

# Marathon Public Noticed Permit Fact Sheet

## General Information

Permit Number	WI-0020273-10-0
Permittee	Marathon Water & Sewer Dept, P O Box 487, Marathon City, WI 54448
Permitted Facility	Marathon Water & Sewer Department Wastewater Treatment Plant, 104 Chestnut Street, Marathon City, WI 54448
Permit Term	April 01, 2026 to March 31, 2031
Discharge Location	Outfall Location: Stormwater swale on the south bank of the Rib River, northeast of the Village of Marathon garage/yard waste site  NE14/ SE1/4, Section 6, T28N R06E, Village of Marathon City, Marathon County, WI
Receiving Water	Big Rib River in Lower Rib River Watershed of Central Wisconsin River Basin in Marathon County
Stream Flow (Q <sub>7,10</sub> )	19 cfs
Stream Classification	Warmwater sport fisheries, non-public water supply
Discharge Type	Existing, Continuous
Annual Average Design Flow	0.360 MGD
Industrial or Commercial Contributors	Marathon Cheese Corporation, Custom Meats, Inc, Marathon Cheese Truck Garage. They are not categorical industrial contributors
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

## Facility Description

The Marathon Water & Sewer Wastewater Treatment Facility treats domestic wastewater from the Village of Marathon City and various wastewaters from the following industries: Marathon Cheese Corporation (processes & packages cheese-discharges process wastewater), Custom Meats, Inc (a meat processing plant- discharges process wastewater), Marathon Cheese Transportation Equipment (discharges washwater). The design flow of the facility is 0.36 million gallons per day (MGD) and had an actual annual average effluent flow of 0.223 MGD in 2025. The new Aero-Mod treatment plant was fully operational September 2023. treatment plant is an activated sludge, secondary wastewater treatment facility. The plant consists of a Huber step screen, Pista grit collector/removal system with a Wemco Hygrogritter-grit classifier, influent pumping station, Aero-Mod secondary treatment (consisting of a bio-p fermenter tank, a bio-p selector tank, and 2 trains of each of the following; 1st, 2nd, and 3rd stage aeration, and final clarifiers), biological and chemical (alum) phosphorus removal, and UV disinfection prior to discharge to the Big Rib River. Biosolids are stabilized in two aerobic digesters. Solids are allowed to gravity settle and then are pumped to a digested sludge storage tank. The digested sludge

is then mixed and aerated in the digested sludge storage tank for approximately one week, prior to thickening on an Ashbrook 0.8 M gravity belt thickener. Thickened digested sludge is then pumped to an above ground 280,000-gallon Biosolids Storage Tank, until land application each spring and fall.

## Substantial Compliance Determination

Enforcement During Last Permit: A Notice of Noncompliance was issued on 5/26/2023 for a treatment facility overflow. The facility has completed all previously required actions as required in the Notice of Noncompliance.

After a desk top review of all discharge monitoring reports, CMARs, land application reports, and all compliance schedule reports for a treatment plant upgrade/replacement, phosphorus watershed project requirements, and a phosphorus schedule for continued optimization, and a site visit on 05/02/2025, the Marathon Water & Sewer DPT WW Treatment Plant has been found to be in substantial compliance with their current permit.

Compliance determination made by Nick Lindstrom on 07/11/2025.

## Sample Point Descriptions

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	0.223 MGD	Representative influent samples shall be taken after the pista grit chamber, prior to the influent pumping station.
001	Flow monitoring not reported last permit term, but it is assumed it was equal to influent flow at 0.223 MGD	Representative effluent samples shall be taken within the concrete channel downstream of the secondary clarifiers and upstream of the effluent Parshall flume and UV disinfection modules. Bacteria samples shall be taken downstream of UV disinfection modules.
002	244,000 gallons (2025)	Representative sludge samples shall be collected and monitored annually for Lists 1, 2, 3, 4 and PFAS, and once in 2027 for PCBs.

# Permit Requirements

## 1 Influent – Monitoring Requirements

### 1.1 Sample Point Number: 701- AFTER PISTA GRIT CHAMBER

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	
CBOD5		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

#### Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term. The following changes were made this permit term” 1) An increase in the CBOD, BOD & TSS monitoring frequency from 2/week to 3/week to match the effluent monitoring frequency.

#### Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

## 2 Surface Water - Monitoring and Limitations

### 2.1 Sample Point Number: 001- EFFLUENT to RIB RIVER

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
CBOD5	Monthly Avg	25 mg/L	3/Week	24-Hr Flow Prop Comp	
CBOD5	Weekly Avg	40 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids,	Weekly Avg	45 mg/L	3/Week	24-Hr Flow	

<b>Monitoring Requirements and Limitations</b>					
<b>Parameter</b>	<b>Limit Type</b>	<b>Limit and Units</b>	<b>Sample Frequency</b>	<b>Sample Type</b>	<b>Notes</b>
Total				Prop Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Nitrogen, Ammonia Variable Limit		mg/L	5/Week	See Table	Look up the variable ammonia limit from the 'Variable Daily Max Ammonia Limitation' table below and report the variable limit in the Ammonia Variable Limit column on the eDMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	5/Week	24-Hr Flow Prop Comp	Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the eDMR. See Ammonia Limitation Section below.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	108 mg/L	5/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	108 mg/L	5/Week	24-Hr Flow Prop Comp	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit effective May through September
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May through September. See the E. coli Percent Limit section in the permit. Enter the result in the DMR on the last day of the month.
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	1.73 lbs/day	3/Week	Calculated	See TMDL section below and in permit.
Phosphorus, Total	Monthly Avg	lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See TMDL section below and in

