



**National Pollutant Discharge Elimination System (NPDES)/
State Disposal System (SDS) Permit Program Fact Sheet**
Permit Reissuance
MN0024368

Permittee: City of Northfield
1450 Highway 3 North
Northfield, MN 55057

Facility name: Northfield Wastewater Treatment Facility
1450 Highway 3 North
Northfield, MN 55057

Current permit expiration date: October 31, 2015

Public comment period begins:

Public comment period ends:

Receiving water: Cannon River - Class 2Bg, 3C, 4A, 4B, 5, 6 Water

Permitting contact: Holly L. Mikkelson
Minnesota Pollution Control Agency
7678 College Road, Suite 105
Baxter, MN 56245

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Purpose and participation

Applicable statutes

This fact sheet has been prepared according to the 40 CFR § 124.8 and 124.56 and Minn. R. 7001.0100, subp. 3, in regards to a draft National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permit to construct and/or operate wastewater treatment facilities and to discharge into waters of the State of Minnesota.

Purpose

This fact sheet outlines the principal issues related to the preparation of this draft permit and documents the decisions that were made in the determination of the effluent limitations and conditions of this permit.

Public participation

You may submit written comments on the terms of the draft permit or on the Commissioner's preliminary determination. Your written comments must include the following:

1. A statement of your interest in the permit application or the draft permit.
2. A statement of the action you wish the Minnesota Pollution Control Agency (MPCA) to take, including specific references to sections of the draft permit that you believe should be changed.
3. The reasons supporting your position, stated with sufficient specificity as to allow the Commissioner to investigate the merits of your position.

You may also request that the MPCA Commissioner hold a public informational meeting. A public informational meeting is an informal meeting which the MPCA may hold to help clarify and resolve issues.

In accordance with Minn. R. 7000.0650 and Minn. R. 7001.0110, your petition requesting a public informational meeting must identify the matter of concern and must include the following: items one through three identified above; a statement of the reasons the MPCA should hold the meeting; and the issues you would like the MPCA to address at the meeting.

In addition, you may submit a petition for a contested case hearing. A contested case hearing is a formal hearing before an administrative law judge. Your petition requesting a contested case hearing must include a statement of reasons or proposed findings supporting the MPCA decision to hold a contested case hearing pursuant to the criteria identified in Minn. R. 7000.1900, subp. 1 and a statement of the issues proposed to be addressed by a contested case hearing and the specific relief requested. To the extent known, your petition should include a proposed list of witnesses to be presented at the hearing, a proposed list of publications, references or studies to be introduced at the hearing, and an estimate of time required for you to present the matter at hearing.

You must submit all comments, requests, and petitions during the public comment period identified on page one of this notice. All written comments, requests, and petitions received during the public comment period will be considered in the final decisions regarding the permit. If the MPCA does not receive any written comments, requests, or petitions during the public comment period, the Commissioner or other MPCA staff as authorized by the Commissioner will make the final decision concerning the draft permit.

Comments, petitions, and/or requests must be submitted by the last day of the public comment period to:

Holly L. Mikkelson
Minnesota Pollution Control Agency
7678 College Road, Suite 105
Baxter, MN 56425

The permit will be reissued if the MPCA determines that the proposed Permittee or Permittees will, with respect to the facility or activity to be permitted, comply or undertake a schedule to achieve compliance with all applicable state and federal pollution control statutes and rules administered by the MPCA and the conditions of the permit and that all applicable requirements of Minn. Stat. ch. 116D and the rules promulgated thereunder have been fulfilled.

More detail on all requirements placed on the facility may be found in the Permit document.

Facility description

Background information

Facility location

The Northfield Wastewater Treatment Facility (Facility) is located at 1450 Highway 3 North, Northfield, Minnesota 55057, Dakota County, approximately one mile north of the city of Northfield and about ¼ mile north of the Dakota and Rice county borders.

Outfall location

The outfall, Monitoring Station SD006, is located just to the east (less than ¼ mile) of the wastewater treatment facility at latitude 44° 28' 45" and longitude 93° 08' 45". The outfall discharges directly to the Cannon River.

Components and treatment technology

Current information

The Facility has a continuous discharge to the Cannon River and is designed to treat an average wet weather design flow (AWWDF) of 5.2 million gallons per day (MGD), an average dry weather design flow of 3.23 MGD, a five-day carbonaceous biochemical oxygen demand strength of 185 milligrams per liter (mg/L), a total suspended solids concentration of 150 mg/L, and a total phosphorus concentration of 8 mg/L. This is a Class A facility.

The existing Facility treats flow for the city of Northfield and the city of Dundas. The treatment process consists of a raw wastewater pumping station, flow metering, fine screens, vortex grit removal, six rapid-mix tanks, chemical addition of ferric chloride and polymer for phosphorus removal, two flocculation tanks, two lamella plate primary clarifiers, ten upflow biological aerated filters, a filter backwash tank, and ultraviolet light disinfection. There are two Rotating Biological Contactors and secondary clarifiers that are still present but are not in use.

The biosolids treatment system consists of a raw biosolids storage tank, belt filter press dewatering, and lime/heat pasteurization to produce exceptional quality biosolids. The biosolids are stored on-site until they are land applied.

The MPCA has evaluated the treatment components of the Facility with regards to the total phosphorus limits in this permit. At the time of permit issuance, the Facility is operating at less than the permitted AWWDF of 5.2 MGD and is demonstrating the capability of meeting the total phosphorus effluent limits of 24.80 kg/day calendar month average (Jun-Sep), 6,223 kg/year 12-month moving total (Jan-Dec), and 1.0 mg/L calendar month average (Jan-Dec). As the Facility approaches its AWWDF, it may need infrastructure improvements and/or operational changes to maintain compliance. This permit includes additional reporting requirements to assure compliance with the total phosphorus effluent limits as the Facility's influent flows and/or pollutant loadings increase.

