

Village of Unity Public Noticed Permit Fact Sheet

General Information

Permit Number	WI-0060526-09-0
Permittee	Village of Unity, P O Box 47, Unity, WI 54488
Permitted Facility	Unity Wastewater Treatment Facility, 485 N. Front St., Unity, WI
Permit Term	November 01, 2026 to September 30, 2031
Discharge Location	Southwest corner of old pond system at the edge of riparian wetland that flows to the Little Eau Pleine River. (NE ¼ NW ¼, Section 1, T27N R01E, Town of Unity, Clark County WI)
Receiving Water	the riparian wetland on the edge of the Little Eau Pleine River and the groundwaters of the Little Eau Pleine River Watershed, all located in the Upper Wisconsin River Central Sub-Basin in Clark County
Stream Flow (Q _{7,10})	0 cfs
Stream Classification	Limited aquatic life (LAL, non-public water supply
Discharge Type	Existing, continuous
Annual Average Design Flow	0.089 MGD
Industrial or Commercial Contributors	None
Plant Classification	A3 - Recirculating Media Filters; A4 - Ponds, Lagoons and Natural Systems; P - Total Phosphorus; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Unity operates the Unity Wastewater treatment Facility that consists of a two-cell aerated lagoon system with an intermittent sand filter (ISF) utilized when BOD and/or TSS values are too high to maintain effluent limit requirements for discharge to surface water. The annual average design flow of the facility is 0.089 million gallons per day (MGD). The actual average annual influent flow in 2025 was 0.044 MGD and the actual annual average effluent flow in 2025 was 0.045 MGD.

Substantial Compliance Determination

Enforcement During Last Permit: The facility has had a number of violations over the last 5 years. This was determined to be due to a lack of resources at the facility including the following: aging infrastructure, lack of funding, inadequate staffing, lack of experience and an improperly operated sand filter. The violations included late reporting, missed sampling, limit exceedances of phosphorus and suspended solids, missed compliance schedule submittals, and a general lack of communication with the department. Notices of noncompliance were issued on July 26, 2022, August 10, 2022, September 30, 2022, March 13, 2023, March 29, 2023, and November 9, 2023. The compilation of these NON's and lack

of response and adequate follow up to the requested action items led to the facility receiving an NOV in July 2024 and again in July 2025. Through secondary enforcement the department and the facility were able to resolve the outstanding issues and ultimately close the enforcement case. In October of 2025 a new licensed operator started and has been working hard to maintain compliance at the facility and continue bringing all processes up to the standards outlined in the WPDES permit. The facility is currently in compliance and working with the department well.

After a desk top review of all Discharge monitoring reports, Land application reports, and compliance schedule items, and an inspection on 01/21/2026, Unity WWTF has been found to be in substantial compliance with their current permit.

Compliance determination made by Jenna Monahan, Wastewater Engineer, on 03/02/2026.

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	0.044 MGD (2025)	Representative influent samples shall be collected from the influent manhole prior to treatment.
001	0.045 MGD (2025)	Representative effluent samples shall be collected from the pipe following the final treatment manhole prior to discharge to the riparian zone.
003	Sludge not been removed from lagoons	Representative composited lagoon sludge samples shall be collected in 2027 and monitored for the parameters as listed in the table below. If the permittee plans to remove sludge, they shall monitor sludge for Lists 1, 2, 3 & 4 and PFAS prior to land application. The Department shall be notified at least 30 days in advance of sludge removal so that appropriate monitoring forms can be provided. Approval of landspreading sites must be completed prior to sludge removal.

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	Grab	
Suspended Solids, Total		mg/L	Weekly	Grab	

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 BOD and TSS was increased from 2/month to weekly.