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					permit.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL section below and in permit.
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.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Monitoring required annually in specific quarters. See Nitrogen Series Monitoring section in permit.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Monitoring required annually in specific quarters. See Nitrogen Series Monitoring section in permit.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Monitoring required annually in specific quarters. See Nitrogen Series Monitoring section below. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET testing section in permit
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET testing section in permit

## Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit: 1) Addition of flow monitoring. 2) PFOS/PFOA monitoring added once every two months and a schedule included associated with this monitoring. 3) Removal of the phosphorus multidischarger variance (MDV). The permittee has optimized and is able to meet the WIRB TMDL phosphorus limit. 4) Chronic WET testing added twice during the permit term 5) Monitoring frequencies were changes for BOD5, TSS, ammonia and pH. See the “Monitoring Frequencies” section below for details.

## Explanation 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. After consideration, an increase in frequency for BOD5 and TSS from 2/week to 3/week has been included to meet the minimum monitoring frequency and ammonia has been increased from 3/week to 5/week to meet the standard monitoring frequency. These increases will allow for better determination of compliance with the BOD, TSS and ammonia effluent limitations. The pH monitoring frequency has been reduced from daily to 5/week. This reduction was requested by the permittee and is approved by the Department due to the permittee’s proper pH compliance history.

Limits were determined for Marathon Water & Sewer Department’s existing discharge to the Wisconsin River using chs. NR 102, 104, 105, 106, 207, 210, 212 and 217 of the Wisconsin Administrative Code (where applicable). For additional information on any of the limits see the October 27, 2025 memo from Ben Hartenbower to Holly Heldstab titled “Water Quality-Based Effluent Limitations for the Marathon Water and Sewer Department Wastewater Treatment Plant WPDES Permit No. WI-0020273”.

Note: The Acute WET checklist points for triggering reasonable potential to exceed ammonia limits were incorrectly assigned in the above referenced WQBEL memo. The points assigned for industrial contributors were correct. The acute WET total has been adjusted from 21 pts to 16 pts. However, this adjusted total still exceeds the threshold that requires two acute WET tests in the reissued permit. The final WET monitoring requirements remain at two acute and two chronic.

**MUNICIPAL EFFLUENT LIMITS** – In accordance with the federal regulation 40 CFR 122.45(d), and to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable.

**Ammonia:** Water quality-based effluent limitations were evaluated for Ammonia Nitrogen based upon water quality criteria in ch. NR 105 (as revised March 2004), including acute toxicity criteria (ATC) and chronic toxicity criteria (CTC). Effluent limitations for ammonia are calculated using the procedures in s. NR 106.32, Wis. Adm. Code and are shown in the WQBEL memo dated 10/27/2025 referenced above. In addition to weekly and monthly average ammonia, daily maximum ammonia limits that vary with effluent pH apply year-round. See table below for more information. Monitoring for pH shall occur on the same day total ammonia (NH<sub>3</sub>-N) sampling occurs.

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

**Wisconsin River Total Maximum Daily Load (TMDL):** The permitted facility is included within the Wisconsin River Basin Total Maximum Daily Load (TMDL), which was approved by EPA April 26, 2019. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amounts of phosphorus that can be discharged and still protect water quality. The final effluent limits and monitoring expressed in the permit were derived from Site-Specific Criteria (SSC) for Lakes Petenwell, Castle Rock, and Wisconsin originally included in Appendix K of the TMDL report and approved by the U.S. Environmental Protection Agency on July 9, 2020. The permittee’s approved SSC-based limits are consistent with the assumptions and requirements of the EPA-approved WLA in the TMDL, which is 393 lbs/yr for Marathon. The approved TMDL expresses WLAs as lbs/year and lbs/day (maximum annual load divided by 365 days). As outlined in Section 4.6 of the department’s *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Program*, mass limits must be given in the permit that are consistent with the TMDL WLA and the phosphorus impracticability agreement that was approved by USEPA in 2012 (see NPDES MOA Addendum dated July 12, 2012 at <https://apps.dnr.wi.gov/swims/Documents/DownloadDocument?id=167886175>). Continuously discharging facilities covered by the WRB TMDL are given monthly average mass limits. The equivalent effluent concentration of 0.36 mg/L was calculated for the facility, thus, TMDL based mass limits are expressed as a monthly average. Facilities with WRB TMDL based effluent limits for phosphorus must report the 12-month rolling sum of total monthly discharge (lbs/yr). If reported 12-month rolling sums exceed the facility’s max annual WLA, the facility’s mass limits (monthly average) may be recalculated using more appropriate CVs or monitoring frequencies when the permit is reissued to bring discharge levels into compliance with the facility’s given WLA.

**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 municipal dischargers with an average flow rate less than 1 MGD, to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(c), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the permit was drafted, indirect dischargers contributing to the collection system indicates potential for PFOS/PFOA. Therefore, monitoring once every two months is included. 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.

