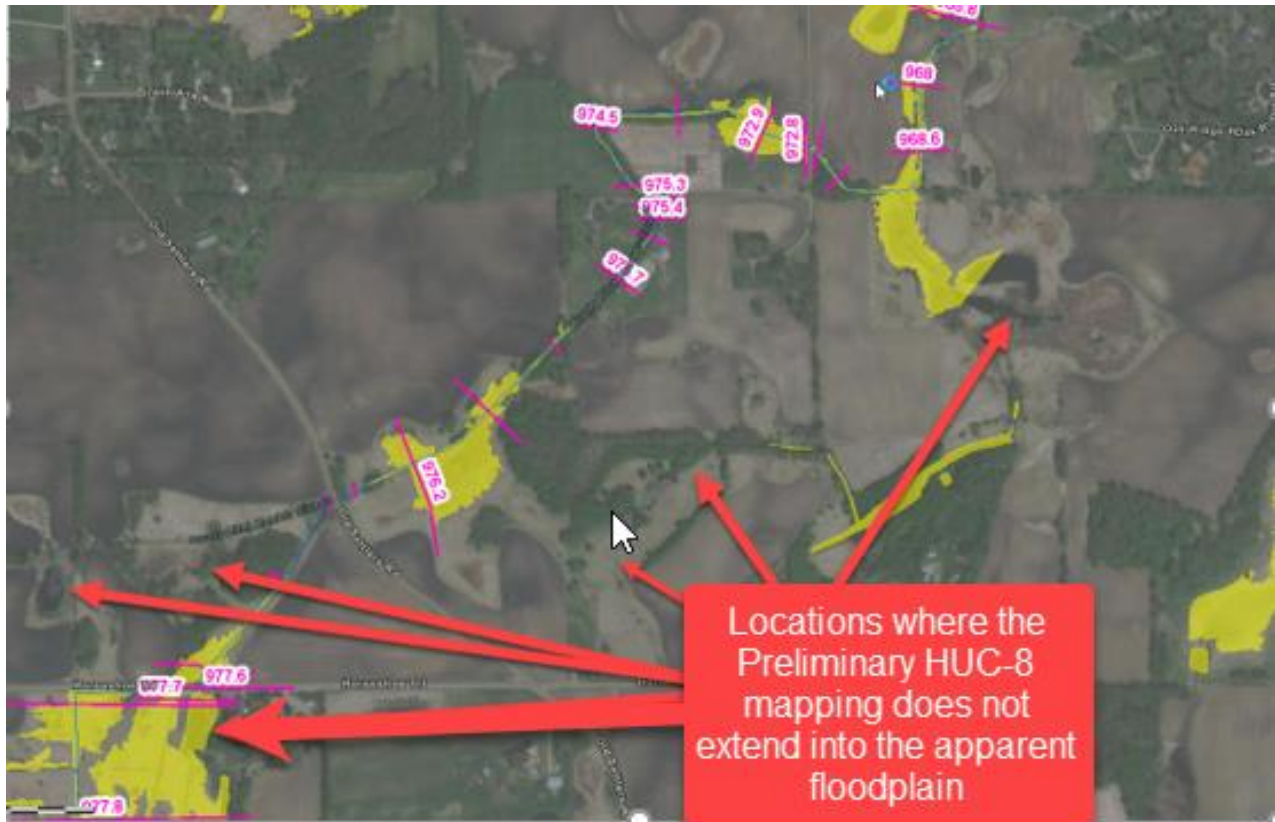


Figure 4 Rush Creek in Corcoran near Old Settlers Road (HEC-RAS Reach RushCreek_BR5)

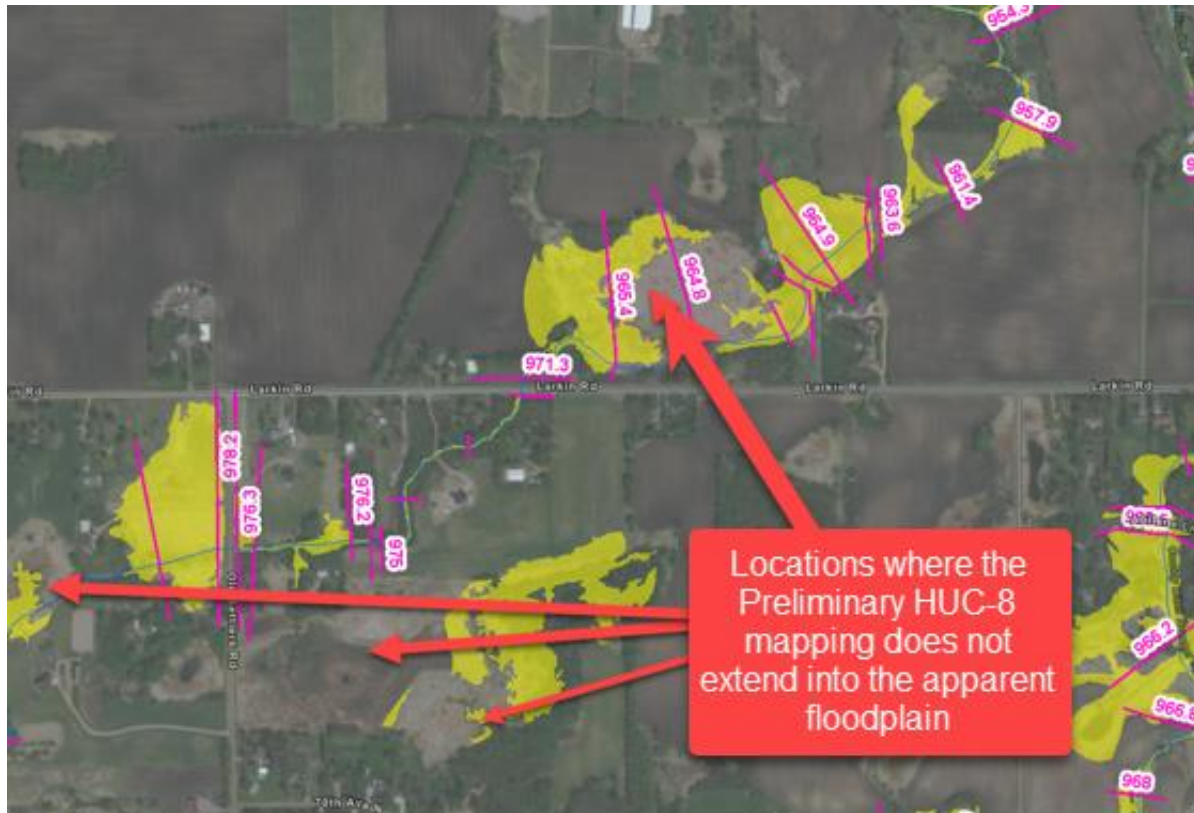


Figure 5 Elm Creek Tributary in Corcoran (HEC-RAS Reach ElmCreek_BR5)

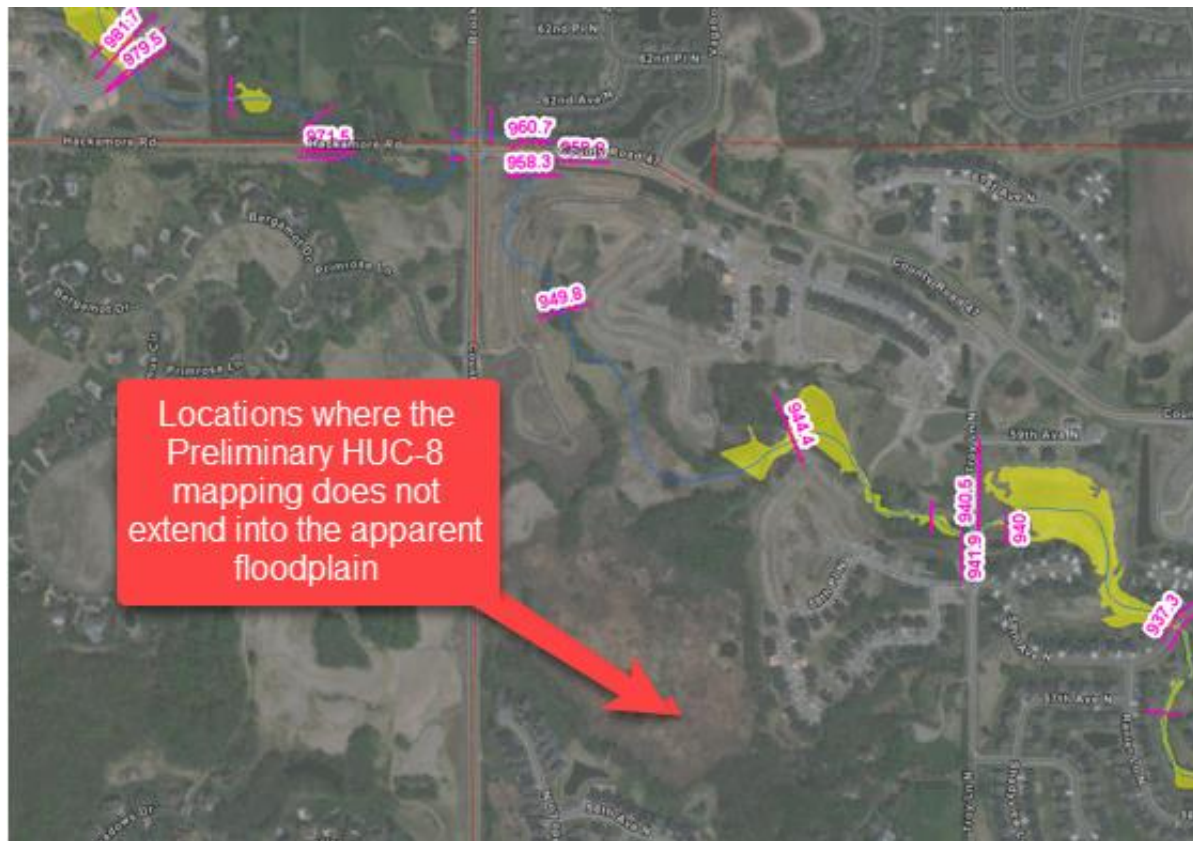


Figure 6 Tributary (HEC-RAS ElmCreek_BR4) tributary from near the Corcoran-Medina-Plymouth-Maple Grove Municipal Boundary. Also note that mapping is not provided between the 979.5 and 944.4-foot base flood elevation.

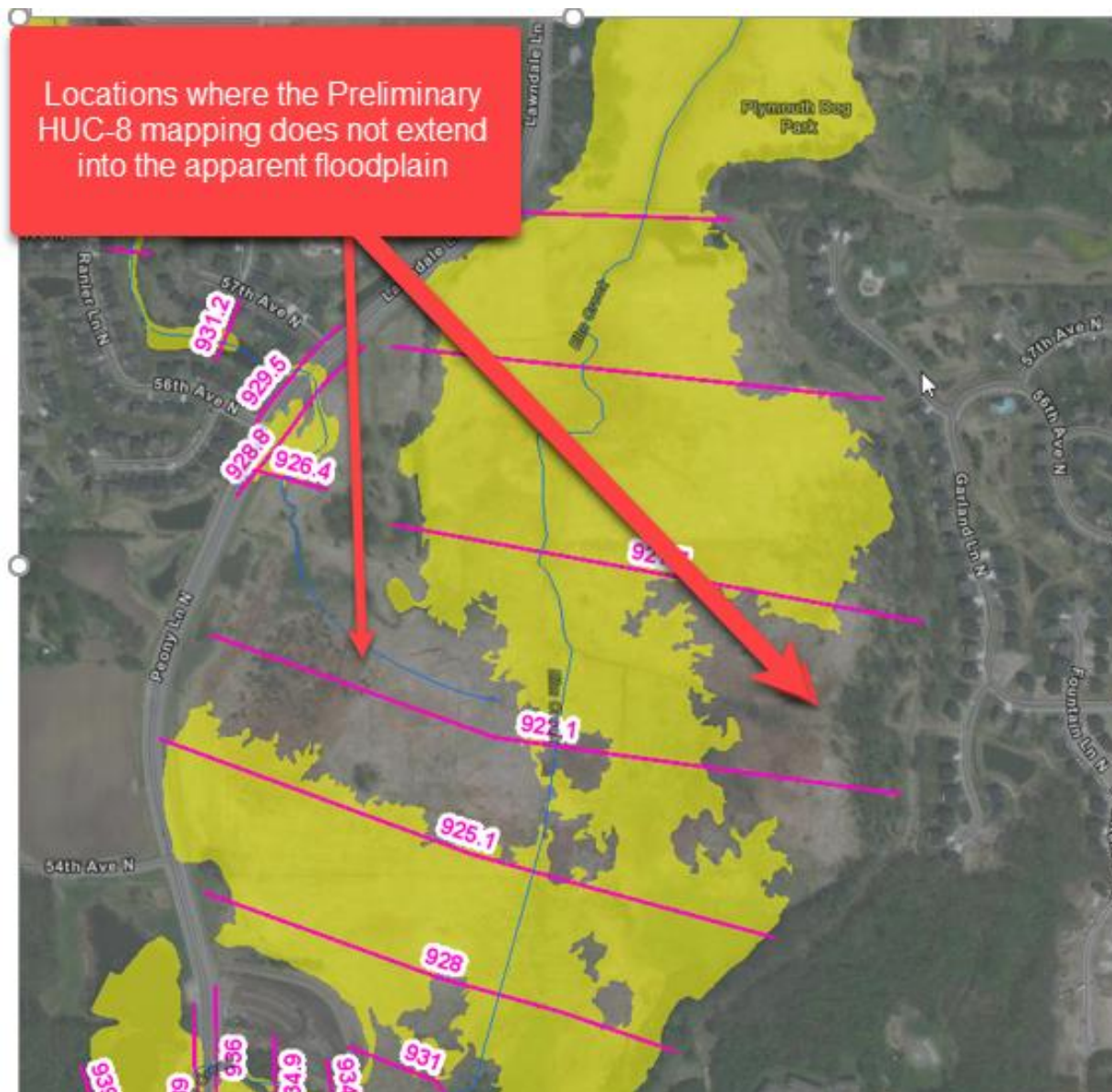


Figure 7 Elm Creek Greenway in Plymouth just east of Peony Lane. Also note that the tributary base flood elevations differ from the adjacent reach and that the cross sections do not extend across the apparent wetlands/floodplains (HEC-RAS Reaches ElmCreek and ElmCreek_BF4)

