

Permit Fact Sheet

General Information

Permit Number:	WI-0027995-11-0	
Permittee Name:	Village of Plover	
Address:	P O Box 37	
City/State/Zip:	Plover WI 54467	
Discharge Location:	South bank of Wisconsin River ~ 9 miles upstream of dam at Nd Paper Inc. (44.4614682, -89.6093879)	
Receiving Water:	Wisconsin River in the Fourmile and Fivemile Creek Watershed (Central Wisconsin River Basin), Portage County	
StreamFlow (Q _{7,10}):	7-Q ₁₀ = 1160 cfs (cubic feet per second) 7-Q ₂ = 1190 cfs 90-Q ₁₀ = 1590 cfs	
Stream Classification:	Warm Water Sport Fish (WWSF) community, non-public water supply	
Discharge Type:	Continuous, Surface Water	
Design Flow(s)	Daily Maximum	2.6 MGD (Million Gallons per Day)
	Annual Average	1.800 MGD
Significant Industrial Loading?	Yes. Del Monte Foods, Monogram Foods, Silgan Containers, Ingredion Foods McCains Foods (formerly Infinity), Oso Brewing, and Online Packaging Inc.	
Operator at Proper Grade?	Yes. Certification #32592 Biological Solids/Sludge Handling, Processing & Reuse - Advanced Biological Treatment: Suspended Growth Processes - Advanced Disinfection - Advanced Laboratory - Advanced Nutrient Removal: Total Phosphorus - Advanced Sanitary Sewage Collection System - Basic Solids Separation - Advanced	
Approved Pretreatment Program?	N/A	

Facility Description

The Plover Wastewater Treatment Facility (WWTF) treats domestic and industrial waste. The annual average design flow of the facility is 1.8 million gallons per day (MGD). Del Monte Foods, Monogram Foods, Silgan Containers, Ingredion Foods, McCains Foods (formerly Infinity), Oso Brewing, and Online Packaging Inc. Additionally, the WWTF treats leachate from Portage, Oneida and Lincoln Counties, as well as septage and holding tank waste. Preliminary treatment consists of screening and grit removal. Additional treatment includes activated sludge treatment through the use of a three-ring oxidation ditch (aerobic and anaerobic) and biological phosphorus removal. A chemical feed system is also in

place to provide chemical phosphorus removal as a back-up for the biological removal system. Seasonal disinfection (May – Sept) via ultraviolet (UV) light is conducted prior to discharge of effluent to the Wisconsin River. Biosolids generated at the facility are thermally aerobic digested and then pressed into a cake sludge. The sludge is stored in a building onsite until it is landspread on Department approved agricultural fields.

Substantial Compliance Determination

Enforcement During Last Permit:

Fecal coliform limit exceedances occurred in May 2020 and August 2021 resulting from temporary outages of the UV disinfection system. No formal enforcement action taken.

After a desk top review of all discharge monitoring reports, Compliance Maintenance Annual Reports (CMARs), the Capacity, Management, Operations and Maintenance (CMOM) Program, and a site visit on **June 28, 2023**, this facility has been found to be in substantial compliance with their current permit.

Compliance determination entered by Nicholas Lindstrom, wastewater compliance engineer, on July 7, 2023.

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	1.47 MGD annual average (2019 – 2023 reported data)	INFLUENT: Representative samples shall be collected from the influent channel after the fine screen and prior to the grit removal system.
001	Flow not measured at Sample Point 001	EFFLUENT: Representative 24 hr flow proportional composite samples shall be collected after the clarifiers from the collection well prior to disinfection. Grab samples shall be collected after the disinfection channel effluent weir prior to discharge to the Wisconsin River.
002	312 dry tons land applied annually on average (3400-55 form data 2019-2023)	MUNICIPAL SLUDGE: Representative sludge samples shall be collected from the cake storage and prior to land application.
103	N/A	MERCURY FIELD BLANK: The field blank shall be collected using standard handling procedures each day mercury samples are collected.

1 Influent – Monitoring Requirements

Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
CBOD5		mg/L	5/Week	24-Hr Flow	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
				Prop Comp	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Quarterly	24-Hr Flow Prop Comp	

Changes from Previous Permit

Influent monitoring requirements were re-evaluated for the proposed permit term. There are no changes to influent monitoring.

Explanation of Limits and Monitoring Requirements

CBOD5 and Total Suspended Solids: Tracking of CBOD5, and Suspended Solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code. As allowed by s. NR 210.05(1)(d), Wis. Adm. Code, the permittee had previously requested that the Department substitute the parameter CBOD5 for the parameter BOD5 for the purpose of demonstrating compliance with the required 30-day average influent to effluent percent removal rate of 85%. BOD5 is not monitored in the effluent.

