Wastewater Facility Plan

Montrose Utilities

City of Montrose
March 3, 2023

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Certification

Wastewater Facility Plan

For

City of Montrose

Montrose, Minnesota
0W1.127810

March 3, 2023

PROFESSIONAL ENGINEER

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature: Jennifer Selchow

Typed or Printed Name: Jennifer Selchow, P.E.

Date: 3/3/2023 License Number: 59177

Table of Contents

I. Introduction 1
- A. Purpose 1
- B. Background 1
- C. Report Organization 1

II. Design Conditions 2
- A. General 2
- B. Population Projections 2
- C. Historical Flows 4
- D. Future Design Flows 7
- E. Historical Loadings 9
- F. Design Flows Loadings 14
- G. Biosolids 15
- H. NPDES Discharge Permit 16
- I. Potential Future Effluent Limits 16

III. Existing Wastewater Facilities 19
- A. Overview of System 19
- B. Treatment Performance 27

IV. Alternative Design Concepts and Cost Analysis 31
- A. General 31
- B. Treatment Alternatives 31
- C. Biosolids Handling and Disposal 36
- D. Dewatering with cake storage 36
- E. Class A Biosolids 37
- F. Disposal 39
- G. Tertiary Treatment for River Eutrophication Standards 39
- H. Alternative Considered 45
- I. Alternative 1 – Extended Aeration Activated Sludge 45
- J. Alternative 2 – Regionalization 47
- K. Financial Considerations 48

V. Recommendations and Implementation 50
- A. General 50
- B. Summary of Alternatives 50
- C. Recommended Alternative 50
- D. Financing Options 50
- E. Implementation Schedule 52

Figures

Figure 2.1 – Project Planning Area 3
Figure 2.2 – Population Projections 4
Figure 2.3 – Historical Influent Wastewater Flows 6
Figure 2.4 – Historical Influent $CBOD_5$ Concentration (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility 12
Figure 2.5 – Historical Influent TSS Concentration (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility 13
Figure 2.6 – Historical Influent TP Concentrations (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility 14
Figure 3.1 – Process Flow Diagram, Existing Facilities 22
Figure 3.2 – Existing Facilities Location Map 23
Figure 3.3 – Waverly Lift Stations 24
Figure 3.4 – Historical Effluent $CBOD_5$ Concentration (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility 28
Figure 3.5 – Historical Effluent TSS Concentration (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility 29
Figure 3.6 – Historical Effluent TP Concentrations (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility 30
Figure 4.1 – Disc Filtration Unit 40
Figure 4.2 – Ultrafiltration Unit 42
Figure 4.3 – Upflow Sand Filtration System 44

Tables

Table 2.1 – Population Projections 2
Table 2.2 – Historical Influent Wastewater Flow – Montrose, MN 5
Table 2.3 – Summary of Historical Flows 7
Table 2.4 – Summary of Design Flows 8
Table 2.5 – Determination of 20-Year Design Flows 8
Table 2.6 – Summary of Historical Loadings 11
Table 2.7 – Historical Influent Monitoring-Average Pollutant Loadings 11
Table 2.8 – Residential and Commercial Design Loadings 15
Table 2.9 – Summary of Design Criteria 15
Table 2.10 – NPDES Discharge Limits – Montrose, MN 16
Table 3.1 – Summary of Existing Wastewater Treatment Components 20
Table 4.1 – Disc Filter Design Summary 41
Table 4.2 – Ultra Filter Design Summary 42

Table 4.3 – Upflow Sand Filtration/Adsorption Design Summary 43
Table 4.4 – Gravity Filter Design Summary 45
Table 4.5 – Alternatives 1 & 2 Capital Cost 49
Table 5.1 – Decision Matrix 50
Table 5.2 – Schedule 53

Appendix

Appendix A: Copy of Montrose and Waverly Sanitary Sewer Agreement

Appendix B: Copy of Current NPDES / SDS Permit

Appendix C: Montrose City Council Memorandum and NAC's Montrose and Waverly Population Estimates

Appendix D: MPCA Design Flow and Loading Determination Guideline

Appendix E: Phosphorus Effluent Limit Review

Appendix F: Plan Resolution

Appendix G: MPCA Forms

Appendix H: CWRF Facilities Plan Submittal Checklist

Appendix I: List of Ordinances

Appendix J: List of Abbreviations

I. Introduction

A. Purpose

This report provides the Cities of Montrose and Waverly, Minnesota with recommendations for wastewater treatment facility (WWTF) improvements to address the existing aging infrastructure and future treatment requirements. Recommendations are based on input from city staff, a visual evaluation of facility infrastructure, typical wastewater treatment design standards, and an evaluation of the treatment process with consideration of potential future regulations. City officials may use the information included in this report to make informed decisions on improvements to be implemented at the Montrose Wastewater Treatment Facility.

B. Background

The Montrose Wastewater Treatment Facility was originally constructed in 1965 and consisted of stabilization ponds. The facility received significant upgrades in 2002 including new pretreatment, high intensity aeration basins, a ferric chloride feed system, final clarifiers, biosolids storage, and UV disinfection. The treatment facility receives raw residential wastewater from residences and businesses throughout the city of Montrose, as well as 12-Hi Mobile Home Park, and the City of Waverly. See Appendix A for the Montrose and Waverly Sanitary Sewer Agreement dated May 14, 2002.

The Minnesota Pollution Control Agency (MPCA) determines and regulates discharge limits for the facility's National Pollutant Discharge Elimination System (NPDES) permit. The city of Montrose submitted a permit renewal in July 2022, a formal response is pending. See Appendix B for a copy of the current permit. The city of Montrose has retained Bolton & Menk, Inc. to develop this Facility Plan to explore alternatives to improve the existing wastewater treatment facility and develop a plan forward for the facility. This report analyzes the existing facility and will discuss future discharge regulations and the potential impact on improvement needs.

C. Report Organization

This report is structured into six sections to adequately address the existing facility and proposed improvements. Section I is the Introduction; Section II provides an analysis of current and future design criteria; Section III provides an evaluation of the existing wastewater facility and condition assessment; Section IV discusses alternative treatment options and associated cost analysis; Section V provides recommendations and implementation of the proposed wastewater system improvements; and Section VI summarizes conclusions and recommendations.

II. Design Conditions

A. General

The customers served by the existing facility and proposed treatment alternatives include residents and businesses throughout the City of Montrose, Minnesota, the City of Waverly, Minnesota, and 12-Hi Mobile Home Park all in Wright County. Figure 2.1 illustrates the project planning area encompassed by this report and the improvements discussed herein.

Wastewater treatment facilities are typically designed based on a 20-year planning period, as it is generally not feasible to make frequent changes in the capacity of a wastewater treatment facility. In addition, a 20-year planning period is required for the project to be eligible for funding assistance with the MN Public Facilities Authority (PFA). A design year of 2045 is used for this evaluation. Projected wastewater flows and loadings are determined using a combination of population trends and expected commercial and industrial growth.

B. Population Projections

There are several methods available for predicting population trends for cities such as Montrose. The Minnesota State Demographic Center (SDC) publishes population projections for all counties in Minnesota. The city hired Northwest Associated Consultants, Inc. (NAC) to analyze the historical city and county population trends. NAC provided a lower threshold estimate resulting in an average of 38 homes per year. City staff discussed and determined the population projections should be increased to an average of 50 homes per year with 2.5 people per household. NAC also provided an analysis for the city of Waverly. The Montrose Council Memorandum and NAC analysis for both communities can be found in Appendix C. Table 2.1 and Figure 2.2 summarize the population projections.

Table 2.1 – Population Projections

Year	Wright County[1]	City of Montrose[1]	City of Waverly[1]	Montrose and Waverly Combined
1995	77,232	--	--	--
2000	89,986	1,143	732	1,875
2005	110,836	2,145	925	3,070
2010	124,700	2,847	1,357	4,204
2015	131,361	3,079	1,398	4,477
2020	141,337	3,775	1,900	5,675
2025	145,688[1]	4,267	2,206	6,473
2030	152,493[1]	4,758	2,512	7,270
2035	158,826[1]	5,517	2,827	8,344
2040	164,652[1]	6,275	3,142	9,417
2045	170,061[1]	6,600	3,387	9,987[2]

[1]Projected by MN State Demographic Center (February 2021)
[2] Design population for this report

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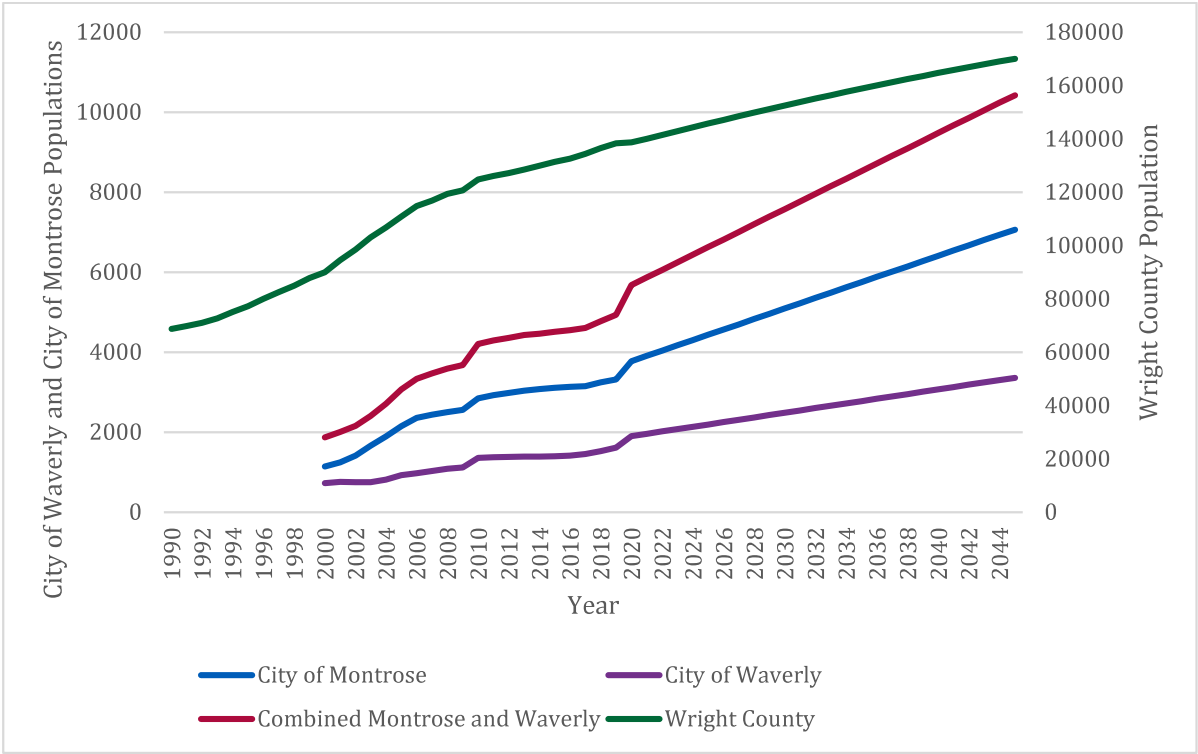


Figure 2.2 – Population Projections

C. Historical Flows

1. Flow Monitoring Data

a) Influent Flow Monitoring

Montrose city staff records daily influent flows in monthly Discharge Monitoring Reports (DMRs) as required by the facility's NPDES permit. The recorded flows are used to evaluate current flow trends and develop future flow projections. The flows to the treatment facility are measured using a magnetic meter prior to the screening processes. A summary of monthly average and maximum daily flows for the past five years is presented in Table 2.2. Figure 2.3 illustrates average daily and maximum flow trends over the same time frame.

Average annual flow has varied over the years. Seasonal spikes in flow are also apparent in the wettest months between April and June. Seasonal weather patterns are highly correlated with wastewater flow due to the effects of infiltration and inflow (I&I) into the wastewater collection system.

Table 2.2 – Historical Influent Wastewater Flow – Montrose, MN												
	2017		2018		2019		2020		2021		5 Year	
Month	Monthly Average (MGD)	Max. Day (MGD)	Monthly Average (MGD)	Max. Day (MGD)	Monthly Average (MGD)	Max. Day (MGD)	Monthly Average (MGD)	Max. Day (MGD)	Monthly Average (MGD)	Max. Day (MGD)	Monthly Average (MGD)	Max. Day (MGD)
January	0.336	0.504	0.312	0.381	0.311	0.374	0.358	0.457	0.306	0.373	0.325	0.504
February	0.335	0.484	0.288	0.381	0.294	0.364	0.322	0.398	0.306	0.362	0.309	0.484
March	0.330	0.423	0.329	0.516	0.451	1.236	0.444	0.892	0.356	0.438	0.382	1.236
April	0.400	0.702	0.413	0.591	0.521	0.984	0.440	0.568	0.387	0.520	0.432	0.984
May	0.482	0.921	0.348	0.447	0.574	1.091	0.398	0.524	0.356	0.431	0.432	1.091
June	0.332	0.437	0.395	0.506	0.404	0.493	0.350	0.390	0.319	0.378	0.360	0.506
July	0.293	0.369	0.359	0.654	0.432	0.617	0.331	0.385	0.295	0.346	0.342	0.654
August	0.309	0.492	0.298	0.391	0.343	0.433	0.313	0.391	0.294	0.34	0.311	0.492
September	0.289	0.384	0.344	0.691	0.411	0.674	0.313	0.382	0.294	0.372	0.330	0.691
October	0.452	0.966	0.360	0.558	0.522	0.950	0.297	0.362	0.293	0.372	0.385	0.966
November	0.340	0.419	0.322	0.386	0.372	0.446	0.310	0.376	0.299	0.366	0.329	0.446
December	0.320	0.399	0.313	0.376	0.366	0.539	0.306	0.364	0.303	0.372	0.322	0.539
Annual Average/Max. Daily	0.352	0.542	0.340	0.490	0.417	0.683	0.349	0.457	0.317	0.389	0.355	0.716

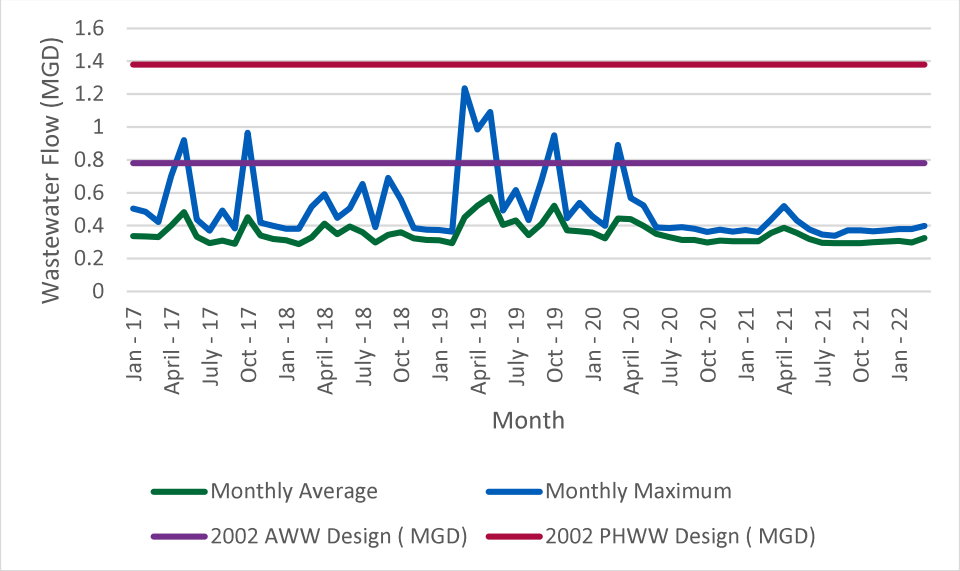


Figure 2.3 – Historical Influent Wastewater Flows

The MPCA has developed guidelines to provide a comprehensive and systematic approach to analyze I&I. These guidelines were used to determine if I&I is considered excessive in the City of Montrose's wastewater collection system. The following are definitions of inflow and infiltration as provided by the MPCA guidelines:

- *Infiltration – is water other than wastewater that enters a sewer system (including service sewer connections and foundation drains) from the ground through broken or defective pipes, pipe joints, connections, manholes, and wet basements.*
- *Inflow – is water other than wastewater that enters a sewer system (including sewer service connections) through sources such as, but not limited to, roof leaders, foundation drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, storm waters, surface runoff, street wash water, or other drainage structures.*
- *Excessive infiltration – Infiltration is excessive if the quantity of flow (domestic base flow and infiltration) is greater than 120 gallons per capita per day (gpcd). The quantity of flow was determined using the annual average flow over the past five (5) years. The population used in the per capita calculation is the 2020 population of 5,675.*

  355,000 gpd / 5,675 people = 63 gpcd
- *Excessive Inflow – Inflow is excessive if the quantity of flow during storm events that results in chronic operational problems related to the hydraulic overloading of the treatment system or that results in a total flow of more than 275 gpcd (domestic base flow plus infiltration and inflow). The flow during storm events was determined using the maximum 30-day average flow over the past five (5) years.*

  574,000 gpd / 5,675 people = 101 gpcd

According to MPCA criteria, the City of Montrose is below the threshold of excessive I&I into their collection system. Excessive I&I is a common problem for most municipalities throughout Minnesota and is typically attributed to aging and deteriorating collection system infrastructure. Regardless, I&I is not considered a major issue in Montrose as the facility is equipped with a pond system with the capacity to store excessive inflow during major rain events to provide consistent flows into the treatment facility.

This report is focused on treatment alternatives. If the City would like to reduce I&I, it is recommended they do so as part of annual street improvements.

b) Summary of Design Criteria

Table 2.3 summarizes the historical flows of the Montrose Municipal Wastewater Treatment Facility. These values will be utilized in subsequent sections to evaluate the existing treatment system and to determine the necessary improvement alternatives.

Table 2.3 – Summary of Historical Flows

Design Flow Parameter	Existing Design Value (MGD)
ADW	0.411
AWW	0.781
PHWW	1.38
PIWW	1.648

c) Interconnection Flows

The city of Waverly is interconnected to the city of Montrose's collection system. Waverly has a treatment agreement with the City of Montrose (see Appendix A). Waverly's flow contribution is included in the previous tables.

D. Future Design Flows

The design flows are based on historical raw water monitoring data, population projections, and industrial allocations.

1. Design Flows

The MPCA has guidelines for determining design wastewater flows for new or expanded treatment facilities. Flow projections are developed for different climatic conditions as described below.

a) *Average Dry Weather (ADW) Flow* – Measure of flow during which there is no inflow due to precipitation and/or snow melt and no infiltration due to high groundwater. This flow typically occurs during winter months or very dry summers. It is also strongly correlated with drinking water usage.

b) *Average Wet Weather (AWW) Flow* – Daily average flow for the wettest 30 consecutive days for mechanical treatment facilities. AWW flow is based on flow with infiltration due to high groundwater and typical inflow due to precipitation and/or snow melt. This flow typically occurs during the spring and early summer.

c) *Peak Hourly Wet Weather (PHWW) Flow* – Peak flow during the peak hour of

the day at a time when the groundwater is high and a five-year, one-hour storm event is occurring.

d) *Peak Instantaneous Wet Weather (PIWW) Flow* – Peak instantaneous flow during the day at a time when the groundwater is high and a 25-year, one-hour storm event is occurring. This flow is used for sizing pumps and piping systems.

The flow parameters described above are determined by following the procedures outlined in the MPCA document "Design Flow and Loading Determination Guidelines for Wastewater Treatment Plants," which is included in Appendix D of this report. Additional flow from population increase will be estimated based on a Ten States Standard flow of 100 gal/cap/day for AWW. Based on these guidelines, a detailed breakdown of the design flow analysis for the City of Montrose's municipal wastewater facility is presented in Table 2.5.

The City of Montrose is expected to see a population growth of 2,862 and Waverly is expected to see 1,526 for a total of 4,388 over the 20-year design period. Flow from commercial and institutional users is expected to grow proportionally with residential flows. Both will contribute additional wastewater to the treatment facility.

2. Summary of Design Criteria

Table 2.4 summarizes the design flows of the Montrose Municipal Wastewater Treatment Facility. These values will be utilized in subsequent sections to evaluate the existing treatment system and to determine the necessary improvement alternatives.

Table 2.4 – Summary of Design Flows

Flow Parameter	2045 Design Value (MGD)
AADW	0.63
AWW	0.99
PHWW	2.95
PIWW	3.40

Table 2.5 – Determination of 20-Year Design Flows

A)	For Determination of Peak Hourly Wet Weather Design Flow (PHWW)		MGD
1	Present peak hourly dry weather flow		1.817
2	Present peak hourly flow during high ground water period (no runoff)		6.358
3	Present peak hourly dry weather flow [same as (1)]	-	1.817
4	Present peak hourly infiltration	=	4.541
5	Present hourly flow during high ground water period and runoff at point of greatest distance between Curves Y and Z		8.275
6	Present hourly flow during high ground water (no runoff) at same time of day as (5) measurement	-	6.358
7	Present peak hourly flow	=	1.918
8	Present peak hourly inflow adjusted for a 5-year 1-hour rainfall event		0.000
9	Present peak hourly infiltration [same as (4)]		4.541

10	Peak hourly infiltration cost effective to eliminate	-	4.000
11	Peak hourly infiltration after rehabilitation (where rehabilitation is cost effective)	=	0.541
12	Present Peak hourly adjusted inflow [same as (8)]		4.000
13	Peak hourly inflow cost effective to eliminate	-	3.300
14	Peak hourly inflow after rehabilitation (where rehabilitation is cost effective)	=	0.700
15	Population increase of 3,932 @ 100 gpcd x 2.85 peaking factor (Per Ten State Standards)		1.121
16	Peak hourly flow from planned industrial increase		0.000
17	Estimated peak hourly flow from future unidentified industries		0.000
18	Peak hourly flow from other future increases		0.000
19	Peak hourly wet weather design flow [(1)+(11)+(14)+(15)+(16)+(17)+(18)]		3.058
B)	For Determination of Peak Instantaneous Wet Weather Design Flow (PIWW)		MGD
20	Peak hourly wet weather design flow [same as (19)]		3.058
21	Present peak hourly inflow adjusted for a 5-year 1-hour rainfall event [same as (8)]	-	0.000
22	Present peak inflow adjusted for a 25-year 1-hour rainfall event	+	0.450
23	Peak instantaneous wet weather design flow	=	3.508
C)	For Determination of Average Dry Weather Design Flow (ADW)		MGD
24	Present average dry weather flow		0.606
25	Population increase of 3,932 @ 100 gpcd	+	0.393
26	Average flow from planned industrial increase	+	0.000
27	Estimated average flow from other future unidentified industries	+	0.000
28	Average flow from other future increases	+	0.000
29	Average dry weather design flow [(24)+(25)+(26)+(27)+(28)]	=	0.999
D)	For Determination of Average Wet Weather Design Flow (AWW)		MGD
30	Present average dry weather flow		0.606
31	Average infiltration and inflow after rehabilitation (where rehabilitation is cost effective)	+	0.000
33	Population increase of 3,932 @ 100 gpcd	+	0.393
34	Average flow from planned industrial increase	+	0.000
35	Estimated average flow from future unidentified industries	+	0.000
36	Average flow from other future industries	+	0.000
37	30-day average wet weather design flow [(30)+(31)+(32)+(33)+(34)+(35)+(36)]	=	0.999

E. Historical Loadings

1. Total Plant Influent Loads Monitoring

   Montrose staff monitors influent wastewater pollutant loadings at sample station WS 001 as required by the facility's NPDES discharge permit. The pollutant parameters include 5-day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), total phosphorus (TP), and pH.

   The following is a short discussion on each pollutant parameter concerning historical influent monitoring and trends:

   a) *$CBOD_5$*: Since 2017, the average $CBOD_5$ concentration has been 224.93 mg/L. The current effluent design average is 25 mg/L. The historical average $CBOD_5$ mass loading is 665.65 lbs/day, with a maximum 30-day average of 1038.72 lbs/day. The current design loading is 73.98 lbs/day.

   b) *TSS*: Effluent TSS concentration has averaged 408.38 mg/L, with an average mass loading of 1,208.53 lbs/day. The maximum 30-day average TSS mass loading is 3299.63 lbs/day.

   c) *Total Phosphorus*: Effluent total phosphorus has averaged 408.38 mg/L, with an average mass loading of 1,208.53 lbs/day. The maximum 30-day average phosphorus loading is 71.02 lbs/day.

   d) *Total Kjeldahl nitrogen (TKN)*: Total Kjeldahl nitrogen is a measurement of nitrogen contained in organic compounds plus ammonia (NH_3-N). In order to biologically remove organic nitrogen from the raw wastewater, it must be converted to ammonia through the process of ammonification. Thus, TKN is an important process parameter that describes the total amount of nitrogen that needs to be removed from the system through biological treatment (nitrification and denitrification).

   e) *Pollutant Loading Rates*: Common per capita design loading rates for domestic wastewater, given by the *Recommended Standards for Wastewater Facilities – 2014 Edition* (commonly known as the Ten State Standards), are the following ranges:

      - 0.17-0.22 lbs. $CBOD_5$/capita/day;
      - 0.20-0.25 lbs. TSS/capita/day;
      - 0.036-0.046 lbs. TKN/capita/day;
      - A common loading for total phosphorus, according to Metcalf & Eddy (2003), is 0.008 lbs. TP/capita/day.

2. Summary of Design Criteria

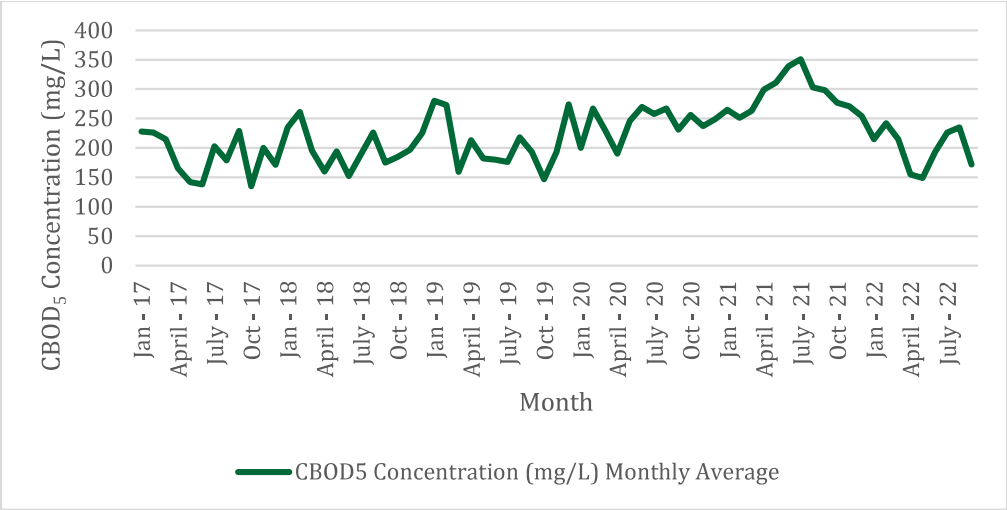
   Table 2.6 summarizes the historical influent loadings of the Montrose Municipal Wastewater Treatment Facility. These values will be utilized in subsequent sections to evaluate the existing treatment system and to determine the necessary improvement alternatives.

Table 2.6 – Summary of Historical Loadings	
Design Parameter	Existing Design Value (lbs/day)
$CBOD_5$	740
TSS	822
TKN	164
TP	--

Table 2.7 shows average loading rates for Montrose's wastewater based on historical monitoring data, which includes all residential, commercial, and industrial sources. On average, the $CBOD_5$ loading rate is within the typical design range specified above, while TSS is slightly above the design range. However, in a given year, both $CBOD_5$ and TSS have exceeded the design rates specified. Total phosphorus exceeds the loading rate given as well. The facility does not monitor influent TKN or ammonia, therefore, historical values are not provided. Figures 2.4, 2.5, and 2.6 illustrate monthly fluctuations for CBOD5, TSS, and TP, respectively.

The proposed design loadings presented later in this section are well above the historical loadings and include allocations for future residential and industrial growth.

Table 2.7 – Historical Influent Monitoring-Average Pollutant Loadings							
Parameter (1)	Unit	2017	2018	2019	2020	2021	5-Year Average
Population Estimate		4,604	4,775	4,929	5,675	5,865	5,170
Average Flow	MGD	0.35	0.34	0.42	0.35	0.32	0.35
$CBOD_5$	mg/L	185.92	199.50	207.33	241.75	290.17	224.93
	lbs/day	545.02	565.84	720.63	702.64	767.94	665.65
	lbs/capita/day(1)	0.12	0.12	0.15	0.12	0.13	0.12
TSS	mg/L	318.67	368.17	397.00	557.67	400.42	408.38
	lbs/day	934.17	1,044.23	1,379.85	1,620.85	1,059.73	1,208.53
	lbs/capita/day(1)	0.20	0.22	0.28	0.29	0.18	0.23
Total Phosphorus	mg/L	318.67	368.17	397.00	557.67	400.42	408.38
	lbs/day	934.17	1,044.23	1,379.85	1,620.85	1,059.73	1,208.53
	lbs/capita/day(1)	0.20	0.22	0.28	0.29	0.18	0.23
(1) The existing facility is not required to monitor influent TKN or ammonia							



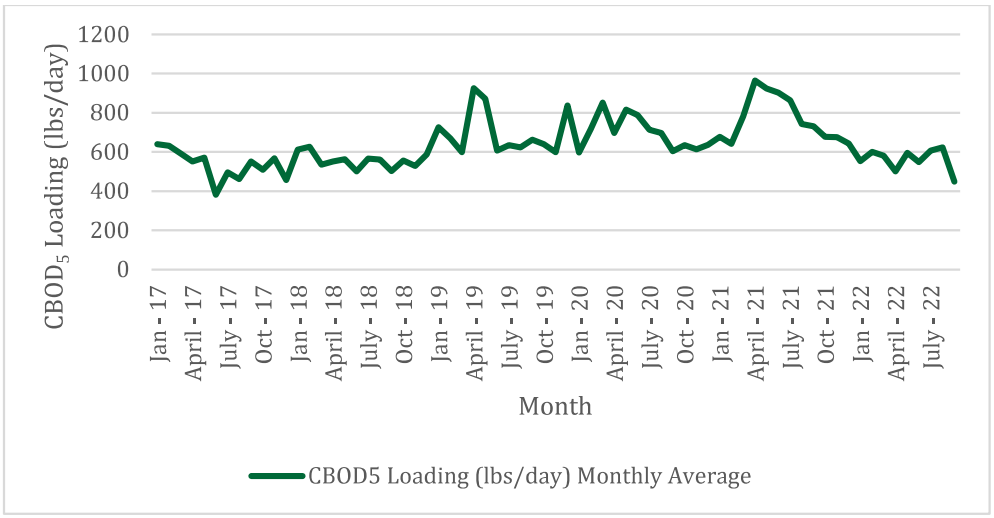
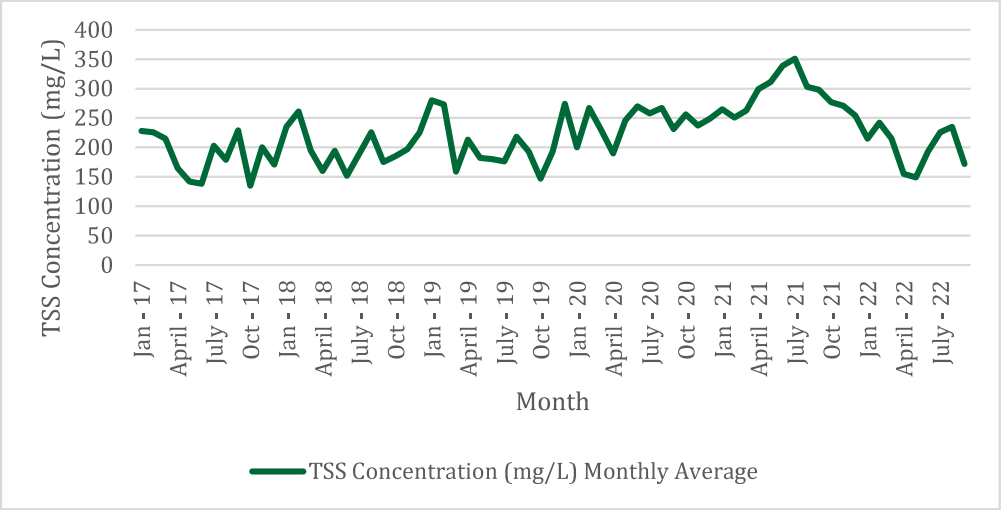


Figure 2.4 – Historical Influent $CBOD_5$ Concentration (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility



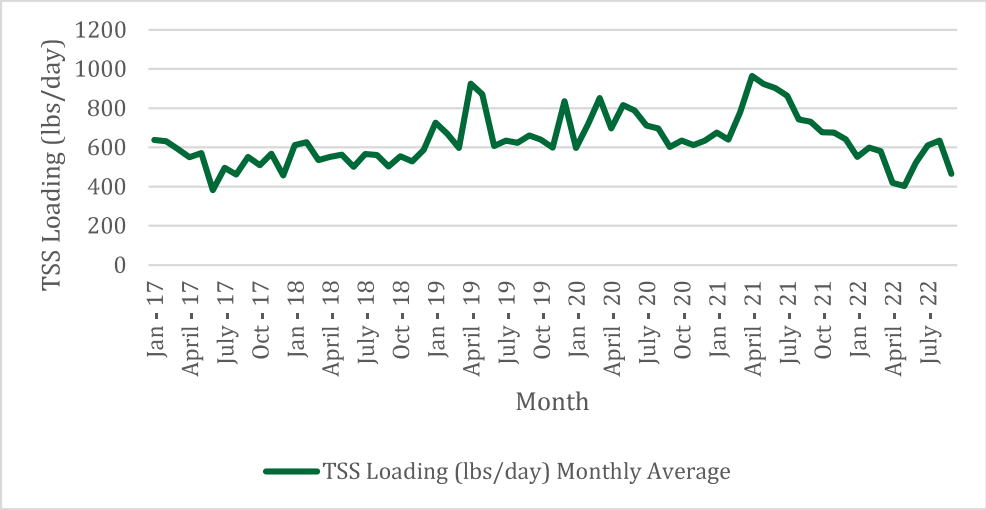
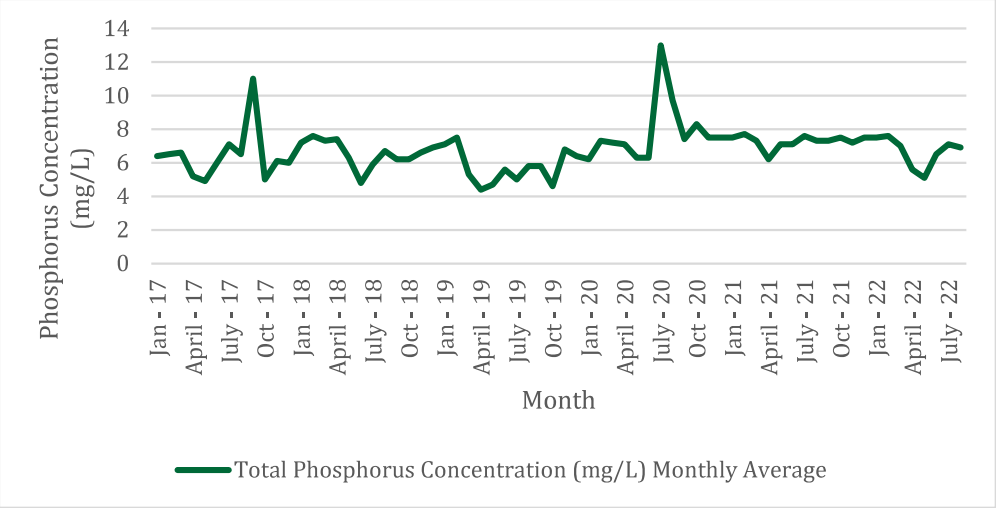


Figure 2.5 – Historical Influent TSS Concentration (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility



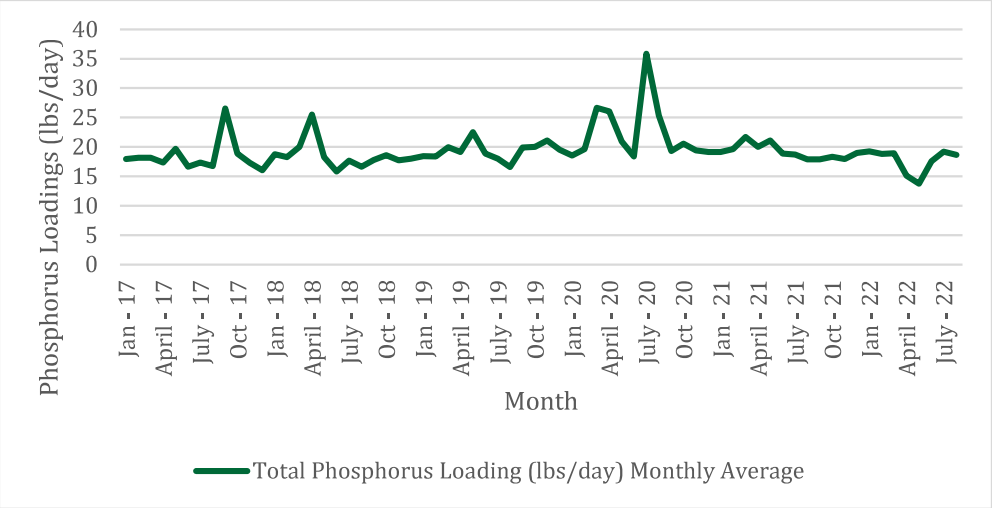


Figure 2.6 – Historical Influent TP Concentrations (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility

F. Design Flows Loadings

The pollutant loadings are based on historical raw water monitoring data, population projections, and industrial allocations. The City of Montrose's wastewater treatment facility receives pollutant loading contributions from residential, commercial, and industrial users. The City of Montrose's wastewater treatment facility receives pollutant loading contributions from residential, commercial, and industrial users.

1. Residential Commercial Design Loadings

Design loadings from residential and commercial users are calculated by determining mass per capita (e.g. lbs/capita/day) values for $CBOD_5$, TSS, Total Kjeldahl Nitrogen (TKN), and total phosphorus. As previously discussed, common capita design loading rates, given by the *Recommended Standards for Wastewater Facilities – 2014 Edition*, are 0.17-0.22 lbs. $CBOD_5$/capita/day, 0.20-0.25 lbs. TSS/capita/day, and 0.036-0.046 lbs. TKN/capita/day. A common loading for total phosphorus, according to Metcalf & Eddy (2003), is 0.008 lbs. TP/capita/day.

As a conservative estimate, residential and commercial design loadings are characterized by using the high-end value of the typical design ranges specified above.

Table 2.8 summarizes design loadings for residential and commercial users in Montrose.

Table 2.8 – Residential and Commercial Design Loadings			
Parameter	Per Capita Design Loading	2002 Design Loading	2045 Design Value
Design Population	--	4,110	9,987
$CBOD_5$	0.22 lbs./capita-day(1)	740 lbs./day	2,197 lbs./day(1)
TSS	0.25 lbs./capita-day(1)	822 lbs./day	2,497 lbs./day(1)
TKN	0.046 lbs./capita-day(1)	164 lbs./day	460 lbs./day(1)
TP	0.008 lbs./capita-day(2)	--	80 lbs./day(2)
(1) Design value per Ten State Design Standards (2) Design value per Metcalf & Eddy (2003)			

2. Summary of Design Criteria

Table 2.9 summarizes the design flows and loadings of the Montrose Municipal Wastewater Treatment Facility. These values will be utilized in subsequent sections to evaluate the existing treatment system and to determine the necessary improvement alternatives.

Table 2.9 – Summary of Design Criteria	
Parameter	2045 Design Value
Average Annual Day	0.63 mgd
Average Wet Weather	0.99 mgd
Peak Hourly Wet Weather	2.95 mgd
Peak Instantaneous Wet Weather	3.40 mgd
$CBOD_5$	2,197 lbs/day
TSS	2,497 lbs/day
TKN	460 lbs/day
TP(1)	80 lbs/day
(1) Design parameter not specified for existing facility	

G. Biosolids

The Montrose Wastewater Treatment Facility produces Class B biosolids stored in the biosolids storage tank. Sludge storage bags were used in addition to the biosolids storage tank. Biosolids were hauled off-site in Fall 2022.

Biosolids production is impacted by several variables including the amount of $CBOD_5$ and TSS loadings entering the facility, the amount removed in the treatment process, and the type of biological treatment process. Dense non-soluble organic solids are removed in the clarifiers, while the remaining solids and soluble organics are removed in the biological treatment system and clarification processes. Solids production can vary significantly based on the type of biological treatment processes utilized. In any biological system, the internal growth of bacteria and microorganisms needed to treat the wastewater contributes towards the overall solids production. If Montrose moves to an activated sludge-based system, biosolids are expected to increase.

H. NPDES Discharge Permit

1. Existing Permit

The treatment facility's effluent discharge is monitored and regulated in accordance with National Pollutant Discharge Elimination System (NPDES) Permit No. MN0024228. A copy of the current permit is included in Appendix B. A summary of the current effluent limits is presented in Table 2.10 below. Within the past few years there have been a few instances where $CBOD_5$ and TSS loading limits were exceeded. Total Phosphorus concentration limits have not been exceeded and is currently compliant with the mass loading limit goal of 10 mg/L.

Table 2.10 – NPDES Discharge Limits – Montrose, MN

Parameter	Season	Limit Type	Limits
$CBOD_5$	Jan. - Dec.	Monthly Ave.	25 mg/L (74 kg/day)
	Jan. - Dec.	Max. Week Ave.	40 mg/L (118 kg/day)
	Jan. – Dec.	Min. Monthly Ave.	85%
TSS	Jan. – Dec.	Monthly Ave.	45 mg/L (133 kg/day)
	Jan. – Dec.	Max. Week Ave.	65 mg/L (192 kg/day)
	Jan. – Dec.	Min. Monthly Ave.	85%
Fecal Coliform	Apr. – Oct.	Monthly Ave. (Geometric)	200 #/100 mL
pH	Jan. – Dec.	Monthly Min.	6.0
	Jan. – Dec.	Monthly Max.	9.0
Total Phosphorus	June - Sept.	Monthly Ave.	1.3 kg/day
	Jan. – Dec.	Monthly Ave.	1.0 mg/L

I. Potential Future Effluent Limits

1. Phosphorus Limits

In September 2018, MPCA released a Phosphorus Effluent Limit Review for the Greater Crow River Watershed. This memorandum is found in Appendix E, addresses how excess total phosphorus (TP) contributes to higher levels of algae, which negatively impacts the ecosystem. Whenever algae blooms levels are too high, the MPCA is required to develop a plan to reduce TP levels.

The 2018 Montrose NPDES permit has a State Discharge Restriction (SDR) Phosphorus

limit of 1.0 mg/L calendar monthly average, a River Eutrophication Standard (RES) water quality based effluent limit (WQBEL) for June-September of 1.30 kg/day based on achieving a long-term (multi-summer) average of 0.62 kg/day, and a 12-month moving total WQBEL of 1,079 kg/yr to protect Lake Pepin. These limits may be reevaluated during the permit renewal process.

The 5-year average effluent phosphorus levels have been a calendar month average of 0.643 mg/L, a monthly effluent loading of 0.89 kg/day, and a yearly loading of 325.22 kg/year. The 2045 design loading is 79.90 lbs/day.

Research has shown that some phosphorus, in the range of 0.02 mg/L to greater than 0.10 mg/L in similar facilities, can be recalcitrant (non-reactive) and soluble. This type of phosphorus cannot be precipitated and filtered out. It requires reverse osmosis (RO) filtration to remove. RO technology is not practical to install at the tail end of a wastewater treatment facility.

Another method of phosphorus removal requires that the facility would need to convert all the reactive phosphorus to solids. An additional unit process would be necessary to fully react all the phosphorus and capture the resulting solids. Chemical addition, rapid mix, and flocculation would be necessary after the final clarifiers to maximize the conversion of phosphorus to solids. Solids capture technology would be required, such as a filter or ballasted clarification. Many filtration options are available to meet the new limits including disc filters, ultra-filtration membranes, upflow sand filtration, and gravity sand media filtration.

2. Nitrogen Limits

   The State of Minnesota has implemented a Nutrient Reduction Strategy (NRS) to meet in-state and downstream water quality goals. Nitrogen has been identified as a target pollutant in this effort with a milestone for the Mississippi River set at a 20 percent reduction by 2025. As a result, wastewater treatment facilities throughout the State have received additional limits and monitoring requirements for various nitrogen compounds. The Montrose wastewater treatment facility is not currently subject to limits on ammonia-nitrogen (NH_3-N) discharge.

   The biological process of nitrification is used to convert ammonia in the raw wastewater to nitrate prior to discharge. This is the first step to achieving a total nitrogen limit. Denitrification, which is the conversion of nitrate into nitrogen gas, requires additional treatment to achieve. In this process, nitrate-rich water passes through a mixed tank that is absent of free oxygen. In this environment, bacteria utilize the bound oxygen in the nitrate compound and reduces it to nitrogen gas which then off-gasses to the atmosphere and is removed from the liquid stream. Design of the system is dependent on the specific total nitrogen entering the system and effluent limit. The design may include the following components:

   - Anoxic Tank
   - Recycle Pump(s)
   - Anoxic Mixer(s)
   - Supplemental Carbon Source

3. Total Chlorides

   The Montrose Municipal Wastewater Treatment Facility monitors specific conductivity for total chlorides in their treated effluent discharge. In the most recent permitting

cycle, many municipalities in western and southern Minnesota with low flow receiving streams have received discharge limits for total chlorides.

Chloride is a mineral ion that is found naturally in water, foods, and other sources. The primary source of chlorides in wastewater is from water softeners installed in homes and businesses to remove naturally occurring hardness in groundwater. Water softeners reduce hardness in drinking water by exchanging natural hardness ions (calcium and magnesium) in the drinking water with sodium, which does not contribute to hardness. As these ions are exchanged with the softening units, eventually there is no more sodium to exchange, and the water cannot be softened. Once this happens, the softeners automatically recharge by backflushing a brine (salt) solution through the media bed. This brine solution contains high concentrations of chlorides that are discharged to the sanitary sewer system once recharging is complete.

Wastewater treatment technologies are not equipped to remove dissolved ions such as chloride in a cost-effective manner. In nearly all cases, source reduction of chlorides is the most cost-effective way to achieve a chloride limit. To do this, some communities have opted to implement reverse osmosis, lime-soda ash softening, or other softening treatment at their municipal drinking water treatment facility. Producing soft drinking water encourages residents and businesses to reduce salt usage, which lowers chloride discharge to the wastewater system and may help meet limits.

Montrose Wastewater Treatment Facility currently provides treated water with a total hardness of 430.96 mg/L as $CaCO_3$.

4. Other Salty Discharge Parameters

   The Effluent Limitations Summary received from the MPCA also includes proposed concentration limits for hardness (calcium + magnesium), total dissolved solids, and specific conductivity. Similar to the proposed chloride limit, these values are equivalent to the historical monthly maximum concentration measured at the facility (excluding outliers). The proposed average limits are as follows:

   - Hardness (Ca + Mg) = 431.18 mg/L as $CaCO_3$
   - Total Dissolved Solids (TDS) = 1,341.34 mg/L
   - Specific Conductivity = 2,393.70 umhos/cm

   These parameters consist of dissolved ions that conventional wastewater treatment technologies are not equipped to remove. Similar to chloride, source reduction strategies through drinking water treatment improvements (i.e. softening and/or blending) are likely needed to ensure these limits are met. The MPCA has been promoting the concept of “linkage,” whereas only a chloride limit is issued by the MPCA and the above salty discharge parameters are assumed to be met.

5. Other Considerations

   The U.S. EPA conducted extensive research on the environmental impacts of pharmaceutical products that pass-through wastewater treatment plants. This research suggests that endocrine disruptor chemicals impact aquatic life, the EPA finalized regulations on pharmaceutical waste production by healthcare facilities in a rule published in 2019. There are no conventional treatment technologies for the removal of these chemicals.

III. Existing Wastewater Facilities

A. Overview of System

Montrose Utilities owns and operates a Class B wastewater treatment facility that treats municipal wastewater generated by residents and businesses throughout the City of Montrose, the City of Waverly, and 12-Hi Mobile Home Park. The facility continuously discharges treated effluent to an unnamed creek the flows into Mud Lake in the Woodland Wildlife Management Area in accordance with National Pollutant Discharge Elimination System (NPDES) Permit No. MN0024228.

1. History

The Montrose Municipal Wastewater Treatment Facility was originally constructed in 1965 and consisted of a series of stabilization ponds. The facility received significant upgrades in 2002. These upgrades are summarized in the following bullet points:

- Meter vault with influent magnetic flow meter
- Mechanical fine screen with manual bar screen bypass
- High intensity aeration ponds
- Two Clarifiers
- Ferric chloride feed system
- UV disinfection
- WAS lift station
- Biosolids storage

2. Process Description

The Montrose Municipal Wastewater Treatment Facility utilizes a combination of physical, chemical, and biological treatment processes to produce treated effluent that complies with all requirements specified by their NPDES discharge permit. The facility is equipped with a fine screen, two high intensity aeration ponds (Ponds 1 & 2) adjacent to three polishing ponds (Ponds 3, 4, & 5), two final clarifiers including chemical treatment, and ultraviolet (UV) disinfection is completed prior to discharge into Mud Lake. The biosolids treatment consists of a waste activated sludge (WAS) pump station, biosolids storage, and a biosolids transfer pump. Table 3.1 below summarizes the sizes and capacity for the existing components at the facility. Figure 3.1 illustrates the process flow diagram for the existing treatment facility. Figure 3.2 is a location map of the existing treatment facility and lift stations.

Table 3.1 – Summary of Existing Wastewater Treatment Components	
PRELIMINARY TREATMENT	
Lift Station Pumps	
Type	KSB Submersible
No. of Units	3
Design Capacity	960 gpm (with one pump out of service) @ 50 ft. TDH, 25 HP
Fine Screen	
No. of Units	1
Design Capacity	2.0 MGD w/ washer or 3.5 MGD w/out washer
Chemical Feed Pumps	
Type	Peristaltic Metering Pumps
Chemical	Ferric Chloride
No. of Units	2
Design Capacity	0.25 GPH
SECONDARY TREATMENT	
High Intensity Aeration Basins (Ponds 1 & 2)	
Capacity	4.0 MG (Pond 1), 4.0 MG (Pond 2)
Aeration Blowers	
Type	Positive Displacement w/ VFD
No. of Units	2
Design Capacity	50 HP, 690 SCFM @ 8.3 PSIG
Diffusers	
Type	Fine Bubble
Final Clarifiers	
Type	Circular, Center Feed, Flocculating
No. of Units	2
Design Capacity	0.69 MGD (each) (1/2 PHWW)
Scum Pump	100 GPM @ 20 ft. TDH
Size	35 ft. dia., 14 ft. SWD
Chemical Feed Pumps	
Type	Peristaltic Metering Pumps
Chemical	Ferric Chloride
No. of Units	2
Design Capacity	0.25 GPH
DISINFECTION	
Ultraviolet Disinfection	
Type	Low Pressure UV Lamps
No. of Banks	2
No. of Lamps	48
Design Capacity	1.648 MGD (PIWW)
BIOSOLIDS TREATMENT	

WAS Pumps	
No. of Units	2
Design Capacity	100 GPM @ 20 ft. TDH, 5 HP
Biosolids Transfer Pump	
No. of Units	1
Design Capacity	600 GPM @ 25 ft. TDH, 10 HP
Biosolids Storage Tank	
Dimensions	105' long x 55' wide x 14 ft. SWD
Storage Capacity	80,850 ft^2 or 605,000 gal
Storage Mixers	2 - 15 HP Submersible Mixers, 15,600 gpm

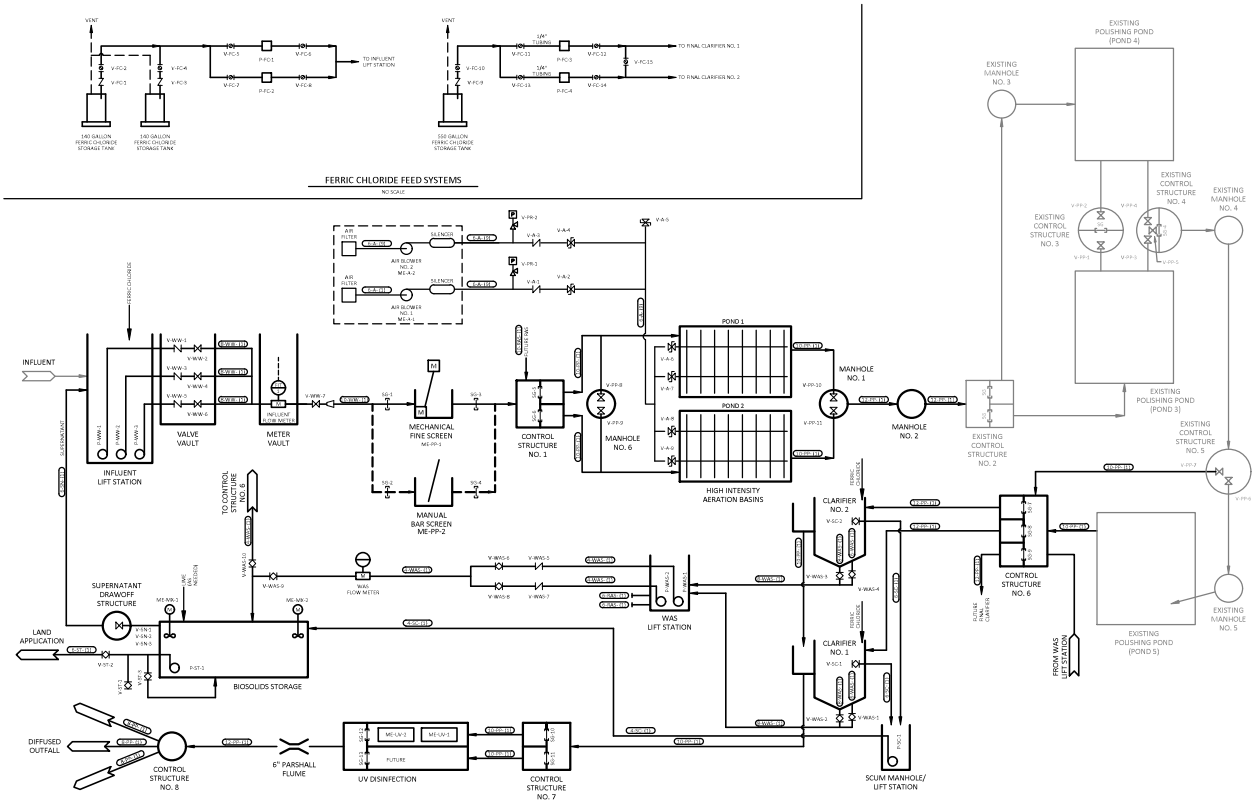
WASTEWATER TREATMENT FACILITY PLAN

MONTROSE, MINNESOTA

FIGURE 3.1

JANUARY, 2023

BOLTON & MENK



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WASTEWATER TREATMENT FACILITY PLAN

MONTROSE, MINNESOTA

FIGURE 3.2

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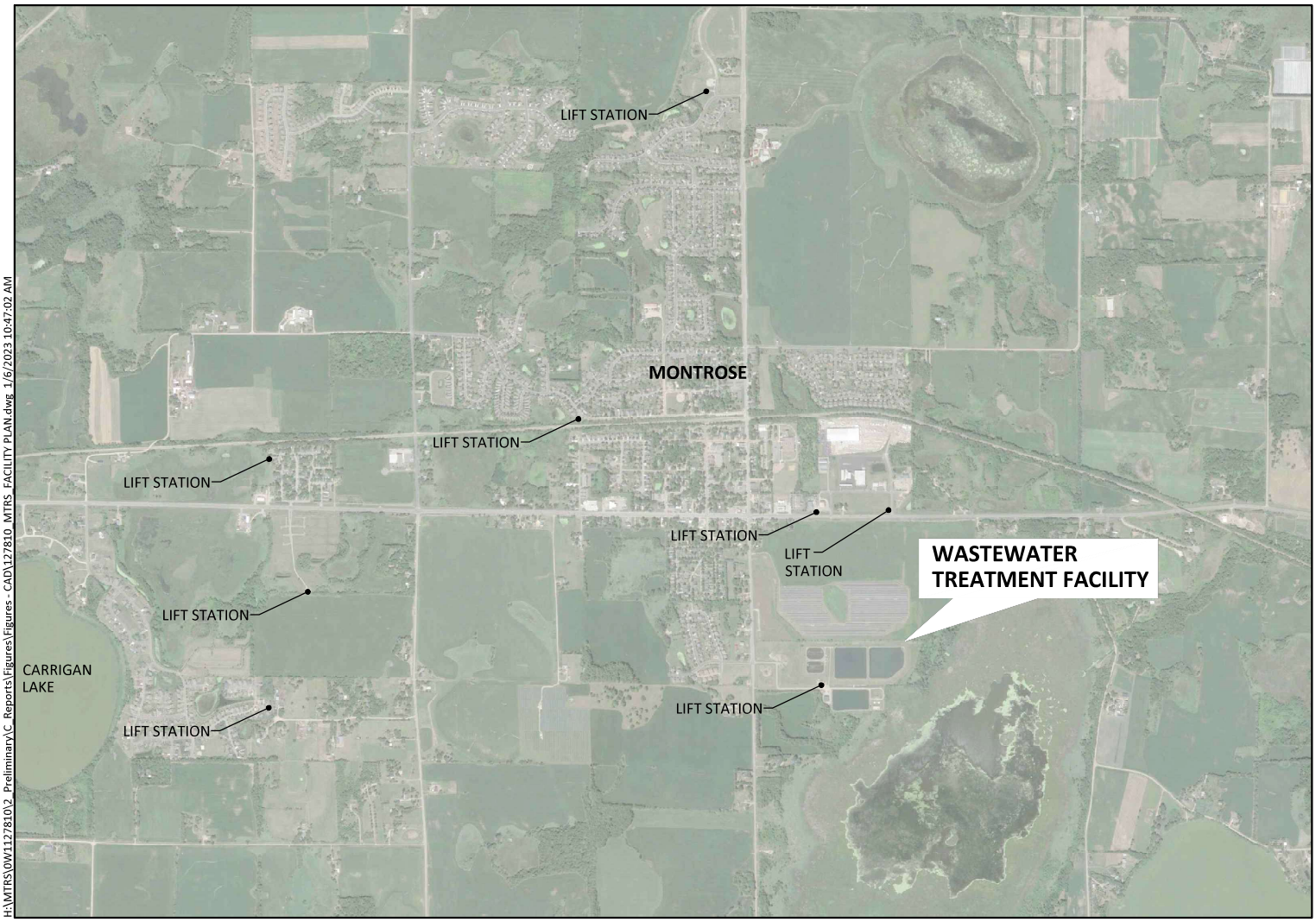

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WASTEWATER TREATMENT FACILITY PLAN

MONTROSE, MINNESOTA

FIGURE 3.3

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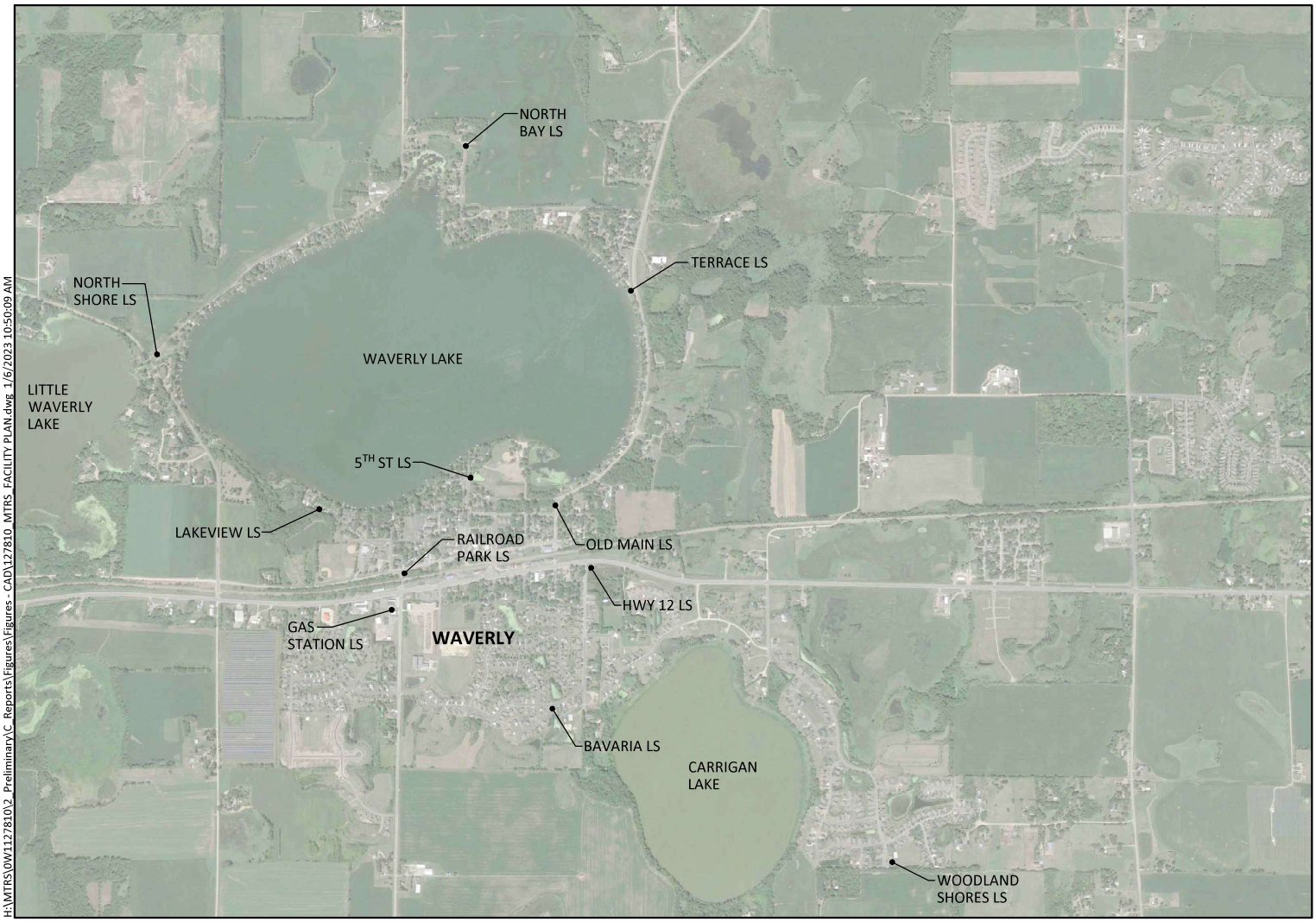

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a) Lift Stations

The service area consists of 5 (five) sanitary lift stations, eleven (11) Waverly lift stations (two pump to the Montrose Municipal Wastewater Treatment Facility), and one privately owned lift station. Raw wastewater generated throughout the service area is conveyed to the municipal treatment facility via a 24-inch gravity sewer. The main lift station, located onsite, pumps the raw wastewater in a 10-inch PVC pipe through the meter vault, with a magnetic flow meter installed in 2021, to the pretreatment building.

