Permit Fact Sheet

General Information

Permit Number:	WI-0024643-11-0	
Permittee Name:	CITY OF MAYVILLE	
Address:	400 Kekoskee St	
City/State/Zip:	Mayville WI 53050	
Discharge Location:	NWQ, SEQ, Section 14, T12N, R16E, 400 Kekoskee Street, Mayville, WI	
Receiving Water:	East Branch Rock River (East Branch Rock River Watershed, UR13 – Upper Rock River Basin) in Dodge County, Lat: 43.504220 N, Lon: 88.548370 W	
StreamFlow ($Q_{7,10}$):	1.3 cfs	
Stream Classification:	Warm Water Sport Fish (WWSF) community, non-public water supply	
Discharge Type:	Existing, Continuous	
Design Flow:	Annual Average	1.12 MGD
Significant Industrial Loading?	Yes, Seneca Foods Mayville, Old Fashioned Cheese, Gleason Reel Co, Metalcraft of Mayville, and Mayville Engineering Co.	
Operator at Proper Grade?	Yes. Mayville is an Advanced facility requiring subclasses A1, B, C, P, D, L, and SS. OIC is fully certified except for L subclass. Primary lab operator holds L subclass.	
Approved Pretreatment Program?	N/A	

Facility Description

The Mayville WWTF serves the City of Mayville and two satellite collection systems, LeRoy Sanitary District and the Village of Kekoskee, for a total of about 5400 users. The City of Mayville also has a municipal water supply system. The plant is a conventional activated sludge mechanical plant, including aeration basins preceded by fine screening and grit removal, followed by aeration, final clarification, and UV disinfection. Phosphorus is removed through chemical addition at the aeration step prior to final clarification. Waste sludge is aerobically digested before it is hauled to another permitted facility to be land applied.

Chloride limits came into effect October 1, 2020. A schedule has been included in this permit to support continued source reduction measures.

Mayville previously held a Mercury Variance and has since come into compliance with the final mercury WQBEL effective October 1, 2024 through source reduction measures. Continued mercury monitoring and a schedule for continued mercury source reduction has been included.

Mayville has requested a continuation of the Dissipative Cooling Study conducted in 2019. Given there have not been substantial changes to the facility or thermal loadings, continued monitoring is included, and no temperature limits have been recommended.

Substantial Compliance Determination

Enforcement During Last Permit – Since 2022, Mayville has had two TFOs at the same location at the treatment plant, at a secondary screening shed located after the aeration basins. An NON for such an overflow was issued April 2023. Throughout the previous two permit terms, Mayville has seen multiple SSOs within the collection system and TFOs at the influent wet well to the plant due to excessive I/I. Mayville is in the process of facility planning to address known bottleneck areas within the plant and implementing their CMOM to improve I/I.

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on 9/21/2023 this facility has been found to be in substantial compliance with their current permit.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	0.81 MGD (2023)	INFLUENT: Representative influent samples shall be collected from the influent pump manifold discharge after the bar screen prior to grit removal.
001	0.85 MGD (1/2019 – 6/2024)	EFFLUENT: 24-hour composite sampler located after UV disinfection. Representative effluent grab samples shall be collected at the post-aeration steps after UV disinfection, prior to discharge to the East Branch Rock River.
002	133 dry U.S. tons (WPDES Application, 2024)	SLUDGE: Aerobically digested, Liquid, Class B. Representative sludge samples shall be collected from the sludge load-outpipe at the WWTF.
103	N/A	FIELD BLANK: Collect at least one mercury field blank for each day a mercury sample is collected at both Sample Point 701 (Influent) and 001 (Effluent) using the sample handling procedures as specified in s. NR 106.145(9), Wis. Adm. Code

1 Influent – Monitoring Requirements

Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Grab	See 'Mercury Monitoring' section for specific sampling and analysis requirements.

Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

Explanation of Limits and Monitoring Requirements

BOD5 and Total Suspended Solids: Tracking of BOD5 and Suspended Solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code.

Mercury, Total Recoverable: Mercury monitoring is included in the proposed permit pursuant to s. NR 106.145, Wis. Adm. Code. Required field blanks for Mercury monitoring per ss. NR 106.145 (9) and (10), Wis. Adm. Code requirements. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). The permittee shall report results of influent and effluent samples and field blanks to the Department on Discharge Monitoring Reports.

2 Inplant - Monitoring and Limitations

Sample Point Number: 103- FIELD BLANK

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Blank	

Changes from Previous Permit:

No changes from previous permit.

Explanation of Limits and Monitoring Requirements

Mercury, Total Recoverable: Required field blanks for Mercury monitoring per ss. NR 106.145(9) and (10), Wis. Adm. Code, requirements. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). The permittee shall report results of influent and effluent samples and field blanks to the Department on Discharge Monitoring Reports.

3 Surface Water - Monitoring and Limitations

Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
BOD5, Total	Weekly Avg	21 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for May - October.
BOD5, Total	Weekly Avg	42 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for November - April.
BOD5, Total	Monthly Avg	21 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for May - October.
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for November - April.
BOD5, Total	Weekly Avg	385 lbs/day	3/Week	Calculated	Limit effective for May - October.
BOD5, Total	Weekly Avg	193 lbs/day	3/Week	Calculated	Limit effective for November - April.
Suspended Solids, Total	Weekly Avg	21 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for May - October.
Suspended Solids, Total	Weekly Avg	42 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for November - April.
Suspended Solids, Total	Monthly Avg	21 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for May - October.
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for November - April.
Suspended Solids, Total	Weekly Avg	271 lbs/day	3/Week	Calculated	Limit effective for January, March and December.
Suspended Solids, Total	Weekly Avg	295 lbs/day	3/Week	Calculated	Limit effective for February.
Suspended Solids, Total	Weekly Avg	189 lbs/day	3/Week	Calculated	Limit effective for April and August.
Suspended Solids, Total	Weekly Avg	154 lbs/day	3/Week	Calculated	Limit effective for May and July.
Suspended Solids, Total	Weekly Avg	193 lbs/day	3/Week	Calculated	Limit effective for June, September and October.
Suspended Solids, Total	Weekly Avg	272 lbs/day	3/Week	Calculated	Limit effective for November.
Suspended Solids,	Monthly Avg	192 lbs/day	3/Week	Calculated	Limit effective for January, March, October and