### 3 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	Fecal Coliform & Aerobic Digestion	Aerobic SOUR	Land Application	34 dry US tons
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No						
Is a priority pollutant scan required? No						
Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

#### 3.1 Sample Point Number: 002- SLUDGE at STORAGE TANK

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Composite	
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	
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	

<b>Monitoring Requirements and Limitations</b>					
<b>Parameter</b>	<b>Limit Type</b>	<b>Limit and Units</b>	<b>Sample Frequency</b>	<b>Sample Type</b>	<b>Notes</b>
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	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2027
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2027
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:**

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit: PFAS monitoring is required annually pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

### **Explanation of Limits and Monitoring Requirements**

Requirements for disposal, including 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) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k).

**PFAS-** The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment to determine future land application rates and released this risk assessment in January of 2025. The department is evaluating this new information. Until a decision is made, the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS” should be followed

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 this WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

## 4 Schedules

### 4.1 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
<p><b>Report on Effluent Discharge:</b> 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.</p> <p>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.</p>	03/31/2027
<p><b>Report on Effluent Discharge and Evaluation of Need:</b> 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.</p> <p>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.</p> <p>The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan.</p> <p>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 of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued.</p> <p>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.</p>	03/31/2028

**Explanation of Schedule:** PFOS/PFOA Minimization Plan Determination of Need - As stated above, ch. NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Section 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.

## **Other Comments**

Publishing Newspaper: Wausau Daily Herald, 800 Scott Street, Wausau, WI, 54402-1286

## **Attachments**

Water Quality Based Effluent Limits: October 27, 2025 memo from Ben Hartenbower to Holly Heldstab titled "Water Quality-Based Effluent Limitations for the Marathon Water and Sewer Department Wastewater Treatment Plant WPDES Permit No. WI-0020273".

## **Justification Of Any Waivers From Permit Application Requirements**

No waivers requested or granted as part of this permit reissuance

**Prepared By:** Holly Heldstab, Wastewater Specialist

**Date:** February 9, 2026, 2026

# CORRESPONDENCE/MEMORANDUM

DATE: October 27, 2025

TO: Holly Heldstab – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for the Marathon Water & Sewer Department Wastewater Treatment Plant  
WPDES Permit No. WI-0020273

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 Marathon Water & Sewer Department Wastewater Treatment Plant in Marathon County. This municipal wastewater treatment facility (WWTF) discharges to the Big Rib River, located in the Lower Rib River Watershed in the Central Wisconsin River Basin. This discharge is included in the Wisconsin River Basin (WRB) Total Maximum Daily Load (TMDL) as approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020. 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	Six-Month Average	Footnotes
CBOD <sub>5</sub>			40 mg/L	25 mg/L		1, 2, 3
TSS			45 mg/L	30 mg/L		1, 2
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen	Variable		<b>108 mg/L</b>	<b>108 mg/L</b>		1,4,5
<i>E. coli</i> May - September				126 #/100 mL geometric mean		6
PFOS and PFOA						7
Phosphorus TBEL TMDL Limit				1.0 mg/L 1.73 lbs/day		8
TKN, Nitrate+Nitrite, and Total Nitrogen						9
Acute WET						10, 11
Chronic WET						10, 12

Footnotes:

1. No changes from the current permit.
2. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
3. This facility meets the conditions as described in s. NR 210.07(4), Wis. Adm. Code. An additional requirement is the 30-day average CBOD<sub>5</sub> percent removal may not be less than 85%. Significant improvements to treatment quality at the facility will prompt a re-evaluation of this variance. Otherwise the need for CBOD<sub>5</sub> limits does not need to be demonstrated at subsequent permit reissuances if the treatment quality is expected to remain similar as compared to when the limits were implemented in the permit.

4. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values.

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

5. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
6. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
7. PFOS and PFOA monitoring is recommended once every two months in accordance with s. NR 106.98(2), Wis. Adm. Code.
8. The mass limit is based on the Total Maximum Daily Load (TMDL) for the Wisconsin River to address phosphorus within the TMDL area. The TMDL was approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020.
9. 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. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO<sub>3</sub>), nitrite (NO<sub>2</sub>), and total Kjeldahl nitrogen (TKN) (all expressed as N).
10. Two Acute and Chronic WET tests are recommended. 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.
11. 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.
12. The Instream Waste Concentration (IWC) to assess chronic test results is 10%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual*

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Benjamin Hartenbower at (715) 225-4705 or benjamin.hartenbower@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Thermal Table, & Map

PREPARED BY:



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Date: 10/27/2025

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**Water Quality-Based Effluent Limitations for  
The Marathon Water & Sewer Department Wastewater Treatment Plant**

**WPDES Permit No. WI-0020273**

Prepared by: Benjamin P. Hartenbower

**PART 1 – BACKGROUND INFORMATION**

**Facility Description**

The Marathon Water and Sewer Department Wastewater Treatment Plant is an activated sludge, secondary wastewater treatment facility. The plant consists of a Huber step screen, Pista grit collector/removal system with a Wemco Hygrogritter-grit classifier, influent pumping station, Aero-Mod secondary treatment (consisting of a bio-p fermenter tank, a bio-p selector tank, and 2 trains of each of the following; 1st, 2nd, and 3rd stage aeration, and final clarifiers), biological and chemical phosphorus removal, and UV disinfection prior to discharge to a stormwater swale that discharges to the Big Rib River.

