

Permit Fact Sheet

General Information

Permit Number	WI-0029050-11-0
Permittee Name and Address	Phelps Sanitary District #1 PO Box 227, Phelps, WI 54554
Permitted Facility Name and Address	PHELPS SANITARY DISTRICT #1 2171 TOWER ROAD, PHELPS, WISCONSIN
Permit Term	July 01, 2026 to June 30, 2031
Discharge Location	Outfall 001 is located about 50 feet north of the secondary lagoon. It discharges from an 8-inch PVC pipe and flows into the adjacent wetland and then flows into the unnamed tributary and eventually to the Deerskin River for about a 3-month period during the spring. During the rest of the year there is not enough flow to reach the Deerskin River.
Receiving Water	A wetland discharging into an unnamed tributary to the Deerskin River, in the Deerskin River Watershed in the Upper Wisconsin River Basin, in Vilas County
Stream Flow (Q _{7,10})	0 cfs
Stream Classification	Limited Aquatic Life (LAL)
Discharge Type	Existing; Continuous
Annual Average Design Flow	0.115 MGD
Industrial or Commercial Contributors	None
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; SS - Sanitary Sewage Collection System; D - Disinfection; P - Phosphorus Removal
Approved Pretreatment Program?	N/A

Facility Description

The Phelps Sanitary District #1 (Phelps SD #1) serves a population of approximately 600 with no significant industrial contributors. Treatment consists of two PVC-lined lagoons operated in series. Within these ponds naturally occurring bacteria and organisms already present in the wastewater breakdown the organic matter until the wastewater is able to meet discharge standards. Aeration to the primary cell is provided by 21 coarse bubble, static-tube helixors. The secondary lagoon is a 1.5-acre lagoon which is divided into two parts by a baffle. The first part is aerated using five helixors and the second part is a quiescent zone used as a polishing pond. Effluent is discharged on a continuous basis via Outfall 001 to a wetland to an unnamed tributary to the Deerskin River.

Substantial Compliance Determination

Enforcement During Last Permit: There were no formal enforcement actions taken during the previous permit term. After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on 12/1/25, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Brooke Klingbeil, Wastewater Specialist on December 8, 2025.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
701	0.061 MGD (Avg. April 2020-May 2025)	Representative influent samples shall be collected from the influent manhole prior to the primary pond.
101	N/A – no flow monitoring at this sample point	Representative samples shall be collected or measurements obtained from a reliable source to track the precipitation volume from rain events.
102	N/A – no flow monitoring at this sample point	Representative samples shall be collected from the discharge from the primary pond to the secondary pond.
001	0.065 MGD (Avg. April 2020-May 2025)	Representative effluent samples shall be collected from the effluent manhole after the secondary pond, prior to discharge to the wetland discharging into an unnamed tributary to the Deerskin River.
002	N/A – sludge was not removed during the previous permit term	Representative samples of the sludge shall be collected from appropriate locations in the lagoons. Removal and disposal of sludge is not anticipated during this permit term.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 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	
BOD5, Total		mg/L	Weekly	3-Hr Comp	
Suspended Solids, Total		mg/L	Weekly	3-Hr Comp	
Copper, Total Recoverable		ug/L	Quarterly	3-Hr Comp	

1.1.1 Changes from Previous Permit

Influent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

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

1.1.2 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. Influent copper monitoring is required as a condition of the copper variance.

2 In-plant - Monitoring and Limitations

2.1 Sample Point Number: 101- GENERAL PLANT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Precipitation		in/day	Per Occurrence	Measure	

2.1.1 Changes from Previous Permit

In-plant limitations and monitoring requirements were evaluated for this permit term and no changes were required.

2.1.2 Explanation of Limits and Monitoring Requirements

Precipitation – This is an operational parameter, not a permit requirement but it is available on the eDMR. Measuring wet weather events is a tool that assists the facility in maintaining a healthy treatment system.

2.2 Sample Point Number: 102- PRIMARY POND

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Dissolved Oxygen		mg/L	Weekly	Grab	

2.2.1 Changes from Previous Permit

In-plant limitations and monitoring requirements were evaluated for this permit term and no changes were required.

2.2.2 Explanation of Limits and Monitoring Requirements

This monitoring assists the permittee in determining the level of treatment in the primary pond.

3 Surface Water - Monitoring and Limitations

3.1 Sample Point Number: 001- EFFLUENT

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	Weekly	Grab	
BOD5, Total	Monthly Avg	20 mg/L	Weekly	Grab	
Suspended Solids, Total	Weekly Avg	30 mg/L	Weekly	Grab	
Suspended Solids, Total	Monthly Avg	20 mg/L	Weekly	Grab	
pH Field	Daily Min	6.0 su	Weekly	Grab	
pH Field	Daily Max	9.0 su	Weekly	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	Weekly	Grab	
E. coli		#/100 ml	Weekly	Grab	Monitoring only July-September 2026 and May-June 2027. See the Effluent Limitations for E. coli Schedule.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit permit section. Enter the result in the eDMR on the last day of the month.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	Weekly	Grab	Limits apply year-round. See the Daily Maximum Ammonia Nitrogen (NH3-N) Limits permit section.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	51 mg/L	Weekly	Grab	Limit effective April-May.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	31 mg/L	Weekly	Grab	Limit effective June-September.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	71 mg/L	Weekly	Grab	Limit effective October-March.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	24 mg/L	Weekly	Grab	Limit effective April-May.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	17 mg/L	Weekly	Grab	Limit effective June-September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	33 mg/L	Weekly	Grab	Limit effective October-March.
Phosphorus, Total	Monthly Avg	2.8 mg/L	Weekly	Grab	
Phosphorus, Total	Monthly Avg	0.77 lbs/day	Weekly	Calculated	Monitoring only upon permit effective date. Final TMDL-Based Mass Limits for Total Phosphorus go into effect per the Schedule. See also the Phosphorus TMDL permit section.
Phosphorus, Total	6-Month Avg	0.26 lbs/day	Weekly	Calculated	Monitoring only upon permit effective date. Final TMDL-Based Mass Limits for Total Phosphorus go into effect per the Schedule. See also the Phosphorus TMDL permit section.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the eDMR. See TMDL Calculations permit section.
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 eDMR. See TMDL Calculations permit section.
Copper, Total Recoverable	Daily Max	18 ug/L	Quarterly	Grab	Interim limit. See the Copper Variance permit section and the Copper Pollutant Minimization Program Schedule.
Hardness, Total as CaCO3		mg/L	Quarterly	Grab	Sampling shall occur at the same time as copper

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					monitoring.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring permit section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring permit section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring permit section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Chronic WET		TUc	See Listed Qtr(s)	Grab	See the Whole Effluent Toxicity (WET) Testing permit section.

3.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

- The sample frequency for Flow Rate has been changed from “continuous” to “daily” for eDMR reporting purposes.
- Monitoring and limits have been added for Escherichia coli (E. coli) to become effective per the Schedule.
- Ammonia Nitrogen weekly average and monthly average limits have been updated.
- The Phosphorus interim limit has been decreased to 2.8 mg/L (from 3.0 mg/L) and the monthly average and 6-month average TMDL-based mass limits are to become effective on April 1, 2028, per the Schedule.
- Chloride monitoring has been removed as the data collected during the previous permit term showed concentrations that are significantly below the calculated limits for chloride.
- The Copper variance interim limit has been decreased to 18 µg/L (from 21 µg/L).
- Annual Total Nitrogen (TKN, NO₂+NO₃ and Total N) monitoring has been added.
- Chronic WET testing replaces Acute WET testing.

3.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated August 12, 2025.

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

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

Disinfection and 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. Section NR 102.04(5)(a), Wis. Adm. Code, states that all surface waters shall be suitable for recreational use and meet the E. coli criteria established to protect this use. As part of the reissuance process, the requirements for disinfection were reviewed under s. NR 210.06(3), Wis. Adm. Code.

E. coli effluent 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 are to become effective May 1, 2031, per the Schedule. Monitoring during the first full disinfection season (July-September 2026 and May-June 2027) is included to determine if disinfection is required or not pursuant to s. NR 210.06(3), Wis. Adm. Code.

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 municipal dischargers of more than 150 pounds of phosphorus per month to 1.0 mg/L. That data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities, in accordance with s. NR 217.04(1)(a)1, Wis. Adm. Code, and therefore the 1.0 mg/L limit is not required.