2 Inplant - Monitoring and Limitations

Sample Point Number: 103- MERCURY FIELD BLANK

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

Changes from Previous Permit

Explanation of Limits and Monitoring Requirements

3 Surface Water - Monitoring and Limitations

Sample Point Number: 001- EFFLUENT TO WISCONSIN RIVER

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
CBOD5	Weekly Avg	40 mg/L	5/Week	24-Hr Flow Prop Comp	
CBOD5	Monthly Avg	25 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 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	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	108 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	108 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia Variable Limit	Daily Max	mg/L	3/Week	See Table	Look up the variable ammonia limit from the 'Variable Ammonia Limitations' table in the permit. Report the variable limit in the 'Nitrogen, Ammonia Variable Limit' column on the DMR.
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	2/Week	Grab	Interim limit effective May through September annually until the final E. coli limit goes into effect per the 'Effluent Limitations for E. coli' Schedule.
E. coli		#/100 ml	Weekly	Grab	Monitoring only May through September annually until the final limit goes into effect per the 'Effluent Limitations for E. coli' Schedule.
E. coli	Geometric Mean - Monthly	126#/100 ml	Weekly	Grab	Limit effective May through September annually per the 'Effluent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Limitations for E. coli' Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit Effective May through September annually per the 'Effluent Limitations for E. coli Schedule'. See the 'E. coli Percent Limit' section below. Enter the result in the DMR on the last day of the month.
Mercury, Total Recoverable		ng/L	Quarterly	Grab	Monitoring only. See 'Mercury Monitoring' and 'Mercury - Pollutant Minimization Program' sections below.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only during calendar year 2028. See 'Chloride Monitoring Requirements' section in permit below.
Phosphorus, Total	Monthly Avg	0.93 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	7.96 lbs/day	3/Week	Calculated	
Phosphorus, Total		lbs/month	3/Week	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See 'TMDL Calculations' section in permit.
Phosphorus, Total		lbs/yr	3/Week	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 permit subsection 'Total Maximum Daily Load (TMDL) Limitations for Total Phosphorus'.
Nitrogen, Total		mg/L	Quarterly	24-Hr Flow	See permit subsection

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Kjeldahl				Prop Comp	'Nitrogen Series Monitoring'.
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	See permit subsection 'Nitrogen Series Monitoring'.
Nitrogen, Total		mg/L	Quarterly	Calculated	See permit subsection 'Nitrogen Series Monitoring'. Total Nitrogen = Total Kjeldahl N (mg/L) + (Nitrite + Nitrate Nitrogen) (mg/L)
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See permit subsections 'PFOS/PFOA Sampling and Reporting Requirements' and 'PFOS/PFOA Minimization Plan Determination of Need' and permit schedule 'PFOS/PFOA Minimization Plan Determination of Need'.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See permit subsections 'PFOS/PFOA Sampling and Reporting Requirements' and 'PFOS/PFOA Minimization Plan Determination of Need' and permit schedule 'PFOS/PFOA Minimization Plan Determination of Need'.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See permit subsection 'Whole Effluent Toxicity (WET) Testing'.

Changes from Previous Permit

E. coli - Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits. See additional explanation of limits under “Explanation of Limits and Monitoring Requirements” below. Fecal Coliform Geometric Mean – Wkly limit of 656 #/100 ml was removed.

Nitrogen, Ammonia (NH3-N) Total – The monitoring frequency was increased from 2/Week to 3/Week.

Phosphorus, Total – The final monthly average mass limit was recalculated and increased from 3.6 lbs/day to 7.96 lbs/day.

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

Explanation of Limits and Monitoring Requirements

Refer to the WQBEL memo for the detailed calculations, prepared by the Water Quality Bureau dated August 21, 2024 used for this reissuance.

Monitoring Frequencies - Monitoring frequencies were reviewed based on the size and type of the facility and effluent quality and variability. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. The monitoring frequency for Ammonia, Nitrogen (NH₃-N) Total increased to 3/Week in response to the increasing trend in effluent concentrations starting in November 2023. The weekly average of concentration taken from November 15, 2023 to July 31, 2024 data is 21.73 mg/L as compared to the weekly average concentration of 1.06 mg/L taken from data at the start of the permit term up to November 15, 2023. Monitoring frequencies for all other listed parameters remain unchanged from the previous permit.

Expression of Limits- In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code. limits in this permit are to be expressed as weekly average and monthly average limits for municipal dischargers whenever practicable. Minor changes have been made to Ammonia Nitrogen.

CBOD₅ and Total Suspended Solids: Tracking of BOD₅, and Suspended Solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code. As allowed by s. NR 210.05(1)(d), Wis. Adm. Code, the permittee had previously requested that the Department substitute the parameter CBOD₅ for the parameter BOD₅.

pH - Per s. NR 210.05(1)(c), Wis. Adm. Code, effluent pH shall be within the range of 6.0 s.u. and 9.0 s.u.

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. 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. Plover's daily maximum ammonia limits vary with effluent pH.