Attachment #3 is a map of the area showing the approximate location of Outfall 001.

**Existing Permit Limitations**

The current permit, which expired on September 30, 2025, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
CBOD <sub>5</sub>			40 mg/L	25 mg/L		1, 2, 3
TSS			45 mg/L	30 mg/L		1, 2
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen	Variable		<b>108 mg/L</b>	<b>108 mg/L</b>		4
Fecal Coliform May - September				400 #/100 mL geometric mean		5
<i>E. coli</i>				126#/100 mL Geometric Mean		
Phosphorus TBEL MDV Interim				1.0 mg/L 0.8 mg/L		6
TKN, Nitrate+Nitrite, and Total Nitrogen						7
Acute WET						8

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.

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2. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
3. This facility meets the conditions as described in s. NR 210.07(4), Wis. Adm. Code. An additional requirement is the 30-day average CBOD<sub>5</sub> percent removal may not be less than 85%. Significant improvements to treatment quality at the facility will prompt a re-evaluation of this variance. Otherwise the need for CBOD<sub>5</sub> limits does not need to be demonstrated at subsequent permit reissuances if the treatment quality is expected to remain similar as compared to when the limits were implemented in the permit.
4. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values.

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

5. A compliance schedule is in the current permit for the *E. coli* limit to replace the Fecal Coliform limit by May 1, 2024
6. A compliance schedule is in the current permit to meet the MDV Interim Limit by October 1, 2023.
7. Monitoring only.
8. Acute WET testing required: July - September 2023 and October - December 2024.

**Receiving Water Information**

- Name: Big Rib River
- Waterbody Identification Code (WBIC): 1451800
- 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<sub>10</sub> and 7-Q<sub>2</sub> values are from USGS for Station 05396200 at State Highway 107 at Marathon City, in the Big Rib River, where Outfall 001 is located.
  - 7-Q<sub>10</sub> = 19 cubic feet per second (cfs)
  - 7-Q<sub>2</sub> = 30 cfs
  - Harmonic Mean Flow = 84 cfs using a drainage area of 365 mi<sup>2</sup>
 The Harmonic Mean has been estimated based on average flow and the 7-Q<sub>10</sub> using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).
- Hardness = 84 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of hardness from WET

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Testing from 07/06/1995 to 12/02/2014 (n = 9).

- % 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: Metals data from the Big Rib River at Goodrich are used in this evaluation. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: None.
- Impaired water status: The Big Rib River is impaired for Mercury from mile 0 to 11.84 and Total Phosphorus from mile 44.8 to 55.13. This discharge is located within the Wisconsin River TMDL for phosphorus.

**Effluent Information**

- Flow Rate(s):  
Annual Average = 0.360 MGD (Million Gallons per Day)  
For reference, the actual average flow from October 2020 to August 2025 was 0.259 MGD.
- Hardness = 117 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean four samples collected in May to September 2024 which were reported in the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Domestic wastewater with three Significant Non-domestic Contributors.
- Water supply: Marathon City Waterworks
- Additives: Aluminum Sulfate (Water Quality Conditioner)
- Total Phosphorus Wasteload Allocation: 393 lbs/year = 1.08 lbs/day
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus chloride and hardness. The permit-required monitoring for Ammonia Nitrogen and Phosphorus from January 2016 to August 2025 is used in this evaluation.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, 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 Data for Outfall 001**

Sample Date	Copper µg/L	Sample Date	Chloride mg/L
5/6/2024	3.229	5/6/2024	90
5/13/2024	2.964	5/20/2024	123
5/20/2024	4.688	6/24/2024	50
6/3/2024	2.314	9/23/2024	142
6/24/2024	3.777		
7/8/2024	3.439		

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Sample Date	Copper $\mu\text{g/L}$	Sample Date	Chloride $\text{mg/L}$
8/5/2024	2.900		
8/19/2024	3.158		
9/2/2024	2.901		
9/23/2024	4.339		
10/7/2024	4.590		
1-day P <sub>99</sub>	5.664	mean	101
4-day P <sub>99</sub>	4.478		

The following table presents the average concentrations and loadings at Outfall 001 from January 2016 to August 2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

**Parameters with Effluent Limits**

	Average Measurement
CBOD <sub>5</sub>	4 mg/L*
TSS	6.0 mg/L*
pH	6.8 s.u.
Fecal Coliform	4 #/100 mL**
Ammonia Nitrogen	4.32 mg/L*
Phosphorus	0.61 mg/L

\*Results below the limit of detection (LOD) were included as zeros in calculation of average.

\*\* The average measurement for bacteria is calculated as a geometric mean. Values reported below the LOD are replaced with a value of 1 for the calculation of the geometric mean.

**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 99<sup>th</sup> percentile (or P<sub>99</sub>) 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<sub>10</sub>**

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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<sub>10</sub> 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.

$$\text{Limitation} = \frac{(\text{WQC}) (Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)}{Q_e}$$

Where:

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

Q<sub>s</sub> = average minimum 1-day flow which occurs once in 10 years (1-day Q<sub>10</sub>)  
if the 1-day Q<sub>10</sub> flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q<sub>10</sub>).

