

Village of Spencer Public Noticed Permit Fact Sheet

General Information

Permit Number:	WI-0021521-10-0
Permittee Name:	Village of Spencer, P O Box 360, 105 Park St, Spencer WI 54479
Discharge Location:	Spencer Wastewater Treatment Facility, 610 East Depot Street, Spencer, WI 54479 The north bank of the unnamed tributary, 200 feet east of the intersection of Truman Street and Hemlock Street in the Village of Spencer. SW1/4 NE1/4, Section 08, T26N R02E, Village of Spencer, Marathon County
Receiving Water:	the unnamed tributary of the Little Eau Pleine River, located in the Little Eau Pleine River Watershed in the Central Wisconsin River Basin
StreamFlow (Q _{7,10}):	0.01 cfs
Stream Classification:	Limited Aquatic Life (LAL), non-public water supply at the point of discharge. About 2.8 miles downstream, the Little Eau Pleine River is classified default warm water sport fish (WWSF) community, non-public water supply.
Discharge Type:	Existing, continuous
Design Flow	0.52 MGD (annual average)
Significant Industrial Loading?	Although not a “significant” industrial loading per s. 211.03(19m) Wis. Adm. Code, the permittee accepts industrial waste from Land O’Lakes and FBC industries Inc.
Operator at Proper Grade?	Yes
Approved Pretreatment Program?	No

Facility Description

The Village of Spencer owns and operates a biological wastewater treatment facility that accepts domestic wastewater from the Village of Spencer and pre-treated industrial wastewater from the Land O’Lakes dairy plant and FBC industries Inc. The Spencer treatment facility has an annual average design flow of 0.52 million gallons per day (MGD) and had an actual annual average effluent flow of 0.295 MGD in 2023. Primary treatment consists of screening and grit removal. This is followed by an oxidation ditch, which is operated in extended aeration mode, chemical (ferric chloride) phosphorous removal and final clarification. Effluent is disinfected May – September via ultraviolet light prior to discharge. Biosolids are stabilized aerobically, thickened, and stored onsite until land applied on Department approved fields. Significant effluent monitoring and/or limit changes this permit term are as follows: 1) the addition of annual monitoring for total nitrogen, nitrite + nitrate nitrogen and total Kjeldahl nitrogen, 2) addition of ammonia limits, 3) fecal coliform monitoring has been replaced with Escherichia coli (E. coli) monitoring and limits, 4) addition of chloride limits and a schedule to meet them, 5) removal of the copper limits and a reduction in the monitoring frequency, 6) an increase in the monitoring frequency for BOD, TSS, ammonia, phosphorus and chronic WET testing, 7) a reduction in the acute WET test frequency, and 8) monitoring for PFOS and PFOA every other month has been added in accordance with s. NR 106.98(2)(c), Wis. Adm. Code. The sample frequency for flow has been changed from “continuous” to “daily” at the effluent & influent for eDMR reporting purposes. Additionally, to quantitate the risk, PFAS sludge sampling has been included in the permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

Substantial Compliance Determination

Enforcement During Last Permit: None

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on 01/11/2024, the Spencer Wastewater Treatment Facility has been found to be in substantial compliance with their current permit.

Compliance determination entered by Nick Lindstrom on 01/12/2024.

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	0.286 MGD (2023)	Representative influent samples shall be collected in the screening room after the grit removal chamber.
001	0.295 (2023)	Representative effluent samples (grab and composite) shall be collected from the effluent discharge channel after the UV disinfection channel.
002	75 dry US tons	Representative sludge samples shall be collected from the storage tanks before being hauled or land applied and monitored annually for Lists 1, 2, 3 & 4 and PFOA + PFOS, and once in 2025 for PCBs.

1 Influent – Monitoring Requirements

Sample Point Number: 701- AFTER GRIT REMOVAL 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	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	2/Week	24-Hr Flow Prop Comp	

Changes from Previous Permit:

The sample frequency for flow has been changed from “continuous” to “daily” for eDMR reporting purposes.

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

Sample Point Number: 001- EFFLUENT TO TRIBUTARY

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	5/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	9.0 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	9.0 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	7.3 mg/L	3/Week	24-Hr Flow Prop Comp	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit & monitoring apply May - Sept.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit & monitoring apply May-Sept. See the E. coli Percent Limit section in permit. Enter the result in the DMR on the last day of the month.
Copper, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	Collect sample at the same time WET test samples are collected in those specific quarters.
Hardness, Total as CaCO3		mg/L	Quarterly	24-Hr Flow Prop Comp	Collect sample at the same time copper samples are

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					collected.
Chloride	Weekly Avg	400 mg/L	4/Month	24-Hr Flow Prop Comp	Samples shall be collected on four consecutive days each month. Monitoring applies at permit effective date. Limits apply 01/01/2026. See associated comp sched. for details. Collect sample at the same time WET test samples are collected in those specific quarters.
Chloride	Weekly Avg	1,735 lbs/day	4/Month	24-Hr Flow Prop Comp	
Chloride	Monthly Avg	400 mg/L	4/Month	Calculated	
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA sections below & in permit, as well as the associated schedule.
PFOA		ng/L	1/ 2 Months	Grab	
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	See TMDL section below & in permit
Phosphorus, Total	6-Month Avg	0.93 lbs/day	3/Week	Calculated	
Phosphorus, Total	Monthly Avg	2.8 lbs/day	3/Week	Calculated	
Phosphorus, Total		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 in 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 in permit.
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 below.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	
Acute WET		TUa	See Listed	24-Hr Flow	See WET testing section