Chloride – Chloride monitoring in the final calendar year of the permit is included for purposes of limits evaluation with the next permit reissuance.

Mercury - Requirements for mercury are included in s. NR 106.145 Wis. Adm. Code. Plover collected mercury samples quarterly during the current permit term. A total of 19 effluent sampling results are available from October 2019 to April 2024 for total recoverable mercury. The average concentration was 0.87 ng/L, and the maximum was 2.80 ng/L. Because the 30-day P₉₉ of available data (1.12 ng/L) is less than the most stringent WQBEL of 1.3 ng/L, no WQBEL for mercury is required for permit reissuance. However, quarterly monitoring for mercury influent, effluent and field blanks are still required because Plover is a major municipal facility. Plover shall continue to implement its Mercury Pollutant Minimization program to help assure that mercury influent and effluent concentrations do not increase.

E. Coli - 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.

E. coli monitoring is required at the permit effective date. An interim fecal coliform limit of 400 #/100 ml as a monthly geometric mean will apply from the permit effective date through the end of a compliance schedule. At the end of the compliance schedule, E. coli limits of 126 #/100 ml as a monthly geometric mean that may not be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply.

Phosphorus - Phosphorus requirements are based on the Phosphorus Rules that became effective 12/1/2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. The code categorically limits industrial dischargers of more than 60 pounds of phosphorus per month and municipal dischargers of more than 150 pounds of phosphorus per month to 1.0 mg/L unless an alternative limit is approved. NR 217 also specifies WQBELs (water quality based effluent limits) for discharges of phosphorus to surface waters of the state from publicly and privately owned wastewater facilities, noncontact cooling water discharges which contain phosphorus, concentrated animal feeding operations that discharge through alternative treatment facilities and a facility/site that is regulated under NR 216 where the standards in NR151 and 216 are not sufficient to meet phosphorus criteria. WQBELs for phosphorus are needed whenever the discharge contains phosphorus at concentrations or loadings that will cause or contribute to an exceedance of the water quality standards.

TMDL (TOTAL MAXIMUM DAILY LOAD) DERIVED LIMITS - 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. Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits require the permittee to calculate and report rolling 12-month sums of total monthly loads for TP. In addition, without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limit of 0.93 mg/L must be continued in the reissued permit.

Total Nitrogen Monitoring (NO₂+NO₃, TKN and Total N) - 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.

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

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

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

Whole Effluent Toxicity - 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>). Acute WET testing is required each year in rotating quarters as specified in the permit.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Cake	Fecal coliform bacteria density measurements	Volatile solids reduction	Land Application on department approved fields	527 dry tons/year
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.						
If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
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.						

Sample Point Number: 002- SLUDGE

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Quarterly	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Quarterly	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Quarterly	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Quarterly	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Quarterly	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Quarterly	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Quarterly	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Quarterly	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Quarterly	Composite	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Total Kjeldahl	Ceiling	57 mg/kg	Quarterly	Composite	
Nitrogen, Total Kjeldahl	High Quality	17 mg/kg	Quarterly	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Quarterly	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Quarterly	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Quarterly	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Quarterly	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Quarterly	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Quarterly	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Quarterly	Composite	
Nitrogen, Total Kjeldahl		Percent	Quarterly	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Quarterly	Composite	
Phosphorus, Total		Percent	Quarterly	Composite	
Phosphorus, Water Extractable		% of Tot P	Quarterly	Composite	
Potassium, Total Recoverable		Percent	Quarterly	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once during calendar year 2026. See 'Sludge Analysis for PCBs' section in permit.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once during calendar year 2026. See 'Sludge Analysis for PCBs' section in permit.
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 monitoring requirements and limitations were re-evaluated for the proposed permit term. List 2 analysis for nutrients prior to land application has been added. PFAS monitoring once during the permit term is included in the permit pursuant to 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). Radium requirements are addressed in s. NR 204.07(3)(n).

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.

Water Extractable Phosphorus- Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that “tie-up” phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin’s nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

5 Schedules

5.1 Effluent Limitations for E. coli

The permittee shall comply with surface water limitations for E. coli as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification.

Required Action	Due Date
Status Update: The permittee shall submit information within the discharge monitoring report (DMR) comment section documenting the steps taken in preparation for properly monitoring and testing for E. coli including, but not limited to, selected test method and location of sampling.	02/21/2025
Operational Evaluation Report: The permittee shall prepare and submit an Operational Evaluation Report to the Department for review and approval. The report shall include an evaluation of collected effluent data and proposed operational improvements that will optimize efficacy of disinfection at the treatment plant during the period prior to complying with final E. coli limitations and, to the extent possible, enable compliance with the final E. coli limitations. The report shall include a plan and schedule for implementation of the operational improvements. These improvements shall occur as soon as possible, but not later than April 30, 2026. The report shall state whether the operational improvements are expected to result in compliance with the final E. coli limitations. The permittee shall implement the operational improvements in accordance with the approved plan	11/30/2025

