

Applicant: David Long; Twin Cities and Western Railroad Company
Consultant: Jeff Cooley; Civil Design, Inc.
Project: Railroad Track Additions and Culvert Improvements
Location: 6282 Industrial Drive, Eden Prairie, MN
Applicable Rule(s): 2, 3, 4, 5, 6 and 7
Reviewer(s): Louise Heffernan and Bob Obermeyer; Barr Engineering Co.

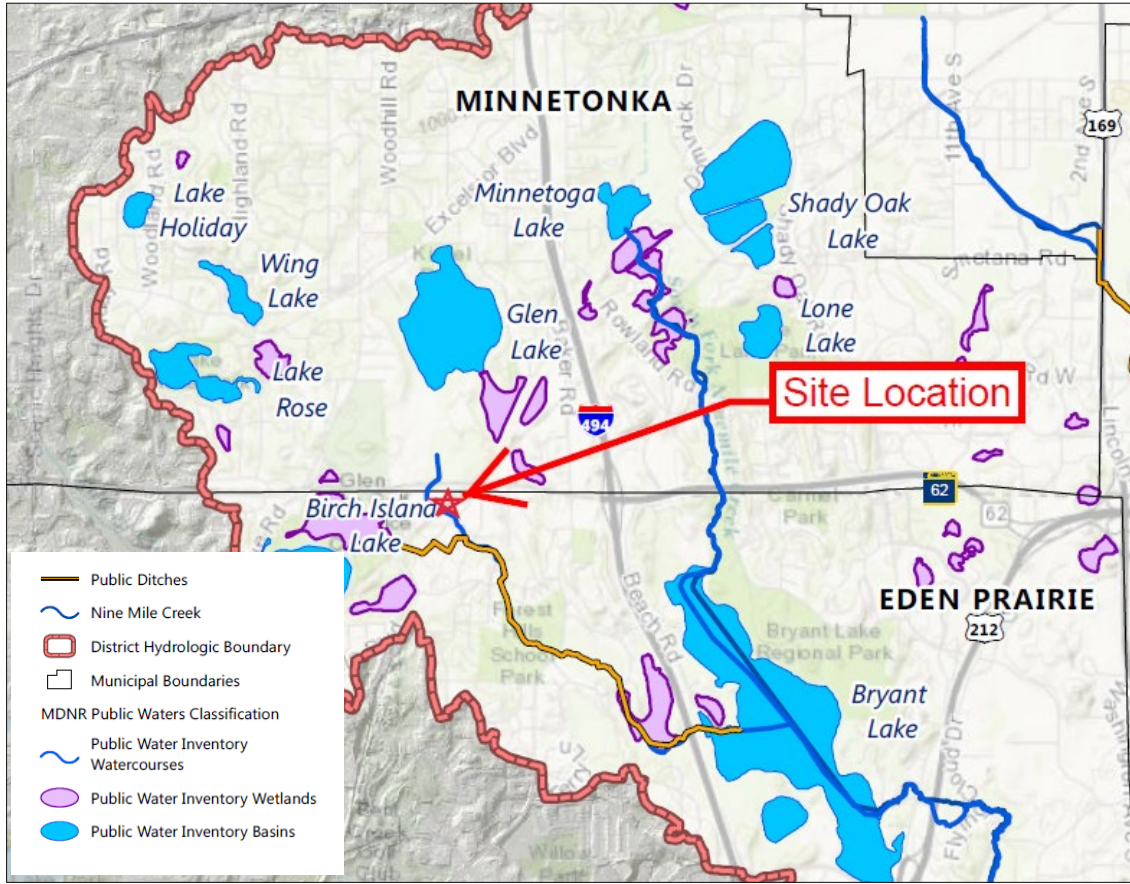
General Background & Comments

The applicant, the Twin Cities and Western Railroad Company (TCWR), proposes culvert improvements and the addition of railroad tracks located at 6282 Industrial Drive in Eden Prairie. Proposed work includes the following:

- Addition of railroad tracks and expansion of the existing railroad bed adjacent to the mainline at 6280 and 6282 Industrial Drive for the purpose of improving truck transloading accessibility and freight capacity.
- Installation of a 20-foot reinforced concrete pipe (RCP) extension at the downstream end of the existing 48-inch culvert beneath the mainline railroad, including installation of riprap and granular filter material at the proposed extension flared end section (FES).
- Installation of a 24-inch RCP culvert beneath the railroad track addition to replace the existing drainage ditch section along the railroad embankment.

The project site is located along the Glen Lake Outlet branch of Nine Mile Creek (creek) and will involve land-altering activities below the 100-year frequency flood elevation of the creek. The reach of the creek within the site limits is identified as a Minnesota Department of Natural Resources (MnDNR) Public Watercourse (Unnamed Stream M-055-005-001-003). The project site location, relative to the creek and the surrounding area, is shown on Figure 1 below.

Figure 1. Site Location.



The project site information is summarized in Table 1 below.

Table 1. Project Site Information.