Q<sub>e</sub> = 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

C<sub>s</sub> = 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<sub>10</sub> 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 the Marathon Water & Sewer Department Wastewater Treatment Plant, 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. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L).

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**

RECEIVING WATER FLOW = 15 cfs, (1-Q<sub>10</sub> (estimated as 80% of 7-Q<sub>10</sub>)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P <sub>99</sub>	1-day MAX. CONC.
Arsenic		339.8		680	136	0.295		
Cadmium	117	12.38	0.0115	25	5	<0.268		
Chromium (+3)	117	2055.68	0.391	4111	822	0.404		
Copper	117	18.05	0.795	36			5.664	4.688
Lead	117	124.81	0.1404	250	50	1.182		
Nickel	117	537.23		1074	215	2.721		
Zinc	117	138.47	1.831	277	55	42		84
Chloride (mg/L)		757	22	1514	303	101		142

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

Attachment #1

**Weekly Average Limits based on Chronic Toxicity Criteria (CTC)**

RECEIVING WATER FLOW = 4.8 cfs, (1/4 of 7-Q<sub>10</sub>), 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 <sub>99</sub>
Arsenic		152.2		1450	290	0.295	
Cadmium	84	2.14	0.0115	20	4	<0.268	
Chromium (+3)	84	114.34	0.391	1086	217	0.404	
Copper	84	8.9	0.795	78			4.478
Lead	84	23.62	0.1404	224	45	1.182	
Nickel	84	44.96		428	86	2.721	
Zinc	84	103.17	1.831	967	193	42	
Chloride (mg/L)		395	22	3576	715	101	

**Monthly Average Limits based on Wildlife Criteria (WC)**

The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

**Monthly Average Limits based on Human Threshold Criteria (HTC)**

RECEIVING WATER FLOW = 21 cfs, (1/4 of Harmonic Mean), as specified in s. NR 106.06(4)(c), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P <sub>99</sub>
Cadmium	370	0.0115	14254	2851	<0.268	
Chromium (+3)	3818000	0.391	147089907	29417981	0.404	
Lead	140	0.1404	5388	1078	1.182	
Nickel	43000		1656592	331318	2.721	

**Monthly Average Limits based on Human Cancer Criteria (HCC)**

RECEIVING WATER FLOW = 21 cfs, (1/4 of Harmonic Mean), as specified in s. NR 106.06(4)(c), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P <sub>99</sub>
Arsenic	13.3		512.4	102.5	0.295	

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 calculated limitations and effluent data, effluent limitations are not required for toxic substances.

Mercury– The permit application did not require monitoring for mercury because the Marathon Water & Sewer Department Wastewater Treatment Plant is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, “there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code.” A review of the past five years of sludge characteristics data reveals that all sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 2020 to 2024 was <1 mg/kg. **Therefore, no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code.

Available monitoring sample data from the Marathon City Waterworks (PWS ID: 73701518) is provided in the table below:

**Water Supply PFAS Data**

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
04/26/2022	616128001		<0.943	<0.943
04/18/2023	CB03838-01		0.91	0.83
Average =			0.455	0.415

The limited data above shows the municipal water supply is below 1/5th of the applicable PFOS and PFOA criteria.

However, based on the types of indirect dischargers contributing to the collection system, **PFOS and PFOA monitoring is recommended once every two months.**

**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 variable daily maximum 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.
- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.
- The Maximum expected 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:

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

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport Fishery, and

pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1795 samples were reported from October 2020 to August 2025. The maximum reported value was 7.60 s.u. (Standard pH Units). The effluent pH was 7.40 s.u. or less 99% of the time. The 1-day P<sub>99</sub>, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.48 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 7.46 s.u. Therefore, a value of 7.48 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 7.48 s.u. into the equation above yields an ATC = 20.49 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 the 1-Q<sub>10</sub> 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<sub>10</sub> (estimated as 80 % of 7-Q<sub>10</sub>) and the 2×ATC approach are shown below.

**Daily Maximum Ammonia Nitrogen Determination**

	Ammonia Nitrogen Limit mg/L
2×ATC	40.98
1-Q <sub>10</sub>	576

The 2×ATC method yields the most stringent limits for the Marathon Water & Sewer Department Wastewater Treatment Plant.

The current permit has variable daily maximum effluent limits based on effluent pH. Presented below is a table of daily maximum limitations corresponding to various effluent pH values.

**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 ammonia limit calculation also warrants evaluation of weekly and monthly average limits based on chronic toxicity criteria for ammonia, because those limits relate to the assimilative capacity of the receiving water.

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a Warm Water Sport Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

$$CTC = E \times \{ [0.0676 \div (1 + 10^{(7.688 - pH)})] + [2.912 \div (1 + 10^{(pH - 7.688)})] \} \times C$$

Where:

pH = the pH (s.u.) of the receiving water,

E = 0.854,

C = the minimum of 2.85 or  $1.45 \times 10^{(0.028 \times (25 - T))}$  – (Early Life Stages Present), or

C =  $1.45 \times 10^{(0.028 \times (25 - T))}$  – (Early Life Stages Absent), and

T = the temperature (°C) of the receiving water – (Early Life Stages Present), or

T = the maximum of the actual temperature (°C) and 7 - (Early Life Stages Absent)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q<sub>10</sub> (4-Q<sub>3</sub>, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q<sub>5</sub> (estimated as 85% of the 7-Q<sub>2</sub> if the 30-Q<sub>5</sub> is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 °C, 25% of the flow is used if the Temperature < 11°C, and 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

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Section NR 106.32 (3), Wis. Adm. Code, provides a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 °C, during the winter and spring months. Burbot, an early spawning species, are not believed to be present in the Big Rib River, based on raw fish data in the Fisheries Management Information System. So “ELS Absent” criteria apply from October through March, and “ELS Present” criteria will apply from April through September for a Warm Water Sport Fish classification.