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Total					December.
Suspended Solids, Total	Monthly Avg	209 lbs/day	3/Week	Calculated	Limit effective for February.
Suspended Solids, Total	Monthly Avg	134 lbs/day	3/Week	Calculated	Limit effective for April and August.
Suspended Solids, Total	Monthly Avg	109 lbs/day	3/Week	Calculated	Limit effective for May and July.
Suspended Solids, Total	Monthly Avg	151 lbs/day	3/Week	Calculated	Limit effective for June.
Suspended Solids, Total	Monthly Avg	167 lbs/day	3/Week	Calculated	Limit effective for September.
Suspended Solids, Total	Monthly Avg	193 lbs/day	3/Week	Calculated	Limit effective for November.
Dissolved Oxygen	Daily Min	6.0 mg/L	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September annually. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.
Nitrogen, Ammonia (NH3-N) Total	Daily Max	6.4 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	7.6 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for April.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	4.4 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for May – September.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	12 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for October – March.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.6 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for April.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.1 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for May – September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	6.2 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective for October – March.
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	Limit is retained for anti-backsliding.
Phosphorus, Total	Monthly Avg	2.73 lbs/day	3/Week	Calculated	Limit effective for January.
Phosphorus, Total	Monthly Avg	3.23 lbs/day	3/Week	Calculated	Limit effective for February.
Phosphorus, Total	Monthly Avg	2.52 lbs/day	3/Week	Calculated	Limit effective for March.
Phosphorus, Total	Monthly Avg	2.1 lbs/day	3/Week	Calculated	Limit effective for April.
Phosphorus, Total	Monthly Avg	1.67 lbs/day	3/Week	Calculated	Limit effective for May.
Phosphorus, Total	Monthly Avg	2.04 lbs/day	3/Week	Calculated	Limit effective for June.
Phosphorus, Total	Monthly Avg	1.87 lbs/day	3/Week	Calculated	Limit effective for July.
Phosphorus, Total	Monthly Avg	1.95 lbs/day	3/Week	Calculated	Limit effective for August.
Phosphorus, Total	Monthly Avg	1.96 lbs/day	3/Week	Calculated	Limit effective for September.
Phosphorus, Total	Monthly Avg	2.15 lbs/day	3/Week	Calculated	Limit effective for October.
Phosphorus, Total	Monthly Avg	2.41 lbs/day	3/Week	Calculated	Limit effective for November.
Phosphorus, Total	Monthly Avg	2.54 lbs/day	3/Week	Calculated	Limit effective for December.
Chloride	Weekly Avg	555 mg/L	4/Month	24-Hr Flow Prop Comp	A sample frequency of 4/month requires that samples be collected on four consecutive days each month.
Chloride	Monthly Avg	555 mg/L	4/Month	24-Hr Flow Prop Comp	A sample frequency of 4/month requires that samples be collected on four consecutive days each month.
Chloride, Variable Limit		lbs/day	4/Month	Calculated	Look up the chloride mass from the 'Variable Chloride Mass' table and report the variable limit in the Chloride Variable Limit column on the eDMR.
Chloride	Weekly Avg - Variable	lbs/day	4/Month	Calculated	Report the weekly average mass Chloride result in the

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Chloride column of the eDMR. See Chloride Mass Limit – Non-Wet Weather and Alternative Wet Weather Mass Limit Section.
Mercury, Total Recoverable		ng/L	Quarterly	Grab	Monitoring only and PMP efforts to continue.
Temperature Maximum		deg F	Daily	Continuous	Monitoring only in 2028.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET testing section for more information.
Chronic WET	Monthly Avg	1.4 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET testing section for more information.

Changes from Previous Permit

Changes are highlighted in the table above.

pH and Dissolved Oxygen- Sampling frequency increased from 3/week to 5/week.

E. coli- Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits.

Mercury, Total Recoverable- Limit removed from the permit and replaced with quarterly monitoring.

PFOS and PFOA – Monitoring once every two months is included in the permit in accordance with s. NR 106.98(2)(b), Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

Refer to the Water Quality-Based Effluent Limitations (WQBELs) memo for the Mayville Wastewater Treatment Facility prepared by Zainah Masri dated October 2, 2024 for detailed discussions of limits and monitoring requirements.

Monitoring Frequencies- The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. The permit includes increased monitoring frequency for Dissolved Oxygen, increasing from 3/week to 5/week.

Expression of Limits- In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable. See WQBEL Memo. Bolded limits in the recommended WQBEL limits table are placed in the permit to comply with expression of limits requirements.

BOD5, Total Suspended Solids and pH- Categorical limits and WQBELs are included in the permit as outlined in ch. NR 210, Wis. Adm. Code. The effluent limitations for BOD5, Total Suspended Solids, and pH are carried over from the previous permit and are not subject to change at this time because the receiving water characteristics have not changed.

Acute and Chronic WET- Testing is required during the following quarters: April – June 2025, January – March 2026, October – Dec 2027, July – September 2028, April – June 2029.

PFOS and PFOA – NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for major municipal dischargers with an average flow rate greater than 1 MGD but less than 5 MGD, at a minimum sample effluent once every two-months for PFOS and PFOA pursuant s. NR 106.98(2)(b), Wis. Adm. Code.

A sample frequency of 1/2 months means one sample is taken during any two-month period. Examples of 1/2 month sample would be every other month (Jan, March, May, etc.) or back-to-back months with a break in between (February & March, May & June, Aug & Sept, etc.). DMR Short Forms will be generated for the following time periods: January-February, March-April, May-June, July-August, September-October, and November-December. At a minimum one sample result will be present on each form.

The initial determination of the need for sampling shall be conducted for up to two years in order to determine if the permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	Does not land apply. Contractor hauls sludge off-site.			133 dry US tons
Does sludge management demonstrate compliance? **Yes.**						
Is additional sludge storage required? **Yes.**						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? **No.**						
Is a priority pollutant scan required? **No.**						

Sample Point Number: 002- SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Grab	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Sample once in calendar year 2026. See 'Sludge Analysis for PCBs' section in permit.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Sample once in calendar year 2026. See 'Sludge Analysis for PCBs' section in permit.
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Once	Composite	Sample only if land application occurs.
Nitrogen, Ammonia (NH3-N) Total		Percent	Once	Composite	Sample only if land application occurs.
Phosphorus, Total		Percent	Once	Composite	Sample only if land application occurs.
Phosphorus, Water Extractable		% of Tot P	Once	Composite	Sample only if land application occurs.
Potassium, Total Recoverable		Percent	Once	Composite	Sample only if land application occurs.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

Changes from Previous Permit:

Changes are highlighted in the table above.

List 2 (Nutrients)- Nutrients have been added to the permit. Monitoring only required if sludge is land applied.

PFAS - Annual monitoring is included in the permit.

Explanation of Limits and Monitoring Requirements

Requirements for land application of municipal sludge are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7), Wis. Adm. Code for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k), Wis. Adm. Code.

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS".

Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department's implementation of EPA's recommendations. To quantitate this risk, PFAS sampling has been included in the proposed WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9, Wis. Adm. Code.

5 Schedules

5.1 Chloride Reduction Plan

Required Action	Due Date
Chloride Reduction Plan: The permittee shall complete and submit for Department review and approval a chloride reduction plan (CRP). The CRP is targeted at controlling chloride sources and to support compliance with effective chloride limits. The CRP shall list all applicable source reduction measures (SRMs) and establish appropriate implementation activities for the SRMs. The CRP shall include a schedule for implementing the selected SRMs.	06/30/2025
Annual Chloride Progress Report: Submit an annual chloride progress report related to the source reduction activities for the previous year. The annual chloride progress report shall: Indicate which chloride source reduction measures or activities in the Chloride Reduction Plan have been implemented and state which, if any, source reduction measures from the Chloride Reduction Plan were not pursued and why. Include an assessment of whether each implemented source reduction measure appears to be effective or ineffective at reducing pollutant discharge concentrations and identify actions planned for the upcoming year; Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and Include an analysis of how effluent chloride varies with time and with significant loadings of chloride. Note that the interim limitation listed in the Surface Water section of this permit remains enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Date Due.	01/31/2026
Annual Chloride Progress Report #2: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2027
Annual Chloride Progress Report #3: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2028
Annual Chloride Progress Report #4: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2029
Annual Chloride Reports After Permit Expiration: In the event that this permit is not reissued by the date the permit expires the permittee shall continue to submit annual chloride reports for the previous year following the due date of Annual Chloride Progress Reports listed above. Annual Chloride Progress Reports shall include the information as defined above.	

Explanation of Schedule

This schedule requires the permittee to implement measures to reduce sources of chloride to the treatment plant. The permit requires the submittal of a chloride reduction plan with annual progress reports.