Total Maximum Daily Load (TMDL) Derived Limits – Wisconsin River Basin (WRB) TMDL Approved – Waste load allocations (WLAs) specified in TMDLs are expressed as WQBELs (water quality-based effluent limits). The WLA-derived WQBELs are consistent with the assumptions and requirements of the approved WRB TMDL. The WRB TMDL sets total phosphorus WLAs for dischargers throughout the project area. The WLA-derived limits must be included in WPDES permits once the TMDL has been approved by US EPA (WRB TMDL approved on April 26, 2019). Since WLAs 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 total phosphorus. Rolling 12-month sums can be compared directly to the annual WLA. The remainder of an existing compliance schedule for meeting the TMDL-based limits for total phosphorus is included in the reissued permit. Final limits become effective April 1, 2028. An interim limit is needed when a compliance schedule is included in the permit to meet the TMDL limits. This limit should reflect a value which the facility is able to currently meet; however, it should also consider the receiving water quality, keeping the water from further impairment. The interim limit included in the permit is 2.8 mg/L expressed as a monthly average. This value reflects the 4-day P₉₉ concentration of 2.8 mg/L from the current permit term.

Copper – The Phelps SD #1 applied for a copper variance, under the provisions of 283.15, Wis. Stats., with its application for permit reissuance. The previous permit also included a copper variance. The Department reviewed the permittee's application for a copper variance. The information supplied in the application supports the request. The proposed permit requires the permittee to implement a Copper Pollutant Minimization Program (PMP) and submit annual progress reports each year by March 31st.

The Department concludes that the Phelps SD #1 is qualified for a variance from the water quality standard for copper and proposes reissuance of this permit with the proposed variance.

Total Nitrogen Monitoring (TKN, NO₂+NO₃, and Total N) – The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under s. 283.55(1)(e), Wis. Stats. Testing is required during the

following quarters: October – December 2026; April – June 2027; July – September 2028; January – March 2029; and October – December 2030.

Chronic WET – Testing is required three times during the permit term during the following quarters: April – June 2027; January – March 2029; and October – December 2030.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Liquid	Sludge is not expected to be removed during this permit term.			
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.						

4.1 Sample Point Number: 002- LAGOON SLUDGE

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

4.1.1 Changes from Previous Permit

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

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

4.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). 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 has developed a draft risk assessment to determine future land application rates and released this risk assessment in January of 2025. The Department is evaluating this new information. Until a decision is made, the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS” should be followed.

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

5 Schedules

5.1 Disinfection and Effluent Limitations for E. coli

The permittee shall install disinfection treatment and 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 requirement.

Required Action	Due Date
<p>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.</p>	08/21/2026
<p>Report on Effluent Discharge: The permittee shall prepare and submit a report on effluent discharge. The report shall include an evaluation of collected effluent data and the facility's ability to comply with final E. coli limitations. The report shall state whether current treatment results in compliance with the final E. coli limitations. The permittee shall also submit a request to the Department to evaluate the need for disinfection pursuant s. NR 210.06(3), Wis. Adm. Code.</p> <p>MODIFICATION - If the Department determines, based on the information submitted in the Report on Effluent Discharges, that disinfection is not required pursuant s. NR 210.06(3), Wis. Adm. Code, the Department will modify or revoke and reissue the permit in accordance with public notice procedures under ch. 283, Wis. Stats., and ch. NR 203, Wis. Adm. Code, to remove monitoring, the final E. coli limitations, and the remaining actions in this schedule of compliance.</p> <p>FACILITY PLAN - If the Report on Effluent Discharge concludes that current treatment does not 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>	07/31/2027
<p>Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code, for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.</p>	01/31/2028
<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 meet disinfection requirements per s. NR 210.06(1), Wis. Adm. Code, achieve compliance with final E. coli limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below.</p>	01/31/2029
<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, Wis. 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, Wis. Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.</p>	07/31/2029
<p>Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.</p>	07/31/2030
<p>Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.</p>	01/31/2031
<p>Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.</p>	04/30/2031

5.1.1 Explanation of Schedule

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

5.2 Copper Pollutant Minimization Program

As a condition of the variance to the water quality-based effluent limitation(s) for copper granted in accordance with 283.15, Wis. Stats., the permittee shall perform the following actions.

Required Action	Due Date
<p>Annual Copper Progress Reports: Submit an annual copper progress report related to the pollutant minimization activities for the previous year. The annual copper progress report shall:</p> <p>Indicate which copper pollutant minimization activities or activities outlined in the Pollutant Minimization Program Plan have been implemented and state which, if any, activities from the Pollutant Minimization Program Plan were not pursued and why;</p> <p>Include an assessment of whether each implemented pollutant minimization activity appears to be effective or ineffective at reducing pollutant discharge concentrations and identify actions planned for the upcoming year;</p> <p>Identification of barriers that have limited program effectiveness and adjustments to the program that will be implemented during the next year to help address these barriers;</p> <p>Include an analysis of trends in total effluent copper concentrations based on copper sampling; and</p> <p>Include an analysis of how influent and effluent copper varies with time and with significant loading of copper.</p> <p>The first annual copper progress report is to be submitted by the Due Date.</p>	03/31/2027
<p>Annual Copper Progress Report #2: Submit a copper progress report, related to the pollutant minimization activities for the previous year, as defined above.</p>	03/31/2028
<p>Annual Copper Progress Report #3: Submit a copper progress report, related to the pollutant minimization activities for the previous year, as defined above.</p>	03/31/2029
<p>Annual Copper Progress Report #4: Submit a copper progress report, related to the pollutant minimization activities for the previous year, as defined above.</p>	03/31/2030
<p>Final Copper Report: Submit a final report documenting the success in reducing copper concentrations in the effluent, as well as the anticipated future reduction in copper sources and copper effluent concentrations.</p> <p>The report shall:</p> <p>Summarize copper pollutant minimization activities that have been implemented during the current permit term and state which, if any, activities from the Pollutant Minimization Program Plan were not pursued and why;</p> <p>Include an assessment of which pollutant minimization activities appear to have been effective or ineffective. Evaluate any needed changes to the pollutant reduction strategy accordingly;</p> <p>Identification of barriers that have limited program effectiveness and adjustments to the program that will be implemented during the next variance term (if applicable) to help address these barriers;</p> <p>Include an analysis of trends in copper concentrations based on sampling and data during the current permit term; and</p> <p>Include an analysis of how influent and effluent copper varies with time and with significant loadings of copper.</p> <p>If the permittee intends to reapply for a copper variance per 283.15, Wis. Stats., for the reissued permit, a detailed Pollutant Minimization Program Plan outlining the pollutant minimization activities</p>	03/31/2031

<p>proposed for the upcoming permit term shall be submitted along with the final report. An updated pollutant minimization plan shall:</p> <p>Include an explanation of why or how each pollutant minimization activity will result in reduced discharge of the target pollutant;</p> <p>Evaluate any new available information on pollutant sources, timing, and concentration to update the mass balance assumptions and expected sources of the pollutant, and</p> <p>Identify any information needs that would help to better determine pollutant sources and make plans to collect that information.</p>	
<p>Annual Copper Reports After Permit Expiration: In the event that this permit is not reissued by the date the permit expires, the permittee shall continue to submit annual copper reports for the previous year following the due date of Annual Copper Progress Reports listed above. Annual Copper Progress reports shall include the information as defined above.</p>	

5.2.1 Explanation of Schedule

This schedule is included as a condition of the variance from the water quality-based effluent limits for copper granted in accordance with 283.15, Wis. Stats. The schedule requires annual reports to be submitted each year by the due date.

5.3 WI River Basin TMDL WLA Limits for Total Phosphorus

The permittee shall comply with the actions 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 requirement.

Required Action	Due Date
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	03/31/2027
Achieve Compliance: The permittee shall achieve compliance with TMDL WLA limits. Note: The TMDL WLA limits become effective April 1, 2028.	03/31/2028

5.3.1 Explanation of Schedule

This schedule includes the remaining actions required for compliance with the TMDL WLA limits, as provided under s. NR 217.17(2), Wis. Adm. Code. The schedule allows the permittee time to come into compliance with the final phosphorus limits that are scheduled to take effect on April 1, 2028.

Attachments

Water Quality-Based Effluent Limitations for the Phelps Sanitary District #1 WPDES Permit No. WI-0029050-11-0, by Michael Polkinghorn, Water Resources Engineer, dated August 12, 2025

Copper Variance EPA Data Sheet

Copper PMP (Pollutant Minimization Program) Plan, dated 2026 to 2031

Justification Of Any Waivers From Permit Application Requirements

The permittee received instructions in the application notification letter that exempted them from certain standard monitoring requirements.