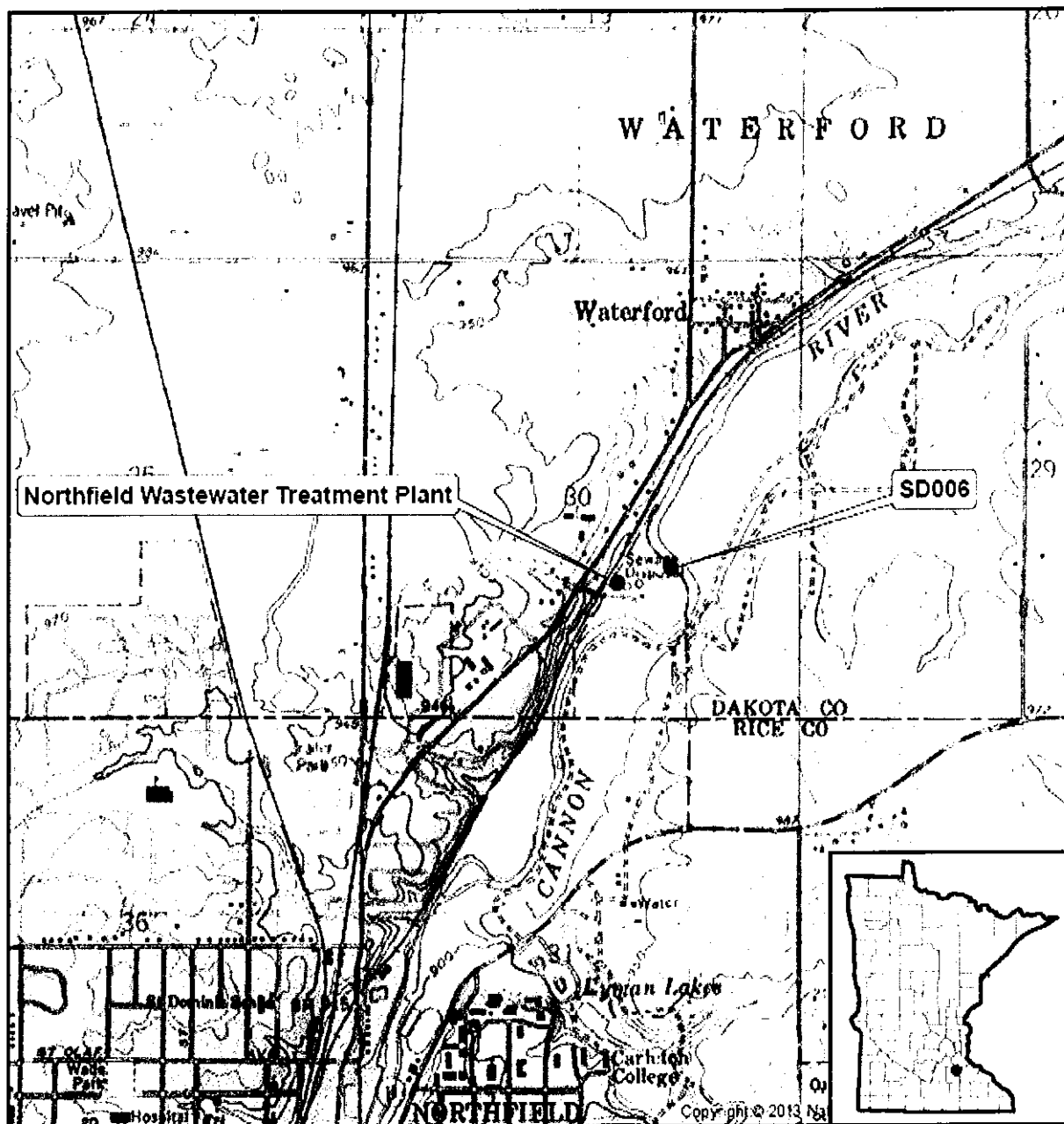
The Facility was delegated pretreatment authority on April 5, 2013.

The Facility is further described in plans and specifications on file with the MPCA in an engineering report by the firm of Bolton & Menk, Inc., dated April 23, 1998, and letters from Bolton & Menk, Inc., dated through February 23, 2000.

Map of permitted facility

Topographic Map of Permitted Facility

MN0024368: Northfield Wastewater Treatment Facility
T112N, R19W, Section 30
Northfield, Dakota County, Minnesota