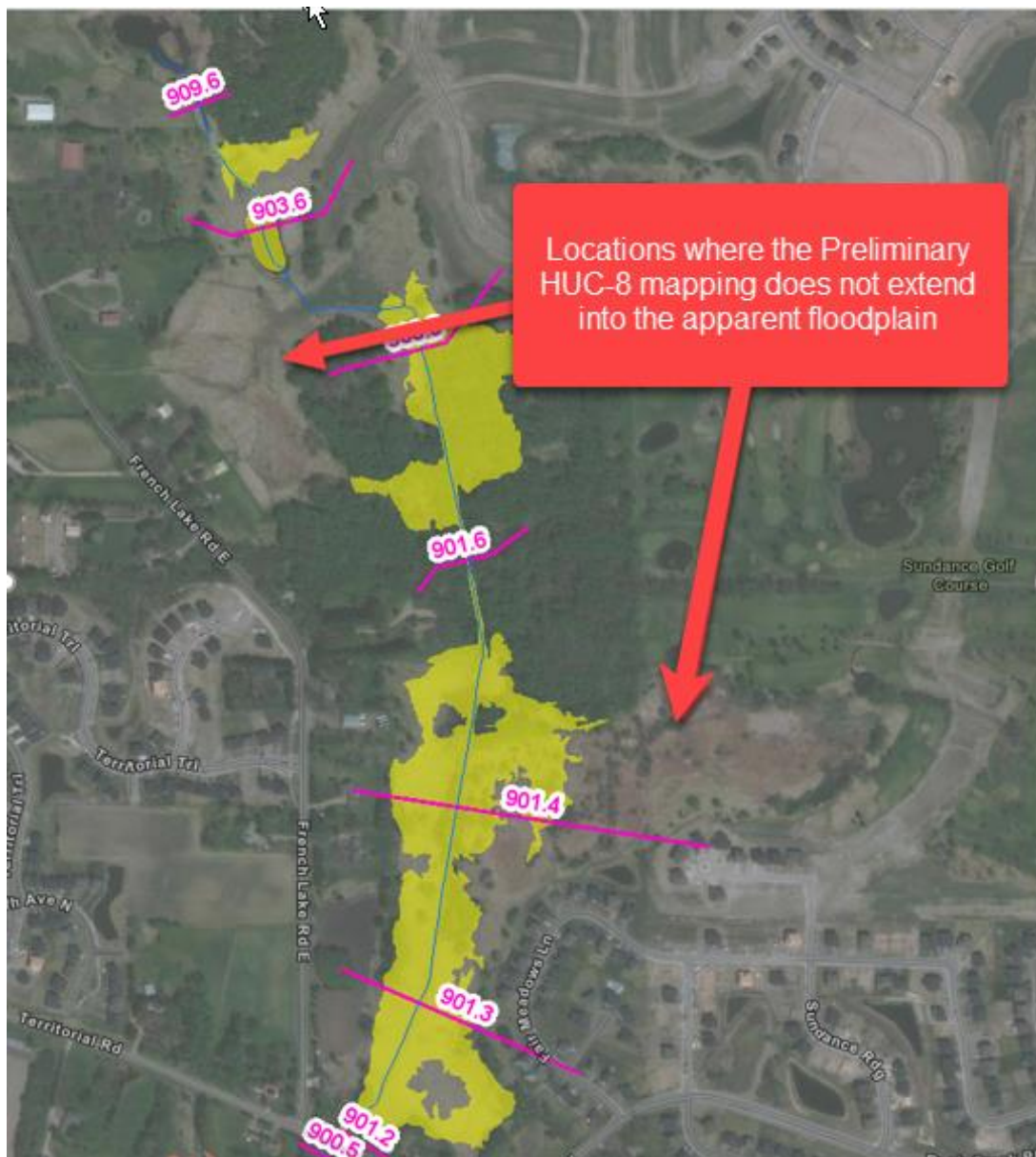


Figure 8 Rush Creek Tributary in Dayton near French Lake Road E (HEC-RAS Reach RushCreek_BR7). Also note the significant decrease in base flood elevation at the upstream end of the reach.

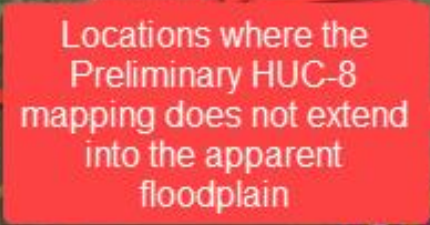


Figure 9 Rush Creek in Dayton near French Lake Road E (HEC-RAS Reach RushCreek, RushCreek_BR4, and RushCreek_BR5).

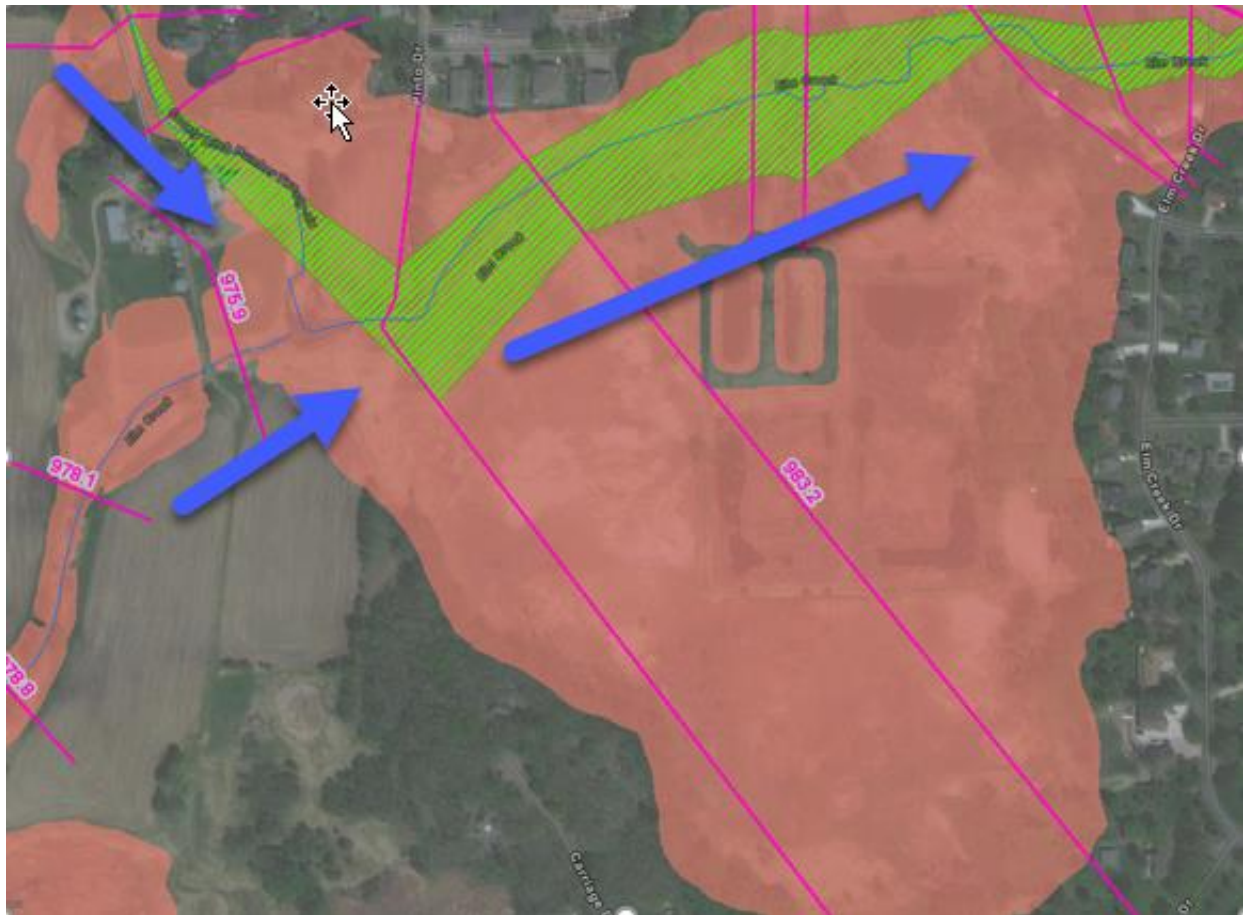


Figure 10 Just upstream of the crossing of Elm Creek's crossing with Hamel Road in Medina (HEC-RAS Reaches ElmCreek and ElmCreek_BR2), note the adversely increasing base flood elevation in the direction of flow (975.9' to 983.2') as well as the inconsistencies in the mapped floodway.

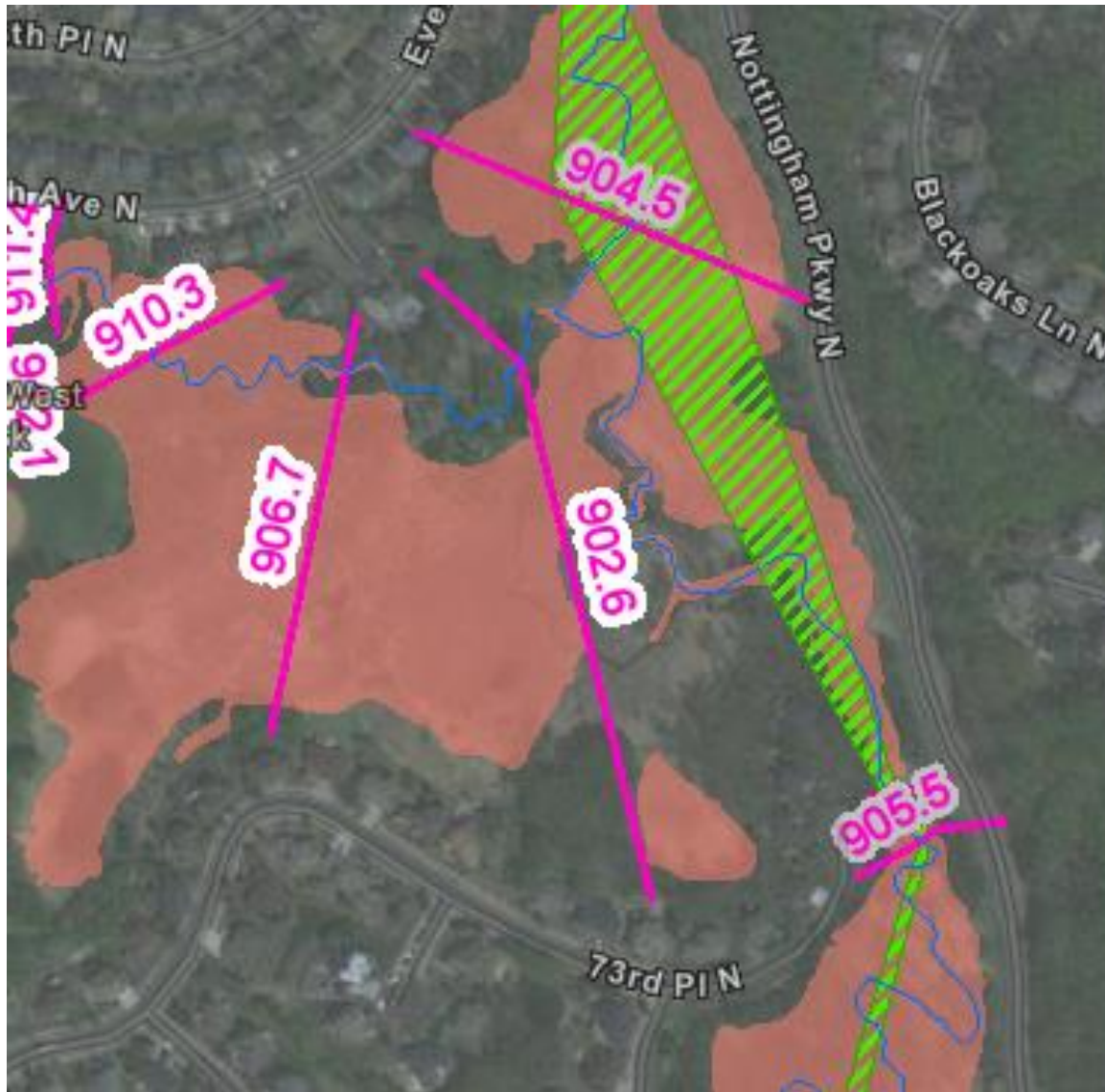


Figure 11 Note the difference in base flood elevations of the confluence of HEC-RAS Reaches ElmCreek and ElmCreek_BR5 between 73rd Place North and Nottingham Parkway N in Maple Grove as well as the inconsistencies in the mapped floodway.