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
			Qtr(s)	Prop Comp	below. Collect sample at the same time as a chloride and copper sample.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	

Changes from Previous Permit

1) the addition of annual monitoring for total nitrogen, nitrite + nitrate nitrogen and total Kjeldahl nitrogen, 2) addition of ammonia limits, 3) fecal coliform monitoring have been replaced with Escherichia coli (E. coli) monitoring and limits, 4) addition of chloride limits and a schedule to meet them, 5) removal of the copper limits and a reduction in the monitoring frequency, 6) an increase in the monitoring frequency for BOD, TSS, ammonia, phosphorus and chronic WET testing, 7) a reduction in the acute WET test frequency, 8) the sample frequency for flow has been changed from “continuous” to “daily” for eDMR reporting purposes, and 9) monitoring for PFOS and PFOA every other month has been added in accordance with s. NR 106.98(2)(c), Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

The effluent monitoring frequency for all parameters were considered. Monitoring frequencies are based on the size and type of the facility and are established to best characterize effluent quality and variability, to detect events of noncompliance, and to ensure fairness and consistency in permits issued across the state. Requirements in administrative code (NR 108, 205, 210 and 214 Wis. Adm. Code) and Section 283.55, Wis. Stats. were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. For more information see the March 22, 2021 version of the Bureau of Water Quality Program Guidance Document “Monitoring Frequencies for Individual Wastewater Permits”. Using the criteria previously stated, the department has made the following monitoring frequency changes: 1) the flow frequency from continuous to daily for eDMR reporting purposes, 2) the frequency for BOD, TSS, phosphorus, ammonia and chronic WET testing has increased, and 3) the frequency for copper monitoring has decreased.

Limits were determined for Spencer’s discharge to the unnamed tributary of the Little Eau Pleine 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 February 29, 2024 memo from Ben Hartenbower to Holly Heldstab titled “Water Quality-Based Effluent Limitations for Spencer Wastewater Treatment Facility WPDES Permit No. WI-0021521”.

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.

BOD, TSS, DO and pH: TSS limits are regulated by NR 102.04(1), Wis. Adm. Code. Categorical limits for pH are required per ch. NR 210 (Subchapter II). Chapter NR 102, Wis. Adm. Code ‘Water Quality Standards for Surface Waters’ also specifies requirements for pH for fish and aquatic life streams. Other than the increase in monitoring frequency for BOD & TSS from 2/week to 3/week, monitoring and limits for these pollutants correspond to the requirements of the current permit since the facility has not increased the capacity of the wastewater treatment system since the last permit issuance, nor are increases expected during the term of the proposed permit.

Ammonia: Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia. Based on effluent ammonia data submitted with the permit reissuance application, new daily max, weekly average and monthly average ammonia limits are required. Weekly average limits are required to meet the requirements of s. NR 106.07 Wis. Adm. Code. The permittee is able to meet the limits, therefore no schedule is required.

Disinfection/E. Coli/Fecal Coliform: Spencer disinfects the effluent May-Sept using ultraviolet (UV) light prior to discharge to the unnamed tributary of the Little Eau Pleine River. Fecal coliform monitoring and limits have been replaced with *Escherichia coli* (*E. coli*) monitoring and limits. Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying *E. coli* WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for *E. coli* while facilities are disinfecting during the recreation period and establish effluent limitations for *E. coli* established in s. NR 210.06 (2), Wis. Adm Code. The administrative code rule changes included the following actions: revised the bacteria water quality criteria from fecal coliform to *E. coli* to protect recreation in ch. NR 102, Wis. Adm. Code.; removed fecal coliform criteria for certain individual waters from ch. NR 104, Wis. Adm. Code.; revised permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code.; and, updated approved analytical methods for bacteria in ch. NR 219, Wis. Adm. Code.

Copper & Hardness: Using effluent data from the current permit term (September 2019 to December 2023), the 1-day P99 copper concentration is 23.5 mg/L, and the 4-day P99 of effluent data is 16.6 mg/L. These effluent concentrations are below the calculated WQBELs for copper, therefore no effluent limits are needed. The current limits were removed in accordance with s. NR 207.12(3)(a), Wis. Adm. Code. To ensure that representative sample results are available at the next permit issuance, copper monitoring continues but at a reduced rate of quarterly. Hardness monitoring is required because of the relationship between hardness and daily maximum copper limits based on acute toxicity.

Total Nitrogen Series: The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the “Guidance for Total Nitrogen Monitoring in Wastewater Permits” dated October 1, 2019. Annual tests are scheduled in the following quarters:

- 3rd quarter (July – Sept) 2024
- 2nd quarter (April – June) 2025
- 4th quarter (Oct – Dec) 2026
- 1st quarter (Jan – March) 2027
- 3rd quarter (July – Sept) 2028

Chloride: Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter VII of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride. Effluent chloride concentrations submitted during the last permit term (Sept 2019 to December 2023) indicate the need for limits, therefore weekly average and monthly average limits are included in the permit, along with a compliance schedule to meet them.