Explanation of Limits and Monitoring Requirements

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

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT to RIPARIAN WETLAND

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate	Monthly Avg	0.089 MGD	Daily	Continuous	
BOD5, Total	Monthly Avg	20 mg/L	Weekly	24-Hr Flow Prop Comp	
BOD5, Total	Weekly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	See pH section in permit
pH Field	Daily Min	6.0 su	5/Week	Grab	See pH section in permit
Dissolved Oxygen	Daily Min	4.0 mg/L	5/Week	Grab	See DO section in permit
Nitrogen, Ammonia Variable Limit		mg/L	Weekly	See Table	Look up the variable ammonia limit from the 'Variable Daily Max Ammonia Limitation' table in the permit and report the variable limit in the Ammonia Variable Limit column on the eDMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	Weekly	24-Hr Flow Prop Comp	Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					eDMR. See Ammonia Limitation Section below.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	26 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies Oct - May
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	16 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies April & May
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	29 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies June - Sept
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	13 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies June - Sept
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	26 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies Oct - March
E. coli		#/100 ml	Weekly	Grab	Monitoring only May through September annually until the final limit goes into effect per the Effluent Limitations for E. coli Schedule.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit Effective May through September annually per the Effluent Limitations for E. coli Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit Effective May through September annually per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit section in the permit. Enter the result in the DMR on the last day of the month.
Chloride	Weekly Avg	400 mg/L	4/Month	24-Hr Flow Prop Comp	Monitoring for chloride is required at permit effective date. Limits effective 10/01/2030. See chloride sections in permit & the associated compliance schedule.
Chloride	Monthly Avg	400 mg/L	4/Month	24-Hr Flow Prop Comp	Monitoring for chloride is required at permit effective

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					date. Limits effective 10/01/2030. See chloride sections in permit & the associated compliance schedule.
Chloride, Variable Limit	Weekly Avg	lbs/day	4/Month	Calculated	Monitoring for chloride is required at permit effective date. Limits effective 10/01/2030. Look up the variable chloride mass limit from the 'Variable Chloride Mass Limitation' table below and report the variable limit in the Chloride Variable Limit column on the DMR. See chloride sections in permit & the associated compliance schedule.
Chloride	Weekly Avg - Variable	lbs/day	4/Month	Calculated	Monitoring for chloride is required at permit effective date. Limits effective 10/01/2030. Report the chloride mass result in the Chloride Weekly Average Mass column on the DMR. Compare to the Variable Chloride Mass Limitation table below to determine compliance. See chloride sections in permit & the associated compliance schedule.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Weekly	24-Hr Flow Prop Comp	This is an interim MDV limit effective throughout the permit term. See the MDV/Phosphorus subsections and phosphorus schedules in the permit.
Phosphorus, Total		lbs/month	Monthly	Calculated	Report the total monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See Standard Requirements for

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					'Appropriate Formulas' in the permit to calculate the Total Monthly Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum of the total monthly discharges (for the months that the MDV is in effect) for the calendar year on the Annual report form.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Nitrogen Series Monitoring section in permit for specific quarters that monitoring is required.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Nitrogen Series Monitoring section in permit for specific quarters that monitoring is required.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	See Nitrogen Series Monitoring section in permit for specific quarters that monitoring is required. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET testing section in permit

Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit: 1) an increase in monitoring frequency for BOD & TSS (from 2/month to weekly) and DO & pH (from weekly to 5/week), 2) the sample types for all but pH and DO switched to 24 hour flow prop comp from grab, 3) addition of Acute WET testing twice during the permit term, 4) the addition of seasonal *Escherichia coli* (*E. coli*) limits & a compliance schedule to meet them, 5) the single daily max ammonia limit has been replaced with a variable daily max ammonia limit that varies with effluent pH, and the months at which weekly & monthly average limits apply have been adjusted, 6) addition of chloride limits and a compliance schedule to meet them and 7) the sample frequency for flow has changed from “continuous” to “daily” for eDMR reporting purposes.

Explanation of Limits and Monitoring Requirements

Monitoring Frequencies- The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. At this time, there is an increase in monitoring frequency for BOD & TSS (from 2/month to weekly) and for DO & pH (from weekly to 5/week).

Limits were determined for Unity’s existing discharge to the riparian wetland using chs. NR 102, 104, 105, 106, 207, 210, 212 and 217 of the Wisconsin Administrative Code (where applicable). For additional information on any of the limits see the 08/21/2026 memo from Ben Hartenbower to Holly Heldstab titled “Water Quality-Based Effluent Limitations for the Unity Wastewater Treatment Facility WPDES Permit No. WI-0060526”.