5.2 Mercury Pollutant Minimization Summary

Required Action	Due Date
Final Mercury Report: Submit a report summarizing the mercury pollutant minimization measures implemented during the current permit term and the success in maintaining effluent quality at or below the current concentrations. The report shall include an analysis of trends in quarterly and annual average mercury concentrations and total mass discharge of mercury based on mercury sampling and flow data covering the current permit term. The report shall also include an analysis of how influent and effluent mercury varies with time and with significant loadings of mercury such as loads from industries or collection system maintenance.	06/30/2029

Explanation of Schedule

Mayville previously held a Mercury Variance and has since come into compliance with the final mercury WQBEL effective October 1, 2024 through source reduction measures. A schedule for continued mercury source reduction has been included to continue supporting compliance with effective limits.

5.3 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.	12/31/2025
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan. If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring	12/31/2026

of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued. If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	

Explanation of Schedule

As stated above, NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. S. NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge.

If the Department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

5.4 Land Application Management Plan

Required Action	Due Date
Land Application Management Plan Submittal: If the permittee proposes to land apply sludge instead of continuing to utilize Other Methods of Disposal, a management plan shall be submitted and approved by the Department minimum 60 days prior to land application. The management plan shall outline how the facility will maintain compliance with ch. NR 204 Wis. Adm. Code and be consistent with the requirements of this permit. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes.	60 days prior to land application.

Explanation of Schedule

In recent history, Mayville has utilized Other Methods of Disposal to haul out sludge to another WPDES permitted facility and has chosen not to landspread on their own permitted fields. If Mayville would like to begin landspreading under their own permit, a Land Application Management Plan is needed for review and approval.

This schedule requires the permittee to submit a plan that specifies how Mayville will maintain compliance with ch. NR 204, Wis. Adm. Code while landspreading. An outline is available upon request to assist in plan development.

Special Reporting Requirements

None.

Other Comments:

None.

Attachments:

Water Quality Based Effluent Limitations Memo, dated October 2, 2024.

Expiration Date:

December 31, 2029

Justification Of Any Waivers From Permit Application Requirements

No waivers were requested or granted from permit application requirements.

Prepared By: Melanie Burns, Wastewater Specialist

Date: October 4, 2024

Date Post Fact Check: October 28, 2024 (Corrected Ammonia Nitrogen Daily Max limits, changed WET testing dates, and corrected effluent sample point description).

Date Post Public Notice:

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: October 2, 2024

TO: BetsyJo Howe – Fitchburg/SCR

FROM: Zainah Masri – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the Mayville Wastewater Treatment Facility
WPDES Permit No. WI-0024643-11-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Mayville Wastewater Treatment Facility in Dodge County. This municipal wastewater treatment facility (WWTF) discharges to the East Branch of Rock River, located in the East Branch Rock River Watershed in the Rock River Basin. This discharge is included in the Rock River TMDL as approved by EPA. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					2
BOD_5					1,3
November – April			42 mg/L 193 lbs/day	**30 mg/L**	
May – October			21 mg/L 385 lbs/day	**21 mg/L**	
TSS					3,4
November – April			42 mg/L	**30 mg/L**	
May – October			21 mg/L	**21 mg/L**	
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		6.0 mg/L			1
Ammonia Nitrogen					
April	6.4 mg/L		7.6 mg/L	3.6 mg/L	5
May – September	6.4 mg/L		4.4 mg/L	3.1 mg/L	
October – March	6.4 mg/L		12 mg/L	6.2 mg/L	
Bacteria					
E. coli				126 #/100 mL geometric mean	6
Chloride					
Concentration Limit			555 mg/L	**555 mg/L**	3,7
Dry Weather Mass Limit			5,184 lbs/day		
Wet Weather Mass Limit			14,117 lbs/day		
Mercury					8
PFOS and PFOA					9
Phosphorus				1.0 mg/L	4

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
TKN, Nitrate+Nitrite, and Total Nitrogen					10
Temperature					11,12
Acute WET					13
Chronic WET				1.4 TUc	14,15

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, are included in bold.
4. Additional phosphorus and TSS mass limitations required in accordance with the wasteload allocations specified in the Rock River TMDL.

Rock River TMDL			
Month	Monthly Avg TSS Effluent Limit (lbs/day)	Weekly Avg TSS Effluent Limit (lbs/day)	Monthly Avg Total Phosphorus Effluent Limit (lbs/day)
January	192	271	2.73
February	209	295	3.23
March	192	271	2.52
April	134	189	2.10
May	109	154	1.67
June	151	193	2.04
July	109	154	1.87
August	134	189	1.95
September	167	193	1.96
October	192	193	2.15
November	193	272	2.41
December	192	271	2.54

5. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq pH \leq 6.1$	108	$7.0 < pH \leq 7.1$	66	$8.0 < pH \leq 8.1$	14
$6.1 < pH \leq 6.2$	106	$7.1 < pH \leq 7.2$	59	$8.1 < pH \leq 8.2$	11
$6.2 < pH \leq 6.3$	104	$7.2 < pH \leq 7.3$	52	$8.2 < pH \leq 8.3$	9.4
$6.3 < pH \leq 6.4$	101	$7.3 < pH \leq 7.4$	46	$8.3 < pH \leq 8.4$	7.8
$6.4 < pH \leq 6.5$	98	$7.4 < pH \leq 7.5$	40	$8.4 < pH \leq 8.5$	6.4
$6.5 < pH \leq 6.6$	94	$7.5 < pH \leq 7.6$	34	$8.5 < pH \leq 8.6$	5.3
$6.6 < pH \leq 6.7$	89	$7.6 < pH \leq 7.7$	29	$8.6 < pH \leq 8.7$	4.4
$6.7 < pH \leq 6.8$	84	$7.7 < pH \leq 7.8$	24	$8.7 < pH \leq 8.8$	3.7
$6.8 < pH \leq 6.9$	78	$7.8 < pH \leq 7.9$	20	$8.8 < pH \leq 8.9$	3.1
$6.9 < pH \leq 7.0$	72	$7.9 < pH \leq 8.0$	17	$8.9 < pH \leq 9.0$	2.6

6. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
7. For chloride, four samples per month (on consecutive days) are recommended. This allows for averaging of the results to compare with the interim limit and allows the use of the average in determining future interim limits, and degree of success with chloride reduction measures.
8. Quarterly monitoring and PMP efforts are recommended to continue during the reissued permit term to maintain effluent quality at or below current levels.
9. Based on the indirect dischargers contributing to the collection system, PFOS and PFOA monitoring is recommended at a once every two months frequency.
10. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all municipal major permittees. Total Nitrogen is the sum of nitrate (NO3), nitrite (NO2), and total kjeldahl nitrogen (TKN) (all expressed as N).
11. Temperature monitoring is recommended for one year per the requirements of s. NR 106.59(7), Wis. Adm. Code.
12. The Mayville Wastewater Treatment Facility has submitted a request for continued consideration of dissipative cooling in 2022, which was originally conducted on November 26, 2019. Based on this information, the department has found that it is not necessary to include temperature limits in the reissued permit.
13. After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above at least one acute and one chronic test are recommended annually in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).
14. The Instream Waste Concentration (IWC) to assess chronic test results is 71 %. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the East Branch Rock River.
15. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Zainah Masri at Zainah.Masri@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Ammonia Nitrogen Calculations & Map

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Attachment #1

Water Quality-Based Effluent Limitations for the Mayville Wastewater Treatment Facility

WPDES Permit No. WI-0024643-11-0

Prepared by: Zainah Masri

PART 1 – BACKGROUND INFORMATION

Facility Description

The Mayville WWTF serves the City of Mayville and two satellite collection systems, LeRoy Sanitary District and the Village of Kekoskee, for a total of about 5,400 users. The plant consists of an activated sludge aeration basins preceded by fine screening and grit removal, followed by aeration, final clarification, and disinfection via ultraviolet light. Phosphorus is removed through chemical addition at the aeration step prior to final clarification. Waste sludge is aerobically digested before it is hauled to another permitted facility to be land applied.