Prepared By: Sarah Donoughe, Wastewater Specialist-Adv

Date: January 7, 2026

CORRESPONDENCE/MEMORANDUM

DATE: August 12, 2025

TO: Sarah Donoughe – NER/Green Bay Service Center

FROM: Michael Polkinghorn – NOR/Rhineland Service Center *Michael Polkinghorn*

SUBJECT: Water Quality-Based Effluent Limitations for the Phelps Sanitary District #1
 WPDES Permit No. WI-0029050-11-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable) for the discharge from the Phelps Sanitary District #1 in Vilas County. This municipal wastewater treatment facility (WWTF) discharges to a wetland to an unnamed tributary to the Deerskin River, located in the Deerskin River Watershed in the Upper Wisconsin River Basin. This discharge is included in the Wisconsin River Basin (WRB) Total Maximum Daily Load (TMDL) as approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅			30 mg/L	20 mg/L		1, 2
TSS			30 mg/L	20 mg/L		1, 2
pH	9.0 s.u.	6.0 s.u.				1, 2
Dissolved Oxygen		4.0 mg/L				1, 2
<i>E. coli</i> May – September				126 #/100 mL geometric mean		3
Residual Chlorine	19 µg/L		7.3 µg/L	7.3 µg/L		3, 4
Ammonia Nitrogen Year round April – May June – September October – March	Variable		51 mg/L 31 mg/L 71 mg/L	24 mg/L 17 mg/L 33 mg/L		4, 5
Phosphorus						
Interim				2.8 mg/L		6
Final				0.77 lbs/day	0.26 lbs/day	
Copper (Total Recoverable)						
Interim	18 µg/L					4, 7
Final	9.3 µg/L		6.5 µg/L	6.5 µg/L		
Hardness (Total as CaCO ₃)						1, 7
TKN, Nitrate+Nitrite, and Total Nitrogen						8
Chronic WET						9

Footnotes:

1. No changes from the current permit.
2. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL. The permit will include a compliance schedule to meet these limits. Chlorine limits are required if Phelps SD #1 decides to use chlorination as its disinfection treatment.
4. 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.
5. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Daily Maximum Ammonia Nitrogen Limits

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	84	7.0 < pH ≤ 7.1	51	8.0 < pH ≤ 8.1	11
6.1 < pH ≤ 6.2	82	7.1 < pH ≤ 7.2	46	8.1 < pH ≤ 8.2	9.0
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	41	8.2 < pH ≤ 8.3	7.5
6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	36	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	5.0
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	27	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	23	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.9
6.8 < pH ≤ 6.9	61	7.8 < pH ≤ 7.9	16	8.8 < pH ≤ 8.9	2.4
6.9 < pH ≤ 7.0	56	7.9 < pH ≤ 8.0	13	8.9 < pH ≤ 9.0	2.1

6. The phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Wisconsin River Basin (WRB) to address phosphorus water quality impairments within the TMDL area. The monthly average phosphorus concentration limit of 2.8 mg/L, based on the 4-day P₉₉ of effluent data, will serve as the interim limit for the phosphorus compliance schedule.
7. These are the WQBELs for copper. If this limit is included in the permit, mass limits would also need to be included. A variance limit of 18 µg/L as a daily maximum, equal to the 1-day P₉₉ of representative data, may be included in the permit in place of the WQBEL if the copper variance application that was submitted is approved by EPA. Hardness monitoring is recommended because of the relationship between hardness and daily maximum limits based on acute toxicity criteria.
8. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total Kjeldahl nitrogen (TKN) (all expressed as N).
9. Three chronic whole effluent toxicity (WET) tests are recommended during the reissued permit term. 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%. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a grab sample collected from Deerskin Creek upstream of the influence with the UT.

Sampling WET concurrently with copper and other chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Michael Polkinghorn at (715) 360-3379 or Michael.Polkinghorn@wisconsin.gov and Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (2) – Narrative & discharge area map.

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**Water Quality-Based Effluent Limitations for
Phelps Sanitary District #1**

WPDES Permit No. WI-0029050-11-0

Prepared by: Michael A. Polkinghorn

PART 1 – BACKGROUND INFORMATION

Facility Description

The Phelps Sanitary District #1 (Phelps SD #1) serves a population of approximately 600 with no significant industrial contributors. Treatment consists of two PVC-lined lagoons operated in series. Within these ponds naturally occurring bacteria and organisms already present in the wastewater break down the organic matter until the wastewater is able to meet discharge standards. Aeration to the primary cell is provided by 21 coarse bubble, static-tube helixors. The secondary lagoon is a 1.5-acre lagoon which is divided into two parts by a baffle. The first part is aerated using 5 helixors and the second part is a quiescent zone used as a polishing pond. Effluent is discharged on a continuous basis via Outfall 001 to a wetland to an unnamed tributary to the Deerskin River.

Attachment #2 is a discharge area map of Outfall 001.

Existing Permit Limitations

The current permit, which expired on 03/31/2025, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅			30 mg/L	20 mg/L		1, 2
TSS			30 mg/L	20 mg/L		1, 2
pH	9.0 s.u.	6.0 s.u.				1, 2
Dissolved Oxygen		4.0 mg/L				1, 2
Ammonia Nitrogen	Variable		84 mg/L	84 mg/L		3, 4
Phosphorus						
Interim				3.0 mg/L		5
Final				0.77 lbs/day	0.26 lbs/day	
Copper (Total Recoverable)						
Interim	21 µg/L					4, 6
Final	13 µg/L		8.8 µg/L	8.8 µg/L		
Hardness (Total as CaCO ₃)						7
Chloride						7

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Acute WET						

Footnotes:

1. **These limitations are not being evaluated as part of this review.** Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Daily Maximum Ammonia Nitrogen Limits

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	84	7.0 < pH ≤ 7.1	51	8.0 < pH ≤ 8.1	11
6.1 < pH ≤ 6.2	82	7.1 < pH ≤ 7.2	46	8.1 < pH ≤ 8.2	9.0
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	41	8.2 < pH ≤ 8.3	7.5
6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	36	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	5.0
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	27	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	23	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.9
6.8 < pH ≤ 6.9	61	7.8 < pH ≤ 7.9	16	8.8 < pH ≤ 8.9	2.4
6.9 < pH ≤ 7.0	56	7.9 < pH ≤ 8.0	13	8.9 < pH ≤ 9.0	2.1

4. 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.
5. The phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Wisconsin River Basin (WRB) to address phosphorus water quality impairments within the TMDL area. The monthly average phosphorus concentration limit of 3.0 mg/L functions as an interim limit for the phosphorus compliance schedule.
6. These are the WQBELs for copper. If these limits are included in the permit, mass limits would also need to be included. A variance limit of 21 µg/L as a daily maximum, equal to the 1-day P₉₉ of representative data, functions as an interim limit for the copper variance.
7. Monitoring only.
8. Two acute whole effluent toxicity (WET) tests are required in the current permit.

Receiving Water Information

- Name: Wetland to an unnamed tributary to the Deerskin River
- Waterbody Identification Code (WBIC): Wetland – NA, Unnamed tributary (UT) – 1602100, Deerskin River - 1600400
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code:
 - o Wetland: Limited Aquatic Life (LAL) community as described in Table 6, Row 13 of s. NR

Attachment #1

- 104.08(2), Wis. Adm. Code, from Outfall 001 to STH 17 (Distance NA).
- UT (upstream section): LAL community as described in Table 6, Row 13 of s. NR 104.08(2), Wis. Adm. Code, from STH 17 to St. Louis Rd crossing (approx. 2.8 mi).
- UT (downstream section): LFF community as described in Table 6, Row 13 of s. NR 104.08(2), Wis. Adm. Code, from St. Louis Rd crossing to Deerskin River (approx. 1.0 mi).
- Deerskin River: Cold Water (CW) community, Outstanding Resource Water (ORW) at Board Bridge Rd crossing (Approx. 1.2 mi downstream of UT confluence with Deerskin River).
- All receiving waters are non-public water supplies and recreational use.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code:
 - The low flows for the wetland and the headwaters of the unnamed tributary are expected to be zero.
 - The following 7-Q₁₀ and 7-Q₂ values are for the unnamed tributary downstream of the wetland where the classification changes to an LFF community. These flows are from surface water data viewer (SWDV) using the formulas in the U.S. Geological Survey publication, *Low-Flow Characteristics of Streams in Upper Wisconsin River basin*.
 - 7-Q₁₀ = 0.29 cubic feet per second (cfs)
 - 7-Q₂ = 0.55 cfs
 - The following 7-Q₁₀ and 7-Q₂ values are for the Deerskin River at the confluence with the unnamed tributary and are from USGS for Station 05390410 in the SE ¼, SE ¼, sec. 12, T. 41 N., R. 11; 1 mile downstream of Long Lake outlet, 2.2 miles South of Phelps, WI. These values are found in the U.S. Geological Survey publication, *Low-Flow Characteristics of Streams in Upper Wisconsin River basin*.
 - 7-Q₁₀ = 4.3 cfs
 - 7-Q₂ = 6.3 cfs
- Hardness: 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: There are no known impairments to the wetland, UT, or the Deerskin River. Approximately 14 mi downstream of Outfall 001 both Scattering Rice Lake and Eagle Lake are included on the Clean Water Act Section 303(d) list. Scattering Rice Lake is impaired by total phosphorus and Eagle Lake is impaired by mercury and total phosphorus. The discharge is also inside the WRB TMDL area which addresses phosphorus impairments within the TMDL area.