<p>and schedule specified in the Operational Evaluation Report and in no case later than April 30, 2026.</p> <p>If the Operational Evaluation Report concludes that the operational improvements are expected to result in compliance with the final E. coli limitations, the permittee shall comply with the final E. coli limitations by April 30, 2026 and the permittee is not required to comply with subsequent milestones identified below in this compliance schedule ('Submit Facility Plan', 'Final Plans and Specifications', 'Treatment Plant Upgrade to Meet Limitations', 'Construction Upgrade Progress Report', 'Complete Construction', 'Achieve Compliance').</p> <p>FACILITY PLAN - If the Operational Evaluation Report concludes that operational improvements alone are not expected to result in compliance with the final E. coli limitations, the permittee shall initiate development of a facility plan for meeting final E. coli limitations and comply with the remaining required actions in this schedule of compliance.</p> <p>If the Department disagrees with the conclusion of the report and determines that the permittee can achieve final E. coli limitations using the existing treatment system with only operational improvements, the Department may reopen and modify the permit to include an implementation schedule for achieving the final E. coli limitations sooner than April 30, 2029.</p>	
<p>Submit Facility Plan: If the Operational Evaluation Report concluded that the permittee cannot achieve final E. coli limitations with operational improvements alone, the permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.</p>	04/30/2026
<p>Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to achieve compliance with final E. coli limitations and a schedule for completing construction of the upgrades by the complete construction date specified below.</p>	03/31/2027
<p>Treatment Plant Upgrade to Meet Limitations: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.</p>	09/30/2027
<p>Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.</p>	09/30/2028
<p>Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.</p>	03/31/2029
<p>Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.</p>	04/30/2029

5.2 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
<p>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.</p> <p>This report shall include all additional PFOS and PFOA data that may be collected including any</p>	12/31/2025

influent, intake, in-plant, collection system sampling, and blank sample results.	
<p>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.</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>	12/31/2026

Explanation of Schedules

Effluent Limitations for E. coli - A compliance schedule is included in the permit to provide time for the permittee to investigate options for meeting new effluent E. coli water quality-based effluent limits while coming into compliance with the limits as soon as reasonably possible.

PFOS/PFOA Minimization Plan Determination of Need - 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.

Discontinuation of Phosphorus Limit Schedule – The schedule under the last permit term to achieve compliance with final effluent phosphorus limits by September 30, 2026 is removed from this permit. The TMDL-based phosphorus limit is effective immediately in the permit pursuant s. NR 217.17(1)(a), Wis. Adm. Code, as there is no reasonable potential to exceed the continued concentration limit of 0.93 mg/L and mass limit of 7.96 lbs/day expressed as monthly averages. The reasonable potential to exceed the limits was based on a review of four different scenarios looking at the whole data period and a subset of data as well as calculating what would be the phosphorus load discharged assuming the plant design flow of 1.8 MGD would be sustained. The calculated 30-day P99’s of these scenarios are presented in the table below.

30 day p-99 Reasonable Potential Determination

Data Period	Jan 2022-Aug 2024	Oct 2019-Aug 2024
Loading Calculated with Actual Flow	4.33 lbs/day	4.17 lbs/day
Loading Calculated with Design Flow	5.12 lbs/day	5.56 lbs/day

Special Reporting Requirements

None

Other Comments:

None

Justification Of Any Waivers From Permit Application Requirements

No waivers were requested or approved.

Attachments:

Water Quality-Based Effluent Limitations for the Plover Wastewater Treatment Facility WPDES Permit No. WI-0027995, dated August 21, 2024 and prepared by Water Resources Engineer, Benjamin Hartenbower

Expiration Date:

December 31, 2029

Prepared By: Bryan Hartsook

Wastewater Field Supervisor

Date: October 14, 2024

for public notice

Notice of reissuance was published in the Stevens Point Journal, 601 Main Street, Ste 200, Stevens Point, WI 54481

CORRESPONDENCE/MEMORANDUM

DATE: August 21, 2024

TO: Bryan Hartsook – SER/Milwaukee

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for the Plover Wastewater Treatment Facility
WPDES Permit No. WI-0027995

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 Plover Wastewater Treatment Facility in Portage County. This municipal wastewater treatment facility (WWTF) discharges to the Wisconsin River, located in the Fourmile and Fivemile Creek Watershed in the Central Wisconsin River Basin. This discharge is included in the Wisconsin River TMDL as approved by EPA on April 26, 2019 with site-specific criteria approved by EPA on July 9, 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	Footnotes
CBOD ₅			40 mg/L	25 mg/L	1
TSS			45 mg/L	30 mg/L	1
pH	9.0 s.u.	6.0 s.u.			1
Ammonia Nitrogen	Variable		108 mg/L	108 mg/L	2,3
Bacteria					4
Interim Limit Fecal Coliform				400 #/100 mL geometric mean	
Final Limit <i>E. Coli</i>				126 #/100 mL geometric mean	
Chloride					5
Mercury					5
PFOS and PFOA					6
Phosphorus TMDL Limit				0.93 mg/L 7.96 lbs/day	7
TKN, Nitrate+Nitrite, and Total Nitrogen					8
Acute WET					9