The default basin assumed values are used for temperature and background ammonia. The pH values are from the Big Rib River. These values are shown in the table below, with the resulting criteria and effluent limitations.

**Weekly and Monthly Average Ammonia Nitrogen Limits – WWSF**

		April & May	June - September	October - March
<b>Effluent Flow</b>	Qe (MGD)	0.360	0.360	0.360
<b>Background Information</b>	7-Q <sub>10</sub> (cfs)	19	19	19
	7-Q <sub>2</sub> (cfs)	30	30	30
	Ammonia (mg/L)	0.08	0.05	0.14
	Average Temperature (°C)	12	19	3.5
	Maximum Temperature (°C)	14	21	10
	pH (s.u.)	7.70	8.01	7.64
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	9.50	19.00	4.75
	Reference Monthly Flow (cfs)	12.75	25.50	6.38
<b>Criteria mg/L</b>	4-day Chronic			
	Early Life Stages Present	8.99	4.09	9.54
	Early Life Stages Absent	9.03	4.09	12.76
	30-day Chronic			
	Early Life Stages Present	3.60	1.63	3.81
	Early Life Stages Absent	3.61	1.63	5.11
<b>Effluent Limitations mg/L</b>	Weekly Average			
	Early Life Stages Present	161	142	
	Early Life Stages Absent			120
	Monthly Average			
	Early Life Stages Present	84	74	
	Early Life Stages Absent			62

**Effluent Data**

The following table evaluates the statistics based upon ammonia data reported from October 2020 to August 2025.

**Ammonia Nitrogen Effluent Data**

Ammonia Nitrogen mg/L	April & May	June - September	October - March
1-day P <sub>99</sub>	25.11	11.54	32.46
4-day P <sub>99</sub>	14.54	6.58	17.69
30-day P <sub>99</sub>	9.19	2.82	9.00
Mean*	6.81	1.25	5.44
Std	4.96	2.93	6.98
Sample size	87	165	260
Range	0.44 - 24.12	<0.13 - 16.6	<0.19 - 26

\*Values lower than the limit of detection were substituted with a zero.

**Reasonable Potential**

The need to include ammonia limits in the Marathon Water & Sewer Department Wastewater Treatment Plant permit is determined by calculating 99th upper percentile (or P<sub>99</sub>) values for ammonia during the month ranges and comparing those to the calculated limits. Based on this comparison, daily limits are required October - March. However, since the permit currently has variable daily maximum, weekly and monthly average limits, **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.

**Expression of Limits**

Revisions to ch. NR 106, Wis. Adm. Code, in September 2016 aligned Wisconsin's WQBELs with 40 CFR § 122.45(d), which specifies that effluent limits for continuous dischargers must be expressed as weekly and monthly averages for publicly owned treatment works and as daily maximums and monthly averages for all other dischargers, unless shown to be impracticable. Because a daily maximum ammonia limit is necessary for the Marathon Water & Sewer Department Wastewater Treatment Plant, weekly and monthly average limits are also required under this code revision.

The methods for calculating limitations for municipal treatment facilities to conform to 40 CFR 122.45(d) are specified in s. NR 106.07(3), Wis. Adm. Code, and are as follows:

Whenever a daily maximum limitation is determined necessary to protect water quality, a weekly and monthly average limitation shall also be included in the permit and set equal to the daily maximum limit unless a more restrictive limit is already determined necessary to protect water quality.

In this case, the recommended daily maximum limits vary with effluent pH, so additional limits should be set equal to the highest recommended limit. Therefore, **monthly and weekly average limits of 108 mg/L** are recommended in the permit.

### **Conclusions and Recommendations**

In summary, after rounding to two significant figures, a variable daily maximum ammonia nitrogen limitation is recommended to continue along with additional monthly and weekly average limits to meet the requirements in s. NR 106.07, Wis. Adm. Code. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm. Code.

## **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.

Because the Marathon Water & Sewer Department Wastewater Treatment Plant 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 May through September. No changes are recommended to the current recreational period and the required disinfection season.

### **Effluent Data**

The Marathon Water & Sewer Department Wastewater Treatment Plant has monitored effluent *E. coli* from September 2023 to August 2025 and a total of 46 results are available. A geometric mean of 126 counts/100 mL was never exceeded in the last 10 months of monitoring, with a maximum monthly geometric mean of 119 counts/100 mL. Effluent data never exceeded 410 counts/100 mL. The maximum reported value was 400 counts/100 mL.

## 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.

**Since the Marathon Water & Sewer Department Wastewater Treatment Plant has previously exceeded the threshold to require a TBEL and the phosphorus limits in effect that are more stringent than 1.0 mg/L, the need for a TBEL will not be considered further.**

In addition, the need for a WQBEL for phosphorus must be considered.