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

Ammonia: Weekly and monthly average ammonia limits vary seasonally. Daily maximum ammonia limits that vary with effluent pH apply year-round are presented in the table below.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq \text{pH} \leq 6.1$	83	$7.0 < \text{pH} \leq 7.1$	51	$8.0 < \text{pH} \leq 8.1$	11
$6.1 < \text{pH} \leq 6.2$	82	$7.1 < \text{pH} \leq 7.2$	46	$8.1 < \text{pH} \leq 8.2$	8.8
$6.2 < \text{pH} \leq 6.3$	80	$7.2 < \text{pH} \leq 7.3$	40	$8.2 < \text{pH} \leq 8.3$	7.3
$6.3 < \text{pH} \leq 6.4$	78	$7.3 < \text{pH} \leq 7.4$	35	$8.3 < \text{pH} \leq 8.4$	6.0
$6.4 < \text{pH} \leq 6.5$	75	$7.4 < \text{pH} \leq 7.5$	31	$8.4 < \text{pH} \leq 8.5$	4.9
$6.5 < \text{pH} \leq 6.6$	72	$7.5 < \text{pH} \leq 7.6$	26	$8.5 < \text{pH} \leq 8.6$	4.1
$6.6 < \text{pH} \leq 6.7$	69	$7.6 < \text{pH} \leq 7.7$	22	$8.6 < \text{pH} \leq 8.7$	3.4
$6.7 < \text{pH} \leq 6.8$	65	$7.7 < \text{pH} \leq 7.8$	19	$8.7 < \text{pH} \leq 8.8$	2.8
$6.8 < \text{pH} \leq 6.9$	60	$7.8 < \text{pH} \leq 7.9$	16	$8.8 < \text{pH} \leq 8.9$	2.4
$6.9 < \text{pH} \leq 7.0$	56	$7.9 < \text{pH} \leq 8.0$	13	$8.9 < \text{pH} \leq 9.0$	2.0

Chloride: Chloride has a mass limit based on weather conditions, effective 10/01/2030. See the table below for the variable limits.

Variable Chloride Mass Limitation

Parameter	Weekly Average Mass Limitation	Weekly Average Wet Weather Mass Limitation
Chloride	148 lbs/day weekly average	488 lbs/day weekly average

Phosphorus – Phosphorus rules became effective December 1, 2010 per NR 217, Wis. Adm. Code, that required the permittee to comply with water quality based effluent limits (WQBELs) for total phosphorous. The final phosphorus WQBELs are 0.171 lbs/day (monthly average) and 0.057 lbs/day (6 month averages) and were to become effective as scheduled unless a variance was granted. For this permit term, the permittee has reapplied for the Multi-Discharger Variance (MDV) for phosphorus as provided for in s. 283.16, Wis. Stats., and approved by USEPA on September 3, 2025 for a 10-year duration. The permittee qualifies for the MDV because it is an existing source and a major facility upgrade is needed to comply with the applicable phosphorus WQBELs, thereby creating a financial burden. The interim effluent

limit for total phosphorus is 1.0 mg/L as a monthly average limit. The limit was derived using DMR data from July 2020 to June 2026.

Conditions of the MDV require the permittee to optimize phosphorus removal throughout the proposed permit term, comply with interim limits and implement a plan that is designed to result in annual phosphorus reductions from other sources in the basin based on the pounds of phosphorus discharged during the previous year in excess of the specified target value.

The permittee is required to report the total amount of phosphorus discharged in lbs/month and lbs/year. By March 1 of each year the permittee shall make a payment to participating county(s) of \$68.40 per pound of phosphorus discharged during the previous year in excess of the TMDL derived limit.

The “price per pound” value is \$50.00 adjusted for CPI annually as defined by s. 283.16(8)(a)2, Wis. Stats and takes effect for reissued permits with effective dates starting April 1. This may differ from the “price per pound” that is public noticed; however, the “price per pound” is set upon reissuance and is applicable for the entire permit term. The participating county(s) uses these payments to implement nonpoint source phosphorus control strategies at the watershed level.

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. 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.

3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
003	B	Liquid	Sludge was not removed from the lagoons during the last 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						

3.1 Sample Point Number: 003- 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	
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	
Nitrogen, Total Kjeldahl		Percent	Per Application	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Per Application	Composite	
Phosphorus, Total		Percent	Per Application	Composite	
Phosphorus, Water Extractable		% of Tot P	Per Application	Composite	
Potassium, Total Recoverable		Percent	Per Application	Composite	
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

Changes from Previous Permit:

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

Clarification language has been added notifying the permittee they must monitor sludge for List 2 nutrients and meet the requirements of List 3 (Pathogen Control) and List 4 (Vector Attraction Reduction) prior to landspreading if they remove sludge from the lagoon(s). A schedule has been included requiring the permittee submit a sludge management plan prior to removal and land application of sludge from the pond(s). Additionally, to quantitate the risk, PFAS sludge sampling has been included in the permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code. PCB monitoring removed this permit term

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.