Site Information	Project Area
Total Site Area (acres)	25.1
Existing Site Impervious Area (acres)	0
Proposed Site Impervious Area (acres)	0
Change in Impervious Area (acres)	0
Regulated Impervious Area (acres)	0
Total Disturbed Area (acres)	2.7

Exhibits Reviewed:

1. Permit Application dated November 30, 2021, received December 15, 2021.
2. Correspondence outlining items required for a complete application:
 - a. Email correspondence dated January 7, 2022, outlining 17 items required to complete the application.
 - b. Email correspondence dated February 23, 2022, reiterating preliminary information required to complete the application (documenting a February 23, 2022, discussion).
 - c. Email correspondence dated February 24, 2022, and February 25, 2022, reiterating 14 items required to complete the application.
 - d. Email correspondence dated March 11, 2022, reiterating 14 items required to complete the application, following the March 11, 2022, XP-SWMM model resubmission (item 5, below).
 - e. Email correspondence dated March 17, 2022, reiterating items required to complete the application, following the applicant's status update request.
 - f. Email correspondence dated March 21, 2022, reiterating 14 items required to complete the application, following review of Flood Zone and Wetland Exhibits received on March 11, 2022 (item 4, below).
 - g. Meeting on May 11, 2022, with TCWR, Civil Design, Inc., NMCWD and Barr Engineering Co. staff to discuss items required to complete the application. Email correspondence dated May 12, 2022 documenting items discussed on May 11, 2022, required to complete the application.
 - h. NMCWD Extension of Permit Application #2021-173 issued on June 3, 2021, extending the NMCWD action deadline to August 4, 2022, to provide adequate time to advance the permitting process once information is submitted by the applicant following the May 11, 2022 meeting with TCWR, Civil Design, Inc., NMCWD and Barr Engineering staff.
3. Preliminary plan(s) prepared by Civil Design, Inc.:
 - a. received on December 15, 2021 (dated December 10, 2021)
 - b. received on February 2, 2022 (dated September 16, 2021)
 - c. received on April 6, 2022 (dated April 1, 2022)
 - d. received on June 17, 2022 (dated April 1, 2022)
4. Flood Zone and Wetland Exhibits dated March 8, 2021, received on March 11, 2022, prepared by Civil Design, Inc.
5. XP-SWMM modeling files received on December 15, 2021, March 11, 2022, April 6, 2022, and June 17, 2022, prepared by Civil Design, Inc.
6. NMCWD comment responses received on February 2, 2022, April 6, 2022, and June 17, 2022, prepared by Civil Design, Inc.
7. Wetland Delineation Report dated September 9, 2021, prepared by Stantec.

8. The revised submittal items received on June 17, 2022 (noted above) complete the application.

2.0 Floodplain Management and Drainage Alterations

Because the project will involve land-altering activities below the 100-year frequency flood elevation of the creek (901.0 M.S.L.), the project must conform to the requirements of the District's Floodplain Management and Drainage Alterations Rule 2.0 (Rule 2.2.1).

Proposed earth work and grading for the expansion of the mainline railroad bed, installation of the 20-foot extension of the existing 48-inch RCP culvert, and installation of a 24-inch RCP culvert will take place below elevation 901.0 M.S.L. Under subsection 2.2.1a, the riprap installation is exempt from the requirements set forth by the District's Floodplain Management and Drainage Alterations Rule 2.0 because:

- The riprap will be installed to provide an energy dissipation measure to reduce the erosive force of concentrated creek flow and prevent scour at outlet(s).
- The riprap design and materials are consistent with the standards in the District's Shoreline and Streambank Improvements Rule 7.0. See *Section 7.0 Shoreline and Streambank Improvements* of this report for Rule 7.0 conformance analysis.

Rule 2 criteria for floodplain and drainage alterations includes the following:

2.3.1: The low floor elevation of all new and reconstructed structures must be constructed in accordance with the NMCWD Stormwater Rule, subsection 4.3.3.

The project does not include new or reconstructed buildings, bridges or boardwalks that qualify as "structures" pursuant to NMCWD Resolution #22-02 adjacent to the creek.

2.3.2: Placement of fill below the 100-year flood elevation is prohibited unless fully compensatory flood storage is provided within the floodplain and:

- a. at the same elevation +/- 1 foot for fill in the floodplain; or*
- b. at or below the same elevation for fill in the floodplain of a water basin or constructed stormwater facility.*

The project will result in approximately 170 cubic yards of fill material placed below elevation 901.0 M.S.L., the creek's flood elevation, at elevations ranging from approximately 893.0 M.S.L. to 901.0 M.S.L. The applicant proposes 170 cubic yards of material to be excavated and removed from the creek for compensatory storage at the same elevations as the fill (ranging from approximately 893.0 M.S.L. to 901.0 M.S.L.), in compliance with subsection 2.3.2 criteria. The supporting materials demonstrate and the NMCWD engineer concurs that the project is in conformance with Rule 2.3.2 criteria.

2.3.3. The District will issue a permit to alter surface flows only if it finds that the alteration is not reasonably likely to have a significant adverse impact on any upstream or downstream landowner and is not reasonably likely to have a significant adverse effect on flood risk, basin or channel stability, groundwater hydrology, stream base-flow, water quality or aquatic or riparian habitat.