The main lift station is designed for PHWW flow. The capacity is 960 gpm at 50 ft total dynamic head (TDH) with one pump out of service. The treatment capacity of these processes is controlled by influent flow rates (hydraulic loading) rather than BOD loading (organic loading).

The main lift station is in fair condition, but in need of improvements. Pump #3 was recently rebuilt, pump #2 is on the maintenance schedule to be rebuilt as well, and parts are difficult to acquire. The valve vault is regularly full of water; site grading modifications would improve access to the valves. Montrose has issues with rag accumulation in their lift stations and pretreatment building and grinders may protect the downstream equipment. The main lift station also needs a new control cabinet.

b) Preliminary Treatment Building

The mechanical fine screen, located in the preliminary treatment building, is used to remove solids (0.25” or larger) such as sticks, rags, and other debris that may be present in the wastewater. A manual bar screen is provided as a backup for maintenance or failure of the mechanical fine screen. The mechanical fine screen is based on the PIWW flow and the current design capacity is 2.0 MGD (with washer on).

This building also houses employee desks, lab space, and the blowers. The doors need replacement, and the masonry suffers from efflorescence. The blowers are original; sizing should be upgraded to new positive displacement blowers to meet demands. The VFDs should be replaced as well. An electrical study should be completed to determine the needs of the SCADA system.

c) Aeration Basins and Polishing Ponds

The screened wastewater splits the flow into the high intensity aeration basins where oxygen and mixing are supplied to the biology. All pond control structures need to be replaced. The high intensity aeration basins (Ponds 1 & 2) are currently operating as an activated sludge process, but there is not return sludge. In this process, the waste is biologically treated by biomass, or “activated sludge”, which is present in the aeration basin. The aeration basins are currently sized at 4.0 million gallons each. Oxygen is supplied in the basins through an aeration system to increase the rate of biological treatment, which consumes oxygen. The air used to supply the oxygen also provides mixing within the aeration basins to prevent solids from settling. Stubouts in Control Structure No. 1 allow for future return activated sludge (RAS) to be conveyed to the high intensity aeration basins.

Due to the expected large increase in flows, the current aeration basins (Ponds 1 & 2) will need more oxygen supplied to them or be used in a different capacity such as roughing ponds.

The polishing ponds (Ponds 3, 4, & 5) allow the biomass and other suspended solids to settle, allowing clear liquid to be separated from the settled activated sludge. Section IV will give more detail regarding the use of these ponds.

d) Final Clarification

The wastewater from the polishing ponds goes through Control Structure No. 6 and into the final clarifiers. Ferric chloride is added in Control Structure No. 6 to aid in coagulation of the smaller particles entering the clarifiers to create a floc or larger particle. The final clarifiers have a concentric drive suction type floc clarifier mechanism controlled by VFDs. When the plant switched from aluminum sulfate to ferric chloride, the drive was turned off. In the clarifiers less dense suspended solids are given time to settle. They are removed by the clarifier sludge collector mechanism and are pumped to the biosolids storage tank using the waste activated sludge (WAS) lift station. Floating solids, or scum, such as oil and grease are also removed by the surface skimming mechanisms.

Since construction the West clarifier has settled such that the East clarifier is higher, hydraulically this makes removing sludge more difficult. Clarifiers effectively reduce the loading to the biological treatment system and eliminate issues with solids accumulation. Scum from the clarifiers is diverted to the scum manhole/lift station which flows into the biosolids storage tank. Clean water flows under the baffle wall, over the v-notch weirs, into the effluent trough, and out to the UV disinfection units. The baffle walls are not level and need to be replaced with the louver. A new valve box is also needed.

The current facility has two 35-ft final clarifiers each designed at one-half of a PHWW flow with a combined capacity of 1.38 MGD.

e) Disinfection and Reaeration

Before final discharge to the wetlands, the treated wastewater must be disinfected to remove harmful bacteria. The existing UV disinfection system is used for disinfection purposes. Two banks of low-pressure ultraviolet lamps inactivate the bacteria to accomplish disinfection. An electric hoist with a beam should be added to aid in pulling UV banks. From the UV channel, the disinfected wastewater flows through the Parshall flume and is discharged. Space has been allotted for expansion of the UV system. The effluent discharges to an unnamed creek the flows into Mud Lake in the Woodland Wildlife Management Area.

The UV disinfection system is designed based on the PIWW flow of 1.648 MGD and consists of one open flow channel with two UV banks and a total of 48 lamps.

f) Biosolids Processing

A byproduct of the wastewater treatment process is the production of biosolids. Solid byproducts are derived from various sources throughout the treatment process and includes both inorganic and organic components. Much of the inorganics are removed in the screening process, which is inert and cannot be processed further. Therefore, these solids are disposed of at a landfill and are

not incorporated into the biosolids. The organic portion of solids are both natural in the raw wastewater and created in the biological treatment process as part of microbial metabolism. Sludge from the bottom of the final clarifiers, as well as the scum troughs, is pumped to the biosolids storage tank which has a capacity of 80,850 ft^3 (~605,000 gallons). Supernatant from the biosolids storage tank flows back into the influent lift station. Solids in the storage tank decompose and settle by gravity to the bottom of the tank. During the first 18 years of operation, the biosolids storage tank was not emptied. The biosolids turned into a jello material. In the summer of 2020, water was added to the biosolids storage tank to pump the solids to a sludge dewatering bag. The bag was removed in the fall of 2022. Montrose WWTF continues to pump WAS and scum to the biosolids storage tank.

Solids processing infrastructure is chosen based on the type of liquid stream processes used to treat the raw wastewater. Anaerobic digestion is often used in combination with primary clarifiers due to the need to break down the complex organic material that settles out in the clarifiers. With an extended aeration activated sludge process that is designed to handle high organic and solids loadings, the need for primary clarification and anaerobic digestion is eliminated.

g) Summary

Structures within the facility are structurally sound, process and mechanical equipment is in fair condition with some needed upgrades and replacements, and pond linings have not been inspected. As mentioned previously, the buildings throughout the facility have efflorescent issues.

Review of the existing wastewater facility indicates that the existing wastewater treatment facility is at capacity given the current loading; however, with flows and loading increasing dramatically in the near future, the plant will need to be upgraded to meet permit limits. Section IV will discuss alternatives for upgrading the facility.

B. Treatment Performance

The treatment facility's NPDES permit specifies pollutant discharge limits for $CBOD_5$, TSS, pH, fecal coliform, and total phosphorus. Figures 3.4 through 3.6 show reported effluent discharge values for each of these pollutants from 2017 to 2022. In this timeframe, Montrose staff mostly meets these discharge parameters.

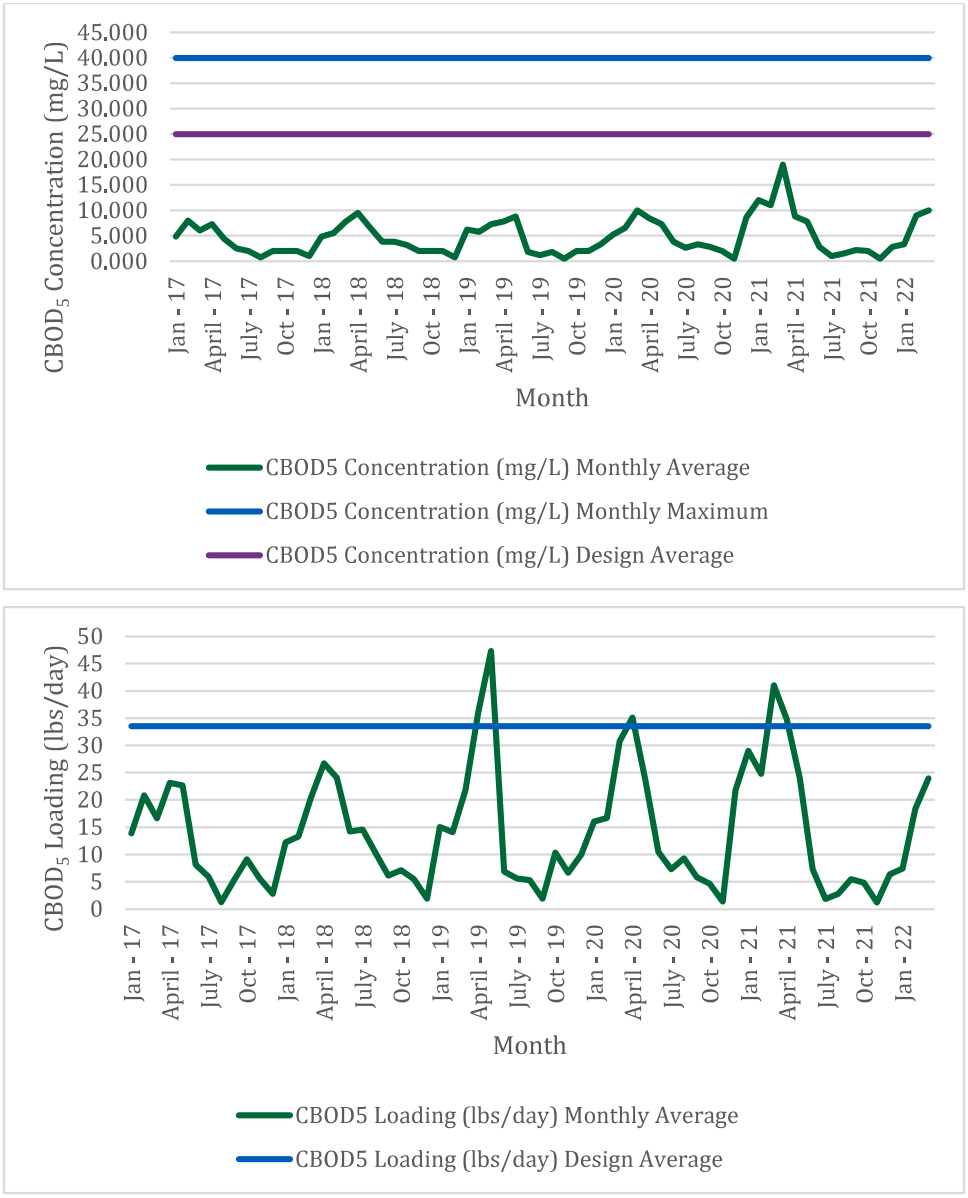
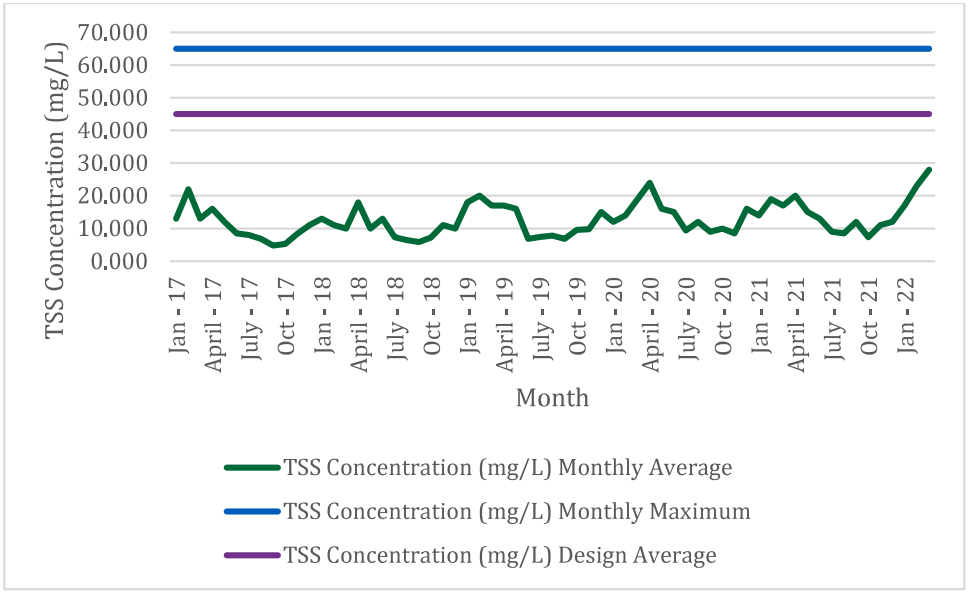


Figure 3.4 – Historical Effluent $CBOD_5$ Concentration (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility



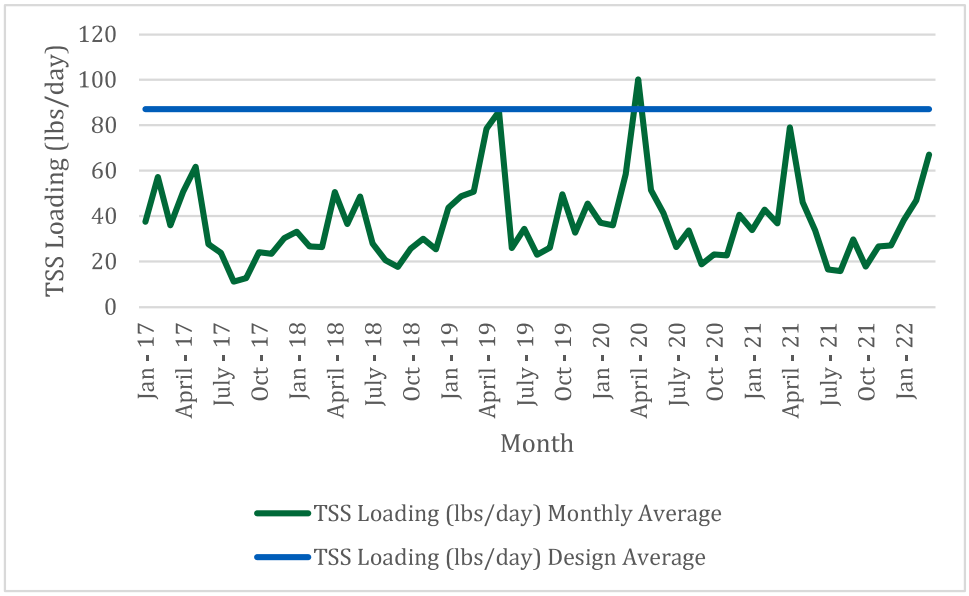


Figure 3.5 – Historical Effluent TSS Concentration (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility

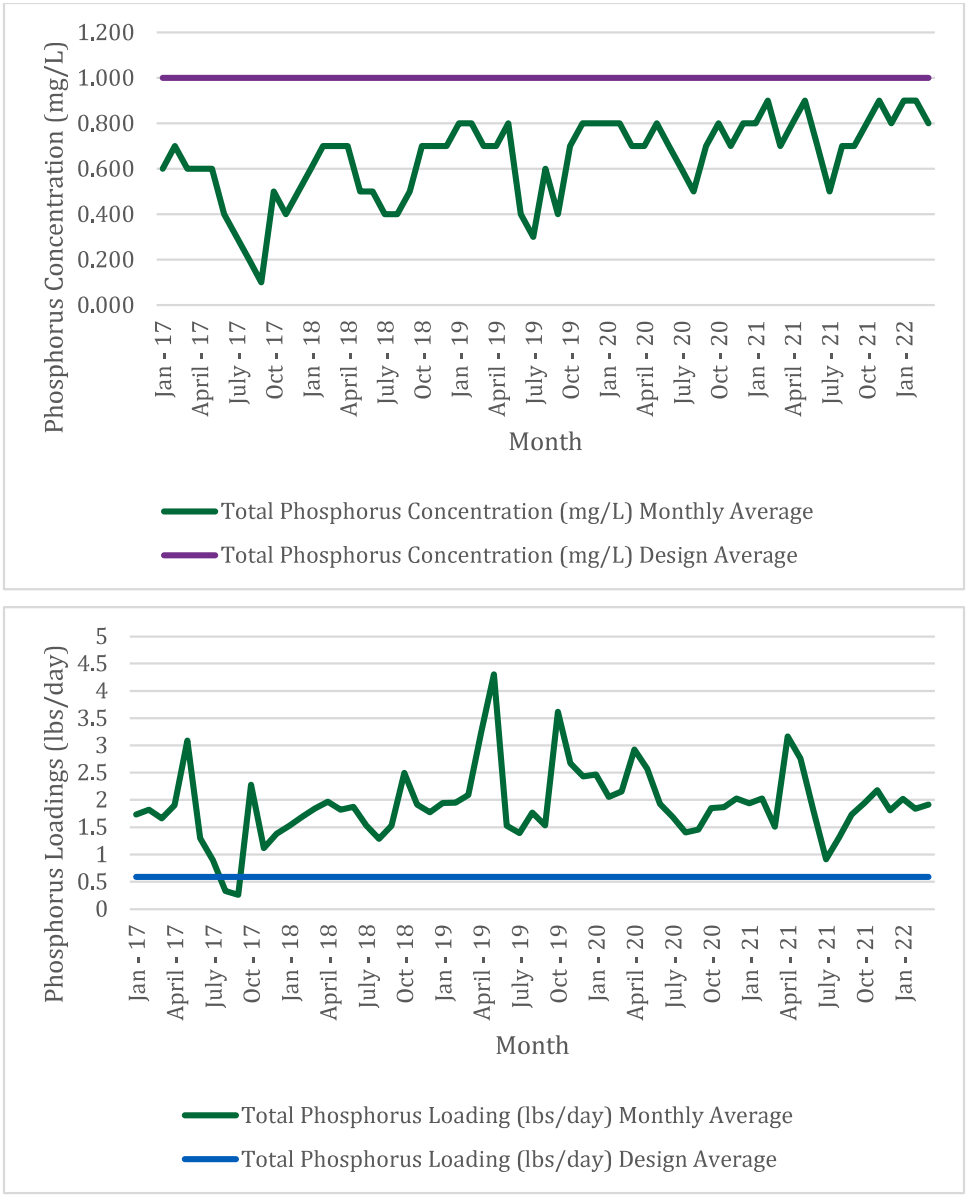


Figure 3.6 – Historical Effluent TP Concentrations (Top) and Mass Loading (Bottom) at Wastewater Treatment Facility

IV. Alternative Design Concepts and Cost Analysis

A. General

This section discusses alternatives to improve the City of Montrose's wastewater treatment system based on the detailed evaluation of design criteria and existing conditions presented in Sections II and III. Improvement needs are driven by the age and condition of the existing facility, as well as more stringent discharge limits that are expected over the next few permitting cycles.

B. Treatment Alternatives

There are several categories of alternatives that are given consideration when determining effective wastewater treatment improvements. For the City of Montrose, these broad alternative solutions include:

1. Upgrade the existing facility.
2. Construct a new mechanical plant.
3. Regionalize with the city of Buffalo.
4. Do nothing.

Determining the best approach to implementing improvements is influenced by several factors, including the age/condition of the existing infrastructure and the technological capacity of the treatment processes to meet current and future NPDES discharge requirements. As discussed in Section III, the Montrose wastewater treatment facility consists of a variety of different treatment processes that vary in both physical condition and effectiveness. The primary limitation of the existing wastewater facility is the limited budget and space to expand.

1. Upgrade the Existing Facility

Based on an evaluation of the design flows and loadings, existing treatment facility infrastructure, and treatment performance presented in Sections II and III, the needs for the WWTF involve process modifications and equipment replacement. The current facility footprint covers most of the city's property. The ponds would need to be dredged to install new aeration equipment and increase the pond volume back to the original design. This system may have difficulty meeting anticipated future total nitrogen and phosphorus limits. Additional processes would be necessary, including but not limited to, a return activated sludge line for nitrification and filtration for phosphorus removal. The higher loading rate caused by future growth may create seasonal odor issues as well. The system also needs to improve biosolids treatment and determine a disposal method. *Due to the extensive upgrades without truly expanding capacity, upgrading the existing facility has been eliminated from consideration.*

2. Construct a New Mechanical Plant

A mechanical treatment plant involves a combination of physical, biological, and chemical processes to achieve treatment objectives. Mechanical facilities may include the following treatment components: preliminary treatment, primary treatment, secondary treatment, tertiary treatment, disinfection, and biosolids handling and disposal. The general purpose and function of each of these components is described below.

Preliminary Treatment – Involves the removal of constituents that can clog or damage equipment and interfere with downstream processes. These constituents may include inorganic solids such as rags, paper, wood, and garbage, as well as oil and grease. General technologies utilized include screening and grit removal devices.

Primary Treatment – Involves the physical separation of suspended solids utilizing clarifier technology. This separation reduces solids not removed in preliminary processes, as well as removal of a portion of influent biochemical oxygen demand (BOD) that is associated with the organic solids removed in the primary treatment process.

Secondary Treatment – Involves the removal or reduction of contaminants that are not removed during primary treatment. This can be done through a combination of biological, physical, and chemical processes. Biological treatment involves the oxidation of pollutants such as organics and nitrogen through bacterial metabolism. Biological processes are often combined with physical processes such as clarification or membrane filtration to retain bacteria and remove suspended solids from the liquid stream. Chemicals are commonly added to optimize the process or to help remove pollutants such as phosphorus. A wide variety of secondary treatment processes are utilized in the wastewater industry. Raw wastewater characteristics, flow rates, and effluent requirements dictate which processes are necessary.

Tertiary Treatment – Involves the use of advanced wastewater treatment technologies to further remove pollutants from wastewater. Tertiary treatment technologies include tertiary sand filtration, ion exchange, carbon adsorption, and membrane processes. Tertiary treatment is required for plants with very stringent total suspended solids, CBOD, total nitrogen, and/or phosphorus discharge limits. Tertiary treatment may also be required for removal of specific contaminants such as organic contaminants that are not removed in conventional biological secondary treatment, or heavy metals.

Disinfection – Involves the destruction or inactivation of waterborne pathogens prior to discharging effluent to receiving waters for the purpose of minimizing public health threats. Disinfection can be done both chemically and physically. Chemical disinfection most commonly includes the use of chlorine-based products to destroy pathogens. Physical disinfection most commonly includes the use of ultraviolet irradiation (UV) to inactivate the pathogens' ability to replicate.

Biosolids Handling and Disposal – Involves the processing, storage, and disposal of biosolids generated at a wastewater treatment facility. Biosolids are derived from excess growth and subsequent disposal of bacteria and other microorganisms in the biological treatment process, as well as solids collected in the primary treatment process. Biosolids are collected, further stabilized, and stored until final disposal. Depending on the degree and method of stabilization, biosolids are most commonly disposed through land application.

In most domestic wastewater treatment applications, biological secondary treatment is the key component in the process. Biological treatment utilizes either suspended growth or attached growth processes. In suspended growth systems, microorganisms responsible for the oxidation of pollutants are suspended in the wastewater through mixing and aeration. Commonly used processes include:

a) Extended Aeration Activated Sludge (with or without Biological Nutrient Removal)

b) Oxidation Ditch

c) Membrane Bioreactor (MBR)

d) Sequencing Batch Reactor (SBR)

Important criteria for selecting a treatment process include the following:

- Ability of process to meet effluent quality requirements
- System reliability
- Ability of process to maintain performance during hydraulic fluctuations
- Capital costs
- Operation, maintenance, and replacement costs (OM&R)
- System expandability to meet future capacity requirements
- System adaptability to meet future effluent quality requirements.

The following paragraphs summarize many of the treatment processes listed above.

a) Extended Aeration Activated Sludge

Extended aeration activated sludge process utilizes an aeration system to provide dissolved oxygen for biological metabolism and mixing for suspended growth. Air is supplied from positive-displacement or centrifugal blowers and is dispersed in the aeration basins via a network of fine-pore diffusers that maximize oxygen transfer and provide mixing. In a typical activated sludge process, incoming wastewater undergoes screening and grit removal prior to aeration. From the aeration basins, wastewater is conveyed to the final clarifiers where solids and biomass are settled out and either recirculated back into the aeration basins or wasted to the biosolids handling system. Clarified effluent flows over the weirs and is conveyed to the disinfection system.

Extended aeration, which is a modification of conventional activated sludge treatment, eliminates the need for a primary clarifier and utilizes a larger aeration basin and longer solids retention time. Extended aeration is known to produce high quality effluent and is a widely used, reliable technology. In addition, extended aeration systems are adaptable to achieve biological nutrient removal (i.e. nitrogen and phosphorus removal) and produce a low level of sludge in comparison to the conventional activated sludge process. *For these reasons, extended aeration should be considered for the Montrose wastewater system improvements.*

b) Oxidation Ditch

The oxidation ditch process is a variation of the activated sludge process. The oxidation ditch process typically includes course screening, grit removal, one or more close loop aerated channels for biological treatment, secondary clarification, and disinfection. The closed-loop configuration is often called a “racetrack type” reactor, as wastewater travels in a circle until it is released from the reactor and travels to the secondary clarifiers.

Long solids retention times (SRTs) associated with oxidation ditch system allow for a high degree of nitrification. An oxidation ditch system can be operated to achieve partial denitrification with the addition of an anoxic tank and proper

recirculation, however TN removal can be difficult to control. Biological phosphorus removal is also possible with the addition of an anaerobic tank prior to the ditch. Key advantages include: low sludge production due to long solids retention times; adaptability to achieve nutrient removal; and common wall construction of racetrack tank design. Disadvantages include: potential freezing problems with surface aerators; relatively high maintenance requirements; larger land requirements (tanks need to be shallower since surface aeration is used); more difficult to control process compared to other activated sludge options; and the system is considered proprietary so limited equipment options are available. *Due to these reasons, the Oxidation Ditch process has been eliminated from consideration as it is similar to activated sludge and costs the same or more.*

c) Membrane Bioreactor

Membrane bioreactors (MBRs) utilize the extended aeration activated sludge treatment process. However, the major difference is that final clarifiers are replaced with micro- or ultrafiltration membranes for physical solids separation. The use of membranes for solids separation is advantageous in that system performance is not dependent on sludge settling characteristics, which can be problematic in conventional systems. Also, membranes remove virtually 100% of solids from the treated effluent and retain all biomass in the biological system. This allows the system to run at higher solids concentration and significantly longer SRTs without a reduction in performance – effectively reducing reactor size requirements and minimizing solids production.

Despite smaller land area requirements, membranes are expensive and need frequent replacement every 3 to 5 years. Capital costs are similar or slightly higher compared to conventional systems, but life-cycle costs are known to be higher due to membrane replacement. More importantly, operation and maintenance costs are much higher due to fouling control and chemical cleaning requirements. Fouling control can be difficult to manage since filterability is highly dependent on wastewater characteristics – especially temperature.

Although MBR systems are known to produce extremely high effluent quality, other activated sludge based systems can produce high effluent quality at a lower operating cost. MBR systems are most commonly used in low flow systems that have both space restrictions and require extremely high effluent quality. Montrose's situation is fairly conventional and does not fall under any of these requirements; *therefore, an MBR treatment system has been eliminated from further consideration.*

d) Sequencing Batch Reactor (SBR)

Sequencing batch reactors are an activated-sludge based technology that incorporates the aeration, sedimentation, and decant functions in a single five-stage batch reactor process. The five stages are as follows: fill, react, settle, decant, and idle. In order to provide continuous treatment, three reactors (minimum) are utilized with the capability to meet design capacity requirements with one reactor out of service. The existing equalization basins would be used to handle peak wet weather flows and reduce reactor basin sizes. Advantages include potential reduced area required for process tanks and potential for lower capital costs due to construction of fewer concrete structures – namely

clarifiers. Disadvantages include higher operational complexity and controls, higher operation and maintenance costs, reliability concerns, and limited nutrient removal capabilities. SBRs are not capable of reliably achieving the same level of nutrient removal as other extended aeration activated sludge processes, since the anoxic and anaerobic conditions are not highly controllable.

Biological phosphorus removal is difficult to achieve in a batch process tank because an anaerobic environment must be provided for phosphorus accumulating organisms (PAO) to gain a competitive advantage and proliferate. If nitrate is present in the anaerobic step of a sequencing batch reactor, PAO growth will be inhibited by denitrifying organisms. If PAO growth is inhibited, biological phosphorus removal will be reduced.

The ability to correct operational issues, such as poor settleability of solids, is also greatly reduced in a SBR because multiple processes occur in the same tank. A conventional activated sludge system utilizes separate tanks for bioreactors and sedimentation basins which, among other things, allows the operator to treat wastewater with chemical addition and polymer prior to the sedimentation step at the clarifiers. The use of one tank for multiple processes also increases the negative effects of taking one SBR tank offline because in that one tank, the plant is losing treatment capacity for hydraulic and pollutant loadings for anaerobic, anoxic, aerobic, and sedimentation tanks. Montrose is constrained by space restrictions for plant expansion, so the reduced plant area requirements are beneficial.

Due to the operational complexity and significant reliability concerns, which are not offset by significant cost savings, *the SBR process has been eliminated from further consideration.*

3. Regionalize with the City of Buffalo

The city of Montrose WWTF is approximately 8 miles following a likely forcemain route (4 miles as the crow flies) from the city of Buffalo's WWTF. Regionalization with the city of Buffalo is a viable option for Montrose and Waverly. This alternative would require forcemain and main lift station improvements. The existing ponds would be converted to equalization basins and the main lift station would be designed for the average daily flow. The remaining ponds and processes would be decommissioned, and the city property could be used for additional purposes. Regionalization eliminates the need for Montrose to determine a biosolids disposal plan and increasing operator licensing levels. The growth between the three cities could require an expansion for the Buffalo WWTF as early as 2030. Each entity would be responsible for a part of the expansion as defined in the agreement.

Montrose and Waverly would become users of the Buffalo system and an agreement is required between the cities. This includes capital improvement obligations, ownership definitions, operational responsibilities, user rates, and other negotiations. *Regionalization should be considered for the Montrose wastewater system improvements.*

4. Do Nothing

Based on discussions with the city of Montrose staff and evaluations in Sections II and III of this report, the "do nothing" alternative is not viable. Due to the age of the facility, upcoming permit requirements, and the planned growth of the community, the facility has improvements required over the next 3-5 years. Choosing to delay the

improvement process increases the risk of permit violations. *This alternative is not considered further in this report.*

C. Biosolids Handling and Disposal

Wastewater biosolids, or sludge, consists of solids removed from raw wastewater and biosolids generated in the treatment process. The proper handling and disposal of biosolids is an important aspect of wastewater treatment. A method that is economical and acceptable from health, environmental, and aesthetic points of view must be selected.

The sludge is currently stored in a holding tank with a 180-day minimum capacity of three percent total solids. For most rural communities, the most widely practiced disposal method is land application. The Montrose WWTF does not currently land apply, and land is becoming increasingly difficult to find. A plan must be developed to dispose of the existing biosolids.

There are two basic categories that biosolids are classified depending on the methods of biosolids treatment and disposal. The two categories are called Class A and Class B biosolids. The Class A biosolids receive the highest treatment for pathogen (less than 1000 fecal coliform) and vector allocation. In addition, the Class A biosolids may be classified as "exceptional quality" if the heavy metal parameters in the biosolids are below the federal standards. The Class A exceptional quality has fewer permitting and regulations in the final disposal options. The Class B biosolids pathogens are only required to be less than 2 million fecal coliforms. Because Class B biosolids are not treated to the same degree as the Class A biosolids, they can only be applied to non-agricultural lands. Application to agricultural land would occur during periods when the crops are not growing or otherwise on property that was temporarily out of crop production according to MPCA guidelines.

The options include:

1. Treat the Biosolids to Class A
    a) Biosolids screw press with lime-heat stabilization
    b) Dewatering and drying facility
    c) Belt filter press with lime-heat stabilization
    d) Centrifuges with lime-heat stabilization
2. Continue with Class B Biosolids
    a) Dewatering with Cake Storage

D. Dewatering with cake storage

The biosolids dewatering is a physical operation that is used to reduce the moisture content of biosolids. This in return reduces the necessary biosolids storage. Modifications and additions to the existing sludge pumping facilities would be necessary. An additional building would be constructed to house the dewatering system designed with a footprint for future drying equipment. The dewatering system would provide a solids product at approximately 15% solids that would be stored in a new bunker storage building adjacent to the dewatering building. A conveyor would be used to move the solids to the bunker. As discussed above, a screw press, centrifuge, or belt filter press system are options. Removing the lime addition reduces the biosolids to a class B.

1. Advantages of dewatering with cake storage:
    a) No additional chemicals used

b) Enclosed system provides good odor and noise control

c) Small footprint

d) Fewer solids to haul

2. Disadvantages of dewatering with cake storage:

a) Conveyor maintenance

b) Need to pursue land application or partner with a disposal facility

E. Class A Biosolids

1. Dewatering and Drying Facility

Heat drying consists of placing dewatered biosolids into a specially designed heat drying/mixing chamber where the biosolids are heated to over 140°F and liquid evaporated. The heat and evaporation kill pathogens and produce a Class "A" Exceptional Quality product. The belt drying process is a continuous feed process in which the dewatered solids are slowly conveyed on a belt while heated air is circulated through the belt. The hot air is provided indirectly from a natural gas boiler and heat exchanger. The heat exchanger eliminates the chance of a spark or hot flue gas from contacting the solids and causing a fire. The process is highly automated and typically is operated 24 hours per day to maximize efficiency. The staffing is only required during the normal working hours. The process equipment is also under a vacuum at all times, preventing the release of any odors or dust.

a) Advantages of sludge drying:

- Enclosed system provides odor and noise containment.
- Easily expandable
- Small footprint

b) Disadvantages of sludge drying:

- Low throughput
- High chemical consumption
- High capital cost

2. Dewatering with Lime-Heat Stabilization

The biosolids dewatering is a physical operation that is used to reduce the moisture content of biosolids. By reducing the moisture, the biosolids storage volume is reduced. Following dewatering, lime-heat stabilization would produce a Class A biosolid which provides more alternatives for final disposal. The lime stabilization process begins as the dewatered cake is dosed with lime in an enclosed hopper to achieve an elevated pH. The chemical reaction between the lime and the cake will be exothermic, increasing the cake temperature between 122-158°F. Ammonia is released during this reaction inactivating pathogens and gases created are captured and scrubbed. Combining the screw press system with the lime addition system will produce a Class A biosolid. Mechanical dewatering and treatment processes can result in solids concentrations of 18-90% effectively reducing the required storage and hauling volume.

a) Dewatering Screw Press with Lime-Heat Stabilization

A dewatering screw press compresses and dewaters the polymer conditioned biosolids. The screw press operates at a low speed inside a perforated screen applying pressure against the screen to drive water out of the biosolids. The solids are compacted within the flights of the screw by increasing pressure. The filtrate will be discharged back to the head of the plant while the dewatered biosolids cake will then undergo lime and heat stabilization. A dewatering screw press can result in approximately 16-18% dewatered cake.

- Advantages of the screw press:
    - Enclosed system provides good odor containment.
    - Ease of startup and shutdown
    - Low power consumption
    - Low maintenance requirements
- Disadvantages of the screw press:
    - Low throughput
    - Chemical handling

b) Belt Filter Press with Lime-Heat Stabilization

A Belt Filter Press (BFP) operates by feeding conditioned sludge onto a porous belt and mechanical pressure is applied to squeeze the water out of the biosolids. Biosolids are first introduced onto the belt in the gravity drainage sections where the biosolids begin thickening. Following the gravity drainage is the wedge zone which uses a second belt to sandwich the biosolids between two belts, and the third zone is the pressure zone. In this zone, medium and high pressure is applied to the biosolids to drive water out of the biosolids. The biosolids will travel through several passes of rollers thereby maximizing the amount of water released. The final product is removed from the belts by scraper blades and is transported by conveyor belt for lime-heat stabilization. The water released is called the centrate and is returned to the head of the facility for treatment. The feed sludge is typically 1-3% solids and the dewatered sludge ranges from 12-25% solids.

The lime-heat stabilization following the belt filter press would be the same process as outlined in the screw press. After completion of the lime stabilization, the sludge would be Class A.

- Advantages of the belt filter press:
    - Large throughput
    - Low energy requirements
    - Low chemical consumption
    - Simplicity of maintenance
- Disadvantages of the belt filter press:
    - High capital cost
    - Requires indoor installation
    - Lower cake storage

- High operator attention including manual washdown
- Generates large volumes of washwater

c) Centrifuges with Lime-Heat Stabilization

Polymer is added to the biosolids to bind the solids together and reduce the solids lost in the process. The biosolids are then fed at a constant rate into the centrifuge. A spinning basket maintains the solids while the water is ejected through the basket, similar to clothes being tumble-dried in a clothes dryer. The solids roll forward and are collected. The centrifuge can generally produce a drier product than the belt filter press, however it requires greater energy and chemical usage to achieve this. The centrifuge process also is most efficiently operated continuously. A centrifuge would be expected to produce 15-35% solids material.

The lime-heat stabilization following the centrifuge would be the same process as outlined in the screw press. After completion of the lime stabilization, the sludge would be Class A.

- Advantages of the centrifuge:
  - High solids capacity
  - Smaller footprint
  - Low chemical consumption
  - Simplicity of maintenance
- Disadvantages of the centrifuge:
  - High energy requirements
  - Start-up and shutdown require significant time
  - High chemical consumption
  - Requires vibration isolation

F. Disposal

The most practiced disposal method for communities like Montrose is land application, which Montrose does not currently practice. This is an environmentally sustainable and beneficial practice as it utilizes the nutrients available of suitable land. With limited land availability, the option to haul to another facility may be practical. With either method, dewatering will reduce the quantity of biosolids hauled or land applied.

If the biosolids are treated to Class A, Montrose could dispose of the biosolids in a landfill or land apply year-round. These options are shown above in Section IV.E. and are often considered in metropolitan areas that lack land availability. They also come with significant increases in capital and operating costs and, therefore, are not justifiable based on Montrose's needs.

Montrose could consider contracting with a licensed applicator for sludge hauling and land application in lieu of having their own staff complete this work.

G. Tertiary Treatment for River Eutrophication Standards

The facility is in the permit renewal process in which new or more stringent limits may be applied. To meet the proposed limits, the facility will need to covert the reactive

phosphorous to solids. An additional unit process is necessary to fully react the phosphorus and capture the resulting solids.

Chemical addition, rapid mix, and flocculation are necessary after the final clarifiers to maximize the conversion of phosphorus to solids. Solids capture technology is required, such as a filter or ballasted clarification. Many filtration options are available to meet new limits including disc filters, ultra-filtration membranes, upflow sand filtration, and gravity sand media filtration.

1. Disc Filters

   Disc filters are a compact high-rate filtration process. The disc filters use pressure to drive the final clarifier effluent across the cloth or membrane media to remove the solids. The disc filters have a nominal pore size of approximately 10 (ten) microns. The water is fed into the center of the drum and dispersed to each of the individual filter discs. The water passes through the media and the solids are captured. The filtered effluent is discharged while the solids captured are collected on the filter media. The disc filters require backwashing with the plant effluent.

   A backwash supply tank is needed to hold plant effluent to backwash the disc filters. Backwash waste from the disc filters is pumped to the aeration basin complex. Sludge from the disc filters is pumped to the Biosolids Storage Tank. Figure 4.1 illustrates the disc filter process.

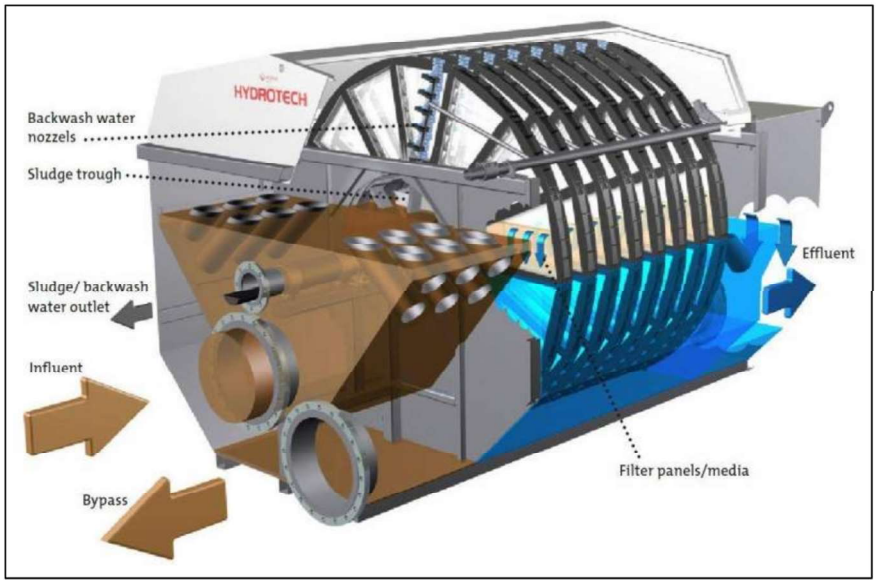


Figure 4.1 – Disc Filtration Unit

Table 4.1 – Disc Filter Design Summary		
Parameter	Kruger Value	WesTech Value
Number of Systems	2 Units	2 Units
Total Filter Area	723 ft^2 per unit	509.1ft^2 per unit
Submerged Filter Area	470 ft^2 per unit	NA
Disc Diameter	2.2 feet	7.87 feet
Peak Firm Hydraulic Loading Rate	4.14 gpm/ft^2	4.6 gpm/ft^2 (one unit off)
Number of Discs per Unit	12	11 / 15
Media Pore Size	10 microns	10 microns
Drive Motor Size	1.5 HP	1.5 HP
Backwash Pump	10 HP	20 HP

Benefits:

a) Small footprint

b) Straight forward operation

Concerns:

c) High doses of ferric chloride can foul the disc media

d) Filtration rate declines over time

e) Requires pilot testing to confirm low level performance capabilities

f) Requires good chemical management

Cost Estimate

g) Kruger and WesTech provided budgetary estimates based on current and design flows and loadings, as seen in Section II. The estimated pricing including process and design engineering, field services, and equipment supply is $586,000 as provided by Kruger. WesTech's cost estimate is $771,000 including the filtration system and a chemical cleaning system.

2. Ultra-Filtration Membranes

Ultra-filtration (UF) membranes are a separation process using membranes with pore sizes in the range of 0.1 to 0.001 micron. Typically, UF membranes will remove high molecular-weight substances, colloidal materials, and organic and inorganic polymeric molecules. Low molecular-weight organics and ions such as sodium, calcium, magnesium chloride, and sulfate are not removed. Because only high-molecular weight species are removed, the pressure differential across the UF Membrane surface is relatively low. The low-pressure differential means it takes less energy and is cost competitive to operate.

For the Montrose treatment system, the final clarifier effluent would be pumped into a feed header for the membrane unit. The header would split the flow into each of the membrane modules which contain thousands of membrane fibers with microscopic pores on the membrane surface. As the water flows through the fibers, particles

greater than 0.04 micron are rejected by the membrane. The particles smaller than 0.04 micron pass through the membrane and then onto further treatment by UV and reaeration before discharge into Mud Lake. The particles rejected by the membrane will be washed off the membranes during the backwash sequence and pumped back to splitter box for the aeration basin complex. Figure 4.2 illustrates an ultrafiltration membrane skid.

Preliminary sizing of the membrane skid is based on information gathered from the manufacturers. Table 4.2 shows the layout parameters as described by Westech. This information is used to develop a cost for a proposed improvement.

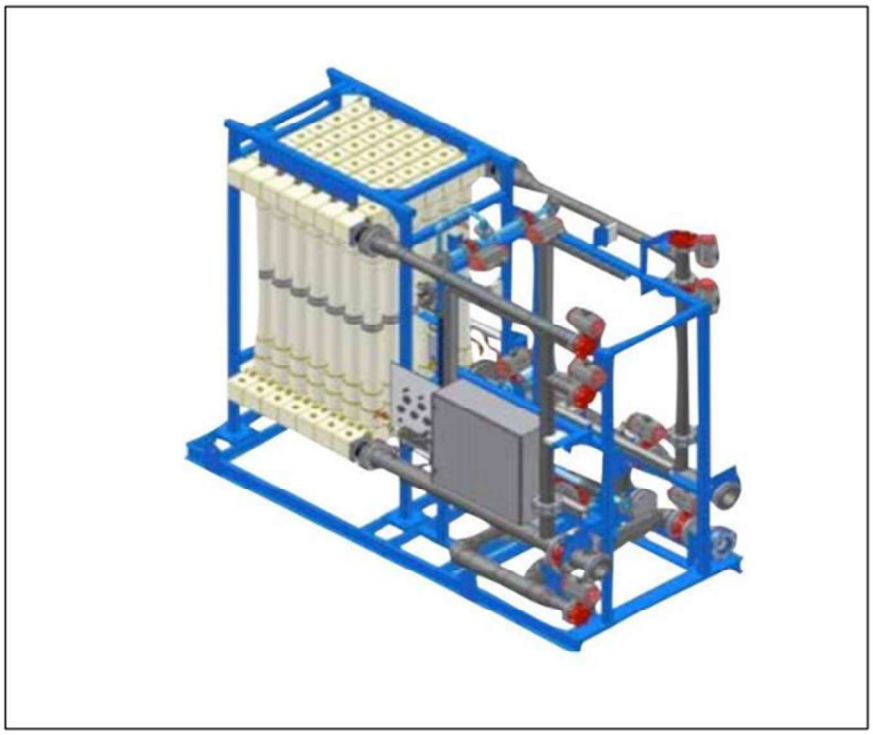


Figure 4.2 – Ultrafiltration Unit

Table 4.2 – Ultra Filter Design Summary	
Parameter	Value
Manufacturer Basis	Westech
Module Units	50
Nominal Membrane Area	969 ft^2
Membrane Area in Operation	96,900 ft^2 (One Unit Off)
Design Flux	39.7 gfd (One Unit Off)

Benefits:

a) Small footprint

b) Best available technology for solids capture

Concerns:

c) High doses of ferric chloride can foul the membrane media

d) Filtration rate declines over time

e) Proprietary technology

f) Requires pilot testing to confirm low level performance capabilities

g) Requires good chemical management

h) Requires highly trained operations staff

Cost Estimate

a) WesTech provided budgetary estimates based on current and design flows and loadings, as seen in Section II. They provided an estimate of $2,115,000.

3. Upflow Sand Filtration/Adsorption

The Upflow Sand Filtration/Adsorption System is a continuous backwash upflow sand filtration system with ferric dosing system for phosphorus removal and filtration. With this filtration system, inlet water is distributed across the cross-sectional area of the filter near the bottom of the media bed. Water flows upward, carrying chemical that also coats the media with hydrous ferric oxide. Media receives its coating, captures contaminants and moves downward in countercurrent flow by gravity to an airlift pump.

The airlift pump transports the TSS and contaminants up into the washbox where the scoured hydrous ferric oxide coating and adsorbed contaminants are separated from the media. Water velocities in the washbox are carefully controlled to carry away the contaminants while allowing the media to fall to the filter bed. The freshly scrubbed media from the washbox is recoated with hydrous ferric oxide (regenerated) as its cycle begins again. Figure 4.3 illustrates the Upflow Sand Filtration system.

Table 4.3 – Upflow Sand Filtration/Adsorption Design Summary		
Parameter	DynaSand Values	Westech Values
Number of Systems	3 modules	9 units
Total Filter Area	600 ft^2 (150ft^2 per filter cell)	576 ft^2
Peak Hydraulic Loading Rate	4.552 gpm/ft^2, 1 cell out of service	4.6 gpm/ft^2 (One Unit Off)

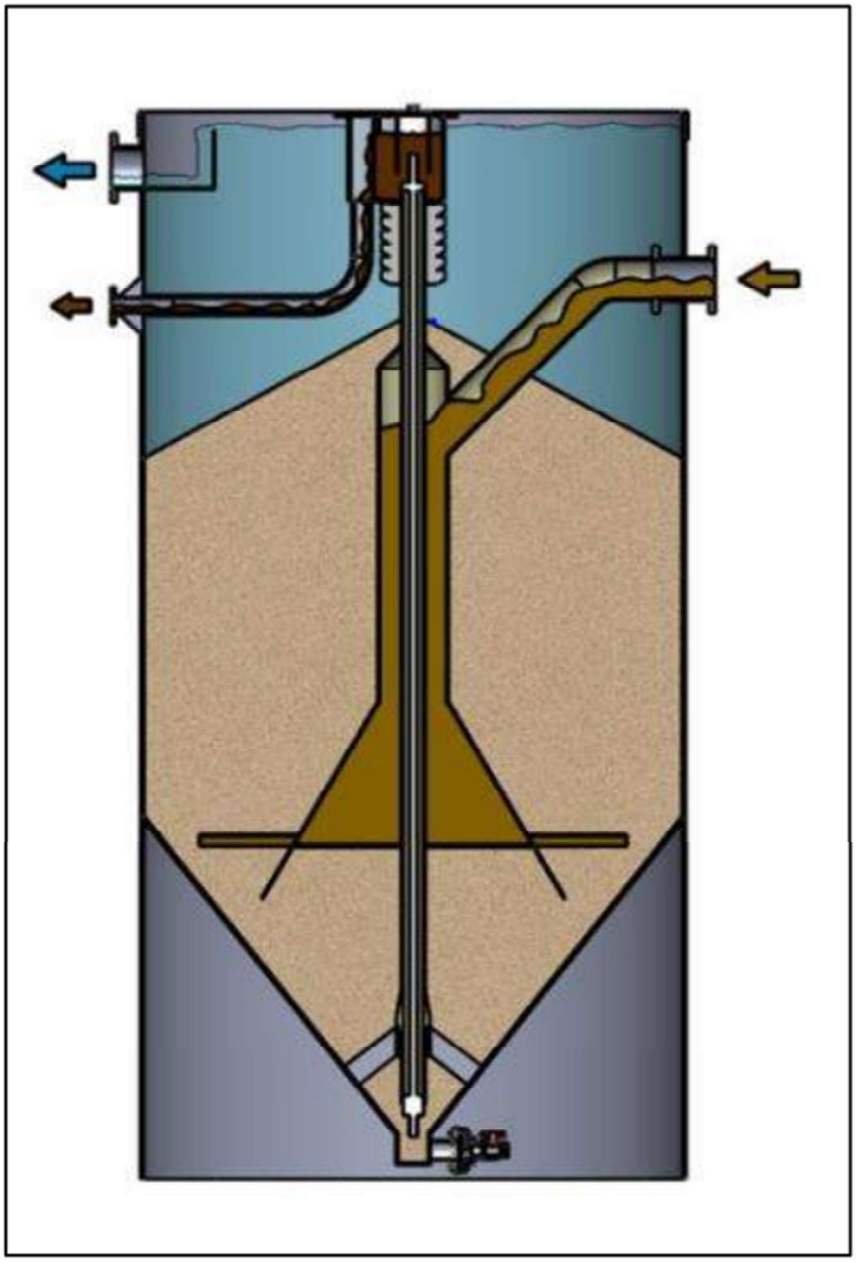


Figure 4.3 – Upflow Sand Filtration System

4. Benefits:
    a) Filtration and adsorption for phosphorus capture
    b) Robust in the face of chemical overdose
5. Concerns:
    a) Requires pilot testing to confirm low level performance capabilities.
    b) Proprietary technology
6. Cost Estimate:
    a) DynaSand and WesTech provided budgetary estimates based on design flows and loadings, as seen in Section II. Their provided budget pricing was $830,00

with $963,942 for installation costs (including concrete, grout, and internals) as provided by DynaSand. WesTech provided an estimate of $553,000.

7. Gravity Sand Filtration

Sand filters use relatively coarse sand and other granular media to remove particles and impurities that have been trapped in a floc. Unfiltered water flows through the filter medium under gravity conditions and the floc material is trapped in the sand matrix.

Sand filters must be cleaned by backwashing which involves reversing the direction of water and adding air scour. During backwashing, the bed is fluidized, and the trapped floc material is washed away. Care must be taken to not wash away the sand media. A backwash supply and a backwash holding tank will be required. Backwash water will be returned to the aeration basin complex at a rate of 100 gallons per minute.

Table 4.4 – Gravity Filter Design Summary	
Parameter	Value
Number of Filter Cells	2 Filters, 3 Cells per Filter
Dimensions	25’ x 10’
Total Filter Area	500 ft^2
Filter Area with one cell out	250 ft^2
Hydraulic Loading Rate	4.1 gpm/ft^2

8. Benefits:
   a) Staff familiar with the technology
   b) Robust in the face of chemical overdose
9. Concerns:
   a) Requires pilot testing to confirm low level performance capabilities
   b) Requires good chemical management
   c) Requires highly trained operations staff
10. Cost Estimate:
   a) WesTech provided budgetary estimates based on current and design flows and loadings, as seen in Section II. The estimated is $1,185,000 as provided by WesTech.

H. Alternative Considered

Based on the discussion of potential treatment options in Section IV, the following options have been identified and will be considered throughout the remainder of this report.

1. Alternative 1 – Extended Aeration Activated Sludge
2. Alternative 2 – Regionalization

I. Alternative 1 – Extended Aeration Activated Sludge

Construction of the extended aeration treatment facility includes the following major process components:

Liquid Stream Processes

1. Rehabilitation of Preliminary Treatment System:
    a) Rehabilitation of Main Lift Station:
        - Install new control cabinet;
        - Install new grinder;
        - Grout corners of wet well;
        - Replace existing raw wastewater pumps.
        - Existing Flow Meter to remain;
        - Grade site to avoid water collecting in wet well and valve vault.
    b) Convert the High Intensity Aeration Ponds into Equalization Ponds
    c) Mechanical Screening
        - Existing mechanical screen to remain.
    d) Grit Removal
        - Install a new combination grit cyclone/classifier unit and associated pipe modifications;
        - Install a grit pump and necessary piping and valves (as needed).
2. Construction of new Secondary Treatment System:
    a) Decommission polishing ponds 3, 4, and 5
    b) New Aeration Basin Structure
        - Cast-in-place concrete, multi-chambered structure;
        - Hydraulic gates to control operation of basins (series vs. parallel flow options);
        - Submerged fine-pore membrane diffusers and associated header piping and valves;
        - Floating dissolved oxygen (DO) sensors;
        - Positive displacement blowers;
        - Cast-in-place concrete splitter structure with aluminum stop gates and appurtenances.
    c) New Rapid Mix Structure
        - Cast-in-place or precast concrete structure;
        - Rapid mixer;
        - Chemical feed lines.
    d) Use Existing Clarifier Splitter Structure
    e) Use Existing and Construct New Final Clarifier
        - Cast-in-place concrete structure;
        - Clarifier mechanism;

- Baffles and weir plates;
- Correct hydraulic limitations.

f) RAS Pumping

- Non-clog horizontal centrifugal pumps;
- Suction/discharge piping and valves.

g) WAS Pumping

h) Rehabilitation to Disinfection System and Building:

- Replace UV disinfection system
- Building modifications
- Chemical feed improvements

i) New Operations Building, to house:

- Aeration blowers;
- RAS and WAS pumps;
- Space provisions for future process pumps;
- Space provision for future aeration blowers;
- Electrical room

Solid Stream Processes

3. Construct a Dewatering with Cake Biosolids System
   a) Construct a new Biosolids Building
   b) Install one of the three dewatering technologies
      - Belt Filter Press
      - Screw Press
      - Centrifuge
   c) Cake storage
   d) Loadout modifications

Miscellaneous

4. New SCADA System
   a) Upgrade existing system to SCADA for better remote system control.
5. General site work
   a) Pave the roads on site.
6. Construct a new garage for storage and vehicles.

J. Alternative 2 – Regionalization

Regionalization with the city of Buffalo is a realistic option for the cities of Montrose and Waverly. The main lift station would need improvements and forcemain construction to connect the two facilities. This includes:

1. Wet well, valve vault, and meter vault structure recoating to reduce groundwater leaking into the structures

2. Replace all lift station piping and appurtenances

3. Install a grinder station prior to the main lift station

4. Site regrading to reduce drainage into the lift station from runoff

5. Convert the high intensity aeration ponds into equalization for high flow events and reroute piping as needed

6. Replace the existing lift station pumps for the new hydraulic conditions

7. Evaluate the most economical forcemain route and install air release and cleanout manholes as necessary

8. Decommission the existing facility

    a) Dispose of biosolids

    b) Remove unused buildings and equipment

    c) Repurpose the space

9. Electrical panels, components, and controls shall be replaced

10. Install a permanent generator

K. Financial Considerations

1. Capital Cost Opinion

Table 4.5 – Alternatives 1 & 2 Capital Cost		
Item	Alternative 1 - Extended Aeration	Alternative 2 - Regionalization
Mobilization, Bonds, & Insurance	$775,000	$775,000
Site Work	$100,000	$100,000
Excavation, Backfill, Pavement, & Finishing	$405,000	
Rehabilitation of Existing Pretreatment Building	$1,000,000	
Decommissioning		$1,000,000
Rehabilitation of Main Lift Station	$108,000	$108,000
Misc. Metals	$570,000	
Aeration	$675,000	
Rapid Mix Mixer	$65,000	
Clarifier Baffles and Louver	$300,000	
RAS	$50,000	
WAS Pumping	$50,000	
Biosolids Dewatering	$8,000,000	
Concrete	$3,380,000	
SCADA	$22,000	
Electrical, Instrumentation and Control	$250,000	$60,000
Garage	$700,000	
Masonry	$655,000	
Architectural (Metals, Carpentry, Doors, Finishes, Roofing)	$225,000	
Existing Building & Structural Renovations	$465,000	
Painting & Coating Systems	$350,000	$15,000
Pumps		$240,000
Piping		$50,000
Forcemain		$4,000,000
Concrete Control Panel		$8,000
Asphalt Paving	$100,000	$75,000
Subtotal	$18,245,000	$6,431,000
Contingency (20%)	$3,649,000	$1,287,000
Construction Subtotal	$21,894,000	$7,718,000
Engineering, Administration, Legal (20%)	$4,379,000	$1,544,000
Total	$26,273,000	$9,262,000
Project Cost Range (+/- 15%)	$22.3M-30.2M	$7.8M-10.6M

V. Recommendations and Implementation

A. General

Previous sections of this report evaluated two main alternatives for wastewater system improvements at the Montrose wastewater treatment facility. This section summarizes these alternatives and provide recommendations for improvements based on both quantitative and qualitative factors, including financial considerations and the overall ability to meet the City of Montrose's long-term treatment needs. Financing options and a proposed implementation schedule are also discussed.