Effluent Information

- Design flow rate(s):
 - Annual average = 0.115 MGD million gallons per day (MGD)
 - Peak daily = 0.339 MGD
 - Peak weekly = 0.226 MGD
 - Peak monthly = 0.143 MGD
- For reference, the actual average flow from April 2020 – May 2025 was 0.065 MGD.
- Hardness = 58 mg/L as CaCO₃. This value represents the geometric mean of data (n = 19) from the current permit required monitoring during June 2020 – May 2025.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable –

Attachment #1

this facility does not have an approved Zone of Initial Dilution (ZID).

- Wastewater source: Domestic wastewater with no industrial contributors.
- Water supply: Municipality waterworks.
- Additives: None.
- Effluent characterization: This facility is categorized as a minor municipality and received instructions in the application notification letter that exempt it from standard monitoring requirements. The permit required hardness and chloride monitoring during the current permit term.
- Substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Chloride Effluent Data

Sample Date	Conc. (mg/L)	Sample Date	Conc. (mg/L)	Sample Date	Conc. (mg/L)
02/25/2021	49	04/20/2021	41	09/09/2021	51
03/03/2021	49	05/06/2021	42	10/05/2021	52
03/16/2021	46	06/03/2021	44	11/09/2021	51
03/30/2021	44	07/06/2021	51	12/01/2021	53
04/06/2021	42	08/11/2021	51		
04/15/2021	40	09/02/2021	52		
1-day P ₉₉ = 59 mg/L					
4-day P ₉₉ = 53 mg/L					

Copper Effluent Data

Sample Date	Conc. (µg/L)	Sample Date	Conc. (µg/L)	Sample Date	Conc. (µg/L)
06/02/2020	5.8	01/04/2022	16	10/12/2023	5.1
09/16/2020	7.3	04/26/2022	10	01/24/2024	12
11/10/2020	7.9	08/02/2022	8.0	04/23/2024	8.6
03/03/2021	15	12/06/2022	8.7	07/23/2024	6.8
06/10/2021	6.4	02/01/2023	11	12/03/2024	8.2
08/04/2021	6.8	06/21/2023	11	02/13/2025	10
11/23/2021	11	09/12/2023	5.2		
1-day P ₉₉ = 18 µg/L					
4-day P ₉₉ = 13 µg/L					

The following table presents the average concentrations and loadings at Outfall 001 from April 2020 – May 2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameters with Effluent Limits

	Average Measurement*
BOD ₅	8.9 mg/L
TSS	8.7 mg/L
pH field	7.2 s.u.
Dissolved Oxygen	7.2 mg/L
Ammonia Nitrogen	4.9 mg/L

Attachment #1

	Average Measurement*
Phosphorus	1.9 mg/L
Copper (TR)	9.0 µg/L

*Any results below the limit 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. In this case the 1-Q₁₀ method is always more stringent than the 2xATC method because the receiving water flow is zero.

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 cfs

SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT*	1-day P ₉₉	1-day MAX. CONC.
Copper	58	9.3	9.3	18	16
Chloride (mg/L)		757	757	59	53

* 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 cfs

SUBSTANCE	REF. HARD. mg/L	CTC	WEEKLY AVE. LIMIT	4-day P ₉₉
Copper	58	6.5	6.5	13
Chloride (mg/L)		395	395	53

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for copper. Limits and/or monitoring recommendations are made in the paragraphs below:

Copper – Considering available effluent data from the current permit term (June 2020 – February 2025), the 1-day and 4-day P₉₉ of effluent data are 18 and 13 µg/L respectively, with a maximum concentration of 16 µg/L. These concentrations exceed the daily maximum and weekly average copper WQBELs; therefore, **the copper WQBELs of 9.3 µg/L as a daily maximum and 6.5 µg/L as a weekly average are recommended in the permit along with associated mass limits should copper WQBELs become effective in the reissued permit. The monthly average limit of 6.5 µg/L is also recommended to satisfy the expression of limits requirements in s. NR 106.07, Wis. Adm. Code.**

Phelps SD #1 has been granted a copper variance in the current permit with an effective interim limit of 21 µg/L as a daily maximum in support of pollutant minimalization program efforts. **If a future copper variance is approved the daily maximum limit of 18 µg/L, equal to the 1-day P₉₉ of effluent data, is recommended during the reissued permit term.**

Quarterly hardness monitoring is also recommended because of the relationship between hardness and daily maximum limits based on acute toxicity criteria.

Chloride – Considering available effluent data from the current permit term (February 2021 – December 2021), the 1-day and 4-day P₉₉ of effluent data are 59 and 53 mg/L respectively, with a maximum concentration of 53 mg/L. These effluent concentrations are significantly below the calculated chloride WQBELs; therefore, **chloride limits or monitoring are not recommended during the reissued permit term.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of discharge, effluent flow rate, the lack of indirect dischargers contributing to the collection system, lack of available PFOS/PFOA monitoring data, and unknown levels of PFOS/PFOA in the source water; **PFOS and PFOA monitoring is not recommended during the reissued permit term.** The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

**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 year round. These limits are re-evaluated at this time due to the following changes:

- Correction of an error with implementing weekly and monthly average limits for municipal treatment plants to satisfy the expression of limits requirements as described in section NR 106.07(3), Wis. Adm. Code.

Weekly & Monthly Average Limits based on Chronic Toxicity Criteria (CTC)

Weekly and monthly average limits based on chronic toxicity criteria (CTC) for ammonia are reviewed to redetermine the weekly and monthly average limits needed to meet the expression of limits requirements of s. NR 106.07(3), Wis. Adm. Code.

The weekly and monthly average ammonia nitrogen limits calculated in the previous limit evaluation (July 2018) do not change because there have been no changes in the effluent and receiving water flow rates of both the immediate and downstream surface waters. The applicable calculated weekly and monthly average ammonia nitrogen limits are based on the LFF community section of the UT accounting for ammonia decay and are provided in the table below. The detailed calculations of the derivation of the weekly and monthly average ammonia nitrogen limits are included as attachment #3.

Weekly & Monthly Average Ammonia Nitrogen Limits – LFF after Decay

Season	Weekly Average	Monthly Average
April - May	51	24
June - September	31	17
October - March	71	33

The previous limit evaluation (July 2018) found there was no reasonable potential for weekly and monthly average ammonia nitrogen limits, but they are required to be in the permit because there was reasonable potential for a daily maximum ammonia nitrogen limit. The variable ammonia nitrogen daily maximum limit table was implemented in place of the single limit, so the weekly and monthly average ammonia nitrogen limits applicable to satisfy the expression of limits requirements are either; both set equal to the highest daily maximum limit in the variable limit table (84 mg/L respectively), or the calculated weekly and monthly average limits, whichever are more stringent. **In this case the ammonia nitrogen WQBELs in the table above are all more stringent than the 84 mg/L; therefore, they are**

recommended in the permit instead. This conclusion was also recommended in the previous limit evaluation (July 2018) but was inadvertently not implemented in the current permit.

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from June 2020 – May 2025 for informational purposes.

Ammonia Nitrogen Effluent Data

Statistics (mg/L)	April - May	June - September	October - March
1-day P ₉₉	26	3.7	29
4-day P ₉₉	17	2.1	16
30-day P ₉₉	12	0.93	9.3
Mean *	9.6	0.44	6.4
Std	4.8	0.86	5.9
Sample size	42	86	129
Range	0.04 - 19	<0.04 - 6.2	0.01 - 20

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

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.

Phelps SD #1 had previously been exempted from disinfection based on the LAL or LFF community classification of the receiving water. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis. Adm. Code (not on the water quality classifications - i.e., LFF, LAL - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for the wetland and UT are listed in ch. NR 104, Wis. Adm. Code, as a wetland and noncontinuous respectively. First, wetlands are surface waters of the state and the recreational use applies to them. Second, discharges to noncontinuous streams with Q_{7,10} values < 0.1 cfs usually result in effluent-dominated situations. The risk of illness is related to the concentration of *E. coli*, so dilution is an important consideration when considering risk to human health. Therefore, disinfection should not be exempted based solely on these hydrological classifications.

The Department has considered the information required by s. NR 210.06(3), Wis. Adm. Code, and has determined that the discharge cannot meet bacteria limits without disinfection. 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:

Attachment #1

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.

These limits are required during May through September. The permit will include a compliance schedule to meet these limits.