Because the proposed activities will alter surface flows below the 100-year flood elevation of the creek, the applicant must demonstrate that the proposed earth work, grading, culvert

improvements and riprap placement are not reasonably likely to have a significant adverse impact on any upstream or downstream landowner(s), flood risk, channel stability, groundwater hydrology, stream base-flow, water quality or aquatic or riparian habitat.

To demonstrate compliance, the flood stage, outlet characteristics, and peak discharges and peak velocities for the project were evaluated for the 100-year, 24-hour event. The XP-SWMM modeling provided demonstrates minor increases in the post-project peak discharge rates and peak velocities, as summarized in Table 2 below. Modeling results indicate a minor increase in the conveyance through the existing 48-inch pipe as a result of the 20-foot extension. The plans indicate the pipe extension will be installed at a 20-degree bend to promote alignment of the outlet with the creek bed, improving the hydraulics of the system. Based on the hydraulic design and the modeling, the engineer finds that the minor increase in discharge rates and velocities, except for the peak outflow velocity at the proposed 24-inch RCP, is within the degree of engineering accuracy and not reasonably likely to have a significant adverse impact on upstream or downstream landowners, stream-base flow, or channel stability in conformance with Rule 2.3.3 criteria. To conform to subsection 2.3.3 criteria, the potential erosive outlet velocity from the proposed 24-inch RCP outlet must be reduced, as outlined in the *Recommendations* section of this report. A reduction in the outlet velocity may require that a drop manhole be installed along the pipe alignment and/or an increase in the outlet pipe size (i.e., a 36-inch pipe to the creek). Additionally, it is recommended that the 24-inch outlet invert be installed at the thalweg of the creek with the outflow discharge directed along the flowline of the creek to prevent water quality degradation.

Table 2. Peak Discharge Rates

Location and XP-SWMM Node	Existing 100-year, 24-hour (c.f.s.)	Proposed 100-year, 24-hour (c.f.s.)	Increase/Decrease (+/-)
48-inch RCP at Site with proposed 20-foot extension (74_MilwaukeeRR)	83.9	85.7	+1.8
Creek Section Upstream of Site (GL5_xs_C)	55.6	55.7	+0.1
36-inch RCP Downstream of Site (73_IndustrialDr)	71.7	71.8	+0.1
New 24-inch RCP at Site (24-inRCP)	0	6.3	+6.3

Table 3. Peak Velocities

Location and XP-SWMM Node	Existing 100-year, 24-hour (ft/sec)	Proposed 100-year, 24-hour (ft/sec)	Increase/Decrease (+/-)
48-inch RCP at Site (74_MilwaukeeRR)	6.4	6.5	+0.1
Creek Section Upstream of Site (GL5_xs_C)	1.2	1.3	+0.1
36-inch RCP Downstream of Site (73_IndustrialDr)	10.1	10.1	0
New 24-inch RCP at Site (24-inRCP)	0	8.8	+8.8

The XP-SWMM model was used to evaluate upstream and downstream flood risk for pre-project and post-project high water levels along the creek. This information is summarized in Table 4 below. For the 100-year, 24-hour design event, flood risk is not increased, as the upstream and downstream 100-year high water levels of the creek are maintained to pre-project conditions as shown in Table 4 below.

Table 4. 100-year High Water Levels

Location	100-Year High Water Level (M.S.L.)		
	Existing	Proposed	Change
MtkaCrk11 (Upstream of site)	901.0	901.0	0
EPCrk1a (Site creek section)	900.1	900.1	0
EPCrk1 (Downstream of site)	900.1	900.1	0

Standard practice for published flood management elevations includes high water levels reported to the tenth of a foot as shown in Table 4. The XP-SWMM modeling reports changes (increases or decreases) to the hundred or thousandth of a foot. Based on the modeling results, the proposed hydraulic modifications result in a 0.003-foot decrease in the flood elevation of the creek section at the crossing, a 0.02-foot decrease in the flood elevation upstream of the crossing, and a 0.002-foot decrease downstream of the crossing. With the proposed decreases, the NMCWD engineer finds that the project is not likely to significantly adversely impact flood risk in conformance with subsection 2.3.3 criteria.

Groundwater hydrology will not be changed and/or altered as a result of the project because the project does not propose alterations (e.g. pumping, establishment of new normal water levels, changes in the upstream or downstream elevations of the creek, or physical characteristic changes such as depth of flow or bed permeability) that would result in surface water inflow to groundwater interaction changes or restriction of seepage out of the bed of the creek. The NMCWD engineer finds that the project is not reasonably likely to have significant adverse impacts on groundwater hydrology in conformance with Rule 2.3.3 criteria.

Erosion prevention and sediment control measures are to be installed to prevent erosion from the disturbed surfaces and capture sediment onsite to maintain the water quality of the creek and downstream waterbodies. Based on the velocity of the outlet at the 48-inch culvert extension, riprap will be placed to reduce erosive forces at the channel bed and bank. With the permanent stabilization methods (riprap) and temporary erosion control measures including perimeter controls, rock ditch checks, and native seed mixtures for final stabilization, the project is not reasonably likely to have a significant adverse impact on water quality in accordance with Rule 2.3.3 criteria. Further considerations for the proposed 24-inch outlet are stated in the discussion of peak velocities above and in the *Recommendation* section of this report.