Mayville has multiple industrial users including Seneca Foods Mayville, Old Fashioned Cheese, Gleason Reel Co, Metalcraft of Mayville, and Mayville Engineering Co.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations

The current permit, expiring on September 30, 2024 includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					2
BOD_5 November – April May – October			 42 mg/L 193 lbs/day 21 mg/L 385 lbs/day	 30 mg/L 21 mg/L	 1
TSS November – April May – October			 42 mg/L 21 mg/L	 30 mg/L 21 mg/L	1,4
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		6.0 mg/L			1
Ammonia Nitrogen Year round April May – September October– March	 15 mg/L		 7.6 mg/L 4.4 mg/L 12 mg/L	 3.6 mg/L 3.1 mg/L 6.2 mg/L	 -

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Fecal Coliform May – September			**780#/100 mL** **geometric mean**	400#/100 mL geometric mean	5
Chloride Dry Weather Mass Wet Weather Mass			555 mg/L 5,184 lbs/day 14,117 lbs/day	**555 mg/L**	5,7
Mercury	4.5 ng/L				6
Phosphorus				1.0 mg/L	4
Temperature					3
TKN, Nitrate+Nitrite, and Total Nitrogen					8
Acute WET					9
Chronic WET				1.4 TUc	10

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. Monitoring Only
3. Monitoring is required in October, November, and December throughout the permit term.
4. Additional Phosphorus and TSS mass limitations required in accordance with the wasteload allocations specified in the Rock River TMDL.

Rock River TMDL			
Month	Monthly Avg TSS Effluent Limit (lbs/day)	Weekly Avg TSS Effluent Limit (lbs/day)	Monthly Avg Total Phosphorus Effluent Limit (lbs/day)
January	192	271	2.73
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April	134	189	2.10
May	109	154	1.67
June	151	193	2.04
July	109	154	1.87
August	134	189	1.95
September	167	193	1.96
October	192	193	2.15
November	193	272	2.41
December	192	271	2.54

5. Additional limits to comply with s. NR 106.07 are included in bold.
6. This is an interim limit for mercury. A compliance schedule is included in the permit to meet the final monthly average limit of 1.3 ng/L along with mass limits of 0.000012 lbs/day dry weather and 0.000033 lbs/day wet weather becomes effective on October 1, 2024.

7. A compliance schedule is included in the permit to meet the final limits by October 1, 2020.
8. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).
9. Acute WET test shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Acute tests shall continue after the permit expiration date in accordance with WET requirements.
10. Chronic WET tests shall be conducted twice each year in rotating quarters in order to collect seasonal information about the discharge.

Receiving Water Information

- Name: East Branch Rock River
- Waterbody Identification Code (WBIC): 861400
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS and were developed for the East Rock River Branch at the Walnut St. Bridge in Mayville on February 13, 2013, where Outfall 001 is located.
  7-Q_{10} = 2.8 cfs (cubic feet per second)
  7-Q_2 = 9.1 cfs
  90-Q_{10} = 7.74 cfs
  Harmonic Mean Flow = 22.16 cfs
- Hardness = 338 mg/L as $CaCO_3$. This value represents the geometric mean of data from chronic WET testing completed between 2013 and 2015.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%
- Source of background concentration data: Since no data available for the East Branch Rock River, the background concentration is assumed to be negligible and a value of zero is used in the computations.
- Multiple dischargers: The Village of Theresa WWTF discharges approximately 12 miles upstream of the Mayville WWTF. Combined impacts are not evaluated since there is little likelihood of an overlapping mixing zone.
- Impaired water status: The East Rock Branch River is impaired for total phosphorus and total suspended solids as evidenced by low dissolved oxygen, degraded habitat, and degraded biological community at the point of discharge from Mayville WWTF (river mile 0.00-11.61)

Effluent Information

- Design flow rates:
  Annual average = 1.12 MGD (Million Gallons per Day)
  Peak daily = 3.39 MGD
  Peak weekly= 3.05
  Peak monthly= 1.297 MGD
  The peak flows were taken from the WQBEL dated April 18, 2018.
  For reference, the actual average flow from January 2019 to June 2024 was 0.85 MGD.
- Hardness = 390 mg/L as $CaCO_3$. This value represents the geometric mean (n=4) of data collected during October 2023 from the permit application.

- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable
- Water source: Domestic wastewater with water supply from wells and industrial sources from Seneca Foods and Old Fashioned Foods.
- Additives: Neo Water Treatment for Phosphorus Treatment
- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the "priority pollutants" except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Effluent Copper Data

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
10/18/2023	8.9	11/3/2023	9.1	11/17/2023	7.2
10/24/2023	6.8	11/7/2023	8.1	11/22/2023	7.3
10//27/2023	8.4	11/10/2023	8.6	11/27/2023	7
10/31/2023	8.5	11/14/2023	6.6		
1-day P_{99} =10.2 µg/L					
4-day P_{99} = 9.0 µg/L					

The following table presents the average concentrations and loadings at Outfall 001 from January 2019 to June 2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD_5	2.9 mg/L*	19.7 lbs/day
TSS	3.4 mg/L*	24.8 lbs/day
pH field	7.8 s.u.	
Phosphorus	0.4 mg/L	2.8 lbs/day
Ammonia Nitrogen	0.07 mg/L*	

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

WQC =Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q_{10}) if the 1-day Q_{10} flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q_{10}).

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Mayville Wastewater Treatment Faculty and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling for all the detected substances. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury (ng/L)

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 2.24 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT***	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340	679.6	135.9	<1.1		
Cadmium	390	49.1	98.2	19.6	<0.19		
Chromium	301	4446	8891.7	1778	1.4		
Chromium (+6)		16	32	6.41	2.4		
Copper	390	56	112.1			10.2	6.1
Lead	356	365	729.3	145.9	<4.3		
Mercury		830	1660	332			
Nickel	268	1080	2160.6	432	1.6		
Zinc	333	345	689.4	137.9	11		

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SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT***	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chloride (mg/L)		757	1514			971.9	1215
Phenol**		4460.3	4460	892	0.052		

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

** The limit for this substance is based on a secondary value. Acute limits are set equal to the secondary value rather than two times or using the 1-Q_{10} s. NR 106.06(3)(b)2 and s. NR 105.05(2)(f)6), Wis. Adm Code.