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 proposed permit was drafted, PFOS/PFOA monitoring is required because of the presence of PFOS/PFOA industrial wastes to the treatment works. Therefore, monitoring once every two months is included. 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.

Phosphorus: Spencer is included within the Wisconsin River Basin 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 TMDL SSC-based limits are consistent with the assumptions and requirements of the EPA-approved WLA in the TMDL, which is 280 lbs/yr annual total, which equates to limits of 2.8 lbs/day (monthly average) and 0.93 lbs/day (6-month average). The monthly average limit of 1.0 mg/L remains in the permit to prevent backsliding.

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://prodoasint.dnr.wi.gov/swims/downloadDocument.do?id=167886175>). For the reasons explained in the April 30, 2012 paper entitled 'Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin', WDNR has determined that it is impracticable to express the phosphorus WQBEL for the permittee as a maximum daily or weekly value. The final effluent limit for phosphorus is expressed as a monthly average. This final effluent limit was derived from and complies with the applicable water quality criterion.

Continuously discharging facilities covered by the WRB 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 (averaging period of May through October and November through April) are also included. The equivalent effluent concentration of 0.18 mg/L was calculated for the facility, thus, TMDL based mass limits are expressed as a six-month average and a monthly average equal to three times the six-month average limits.

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 and six-month 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.

WET Testing: Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised August 2016. (See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at <http://dnr.wi.gov/topic/wastewater/wet.html>). Chronic WET testing is required annually and a 2.6 TU_c limit is carried over from the last permit term. WET limit.

Acute WET tests are required in the following quarters:

- 2nd quarter (April – June) 2025
- 3rd quarter (July – Sept) 2028

Chronic WET tests are required in the following quarters:

- 2nd quarter (April – June) 2025
- 1st quarter (Jan – March) 2027
- 3rd quarter (July – Sept) 2028

Thermal: Requirements for Temperature are included in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature. Thermal discharges must meet the Public Health criterion of 120 degrees F and the Fish & Aquatic Life criteria which are established to protect aquatic communities from lethal and sub-lethal thermal effects. Based on the available effluent data, no effluent limits or monitoring are required.

Mercury: The permit application did not require monitoring for mercury because the Spencer Wastewater Treatment Facility 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 the sample results are within expected analytical ranges and well below the 17 mg/kg level. The concentration in the sludge from 2020 to 2023 was 1.07 kg/mg, with a maximum reported concentration of 2.20mg/kg. Therefore, no mercury monitoring is required at Outfall 001.

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 SOUR	Land Application	75
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						

Sample Point Number: 002- THICKENED LIQUID SLUDGE

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	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
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	
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 (NH ₄ -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 2025
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2025
PFOA + PFOS		ug/kg	Annual	Calculated	
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

Changes from Previous Permit:

PFAS – Monitoring is required once during the permit term pursuant s. NR 204.06(2)(b)9., Wis. Adm. Code.

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) 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 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.

4 Schedules

4.1 Chloride Schedule

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent discharges of chloride with conclusions regarding compliance.	12/31/2024
Action Plan: Submit an action plan for complying with the chloride effluent limitations. If construction is required, include plans and specifications with the submittal.	03/01/2025
Complete Actions: Complete actions necessary to achieve compliance with the chloride effluent limitations.	03/01/2026

Explanation of Schedule: The compliance schedule for chloride provides a schedule for conducting the actions necessary to comply with the new limits. The compliance schedule lays out a timeline for the permittee to investigate and implement a plan to comply with the limits by the end of the schedule.

4.2 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 PFOS and PFOA data collected including any voluntary influent, intake, in-plant, collection system sampling, and blank sample results.	06/30/2025
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 PFOS and PFOA data collected including any voluntary 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	06/30/2026

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.

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 PFOA/PFOA 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.

Special Reporting Requirements

None

Other Comments:

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

Attachments:

Water Quality Based Effluent Limits: February 29, 2024 memo from Ben Hartenbower to Holly Heldstab titled “Water Quality-Based Effluent Limitations for Spencer Wastewater Treatment Facility WPDES Permit No. WI-0021521”.

Expiration Date:

June 30, 2029

Justification Of Any Waivers From Permit Application Requirements

N/A

Prepared By: Holly Heldstab, Wastewater Specialist

Date: April 11, 2024

CORRESPONDENCE/MEMORANDUM

DATE: February 29, 2024

TO: Holly Heldstab– WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for the Spencer Wastewater Treatment Facility
WPDES Permit No. WI-0021521

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 Spencer Wastewater Treatment Facility in Marathon County. This municipal wastewater treatment facility (WWTF) discharges to the unnamed tributary of the Little Eau Pleine River, located in the Little Eau Pleine River Watershed in the Central Wisconsin River Basin. 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
Flow Rate						1,2
BOD ₅			30 mg/L	20 mg/L		1
TSS			30 mg/L	20 mg/L		1
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1
Ammonia Nitrogen October - March	9.0 mg/L		9.0 mg/L	7.3 mg/L		3
Bacteria <i>E. coli</i>				126#/100 mL geometric mean		4
Copper						2
Hardness						5
Chloride			400 mg/L, 1735 lbs/day	400 mg/L		3,6
PFOS and PFOA						7
Phosphorus TBEL TMDL Limit				1.0 mg/L 2.8 lbs/day	0.93 lbs/day	8
TKN, Nitrate+Nitrite, and Total Nitrogen						9
Acute WET						10
Chronic WET						10,11

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, NR 106.33, and NR 205.065(7), Wis. Adm. Codes, are included in bold.