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

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

4 Schedules

4.1 Effluent Limitations for E. coli

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

Required Action	Due Date
Status Update: The permittee shall submit information within the discharge monitoring report (DMR) comment section documenting the steps taken in preparation for properly monitoring and testing for E. coli including, but not limited to, selected test method and location of sampling.	12/21/2026
Operational Evaluation Report: The permittee shall prepare and submit an Operational Evaluation Report to the Department for review and approval. The report shall include an evaluation of collected effluent data and proposed operational improvements that will optimize efficacy of disinfection at the treatment plant during the period prior to complying with final E. coli limitations and, to the extent possible, enable compliance with the final E. coli limitations. The report shall include a plan and schedule for implementation of the operational improvements. These improvements shall occur as soon as possible, but not later than 04/30/2028. The report shall state whether the operational improvements are expected to result in compliance with the final E. coli limitations. The permittee shall implement the operational improvements in accordance with the approved plan and schedule specified in the Operational Evaluation Report and in no case later than 04/30/2028. If the Operational Evaluation Report concludes that the operational improvements are expected to result in compliance with the final E. coli limitations, the permittee shall comply with the final E. coli limitations by 04/30/2028 and the permittee is not required to comply with subsequent milestones identified below in this compliance schedule ('Submit Facility Plan', 'Final Plans and Specifications', 'Treatment Plant Upgrade to Meet Limitations', 'Construction Upgrade Progress Report', 'Complete Construction', 'Achieve Compliance'). FACILITY PLAN - If the Operational Evaluation Report concludes that operational improvements alone are not expected to result in compliance with the final E. coli limitations, the permittee shall initiate development of a facility plan for meeting final E. coli limitations and comply with the remaining required actions in this schedule of compliance. If the Department disagrees with the conclusion of the report and determines that the permittee can achieve final E. coli limitations using the existing treatment system with only operational improvements, the Department may reopen and modify the permit to include an implementation schedule for achieving the final E. coli limitations sooner than 04/30/2028.	10/31/2027
Submit Facility Plan: If the Operational Evaluation Report concluded that the permittee cannot achieve final E. coli limitations with operational improvements alone, the permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	04/30/2028
Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to achieve compliance with final E. coli limitations and a schedule for completing construction of the upgrades by the complete construction date specified below.	03/31/2029
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	09/30/2029

and schedule from the Department pursuant to s. 281.41, Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	09/30/2030
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	03/31/2031
Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.	04/30/2031

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

4.2 Chloride Compliance Schedule

Required Action	Due Date
Annual Chloride Progress Report: Submit an annual chloride progress report on chloride pollution and waste minimization measures implemented during the previous year with conclusions regarding compliance with final chloride effluent limitations. The annual chloride progress report shall include the following: Identify chloride pollution and waste minimization measures that have been implemented and assess the effectiveness of such measures in making progress towards meeting final chloride effluent limitations. Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and Include an analysis of how effluent chloride varies with time and with significant loadings of chloride.	11/30/2027
Annual Chloride Progress Report: Submit the chloride progress report as defined above.	11/30/2028
Annual Chloride Progress Report: Submit the chloride progress report as defined above.	11/30/2029
Final Chloride Report: Submit a final report documenting the success in meeting the chloride limitations of 400 mg/L weekly average and monthly average and 148 lbs/day weekly average and 488 lbs/day alternative wet weather weekly average, as well as the anticipated future reduction in chloride sources and chloride effluent concentrations.	06/30/2030
Effective Chloride Limit Date: The chloride limitations of 400 mg/L weekly average and monthly average and 148 lbs/day weekly average and 488 lbs/day alternative wet weather weekly average become effective.	10/01/2030

Explanation of Schedule: Concentration and mass limits are required because the 4-day P99 of the effluent data exceeds the calculated weekly average limit. This schedule requires the permittee to implement measures to reduce sources of chloride to the treatment plant and comply with the new chloride WQBELs concentration and mass limitations as soon as possible but no later than 10/01/2030.

4.3 Phosphorus Payment per Pound to County

The permittee is required to make annual payments for phosphorus reductions to the participating county or counties in accordance with s. 283.16(8), Wis. Stats, and the following schedule. The price per pound will be set at the time of permit reissuance and will apply for the duration of the permit.