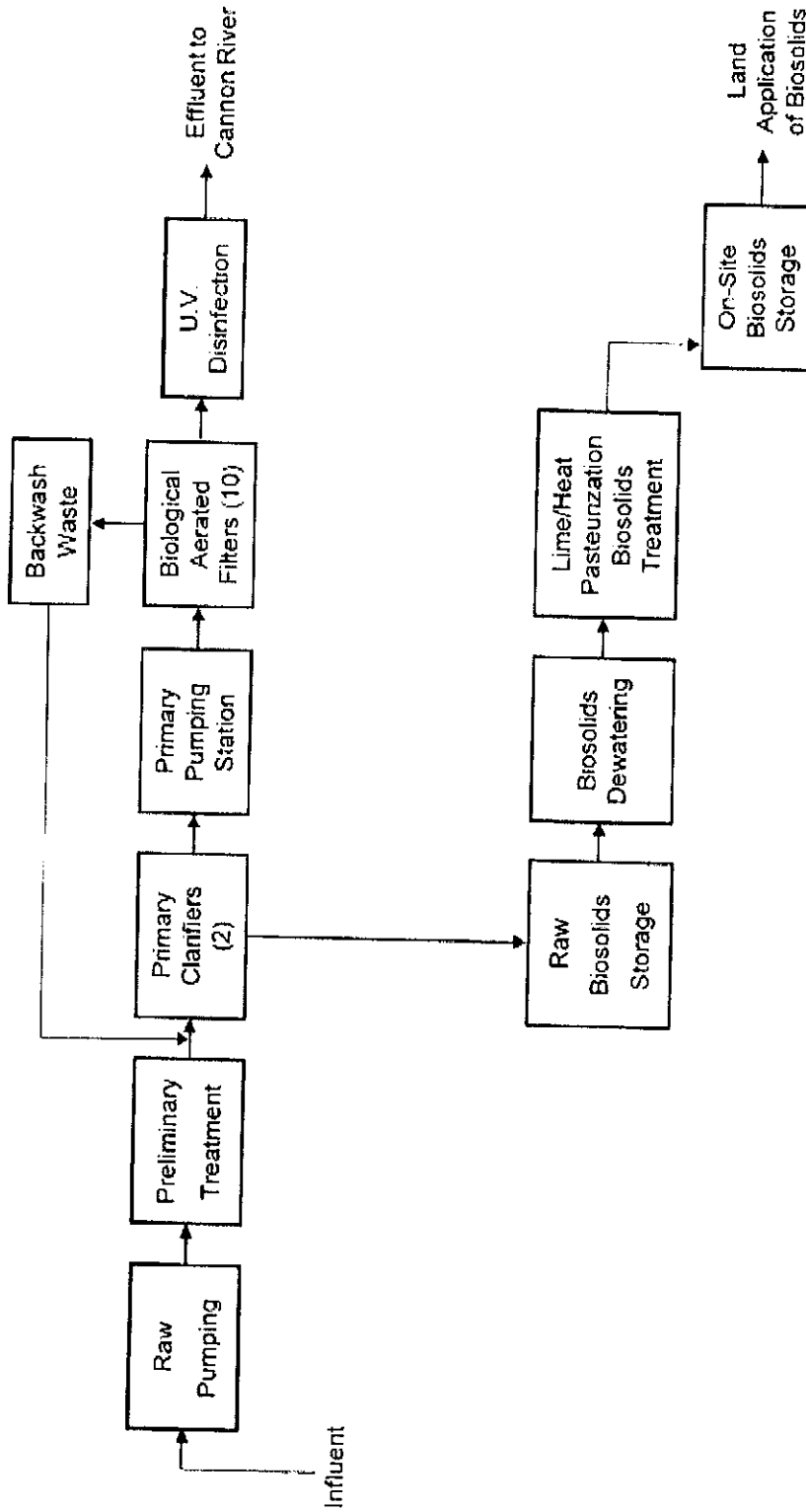
Map produced by: MPCA Staff, 11/5/2019
Source: USGS Quad
Scale: 1:20,000

0 0.2 0.4 0.8 Miles



Flow schematic

Wastewater Treatment Schematic 2015
Northfield, Minnesota



Changes to facility or operation

There have been no changes to the Facility or its operation since the last five-year permit cycle.

Significant industrial users (SIUs)

Table 1

Name of SIU, Product/Concern	Total Avg Flow (MGD) - all from process WW	Control Mechanism or Local Limit?	Subject to Categorical Standards?
Malt-O-Meal, breakfast cereal	0.16	Y	N
Multek Flexible Circuits, heavy metals	0.14	Y	Y
All Flex, heavy metals	0.009	Y	Y

Chemical Additives

Table 2

Chemical	Purpose	Location of Addition	Frequency/Duration	Average Rate of Use	Maximum Rate of Use
Ferric Chloride	coagulant	Before Clarifier	Continuous; flow proportional	120 gpd	145 gpd
Ferric Chloride	odor control	To Sludge Tank	Continuous; constant	15 gpd	15 gpd
Polymer Chemisolv 9229	flocculant	Before Clarifier	Continuous; flow proportional	9.25 lbs/day	10.8 lbs/day

Recent compliance history

A Compliance Evaluation Inspection of the Facility was conducted on March 20, 2019, by Cara Omana and Christopher Hinze of the Minnesota Pollution Control Agency (MPCA), to determine the compliance of the Facility with the terms and conditions of its National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Permit. The inspection included a review of the Discharge Monitoring Reports for the time period of November 2016 through March 2019. The inspection yielded two violations: failure to sample for total mercury (once in 2018) and total dissolved solids (once in 2017), and exceedance of effluent limitations for total suspended solids (TSS) during one month of 2018. To correct these violations, the Permittee submitted: (a) its standard operating procedures for monitoring/sampling, and (b) a summary of actions taken to mitigate TSS exceedances at the Facility. Other violations of terms and conditions set forth in the NPDES/SDS permit have been noted since the inspection but cannot be disclosed at this time, pending further action by the MPCA. For compliance and enforcement questions, please contact Cara Omana at 651-757-2891.

Receiving water(s)

Use classification

Based on considerations of best usage and the need for water quality protection in the interest of the public, and in conformance with the requirements of Minnesota Statutes, section 115.44, the waters of the state are grouped into one or more of the classes in subparts 2 to 8. The classifications are listed in parts 7050.0400 to 7050.0470. The classifications should not be construed to be in order of priority, nor considered to be exclusive or prohibitory of other beneficial uses.

Class 2 waters, aquatic life and recreation. Aquatic life and recreation includes all waters of the state that support or may support fish, other aquatic life, bathing, boating, or other recreational purposes and for which quality control is or may be necessary to protect aquatic or terrestrial life or their habitats or the public health, safety, or welfare.

Class 3 waters, industrial consumption. Industrial consumption includes all waters of the state that are or may be used as a source of supply for industrial process or cooling water, or any other industrial or commercial purposes, and for which quality control is or may be necessary to protect the public health, safety, or welfare.

Class 4 waters, agriculture and wildlife. Agriculture and wildlife includes all waters of the state that are or may be used for any agricultural purposes, including stock watering and irrigation, or by waterfowl or other wildlife and for which quality control is or may be necessary to protect terrestrial life and its habitat or the public health, safety, or welfare.

Class 5 waters, aesthetic enjoyment and navigation. Aesthetic enjoyment and navigation includes all waters of the state that are or may be used for any form of water transportation or navigation or fire prevention and for which quality control is or may be necessary to protect the public health, safety, or welfare.