B. Summary of Alternatives

Table 5.1 presents a summary of the two wastewater system improvements alternatives discussed in Section IV. The criteria considered in this summary include both monetary and non-monetary factors. Both alternatives would work well for meeting the current and future treatment needs of Montrose. The primary difference is alternative 1 would involve rehabilitating and expanding the existing facility with continued operations by Montrose staff. Alternative 2 would send all future wastewater to the Buffalo WWTF and Montrose staff would be responsible for the lift station maintenance as defined in the agreement set between each city. The agreement would also define Montrose's capital responsibility for Buffalo's future expansion.

Table 5.1 – Decision Matrix

Item	Alternative 1 – Extended Aeration Activated Sludge	Alternative 2 – Regionalization
Overall Ability to Meet Improvements Needs	Excellent	Excellent
Expandability Potential	Good	Excellent
Ability to meet *Current* Discharge Limits	Excellent	Excellent
Ability to meet *Future* Discharge Limits	Excellent	Excellent
Additional Land Requirement	0 acres	0 acres
Estimated Capital Costs	22.3-30.2M	7.8-10.6M

C. Recommended Alternative

1. Recommended Alternative: Alternative 2 – Regionalization

After careful consideration of all design information, condition of exciting facilities, required effluent limits, and all treatment alternations, Bolton & Menk, Inc. recommends construction and coordination of Alternative 2 – Regionalization. The MPCA encourages regionalization where it is feasible, and an extended aeration treatment facility is a large financial and operational undertaking for the city of Montrose.

D. Financing Options

1. Bonding

The City could sell general obligation, local improvement, or revenue bonds to raise the capital costs to finance the treatment facility improvements. The proceeds of the

bonds would need to be repaid, either through property taxes, assessments, or user charges to the system.

2. Assessment

   A portion of the capital costs of the project can be assessed to local property owners under Minnesota Statue 429. Using this method, a one-time assessment could be levied and repaid over a period of 10 to 20 years. This cost could help offset some monthly increases in user fees and permit use of general obligation bonding.

3. State Revolving Fund Load (through PFA)

   The Clean Water Revolving Fund (CWRF) loan program was created under the State Revolving Fund (SRF) provisions in the Federal Clean Water Act to provide financial assistance for water pollution control projects. Minnesota's revolving loan program provides loans to municipalities for planning, design, and construction of wastewater treatment projects. The loan monies are administered through the Public Facilities Authority. To be eligible for PFA funding, the City must submit a Facilities Plan for review and approval by the Minnesota Pollution Control Agency.

   Revenue for loan repayment is typically generated by user rates, availability charges, or assessment. In recent years, interest rates have been below three percent, and this has proven to be an excellent funding source for this type of project.

4. Rural Development (RD) Loan

   The United States Department of Agriculture (USDA) Office of Rural Development (RD) has a water and waste disposal program that provides low-interest loans and grant money for eligible communities under populations of 10,000.

5. Small Cities Development Program

   The Small Cities Development Program provides federal grants from the US Department of Housing and Urban Development (HUD) to local units of the government on a competitive basis for a variety of community development projects. Eligible applicants include cities and townships with populations under 50,000 and counties with populations under 200,000.

   The proposed project must meet one of the three (3) national objectives:

   Benefit to low and moderately low-income persons;

   Elimination of slum and blight conditions; or

   Elimination of an urgent threat to public health or safety.

   In addition, the proposed activities must be eligible for funding, project needs must be documented, and the general public must be involved in the application preparation.

   Under this program, Small Cities Development Public Facility grants are available for wastewater treatment projects, including collection systems and treatment plants; fresh water projects, including wells, water towers, and distribution systems; storm sewer projects; flood control projects; and occasionally street projects. The maximum grant award for Public Facility project is $600,000. Based on this program's national objectives and the project needs for Montrose, this is likely not an eligible financing source for this project.

6. Wastewater Infrastructure Funding (WIF) Program

   Supplemental assistance to municipalities is currently available through the

wastewater infrastructure (WIF) program. The Public Facilities Authority (PFA) administers the WIF program to those communities that are applying for funding under the Clean Water Revolving Fund loan program or the United States Department of Agriculture Rural Economic and Community Development's (USDA/RECD) Water and Waste Disposal Loans and Grants Program.

Assistance is in the form of zero percent loans, which may be forgiven upon receipt of the notice from MPCA that the project operational performance standards have been met.

This program is income based. Since the proposed project cost would not exceed the City's affordability threshold (calculated as 1.4% of monthly MHI), the project would not be eligible for this financing source.

7. Economic Development Administration

   The Economic Development Administration (EDA) has a grant program, which is used to help communities develop the infrastructure required to attract or maintain businesses or industries. Grant sizes vary depending upon the community's need and the impact the project would have on the community. If the City of Montrose expects to get an industry that provides jobs to its residents and has wastewater treatment needs, the City may be eligible for an EDA Grant, or by leveraging existing industries it could also be eligible. Montrose City staff should discuss this potential to determine whether this program is worth pursuing.

8. Point Source Implementation Grant (PSIG)

   The Point Source Implementation Grant (PSIG) is a grant program to assist and encourage communities to make infrastructure improvements in order to comply with new stringent NPDES permit limits, such as TMDL waste load requirements, phosphorus reduction requirements, and water quality based effluent limits. The program is funded through the Clean Water Legacy Program and is competitive based on scoring from the MPCA under the same criteria as the CWRF. The grant program provides 80% grant on eligible portions of the project up to a maximum of $7 million dollars. Based on the proposed lower phosphorus limit, Montrose may be eligible for this funding source to help finance infrastructure related to phosphorus removal.

   PSIG funding could also potentially be triggered if Montrose were to voluntarily accept new nutrient limits under a regulatory certainty program. Such limits are negotiated on a case-by-case basis, but would likely require the facility to accept the lower phosphorus limit in accordance with RES standards, as well as a total nitrogen limit of 10 mg/L. As part of the agreement, these limits would be locked in for 20 years, preventing more stringent limits from being imposed. However, it may also trigger anti-backsliding, in which the facility may not be able to reverse these voluntary limits if future research on nutrient impacts suggests otherwise.

E. Implementation Schedule

Table 5.2 – Schedule	
Item	**Date**
Submit Facility Plan to MPCA	March 2023
Submit Project Priority List Application	March 2023
Regionalization Discussions	April 2023 – May 2023
Preliminary Design	July 2023
MPCA Certify Facility Plan	June 2023
Final Design	August 2023 – March 2024
MPCA Plan Review	March 2024 – June 2024
Permitting Process	March 2024 – August 2024
Project Bid	Fall 2024
Construction	Fall 2024 – Fall 2025
Initiate Operation	October 2025

Appendix A: Copy of Montrose and Waverly Sanitary Sewer Agreement

Montrose W
m21.32215

COPY

SANITARY SEWER AGREEMENT

CITY OF MONTROSE
CITY OF WAVERLY

AGREEMENT

THIS AGREEMENT made on this 14th day of May, 2002 and entered into by and between the CITY OF MONTROSE, a Minnesota municipal corporation, herein called "Montrose", and the CITY OF WAVERLY, a Minnesota municipal corporation, herein called "Waverly".

RECITALS

A. Montrose owns and operates a Wastewater Treatment Plant, herein called "WWTP", for the treatment of sanitary sewage.

B. Waverly desires to discharge sewage to Montrose for collection and treatment and Montrose agrees to provide such services.

COVENANTS

NOW, THEREFORE, in consideration of the recitals and other mutual obligations of the parties herein expressed, Montrose and Waverly do agree as follows:

1. Term and Terminations

a. Waverly shall have the right for as long as Montrose operates its wastewater treatment plant to use the WWTP for treatment of its sanitary sewage as long as it complies with the provisions of this Agreement or until this Agreement is mutually terminated as otherwise provided herein. In the event Waverly fails to comply with any of the terms and conditions of this Agreement or any Federal, State or local law, regulation or rule governing wastewater disposal, and

Waverly fails to bring itself in compliance within ninety (90) days of receipt of written notice of material noncompliance, this Agreement may be terminated by Montrose.

b. Initial Term and Renewal.

This Agreement shall be for an initial term of twenty (20) years from and after the first day of the first calendar month in which the System is full operational, which date shall be mutually agreed to and appended to this Agreement by certificate executed by both parties. Thereafter, this Agreement shall automatically be extended for additional, consecutive ten year periods, unless at least 180 days prior to the expiration of the initial term, or any extension term, any party shall have given written notice to the other parties of such party's intention to terminate this Agreement, provided however such notice shall be notice of intent only and shall not terminate this Agreement, and no termination of the Agreement shall be effective unless mutually agreed to by the City of Waverly and the City of Montrose.

c. Rights Upon Termination.

No termination of this Agreement shall terminate the rights of either party to indemnification, payment, or other outstanding performance, remedy, or recourse arising with respect to an event, circumstance, or Event of Default occurring or existing prior to the date of termination.

d. The parties agree that this Agreement shall apply to businesses and residences located within the current geographical limits of the City of Montrose and the City of Waverly. In the event Montrose or Waverly extends its geographical boundaries and wishes to provide sanitary sewer

services to said area it shall notify the other party to the Agreement (in writing) of proposed plats in each jurisdiction. Each party to the Agreement must provide the other with copies of all preliminary and final plats. The City Administrator of Montrose will keep an account of capacity allocation in order to ensure capacity availability. Each time a final plat is approved a capacity allocation memorandum will be sent to both parties of the Agreement. The memorandum will inform all parties of remaining capacity in the existing treatment system. Capacity allocation must be available prior to either city approving a final plat.

e. Capacity allocation shall be based upon objective criteria taking into account the most recent information on the remaining capacity of the plant, capacity allocations already made and the strength and flow of the allocated wastes. Capacity allocation shall be available to each City on a first come-first serve basis. At the time that plant capacity reaches 85% the parties shall meet to determine a fair allocation of remaining capacity and expansion of the facility.

f. In the event that an industrial or commercial use is proposed in Waverly which will discharge wastes which exceed normal domestic strength, as defined in Section 4 of this Agreement, prior to approval by Waverly the discharge shall be approved by the Montrose City Engineer who may disapprove the use if he determines that the discharge will adversely affect the treatment facility.

2. Compliance with Applicable Laws

a. Prior to initial connection, Waverly shall adopt, maintain, and enforce the following:

1. An Ordinance providing for sanitary sewer use that is the same as the sanitary sewer and water use ordinances adopted by the City of Montrose. The Ordinance shall include standard building requirements for gas traps, grease traps and flow reduction devices.
2. An Ordinance providing for storm water pollution control for new developments. The Ordinance shall be acceptable to the Minnesota Pollution Control Agency.
3. An Ordinance providing for charges for sanitary sewer use which provides charges equal to the like charges being made in the City of Montrose. All charges associated with the operation, maintenance and debt service for the WWTP shall be the same for both parties to this Agreement.

   Internal wastewater budgets and fees associated with the internal budget are the responsibility of the individual communities.

   Sewer use rates shall be evaluated on a yearly basis by the Rate Committee. The Rate Committee shall be made up of two Council Members and the City Clerk/Administrator of each City. The Rate Committee will make recommendation to the City Councils for rate adjustments required. The recommendations shall be based upon available information regarding the current and future costs for debt retirement, operation, maintenance and repair of the facility. The Committee shall meet once per year prior to the start of the budget process.

Monthly payments shall be made to Montrose from Waverly. The monthly payments shall be based on the flow recorded by the flow meter located at 1st Street and Trunk Highway 12 in Waverly, the required base fee per unit and any sewer access charges (SAC) collected by either party. Payments for services shall be made to Montrose by the 15th of each month.

4. In particular, unless otherwise agreed between the Cities of Montrose and Waverly, any industrial or commercial business connected to the Sanitary Sewer System, must comply with the same regulations, flowage requirements and restrictions as required for a like commercial or industrial business located in the City of Montrose. Any new industrial or commercial business not initially connected to the Montrose WWTP pursuant to this Agreement which discharges waste which exceeds normal domestic strength waste or flow, must be approved by the Montrose City Engineer before it shall be permitted to discharge into the Sanitary Sewer System. Normal domestic strength waste and flow shall be defined as having no fats, wax, grease or oils in excess of 25 mg/l; no strong acids; no radioactive waste; no arsenic or heavy metals; a pH level of less than 9.5 and more than 5.0; a BOD5 concentration of not greater than 250 mg/l; a TSS concentration of not greater than 300 mg/l; a VOC not greater than 1.0 part per million; and/or a flow not greater than 750 gallons per day.

b. In the construction, maintenance, and operation of its sewer system, Montrose and Waverly will be solely responsible for all costs of operation and maintenance of its collection system and will comply with all applicable State & Federal laws.

c. Montrose shall enforce its Sewer Rate and Sewer Use Ordinances at the point of discharge from Waverly into the City sewer system and in addition to its contract and legal remedies shall have the right to refuse to accept or treat sewage if the City Engineer determines that an emergency situation exists resulting from the type of strength of sewage discharged from Waverly and its anticipated detrimental affect on the treatment facility. In the event of any violation of Ordinance which will not detrimentally affect the treatment facility, Waverly shall be given reasonable notice and opportunity to correct any violation.

d. Waverly shall not allow any use from outside its corporate limits to discharge sewage into its sewer system without the prior written approval of Montrose. Septage will only be accepted at the WWTP. Septage haulers must notify Montrose prior to discharge at the WWTP.

3. Initial Construction

a. Waverly will purchase and maintain at its own expense, all sanitary sewer plus all equipment necessary to connect their sanitary sewer to Montrose's WWT system. Waverly shall pay for the construction cost, operation and maintenance cost of the lift station required to pump the sanitary sewage from Waverly to Montrose. All improvements will be constructed by Montrose as part of the overall sewer project.

b. Montrose shall approve the meter type and location for measuring flow from Waverly into Montrose's system. Montrose shall have the right to calibrate the meter and review any calibration work completed by Waverly.

c. Waverly shall be responsible to maintain the sewer connection up to the point of connection to Montrose's system.

d. The City of Montrose will finance the construction of the improvements required for connection to Montrose Sewer System as outlined in Paragraph 3.a. above. Montrose will bill Waverly monthly over a 20 year period at the interest rate charged by the funding agency.

e. Any grant money received will be used to reduce the total project cost and user rates to all customers.

4. Operations

a. All parties will at all times use reasonable and diligent care to keep their sewer systems and water pollution control facilities in good operating conditions. Both Cities shall have a Class B operator on staff. If an operator does not have the appropriate license, he must work at the facility as needed to meet the requirements of certification as outlined by the Minnesota Pollution Control Agency. A certified operator will be allowed to work at the WWTP a sufficient number of hours to maintain his certification.

b. All parts of the WWTP and all records and accounts relating to the matters covered by this Agreement and the applicable sewer ordinances, shall be made available for inspection by any party at any reasonable time.

c. All parties will cooperate with each other in the enforcement of their sewer related ordinances.

d. Both Cities shall share weekend duties as it relates to the operation and maintenance of the WWTP, on an every other weekend rotation.

e. Montrose shall have the right to witness Waverly's sampling process and to take concurrent samples as it deems appropriate.

f. Neither party shall be liable to the other for damages in case of an operational or system failure not due to its negligence or which is caused by an event beyond its control.

5. Remedies

a. In addition to the remedies provided in this Agreement and those normal remedies provided by law for breach of contract, the parties specifically agree that this Agreement may be enforced in a Court of competent jurisdiction by an action to require specific performance.

b. At any time Waverly defaults in making payments due at a specific time, an interest rate (in accordance with current ordinance) shall be added to the payments. In addition to said interest, Montrose may terminate this Agreement and discontinue service to Waverly, if it does not make payment with the time periods specified by Montrose's Ordinance. Said termination shall follow the same procedure specified in Montrose's Sewer Use Ordinance for discontinuation of residential services within the City of Montrose.

c. Infiltration and Inflow

Parties will continue to cooperate with all applicable agencies and in good faith attempt to eliminate infiltration and inflow presently existing in their respective systems.

6. Insurance

a. Montrose and Waverly shall each procure and maintain at their individual expense policies of insurance for worker's compensation, automobiles, damage to their separate property, and general liability.

b. Montrose shall procure and maintain policies of insurance for damage to the WWTP and appurtenances. The cost of such insurance shall be considered a cost of operation within the meaning of Section 2.a.3.

c. Montrose shall defend, indemnify, and hold Waverly harmless from any and all claims arising from Montrose's responsibilities and obligations under the terms of this Agreement, and Montrose shall name Waverly as an additional insured on its policies of liability insurance.

Waverly shall defend, indemnify and hold Montrose harmless from any and all claims arising from Waverly's responsibilities and obligations under the terms of this Agreement, and Waverly shall name Montrose as an additional insured on its policies of liability insurance.

IN WITNESS WHEREOF, the Council of Montrose, by appropriate resolution duly adopted, has caused this Agreement to be executed in its corporate

name by its Mayor and City Clerk/Manager and its corporate seal to be affixed hereto; and the Council of Waverly by appropriate resolution duly adopted has caused this Agreement to be executed in its corporate name by its Mayor and City Clerk and its corporate seal to be affixed hereto, the date and year first above written.

THE CITY OF MONTROSE

By: _____
Mayor

By: _____
City Administrator

THE CITY OF WAVERLY

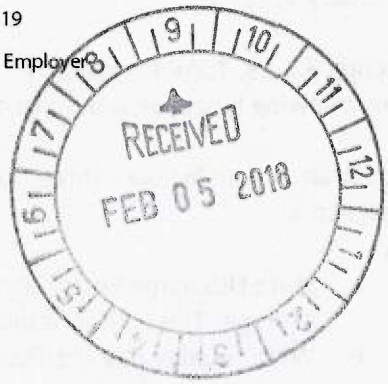
By: _____
Mayor

By: _____
City Clerk

Appendix B: Copy of Current NPDES / SDS Permit

MINNESOTA POLLUTION CONTROL AGENCY

Detroit Lakes Office | 714 Lake Avenue | Suite 220 | Detroit Lakes, MN 56501 | 218-847-1519
800-657-3864 | Use your preferred relay service | info.pca@state.mn.us | Equal Opportunity Employer



February 1, 2018

The Honorable Andrew Kauffman
Mayor, City of Montrose
PO Box 25
Montrose, MN 55363-0025

RE: Final Reissued NPDES/SDS Permit Number MN0024228
Montrose Wastewater Treatment Facility
NPDES/SDS Permit No. MN0024228
T118N, R26W, Section 1, City of Montrose, Wright County, Minnesota

Dear Mayor Kauffman:

Enclosed is the final permit and statement of basis for the facility identified above. The Minnesota Pollution Control Agency (MPCA) has prepared this permit in accordance with Minn. Stat. chs. 115, 115A, and 116, and Minn. R. chs. 7000, 7001, and 7035.

Only the written comment letter from the city of Montrose was received during the 30-day public comment period. The MPCA sent a response to the comments under separate cover. In response to the comments received, the MPCA has made the following changes to your permit:

Section 5.2.5, Salty Discharge Monitoring
The following language will replace Section 5.2.5 in the permit.

Salty Discharge Monitoring
This facility has a continuous discharge where the receiving water stream flow to effluent design flow dilution ratio under low flow conditions is less than 5:1. Therefore, salty discharge monitoring is required.

If monitoring results indicate a reasonable potential to exceed a water quality standard for any of the salty parameters: Chloride, Ca and Mg Hardness as CaCO3, Specific Conductance, Total Dissolved Salts (AKA:solids), Sulfates as SO4, Bicarbonates, Sodium, Calcium, Magnesium, Potassium and Total Salinity at 25 C, the facility will be assigned new effluent limits, as appropriate.

The Permittee may request a reduction in monitoring of these parameters if, after two years of data, the monitoring does not indicate a reasonable potential to exceed a water quality standard. To assist with the analysis of monitoring data, an "Assessing Salty Discharge Monitoring Data..." guidance document and "Mass Balance Calculations Form" can be found on the MPCA Website (www.pca.state.mn.us). If the Permittee chooses to request a reduction in monitoring, an application for a permit modification must be submitted along with a request to reduce the monitoring frequency of the salty discharge parameters. [Minn. R. 7001]

Section 5.5.13, Total Phosphorus
The following language will replace Section 5.5.13 in the permit.

This draft permit includes three total phosphorus limits assigned to the Montrose WWTF. The WWTF is assigned a:

a. State Discharge Restriction (SDR) limit of 1.0 milligrams per liter (mg/L), calendar month average. This limit is based on Minn. R. Ch. 7053.0255, subp. 3.
b. Water quality based effluent limit (WQBEL) of 1,079 kilograms per year (kg/year). This limit is a 12-month moving total to protect for eutrophication impairments in Lake Pepin and is consistent with lake eutrophication standards.
c. WQBEL of 1.3 kilograms per day (kg/day), June – September, calendar month average at SD001. The WQBEL of 1.3 kg/day is based on achieving a long-term (multi-summer) average of 0.62 kg/day, June-September, which is necessary to achieve river eutrophication standards (RES) in the North Fork Crow River. Since the long-term average (0.62 kg/day) is to be achieved over a multi-summer period, the MPCA calculated a monthly limit (1.3 kg/day) that accounts for variability of treatment over time. At the next permit reissuance, the MPCA will evaluate all available data to ensure that RES are met.

Compliance Schedule
Sections 5.7.28 and 5.7.33 both contain the final limit of 1.3 kg/day along with the timeframe of June-September.

Limits and Monitoring
The influent pH monitoring frequency has been corrected to once per week.

If you have any questions regarding any of the terms and conditions of the final permit, please contact Holly Mikkelson at 218-846-8104 or by email at holly.mikkelson@state.mn.us.

Sincerely,

Bill Priebe

This document has been electronically signed.

Bill Priebe
Supervisor
Metro Regional & Infrastructure Financing
Municipal Division

BP/HM:db

Enclosures: Final Permit
Statement of Basis

cc: Quinton White, U.S. EPA Region 5, Chicago (w/enclosures)
Barbara Thwing-Swanson, Montrose City Administrator (w/enclosures)
Sean Diercks, Montrose Public Works Director (w/enclosures)
Brad DeWolf, Bolton & Menk, Willmar (w/enclosures)
Woodland Township Chairperson, Montrose (w/enclosures)

MINNESOTA POLLUTION CONTROL AGENCY

National Pollutant Discharge Elimination System/State Disposal System

MN0024228

Permittee:	City of Montrose
Facility name:	Montrose Wastewater Treatment Facility
Receiving water:	Unnamed ditch - Class 2B, 3C, 4A, 4B, 5, 6 water
City:	Montrose **County:** Wright
Issuance date:	February 1, 2018
Expiration date:	January 31, 2023

The state of Minnesota, on behalf of its citizens through the Minnesota Pollution Control Agency (MPCA), authorizes the Permittee to operate a disposal system at the facility named above and to discharge from this facility to the receiving water named above, in accordance with the requirements of this permit.

The goal of this permit is to reduce pollutant levels in point source discharges and protect water quality in accordance with the U.S. Clean Water Act, Minnesota statutes and rules, and federal laws and regulations.

This permit is effective on the issuance date identified above. This permit expires at midnight on the expiration date identified above.

Signature: Bill Priebe

This document has been electronically signed.

for the Minnesota Pollution Control Agency

Bill Priebe
Supervisor
Metro Regional & Infrastructure Financing
Municipal Division

Submit eDMRs
Submit via the MPCA Online Services Portal at
https://netweb.pca.state.mn.us/private/

Questions on this permit?
For eDMR and other permit reporting issues, contact:
Belinda Nicholas: 651-757-2613

Submit other WQ reports to:
Attention: WQ Submittals Center
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

For specific permit requirements please refer to:
Kaitlin Jamieson: 651-757-2306

Wastewater Permit Program general questions, contact:
MPCA, 651-282-6143 or 1-800-657-3938.

Table of Contents

Page

1. Permitted facility description 3
2. Location map of permitted facility 4
3. Flow diagram 5
4. Summary of stations and station locations 6
5. Permit requirements 7
6. Submittal action summary 27
7. Limits and monitoring 29

1. Permitted facility description

The Montrose Wastewater Treatment Facility (facility) is located at 800 Buffalo Ave S, Montrose, Minnesota 55363, Wright County.

Major components of the facility include:
- Aerated Pond (more than 2 hours)
- Collection system (gravity and/or pressure)
- Disinfection (ultraviolet light)
- Phosphorus Removal (chemical addition)
- Polishing Ponds without aeration
- Preliminary treatment - fine screen
- Preliminary treatment - mechanical bar screen
- Primary treatment - primary stabilization pond
- Secondary Clarification
- Secondary Stabilization Pond
- Solids Disposal - Land Application
- Solids Handling - Storage Tank
- Solids Treatment - Lime Treatment (Class A)
- Solids Treatment - Lime Treatment (Class B)

The City of Waverly and the 12 Hi Estates Mobile Home Park are connected to this Facility.

The Facility is designed for a continuous discharge (SD001) to the Woodland Wildlife Management Area (Class 2D, 3D, 4C, 5, 6 Water) to an unnamed creek (Class 2B, 3C, 4A, 4B, 5, 6 Water) and to treat an average wet weather flow of 0.781 million gallons per day (mgd), 0.411 mgd average dry weather flow, 1.380 mgd peak hourly wet weather flow, 740 pounds per day (114 mg/L) of 5-day carbonaceous biochemical oxygen demand ($CBOD_5$), and 822 pounds per day (126 mg/L) of total suspended solids (TSS).There are no known bypasses in the treatment system.

In accordance with MPCA rules regarding nondegradation for all waters that are not Outstanding Resource Value Waters (ORVW), nondegradation review is required for any new or expanded significant discharge (Minn. R. 7050.0185). A significant discharge is: (1) a new discharge (not in existence before January 1, 1988) that is greater than 200,000 gallons per day to any water other than a Class 7 water or; (2) an expanded discharge that expands by greater than 200,000 gallons per day that discharges to any water other than a Class 7 water or; (3) a new or expanded discharge containing any toxic pollutant at a mass loading rate likely to increase the concentration of the toxicant in the receiving water by greater than one percent over the baseline quality. The flow rate used to determine significance is the design average wet weather flow. The January 1, 1988, design average wet weather flow for this Facility is 0.145 mgd.

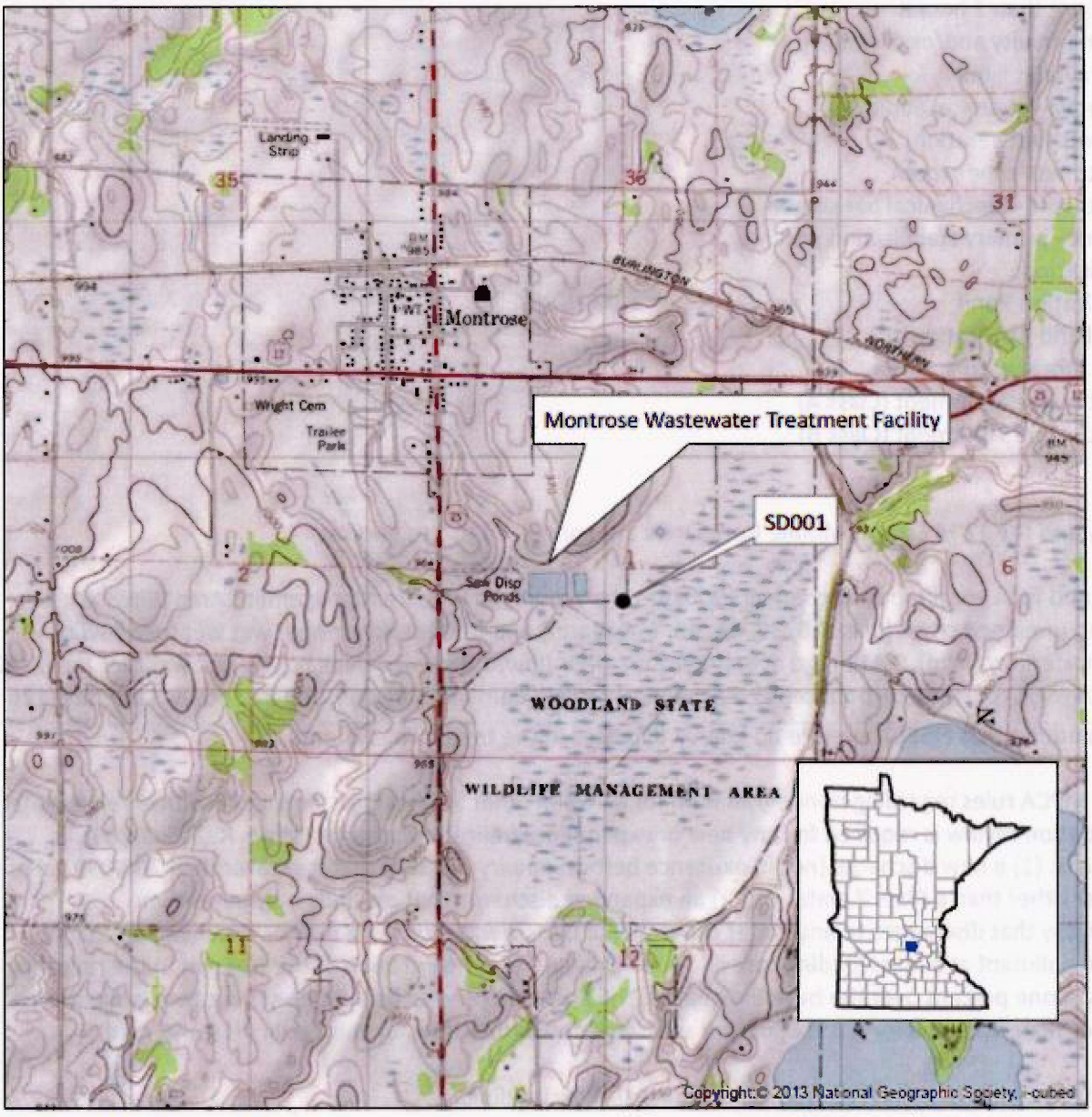
This Permit also complies with Minn. R. 7053.0275 regarding anti-backsliding.

Any point source discharger of sewage, industrial, or other wastes for which a NPDES permit has been issued by the MPCA 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.]

2. Location map of permitted facility

Topographic Map of Permitted Facility

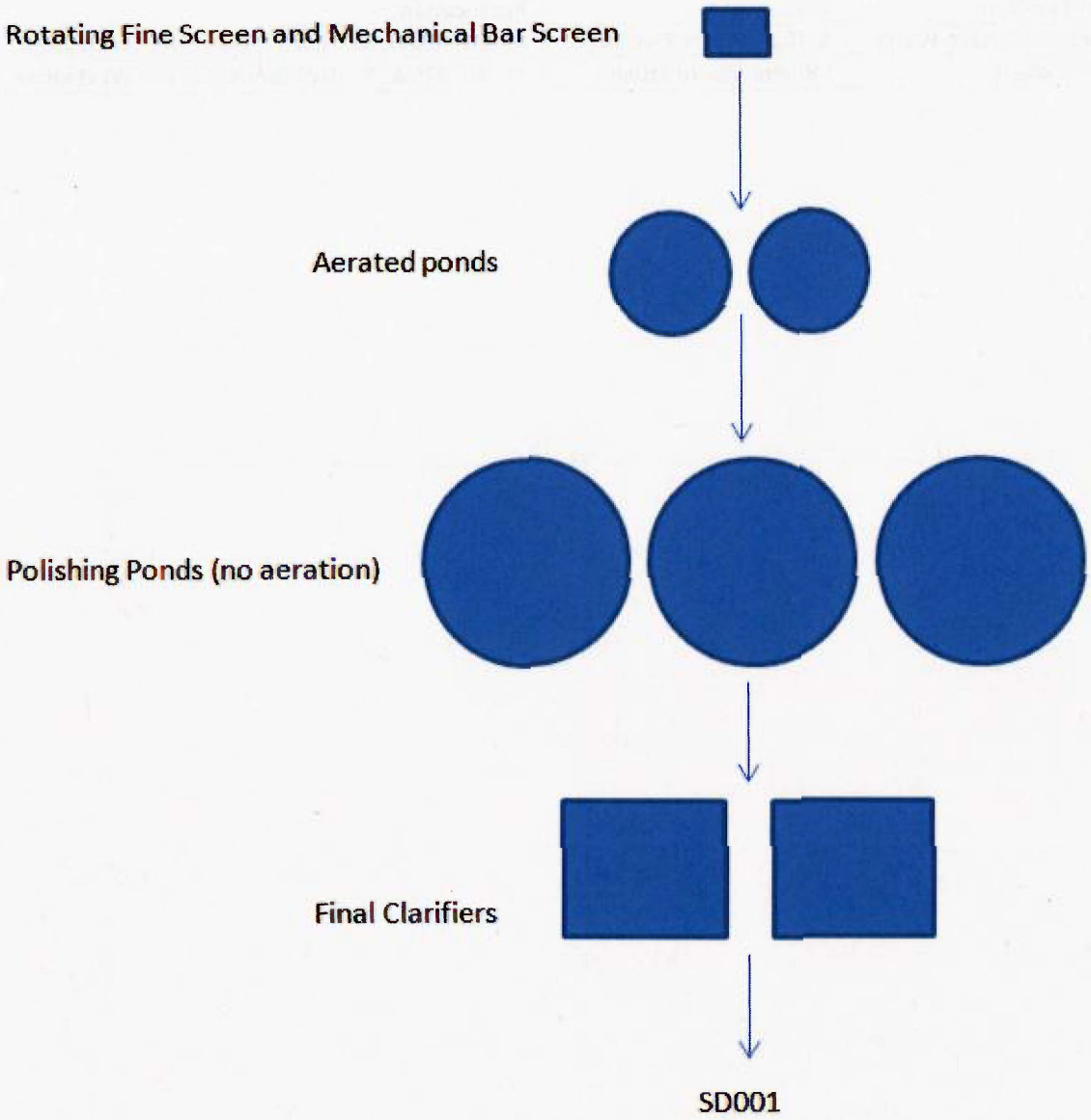
MN0024228: Montrose Wastewater Treatment Facility
T118N, R26W, Section 1
Montrose, Wright County, Minnesota



Map produced by: MPCA Staff, 8/1/2016
Scale: 1:24,000

0 0.25 0.5 1 Miles

3. Flow diagram



4. Summary of stations and station locations

Station	Type of station	Local name	PLS location
SD 001	Effluent To Surface Water	Surface Water Discharge	T118N, R26W, S1, NE Quarter of the SW Quarter
WS 001	Influent Waste	Influent Waste Stream	T118N, R26W, S1, NW Quarter of the SW Quarter

5. Permit requirements

SD 001	**Effluent To Surface Water**	
		Surface Discharge: Class B Minor Facility Effluent Requirements
	5.1.1	The Permittee shall submit a monthly DMR : Due by 21 days after the end of each calendar month following permit issuance. [Minn. R. 7001.0150, Subp. 2(B)]
	5.1.2	Sampling Location. [Minn. R. 7001.0150, Subp. 2(B)]
	5.1.3	Samples for Station SD001 shall be collected after the final treatment unit and be representative of the flow discharged from the facility. [Minn. R. 7001.0150, Subp. 2(B)]
	5.1.4	The Permittee shall submit monitoring results in accordance with the limits and monitoring requirements for this station. If conditions are such that no sample can be acquired, the Permittee shall report "No Flow" or "No Discharge" on Discharge Monitoring Report (DMR) and shall add a Comments attachment to the DMR detailing why the sample was not collected. [Minn. R. 7001.0150, Subp. 2(B)]
		Facility Specific Requirements
	5.2.5	Salty Discharge Monitoring This facility has a continuous discharge where the receiving water stream flow to effluent design flow dilution ratio under low flow conditions is less than 5:1. Therefore, salty discharge monitoring is required. If monitoring results indicate a reasonable potential to exceed a water quality standard for any of the salty parameters: Chloride, Ca and Mg Hardness as CaCO3, Specific Conductance, Total Dissolved Salts (AKA:solids), Sulfates as SO4, Bicarbonates, Sodium, Calcium, Magnesium, Potassium and Total Salinity at 25 C, the facility will be assigned new effluent limits, as appropriate. The Permittee may request a reduction in monitoring of these parameters if, after two years of data, the monitoring does not indicate a reasonable potential to exceed a water quality standard. To assist with the analysis of monitoring data, an "Assessing Salty Discharge Monitoring Data..." guidance document and "Mass Balance Calculations Form" can be found on the MPCA Website (www.pca.state.mn.us). If the Permittee chooses to request a reduction in monitoring, an application for a permit modification must be submitted, along with a request to reduce the monitoring frequency of the salty discharge parameters. [Minn. R. 7001]
	5.2.6	Parameters that have a monitoring frequency of once per quarter and an effective period of Mar, Jun, Sep, Dec may be taken any time during that calendar quarter but must be reported on the designated month's DMR (e.g. the sample for the first calendar quarter of Jan-Mar will be reported on the March DMR). [Minn. R. 7001]
	5.2.7	Dissolved Mercury, Total Mercury, and Total Suspended Solids (grab) have a monitoring frequency of once per year and an effective period of Dec. Samples for these parameters shall be collected in July each year with results reported on the December DMR. [Minn. R. 7001]
WS 001	**Influent Waste**	
		Waste Stream: Class B Minor Facility Influent Requirements
	5.3.1	The Permittee shall submit a monthly DMR : Due by 21 days after the end of each calendar month following permit issuance. [Minn. R. 7001.0150, Subp. 2(B)]
	5.3.2	Sampling Location. [Minn. R. 7001.0150, Subp. 2(B)]
	5.3.3	Samples for Station WS001 shall be taken at a point representative of total influent

		flow to the system. [Minn. R. 7001.0150, Subp. 2(B)]
	5.3.4	The Permittee shall submit monitoring results in accordance with the limits and monitoring requirements for this station. If conditions are such that no sample can be acquired, the Permittee shall report "No Flow" or "No Discharge" on Discharge Monitoring Report (DMR) and shall add a Comments attachment to the DMR detailing why the sample was not collected. [Minn. R. 7001.0150, Subp. 2(B)]
		Facility Specific Requirements
	5.4.5	Parameters that have a monitoring frequency of once per quarter and an effective period of Mar, Jun, Sep, Dec may be taken any time during that calendar quarter but must be reported on the designated month's DMR (e.g. the sample for the first calendar quarter of Jan-Mar will be reported on the March DMR). [Minn. R. 7001]
MN0024228	**Montrose WWTP**	
		Surface Discharge Station General Requirements
	5.5.1	Analysis Requirements. [Minn. R. 7001]
	5.5.2	The pH analyses shall be conducted within 15 minutes of Sample collection. [Minn. R. 7001]
	5.5.3	Representative Samples. [Minn. R. 7001]
	5.5.4	Samples and measurements required by this permit shall be representative of the monitored activity. [Minn. R. 7001]
	5.5.5	Surface Discharge Prohibitions. [Minn. R. 7001]
	5.5.6	Floating solids or visible foam shall not be discharged in other than trace amounts. [Minn. R. 7001]
	5.5.7	Oil or other substances shall not be discharged in amounts that create a visible color film. [Minn. R. 7001]
	5.5.8	The Permittee shall install and maintain outlet protection measures at the discharge stations to prevent erosion. [Minn. R. 7001]
	5.5.9	Winter Sampling Conditions. [Minn. R. 7001]
	5.5.10	The Permittee shall sample flows at the designated monitoring stations including when this requires removing ice to sample the water. If the station is completely frozen throughout a designated sampling month, the Permittee shall check the "No Discharge" box on the Discharge Monitoring Report (DMR) and note the ice conditions in Comments on the DMR. [Minn. R. 7001]
	5.5.11	Phosphorus Limits and Monitoring Requirements. [Minn. R. 7001]
	5.5.12	Phosphorus Calculation Definitions. [Minn. R. 7001]
	5.5.13	"12-Month Moving Average" is a rolling average. To calculate, add all of the monthly average values during the last 12 months and divide by 12. This permit includes three total phosphorus limits assigned to the Montrose WWTP. The WWTP is assigned a: a) State Discharge Restriction (SDR) limit of 1.0 milligrams per liter (mg/L), calendar month average. This limit is based on Minn. R. Ch. 7053.0255, subp. 3. b) Water quality based effluent limit (WQBEL) of 1,079 kilograms per year (kg/year). This limit is a 12-month moving total to protect for eutrophication impairments in Lake Pepin and is consistent with lake eutrophication standards. c) WQBEL of 1.3 kilograms per day (kg/day), June-September, calendar month average at SD001. The WQBEL of 1.3 kg/day is based on achieving a long-term (multi-summer) average of 0.62 kg/day, June-September, which is necessary to achieve river eutrophication standards (RES) in the North Fork Crow River. Since the long-term average (0.62 kg/day) is to be achieved over a multi-summer period, the MPCA calculated a monthly limit (1.3 kg/day) that accounts for variability of treatment over time. At the next permit reissuance, the MPCA will evaluate all available data to

		ensure that RES are met. [Minn. R. 7001]
	5.5.14	Mercury Limits and Monitoring Requirements. [Minn. R. 7001]
	5.5.15	Permittees are required to sample for TSS (grab sample) at the same time that Total/Dissolved Mercury samples are taken. Total Mercury, Dissolved Mercury, and TSS (grab sample) samples shall be collected via grab samples. All results shall be recorded on DMRs. [Minn. R. 7001]
	5.5.16	Total and Dissolved Mercury samples shall be analyzed using the most current versions of EPA Method 1631 with clean techniques method 1669. Should another mercury analytical method that has a reportable quantitation level of <0.5 ng/L that allows for low-level sample characterization be approved by the EPA and certified by an MPCA recognized accreditation body, the method may be used in place of 1631/1669. [Minn. R. 7001]
	5.5.17	Nitrogen Limits and Monitoring Requirements. [Minn. R. 7001]
	5.5.18	"Total Nitrogen" is to be reported as the summation of the Total Kjeldahl Nitrogen and Total Nitrite plus Nitrate Nitrogen values. [Minn. R. 7001]
		Waste Stream Station General Requirements
	5.6.19	Analysis Requirements. [Minn. R. 7001]
	5.6.20	The pH analyses shall be conducted within 15 minutes of Sample collection. [Minn. R. 7001]
	5.6.21	Representative Samples. [Minn. R. 7001]
	5.6.22	Grab and composite samples shall be collected at a point representative of total influent flow to the system. [Minn. R. 7001]
	5.6.23	Nitrogen Limits and Monitoring Requirements. [Minn. R. 7001]
	5.6.24	"Total Nitrogen" is to be reported as the summation of the Total Kjeldahl Nitrogen and Total Nitrite plus Nitrate Nitrogen values. [Minn. R. 7001]
		Compliance Schedule Requirements
	5.7.25	The Montrose Wastewater Treatment Facility's (Facility) discharge is one among several point sources that has been shown to contribute to elevated total phosphorus and chlorophyll-a (Chl-a) concentrations in the North Fork Crow River (NFCR). The phosphorus limits assigned to the Facility (1,079 kg/yr, 12 month moving total & 1.0 mg/L, calendar month average) were assigned to protect for the nutrient impairment in Lake Pepin and in accordance with Minn. R. Ch. 7053.0255, but are not sufficient to protect waters within the NFCR Watershed. As a result, the Facility was assigned a new total phosphorus water quality based effluent limit (WQBEL) of 1.3 mg/L, calendar month average, June - September. This compliance related construction schedule requires the permittee to complete the Facility modifications necessary to achieve compliance with the new limit as soon as possible, but no later than June 30, 2022. The permit (as described in the limits and monitoring section of the permit) includes Phase 1 for the final phosphorus limit as outlined below: Full Permit Cycle 1,079 kg/year, 12 month moving total, Jan-Dec 1.0 mg/L, calendar month average, Jan-Dec Phase 2 1.3 kg/day, calendar month average, Jun-Sep Limit begins January 1, 2019, if no modifications are necessary to meet the final limit. Limit begins June 30, 2023, if modifications are necessary to meet the final limit. The Permittee shall submit a 2017 and 2018 Total Phosphorus Operational and Optimization Implementation Plan, including both actions and estimated timeframes for implementation, for MPCA review. submit a plan : Due by 60 days after permit

		issuance. [Minn. R. 7001]
	5.7.27	The Permittee shall submit a final report of the 2017 and 2018 Operational and Optimization Implementation work and the determination of whether modifications are necessary for the wastewater treatment facility. submit a final report : Due before 01/01/2019. [Minn. R. 7001]
	5.7.28	Should the determination be that no facility modifications are necessary, the final total phosphorus limit of 1.3 kg/day, June-September, will go into effect upon submittal of the final report. Otherwise, the Permittee shall submit a facility plan based off the determination of the Operational and Optimization Implementation final report for MPCA review by March 1, 2019. [Minn. R. 7001]
	5.7.29	If applicable, the Permittee shall submit plans and specifications for the proposed improvements identified in the facility plan for MPCA review and approval by March 1, 2020. [Minn. R. 7001]
	5.7.30	If applicable, the Permittee shall submit a copy of the notice to proceed by December 31, 2020. [Minn. R. 7001]
	5.7.31	If applicable, the Permittee shall submit a notice of completion of construction by December 31, 2021. [Minn. R. 7001]
	5.7.32	If applicable, the Permittee shall initiate operation of the upgraded facility by March 31, 2022. [Minn. R. 7001]
	5.7.33	If applicable, the Permittee shall obtain compliance with the final (Phase 1) total phosphorus effluent limit of 1.3 kg/day, June-September, by June 30, 2022. [Minn. R. 7001]
	5.7.34	If applicable, the Permittee shall send final technical documents to the MPCA by June 30, 2023. [Minn. R. 7001]
	5.7.35	Definitions. [Minn. R. 7001]
	5.7.36	"Initiation of operation" means the date that MPCA determines all components of the wastewater treatment system are complete and functioning and the project begins operating for the purposes for which it was planned, designed, and built. [State Definitions]. [Minn. R. 7001]
	5.7.37	"Completion of construction" means all the construction is complete except for minor weather-related components and conforms to the approved plans and specifications and change orders. [State Definitions]. [Minn. R. 7001]
	5.7.38	"Notice to proceed" means a written notice given by the Permittee to the contractor that affixes the contract effective date and the date that the contractor begins performing the work specified in the contract documents. [State Definitions]. [Minn. R. 7001]
		Mercury Minimization Plan
	5.8.39	The Permittee is required to complete and submit a Mercury Pollutant Minimization Plan (MMP) to the MPCA as detailed in this section. If the Permittee has previously submitted a MMP, it shall update its MMP and submit the updated MMP to the MPCA. The purpose of the MMP is to evaluate collection and treatment systems to determine possible sources of mercury as well as potential mercury reduction options. Guidelines for developing a MMP are detailed in this section. [Minn. R. 7001]
	5.8.40	The specific mercury monitoring requirements are detailed in the limits and monitoring section of this permit. Information gained through the MMP process can be used to reduce mercury concentrations. As part of its mercury control strategy, the Permittee should consider selecting activities based on the potential of those activities to reduce mercury loadings to the wastewater treatment facility. [Minn. R. 7001]
	5.8.41	The Permittee shall submit a mercury pollutant minimization plan : Due by 180 days prior to permit expiration. [Minn. R. 7001]
	5.8.42	At a minimum, the MMP shall include the following:

		a. A summary of mercury influent and effluent concentrations and biosolids monitoring data using the most recent five years of monitoring data, if available. b. Identification of existing and potential sources of mercury concentrations and/or loading to the facility. As appropriate for your facility, you should consider residential, institutional, municipal, and commercial sources (such as dental clinics, hospitals, medical clinics, nursing homes, schools, laundries, and industries with potential for mercury contributions). You should also consider other influent mercury sources, such as stormwater inputs, ground water (inflow & infiltration) inputs, lift station components, and waste streams or sewer tributaries to the wastewater treatment facility. c. An evaluation of past and present WWTF operations to determine those operating procedures that maximize mercury removal. d. A summary of any mercury reduction activities implemented during the last five years. e. A plan to implement mercury management and reduction measures during the next five years. [Minn. R. 7001]
		Pond System
	5.9.43	Ponds - Observations. [Minn. R. 7001]
	5.9.44	The Permittee shall inspect the pond system weekly, and shall take measurements of pond water depth, estimate the coverage of aquatic plants, floating mats and ice cover on the surface of the ponds, and note odors, the condition of the dikes and the presence of muskrats. The Permittee shall maintain records of these weekly inspections for the last three (3) years, and submit the results on the Discharge Monitoring Report (DMR) supplemental form. [Minn. R. 7001.0150, 3(F)]
	5.9.45	The Permittee shall maintain daily precipitation records. [Minn. R. 7001.0150, 3(F)]
		Mechanical System
	5.10.46	Bypass Structures. [Minn. R. 7001]
	5.10.47	All structures capable of bypassing the treatment system shall be manually controlled and kept locked at all times. [Minn. R. 7001.0030]
	5.10.48	Sanitary Sewer Extension Permit. [Minn. R. 7001]
	5.10.49	The Permittee may be required to obtain a Sanitary Sewer Extension Permit from the MPCA for any addition, extension or replacement to the sanitary sewer. If a sewer extension permit is required, construction may not begin until plans and specifications have been submitted and a written permit is granted except as allowed in Minn. Stat. 115.07, Subd. 3(b). [Minn. R. 7001.0020, D]
	5.10.50	Operator Certification. [Minn. R. 7001]
	5.10.51	The Permittee shall provide a Class B state certified operator who is in direct responsible charge of the operation, maintenance and testing functions required to ensure compliance with the terms and conditions of this permit. [Minn. R. 9400]
	5.10.52	The Permittee shall provide the appropriate number of operators with a Type IV certification to be responsible for the land application of biosolids or semisolids from commercial or industrial operations. [Minn. R. 7001]
	5.10.53	If the Permittee chooses to meet operator certification requirements through a contractual agreement, the Permittee shall provide a copy of the contract to the MPCA, WQ Submittals Center. The contract shall include the certified operator's name, certificate number, company name if appropriate, the period covered by the contract and provisions for renewal; the duties and responsibilities of the certified operator; the duties and responsibilities of the permittee; and provisions for notifying the MPCA 30 days in advance of termination if the contract is terminated prior to the expiration date. [Minn. R. 9400]
	5.10.54	The Permittee shall notify the MPCA within 30 days of a change in operator certification or contract status. [Minn. R. 9400]

		Pretreatment: Undelegated Requirements
	5.11.55	Pretreatment - Definitions. [Minn. R. 7049]
	5.11.56	An "Individual Control Mechanism" is a document, such as an agreement or permit, that imposes limitations or requirements on an individual industrial user of the POTW. [Minn. R. 7049]
	5.11.57	"Significant Industrial User" (SIU) means any industrial user that: a. discharges 25,000 gallons per day or more of process wastewater; b. contributes a load of five (5) % or more of the capacity of the POTW; or c. is designated as significant by the Permittee or the MPCA on the basis that the SIU has a reasonable potential to adversely impact the POTW, or the quality of its effluent or residuals. [Minn. R. 7049]
	5.11.58	Pretreatment - Permittee Responsibility to Control Users. [Minn. R. 7049]
	5.11.59	It is the Permittee's responsibility to regulate the discharge from users of its wastewater treatment facility. The Permittee shall prevent any pass through of pollutants or any inhibition or disruption of the Permittee's facility, its treatment processes, or its sludge processes or disposal that contribute to the violation of the conditions of this permit or any federal or state law or regulation limiting the release of pollutants from the POTW. [Minn. R. 7049]
	5.11.60	The Permittee shall prohibit the discharge of the following to its wastewater treatment facility: a. pollutants which create a fire or explosion hazard, including any discharge with a flash point less than 60 degrees C (140 degrees F); b. pollutants which would cause corrosive structural damage to the POTW, including any waste stream with a pH of less than 5.0; c. solid or viscous pollutants which would obstruct flow; d. heat that would inhibit biological activity, including any discharge that would cause the temperature of the waste stream at the POTW treatment plant headwork's to exceed 40 degrees C (104 degrees F); e. pollutants which produce toxic gases, vapors, or fumes that may endanger the health or safety of workers; or f. any pollutant, including oxygen demanding pollutants such as biochemical oxygen demand, released at a flow rate or pollutant concentration that will cause interference or pass through. [Minn. R. 7049]
	5.11.61	The Permittee shall prohibit new discharges of non-contact cooling waters unless there is no cost effective alternative. Existing discharges of non-contact cooling water to the Permittee's wastewater treatment facility shall be eliminated, where elimination is cost-effective, or where an infiltration/inflow analysis and sewer system evaluation survey indicates the need for such removal. [Minn. R. 7049]
	5.11.62	If the Permittee accepts trucked-in wastes, the Permittee shall evaluate the trucked in wastes prior to acceptance in the same manner as it monitors sewered wastes. The Permittee shall accept trucked-in wastes only at specifically designated points. [Minn. R. 7049]
	5.11.63	Pollutant of concern means a pollutant that is or may be discharged by an industrial user that is, or reasonably should be of concern on the basis that it may cause the permittee to violate any permit limits on the release of pollutants. The following pollutants shall be evaluated to determine if they should be pollutants of concern: pollutants limited in this permit, pollutants for which monitoring is required in this permit, pollutants that are likely to cause inhibition of the Permittee's POTW, pollutants which may interfere with sludge disposal, and pollutants for which the Permittee's treatment facility has limited capacity. [Minn. R. 7049]
	5.11.64	Control of Significant Industrial Users. [Minn. R. 7049]

	5.11.65	The Permittee shall impose pretreatment requirements on SIUs which will ensure compliance with all applicable effluent limitations and other requirements set forth in this permit or any federal or state law or regulation limiting the release of pollutants from the POTW. These requirements shall be applied to SIUs by means of an individual control mechanism. [Minn. R. 7049]
	5.11.66	The Permittee shall not knowingly enter into an individual control mechanism with any user that would allow the user to contribute an amount or strength of wastewater that would cause violation of any limitation or requirement in the permit, or any applicable federal, state or local law or regulation. [Minn. R. 7049]
	5.11.67	Monitoring of Significant Industrial Users. [Minn. R. 7049]
	5.11.68	The Permittee shall obtain from SIUs specific information on the quality and quantity of the SIU's discharges to the Permittee's POTW. Except where specifically requested by the Permittee and approved by the MPCA, this information shall be obtained by means of representative monitoring conducted by the Permittee or by the SIU under requirements imposed by the Permittee in the SIU's individual control mechanism. Monitoring performed to comply with this requirement shall include all pollutants for which the SIU is significant and shall be done at a frequency commensurate with the significance of the SIU. [Minn. R. 7049]
	5.11.69	Reporting and Notification. [Minn. R. 7049]
	5.11.70	If a SIU discharges to the facility during a given calendar year, the Permittee shall submit a Pretreatment Annual Report, due by January 31 of the following year. The Pretreatment Annual Report shall be submitted on forms provided by the agency or shall provide equivalent information. The Permittee shall submit the Pretreatment Report to the following address: MPCA Attn: WQ Submittals Center 520 Lafayette Road North St. Paul, MN 55155-4194. [Minn. R. 7049]
	5.11.71	The Pretreatment Annual Report shall be submitted on forms provided by the agency or shall provide equivalent information. The Permittee shall submit the pre-treatment report to the following address: MPCA Attn: WQ Submittals Center 520 Lafayette Road North St. Paul, Minnesota 55155-4194. [Minn. R. 7049]
	5.11.72	The Permittee shall notify the MPCA in writing of any: a. SIU of the Permittee's POTW which has not been previously disclosed to the MPCA; b. anticipated or actual changes in the volume or quality of discharge by an industrial user that could result in the industrial user becoming an SIU as defined in this chapter; or c. anticipated or actual changes in the volume or quality of discharges by a SIU that would require changes to the SIU's required local limits. This notification shall be submitted within 30 days of identifying the IU as a SIU. Where changes are proposed, they shall be submitted prior to changes being made. [Minn. R. 7049]
	5.11.73	Upon notifying the MPCA of a SIU or change in a SIU discharge as required above, the Permittee shall submit the following information on forms provided by the agency or in a comparable format:

		a. the identity of the SIU and a description of the SIU's operation and process; b. a characterization of the SIU's discharge; c. the required local limits that will be imposed on the SIU; d. a technical justification of the required local limits; and e. a plan for monitoring the SIU which is consistent with monitoring requirements in this chapter. [Minn. R. 7049]
	5.11.74	In addition, the Permittee shall, upon request, submit the following to the MPCA for approval: a. additional information on the SIU, its processes and discharge; b. a copy of the individual control mechanism used to control the SIU; c. the Permittee's legal authority to be used for regulating the SIU; and d. the Permittee's procedures for enforcing the requirements imposed on the SIU. [Minn. R. 7049]
	5.11.75	**The permittee shall notify MPCA of any of its industrial users that may be subject to national categorical pretreatment standards. [Minn. R. 7049]**
	5.11.76	This permit may be modified in accordance with Minnesota Rules, ch. 7001 to require development of a pretreatment program approvable under the Federal General Pretreatment Regulation (40 CFR 403). [Minn. R. 7049]
		Biosolids: Land Application
	5.12.77	Authorization. [Minn. R. 7041]
	5.12.78	This permit authorizes the Permittee to store and land apply domestic wastewater treatment biosolids in accordance with the provisions in this chapter and Minnesota Rules, ch. 7041. [Minn. R. 7041]
	5.12.79	**Permittees who prepare bulk biosolids shall obtain approval of the sites on which bulk biosolids are applied before they are applied unless they are Exceptional Quality Biosolids. Site application procedures are set forth in Minn. R. ch. 7041.0800. [Minn. R. 7041.0800]**
	5.12.80	**Compliance Responsibility. [Minn. R. 7041]**
	5.12.81	**The Permittee is responsible for ensuring that the applicable requirements in this chapter and Minn. R. ch. 7041 are met when biosolids are prepared, distributed, or applied to the land. [Minn. R. 7041]**
	5.12.82	**Notification Requirements. [Minn. R. 7041]**
	5.12.83	**The Permittee shall provide information needed to comply with the biosolids requirements of Minn. R. ch. 7041 to others who prepare or use the biosolids. [Minn. R. 7041]**
	5.12.84	**Pollutant Limits. [Minn. R. 7041]**
	5.12.85	Biosolids which are applied to the land shall not exceed the ceiling concentrations in Table 1 and shall not be applied so that the cumulative amounts of pollutant in Table 2 are exceeded. Table 1 Ceiling Concentrations (dry weight basis) Parameter in units mg/kg Arsenic 75 Cadmium 85 Copper 4300 Lead 840 Mercury 57 Molybdenum 75 Nickel 420 Selenium 100 Zinc 7500

		Table 2 Cumulative Loading Limits Parameter in units lbs/acre Arsenic 37 Cadmium 35 Copper 1339 Lead 268 Mercury 15 Molybdenum not established* Nickel 375 Selenium 89 Zinc 2500 *The cumulative limit for molybdenum has not been established at the time of permit issuance. [Minn. R. 7041.1100]
	5.12.86	Pathogen and Vector Attraction Reduction. [Minn. R. 7041]
	5.12.87	Biosolids shall be processed, treated, or be incorporated or injected into the soil to meet one of the vector attraction reduction requirements in Minnesota Rules, pt. 7041.1400. [Minn. R. 7041.1400]
	5.12.88	Biosolids shall be processed or treated by one of the alternatives in Minnesota Rules, pt. 7041.1300 to meet the Class A or Class B standards for the reduction of pathogens. When Class B biosolids are applied to the land, the site restrictions in Minnesota Rules, pt. 7041.1300 shall also be met. [Minn. R. 7041.1300]
	5.12.89	The minimum duration between application and harvest, grazing or public access to areas where Class B biosolids have been applied to the land is as follows: a. 14 months for food crops whose harvested parts may touch the soil/biosolids mixture (such as melons, squash, tomatoes, etc.), when biosolids are surface applied, incorporated or injected. b. 20 months or 38 months depending on the application method for food crops whose harvested parts grow in the soil (such as potatoes, carrots, onions, etc.). The 20 month time period is required when biosolids are surface applied or surface applied and incorporated after they have been on the soil surface for at least four (4) months. The 38 month time period is required when the biosolids are injected or surface applied and incorporated within four (4) months of application. c. 30 days for feed crops, other food crops (such as field corn, sweet corn, etc.), hay or fiber crops when biosolids are surface applied, incorporated or injected. d. 30 days for grazing of animals when biosolids are surface applied, incorporated or injected. e. One year where there is a high potential for public contact with the site, (such as a reclamation site located in populated areas, a construction site located in a city, turf farms, plant nurseries, etc.) and 30 days where there is low potential for public contact (such as agricultural land, forest, a reclamation site located in an unpopulated area, etc.) when biosolids are surface applied, incorporated, or injected. [Minn. R. 7041]
	5.12.90	Management Practices. [Minn. R. 7041]
	5.12.91	The management practices for the land application of biosolids are described in detail in Minn. R. ch. 7041.1200 and shall be followed unless specified otherwise in a site approval letter or a permit issued by the MPCA. [Minn. R. 7041.1200]
	5.12.92	Overall management requirements: a. Biosolids shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under Section 4 of the Endangered Species Act or its designated critical habitat. b. Biosolids shall not be applied to flooded, frozen or snow covered ground so that the biosolids enter wetlands or other waters of the state.