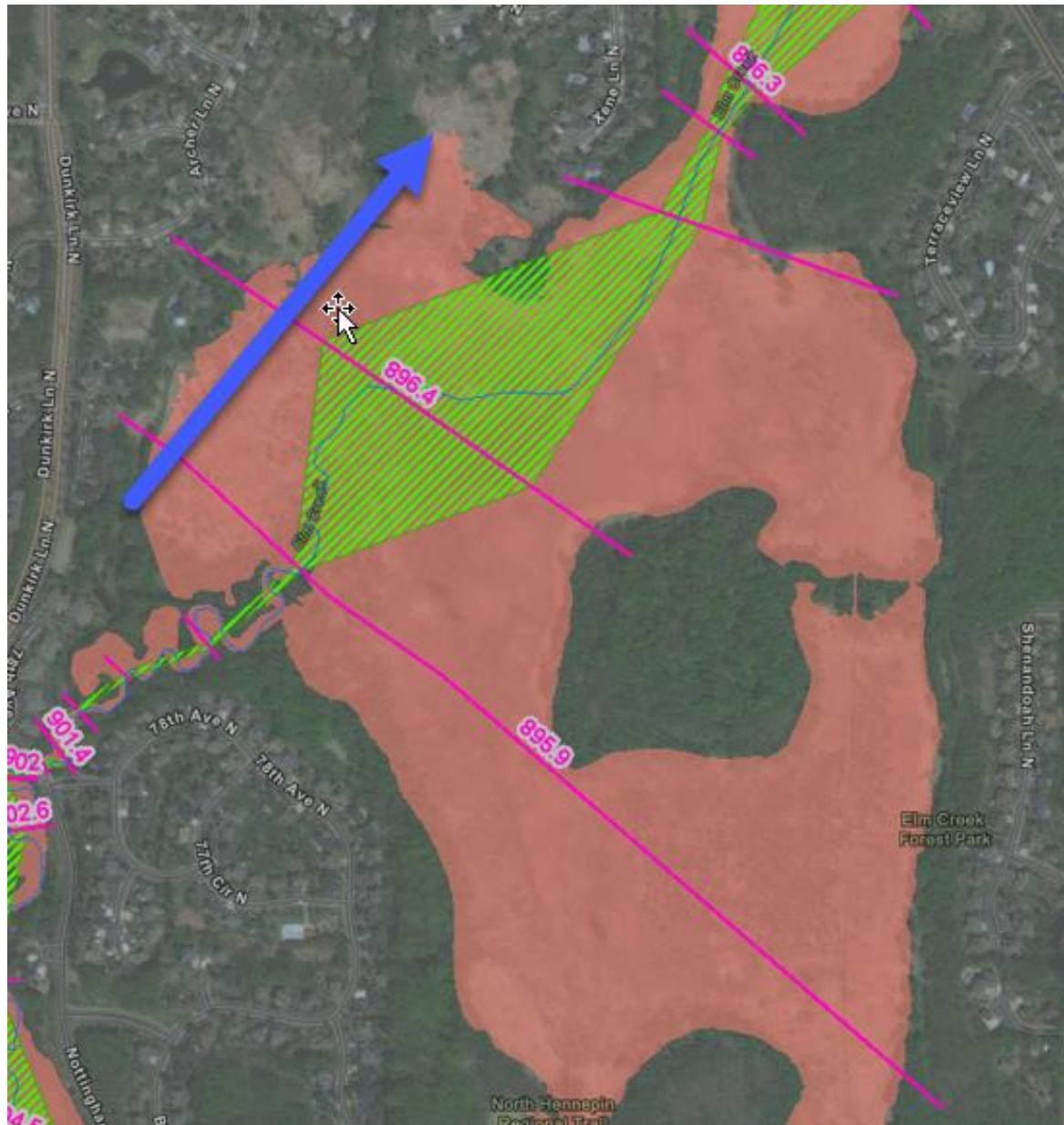


Figure 12 Elm Creek between Nottingham Parkway North and Weaver Lake Road. Note how the simulated floodplain elevation increases with the direction of flow.

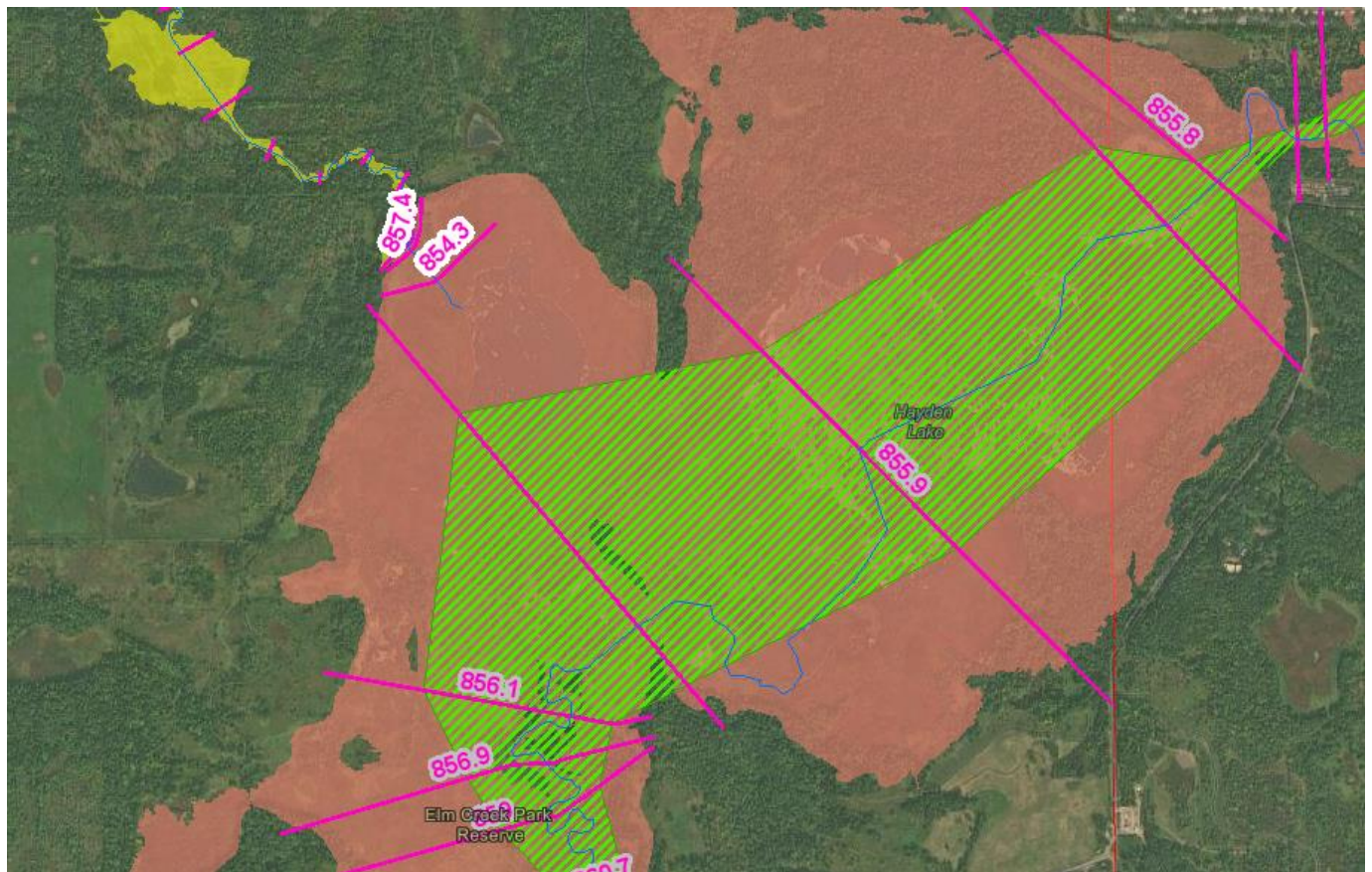


Figure 13 Note the difference in base flood elevations at the confluence of Rush Creek and Elm Creek.

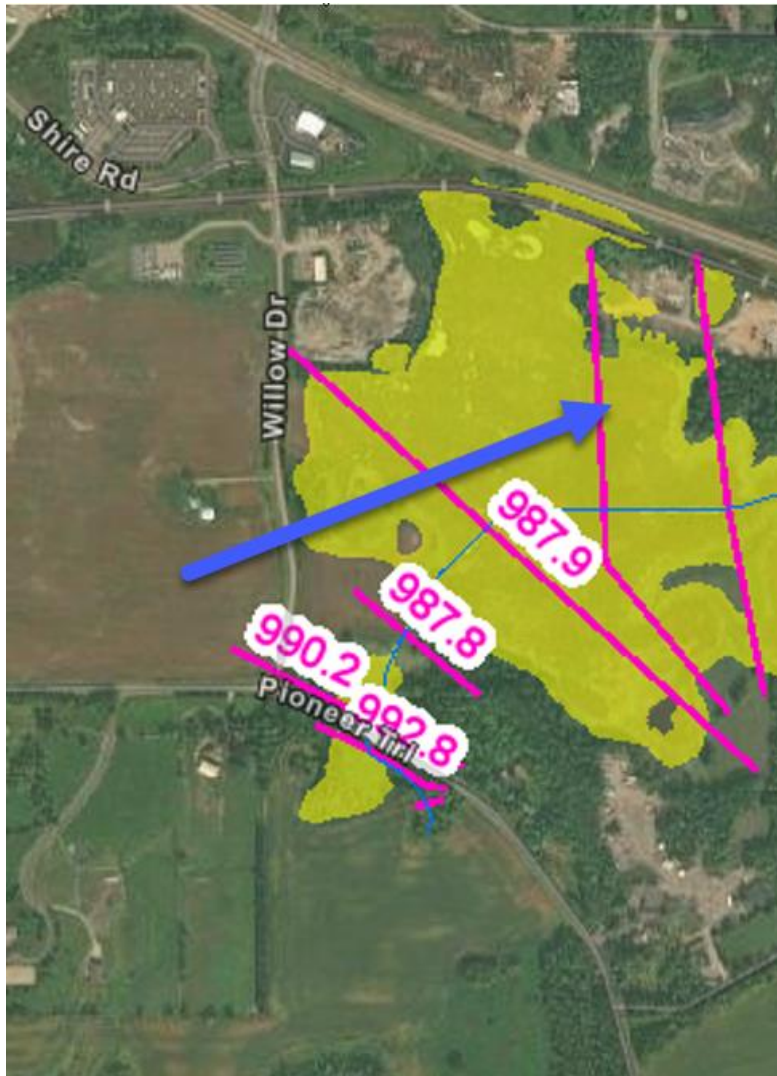


Figure 14 HEC-RAS Reach RushCreek_BR5 in Medina. Note how the simulated floodplain elevation increases with the direction of flow.



Figure 15 HEC-RAS RushCreek_BR5 just north of the Hennepin County Public Works building in. Note portions of the channel are unmapped and the apparent floodplain (upstream of base flood elevation 980.7) is unmapped.

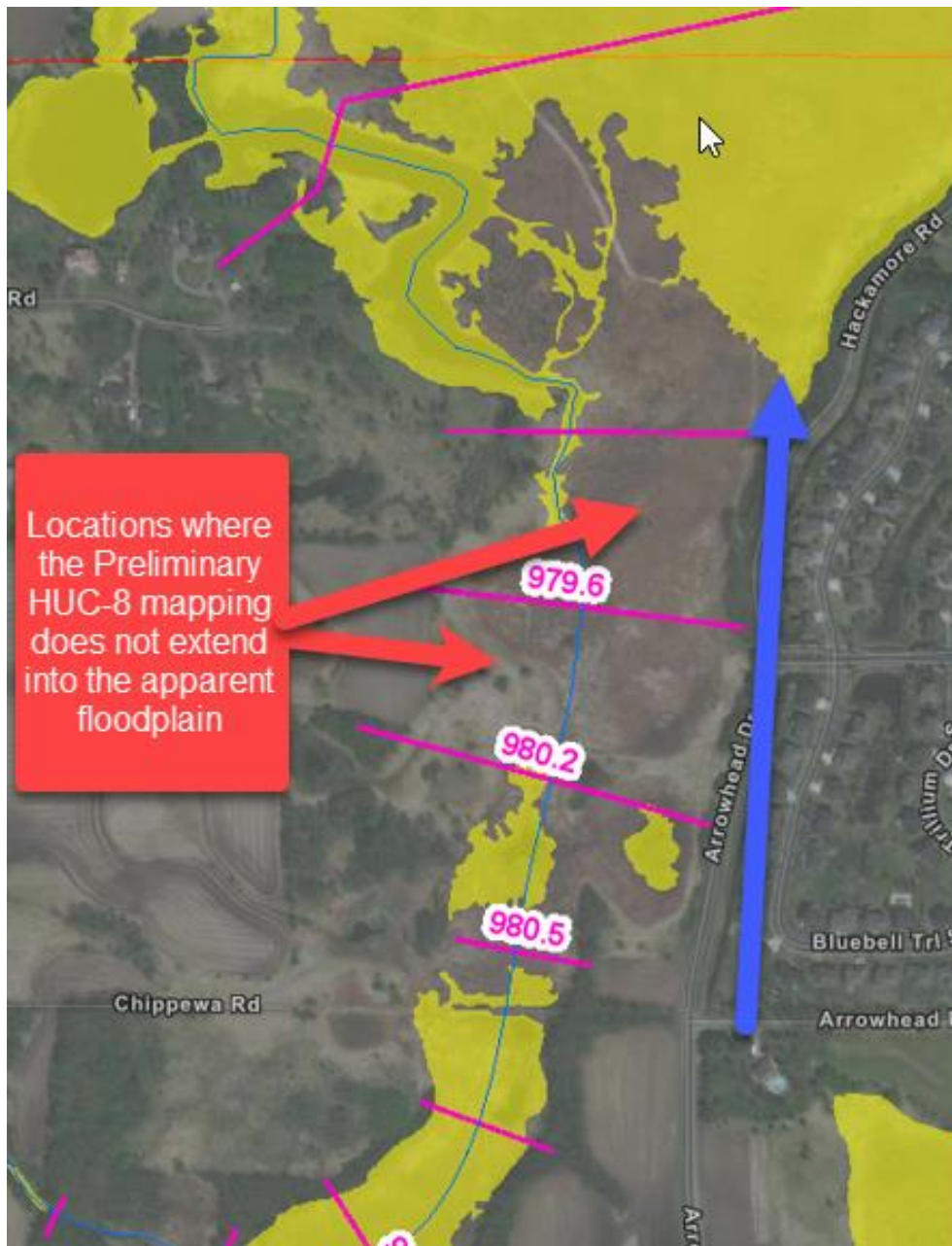


Figure 16 HEC-RAS Reach RushCreek_BR5 near the Medina-Corcoran municipal boundary.