Class 6 waters, other uses and protection of border waters. Other uses includes all waters of the state that serve or may serve the uses in subparts 2 to 6 or any other beneficial uses not listed in this part, including without limitation any such uses in this or any other state, province, or nation of any waters flowing through or originating in this state, and for which quality control is or may be necessary for the declared purposes in this part, to conform with the requirements of the legally constituted state or national agencies having jurisdiction over such waters, or for any other considerations the agency may deem proper.

Impairments

The Northfield Wastewater Treatment Facility discharges directly to the Cannon River. There are 33 impairments downstream of the discharge including: mercury in fish tissue, mercury in the water column, *E. Coli*, fecal coliform, benthic macroinvertebrate bioassessments, fishes bioassessments, turbidity, nutrients, PCB in fish tissue, and total suspended solids. Following are the total maximum daily load studies with wasteload allocations that affect this Facility.

Statewide Mercury Total Maximum Daily Load (TMDL) - Mercury in Fish Tissue and Mercury in Water Column Impairments

- Mercury limits, monitoring, and MMP requirements in the permit should be in accordance with the Mercury Permit Writers Guidance.

Lower Mississippi River Basin Fecal Coliform TMDL

- WLA = 1.18 trillion organisms per month
- The WLA was calculated using the average wet weather design flow of 5.2 MGD and the permitted discharge limit of 200 organisms per 100 mL.
- The WLA is equivalent to the existing permitted effluent limit.

Cannon River Watershed TMDL

Total Phosphorus

- WLA = 11.81 kg/day Jun-Sep, and 6,223 kg/year Jan-Dec
- The 11.81 kg/day is a long term average over multiple summers. The actual Jun-Sep limit in the permit is 24.80 kg/day.

Bacteria

- WLA = 24.802 billion organisms per day
- The WLA is equivalent to the current permitted fecal coliform effluent limit of 200 orgs/100 mL.

Total Suspended Solids (TSS)

- WLA = 0.651 tons per day
- The WLA is roughly equivalent to the current permitted mass effluent TSS limit, plus 50% for future growth.

Lower Cannon River Turbidity TMDL

- WLA = 578 kg/day
- This facility is listed in Appendix C: NPDES Permit Holders
- The WLA is calculated using the permitted TSS load (386 kg/day) plus approximately 50% to allow for future growth.

South Metro Mississippi TMDL Turbidity (TSS) Impairment

- TSS WLA = 140,890 kg/year and 386.00 kg/day
- This facility is included in Appendix A, Section A.1., Minnesota Wastewater Permits with TSS Limits ≤ 32 mg/L and Eligible for Future WLA Increase.
- This WLA is equivalent to the current permitted mass effluent TSS limit.

Existing permit effluent limits

The effluent limits and monitoring requirements in the existing permit are presented in Table 4 at the end of this section. Table 4 lists technology based effluent limits, water quality based effluent limits, and state discharge restrictions.

Technology based effluent limits (TBELs)

The following parameters have technology based effluent limits developed for achieving secondary treatment standards: five-day carbonaceous biochemical oxygen demand (CBOD₅), CBOD₅ percent removal, pH, total suspended solids (TSS), and TSS percent removal. These limits are specified in 40 CFR § 133.102 and Minn. R. 7050.0211 and Minn. R. 7053.0215.

State Discharge Restrictions (SDRs)

The total phosphorus concentration limit and the fecal coliform limit that are included in this permit are based on State Discharge Restrictions. These limits are specified in Minn. R. 7053.0255, subp. 3, and Minn. R. 7053.0215, subp. 1, respectively.

Water quality based effluent limits (WQBELs)

The mass total phosphorus, total copper, and total ammonia nitrogen limits that are included in this permit are WQBELs. WQBELs are established to meet applicable water quality standards. Under 40 CFR § 122.44(d)(1)(i), all dischargers who have the reasonable potential to cause or contribute to an exceedance of a water quality standard are required to have a WQBEL.

Existing Limits and Monitoring Requirements

Table 4

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency
CBOD₅	322	kg/day	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
CBOD₅	25	mg/L	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
CBOD₅	515	kg/day	Maximum Calendar Week Average	Jan-Dec	24-Hour Flow Composite	3 x Week
CBOD₅	40	mg/L	Maximum Calendar Week Average	Jan-Dec	24-Hour Flow Composite	3 x Week
CBOD₅ % Removal	85	%	Minimum Calendar Month Average	Jan-Dec	Calculation	3 x Week
Copper, Total	1.45	kg/day	Daily Maximum	Jan-Dec	24-Hour Flow Composite	2 x Month
Copper, Total	113	ug/L	Daily Maximum	Jan-Dec	24-Hour Flow Composite	2 x Month
Fecal Coliform	200	#100mL	Calendar Month Geometric Mean	Apr-Oct	Grab	3 x Week
Flow	Monitor Only	MGD	Calendar Month Average	Jan-Dec	Measurement, Continuous	1 x Day
Flow	Monitor Only	MGD	Calendar Month Maximum	Jan-Dec	Measurement, Continuous	1 x Day
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Measurement, Continuous	1 x Day
Mercury, Total	Monitor Only	ng/L	Calendar Quarter Maximum	Jan-Dec	Grab	1 x Quarter
Nitrite Plus Nitrate, Total	Monitor Only	mg/L	Calendar Month Average	Apr, Sep	24-Hour Flow Composite	1 x Month
Nitrogen, Ammonia, Total	Monitor Only	mg/L	Calendar Month Average	Dec-Mar	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	393	kg/day	Calendar Month Average	Apr-May	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	20	mg/L	Calendar Month Average	Apr-May	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	175	kg/day	Calendar Month Average	Jun-Sep	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	8.9	mg/L	Calendar Month Average	Jun-Sep	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	668	kg/day	Calendar Month Average	Oct-Nov	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	34	mg/L	Calendar Month Average	Oct-Nov	24-Hour Flow Composite	3 x Week
Nitrogen, Kjeldahl, Total	Monitor Only	mg/L	Calendar Month Average	Apr, Sep	24-Hour Flow Composite	1 x Month
Oxygen, Dissolved	Monitor Only	mg/L	Calendar Month Minimum	Jan-Dec	Grab	1 x Day
pH	9.0	SU	Calendar Month Maximum	Jan-Dec	Grab	1 x Day
pH	6.0	SU	Calendar Month Minimum	Jan-Dec	Grab	1 x Day
Phosphorus, Total	1.0	mg/L	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
Phosphorus, Total	7174	kg/yr	Calendar Year to Date Total	Jan-Dec	24-Hour Flow Composite	3 x Week
Phosphorus, Total	19.6	kg/day	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
Solids, Total Dissolved	Monitor Only	mg/L	Calendar Month Maximum	Apr, Sep	24-Hour Flow Composite	1 x Month
TSS	386	kg/day	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
TSS	30	mg/L	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
TSS	578	kg/day	Maximum Calendar Week Average	Jan-Dec	24-Hour Flow Composite	3 x Week
TSS	45	mg/L	Maximum Calendar Week Average	Jan-Dec	24-Hour Flow Composite	3 x Week
TSS % Removal	85	%	Minimum Calendar Month Average	Jan-Dec	Calculation	3 x Week