Required Action	Due Date
Annual Verification of Phosphorus Payment to County: The permittee shall make a total payment to the participating county or counties approved by the Department by March 1 of each calendar year. The amount due is equal to the following: [(lbs of phosphorus discharged minus the permittee's target value) times (\$68.40 per pound)] or \$640,000, whichever is less. See the payment calculation steps in the Surface Water section. The permittee shall submit Form 3200-151 to the Department by March 1 of each calendar year indicating total amount remitted to the participating counties to verify that the correct payment was made. The first payment verification form is due by the specified Due Date. Note: The applicable Target Value is the TMDL derived limit as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value is \$50.00 adjusted for CPI.	03/01/2027
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2028
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2029
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2030
Annual Verification of Payment #5: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2031
Continued Coverage: If the permittee intends to seek a renewed variance, an application for the MDV (Multi Discharger Variance) shall be submitted as part of the application for permit reissuance in accordance with s. 283.16(4)(b), Wis. Stats.	
Annual Verification of Payment After Permit Expiration: In the event that this permit is not reissued prior to the expiration date, the permittee shall continue to submit Form 3200-151 to the Department indicating total amount remitted to the participating counties by March 1 each year.	

Explanation of Schedule: Subsection 283.16(6)(b), Wis. Stats., requires permittees that have received approval for the multi-discharger variance (MDV) to implement a watershed project that is designed to reduce nonpoint sources of phosphorus within the HUC 8 watershed in which the permittee is located. The permittee has selected the "Payment to Counties" watershed option described in s. 283.16(8), Wis. Stats. Under this option the permittee shall make annual payment(s) to participating county(s) that are calculated based on the amount of phosphorus actually discharged during a calendar year in pounds per year less the amount of phosphorus that would have been discharged had the permittee discharged phosphorus at a target value based on TMDL-derived limitations. The pounds of phosphorus discharged in excess of the target value is multiplied by a per pound phosphorus charge that will equal \$68.40 per pound. This schedule requires the permittee to submit Form 3200-151 to the Department indicating the total amount remitted to the participating county(s).

4.4 Phosphorus Schedule - Optimization and Compliance Planning

The permittee is required to optimize performance and undertake compliance planning to control phosphorus discharges per the following schedule.

Required Action	Due Date
Optimization and Compliance Alternatives: The permittee shall implement a phosphorus discharge optimization plan to control phosphorus discharges to the greatest extent practicable. Submit a progress report that summarizes the approach to phosphorus removal at the facility, the resulting concentration and mass loading for the last 12-month period, and any changes that were or are needed to optimize removal of phosphorus by the due date. The permittee shall also evaluate alternative phosphorus compliance options such as water quality trading and adaptive management. The progress report submitted on the date due shall also detail any outreach activities undertaken to evaluate these options, any communications with credit generators, brokers/clearinghouse, and any potential water quality trading or adaptive management projects that may lead to compliance with phosphorus QBELs. Financial alternatives evaluation: If the permittee intends to seek a renewed variance at the end of this permit term, the permittee may complete a financial evaluation to support ongoing variance eligibility. The report must evaluate financial mechanisms that have the potential to make compliance with phosphorus QBELs economically feasible. Include an assessment of the feasibility and financial outcomes of the following opportunities: variable rate structures, grants through USDA or other sources, and DNR's Clean Water Fund Program. The assessment of the DNR's Clean Water Fund program should take into account subsidized interest rate loans, principal forgiveness, and other options as outlined in EPA's March 2024 Financial Capabilities Assessment Guidance, Appendix C.	10/31/2027
Progress Report #2: Submit a progress report per the above for the prior calendar year.	10/31/2028
Progress Report #3: Submit a progress report per the above for the prior calendar year.	10/31/2029
Progress Report #4: Submit a progress report per the above for the prior calendar year.	10/31/2030
Final MDV Optimization and Compliance Alternatives Report: Submit a progress report per the above for the prior calendar year. If water quality trading or adaptive management will be used to comply with phosphorus limitations during the next permit term, submit a draft water quality trading plan, adaptive management plan, or executed clearinghouse credit purchase agreement. The financial alternatives evaluation as described above must be submitted by the date due if the facility chooses to seek renewal of the variance.	03/31/2031