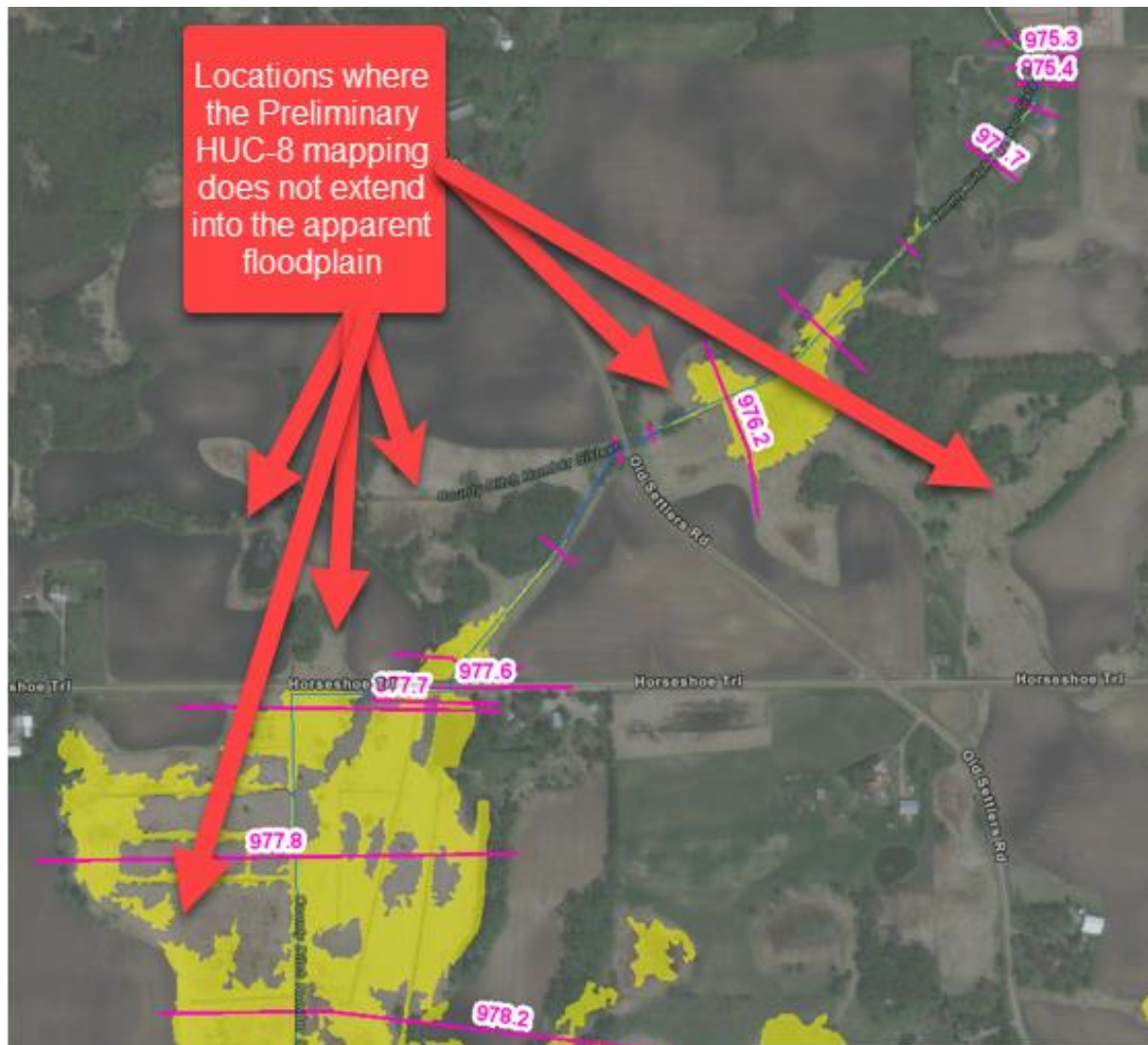


Figure 17 HEC-RAS Reach RushCreek_BR5 in Corcoran near its crossing with Horseshoe Trail and Old Settlers Road. B

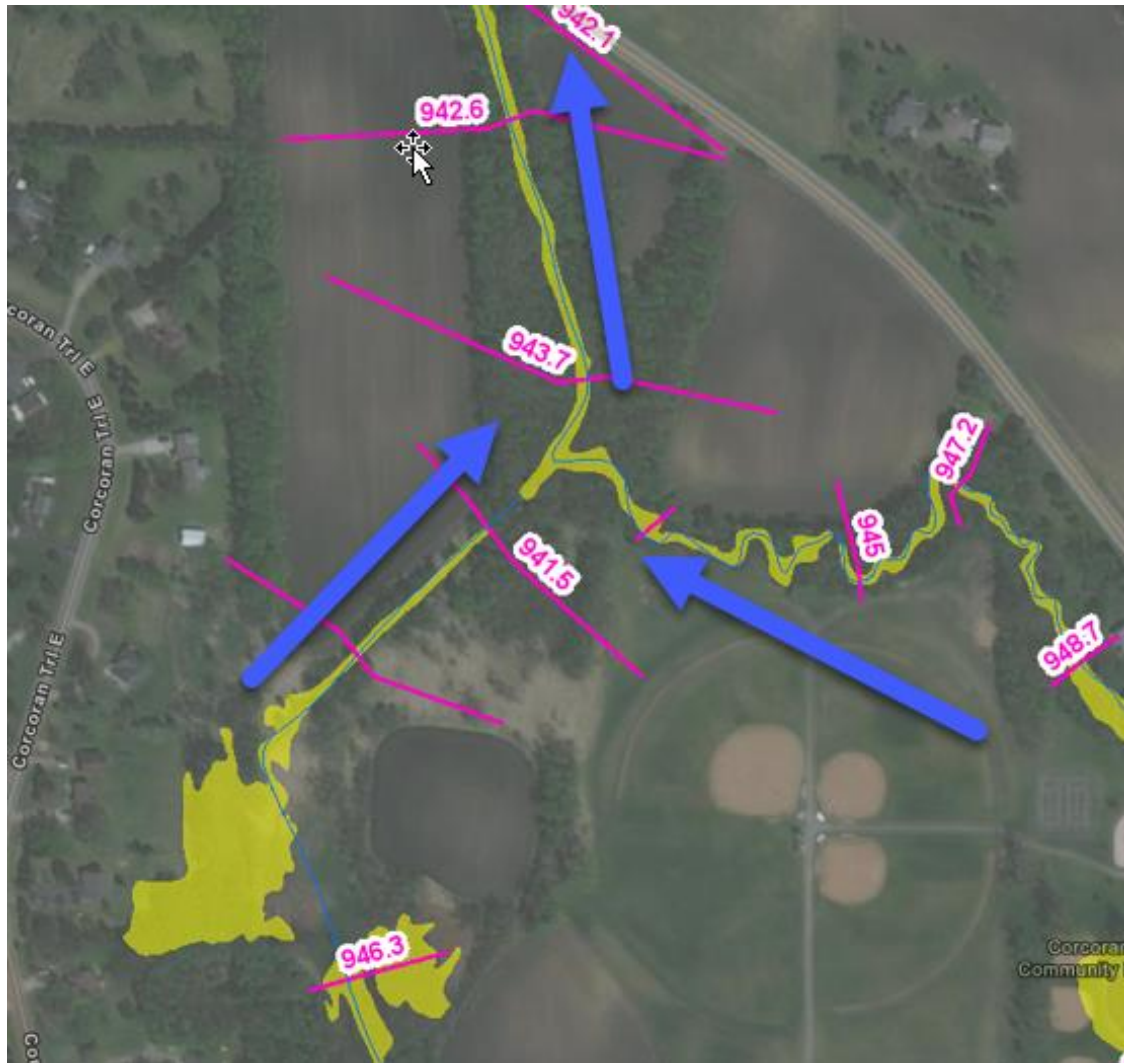


Figure 18 HEC-RAS Reach RushCreek_BR5 in Corcoran near its confluence with HEC-RAS Reach RushCreek_BR4. Note the difference in base flood elevations at the confluence of Rush Creek and Elm Creek.



Figure 19 Rush Creek (HEC-RAS Reach RushCreek) over Scott Lake and just downstream of Lake Jupert. Note how the base flood elevation increases in the direction of flow.

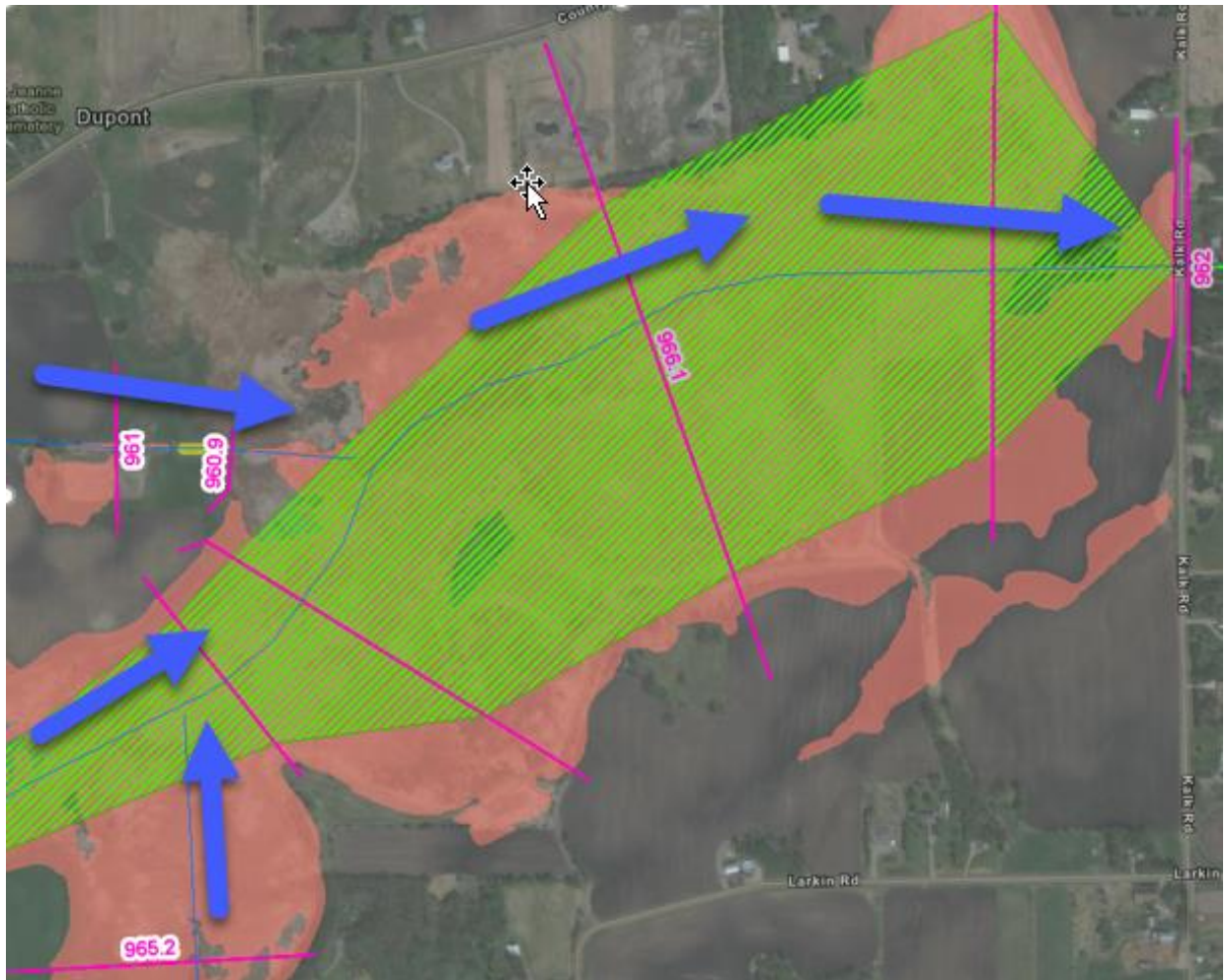


Figure 20 County Ditch #3 (HEC-RAS Reaches RushCreek, RushCreek_BR1, and RushCreek_BR2). Note how the base flood elevation increases in the direction of flow as well as the inconsistencies in the mapped floodway.

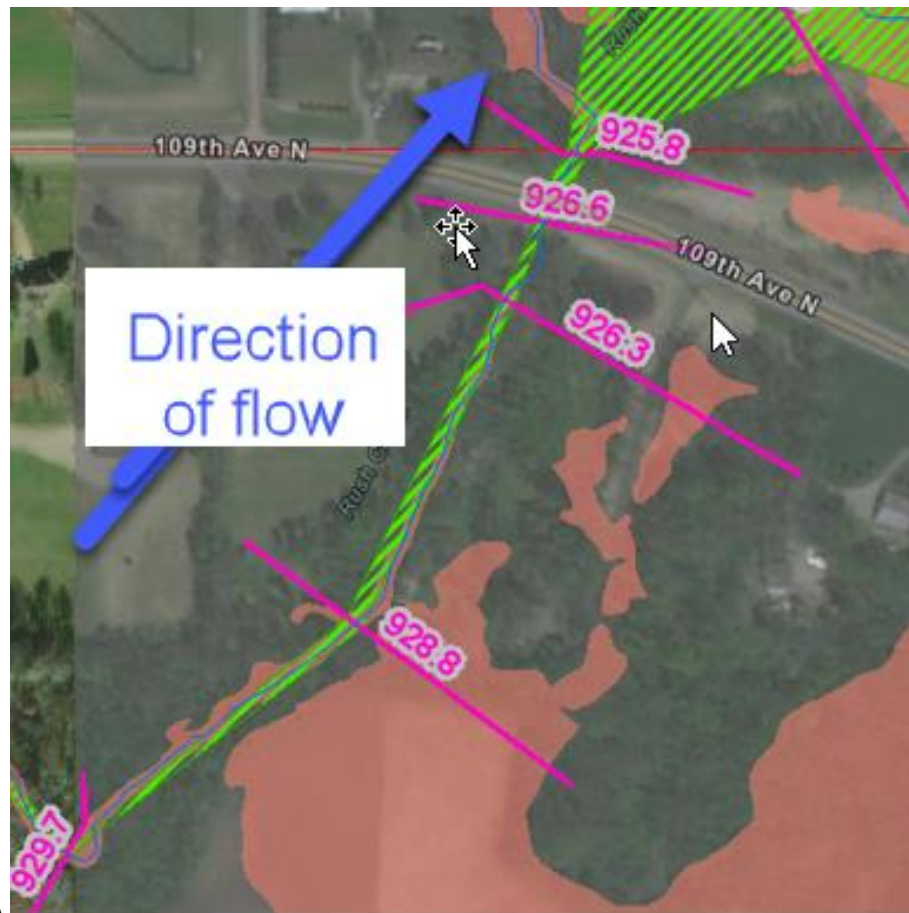


Figure 21 North Fork Rush Creek in Corcoran near 109th Avenue North (HEC-RAS Reach NorthFrkRushCrk). Note the adversely increasing base flood elevation in the downstream direction



Figure 22 Rush Creek near the Confluence with North Fork Rush Creek in Maple Grove, note the adversely increasing base flood elevation

To: Elm Creek Watershed Management Commissioners and Member Cities

From: Ross Mullen, PE, CFM and
Jim Kujawa

Date: December 22, 2021

Subject: Proposed rules revisions regarding low floor/freeboard

INTRODUCTION AND PURPOSE

Rule D.3.b.i.7 of the 2015 Elm Creek Watershed Management Commission Third Generation Plan states, *“The low floor shall be at minimum two feet above the critical event 100-year elevation and a minimum one foot above the emergency overflow elevation of nearby waterbodies and stormwater ponds”*.