Proposed permit effluent limits

The effluent limits and monitoring requirements in the proposed permit are presented in Table 6 at the end of this section. Table 6 lists technology based effluent limits, water quality based effluent limits, and state discharge restrictions.

Technology based effluent limits (TBELs)

The following parameters have TBELs developed for achieving secondary treatment standards: five-day carbonaceous biochemical oxygen demand (CBOD₅), CBOD₅ percent removal, pH, total suspended solids (TSS), and TSS percent removal. These limits are specified in 40 CFR § 133.102 and Minn. R. 7050.0211 and Minn. R. 7053.0215.

State Discharge Restrictions (SDRs)

The total phosphorus concentration limit and the fecal coliform limit that are included in this permit are based on SDRs. These limits are specified in Minn. R. 7053.0255, subp. 3, and Minn. R. 7053.0215, subp. 1, respectively.

Water quality based effluent limits (WQBELs)

The mass total phosphorus, total copper, and total ammonia nitrogen limits that are included in this permit are WQBELs. WQBELs are established to meet applicable water quality standards. Under 40 CFR § 122.44(d)(1)(i), all dischargers who have the reasonable potential to cause or contribute to an exceedance of a water quality standard are required to have a WQBEL.

Mass Cap Effluent Limits

The mass effluent limits for CBOD₅, TSS, and total copper are based on the previous average wet weather design flow (AWWDF) of 3.4 MGD, as of November 5, 1984.

The mass limits for total phosphorus and total ammonia nitrogen were not capped on November 5, 1984. These are based on the AWWDF of 5.20 MGD, which is the current AWWDF.

Reasonable Potential Review

Background

The discharge is located on the Cannon River. The discharger has submitted three whole effluent toxicity (WET) tests and two priority pollutant scans since 2011. The average dry weather design flow (ADWDF) is used to calculate WQBELs under critical low flow stream conditions. The low flow condition is defined by the once in ten year weekly average flow (7Q₁₀), which is determined to be 30 MGD. The wet weather design flow is used for nondegradation evaluations applicable in Minn. R. 7050.0180. The dilution ratio is 5.4:1, river low flow to effluent flow at the ADWDF. The analysis below is based on data submitted to date.

Reasonable Potential for Chemical Specific Pollutants (40 CFR § 122.44(d)(1))

Federal regulations require MPCA to evaluate the discharge to determine whether the discharge has the reasonable potential to cause or contribute to a violation of water quality standards. The MPCA must use acceptable technical procedures, accounting for variability (coefficient of variation or CV), when determining whether the effluent causes has the reasonable potential to cause or contribute to an excursion of an applicable water quality standard. Projected effluent quality (PEQ) derived from effluent monitoring data is compared to Preliminary Effluent Limits (PELs) determined from mass balance inputs. Both determinations account for effluent variability. Where PEQ exceeds the PEL, there is reasonable potential to cause or contribute to a water quality standards excursion. When reasonable potential is indicated, the permit must contain a WQBEL for that pollutant.

The priority pollutant scan information of the effluent was evaluated using reasonable potential procedures. All of the organic priority pollutants were below the level of detection. Since these pollutants were at low enough levels not to be detected, reasonable potential to cause or contribute to a water quality standards excursion is not indicated. At the dilution ratio of 5.4:1, no pollutant would indicate reasonable potential to cause or contribute to an excursion of a water quality standard. Therefore, no limit is needed in either case.

Three chronic WET tests were submitted since 2011. None of them were above the screening level of 10 toxic units. No WET limit is needed.

Mercury- Monitoring results of the effluent include 24 data points at a calculated CV of 0.3. Projected effluent quality (PEQ) is derived as an upper bound value from the highest value measured (1.3 ng/l), and the determined variability (CV = 0.3) and number of data points (15). The preliminary effluent limit (PEL) calculation assumes that the background mercury concentration is at the water quality standard (6.9 ng/l) when the listed stream impairment is for fish consumption advice, and no local river water column analytical data exist. To assure that the discharge does not cause or contribute to a water quality standards excursion for mercury impaired waters, the numeric water quality standard (6.9 ng/l) is applied at the point of discharge for the mass balance equation for the subsequent preliminary effluent limit calculations. Where PEQ exceeds the PEL, there is reasonable potential to cause or contribute to a water quality standards excursion. Since PEQ does not exceed the PEL in this case, reasonable potential to cause or contribute to an excursion above water quality standards is not indicated. A WQBEL is not needed.

Table 5 contains the inputs to the reasonable potential analysis for copper, lead, nickel, zinc, and mercury. The analysis is made with effluent data that is expressed as total metal. These pollutants were evaluated on the basis of analytical measurements that made evident the need for a full determination. Where PEQs exceeds PELs, a WQBEL is needed.