Total Residual Chlorine – If Phelps SD #1 decides to upgrade to use chlorination for disinfection, effluent limitations would be recommended to assure proper operation of the de-chlorination system. Section NR 210.06(2)(b), Wis. Adm. Code, states, “When chlorine is used for disinfection, the daily maximum total residual chlorine concentration of the discharge may not exceed 0.10 mg/L.” Because the WQBELs are more restrictive, they are recommended instead. Specifically, **a daily maximum limit of 19 µg/L would be required.** Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. The calculated **weekly average effluent limitation of 7.3 µg/L would also be included in the permit because it is more restrictive than the daily maximum limit.**

Sections NR 106.07(3) and NR 205.067(7), Wis. Adm. Code, require WPDES permits contain weekly average and monthly average limitations for municipal dischargers whenever practicable and necessary to protect water quality. **Therefore, a monthly average limit of 7.3 µg/L would also be required.**

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 Phelps SD #1 does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance with s. NR 217.04(1)(a)1, Wis. Adm. Code. **Therefore, a technology-based limit is not recommended during the reissued permit term.** In addition, the need for a WQBEL for phosphorus must be considered.

Annual Average Mass Total Phosphorus Loading

Month	Average Phosphorus Concentration (mg/L)	Total Effluent Flow (Million Gallons)	Calculated Mass (lbs/month)
June 2024	2.0	2.9	49
July 2024	2.2	2.6	48
Aug 2024	2.6	2.2	48
Sept 2024	2.1	1.7	31
Oct 2024	2.4	1.8	37
Nov 2024	2.2	1.8	34
Dec 2024	2.4	1.4	28
Jan 2025	2.9	1.4	33
Feb 2025	3.0	1.3	33

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March 2025	3.1	1.7	45
April 2025	2.4	1.9	39
May 2025	1.8	1.5	23
Average =			37

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
 Where total flow is the sum of the actual flow (MGD) for that month

TMDL Limits

Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (April 2020)* and are based on the annual phosphorus wasteload allocation (WLA) given in lbs/yr. This WLA is found in page 24 of Appendix K of the *Total Maximum Daily Loads for Total Phosphorus in the Wisconsin River Basin (April 2019)* and is expressed as a maximum annual load (lbs/yr). For Phelps SD #1, this WLA is 128 lbs/yr and 0.35 lbs/day.

The monthly average limit of 0.77 lbs/day and the 6-month average limit of 0.26 lbs/day were determined in the previous limit addendum (May 2019). The 6-month average multiplier of 1.11 was chosen as described in the Department TMDL Implementation guidance using a coefficient of variation (CV) of 0.6 and a weekly effluent monitoring frequency. The TMDL-based phosphorus WQBEL(s) will be re-evaluated if the annual phosphorus WLA is not being met as described in the prior stated guidance. This is done by comparing each rolling sum of 12 consecutive months of total monthly mass phosphorus discharges over the current permit term directly against the annual WLA. In this case, the TMDL limits are not effective because there is a compliance schedule in the current permit to meet them by 03/31/2028, so they do not need to be reevaluated at this time. **Therefore, the monthly and 6-month average limits of 0.77 and 0.26 lbs/day respectively will remain unchanged during the reissued permit term.**

Effluent Data

The following table evaluates the statistics based upon phosphorus data reported from June 2020 – May 2025 for informational purposes.

Statistics	Conc. (mg/L)
1-day P ₉₉	3.9
4-day P ₉₉	2.8
30-day P ₉₉	2.2
Mean*	1.9
Std	0.64
Sample size	258
Range	0.16 - 3.8

Interim Limit

An interim limit is required per s. NR 217.17, Wis. Adm. Code, when a compliance schedule is needed in the permit to meet the WQBEL. The interim limit should reflect a concentration that the facility is able to meet without investing in additional “temporary” treatment, but also should prevent backsliding from current conditions. **Therefore, it is recommended that the interim limit be set equal to 2.8 mg/L for permit reissuance along with requirements for optimization of phosphorus removal.** This value

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reflects the 4-day P₉₉ concentration of 2.8 mg/L during June 2020 – May 2025. This value will allow operational flexibility when the facility continues to implement phosphorus treatment optimization activities. Phelps SD #1 would have been in compliance with this limit 95% of the time or only 3 months during June 2020 – May 2025 would have exceeded 2.8 mg/L.

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 and described in s. NR 106.55(2), Wis. Adm. Code, which has a daily maximum effluent temperature limitation of 120 °F. The 120° F limit applies because the hydrologic classification is listed as wetland in ch. NR 104, Wis. Adm. Code.

Downstream protections for the LFF community section of the UT, approx. 2.8 mi downstream of Outfall 001, will also be evaluated. In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from April 2020 – May 2025.

The heat loss equation as described by s. NR 106.55(5), Wis. Adm. Code, is used for discharges to storm sewer/storm water conveyance channels where the default cooling rate is estimated as 1 °F per 400 ft and is used to estimate the given cooling over the 2.8 mi between Outfall 001 and the classification change. This is considered conservative for open-channel flow especially during the winter months where the heat loss is expected to be more significant than estimated.

The following daily maximum effluent limitations are representative of the thermal water quality protection of the LAL community (wetland) and the weekly average effluent limitations are representative of the protection of the unnamed tributary LFF community. The complete temperature limit calculation is included as attachment #4. The cooling adjusted limits are shown in the table below:

Monthly Temperature Effluent Data & Limits

	Calculated Effluent Limit	
	Weekly Average Effluent Limitation (°F)*	Daily Maximum Effluent Limitation (°F)
JAN	105	120
FEB	102	120
MAR	102	120

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Month	Calculated Effluent Limit	
	Weekly Average Effluent Limitation (°F)*	Daily Maximum Effluent Limitation (°F)
APR	104	120
MAY	111	120
JUN	119	120
JUL	NA	120
AUG	NA	120
SEP	113	120
OCT	104	120
NOV	95	120
DEC	102	120

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

At temperatures above approx. 103° F, conventional biological treatment systems do not function properly and experience upsets. There is no indication that this has ever occurred in this treatment system. In addition, WWTFs that treat domestic wastewater only do not have the potential to exceed temperature limits of 90° F, so there is no reasonable potential for Outfall 001 to exceed the calculated limits.

Therefore, temperature limits or monitoring are not recommended during the reissued permit term.

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

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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 = 0.115 MGD = 0.178 cfs.
- f = fraction of the Q_e withdrawn from the receiving water = 0.
- Q_s = ¼ of the 7-Q₁₀ of UT= 0 cfs ÷ 4 = 0 cfs.

- The previous limit evaluation (January 2018) utilized an IWC of 4% based on the protection of Deerskin Creek. The natural community of the UT is “Cool-Warm Headwater” using the Natural Communities layer of Surface Water Data Viewer. Because this implies the presence of a fish and aquatic life community beyond solely macroinvertebrates, the need of WET limits and testing should also account for the protection of the UT and not only Deerskin Creek. Therefore, the IWC of 100% will be used in this evaluation.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm. Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations. 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. Therefore, only WET tests performed from June 2005 to present are included in the table below:

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	Pass or Fail?	Use in RP?	
11/13/2007					>100	>100	Pass	Yes	
09/23/2008					>100	>100	Pass	Yes	
04/21/2009					>100	>100	Pass	Yes	
06/02/2021	>100	>100	Pass	Yes					
12/18/2023	>100	>100	Pass	Yes					

- 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

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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.

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

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

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC₅₀, IC₂₅ or IC₅₀ ≥ 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	Two tests used to calculate RP. No tests failed. 0 Points	Three tests used to calculate RP. No tests failed. No chronic tests within last 5 years. 5 Points
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. 0 Points	Same as acute. 0 Points
Receiving Water Classification	Cool-Warm Headwater natural community less than 4 mi downstream. 5 Points	Same as acute. 5 Points
Chemical-Specific Data	Reasonable potential for copper limits based on ATC; Ammonia nitrogen limit carried over from the current permit. Chloride detected. No additional compounds of concern. 7 Points	Reasonable potential for copper limits based on CTC; Ammonia nitrogen limit carried over from the current permit. Chloride detected No additional compounds of concern. 7 Points

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	Acute	Chronic
Additives	None used. 0 Points	None used. 0 Points
Discharge Category	No industrial contributors. 0 Points	Same as acute. 0 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:	12 Points	32 Points
Recommended Monitoring Frequency (from Checklist):	No acute tests recommended.	Three chronic tests recommended.
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, **3x chronic WET tests are recommended in the reissued permit.** Sampling WET concurrently with copper and other chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge.



**Weekly Average & Monthly Average Limits based on Chronic Toxicity Criteria (CTC) - July 2018
Limit Evaluation**

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. The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified for Limited Aquatic Life is calculated by the following equation.

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

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 of the receiving (°C)

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a **Limited Forage Fishery** is calculated by the following equation.

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

Where:

- pH = the pH (s.u.) of the receiving water,
- E = 1.0,
- C = the minimum of 3.09 or $3.73 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or
 $3.73 \times 10^{(0.028 \times (25 - T))}$ – (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 30-day chronic toxicity criterion (CTC) for ammonia in waters classified for a **Cold water fishery** is calculated by the following equation.

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

Where:

- pH = the pH (s.u.) of the receiving water,
- E = 0.854,
- C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$,
- T = the temperature (°C) of the receiving water

The 4-day criterion is simply 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.