Explanation of schedule: Per s. 283.16(6)(a), Wis. Stats. the Department may include a requirement that the permittee optimize the performance of a point source in controlling phosphorus discharges, which may be necessary to achieve compliance with applicable effluent limits. This compliance schedule requires the permittee to prepare an optimization plan with a schedule for implementation and submit it for Department approval. The schedule also includes a compliance planning element focused on economically feasible solutions to low-level phosphorus effluent limits such as water quality trading or adaptive management. The permittee shall take the steps called for in the optimization plan and submit annual progress reports on optimizing the removal of phosphorus and establishing a water quality trade or adaptive management project. Should the permittee intend to reapply for a subsequent term of variance coverage, a financial alternatives analysis will need to be completed. Report elements are listed in the schedule, and more information can be found in EPA's March 2024 Financial Capabilities Assessment Guidance, Appendix C.

4.5 Sludge Management Plan

Required Action	Due Date
Sludge Management Plan: The permittee shall submit a management plan for approval if removal of sludge will occur during this permit term. The plan shall demonstrate compliance with ch. NR 204, Wis. Adm. Code and at minimum address 1) How and where is sludge sampled; 2) Available sludge storage details and location(s); 3) How will the sludge be removed with details on volume, characterization and how will the treatment plant continue to function during the drawdown; 4) Describe the type of transportation and spreading vehicles and loading and unloading practices; 5) Identify approved land application sites, apply for needed sites, site limitations, total acres needed and vegetative cover management; 6) Specify record keeping procedures including site loading; 7) Address contingency plans for adverse weather and odor/nuisance abatement; and 8) Include any other pertinent information such as other disposal options that may be used or specifications of any pretreatment processes Once approved, all sludge management activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes. No desludging may occur unless approval from the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed. The plan is due at least 60 days prior to desludging.	

Explanation of Sludge Management Plan Schedule: If the lagoons are to be de-sludged during this permit term, a management plan is needed to show compliance with ch NR 204, Wis. Adm. Code that clearly explains how the sludge will be safely removed, what contingencies are in place, the type of equipment that will be used and how the sludge will be land applied to ensure the proper precautions are in place to prevent any negative impacts to surface water or groundwater.

Other Comments

None

Attachments

- Water Quality Based Effluent Limits: 8/21/2026 memo from Ben Hartenbower to Holly Heldstab titled “Water Quality-Based Effluent Limitations for the Unity Wastewater Treatment Facility WPDES Permit No. WI-006026”
- MDV Evaluation Checklist, completed by Matt Claucherty, dated 08/11/2025
- MDV Conditional Approval Letter, completed by Matt Claucherty, dated 08/11/2025

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Holly Heldstab, Wastewater Specialist

Date: 09/08/2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: August 21, 2026

TO: Holly Heldstab – Eau Claire

FROM: Benjamin Hartenbower – Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for the Unity Wastewater Treatment Facility
WPDES Permit No. WI-0060526

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 Unity Wastewater Treatment Facility in Marathon County. This municipal wastewater treatment facility (WWTF) discharges to the Wetland adjacent to the Little Eau Pleine River, located in the Little Eau Pleine River Watershed in the Central Wisconsin River Basin. This discharge is included in the Wisconsin River Basin (WRB) Total Maximum Daily Load (TMDL) as approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate				0.089 MGD		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
Dissolved Oxygen		4.0 mg/L				1,2
Ammonia Nitrogen						3,4
April & May	Variable		26 mg/L	16 mg/L		
June - September	Variable		29 mg/L	13 mg/L		
October - March	Variable		26 mg/L	26 mg/L		
<i>E. coli</i>				126 #/100 mL		5
May - September				geometric mean		
Chloride			400 mg/L, 148 lbs/day	400 mg/L		3
Wet Weather Limit			488 lbs/day			
Phosphorus				1.0 mg/L		6,7
HAC Interim				0.171 lbs/day	0.057 lbs/day	
Final TMDL Limit						
TKN, Nitrate+Nitrite, and Total Nitrogen						8
Acute WET						9,10

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 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.

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

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	83	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	8.8
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	40	8.2 < pH ≤ 8.3	7.3
6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	35	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	4.9
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	26	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	22	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.8
6.8 < pH ≤ 6.9	60	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	2.0

5. Additional Limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. Under the phosphorus MDV, the highest attainable condition (HAC) interim limit of 1.0 mg/L should be effective upon permit reissuance.
7. The mass limits are based on the Total Maximum Daily Load (TMDL) for the Wisconsin River to address phosphorus within the TMDL area. The TMDL was approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020.
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. Two Acute WET tests are recommended. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge.
10. 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.