Reasonable Potential Inputs

Table 5

Parameter	Hg (ng/L)
Max Measured Value	1.3
# data points	24
PEQ	2.366
Plant flow ADW (MGD)	5.2
Rec. water flow, 7Q10(MGD)	5
Background Conc.	6.9
Continuous Std (cs) 67.5 ppm hard	6.90
Maximum Std (ms) 67.5 ppm hard	2400.00
Final Acute Value (FAV) 67.5 ppm hard	4900
Mass Balance -cs	6.90
Mass Balance -ms	4701.06
Coeff of Variation (CV)	0.3162
Long Term Avg-cs	6.04
Long Term Avg-ms	2404.79

Parameter	Hg (ng/L)
Preliminary Effl limits:	
Daily Max	11.81
Monthly Ave (2x/month)	8.48
<u>Reasonable Potential</u>	
PEQ>Daily max	FALSE
PEQ>Monthly Ave.	FALSE
PEQ> FAV	FALSE
Final Reasonable Potential	No

Proposed Limits and Monitoring Requirements

Table 6

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency
CBOD₅	322	kg/day	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
CBOD₅	25	mg/L	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
CBOD₅	515	kg/day	Maximum Calendar Week Average	Jan-Dec	24-Hour Flow Composite	3 x Week
CBOD₅	40	mg/L	Maximum Calendar Week Average	Jan-Dec	24-Hour Flow Composite	3 x Week
CBOD₅ % Removal	85	%	Minimum Calendar Month Average	Jan-Dec	Calculation	1 x Month
Copper, Total	1.45	kg/day	Daily Maximum	Jan-Dec	24-Hour Flow Composite	2 x Month
Copper, Total	113	ug/L	Daily Maximum	Jan-Dec	24-Hour Flow Composite	2 x Month
Fecal Coliform	200	#100mL	Calendar Month Geometric Mean	Apr-Oct	Grab	3 x Week
Flow	Monitor Only	MGD	Calendar Month Average	Jan-Dec	Measurement, Continuous	1 x Day
Flow	Monitor Only	MGD	Calendar Month Maximum	Jan-Dec	Measurement, Continuous	1 x Day
Flow	Monitor Only	MG	Calendar Month Total	Jan-Dec	Measurement, Continuous	1 x Day
Mercury, Dissolved	Monitor Only	ng/L	Calendar Month Maximum	May, Sep	Grab	1 x Month
Mercury, Total	Monitor Only	ng/L	Calendar Month Maximum	May, Sep	Grab	1 x Month
Nitrite Plus Nitrate, Total	Monitor Only	mg/L	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	1 x Month
Nitrogen, Ammonia, Total	Monitor Only	mg/L	Calendar Month Average	Dec-Mar	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	393	kg/day	Calendar Month Average	Apr-May	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	20	mg/L	Calendar Month Average	Apr-May	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	175	kg/day	Calendar Month Average	Jun-Sep	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	8.9	mg/L	Calendar Month Average	Jun-Sep	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	668	kg/day	Calendar Month Average	Oct-Nov	24-Hour Flow Composite	3 x Week
Nitrogen, Ammonia, Total	34	mg/L	Calendar Month Average	Oct-Nov	24-Hour Flow Composite	3 x Week
Nitrogen, Kjeldahl, Total	Monitor Only	mg/L	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	1 x Month
Nitrogen, Total	Monitor Only	mg/L	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	1 x Month
Oxygen, Dissolved	Monitor Only	mg/L	Calendar Month Minimum	Jan-Dec	Grab	1 x Day

Parameter	Limit	Units	Limit Type	Effective Period	Sample Type	Frequency
pH	9.0	SU	Calendar Month Maximum	Jan-Dec	Grab	1 x Day
pH	6.0	SU	Calendar Month Minimum	Jan-Dec	Grab	1 x Day
Phosphorus, Total	1.0	mg/L	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
Phosphorus, Total	6223	kg/yr	12-Month Moving Total	Jan-Dec	24-Hour Flow Composite	3 x Week
Phosphorus, Total	24.80	kg/day	Calendar Month Average	Jun-Sep	24-Hour Flow Composite	3 x Week
Phosphorus, Total	Monitor Only	kg/day	Calendar Month Average	Oct-May	24-Hour Flow Composite	3 x Week
Solids, Total Dissolved	Monitor Only	mg/L	Calendar Month Average	Mar, Sep	24-Hour Flow Composite	1 x Month
TSS	386	kg/day	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
TSS	30	mg/L	Calendar Month Average	Jan-Dec	24-Hour Flow Composite	3 x Week
TSS	578	kg/day	Maximum Calendar Week Average	Jan-Dec	24-Hour Flow Composite	3 x Week
TSS	45	mg/L	Maximum Calendar Week Average	Jan-Dec	24-Hour Flow Composite	3 x Week
TSS % Removal	85	%	Minimum Calendar Month Average	Jan-Dec	Calculation	1 x Month
TSS, grab (Mercury)	Monitor Only	mg/L	Calendar Month Maximum	May, Sep	Grab	1 x Month

Differences between the existing permit effluent limits and monitoring requirements and the proposed effluent limits and monitoring requirements.

- a) The CBOD₅ percent removal and TSS percent removal frequencies are now 1 x month.
- b) Dissolved mercury is added as a "monitoring only" calendar month maximum, 1 x month, May and September requirement.
- c) Total mercury changed to a calendar month maximum, 1 x month, May and September requirement.
- d) Total nitrite plus nitrate and total Kjeldahl nitrogen changed to 1 x month, January through December requirements.
- e) Total nitrogen is added as a "monitoring only" calendar month average, 1 x month, January through December requirement.
- f) The total phosphorus mass limit of 7,174 kg/yr calendar year to date total requirement changed to a mass limit of 6,223 kg/yr, 12-month moving total requirement.
- g) The total phosphorus mass limit of 19.6 kg/day calendar month average, January through December requirement has been replaced with a RES mass limit of 24.80 kg/day calendar month average, June through September requirement. "Monitoring Only" is required for kg/day, October through May.
- h) Total dissolved solids changed to a calendar month average, March and September requirement.
- i) TSS, grab (mercury) is added as a "Monitor Only" calendar month maximum, May and September, 1 x month requirement.