* * *The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0.70 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Arsenic		152.2		214	42.7	<1.1	
Cadmium	175	3.82		5.36	1.1	<0.19	
Chromium	301	325.8		457	91.5	1.4	
Chromium (+6)		10.98		15.4	3.08	2.4	
Copper	338	29.4		41.2			9.0
Lead	338	90.9		127.5	25.5	<4.3	
Mercury		440		618	123.5		
Nickel	268	120.2		169	33.7	1.6	
Zinc	333	344.7		484	96.8	11	
Chloride (mg/L)		**395**		**555**			**705.7**
Phenol**		2197.2		4394.4	878.88	0.052	

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

** The limit for this substance is based on a secondary value.

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 1.93 cfs (¼ of the 90-Q_{10}), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Mercury (ng/L)	1.3	1.3	1.3			**0.8***

***See mercury discussion below tables.**

Monthly Average Limits based on Human Threshold Criteria (HTC)
RECEIVING WATER FLOW = 5.5 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Antimony	373		1565	313.1	0.35
Cadmium	370		1553	310.6	<0.19
Chromium	3818000		16023676	3204735	1.4
Chromium (+6)	7636		32047	6409	2.4
Lead	140		588	117.5	<4.3
Mercury	1.5		6.3	1.26	
Nickel	43000		180466	36093	1.6
Diethyl Phthalate*	68000		285388	57078	0.31

* The limit for this substance is based on a secondary value. Acute limits are set equal to the secondary value rather than two times or using the 1-Q_{10} s. NR 106.06(3)(b)2 and s. NR 105.05(2)(f)6), Wis. Adm Code.

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 5.5 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3		55.8	11.2	<1.1

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

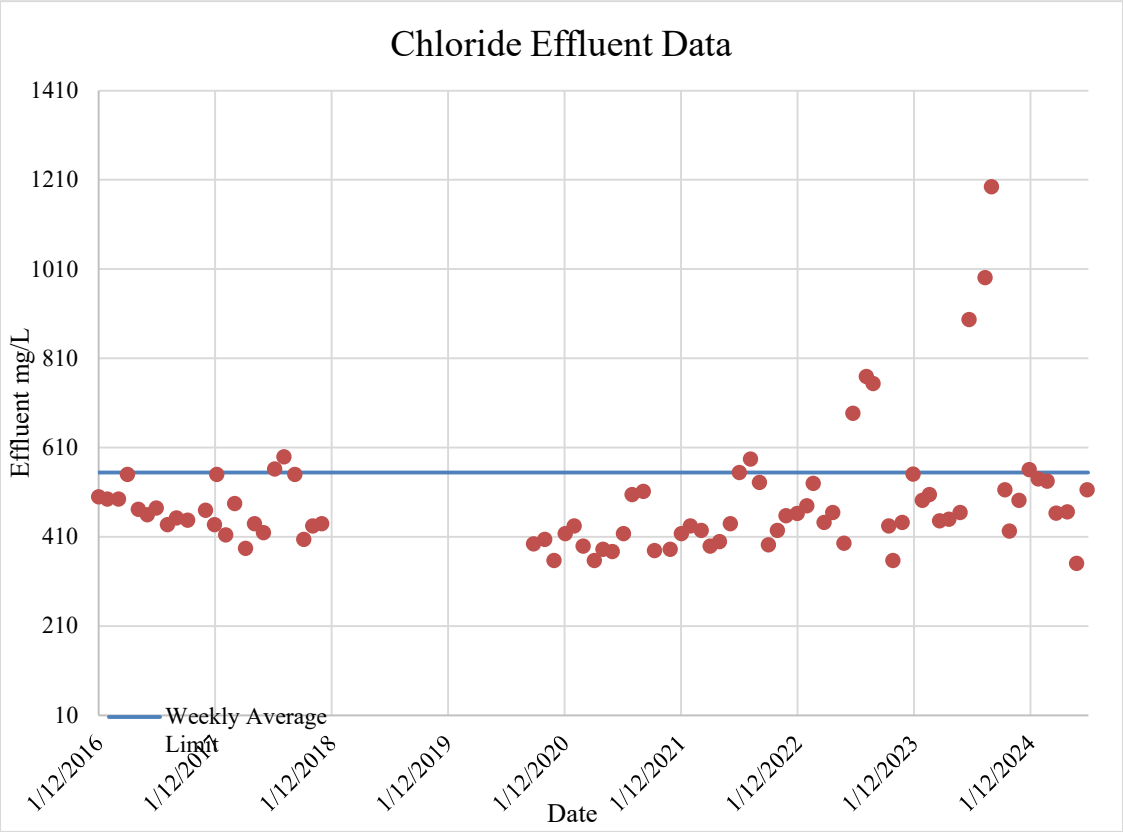
Conclusions and Recommendations
Based on a comparison of the effluent data and calculated effluent limitations, **effluent limitations are required for chloride.**

Chromium (+6) – Chromium (6+) data provided in the permit application is greater than the value submitted for total chromium. Due to a less reliable analytical test, the value used for the limit evaluation for chromium (6+) will be set equal to the total chromium value of 1.4 µg/L. The analytical test for hexavalent chromium is less reliable than the test for total recoverable chromium.

Copper – Considering available effluent data from the October 2023 to November 2023 the 1-day P_{99} concentration is 10.2 µg/L, with a maximum concentration of 9.1 µg/L. The maximum effluent concentration and the 1-day P_{99} of the effluent data does not exceed the calculated daily maximum limit, therefore **no concentration and mass limits are required**.

Chloride – Considering available effluent data from the January 2014 to June 2024
the 1-day P_{99} chloride concentration is 971.9 mg/L, and the 4-day P_{99} of effluent data is 705.7 mg/L.

Because the 4-day P_{99} exceeds the calculated weekly average WQBEL, **an effluent limit is needed** in accordance with s. NR 106.05(4)(b), Wis. Adm. Code.



In the permit application, Mayville Wastewater Treatment Facility has requested a chloride variance limit. However, since the WQBEL is currently in effect, they are not eligible for this variance due to anti-backsliding and antidegradation requirements in ch. NR 207, Wis. Adm. Code. The table below shows the average weekly chloride effluent data from the last ten years as there was no data from January 2018 until January 2020.

Effluent Chloride Data

	mg/L
1-day P_{99}	971.9
4-day P_{99}	705.7
30-day P_{99}	564.72
Mean	493.94
Standard deviation	157.81
Sample size	227
Range	310 - 1215

The Mayville Wastewater Treatment Facility will be subject to an alternative WQBEL limit of 555 mg/L has a weekly average; the weekly average dry weather mass limit of 5,184 lbs/day (555 mg/L × 1.12 MGD × 8.34) and an alternative wet weather mass limit of 14,117 lbs/day (555 mg/L × 3.05 MGD × 8.34). The flow rate used to calculate the alternative wet weather mass limit is the maximum expected weekly average flow calculated by multiplying the average design flow rate by the peaking factor (1.12 × peaking factor (2.7))

Sections NR 106.07(3) and NR 205.067(7), Wis. Adm. Code require WPDES permits contain weekly average and monthly average limitations for municipal dischargers whenever practicable and necessary to protect water quality. **Therefore, a weekly average and monthly average limit of 555 mg/L is required** to meet expression of limits requirements in addition to a dry weather and wet weather mass limits expressed as weekly averages.

Chloride Monitoring Recommendations
Four samples per month (on consecutive days) are recommended. This allows for averaging of the results to compare with the interim limit and allows the use of the average in determining future interim limits, and degree of success with chloride reduction measures.

Mercury – The current permit has a daily maximum limit of 4.5 ng/L which is an alternative mercury effluent limit based on the variance granted by EPA as described in s. NR 106.145(4), Wis. Adm. Code. A review of data from January 2019 to June 2024 found one data point from December 5, 2022 with a value of 89 ng/L that is not believed to be representative of the discharge. When the outlying data point is excluded from the data set, the 30-day P_{99} is 0.80 ng/L which is below the wildlife criterion of 1.3 ng/L. Therefore, **a mercury effluent limit is not required for Mayville Wastewater Treatment Facility.**

Effluent Mercury Data

	Mercury ng/L
1-day P_{99}	2.2
4-day P_{99}	1.3
30-day P_{99}	0.80
Mean	0.59
Std	0.44
Sample size	56
Range	0.22-3

Antidegradation and Antibacksliding
Since current treatment capability and PMP/SRM measures are expected to remain in place, the removal of the daily maximum mercury variance limit will not increase the concentration, level, or loading of mercury to East Branch Rock River. Therefore, antidegradation would not be applicable. To be consistent with antibacksliding requirements, the current limit may be removed in accordance with s. NR 207.12(4)(b), Wis. Adm. Code.