4. Bacteria limits apply during the disinfection season of May-September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. Hardness monitoring is recommended because of the relationship between hardness and daily maximum limits based on acute toxicity criteria.
6. An alternative wet weather limit of 2960 lbs/day would also be needed in the permit.
7. Monitoring once every two months is required in accordance with s. NR 106.98(2), Wis. Adm. Code.
8. The phosphorus mass limit is based on the Total Maximum Daily Load (TMDL) for the Wisconsin River Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA on April 26, 2019 with site-specific criteria approved by EPA on July 9, 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. Total Nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total kjeldahl nitrogen (TKN) (all expressed as N).
10. Two Acute and three 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 and should continue after the permit expiration date (until the permit is reissued).
11. The Instream Waste Concentration (IWC) to assess chronic test results is 100%. 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 unnamed tributary of the Little Eau Pleine River.

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 (2) – Narrative & Map

PREPARED BY:



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Date: 02/29/2024

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**Water Quality-Based Effluent Limitations for
the Spencer Wastewater Treatment Facility
WPDES Permit No. WI-0021521**

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description:

The Village of Spencer owns and operates a biological wastewater treatment facility that accepts domestic wastewater from the Village of Spencer, pretreated industrial wastewater from a Land O Lakes dairy plant and hauled in holding tank waste from the surrounding area. FBC Industries is also an industrial contributor. The facility has an annual average design flow of 0.52 million gallons per day but typically operates at half capacity. Preliminary treatment consists of screening and grit removal. This is followed by an oxidation ditch operated in extended aeration mode, chemical phosphorus removal with ferric chloride, final clarification, and ultraviolet disinfection on a seasonal basis. Biosolids are stabilized aerobically, thickened, and stored onsite until applied to local farm fields. Treated effluent is discharged to an unnamed tributary of the Little Eau Pleine River.

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

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD ₅			30 mg/L	20 mg/L		1
TSS			30 mg/L	20 mg/L		1
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1
Ammonia Nitrogen						2
Fecal Coliform May-September			656#/100 mL geometric mean	400#/100 mL geometric mean		
Copper	29 µg/L, 0.44 lbs/day		18 µg/L, 0.08 lbs/day	18 µg/L		
Chloride						2
Hardness						2
Phosphorus TBEL TMDL Limit				1.0 mg/L 2.8 lbs/day	0.93 lbs/day	
Acute WET						3
Chronic WET						4

Footnotes:

Attachment #1

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. Acute WET testing required: Oct - Dec 2019, Apr - June 2021, and July - Sept 2023.
4. Chronic WET testing required: July - Sept 2023. The IWC for chronic WET was 100%.

Receiving Water Information

- Name: The unnamed tributary of the Little Eau Pleine River
- Waterbody Identification Code (WBIC): 3000047
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Limited Aquatic Life (LAL), non-public water supply at the point of discharge. About 2.8 miles downstream, the Little Eau Pleine River is classified default warm water sport fish (WWSF) community, non-public water supply.
- Low Flow: Low flow values at the point of discharge are zero. The following 7-Q10 and 7-Q2 values for the Little Eau Pleine River are used for downstream calculations.
7-Q10 = 0.01 cfs (cubic feet per second)
7-Q2 = 0.01 cfs
- Hardness = 217 mg/L as CaCO₃. This value represents the geometric mean effluent data. Effluent hardness is used in place of receiving water because there is no receiving water flow upstream of the discharge.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero.
- Source of background concentration data: Background concentrations are not included because they do not impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None
- Impaired water status: This discharge is located within the WI River TMDL for phosphorus.

Effluent Information:

- Design Flow Rates(s):
Annual Average = 0.520 MGD (Million Gallons per Day)
Peak daily = 1.820 MGD
Peak weekly = 1.187 MGD (estimated)
Peak monthly = 0.810 MGD
For reference, the actual average flow from September 2019 to December 2023 was 0.302 MGD.
- Hardness = 217 mg/L as CaCO₃. This value represents the geometric mean of 17 effluent samples collected from 12/05/2019 to 11/01/2023.
- 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).
- Water Source: Domestic wastewater with water supply from the wells and non-domestic contribution from Land O' Lakes.
- Additives: Ferric Chloride
- Total Phosphorus Wasteload Allocation: 280 lbs/year = 0.767 lbs/day

Attachment #1

- 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. The permit-required monitoring for Ammonia, Copper, Chloride, Hardness, and Phosphorus from September 2019 to December 2023 is used in this evaluation.

Chemical Specific Effluent Data at Outfall 001

	Copper µg/L	Chloride mg/L
1-day P ₉₉	23.53	568
4-day P ₉₉	16.61	453
30-day P ₉₉	12.98	389
Mean	11.19	453
Std	3.98	76
Sample size	56	17
Range	2.5 - 31	258 - 514

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.”.