The ambiguity in Rule D.3.b.i.7 has prompted some questions on the part of technical staff, member community, and members of the Technical Advisory Committee (TAC), such as:

- *What was the policy goal for the rule?*
 - *Limit surface water flooding?*
 - *Limit groundwater-induced flooding, including:*
 - *seepage through foundation walls*
 - *structure failures at foundation walls caused by hydrostatic pressure?*
 - *structural failure caused by buoyancy forces on footings?*
 - *Cascade failure from a combination of the above (e.g. a power outage occurs simultaneous with a flood and sump pump without battery backup is unable to pump groundwater away from the foundation).*
- *Under the low floor rule, what constitutes a “stormwater pond or waterbody”? Are localized depressions used to convey stormwater runoff to catch basins included?*
- *What constitutes “nearby”? Are structures not immediately adjacent to the floodplain that have proposed lowest floors beneath the floodplain elevation subject to the rules? How far away must structures be placed to be exempt from these rules?*

The Commission’s technical staff and TAC met to discuss rules revisions for the low floor rules based on the risk to structures at the June and December 2021 TAC meetings. The Commission’s technical staff and TAC have also reviewed freeboard rules required by state agencies, member cities, and adjacent watersheds as listed in Table 1. Freeboard is the technical term applied to the vertical height between the 100 Year event peak flood stage and the lowest regulatory height that a structure must be built to. Minnehaha Creek Watershed District is the only jurisdiction that uses the low opening as the regulatory height instead of the low floor (used by all other entities reviewed in Table 1).

Table 1 Freeboard Policies by ECWMC Technical Staff and the Technical Advisory Committee

| State Agencies | Cities | | Watersheds |
|---|--------------------------------|-------------|--------------------|
| Minnesota Department of Natural Resources | Elm Creek WMC Member Cities | Champlin | Coon Creek |
| | | Corcoran | Watershed District |
| | | Dayton | Minnehaha Creek |
| | | Maple Grove | Watershed District |
| | | Medina | Shingle Creek and |
| | | Plymouth | West Mississippi |
| | | Rogers | WMCs |

The Commission's technical staff and TAC have determined that transition from the existing rules to a three-tiered approach based on the unique flood risk posed to structures based on the flooding source without over complication of the ECWMC's rules.

The Commission's technical staff and TAC recommend the tiered approach to recognize the differences in flood risk from large waterbodies that may have flood stages that last weeks or months from those of small stormwater ponds and waterbodies where the flood stages last hours or days. The flood risk, especially that caused by groundwater sources, is significantly lower to structures surrounding these small stormwater ponds and waterbodies.

Exhibit A shows a diagram of the proposed freeboard requirements.

TIMELINE

This rule shall go into effect as soon as Commissioner's approve the revisions and a Minor Plan Amendment is approved by the Minnesota Board of Soil and Water.

REVISIONS

1. Revise Rule A to include the definition of “Low Opening”.
 - a. *“Low Opening. The low opening is the lowest elevation of an enclosed area, such as a basement, that allows surface water to into the enclosed area. Examples of low openings, include but are not limited to doors and windows. Foundation wall cracks, drainage seepage through drain tile, and sewer backup elevations are not low openings.”*
2. Revise Rule D.3.b.i.7
 - a. Existing: *“The low floor elevation shall be at minimum two feet above the critical event 100-year elevation and at minimum one foot above the emergency overflow elevation of nearby waterbodies and stormwater ponds.”*
 - b. Proposed: *“Structures shall be elevated according to the following criteria based on the flooding source.*
 - i. *Structures that are within the closed basin of naturally landlocked waterbodies and outside of the effective Federal Emergency Management Agency floodplain as shown on the Flood Insurance Rate Map and outside of the Commission’s floodplain shall meet the following criteria:*
 1. *The low floor must be at minimum one foot above the normal water level and*
 2. *The low floor must be at least two feet above the back-to-back 100-year 24-hour flood elevation.*
 - ii. *Structures within the proposed Federal Emergency Management Agency and/or within the Commission’s floodplain (excluding FEMA Zone A areas) shall meet the following criteria:*
 1. *The Low Floor must be at minimum two feet above the 100-year flood elevation and at least one foot above the emergency overflow*
 - iii. *Structures that are within the closed basin of naturally landlocked waterbodies and the Federal Emergency Management Agency and/or Commission’s floodplain shall have a low floor elevation at whichever elevation highest elevation calculated from the following:*
 1. *The low floor must be at minimum one foot above the normal water level and*
 2. *The low floor must be at least two feet above the back-to-back 100-year 24-hour flood elevation.*
 3. *The low floor must be at minimum two feet above the 100-year flood elevation.*
 - iv. *Structures near the maximum inundation extents caused during the high-water level of nearby stormwater ponds and/or waterbodies that are outside of a naturally landlocked waterbody basin, Federal Emergency Management Agency floodplain, and the Commission’s floodplain shall meet the following criteria:*

- a. *The Low Floor must be at minimum one foot above the normal water level of nearby ponds or groundwater level and*
 - b. *The Low Opening must be at least two feet above the 100-year flood elevation and*
 - c. *The Low Opening should be at least one foot above the emergency overflow and*
 - d. *Hydrogeological analyses demonstrating a structure is outside of the lateral transmissivity zone of groundwater flow mounding caused by the 100-year event on nearby stormwater ponds or waterbodies based on the duration of the flood hydrograph in those stormwater ponds or waterbodies, to the satisfaction of the Commission's engineer, may be used to exempt structures from the above rules.*
 - e. *Structures located greater than 200-feet away from the high-water level inundation of nearby stormwater ponds and waterbodies are exempt from the above rules.*
 - f. *The emergency overflow should be an overland flow section, where possible.*
- v. *Structures adjacent to localized depressions use to route stormwater to waterbodies and stormwater ponds are exempt from these requirements.*

3. Revise Rule F.3.b

- a. Existing: *"All new structures shall be constructed with the low floor at the elevation required in the municipality's ordinance, however, in no case shall the low floor be less than two feet above the regulatory elevation."*
- b. Proposed: *"Structures shall be elevated to reduce flood risk as specified in Rule D.3.b.i.7."*

Start

Basin type:

Designed detention basin,
BMP, river, lake, pond,
stormwater pond, or wetland
with outlet?

Naturally Landlocked
Waterbody
(basin is 1 acre or larger with
no natural outlet below the
100-year flood elevation as
determined by the 100-year,
10-day runoff event)

Floodplain Type

Not within FEMA
or ECWMC
jurisdictional
floodplains

Site is within either or both the:

A. FEMA Jurisdictional Floodplain:

<https://fema.maps.arcgis.com/apps/webappviewer/index.html?id=29f87515702d4845a906419b287e2049>

B. ECWMC Jurisdictional Floodplain:

http://www.elmcreekwatershed.org/uploads/5/8/3/0/58303031/ec_flood_study.pdf

Simulate 100-
year, critical
duration event

Exhibit A: Flow Chart of Proposed Changes to Low Floor/ Freeboard Rules

Developed by Jim Kujawa and Ross Mullen
December 22, 2021

End

A. The **Low Floor** must be at minimum one foot above the normal water level and
B. The **Low Floor** must be at least two feet above the back-to-back, 100-year, 24-hour flood elevation

Rule applies to all parcels near the maximum inundation extents during the 100-year event:
A. The **Low Floor** must be at minimum one foot above the normal water level of nearby ponds, and
B. The **Low Opening** must be at least two feet above the 100-year flood elevation, and
C. The **Low Opening** should be at least one foot above the **emergency overflow**, and
D. Hydrogeological analyses demonstrating a structure is outside of the lateral transmissivity zone of groundwater flow mounding caused by the 100-year event on nearby stormwater ponds or waterbodies based on the duration of the flood hydrograph in those stormwater ponds or waterbodies, to the satisfaction of the Commission's engineer, may be used to exempt structures from the above rules, and
E. Structures **located greater than 200-feet away** from the high-water level inundation of nearby stormwater ponds and waterbodies are exempt from the above rules, and
F. The **emergency overflow** should be an overland flow section, where possible

The **Low Floor** must be at minimum two feet above the 100-year flood elevation and at least one foot above the emergency overflow

To: Elm Creek Watershed Management Commissioners, Technical Advisory Committee, and Member Cities

From: Ross Mullen, PE, CFM

Date: December 22, 2021

Subject: Minor rules revisions to align Elm Creek Watershed Management Commission rules with the latest Municipal Separate Storm Sewer System (MS4) permit

INTRODUCTION AND PURPOSE

In 2021, the Minnesota Pollution Control Agency (MPCA) issued a new a Municipal Separate Storm Sewer System (MS4) Phase II general permit to Minnesota cities. An individual MS4 Phase II permit requires a city to develop and implement a stormwater pollution prevention program to reduce the discharge of pollutants from their storm sewer system. All member communities in the Elm Creek Watershed Management Commission are MS4 Phase II permit holders.

The revised MS4 Phase II permit requires:

- For non-linear projects, treatment of the amount of 1.0-inches of runoff from new and fully reconstructed impervious surfaces.
- For linear projects, treatment of A) 1.0-inches of runoff from the new impervious surface or B) 0.50-inches of runoff from new and fully reconstructed impervious surfaces, whichever is greater.

The 2015 Third Generation Elm Creek Watershed Management Commission Plan rules require applicants to provide treatment in the amount of 1.1-inches of runoff from the net, new impervious areas for projects with construction disturbance of more than one acre.

The revisions to the MS4 Phase II permit create inconsistencies between the 2015 Third Generation Elm Creek Watershed Management Commission Plan rules and the rules of its member cities as required by the newest MS4 Phase II permit. We propose to revise the Commission's rules to align with the MS4 Phase II permit requirements. These proposed revisions will have the greatest impact to redevelopment, including public works projects (i.e. road projects) and will have negligible impact to new construction projects on, greenfield sites. It is important to the Commission's member cities that its rules be aligned with their MS4 Phase II permit requirements to be at least as stringent as its member cities and to create consistency in the project review process.

TIMELINE

The MPCA updated MS4 discharge permits to the Commission's member cities in October and November 2021. The member cities have one year to come into compliance with the new MS4 Phase II permit requirements. Project reviews submitted to the Commission after November 30, 2022, shall be required to follow the revised requirements. This rule shall go into effect as soon as a member city fully implements its new MS4 Phase II permit and a Minor Plan Amendment is approved by the Minnesota Board of Soil and Water, no later than November 30, 2022.

REVISIONS TO THE THIRD GENERATION PLAN

1. Revise Rule A to include the definition of fully reconstructed impervious surfaces:
 - a. *"Fully Reconstructed Impervious Surfaces. Areas where impervious surfaces have been removed down to the underlying soils. Activities such as structure renovation, mill and overlay projects, and other pavement rehabilitation projects that do not expose the underlying soils beneath the structure, pavement, or activity are not considered fully reconstructed. Maintenance activities such as catch basin repair/replacement, utility repair/replacement, pipe repair/replacement, lighting, and pedestrian ramp improvements are not considered fully reconstructed"*
2. Revise Rule A to include the definition of linear projects:
 - a. *"Linear project". Linear projects are projects with construction of new or fully reconstructed roads, trails, sidewalks, or rail lines that are not part of a common plan of development or sale."*
3. Revise Rule D.2.b
 - a. Existing: *"Linear projects that create one acre or more of new impervious surface must meet all Commission requirements for the net new impervious surface. Sidewalks and trails that do not exceed twelve feet (12'0") in width, are not constructed with other improvements, and have a minimum of five feet (5'0") of vegetated buffer on both sides are exempt from Commission requirements."*
 - b. Proposed: *"Linear projects that create one acre or more of new or fully reconstructed impervious surfaces must meet all Commission requirements for 1.1-inches of runoff from the new impervious surface or 0.55-inches from the combination of new and fully reconstructed impervious surfaces, whichever is greater."*
4. Revise Rule D.3.c
 - a. Existing: *"Stormwater runoff volume must be infiltrated/abstracted onsite in the amount equivalent to one point one inch (1.1") of runoff generated from new impervious surface."*
 - b. Proposed: *"For non-linear projects, stormwater runoff volume must be infiltrated/abstracted onsite in the amount equivalent to one point one inch (1.1") of runoff generated from new and fully impervious surfaces."*

Elm Creek Watershed Management Commission

Cost Share Policy

To facilitate implementation of improvement projects within the watershed, the Elm Creek Watershed Management Commission's Joint Powers Agreement (JPA) and Section V of its Second Generation Watershed Management Plan provide for a Capital Improvement Program (CIP). The JPA also describes how the costs of capital projects shall be allocated.