The project is not likely to deter wildlife (such as waterfowl, amphibians, reptiles) from using the site, if currently used. Revegetation plans provided by the applicant propose native vegetation to enhance ecological benefit. Because wildlife native to the area will be

able to continue using the native vegetated area at the site, the NMCWD engineer concurs that the proposed project is in compliance with subsection 2.3.3 criteria.

2.3.4 No structure may be placed, constructed, or reconstructed and no surface may be paved within 50 feet of the centerline of any water course, except that this provision does not apply to:

a. Bridges, culverts, and other structures and associated impervious surface regulated under Rule 6.0;

b. Trails 10 feet wide or less, designed primarily for nonmotorized use.

No structure is proposed to be placed, constructed, or reconstructed as part of the project and no surface will be paved within 50 feet of the centerline of the creek. The engineer finds that the project is in conformance with Rule 2.3.4 criteria.

3.0 Wetlands Management

The District's Wetland Management Rule 3.0 applies to the project because land-disturbing activities are proposed within and upgradient of the wetland within the project area and a permit under District Rules 2.0, 4.0, 6.0 and 7.0 is required (Rule 3.4).

The district is the Local Government Unit (LGU) responsible for administering the Wetland Conservation Act (WCA) in Eden Prairie. A wetland boundary determination was completed on August 23, 2021, within the project limits. Stantec submitted a Joint Application Form for Activities Affecting Water Resources in Minnesota received on September 16, 2021, requesting a wetland boundary and type approval. An additional Joint Application Form for Activities Affecting Water Resources in Minnesota was received requesting a WCA utility exemption approval for proposed wetland impacts, including 339 square feet of permanent wetland fill associated with the culvert improvements.

A WCA Notice of Decision approving the wetland boundary and type determination was issued on November 22, 2021, and a WCA Notice of Decision approving the utility exemption was issued on March 3, 2022. Subsection 3.2.2a of the District's Rules indicate that the requirements of Rule 3.4 Wetland Buffers and Rule 3.5 Stormwater Treatment do not apply to wetlands that are disturbed by utility improvements or repairs that are the subject of a utilities-exemption determination from the LGU. Following wetland disturbances, all wetland characteristics will be restored to pre-project conditions within 90 days of the commencement of construction. The project conforms to the requirements of Rule 3.0.

4.0 Stormwater Management

The District's requirements for stormwater management apply to the project because more than 50 cubic yards of material will be disturbed and 5,000 square feet or more of surface area is altered, Rules 4.2.1a and b.

The NMCWD's Rule for Redevelopment, Rule 4.2.3, states, if a proposed activity will disturb more than 50% of the existing impervious surface on the site or will increase the imperviousness of the site by more than 50%, stormwater management will apply to the entire project site. Otherwise, the stormwater requirements will apply only to the disturbed, replaced and net additional impervious surface on the project site. Because the project will not disturb

existing impervious surface on the site (0% to be disturbed) and will not increase impervious surface on the site (0% increase proposed), stormwater management is not required.

5.0 Erosion and Sediment Control

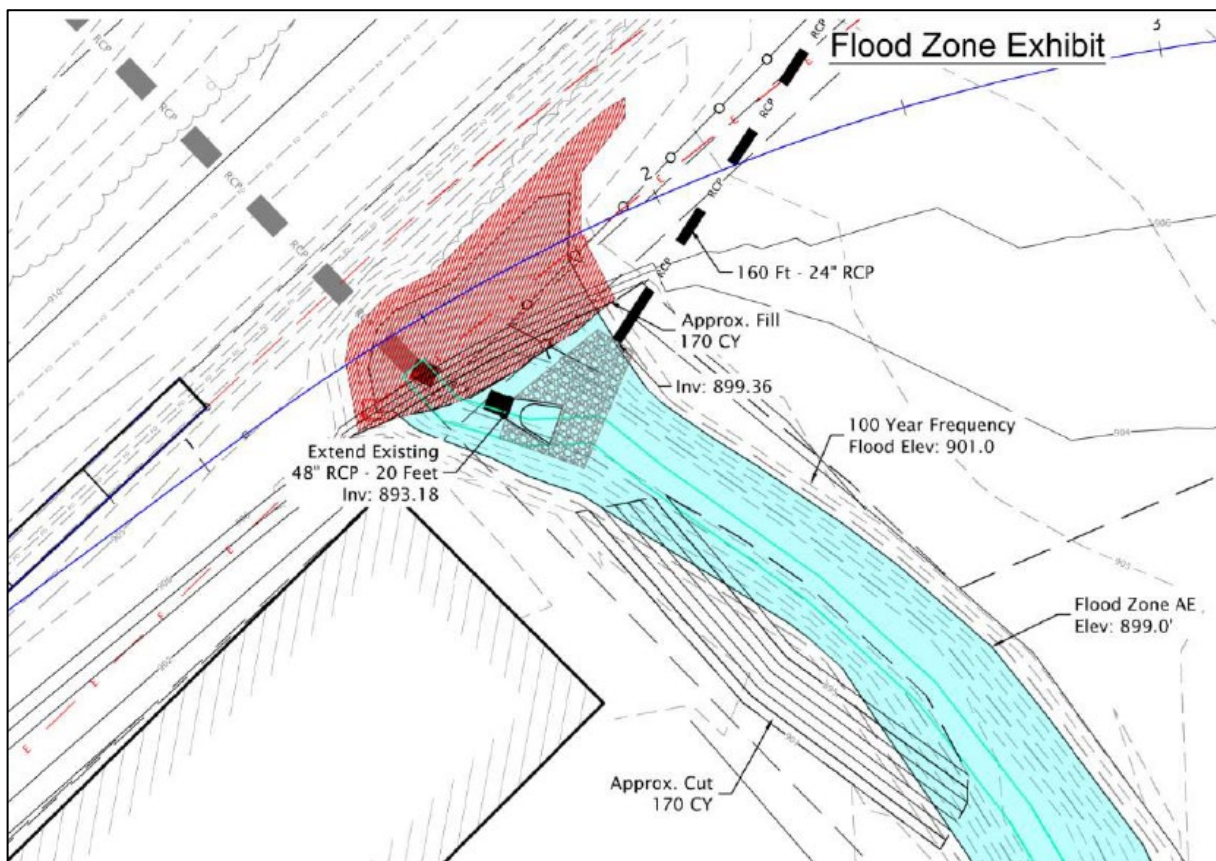
The District's requirements for erosion and sediment control apply to the project because more than 50 cubic yards of material will be disturbed and 5,000 square feet or more of surface area is altered, Rules 5.2.1a and b.