The following table presents the average concentrations and loadings at Outfall 001 from September 2019 to December 2023 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6):

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD ₅	3 mg/L*	
TSS	6 mg/L*	
pH	7.12 s.u.	
Dissolved Oxygen	10 mg/L	
Fecal Coliform	22#/100 mL	
Copper	11.19 ug/L	0.0315 lbs/day
Phosphorus	0.2063 mg/L*	0.58 lbs/day

*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 P₉₉) 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-Q₁₀

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-Q₁₀ 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_s = average minimum 1-day flow which occurs once in 10 years (1-day Q₁₀)
if the 1-day Q₁₀ flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q₁₀).

Q_e = 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_s = 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-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for the Village of Spencer Wastewater Treatment Facility.

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 = 0.00 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), 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 P99	1-day MAX. CONC.
Arsenic		339.8		339.8	67.96	<0.989		
Cadmium	217	70.15		70.15	14.03	<0.19		
Chromium	217	3399.13		3399.1	679.8	<1.1		
Copper	217	32.21		32.2			23.5	31
Lead	217	225.9		225.9	45.2	<1		
Nickel	217	903.18		903.2	180.6	<8		
Zinc	217	236.9		236.9	47.4	34		
Chloride		757		757			568	514

** Per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016 consideration of ambient concentrations and 1-Q₁₀ flow rates yields a more restrictive limit than the 2 × ATC method of limit calculation.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0.00 cfs (¼ of the 7-Q₁₀), 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 P99
Arsenic		152.2		152.2	30.4	<0.989	
Cadmium	175	3.82		3.8	0.8	<0.19	
Chromium	217	249.06		249.1	49.8	<1.1	
Copper	217	20.08		20.1			16.6
Lead	217	59.17		59.2	11.8	<1	
Nickel	217	141.36		141.4	28.3	<8	
Zinc	217	236.9		236.9	47.4	34	
Chloride		395		395			453

* 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.

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 = 0.00 cfs (1/4 of Harmonic Mean), as specified in s. NR 106.06 (4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MOLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	880		880	176	<0.19
Chromium	8400000		8400000	1680000	<1.1
Lead	2240		2240	448	<1
Nickel	110000		110000	22000	<8

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 0.00 cfs (1/4 of Harmonic Mean), as specified in s. NR 106.06 (4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MOLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	40		40	8	<0.989

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, limits are required for Chloride.

Chloride – Considering available effluent data from the current permit term (September 2019 to December 2023), the 30-day P₉₉ concentration is 389 mg/L, the 4-day P₉₉ concentration is 453 mg/L, and the 1-day P₉₉ concentration is 568 mg/L, with a maximum concentration of 514 mg/L. The effluent exceeds the calculated **weekly limit of 400 mg/L**, therefore concentration and mass limits, as well as monthly monitoring, are required.

The **weekly mass limitation of 1735 lbs/day** is based on the concentration limit and the annual average flow of 0.52 MGD (400 mg/L * 0.52 MGD * 8.34) in accordance with s. NR 106.07(2)(c), Wis. Adm. Code. An **alternate wet weather mass limit of 2960 lbs/day** was calculated using the estimated weekly design flow of 1.187 MGD.

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 weekly chloride limit is necessary for the Spencer Wastewater Treatment Facility, a monthly average limit is 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 weekly average limitation is determined necessary to protect water quality, a monthly average limitation shall be set equal to the weekly average limitation or the monthly average water quality-based effluent limitation, whichever is more restrictive.

Therefore, **a monthly average limit of 400 mg/L** is also recommended in the permit.

Copper – Considering available effluent data from the current permit term (September 2019 to December 2023), the 4-day P₉₉ concentration is 16.6 µg/L and the 1-day P₉₉ concentration is 23.5 µg/L, with a maximum concentration of 31 µg/L.

These effluent concentrations are below the calculated WQBELs for copper, therefore no effluent limits are needed. The removal of the daily maximum, weekly and monthly average copper limits will not increase the concentration, level, or loading of copper to the unnamed tributary of the Little Eau Pleine River. Therefore, antidegradation would not be applicable. To be consistent with antibacksliding requirements, the current limits may be removed in accordance with s. NR 207.12(3)(a), Wis. Adm. Code. To ensure that representative sample results are available at the next permit issuance, **copper and hardness monitoring are recommended to continue.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98, Wis. Adm. Code. Based on the nondomestic contributions, **PFOS and PFOA monitoring is recommended once every two months.**

Mercury – The permit application did not require monitoring for mercury because the Spencer Wastewater Treatment Facility 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). A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 2020 to 2023 was 1.07 mg/kg, with a maximum reported concentration of 2.20 mg/kg. **Therefore, no mercury monitoring is recommended at Outfall 001.**

**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. Given the fact that the Spencer Wastewater Treatment Facility does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

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.

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

Where:

A = 0.633 and B = 90.0 for Limited Aquatic Life, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1581 sample results were reported from September 2019 to December 2023. The maximum reported value was 8.19 s.u. (Standard pH Units). The effluent pH was 8.02 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.87 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 7.84 s.u. Therefore, a value of 8.02 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 8.02 s.u. into the equation above yields an ATC = 12.48 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-Q₁₀ 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-Q₁₀ (estimated as 80 % of 7-Q₁₀) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC (LAL)	24.95
1-Q ₁₀ (LAL)	12.48
2×ATC (WWSF)	16.19
1-Q ₁₀ (WWSF)	8.18

The 1-Q₁₀ method calculated for downstream protection of the WWSF classification change yields the most stringent limits for the Spencer Wastewater Treatment Facility.