Additional requirements

Mercury Monitoring and the Mercury Minimization Plan (MMP)

This permit contains requirements for mercury monitoring. These requirements were added in response to the U.S. Environmental Protection Agency's approval of the Minnesota statewide Mercury Total Maximum Daily Load (TMDL) plan. More information on the TMDL can be found on the MPCA internet site at <http://www.pca.state.mn.us/wfhy9ef>. Specific mercury monitoring requirements are found in the Surface Discharge Station section of this permit. Those requirements include sampling for TSS via a grab sample taken at the same time as the total and dissolved mercury grab samples are taken.

You are required to submit a MMP or updated MMP. This requirement complies with the U.S. Environmental Protection Agency's approval of the Minnesota statewide Mercury Total Maximum Daily Load (TMDL) plan. Guidance for completing the MMP is available on the MPCA internet site at <http://www.pca.state.mn.us/gp0rb25>.

Phosphorus Limits and Monitoring Requirements

Phosphorus is a common constituent in many wastewater discharges and a pollutant that has the potential to negatively impact the quality of Minnesota's lakes, wetlands, rivers, and streams. Phosphorus promotes algae and aquatic plant growth often resulting in decreased water clarity and oxygen levels. In addition to creating general aesthetic problems, these conditions can also impact a water body's ability to support healthy fish and other aquatic species. Therefore, phosphorus discharges are being carefully evaluated throughout the state.

You are required to meet a phosphorus limit as specified in the limits and monitoring section of this permit. Although you are not required to prepare a Phosphorus Management Plan, elimination or reduction of phosphorus at the source will decrease the influent load to the wastewater treatment facility and has the potential to improve treatment efficiency and reduce treatment costs. The MPCA strongly encourages you to identify and eliminate/reduce sources of phosphorus to, and optimize phosphorus management within, your wastewater treatment facility.

All phosphorus samples must be analyzed by a certified laboratory and the data submitted to the MPCA. If your laboratory would like more information about becoming certified, please call the Environmental Laboratory Certification Unit at 612-676-5200. Samples must be collected in a clean bottle (preferably cleaned by a certified laboratory) that was not washed with phosphate detergent. Also, a sulfuric acid preservative must be added immediately after the sample is collected, and it must be stored at four degrees Celsius until analysis. If a contract laboratory is used, the bottle and preservative would typically be provided by the laboratory analyzing the sample.

Total Phosphorus Water Quality Based Effluent Limit (WQBEL)

Federal law [40 CFR § 122.44(d)] restricts mass increases of pollutants upstream of an impaired water and requires water quality based effluent limits (WQBEL) to be established for pollutant parameters where it is found that a NPDES/SDS discharger has the reasonable potential (RP) to cause or contribute to an excursion above a state water quality standard (WQS). An effluent limits analysis was completed on the Northfield Wastewater Treatment Facility to determine if the wastewater treatment facility's discharge has RP to cause or contribute to an exceedance of a state WQS or contribute to any downstream impairment. As a result of the analysis, total phosphorus effluent limits were established for the wastewater treatment facility to ensure protection of downstream waters and to comply with River Eutrophication Standards (RES) and State Discharge Restrictions. A summary of the effluent limits analysis and the assigned total phosphorus limit(s) are included below. For additional details regarding the effluent limits analysis, please see the "Phosphorus effluent limit review: Cannon River Watershed Upstream of Lake Byllesby" (June 2019). A copy of the MPCA memorandum is available upon request.

Total Phosphorus Lake Eutrophication Standards (LES)

Effluent from the wastewater treatment facility is discharged upstream of Lake Byllesby which currently exceeds numeric lake eutrophication standards (LES). Eutrophication standards for lakes, shallow lakes, and reservoirs can be found in Minn. R. 7050.0222 (<https://www.revisor.mn.gov/rules/?id=7050.0222>). Federal law [40 CFR § 122.44(d)] restricts mass increases upstream of impaired waters and states that NPDES/SDS permits for all dischargers that have the RP to cause or contribute to downstream impaired waters are required to contain WQBELs derived from the WQS. When determining RP, the Code of Federal Regulations also states that MPCA shall use procedures which account for existing controls on point and nonpoint sources of pollution. Permittees are found to have RP for total phosphorus (TP) if: (1) they discharge upstream of a nutrient impaired waterbody, (2) they discharge at TP concentrations greater than the ambient target, and (3) there is no geographical barrier capable of trapping a significant mass of nutrients between the outfall and the impairment. For all reasons listed above, the wastewater treatment facility is found to have RP for TP upstream of Lake Byllesby. Therefore, the Facility is assigned a 12-month moving total mass TP WQBEL as a result of the Waste Load Allocation (WLA) derived from the WQS. Final WLAs in combination with other point and nonpoint allocations are calculated to achieve the nutrient/eutrophication WQS for Lake Byllesby.

Currently there are 29 dischargers upstream of Lake Byllesby with RP. The gross WLA was split between the affected dischargers, in consideration of facility size and type. More detail regarding the method used to split the gross WLA into individual WLAs is provided in the MPCA memorandum for the watershed effluent limit analysis.

The TP effluent limit assigned to the wastewater treatment facility to protect for eutrophication impairment in Lake Byllesby is 6,223 kg/yr as a 12-month moving total.

Total Phosphorus River Eutrophication Standards (RES)

A watershed scale analysis was completed to determine if total phosphorus effluent limits were necessary for the wastewater treatment facilities located within the watershed to protect for RES. Guidance for the analysis, determination of RP, and WQBEL setting process is defined in the *Procedures for Implementing River Eutrophication Standards for NPDES Wastewater Permits in Minnesota* (MPCA 2015), which can be found at: <https://www.pca.state.mn.us/sites/default/files/wq-wwprm2-15.pdf>.