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Previous monitoring produced a PFOS result of 1.39 ng/L and a PFOA result of 3.38 ng/L. Based on the indirect dischargers contributing to the collection system, **PFOS and PFOA monitoring is recommended at a once every two months frequency.**

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. The current permit has daily maximum, weekly average and monthly average limits. These limits are re-evaluated at this time due to the following changes:

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- The maximum expected effluent pH has changed.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)
Daily maximum limitations are based on acute toxicity criteria in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation:

$$\text{ATC in mg/L} = [A \div (1 + 10^{(7.204 - pH)})] + [B \div (1 + 10^{(pH - 7.204)})]$$

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 833 sample results were reported from January 2019 to June 2024. The maximum reported value was 8.5 s.u. (Standard pH Units). The effluent pH was 8.27 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.19 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.27 s.u. Therefore, a value of 8.5 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.5 s.u. into the equation above yields an ATC = 3.2 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method
In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the 1-Q_{10} receiving water low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q_{10} (estimated as 80 % of 7-Q_{10}) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	6.41
1-Q_{10}	7.29

The 2×ATC method yields the most stringent limits for Mayville Wastewater Treatment Facility.

Presented below is a table of daily maximum limitations corresponding to various effluent pH values. Use of this table is not necessarily recommended in the permit, but it is presented herein for informational purposes.

Daily Maximum Ammonia Nitrogen Limits – WWSF

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)
The weekly and monthly average ammonia nitrogen limits calculation from the memo November 5, 2007 do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the WQBEL memo dated November 5, 2007 are shown in Attachment #2.

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from January 2019 to June 2024 with those results being compared to the calculated limits to determine the need to include ammonia limits in the Mayville Wastewater Treatment Facility permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or P_{99}) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April	May - September	October - March
1-day P_{99}	2.1	1.3	0.1
4-day P_{99}	1.5	1.0	0.1
30-day P_{99}	0.68	0.48	0.04
Mean*	0.17	0.10	0.03
Std	0.74	0.54	0.02
Sample size	76	338	418
Range	<0.024-5.18	<0.024-7.13	<0.024-0.26

*Values lower than the level of detection were substituted with a zero

The permit currently has daily maximum limits, daily, weekly, and monthly limits year round. Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

(b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

Conclusions and Recommendations

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm. Code.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L*	Weekly Average mg/L	Monthly Average mg/L
April	6.4 mg/L	7.6 mg/L	3.6 mg/L
May– September	6.4 mg/L	4.4 mg/L	3.1 mg/L
October – March	6.4 mg/L	12 mg/L	6.2 mg/L

*The daily maximum variable limit table may be included in place of the single daily maximum limit

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

On May 1, 2020, revisions to chs. NR 102 and NR 210, Wis. Adm. Codes, became effective which replace fecal coliform limits with new *Escherichia coli* (*E. coli*) limits for protection of recreational uses. Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

1. The geometric mean of *E. coli* bacteria in effluent samples collected in any calendar month may not exceed 126 counts/100 mL.
2. No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 counts/100 mL.

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Because Mayville Wastewater Treatment Facility permit requires weekly monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

These limits are required during May through September. No changes are recommended to the current recreational period and the required disinfection season.

Effluent Data

Mayville Wastewater Treatment Facility has monitored effluent *E. coli* from July 2023 to September 2023 and a total of 24 results are available. A geometric mean of 126 counts/100 mL was not exceeded, with a maximum monthly geometric mean of 12 counts/100 mL. Effluent data has not exceeded 410 counts/100 mL. The maximum reported value was 12 counts/100 mL. Based on this effluent data it appears that the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.

PART 5 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Mayville Wastewater Treatment Facility currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

TMDL Limits – Phosphorus
Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL-derived water quality based effluent limit (WQBEL) for phosphorus in addition to, or in lieu of, a s. NR 217.13, Wis. Adm. Code, WQBEL in a WPDES permit. The Rock River TMDL was developed to protect the water quality of impaired waters within the watershed, and the discharge from the Theresa Wastewater Treatment Facility is to the East Branch Rock River in Dodge County. Since the East Branch Rock River was listed as impaired prior to the TMDL development, the TMDL-based phosphorus limits were included in the permit at the last reissuance rather than the s. NR 217.13, Wis. Adm. Code, WQBEL.

The monthly average total phosphorus (Total P) effluent limits in lbs/day are calculated based on the monthly wasteload allocation (WLA) given in pounds per month as suggested in the *TMDL and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* dated April 15, 2013. The WLA fort Mayville WWTF and Leroy Kekoskee WWTF is found in the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin* report dated July 2011. The monthly average WLA for Mayville WWTF should be the combination of both Mayville and Leroy Kekoskee's WLA because the WWTFs have centralized and now one single facility. The allocations do not need to be adjusted because both dischargers are to the same reach and have the same downstream point of standard application which meets the requirements of the TMDL. **The monthly average limits in lbs/day should be included in the reissued permit.** The limits are equivalent to concentrations ranging 0.18 mg/L to 0.36 mg/L at the facility design flow of 1.12 MGD.

Total Phosphorus Effluent Limitations

Month	Mayville Monthly Total P WLA[1] (lbs/month)	Leroy Kekoskee Monthly Total P WLA[1] (lbs/month)	Combined Monthly Total P WLA[1] (lbs/month)	Days Per Month	Monthly Ave Total Effluent Limit[2] (lbs/day)
January	75.75	8.82	84.57	31	2.73
February	77.79	12.65	90.44	28	3.23
March	64.59	13.62	78.21	31	2.52
April	53.86	9.04	62.89	30	2.10
May	44.75	7.00	51.75	31	1.67
June	55.1	6.15	61.25	30	2.04
July	52.79	5.06	57.85	31	1.87
August	56.94	3.63	60.57	31	1.95
September	53.97	4.9	68.87	30	1.96
October	60.18	6.36	66.54	31	2.15
November	64.39	7.91	72.3	30	2.41
December	71.34	7.26	78.6	31	2.54

Footnotes:
1-Rock River TMDL Appendix P. Monthly Total Phosphorus Allocations by Wastewater Treatment Facility (p. 147 & 148)
2-Monthly Average Total P effluent limit (lbs/day) = monthly Total P WLA (lbs/month) ÷ days per month

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from January 2019 to May 2024.

Total Phosphorus Effluent Data

	Concentration mg/L	Mass lbs/day
1-day P_{99}	1.2	10.5
4-day P_{99}	0.8	6.1
30-day P_{99}	0.51	3.8
Mean	0.40	2.8
Std	0.24	2.1
Sample Size	834	972
Range	0.062 - 1.35	0.18 - 21.3

PART 6 – Total Suspended Solids

The Rock River TMDL also has wasteload allocations (WLA) for total suspended solids (TSS). The limits for TSS must be expressed as weekly and monthly averages for a municipal facility.