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, since 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 Limited Aquatic Life 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 = 1.0,

C = $8.09 \times 10^{(0.028 \times (25 - T))}$

T = the temperature (°C) of the receiving water $\times 10^{(0.028 \times (25 - T))}$

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-Q₁₀ (4-Q₃, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q₅ (estimated as 85% of the 7-Q₂ if the 30-Q₅ 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.

The “default” basin assumed values are used for temperature and background ammonia concentrations, because minimum ambient data is available. The values for pH are based on data collected from the Little Eau Pleine River. These values are shown in the table below, with the resulting criteria and effluent limitations.

Weekly and Monthly Ammonia Nitrogen Limits – LAL

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
Effluent Flow	Qe (MGD)	0.520	0.520	0.520
Background Information	7-Q ₁₀ (cfs)	0.00	0.00	0.00
	7-Q ₂ (cfs)	0.00	0.00	0.00
	Ammonia (mg/L)	0.07	0.04	0.14
	Temperature (°C)	13.3	17.8	9.4
	pH (s.u.)	7.38	7.43	7.34
	% of Flow used	25	100	25
	Reference Weekly Flow (cfs)	0.000	0.000	0.000
	Reference Monthly Flow (cfs)	0.000	0.000	0.000
Criteria mg/L	4-day Chronic	84.83	61.09	112.10
	30-day Chronic	33.93	24.44	44.84
Effluent Limits mg/L	Weekly Average	84.83	61.09	112.10
	Monthly Average	33.93	24.44	44.84

Downstream Protection

The seasonal averages of temperature and pH data from the South Branch of the Yellow River in 2011 stored in the SWIMS database are used in this evaluation. Since minimal ambient ammonia concentration data is available, the “default” basin assumed values are used. Background values are shown in the table below, with the resulting criteria and effluent limitations.

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 Little Eau Pleine River. So “ELS Absent” criteria apply from October through March, and “ELS Present” criteria will apply from April through September for a WWSF classification.

Weekly and Monthly Ammonia Nitrogen Limits – WWSF (2.8 miles downstream)

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
Effluent Flow	Qe (MGD)	0.520	0.520	0.520
Background Information	7-Q ₁₀ (cfs)	0.01	0.01	0.01
	7-Q ₂ (cfs)	0.01	0.01	0.01
	Ammonia (mg/L)	0.07	0.04	0.14
	Temperature (°C)	14.4	20.6	10.0
	pH (s.u.)	7.38	7.43	7.34
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	0.005	0.01	0.0025
	Reference Monthly Flow (cfs)	0.00425	0.0085	0.002125
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	12.03	7.82	12.37
	Early Life Stages Absent	12.09	7.82	16.56
	30-day Chronic			
	Early Life Stages Present	4.81	3.13	4.95
	Early Life Stages Absent	4.83	3.13	6.62

Attachment #1

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	12.10	7.91	
	Early Life Stages Absent			16.61
	Monthly Average			
	Early Life Stages Present	4.84	3.16	
	Early Life Stages Absent			6.64

Ammonia Decay

The Department must establish limits to protect downstream uses, according to s. NR 106.32(1)(b), Wis. Adm. Code. Ammonia decay may be considered when determining limits at the outfall to protect the downstream classification, according to s. NR 106.32(4)(c), Wis. Adm. Code. Where the calculated limits are more restrictive based on downstream uses, ammonia decay can be considered to determine if these more restrictive limits are needed or if the ammonia will decay before it reaches the point of the classification change.

Ammonia decay rates are dependent on temperature with in-stream nitrification essentially non-existent in the winter. In-stream decay is expected so a first order decay model should be used. Based on the available literature, a decay rate of 0.25 day⁻¹ at 20°C has been suggested as a default rate. A temperature correction factor of $\theta = 1.08$ is ($k_t = k_{20} \theta^{(T-20)}$). The ammonia nitrogen decay equation is provided below.

$$N_{Limit} = \left(\frac{N_{down}}{EXP(-k_t T)} \right)$$

- Where: N_{Limit} = Ammonia limit needed to protect downstream use (mg/L)
- N_{down} = Ammonia limit calculated based on downstream classification and flow (mg/L)
- $-k_t$ = Ammonia decay rate at background stream temperature (day⁻¹)
- T = Travel time from outfall to downstream use (day)

The velocity of receiving water is assumed to be 3.5 miles per day and the distance from the point of discharge to the classification change is approximately 2.8 miles for a travel time of 0.8 days. After decay, the limits are increased as shown in the following table.

Months Applicable	LAL		WWSF			After decay		
	Weekly Average mg/L	Monthly Average mg/L	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
April & May	84.83	33.93	8.18	12.10	4.84	9.31	13.79	5.51
June-Sept	61.09	24.44	8.18	7.91	3.16	10.07	9.75	3.89
Oct-Mar	112.10	44.84	8.17	16.61	6.64	8.97	18.22	7.28

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from September 2019 to December 2023, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Spencer Wastewater Treatment Facility permit for the respective month ranges.