The Management Plan proposes to share the cost of high-priority watershed capital improvements and demonstration projects through the CIP. High-priority watershed capital improvements are those activities that go above and beyond general city management activities and are intended to provide a significant improvement to the water resources in the watershed. To be considered for inclusion in the CIP, projects must be identified in a Commission-adopted management plan, approved TMDL, or member local stormwater plan or CIP.

In order to identify projects for inclusion on its Capital Improvement Program, the Elm Creek Watershed Management Commission will accept city proposals for cost-share projects until March 15 of every year. Following that date, the Commission's Technical Advisory Committee will review and score the submittals and make a recommendation regarding additions and revisions to the Commission's existing CIP at their regular May meeting.

The Commission has developed a set of criteria by which proposed projects will be scored, with those projects scoring a certain minimum number of points on the submittal form screening questions advancing to a prioritization stage. (Refer to the Commission's Capital Improvement Program Standards and Guidelines.)

Prior to consideration for funding, a feasibility study or engineering report must be written for the proposed project. The city acting as the lead agency for a proposed project will be responsible for the development of and the costs associated with the feasibility study/engineering report.

The Commission has elected to fund capital projects through an ad valorem tax levy. Under the authority provided by MN Stat 103B.251, Subd. 5, the Commission has the authority to certify for payment by the county all or part of the cost of an approved capital improvement. The Commission will pay up to 25 percent of the cost of qualifying projects. This amount will be shared by all taxpayers in the watershed, with the balance of the project cost being shared by the local government(s) participating in or benefiting from the improvement.

- a. The Commission's maximum annual share of an approved project is up to \$250,000.
 - 1) The Commission's share will be funded through the ad valorem tax levy – spread across all taxpayers within the watershed.
 - 2) The Commission will use a maximum annual levy of \$500,000 as a working guideline.
- b. The cities' share will be a minimum of 75% of the cost of the project. The basis of this apportionment will likely be unique to each project. The 75% share will be apportioned to the cities in the following manner or in some other manner acceptable to them. For example,
 - 1) The area directly benefiting from the project will be apportioned 25% of the cost of the project. This will be apportioned to cities based on the proportion of lake or stream frontage.

- 2) 50% of the cost of the project will be apportioned based on contributing/benefiting area.
- c. The cities will each decide the funding mechanism that is best suited to them for payment of their share, for example through special assessments, storm drainage utility, general tax levy, or watershed management taxing district.
- d. Funding from grant sources may also be used to help pay the costs of the capital projects.

The Elm Creek Watershed Management Commission may consider Commission- or City-generated requests to undertake subwatershed assessments (SWAs). Primarily, SWAs will be completed in rural areas suspected of being high-nutrient loading and will be specific enough to identify potential load-reducing projects. SWAs will be

- a. ~~Identified in areas outside of the Municipal Urban Service Area (MUSA).~~
- b. Supported by the City in which the SWA is located.
- c. Undertaken at the discretion of the Commission.
- d. Funded by a \$15,000 maximum cap (grant or Commission funding) and a 20% match by the City requesting the SWA.

elm creek Watershed Management Commission

Subwatershed Assessment Cost Share Application

Date: [October 15, 2021](#)

Waterbody to be assessed: [Rice Lake](#)

Sponsor City: [Maple Grove](#)

Total cost estimate: [\\$30,000](#)

Anticipated City Contribution: [\\$22,500](#)

Anticipated Commission Contribution: [\\$7,500](#)

Firm(s) solicited: [TBD](#)

Background information

Why is the sponsoring city interested in this SWA? [Rice Lake is an important resource in the City of Maple Grove. Rice Lake supports fishing and aquatic recreation. Park trails surround Rice Lake making it accessible to the entire community.](#)

Other supporting documents showing water quality issues? Ex: TMDL, Stressor ID report, etc. Please provide web links [Per the Elm Creek Watershed TMDL approved in 2017, Rice Lake has a contributing watershed of 17,460 acres, is 330 acres in size with a maximum depth of 11 feet. Classified as a “shallow lake”, Rice has severely degraded water quality and is impaired for aquatic recreation due to excess nutrients. Curlyleaf pondweed and carp are present in excessive quantities. Seventy-four percent of the phosphorus load comes from the watershed.](#)

Any additional local knowledge of issues? [The Rice Lake Area Association \(RLAA\) is active in partnering on projects to improve the lake including aeration, drawdowns, carp management, plant surveys and curlyleaf pondweed management. Rice may have had a toxic algae bloom in the summer of 2021.](#)

Implementation

What implementation support will the sponsoring city provide? Ex: funding, staff time, outreach, submitting a Clean Water Fund app, etc [The City of Maple Grove has, and will continue to provide funding, staff time, and outreach toward the improvement and protection of Rice Lake. Recently, the City of Maple Grove, in partnership with the Elm Creek Watershed, has completed a stream restoration in the southern portion of the study area. In addition, the RLAA is an active group partnering with the City on funding and implementation of projects to improve and protect Rice including a drawdown during the winter of 2021-2022 and on-going carp management.](#)

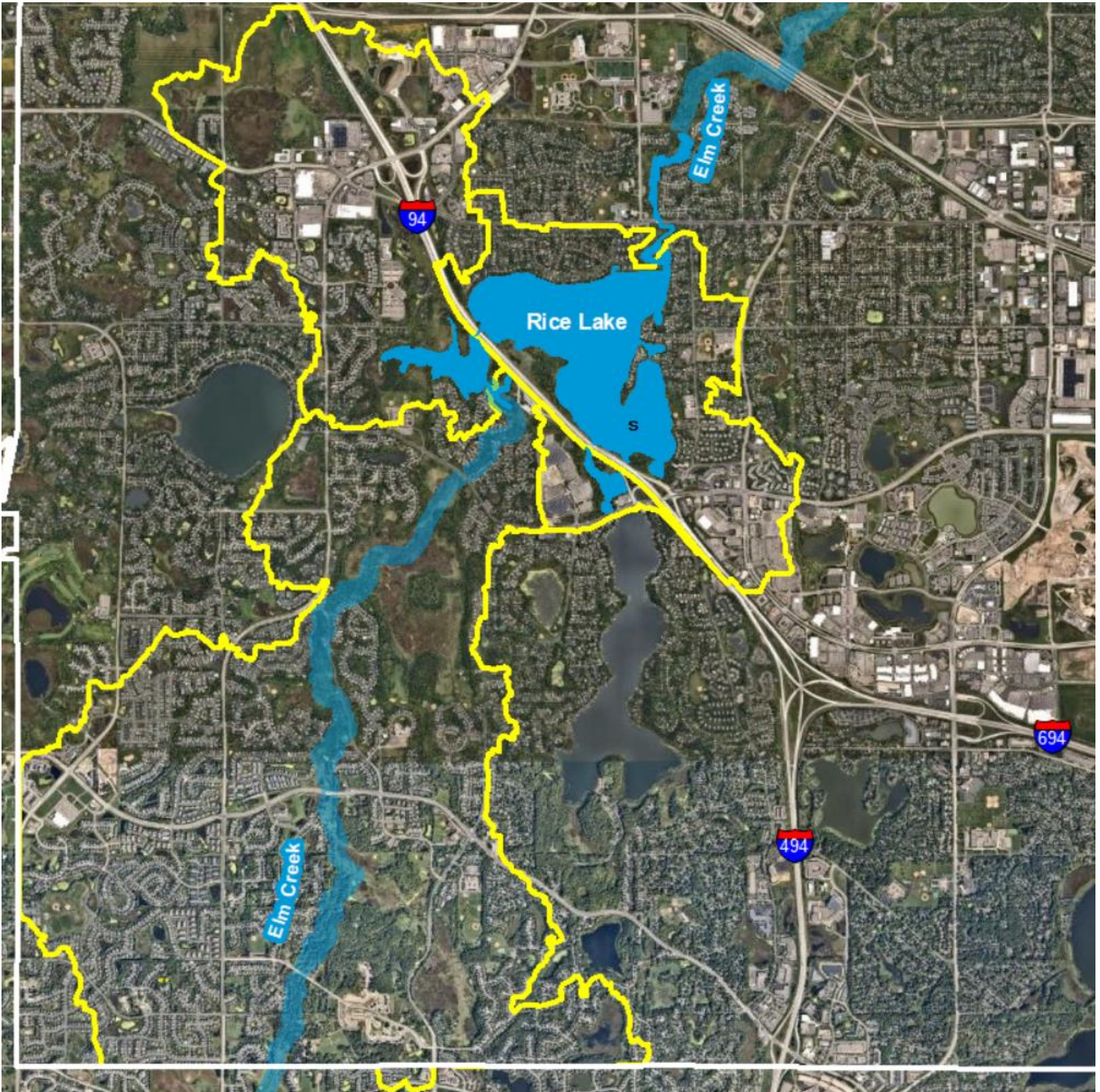
Does the sponsoring city presently have plans to incorporate the SWA information into their planning or other work? Please explain. [The sub-watershed assessment will serve to organize existing data, identify gaps, update watershed modeling, and will serve as the genesis for projects in the Rice Lake sub-watershed originating from the RLAA and/or the City of Maple Grove.](#)

Other information

Is there anything else the Commission should know about the proposed SWA? [No.](#)

Attachments

Please attach a map of the proposed project area as well as any cost estimates solicited