		c. Biosolids shall be applied at an agronomic rate unless specified otherwise by the MPCA in a permit. d. Biosolids shall not be applied within 33 feet of a wetland or waters of the state unless specified otherwise by the MPCA in a permit. [Minn. R. 7041]
	5.12.93	Monitoring Requirements. [Minn. R. 7041]
	5.12.94	Representative samples of biosolids applied to the land shall be analyzed by methods specified in Minnesota Rule pt. 7041.3200 for the following parameters: arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, Kjeldahl nitrogen, ammonia nitrogen, total solids, volatile solids, phosphorus, potassium and pH. [Minn. R. 7041.3200]
	5.12.95	At a minimum, biosolids shall be monitored at the frequencies specified in Table 3 for the parameters listed above, and any pathogen or vector attraction reduction requirements in Minnesota Rules, pts. 7041.1300 and 7041.1400 if used to determine compliance with those parts. Table 3 Minimum Sampling Frequencies Biosolids Applied* Biosolids Applied* Frequency (metric tons/365-day period) (tons/365-day period) (times/365-day period) >0 but <290 >0 but <320 1 >=290 but <1,500 >=320 but <1,650 4 >=1,500 but <15,000 >=1,650 but <16,500 6 >=15,000 >=16,500 12 * Either the amount of bulk biosolids applied to the land or the amount of biosolids received by a person who prepares biosolids that are sold or given away in a bag or other container for application to the land (dry weight basis). [Minn. R. 7041.1300, Minn. R. 7041.1400]
	5.12.96	Representative samples of biosolids that are transferred to storage units and are stored for more than two years shall be analyzed by methods specified in Minnesota Rule pt. 7041.3200 for each cropping year they are stored for the following parameters: arsenic, cadmium, copper, lead, molybdenum, nickel, selenium, and zinc. Mercury is specifically NOT included in the stored biosolids analysis because of the short holding time [28 days] required between sampling and analysis. [Minn. R. 7041.3200]
	5.12.97	Increased sampling frequencies are specified for the parameters listed in Table 4. Sampling at a frequency at twice the minimum frequencies in Table 3 is required if concentrations listed in Table 4 are exceeded (based on the average of all analyses made during the previous cropping year). Table 4 Increased Frequency of Sampling Parameter (mg/kg dry weight basis) Arsenic 38 Cadmium 43 Copper 2150 Lead 420 Mercury 28 Molybdenum 38 Nickel 210 Selenium 50 Zinc 3750. [Minn. R. 7041]

	5.12.98	Records. [Minn. R. 7041]
	5.12.99	The Permittee shall keep records of the information necessary to show compliance with pollutant concentrations and loadings, pathogen reduction requirements, vector attraction reduction requirements and management practices as specified in Minnesota Rules, pt. 7041.1600, as applicable to the quality of biosolids produced. [Minn. R. 7041.1600]
	5.12.100	Reporting Requirements. [Minn. R. 7041]
	5.12.101	The Permittee shall submit a biosolids annual report : Due annually, by the 31st of December on a form provided by or approved by the MPCA. The report shall include the requirements in Minnesota Rules, part 7041.1700. [Minn. R. 7041.1700]
	5.12.102	The permittee shall submit a Biosolids Annual Report by December 31 of each year for biosolids storage and/or transfer activities occurring during the cropping year previous to December 31. The report shall indicate whether or not biosolids were transferred and/or stored. If biosolids were transferred, the report shall describe how much was transferred, where it was transferred to, the name of the facility that accepted the transfer and the contact person at that facility. "Cropping year" means a year beginning on September 1 of the year prior to the growing season and ending August 31 the year the crop is harvested. For example, the 2012 cropping year began September 1, 2011, and ended August 31, 2012. [Minn. R. 7041]
	5.12.103	For biosolids that are stored for more than two years, the Biosolids Annual Report shall also include the analytical data from the representative sample of the biosolids generated during the cropping year. [Minn. R. 7041]
	5.12.104	The Permittee shall submit the Biosolids Annual Report to: MPCA Submittals Center, Minnesota Pollution Control Agency, 520 Lafayette Road North, St Paul Minnesota 551554194. [Minn. R. 7041]
	5.12.105	The Permittee shall notify the MPCA in writing when 90 percent or more of any of the cumulative pollutant loading rates listed for any Land Application Sites has been reached for a site. [Minn. R. 7041]
		Industrial Stormwater No Exposure Exclusion
	5.13.106	Conditional Exclusion for No Exposure. [Minn. R. 7001]
	5.13.107	No exposure means all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snow melt, and/or runoff. Industrial activities or materials include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. [Minn. R. 7090]
	5.13.108	The conditional exclusion for No Exposure is available on a facility-wide basis in accordance with G158.3060, subp. 5(B). [Minn. R. 7090]
	5.13.109	The no exposure certification is non-transferrable in accordance with G158.3060, subp. 5(D). In the event that the facility operator changes, then the new operator shall submit written notification of the change to the MPCA, Attn: WQ Submittal Center, 520 Lafayette Road North, St Paul, Minnesota 55155-4194. [Minn. R. 7090]
	5.13.110	The MPCA retains the authority to require the facility operator to apply for a permit modification to this permit for stormwater coverage or to apply for coverage under the Industrial Stormwater General Permit (MNR050000), even when an industrial operator certifies No Exposure, if the MPCA has determined that the discharge is contributing to the violation of, or interfering with the attainment or maintenance of water quality standards, including designated uses. [Minn. R. 7090]
	5.13.111	Any facility that has previously obtained a conditional exclusion for No Exposure shall recertify for the exclusion no later than five years from the effective date of the most recent No Exposure certificate issued to the facility by the Agency. [Minn. R. 7090]
	5.13.112	The No Exposure exclusion is conditional. The facility shall maintain a condition of No Exposure at the facility in order for the No Exposure exclusion to remain applicable. In the event of any change or circumstance that causes exposure of industrial activities

		or materials to stormwater, the facility shall comply with the stormwater requirements of this chapter. [Minn. R. 7090]
	5.13.113	Based on the information submitted with the permit application, the Agency has determined the Permittee meets the exclusion criteria for "No Exposure" in accordance with Minnesota Rules Chapter 7090.3060. [Minn. R. 7090]
		Total Facility Requirements (NPDES/SDS)
	5.14.114	Definitions. Refer to the 'Permit Users Manual' found on the MPCA website (www.pca.state.mn.us) for standard definitions. [Minn. R. 7001.]
	5.14.115	Incorporation by Reference. The following applicable federal and state laws are incorporated by reference in this permit, are applicable to the Permittee, and are enforceable parts of this permit: 40 CFR pts. 122.41, 122.42, 136, 403 and 503; Minn. R. pts. 7001, 7041, 7045, 7050, 7052, 7053, 7060, and 7080; and Minn. Stat. ch. 115 and 116. [Minn. R. 7001]
	5.14.116	Permittee Responsibility. The Permittee shall perform the actions or conduct the activity authorized by the permit in compliance with the conditions of the permit and, if required, in accordance with the plans and specifications approved by the Agency. [Minn. R. 7001.0150, subp. 3(E)]
	5.14.117	Toxic Discharges Prohibited. Whether or not this permit includes effluent limitations for toxic pollutants, the Permittee shall not discharge a toxic pollutant except according to Code of Federal Regulations, Title 40, sections 400 to 460 and Minnesota Rules 7050, 7052, 7053 and any other applicable MPCA rules. [Minn. R. 7001.1090, subp. 1(A)]
	5.14.118	Nuisance Conditions Prohibited. The Permittee's discharge shall not cause any nuisance conditions including, but not limited to: floating solids, scum and visible oil film, acutely toxic conditions to aquatic life, or other adverse impact on the receiving water. [Minn. R. 7050.0210, subp. 2]
	5.14.119	Property Rights. This permit does not convey a property right or an exclusive privilege. [Minn. R. 7001.0150, subp. 3(C)]
	5.14.120	Liability Exemption. In issuing this permit, the state and the MPCA assume no responsibility for damage to persons, property, or the environment caused by the activities of the Permittee in the conduct of its actions, including those activities authorized, directed, or undertaken under this permit. To the extent the state and the MPCA may be liable for the activities of its employees, that liability is explicitly limited to that provided in the Tort Claims Act. [Minn. R. 7001.0150, subp. 3(O)]
	5.14.121	The MPCA's issuance of this permit does not obligate the MPCA to enforce local laws, rules, or plans beyond what is authorized by Minnesota Statutes. [Minn. R. 7001.0150, subp. 3(D)]
	5.14.122	Liabilities. The MPCA's issuance of this permit does not release the Permittee from any liability, penalty or duty imposed by Minnesota or federal statutes or rules or local ordinances, except the obligation to obtain the permit. [Minn. R. 7001.0150, subp. 3(A)]
	5.14.123	The issuance of this permit does not prevent the future adoption by the MPCA of pollution control rules, standards, or orders more stringent than those now in existence and does not prevent the enforcement of these rules, standards, or orders against the Permittee. [Minn. R. 7001.0150, subp. 3(B)]
	5.14.124	Severability. The provisions of this permit are severable and, if any provisions of this permit or the application of any provision of this permit to any circumstance are held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby. [Minn. R. 7001]
	5.14.125	Compliance with Other Rules and Statutes. The Permittee shall comply with all applicable air quality, solid waste, and hazardous waste statutes and rules in the operation and maintenance of the facility. [Minn. R. 7001]
	5.14.126	Inspection and Entry. When authorized by Minn. Stat. ch. 115.04; 115B.17, subd. 4;

		and 116.091, and upon presentation of proper credentials, the agency, or an authorized employee or agent of the agency, shall be allowed by the Permittee to enter at reasonable times upon the property of the Permittee to examine and copy books, papers, records, or memoranda pertaining to the construction, modification, or operation of the facility covered by the permit or pertaining to the activity covered by the permit; and to conduct surveys and investigations, including sampling or monitoring, pertaining to the construction, modification, or operation of the facility covered by the permit or pertaining to the activity covered by the permit. [Minn. R. 7001.0150, subp. 3(I)]
	5.14.127	Control Users. The Permittee shall regulate the users of its wastewater treatment facility so as to prevent the introduction of pollutants or materials that may result in the inhibition or disruption of the conveyance system, treatment facility or processes, or disposal system that would contribute to the violation of the conditions of this permit or any federal, state or local law or regulation. [Minn. R. 7001.0150, subp. 3(F)]
	5.14.128	Sampling. [Minn. R. 7001]
	5.14.129	Representative Sampling. Samples and measurements required by this permit shall be conducted as specified in this permit and shall be representative of the discharge or monitored activity. [40 CFR 122.41(j)(1)]
	5.14.130	Additional Sampling. If the Permittee monitors more frequently than required, the results and the frequency of monitoring shall be reported on the Discharge Monitoring Report (DMR) or another MPCA-approved form for that reporting period. [Minn. R. 7001.1090, subp. 1(E)]
	5.14.131	Certified Laboratory. A laboratory certified by the Minnesota Department of Health and/or registered by the MPCA shall conduct analyses required by this permit. Analyses of dissolved oxygen, pH, temperature, specific conductance, and total residual oxidants (chlorine, bromine) do not need to be completed by a certified laboratory but shall comply with manufacturers specifications for equipment calibration and use. [Minn. R. 4740.2010, Minn. R. 4740.2050 through 2120]
	5.14.132	Sample Preservation and Procedure. Sample preservation and test procedures for the analysis of pollutants shall conform to 40 CFR Part 136 and Minn. R. 7041.3200. [40 CFR 136, Minn. R. 7041.3200]
	5.14.133	Equipment Calibration: Flow meters, pumps, flumes, lift stations or other flow monitoring equipment used for purposes of determining compliance with permit shall be checked and/or calibrated for accuracy at least twice annually. [Minn. R. 7001.0150, 2(B and C)]
	5.14.134	Maintain Records. The Permittee shall keep the records required by this permit for at least three years, including any calculations, original recordings from automatic monitoring instruments, and laboratory sheets. The Permittee shall extend these record retention periods upon request of the MPCA. The Permittee shall maintain records for each sample and measurement. The records shall include the following information: a. the exact place, date, and time of the sample or measurement; b. the date of analysis; c. the name of the person who performed the sample collection, measurement, analysis, or calculation; d. the analytical techniques, procedures and methods used; and e. the results of the analysis. [Minn. R. 7001.0150, 2(C)]
	5.14.135	Completing Reports. The Permittee shall submit the results of the required sampling and monitoring activities on the forms provided, specified, or approved by the MPCA. The information shall be recorded in the specified areas on those forms and in the units specified. Required forms may include DMR Supplemental/Sample Value Form Individual values

		for each sample and measurement shall be recorded on the DMR Supplemental/Sample Value Form which, if required, will be provided by the MPCA. DMR Supplemental/Sample Value Forms shall be submitted with the appropriate DMRs. You may design and use your own supplemental form; however it shall be approved by the MPCA. Note: Required summary information shall also be recorded on the DMR. Summary information that is submitted ONLY on the DMR Supplemental/Sample Value Form does not comply with the reporting requirements. [Minn. R. 7001.1090, 1(D), Minn. R. 7001.150, 2(B)]
	5.14.136	Submitting Reports. DMRs and Supplementals shall be submitted to: MPCA, Attn: Discharge Monitoring Reports, 520 Lafayette Road North, St Paul Minnesota 551554194. DMRs, DMR supplemental forms and related attachments may be electronically submitted via the MPCA Online Services Portal after authorization is approved. When electronically submitted, the paper DMR submittal requirement is waived. DMRs and DMR Supplemental Forms shall be postmarked or electronically submitted by the 21st day of the month following the sampling period or as otherwise specified in this permit. Electronic DMR submittal shall be complete on or before 11:59 PM of the 21st day of the month following the sampling period or as otherwise specified in this permit. A DMR shall be submitted for each required station even if no discharge occurred during the reporting period. Other reports required by this permit shall be postmarked by the date specified in the permit to: MPCA, Attn: WQ Submittals Center, 520 Lafayette Road North, St Paul Minnesota 551554194. [Minn. R. 7001.0150, 2(B), Minn. R. 7001.150, 3(H)]
	5.14.137	Incomplete or Incorrect Reports. The Permittee shall immediately submit an electronically amended report or DMR to the MPCA upon discovery by the Permittee or notification by the MPCA that it has submitted an incomplete or incorrect report or DMR. The amended report or DMR shall contain the missing or corrected data along with a cover letter explaining the circumstances of the incomplete or incorrect report. If it is impossible to electronically amend the report or DMR, the Permittee shall immediately notify the MPCA and the MPCA will provide direction for the amendment submittals. [Minn. R. 7001.0150, 3(G)]
	5.14.138	Required Signatures. All DMRs, forms, reports, and other documents submitted to the MPCA shall be signed by the Permittee or the duly authorized representative of the Permittee. Minn. R. 7001.0150, subp. 2, item D. The person or persons that sign the DMRs, forms, reports or other documents shall certify that he or she understands and complies with the certification requirements of Minn. R. 7001.0070 and 7001.0540, including the penalties for submitting false information. Technical documents, such as design drawings and specifications and engineering studies required to be submitted as part of a permit application or by permit conditions, shall be certified by a registered professional engineer. [Minn. R. 7001.0540]
	5.14.139	Detection Level. The Permittee shall report monitoring results below the reporting limit (RL) of a particular instrument as "<" the value of the RL. For example, if an instrument has a RL of 0.1 mg/L and a parameter is not detected at a value of 0.1 mg/L or greater, the concentration shall be reported as "<0.1 mg/L." "Non-detected," "undetected," "below detection limit," and "zero" are unacceptable reporting results, and are permit reporting violations. Where sample values are less than the level of detection and the permit requires reporting of an average, the Permittee shall calculate the average as follows: a. If one or more values are greater than the level of detection, substitute zero for all

		nondetectable values to use in the average calculation. b. If all values are below the level of detection, report the averages as "<" the corresponding level of detection. c. Where one or more sample values are less than the level of detection, and the permit requires reporting of a mass, usually expressed as kg/day, the Permittee shall substitute zero for all nondetectable values. [Minn. R. 7001.0150, 2(B)]
	5.14.140	Records. The Permittee shall, when requested by the Agency, submit within a reasonable time the information and reports that are relevant to the control of pollution regarding the construction, modification, or operation of the facility covered by the permit or regarding the conduct of the activity covered by the permit. [Minn. R. 7001.0150, 3(H)]
	5.14.141	Confidential Information. Except for data determined to be confidential according to Minn. Stat. ch. 116.075, subd. 2, all reports required by this permit shall be available for public inspection. Effluent data shall not be considered confidential. To request the Agency maintain data as confidential, the Permittee shall follow Minn. R. 7000.1300. [Minn. R. 7000.1300]
	5.14.142	Noncompliance and Enforcement. [Minn. R. 7001]
	5.14.143	Subject to Enforcement Action and Penalties. Noncompliance with a term or condition of this permit subjects the Permittee to penalties provided by federal and state law set forth in section 309 of the Clean Water Act; United States Code, title 33, section 1319, as amended; and in Minn. Stat. ch. 115.071 and 116.072, including monetary penalties, imprisonment, or both. [Minn. R. 7001.1090, 1(B)]
	5.14.144	Criminal Activity. The Permittee may not knowingly make a false statement, representation, or certification in a record or other document submitted to the Agency. A person who falsifies a report or document submitted to the Agency, or tampers with, or knowingly renders inaccurate a monitoring device or method required to be maintained under this permit is subject to criminal and civil penalties provided by federal and state law. [Minn. R. 7001.0150, 3(G), Minn. R. 7001.1090, 1(G and H), Minn. Stat. ch. 609.671, 1]
	5.14.145	Noncompliance Defense. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. [40 CFR 122.41(c)]
	5.14.146	Effluent Violations. If sampling by the Permittee indicates a violation of any discharge limitation specified in this permit, the Permittee shall immediately make every effort to verify the violation by collecting additional samples, if appropriate, investigate the cause of the violation, and take action to prevent future violations. If the permittee discovers that noncompliance with a condition of the permit has occurred which could endanger human health, public drinking water supplies, or the environment, the Permittee shall within 24 hours of the discovery of the noncompliance, orally notify the commissioner and submit a written description of the noncompliance within 5 days of the discovery. The written description shall include items a. through e., as listed below. If the Permittee discovers other non-compliance that does not explicitly endanger human health, public drinking water supplies, or the environment, the non-compliance shall be reported during the next reporting period to the MPCA with its Discharge Monitoring Report (DMR). If no DMR is required within 30 days, the Permittee shall submit a written report within 30 days of the discovery of the noncompliance. This description shall include the following information: a. a description of the event including volume, duration, monitoring results and receiving waters; b. the cause of the event; c. the steps taken to reduce, eliminate and prevent reoccurrence of the event; d. the exact dates and times of the event; and e. steps taken to reduce any adverse impact resulting from the event. [Minn. R.

		7001.150, 3(K)]
	5.14.147	Upset Defense. In the event of temporary noncompliance by the Permittee with an applicable effluent limitation resulting from an upset at the Permittee's facility due to factors beyond the control of the Permittee, the Permittee has an affirmative defense to an enforcement action brought by the Agency as a result of the noncompliance if the Permittee demonstrates by a preponderance of competent evidence: a. the specific cause of the upset; b. that the upset was unintentional; c. that the upset resulted from factors beyond the reasonable control of the Permittee and did not result from operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or increases in production which are beyond the design capability of the treatment facilities; d. that at the time of the upset the facility was being properly operated; e. that the Permittee properly notified the Commissioner of the upset in accordance with Minn. R. 7001.1090, subp. 1, item I; and f. that the Permittee implemented the remedial measures required by Minn. R. 7001.0150, subp. 3, item J. [Minn. R. 7001.1090]
	5.14.148	Release. [Minn. R. 7001]
	5.14.149	Unauthorized Releases of Wastewater Prohibited. Except for discharges from outfalls specifically authorized by this permit, overflows, discharges, spills, or other releases of wastewater or materials to the environment, whether intentional or not, are prohibited. However, the MPCA will consider the Permittee's compliance with permit requirements, frequency of release, quantity, type, location, and other relevant factors when determining appropriate action. [40 CFR 122.41, Minn. Stat. ch. 115.061]
	5.14.150	Discovery of a release. Upon discovery of a release, the Permittee shall: a. Take all reasonable steps to immediately end the release. b. Notify the Minnesota Department of Public Safety Duty Officer at 1(800)422-0798 or (651)649-5451 (metro area) immediately upon discovery of the release. You may contact the MPCA during business hours at 1(800)657-3864 or (651)296-6300 (metro area). c. Recover as rapidly and as thoroughly as possible all substances and materials released or immediately take other action as may be reasonably possible to minimize or abate pollution to waters of the state or potential impacts to human health caused thereby. If the released materials or substances cannot be immediately or completely recovered, the Permittee shall contact the MPCA. If directed by the MPCA, the Permittee shall consult with other local, state or federal agencies (such as the Minnesota Department of Natural Resources and/or the Wetland Conservation Act authority) for implementation of additional clean-up or remediation activities in wetland or other sensitive areas. [Minn. R. 7001.1090]
	5.14.151	Sampling of a release. Upon discovery of a release, the Permittee shall: a. Collect representative samples of the release. The Permittee shall sample the release for parameters of concern immediately following discovery of the release. The Permittee may contact the MPCA during business hours to discuss the sampling parameters and protocol. In addition, Fecal Coliform Bacteria samples shall be collected where it is determined by the Permittee that the release contains or may contain sewage. If the release cannot be immediately stopped, the Permittee shall consult with MPCA regarding additional sampling requirements. Samples shall be collected at least, but not limited to, two times per week for as long as the release continues. b. Submit the sampling results on the Release Sampling Form (http://www.pca.state.mn.us/index.php/view-document.html?gid=18867). The

		Release Sampling Form shall be submitted to the MPCA with the next DMR or within 30 days whichever is sooner. [Minn. R. 7001.1090]
	5.14.152	Bypass. [Minn. R. 7001]
	5.14.153	Anticipated bypass. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if the bypass is for essential maintenance to assure efficient operation of the facility. The permittee shall submit prior notice, if possible at least ten days before the date of the bypass to the MPCA. The notice of the need for an anticipated bypass shall include the following information: a. the proposed date and estimated duration of the bypass; b. the alternatives to bypassing; and c. a proposal for effluent sampling during the bypass. Any bypass wastewater shall enter waters of the state from outfalls specifically authorized by this permit. Therefore, samples shall be collected at the frequency and location identified in this permit or two times per week for as long as the bypass continues, whichever is more frequent. [40 CFR 122.41(m)(2 and 3), Minn. R. 7001.1090, 1(J)]
	5.14.154	All other bypasses are prohibited. The MPCA may take enforcement action against the Permittee for a bypass, unless the specific conditions described in Minn. R. Ch. 7001.1090 subp. 1, K and 122.41(m)(4)(i) are met. In the event of an unanticipated bypass, the permittee shall: a. Take all reasonable steps to immediately end the bypass. b. Notify the Minnesota Department of Public Safety Duty Officer at 1(800)422-0798 or (651)649-5451 (metro area) immediately upon commencement of the bypass. You may contact the MPCA during business hours at 1(800)657-3864 or (651)296-6300 (metro area). c. Immediately take action as may be reasonably possible to minimize or abate pollution to waters of the state or potential impacts to human health caused thereby. If directed by the MPCA, the Permittee shall consult with other local, state or federal agencies for implementation of abatement, clean-up, or remediation activities. d. Only allow bypass wastewater as specified in this section to enter waters of the state from outfalls specifically authorized by this permit. Samples shall be collected at the frequency and location identified in this permit or two times per week for as long as the bypass continues, whichever is more frequent. The permittee shall also follow the reporting requirements for effluent violations as specified in this permit. [40 CFR 122.41(m)(4)(i), Minn. R. 7001.1090, 1(K), Minn. Stat. ch. 115.061]
	5.14.155	Operation and Maintenance. [Minn. R. 7001]
	5.14.156	The Permittee shall at all times properly operate and maintain the facilities and systems of treatment and control, and the appurtenances related to them which are installed or used by the Permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. The Permittee shall install and maintain appropriate backup or auxiliary facilities if they are necessary to achieve compliance with the conditions of the permit and, for all permits other than hazardous waste facility permits, if these backup or auxiliary facilities are technically and economically feasible Minn. R. 7001.0150. subp. 3, item F. [Minn. R. 7001.0150, 3(F)]
	5.14.157	In the event of a reduction or loss of effective treatment of wastewater at the facility, the Permittee shall control production or curtail its discharges to the extent necessary to maintain compliance with the terms and conditions of this permit. The Permittee

		shall continue this control or curtailment until the wastewater treatment facility has been restored or until an alternative method of treatment is provided. [Minn. R. 7001.1090, 1(C)]
	5.14.158	Solids Management. The Permittee shall properly store, transport, and dispose of biosolids, septage, sediments, residual solids, filter backwash, screenings, oil, grease, and other substances so that pollutants do not enter surface waters or ground waters of the state. Solids should be disposed of in accordance with local, state and federal requirements. [40 CFR 503, Minn. R. 7041]
	5.14.159	Scheduled Maintenance. The Permittee shall schedule maintenance of the treatment works during non-critical water quality periods to prevent degradation of water quality, except where emergency maintenance is required to prevent a condition that would be detrimental to water quality or human health. [Minn. R. 7001.0150, 3(F), Minn. R. 7001.150, 2(B)]
	5.14.160	Control Tests. In-plant control tests shall be conducted at a frequency adequate to ensure compliance with the conditions of this permit. [Minn. R. 7001.0150, 3(F), Minn. R. 7001.150, 2(B)]
	5.14.161	Changes to the Facility or Permit. [Minn. R. 7001]
	5.14.162	Permit Modifications. Except as provided under Minnesota Statutes, section 115.07, subdivisions 1 and 3, no person required by statute or rule to obtain a permit may construct, install, modify, or operate the facility to be permitted, nor shall a person commence an activity for which a permit is required by statute or rule until the agency has issued a written permit for the facility or activity. Permittees that propose to make a change to the facility or discharge that requires a permit modification shall follow Minn. R. 7001.0190. If the Permittee cannot determine whether a permit modification is needed, the Permittee shall contact the MPCA prior to any action. It is recommended that the application for permit modification be submitted to the MPCA at least 180 days prior to the planned change. [Minn. R. 7001.0030]
	5.14.163	Plans, specifications and MPCA approval are not necessary when maintenance dictates the need for installation of new equipment, provided the equipment is the same design size and has the same design intent. For instance, a broken pipe, lift station pump, aerator, or blower can be replaced with the same design-sized equipment without MPCA approval. If the proposed construction is not expressly authorized by this permit, it may require a permit modification. If the construction project requires an Environmental Assessment Worksheet under Minn. R. 4410, no construction shall begin until a negative declaration is issued and all approvals are received or implemented. [Minn. R. 7001.0030]
	5.14.164	Report Changes. The Permittee shall give advance notice as soon as possible to the MPCA of any substantial changes in operational procedures, activities that may alter the nature or frequency of the discharge, and/or material factors that may affect compliance with the conditions of this permit. [Minn. R. 7001.0150, 3(M)]
	5.14.165	Chemical Additives. The Permittee shall receive prior written approval from the MPCA before increasing the use of a chemical additive authorized by this permit, or using a chemical additive not authorized by this permit, in quantities or concentrations that have the potential to change the characteristics, nature and/or quality of the discharge. The Permittee shall request approval for an increased or new use of a chemical additive at least 60 days, or as soon as possible, before the proposed increased or new use. This written request shall include at least the following information for the proposed additive:

		a. The process for which the additive will be used; b. Safety Data Sheet (SDS) which shall include aquatic toxicity, human health, and environmental fate information for the proposed additive. The aquatic toxicity information shall include at minimum the results of: a) a 48-hour LC50 or EC50 acute study for a North American freshwater planktonic crustacean (either Ceriodaphnia or Daphnia sp.) and b) a 96-hour LC50 acute study for rainbow trout, bluegill or fathead minnow or another North American freshwater aquatic species other than a planktonic crustacean; c. a complete product use and instruction label; d. the commercial and chemical names and Chemical Abstract Survey (CAS) number for all ingredients in the additive (If the MSDS does not include information on chemical composition, including percentages for each ingredient totaling to 100%, the Permittee shall contact the supplier to have this information provided); and e. The proposed method of application, application frequency, concentration, and daily average and maximum rates of use. Upon review of the information submitted regarding the proposed chemical additive, the MPCA may require additional information be submitted for consideration. This permit may be modified to restrict the use or discharge of a chemical additive and include additional influent and effluent monitoring requirements. Approval for the use of an additive shall not justify the exceedance of any effluent limitation nor shall it be used as a defense against pollutant levels in the discharge causing or contributing to the violation of a water quality standard. [Minn. R. 7001.0170]
	5.14.166	MPCA Initiated Permit Modification, Suspension, or Revocation. The MPCA may modify or revoke and reissue this permit pursuant to Minn. R. 7001.0170. The MPCA may revoke without reissuance this permit pursuant to Minn. R. 7001.0180. [Minn. R. 7001.0170, Minn. R. 7001.0180]
	5.14.167	TMDL Impacts. Facilities that discharge to an impaired surface water, watershed or drainage basin may be required to comply with additional permits or permit requirements, including additional restriction or relaxation of limits and monitoring as authorized by the CWA 303(d)(4)(A) and 40 CFR 122.44.l.2.i., necessary to ensure consistency with the assumptions and requirements of any applicable US EPA approved wasteload allocations resulting from Total Maximum Daily Load (TMDL) studies. [40 CFR 122.44(l)(2)(i)]
	5.14.168	Permit Transfer. The permit is not transferable to any person without the express written approval of the Agency after compliance with the requirements of Minn. R. 7001.0190. A person to whom the permit has been transferred shall comply with the conditions of the permit. [Minn. R. 7001.0150, 3(N)]
	5.14.169	Facility Closure. The Permittee is responsible for closure and post-closure care of the facility. The Permittee shall notify the MPCA of a significant reduction or cessation of the activities described in this permit at least 180 days before the reduction or cessation. The MPCA may require the Permittee to provide to the MPCA a facility Closure Plan for approval. Facility closure that could result in a potential long-term water quality concern, such as the ongoing discharge of wastewater to surface or ground water, may require a permit modification or reissuance. The MPCA may require the Permittee to establish and maintain financial assurance to ensure performance of certain obligations under this permit, including closure, post-closure care and remedial action at the facility. If financial assurance is required, the amount and type of financial assurance, and proposed modifications to previously MPCA-approved financial assurance, shall be approved by the MPCA. [Minn. Stat. ch.

		116.07, 4]
	5.14.170	Permit Reissuance. If the Permittee desires to continue permit coverage beyond the date of permit expiration, the Permittee shall submit an application for permit reissuance : Due by 180 days prior to permit expiration. If the Permittee does not intend to continue the activities authorized by this permit after the expiration date of this permit, the Permittee shall notify the MPCA in writing at least 180 days before permit expiration. If the Permittee has submitted a timely application for permit reissuance, the Permittee may continue to conduct the activities authorized by this permit, in compliance with the requirements of this permit, until the MPCA takes final action on the application, unless the MPCA determines any of the following (Minn. R. 7001.0040 and 7001.0160): a. The Permittee is not in substantial compliance with the requirements of this permit, or with a stipulation agreement or compliance schedule designed to bring the Permittee into compliance with this permit; b. The MPCA, as a result of an action or failure to act by the Permittee, has been unable to take final action on the application on or before the expiration date of the permit; c. The Permittee has submitted an application with major deficiencies or has failed to properly supplement the application in a timely manner after being informed of deficiencies. [Minn. R. 7001.0160]

6. Submittal action summary

SD 001	Effluent To Surface Water	
		Surface Discharge: Class B Minor Facility Effluent Requirements
	6.1.1	The Permittee shall submit a monthly DMR : Due by 21 days after the end of each calendar month following permit issuance. [Minn. R. 7001.0150, Subp. 2(B)]
WS 001	Influent Waste	
		Waste Stream: Class B Minor Facility Influent Requirements
	6.2.1	The Permittee shall submit a monthly DMR : Due by 21 days after the end of each calendar month following permit issuance. [Minn. R. 7001.0150, Subp. 2(B)]
MN0024228	Montrose WWTP	
		Compliance Schedule Requirements
	6.3.1	The Montrose Wastewater Treatment Facility's (Facility) discharge is one among several point sources that has been shown to contribute to elevated total phosphorus and chlorophyll-a (Chl-a) concentrations in the North Fork Crow River (NFCR). The phosphorus limits assigned to the Facility (1,079 kg/yr, 12 month moving total & 1.0 mg/L, calendar month average) were assigned to protect for the nutrient impairment in Lake Pepin and in accordance with Minn. R. Ch. 7053.0255, but are not sufficient to protect waters within the NFCR Watershed. As a result, the Facility was assigned a new total phosphorus water quality based effluent limit (WQBEL) of 1.3 mg/L, calendar month average, June - September. This compliance related construction schedule requires the permittee to complete the Facility modifications necessary to achieve compliance with the new limit as soon as possible, but no later than June 30, 2022. The permit (as described in the limits and monitoring section of the permit) includes Phase 1 for the final phosphorus limit as outlined below: Full Permit Cycle 1,079 kg/year, 12 month moving total, Jan-Dec 1.0 mg/L, calendar month average, Jan-Dec Phase 2 1.3 kg/day, calendar month average, Jun-Sep Limit begins January 1, 2019, if no modifications are necessary to meet the final limit. Limit begins June 30, 2023, if modifications are necessary to meet the final limit. The Permittee shall submit a 2017 and 2018 Total Phosphorus Operational and Optimization Implementation Plan, including both actions and estimated timeframes for implementation, for MPCA review. submit a plan : Due by 60 days after permit issuance. [Minn. R. 7001]

	6.3.2	The Permittee shall submit a progress report of the 2017 Operational and Optimization Implementation work, for MPCA review. submit a compliance schedule progress report : Due before 01/01/2018. [Minn. R. 7001]
	6.3.3	The Permittee shall submit a final report of the 2018 Operational and Optimization Implementation work and the determination of whether modifications are necessary for the wastewater treatment facility. submit a final report : Due before 01/01/2019. [Minn. R. 7001]
		Mercury Minimization Plan
	6.4.4	The Permittee shall submit a mercury pollutant minimization plan : Due by 180 days prior to permit expiration. [Minn. R. 7001]
		Biosolids: Land Application
	6.5.5	The Permittee shall submit a biosolids annual report : Due annually, by the 31st of December on a form provided by or approved by the MPCA. The report shall include the requirements in Minnesota Rules, part 7041.1700. [Minn. R. 7041.1700]
		Total Facility Requirements (NPDES/SDS)
	6.6.6	Permit Reissuance. If the Permittee desires to continue permit coverage beyond the date of permit expiration, the Permittee shall submit an application for permit reissuance : Due by 180 days prior to permit expiration. If the Permittee does not intend to continue the activities authorized by this permit after the expiration date of this permit, the Permittee shall notify the MPCA in writing at least 180 days before permit expiration. If the Permittee has submitted a timely application for permit reissuance, the Permittee may continue to conduct the activities authorized by this permit, in compliance with the requirements of this permit, until the MPCA takes final action on the application, unless the MPCA determines any of the following (Minn. R. 7001.0040 and 7001.0160): a. The Permittee is not in substantial compliance with the requirements of this permit, or with a stipulation agreement or compliance schedule designed to bring the Permittee into compliance with this permit; b. The MPCA, as a result of an action or failure to act by the Permittee, has been unable to take final action on the application on or before the expiration date of the permit; c. The Permittee has submitted an application with major deficiencies or has failed to properly supplement the application in a timely manner after being informed of deficiencies. [Minn. R. 7001.0160]

7. Limits and monitoring

		Discharge limitations						Monitoring requirements				
Subject item	**Parameter**	**Quantity /Loading avg.**	**Quantity /Loading max.**	**Quantity /Loading units**	**Quality /Conc. min.**	**Quality /Conc. avg.**	**Quality /Conc. max.**	**Quality/ Conc. units**	**Frequency**	**Sample type**	**Effective period**	**Notes**
SD 001 Surface Water Discharge	Bicarbonates (HCO3)						Monitor only. calendar month maximum	milligrams per liter	once per month	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	BOD, Carbonaceous 05 Day (20 Deg C)	74 calendar month average	118 maximum calendar week average	kilograms per day		25 calendar month average	40 maximum calendar week average	milligrams per liter	once per week	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	BOD, Carbonaceous 05 Day (20 Deg C) Percent Removal				85 minimum calendar month average			percent	once per week	Calculation	Jan-Dec	
SD 001 Surface Water Discharge	Calcium, Total (as Ca)						Monitor only. calendar month maximum	milligrams per liter	once per month	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	Chloride, Total						Monitor only. calendar month maximum	milligrams per liter	once per month	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	Fecal Coliform, MPN or Membrane Filter 44.5C					200 calendar month geometric mean		organisms per 100 milliliter	once per week	Grab	Apr-Oct	
SD 001 Surface Water Discharge	Flow		Monitor only. calendar month total	million gallons		Monitor only. calendar month average	Monitor only. calendar month maximum	million gallons per day	once per day	Measurement, Continuous	Jan-Dec	
SD 001 Surface Water Discharge	Hardness, Calcium & Magnesium, Calculated (as CaCO3)						Monitor only. calendar month maximum	milligrams per liter	once per month	24-Hour Flow Composite	Jan-Dec	

		Discharge limitations						Monitoring requirements				
Subject item	Parameter	Quantity /Loading avg.	Quantity /Loading max.	Quantity /Loading units	Quality /Conc. min.	Quality /Conc. avg.	Quality /Conc. max.	Quality/ Conc. units	Frequency	Sample type	Effective period	Notes
SD 001 Surface Water Discharge	Magnesium, Total (as Mg)						Monitor only. calendar month maximum	milligrams per liter	once per month	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	Mercury, Dissolved (as Hg)						Monitor only. calendar month maximum	nanograms per liter	once per year	Grab	Dec	
SD 001 Surface Water Discharge	Mercury, Total (as Hg)						Monitor only. calendar month maximum	nanograms per liter	once per year	Grab	Dec	
SD 001 Surface Water Discharge	Nitrite Plus Nitrate, Total (as N)					Monitor only. calendar quarter average		milligrams per liter	once per quarter	24-Hour Flow Composite	Mar, Jun, Sep, Dec	
SD 001 Surface Water Discharge	Nitrogen, Ammonia, Total (as N)					Monitor only. calendar month average		milligrams per liter	once per month	24-Hour Flow Composite	Mar, Sep	
SD 001 Surface Water Discharge	Nitrogen, Kjeldahl, Total					Monitor only. calendar quarter average		milligrams per liter	once per quarter	24-Hour Flow Composite	Mar, Jun, Sep, Dec	
SD 001 Surface Water Discharge	Nitrogen, Total (as N)					Monitor only. calendar quarter average		milligrams per liter	once per quarter	24-Hour Flow Composite	Mar, Jun, Sep, Dec	
SD 001 Surface Water Discharge	Oxygen, Dissolved				Monitor only. calendar month minimum			milligrams per liter	once per day	Grab	Jan-Dec	
SD 001 Surface Water Discharge	pH				6.0 calendar month minimum		9.0 calendar month maximum	standard units	once per week	Grab	Jan-Dec	

		Discharge limitations						Monitoring requirements				
Subject item	**Parameter**	**Quantity /Loading avg.**	**Quantity /Loading max.**	**Quantity /Loading units**	**Quality /Conc. min.**	**Quality /Conc. avg.**	**Quality /Conc. max.**	**Quality/ Conc. units**	**Frequency**	**Sample type**	**Effective period**	**Notes**
SD 001 Surface Water Discharge Phase 1	Phosphorus, Total (as P)	Monitor only. calendar month average		kilograms per day					once per week	24-Hour Flow Composite	Jun-Sep	
SD 001 Surface Water Discharge Phase 2	Phosphorus, Total (as P)	1.30 calendar month average		kilograms per day					once per week	24-Hour Flow Composite	Jun-Sep	
SD 001 Surface Water Discharge	Phosphorus, Total (as P)					1.0 calendar month average		milligrams per liter	once per week	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	Phosphorus, Total (as P)		1079.0 12-month moving total	kilograms per year					once per month	Calculation	Jan-Dec	
SD 001 Surface Water Discharge	Potassium, Total (as K)						Monitor only. calendar month maximum	milligrams per liter	once per month	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	Sodium, Total (as Na)						Monitor only. calendar month maximum	milligrams per liter	once per month	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	Solids, Total Dissolved (TDS)					Monitor only. calendar month average		milligrams per liter	once per month	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	Solids, Total Suspended (TSS)	133 calendar month average	192 maximum calendar week average	kilograms per day		45 calendar month average	65 maximum calendar week average	milligrams per liter	once per week	24-Hour Flow Composite	Jan-Dec	
SD 001 Surface Water Discharge	Solids, Total Suspended (TSS) Percent Removal				85 minimum calendar month average			percent	once per week	Calculation	Jan-Dec	

		Discharge limitations						Monitoring requirements				
Subject item	**Parameter**	**Quantity /Loading avg.**	**Quantity /Loading max.**	**Quantity /Loading units**	**Quality /Conc. min.**	**Quality /Conc. avg.**	**Quality /Conc. max.**	**Quality/ Conc. units**	**Frequency**	**Sample type**	**Effective period**	**Notes**
SD 001 Surface Water Discharge	Solids, Total Suspended (TSS), grab (Mercury)						Monitor only. calendar month maximum	milligrams per liter	once per year	Grab	Dec	
SD 001 Surface Water Discharge	Specific Conductance						Monitor only. calendar month maximum	micromhos per cm	once per month	Measurement	Jan-Dec	
SD 001 Surface Water Discharge	Sulfate, Total (as SO4)						Monitor only. calendar month maximum	milligrams per liter	once per month	24-Hour Flow Composite	Jan-Dec	
WS 001 Influent Waste Stream	BOD, Carbonaceous 05 Day (20 Deg C)					Monitor only. calendar month average	Monitor only. calendar month maximum	milligrams per liter	once per week	24-Hour Flow Composite	Jan-Dec	
WS 001 Influent Waste Stream	Flow		Monitor only. calendar month total	million gallons		Monitor only. calendar month average	Monitor only. calendar month maximum	million gallons per day	once per day	Measurement, Continuous	Jan-Dec	
WS 001 Influent Waste Stream	Nitrite Plus Nitrate, Total (as N)					Monitor only. calendar quarter average		milligrams per liter	once per quarter	24-Hour Flow Composite	Mar, Jun, Sep, Dec	
WS 001 Influent Waste Stream	Nitrogen, Kjeldahl, Total					Monitor only. calendar quarter average		milligrams per liter	once per quarter	24-Hour Flow Composite	Mar, Jun, Sep, Dec	
WS 001 Influent Waste Stream	Nitrogen, Total (as N)					Monitor only. calendar quarter average		milligrams per liter	once per quarter	24-Hour Flow Composite	Mar, Jun, Sep, Dec	
WS 001 Influent Waste Stream	pH				Monitor only. calendar month minimum		Monitor only. calendar month maximum	standard units	once per week	Grab	Jan-Dec	

		Discharge limitations						Monitoring requirements				
Subject item	**Parameter**	**Quantity /Loading avg.**	**Quantity /Loading max.**	**Quantity /Loading units**	**Quality /Conc. min.**	**Quality /Conc. avg.**	**Quality /Conc. max.**	**Quality/ Conc. units**	**Frequency**	**Sample type**	**Effective period**	**Notes**
WS 001 Influent Waste Stream	Phosphorus, Total (as P)					Monitor only. calendar month average		milligrams per liter	once per week	24-Hour Flow Composite	Jan-Dec	
WS 001 Influent Waste Stream	Precipitation		Monitor only. calendar month total	inches					once per day	Measurement	Jan-Dec	
WS 001 Influent Waste Stream	Solids, Total Suspended (TSS)					Monitor only. calendar month average	Monitor only. calendar month maximum	milligrams per liter	once per week	24-Hour Flow Composite	Jan-Dec	

MINNESOTA POLLUTION CONTROL AGENCY

Statement of Basis

Permittee: City of Montrose
PO Box 25
Montrose, Minnesota 55363-0025

Facility: Montrose Wastewater Treatment Facility
Permit Number: MN0024228
Date: February 2018

Description of Permitted Facility

The Montrose Wastewater Treatment Facility (facility) is located at 800 Buffalo Ave S, Montrose, Minnesota 55363, Wright County.

Major components of the facility include:

- Aerated Pond (more than 2 hours)
- Collection system (gravity and/or pressure)
- Disinfection (ultraviolet light)
- Phosphorus Removal (chemical addition)
- Polishing Ponds without aeration
- Preliminary treatment - fine screen
- Preliminary treatment - mechanical bar screen
- Primary treatment - primary stabilization pond
- Secondary Clarification
- Secondary Stabilization Pond
- Solids Disposal - Land Application
- Solids Handling - Storage Tank
- Solids Treatment - Lime Treatment (Class A)
- Solids Treatment - Lime Treatment (Class B)

The City of Waverly and the 12 Hi Estates Mobile Home Park are connected to this Facility.

The Facility is designed for a continuous discharge (SD001) to the Woodland Wildlife Management Area (Class 2D, 3D, 4C, 5, 6 Water) to an unnamed creek (Class 2B, 3C, 4A, 4B, 5, 6 Water) and to treat an average wet weather flow of 0.781 million gallons per day (mgd), 0.411 mgd average dry weather flow, 1.380 mgd peak hourly wet weather flow, 740 pounds per day (114 mg/L) of 5-day carbonaceous biochemical oxygen demand ($CBOD_5$), and 822 pounds per day (126 mg/L) of total suspended solids (TSS).There are no known bypasses in the treatment system.

In accordance with MPCA rules regarding nondegradation for all waters that are not Outstanding Resource Value Waters (ORVW), nondegradation review is required for any new or expanded significant discharge (Minn. R. 7050.0185). A significant discharge is: (1) a new discharge (not in existence before January 1, 1988) that is greater than 200,000 gallons per day to any water other than a Class 7 water or; (2) an expanded discharge that expands by greater than 200,000 gallons per day that discharges to any water other than a Class 7 water or; (3) a new or expanded discharge containing any toxic pollutant at a mass loading rate likely to increase the concentration of the toxicant in the receiving water by greater than one percent over the baseline quality. The flow rate used to determine significance is the design average wet weather flow. The January 1, 1988, design average wet weather flow for this Facility is 0.145 mgd.

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 MPCA 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.]

Effluent to Surface Water Discharge

Limit and monitoring requirements for surface water dischargers are set in consideration of Minnesota state water discharge criteria also known as State Discharge Restrictions (SDR) based on Minn. R. Ch. 7053, Minnesota state water quality based effluent limits (WQBEL) for the receiving water use classification, federal technology based effluent limits (TBEL) applicable to specific discharge types, or a combination of these standards to regulate the discharge of wastewater. When limits overlap for a particular parameter or analyte, the most stringent limit is the one applied in the permit. In addition, MPCA may derive standards that are specific to a particular discharge. These standards may be based on toxicity studies, professional judgement analysis, technology based standards, and in some instances standards developed by other U.S. states or regulatory agencies.

The monitoring frequencies for outfall SD001 are based on MPCA guidelines for Class B municipal discharges that are less than one million gallons per day (mgd). The monitoring frequencies are set to achieve sufficient data to determine the compliance with established limits.

Technology Based Effluent Limits

Limits are applied pursuant to Minn. R. 7053.0215 subp. 1 for total suspended solids and pH.

Table 1: Technology Based Effluent Limit

Pollutant	Calendar Month Average	Calendar Week Maximum	Calendar Month Max/ Calendar Month Min	Minimum Calendar Month Average
pH			9.0 SU 6.0 SU	
Total Suspended Solids	45 mg/L and 133 kg/day	65 mg/L and 192 kg/day		

Water Quality Based Effluent Limitations

Minn. R. 7053.0205 subp. 8 authorizes the MPCA to develop water quality-based effluent limitations for point source discharges to waters of the state of Minnesota to protect receiving waters for the applicable use classifications.

Water quality based effluent limits are applied for 5-day carbonaceous biochemical oxygen demand and total phosphorus.

Table 2: Water Quality Based Effluent Limits

Pollutant	Calendar Month Average	Calendar Week Maximum	12 Month Moving Total	Monthly Average (June-Sept)
Phosphorus, Total (as P)			1,079 kg/year[1]	1.30 kg/day[2]
BOD, Carbonaceous 5 day (20 Deg C)	25 mg/L and 74 kg/day	40 mg/L and 118 kg/day		

[1]Limit applies January-December (Lake Pepin based limit)

[2]Limit applies June-September (River Eutrophication Standard based limit)

State Discharge Restrictions

State Discharge Restrictions are not considered water quality based effluent limits. However, these restrictions were designed to protect water quality and maintain in-stream water quality standards. Therefore, the restrictions are

strict enough to protect water quality standards. The limits for fecal coliform and total phosphorus are is based on Minn. R. 7053.0255.

Table 3: State Discharge Restrictions

Pollutant	Calendar Month Average	Calendar Month Geometric Mean
Fecal Coliform, MPN or Membrane Filter 44.5 C		200 #100ml
Phosphorus, Total (as P)	1.0 mg/L[1]	

[1]Limit applies January-December

Total Phosphorus Effluent Limits

WQBELs

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 Montrose Wastewater Treatment Facility (WWTF) to determine if the WWTF's discharge has RP to cause or contribute to an exceedance of a state water quality standard or contribute to any downstream impairment. As a result of the analysis, total phosphorus effluent limits were established for the Montrose WWTF to ensure protection of downstream waters and to comply with Lake Eutrophication Standards, River Eutrophication Standards, 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 "*Greater Crow River Watershed Phosphorus Effluent Limit Analysis*". A copy of the MPCA memorandum is available upon request.

Lake Eutrophication Standards

Effluent from theMontrose WWTF is discharged upstream of Lake Pepin which currently exceeds numeric lake eutrophication standards (LES). Lake Pepin is located in the Western Corn Belt Plains Ecoregion. 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 reasonable potential (RP) to cause or contribute to downstream impaired waters are required to contain water quality effluent based limits (WQBELs) derived from the water quality standard (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 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 Montrose WWTF is found to have RP for TP upstream of Lake Pepin. Therefore, the Montrose WWTF is assigned a 1,079 12-month moving total mass TP WQBEL as a result of the Waste Load Allocation (WLA) derived from the WQS. Draft WLAs in combination with other point and nonpoint allocations are calculated to achieve the nutrient/eutrophication WQS for Lake Pepin.

Currently there are over 500 dischargers upstream of Lake Pepin 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 Montrose WWTF to protect for eutrophication impairment in Lake Pepin is 1,079 kg/yr as a 12-month moving total.

River Eutrophication Standards

The Montrose WWTF is one of 10 WWTFs located within the North Fork Crow River Watershed. A watershed scale analysis was completed to determine if total phosphorus effluent limits were necessary for the WWTF's located within the watershed to protect for RES. Guidance for the analysis, determination of reasonable potential (RP), and water quality based effluent limit (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 complete "*Greater Crow River Watershed Phosphorus Effluent Limit Analysis*" memorandum is available upon request from the MPCA.

The total phosphorus (TP) effluent limit assigned to the Montrose WWTF was developed to protect for the Central Nutrient Region, which has RES standards (Minn. R. 7050.0222) of: ≤100 ug/L for Total Phosphorus and ≤ 18 ug/L for Chlorophyll-a (Chl-a).

Mass Balance Method

The total phosphorus (TP) effluent limit of 1.3 kg/day included in this permit is derived from water quality at the North Fork Crow River/WID 07010204-503. A load duration analysis was used to evaluate current loading at moderate low flow (80% exceeds flow). At this step of the analysis, facilities are represented at current actual flow and concentration. Results are then used in a mass balance equation to determine the pollutant load necessary to support the water quality standard. Because federal regulations [40 CFR 122.44(d)] require the examination of the *potential* to cause or contribute to an excursion of standards, facility impacts must be evaluated at full authorized levels and not just current actual discharge rates. Contributing facilities are evaluated at 70% of average wet weather design flow (AWWDF) and 100% maximum design flow (MDF) for municipal and industrial discharges, respectively. Concentrations are adjusted to maximum authorized levels. If a contributing facility does not currently have a limit, the long-term average concentration is used.

A wasteload allocation (WLA) was calculated to achieve RES for the North Fork Crow River. Currently there are 10 dischargers upstream of the North Fork Crow River with reasonable potential (RP). The gross WLA was split between 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.

A sensitivity analysis was used to determine whether mass or concentration limits are necessary. Limits to protect for RES are expressed as mass values unless the sensitivity analysis determines otherwise. The RP mass balance equation was re-run with modified inputs to determine whether a facility with a mass limit could operate at a lower flow and higher concentration without causing a measurable water quality impact. Facility flow was reduced from 70% AWWDF and/or MDF to current actual levels. Concentrations were adjusted to maximum authorized levels. Basically, the same mass of authorized TP is added to the river of interest with less water. This can cause a "biologically significant" or "measureable" increase of projected concentration in the river of interest. If a significant change is not found, a mass limit is found to be protective of the river. If a significant change is found, a concentration limit is assigned to protect the river. Upon completion of the sensitivity analysis, a mass limit was assigned to the Montrose WWTF.

Individual seasonal WLAs were then converted into monthly average effluent limits. In this circumstance, the seasonal WLA was multiplied by 2.1 to achieve a monthly average limit. A statewide effluent dataset was evaluated with statistical procedures in federal guidance (https://www3.epa.gov/npdes/pubs/owm0264.pdf). If, over the course of the permit, the facility meets the final effluent limit but does not achieve the final WLA as a long term average, limits in the subsequent permit may be adjusted on the basis of individual facility variability. Section 5.5.13 and the Compliance Schedule Requirements Section of this permit include language regarding attainment of the WLA.

State Discharge Restrictions (SDR)

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

Table 4: SD001 Effluent to Woodland State Wildlife Management Area (a wetland)

Pollutant	Calendar Month Average	Max Calendar Week Average	12 Mo Moving Total	Calendar Month Total	Calendar Month Min	Calendar Month Max	Calendar Month Geometric Mean	Frequency	Which Months
Bicarbonates (HCO3)						Monitor Only (mg/L)		Once per month	Jan-Dec
BOD, Carbonaceous 05 (20 Deg C)	25 mg/L 74 kg/day	40 mg/L 118 kg/day						Once per week	Jan-Dec
BOD, Carbonaceous 05 (20 Deg C) Percent Removal					85%			Once per week	Jan-Dec
Calcium, Total (as Ca)						Monitor Only (mg/L)		Once per month	Jan-Dec
Chloride, Total						Monitor Only (mg/L)		Once per month	Jan-Dec
Fecal Coliform, MPN, or Membrane Filter 44.5C							200 #100ml	Once per week	Apr-Oct
Flow	Monitor Only (mgd)			Monitor Only (MG)		Monitor Only (mgd)		Once per Day	Jan-Dec
Hardness, Calcium & Magnesium, Calculated (as CaCO3)						Monitor Only (mg/L)		Once per month	Jan-Dec
Magnesium, Total (as Mg)						Monitor Only (mg/L)		Once per month	Jan-Dec
Mercury, Dissolved (as Hg)						Monitor Only (ng/L)		Once per year	Dec
Mercury, Total (as Hg)						Monitor Only (ng/L)		Once per year	Dec
Nitrite Plus Nitrate, Total (as N)	Monitor Only (mg/L)							Once per quarter	Mar, Jun, Sep, Dec
Nitrogen, Ammonia, Total (as N)	Monitor Only (mg/L)							Once per month	Mar, Sep
Nitrogen, Kjeldahl, Total	Monitor Only (mg/L)							Once per quarter	Mar, Jun, Sep, Dec
Nitrogen, Total	Monitor Only (mg/L)							Once per quarter	Mar, Jun, Sep, Dec
Oxygen, Dissolved					Monitor Only (mg/l)			Once per day	Jan-Dec
pH					6.0 (SU)	9.0 (SU)		Once per week	Jan-Dec
Phosphorus, Total (as P)	1.0 mg/L							Once per week	Jan-Dec
Phosphorus, Total (as P)			1079.0 kg/yr					Once per	Jan-Dec

Pollutant	Calendar Month Average	Max Calendar Week Average	12 Mo Moving Total	Calendar Month Total	Calendar Month Min	Calendar Month Max	Calendar Month Geometric Mean	month Frequency	Which Months
Phosphorus, Total (as P) **Phase 2**	1.30 kg/day							Once per week	Jun-Sep
Phosphorus, Total (as P) **Phase 1**	Monitor Only (kg/day)							Once per week	Jun-Sep
Potassium, Total (as K)						Monitor Only (mg/L)		Once per month	Jan-Dec
Sodium, Total (as Na)						Monitor Only (mg/L)		Once per month	Jan-Dec
Solids, Total Dissolved (TDS)	Monitor Only (mg/L)							Once per month	Jan-Dec
Solids, Total Suspended (TSS)	45 mg/L 133 kg/day	65 mg/L 192 kg/day						Once per week	Jan-Dec
Solids, Total Suspended (TSS) percent removal					85%			Once per week	Jan-Dec
Solids, Total Suspended (TSS), grab (Mercury)						Monitor Only (mg/L)		Once per year	Dec
Specific Conductance						Monitor Only (umh/cm)		Once per month	Jan-Dec
Sulfate, Total (as SO4)						Monitor Only (mg/L)		Twice per week	Jan-Dec

Waste Streams

Limit and monitoring requirements for waste streams are assigned in order to ascertain their impact on wastewater treatment processes, contributions to other treatment facilities, and/or land treatment/discharge sites. Requirements are based on MPCA sampling policies and/or state health requirements. The following table outlines the recommended limit and monitoring requirements for the waste stream station in the new permit.

Table 5: WS001 Influent Waste Stream Monitoring

Pollutant	Calendar Month Minimum	Calendar Month Maximum	Calendar Month Maximum	Calendar Month Average	Calendar Month Total	Frequency	Which Months
BOD, Carbonaceous 05 Day (20 Deg C)			Monitor Only (mg/L)	Monitor Only (mg/L)		Once per week	Jan-Dec
Flow			Monitor Only (mgd)	Monitor Only (mgd)	Monitor Only (MG)	Once per day	Jan-Dec
Nitrite Plus Nitrate, Total (as N)				Monitor Only (mg/L)		Once per quarter	Mar, Jun, Sep, Dec
Nitrogen, Kjeldahl, Total				Monitor Only (mg/L)		Once per quarter	Mar, Jun, Sep, Dec
Nitrogen, Total				Monitor Only (mg/L)		Once per quarter	Mar, Jun, Sep, Dec
pH	Monitor Only (SU)	Monitor Only (SU)				Once per week	Jan-Dec
Phosphorus, Total (as P)				Monitor Only (mg/L)		Once per week	Jan-Dec
Precipitation					Monitor Only (in)	Once per day	Jan-Dec
Solids, Total Suspended (TSS)			Monitor Only (mg/L)	Monitor Only (mg/L)		Once per week	Jan-Dec

Pollutants of Concern

Mercury

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 state-wide 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 Stations Chapter 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.

The draft permit requires the Permittee to sample total and dissolved mercury and total suspended solids (TSS) grab (Mercury) in the effluent at a frequency of once per year in July of each year (results submitted on the December DMR).