Ammonia Nitrogen Effluent Data			
Ammonia Nitrogen mg/L	April & May	June-September	October-March
1-day P ₉₉	N/A	N/A	40.72
4-day P ₉₉	N/A	N/A	22.28
30-day P ₉₉	N/A	N/A	9.75
Mean*	0.72	0.12	4.55
Std	3.33	1.20	10.64
Sample size	8	17	32
Range	<0.13 - 5.22	<0.13 - 1.88	<0.13 - 28

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

Based on this comparison, daily maximum, weekly average, and monthly average limits are required October through March.

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.

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 the case of the required limits for October through March, the recommended daily maximum limit is more restrictive than the calculated weekly average. Therefore, **a weekly average limit set equal to the daily maximum limit of 9.0 mg/L** along with the **calculated daily max and monthly average limits** are recommended in the permit.

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
October - March	9.0	9.0	7.3

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 the Spencer 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 required disinfection season.

Effluent Data

The Spencer Wastewater Treatment Facility has monitored effluent *E. coli* from June 2023 to September 2023 and a total of 14 results are available. A geometric mean of 126 counts/100 mL was never exceeded, with a maximum monthly geometric mean of 6 counts/100 mL. Effluent data never exceeded 410 counts/100 mL. The maximum reported value was 23 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.

Attachment #1
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 the Spencer 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

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* (May 2020). The wasteload allocations (WLA) that implement site-specific criteria for Lakes Petenwell, Castle Rock, and Wisconsin are found in Appendix K of the *Total Maximum Daily Loads for Total Phosphorus in the Wisconsin River Basin (WRB TMDL)* report dated April 26, 2019 and are expressed as maximum annual loads (lbs/year) and maximum daily loads (lbs/day). The WLA that implement statewide criteria found in Appendix J of the TMDL report are no longer applicable following approval of these site-specific criteria. The daily WLAs in the WRB TMDL equals the annual WLA divided by the number of days in the year. Therefore, the daily WLA is an annual average. Since the derivation of daily WLAs from annual WLAs does not take effluent variability or monitoring frequency into consideration, maximum daily WLAs from the WRB TMDL should not be used directly as permit effluent limits.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL.

Therefore, limits given to continuously discharging facilities covered by the WRB 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:

$$\begin{aligned} \text{TP Equivalent Effluent Concentration} &= \text{Daily WLA} \div (\text{Flow Rate} * \text{Conversion Factor}) \\ &= 0.767 \text{ lbs/day} \div (0.520 \text{ MGD} * 8.34) \\ &= 0.18 \text{ mg/L} \end{aligned}$$

Since this value is less than 0.3 mg/L, both a six-month average mass limit and a monthly average mass limit are applicable for total phosphorus. The monthly average limit is set equal to three times the six-month average limit.

$$\begin{aligned} \text{TP 6-Month Average Permit Limit} &= \text{Daily WLA} * \text{6-Month average multiplier} \\ &= 0.767 \text{ lbs/day} * 1.21 \\ &= 0.93 \text{ lbs/day} \end{aligned}$$

$$\begin{aligned} \text{TP Monthly Average Permit Limit} &= \text{TP 6-Month Average Permit Limit} * 3 \\ &= 0.93 \text{ lbs/day} * 3 \\ &= 2.78 \text{ lbs/day} \end{aligned}$$

The multiplier used in the six-month average calculation was determined according to TMDL implementation guidance. The standard coefficient of variation of 0.6, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as twice weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

The WRB TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries to the Wisconsin River. Therefore, WLA-based WQBELs are protective of immediate receiving waters and 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. Six-month average limits apply in the periods May – October and November – April.

Effluent Data

The following table lists the statistics for effluent phosphorus levels from September 2019 to December 2023 for informational purposes. In the cases where reporting the mass discharge is not required in the current permit, the mass is calculated using the reported phosphorus concentration and the effluent flow rate for that day.

Total Phosphorus Statistics

	Concentration (mg/L)	Mass Discharge (lbs/day)
1-day P ₉₉	0.67	2.14
4-day P ₉₉	0.40	1.24
30-day P ₉₉	0.27	0.78
Mean	0.21	0.58
Std	0.13	0.42
Sample Size	422	422
Range	<0.011 - 0.87	0.09 - 3.50

Conclusions:

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

- Total Phosphorus concentration limit of 1.0 mg/L
- Monthly average Total Phosphorus mass limit of 2.8 lbs/day
- Six-month average Total Phosphorus mass limit of 0.93 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 Chapters NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The daily maximum effluent temperature limitation shall be 86 °F for discharges to surface waters classified as Limited Aquatic Life according to s. NR 104.02(3)(b)1, Wis. Adm. Code, except for those classified as wastewater effluent channels and wetlands regulated under ch. NR 103 [s. NR 106.55(2), Wis. Adm. Code] which has a daily maximum effluent temperature limitation of 120 °F.