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Since minimal ambient data is available, the “default” basin assumed values are used for Temperature, pH and background ammonia concentrations, shown in the table below, with the resulting criteria and effluent limitations for a limited aquatic life community with no background flow.

Limited Aquatic Life		Spring	Summer	Winter
		April & May	June – Sept.	Oct. – March
Effluent Flow	Qe (MGD)	0.115	0.115	0.115
Background Information	7-Q ₁₀ (cfs)	0	0	0
	7-Q ₂ (cfs)	0	0	0
	Ammonia (mg/L)	0.07	0.04	0.135
	Temperature (°C)	14	21	10
	pH (s.u.)	7.69	7.75	7.59
	% of Flow used	25	100	25
	Reference Weekly Flow (cfs)	0	0	0
	Reference Monthly Flow (cfs)	0	0	0
Criteria mg/L	4-day Chronic	95.95	42.39	106.48
	30-day Chronic	38.38	16.96	42.59
Effluent Limits mg/L	Weekly Average	95.95	42.39	106.48
	Monthly Average	38.38	16.96	42.59

For a limited forage fish community, the rules provide 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 tributary to the Deerskin River, based on conversations with local fisheries biologists. So “ELS Absent” criteria apply from October through April, and “ELS Present” criteria will apply from May through September for a limited forage fish waterbody.

The following table assumes values for Temperature, pH and background ammonia concentrations with resulting criteria and effluent limitations for a limited forage fish community.

Limited Forage Fish		Spring	Summer	Winter
		April & May	June – Sept.	Oct. – March
Effluent Flow	Qe (MGD)	0.115	0.115	0.115
Background Information	7-Q ₁₀ (cfs)	0.29	0.29	0.29
	7-Q ₂ (cfs)	0.55	0.55	0.55
	Ammonia (mg/L)	0.07	0.04	0.135
	Temperature (°C)	11	17	4
	pH (s.u.)	7.69	7.75	7.59
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	2.15	4.3	1.075
	Reference Monthly Flow (cfs)	2.6775	5.355	1.33875
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	11.48	10.73	12.74
	Early Life Stages Absent	34.18	21.69	49.09
	30-day Chronic			
	Early Life Stages Present	4.59	4.29	5.10
	Early Life Stages Absent	13.67	8.67	19.64
	Weekly Average			

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Effluent Limitations mg/L	Early Life Stages Present	16.13	28.14	17.88
	Early Life Stages Absent	48.08	56.97	69.04
	Monthly Average			
	Early Life Stages Present	7.56	15.46	8.36
	Early Life Stages Absent	22.61	31.36	32.45

The following table assumes values for Temperature, pH and background ammonia concentrations with resulting criteria and effluent limitations for a cold water community.

Cold Water Community		Spring	Summer	Winter
		April & May	June – Sept.	Oct. – March
Effluent Flow	Q _e (MGD)	0.115	0.115	0.115
Background Information	7-Q ₁₀ (cfs)	4.3	4.3	4.3
	7-Q ₂ (cfs)	6.3	6.3	6.3
	Ammonia (mg/L)	0.07	0.04	0.135
	Temperature (°C)	11	17	4
	pH (s.u.)	7.69	7.75	7.59
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	2.15	4.3	1.075
	Reference Monthly Flow (cfs)	2.6775	5.355	1.33875
Criteria mg/L	4-day Chronic	9.05	6.49	10.04
	30-day Chronic	3.62	2.60	4.01
Effluent Limits mg/L	Weekly Average	63.27	162.34	69.86
	Monthly Average	30.31	79.51	33.21

Ammonia decay is considered to determine limits at the outfall to protect the downstream classification. The more restrictive calculated limits should be used to protect at the point of discharge and downstream uses. 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 will 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 ($k_t = k_{20} \theta^{(T-20)}$).

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

- 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 5 miles per day and the distance from the point of discharge to the classification change is approximately 2 miles for a travel time of 0.5 days. This equation shows that at the location where the classification change, 94% of the ammonia is remaining in the winter seasons.

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Months	LAL		LFF		LFF after decay		Cold Water		CW after decay	
	Weekly Average (mg/L)	Monthly Average (mg/L)								
April - May	95.95	38.38	48.08	22.61	50.5	23.8	63.27	30.31	68.2	32.7
June - Sept	42.39	16.96	28.14	15.46	30.5	16.7	162.34	79.51	42.4	17.0
Oct - March	106.48	42.95	69.04	32.45	71.1	33.4	69.86	33.21	73.0	34.7

As shown in the table, the weekly and monthly average ammonia nitrogen limits calculated based on the downstream limited forage fishery after decay are the most restrictive.

Temperature Limits for Receiving Waters with Unidirectional Flow

(calculation using default ambient temperature data)

Facility:	Phelps SD #1	7-Q₁₀:	0.29 cfs	Temp Dates	NA	Flow Dates	04/01/20
Outfall(s):	001	Dilution:	25%	Start:	NA	End:	05/31/25
Date Prepared:	7/22/2025	f:	0	Stream type: Limited forage fish community			
Design Flow (Qe):	0.115 MGD	Qs:Qe ratio:	0.4 :1	Calculation Needed? YES			
Storm Sewer Dist.	14,784 ft						

Month	Water Quality Criteria		Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Flow Rate (Qe)		Representative Highest Monthly Effluent Temperature	Calculated Effluent Limit		Adjusted Thermal Limits	
	Ta (default) (°F)	Sub-Lethal WQC (°F)		Acute WQC (°F)	7-day Rolling Average (Qesl) (MGD)		Daily Maximum Flow Rate (Qea) (MGD)	f	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	37	54	78	0.058	0.071	0	68	105	105	120
FEB	39	54	79	0.064	0.085	0	65	101	102	120
MAR	43	57	80	0.080	0.126	0	65	94	102	120
APR	50	63	81	0.152	0.174	0	67	89	104	120
MAY	59	70	84	0.125	0.176	0	74	91	111	120
JUN	64	77	85	0.120	0.151	0	82	92	119	120
JUL	69	81	86	0.107	0.152	0	86	91	120	120
AUG	68	79	86	0.120	0.172	0	83	91	120	120
SEP	63	73	85	0.158	0.196	0	76	90	113	120
OCT	55	63	83	0.096	0.134	0	67	93	104	120
NOV	46	54	80	0.097	0.134	0	58	92	95	120
DEC	40	54	79	0.061	0.075	0	65	103	102	120

Facility Specific Copper Variance Data Sheet

Directions: Please complete this form electronically. Record information in the space provided. Select checkboxes by double clicking on them. Do not delete or alter any fields. For citations, include page number and section if applicable. Please ensure that all data requested are included and as complete as possible. Attach additional sheets if needed.

Section I: General Information

A. Name of Permittee: Phelps Sanitary District #1
 B. Facility Name: Phelps Sanitary District #1 WWTF
 C. Submitted by: Wisconsin Department of Natural Resources
 D. State: Wisconsin Substance: Copper Date completed: January 29, 2026
 E. Permit #: WI-0029050-11-0 WQSTS #: (EPA USE ONLY)
 F. Duration of Variance Start Date: July 1, 2026 End Date: June 30, 2031
 G. Date of Variance Application: September 30, 2024
 H. Is this permit a: First time submittal for variance
 Renewal of a previous submittal for variance (Complete Section X)

I. Description of proposed variance: Phelps Sanitary District #1 seeks a variance to the water quality-based effluent limits for copper. The proposed variance for copper, from the chronic limit (weekly and monthly average) of 6.5 µg/L and the acute limit (daily maximum) of 9.3 µg/L, to an interim limit of 18 µg/L, is expressed as a daily maximum. The term of the proposed variance is five years, concurrent with the term of the proposed WPDES permit.

J. List of all who assisted in the compilation of data for this form

Name	Email	Phone	Contribution
Sarah Donoughe	Sarah.Donoughe@Wisconsin.gov	920-366-6076	Permit Drafter/Variance Coordinator
Brooke Klingbeil	Brooke.Klingbeil@Wisconsin.gov	715-495-1336	Compliance Staff
Michael Polkinghorn	Michael.Polkinghorn@Wisconsin.gov	715-360-3379	Limits Calculator

Section II: Criteria and Variance Information

A. Water Quality Standard from which variance is sought: Copper (ATC & CTC)
 B. List other criteria likely to be affected by variance: None.
 C. Source of Substance: The main source of copper to the wastewater collection system is from corrosion of water supply piping materials.
 D. Ambient Substance Concentration: N/A Measured Estimated
 Default Unknown

E. If measured or estimated, what was the basis? Include citation. Since there is zero background flow, the calculated limits are set equal to WQC so the background concentration is undefined.