Total Suspended Solids Effluent Limitations

Month	Mayville Monthly Total TSS WLA[1] (tons/month)	Days Per Month	Monthly Ave Total Effluent Limit[2] (lbs/day)	Weekly Ave Total Effluent Limit[3] (lbs/day)
January	2.98	31	192	271
February	2.93	28	209	295
March	2.98	31	192	271
April	2.01	30	134	189
May	1.69	31	109	154
June	2.26	30	151	193
July	1.69	31	109	154
August	2.08	31	134	189
September	2.51	30	167	193
October	2.98	31	192	193
November	2.89	30	193	272
December	2.98	31	192	271

Footnotes:
1-Rock River TMDL Appendix Q. Monthly Total Suspended Solids Allocations by Wastewater Treatment Facility (p. 149 & 150)
2-Monthly Average TSS effluent limit (lbs/day) =(maximum monthly TSS WLA (tons/month) ÷ day per month) x 2,000 lbs/ton
3- Weekly Average Effluent Limits (lbs/day)= monthly average limit (lbs/day) x multiplier

Weekly average mass limits were calculated using the WLA for Mayville Wastewater Treatment Facility and not the Kekoskee Wastewater Treatment Facility . At that time, the coefficient of variation (the standard deviation divided by the mean) was assumed to be 0.6 and the monitoring frequency was 2x/week. As the Mayville Wastewater Treatment Facility is currently meeting the wasteload allocations, the effluent limitations are not reevaluated and should remain as is.

Effluent Data

The table below lists the statistics for total suspended solids discharge as both a concentration and a mass, from January 2019 through June 2024.

Total Suspended Solids Effluent Data

	TSS (mg/L)	TSS (lbs/day)
1-day P_{99}	8.9	86.9
4-day P_{99}	5.9	51.9
30-day P_{99}	4.21	33.15
Mean*	3.40	24.81
Std	1.63	17.13
Sample size	868	1008
Range	<2.0 - 23	0-202

*Values lower than the level of detection were substituted with a zero

PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported for the months of October through December for the years of 2019 to 2023.

The table below summarizes the maximum temperatures reported during monitoring from January 2013 to December 2023.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	52	53	60	99
FEB	52	53	62	100
MAR	51	53	71	117
APR	56	57	78	120
MAY	61	62	77	108
JUN	66	67	83	92
JUL	70	71	88	92
AUG	72	73	88	89
SEP	73	74	77	85
OCT	74	75	66	90
NOV	68	70	62	120
DEC	65	66	59	94

Reasonable Potential

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:

(a) The highest recorded representative daily maximum effluent temperature
(b) The projected 99th percentile of all representative daily maximum effluent temperatures

- A sub−lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  (a) The highest weekly average effluent temperature for the month.
  (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

The Mayville Wastewater Treatment Facility has submitted a request for continued consideration of dissipative cooling in 2022, which was originally conducted on November 26, 2019, along with a statement that there have not been substantial changes to the facility or thermal loadings. Based on this information, the department has found that it **is not necessary to include temperature limits in the reissued permit. Temperature monitoring is recommended for one year** per the requirements of s. NR 106.59(7), Wis. Adm. Code.

Future WPDES Permit Reissuance
Dissipative cooling (DC) requests must be re-evaluated every permit reissuance. The permittee is responsible for submitting an updated DC request prior to permit reissuance. Such a request must either include:

a) A statement by the permittee that there have been no substantial changes in operation of, or thermal loadings to, the treatment facility and the receiving water; or
b) New information demonstrating DC to supplement the information used in the previous DC determination. If significant changes in operation or thermal loads have occurred, additional DC data must be submitted to the Department.

PART 8 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (2022).*

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC_{50} (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 71% shown in the WET Checklist summary below was calculated according to the

following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$IWC\ (as\ \%) = Q_e \div \{(1 - f)\ Q_e + Q_s\} \times 100$$

Where:

Q_e = annual average flow = 1.12 MGD = 1.73 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 2.8 cfs ÷ 4 = 0.7 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.

WET Data History

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %					Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Algae (IC_{50})	Pass or Fail?	Use in RP?	
12/14/2006	>100	>100	Pass	Yes	-	-	-	-	-	
02/16/2006					>100	>100	-	Pass	Yes	
05/11/2006					>100	91.4	-	Pass	Yes	
09/19/2006					>100	>100	-	Pass	Yes	
12/14/2006					>100	>100	-	Pass	Yes	
02/27/2007					>100	>100	-	Pass	Yes	
06/07/2007					>100	>100	-	Pass	Yes	
10/09/2008					>100	>100	-	Pass	No	1
04/07/2009	>100	>100	Pass	No	>100	>100	-	Pass	No	1
10/22/2009					>100	>100	-	Pass	No	1
02/04/2010	>100	>100	Pass	No	>100	>100	-	Pass	No	1
07/27/2010					>100	>100	-	Pass	No	1
06/01/2011					>100	>100	-	Pass	No	1
11/01/2011				No	>100	>100	-	Pass	Yes	
01/17/2012					>100	>100	-	Pass	Yes	
07/10/2012	>100	>100	Pass	Yes	88.6	87.2	-	Pass	Yes	
01/16/2013	>100	>100	Pass	Yes	-	-	-	-	-	
04/02/2013					>100	>100	-	Pass	Yes	
10/08/2013					>100	>100	-	Pass	Yes	
06/10/2014					96.8	>100	-	Pass	Yes	
02/10/2015					>100	>100	-	Pass	Yes	
08/02/2016	>100	>100	Pass	Yes	>100	>100	-	Pass	Yes	
05/09/2017	>100	>100	Pass	Yes	>100	>100	-	Pass	Yes	
03/24/2020	>100	>100	Pass	Yes	91.8	>100	-	Pass	Yes	
09/08/2020	-	-	-	-	>100	>100	-	Pass	Yes	
04/20/2021	>100	>100	Pass	Yes	>100	>100	-	Pass	Yes	
10/12/2021	-	-	-	-	>100	67.9	-	Fail	Yes	
11/09/2021	-	-	-	-	57.6	>100	-	Fail	Yes	
04/19/2022	-	-	-	-	>100	>100	-	Pass	Yes	

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Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %					Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Algae (IC_{50})	Pass or Fail?	Use in RP?	
05/17/2022	-	-	-	-	>100	>100	-	Pass	Yes	
06/14/2022	-	-	-	-	>100	>100	-	Pass	Yes	
07/12/2022	>100	>100	Pass	Yes	>100	>100	-	Pass	Yes	
08/23/2022	>100	>100	Pass	Yes	>100	>100	-	Pass	Yes	
01/10/2023	>100	>100	Pass	Yes	>100	>100	-	Pass	Yes	
10/03/2023	>100	>100	Pass	Yes	83.7	>100	-	Pass	Yes	
04/09/2024	-	-	-	-	>100	>100	-	Pass	Yes	

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.

According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

Acute Reasonable Potential = [(TU_a effluent) (B)(AMZ)]

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

Chronic Reasonable Potential = [(TU_c effluent) (B)(IWC)]

Chronic WET Limit Parameters

TUc (maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/57.6 = 1.74	2.3 Based on 5 detects	71%

[(TUc effluent) (B)(IWC)] = 2.8 > 1.0

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6) and representative data from December 2006 to April 2024.