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 September 2014, the MPCA completed the final draft of 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 the Facility additional effluent nitrogen monitoring has been added to the Permit. This monitoring has been added in accordance with Minnesota Statues Chapter 115.03.

The draft Permit includes effluent monitoring for Nitrite plus Nitrate-Nitrogen, Total Kjeldahl Nitrogen, and Total Nitrogen at a frequency of once per quarter during March, June, September and December. Ammonia Nitrogen shall be sampled at a frequency of once per month in March and September. Total Dissolved Solids shall be sampled at a frequency of once per month January through December. These requirements are for the duration of the five-year term of the Permit.

The draft Permit includes influent monitoring for Nitrite plus Nitrate-Nitrogen, Total Kjeldahl Nitrogen, and Total Nitrogen at a frequency of once per quarter during March, June, September and December.

This additional monitoring will provide the data necessary to develop a better understanding of the total nitrogen concentrations and loadings that is currently being received and discharged from municipal and industrial wastewater treatment plants. Once a more extensive total nitrogen data set is established nitrogen reduction work can begin to achieve the necessary reductions to meet the goal of a 20% reduction in total nitrogen loads from point source dischargers by 2025. The changes and/or increases in total nitrogen monitoring in wastewater Permits as a result of the Statewide Nutrient Reduction Strategy is outlined in the Minnesota NPDES Wastewater Permit Nitrogen Monitoring Implementation Plan document located on the MPCA wastewater Permits webpage at: http://www.pca.state.mn.us/index.php/water/water-types-and-programs/wastewater/wastewater-permits/index.html.

Phosphorus

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.

Changes from previous permit:

The draft permit includes a new phosphorus mass limit of 1.30 kilograms per day (kg/day) as a calendar month average. This limit is effective June through September, as specified in the limits and monitoring section of this permit. This limit is based on the new River Eutrophication Standard in the North Fork Crow River.

Since the Permittee is not able to consistently meet the proposed limit, the draft permit includes a compliance schedule. The Permittee will complete an Operational and Optimization Implementation Plan for the first two years of the permit followed by a final report and the determination of whether or not facility modifications are necessary. If not, the final limit will go into effect January 1, 2019. Should facility modifications be necessary, the final limit will go into effect on June 30, 2022.

The Permittee is not required to prepare a Phosphorus Management Plan (PMP), 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 facilities 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. 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.

Salty Discharge Monitoring

In recent years, MPCA staff became aware of issues associated with "salty discharges" from industrial and municipal facilities. As a result, MPCA staff began to request additional monitoring for these facilities and also began assigning effluent limits to facilities that already have data which shows a reasonable potential to exceed a water quality standard for Class 3 and 4.

As a result of increased concern regarding salty discharges, MPCA staff determined that there is a need to obtain more information from dischargers. Industrial and municipal facilities with continuous, periodic/seasonal, or intermittent waste flows where the receiving water stream flow to effluent design flow dilution ratio under low flow conditions is less than 5:1 (annual climatic 7Q10: Maximum Daily Design Flow) will be required to monitor effluent for the following parameters: bicarbonates, calcium, chloride, hardness, magnesium, total dissolved solids, specific conductance, sodium, potassium, and sulfate.

Samples will be collected from one location at surface discharge station SD001 at a frequency of once per month, January through December. Permittees may request a reduction in monitoring if after two years of data (or 10 data points), if the monitoring does not indicate a reasonable potential to exceed a limit. If monitoring results indicate a reasonable potential for any of the parameters, the Permittee will be required to submit an application for permit modification and, if necessary, a compliance schedule will be added to the Permit to ensure progress towards meeting the water quality standards. Please review the Facility Specific Requirements-Salty Discharge Monitoring of Effluent to Surface Water Section of the permit carefully.

Total Facility Requirements

Certified Laboratory

Effective January 1, 2013, all Minnesota municipal, county or industrial laboratories that analyze wastewater per Clean Water Act requirements must be certified by the MPCA or the Minnesota Department of Health. Information regarding MPCA laboratory certification is located on the MPCA website at http://www.pca.state.mn.us/4p44whk. If you have questions concerning MPCA laboratory certification, please contact the MPCA at 1-800-657-3864 or by email at qa.questions.mpca@state.mn.us. Commercial laboratories doing these analyses must maintain Minnesota Department of Health certification.

Electronic Discharge Monitoring Reports (eDMRs)

The electronic Discharge Monitoring Reports (eDMRs), Sample Values/Operational Spreadsheets, and related attachments shall be electronically submitted via the MPCA Online Services Portal (https://netweb.pca.state.mn.us/private/). Paper copies of Discharge Monitoring Reports will no longer be

accepted. The eDMR and Sample Value/Operational Spreadsheets are generated directly from the limits and monitoring requirements in the [final issued/reissued/modified] permit for your facility. They are generated by the Pollution Control Data Specialist (PCDS) assigned to manage the data for your facility and will be available online within 30 days of the permit action, please make sure to download the most recent version of the eDMR and Sample Value/Operational Spreadsheet prior to submitting your next monthly eDMRs.

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. 7050.0250 to 7050.0335.

The Permit 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 MPCA that contains effluent limits more stringent than those that would be established by parts 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.

Term of Permit

The Agency has made a preliminary determination to reissue this NPDES/SDS permit for a term of approximately five years, per Minn. Rule 7001.0150.

Appendix C: Montrose City Council Memorandum and NAC's Montrose and Waverly Population Estimates

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MEMORANDUM

Date: October 4, 2022

To: Honorable Mayor Moynagh and Members of the City Council
City of Montrose, Minnesota

From: Jared Voge, P.E.
City Engineer

Subject: Water Treatment Plant & Wastewater Treatment Plant – Population Projections
City of Montrose
Project No.: W13.123744

As we continue with design of the Water Treatment Plant and the Facility Plan for the Wastewater Treatment Plant, a population projection for the City of Montrose is required to adequately size the facilities for future growth.

Attached is a memo from City Planner Steve Grittman with NAC with a possible population projection and some things to consider when looking at predicting growth within Montrose. As noted in the memo, the population projection of 6,192 for the year 2050 is a lower threshold estimate. This would include an average of 38 new homes per year.

City staff have discussed this and agree that this number seems to be a low estimate. Therefore, City staff is recommending increasing the projection of new homes to 50 per year on average. This would result in a 2040 population projection of 6,275 and 2050 population projection of 7,525 assuming 2.5 people per home.

Population projections are key for determining the appropriate size treatment facility to construct. Constructing too large of a facility results in unused infrastructure needing to be paid for by existing residents and constructing too small of a facility results in needing to complete a plant expansion soon after the initial project. Expansion projects are more costly compared to initial plant construction.

The City Council should adopt a population projection that you are comfortable with for sizing of both the water treatment plant and wastewater treatment plant.

If you have any questions, please call.

Enc.

Montrose Population/Household Projections

Year	Population	Pop Increase	Households	HH Increase
2020	3,775		1,319	
2030	4,758	983	1,755	446
2040	5,618	960	2,112	357
2050	6,192	574	2,457	345

This data is based on MN State Demographer population projections for the State and County, and interpolated for Montrose's trend in share of State and County Population. Household estimates based on County persons per household estimates, adjusted for the expected increase in senior households.

The State Demographer's estimates are based largely on modified birth- and death-rate natality and mortality, and make negligible accommodations for intra-state migration trends or factors.

Generally, early family formation age groups (18-40) seek lower cost housing opportunities, and the narrative describes a significant shift to exurban Twin Cities areas in providing those housing opportunities. It is likely that this factor will increase Montrose's share of intra-state migration housing beyond the natality/mortality growth factors. Moreover, Montrose's access to school quality will continue to fuel housing development in the community.

Real estate industry investment advisers predict continued short supplies of housing for the foreseeable future, although price appreciation is expected to slow, particularly as interest rates rise as the Federal Reserve central bank has initiated a series of increases to be phased in through 2022 in an inflation-fighting measure.

However, the industry expects continued upward demand pressure in the greater Twin Cities market for a number of foundational reasons. These include a strong job market fueling continued new home demand, an increase in household formation as the area recovers from the pandemic-induced shutdowns, and a strong, balanced regional economy relative to other areas of the upper Midwest.

This trend is propelled by a lower, but rising, overall price and price per square foot, and a shift in work location as the pandemic fueled a move to remote work. Those trends are all likely to continue, even as the pandemic recedes. Bisnow, a platform that tracks the commercial real estate industry recently reported that half of all companies plan to require full-time in-person work within the next year. While this represents a move back to the norm, the article notes that full-time remote, or hybrid, office work models will retain a prominent role going forward. This result frees office workers to find less urban housing which was previously impractical to many.

Moreover, Bisnow reports that there is a strong backlash amongst employees who seek continued remote work opportunities, a factor that has changed recruitment strategies for several large employers.

In summary, the post-pandemic housing landscape has likely been changed in a substantive way, setting the stage for a strong long-term housing market in communities such as Montrose, which has already been experiencing that trend. As supply-chain disruptions ease and construction materials costs moderate, the competitiveness of Montrose's housing market opportunities should continue to sustain a strong growth pattern.

As such, NAC believes this projection to be a **lower threshold estimate**, and does not likely account for upward shift in out-migration from the Twin Cities area counties reflected in the post-pandemic narrative above.

Waverly Population/Household Projections

Year	Population	Pop Increase	Households	HH Increase
2020	1,900		669	
2030	2,512	612	900	231
2040	3,142	630	1,138	238
2050	3,943	801	1,493	355

This data is based on MN State Demographer population projections for the State and County, and interpolated for Waverly's trend in share of State and County Population. Household estimates based on County persons per household estimates, adjusted for the expected increase in senior households.

The State Demographer's estimates are based largely on modified birth- and death-rate natality and mortality, and make negligible accommodations for intra-state migration trends or factors.

Generally, early family formation age groups (18-40) seek lower cost housing opportunities, and the narrative describes a significant shift to exurban Twin Cities areas in providing those housing opportunities. It is likely that this factor will increase Waverly's share of intra-state migration housing beyond the natality/mortality growth factors.

This factor is true for most of communities that are similarly situated. One interesting element is that the analysis tended to back-weight the growth rate for Waverly, adding an increased population and housing growth in the later decade of the projection.

Real estate industry investment advisers predict continued short supplies of housing for the foreseeable future, although price appreciation is expected to slow, particularly as interest rates rise as the Federal Reserve central bank has initiated a series of increases to be phased in through 2022 in an inflation-fighting measure.

However, the industry expects continued upward demand pressure in the greater Twin Cities market for a number of foundational reasons. These include a strong job market fueling continued new home demand, an increase in household formation as the area recovers from the pandemic-induced shutdowns, and a strong, balanced regional economy relative to other areas of the upper Midwest.

This trend is propelled by a lower, but rising, overall price and price per square foot, and a shift in work location as the pandemic fueled a move to remote work. Those trends are all likely to continue, even as the pandemic recedes. Bisnow, a platform that tracks the commercial real estate industry recently reported that half of all companies plan to require full-time in-person work within the next year. While this represents a move back to the norm, the article notes that full-time remote, or hybrid,

office work models will retain a prominent role going forward. This result frees office workers to find less urban housing which was previously impractical to many.

Moreover, Bisnow reports that there is a strong backlash amongst employees who seek continued remote work opportunities, a factor that has changed recruitment strategies for several large employers.

In summary, the post-pandemic housing landscape has likely been changed in a substantive way, setting the stage for a strong long-term housing market in communities such as Waverly which has likely already been experiencing that trend. As supply-chain disruptions ease and construction materials costs moderate, the competitiveness of Waverly's housing market opportunities should continue to sustain a strong growth pattern.

As such, NAC believes this projection to be a **lower threshold estimate**, and does not likely account for upward shift in out-migration from the Twin Cities area counties reflected in the post-pandemic narrative above.

Appendix D: MPCA Design Flow and Loading Determination Guideline

Minnesota Pollution Control Agency

Water Quality

Wastewater Review and Guidance

Design Flow and Loading Determination Guidelines for Wastewater Treatment Plants

Water/Wastewater Technical Review and Guidance/#5.20, February 2002

Contents:

Introduction 1

Bypass/Overflow 5

Treatment Systems with New Sanitary Sewer Collection Systems 3

Mechanical Treatment Plants with Existing Sanitary Sewer Systems 4

Controlled Discharge Pond Systems with Existing Sanitary Sewer Systems 5

Flow Equalization 5

Infiltration and Inflow (I/I) 5

Essential Project Components Percentage 5

Wastewater Treatment Plant Design Loading ... 5

The determination of design flows and pollutant loadings is one of the most important items in the planning of a new or expanded wastewater treatment facility. A detailed analysis of existing flow conditions and the use of adequate flow estimates will determine the hydraulic and pollutant removal capacity needed to properly treat the wastewater and comply with permit conditions. It is necessary to include all contributing flow streams and pollutant loading sources in this analysis, including all residential, seasonal, institutional, commercial, industrial, inflow, infiltration, return and recycle streams and any other unique aspect of flow and pollutant contributions.

These guidelines are the recommended procedures for estimating the design flow and pollutant loading conditions, and are considered to be the minimum values necessary to assure adequate treatment facility capacity. It is expected that sound engineering judgment will be used to determine the appropriate design conditions for each individual treatment facility and that consideration will be given to impacts of decisions on upstream and downstream unit processes.

Introduction

The flow monitoring period for any particular project must record flow data during critical low as well as peak wet weather flow events. Data collected during these flow periods are used to estimate the four flow conditions that are critical to the design and operation of wastewater treatment plants including average dry weather (ADW), average wet weather (AWW), peak hourly wet weather (PHWW), and peak instantaneous wet weather (PIWW).

The average dry weather flow is the daily average flow when the ground water is at or near normal and a runoff condition is not occurring.

Average wet weather or peak month flow is the daily average flow for the wettest 30 consecutive days for mechanical plants or for the wettest 180 consecutive days for controlled discharge pond systems. The 180 consecutive days for pond systems should be based on either the storage period from approximately November 15 through May 15 or the storage period from approximately May 15 through November 15.

The peak hourly wet weather flow is the peak flow during the peak hour of the day at a time when the ground water is high and a five-year one-hour storm event is occurring. To determine this five-year one-hour storm event for the specific project, please refer to the attached Map Number 1.

The peak instantaneous wet weather flow is the peak instantaneous flow during the day at a time when the ground water is high and a twenty-five year one-hour storm event is occurring. To determine the appropriate twenty-five year one-hour storm event, please refer to Map Number 2.

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Where the Minnesota Pollution Control Agency (MPCA) determines that the above design flow considerations will not provide adequate protection to the receiving waters, facility capacity in excess of peak instantaneous wet weather flow may be required.

In cases where flow studies are over five years old, or where the consultant designing the treatment or transmission facility did not perform the flow study, a verification of the acceptability of the flow data should be performed.

Table 1 contains a summary of the minimum recommended flow and loading conditions for only a select group of processes. Specific design parameter details for individual treatment process units shall be in accordance with Ten States Standards.

Table 1: Design Conditions Summary

Item	Design
Collection System	Must be capable of transporting all flow to the treatment facility without bypassing.
Lift Station	Must be capable of transporting all flow to the treatment facility without bypassing.
Sanitary Sewers	100 gpcd (Other flows may be approved provided adequate justification is provided. In no case will a flow of less than 75 gpcd be approved.) + 80 gpcd for seasonal visitors + 20 gpcd for out-of-town student + commercial, industrial, and other non-residential flow
Organic Loading	Minimum BOD of 0.17 #pcd plus commercial, industrial, and other non-residential flow
Organic Loading	Minimum TSS of 0.20 #pcd plus commercial, industrial, and other non-residential flow
Peak Hourly Wet Weather with new collection systems	Actual flow data; or Ten States Standards Figure 1, Chapter 10; or 2.5 times AWW for residential, commercial + peak hourly industrial flow
Peak Instantaneous Wet Weather with new collection systems	Actual flow data; or 2.5 times AWW for residential, commercial +peak hourly industrial flow
Flow Equalization Basin	If PHWW/ADW $\geq$ 3, flow equalization must be considered. If PHWW/AWW $\geq$ 3, flow equalization must be considered. If equalization is not provided, a discussion of how the facility will handle the transition in flow must be included. See page 4
Facility Piping and Pumping	PIWW
Preliminary Treatment Unit (screens, grit removal, influent filters, etc.)	PIWW
Clarifiers (surface settling rate and weir loading rate)	PHWW + recirculation flow see “Ten States Standards”
Disinfection (detention time)	PHWW see (Ten States Standards)

Design Flows

Design flow determinations shall be made from actual facility flow data to the extent possible. The probable degree of accuracy of the data shall also be evaluated. This reliability estimation should include an evaluation of the accuracy of the existing data measurement, as well as the reliability of estimates of flow reductions or contributions from infiltration and inflow. Critical data and methodology used should be discuss in the facility plan or other engineering documents. A discussion of a method to use when existing flow data is available and when it isn't available is discuss below.

Treatment Systems with New Sanitary Sewer Collection Systems

For mechanical plants, if the industrial flow varies during the day or week, the design flow should be based on the average flow on the peak day during the period when the industry or industries are operating. This condition is called "rated flow." For example, if the industry discharges 10,000 gallons over eight of the twenty-four hours, the rated flow is 30,000 gallons per day. For controlled discharge pond systems, if the industrial flow varies during the day or week, the average design flow may be based on a weekly average.

The peak hourly wet weather design flow are the sum of the average wet weather design flow for residential (full-time and seasonal), commercial and out-of-town students multiplied by a peaking factor, plus the peak hourly industrial flow. The peaking factor shall be determined in accordance with Figure 1, in Chapter 10 of Ten States Standards.

The MPCA may approve of an alternative flow design with appropriate justification. For determining the design of the collection system (including design flow), refer to Chapter 20 Design of Sewers from "Recommended Standards for Sewage Works" (Ten States Standards).

Some form of permit "control language" may be included for wastewater treatment facilities if the per capita design flow is less than what is recommended in this document. For this situation, it may be a permit violation with "no more connections" when the permitted design flow is reached. Violation of the permitted flow could result in the requirement for submittal of a report that examines the flow in comparison to the number of connections and the number of people using the system. The permittee could also be required to plan, design, and build additional treatment units upon reaching the design capacity.

Treatment Systems with Existing Sanitary Sewer Systems

For a mechanical plant, if a separate sanitary sewer system exists, the attached Table 2 should be used to determine the peak hourly wet weather flow, the peak instantaneous wet weather flow, the average dry weather flow, and the average wet weather flow.

Part A of Table 2 and Figure 1 are used to determine the peak hourly wet weather flow. The measured flow should be plotted for a twenty-four hour period when ground water is at or near normal and a runoff condition is not occurring (Curve X on Figure 1). The ground water elevation in relation to the sewer elevation should be noted. The present peak hourly dry weather flow [(1) on Figure 1 and Table 2] is peak hourly flow during the twenty-four hour period when the ground water is at or near normal and a runoff condition is not occurring. The measured flow should be plotted for a twenty-four hour period when ground water is high and a runoff condition is not occurring (Curve Y). The ground water elevation in relation to the sewer elevation should be noted. Number (2) on Figure 1 and Table 2 is the peak hourly flow during a high groundwater period for that specific area and system when a runoff condition is not occurring. This flow (2) minus the present peak hourly dry weather flow (1) is the peak hourly infiltration.

The measured flow should be plotted for a twenty-four hour period when the ground water is high and a runoff condition is not occurring (Curve Z). This should include overflow, bypasses, and emergency pumping. The amount of rainfall and its duration should be plotted on the same graph. The peak inflow is represented by the greatest distance between Curve Y and Curve Z. The present hourly flow at the point of greatest distance between Curve Y and Z [(5) on Figure 1 and Table 2] minus the present hourly flow during high ground water at the same time of day [(6) on Figure 1 and Table 2] is the peak hourly inflow. It may be necessary to adjust the measured flow based on a relationship between the data attained during a major storm event and the five-year one-hour designed storm event. Items (10) and (13) are determined through a cost effectiveness evaluation. The gpcd contribution for population increase in item (15) [also in (25), (33), and (41)] should be 100 gpcd.

Part B of the table determines the peak instantaneous wet weather flow. The present peak hourly inflow adjusted for a five-year one-hour rainfall event [see part A(8)] is subtracted from the peak hourly wet weather flow [see part

A(19)]. To this number, add the present peak hourly inflow adjusted for a twenty-five year one-hour storm event. The resulting number is the peak instantaneous wet weather flow.

Part C of Table 2 determines the average dry weather flow. The present average dry weather flow (24) is the average flow received over a twenty-four hour period when the ground water is at or near normal and a runoff condition is not occurring. If the industrial flow varies during the day or week, the present average dry weather flow should be based on the average flow of the peak day during the period when the industry or industries are operating (rated flow). This also applies to the average flow from industrial increases.

Part D of the table determines the thirty-day average wet weather design flow. The average infiltration and inflow after rehabilitation (where rehabilitation is cost effective) is the wettest thirty-day average. The amount of infiltration after rehabilitation averaged over the thirty wettest days should be the same or nearly the same as the peak infiltration after rehabilitation. This is due to the fact that the ground water could stay high for a fairly extended period of time. The amount of inflow after rehabilitation averaged over the thirty wettest days depends on the type of sources, their location, the amount of rainfall that affects the source, etc.

Part E of Table 2 correlates all related information that can impact the degree of accuracy of the determination of design flows. It is recommended that a minimum of six months of accurate data be recorded. Minnesota Rules 7077.0150 subp. 2(b) requires a minimum of 30 consecutive days of actual flow monitoring. Data associated with the critical peak wet weather flow events for a sustained wet weather period are essential for accurate estimation of design flows. Critical peak wet weather flow events typically occur in the spring (March-June) and must include the condition of high ground water with inflow.

Controlled Discharge Pond Systems with Existing Sanitary Sewer Systems

The peak hourly wet weather and the peak instantaneous wet weather design flows to a pond system with an existing sanitary sewer system are arrived at in the same manner as in Parts A and B of the previous section. If the present industrial flow varies during the day or week, the present average dry weather flow (24) and (30) may be based on a weekly average. When computing the average wet weather flow, the average infiltration after rehabilitation (31), and the average inflow after rehabilitation (32) are averages over the wettest 180 consecutive days.

Flow Equalization

This section applies to all treatment facilities except pond systems. During a period of high ground water for that area and system, if the ratio of peak hourly wet weather design flow to average wet weather design flow [which is (19) divided by (37)] is three or more, flow equalization shall be evaluated. When the ratio is three or more and flow equalization is not employed, an explanation must be included outlining how the plant will handle this transition from average wet weather design flow to peak hourly wet weather design flow.

During a normal ground water period, if the ratio of the peak hourly design flow during the five-year one-hour storm event [(1)+(14)+(15)+(17)+(18)] to the average dry weather design flow (29) is three or more, flow equalization shall be evaluated. When the ratio is three or more and flow equalization is not employed, an explanation must be included outlining how the plant will handle this flow transition.

Infiltration and Inflow (I/I)

Inflow means water other than wastewater that enters a sewer system from sources such as roof leaders, foundation drains, yard drains, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, storm water runoff and other drainage structures.

Infiltration means water other than wastewater that enters the sewer system from the ground through defective pipe, pipe joints, and manholes.

I/I is a part of every collection system and must be taken into account in the determination of an appropriate design flow.

Excessive infiltration means the quantity of flow that is more than 120 gpcd (domestic base flow and infiltration).

Excessive inflow means the quantity of flow during storm events that results in chronic operational problems related to hydraulic overloading of the treatment system or that results in a total flow of more than 275 gpcd (domestic and industrial base flow plus infiltration and inflow). Chronic

operational problems may include surcharging, backups, bypasses, and overflows.

If excessive levels of infiltration or inflow exist in the system, a comparison of alternatives for elimination of the excessive flow and treating the excessive flow shall be included with the design summary.

Bypass/Overflow

All bypass/overflow structures shall be manually controlled and kept locked at all times. All bypassing is regulated by permit and is prohibited. An upset defense may be available if: 1) bypass was unavoidable to prevent loss of life, personal injury or severe property damage; 2) there was no feasible alternative to the bypass; or 3) the permittee gives previous notice of an anticipated bypass.

Any bypassing must be reported to the MPCA in a report consistent with permit requirements. This report shall include, but not be limited to, the bypass duration, estimated volume and associated meteorological conditions. Refer to the facility permit for specific bypass requirements. All bypasses and overflows must be immediately reported to the MN Duty Officer at 1-800-422-0798 (outstate) or (651) 649-5451 (Twin Cities Metro Area).

The MPCA may require a corrective action plan to mitigate frequent and/or unjustified bypass events. Failure to follow the proper bypass notification procedures or resolve problems in a timely manner may subject the permittee to enforcement actions, including monetary penalties.

The following design flow considerations may be required to be incorporated into new or existing treatment facilities on a temporary or full time basis in order to reduce the frequency as well as degree of adverse environmental impact associated with bypassing:

A. The treatment facility shall provide pretreatment for the removal of coarse floatable and/or settleable solids during flows in excess of peak instantaneous wet weather. In addition, the pretreated wastes shall then be blended with the fully treated effluent, where practical, and discharge samples collected for the purpose of determining NPDES/SDS permit compliance of the blended effluent.

B. Flow equalization for mechanical plants may be necessary in order to effectively operate treatment plants. Please refer to the section entitled Flow Equalization.

Essential Project Components Percentage

Minnesota Rules 7077.0111 to 7077.0292 apply to the MPCA's administration of financial assistance programs for the construction of municipal wastewater treatment systems. The assistance programs include the Wastewater Infrastructure Fund (WIF) and the State Revolving Fund (SRF) loan program. These rules require the calculation of an "essential project components percentage." The percentage will be used by the Public Facilities Authority (PFA) in their determination of a project's cost that may qualify for assistance with the WIF. Please see Table 3 for more information on calculating an essential project components percentage.

Wastewater Treatment Plant Design Loading

Table 4 should be used to determine the design loadings for the upgraded wastewater treatment plant.

For More Information

Please contact the engineer assigned to the project or District. If the engineer is unknown, contact the Customer Assistance Center.

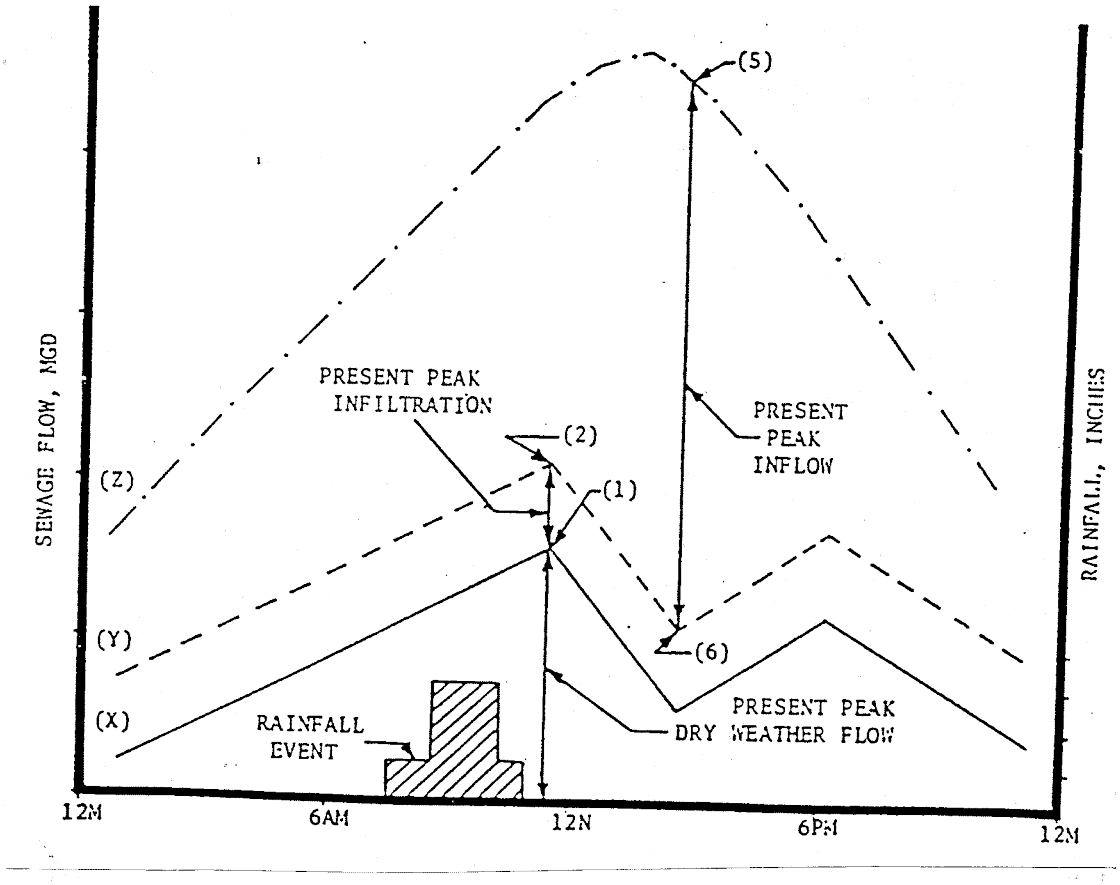
Customer Assistance Center ..... (651) 297- 2274

MPCA ..... (651) 296-6300

Toll-free ..... (800) 657-3864

TTY ..... (651) 282-5332

Figure 1: Determination of Peak Hourly Flows Before Adjustment for Storm Event



Note: All flow measurements taken at treatment plant with adjustments for bypasses, overflows, and emergency pumping.
Groundwater elevation in relation to sewers should be stated for several points in the sewer system.
Dates of flow measurement should be stated.

PROJECT NAME _____
LOCATION _____
COMPLETED BY _____ **DATE** _____

Table 2: Determination of Design Flows

(A) For determination of peak hourly wet weather design flows (PHWW): Gallons Per Day

1	Present peak hourly dry weather flow	
2	Present peak hourly flow during high ground water period (no runoff)	
3	Present peak hourly dry weather flow [same as (1)] -	
4	Present peak hourly infiltration =	
5	Present hourly flow during high ground water period and runoff at point of greatest distance between Curves Y and Z	
6	Present hourly flow during high ground water (no runoff) at same time of day as (5) measurement -	
7	Present peak hourly inflow =	
8	Present peak hourly inflow adjusted for a 5-year 1-hour rainfall event	
9	Present peak hourly infiltration [same as (4)]	
10	Peak hourly infiltration cost effective to eliminate -	
11	Peak hourly infiltration after rehabilitation (where rehabilitation is cost effective) =	
12	Present peak hourly adjusted inflow [same as (8)]	
13	Peak hourly inflow cost effective to eliminate -	
14	Peak hourly inflow after rehabilitation (where rehabilitation is cost effective) =	
15	Population increase _____@_____ gpcd times 2.5 (peaking factor)	
16	Peak hourly flow from planned industrial increase	
17	Estimated peak hourly flow from future unidentified industries	
18	Peak hourly flow from other future increases	
19	Peak hourly wet weather design flow [(1)+(11)+(14)+(15)+(16)+(17)+(18)]	

(B) For determination of peak instantaneous wet weather design flow (PIWW): Gallons Per Day

20	Peak hourly wet weather design flow [same as (19)]	
21	Present peak hourly inflow adjusted for a 5-year 1-hour rainfall event [same as (8)] -	
22	Present peak inflow adjusted for a 25-year 1-hour rainfall event +	
23	Peak instantaneous wet weather design flow =	

(C) For determination of average dry weather design flow (ADW): Gallons Per Day

24	Present average dry weather flow	
25	Population increase _____@_____ gpcd	
26	Average flow from planned industrial increase +	
27	Estimated average flow from other future unidentified industries +	
28	Average flow from other future increases +	
29	Average dry weather design flow [(24)+(25)+(26)+(27)+(28)] =	

(D) For determination of average wet weather design flow (30-day average for mechanical plants and 180-day average for controlled discharge ponds) (AWW): Gallons Per Day

30	Present average dry weather flow	
31	Average infiltration after rehabilitation (where rehabilitation is cost effective) +	
32	Average inflow after rehabilitation (where rehabilitation is cost effective) +	
33	Population increase @ gpcd +	
34	Average flow from planned industrial increase +	
35	Estimated average flow from other future unidentified industries +	
36	Average flow from other future increases +	
37	Average wet weather design flow [(30)+(31)+(32)+(33)+(34)+(35)+(36)] =	

(E) Critical data (including a graphical display similar to Figure 1), methodology, and a discussion on the following items shall be included with the above calculations:

38	Dates during which actual flow data was recorded and its probable degree of accuracy.
39	Ground water elevation data relative to the collection system, during the time period when flow data was recorded.
40	Rainfall data during the time period when flow data was recorded and how the amount of rainfall compares to normal seasons.
41	Probable degree of accuracy of flow reduction due to proposed or completed I/I correction or elimination of bypasses.

Table 3: Essential Project Components Percentage

Definitions:

"Essential project components" means those components of a wastewater disposal system that are necessary to convey or treat a municipality's existing wastewater flows and loadings and future flows and loadings based on the projected residential growth of the municipality for a 20-year period.

Mass Loading (lbs./day) = Flow (MGD) X Concentration (mg/l) X 8.34

	Total Existing Daily Conditions		Total Proposed 20-year Design Conditions	
Flow (MGD)		MGD		MGD
$CBOD_5$ (mg/l)		mg/l		mg/l
Mass Loading (lbs./day)		lbs./day		lbs./day

Essential Project Components Percentage = $100 \times \frac{\text{Total Existing } CBOD_5 \text{ Mass Loading}}{\text{Total 20-year Growth Mass Loading}}$

$= 100 \times \frac{(\quad)}{(\quad)}$

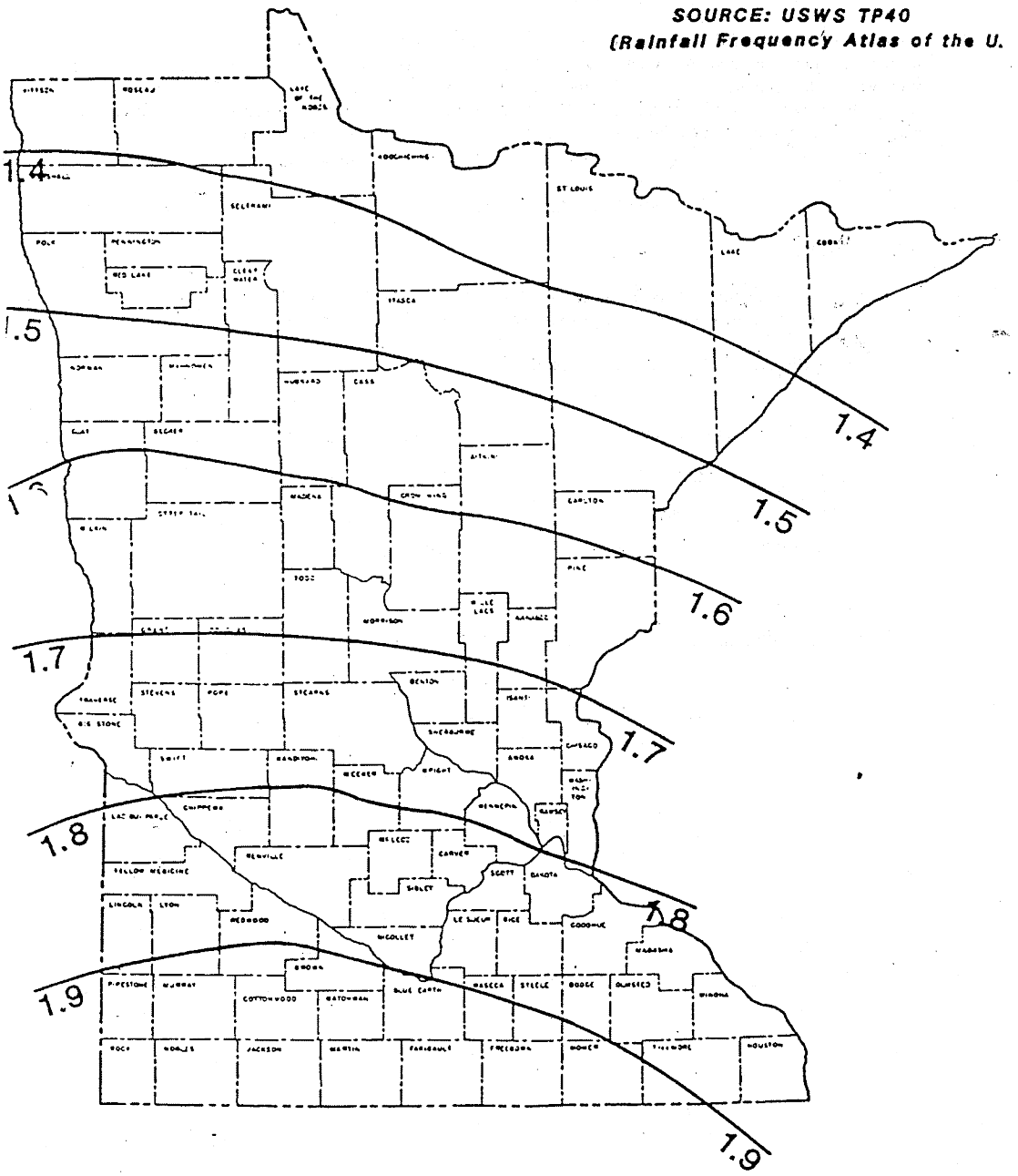
$= \_\_\_\_\_\%$

Table 4: Determination of Design Loadings

		Unit Basis	ADW	AWW
Residential Waste	Population			
	Flow, GPD			
	BOD_5, #/day			
	TSS, #/day			
	NH_3-N, #/day			
	P, #/day			
Out-of-Town Students and Workers	Number			
	Flow, GPD			
	BOD_5, #/day			
	TSS, #/day			
	NH_3-N, #/day			
	P, #/day			
Seasonal Residents	Number			
	Flow, GPD			
	BOD_5, #/day			
	TSS, #/day			
	NH_3-N, #/day			
	P, #/day			
Industrial	Flow, GPD			
	Rated Flow, GPD			
	BOD_5, #/day			
	TSS, #/day			
	NH_3-N, #/day			
	P, #/day			
Other (Specify)	Flow, GPD			
	Rated Flow, GPD			
	BOD_5, #/day			
	TSS, #/day			
	NH_3-N, #/day			
	P, #/day			
Infiltration	GPD			
Inflow	GPD			
Total	Flow, GPD			
	Rated Flow, GPD			
	BOD_5, mg/l			
	BOD_5, #/day			
	TSS, mg/l			
	TSS, #/day			
	NH_3-N, mg/l			
	NH_3-N, #/day			
	P, mg/l			
	P, #/day			

* It may be necessary to also test for TKN for certain industrial contributors.

MAP NUMBER 1:
5-Year, 1-Hour Storm Event (inches)



Appendix E: Phosphorus Effluent Limit Review

DATE : 9/24/2018
TO : File
Matt Lindon
FROM : Effluent Limits Unit
Environmental Analysis and Outcomes Division
PHONE : 651-757-2530

SUBJECT : Phosphorus Effluent Limit Review for the Greater Crow River Watershed v1.12

VERSION :
1.13 Adjusted NF Crow WLA Calculations to include Atwater WWTP
1.12 Removed RES analysis on WID 07010205-513 based on designation as a Class 7 water and adjusted WLA calculations
1.11 Added Seneca Food – Glencoe limits based on new information on their discharge, Changed Green Lake, to Glacial Lakes SSWD
1.10 Atwater WWTP added to the facility list.
1.9 Lake limit changed for Cosmos, Lake Lillian and Cedar Mills based on Otter lake retention time, Silver Lake pond based limit added, RES limits added to Great River Energy Dickinson, AB Mauri Foods Inc. Lake Pepin based limit adjusted.
1.8 Added executive summary Adjusted Delano WTP and Darwin WWTP limits
1.7 Loreto Limits added based on Pioneer –Sara Creek Watershed TMDL
1.6 New Germany SDR limit removed based on error
1.5 Bushmills Ethanol taken out
1.4 Limits added limits for Belgrade
1.3 Notes: Loretto WWTP Changed based on TMDL issues Feb 26 2016

Table of contents

Table of contents 1
Executive summary 2
Introduction 4
Lake Pepin TMDL 6
North Fork Crow 7
Lake eutrophication standard limits 12
Purposed phosphorus limits North Fork Crow River Watershed 13
South Fork Crow 14
River eutrophication standard limit analysis 15
Lake eutrophication standard based limits 20
Lower Crow 22
River eutrophication standard limit analysis 22
Lake eutrophication standard limits 26
Lower Crow facility limits 26
Conclusion 27
References 29

Executive summary

This memorandum will explain why additional phosphorus reductions are needed within the North and South Fork Crow River Watersheds from some wastewater treatment facilities (WWTFs). The both Crow Rivers as well as downstream in the Mississippi River have high levels of algae on average. Algae are an important part of the food web of rivers, but too much is not good. When algal levels are high, only the toughest species of fish and aquatic insects can survive. In addition, the smelly and murky water makes canoeing and swimming on the river unpleasant.

High levels of the nutrient phosphorus are needed to produce large algal blooms. In 2015, the Minnesota Pollution Control Agency (MPCA) adopted rules, which included standards (targets) for total phosphorus (TP) and algae in rivers. Now, when TP levels and algal levels are too high, the MPCA is required by law to develop a plan to reduce levels of TP, which will reduce algal levels to desirable levels.

For a healthier Crow River and Mississippi River, phosphorus reductions need to be made by both point and non-point sources. Phosphorus contributions from both sources vary depending on weather and river conditions. During periods of high precipitation, non-point sources such as erosion and agriculture contribute most of the phosphorus going into the Mississippi River. During periods of lower precipitation, when the Mississippi River is at low flow, point sources such as WWTFs contribute much of the phosphorus going into the Mississippi River.

The MPCA worked with the U.S. Environmental Protection Agency for over two years on developing its procedures for implementing effluent limits to meet the phosphorus standards for rivers. In June of 2016, the Minnesota Court of Appeals affirmed a process for setting limits that was the same as the process used for the limits outlined in this memorandum[1].

There are several important details for the new river eutrophication based TP limits (Executive summary table 1). First, the River Eutrophication limits only apply from June through September. Second, limits for the North and Greater Crow facilities are mass based which allow the facility to discharge at a higher concentration if their flows are well below design flow. As an individual facility grows, they will have to reduce the concentration of their effluent limit to meet the mass limit. Third, the new limits will have a monthly limit and a long-term goal (waste Load Allocation /WLA). The limit is the highest monthly mass the facility can discharge during a summer month. The limit is twice the long-term goal and allows for the inherent variability in WWTF effluent. The long-term goal will be included in the permit text. Complying with the limit each month should result in the facility achieving the long-term goal as an average of all summer months over a 5-year permit cycle. Each facility will need to look at the variability in their TP concentration and effluent flow during summer to assess if their facility can meet the proposed TP mass limits for river eutrophication standards. The MPCA has developed flow and concentration charts for each WWTF to help the operator identify what concentration they need to achieve at a given flow rate to comply with the monthly and long-term mass goals.

Stabilization ponds

While many ponds may have RP for North and South Fork Crow River, the risk that they may exceed the river RES WLA on average after an annual Lake Pepin limit is applied is less than for a continuous facility for two reasons. First, ponds cannot discharge during much of the summer. Second, during early and late summer periods in which ponds can discharge, data demonstrate that summer (June – September) discharge only occurs 25% of the time. In the Lake Pepin drainage area, for instance, ponds only discharge during 5 of 122 summer days, on average. As such, there is a low probability that a pond discharge may occur during the growing season, regardless of concentration, which minimizes the environmental impact.

[1] MCEA vs. MCES and MPCA https://mn.gov/law-library-stat/archive/ctapun/2016/opa151622-061316.pdf

Executive Summary Table 1 Phosphorus limits and permit actions for North and South Fork Crow Watershed facilities

Facility	Permit ID	Permit Action/ Limit	SDR Limit mg/L	Lake Limit[1] kg/y	River WLA[2] kg/d	River Limit[3] kg/d	River WLA[2] mg/L	River Limit[3] mg/L
AB Mauri Food Inc	MNG250099	Limits	-	621.7	-	-	0.15	0.32
AMPI – Paynesville	MN0044326	Limits	1.0	15.9	-	-	-	-
Annandale/Maple Lake	MN0066966	Limits	1.0	1,636	0.63	1.32	-	-
Atwater WWTP	MN0022659	Limits	-	553	0.25	0.52	-	-
Belgrade WWTP	MN0051381	Limits	-	807	1.1	2.2	-	-
Brooten WWTP [4]	MN0025909	Limits	1.0	184	-	-	-	-
Brownton WWTP	MN0022951	Limits	-	493.2	-	-	0.47	1.0
Buffalo Lake WWTP [4]	MN0050211	Limits	-	455.9	-	-	-	2.0
Buffalo WWTP	MN0040649	Limits	1.0	4,774	2.29	4.81	-	-
Cedar Mills WWTP	MN0066605	Limits	-	44.2	-	-	-	2.0
Cokato WWTP	MN0049204	Limits	-	1,003	0.58	1.21	-	-
Cosmos WWTP	MNG580056	Limits	-	248.7	-	-	-	2.0
Darwin WWTP [4]	MNG580150	Limits	1.0	69	-	-	-	-
Dassel WWTP	MN0054127	Limits	1.0	260	-	-	-	-
Delano WTP	MNG640123	Limits	1.0	20.7	-	-	0.29	0.6
Delano WWTP	MN0051250	Limits	-	2,430.4	-	-	0.25	0.53
Faribault Foods - Cokato	MN0030635	Limits	-	360	-	-	-	-
Glencoe WWTP	MN0022233	Limits	-	2,873.6	-	-	0.25	0.53
Great River Energy Dickinson	MN0049077	Limit	-	41.4	0.17	0.24	-	-
Glacial Lakes SSWD WWTP	MN0052752	Limits		1228.2	0.71	1.48	-	-
Greenfield WWTP	MN0063762	Limits	1.0	138	0.13	0.26	-	-
Grove City WWTP	MN0023574	Limits	-	309.5	0.18	0.37	-	-
Hector WWTP	MN0025445	Limits	-	911.8	-	-	0.3	0.63
Hutchinson Technology Inc.	MN0055506	Limits	-	92.6	-	-	0.26	0.54
Hutchinson WWTP	MN0055832	Limits	-	6,001.30	-	-	0.15	0.32
Lake Lillian WWTP[4]	MNG580225	Limit	-	147.1	-	-	-	2.0
Lester Prairie WWTP	MN0023957	Limits	1.0	502.9	-	-	0.3	0.63
Litchfield WWTP	MN0023973	Limits	1.0	2619.4	1.26	2.64	-	-
Loretto WWTP[5]	MN0023990	Limits	-	0	-	-	-	-
Mayer WWTP	MN0021202	Limits	1.0	601	-	-	0.3	0.63
Meadows of Whisper Creek	MN0066753	Limits	-	96.7	0.09	0.19	-	-
Minnesota Energy	MN0063151	Limits	-	871.7	-	-	1.0	2.1
Montrose WWTP	MN0024228	Limits	1.0	1079	0.62	1.3	-	-
New Germany WWTP [4]	MN0024295	Limits	-	204	-	-	-	2.0
Otsego East WWTP	MN0064190	Limits	1.0	1,823.6	1.66	3.48	-	-
Paynesville WWTP	MN0020168	Limits	1.0	1,225.8	-	-	-	-
Rockford WWTP	MN0024627	Limits	-	899.4	0.82	1.72	-	-
Rogers WWTP	MN0029629	Limits	1.0	1,770.6	1.62	3.4	-	-
Saint Michael WWTP	MN0020222	Limits	1.0	2,702.3	2.47	5.18	-	-
Seneca Foods Corp – Glencoe	MN0001236	Limits	-	1,183	-	-	0.15	0.32
Silver Lake WWTP[4]	MNG580164	Limit	-	672.1	-	-	-	2.0
Stewart WWTP [4]	MNG580077	Limits	-	315	-	-	-	2.0
Watertown WWTP	MN0020940	Limits	-	1,394.8	-	-	0.25	0.53
Winsted WWTP	MN0021571	Limits	-	1,132.9	-	-	0.3	0.63

1- Limit based on Lake Pepin TMDL- 12 Month Rolling Total
2- Waste Load allocation needs to be meet as a long term average
3- Recommended effluent limit to meet RES in the North and South Fork Crow River
4- Stabilization Pond

Introduction

The purpose of this memorandum is to determine wastewater total phosphorus (TP) effluent limits to protect waters of the Greater Crow River Watershed (GCRW). For the purposes of the memo, the Greater Crow is divided into three separate watersheds: North Fork Crow River Watershed (NFCRW), South Fork Crow River Watershed (SFCRW), and the Lower Crow River Watershed (LCRW, Figure 1). The memo is broken up into three sections describing the analysis and proposed limits for each of the three watersheds. Currently, there are forty-five permitted national pollutant discharge elimination system (NPDES) facilities within the watersheds. Since 2008, MPCA has set effluent limits for wastewater treatment facilities (WWTFs) upstream of lakes and reservoirs consistent with lake eutrophication standards (LES). The Minnesota Pollution Control Agency (MPCA) recently adopted river eutrophication Standards (RES) applicable across the state. This memo describes the effluent limits necessary to meet the respective River and Lake Eutrophication Standards.

Federal law [40 CFR 122.44(d)] restricts mass increases upstream of impaired waters and states that all NPDES dischargers that have the reasonable potential (RP) to cause or contribute to downstream impaired waters are required to have a water quality based effluent limit (WQBEL).The following analysis will examine RP for both river reaches and downstream lakes. In rivers, the process used to determine RP and derive WQBELs is defined in *Implementing River and Lake eutrophication standards for NPDES wastewater permits* (Wasley 2014). For lakes, permittees are found to have RP for 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. Lake eutrophication computer models are then used to derive lake eutrophication limits.

Figure 1. Greater Crow Watersheds and NPDES wastewater treatment facilities.

River eutrophication based effluent limits

Critical aspects of RES (Minn. R. 7050.0222, Heiskary, 2013) include:

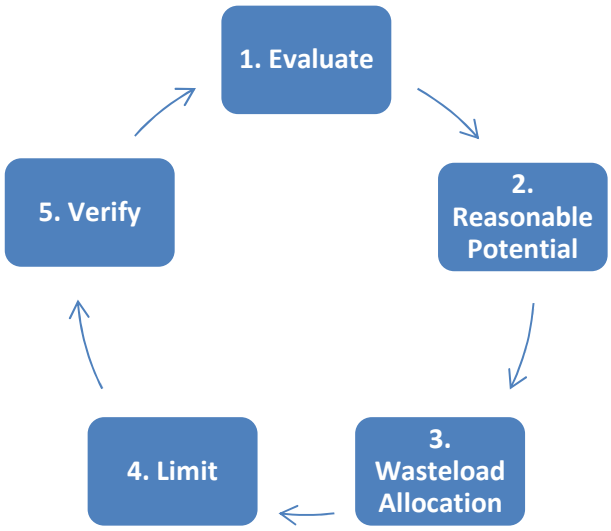
- Applicable only during June – September
- Criteria includes Phosphorus and response variable Chlorophyll-a
- RES are regionally based criteria
- Limits are assigned bases on calculated load allocation and a 2.1 multiplier (Wasley, 2015)

The GCRW spans three River Nutrient Regions (RNRs):

- South RNR (SFCRW) ≤ 150 µg/L TP and ≤ 35 µg/L Chl-a
- North RNR (NFCRW) ≤ 100 µg/L TP and ≤ 18 µg/L Chl-a
- Lower Crow River (LCRW) RNR ≤ 125 µg/L TP and ≤ 18 µg/L Chl-a (site-specific reach due to combination of two upstream rivers from different RNRs)

The process for reviewing TP limits in the GCRW included a five-step process (Figure 2). Methods for the analysis and limit determinations were consistent with MPCA guidance on implementing river eutrophication standards (Wasley, 2014). The five steps were completed on each of the three GCRWs, as well as two subwatersheds in the SFCRW. The RES five-step process is briefly described below. Using RES implementation guidance, it was determined that facilities in all three watersheds have RP to cause or contribute to the exceedance of applicable RES. Proposed Phosphorus effluent limits were calculated for facilities to ensure RES are met.

Figure 2. General process for RES analysis and NPDES permitee limit determination.



Lake eutrophication bases limits

Since 2008, MPCA has set effluent limits for WWTFs upstream of lakes and reservoirs consistent with LES. Eutrophication standards for lakes, shallow lakes, and reservoirs can be found in Minn. R. 7050.0222. Many facilities in the GCRW already have WQBELs for downstream lakes. Several total maximum daily load (TMDL) studies completed in the watershed have determined necessary phosphorus wasteloads from point sources to protect lakes, and include the following: Rice Lake Excess Nutrient TMDL 2012, North Fork Crow River TMDL Bacteria, Nutrients, and Turbidity TMDL, Lake Independence Phosphorus TMDL and South Fork Crow River Lakes Excess Nutrients. All of these TMDLs are designed to meet lake standards that have lower criteria values than applicable river eutrophication standards. In this way, it is reasonable to assume that limits designed to meet lake WLAs are therefore sufficient to protect intervening river reaches.

Lake Pepin TMDL

Effluent from all GCRW facilities is discharged upstream of Lake Pepin, a reservoir on the Mississippi River. In 2002, Lake Pepin was placed on the federal Clean Water Act Section 303(d) list of impaired waters due to excess nutrients. A TMDL study is currently delayed; however, a significant portion of the modeling analysis has been completed. Phosphorus is the primary nutrient responsible for excess algal growth in Lake Pepin. The Facilities were all shown to have RP for TP at Lake Pepin. Therefore, Facilities in the GCRW are required to have a TP (WQBEL as well. It is recommended that The Facilities receive a 12-month moving total mass limit derived from a draft TMDL Wasteload Allocation (WLA), as described below (Table 1). Draft WLAs in combination with other point and nonpoint reductions are sufficient to meet draft criteria in Lake Pepin designed to support the designated uses of this water resource.

A computer reservoir model for Lake Pepin was developed by MPCA modeling consultant, LimnoTech, to evaluate site-specific eutrophication criteria and the reductions necessary to achieve these criteria (LTI, 2009. Using the best available science, draft criteria for Lake Pepin were determined to be 0.100 mg/L for TP and 0.028 µg/L for Chl-a (Heiskary and Wasley 2012. Within the model, all major sources of TP upstream of Lake Pepin were considered, and 21 separate scenarios were developed. Scenario 17 achieved compliance with the draft criteria and predicted the following TP reductions from tributaries would be necessary: 50% from the Minnesota River and Cannon River and 20% from the Mississippi River upstream of Lock and Dam 1 and the St. Croix River. Again, per Code of Federal Regulations, it was assumed that reductions would be from both point and nonpoint sources. During the modeling process MPCA, staff simultaneously developed draft WLAs compatible with scenario 17 reductions for all NPDES dischargers within the contributing watershed.

A categorical approach was used to develop individual WLAs for the draft Lake Pepin TMDL. Calculations use the general formula below.

> Facility WLA = Average Wet Weather Design Flow /Max Design Flow x categorical concentration mg/L TP x 3.785 L/gal x 365 days/yr.

Concentration categories are based on facility size and type (Table 1). Resulting Lake Pepin WLAs for individual facilities are expressed as 12-month moving total mass limits.

Table 1. *Draft* WQBELS for municipal and industrial WWTFs in the Lake Pepin drainage.

Facility (AWWDF or MDF*)	Components of mass limit to meet Lake Pepin WQBEL
> 20.0 mgd	AWWDF x 0.3 mg/L
1.0 – 20.0 mgd	AWWDF x 0.8 mg/L
0.2 – 1.0 mgd	AWWDF x 1.0 mg/L
Continuous <0.2 mgd	Maintain current discharge**
Stabilization ponds <0.2 mgd	Maintain current discharge**
WWTFs at conc. Below RES	Maintain current discharge***
Industrial Discharge with concentration > 1.0 mg/L	MDF x 1.0 mg/L
Industrial Discharge with concentration < 1.0 mg/L	Current load x 1.15
Other Industrial	Limits specified on a site specific basis

* MDF = Maximum Design Flow --> common value used to evaluate industrial discharges.
**Mass limits based on categorical concentration and AWWDF (Average Wet Weather Design Flow)
***Expansion of these WWTFs may be permitted assuming effluent concentration remains below RES

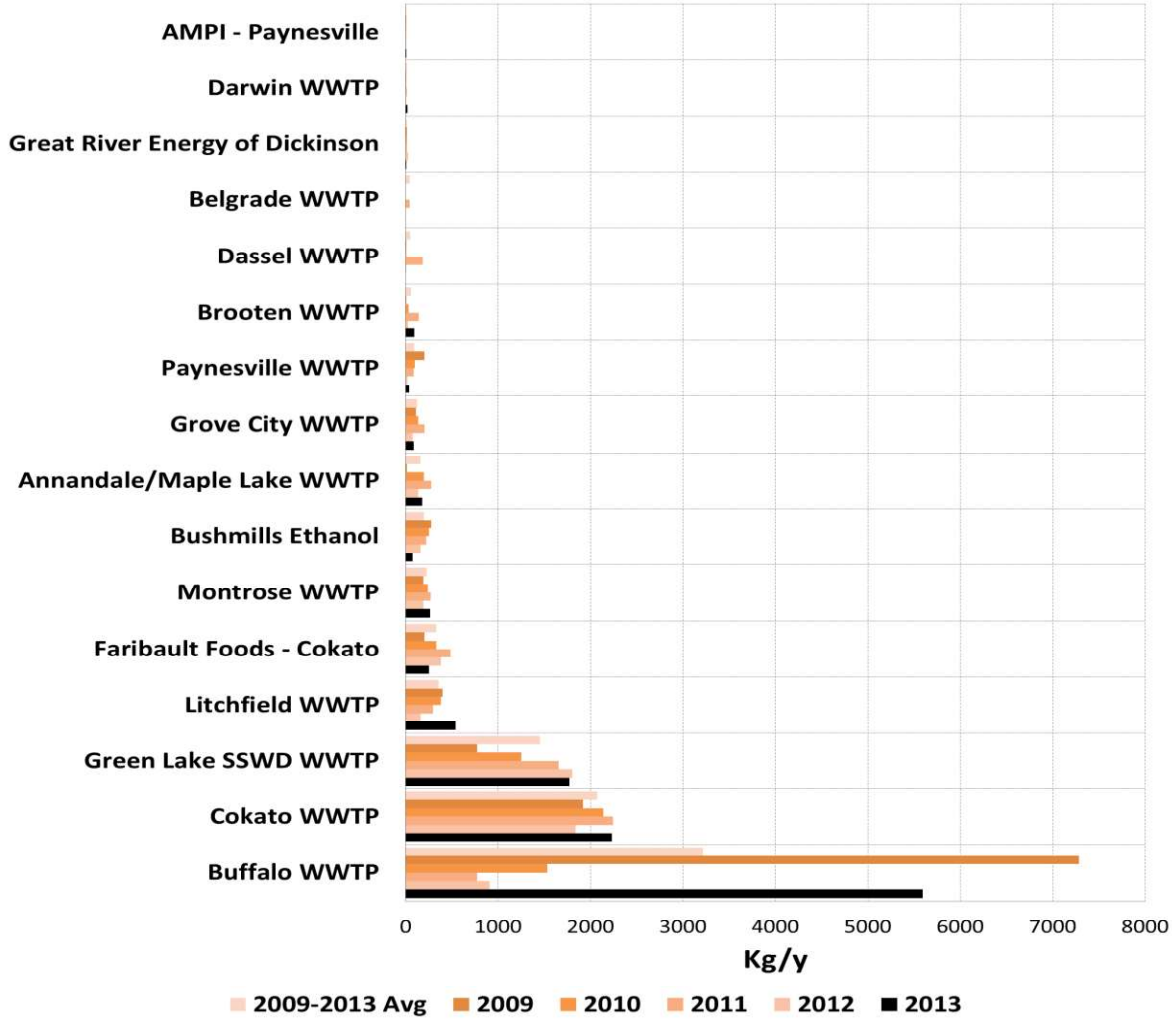
North Fork Crow

Introduction

The North Fork Crow River Watershed (NFCRW) covers 861,232 acres from the headwaters in Pope County to the confluence of the South Fork Crow River near Rockford (Figure 4). Land use in the North Fork Crow River Watershed is mostly agricultural, with the exception of the urban and commercial eastern portion located on fringe of the twin cities metropolitan area. Many of lakes and reaches of the NFCRW do not meet water quality standards for beneficial uses such as aquatic recreation, drinking, and swimming. The dominant lake pollutant is phosphorus, causing algae blooms in summer months. Reaches of the North Fork Crow River are listed for biological, bacteria, dissolved oxygen (DO), and turbidity impairments.