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

Attachments (2) – Narrative & Map

PREPARED BY:



Benjamin Hartenbower, PE
Water Resources Engineer

Date:

8/21/26

E-cc: Jenna Monahan, Wastewater Engineer – WCR/Eau Claire
Geisa Bittencourt, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Chris Holland, Wastewater Engineer – WY/3
Andrea Gruen, Environmental Toxicologist – WY/3
Michael Polkinghorn, Water Resources Engineer – NOR/Rhineland
Chris Willger, Water Quality Biologist – WCR/Eau Claire

Water Quality-Based Effluent Limitations for The Unity Wastewater Treatment Facility

WPDES Permit No. WI-0060526

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description

The existing wastewater treatment system consists of a 2-cell aerated lagoon system with an intermittent sand filter (ISF) utilized when BOD and/or TSS values are too high to maintain effluent limit requirements for discharge to surface water, which treats municipal-generated wastewater from the Village of Unity. The effluent is discharged in a riparian wetland on the edge of the Little Eau Pleine River.

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

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate				0.089 MGD		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
Dissolved Oxygen		4.0 mg/L				1,2
Ammonia Nitrogen November - April May - September	26 mg/L		26 mg/L 29 mg/L	26 mg/L 16 mg/L		3
Phosphorus Interim MDV Interim Final TMDL Limit				3.5 mg/L 1.0 mg/L 0.16 lbs/day	0.054 lbs/day	4,5
TKN, Nitrate+Nitrite, and Total Nitrogen						7

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 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.

Attachment #1

3. 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.
4. The phosphorus mass limit is based on the Total Maximum Daily Load (TMDL) for the Wisconsin River to address water quality impairments within the TMDL area. The TMDL was approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020.
5. A compliance schedule is in the current permit to meet the MDV Interim Limit by 07/01/2024.
6. Monitoring only.

Receiving Water Information

- Name: Wetland adjacent to Little Eau Pleine River
- Waterbody Identification Code (WBIC): 5537201
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Limited Aquatic Life (LAL), non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: where Outfall 001 is located.
- Hardness: 326 mg/L as CaCO₃.
Effluent hardness is used in place of receiving water because there is no receiving water flow upstream of the discharge.
- % of 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.
- Impaired Water Status: This discharge is located within the Wisconsin River TMDL for phosphorus.

Effluent Information

- Design flow rates:
Annual average = 0.045 million gallons per day (MGD)
Peak Weekly = 0.148 MGD (estimated)
The peak design flow was estimated from the annual average design flow and a peaking factor based on data from the current permit term. For reference, the actual average flow from 07/01/2020 to 06/30/2026 was 0.042 MGD
- Hardness: 326 mg/L as CaCO₃. This value represents the geometric mean of six sample results submitted with the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater Source: Domestic wastewater with no industrial contributors.
- Water supply: Private Wells
- Fraction of the effluent flow withdrawn from receiving water :
("F" as described in s. NR 106.06, Wis. Adm. Code): 0
- Additives: one for phosphorus control (Ferric Chloride).
- Total Phosphorus Wasteload Allocation: 16 lbs/yr

Attachment #1

- Effluent Characterization: This facility is categorized as a minor municipal discharger, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus chloride and hardness.
- The permit-required monitoring for ammonia and phosphorus from July 2020 to June 2026 is used in this evaluation.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Copper and Chloride Effluent Data at Outfall 001

Sample Date	Copper µg/L	Sample Date	Chloride mg/L
01/26/2026	31	01/03/2019	258
01/29/2026	21	05/02/2019	185
02/02/2026	18	08/01/2019	177
02/05/2026	17	10/03/2019	182
02/09/2026	17	02/06/2020	207
02/13/2026	17	04/02/2020	166
02/16/2026	17	01/29/2026	369
02/20/2026	17	02/02/2026	377
02/23/2026	18	02/09/2026	409
02/27/2026	17	02/13/2026	390
03/02/2026	18	02/20/2026	386
		02/23/2026	374
		02/27/2026	372
1-day P ₉₉	31	1-day P ₉₉	602
4-day P ₉₉	24	4-day P ₉₉	431

The following table presents the average concentrations and loadings at Outfall 001 from July 2020 to June 2026 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 for Outfall 001