The erosion control plan prepared by Civil Design, Inc. includes installation of perimeter control and rock check dams. The contractor for the project will need to designate a contact who will remain liable to the district for performance under the District's Erosion and Sediment Control Rule 5.0 from the time the permitted activities commence until vegetative cover is established, in accordance with subsection 5.4.1e. NMCWD must be notified if the responsible individual changes during the permit term.

6.0 Waterbody Crossings and Structures

The District's Waterbody Crossings and Structures Rule 6.0 applies to the project because a new 24-inch RCP culvert and a 20-foot, 48-inch culvert extension will be installed in the bed and/or bank of the creek. Conformance with Rule 6.3 criteria is required. The locations of the proposed culvert improvements are shown in Figure 2 below.

Figure 2. Proposed Culvert Improvement Locations.



Rule 6.3.1 states construction, improvement, repair or removal of a waterbody crossing in contact with the bed or bank of a waterbody:

- a) *Must retain adequate hydraulic capacity and assure no net increase in the flood stage of the pertinent waterbody:*

Because a new 24-inch RCP culvert is proposed to be installed in the bank of the creek and a 20-foot extension to the existing 48-inch RCP culvert is proposed to be installed in the bed of the creek, the improvements must retain adequate hydraulic capacity and assure no net increase in the flood stage of the creek. The plans indicate that the 20-foot extension will be installed at a 20-degree bend to promote alignment of the 48-inch crossing with the creek bed, improving the hydraulics of the system.

The XP-SWMM model was used to evaluate pre- and post-project high water levels along the creek for determining impacts to upstream and downstream properties. The 100-year frequency flood elevation analysis, and discharge rate and velocity analysis, as described in *Section 2.0 Floodplain Management* of this report were provided to demonstrate compliance with Rule 6.3.1a criteria.

Because impervious surface within the project area are not proposed to be increased, subwatershed drainage areas are not to be altered, an increase in additional stormwater runoff volume will not be generated (net zero added impervious surface), changes in the upstream and downstream elevations of the creek section are not proposed, and discharge rate analysis as described in *Section 2.0 Floodplain Management* of this report maintains the flow at the creek crossing within a degree of engineering accuracy, the improvements will retain adequate hydraulic capacity in compliance with Rule 6.3.1a criteria. The NMCWD engineer concurs with the applicant provided runoff modeling results that demonstrate the proposed project will maintain adequate flow rates within the culvert systems relative to existing conditions (see subsection 2.3.3 analysis).

As indicated in the subsection 2.3.3 analysis, the proposed hydraulic modifications result in a 0.003-foot decrease in the 100-year flood elevation of the creek section at the site, a 0.02-foot decrease in the 100-year flood elevation upstream, and a 0.002-foot decrease downstream. With the proposed decreases, the NMCWD engineer agrees that there is no net increase in the flood stage of the creek onsite or at upstream/downstream locations. The project is in conformance with subsection 6.3.1a criteria.

- b) *Must retain adequate navigational capacity pursuant to any requirements of the waterbody's classification by the District:*

The project site is located along the Glen Lake Outlet branch of the creek. This section of the creek is not used for navigational purposes.