Footnotes:

1. No changes from the current permit.
2. 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.

3. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ 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

4. Bacteria limits apply during the disinfection season of May - September. The fecal coliform interim limit will apply until the end of the compliance schedule when *E. coli* limits take effect. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. Monitoring only.
6. Monitoring once every two months is required in accordance with s. NR 106.98(2), Wis. Adm. Code.
7. 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.
8. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all major municipal permittees. Total Nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total kjeldahl nitrogen (TKN) (all expressed as N).
9. Annual acute 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).

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:



Benjamin Hartenbower, PE,
Water Resources Engineer

Date: 08/21/2024

E-cc:

Nick Lindstrom, Wastewater Engineer – WCR/Eau Claire
Geisa Thielen, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Scott Provost, Water Quality Biologist – WCR/Wisconsin Rapids
Nate Willis, Wastewater Engineer – WY/3

Attachment #1
**Water Quality-Based Effluent Limitations for
the Plover Wastewater Treatment Facility
WPDES Permit No. WI-0027995**

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description:

The Plover Wastewater Treatment Facility (WWTF) treats domestic and industrial waste. The design flow of the facility is 1.8 million gallons per day (MGD). Industrial dischargers are the Silgan Container Corp., Del Monte Foods USA, Golden County Foods Inc., Penford Food Ingredients as well as Intevation Food Group, LLC. Additionally, the WWTF treats leachate from Portage, Oneida and Lincoln Counties, as well as septage and holding tank waste. Preliminary treatment consists of screening and grit removal. Additional treatment includes activated sludge treatment through the use of a three-ring oxidation ditch (aerobic and anaerobic) and biological phosphorus removal. A chemical feed system is also in place to provide chemical phosphorus removal as a back-up for the biological removal system. Seasonal disinfection (May – Sept) via ultraviolet (UV) light is conducted prior to discharge of effluent to the Wisconsin River. Biosolids generated at the facility are thermally aerobic digested and then pressed into a cake sludge. The sludge is stored in a building onsite until it is landspread on Department approved agricultural fields.

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

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
CBOD ₅			40 mg/L	25 mg/L		1
TSS			45 mg/L	30 mg/L		1
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen November - April	Variable		108 mg/L	108 mg/L		2,3
Fecal Coliform May - September			656 #/100 mL geometric mean	400 #/100 mL geometric mean		3
Mercury						4
Chloride						4
Phosphorus Interim TMDL Limit				0.93 mg/L, 14 lbs/day 11 lbs/day	3.6 lbs/day	5
TKN, Nitrate+Nitrite, and Total Nitrogen						4
Acute WET						6

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. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 < 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

3. Additional limits to comply with the expression of limits requirements are included in bold.
4. Monitoring only.
5. A compliance schedule is in the current permit to meet the TMDL Limit by September 30, 2026.
6. Acute WET testing required: July - Sept 2020, Oct - Dec 2021, Jan - March 2022, Apr - June 2023, and Jan - March 2024.

Receiving Water Information

- Name: Wisconsin River
 - Waterbody Identification Code (WBIC): 1179900
 - 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: USGS for Station 05400760, 1.6 miles below railroad bridge in Wisconsin Rapids
- 7-Q₁₀ = 1160 cfs (cubic feet per second)
 - 7-Q₂ = 1190 cfs
 - 90-Q₁₀ = 1590 cfs
- Harmonic Mean Flow = 2517 cfs using a drainage area of 5420 mi².
- The Harmonic Mean has been estimated based on average flow and the 7-Q₁₀ 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 = 69 mg/L as CaCO₃. This value represents the geometric mean of 42 samples collected in the Wisconsin River from 10/27/1994 to 05/26/2010.
 - % 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 Wisconsin River at Conover is used for 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.

Attachment #1

- Multiple dischargers: There are several other dischargers to the Wisconsin River however they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: This discharge is located within the WI River TMDL for phosphorus

Effluent Information:

- Design Flow Rates(s):
Annual Average = 1.800 MGD (Million Gallons per Day)
For reference, the actual average flow from October 2019 to May 2024 was 1.474 MGD.
- Hardness = 290 mg/L as CaCO₃. This value represents the geometric mean of 4 effluent samples collected from 11/14/2023 to 12/05/2023.
- 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 Del Monte Foods, Ingredion Foods, McCain Foods, Monogram Foods, Online Packaging Inc, Oso Brewing, and Silgan Containers MFG.
- Additives: Ferric Chloride
- Total Phosphorus Wasteload Allocation: 2007 lbs/year = 5.495 lbs/day
- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the “priority pollutants” except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code. The permit-required monitoring for Mercury, Chloride, and Phosphorus from October 2019 to May 2024 is used in this evaluation.