F. Average effluent discharge rate: 0.065 MGD (April 2020 – May 2025) Maximum effluent discharge rate: 0.196 MGD (September 2020)

G. Effluent Substance Concentration: 1-day P99 = 18 µg/L Measured Estimated
 4-day P99 = 13 µg/L Default Unknown
 Mean = 9.0 µg/L

H. If measured or estimated, what was the basis? Include Citation. Effluent data reported between June 2020 and February 2025.

I. Type of HAC: Type 1: HAC reflects waterbody/receiving water conditions
 Type 2: HAC reflects achievable effluent conditions
 Type 3: HAC reflects current effluent conditions

J. Statement of HAC: The Department has determined the highest attainable condition of the receiving water is achieved through the application of the variance limit in the permit, combined with a permit requirement that

<p>the permittee implement its Copper PMP. Thus, the HAC at commencement of this variance is 18 µg/L, which reflects the greatest copper reduction achievable with the current treatment processes, in conjunction with the implementation of the permittee's Copper PMP. The current effluent condition is reflective of on-site optimization measure that have already occurred. This HAC determination is based on the economic feasibility of available compliance options for the Phelps SD #1 WWTF at this time (see Economic Section below). The permittee may seek to renew this variance in the subsequent reissuance of this permit; the Department will reevaluate the HAC in its review of such a request. A subsequent HAC cannot be defined as less stringent than this HAC.</p>
<p>K. Variance Limit: 18 µg/L as a daily maximum</p>
<p>L. Level Currently Achievable (LCA): 18 µg/L</p>
<p>M. What data were used to calculate the LCA, and how was the LCA derived? (Immediate compliance with LCA is required.) Effluent data reported between June 2020 and February 2025. The daily maximum LCA represents the 1-day P99 of effluent data as calculated using method described in s. NR 106.05(5), Wis. Adm. Code.</p>
<p>N. Explain the basis used to determine the variance limit (which must be ≤ LCA). Include citation. The basis of the variance limit is a statistical analysis provided for in s. 106.05(5)(a), Wis. Adm. Code. The variance limit is set equal to the 1-day P99.</p>
<p>O. Select all factors applicable as the basis for the variance provided <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input checked="" type="checkbox"/> 6 under 40 CFR 131.10(g). Summarize justification below: Any controls that are more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impacts. Citation: Assessing the Economic Impacts of the Proposed Ohio EPA Water Rules on the Ohio Economy, April 24, 1997, Ohio Environmental Protection Agency, Division of Surface Water and Foster Wheeler Environmental Corporation and DRI/McGraw-Hill in support of Amended and New Rules in OAC Chapters 3745-1, -2, and -33.</p>
<p>Section III: Location Information</p>
<p>A. Counties in which water quality is potentially impacted: <u>Vilas</u></p>
<p>B. Receiving waterbody at discharge point: A wetland discharging into an unnamed tributary to the Deerskin River</p>
<p>C. Flows into which stream/river? <u>Deerskin River</u> How many miles downstream? <u>~3 miles</u></p>
<p>D. Coordinates of discharge point (UTM or Lat/Long): Lat <u>46°4'0</u>; Long <u>89°6'0</u></p>
<p>E. What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the chronic criterion of the substance for aquatic life protection? Approximately 3 miles; there is ample dilution capacity in the Deerskin River such that the chronic criterion would be met at that location.</p>
<p>F. Provide the equation used to calculate that distance (Include definitions of all variables, identify the values used for the clarification, and include citation): The treated effluent flows to a 30-acre wetland and then along a meandering channel through other wetlands prior to reaching the Deerskin River (approx. 3 miles). At about 1,500 feet downstream of the outfall to the wetland near the intersection of STH 17, the unnamed tributary/forementioned channel to the Deerskin River has a Non-continuous Hydrologic classification. There is ample dilution capacity in the Deerskin River such that the chronic criterion would be met at that location, assuming the effluent reaches that far.</p>
<p>G. What are the designated uses associated with the direct receiving waterbody, and the designated uses for any downstream waterbodies until the water quality standard is met? At the discharge, the wetland (30 acres) is classified as Limited Aquatic Life (LAL); approx. 1 mile downstream from the outfall the unnamed tributary is classified as Limited Forage Fish (LFF); approx. 3 miles from the outfall the tributary reaches Deerskin River which is classified as Cold Water (CW) and an Outstanding Resource Water (ORW); all receiving waters are non-public water supplies and recreational use.</p>

H. Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody: None.

Permit Number	Facility Name	Facility Location	Variance Limit [µg/L]
N/A			

I. Please attach a map, photographs, or a simple schematic showing the location of the discharge point as well as all variances for the substance currently draining to this waterbody on a separate sheet
See attached "Phelps SD #1 - Variance Outfall(s) Map"

J. Is the receiving waterbody on the CWA 303(d) list? If yes, please list Yes No Unknown
the impairments below.

River Mile	Pollutant	Impairment
N/A		

Section IV: Pretreatment (complete this section only for POTWs with DNR-Approved Pretreatment Programs. See w:\Variances\Templates and Guidance\Pretreatment Programs.docx)

A. Are there any industrial users contributing copper to the POTW? If so, please list.
N/A

B. Are all industrial users in compliance with local pretreatment limits for copper? If not, please include a list of industrial users that are not complying with local limits and include any relevant correspondence between the POTW and the industry (NOVs, industrial SRM updates and timeframe, etc)
N/A

C. When were local pretreatment limits for copper last calculated?
N/A

D. Please provide information on specific SRM activities that will be implemented during the permit term to reduce the industry's discharge of the variance pollutant to the POTW
N/A

Section V: Public Notice

A. Has a public notice been given for this proposed variance? Yes No
 B. If yes, was a public hearing held as well? Yes No N/A
 C. What type of notice was given?
 Notice of variance included in notice for permit Separate notice of variance
 D. Date of public notice: February 11, 2026 Date of hearing: March 31, 2026
 E. Were comments received from the public in regards to this notice or hearing? (If yes, please attach on a separate sheet) Yes No

Section VI: Human Health

A. Is the receiving water designated as a Public Water Supply? Yes No
 B. Applicable criteria affected by variance: No human health criteria for copper.
 C. Identify any expected impacts that the variance may have upon human health, and include any citations:
None.

Section VII: Aquatic Life and Environmental Impact

A. Aquatic life use designation of receiving water: Limited Aquatic Life (LAL)
 B. Applicable criteria affected by variance: Acute and Chronic Toxicity Criteria for copper
 C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations:
 Given the proposed variance limit, effluent hardness of 58 mg/L, and lack of RW low flow, only two species (*Daphnia* and *Ceriodaphnia*) are expected to be acutely impacted by the discharge. For chronic toxicity, six species are expected to be impacted (*Daphnia*, *Ceriodaphnia*, *Gammarus*, *Lophopodella*, *Plumatella*, and *Physa*).

D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations: There are no species that would be affected.

County	Species	Status
N/A		

Citation: U.S. Fish & Wildlife Service – Environmental Conservation Online System (<http://www.fws.gov/Endangered/>) and National Heritage Index (<http://dnr.wi.gov/topic/nhi/>)

Section VIII: Economic Impact and Feasibility

A. Describe the permittee’s current pollutant control technology in the treatment process: Phelps SD #1 WWTF serves a population of approximately 600 with no significant industrial contributors. Treatment consists of two PVC-lined lagoons operated in series. Within these ponds naturally occurring bacteria and organisms already present in the wastewater break down the organic matter until the wastewater is able to meet discharge standards. Aeration to the primary cell is provided by 21 coarse bubble, static-tube helixors. The secondary lagoon is a 1.5-acre lagoon which is divided into two parts by a baffle. The first part is aerated using 5 helixors and the second part is a quiescent zone used as a polishing pond. Effluent is discharged on a continuous basis via Outfall 001 to a wetland to an unnamed tributary to the Deerskin River.

B. What modifications would be necessary to comply with the current limits? Include any citations.
 The capital, operation and maintenance costs of a reverse osmosis (RO) treatment system at the wastewater treatment plant were evaluated and were found to be prohibitively expensive. RO would result in an increase in sewer user rates that are 2.41% of median household income for the Sanitary District.

 MHI and number of households were obtained from the 2020 US Census Bureau Survey and are the most current values available. It is worth noting that approx. 963 households (of the total 1,574) are for seasonal, recreational, or occasional use, however the total number of housing units, including vacant homes, were used in estimating the % MHI increase.

C. How long would it take to implement these changes?
 See above.

D. Estimate the capital cost (Citation): \$193,520 (previous variance application adjusted for inflation)

E. Estimate additional O & M cost (Citation): \$62,787 (previous variance application adjusted for inflation)

F. Estimate the impact of treatment on the effluent substance concentration, and include any citations:
 An RO system at the treatment plant could remove virtually all of the copper in the wastewater discharge, but as noted above it would be prohibitively expensive.

G. Identify any expected environmental impacts that would result from further treatment, and include any citations:
 Disposal of RO reject water could cause potential impacts at the treatment plant where the reject water is disposed of.