- c) *Must not be reasonably likely to significantly adversely affect water quality, change the existing flowline/gradient, or cause increased scour, erosion, or sedimentation:*

Rule 6.3.1c criteria is addressed in *Section 2.0 Floodplain Management and Drainage Alterations* of this report. To conform to subsection 6.3.1c criteria, the potential erosive outlet velocity from the proposed 24-inch RCP outlet must be reduced, as outlined in

the *Recommendations* section of this report. A reduction in the outlet velocity may require that a drop manhole be installed along the pipe alignment and/or an increase in the outlet pipe size (i.e., a 36-inch pipe to the creek). Additionally, it is recommended that the 24-inch outlet invert be installed at the thalweg of the creek with the outflow discharge directed along the flowline of the creek to prevent water quality degradation.

d) *Must provide post-project wildlife passage along each bank and riparian area:*

The project will not permanently change conditions in a manner that will deter wildlife from using the area adjacent to or within the creek. Construction activities may temporarily displace wildlife until the area is restored to pre-project conditions. Revegetation plans provided by the applicant propose native vegetation for the riparian areas along the watercourse to enhance ecological benefit, and native plantings upland for stabilization. Because wildlife native to the area will be able to continue using the native vegetated corridor adjacent/within to the project site, the NMCWD engineer concurs that the proposed project is in compliance with subsection 6.3.1e criteria.

e) *Must represent the “minimal impact” solution to a specific need with respect to all other reasonable alternatives:*

Several project options were investigated including various track alignment alternatives. Due to the creek location and grade at the site in relation to the location of the mainline track and property within the railroad right-of-way, the configuration of the track additions proposed represents the minimal impact solution with safe site operations.

The proposed design reduces impacts to the onsite wetland to 339 square feet of permanent wetland fill. Other alternatives evaluated demonstrated additional permanent fill. With the current design, wetland impacts have been avoided and minimized to the extent possible and the project impacts are significantly less than the ½ acre maximum disturbance exemption threshold allowed under the MN Rule 8420.0420 utility exemption standards. The proposed design maintains the flood storage capacity of the creek, while previous design alternatives did not include compensatory storage.

Because the proposed design minimizes the potential for adverse impact by reducing wetland loss, maintains creek flood storage, and includes stabilization of slopes around the culverts and restoration of the natural bank in comparison to the alternatives proposed, the current design represents the minimal impact solution.

Rule 6.3.2 states, *projects involving directional boring or horizontal drilling must provide for minimum clearance of 3 feet below the bed of a waterbody and a minimum setback of 50 feet from any stream bank for pilot, entrance and exit holes.*

No directional boring or horizontal drilling below a waterbody or near a stream bank is proposed.

Rule 6.3.3 states, removal of structures or other waterway obstructions:

a) *Must maintain the original cross-section and bed conditions to the greatest extent practicable:*

No removal of structures or other waterway obstructions are proposed.

- b) *Must achieve complete removal of the structure, including any footings or pilings that impede navigation:*

The Glen Lake Outlet branch of the creek is not used for navigation, and there are no structures or other waterway obstructions proposed to be removed by the project.

- c) *Must not involve the removal of a water-level control device:*

There are no water-level control devices proposed to be removed by the project.

Rule 6.3.4 requires *that the plans for the work must state that no activity affecting the bed of a protected water may be conducted between March 15 and June 15 on public watercourses, to minimize the impacts on fish spawning and migration:*

Sheet 3 of the project plans identify the dates for work within the creek, complying with Rule 6.3.4 criteria.

Rule 6.3.5 states, *a separate permit under District Rule 7.0 is not required for shoreline or streambank stabilization associated with a waterbody crossing or structure, but such stabilization must comply with the criteria 7.3.3c to e.*

See *Section 7.0 Shoreline and Streambank Improvements* of this report for Rule 7.0 conformance analysis.

In accordance with the requirements of subsection 6.5 for the maintenance of the watercourse crossings, the applicant must submit a draft declaration with NMCWD providing for maintenance of the waterbody crossing, then execute the agreement on approval of NMCWD.

7.0 Shoreline and Streambank Improvements

Because the waterbody crossing improvements involve placement of riprap at the culvert outlets to dissipate energy, the requirements of Rule 7.0 Shoreline and Streambank Improvements apply to the project. Riprap placed within the creek must conform to the requirements of Rule 7.0, as discussed in the following sections.

Rule 7.3.1 states, *An applicant for a shoreline alteration permit must demonstrate a need to prevent shoreline erosion or restore eroded shoreline or streambank, and placement of riprap for cosmetic purposes is prohibited.*

Based on the velocity analysis as described in *Section 2.0 Floodplain Management and Drainage Alterations* of this report, riprap at the culvert outlets is required for stabilization. The riprap will not be placed for cosmetic purposes but for the dissipation of energy at the culvert outlets and for the adequate stabilization of the creek bank. The NMCWD engineer agrees that the project conforms to Rule 7.3.1 criteria.

Rule 7.3.2 states, *An applicant must first consider maintenance or restoration of a shoreline or streambank using bioengineering. If bioengineering cannot provide stabilization, a combination of riprap and bioengineering may be used to restore or maintain a shoreline or streambank. If a combination of riprap and bioengineering cannot provide stabilization within a reasonable period, riprap may be used to restore or maintain shoreline or streambank.*

At the location of proposed riprap, bioengineering and plantings would not be sufficient. Additionally, shore erosion control guidance to support Wisconsin Department of Natural

Resources regulations was utilized to evaluate the proposed culvert outlet stabilization practices. Based on the Wisconsin DNR Chapter NR 328: Shore Erosion Control Structures in Navigable Waterways Erosion Intensity Score Worksheet, the erosion intensity score for the site is 62 – a moderate energy site. A moderate energy site is a site where the erosion intensity score is 48 to 67, where riprap is appropriate for placement. A retaining wall is not proposed as part of the project. The project conforms to Rule 7.3.2 criteria.