Chemical Specific Effluent Data at Outfall 001

	Mercury ng/L
1-day P ₉₉	2.72
4-day P ₉₉	1.66
30-day P ₉₉	1.12
Mean	0.87
Std	0.53
Sample size	19
Range	0.46 - 2.8

Chemical Specific Effluent Data at Outfall 001

Sample Date	Copper $\mu\text{g/L}$	Sample Date	Chloride mg/L
10/16/2023	<5.2	01/16/2023	430
10/20/2023	<5.2	02/02/2023	450
10/24/2023	<5.2	03/13/2023	530
10/28/2023	<5.2	04/12/2023	430
11/01/2023	<5.2	05/17/2023	390
11/06/2023	<5.2	06/13/2023	610
11/10/2023	<5.2	07/05/2023	510
11/14/2023	8.6	08/16/2023	520
11/18/2023	<5.2	09/17/2023	490
11/22/2023	<5.2	10/01/2023	520
12/05/2023	<5.2	11/15/2023	440
		12/05/2023	450
mean	0.78	1-day P ₉₉	638
		4-day P ₉₉	555

“<” means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected results.

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 October 2019 to May 2024 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
CBOD ₅	3.7 mg/L*	
TSS	7.7 mg/L	
pH	7.36 s.u.	
Fecal Coliform	487#/100 mL	
Ammonia Nitrogen	4.98 mg/L*	
Phosphorus	0.30 mg/L	3.68 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 not the case for the Plover Wastewater Treatment Facility and the limits are set based on two times the acute toxicity criteria.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 928 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 P ₉₉	1-day MAX. CONC.
Arsenic		340		680	136	<7.7		
Cadmium	290	34.9	0.006	69.8	14.0	<0.41		
Chromium (+3)	290	4309	0.265	8617	1723	5.1		
Chromium (+6)		16.0		32.0	6.4	<6.8		
Copper	290	42.3	0.268	84.7			11.8	8.6
Lead	290	299	0.168	598	120	2.2		
Mercury		830	1.7	1660			2.72	2.80
Nickel	268	1080		2161	432	3.9		
Zinc	290	305	0.603	610	122	28.90		
Chloride		757	14.7	1514			638.23	610.00
Di-n-butyl phthalate ⁺		81.4		81.4	16.3	0.24		

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

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

⁺ The limit for this substance is based on a secondary value. Acute limits are set equal to the secondary value rather than two times or using the 1-Q₁₀ s. NR 106.06(3)(b)2 and s. NR 105.05(2)(f)(6), Wis. Adm Code.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 290 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.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152		16001	3200	<7.7	
Cadmium	69	1.8	0.006	192.7	38.5	<0.41	
Chromium (+3)	69	97	0.265	10214	2043	5.1	
Chromium (+6)		11.0		1154.3	230.9	<6.8	
Copper	69	7.5	0.268	763.6			4.9
Lead	69	20	0.168	2038	408	2.2	
Mercury		440	1.7	46076			1.66
Nickel	69	38		4006	801	3.9	
Zinc	69	87	0.603	9078	1816	28.90	
Chloride		395	14.7	39992			555.28
Di-n-butyl phthalate ⁺		9.52		1000.83	200.17	0.24	

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

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 398 cfs (¼ of the 90-Q₁₀), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	WC	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
Mercury	1.30	1.7	1.30			1.12

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 629 cfs (¼ of the Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
Cadmium	370	0.006	83981.6	16796.3	<0.41	
Chromium (+3)	3818000	0.265	866612611	173322522	5.1	
Chromium (+6)	7636		1733225.3	346645.1	<6.8	
Lead	140	0.168	31739	6348	2.2	
Mercury	1.5	1.7	1.50			1.12
Nickel	43000		9760174	1952035	3.9	
Cyanide, Total	9300		2110921.4	422184.3	0.08	
Methylene chloride	95000		21563175	4312635	0.83	
Diethyl phthalate	68000		15434694	3086939	0.15	
Di-n-butyl phthalate	4600		1044112	208822	0.24	

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 629 cfs (¼ of the Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
Arsenic	13.3		3018.8	603.8	<7.7	
Chloroform	1960		444882	88976	0.47	
Methylene Chloride	2700		612848	122570	0.83	
1,4-Dichlorobenzene	163		36998	7400	0.16	

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 not required for toxic substances.

PFOS and PFOA

The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98, Wis. Adm. Code. Monitoring of the effluent produced a PFOS result of 1.43 ng/L and a PFOA result of 9.00 ng/L. Monitoring of the water supply produced a PFOA result of 0.54 ng/L. These results are less than one fifth of the respective criteria for each substance. Based on the annual design flow and nondomestic contributions, **PFOS and PFOA monitoring is recommended once every two months.**

Mercury – The WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06 (6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L.