Reasonable Potential

Based on the available discharge temperature data from 05/01/2011 to 12/31/2012 shown below, the maximum daily effluent temperature reported was 74 °F; therefore, no reasonable potential for exceeding the daily maximum limit exists, and **no limits or monitoring are recommended.**

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	48	49	-	86
FEB	47	48	-	86
MAR	57	58	-	86
APR	55	56	-	86
MAY	63	64	-	86
JUN	68	70	-	86
JUL	73	74	-	86
AUG	71	74	-	86
SEP	71	73	-	86
OCT	65	66	-	86
NOV	57	60	-	86
DEC	51	52	-	86

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 LC50 (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 IC₂₅ (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 **100%** 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:

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

Where:

Q_e = annual average flow = 0.520 MGD = 0.805 cfs

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

Q_s = 1/4 of the 7-Q₁₀ = 0.01 cfs ÷ 4 = 0.0025 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual*, 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.
- 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.

Attachment #1
WET Data History

Date Test Initiated	Acute Results LC ₅₀ %				Chronic Results IC ₂₅ %					Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Algae (IC50)	Pass or Fail?	Use in RP?	
06/02/2005					>100	>100		Pass	No	1,2
08/18/2005					>100	>100		Pass	No	2
11/29/2005	>100	>100	Pass	No	>100	>100		Pass	No	2
03/14/2006					15.83	>100		Fail	No	2
04/18/2006					>100	>100		Pass	No	2
06/01/2006					>100	>100		Pass	No	2
06/22/2006					>100	>100		Pass	No	2
08/25/2015					>100	>100		Pass	No	2
09/19/2006					>100	>100		Pass	No	2
11/16/2006					>100	>100		Pass	No	2
02/15/2007					>100	>100		Pass	No	2
06/07/2007					>100	>100		Pass	No	2
08/21/2007					>100	>100		Pass	No	2
10/25/2007	>100	>100	Pass	No	>100	>100		Pass	No	2
03/20/2008					>100	>100		Pass	No	2
05/15/2008					>100	>100		Pass	No	2
08/21/2008					>100	>100		Pass	No	3
10/23/2008					>100	>100		Pass	No	3
03/19/2009					>100	>100		Pass	No	3
06/11/2009					>100	>100		Pass	No	3
09/15/2009					>100	>100		Pass	No	3
11/17/2009					>100	>100		Pass	No	3
03/11/2010					>100	>100		Pass	No	3
05/13/2010					>100	>100		Pass	No	3
09/16/2010					>100	>100		Pass	No	3
11/11/2010					>100	>100		Pass	No	3
03/03/2011	>100	>100	Pass	No	>100	>100		Pass	No	3
07/19/2011	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
09/08/2011					>100	>100		Pass	Yes	
11/08/2011					>100	>100		Pass	Yes	
03/08/2012					>100	>100		Pass	Yes	
06/14/2012					>100	>100		Pass	Yes	
03/12/2013					>100	>100		Pass	Yes	
04/08/2014					>100	>100		Pass	Yes	
08/25/2015					>100	>100		Pass	Yes	
11/19/2019	>100	>100	Pass	Yes						
05/25/2021	>100	>100	Pass	Yes						
08/15/2023	>100	>100	Pass	No	57.2	>100		Fail	No	4
10/24/2023					>100	>100		Pass	Yes	
11/14/2023					>100	>100		Pass	Yes	

Footnotes:

1. *Previous Data Not Representative.* Significant changes were made to WET test methods in 2004 and these changes were assumed to be fully implemented by certified labs by no later than June 2005.

Attachment #1

2. *Data Not Representative.* WWTP, industrial processes or contributions, or other significant changes have occurred which renders data unrepresentative. Completion of a successful TRE, which found and fixed the source of toxicity, caused data prior to the TRE to no longer be representative of the discharge.
 3. *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.
 4. *Qualified Data.* Unusual or upset conditions were present at the treatment plant during testing which calls into question the representativeness of the test results.
- 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.**

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

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

According to s. NR 106.08(6)(d), Wis. Adm. Code, TU_a and TU_c 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 = $0 < 1.0$, 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>.

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. 0 Points	IWC = 100%. 15 Points
Historical Data	Three tests used to calculate RP. No tests failed. 0 Points	Ten tests used to calculate RP. No tests failed. 0 Points
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. 0 Points	Same as Acute. 0 Points

Attachment #1

	Acute	Chronic
Receiving Water Classification	< 4 mi to WWSF (5 pts) 5 Points	Same as Acute. 5 Points
Chemical-Specific Data	Reasonable potential for limits for Ammonia based on ATC; (5 pts) Chloride, Copper, and Zinc detected. (3 pts) Additional Compounds of Concern: None 8 Points	Reasonable potential for limits for Ammonia and Chloride based on CTC; (6 pts) Copper and Zinc detected. (2 pts) Additional Compounds of Concern: None 8 Points
Additives	One Water Quality Conditioner added. (1 pt) Permittee has proper P chemical SOPs in place: Yes 1 Point	Additive used more than once per 4 days. 1 Point
Discharge Category	One Industrial Contributor. (5 pts) 5 Points	Same as Acute. 5 Points
Wastewater Treatment	Secondary or Better 0 Points	Same as Acute. 0 Points
Downstream Impacts	No impacts known 0 Points	Same as Acute. 0 Points
Total Checklist Points:	19 Points	34 Points
Recommended Monitoring Frequency (from Checklist):	2 tests during permit term	3 tests during permit term
Limit Required?	No	No
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 **two acute and three chronic WET tests are recommended 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).