### TMDL Limits

Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (April 2020)* and are based on the annual phosphorus wasteload allocation (WLA) given in lbs/yr. This WLA is found in [page/appendix] of the *Wisconsin River TMDL Report (April 2019)* and is expressed as a maximum annual load (lbs/yr). For the Marathon Water & Sewer Department Wastewater Treatment Plant, this WLA is 393 lbs/yr and 1.08 lbs/day.

Since WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL, limits given to continuously discharging facilities TMDL are given monthly average mass limits. If the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

$$\begin{aligned}\text{TP Equivalent Effluent Concentration} &= \text{Daily WLA} \div (\text{Flow Rate} * \text{Conversion Factor}) \\ &= 1.076 \text{ lbs/day} \div (0.360 \text{ MGD} * 8.34) \\ &= 0.36 \text{ mg/L}\end{aligned}$$

Since this value is greater than 0.3 mg/L, the WLA should be expressed as a monthly average mass limit for total phosphorus and no six-month average limit is required.

$$\begin{aligned}\text{TP Monthly Average Permit Limit} &= \text{Daily WLA} * \text{Monthly Average Multiplier} \\ &= 1.076 \text{ lbs/day} * 1.61 \\ &= 1.732 \text{ lbs/day}\end{aligned}$$

The multiplier used in the monthly average calculation was determined according to TMDL implementation guidance. A coefficient of variation (CV) of 0.78, along with the monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as thrice weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

Because the WLA-based WQBELs are protective of immediate receiving waters, TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required.

Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TP. Rolling 12-month sums can be compared directly to the annual wasteload allocation.

**Effluent Data**

	<b>Concentration (mg/L)</b>	<b>Mass Discharge (lbs/day)</b>
1-day P <sub>99</sub>	1.65	5.805
4-day P <sub>99</sub>	1.05	3.261
30-day P <sub>99</sub>	0.75	1.950
Mean	0.61	1.383
Std	0.31	1.163
Sample size	785	785
Range	0.11 - 2.93	0.17 - 10.30

**Antidegradation & Antibacksliding**

Because the mass-based effluent limitation for phosphorus is consistent with the wasteload allocation and assumptions of a US EPA approved TMDL that is designed to achieve water quality standards in ch. NR 102, Wis. Adm. Code, this TMDL based limitation may be included in a permit in lieu of the current phosphorus limit. Because the TP equivalent concentration is more restrictive than the interim phosphorus limit of 0.8 mg/L, removal of the monthly average limit will not increase the concentration, level, or loading of phosphorus to the Big Rib River. Therefore, antidegradation would not be applicable. To satisfy the requirements of s. NR 217.04, Wis. Adm. Code, a 1.0 mg/L TBEL is still required. To be consistent with antibacksliding requirements, the current limit may be removed in accordance with s. NR 207.12(4)(b), Wis. Adm. Code.

**Conclusions:**

In summary, the following limits are recommended by this evaluation:

- Monthly average Total Phosphorus concentration limit of 1.0 mg/L
- Monthly Average Total Phosphorus mass limit of 1.73 lbs/day

**PART 6 – 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 from October 2020 to August 2025.

Attachment #1

The table below summarizes the maximum temperatures reported during monitoring from January 2014 to December 2014.

**Monthly Temperature Effluent Data & Limits**

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	44	45	NA	120
FEB	43	44	NA	120
MAR	44	46	116	120
APR	45	46	76	120
MAY	54	55	102	120
JUN	63	64	NA	120
JUL	68	70	NA	118
AUG	68	70	NA	120
SEP	64	65	NA	120
OCT	60	64	118	120
NOV	56	57	119	120
DEC	49	50	NA	120

\* NA denotes “not applicable” when the calculated weekly average limit is greater than or equal to 120 °F.

**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 QBEL. 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 QBEL. 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

Based on the available effluent data no effluent limits are recommended for temperature. The complete thermal table used for the limit calculation is attached. Therefore, **no limits or monitoring for temperature are recommended.**

**PART 7 – 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<sub>50</sub> (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<sub>25</sub> (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 10%**, 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:

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

Where:

$Q_e$  = annual average flow = 0.360 MGD = 0.557 cfs

$f$  = fraction of the  $Q_e$  withdrawn from the receiving water = 0

$Q_s$  =  $\frac{1}{4}$  of the 7-Q<sub>10</sub> = 19 cfs  $\div$  4 = 4.75 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.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

**WET Data History**

Attachment #1

Date Test Initiated	Acute Results LC <sub>50</sub> %				Chronic Results IC <sub>25</sub> %					Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Algae (IC <sub>50</sub> )	Pass or Fail?	Use in RP?	
7/6/1995					36.8	16.8			No	1
7/7/1998	>100	>100	Pass	No		>100			No	1
8/11/1998					>100				No	1
5/6/1999	>100	>100	Pass	No	52.8			Pass	No	1
7/18/2000	>100	>100	Pass	No	>100	91.5		Pass	No	1
4/25/2002	>100	>100	Pass	No						1
11/12/2003	>100	>100	Pass	No						1
5/15/2012	>100	>100	Pass	No	41.8	65.7		Pass	No	1
7/10/2013	>100	>100	Pass	No						1
12/2/2014	>100	>100	Pass	No	>100	>100		Pass	No	1
9/20/2023	>100	>100	Pass	Yes						
10/16/2024	>100	>100	Pass	Yes						

Footnotes:

1. *Data Not Representative*. Significant upgrades were made to the wastewater treatment facility and these changes were assumed to be fully implemented by September 2023.
- 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.**

$$\text{Acute Reasonable Potential} = [(TUa \text{ effluent}) (B)]$$

$$\text{Chronic Reasonable Potential} = [(TUc \text{ effluent}) (B)(IWC)]$$

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC<sub>50</sub>, IC<sub>25</sub> or IC<sub>50</sub> ≥ 100%).