Rule 7.3.3a states, *Riprap to be used in shoreline erosion protection must be sized appropriately in relation to the erosion potential of the wave or current action of the particular water body, but in no case shall the riprap rock average less than six inches in diameter or more than 30 inches in diameter. Riprap shall be durable, natural stone and of a gradation that will result in a stable shoreline embankment. Stone, granular filter and geotextile material shall conform to standard Minnesota Department of Transportation specifications, except that neither limestone nor dolomite shall be used for shoreline or stream bank riprap, but may be used at stormwater outfalls. All materials used must be free from organic material, soil, clay, debris, trash or any other material that may cause siltation or pollution:*

The project does not propose placement of riprap to be used for shoreline erosion protection (only streambank protection at the creek).

Rule 7.3.3b states, *Riprap must be placed to conform to the natural alignment of the shoreline.*

The project does not propose placement of riprap along a shoreline.

Rule 7.3.3c states, *A transitional layer consisting of graded gravel, at least six inches deep, and where appropriate, geotextile filter fabric shall be placed between the existing shoreline and any riprap. The thickness of riprap layers should be at least 1.25 times the maximum stone diameter. Toe boulders, if used, must be at least 50 percent buried.*

The project does not propose placement of riprap along a shoreline.

Rule 7.3.3d states, *Riprap must not cover emergent vegetation unless authorized by a Department of Natural Resources permit.*

The riprap to be installed will not cover emergent vegetation as indicated by the plans.

Rule 7.3.3e states, *Riprap may extend no higher than the top of bank or two feet above the 100-year high water elevation, whichever is lower.*

The District's Atlas 14 100-year high water elevation for the creek is 901.0 M.S.L., approximately the top of the bank. The riprap will extend to approximately 899.4 M.S.L. (approximately 1.6 feet below the top of the bank), in conformance with Rule 7.3.3e criteria.

The project must be in conformance with Rule 7.3.3 All shorelines and streambanks.

Rule 7.3.3a states, *The finished slope of any shoreline shall not be steeper than 3:1 (horizontal to vertical).*

Because the proposed slope shown on the design plan is 3:1 (horizontal to vertical) or flatter waterward of the top of the bank (901.0 M.S.L.), the project conforms to Rule 7.3.3a.

Rule 7.3.3b states, *Horizontal encroachment from a shoreline shall be the minimal amount necessary to permanently stabilize the shoreline and shall not unduly interfere with water flow or navigation. No riprap or filter material shall be placed more than six feet waterward of the OHW. Streambank riprap shall not reduce the cross-sectional area of the channel or result in a stage increase of more than 0.01 feet at or upstream of the treatment.*

The requirement stating no riprap or filter material shall be placed more than six feet waterward of the OHW applies to work along waterbodies. The plans show the proposed stabilization will follow the configuration of the existing streambank and will not encroach horizontally from existing streambank conditions. The engineer agrees that the project conforms to Rule 7.3.3b criteria.

Rule 7.3.3c states, *The design of any shoreline erosion protection shall reflect the engineering properties of the underlying soils and any soil corrections or reinforcements necessary. The design shall conform to engineering principles for dispersion of wave energy and resistance to deformation from ice pressures and movement, considering prevailing winds, fetch and other factors that induce wave energy.*

The design of the streambank erosion protection reflects the engineering properties of the underlying soils. The project does not propose to install riprap along a shoreline for which the engineering principles for dispersion of wave energy and resistance to deformation from ice pressures and movement apply. The engineer finds that the project is in conformance with Rule 7.3.3c criteria.

11.0 Fees

Fees for the project are:

Rule 2:	\$1,500
Rule 4:	\$1,500
Rule 5:	\$1,500
Rule 6:	\$300
Rule 7:	\$300
Total Fees:	\$5,100

12.0 Financial Assurances

Financial Assurances for the project are:

Rule 3: Wetlands Management=.....	\$5,000
Rules 5: Perimeter Control: 780 L.F. x \$2.50/L.F. =	\$1,950
Site Restoration: 2.7 acres x \$2,500/acre =	\$6,750
Contingency and Administration	\$5,900

Findings

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The proposed project will conform to the requirements of Rules 2, 5 and 6 if the rule specific permit conditions identified in the *Recommendations* section of this report are met.
3. In accordance with Rule 6.3.4, the project work will not be conducted between March 15 and June 15 on public watercourses to minimize the impacts of fish spawning and migration.

Recommendation

Approval, contingent upon:

Compliance with the General Provisions (attached).

Financial Assurance in the amount of \$19,600, \$8,700 for erosion control and site restoration, and \$5,000 for wetland management.

The applicant providing a name and contact information for the individual responsible for the erosion and sediment control at the site. NMCWD must be notified if the responsible individual changes during the permit term.

In accordance with the requirements of subsection 6.5 for the maintenance of the watercourse crossings, the applicant must submit a draft declaration with NMCWD providing for maintenance of the waterbody crossings, then execute the agreement on approval of NMCWD. A draft declaration must be approved by the District prior to recordation.