| | NOTES | Levy Proj # | Description | Location | Priority | Est Total Project Cost | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | | 2020 | | 2021 | | 2022 | 2023 | Line |
|----|-----------------|-------------------------------|---|------------|----------|------------------------|----------|----------|----------|----------|----------|------------------|-------------|----------|-------------|---|----------------------|---------|------|------|
| | | | | | | | Est Cost | Est Cost | Est Cost | Est Cost | Est Cost | Est Cost | Levy Amount | Est Cost | Levy Amount | Est Cost | Levy Amount | | | |
| 1 | | 2014-01 | Tower Drive Improvements | Medina | | \$3,437,300 | 68,750 | | | | | | | | | | | | | 1 |
| 2 | | 2014-02 | Elm Creek Dam at Mill Pond | Champlin | | 350,000 | 62,500 | | | | | | | | | | | | | 2 |
| | | | Special Studies | | | | | | | | | | | | | | | | | |
| 3 | | | TMDL implementation special study PLACEHOLDER | Watershed | H | \$225,000.00 | | 0 | 25,000 | 25,000 | 25,000 | 25,000 | | | | | | | | 3 |
| 4 | | | Stream segment prioritization PLACEHOLDER | Watershed | H | \$20,000.00 | | 10,000 | 0 | 0 | 0 | 10,000 | | | | | | | | 4 |
| | | | High Priority Stream Restoration Projects | | | | | | | | | | | | | | | | | |
| 5 | | 2015-01 | Elm Cr Reach E | Plymouth | H | \$1,086,000.00 | | 250,000 | | | | | | | | | | | | 5 |
| 6 | | 2016-01 | CIP-2016-RO-01 Fox Cr, Creekview | Rogers | H | \$321,250.00 | | 0 | 80,312 | 0 | 0 | 0 | | | | | | | | 6 |
| 7 | | 2016-02 | Mississippi Point Park Riverbank Repair | Champlin | M | \$300,000.00 | | 0 | 75,000 | 0 | 0 | 0 | | | | | | | | 7 |
| 8 | | 2016-03 | Elm Creek Dam | Champlin | H | \$7,001,220.00 | | 0 | 187,500 | 0 | 0 | 0 | | | | | | | | 8 |
| 9 | | | Tree Thinning and Bank Stabilization Project PLACEHOLDER | Watershed | H | \$50,000.00 | | 0 | | 50,000 | 50,000 | 50,000 | | | | | | | | 9 |
| 10 | | 2017-01 | Fox Cr, Hyacinth | Rogers | M | \$450,000.00 | | 0 | 0 | 112,500 | 0 | 0 | | | | | | | | 10 |
| 11 | | | Fox Cr, South Pointe, Rogers MOVED TO 2021 | Rogers | M | \$90,000.00 | | 0 | 0 | 22,500 | 0 | 22,500 | | | | | | 22,500 | | 11 |
| 12 | | | Other High Priority Stream Project PLACEHOLDER | Watershed | H | \$500,000.00 | | 0 | 0 | 0 | 125,000 | 125,000 | | | | | | | | 12 |
| 13 | removed 2021 | 2016-04 2018-01 2019-01 | CIP-2016-MG-02 Rush Creek Main | MG | | \$1,650,000.00 | | | 75,000 | 75,000 | 75,000 | 25,000 | 26,513 | | | —25,000 | | | | 13 |
| 14 | removed 2021 | | CIP-2016-MG-03 Rush Creek South | MG | | \$675,000.00 | | | | | 168,750 | | | | | | | | | 14 |
| 15 | | 2018-02 | CIP-2017-PL-01 EC Stream Restoration Reach D | Plymouth | | \$850,000.00 | | | | | 212,500 | | | | | | | | | 15 |
| | | | High Priority Wetland Improvements | | | | | | | | | | | | | | | | | |
| 16 | removed 4/2021 | | DNR #27-0437 | MG | L | \$75,000.00 | | 0 | 0 | 0 | 0 | 0 | | | 4 | | | | | 16 |
| 17 | removed 2019 | | Stone's Throw Wetland— | Corcoran | M | | | 0 | 0 | 112,500 | 112,500 | 112,500 | | | | | | | | 17 |
| 18 | | | Other High Priority Wetland Projects PLACEHOLDER | Watershed | L | \$100,000.00 | | 0 | 0 | 0 | 0 | 0 | | | | | | | | 18 |
| 19 | | 2019-02 | CIP-2016-MG-01 Ranchview W'land Restora MOVED TO 2019 | MG | | 2,500,000.00 | | | | 250,000 | 250,000 | 125,000 | | | | | | 250,000 | | 19 |
| | | | Lake TMDL Implementation Projects | | | | | | | | | | | | | | | | | |
| 20 | | 2017-03 | Mill Pond Fishery and Habitat Restoration | Champlin | H | \$5,000,000.00 | | 0 | 0 | 250,000 | 0 | 0 | | | | | | | | 20 |
| 21 | | | Other Priority Lake Internal Load Projects PLACEHOLDER | Watershed | M | \$100,000.00 | | 0 | 0 | 0 | 0 | 0 | | | | | | | | 21 |
| 22 | | 2016-05 | CIP-2016-MG-04 Fish Lake Alum Treatment-Phase 1 | MG | H | \$300,000.00 | | | 75,000 | | | | | | | | | | | 22 |
| 23 | removed 4/2021 | | Stonebridge | MG | M | \$200,000.00 | | 0 | | 50,000 | 0 | 0 | | | | | | | | 23 |
| 24 | | 2017-04 | Rain Garden at Independence Avenue | Champlin | L | \$300,000.00 | | 0 | | 75,000 | 0 | 0 | | | | | | | | 24 |
| 25 | | | CIP-2016-CH-01 Mill Pond Rain Gardens | Champlin | M | \$400,000.00 | | 0 | 0 | | 100,000 | 100,000 | | | | —100,000 | | | | 25 |
| 26 | | | Other Priority Urban BMP Projects PLACEHOLDER | Watershed | L | \$200,000.00 | | 0 | 0 | 0 | 0 | 0 | | | | | | | | 26 |
| | | | Other | | | | | | | | | | | | | | | | | |
| 27 | | 2020-01 | Livestock Excluss, Buffer & Stabilized Access new 2020 | Watershed | M | \$50,000.00 | | 0 | 0 | 0 | 50,000 | 0 | | 50,000 | 53,025 | | | | | 27 |
| 28 | | 2020-02 | Agricultural BMPs Cost Share new 2020 | Watershed | H | \$50,000.00 | | 0 | | 50,000 | 50,000 | 50,000 20,000 | | 50,000 | 53,025 | | | | | 28 |
| 29 | | | CIP-2016-RO-04—CIP-2017-RO-1 Ag BMPs—Cowley-Sylvan Connections BMPs | Rogers | | \$300,000.00 | | | | | 75,000 | | | | | | | | | 29 |
| 30 | | | CIP-2016-RO-03 Downtown Pond Exp & Reuse | Rogers | | \$406,000.00 | | | | | 101,500 | | | | | | | 101,500 | | 30 |
| 31 | | 2019-04 | Hickory Dr Stormwater Improvement COST ADJUSTED 2019 | Medina | | \$307,920.00 | | | | | | 56,250-76,823 | 81,471 | | | | | | | 31 |
| 32 | | | SE Corcoran Wetland Restoration | Corcoran | | \$400,000.00 | | | | | | —100,000 | | | | | | | | 32 |
| 33 | | 2019-05 | Downtown Regional Stormwater Pond NEEDS FEAS STUDY | Corcoran | | \$105,910.00 | | | | | | 10,000 26,477 | 28,079 | | | | | | | 33 |
| 34 | | 2018-03 | Elm Creek Stream Restoration Phase III | Champlin | H | \$400,000.00 | | | | | 100,000 | | | | | | | | | 34 |
| 35 | | 2018-04 | Downs Road Trail Raingarden | Champlin | H | \$300,000.00 | | | | | 75,000 | | | | | | | | | 35 |
| 36 | | 2019-06 | Elm Creek Stream Restoration Phase IV | Champlin | H | \$600,000.00 | | | | | | 150,000 | 159,075 | | | | | | | 36 |
| 37 | | | Lowell Pond Raingarden | Champlin | H | \$400,000.00 | | | | | | —100,000 | | | | | | 100,000 | | 37 |
| 38 | | | Rush Creek Headwaters SWA BMP Implementation | Rogers | H | \$200,000.00 | | | | | | | | | | | | | | 38 |
| 39 | | | Hydrologic & Hydraulic Modeling | Watershed | L | \$25,000.00 | | 0 | 0 | 0 | 25,000 | 0 | | | | | | | | 39 |
| 40 | | | Brockton Lane Water Quality improvements NEW 2019 | Plymouth | | \$150,000.00 | | | | | | 0 | | | | —37,500 | moved to 2022 | 37,500 | | 40 |
| 41 | | | Mill Pond Easement NEW, REMOVED 2019 | Champlin | | \$64,000.00 | | | | | | 16,000 | | | | | | | | 41 |
| 42 | | | The Meadows Playfield NEW 2019 | Plymouth | | \$5,300,000.00 | | | | | | | | | | | | 250,000 | | 42 |
| 43 | | 2020-03 | Enhanced Street Sweeper NEW 2019 | Plymouth | | \$350,000.00 | | | | | | | | 75,000 | 31,512 | | | | | 43 |
| 44 | | | Fourth Generation Plan | Commission | L | \$70,000 | | 0 | 0 | 0 | 0 | 0 | | | | | | 17,500 | | 44 |
| 45 | | 2021-01 | Elm Road Area/Everest Lane Stream Restora NEW 2020 | MG | | \$500,000 | | | | | | | | | | 125,000 | 132,563 | | | 45 |
| 46 | will be revised | | Corcoran City Hall Parking Lot NEW 2020/RESCHEDULED 2021 | Corcoran | | \$40,000 | | | | | | | | | | —10,000 | moved to 2022 | 10,000 | | 46 |
| 47 | updated 08/2020 | 2021-02 | EC Stream Restora Ph V_Hayden Lk Outfall NEW 2020 | Champlin | | 900,000-610990 | | | | | | | | | | adjusted Comm share to that stated in feasibility study 152,725 150,000 | 159,075 | | | 47 |

| Table 4.5. Elm Creek Third Generation Plan Capital Improvement Program | | | | | | | | | | | | | 2019 | | 2020 | | 2021 | | | | Line | |
|--|----------|----------------|--|----------|----------|---------------------------|----------|------------|------------|--------------|-----------|------------|--------------|-------------|----------|-------------|---|-----------------------------------|---------|--------|------|----|
| | | Levy Proj # | | | Priority | Est Total Project Cost | 2014 | 2015 | 2016 | 2017 | 2018 | | | | | | | | | | | |
| | NOTES | | Description | Location | | | Est Cost | Est Cost | Est Cost | Est Cost | Est Cost | | Est Cost | Levy Amount | Est Cost | Levy Amount | Est Cost | Levy Amount | 2022 | 2023 | | |
| 48 | new 2021 | | CSAH 12/Dayton River Road Ravine Stabilization | Dayton | | \$382,000 | | | | | | | | | | | | | | 95,500 | 48 | |
| 49 | new 2021 | | Tower Drive West Stormwater Improvement | Medina | | \$271,250 | | | | | | | | | | | moved to 2022. Complete feasibility study to include consideration using iron-enhanced filtration and add improvements to impervious areas. Recalculate cost. | | 67,813 | | | |
| 50 | | | Grass Lake wetland monitoring | Dayton | | \$16,000 | | | | | | | | | | | | not considered to be a CIP by TAC | | 4,000 | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| 51 | | | | | | | | | | | | | | | | | | | | | | |
| 52 | | | | | | | | | | | | | | | | | | | | | | 49 |
| | | | | | | | | | | | | | | | | | | | | | | |
| 54 | | | TOTAL STUDIES | | | 245,000 | | | | | | | | | | | | | | | | 51 |
| 55 | | | TOTAL CIPS | | | 36,899,600 | 131,250 | 250,000 | 492,812 | 437,500 | 932,750 | \$ 278,300 | | | 175,000 | | 275,000 | | 860,813 | 95,500 | 52 | |
| 56 | | | LEVY AMOUNT | | | | 131,250 | \$ 250,000 | \$ 492,812 | \$ 437,500 | 462,500 | | \$ 295,138 | | | 137,562 | | 291,638 | | | 53 | |
| 57 | | | ACCUMULATED LEVY AMOUNT | | | | 131,250 | \$ 381,250 | \$ 874,062 | \$ 1,311,562 | 1,774,062 | | \$ 2,069,200 | | | 2,206,762 | | 2,498,400 | | | 53 | |



3235 Fernbrook Lane
Plymouth, MN 55447
(763) 553-1144
Fax: (763) 553-9326
judie@jass.biz

To: Elm Creek TAC Members
cc: Elm Creek Commissioners
From: Judie Anderson
Date: January 4, 2022
Subject: Project Reviews – O&M Agreements

On January 1, 2021, the Commission adopted a policy that serves as the basis for the collection of funds to cover the cost of project reviews.

While reconciling the escrow monies received with the costs of the services provided by the technical staff, it has come to our attention that many of the projects are approved contingent on receipt of an Operations and Maintenance (or other) agreement. This agreement is usually between the city and the project owner and requires approval by our technical staff. In some cases, this agreement cannot be generated until final plat occurs, sometime years into the future.

Since the City is ultimately responsible for having such an agreement in place to document the future operations and maintenance of the stormwater pond/device/structure, we were concerned that the language in the Commission's Rules is adequate for this purpose. If such language were to be included in the final approval, it would remind cities that this is their responsibility, and Commission staff would not have to go through the lengthy and costly process of ascertaining that the agreements are in place.

The Commission's Rules state the following:

RULES AND STANDARDS

RULE B. PROCEDURAL REQUIREMENTS

5. CONDITIONS. A project review may be approved subject to reasonable conditions to assure compliance with these Rules. The conditions may include a requirement that the applicant and owner enter into an agreement with the member city in a form acceptable to the Commission to a) specify responsibility for the construction and future maintenance of approved structures or facilities, b) document other continuing obligations of the applicant or owner, c) grant reasonable access to the proper authorities for inspection, monitoring and enforcement purposes, d) affirm that the Commission or other political subdivisions can require or perform necessary repairs or reconstruction of such structures or facilities, e) require indemnification of the Commission for claims arising from issuance of the approved project review or construction and use of the approved structures or facilities, and f) reimburse the reasonable costs incurred to enforce the agreement. Project reviews and agreements may be filed for record to provide notice of the conditions and continuing obligations.

In checking with the Commission's attorney, Joel Jamnik, regarding this matter, he responded with the following:

"[My] Only concern is last sentence - Project reviews and agreements may be filed for record to provide notice of the conditions and continuing obligations.

"I would prefer it read, 'Conditions of approval for project reviews and agreements implementing those conditions that bind future owners of the project shall be recorded to provide notice to

future owners of the conditions of approval and the future owners' continuing operation and maintenance obligations.”

ACTION:

It is Staff's recommendation that the Technical Advisory Committee recommend to the Commission the following:

1. That the language recommended by the Attorney be incorporated into the recommendations of appropriate project reviews, effective immediately.
2. That Rule B be modified to incorporate this language at such time as the Rules are adopted as part of the Commission's Fourth Generation Watershed Management Plan.

elm creek

Watershed Management Commission

FINAL

2021 WORK PLAN IN REVIEW

Minnesota Rule 8410.0150 requires the Commission to submit to the Board of Water and Soil Resources a financial report, activity report and audit report for the preceding fiscal year. 8410.0150 Subp. 3 outlines the required content of the annual activity report. It includes an assessment of the previous year's annual work plan and development of a projected work plan for the following year.

The Commission's Third Generation Watershed Management Plan identifies issues, priorities, and goals for the ten-year period 2015-2024.

1. Continue to review local development/redevelopment plans for conformance with the standards outlined in the Commission's Third Generation Watershed Management Plan. *Implement 2021 project review policy, application form, and fee schedule. As of November 17, 2021, the Commission's technical advisors have reviewed fifty-one projects. The escrow fee schedule will be evaluated at year-end to determine how well it is meeting the Commission's goal of funding the costs of reviewing the projects.*
2. Continue to partner with the Three Rivers Park District (TRPD) to share in the costs of conducting lake and stream monitoring in the watershed. *In 2021 TRPD monitored Elm Creek at 77th Avenue (ECF77); Rush Creek at Territorial Road (RT); and Diamond Creek within the Elm Creek Park Reserve (DC). Creek within the Elm Creek Park Reserve. Continuous flow was collected in open channel morphology that required the development of a stage-discharge rating curve at each sampling site. TRPD took manual flow and depth measurements at stream cross-section intervals for the development of a stage-discharge rating curve to estimate flow at each sampling site. Each sampling site also had automated equipment to collect water samples for nutrient analysis during storm events. Water samples were also manually collected bi-weekly for nutrient analysis during base-flow conditions. All water quality samples collected were analyzed for total phosphorus, soluble reactive phosphorus, total nitrogen, and total suspended solids.*

TRPD will also monitor four of fifteen lakes in the Elm Creek watershed (Diamond, Fish, Rice main body, and Weaver) in 2021. Three Rivers Park District monitored the water quality of seven lakes within the Elm Creek watershed. Water quality samples were collected bi-weekly for the four Sentinel Lakes (Fish, Rice, Diamond, and Weaver) as well as three other lakes (Mill Pond, Goose, and Mud) that haven't been monitored since the watershed TMDL was completed. All the lakes had temperature/dissolved oxygen profiles collected at 1-m intervals from the surface to the bottom; and water quality samples were collected at the surface for analysis of total phosphorus, soluble reactive phosphorus, total nitrogen, and chlorophyll-a. Since two of these lakes (Fish and Weaver) frequently stratify during the summer, water quality samples were also collected at the top of the hypolimnion and 1-m from the bottom for analysis of total phosphorus and soluble reactive phosphorus. Point-intercept aquatic vegetation surveys were also conducted in the spring and fall to assess the plant community in four of the lakes (Fish, Mill Pond, Goose, and Mud).

In addition, under the cooperative agreement, the Commission and the Park District provided financial support to assist the monitoring efforts of the USGS stream gauging station on Elm Creek within the Elm Creek Park Reserve.