The current permit requires quarterly monitoring of the influent and effluent for total recoverable mercury. A total of 19 effluent sampling results are available from October 2019 to April 2024 for total recoverable mercury. The average concentration was 0.87 ng/L, and the maximum was 2.80 ng/L. Because the 30-day P₉₉ of available data (1.12 ng/L) is less than the most stringent WQBEL of 1.3 ng/L, no WQBEL for mercury is required for permit reissuance.

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

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

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.
- The maximum expected effluent pH has changed

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

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

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

Where:

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

Attachment #1

The effluent pH data was examined as part of this evaluation. A total of 1705 sample results were reported from October 2019 to May 2024. The maximum reported value was 8.16 s.u. (Standard pH Units). The effluent pH was 7.65 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 7.71 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 7.71 s.u. Therefore, a value of 7.71 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 7.71 s.u. into the equation above yields an ATC = 14.20 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	28.39
1-Q ₁₀	4722

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

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. The continued use of this table should be expanded year-round.

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, 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 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 Wisconsin River. These values are shown in the table below, with the resulting criteria and effluent limitations.

Weekly and Monthly Ammonia Nitrogen Limits – WWSF

		May-October	November-April
Effluent Flow	Q _e (MGD)	2.785	2.785
Background Information	7-Q ₁₀ (cfs)	1160	1160
	7-Q ₂ (cfs)	1190	1190
	Ammonia (mg/L)	0.07	0.14
	Temperature (°C)	23.9	6.7
	pH (s.u.)	7.92	7.47
	% of Flow used	100	25
	Reference Weekly Flow (cfs)	1160	290
	Reference Monthly Flow (cfs)	1012	253
Criteria mg/L	4-day Chronic		
	Early Life Stages Present	3.33	10.43
	Early Life Stages Absent	3.33	17.30

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	30-day Chronic		
	Early Life Stages Present	1.33	4.17
	Early Life Stages Absent	1.33	6.92
Effluent Limitations mg/L	Weekly Average		
	Early Life Stages Present	1362	1082
	Early Life Stages Absent		
	Monthly Average		
	Early Life Stages Present	460	370
	Early Life Stages Absent		

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from November 2019 to April 2024, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Plover Wastewater Treatment Facility permit for the respective month ranges.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	May-October	November-April
1-day P ₉₉	5.23	41.82
4-day P ₉₉	2.83	23.15
30-day P ₉₉	1.40	10.47
Mean*	0.82	5.31
Std	1.11	9.67
Sample size	20	248
Range	0.1 - 4.7	<0.022 - 35.43

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

Based on this comparison, daily limits are required November through April.

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 [facility name], 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, 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
Variable	108	108

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

Section NR 102.04(5), Wis. Adm. Code, states that all surface waters shall be suitable for supporting recreational use and shall meet *E. coli* criteria during the recreation season. Section NR 102.04(5)(b), Wis. Adm. Code, allows the Department to make exceptions when it determines, in accordance with s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to meet *E. coli* limits and protect the recreational use. Section NR 210.06(3), Wis. Adm. Code, tasks the Department with determining the need for disinfection using a site-specific analysis based on potential risk to human or animal health. It sets out the factors that must be considered in determining the necessity to disinfect municipal wastewater or to change the length of the disinfection season.

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 Plover Wastewater Treatment Facility permit requires 2/week 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 Plover Wastewater Treatment Facility has monitored effluent *E. coli* from May 2023 to August 2023 and a total of 16 results are available. A geometric mean of 126 counts/100 mL was exceeded in 2 out of 4 months, with a maximum monthly geometric mean of 1003 counts/100 mL. Effluent data exceeded 410 counts/100 mL 5 times (which is 31% of the total sample results). The maximum reported value was 6000 counts/100 mL. Based on this effluent data it appears that the facility can't meet new *E. coli* limits and a compliance schedule is needed in the reissued permit.

Interim Limit

Available *E. coli* data indicates that the new limitations are not readily attainable. The permit will include a compliance schedule to meet these limits. During the compliance schedule, an interim limit applies to prevent back-sliding from the current level of disinfection during the compliance schedule period. Therefore, the current fecal coliform limit shall be included in the reissued permit as an interim limit of 400 counts/100 mL as a monthly geometric mean. Any weekly geometric mean limit which was included in the current permit for expression of limits purposes does not need to be included in the permit as an interim limit.

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 Plover Wastewater Treatment Facility currently has an existing phosphorus limit below 1.0 mg/L, it 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.