This drainage includes 18 NPDES permitted surface water discharges. Point source phosphorus discharge loading varies among facilities, with major and large facilities (e.g. Litchfield, Cokato, Green Lake and Buffalo) accounting for the majority of the point source phosphorus (Figure 3). Some NFCRW facilities (Paynesville, Bushmills Ethanol, Litchfield, and Buffalo) show recent reductions in phosphorus loading.

Figure 3. North Fork Crow River Watershed Facility Phosphorus Loading 2009-2013.



River Eutrophication Standard Limit Analysis

Water quality evaluation – Step 1

Currently there are six reaches in the NFCRW with sufficient RES data (Table 2 and Figure 4) to conduct a RES analysis. The data from outlet of the NFCRW near Rockford (AUID 07010204-503) shows that this reach exceeds RES. Thus, facilities upstream of this reach discharging during the RES summer window (June-September) also have RP to cause or contribute to the exceedance of RES under current discharge conditions.

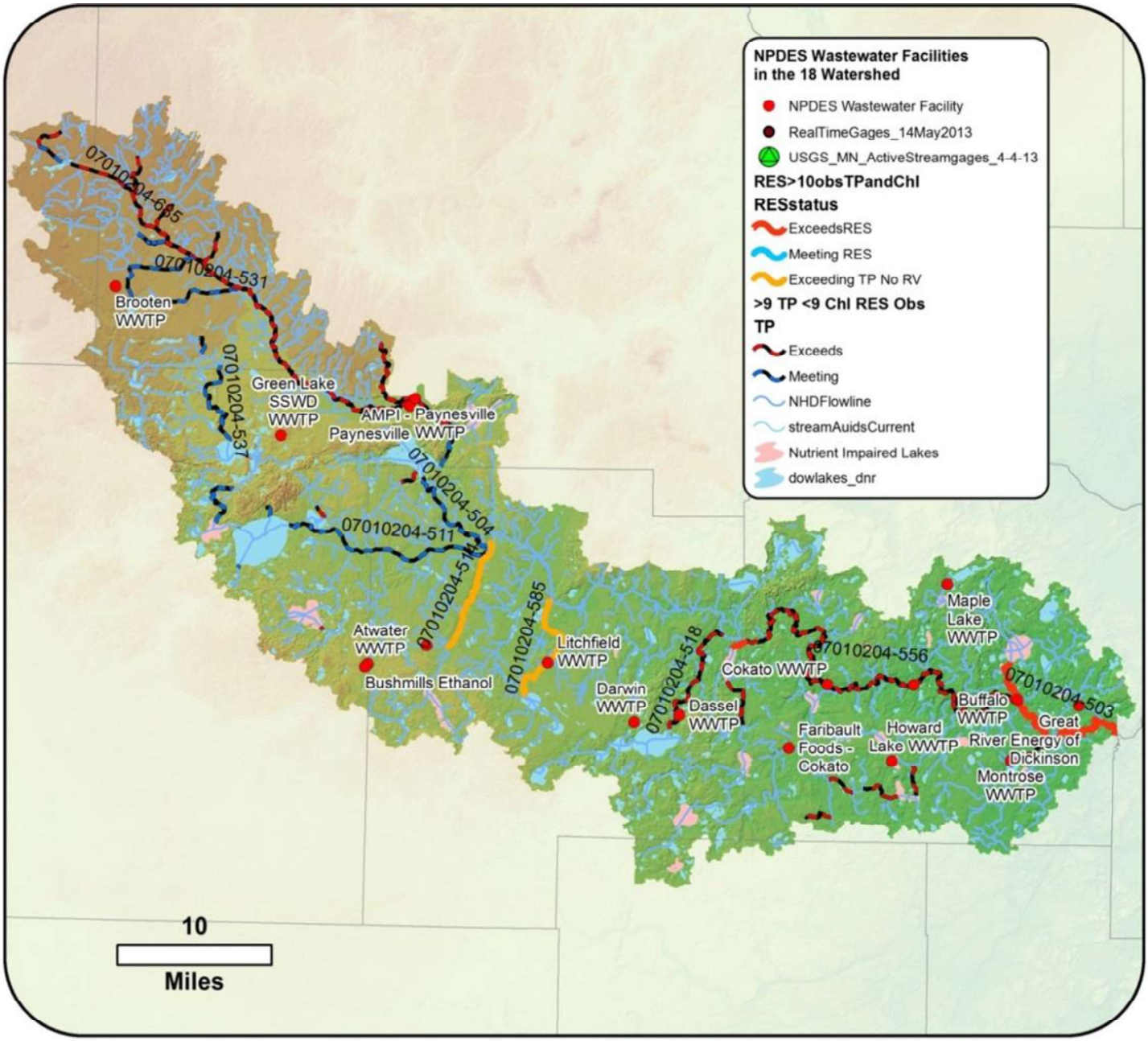
A recent MPCA stressor identification report North Fork Crow River Watershed Biotic Stressor Identification Report discusses low DO as a candidate cause for biological impairment. It also discusses causal pathways and connections with nutrients, Chl-a, and oxygen demand. The potential biological stressor of low DO and the connection to phosphorus could lead to more restrictive TP limits in the future. Additional research is necessary to determine the exact quantity of pollutant reductions, including phosphorus, necessary to restore DO conditions. It is generally assumed that ambient TP at or below RES criteria is sufficient to meet DO standards.

Table 2. NFCRW river reach water quality summary.

Reach AUID	Chl-a Count	Chl-a Avg. (µg/L)	TP Count	TP Avg. (µg/L)	Facilities discharging upstream of AUID
07010204-503	29	**62.4**	100	**203.3**	All Facilities
07010204-514	16	7.2	20	**182.4**	Bush Mills Ethanol
07010204-515	15	22.3	19	**152.1**	No Upstream Facilities
07010204-542	10	13.1	35	**327.8**	No Upstream Facilities
07010204-546	14	**56.6**	66	**126.7**	No Upstream Facilities
07010204-585	17	4.9	26	**327.4**	Litchfield

Exceedance of the RES criteria marked in Red

Figure 4. North Fork Crow River Watershed NPDES wastewater treatment facilities and water quality summary map.



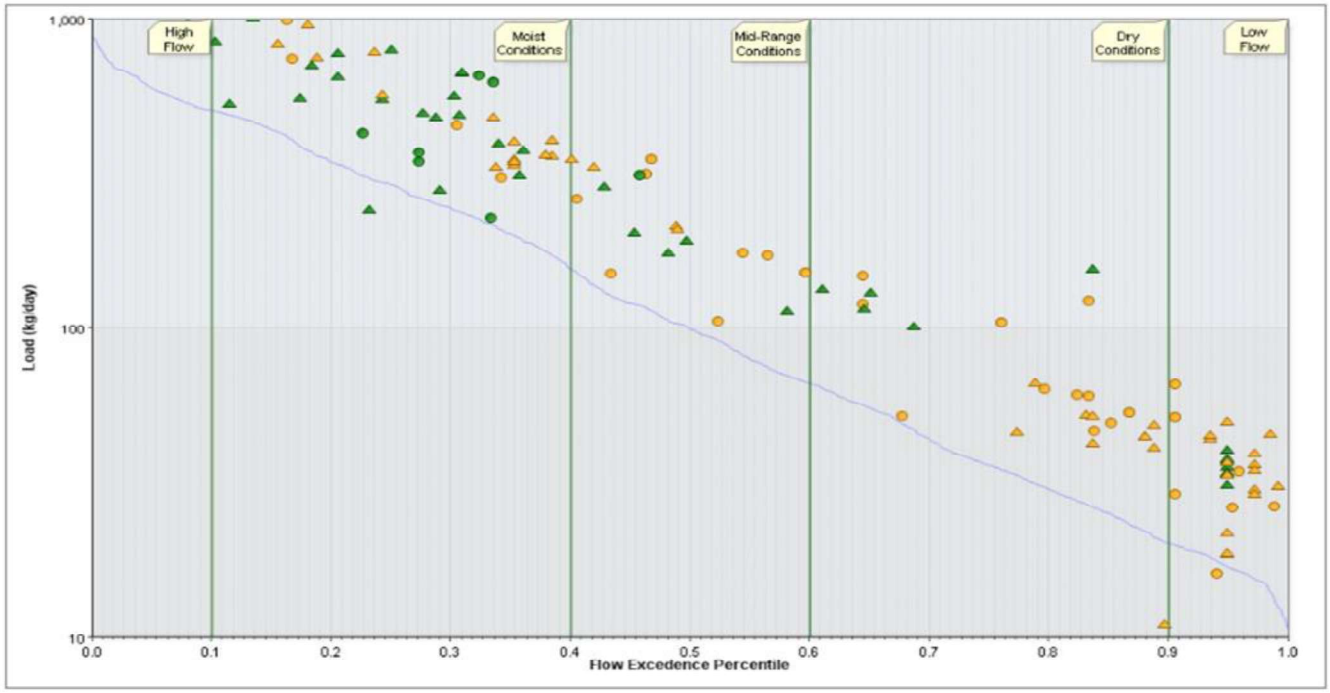
Reasonable potential at low flow – Step 2

The RP evaluation included a look at the contribution from point sources during low flow. Point sources can have a disproportionate impact on receiving waters during low flow conditions. Of the 16 facilities in the NFCRW, only 9 discharge to rivers during the summer period (excluding lakes and spray irrigation discharges).

A load duration curve was developed using flow data from the MPCA/USGS continuous flow monitoring database aka HYDSTRA. Summer (June – September) TP concentrations are evaluated when flow is equal to the 80th percent flow exceedance (when, on average, 80% of the flow exceeds the respective flow value). TP concentrations exceed RES criteria (TP ≤ 0.100 mg/L) at the NFCRW outlet, during low flow conditions (Figure 5).

If facilities are discharging at their full permitted load, the river is estimated to be 0.188 mg/L TP which exceeds RES (Table 1). Therefore, the facilities upstream of this reach have reasonable potential and will require more restrictive limits. Existing full permitted load was derived from limits needed to meet water quality in Lake Pepin. For municipals, this equates to 70% of average wet weather design flow (AWWDF) at the applicable categorical concentration. Industrials are represented by their full Lake Pepin load with no flow modification.

Figure 5. Load Duration Curve and RES Standard from the outlet of the North Fork Crow River Watershed. Flow based on station H18088001 (years of flow data) and TP surface water monitoring station S001-256 (June- Sept 1998-2014).



Equation 1. TP concentration of primary water of interest based on permitted flow for NFCRW Facilities.

$$\mathbf{Cr} = \frac{(\mathbf{Qs} * \mathbf{Cs}) + (\mathbf{Qe} * \mathbf{Ce})}{\mathbf{Qr}}$$

Table 3. Equation 1. values and description for NFCRW.

Variable	Value	Description	Source – Reference
Cr	0.188 mg/L	Concentration of river at critical flow (80th percentile exceeds flow) at design 70% flow and Potential Facility Loading	Equation 1
Qs	69.28 mgd	flow of river without WWTFs (80% flow exceedance – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
Cs	0.08 mg/L	Concentration of river without WWTFs (Low flow load in river – facility loads at low flow	HYDSTRA database, Discharge Monitoring
Qe	8.84 mgd	Facility Design Flows (70% of WWDF for municipals 100% MDF for industrial)	Water Quality Delta Database
Qr	78.12 mgd	downstream river flow (80th percentile flow exceedance)	HYDSTRA

Calculate wasteload allocation – Step 3

Using Equation 2, a Wasteload Allocation (WLA) of 7.95 kg/day was determined for the North Fork Crow River (Table 4). Facility loading would need to be below this WLA order to achieve a river TP concentration of <0.100 mg/L during the June through September summer period at low flow.

Equation 2. Wasteload allocation for the facilities to meet RES of 0.100 mg/L.

$$WLA\ conc._{\cdot} = \frac{\big(RES * (Qs + Qe)\big) - (Qs * Cs)}{Qe}$$

Table 4. Equation 2 values and description for NFCRW.

Variable	Value	Description	Source – Reference
RES	0.100 mg/L	North RER	
Qs	69.28 mgd	flow of river without WWTFs (80% flow exceedance – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
Qe	8.84 mgd	Facility Design Flows (70% of WWDF for municipals 100% MDF for industrial)	
Cs	0.08 mg/L	Concentration of river without WWTFs (Low flow load in river – facility loads at low flow	HYDSTRA database, Discharge Monitoring
WLA Conc.	0.238 mg/L	Effluent concentration to meet RES	Equation 3
WLA Load	8.0 kg/d	Point Source load permissible under the RES bases limits	$WLA\ Load = \frac{WLA\ conc}{QE * 3.785\ gal/L}$

Convert WLA to effluent limits – Step 4

Once the phosphorus effluent WLA is calculated, it is split up as individual WLAs for facilities within the NFCRW. Limits are then derived from individual WLAs. Given that each contributing facility is a different size and that phosphorus removal is typically more economical and easier to implement at larger facilities, the gross WLA is not simply divided by the number of contributing facilities. Instead, concentration multipliers, based on facility size and type, are applied to 70% of AWWDF to achieve individual WLAs. Multipliers are modified until the mass total is at or below the gross WLA (7.95 kg/day). This approach was done using a categorical method similar to that used for Lake Pepin.

Mass limit sensitivity analysis

In order to determine if mass or concentration limits are appropriate to meet RES, a sensitivity analysis was performed. Equation 3 is slightly modified from Equation 1, using **actual average flows** instead of 70% AWWDF and proposed mass limits. Equation 1 demonstrates a slightly higher concentration in the river (CR (Table 3) vs. CR_s (Table 5)), reflecting loss of dilution from equation 1 (Qe (Table 3) vs. Qe_s (Table 5)). The change in river

concentration results from a lower flow volume in Equation 3, ultimately providing less dilution for the river. The results from Equation 3 demonstrate whether downstream waters would be near the RES standard of 0.100 mg/L if facilities discharge at the proposed RES-based mass limits. In short, the sensitivity analysis predicts whether a lower volume, higher concentration slug of wastewater will result in a measurable excursion of water quality standards. If a measurable change is estimated, limits are expressed as concentration values to insure protection of downstream waters. Because facilities typically discharge well under their limit, this analysis estimates whether mass RES limits will be protective for downstream waters.

Equation 3. Mass Limit Sensativity analysis

$$\mathbf{Crs} = \frac{(\mathbf{QS} * \mathbf{CS}) + (\mathbf{QEs} * \mathbf{CEs})}{\mathbf{QRs}}$$

Table 5 Equation 3 values and description for NFCRW.

Variable	Value	Description	Source – Reference
CR_s	0.108 mg/l	Concentration in the River with actual average flows and proposed mass Limits	Equation 3
QS	69.28 mgd	flow of river without WWTFs \ (80% flow exceedance – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
CS	0.08 mg/L	Concentration of river without WWTFs (Low flow load in river – facility loads at low flow	HYDSTRA database, Discharge Monitoring
QE_s	2.84 mgd	actual average effluent flow for The Facilities June – September, 2009 – 2013	Discharge Monitoring
CE_s	0.74 mg/L	Concentration from average mass based effluent proposed limits and Actual Facilities flows June – September	$\mathrm{CEs} = \frac{WLA\ kg/d}{\mathrm{QE2} * 3.785\ \mathrm{gal/L}}$
QR_s	72.06 mgd	Sum of summer flows	$QS+QE_s$

The sensitivity analysis for the NFCRW revealed that there would be little change (0.008 mg/L) from applying monthly mass limits compared to monthly concentration limits. The formulas for monthly mass limits are the following:

*Municipal facilities: WQBEL (kg/day) = WLA (mg/L) * **70% of AWWDF** * 2.1 * 3.785*
*Industrial facilities: WQBEL (kg/day) = WLA (mg/L) * **100% of MDF** * 2.1 * 3.785*

Verify final limits - Step 5

It is generally assumed that limits set to support RES at the outlet of a major watershed will also be sufficient to protect other downstream waters. The next downstream reach from the NFCRW outlet is in the LCRW. This reach has site-specific RES criteria of 125 µg/L TP and 35 µg/L Chl-a (Heiskary and Wasley, 2012). With proposed limits ensuring that outlet concentrations will be meeting the 0.100mg/L stream concentrations, this will be protective for downstream waters as well.

Lake eutrophication standard limits

A review of lake assessments and lake dischargers was completed to ensure that discharges would be in accordance with state lake eutrophication standards (LES). There are five active NPDES discharges directly to or upstream of lakes within the NFCRW. The three lakes affected by these discharges are Rice (73-0196), Washington (47-0026) and Cokato (68-0263). Phosphorus limits protective of these lakes have been previously determined (Table 6).

Table 6. North Fork Crow River Watershed Lake specific discharger limits.

Facility	Downstream Lake	LES Status	Current LES Based Limit	Limit Source
Brooten WWTP	Rice Lake 73-0196	Impaired	184 kg/y	Rice Lake Excess Nutrient TMDL 2012
AMPI – Paynesville	Rice Lake 73-0196	Impaired	15.9 kg/y	Rice Lake Excess Nutrient TMDL 2012
Paynesville WWTP	Rice Lake 73-0196	Impaired	1,226 kg/y	Rice Lake Excess Nutrient TMDL 2012
Darwin	Washington 47-0026	Meeting	69 kg/y	Weiss Memo 2010
Faribault Foods - Cokato	Cokato 68-0263	Impaired	360 kg/y	North Fork Crow River TMDL Bacteria, Nutrients, and Turbidity (Draft TMDL Dec. 2014)

Purposed phosphorus limits North Fork Crow River Watershed

The NFCRW facilities have RP to cause or contribute to the excess nutrient impairment in the North Fork Crow River. In addition, The Facilities have RP to cause or contribute to the excess nutrient impairment in Lake Pepin. In addition, some facilities contribute to specific lakes within the watershed. The Facilities are therefore required to have respective WQBELs. The recommended limits both lakes and rivers are listed in Table 7. It is important to note that future water quality assessments could mean more restrictive limits are needed to protect Lakes and streams as new data becomes available.

Table 7. Proposed Phosphorus Limits for North Fork Crow River.

		Lake Based Limits			State Discharge Restriction Limits[a]		RES Based Limits
		Lake Specific		Pepin WLA	12 Month Moving Average	Calendar Monthly Average	June - Sept monthly average
Facility Name	**Facility ID**	kg/d	kg/yr	kg/yr	mg/L	mg/L	kg/day
AMPI – Paynesville	MN0044326		15.9d	88.7		1.0	
Annandale/Maple Lake WWTP	MN0066966			1,636.0	1.0		1.32
Atwater WWTP	MN0022659			553			0.52
Belgrade WWTP[e]	MN0051381			807			2.2
Brooten WWTP	MN0025909		184[c]	367.5		1.0	
Buffalo WWTP	MN0040649			4,774.6	1.0		4.81
Cokato WWTP	MN0049204			1,003.0			1.21
Darwin WWTP	MNG580150			69[b]		1.0	
Dassel WWTP	MN0054127			260		1.0	
Faribault Foods - Cokato	MN0030635		360[d]	727.0			
Great River Energy of Dickinson	MN0049077			41.4			
Green Lake SSWD WWTP	MN0052752			1,228.2	1.0		1.48
Grove City WWTP	MN0023574			309.5			0.37
Litchfield WWTP	MN0023973			2,619.4	1.0	1.0	2.64
Montrose WWTP	MN0024228			1,079.0		1.0	1.30
Paynesville WWTP	MN0020168		1,225.8			1.0	

[a] State discharge restriction limits based upon Minn. R. 7053.0255

[b] Based on State discharge restriction

[c] Based on facility expansion

[d] More restrictive limits

[e] Emergency only surface discharge

South Fork Crow

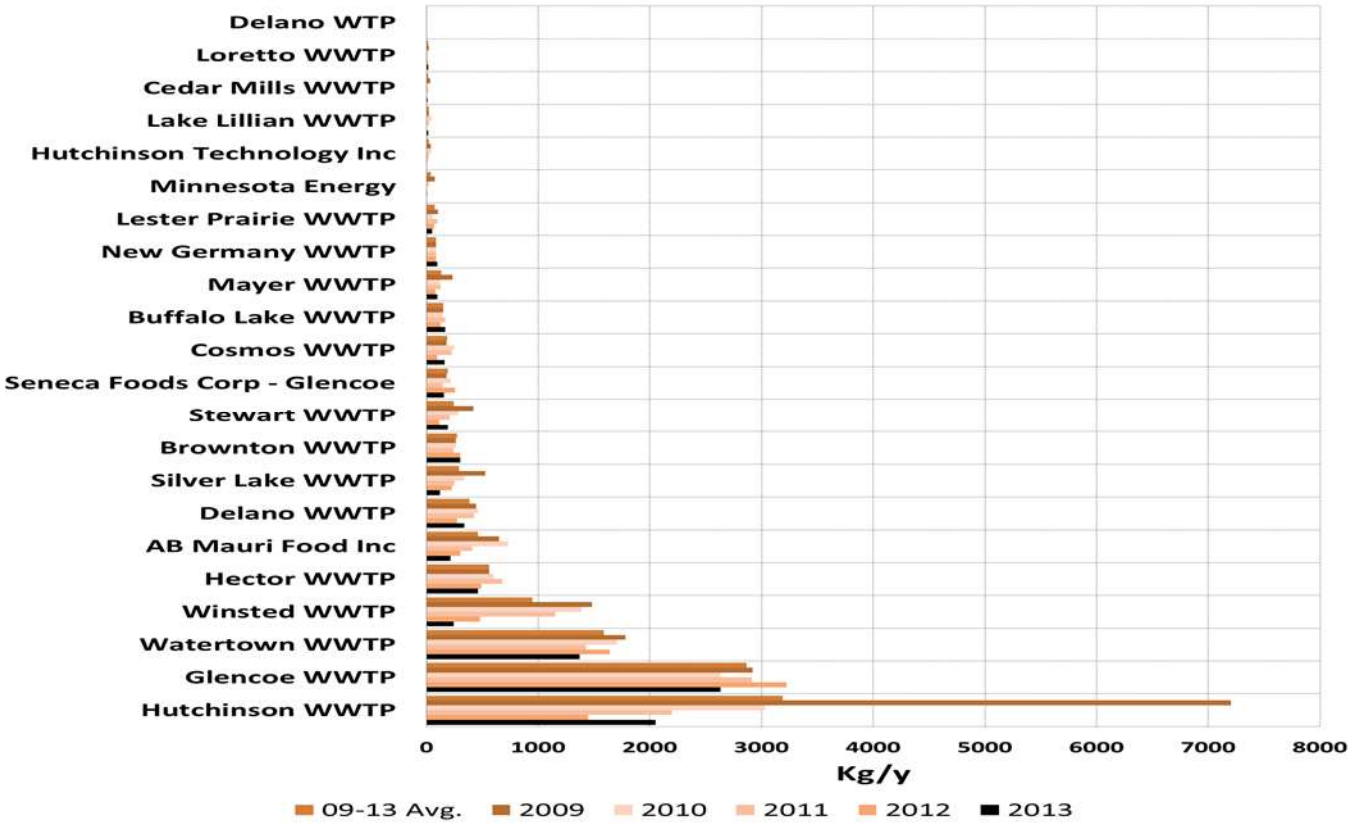
Introduction

The South Fork Crow River Watershed covers 818,428 acres. It encompasses parts of Kandiyohi, Renville, Meeker, McLeod, Sibley, Wright, Carver, and Hennepin counties. The South Fork Crow River joins with the North Fork Crow at Rockford, and then joins the Mississippi River near Dayton. The South Fork Crow River Watershed includes many lakes, streams, and wetlands. Buffalo Creek, a major tributary, flows into the South Fork Crow River downstream of Lester Prairie. Land use in the South Fork Crow River Watershed is largely agricultural, with row crops and pasture/grass lands accounting for approximately 83% of the overall watershed acres.

Several lakes and river reaches of the SFCRW do not meet water quality standards for eutrophication. This accounts for algae blooms and low dissolved oxygen conditions in summer months. The South Fork Crow Watershed intensive monitoring project began in 2012 with the collection of biological, chemical and hydrological data throughout the watershed. Data collection continued through the 2013 monitoring season. Assessments and Stressor ID work is in progress. It is important to note that future water quality assessments could mean more restrictive limits are needed to protect Lakes and streams as new data becomes available.

SFCRW drainage includes 22 NPDES permitted surface water discharges. Point source phosphorus discharge loading varies among facilities, with major and large facilities (Hutchinson, Glencoe, Watertown and Winsted) accounting for the majority of the point source phosphorus (Figure 6). Some SFCRW facilities (Hutchinson, Winsted, Hector and AM Mauri Foods) show recent reduction in phosphorus discharge.

Figure 6. South Fork Crow River NPDES facility Phosphoruse yearly discharge 2009-2013.



River eutrophication standard limit analysis

Water quality evaluation – Step 1

The SFCRW is located in the South RNR and has a criteria of ≤ 0.150 mg/L TP and ≤ 0.035 mg/L (Chl-a) (Minn. R. 7050.0222, Heiskary, 2013). Currently there are five reaches in the SFCRW with sufficient RES data (Table 8 and Figure 7) to conduct RES analysis. The data from the outlet of the SFCRW near Rockford (AUID 07010205-508 exceeds the RES. Thus, facilities discharging during the RES summer window (June-September) have RP to cause or contribute to the exceedance of RES under current discharge conditions.

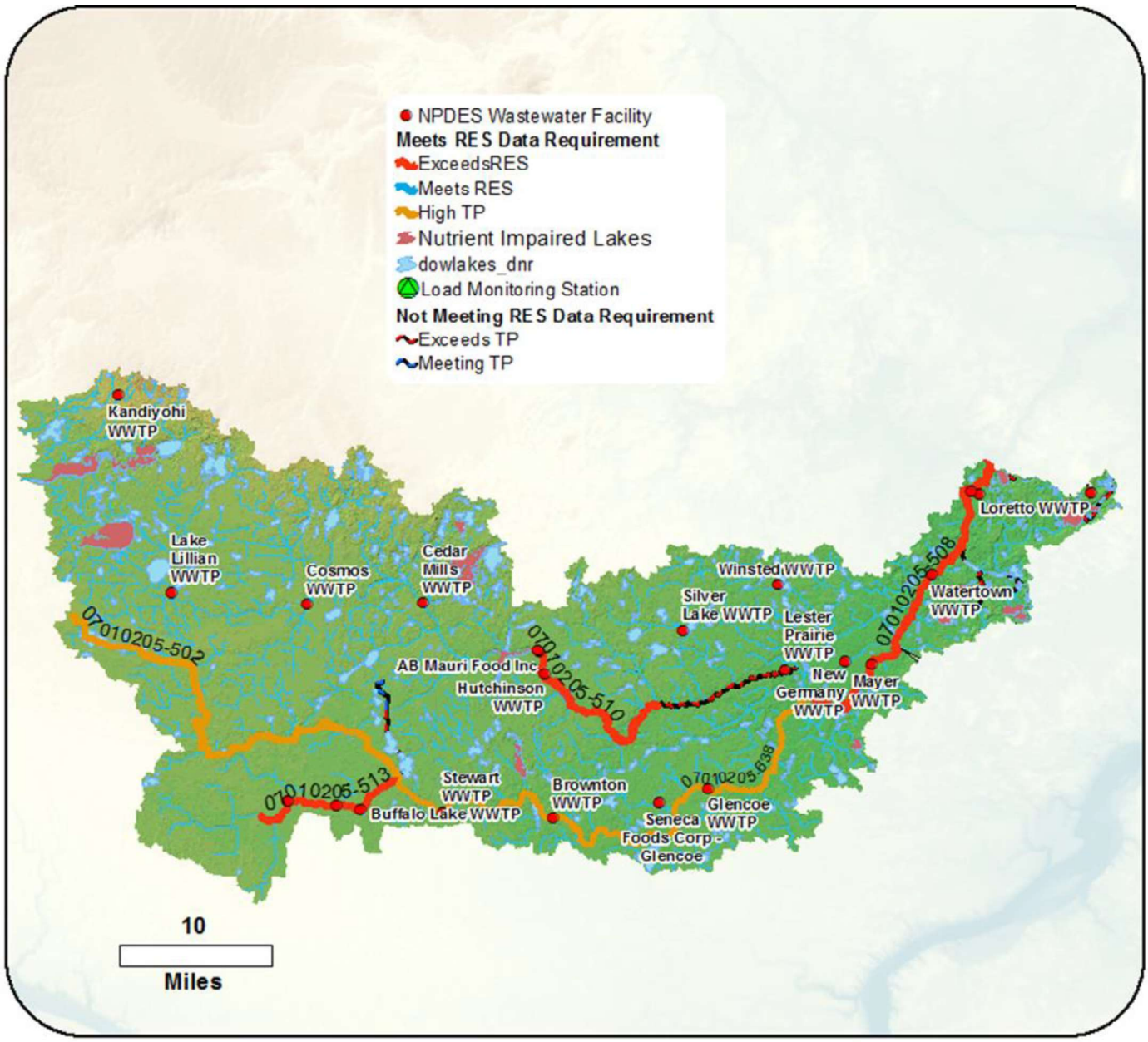
Table 8. SFCRW river reach water quality summary.

Reach AUID	Chl-a Count	Chl-a Avg. mg/L	TP Count	TP Avg.	Facilities discharging upstream of AUID
07010205-508	30	**0.101**	113	**0.322**	All Facilities
07010205-513	22	**0.036**	69	**0.293**	Hector, Buffalo, MN Energy
07010205-638	61	0.028	192	**0.387**	Hector, Buffalo, MN Energy, Stewart, Brownton, Seneca, Glencoe
07010205-502	22	0.012	79	**0.210**	No Facilities
07010205-510	15	**0.055**	39	**0.383**	AB Mauri Foods, Hutchinson WWTP, Hutchinson Technologies

Exceedance of the RES criteria marked in Red.

***Reach 07010205-513 is has been designated as a Class 7 water – RES standard is not applicable**

Figure 7. South Fork Crow NPDES wastewater treatment facilities and water quality summary map.

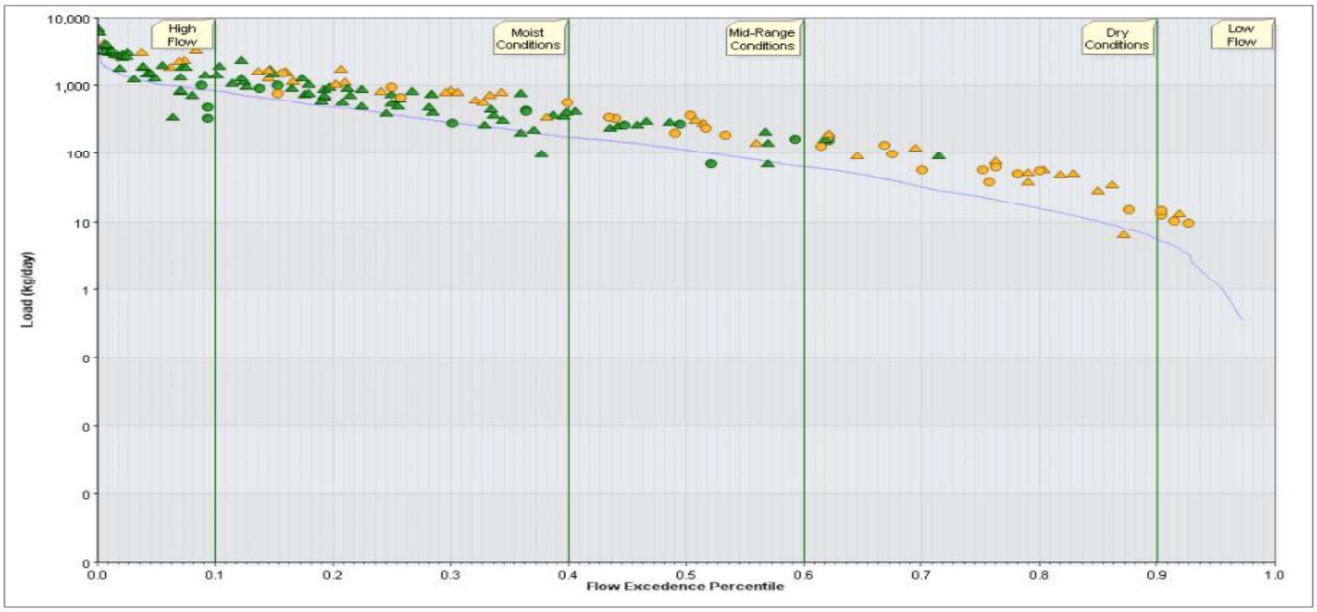


Reach 07010205-513 is has been designated as a Class 7 water – RES standard is not applicable

Reasonable potential at low flow – Step 2

The RP evaluation included a look at the contribution from point sources during low flow. Point sources can have a disproportionate impact on receiving waters during low flow conditions. A load duration curve was developed to analyze conditions when flow is equal to the 80th percent flow exceedance (when, on average, 80% of the flow exceeds the respective flow value). This typically occurs during June - September (Figure 8). This analysis showed TP concentrations exceeding RES (TP ≤ 0.150 mg/L) at the NFCRW outlet, during low flow conditions. Using Equation 1, a concentration was calculated at the outlet during low flow conditions (80% exceed). Facilities were shown to have RP at low flow conditions with current phosphorus limits (Table 9).

Figure 8 Load Duration Curve and RES Standard from the outlet of the South Fork Crow River Watershed. Flow based on station H19001001 (years of flow data) and TP surface water monitoring station S001-255 (June- Sept 1998-2014).



Equation 1. TP concentration of primary water of interest based on permitted flow for SFCRW facilities.

$$Cr = \frac{(Qs * Cs) + (Qe * Ce)}{Qr}$$

Table 9. SFCRW (07010205 outlet) Equation 1 values and descriptions.

Variable	Value	Description	Source – Reference
Cr	0.493 mg/L	Concentration of river at critical flow (80th percentile exceeds flow) at design 70% flow and Potential Facility Loading	Equation 1
Qs	15.54 mgd	flow of river without WWTFs (80% flow exceedance – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
Cs	0.075 mg/L	Concentration of river without WWTFs (Low flow load in river – facility loads at low flow	Because of calculated point source transport loss 50% RES standard was used as background concentration
Qe	13.73 mgd	Facility Design Flows (70% of WWDF for municipals 100% MDF for industrial)	Water Quality Delta Database
Ce	0.967 mg/L	Concentration of effluent based on existing or Lake Pepin WLA based ad 70% permitted flow	Water Quality Delta Database
Qr	29.28 mgd	downstream river flow (80th percentile flow exceedance)	HYDSTRA, Water Quality Delta, Database

Calculate wasteload allocaiton – Step 3

Of the 22 facilities in the SFCRW, only 16 discharge to rivers during the summer period (excluding lakes and no summer discharge facilities). Using Equation 2, a Wasteload Allocation (WLA) of 11.51 kg/day was determined for the South Fork Crow River (Table 10). Facility loading would need to be below this WLA order to achieve a river TP concentration of <0.150 mg/L during the June through September summer period at low flow. A subwatershed analysis completed on 07010205-510 to determining WLA's specific to upstream facilities (Table 11).

Equation 2. Wasteload allocation for SFCRW facilities to meet RES of 0.150 mg/L.

$$\boldsymbol{WLA = \frac{\left(RES * (Qs + Qe)\right) - (Qs * Cs)}{Qe}}$$

Table 10. SFCRW (AUID 07010205 outlet) phosphorus wasteload values and description.

Variable	Value	Description	Source – Reference
RES	0.150 mg/L	South RER Phosphorus Standard	
Qs	15.54 mgd	flow of river without WWTFs (80% flow exceedance – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
Qe	13.73 mgd	Facility Design Flows (70% of WWDF for municipals 100% MDF for industrial)	Discharge Monitoring
Cs	0.075 mg/L	Concentration of river without WWTFs (Low flow load in river – facility loads at low flow	Because of calculated point source transport loss, 50% RES standard was used as background concentration
WLA Conc.	0.235 mg/L	Effluent concentration to meet RES	Equation 4
WLA Load	12.21 kg/d	Point Source load permissible under the RES bases limits	$WLA\ Load = \frac{WLA\ conc}{QE * 3.785\ gal/L}$

Table 11. AUID 07010205-510 phosphorus wasteload values and description.

Variable	Value	Description	Source – Reference
RES	0.150 mg/L	South RER	
Qs	3.80 mgd	flow of river without WWTFs (80% flow exceedance – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
Qe	7.03 mgd	Facility Design Flows (70% of WWDF for municipals 100% MDF for industrial)	Hutchinson WWTP, Hutchinson Technology, and AB Mauri Foods
Cs	0.075 mg/L	Concentration of river without WWTFs (Low flow load in river – facility loads at low flow	Used the Shallow LES based on drainage from Otter Lake
WLA Conc.	0.190 mg/L	Effluent concentration to meet RES	Equation 5
WLA Load	5.07 kg/d	$WLA\ Load = \frac{WLA\ conc}{QE * 3.785\ gal/L}$	

Convert WLA to effluent limits – Step 4

Once the effluent concentrations based off the WLA were allocated for facilities, individual facility limits were set. Limits were set to meet the downstream WLA for each river reach of concern. Given that each contributing facility is a different size and that phosphorus removal is typically more economical and easier to implement at larger facilities, the gross WLA is not simply divided by the number of contributing facilities. Instead, concentration multipliers, based on facility size and type, are applied to 70% of AWWDF to achieve individual WLAs. Multipliers are modified until the mass total is at or below the gross WLAs, using a categorical approach similar to the Lake Pepin TMDL.

Mass limit sensitivity analysis

In order to determine if mass or concentration limits are appropriate to meet RES., a sensitivity analysis was performed. Equation 3 is a slightly modified equation 1; using **actual average flows** instead of 70% average (AWWDF) and proposed limits. This calculation shows higher concentration in all three-river reaches of concern, reflecting loss of dilution from equation 1 (Qe vs. Qe_s). The results show if facilities were discharging at the proposed RES mass limits, downstream waters would be over the RES standard of 0.150 mg/L (Table 12, and 13). This analysis determined mass based RES limits are not protective for the river reaches of concern. Limits are expressed as concentration values in individual permits (Table 14).

Equation 3. Wasteload allocation using preposed limites to meet RES of 0.150 mg/L.

$$Crs = \frac{(Qs * Cs) + (Qes * Ces)}{Qrs}$$

Table 12. AUID 07010205 outlet sensitivity analysis values and description.

Variable	Value	Description	Source – Reference
CR_s	0.210 mg/l	Concentration in the River with actual average flows and proposed mass Limits	Equation 3
QS	15.54 mgd	flow of river without WWTFs (80% flow exceedance – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
CS	0.075 mg/L	Concentration of river without WWTFs (Low flow load in river – facility loads at low flow	Because of calculated point source transport loss 50% RES standard was used as background concentration
QE_s	5.53 mgd	actual average effluent flow for The Facilities June – September, 2009 – 2013	Discharge Monitoring
CE_s	0.58 mg/L	Concentration from average mass based effluent proposed limits and Actual Facilities flows June – September	$\mathrm{CEs} = \frac{WLA\ kg/d}{\mathrm{QE2} * 3.785\ \mathrm{gal/L}}$
QR_s	21.1 mgd	Sum of summer flows	QS+QE_s

Table 13. AUID 07010250-510 sensitivity analysis values and description.

Variable	Value	Description	Source – Reference
CR_s	0.240 mg/l	Concentration in the River with actual average flows and proposed mass Limits	Equation 3
QS	3.80 mgd	flow of river without WWTFs (80% flow exceedance – actual WWTF flow) and drainage area ration	HYDSTRA database, Discharge Monitoring
CS	0.075 mg/L	Concentration of river without WWTFs (Low flow load in river – facility loads at low flow	Used the Shallow LES based on drainage from Otter Lake
QE_s	3.10 mgd	actual average effluent flow for The Facilities June – September, 2009 – 2013	Discharge Monitoring
CE_s	0.43 mg/L	Concentration from average mass based effluent proposed limits and Actual Facilities flows June – September	$\mathrm{CEs} = \frac{WLA\ kg/d}{\mathrm{QE2} * 3.785\ \mathrm{gal/L}}$
QR_s	6.89 mgd	Sum of summer flows	QS+QE_s

Verify final limits – Step 5

It is generally assumed that limits set to support RES at the outlet of a major watershed will also be sufficient to protect other downstream waters. The next downstream reach from the NFCRW outlet is in the LCRW. This reach has site-specific RES criteria of 125 µg/L TP and 35 µg/L Chl-a (Heiskary and Wasley, 2012). A mass balance equation bases on the proposed NFCRW Limits and the SFCRW Limits and 80% exceedance flow (Equation 4). It was determined that these limits are restrictive enough to protect downstream waters in the Lower Crow Watershed. Although the downstream reach has a lower TP criterion value (0.125 mg/L as compared to 0.150 mg/L), dilution from the NFCRW is sufficient to support water quality standards.

Lake eutrophication standard based limits

Three facilities (Cedar Mills, Cosmos, and Lake Lillian) discharge upstream of the Otter Lake. Otter Lake is a shallow reservoir adjacent to the city of Hutchinson on the South Fork of the Crow River in the Western Corn Belt Plains (WCBP) Ecoregion. Otter Lake (43-0084) was placed on the federal 303(d) list of impaired waters in 2010 for eutrophication due to excess nutrients (phosphorus). This water is no longer considered a Lake and limits are now based on RES. A 2012 memo ***Total Phosphorus Water Quality Based Effluent Limit Analysis: Otter Lake 43-0084*** (Weiss 2012) determined WLA required to meet the applicable LES. Otter Lake has been reclassified and is no longer considered a lake or reservoir. River based limit now apply to these facilities. The City of Lorreto discharges to Spurzem Lake, a lake exceeding the LES. The 2007 Lake Independence Phosphorus TMDL determined the WLA necessary to protect Spurzen Lake.

Facilities in the SFCRW have RP to cause or contribute to the excess nutrient impairment in the South Fork Crow River. In addition, The Facilities have RP to cause or contribute to the excess nutrient impairment in Lake Pepin. In addition, some facilities contribute to specific lakes within the watershed. The Facilities are therefore required to have respective WQBELs. The recommended limits both lakes and rivers are listed in Table 14. It is important to note that future water quality assessments could mean more restrictive limits are needed to protect Lakes and streams as new data becomes available.

Table 14. Proposed South Fork Crow Facility limits.

		Lake Based Limits			*State Discharge Restriction Limits		RES Based Limits
		Lake Specific		Pepin WLA 12 month rolling	12 Month Moving Average	Calendar Monthly Average	June – Sept Monthly average
Facility Name	Facility ID	kg/d	kg/y	kg/yr	mg/L	mg/L	mg/L
AB Mauri Food Inc	MNG250099			621.7			0.32
Brownton WWTP	MN0022951			493.2			1.0
Buffalo Lake WWTP	MN0050211			455.9			2.00
Cedar Mills WWTP	MN0066605			44.2			2.0
Cosmos WWTP	MNG580056			248.7			2.0
Delano WTP	MNG640123			20.7	1.0		0.6
Delano WWTP	MN0051250			2,430.4			0.53
Glencoe WWTP	MN0022233			2,873.6			0.53
Hector WWTP	MN0025445			911.8			0.63
Hutchinson Technology Inc.	MN0055506			92.6			0.54
Hutchinson WWTP	MN0055832			6,001.3			0.32
Lake Lillian WWTP	MNG580225			147.1			2.0
Lester Prairie WWTP	MN0023957			502.9	1.0		0.63
Loretto WWTP**	MN0023990	0		**			
Mayer WWTP	MN0021202			601.0	1.0		0.63
Minnesota Energy	MN0063151			871.7			2.10
New Germany WWTP	MN0024295			*204			2.00
Seneca Foods Corp – Glencoe	MN0001236			1,182.5			0.32
Silver Lake WWTP	MNG580164			672.1			2.0
Stewart WWTP	MNG580077			315.0			2.00
Watertown WWTP	MN0020940			1,394.8			0.53
Winsted WWTP	MN0021571			1,132.9			0.63

*Based on Mass Cap of previous facility design flow

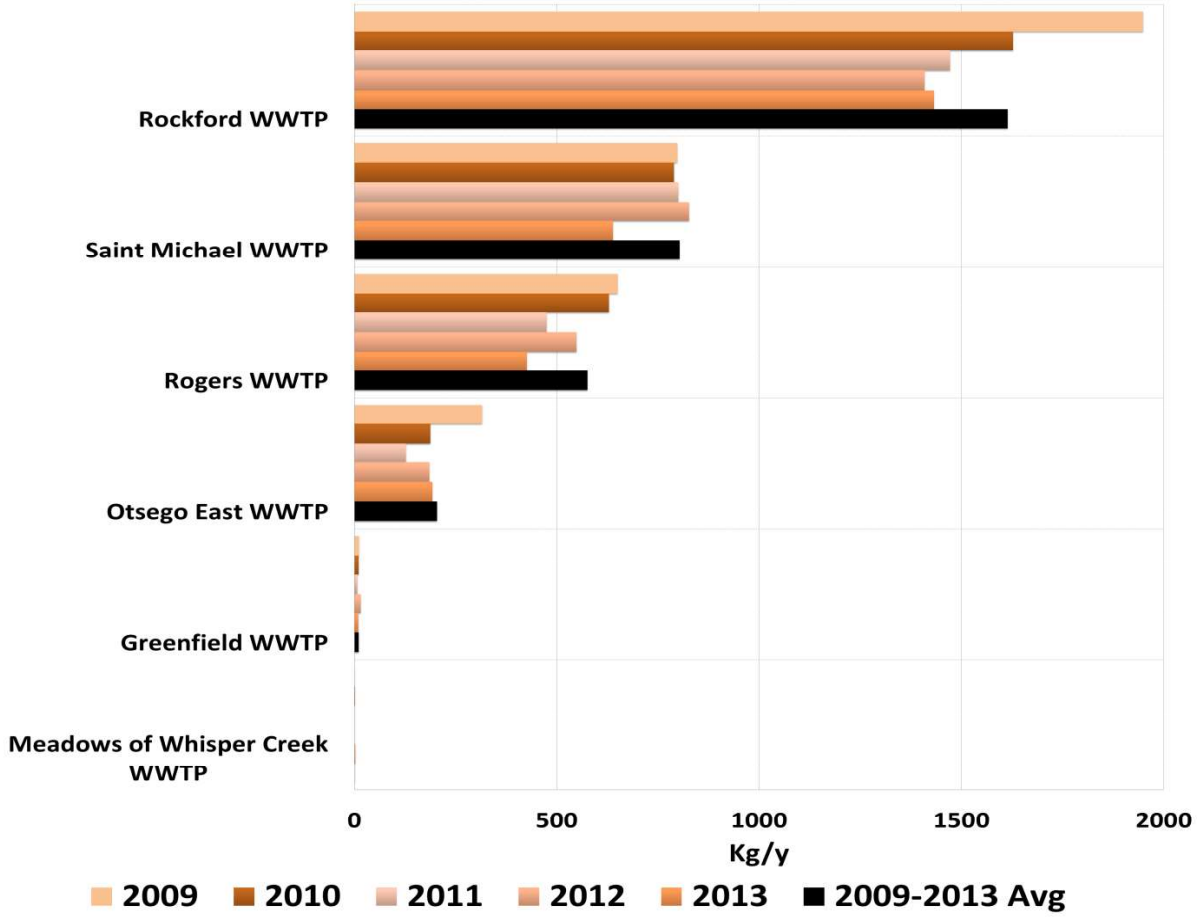
** Phosphorus limit based on Spurzen lake WLA Pioneer Sara Watershed Creek TMDL

Lower Crow

Introduction

The Lower Crow Watershed extends from the confluence of the NFCR and the SFCR to the Mississippi River north of the city for Rogers. The Lower Crow is both broader and deeper than the North and South Fork. There are six NPDES discharges in the LCRW including three major facilities (Rockford, St. Michael, and Rogers). Some facilities have shown reductions in phosphorus in recent years (Figure 9).

Figure 9. Lower Crow River NPDES facility Phosphoruse yearly discharge 2009-2013.

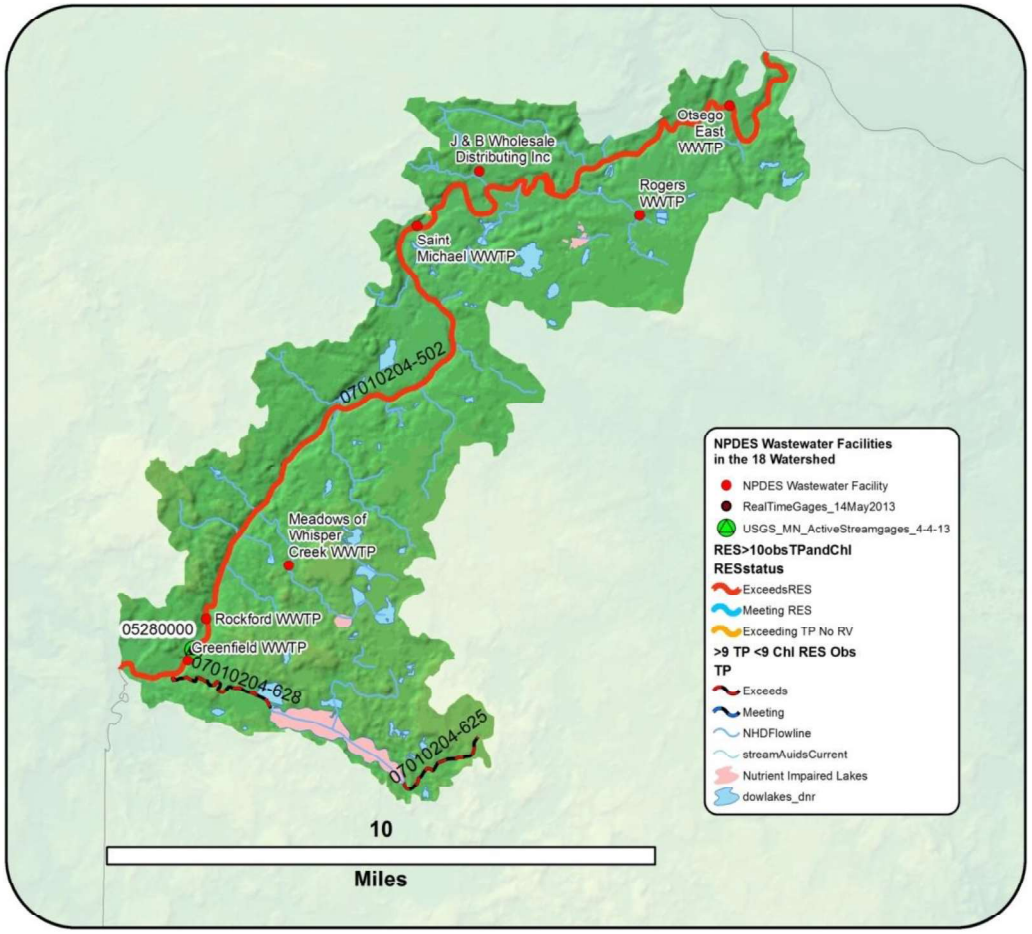


River eutrophication standard limit analysis

Water quality evaluation – Step 1

The LCRW rivers are located in the Lower Crow Nutrient Region (RNR) and has standards of ≤0.125 mg/L TP and ≤ 0.027 mg/L Chl-a (Chl-a) (Minn. R. 7050.0222 https://www.revisor.mn.gov/rules/?id=7050.0222, Heiskary, 2013). Currently only one reaches in LCRW, (# 07010204-502) has sufficient river eutrophication data. This reach exceeds the RES with TP and Chl-a at 224.8 and 92.4 mg/L respectively (Figure 10). All five of the LCRW facilities discharge drains to or is upstream of this reach.

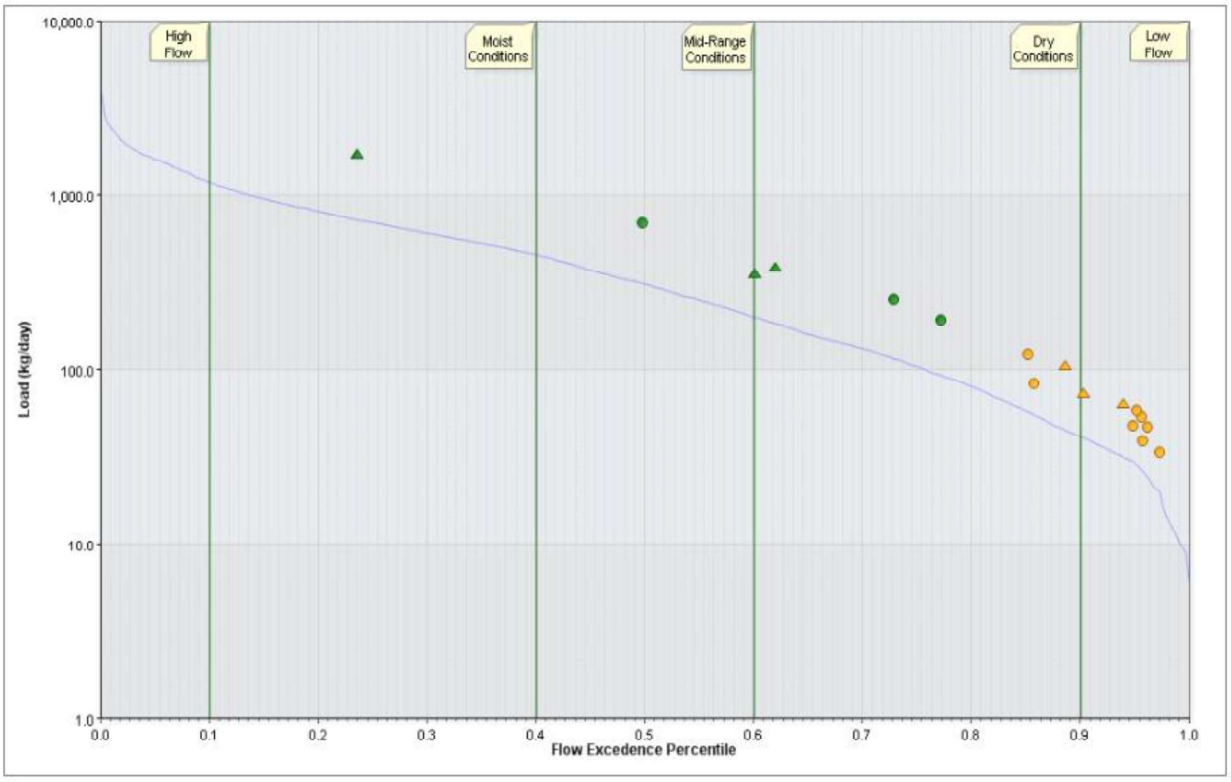
Figure 10. Lower Crow NPDES wastewater treatment facilities and water quality summary map.



Reasonable potential at low flow – Step 2

The RP evaluation included a look at the contribution from point sources during low flow. Point sources can have a disproportionate impact on receiving waters during low flow conditions. A load duration curve was developed to analyze conditions when flow is equal to the 80th percent flow exceedance (when, on average, 80% of the flow exceeds the respective flow value). The load duration curve is a combination of load monitoring station near Rockford (HYDSTRA station #E18087001) and the water quality monitoring station near the out to the Mississippi (EQUIS Station #S001-254). TP concentrations exceeding RES (TP ≤ 0.125 mg/L) at the NFCRW outlet during low flow conditions (figure 11). Using Equation 1, a RP to calculated concentration at the outlet during low flow conditions (80% exceed) with potential facility phosphorus loading, SFCRW facilities have RP to contribute to RES exceedance based on current limits (Table 15).

Figure 11. Lower Crow River at Rockford Load Duration Curve monitoring station E18087001 EQUIS Station S001-254) Load Duration Curve (1998 & 2007).



Equation 1. TP concentration of primary water of interest based on permitted flow for LCRW facilities.

$$Cr = \frac{(Qs * Cs) + (Qe * Ce)}{Qr}$$

Table 15. LCRW Equation 1 values and descriptions.

Variable	Value	Description	Source – Reference
Cr	0.143 mg/l	Concentration of river at critical flow (80th percentile exceeds flow) at design 70% flow and Potential Facility Loading	Equation 1
Qs	110.32 mgd	flow of river without WWTFs (NFCRW + SFCRW 80 % flow exceedance + LCRW area percentage – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
Cs	0.111 mg/L	Concentration of river without WWTFs (NFCRW + SFCRW Low flow river loads load)/ (QS*3.785 gal/L)	HYDSTRA database, Discharge Monitoring
Qe	4.6 mgd	Facility Design Flows (70% of WWDF for municipals 100% MDF for industrial)	Water Quality Delta Database
Ce	0.899 mg/L	Concentration of effluent based on existing or Lake Pepin WLA based and 70% permitted flow	Water Quality Delta Database
Qr	114.9 mgd	downstream river flow (80th percentile flow exceedance) Qs + Qe	HYDSTRA

Calculate wasteload allocation – Step 3

All six LCRW facilities discharge during the RES (June – September) window. Equation 2 was used to calculate WLA for facilities during the four-month seasonal period to meet RES. This calculations determined how much point source phosphorus loading could be added to the calculated background low flow condition (Cs 0.111 mg/L)) and meet the river criteria of 0.125 mg/L.

Equation 6. LCRW wasteload allocation for the Facilities to meet RES of 0.125 mg/L.

$$WLA = \frac{\big(RES * (Qs + Qe)\big) - (Qs * Cs)}{Qe}$$

Table 16. LCRW phosphorus wasteload allocation values and description.

Variable	Value	Description	Source – Reference
RES	0.125 mg/L	Crow River RER Phosphorus Standard	
Qs	110.32 mgd	flow of river without WWTFs (NFCRW + SFCRW 80 % flow exceedance + LCRW area percentage – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
Qe	4.6 mgd	Facility Design Flows (70% of WWDF for municipals 100% MDF for industrial)	Water Quality Delta Database
Cs	0.111 mg/L	Concentration of river without WWTFs (NFCRW + SFCRW Low flow river loads load)/ (QS*3.785 gal/L)	
WLA Conc.	0.451 mg/L	Effluent concentration to meet RES	Equation 7
WLA Load	7.9 kg/d	Point Source load permissible under the RES bases limits	$WLA\ Load = \frac{WLA\ conc}{QE * 3.785\ gal/L}$

Convert WLA to effluent limits – Step 4

Once the phosphorus effluent WLA is calculated (7.9 kg/d, Table 16), it is split up amongst NFCRW facilities. Given that each contributing facility is a different size and that phosphorus removal is typically more economical and easier to implement at larger facilities, the gross WLA is not simply divided by the number of contributing facilities. Instead, concentration multipliers, based on facility size and type, are applied to 70% of AWWDF to achieve individual WLAs. Multipliers are modified until the mass total is at or below the gross WLAs, using a categorical similar to the Lake Pepin TMDL.

Mass limit sensitivity analysis

In order to determine if mass or concentration limits are appropriate to meet RES., a sensitivity analysis was performed. Equation 3 is a slightly modified equation 1, using **actual average flows** instead of 70% average (AWWDF). This calculation shows slightly higher concentrations in the river, reflecting loss of dilution from equation 1 (Qe vs. Qe_s). The results show if facilities were discharging at the proposed RES mass limits, downstream waters would be near the RES standard at 0.128 mg/L (Table 17). In consideration of the uncertainty associated with sampling and laboratory analysis, a difference of 0.003 mg/L TP is unmeasurable and would not be significant. Due to treatment variability and efforts to consistently operate in compliance with limits, facilities typically discharge well under their limit. This analysis assures that a mass RES limits will be protective for rivers in the LCRW.

Equation 3. Mass Limit Sensitivity analysis

$$Crs = \frac{(Qs*Cs)+(Qes*Ces)}{Qrs}$$

Table 17. Equation 3 values and description for LCRW.