To conform to NMCWD Rules 2.3.3 and 6.3.1c criteria, the potential erosive outflow velocity (8.8 ft/sec) from the proposed 24-inch RCP outlet must be reduced. Outflow velocity reduction may be achieved with the installation of a drop manhole structure along the pipe alignment with an increase in the outlet pipe size (i.e., a 36-inch pipe to the creek). Additionally, to prevent erosive forces along the bank of the creek and water quality degradation, it is recommended that the outlet invert be installed at the toe of the creek bank and directed down the flowline of the creek, per May 12, 2022 correspondence.

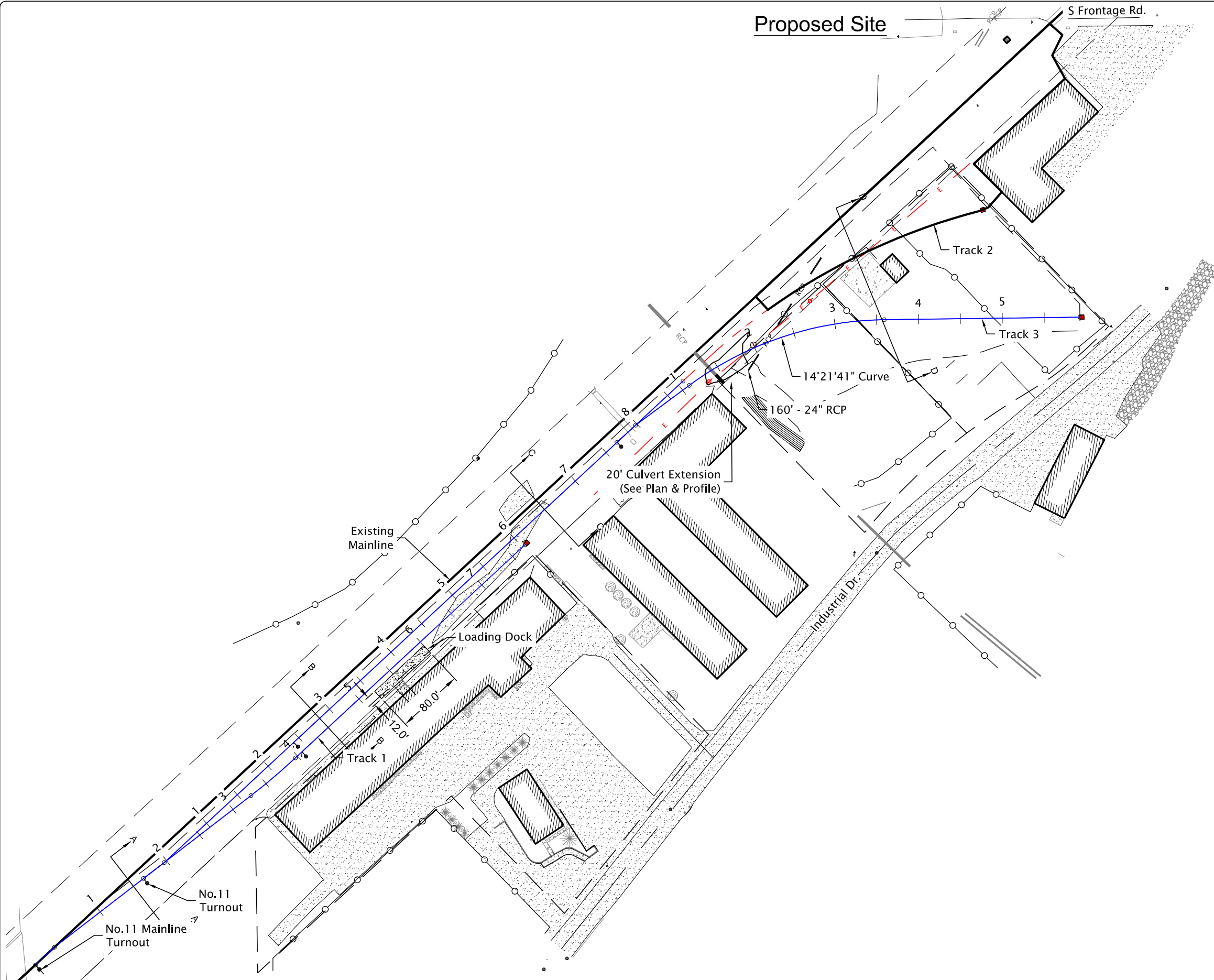
By accepting the permit, when issued, the applicant agrees to the following stipulations for closeout of the permit:

An as-built drawing of the floodplain mitigation areas conforming to the design specifications as approved by the District.

The work for the TCWR railroad track addition and culvert improvements project under the terms of Permit #2021-173, if issued, must have a configuration materially consistent with the approved plans. Design that differs materially from the approved plans (e.g., in terms of the hydraulic alterations, floodplain storage volume, and zero impervious surface alterations) will need to be the subject of a request for a permit modification or new permit, which will be subject to review for compliance with all applicable regulatory requirements.

Proposed Site

S Frontage Rd.



LEGEND

- Proposed Track —
- Future Track - - -



Scale: 1" = 120'



*All Curves are 7°30' Unless Labeled otherwise

*End Of Track Devices To Be Bumping Posts