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

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>.

Attachment #1  
**WET Checklist Summary**

	<b>Acute</b>	<b>Chronic</b>
<b>AMZ/IWC</b>	Not Applicable. <b>0 Points</b>	IWC = 10%. <b>0 Points</b>
<b>Historical Data</b>	Two tests used to calculate RP. No tests failed. <b>0 Points</b>	Three tests used to calculate RP. No data within last 5 years. <b>5 Points</b>
<b>Effluent Variability</b>	Little variability, consistent WWTF operations. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Receiving Water Classification</b>	Warm Water Sport Fish (5 pts) <b>5 Points</b>	Same as Acute. <b>5 Points</b>
<b>Chemical-Specific Data</b>	Reasonable potential for Ammonia limits based on ATC. (5 pts) Ammonia nitrogen limit carried over from the current permit. Arsenic, Chloride, Chromium, Copper, Lead, Nickel, and Zinc detected. (3 pts) Additional Compounds of Concern: None. <b>8 Points</b>	No reasonable potential for limits based on CTC. Ammonia nitrogen limit carried over from the current permit. Ammonia, Arsenic, Chloride, Chromium, Copper, Lead, Nickel, and Zinc detected. (3 pts) Additional Compounds of Concern: None. <b>3 Points</b>
<b>Additives</b>	One Water Quality Conditioner (1 pt) added. Permittee has proper P chemical SOPs in place. <b>1 Point</b>	All additives are used more frequently than once per 4 days. <b>1 Point</b>
<b>Discharge Category</b>	Three Industrial Contributors. <b>7 Points</b>	Same as Acute. <b>7 Points</b>
<b>Wastewater Treatment</b>	Secondary or Better <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Downstream Impacts</b>	No impacts known. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Total Checklist Points:</b>	<b>21 Points</b>	<b>21 Points</b>
<b>Recommended Monitoring Frequency (from Checklist):</b>	2 tests in permit term	2 tests in permit term
<b>Limit Required?</b>	No	No
<b>TRE Recommended? (from Checklist)</b>	No	No

- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, two acute and chronic WET tests are recommended in the reissued permit. 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.

**Temperature limits for receiving waters with unidirectional flow**

(calculation using default ambient temperature data)

<b>Facility:</b>	Marathon Water & Sewer Department WWTP
<b>Outfall(s):</b>	701
<b>Date Prepared:</b>	10/9/2025
<b>Design Flow (Qe):</b>	0.352 MGD
<b>Storm Sewer Dist.</b>	0

<b>7-Q10:</b>	19.00 cfs	<b>Temp Dates</b>	<b>Flow Dates</b>
<b>Dilution:</b>	25%	<b>Start:</b>	01/01/14 10/01/20
<b>f:</b>	0	<b>End:</b>	12/31/14 08/31/25

**Stream type:** Small warm water sport or forage fish community  
**Qs:Qe ratio:** 8.7 :1

**Calculation Needed?** YES

Month	Water Quality Criteria		Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Flow Rate (Qe) (MGD)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default) (°F)	Sub-Lethal WQC (°F)		Acute WQC (°F)	7-day Rolling Average (Qes) (MGD)		Daily Maximum Flow Rate (Qea) (MGD)	Weekly Average (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)
JAN	33	49	76	0.277	0.302	0	44	45	NA	120
FEB	34	50	76	0.369	0.452	0	43	44	NA	120
MAR	38	52	77	0.676	1.095	0	44	46	116	120
APR	48	55	79	1.015	1.685	0	45	46	76	120
MAY	58	65	82	0.577	0.703	0	54	55	102	120
JUN	66	76	84	0.611	0.843	0	63	64	NA	120
JUL	69	81	85	0.713	1.497	0	68	70	NA	118
AUG	67	81	84	0.491	0.845	0	68	70	NA	120
SEP	60	73	82	0.337	0.393	0	64	65	NA	120
OCT	50	61	80	0.597	1.186	0	60	64	118	120
NOV	40	49	77	0.397	0.483	0	56	57	119	120
DEC	35	49	76	0.378	0.482	0	49	50	NA	120



# Marathon Water & Sewer Department WWTP



- Legend:** vector map layers may not be displayed
- ▲ Surface Water Outfalls
  - Latest Leaf Off Imagery

**Notes:**



**Map projection:** NAD 1983 NADN Wisconsin TM  
**Service Layer Credits:** Latest Leaf Off: DNR Basic Feature Vector Tile Layer WTK, - Permits & Determinations: WI DNR Bureau of Watershed Management  
**Map:** 0 320 640 Feet / 0 90 180 Meters  
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