Expression of WET limits

Chronic WET limit = [100/71] TU_c = 1.4 TU_c expressed as a monthly average

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. **0 Points**	IWC = 71 %. **15 Points**
Historical Data	8 tests used to calculate RP. No tests failed. **0 Points**	28 tests used to calculate RP. 2 tests failed. **0 Points**
Effluent Variability	Little variability, minor violations, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	Warm Water Sport Fish Community **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	No limits based on ATC; Ammonia nitrogen, Copper, Chloride, Chromium +6, Chromium, Nickel, Zinc, , and Mercury detected. Other Compounds of Concern: Antimony, Diethyl Phthalate, Phenol **5 Points**	Reasonable potential for limits for Chloride and Mercury based on CTC; Ammonia nitrogen, , Chromium +6, Chromium, Nickel, Zinc, and Mercury detected. Other Compounds of Concern: Antimony, Diethyl Phthalate, Phenol **5 Points**
Additives	0 Biocides and 1 Water Quality Conditioner added. Permittee has proper P chemical SOPs in place Yes. **1 Points**	All additives used more than once per 4 days. **0 Points**
Discharge Category	2 Industrial Contributors. **6 Points**	Same as Acute. **6 Points**
Wastewater	Secondary or Better	Same as Acute.

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	Acute	Chronic
Treatment	**0 Points**	**0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**17 Points**	**31 Points**
Recommended Monitoring Frequency (from Checklist):	**A minimum of 1x annual acute WET test**	**A minimum of 1x annual chronic WET test**
Limit Required?	No	Yes Limit = 1.4 TU_c
TRE Recommended? (from Checklist)	No	No

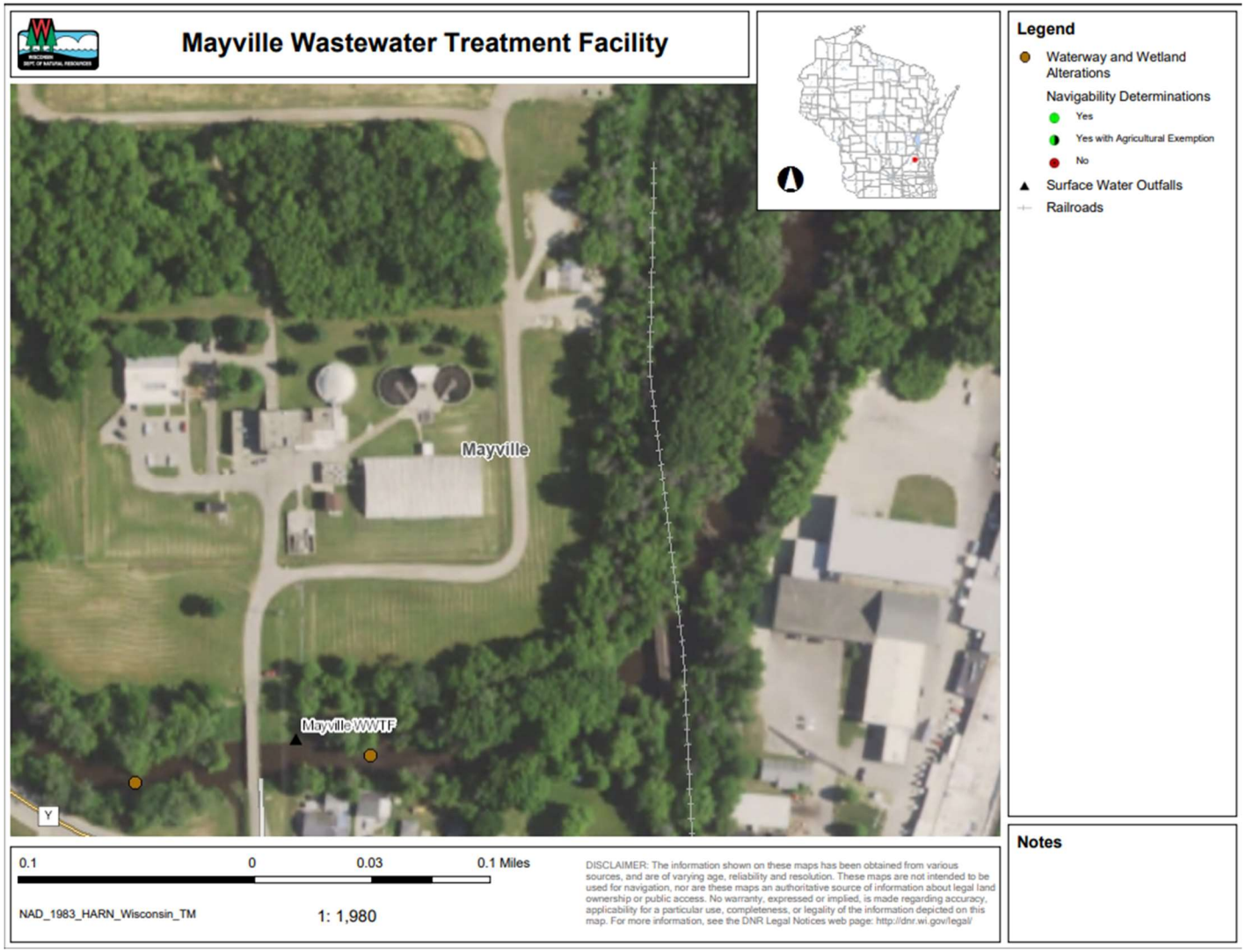
- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above at least one acute and one chronic test are recommended annually in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit shall be expressed as 1.4 TUc as a monthly average in the effluent limits table of the permit.
- A minimum of annual acute and chronic monitoring is recommended because Mayville Wastewater Treatment Facility is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.

Ammonia Nitrogen Calculations from WQBEL dated November 5, 2007

AMMONIA (as N) LIMITS			
CLASSIFICATION:	**WARMWATER SPORTFISH**		
EFFLUENT FLOW (mgd):	1.1		
EFFLUENT FLOW (cfs):	1.702		
MAX. EFFLUENT pH (s.u.):	8.06		
BACKGROUND INFORMATION:	***May-Sept.***	***Oct.-March***	***April***
7Q10 (cfs)	1.3	1.3	1.3
7Q2 (cfs)	4.3	4.3	4.3
Ammonia (mg/L)	0.07	0.17	0.09
Temperature (deg C)	23	3	9
pH (std. units)	8.21	7.97	7.97
% of river flow used:	100	25	25
Reference weekly flow:	1.3	0.325	0.325
Reference monthly flow:	3.655	0.91375	0.91375
CRITERIA (in mg/L):			
Acute (@ effl. pH):	7.50	7.50	7.50
4-day Chronic (@ backgrd. pH):			
early life stages present	2.55	6.35	6.35
early life stages absent	2.55	10.31	9.06
30-day Chronic (@ backgrd. pH)			
early life stages present	1.02	2.54	2.54
early life stages absent	1.02	4.12	3.63
EFFLUENT LIMITS (in mg/L):			
Daily maximum (also see below)	15.00	15.00	15.00
Weekly average			
early life stages present	4.45	7.53	7.55
early life stages absent		12.25	10.78
Monthly average			
early life stages present	3.06	3.81	3.86
early life stages absent		6.25	5.52

Calculated Effluent Limits for Ammonia Nitrogen (mg/L)			
	April	***Summer***	***Winter***
Daily Max	15	15	15
Weekly	7.6	4.4	12
Monthly	3.9	3.1	6.2

Site Map:


Mayville Wastewater Treatment Facility
Mayville
Mayville WWTF
Legend
Waterway and Wetland Alterations
Navigability Determinations
Yes
Yes with Agricultural Exemption
No
Surface Water Outfalls
Railroads
Notes
0.1
0
0.03
0.1 Miles
NAD_1983_HARN_Wisconsin_TM
1: 1,980
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