H. Is it technically and economically feasible for this permittee to modify Yes No Unknown the treatment process to reduce the level of the substance in the discharge? (Provide the basis for this conclusion, including citations. If treatment is technically infeasible, provide an analysis of the factors that demonstrates technical infeasibility. If treatment is economically infeasible, provide an analysis of the economic cost to ratepayers that demonstrate economic infeasibility. Attach additional sheets if necessary.)

 Reverse Osmosis treatment of Phelps Sanitary District’s effluent to meet the WQBEL is technically feasible. However, it is not economically feasible. See DNR’s municipal RO screening tool for costs of reverse osmosis. Use of RO at the WWTF was evaluated; the resulting total cost for sewer user rates was estimated to result in an average cost to households that would be 2.41% of the MHI. An increase of this magnitude would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located.

I. If treatment is possible, is it possible to comply with the limits on the Yes No Unknown substance?

J. If yes, what prevents this from being done? Include any citations.
 See above; treatment is prohibitively expensive to install, operate and maintain.

K. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations:

The current practice is to operate the existing treatment system as effectively as possible along with the introduction of polyphosphate "Aqua-Mag" into the water supply. Low level sampling practices are exercised to avoid sample contamination. In addition, the community is attempting to increase awareness of opportunities within financial reason to consider for reducing copper; however, such opportunities thus far have been limited.

Section IX: Compliance with Water Quality Standards

A. Describe all activities that have been, and are being, conducted to reduce the discharge of the substance into the receiving stream. This may include existing treatments and controls, consumer education, promising centralized or remote treatment technologies, planned research, etc. Include any citations.

The facility adds Aqua-Mag (polyphosphate) to the water supply system which results in an insoluble coating on the internal surfaces of the distribution system therein limiting the amount of copper which can leach into the system. The water supply has two wells which are used on alternating one-week intervals, drawing 20-30 thousand gallons per day. Each well has an injection pump linked to the same power supply as the well itself, so the polyphosphate injection will start and end at the same time as the well's usage. The polyphosphate is injected at a concentration target of 1 ppm, with a normal operating range of 0.5-1.7 ppm. Through the extent of this normal operating range, the performance is monitored to continually verify that the 1 ppm target is optimal. A comparison was made between the levels in the water supply system prior to the addition of Aqua-Mag and the influent entering the facility. This effectively illustrates the high level of reduction the Sanitary District is achieving with the introduction polyphosphate.

Sampling techniques are continuously evaluated.

The Sanitary District has worked to educate the community about the use of noncopper plumbing materials and to avoid products used to remove tree roots growing into wastewater lateral lines that contain copper by sending out periodic mailings to the community, especially during cross connection inspections.

Businesses within the collection system are monitored to investigate potential copper use by periodically visiting and touring businesses, especially during cross connection inspections. On these tours, the operator looks for copper piping and other uses of copper that may be occurring. Because this is a small community, the Sanitary District operator contacts business owners through personal familiarity.

See the Phelps SD #1 Copper PMP Plan dated 2026 to 2031 for planned actions.

B. Describe all actions that the permit requires the permittee to complete during the variance period to ensure reasonable progress towards attainment of the water quality standard. Include any citations.

As conditions of the variance the permittee is required to (a) maintain effluent quality at or below the interim effluent limitations specified in the permit, (b) implement the Copper Pollutant Minimization Program (PMP) Plan dated 2026 to 2031, and (c) perform the actions listed in the Copper Pollutant Minimization Program Schedule (see the proposed permit).

Section X: Compliance with Previous Permit (Variance Reissuances Only)

A. Date of previous submittal: September 4, 2019 **Date of EPA Approval:** January 22, 2020

B. Previous Permit #: WI-0029050-10-0 **Previous WQSTS #:** (EPA USE ONLY)

C. Effluent substance concentration: 9.0 µg/L (Avg.); **Variance Limit:** 21 µg/L
18 µg/L (1-day
P99)

D. Target Value(s): N/A **Achieved?** **Yes** **No** **Partial**

E. For renewals, list previous steps that were to be completed. Show whether these steps have been completed in compliance with the terms of the previous variance permit. Attach additional sheets if necessary.

Condition of Previous Variance	Compliance
Continue to monitor Cu influent and effluent concentration trends.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Continue to operate and maintain WWTP to minimize Cu discharged.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Conduct additional Cu sampling of the public water supply wells.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Improve sampling techniques where possible.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Inspect and educate other potential Copper sources with existing and potentially new contributors. Surveys of the contacts will be retained.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Identify the lift stations of interest and sampling (Low level technique) plan to determine if sources may be different amongst different areas in the community to further focus reduction efforts.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Collect samples from the identified lift stations.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Report on findings and conclusions relative to further minimization efforts.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Based on conclusions, develop a list of possible actions.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Encourage the use of noncopper plumbing materials and collection system tree root control additives.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Continue to evaluate the use and effectiveness of Aqua-Mag (poly-phosphate) without compromising water supply goals and the relationship to minimizing effluent Cu.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Stay current with other water, wastewater, pollutant minimization control technologies regarding the control of Cu. (Including promoting the use of noncopper plumbing materials such as PEX).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Modify the PMP as improvements to it are identified.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Phelps Sanitary District #1
Copper Pollutant Minimization Plan (PMP)
Permit Number: WPDES WI-0029050
Date: 2026 to 2031

PMP Activities	1st Year	2nd Year	3rd Year	4th Year	5th Year
1. Continue to monitor Influent and Effluent Cu quarterly trends and include an analysis of trends in each Annual Report.	X	X	X	X	X
2. Continue to operate & maintain WWTP to minimize Cu discharged. Annual Reports will document if any operational changes are needed or planned for the upcoming year and what, if any, actions were taken during the previous year.	X	X	X	X	X
3. Conduct Cu sampling from 10 locations of the public water supply system. Sampling results will be included in the Annual Report(s). If any follow-up actions are needed or planned based on results of this sampling effort, those actions will be documented in the Annual Report(s).	X				
4. Improve sampling techniques where possible. Annual Reports will document sampling standard operating procedures and if/when sampling improvements are made.	X	X	X	X	X
5. Inspect and educate other potential Copper sources with existing and potentially new contributors. Surveys of the contacts will be retained. Documentation of inspections, education and new contributor surveys will be included with each Annual Report.	X	X	X	X	X
6. Continue to be vigilant in awareness to reduce Cu.					
a) Identify lift stations of interest, create a sampling plan and develop criteria for follow-up actions based on results of lift station sampling. Include these items in the Annual Report.	X				
b) Collect samples from the lift stations identified in the sampling plan. Include sampling data in the Annual Report.		X			
c) Identify any needed follow-up actions based on the criteria previously developed. Report on what follow-up actions will be taken in the Annual Report.			X		
d) Carry-out any needed follow-up actions and document these actions in the Annual Report(s).				X	
7. Encourage outreach efforts will be made to reduce the use of copper plumbing materials and collection system tree root control additives. This outreach will occur annually, and documentation will be included in the Annual Reports. Once each calendar year, outreach materials will be included as an insert with the water bill. Educational material will be posted to the municipal website	X	X	X	X	X

and accessible year-round.					
8. Continue to evaluate the use and effectiveness of Aqua-Mag (polyphosphate) without compromising water supply goals and the relationship to minimizing effluent Cu. The annual usage of Aqua-Mag in total gallons and average concentration of phosphate in the water supply system will be included the annual reports.	X	X	X	X	X
9. Stay current with other water, wastewater, pollutant minimization control technologies regarding the control of Cu. (Including promoting the use of noncopper plumbing materials such as PEX). Each Annual Report will include a discussion on current wastewater pollutant minimization technologies as it relates to copper control and make conclusions as to whether any option needs to be investigated further.	X	X	X	X	X
10. Identify whether accumulated lagoon sludge contributes to elevated copper concentrations in the effluent.					
a) Conduct a lagoon sludge depth survey for all cells. Include survey results and historical survey results from 2022 in the annual report.		X			X
b) Collect sludge samples and analyze for metals. Include results and historical data from 2005, 2008, 2014, 2022 in the annual report.	X				
c) Compare sludge copper concentrations with influent/effluent trends to evaluate internal loading.	X				
d) Based on Year 1 results, determine whether sludge removal or other lagoon management actions are warranted. This determination will be detailed in the annual report.		X			
e) Begin developing a multi-year budgeting plan for sludge removal if needed.			X		
f) Develop a Sludge Management Plan if corrective work is needed. The final SMP will be included as an appendix in the annual report.				X	
g) Continue to refine and update budgeting for sludge removal or lagoon maintenance activities.				X	
h) Prioritize scheduling, funding, and planning efforts (e.g., contractor quotes, disposal options, land application site approvals). Options will be outlined in the annual report.					X
i) Implement sludge removal activities if approved and funded.					X