Variable	Value	Description	Source – Reference
CR_s	0.128 mg/l	Concentration in the River with actual average flows and proposed mass Limits	Equation 3
QS	110.3 mgd	flow of river without WWTFs (80% flow exceedance – actual WWTF flow)	HYDSTRA database, Discharge Monitoring
CS	0.111 mg/L	Concentration of river without WWTFs (Low flow load in river – facility loads at low flow	HYDSTRA database, Discharge Monitoring
QE_s	1.94 mgd	actual average effluent flow for The Facilities June – September, 2009 – 2013	Discharge Monitoring
CE_s	1.07 mg/L	Concentration from average mass based effluent proposed limits and Actual Facilities flows June – September	$\mathrm{CEs} = \frac{WLA\ kg/d}{\mathrm{QE2} * 3.785\ \mathrm{gal/L}}$
QR_s	112.3 mgd	Sum of summer flows	QS+QE_s

The sensitivity analysis for the LCRW revealed that there would be little change (0.003 mg/L) from applying monthly mass limits compared to monthly concentration limits. The formulas for monthly mass limits are the following:

*Municipal facilities: WQBEL (kg/day) = WLA (mg/L) * **70% of AWWDF** * 2.1 * 3.785*
*Industrial facilities: WQBEL (kg/day) = WLA (mg/L) * **100% of MDF** * 2.1 * 3.785*

Verify final limits – Step 5

It is generally assumed that limits set to support RES at the outlet of a major watershed will also be sufficient to protect other downstream waters. The LCRW outlets to the Mississippi River in the Mississippi River Twin Cities Watershed. The RES for the Mississippi River – Twin Cities is 0.100 mg/L TP and 0.018 mg/L Chl-a. Considering this is lower what is required for the LCRW (0.125 mg/L) additional analysis was done to insure phosphorus loading in from LCRW would not contribute to RES exceedances in the Mississippi River - Twin Cities. A 2014 analysis looked at phosphorus limits required to meet Mississippi River – Twin Cities RES standards (Wasley, 2014). This analysis concluded that, with upstream waters meeting RES and dilution from contributing watershed the Mississippi River Twin Cities would meet the RES.

Lake eutrophication standard limits

There are no facilities discharge to a lake prior to Lake Pepin in the LCRW.

Lower Crow facility limits

Facilities in the LCRW have RP to cause or contribute to the excess nutrient impairment in the Crow River. In addition, The Facilities have RP to cause or contribute to the excess nutrient impairment in Lake Pepin. The Facilities are therefore required to have respective WQBELs. The recommended limits both lakes and rivers are listed in Table 18. It is important to note that future water quality assessments could mean more restrictive limits are needed to protect Lakes and streams as new data becomes available.

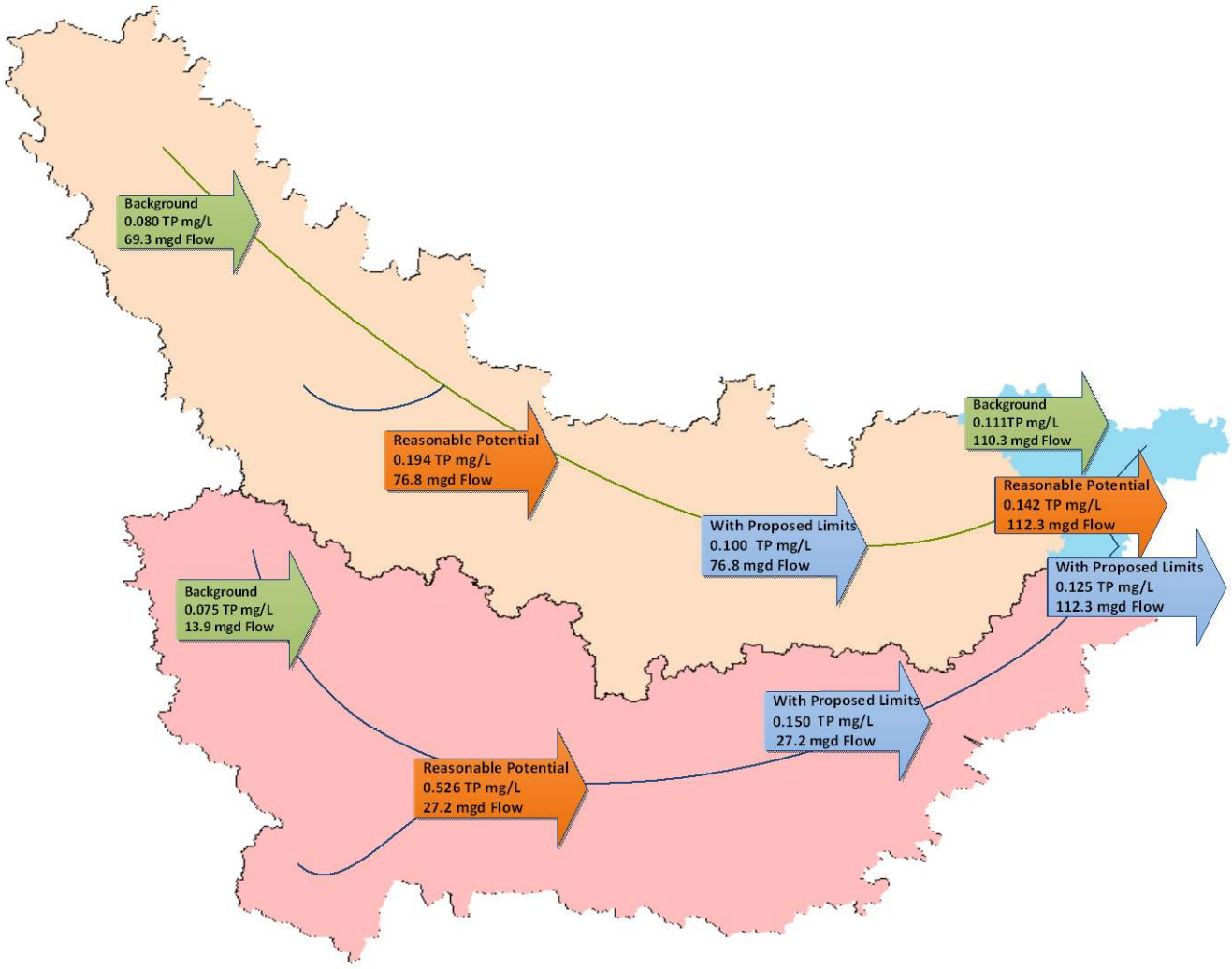
Table 18. Proposed Phosphorus Limits for Lower Crow River.

		Lake Pepin LES	*State Discharge Restriction	RES Based Limits
		12 - Month Moving total	12 Month Moving Average	June - Sept monthly average
Facility Name	Facility ID	kg/yr	mg/L	kg/day
Greenfield WWTP	MN0063762	138	1.0	0.26
Meadows of Whisper Creek WWTP	MN0066753	96.7		0.19
Otsego East WWTP	MN0064190	1,823.6	1.0	3.48
Rockford WWTP	MN0024627	899.4		1.72
Rogers WWTP	MN0029629	1,770.6	1.0	3.40
Saint Michael WWTP	MN0020222	2,702.3	1.0	5.18

Conclusion

Actual average WWTF discharge was shown to cause and contribute to elevated TP and Chl-a concentrations in lakes and rivers within GCRW. In addition, The Facilities have RP to cause or contribute to the excess nutrient impairment in Lake Pepin. Existing limits are not sufficient to protect immediate receiving waters or downstream waters. The Facilities are therefore required to have WQBELs derived from water quality at river reaches within the GCRW. Limits required to meet lake and river eutrophication standards are listed in tables 7, 14 and 18. A summary of the background, reasonable potential and proposed limits are depicted in Figure 12. Finally, the permitees should be informed that more restrictive TP limits may be necessary for local water resources following the completion of the Lake Pepin TMDL study and additional water quality monitoring.

Figure 12. Background, resonable potential and proposed limit Summary for GCRW.



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Wenck Associates, INC. Rice Lake Excess Nutrient TMDL, April 2012

http://www.pca.state.mn.us/index.php/view-document.html?gid=17775

2007 Lake Independence Phosphorus TMDL Pioneer-Sarah Creek Watershed Commission Three Rivers Park District

Wasley, D.M. 2014 Total Phosphorus Effluent Limit Review: Mississippi River - Twin Cities Watershed (portion upstream of Minnesota River confluence

Appendix F: Plan Resolution

City of Montrose
Resolution 2023-9

Resolution Calling a Public Hearing for the Consideration of a Facilities Plan for the Wastewater Treatment System

WHEREAS, pursuant to Minnesota Rules, 7077.0272, the City of Montrose, Minnesota (the "City"), is required to prepare and adopt facility plans (the "Plan") for wastewater treatment systems for when improvements are considered. Facility plans must be submitted to the State for review and approval prior to such considered improvements implemented; said improvements include upgrading to an extended aeration activated sludge system or consider a regionalized wastewater system with the city of Buffalo. Furthermore, a public hearing is required prior to the adoption of such plans; and,

WHEREAS, on April 10, 2023, the City Council will hold a public hearing on its intention to adopt the Plan and the proposed improvements contained therein; and,

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City, that the City Council hereby calls for a public hearing on its intent to adopt the Plan, such hearing to be held on the date and time set forth in Exhibit A attached hereto. The City Council is hereby directed to cause the notice to be published at least 10 but not more than 28 days before the hearing in the official newspaper of the City.

Adopted by the City Council of the City of Montrose this 13th day of February, 2023.

Attest:

_____
Mayor

_____
City Administrator

Exhibit A

City of Montrose, Minnesota

Notice of Public Hearing to Consider Improvements to the Municipal Wastewater System

NOTICE IS HEREBY GIVEN that the City Council of the City of Montrose, Minnesota (the "City") will meet on Monday, April 10, 2023, at 7:00 p.m., at the Montrose Community Center, 200 Center Avenue South in Montrose, Minnesota, to consider potential improvements to the municipal wastewater system. Improvement options that are being considered include upgrading to an extended aeration activated sludge system or consider a regionalized wastewater system with the city of Buffalo. Such persons as desire to be heard with reference to the proposed improvement will be heard at this meeting.

Dated: February 13, 2023.

Jessica Bonniwell
City Administrator
City of Montrose, Minnesota

Appendix G: MPCA Forms

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

Environmental Information Worksheet (EIW) form

Clean Water State Revolving Fund Program

Minnesota Rule Chapter 7077.0272, subp. 2.a.F.
Minnesota Rule Chapter 7077.0277, subp. 3.E.

Doc Type: Wastewater Point Source

Eligible applicants seeking funds for clean water (stormwater and wastewater) projects through the Clean Water State Revolving Fund (commonly referred to as the CWSRF Program) are required by Minn. R. ch. 7077.0272, subp. 2.a. F. and Minn. R. ch. 7077.0277, subp. 3.E., to complete an Environmental Information Worksheet (EIW). This information will be used to assess environmental impacts, if any, caused by the project.

Questions: Contact Review Engineer or Bill Dunn at 651-757-2324 or bill.dunn@state.mn.us.

1. Project title: Montrose WWTF Facility Plan

2. Proposer: Bolton & Menk

Contact person: Jennifer Selchow, PE

Title: Environmental Project Engineer

Address: 7533 Sunwood Drive NW, Suite 206

Ramsey, MN 55303

Phone: 763-614-7232

Fax: 763-427-0833

3. Project location: County: Wright City/Twp: Montrose

____ 1/4 ____ 1/4 Section: ____ Township: ____ Range: ____

Tables, Figures, and Appendices attached to the EIW:

- County map showing the general location of the project;
- United States Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable);
- Site plan showing all significant project and natural features.

4. Description:

a. Provide a project summary of 50 words or less.

Montrose WWTF would regionalize with the city of Buffalo's WWTF. This would entail forcemain and main lift station improvements. The existing ponds would be converted to equalization basins. The remaining ponds and processes would be decommissioned.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

Regionalization with the city of Buffalo is the suggested alternative for the cities of Montrose and Waverly. The main lift station would need improvements and forcemain construction to connect the two facilities. This includes:

1. *Wet well, valve vault, and meter vault structure recoating to reduce groundwater leaking into the structures*
2. *Replace all lift station piping and appurtenances*
3. *Install a grinder station prior to the main lift station*
4. *Site regrading to reduce drainage into the lift station from runoff*

5. *Convert the high intensity aeration ponds into equalization for high flow events and reroute piping as needed*

6. *Replace the existing lift station pumps for the new hydraulic conditions*

7. *Evaluate the most economical forcemain route and install air release and cleanout manholes as necessary*

8. *Decommission the existing facility*

a) *Dispose of biosolids*

b) *Remove unused buildings and equipment*

c) *Repurpose the space*

9. *Electrical panels, components, and controls shall be replaced*

10. *Install a permanent generator*

Project construction is anticipated April 2024-April 2025

c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

This project is intended to provide improvements to Montrose WWTF such that they may address the existing aging infrastructure and future treatment requirements.

d. Are future stages of this development including development on any outlots planned or likely to happen? ☐ Yes ☒ No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

NA

e. Is this project a subsequent stage of an earlier project? ☐ Yes ☒ No
If yes, briefly describe the past development, timeline and any past environmental review.

NA

5. Project magnitude data

Total Project Area (acres) 47.9 or Length (miles) 8
Number of Residential Units: Unattached 2,422 Attached 0 maximum units per building 0
Commercial/Industrial/Institutional Building Area (gross floor space): total square feet NA
Indicate area of specific uses (in square feet): NA

Office	NA	Manufacturing	NA
Retail	NA	Other Industrial	NA
Warehouse	NA	Institutional	NA
Light Industrial	NA	Agricultural	NA
Other Commercial (specify)	NA		

Building height NA If over 2 stories, compare to heights of nearby buildings NA

6. Permits and approvals required. List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans, and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

Unit of government	Type of application	Status
MN Pollution Control Agency	NPDES Permit Modification	To be secured during the design process
MN Pollution Control Agency	NPDES General Stormwater Permit	To be secured during the design process
MN Pollution Control Agency	Facility Plan Approval	To be secured during the design process
Wright County	Conditional Use Permit	To be secured during the design process
City of Montrose	Building Permit	To be secured during the design process
City of Montrose	Plan Approval	To be secured during the design process

7. Land use. Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters.

Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

The Montrose WWTF has been in operation since 1965. The original facility consisted of polishing ponds. The facility received significant upgrades in 2002 including new high intensity aeration basins, UV disinfection, a ferric chloride fee system, final clarifiers, biosolis storage, and pretreatment. The treatment facility receives raw wastewater from residences and businesses throughout the city of Montrose, as well as 12-Hi Mobile Home Park, and the City of Waverly. The planned improvements to the site entail regionalization with Buffalo WWTF (full details in 2). There are no existing or planned environmental hazards onsite.

8. Cover types. Estimate the acreage of the site with each of the following cover types before and after development:

	Before	After		Before	After
Types 1-8 wetlands	0	0	Lawn/landscaping	24.9	24.9
Wooded/forest	0	0	Impervious Surfaces	0	0
Brush/grassland	0	0	Other (describe)	16.4 (Wastewater treatment ponds)	16.4
Cropland	6.6	6.6			
			Total	47.9	47.9

9. Fish, wildlife, and ecologically sensitive resources.

a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

The site is an existing wastewater treatment facility. The following species are potentially affected by activities in this location: the Northern Long-eared Bar, Tricolored Bat, and Monarch Butterfly. There is no proposed tree removal at the wastewater treatment facility so no bats will be disrupted. Effluent water quality to surface water will not be changed. No minimization or mitigation measures are proposed for habitat impacts with this project.

b. Are any state (endangered or threatened) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site?
☐ Yes ☒ No
If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the Minnesota Department of Natural Resources (DNR) Natural Heritage and Nongame Research program has been contacted give the correspondence reference number: NA
Describe measures to minimize or avoid adverse impacts.

NA

10. Physical impacts on water resources. Will the project involve the physical or hydrologic alteration (dredging, filling, stream diversion, outfall structure, diking, and impoundment) of any surface waters such as a lake, pond, wetland, stream or drainage ditch? ☐ Yes ☒ No
If yes, identify water resource affected. Describe alternatives considered and proposed mitigation measures to minimize impacts. Give the DNR Protected Waters Inventory (PWI) number(s) if the water resources affected are on the PWI.

NA

11. Water use. Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? ☐ Yes ☒ No
If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

NA

12. Water-related land use management districts. Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ☐ Yes ☒ No
If yes, identify the district and discuss project compatibility with district land use restrictions.

NA

13. Water surface use. Will the project change the number or type of watercraft on any water body? ☐ Yes ☒ No

If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

NA

14. Erosion and sedimentation. Give the acreage to be graded or excavated and the cubic yards of soil to be moved: **47.9** Acres: **6** **23183** cubic yards. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

Construction shall comply with the MPCA's "General Storm Water Permit". The Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures whenever and as often as necessary to prevent their operation from producing any soil errosion in amounts damaging to property or adjacent lands. Erosion abatement measures include:

1. Proper site grading and prompt turf re-establishment.

2. The use of bales on all excavated or non-re-established turf slopes.

3. Completion of all county ditch crossings during the workday.

4. Pave all disturbed streets as quickly as practical.

15. Water quality – surface-water runoff.

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any storm water pollution prevention plans.

The design of the project will include permanent stormwater treatment, if deemed necessary, and a stormwater prevention plan that meet the requirements of the MN Construction Stormwater General Permit.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The nearest surface water is Fountain Lake. Construction runoff will be mitigated with SWPP and BMPs to meet requirements of MN Construction Stormwater General Permit. Post construction runoff will be determined during design but is expected to have minimal modification to current runoff.

16. Water quality – wastewater.

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

The treatment facility receives raw wastewater from residences and businesses throughout the city of Montrose, as well as 12-Hi Mobile Home Park, and the City of Waverly. This wastewater is pumped through the main lift station and is comprised of domestic waste. Montrose WWTF opperates under a municipal NPDES/SDS wastewater permit (MN0024228).

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

The Montrose WWTF design parameters include the following: Wastewater Flow Average Dry Weather (ADW) 0.411 MGD; Average Wet Weather (AWW) 0.781 MGD; Peak Hourly Wet Weather Flow (PHWW) 1.380 MGD; Peak Instantaneous Wet Weather Flow (PIWW) 1.648 MGD.

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

The Montrose WWTF treats wastewater and consists of polishing ponds, high intensity aeration basins, UV disinfection, a ferric chloride feed system, final clarifiers, biosolids storage, and pretreatment.

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

NA

17. Geologic hazards and soil conditions.

a. Approximate depth (in feet) to Groundwater 0 inches minimum; *32 inches* average.
Bedrock: *112 ft* minimum; *255 ft* average.

Describe any of the following geologic site hazards to groundwater and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due

to any of these hazards.

None known.

b. Describe the soils on the site, giving U.S. Soil Conservation Service (SCS) classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

To be determined during the SWPP review.

18. Solid wastes, hazardous wastes, storage tanks.

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

No hazardous waste is expected to be generated during construction.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

Not aware of any toxic or hazardous materials.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

NA

19. Traffic. Parking spaces added: *NA* Existing spaces (if project involves expansion): *NA*
Estimated total average daily traffic generated: *NA* Estimated maximum peak hour traffic generated (if known) and its timing: *NA* Provide an estimate of the impact on traffic congestion affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

The project will not create any new traffic demands.

20. Vehicle-related air emissions. Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *Environmental Assessment Worksheet (EAW) Guidelines* about whether a detailed air quality analysis is needed.

The project will not create any new traffic demands.

21. Stationary source air emissions. Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing), any greenhouse gases (such as carbon dioxide, methane, and nitrous oxides), and ozone-depleting chemicals (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

Montrose WWTF emits nitrous oxide, carbon dioxide, and methane. With this project no change in emmissions is expected.

22. Odors, noise, and dust. Will the project generate odors, noise or dust during construction or during operation? ☒ Yes ☐ No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

The proposed project has the potential to cause odor, dust, and noise. Dust control and construction vehicle exhaust will be included in the SWPP and BMPs for dust control required of the contractor to minimize and mitigate the impacts during construction. Noise impacts will be minimized by limiting the work hours to day time hours only. The proposed project includes the rehabilitation of the existing sludge storage basins outside of town and should not cause additional odors to residents.

23a. Nearby resources. Are any of the following resources on or in proximity to the site? Projects should search the Minnesota State Historic Preservation Office's (SHPO) National Register of Historic Places database.

***Note:** Project proposers must contact the SHPO at datarequestshpo@mnhs.org to request a database review to obtain

information on any known historical or archaeological sites in the project area. Include a copy of correspondence with SHPO with the submittal of this EIW form.

a. Archaeological, historical, or architectural resources? ☐ Yes ☒ No

b. Prime or unique farmlands or land within an agricultural preserve? ☐ Yes ☒ No

c. Designated parks, recreation areas, or trails? ☐ Yes ☒ No

d. Scenic views and vistas? ☐ Yes ☒ No

e. Other unique resources? ☐ Yes ☒ No

If yes, describe the resource and identify any project-related impacts on the resources. Describe any measures to minimize or avoid adverse impacts.

There are 2 acres of "prime" farmland according to the NRCS Soil Survey onsite. Part 658 of the Farmland Protection Policy Act §658.2 states "Farmland does not include land already in or committed to urban development or water storage". Since this land is already being used in urban development it does not qualify as farmland.

23b. Section 106 Review (36 CFR 800) is required for all CWRF projects. The following forms can be found on the MPCA Wastewater and Stormwater Financial Assistance website at https://www.pca.state.mn.us/ppl. Select Clean Water Revolving Fund tab; then scroll to Facilities Plan and Facilities Plan Supplement for Wastewater Treatment Systems heading.

a. Project is exempt from review (attach completed *Exemption Checklist*) ☐ Yes ☒ No

b. Project is required to complete further Section 106 Review: ☒ Yes ☐ No

   a. SHPO
   b. Tribal consultation
   c. Other Consulting parties

24. Visual impacts. Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? ☐ Yes ☒ No

If yes, explain.

NA

25. Compatibility with plans and land use regulations. Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? ☐ Yes ☒ No

If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

NA

26. Impact on infrastructure and public services. Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? ☐ Yes ☒ No

If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

NA

27. Cumulative impacts. Minn. R. 4410.1700, subp. 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts (or discuss each cumulative impact under appropriate item(s) elsewhere on this form).

The proposed project presents opportunities to improve the existing wastewater system. The main lift station would be rehabilitated and a forecemain would be constructed such that Montrose WWTF can regionalize with Buffalo WWTF. Buffalo WWTF has more advanced biosolids treatment than Montrose WWTF and has 1 discharge point into Crow River. There are no identified negative cumulative impacts.

28. Other potential environmental impacts. If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

No other potential environmental impacts are anticipated.

29. Summary of issues. List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

There are no other permit conditions not listed or discussed in this report that require additional review or mitigative measures.

The facility plan for this project contains details and costs for the selected option. In addition to the selected option, this EIW considered the Do-nothing option. Doing nothing would delay the necessary improvements likely resulting in increased maintenance and energy costs in addition to increased future construction costs.

Teresa Burgess

From: Teresa Burgess
Sent: Friday, February 24, 2023 4:05 PM
To: datarequestshpo@state.mn.us
Subject: Database Request for Environmental Reviews

I am working on environmental reviews for projects in the following Sections. Please provide any information you have in the SHPO database.

Township	Range	Section	County
103	24	4	Faribault
103	24	5	Faribault
103	24	8	Faribault
103	24	9	Faribault
118	26	1	Wright
118	26	2	Wright
119	26	35	Wright
119	26	36	Wright
133	33	1	Wadena
133	33	2	Wadena
133	33	11	Wadena
133	33	12	Wadena

Thank you,

Teresa

Teresa Burgess P.E. (MN, IA, SD, TN) CPESC
Senior Project Engineer
Bolton & Menk, Inc.
1960 Premier Drive
Mankato, MN 56001-5900
Phone: 507-625-4171 ext. 2638
Mobile: (507) 327-9292
teresa.burgess@bolton-menk.com
Bolton-Menk.com

Public Hearing to be held on April 10, 2023.

Presented by

Bolton & Menk, Inc.

April 10, 2023

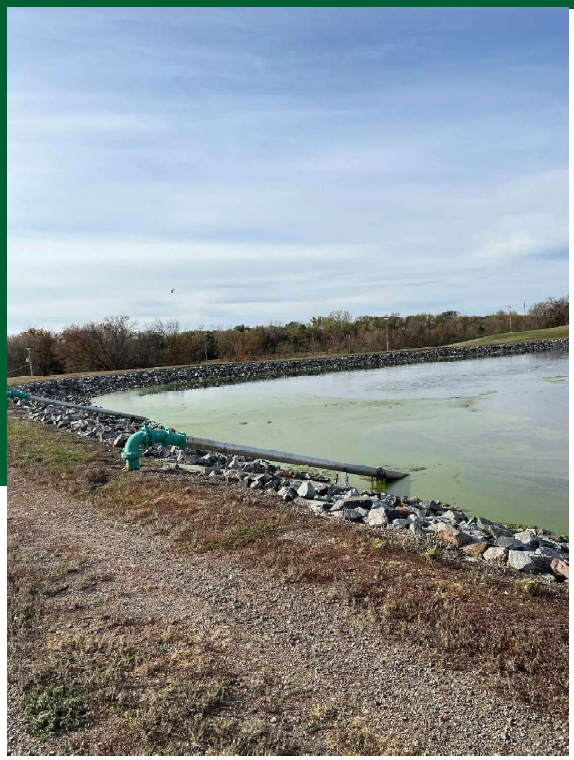
City of Montrose, Minnesota Wastewater Treatment Facility Plan Public Hearing

Background

- Originally constructed in 1965
- Significant upgrades in 2002, including:
  - Pretreatment, high intensity aeration basins, a ferric chloride feed system, final clarifiers, biosolids storage, and UV disinfection.
- Class B Facility
- Serves the City of Montrose and the City of Waverly
  - Projected population increase of 3,932.
- Permit renewal submitted in July 2022

Alternative 1 – Extended Aeration Activated Sludge

- Liquid Stream Processes
  - Rehabilitation of Preliminary Treatment System
  - Construction of new Secondary Treatment System
- Solid Stream Processes
  - Construct a Dewatering with Cake Biosolids System



Alternative 2 – Regionalization

- Regionalize with the City of Buffalo WWTF
- Rehabilitate Main Lift Station
- Forcemain Construction
  - Approximately 8 miles
- Convert High Intensity Aeration Ponds into Equalization Basins

Alternatives Considered

Item	Alternative 1 – Extended Aeration Activated Sludge	Alternative 2 - Regionalization
Overall Ability to Meet Improvement Needs	Excellent	Excellent
Expandability Potential	Good	Excellent
Ability to meet *Current* Discharge Limits	Excellent	Excellent
Ability to meet *Future* Discharge Limits	Excellent	Excellent
Additional Land Requirement	0 acres	0 acres
Estimated Capital Costs	$22.3M-30.2M	$7.8M-10.6M

Recommended Alternative

Alternative 2- Regionalization

- The MPCA encourages regionalization where it is feasible.
- An extended aeration treatment facility is a large financial and operational undertaking.

WWTF Improvements Schedule

Item	Date
Submit Facility Plan to MPCA	March 2023
Submit Project Priority List Application	March 2023
Regionalization Discussions	April 2023 – May 2023
Preliminary Design	July 2023
MPCA Certify Facility Plan	June 2023
Final Design	August 2023 – March 2024
MPCA Plan Review	March 2024 – June 2024
Permitting Process	March 2024 – August 2024
Project Bid	Fall 2024
Construction	Fall 2024 – Fall 2025
Initiate Operation	October 2025

Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155-4194

State Environmental Review Process (SERP) Mailing List Form

Clean Water State Revolving Fund Program

Minnesota Rules 7077.0272, subp. 2.a.A.
Minnesota Rules 7077.0277, subp. 3.B.

Doc Type: Wastewater Point Source

Instructions: This is the complete mailing list that the Minnesota Pollution Control Agency (MPCA) will use to public notice the Environmental Summary or other environmental review documents. Please type names and addresses on this form and return to the MPCA staff engineer. This list should be considered minimum. If a more substantial mailing list is available for the Public Participation Program, it should be added to this mailing list. **Please return this mailing list in MS Word format only.**

Example address blocks:

The Honorable Mark Anderson
Minnesota State Senator
135 State Office Building
St. Paul, MN 55113

Marv Johnson, City Administrator
City of Willmar
236 Oriole Avenue
Willmar, MN 55699

Municipality name: Montrose WWTF **Project number:** 0W1.127810
Contact name: Jennifer Selchow **Phone number:** 763-614-7232
(person completing the form)

Public notice address information

1.	**The Honorable State Senator:**	**6.**	**City Administrator/Clerk:**
	The Honorable Bruce Anderson Minnesota State Senator 95 University Avenue W. Minnesota Senate Bldg., Room 2209 St. Paul, MN 55155		Michael Sommerfeld City Clerk/Treasurer 311 Buffalo Avenue South Montrose, MN 55363
2.	**The Honorable State Representative:**	**7.**	**Engineering Consultant:**
	The Honorable Tom Emmer State Representative 9201 Quaday Ave. NE Suite 206 Otsego, MN 55330		Jennifer Selchow, PE Environmental Project Engineer 7533 Sunwood Drive, NW Suite 206 Ramsey, MN 55303
3.	**The Honorable County Board Chair:**	**8.**	**County Planning and Zoning Office:**
	The Honorable Darek Vetsch Wright County Board Chair 3650 Braddock Ave NE Buffalo, MN 55313		3650 Braddock Ave NE Suite 1600 Buffalo, MN 55313
4.	**The Honorable Mayor:**	**9.**	**Watershed District (if established):**
	The Honorable Kirby Moynagh Mayor of Montrose 311 Buffalo Avenue South Montrose, MN 55363		311 Brighton Avenue South Buffalo, MN 55313
5.	**Township Board Clerk:***	**10.**	**Regional Development Commission:**
			3650 Braddock Ave NE Suite 1201 Buffalo, MN 55313

**Include if any portion of the project (including the facility, interceptor, influent or outfall lines) will be located in the township(s).*

To add rows, place your cursor in the last row of the second column and hit tab.

Interested citizens:	**Interested groups:** (i.e., homeowners associations, environmental, business, civic, etc., organizations)
Teresa Burgess, PE, CPESC 1960 Premier Drive Mankato, MN 56001 Teresa.burgess@bolton-menk.com	Apache Tribe of Oklahoma Bobby Komardley Chairman PO Box 1330 Anadarko, OK 73005 bkomardley@outlook.com
	Cheyenne and Arapaho Tribes, Oklahoma Max Bear THPO 700 Black Kettle Blvd Concho, OK 73022 mbear@c-a-tribes.org
	Flandreau Santee Sioux Tribe of South Dakota Garrie Kills-A-Hundred THPO PO Box 283 Flandreau, SD 57028 garrie.killsahundred@FSST.org
	Fort Belknap Indian Community of the Fort Belknap Reservation of Montana Michael Blackwolf THPO 656 Agency Main Street Harlem, MT 59526-9455 mblackwolf@ftbelknap.org
	Lower Sioux Indian Community in the State of Minnesota Cheyanne St. John THPO PO Box 308 Morton, MN 56270 cheyanne.stjohn@lowersioux.com
	Menominee Indian Tribe of Wisconsin David Grignon Tribal Historic Preservation Officer PO Box 910 Keshena, WI 54135-0910 mitwadmin@mitw.org
	Prairie Island Indian Community in the State of Minnesota Noah White THPO 5636 Sturgeon Lake Road Welch, MN 55089 noah.white@piic.org
	Santee Sioux Nation, Nebraska Misty Frazier THPO 425 Frazier Ave. N. Suite 2 Niobrara, NE 68760 ssn.thpo@gmail.com
	Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota Dianne Desrosiers THPO P.O. Box 907 Sisseton, SD 57262-0509 dianned@swo-nsn.gov

	Spirit Lake Tribe, North Dakota Susie Fox Interim Director THPO P.O. Box 198 Fort Totten, ND 58335-0359 sfox@gondtc.com
	Upper Sioux Community, Minnesota Samantha Odegard THPO PO Box 147 Granite Falls, MN 56241-0147 samanthao@uppersiouxcommunity-nsn.gov

To add rows, place your cursor in the last row of the second column and hit tab.

Property owners:

Property owner list should include all property owners of the site to be, or which has been previously acquired. For pond systems, include the property owner(s) of the pond site, spray irrigation site(s) and all property owners of homes within one-fourth mile of the pond site and any clusters of homes within one-half mile of the pond site.

Federal agencies:

ATTN: Field Supervisor
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425-1665

ATTN: Environmental Compliance Chief
U.S. Army Corps of Engineers
St. Paul District
180 Fifth Street East, Suite 700
St. Paul, MN 55101-1678

ATTN: Regional Environmental Officer
Federal Emergency Management Agency
Region V Office
536 South Clark Street, 6th Floor
Chicago, IL 60605

State agencies:

ATTN: Environmental Review Supervisor
MN Department of Natural Resources
Division of Ecological and Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155 -4025

ATTN: Manager of Government Programs and Compliance
MN Historical Society
Minnesota Historic Preservation Office
345 West Kellogg Boulevard
St. Paul, MN 55102-1906

ATTN: Cultural Resource Director
MN Indian Affairs Council
161 St. Anthony Avenue, Suite 919
St. Paul, MN 55103

MPCA regional office(s):

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

Project Priority List (PPL)

Wastewater Application

Doc Type: Wastewater Point Source

Instructions: Submit completed form to ppl.submittals.pca@state.mn.us.

For more information, please contact Bill Dunn, Clean Water Revolving Fund Coordinator at 651-757-2324 or bill.dunn@state.mn.us. You can also visit our website at: https://www.pca.state.mn.us/business-with-us/apply-for-financial-assistance

1. **New project/Update to existing PPL project:** ☒ New project ☐ Update to existing project ☐ Rescore
   MPCA Project number: _____
2. **NPDES/SDS Permit number:** MN0024228
3. **Project description:**
   Montrose WWTF would regionalize with the city of Buffalo's WWTF. This would entail forcemain and main lift station improvements. The existing ponds would be converted to equalization basins. The remaining ponds and processes would be decommissioned.
4. **Facility Plan/Preliminary Engineering Report submitted along with PPL Application?** ☒ Yes ☐ No
5. **Applicant name:** City of Montrose, MN
   - Project area: Montrose
   - Town/city: Montrose and Waverly
   - Population: 6,055
   - County: Wright
6. **Contact person:** Jessica Bonniwell
   - Address: 311 Buffalo Ave S
   - Phone: 763-575-7422
   - Email: jbonniwell@montrose-mn.com
7. **Project engineering consultants/Firm name (if applicable):** Bolton & Menk
   - Contact name: Jennifer Selchow
   - Address: 7533 Sunwood Drive NW, Suite 206, Ramsey, MN 55303
   - Phone: 763-614-7232
   - Email: Jennifer.Selchow@bolton-menk.com
8. **Project area description:**

	☒ **Sewered**	☐ **Unsewered** (submit map of project area)
a. Number of existing households:	2,422	
b. Number of non-residential users:	2,000	
c. Number of failing SSTS systems:	N/A	

Need or problem project addresses:
(Check all that apply)

- ☐ Rehab collection system
- ☒ Connection to an existing system
- ☐ New treatment and/or collection system
- ☐ Expansion of existing treatment plant
- ☐ Failing SSTS systems
- ☒ Rehab of an existing facility
- ☐ Advanced treatment
- ☐ Other

Note: Required attachments for unsewered area projects. A map of the project service area which has an identifiable scale, identifies all the structures with wastewater flows, and has the maximum impact zone clearly encircled.

9. **Project estimated cost ($):** $9,262,000.00

10. **Current project status:** Preliminary report

11. **Desired construction state date, if financing is available (month/year):** Fall 2024

12. **Project Needs Categories (check all that apply):**
    - ☒ New Collector System
    - ☒ New Interceptors
    - ☒ Sewer System Rehab
    - ☐ Infiltration/Inflow
    - ☐ Secondary Treatment
    - ☐ Advanced Treatment
    - ☐ Reuse
    - ☐ Water Efficiency
    - ☐ Energy Efficiency
    - ☐ Renewable Energy

13. **Please indicate if this project may qualify for Green Project Reserve (GPR), and has potentially eligible components or the entire project is applying to be determined GPR eligible.**

    The U.S. Environmental Protection Agency (EPA) has provided a guidance document listing examples of projects that will qualify for Green Project Reserve dollars. Below is an abbreviated list of those examples. If the proposed project matches one or more of the examples, check the box next to the example that describes the project. For more information, see *Guidance for Green Project Reserve* at https://www.pca.state.mn.us/business-with-us/apply-for-financial-assistance.

Categorical eligible project types (check all that apply):

- ☐ 1. Water Efficiency
- ☐ 2. Energy Efficiency
- ☐ 3. Environmentally Innovative
- ☐ 4. Non-categorical (describe below)

NA

On behalf of an eligible project as their authorized authority, I hereby submit this application for placement on the PPL:

Authorized Representative

Signature: Jessica Bonniwell Title: City Administrator

(This document has been electronically signed.)

Email: *jbonniwell@montrose-mn.com* Date (mm/dd/yyyy): 03/03/2023

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

PPL Wastewater Existing Facility Improvements Scoring Worksheet

Project Priority List (PPL)
Minnesota Rule Chapter 7077.0117

Doc Type: PPL Points Determination

MPCA Use Only

Project Number
Staff Engineer
Total Points
Date

Facility Information (please print)

Project name: Montrose WWTF Facility Plan
Applicant name (if different):

Contact name: Jennifer Selchow Title: Environmental Project Engineer

E-mail address: Jennifer.Selchow@bolton-menk.com Phone: 763-614-7232

Instructions: This worksheet is used to score all requests for state financial assistance for wastewater improvement projects for Minnesota Pollution Control Agency (MPCA) permitted facilities. Scoring is based on the environmental criteria contained in Minnesota Rule Chapter 7077. The result of scoring is a ranked list called the Project Priority List (PPL) from which projects will be selected for funding.

Applicants must complete their sections of the worksheet and submit it with their requests for placement on the PPL. As part of completing the worksheet, the applicant must provide sufficient documentation to support the award of points. Complete application information is located on the MPCA website at http://www.pca.state.mn.us/ppl.

Complete this form if your proposal includes improvements to wastewater collection and/or treatment facilities that have an existing National Pollutant Discharge Elimination System (NPDES) Permit or a State Disposal System (SDS) Permit.

For more information, contact: Bill Dunn, Clean Water Revolving Fund Coordinator at 651-757-2324, Fax 651-297-8324, or bill.dunn@state.mn.us.

Applicant completes questions 15-40 and 85; MPCA completes 45-80, 90-95

Points

[15] Existing and proposed stabilization ponds located in karst areas and SDS facilities with high ground water table [subp. 6]

15.1 Does this project replace or rehabilitate stabilization ponds located over karst areas? ☐ Yes ☒ No

15.2 Does this project replace or rehabilitate wastewater treatment facilities having a disposal site (spray irrigation, rapid infiltration, etc.) with less than three feet of vertical separation from the treated wastewater discharge point to the seasonally high ground water table or to bedrock? ☐ Yes ☒ No

If Yes to either 15.1 or 15.2, enter 20 points

[20] Existing facility at or above 85% capacity [subp. 1]

Complete 20.1 *if project improves only the treatment facility or improves both the treatment facility and the collection facilities.*

20.1 Is this treatment facility at or above 85% of either its permitted hydraulic flow or organic loading capacity as determined by the last 12 month average wet weather flow (AWW) or average annual discharge, **and** will the project proposal appropriately resolve capacity issues either through expansion of treatment capacity or reduction of loadings? ☐ Yes ☒ No

Permitted hydraulic and/or organic loading capacity: NA

Actual hydraulic and/or organic loading capacity: NA

Complete 20.2 *if project improves only the collection facilities.*

20.2 Is this collection facility at or above 85% of the design peak instantaneous wet weather flow (PIWW) or provide documentation of other physical conditions, such as by-passing to show the peak flow has exceeded the design PIWW, **and** will the project proposal appropriately resolve capacity issues through expansion of collection facility capacity? ☒ Yes ☐ No

Design PIWW: 1.648 MGD

Documented peak flow: 2.24 MGD

If Yes to either 20.1 or 20.2, enter 5 points 5

[25] Existing age of treatment or collection facilities within the proposed project service area [subp. 2]
(*Age is determined by the construction year of all or a substantial portion of the existing facility addressed by project.)*

25.1 Last significant construction year of treatment or collection facilities, which are proposed to be repaired or replaced within the service area? ☒ Yes ☐ No

Enter Year: 2002

25.2 Are the facilities 20 years or more old? If yes, attach documentation of last significant construction year. ☒ Yes ☐ No

If Yes, enter 20 points **20**

[30] Existing excessive infiltration/inflow (i/i) with proposed reduction plan [subp. 3]

30.1 Does this facility have excessive infiltration or inflow? (Minn. R. 7077.0105, subp. 12 and 13)

Calculate infiltration: 63 gallon/capita/day Greater than 120 gallon/capita/day? ☐ Yes ☒ No

Calculate inflow: 101 gallon/capita/day Greater than 275 gallon/capita/day? ☐ Yes ☒ No

30.2 Does the proposal include measures to correct excessive infiltration or inflow? ☐ Yes ☒ No

If Yes to both 30.1 and 30.2, enter 15 points

[35] Existing or proposed land (including sub-surface) discharge [subp. 4]

35.1 Does the facility currently land discharge treated wastewater effluent, will it continue to land discharge, **and** not create or contribute to known ground water nitrate levels over 10 mg/L? ☐ Yes ☒ No

35.2 Does the proposed alternative call for the consumptive use (nitrogen or volume) spray irrigation or on-land disposal systems, that are required by permit to denitrify (nitrate limit)? ☐ Yes ☒ No

If Yes to either 35.1 or 35.2, enter 20 points

[40] Existing stringent limit that exceeds secondary treatment [subp. 5]

40.1 Is the existing facility currently subject to CBOD or TSS permit limits that are more stringent than secondary treatment (25 mg/l and 30 mg/l), or has an ammonia, total nitrogen or phosphorus limit? (Minn. R. 7050.0211) Exclude facilities discharging to Class 7 waters that are subject to 15 CBOD. ☒ Yes ☐ No

If Yes, enter 10 points **10**

[45] Existing effluent discharge violations *(Enforcement staff)* [subp. 7]

45.1 Is the existing facility on the Significant Noncompliance List (CFR, title 40, section 123.45, appendix A) **and** would the proposed project designed to eliminate the problem? ☐ Yes ☒ No

If Yes, enter 5 points

[50] Existing repeated facility failures *(Enforcement staff)* [subp. 8]

50.1 Has the existing treatment or collection facility experienced bypasses, overflows and/or surcharges during two or more storm events within a 12-month period when operating at less than "peak instantaneous wet weather flow" **and** is the proposed project designed to eliminate such failures? ☐ Yes ☒ No

If Yes, enter 10 points

[55] Existing discharge to outstanding resource value water (ORVW) or impaired water (*Effluent Limits Coord.)* [subp. 9]

55.1 Does the existing facility currently discharge into an ORVW or Impaired water? ☐ Yes ☒ No

If Yes, enter 5 points

55.2 If yes, does the existing facility also have existing acute/chronic effluent discharge standards violations? (see question 45.1 or subp. 7)? ☐ Yes ☐ No

If Yes to both 55.1 and 55.2, enter 5 points

55.3 If yes, does the existing facility also have existing chronic failures? (see question 50.1 or subp. 8) ☐ Yes ☐ No

If Yes to 55.1, 55.2, and 55.3, enter 5 points

[60] Existing discharge near potable water intake (*Effluent Limits Coordinator)* [subp. 10]

60.1 Is there potable water intake within 25 miles downstream of the existing facility discharge? ☐ Yes ☒ No

If Yes, enter 5 points

[65] Existing endangered or threatened species (*Effluent Limits Coordinator)* [subp. 11]

65.1 Does the receiving water downstream from the existing facility discharge support any endangered or threatened species? ☐ Yes ☒ No

If Yes, enter 5 points

[70] Proposed introduction of more stringent discharge limits for an existing facility (*Effluent Limits Coordinator)* [subp. 12]
Does this existing treatment facility need to meet more intensive and/or extensive wastewater treatment standards because of:

70.1 More stringent facility discharge limits as incorporated into MPCA permit revisions? ☒ Yes ☐ No

70.2 Discontinuation of an existing permit variance? ☒ Yes ☐ No

70.3 Need to treat additional hydraulic or organic loading capacities without increasing either the permitted frozen effluent mass limit or concentration of discharges to the receiving waters? ☐ Yes ☒ No

If Yes to 70.1, 70.2 or 70.3, enter 10 points **10**

[75] Existing receiving water classification *(Effluent Limits Coordinator)* [subp. 13]

Only the most strict classification can be used, 7 points maximum

75.1 Receiving water classification is 2A ☐ Yes ☒ No

If Yes to 75.1, enter 7 points

75.2 Receiving water classification is 1, 2Bd ☐ Yes ☒ No

If No to 75.1 and Yes to 75.2, enter 5 points

75.3 Receiving water classification is 2B, 2C, 2D ☒ Yes ☐ No

If No to 75.1 and 75.2 and Yes to 75.3, enter 3 points **3**

75.4 Receiving water classification is 7 ☐ Yes ☐ No

If No to 75.1, 75.2 and 75.3 and Yes to 75.4, enter 1 point

[80] Project facility effluent to stream impact dilution ratio *(Effluent Limits Coordinator)* [subp. 14]

*For all discharges to rivers, streams, or ditches (flowing receiving water), calculate the facility effluent low flow by averaging the influent flow reported on the monthly discharge monitoring reports (DMRs) for the three consecutive months with the lowest **influent** flow in three climatic years, April 1 to March 31.*

80.1 What is the ratio of the **influent** low flow of the facility to the 7Q10 flow of the receiving water?

Dilution Ratio* = Wastewater Treatment Facility (WWTF) Low Flow (million gallons per day [mgd]) / Receiving water low flow (mgd)

(0.294 mgd/ 0.246 mgd = Dilution Ratio) Dilution Ratio = 1.0

*For all "Dilution Ratios" greater than 1.0 or if the 7Q10 receiving water flow = 0 mgd set dilution ratio = 1.0

Note: Round up calculated value for dilution ratio to the next whole number (e.g., 8.3 = 9). 15 x dilution ratio = **30**

[85] Proposed project implements corrective measures (*Effluent Limits Coordinator)* [subp. 15]

85.1 Will the project implement corrective measure(s) for problems identified in a study, such as: ☐ Yes ☒ No

- Clean Water Partnership Project
- Impaired Water Study
- EPA-approved Watershed Restoration Action Strategy
- Equivalent (other) study, e.g., County Water Plan

Type of Study: *Attach supporting documentation and identify relevant sections.*

If Yes, enter 5 points

[90] Proposed project helps meet a total maximum daily load (TMDL) for a receiving water *(Effluent Limits Coord)* [subp. 16]

90.1 Does this project contribute to the achievement of a TMDL by being designed to reduce the discharge of pollutants as required by an Agency approved TMDL implementation plan or does the project require an National Pollutant Discharge Elimination System (NPDES) Permit or State Disposal System (SDS) Permit that will require the reduced discharge of pollutants based on a TMDL? ☐ Yes ☒ No

If Yes, enter 20 points

[95] Propose project points reduction for new/expanded discharges into specified waters *(Effluent Limits Coord)* [subp. 17]

95.1 Does the proposed project involve a new or expanded discharge* to one or more of the following specified waters? ☐ Yes ☒ No

a) Outstanding Resource Value Waters (Minn. R. 7050.0180)

b) Impaired waters (Section 303(d) of the Clean Water Act)

c) Classification 2A, lake, or wetland that exceeds 200,000 gallons per day

* If new permit requirements include frozen effluent mass limits from the existing permit, the facility is not defined as expanding and negative points will not be assigned.

If Yes, enter minus 5 points

[100] Project includes wastewater reuse

100.1 Does the project include the beneficial use of treated wastewater effluent that will reduce or replace the use of a groundwater, surface water, or potable water source? ☐ Yes ☒ No

100.2 Do the project components needed to beneficially use treated wastewater effluent account for at least 20% of the total eligible project cost? ☒ Yes ☐ No

100.3 Does the project receive points under item 35 (Minn. R. 7077.0117, subp. 4) for land discharge? ☐ Yes ☒ No

If Yes to both 100.1 and 100.2, enter 30 points

Total **78**

MONTROSE, MINNESOTA

WASTEWATER TREATMENT IMPROVEMENTS

CONTRACT DRAWINGS

2002

BOLTON & MENK, INC.
CONSULTING ENGINEERS AND LAND SURVEYORS
MANKATO, MINNESOTA

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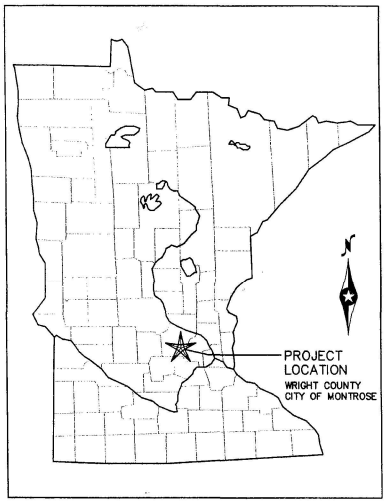
SIGNATURE Seth A. Peterson

TYPED OR PRINTED NAME SETH A. PETERSON

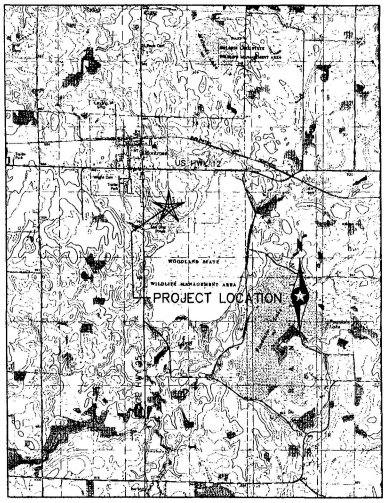
DATE 12/20/02 REG. NO. 26408

Addendum Set



VICINITY MAP

NO SCALE



LOCATION MAP

NO SCALE

SHEET INDEX

1.01 TITLE
1.02 VICINITY MAP, LOCATION MAP, AND SHEET INDEX
1.03 LEGEND
1.04 ABBREVIATION LEGEND
1.05 HYDRAULIC PROFILE
1.06 DESIGN DATA AND VALVE SCHEDULES
1.07 STANDARD DETAILS – SHEET 1
1.08 STANDARD DETAILS – SHEET 2
1.09 STANDARD DETAILS – SHEET 3
1.10 STANDARD DETAILS – SHEET 4

2.01 EXISTING CONDITIONS
2.02 SITE PLAN AND YARD PIPING
2.03 HIGH INTENSITY AERATION (POND 1 AND 2) – GRADING PLAN
2.04 POND 1 AND 2 AERATION PIPING
2.05 FINAL CLARIFIER AND UV DISINFECTION SYSTEM GRADING AND PIPING PLANS
2.06 POND SECTIONS – SHEET 1
2.07 POND SECTIONS – SHEET 2
2.08 POND SECTIONS – SHEET 3
2.09 POND SECTIONS – SHEET 4
2.10 POND SECTIONS – SHEET 5
2.11 POND SECTIONS – SHEET 6
2.12 POND SECTIONS – SHEET 7

3.01 STRUCTURAL NOTES
3.02 PRETREATMENT SYSTEM AND CONTROL STRUCTURE NO. 1 – PLANS AND SECTIONS
3.03 PRETREATMENT SYSTEM AND CONTROL STRUCTURE NO. 1 – ROOF PLAN, EXTERIOR ELEVATIONS, AND DETAILS
3.04 CONTROL BUILDING – PLAN, SECTIONS, AND DETAILS
3.05 CONTROL BUILDING – ROOF PLAN, EXTERIOR ELEVATIONS AND DETAILS
3.06 UV DISINFECTION AND PARSHALL FLUME BUILDING – PLANS, ROOF PLAN, AND EXTERIOR ELEVATIONS
3.07 UV DISINFECTION AND PARSHALL FLUME BUILDING – SECTIONS, AND DETAILS
3.08 WAS PUMP STATION AND CONTROL STRUCTURES 6 AND 7 – PLANS AND SECTIONS
3.09 FINAL CLARIFIERS – PLANS
3.10 FINAL CLARIFIERS – SECTIONS AND DETAILS
3.11 BIOSOLIDS STORAGE FACILITY – PLANS AND DETAILS
3.12 BIOSOLIDS STORAGE FACILITY – SECTIONS
3.13 DETAILS AND SCHEDULES

4.01 PROCESS FLOW DIAGRAM
4.02 INFLUENT LIFT STATION – PLAN AND SECTION
4.03 PRETREATMENT SYSTEM AND CONTROL STRUCTURE NO. 1
4.04 CONTROL BUILDING – PLAN AND SECTIONS
4.05 CONTROL STRUCTURE NO. 2, 3, 4, AND 5 AND MANHOLE NO. 1 AND 6 – PLANS AND SECTIONS
4.06 WAS PUMP STATION AND CONTROL STRUCTURE NO. 6 AND 7 – PLANS AND SECTIONS
4.07 FINAL CLARIFIERS – PLAN
4.08 FINAL CLARIFIERS – SECTIONS AND DETAILS
4.09 BIOSOLIDS STORAGE FACILITY – PLANS AND SECTIONS
4.10 UV DISINFECTION SYSTEM AND PARSHALL FLUME – PLANS AND SECTIONS

5.01 PRETREATMENT SYSTEM AND CONTROL STRUCTURE NO. 1 MECHANICAL PLANS
5.02 CONTROL BUILDING MECHANICAL PLANS
5.03 UV DISINFECTION SYSTEM AND PARSHALL FLUME MECHANICAL PLANS
5.04 PLUMBING PIPING DIAGRAMS
5.05 MECHANICAL DETAILS
5.06 MECHANICAL EQUIPMENT SCHEDULES

6.01 ELECTRICAL SYMBOLS AND ABBREVIATIONS
6.02 ELECTRICAL SITE PLAN
6.03 INFLUENT AND CHEMICAL FEED STRUCTURES ELECTRICAL PLANS
6.04 PRETREATMENT SYSTEM ELECTRICAL PLANS
6.05 CONTROL BUILDING ELECTRICAL PLANS
6.06 FINAL CLARIFIERS STRUCTURES ELECTRICAL PLAN
6.07 BIOSOLIDS STORAGE FACILITY ELECTRICAL PLAN
6.08 UV DISINFECTION SYSTEM AND PARSHALL FLUME ELECTRICAL PLANS
6.09 ELECTRICAL SCHEDULES, SCHEMATICS, AND DETAILS
6.10 ELECTRICAL DETAILS
6.11 MOTOR CONTROL CENTER MCC1 ONE-LINE DIAGRAM
6.12 MOTOR CONTROL CENTER MCC2 ONE-LINE DIAGRAM
6.13 MOTOR CONTROL CENTER SCHEMATICS
6.14 CABLE CONDUIT SCHEDULE

7.01 INFLUENT LIFT STATION SCHEMATIC AND DETAIL
7.02 CONTROL BUILDING CONTROL PANEL SCHEMATIC
7.03 UV BUILDING CONTROL PANEL SCHEMATIC
7.04 UV BUILDING CONTROL PANEL SCHEMATIC

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SIGNATURE: Seth A. Peterson TYPED OR PRINTED NAME: Seth A. Peterson

DATE: 19 APRIL 2002 REG. NO. 26468

BOLTON & MENK, INC

CONSULTING ENGINEERS & SURVEYORS

MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN
BURNSVILLE, MN WILLMAR, MN AMES, IA LIBERTY, MO

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MONTROSE, MINNESOTA

WASTEWATER TREATMENT IMPROVEMENTS

VICINITY MAP, LOCATION MAP, AND SHEET INDEX

SHEET 1.02

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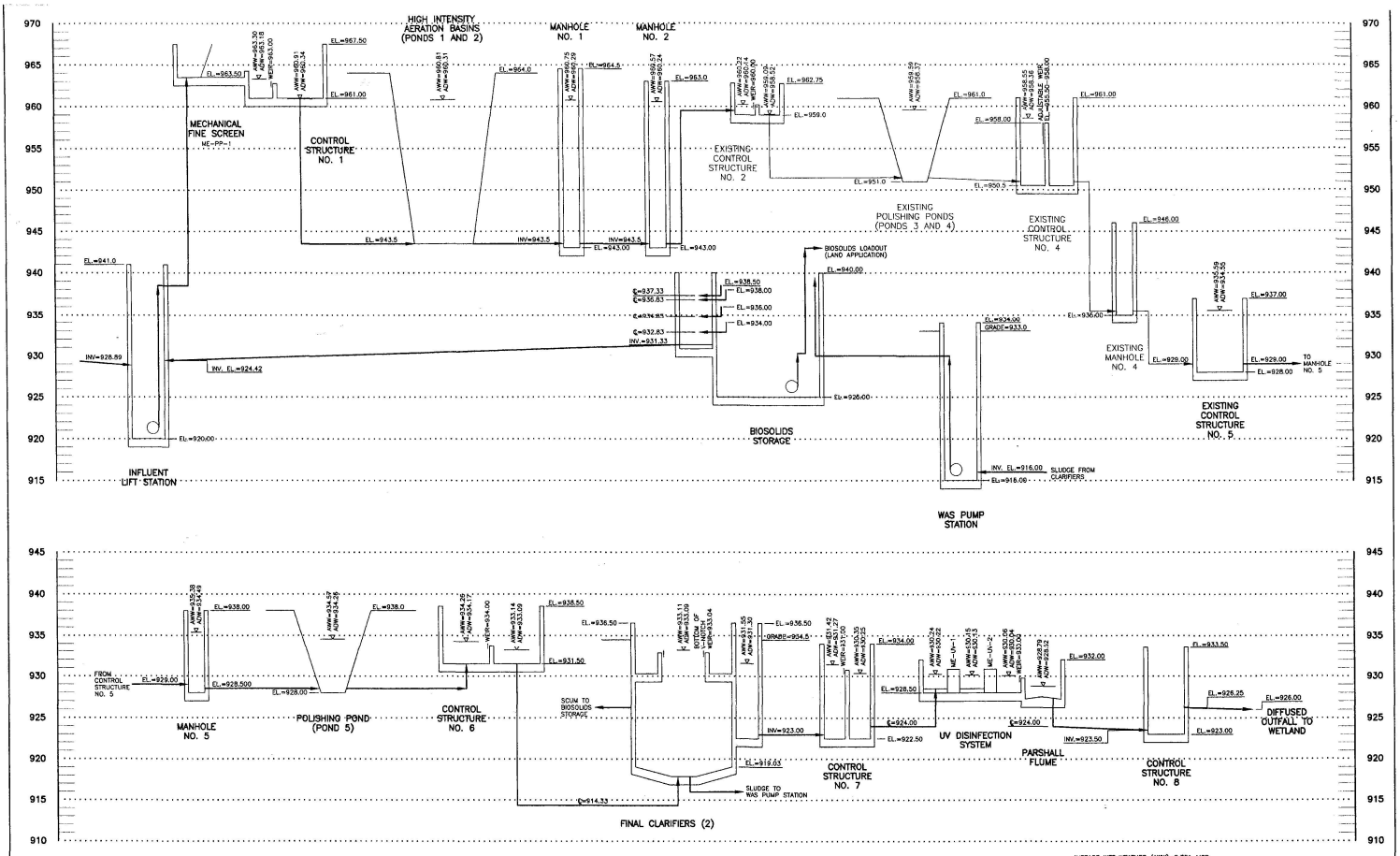

HYDRAULIC PROFILE

AVERAGE WET WEATHER (AWW)=0.781 MGD
AVERAGE DRY WEATHER (ADW)=0.411 MGD

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MONTROSE, MINNESOTA
WASTEWATER TREATMENT IMPROVEMENTS
HYDRAULIC PROFILE

SHEET 1.05

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DESIGN DATA SUMMARY

DESIGN BASIS

DESIGN YEAR	2020
DESIGN POPULATION	4,110

INFLUENT DESIGN FLOWS

	MGD	GPM	CFS
AVERAGE DRY WEATHER FLOW (ADW)	0.411	285	0.64
AVERAGE WET WEATHER FLOW (AWW)	0.781	542	1.21
PEAK HOURLY WET WEATHER FLOW (PHWW)	1.380	958	2.14
PEAK INSTANTANEOUS WET WEATHER FLOW (PIWW)	1.648	1144	2.55

INFLUENT DESIGN LOADINGS

CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND (CBOD)	740 LB/DAY
TOTAL SUSPENDED SOLIDS (TSS)	822 LB/DAY
TOTAL KJELDAHL NITROGEN (TKN)	164 LB/DAY