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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:

$$\begin{aligned}\text{TP Equivalent Effluent Concentration} &= \text{Daily WLA} \div (\text{Flow Rate} * \text{Conversion Factor}) \\ &= 5.495 \text{ lbs/day} \div (1.800 \text{ MGD} * 8.34) \\ &= 0.37 \text{ mg/L}\end{aligned}$$

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.

$$\begin{aligned}\text{TP Monthly Average Permit Limit} &= \text{Daily WLA} * \text{Monthly average multiplier} \\ &= 5.495 \text{ lbs/day} * 1.45 \\ &= 7.96 \text{ lbs/day}\end{aligned}$$

The multiplier used in the monthly average calculation was determined according to TMDL implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 0.6. The facility is able to meet the permit limits based on the WLA, so the current CV is used. This value, along with 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.

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.

Total Phosphorus Statistics

	Concentration (mg/L)	Mass Discharge (lbs/day)
1-day P ₉₉	0.87	11.40
4-day P ₉₉	0.54	6.95
30-day P ₉₉	0.37	4.70
Mean	0.30	3.67
Std	0.17	2.19
Sample Size	717	717
Range	0.02 - 1.2	0.00 - 16.05

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. To be consistent with TBEL requirements, a concentration limit of 1.0 mg/L would still be needed in accordance with s. NR 217.04, Wis. Adm. Code. If the Plover Wastewater Treatment Facility would like to request an increase to the existing phosphorus limit, an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter by parameter basis and includes consideration of operations, maintenance and temporary upsets. Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limit of 0.93 mg/L must be continued in the reissued permit.

Conclusions:

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

- Monthly average Total Phosphorus mass limit of 0.93 mg/L
- Monthly average Total Phosphorus mass limit of 7.96 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.

Due to the amount of upstream flow available for dilution in the limit calculation ($Q_s:Q_e >20:1$), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code). For activated sludge treatment systems of domestic waste, there is no reasonable potential for the discharge to exceed this limit. **Therefore, temperature limits and monitoring are not 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 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 testing is usually not recommended where the ratio of the 7-Q₁₀ to the effluent flow exceeds 100:1. For Plover, that ratio is approximately 417:1. With this amount of dilution, there is believed to be little potential for chronic toxicity effects in the Wisconsin River associated with the discharge from the Plover WWTF, so the need for chronic WET testing will not be considered further.
- 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.
- 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

Date Test Initiated	Acute Results LC50 %				Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	
09/13/1995	>100	>100	Pass	No	1
05/14/1996	>100	>100	Pass	No	1
12/10/1997	>100	>100	Pass	No	1
04/24/2002	>100	>100	Pass	No	1
09/17/2003	>100	>100	Pass	No	1
10/13/2004	>100	>100	Pass	No	1
03/09/2005	70.71	82.4	Fail	No	1
05/17/2005	73.43	75.61	Fail	No	1

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06/28/2005	>100	>100	Pass	No	2
09/21/2005	>100	>100	Pass	No	2
06/21/2006	>100	>100	Pass	No	2
08/22/2007	85.22	>100	Fail	No	2
09/26/2007	>100	>100	Pass	No	2
11/13/2007	>100	>100	Pass	No	2
01/07/2009	>100	>100	Pass	No	2
05/26/2010	>100	>100	Pass	No	2
07/12/2011	>100	>100	Pass	No	2
07/09/2013	>100	>100	Pass	Yes	
12/16/2014	>100	>100	Pass	Yes	
01/06/2015	>100	>100	Pass	Yes	
07/06/2016	>100	>100	Pass	Yes	
04/04/2017	>100	>100	Pass	Yes	
07/22/2020	>100	>100	Pass	Yes	

Footnotes:

1. *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.
 2. *Data Not Representative.* Plover Wastewater Treatment Facility underwent significant plant upgrades which were completed after 2011. It is believed that these upgrades to the treatment plant may have significantly affected effluent toxicity. Therefore, no WET tests prior to 2013 were included in reasonable potential analysis.
- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.

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

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

Acute 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	Chronic not evaluated.
Historical Data	Six tests used to calculate RP. No tests failed. 0 Points	
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. 0 Points	
Receiving Water Classification	Warm Water Sport Fish (WWSF) (5 pts) 5 Points	
Chemical-Specific Data	Reasonable potential for Ammonia limits based on ATC; (5 pts) Chromium, Copper, Lead, Mercury, Nickel, Zinc, and Chloride detected. (3 pts) Additional Compounds of Concern: Chloroform, 1,4-Dichlorobenzene, Diethyl Phthalate, and Di-n-butyl phthalate (2 pts) 10 Points	
Additives	No biocides and one water quality conditioner. Permittee has proper P chemical SOPs in place. 1 Point	
Discharge Category	Seven Industrial Contributors (11 pts) 11 Points	
Wastewater Treatment	Secondary or Better 0 Points	
Downstream Impacts	No impacts known. 0 Points	
Total Checklist Points:	27 Points	
Recommended Monitoring Frequency (from Checklist):	1x yearly	
Limit Required?	No	
TRE Recommended? (from Checklist)	No	

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above annual acute 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).
- A minimum of annual acute monitoring is recommended because the Plover Wastewater Treatment Facility is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.

Attachment #2