The total phosphorus effluent limit assigned to the wastewater treatment facility was developed to protect for the RES South Nutrient Region (HUC 07040002-509) which has RES standards (Minn. R. 7050.0222) of:

South Nutrient Region Standards

Table 7

	South Nutrient Region
Total Phosphorus	≤ 150 µg/L
Chlorophyll-a (Chl-a)	≤ 40 µg/L
DO flux	≤ 5.0 mg/L
BOD ₅	≤ 3.5 mg/L

Total Phosphorus State Discharge Restriction (SDR)

The permit includes a SDR limit of 1.0 mg/L, January through December, Calendar Month Average limit. This limit was assigned pursuant to Minn. R. 7053.0255.

Nitrogen

Nitrogen is a pollutant that can negatively impact the quality of Minnesota’s water resources, including water used for drinking. Studies have shown that nitrogen in lakes and streams has a toxic effect on aquatic life such as fish. Like phosphorus, nitrogen is a nutrient that promotes algae and aquatic plant growth often resulting in decreased water

clarity and oxygen levels. In 2014 the MPCA completed the Statewide Nutrient Reduction Strategy (<http://www.pca.state.mn.us/zihy1146>) which identifies goals and milestones for nitrogen reductions for both point and non-point nitrogen sources within Minnesota. To gain a better understanding of the current nitrogen concentrations and loadings received by and discharged from your Facility additional influent and effluent nitrogen monitoring has been added to the Permit. This monitoring has been added in accordance with Minn. Stat. § 115.03.

The draft permit includes influent monitoring for Nitrite plus Nitrate-Nitrogen, Total Kjeldahl Nitrogen, and Total Nitrogen at a frequency of once per month, January through December, for the five-year term of the Permit.

The draft permit includes effluent monitoring for Ammonia Nitrogen, Nitrite plus Nitrate-Nitrogen, Total Kjeldahl Nitrogen, and Total Nitrogen at a frequency of once per month, January through December, for the five-year term of the Permit.

The draft permit also includes effluent monitoring for Total Dissolved Solids at a frequency of once per month in March and September for the five-year term of the Permit.

There is no nitrogen limit in the Permit.

Special Requirements

This permit includes the following total phosphorus limits that will go into effect at permit issuance: 24.80 kg/day, calendar month average (Jun-Sep) and 6,223 kg/year, 12-month moving total, (Jan-Dec). These are in addition to the existing 1.0 mg/L concentration limit.

At the time of permit issuance, the Facility will be operating at less than the permitted AWWDF and is demonstrating the capability of meeting each of these limits. As the Facility operates closer to the AWWDF, infrastructural improvements or operational changes may be necessary to maintain compliance.

The draft permit requires that the Permittee notify the MPCA immediately if any conditions change that will affect the Facility's ability to maintain compliance with the new total phosphorus limits of 24.80 kg/day and 6,223 kg/year. The Permittee shall also submit a facility compliance evaluation report with the application for permit reissuance or a modification. The report shall include:

- a. An evaluation of the Facility's capability of maintaining compliance with the total phosphorus limits of 24.80 kg/day and 6,223 kg/year for the next five-year permit term, the remainder of this permit term, and at design flow.
- b. The estimated increases in flow and loading over time.
- c. The projected operating conditions that, when reached, would likely result in noncompliance with the total phosphorus limits.
- d. A timeline and milestone events that will trigger the need to take action to assure that the facility will remain in compliance.

Exceptional Quality Biosolids

The draft permit includes language for Exceptional Quality Biosolids. Exceptional Quality Biosolids described in this permit must meet the Class A pathogen reduction requirements in Minn. R. 7041.1300, subp. 2. This language applies to Permittees that treat their biosolids to the exceptional quality level for land application, transfer, or landfilling.

Whole Effluent Toxicity (WET) - Chronic

The Facility has chronic WET monitoring as a requirement. The Facility has chronic WET testing because the ratio of the 7Q₁₀ low flow of the receiving water compared to the Facility's ADWDF is less than or equal to 20:1. An RP evaluation

was done on the chronic WET tests to determine if there was cause to exceed the WET monitoring threshold value of 10 TUc (Toxic Unit chronic). No RP was found to exceed the monitoring threshold of 10 TUc. Because no RP has been found, a monitoring threshold value of 10 TUc has been established. This is a threshold value, not a WET limit. The following monitoring has been included in the draft permit: annual WET testing. If the threshold value of 10 TUc is exceeded for any one WET test, the Facility will perform two WET retests to determine if a Toxicity Reduction Evaluation (TRE) is needed.

An annual requirement to submit chronic toxicity test batteries is required for this five year permit cycle. The first set of annual chronic WET results is due 180 days after the permit issuance date, and annually thereafter. However, the requirement *will not* appear on your Discharge Monitoring Report (DMR) forms. Please note this change in the submittal dates and plan your test batteries accordingly.

Variances

There are no variances to Clean Water Act requirements in this permit.

Total facility requirements (TFR)

All NPDES permits issued in the State of Minnesota contain certain conditions that remain the same regardless of the size, location, or type of discharge. The standard conditions satisfy the requirements outlined in 40 CFR § 122.41. These conditions are listed in the Total Facility Requirements section of an NPDES permit. These requirements cover a wide range of areas including recordkeeping, sampling, equipment calibration, equipment maintenance, reporting, facility upsets, bypass, solids handling, changes in operation, facility inspections, and permit reissuance.

Antidegradation and anti-backsliding

Changes to the Facility may result in an increase in pollutant loading to surface waters or other causes of degradation to surface waters. If a change to the Facility will result in a net increase in pollutant loading or other causes of degradation that exceed the maximum loading authorized through conditions specified in the existing permit, the changes to the Facility are subject to antidegradation requirements found in Minn. R. 7050 to 7050.0335.

This Permit also complies with Minn. R. 7053.0275 regarding anti-backsliding.

Any point source discharger of sewage, industrial, or other wastes for which a NPDES permit has been issued by the agency that contains effluent limits more stringent than those that would be established by Minn. R. 7053.0215 to 7053.0265 shall continue to meet the effluent limits established by the permit, unless the permittee establishes that less stringent effluent limits are allowable pursuant to federal law, under section 402(o) of the Clean Water Act, United States Code, title 33, section 1342.