EFFLUENT QUALITY CRITERIA

5-DAY CBOD (CBOD5)	25 MG/L
TOTAL SUSPENDED SOLIDS (TSS)	45 MG/L
FECAL COLIFORM ORGANISMS (MAR 1 - OCT 31)	200 ORG/100 ML
TOTAL PHOSPHORUS	1 MG/L
pH	6.0-9.0

PRELIMINARY TREATMENT

EQUIPMENT NAME:	INFLUENT LIFT STATION PUMP
TYPE OF EQUIPMENT:	SUBMERSIBLE
NO. OF UNITS:	3
EQUIPMENT ID:	P-WW-1, 2, 3
DESIGN CRITERIA:	PHWW = 958 GPM W/ 1 PUMP OUT OF SERVICE
DESIGN CAPACITY:	960 GPM @ 50 FT TDH
MAX HP:	25
EQUIPMENT NAME:	CHEMICAL FEED PUMPS
TYPE OF EQUIPMENT:	PERISTALTIC METERING
NO. OF UNITS:	2
EQUIPMENT ID:	P-FC-1, 2
DESIGN CAPACITY:	0.25 GPH
EQUIPMENT NAME:	FINE SCREEN
NO. OF UNITS:	1
EQUIPMENT ID:	ME-FS-1
DESIGN CRITERIA:	PHWW = 1.648 MGD
DESIGN CAPACITY:	2.0 MGD W/ WASHER, 3.5 W/ WASHER OFF
GEAR MOTOR MAX HP:	1
ACTIATOR MOTOR MAX HP:	7.8
EQUIPMENT NAME:	MANUAL BAR SCREEN
NO. OF UNITS:	1

SECONDARY TREATMENT

EQUIPMENT NAME:	AERATION BLOWERS
TYPE OF EQUIPMENT:	POSITIVE DISPLACEMENT BLOWER W/ VFD
NO. OF UNITS:	2
EQUIPMENT ID:	ME-A-1, 2
DESIGN CAPACITY:	690 SCFM @ 8.3 PSIG
MAX HP:	50
EQUIPMENT NAME:	DIFFUSERS
TYPE OF EQUIPMENT:	FINE BUBBLE
EQUIPMENT NAME:	FINAL CLARIFIER
TYPE OF EQUIPMENT:	CIRCULAR, CENTER FEED, FLOCCULATING
NO. OF UNITS:	2
EQUIPMENT ID:	ME-FC-1,2
DESIGN CRITERIA:	1/2 PHWW FLOW = 0.69 MGD
SIZE:	35 FT DIA BY 14 FT SWD
MAX DRIVE HP:	0.5
MAX FLOCCULATOR HP:	3
WEIR LENGTH:	93 FT
SURFACE AREA:	962 FT2
SURFACE OERFLOW RATE (GPD/FT2):	717 @ ½ PHWW = 0.69 MGD
WEIR LOADING (GPD/FT):	7,403 @ ½ PHWW = 0.69 MGD
SOLIDS LOADING (LB/DAY/FT2):	18 @ ½(AWW+1)ADW) AND 3,000 MG/L
EQUIPMENT NAME:	SCUM PUMP
TYPE OF EQUIPMENT:	SUBMERSIBLE
NO. OF UNITS:	1
EQUIPMENT ID:	P-SC-1
DESIGN CAPACITY:	100 GPM @ 20 FT TDH
MAX HP:	5
EQUIPMENT NAME:	CHEMICAL FEED PUMPS
TYPE OF EQUIPMENT:	PERISTALTIC METERING
NO. OF UNITS:	2
EQUIPMENT ID:	P-FC-3,4
DESIGN CAPACITY:	0.25 GPH

DISINFECTION

EQUIPMENT NAME:	ULTRAVIOLET DISINFECTION
TYPE OF EQUIPMENT:	LOW PRESSURE LAMPS
NO. OF BANKS/POWER DIST. CENTERS:	2
NO. OF LAMPS:	46
EQUIPMENT ID:	ME-UV-1,2
DESIGN CRITERIA:	PIWW = 1.648 MGD
ELECTRICAL REQUIREMENTS:	
UV SYSTEM CONTROL CENTER (1)	120 VOLTS, 1 PHASE, 2 WIRE, 120 VA
POWER DISTRIBUTION CENTER (2)	208 VOLTS, 3 PHASE, 4 WIRE, 2.3 KVA
EFFLUENT LEVEL CONTROL:	WEIR
WEIR LENGTH (FT):	25.5

BIOSOLIDS TREATMENT

EQUIPMENT NAME:	WAS PUMP STATION
TYPE OF EQUIPMENT:	SUBMERSIBLE
NO. OF UNITS:	2
EQUIPMENT ID:	P-WAS-1,2
DESIGN CAPACITY:	100 GPM @ 20 FT TDH
MAX HP:	5
EQUIPMENT NAME:	BIOSOLIDS TRANSFER PUMP
TYPE OF EQUIPMENT:	SUBMERSIBLE
NO. OF UNITS:	1
EQUIPMENT ID:	P-ST-1
DESIGN CAPACITY:	600 GPM @ 25 FT TDH
MAX HP:	10
EQUIPMENT NAME:	BIOSOLIDS STORAGE MIXERS
TYPE OF EQUIPMENT:	SUBMERSIBLE
NO. OF UNITS:	2
EQUIPMENT ID:	ME-MX-1,2
DESIGN CAPACITY:	15,800 GPM
MAX HP:	15

UTILITY WATER SYSTEM:

EQUIPMENT NAME:	UTILITY WATER PUMP
TYPE OF EQUIPMENT:	CENTRIFUGAL
NO. OF UNITS:	2
EQUIPMENT ID:	P-UW-1,2
DESIGN CAPACITY:	40 GPM @ 88 FT TDH
MAX HP:	2

VALVE SCHEDULE

TAG	TYPE	SIZE (IN)	LOCATION	OPERATOR
V-WW-1	CHECK	8	INFLUENT VALVE VAULT	--
V-WW-2	GATE	8	INFLUENT VALVE VAULT	AWWA NUT
V-WW-3	CHECK	8	INFLUENT VALVE VAULT	--
V-WW-4	GATE	8	INFLUENT VALVE VAULT	AWWA NUT
V-WW-5	CHECK	8	INFLUENT VALVE VAULT	--
V-WW-6	GATE	8	INFLUENT VALVE VAULT	AWWA NUT
V-WW-7	GATE	8	BURIED	AWWA NUT
V-A-1	CHECK	6	CONTROL BUILDING - BLOWER ROOM	--
V-A-2	BUTTERFLY	6	CONTROL BUILDING - BLOWER ROOM	HANDWHEEL
V-A-3	CHECK	6	CONTROL BUILDING - BLOWER ROOM	--
V-A-4	BUTTERFLY	6	CONTROL BUILDING - BLOWER ROOM	HANDWHEEL
V-A-5	BUTTERFLY	6	CONTROL BUILDING - BLOWER ROOM	HANDWHEEL
V-A-6	BUTTERFLY	6	POND 1 EAST DIKE - ABOVE GRADE	HANDWHEEL
V-A-7	BUTTERFLY	6	POND 1 EAST DIKE - ABOVE GRADE	HANDWHEEL
V-A-8	BUTTERFLY	6	POND 2 EAST DIKE - ABOVE GRADE	HANDWHEEL
V-A-9	BUTTERFLY	6	POND 2 EAST DIKE - ABOVE GRADE	HANDWHEEL
V-PP-1	PLUG	10	CONTROL STRUCTURE NO. 3 - SUBMERGED	AWWA NUT
V-PP-2	PLUG	10	CONTROL STRUCTURE NO. 3 - SUBMERGED	AWWA NUT
V-PP-3	PLUG	10	CONTROL STRUCTURE NO. 4 - SUBMERGED	AWWA NUT
V-PP-4	PLUG	10	CONTROL STRUCTURE NO. 4 - SUBMERGED	AWWA NUT
V-PP-5	PLUG	10	CONTROL STRUCTURE NO. 4 - SUBMERGED	AWWA NUT
V-PP-6	PLUG	10	CONTROL STRUCTURE NO. 5 - SUBMERGED	AWWA NUT
V-PP-7	PLUG	10	CONTROL STRUCTURE NO. 5 - SUBMERGED	AWWA NUT
V-PP-8	GATE	10	MANHOLE NO. 1 - SUBMERGED	AWWA NUT
V-PP-9	GATE	10	MANHOLE NO. 2 - SUBMERGED	AWWA NUT
V-PP-10	GATE	10	MANHOLE NO. 6 - SUBMERGED	AWWA NUT
V-PP-11	GATE	10	MANHOLE NO. 6 - SUBMERGED	AWWA NUT
V-WAS-1	PLUG	6	FINAL CLARIFIER NO. 1 - BURIED	AWWA NUT
V-WAS-2	PLUG	8	FINAL CLARIFIER NO. 1 - BURIED	AWWA NUT
V-WAS-3	PLUG	6	FINAL CLARIFIER NO. 2 - BURIED	AWWA NUT
V-WAS-4	PLUG	8	FINAL CLARIFIER NO. 2 - BURIED	AWWA NUT
V-WAS-5	CHECK	4	UV BUILDING - CHEMICAL FEED ROOM	--
V-WAS-6	PLUG	4	UV BUILDING - CHEMICAL FEED ROOM	HANDWHEEL
V-WAS-7	CHECK	4	UV BUILDING - CHEMICAL FEED ROOM	--
V-WAS-8	PLUG	4	UV BUILDING - CHEMICAL FEED ROOM	HANDWHEEL
V-WAS-9	PLUG	4	BURIED	AWWA NUT
V-WAS-10	PLUG	4	BURIED	AWWA NUT
V-SC-1	PLUG	6	FINAL CLARIFIER NO. 1	AWWA NUT
V-SC-2	PLUG	6	FINAL CLARIFIER NO. 2	AWWA NUT
V-SN-1	GATE	6	SUPERNATANT DRAWOFF STRUCTURE	AWWA NUT
V-SN-2	GATE	6	SUPERNATANT DRAWOFF STRUCTURE	AWWA NUT
V-SN-3	GATE	6	SUPERNATANT DRAWOFF STRUCTURE	AWWA NUT
V-ST-1	PLUG	6	SLUDGE LOADOUT - EXPOSED	HANDWHEEL
V-ST-2	PLUG	6	SLUDGE LOADOUT - EXPOSED	HANDWHEEL
V-ST-3	PLUG	6	SLUDGE LOADOUT - BURIED	AWWA NUT

GATE SCHEDULE

TAG	LOCATION	WIDTH (IN)	OPERATOR
SG-1	PRETREATMENT	36	NA
SG-2	PRETREATMENT	36	NA
SG-3	PRETREATMENT	36	NA
SG-4	PRETREATMENT	36	NA
SG-5	CONTROL STRUCTURE NO. 1	36	NA
SG-8	CONTROL STRUCTURE NO. 1	36	NA
SG-7	CONTROL STRUCTURE NO. 6	36	NA
SG-8	CONTROL STRUCTURE NO. 6	36	NA
SG-9	CONTROL STRUCTURE NO. 6	36	NA
SG-10	CONTROL STRUCTURE NO. 7	36	NA
SG-11	CONTROL STRUCTURE NO. 7	36	NA
SG-12	UV DISINFECTION SYSTEM	36	NA
SG-13	UV DISINFECTION SYSTEM	36	NA
SG-14	CONTROL STRUCTURE NO. 4	12	HANDWHEEL

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REG. NO.: 26468

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MANKATO, MN · FAIRMONT, MN · SLEEPY EYE, MN
BURNSVILLE, MN · WILLMAR, MN · AMES, IA · LIBERTY, MO

REV.	BY	DATE
A	LLT	11-9-2001
0	LLT	4-17-2002

MONTROSE, MINNESOTA
WASTEWATER TREATMENT IMPROVEMENTS
DESIGN DATA AND VALVE SCHEDULES

SHEET 1.06

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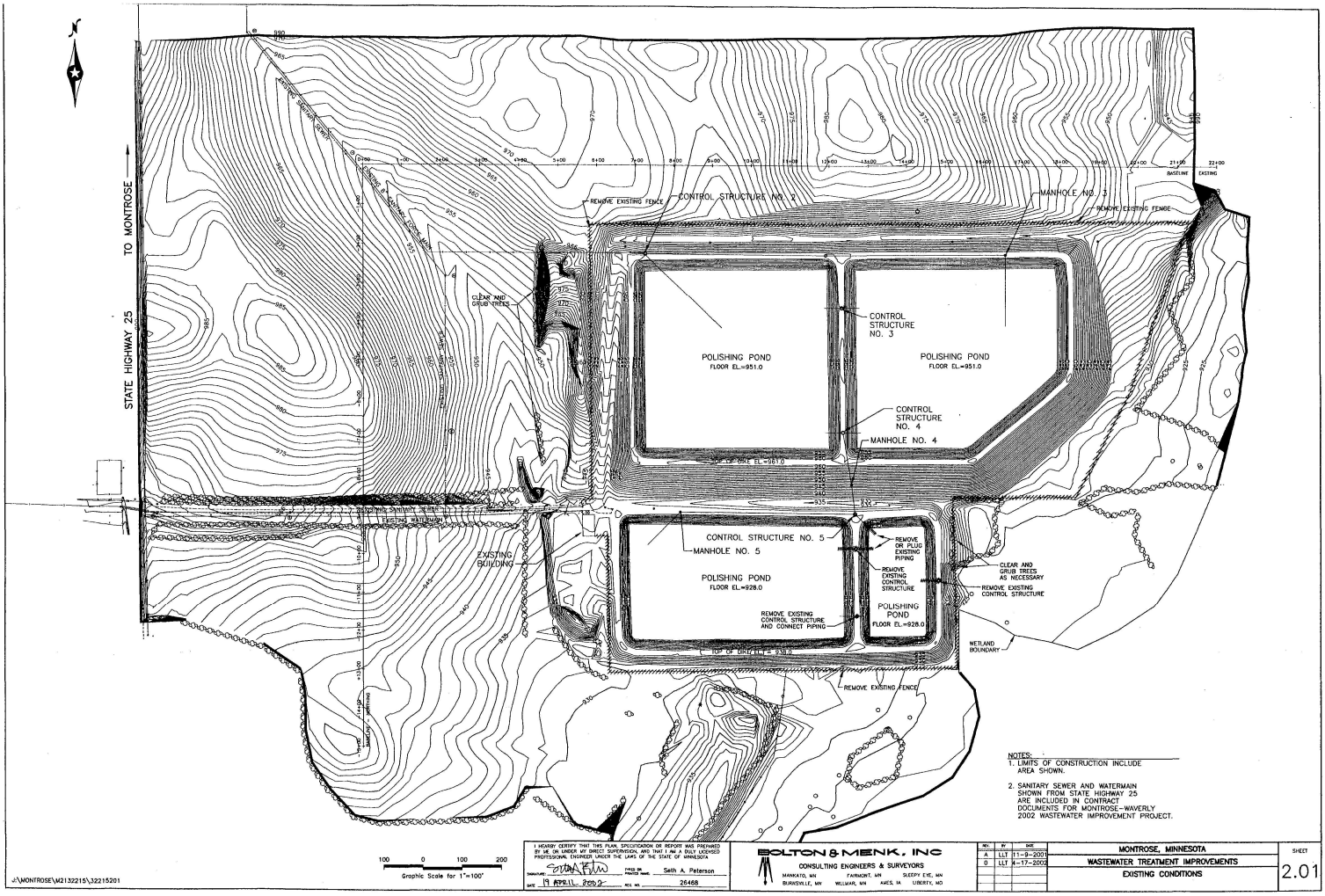

NOTES:
1. LIMITS OF CONSTRUCTION INCLUDE AREA SHOWN.
2. SANITARY SEWER AND WATERMAIN SHOWN FROM STATE HIGHWAY 25 ARE INCLUDED IN CONTRACT DOCUMENTS FOR MONTROSE-WAVERLY 2002 WASTEWATER IMPROVEMENT PROJECT.

100 0 100 200
Graphic Scale for 1"=100'

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MONTROSE, MINNESOTA
WASTEWATER TREATMENT IMPROVEMENTS
EXISTING CONDITIONS

SHEET 2.01

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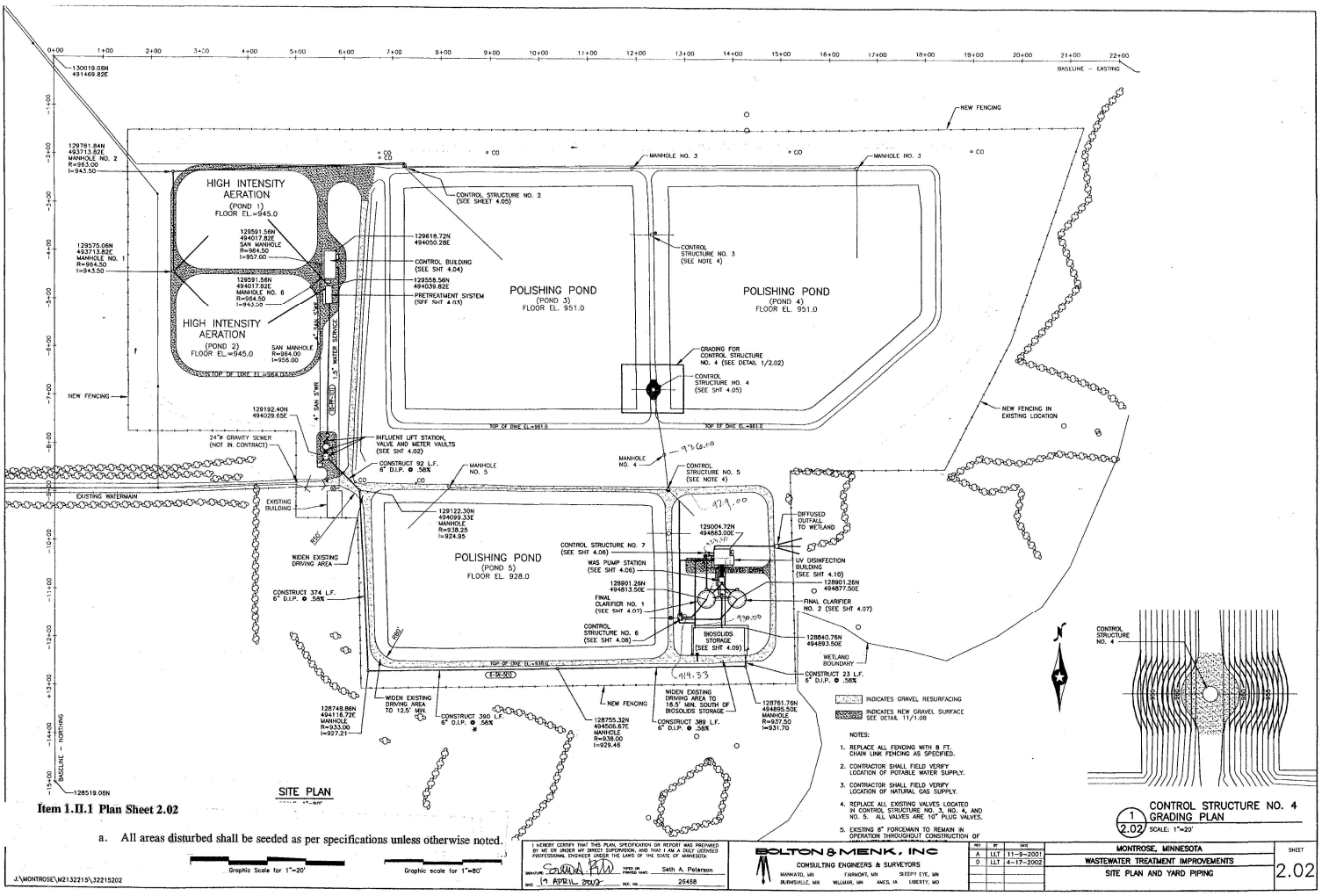

SITE PLAN

Item 1.II.1 Plan Sheet 2.02

a. All areas disturbed shall be seeded as per specifications unless otherwise noted.

Graphic Scale for 1"=20'

Graphic scale for 1"=80'

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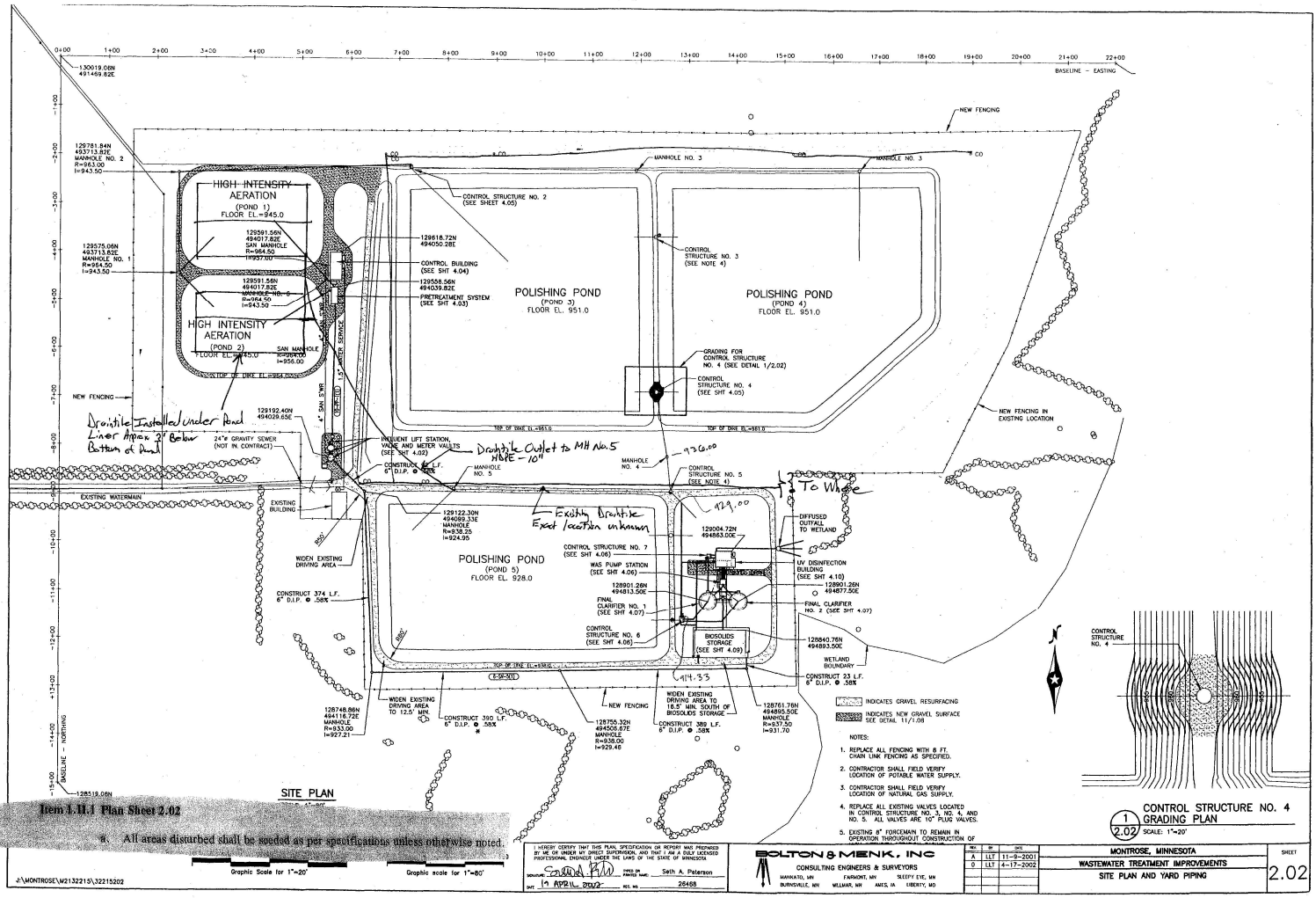
MONTROSE, MINNESOTA
WASTEWATER TREATMENT IMPROVEMENTS
SITE PLAN AND YARD PIPING

SHEET 2.02



SITE PLAN

Graphic Scale for 1"=20'

Graphic scale for 1"=80'

1 / 2.02 CONTROL STRUCTURE NO. 4 GRADING PLAN

SCALE: 1"=20'

Item 1.11.1 Plan Sheet 2.02

a. All areas disturbed shall be seeded as per specifications unless otherwise noted.

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MONTROSE, MINNESOTA

WASTEWATER TREATMENT IMPROVEMENTS

SITE PLAN AND YARD PIPING

SHEET 2.02

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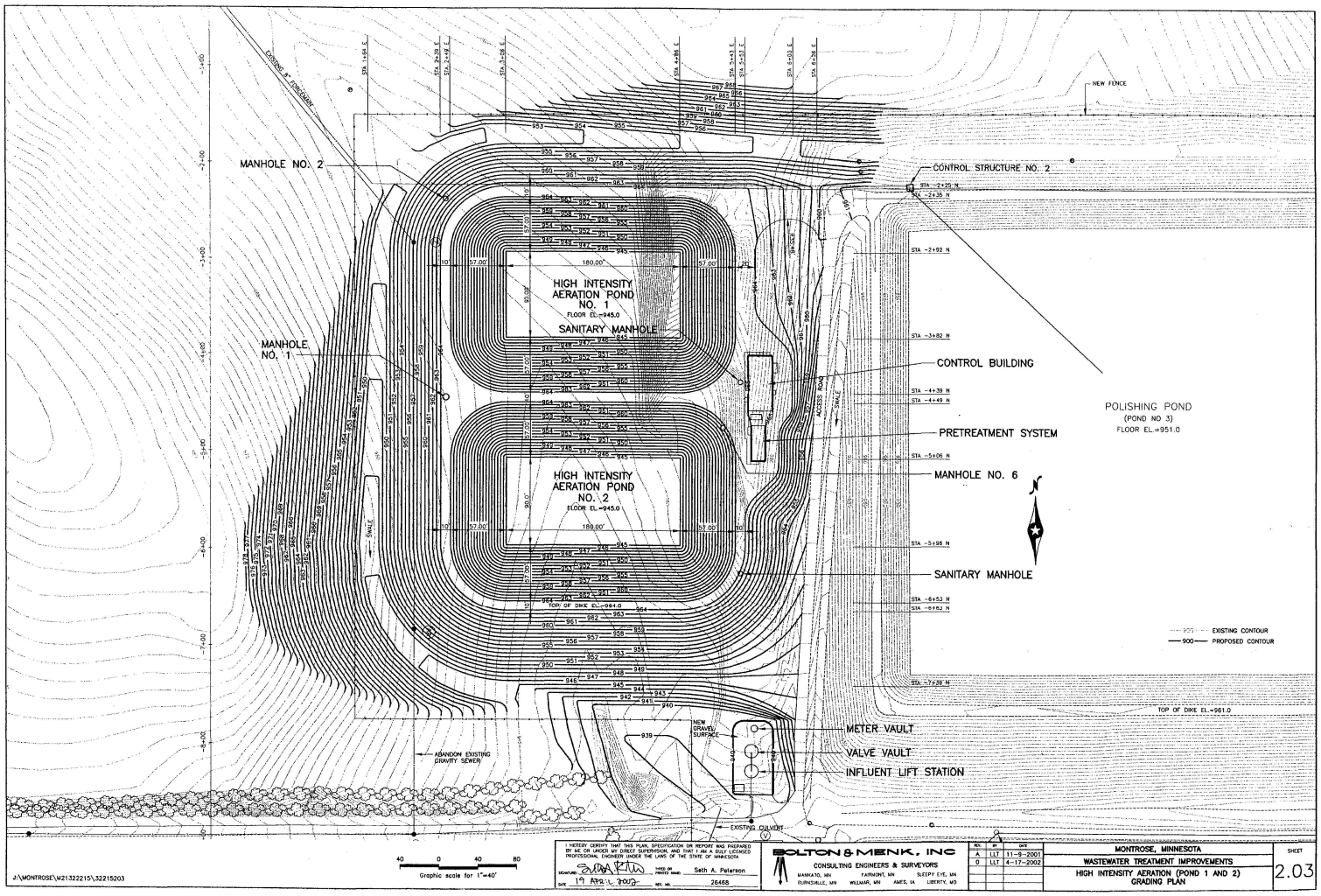

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Graphic scale for 1"=40'

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NO.	BY	DATE
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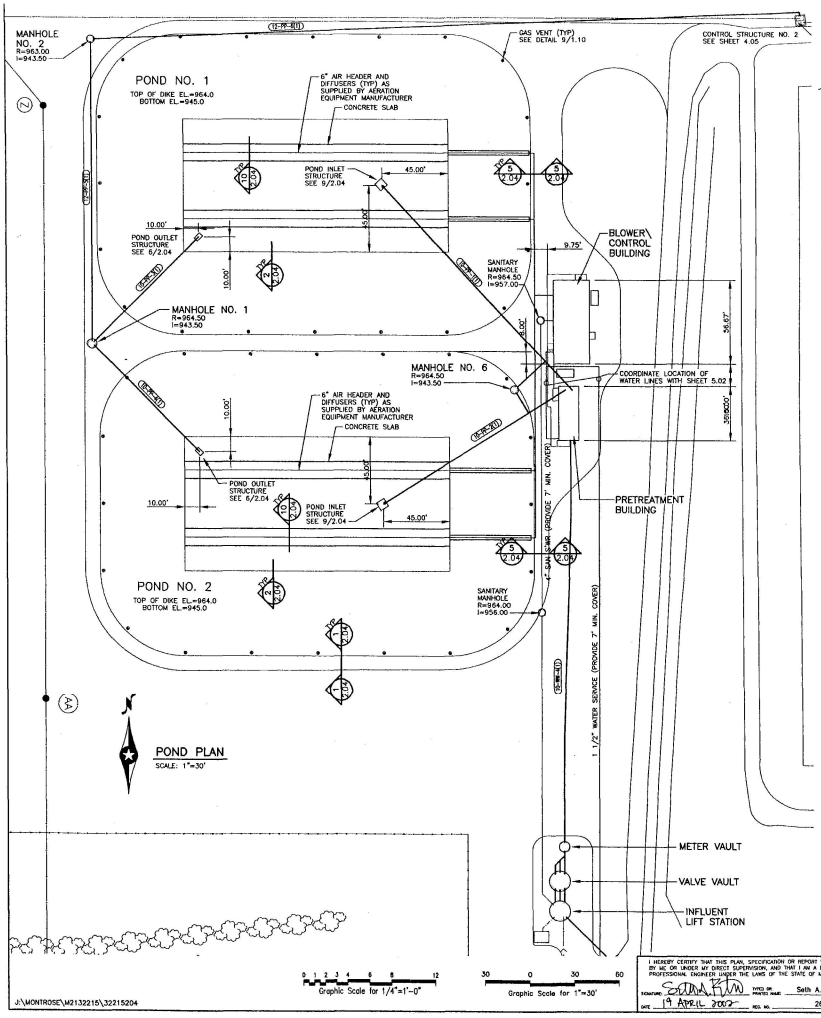
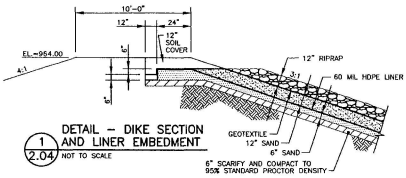
0	LLT	4-17-2002

MONTROSE, MINNESOTA
WASTEWATER TREATMENT IMPROVEMENTS
HIGH INTENSITY AERATION (POND 1 AND 2) GRADING PLAN

SHEET 2.03





1 2.04 DETAIL – DIKE SECTION AND LINER EMBEDMENT
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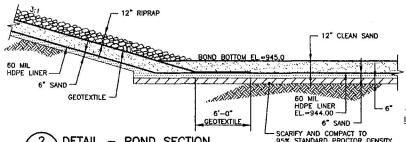

2 2.04 DETAIL – POND SECTION
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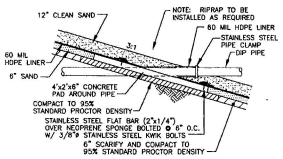

3 2.04 DETAIL – LINER PENETRATION
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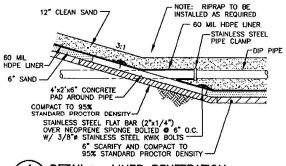

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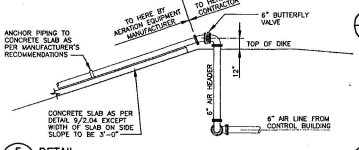

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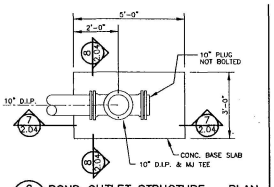

6 2.04 POND OUTLET STRUCTURE – PLAN
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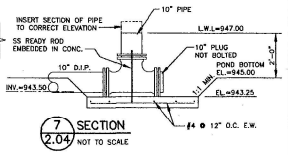

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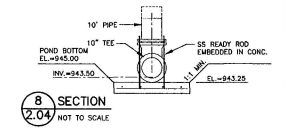

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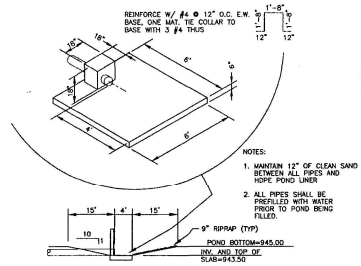

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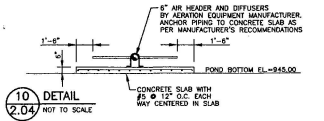

10 2.04 DETAIL
NOT TO SCALE

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

SIGNATURE: Seth A. Peterson
TYPED OR PRINTED NAME: Seth A. Peterson
DATE: 19 APRIL 2002
REG. NO. 26468

BOLTON & MENK, INC
CONSULTING ENGINEERS & SURVEYORS
MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN
BURNSVILLE, MN WILLMAR, MN AMES, IA LIBERTY, MO

NO.	BY	DATE
A	LLT	11-9-2001
0	LLT	4-17-2002

MONTROSE, MINNESOTA
WASTEWATER TREATMENT IMPROVEMENTS
POND 1 AND 2 AERATION PIPING

SHEET 2.04

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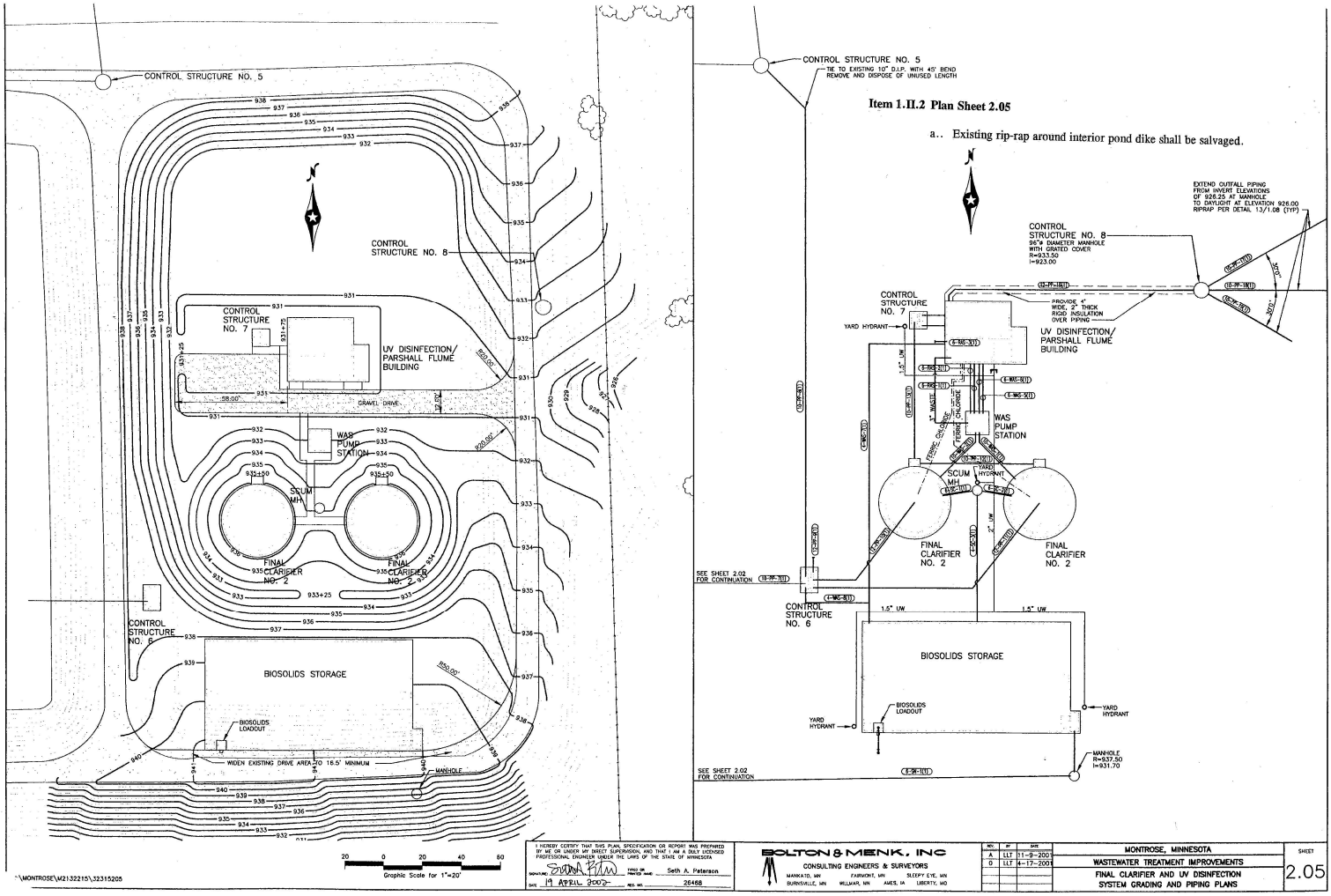

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I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

SIGNATURE Seth A. Peterson
TYPED OR PRINTED NAME
DATE 19 APRIL 2005
REG. NO. 26468

BOLTON & MENK, INC
CONSULTING ENGINEERS & SURVEYORS
MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN
BURNSVILLE, MN WILLMAR, MN AMES, IA LIBERTY, MO

NO.	BY	DATE
A	LLT	11-9-2005
0	LLT	4-17-2006

MONTROSE, MINNESOTA
WASTEWATER TREATMENT IMPROVEMENTS
FINAL CLARIFIER AND UV DISINFECTION SYSTEM GRADING AND PIPING PLANS

SHEET 2.05

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Section 106 Review Exemption Checklist

Clean Water State Revolving Fund Program
Wastewater and Stormwater Projects
(36 CFR Part 800)

Doc Type: Wastewater Point Source

Instructions: If at least one of the "**Yes**" statements is checked, the project is considered to have completed these requirements and is not required to submit additional information to meet the provisions of the Section 106 review.

If the answer to all of the statements is "**No**", the project will be required to submit additional information to meet the provisions of the Section 106 review.

Project information

Project name: Montrose WWTF Faclity Plan

MPCA Review engineer: Ben Carlson-Stehlin MPCA project number:

Exempt criteria	Yes	No
1. The project is limited to environmental study.	☐	☒
2. The project is limited to planning and design.	☐	☒
3. The project is for emergency/disaster relief and/or protection.	☐	☒
4. The project is limited to minor modifications to an existing treatment facility which is less than 45 years old.	☐	☒
5. The project is limited to modifications within existing buildings or treatment components.	☐	☒
6. The project is limited to collection system rehabilitation/replacement in previously disturbed soil with no major extension/expansion in undisturbed soil.	☐	☒
7. The project is limited to sanitary sewer lining.	☐	☒
8. The project is limited to installation of a generator to provide backup power in emergency situations.	☐	☒

If "Yes" to any of 1- 8 above, please provide a brief written description of the project and complete the Certification Statement below.

NA

Certification statement

We certify that the information provided on this form is complete and accurate and that this project meets the exempt criteria established by Minnesota Pollution Control Agency.

Project authorized official or Design engineer

Print name: Jennifer Selchow

Organization: Bolton & Menk

Signature: Jennifer Selchow

Date (mm/dd/yyyy): 3/3/2023

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

CWRF administrative checklist for wastewater collection and treatment projects

Clean Water Revolving Fund (CWRF) Program
Wastewater Projects
Minn. R. 7077

Instructions: This administrative checklist is used by Minnesota Pollution Control Agency (MPCA) staff engineers, project professional engineers, and municipal administrators to track administrative forms that will be submitted for a project and the project progress to completion (aka, *Notification of satisfactory performance to PFA*).

Note: Complete Section A for a Planning Project, Section B for a Design Project, or Section C for a Construction Project. Enter the date (mm/dd/yyyy) submitted or completed on the line.

Municipality name:	Montrose Wastewater Treatment Facility	MPCA Engineer:	Ben Carlson-Stehlin
Project number:	0W1.127810	Consulting Engineer:	Jennifer Selchow
	Submit PPL request forms (7077.0115)	Total points:	

Section A

Planning Projects, Submit Certification Request (Minn. R. 7077.0280, subp. 2)
- Submit a description of scope of work and costs leading to an approved facilities plan.
- Submit a schedule of completion of the facilities plan form.
- (ISTS only) Submit a copy of draft ordinance that adopts Minn. R. ch. 7080.

MPCA Certification of Planning Project to PFA (Minn. R. 7077.0281, subp. 1)

Section B

Design Projects, Submit Certification Request. (Minn. R. 7077.0280, subp. 2).
- Submit a schedule for completion of plans and specs.
- (ISTS only) Submit a copy of draft ordinance that adopts Minn. R. ch. 7080.

MPCA Certification of Design Project to PFA. (Minn. R. 7077.0281, subp. 1)

Section C

3/3/2023 Facilities Plan Submittal (7077.0272)

Facilities Plan supplemental information submittal (Minn. R. 7077.0272, subp. 2a.)
- 3/3/2023 Submit *SERP mailing list form*.
- Submit a summary of the information presented at a Public Hearing.
- Submit formal resolution of adoption.
- Submit a list of ordinances or intermunicipal agreements needed to complete project.
- Submit signed treatment agreements with any SIU.
- 3/3/2023 Submit an EIW (or EAW if appropriate) form.

3/3/2023 Submit *CWRF cost and effectiveness checklist*

3/3/2023 Submit *B3 SB 2030 exemption form* (Minn. Stat. § 218B.241, sub. 1-10 and 16B, sub.1-4)

3/3/2023 Submit *CWRF cost and effectiveness* certification *form* [FWPCA Sec. 602(b)(13)]

_____ **MPCA Facilities Plan Preliminary Approval**

_____ **PFA places project on IUP**

_____ **MPCA Completion of Environmental Review process. (ES or EAW?)**

_____ **MPCA Issues Permit. (NPDES, SDS, or Sewer Extension?)**

_____ **MPCA Facilities Plan Final Approval**

_____ Plans and Specifications Submittal. (Minn. R. 7077.0274)

Additional submittals. (Minn. R. 7077.0274, subp. 3)

_____ Submit *Project schedule form*.

_____ Submit a certification that full-time inspection will be performed.

_____ Submit a certification that monthly written construction reports will be submitted.

_____ Submit a copy of any finalized and executed intermunicipal agreements.

_____ Essential project components: _____ % (Minn. R. 7077.0281, subp. 3a.)

_____ **MPCA Plans and Specifications Approval.**

_____ Construction project certification submittals received. (Minn. R. 7077.0280, subp. 4)

_____ Submit a *Certification of enactment of sewer use/sewer rate ordinance* form.

_____ (ISTS only) Submit a certification that municipality has enacted and enforces an ordinance that adopts Minn. R. ch. 7080, prohibits discharge from nonresidential structures, and establishes a maintenance plan.

_____ **MPCA Certification of Construction Project to PFA.** (Minn. R. 7077.0281, subp. 3)

_____ Submit evidence of certified operator. (60 days prior to initiation of operation.) (Minn. R. 7077.0286)

_____ Submit an O&M Manual or O&M Manual certificate of completion form. (60 days prior to initiation of operation.) (Minn. R. 7077.0286)

_____ **MPCA completes Prefinal Inspection.** (Minn. R. 7077.0286, subp. 2)

_____ **MPCA approves Initiation of Operation.** (Start of one-year performance period) (Minn. R. 7077.0286)

_____ **MPCA completes Final Inspection.** (Minn. R. 7077.0286, subp. 4)

_____ One-year performance certification documents submittal. (Minn. R. 7077.0288)

_____ Submit a *One-year certification* form.

_____ Submit one copy of as-built plan and specifications on microfiche.

_____ Submit a revised O&M manual or revised *O&M Manual certificate of completion* form.

_____ Submit a *Documentation of sufficient funds* (are being collected) form.

_____ If necessary, submit a corrective action report.

_____ **MPCA Notification of satisfactory performance to PFA.** (Minn. R. 7077.0290)

Acronyms

EAW	Environmental Assessment Worksheet
EIW	Environmental Information Worksheet
ES	Environmental Summary
ISTS	Individual Sewage Treatment System
IUP	Intended Use Plan
MPCA	Minnesota Pollution Control Agency
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
PFA	Public Facilities Authority
SDS	State Disposal System
SERP	State Environmental Review Program
SIU	significant industrial users

Appendix H: CWRF Facilities Plan Submittal Checklist

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

CWRF facilities plan submittal checklist

Clean Water Revolving Fund (CWRF) Program

Submissions Required for a Complete Facilities Plan
Minn. R. 7077.0272

Instructions: The Facilities Plan may be submitted via email at ppl.submittals.pca@state.mn.us (and one hard copy submitted to the assigned Minnesota Pollution Control Agency [MPCA] Review Engineer).

Facility information

Project name: Montrose WWTF Facility Plan
Proposed dates for construction: Fall 2024-Fall 2025
City's authorized representative: Dan Remer
Title: Public Works Director Telephone: 763-575-7422
Mailing address: 311 Buffalo Ave S, Montrose, MN 55363
City: Montrose State: MN Zip code: 55363
Technical agent or consulting engineer: Jennifer Selchow
Name of firm/organization: Bolton & Menk Telephone: 763-614-7232

Check yes or no for the following questions

Is the Facilities Plan signed by an engineer registered in the State of Minnesota? ☒ Yes ☐ No

Has the municipality in which the facility will be located held at least one public hearing to discuss the proposed project?

☐ Yes ☒ No If yes, what was the date the hearing was held: April 10, 2023

Check the boxes below if you have included the following items

If all of the following items are not included with the Facilities Plan, the Facilities Plan is incomplete and may be returned or filed until a complete submittal is received. Facilities Plan review will not begin until a complete submittal is received. Please see Minn. R. 7077.0272 for more information about the content of facilities plan.

The following forms can be found on the MPCA website at https://www.pca.state.mn.us/water/wastewater-financial-assistance.

- ☒ A completed *CWRF cost and effectiveness certification checklist* **provided by the MPCA.**
- ☒ A completed *CWRF B3 2030 exemption form* **provided by the MPCA.**
- ☒ A completed CWRF cost and effectiveness certification form **provided by the MPCA.**
- ☒ A summary of the public hearing documenting that the following items were discussed:
  - ☒ The various treatment alternatives considered
  - ☒ The location of the project site
  - ☒ The reasons for choosing the selected treatment method
  - ☒ The estimated sewer service charges

  scheduled for April 10, 2023
- ☐ A summary of the comments received at the public hearing and the action taken to address those comments.
- ☒ A complete list of addresses used for public notice purposes on a form **provided by the MPCA.**
- ☐ A copy of the resolution of the municipality's governing body adopting the facilities plan. scheduled for April 10, 2023
- NA ☒ A list of ordinances or intermunicipal agreements required for the implementation and administration of the project.
- NA ☒ A signed treatment agreement with each significant industrial user.
- ☐ For surface water dischargers only, a copy of the Preliminary Effluent Limits review letter **provided by the MPCA.**
  - Contact the MPCA to determine if a formal request for Preliminary Effluent Limits needs to be made for the project.
  - The alternatives analysis should address antidegradation requirements if the project is proposing an increase in flow or loading. Note: In lieu of Preliminary Request, the City submitted a permit renewal in July 2022.
- ☒ A completed *Environmental Information Worksheet* **provided by the MPCA.**
- NA ☐ For individual sewage treatment systems that serve more than one structure, an assurance from the municipality stating that all property owners who will be served by the proposed system agree to be part of the system, to participate in the construction project, and to finance future operation, maintenance, and replacement of the system.
- ☐ Copies of all notifications, certifications, and comments received.

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

CWRF cost and effectiveness checklist

Clean Water Revolving Fund (CWRF) Program

Instructions: This checklist must be used with the Minnesota Pollution Control Agency (MPCA) *Minnesota Clean Water Revolving Fund (CWRF) cost and effectiveness guidance* document dated March 2018. The guidance document assists the consulting engineer in completing the cost and effectiveness analysis required by the Federal Water Pollution Control Act (FWPCA) Section 602(b)(13). The cost and effectiveness analysis for a project must be further documented in the project Facilities Plan. This checklist is also an attachment to the MPCA *Facilities Plan submittal checklist.*

Project information

Project name: Montrose WWTF Facility Plan Date submitted (mm/dd/yyyy): 3/3/2023

City: Montrose

City's authorized representative: Ben Carlson-Stehlin

Consulting engineer: Jennifer Selchow

Cost analysis items

Cost analysis items to be completed for all CWRF wastewater projects.

Section		Yes	No
II.	Does the project owner have an Asset Management system in place? Where is the Asset Management system documented in the Facilities Plan:	☐	☒
IVA.	Did the Facilities Plan address Energy Conservation Opportunities? Where is the Energy Conservation discussion documented in the Facilities Plan:	☐	☒
IVB.	Did the Facilities Plan address Renewable Energy Opportunities? Where is the Renewable Energy discussion documented in the Facilities Plan:	☐	☒
IV.C.i.	Has the Facilities Plan analyzed Water Reuse options? Where is the Water Reuse options analysis documented in the Facilities Plan:	☐	☒
IV.C.ii.	Has the Facilities Plan analyzed installation of Water Efficient Devices? Where is the use of Water Efficient Devices analysis documented in the Facilities Plan:	☐	☒
IV.C.iii.	Has the Facilities Plan analyzed installation of new Water Meters or replacement of existing Water Meters? Where is the installation of new or replacement Water Meters analysis documented in the Facilities Plan:	☐	☒
IV.C.iv.	Has the Facilities Plan considered or completed Water Audits and/or Conservation Plan? Where is the discussion of Water Audits and/or Conservation Plan documented in the Facilities Plan:	☐	☒
IV.D.	Did the Facilities Plan for the project complete a Buildings, Benchmark, and Beyond (B3) Sustainable Building (SB) Wastewater Treatment Plant (WWTP) or B3 SB 2030 *WWTP exemption form*? Where is the B3 SB 2030 *WWTP exemption form* documented in the Facilities Plan: *Appendix H*	☒	☐

Nonmonetary analysis items **Applicable**: Yes ☐ No ☒

Nonmonetary analysis items to be completed for all new wastewater treatment facilities with design average wet weather (AWW) flow of greater than 100,000 gallons per day, or significant upgrades meaning work on three or more major treatment units for any wastewater treatment facilities with a design AWW flow of greater than 1 million gallons per day.

Section		Yes	No
V.A.i.	Does the Facilities Plan analyze the project sustainability and climate resilience? Where is the discussion on project sustainability and climate resilience documented in the Facilities Plan:	☐	☐
V.A.ii.	Does the Facilities Plan analyze how a project addresses Water Quality objectives? Where is the discussion on how the project addresses Water Quality objectives documented in the Facilities Plan:	☐	☐
V.A.iii.	During the project planning process, did the owner consider project alternatives, such as consolidation or regionalization with another or other service area? Where is the discussion on how the project addresses possible consolidation or regionalization documented in the Facilities Plan:	☐	☐
V.B.i.	Is the project location and physical aspects discussed in the Facilities Plan? Where is the discussion on the project location and physical aspects located in the Facilities Plan:	☐	☐
V.B.ii.	Is the project reliability discussed in the Facilities Plan? Where is the discussion on the project reliability located in the Facilities Plan:	☐	☐
V.B.iii.	Is the project feasibility and operability discussed in the Facilities Plan? Where is the discussion on the project feasibility and operability located in the Facilities Plan:	☐	☐
V.C.i.	Are possible water conservation practices, water reuse and/or water recapture opportunities discussed in the Facilities Plan? Where is the discussion on the project water conservation practices, water reuse, and/or water recapture opportunities located in the Facilities Plan:	☐	☐
V.C.ii.	Are possible energy conservation practices discussed in the Facilities Plan? Where are the possible energy conservation practices discussed in the Facilities Plan:	☐	☐
V.C.iii.	Are possible opportunities to recover and recycle or reuse other resources discussed in the Facilities Plan? Where are possible opportunities to recover and recycle or reuse other resources options discussed in the Facilities Plan:	☐	☐
V.C.iv.	Are possible opportunities to use green infrastructure components within the project discussed in the Facilities Plan? Where are possible opportunities to use green infrastructure components within the project discussed in the Facilities Plan:	☐	☐
V.C.v.	Are possible other environmental impacts of the project discussed in the Facilities Plan? Where are the possible other environmental impacts of the project discussed in the Facilities Plan:	☐	☐

Section		Yes	No
V.D.i.	Are possible considerations which may be part of a local trend or demographics affecting the need or demand for a project discussed in the Facilities Plan? Where are the possible considerations which may be part of a local trend or demographics affecting the need or demand for a project discussed in the Facilities Plan:	☐	☐
V.D.ii.	Are possible considerations which may be part of a local trend or demographics affecting the need or demand for a project discussed in the Facilities Plan? Where are the possible considerations which may be part of a local trend or demographics affecting the need or demand for a project discussed in the Facilities Plan:	☐	☐
V.D.iii.	Are there possible environmental justice issues which may be considered for the project discussed in the Facilities Plan? Where are the possible environmental justice issues which may be considered for the project discussed in the Facilities Plan:	☐	☐
V.D.iv.	Are there possible acceptability or affordability issues which may be considered for the project discussed in the Facilities Plan? Where are the possible acceptability or affordability issues which may be considered for the project discussed in the Facilities Plan:	☐	☐

Integrating cost and effectiveness analysis **Applicable: Yes ☐ No ☒**

Integrating cost and effectiveness analysis to be completed for all new wastewater treatment facilities with design AWW flow of greater than 100,000 gallons per day, or significant upgrades meaning work on three or more major treatment units for any wastewater treatment facilities with a design AWW flow of greater than 1 million gallons per day.

Section		Yes	No
VI.	Has an integrated cost and effectiveness analysis of the cost factors and the other/nonmonetary factors for a project been completed in the Facilities Plan? Where is the integrated cost and effectiveness analysis of the cost factors and the other/nonmonetary factors for a project discussed/located in the Facilities Plan?	☐	☐

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

CWRF B3 SB 2030 exemption form

Clean Water Revolving Fund (CWRF) Program
Wastewater Projects
(Minn. Stat. § 216B.241, sub. 1-10 and 16B, sub. 1-4)

Instructions: If at least one of the "**Yes**" statements is checked, the project is considered to have completed these requirements and is not required to submit additional information to meet the Building, Benchmarks, and Beyond (B3) provisions of the Sustainable Building (SB) 2030 Guidelines (B3 SB 2030). Sign and send the completed form to the Minnesota Pollution Control Agency (MPCA) project engineer.

If the answer to **all of the statements is** "**No**", the project will submit a preliminarily approved Facilities Plan [Minn. R. 7077.0272] to B3 SB 2030 Wastewater Treatment Plant Review. Sign and send the completed form to the MPCA project engineer.

Project information

Project name: Montrose WWTF Facility Plan

MPCA review engineer: Ben Carlson-Stehlin MPCA project number:

Exempt criteria

	Yes	No
1. The project is limited to environmental study.	☐	☒
2. The project is limited to planning and design.	☐	☒
3. The project is for emergency/disaster relief and/or protection.	☐	☒
4. The project is limited to minor modifications to an existing treatment facility.	☐	☒
5. The project is limited to modifications within a new or an existing building less than 10,000 square feet.	☐	☒
6. The project is limited to a new or existing collection system including lift stations.	☒	☐
7. The project is limited to pond system.	☐	☒
8. The project is limited to installation of a backup power generator.	☐	☒
9. The project is limited to a stormwater project	☐	☒

If "Yes" to any of 1- 9 above, please provide a brief written description of the project and complete the Certification Statement below.

This project consists of a lift station upgrade to regionalize with the city of Buffalo.

Certification statement

I certify that the information provided on this form is complete and accurate and that this project:

☒ Meets the exempt criteria established by the Minnesota Pollution Control Agency.

☐ Does not meet the exempt criteria and a preliminary approved Facilities Plan will be sent to the B3 SB 2030 Wastewater Treatment Plant Review

Project Representative or Professional Engineer

Print name: Jennifer Selchow

Organization: Bolton & Menk

Signature: Jennifer Selchow

Date (mm/dd/yyyy): 3/3/2023

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

CWRF cost and effectiveness certification form

Clean Water Revolving Fund (CWRF) Program

Federal Water Pollution Control Act Section 602(b)(13)
and Minn. R. 7077.0272, subp. 2.D. or 7077.0277, subp. 2.C.

Doc Type: Wastewater Point Source

Instructions: The project representative must check boxes 1), 2), and either i) or ii) below, and the form must be signed by both the Project Representative and the Professional Engineer for the project.

☒ 1) The municipality has studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which the assistance is sought under the Clean Water Revolving Fund (Minn. Stat. § 446.07); and

☒ 2) The municipality has selected, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, conservation, and energy conservation[i&ii], taking into account:

a) The cost of constructing the project or activity;
b) The cost of operating and maintaining the project or activity over the life of the project or activity;
c) The cost of replacing the project or activity.

☒ i) This project is exempt from the Building, Benchmarks, and Beyond (B3) provisions of the Sustainable Building (SB) 2030 Guidelines (B3 SB 2030) Wastewater Treatment Plants (WWTP) Review (attach a completed *B3 SB 2030 exemption form*). The form is available on our website here: https://www.pca.state.mn.us/business-with-us/apply-for-financial-assistance

☐ ii) This project is not exempt from B3 SB 2030 WWTP Review. Submit the Facilities Plan to B3 SB 2030 WWTP Review at sb2030@b3mn.org and consider the Review water and energy conservation recommendations.

Project information

Municipality name:	Montrose WWTF
MPCA Project number:	
MPCA Review Engineer:	Ben Carlson-Stehlin
Project name:	Montrose WWTF Facility Plan
Project description:	Regionalization of Montrose WWTF with Buffalo WWTF

Certification

We certify that the project has completed requirements (1 and 2, and either i or ii) as checked above.

Project Representative

Print name: Jessica Bonniwell
Signature: Jessica Bonniwell
Date (mm/dd/yyyy): 3/3/2023
Email address: jbonniwell@montrose-mn.com

Professional Engineer

Print name: Jennifer Selchow
Signature: Jennifer Selchow
Date (mm/dd/yyyy): 3/3/2023
Email address: Jennifer.Selchow@bolton-menk.com

Footnote: If the "ii" box is checked under item 2, the Professional Engineer is certifying that the Facilities Plan has been submitted to the B3 SB 2030 WWTP Review at sb2030@b3mn.org, and the Review water and energy conservation recommendations will be considered. More information is available at https://www.b3mn.org/2030energystandard/.

Appendix I: List of Ordinances

No ordinances necessary to complete the project.

Appendix J: List of Abbreviations

Appendix J – List of Abbreviations	
AADW	Actual Average Daily Weather
AWW	30-Day Average Wet Weather
BOD	Biochemical Oxygen Demand
$CBOD_5$	5-Day Carbonaceous Biochemical Oxygen Demand
DMR	Discharge Monitoring Report
EPA	Environmental Protection Agency
GPD	Gallons per Day
GPCD	Gallons per Capita per Day
I&I	Infiltration and Inflow
kg/day	Kilograms per Dar
kg/yr	Kilograms per Year
lbs/day	Pounds per Day
MBR	Membrane Bioreactor
MGD	Million Gallons per Day
mg/L	Milligrams per Liter
MPCA	Minnesota Pollution Control Agency
NH_3-N	Ammonia-Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRS	Nutrient Reduction Strategy
PHWW	Peak Hourly Wet Weather
RES	River Eutrophication Standards
SCADA	Supervisory Control and Data Acquisition
SDC	State Demographic Center
SDR	Standard Discharge Rate
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Loading
TN	Total Nitrogen
TSS	Total Suspended Solids
TP	Total Phosphorus
UV	Ultraviolet Disinfection
VFD	Variable Frequency Drive
WAS	Waste Activated Sludge

WWTF	Wastewater Treatment Facility