3. Fund the monitoring of one lake through Metropolitan Council's Citizen Assisted Monitoring Program (CAMP). *One lake will be monitored through CAMP in 2021. It was the intent to monitor French Lake in 2021; however, due to the inaccessibility of open water likely due to drought conditions, the volunteer could not perform the monitoring.*
4. Continue to operate the monitoring station in Champlin in cooperation with the United States Geological Survey (USGS). *The cooperative agreement with the USGS will be renewed for WY2021. The 2020-2021 agreement was renewed at a cost of \$40,858. The Commission's share is \$19,296. Twelve monthly manual samples were collected to represent the variations in hydrologic conditions and physical and laboratory analyses of chemicals were also taken. A refrigerated automatic sample was used to collect eight composited samples of runoff events. They were discharge-weighted and collected during increasing or peak streamflow and analyzed for the same constituents as the manual samples. Analysis was completed for Total Phosphorus, Dissolved Phosphorus, Total Ammonia plus Organic Nitrogen, Dissolved Ammonia Nitrogen, Dissolved Nitrite plus Nitrate Nitrogen, Total Suspended Solids, Volatile Suspended Solids, Chemical Oxygen Demand, and Dissolved Chloride. Physical measurements included Water Temperature, Specific Conductance, and pH.*
5. Promote river stewardship through Hennepin County's RiverWatch program with three sites in 2021, *dependent on the status of the pandemic. Due to COVID-19, students were not available to participate in RiverWatch in 2021.*
6. Participate in the MN Wetland Health Evaluation Program (WHEP) with four wetlands in 2021, *dependent on the status of the pandemic. Due to the health and safety limitations of COVID-19, WHEP was not offered in the Elm Creek watershed in 2021.*
7. Conduct the biennial solicitation of interest proposals for administrative, legal, technical and wetland consultants. *This process will be undertaken in January 2021. Solicitations were published in the December 14, 2020, edition of the State Register. Five engineering firms, one legal firm, and one administrative service provider responded. Campbell Knutson, Professional Association, and Judie Anderson's Secretarial Services, Inc. were selected to perform legal and administrative services, respectively, at the Commission's January 13, 2021, meeting. Wenck/Stantec was chosen as the Commission's technical advisor at the February 11, 2021, meeting. This process will be repeated in January 2023.*
8. Continue as a member of the West Metro Water Alliance (WMWA). *Dependent on the status of the pandemic, Watershed PREP classes may be conducted virtually. Classes at one school were taught in person as in 2021. A new Educator has been hired as of December 2021 and will begin reaching out to schedule classroom visits in 2022. A video of the Watershed PREP class is available on the WMWA website for home school or classroom viewing. <http://www.westmetrowateralliance.org/>*
9. Promote "Lawns to Legumes," a program for residents to seed their lawns with a bee lawn mix, targeting habitat for the Rusty-patched bumblebee, an endangered species. The Board of Water and Soil Resources (BWSR) will run the program with funding coming to Hennepin County serving as a Conservation District. *Additional funding is being sought to continue this program in 2021. The Commission will promote the program on its website if funding is realized. At the end of October 2021 more than 1000 trees and shrubs had been planted, more than 800,000 square feet of pollinator habitat had been created, and many thousands of hours had been spent on planting projects to protect pollinators.*
10. Sponsor Rain Garden Workshops as part of the Commission's Education and Public Outreach Program. The workshops are presented by Metro Blooms. *Virtual workshops may be substituted for in-person workshops in 2021 and made available to host cities for rebroadcasting. Since the pandemic precluded holding in-person workshops, a new Blue Thumb training program was implemented to teach participants skills in inspecting and caring for raingardens and other green infrastructure, all within a framework of eco-friendly landscaping practices. People who take part in the three-session program receive a*

Sustainable Landcare Certificate. Participants in the program first receive Stormwater Basics, learning about watersheds and how water travels in our urban environment. They also learn how raingardens are built, how they work, and how to inspect them to ensure they function properly. An important part of the program is identifying weeds, a major culprit of dysfunctional raingardens, and then choosing a way to manage them (without chemicals, if possible).

11. Continue as a member of Blue Thumb and WaterShed Partners. *Staff will continue to virtually attend Blue Thumb and WaterShed Partner meetings, bringing back programs and ideas for promotion by the Commission. Administrative staff attended these meetings, providing updates to the Commission at their monthly meetings.*
12. Continue to work in partnership with the University of Minnesota's agriculture specialist to help build relationships with the agricultural community in the watershed to achieve TMDL load reductions. *The status of the pandemic will determine what amount of interaction with landowners can occur in 2021. Hennepin County sent out mailers to agricultural producers in the Summer to advertise potential BMP projects that could be implemented in order to achieve load reductions outlined in the Rush Creek Subwatershed Assessment, while improving land management. Mailers were tailored towards the needs of either crop farmers, or those who manage livestock, to describe BMPs that would be most applicable for a landowners situation. To date, eight landowners have responded, and are currently working with Hennepin County to design BMP projects on track to be implemented in spring/summer of 2022.*
13. Work with the Hennepin County Rural Conservation Specialist. Assist landowners in identifying BMPs for implementation throughout the watershed. Work with member cities to identify projects that will result in TMDL load reductions. *Hennepin County Environment and Energy Staff will collaborate with landowners to identify BMP projects as well as larger, more strategic projects for inclusion on the Commission's Capital Improvement Program (CIP). Through a variety of outreach efforts, Hennepin County specialists are working with landowners to identify which BMPs would be the most effective. In addition, Hennepin County staff is now working more closely with the City of Corcoran to ensure that their office is aware of ongoing projects, while looking for other opportunities to leverage resources to implement further BMP projects. The County will look to expand this coordination as able.*
14. Send call out to member cities, requesting them to provide updates to the projects already included on the Commission's Capital Improvement Program (CIP) as well as inform the Commission of new projects that they would like to have considered for inclusion on the CIP. Hold public meeting, adopt an amendment to the Third Generation Watershed Management Plan, conduct public hearing, and certify levy to Hennepin County. *This process will be repeated in 2021. The Technical Advisory Committee was convened on May 5, 2021, to update the 2020 CIP. At that meeting the members received revisions, additions, and deletions to the 2020 CIP spreadsheet from the member cities. Four projects were removed at the request of the city (Maple Grove) where they were proposed; two projects were added, one each in Dayton and Medina; and three projects were updated, either for cost or for year of construction. These revisions were approved by the TAC and recommended to the Commission.*

On June 9, 2021, the Commission conducted a Public Meeting at which time it adopted Resolution 2021-03 Adopting a Minor Plan Amendment pursuant to the recommendation of the TAC and set the 2021 maximum levy at \$291,638. The Hennepin County Board approved the Minor Plan Amendment and adopted a 2021 maximum levy of \$291,638 for the Elm Creek Commission on August 3, 2021.

At their August 11, 2021, meeting, the Commission called for a public hearing to be held on September 8, 2021, to consider two projects for levy in 2021, pay 2022:

- a. *Project 2021-01: Elm Road Area/Everest Lane Stream Restoration, Maple Grove. Stream restoration along 800 LF of intermittent stream to reduce sediment and nutrient release to Elm Creek,*

reducing Ph and TSS loading by 15 lbs/year and 15 tons/year, respectively, and improving DO and habitat for fish and invertebrates. Proposed Levy: \$132,563.

b. Project 2021-02: Elm Creek Stream Restoration Phase V Hayden Lake Outfall, Champlin. 3,800 LF of stream bank restoration located upgradient of the Mill Ponds. Proposed construction will improve impaired water with low DO, restoring the stream banks and providing habitat structure. Proposed Levy: \$159,075.

At the September public hearing, with no written or verbal comments having been received from the cities, reviewing agencies, or the public, the Commission adopted Resolution 2021-04 Ordering [the] 2021 Improvement Projects, Designating Members Responsible for Construction and Making Findings and Designating Commission Cost-Share Funding. On September 13, 2021, the Commission informed Hennepin County of the Commission's levy request for 2021 (payable 2022) of \$291,638.

15. Undertake high priority projects identified in the Rush Creek Headwaters Subwatershed Assessment. *This process will continue in 2021. Best management practices that will reduce nutrient, sediment, and bacterial contamination in the Rush Creek Watershed have been completed over the past year, or are currently nearing implementation. Projects that have been completed in 2021 include a waterway and WASCOB as a part of the Jubert Lake Agricultural BMPs Project. More high priority projects related to curbing manure runoff, such as manure bunkers and filter strips, have been identified and are in the initial stages of planning. Larger projects such as the Jubert Lake Agricultural BMPs, are entering second phases that will include more intensive practices such as wetland restorations and grassed waterways.*
16. Adopt a 2022 operating budget. *A Budget Committee will draft a 2022 operating budget for consideration by the Commission in May 2021. At its June 9, 2021, regular meeting, the Elm Creek Commission approved a 2022 operating budget totaling \$931,405. To fund this budget the Commission approved member assessments of \$237,300, a zero increase over the past two years' assessments.*
17. Continue to populate and maintain the Commission's website www.elmcreekwatershed.org to provide news to residents, students, developers and other individuals interested in the water resources of the watershed. *This process will continue in 2021. In 2021 the website had 2,843 total users. Of these, 2,791 were new users in 2021. A total of 4,279 sessions occurred among all users, averaging 1.98 pages per session.*
18. Publish an annual activity report summarizing the Commission's yearly activities and financial reporting. *The 2020 Annual Activity Report will be published in April 2021 and made available to the member cities and the public on the Commission website, <http://www.elmcreekwatershed.org/annual-reports.html>. The report was accepted by the Commission at its April 14, 2021, meeting*
19. For the 2020-2021 biennium of the Watershed-Based funding program, BWSR decided to allocate the funds based on major watershed divides. Elm Creek is in the Mississippi West Major Watershed (MWW) which was allocated \$874,153. Funds become available July 1, 2020. Grants from these funds expire December 31, 2023. *Elm Creek submitted two projects, the Rush Creek Restoration for \$200,000 and the Elm Creek Restoration at the outlet of Hayden Lake for \$300,000. After criteria ranking, Elm Creek was awarded \$281,996.20 to be put toward one or both projects at the discretion of the Commission. A 10% local match is required. In addition, other grant funds will be pursued to complete these stream restorations.*
Elm Creek is also in the North Fork Crow (NFC) major watershed which was allocated \$91,105.00; however, no projects were identified within the major watershed area to use the funding, so it was relinquished to other participants.
20. Complete Special Flood Hazard Areas on the FEMA Floodplain maps located within the watershed into current modeling packages. The total budget for this project in Elm Creek is \$92,772.45 and does not

require a local match. *The DNR provided funding for this project through a FEMA grant that did not require a local match. At December 25, 2020, eight percent of the original budget remained, not including \$14,800 of additional work authorized by the DNR in December 2020 and an additional \$1,200 for the revision of 12 subwatersheds and update of the HEC-HMS model inputs for those subwatersheds. The term of the contract ended March 31, 2021. Barr Engineering submitted final deliverables for the project on that date. The DNR plans to hold a meeting in early 2022 to review the updated special flood hazard areas with member communities.*

21. Support the City of Maple Grove and its partners as they undertake a subwatershed assessment for Weaver Lake. *The City has begun its work on the subwatershed assessment and is awaiting comments from the lake association before finalizing the assessment. The City has nearly completed the Weaver Lake Subwatershed Assessment and a copy will be provided to the Commission upon final completion.*
22. Support the City of Corcoran and its partners as they undertake a subwatershed assessment for the South Fork of Rush Creek. A small portion of the South Fork also flows through the cities of Maple Grove and Medina. *Corcoran intends to continue pursuing funds and/or grants for this project. Staff recognizes a need to generate local funds and has discussed a stormwater utility as development expands in Corcoran's MUSA area as well as considerations for rural Corcoran. Council level discussions are likely to occur in 2021. Council has approved a Stormwater Area Charge Study to evaluate options with results anticipated to be presented to the Council in early 2022.*
23. Support the City of Dayton and its partners to continue efforts for completion of the Diamond Lake subwatershed assessment. *At 2020 year-end, the Diamond Creek Subwatershed Assessment Project was at approximately 75% completion. Most of the technical components of the project (~90%) were completed in 2020, including data compilation, GIS analysis, modeling, field visits, BMP siting, planning level design, and cost estimates. Staff have begun outlining and drafting the final report and plan to have a draft for local stakeholder review by the end of March 2021.*
24. Convene a meeting of the Technical Advisory Committee to review any discrepancies between the Commission and member city Rules and Standards. *On August 26, 2021, the TAC began its review with discussion regarding the challenges related to low elevations/low openings adjacent to flashing waterbodies such as ponds, an issue that became relevant when reviewing a project for which a variance was approved. They worked from a flow chart created by Staff that summarized the review path taken by the Commission's Technical Staff when reviewing projects. They will continue their discussions at a future TAC meeting.*
25. Participate with the Board of Water and Soil Resources in a Performance Review and Assistance Program (PRAP) Level II Review. *At the September meeting Brett Arne described BWSR's Performance Review and Assistance Program and presented the results of the review of the Elm Creek Commission.*
This was a Level II review, conducted by BWSR once every ten years for every local government unit. Its focus is on the degree to which an organization is accomplishing its water management plan. A Level II review includes determination of compliance with BWSR's Level I and II statewide performance standards, a tabulation of progress on planned goals and objectives, a survey of staff and board members of the factors affecting plan implementation, a survey of the Commission's partners about their impressions of working with the Commission, and a BWSR staff report to the organization with findings, conclusions, and recommendations. The final report has not yet been received. The following recommendations were brought forward by BWSR:
 - a. *Existing planning goals are too broad. They need to be more targeted, prioritized, and measurable.*
 - b. *Conduct internal analysis of the CIP. Work with city officials, informing them of the benefits of the program. Identify barriers that preclude this from happening.*
 - c. *Review regulatory timelines.*

- d. *Coordinate communication efforts between Commission and landowners. Focus on specific land areas that contribute to low water quality. Partner with Hennepin County in these efforts. The County is a valuable resource for marketing programs and oftentimes also has grant resources available.*
- e. *(Added during the discussion when the recommendations were presented.) Update the Commissioner Handbook, conduct training session for Commissioners. Look to League of Minnesota Cities and the BWSR website for resources/assistance.*

The PRAP report was accepted at the Commission's September meeting. Plymouth Commissioner Catherine Cesnik volunteered to work with Chairman Doug Baines, Stantec consultant Diane Spector, and Administrator Judie Anderson on these recommendations, particularly item 5. A couple of TAC members will also be invited to be members of this committee.

One of the specific recommendations, a draft Data Practices Policy, was presented and approved at the Commission's October meeting.