	Average Measurement
Flow Rate	0.042 MGD
BOD ₅	9.0 mg/L*
TSS	11 mg/L*
pH	7.10 s.u.
Dissolved Oxygen	12 mg/L
Ammonia Nitrogen	5.5 mg/L*
Phosphorus	2.2 mg/L

*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. Adm. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q₁₀ receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

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

Where:

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

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for the Unity Wastewater Treatment Facility, and the limits are set based on the 1-Q₁₀ method.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0.00 cfs

SUBSTANCE	REF HARD.* mg/L	ATC	MEAN BACK- GRD.	MAX EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340		340	68	<0.231		
Cadmium	326	112	0.025	112	22.4	<0.268		
Chromium (+3)	301	4446	0.569	4446	889.2	<0.282		
Copper	326	47.3	1.338	47.3			30.7	31.0
Lead	326	335	0.4654	335	67	<0.385		
Nickel	268	1080		1080	216	21.0		
Zinc	326	338	3.12	338	67.6	19.0		
Chloride (mg/L)		757		757			602	409

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0.00 cfs

SUBSTANCE	REF HARD.* mg/L	CTC	MEAN BACK- GRD.	WEEKLY EFFL. LIMIT	1/5 OF AVE. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152		152	30.4	<0.231	
Cadmium	175	3.82	0.025	3.82	0.764	<0.268	
Chromium (+3)	301	326	0.569	326	65.2	<0.282	
Copper	326	28.5	1.338	28.5			24.3
Lead	326	87.7	0.4654	87.7	17.54	<0.385	
Nickel	269	170		170	34	21.0	
Zinc	326	338	3.12	338	67.6	19.0	
Chloride (mg/L)		395		395			431

Monthly Average Limits based on Wildlife Criteria (WC)

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

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 0.00 cfs

SUBSTANCE	HTC	MEAN BACK- GRD.	MONTHLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
Cadmium	880	0.025	880	176	<0.268	
Chromium (+3)	8400000	0.569	8400000	1680000	<0.282	
Lead	2240	0.4654	2240		<0.385	
Nickel	110000		110000	22000	21.0	

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 0.00 cfs

SUBSTANCE	HCC	MEAN BACK- GRD.	MONTHLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
Arsenic	40.0		40.0	8.0	<0.231	

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

Conclusions and Recommendations

Based on a comparison of the calculated limitations and effluent data, effluent limitations are required for chloride. Monitoring recommendations are made in the paragraphs below:

Chloride--Considering available effluent data, the 1-day P₉₉ is 602 mg/L with a maximum value of 409 mg/L and the 4-day P₉₉ is 431 mg/L. The 4-day P₉₉ of the effluent data exceeds the calculated weekly average limit, therefore concentration and mass limits as well as monthly monitoring are recommended. **The weekly average limit should be 400 mg/L.**

The weekly mass limitation of 148 lbs/day is based on the concentration limit and the annual average design flow rate of 0.045 MGD (395 mg/L * 0.045 MGD * 8.34) in accordance with s. NR 106.07(2)(a), Wis. Adm. Code. The alternate wet weather weekly mass limitation of 488 lbs/day is based on the concentration limit and the estimated weekly design flow of 0.148 MGD.

Sections NR 106.07(4) and NR 205.065(7), Wis. Adm. Code require WPDES permits contain weekly and monthly average limitations for municipal dischargers whenever practicable and necessary to protect water quality. **Therefore, a monthly average chloride limit of 400 mg/L is required** to meet expression of limits requirements in addition to the weekly average limits.

Mercury-- The permit application did not require monitoring for mercury because the Unity Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past six years of sludge characteristics data reveals that all sample results are within expected analytical ranges and well below the 17 mg/kg level. The concentration in the sludge from 2021 was 0.400 mg/kg. **Therefore, no mercury monitoring is recommended at Outfall 001.**

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

Based on the annual design flow and lack of nondomestic contributions, it is unlikely that the effluent will contain PFOS or PFOA. Therefore, **PFOS and PFOA monitoring is not recommended.**

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, and 2 weekly average, and 2 monthly average limits. These limits are re-evaluated due to the following changes:

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

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

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

Where:

A = 0.633 and B = 90 for a Limited Aquatic Life, and
pH (s.u.) = that characteristic of the effluent

The effluent pH data was examined as part of this evaluation. A total of 311 sample results were reported from July 2020 to June 2026. The maximum reported value was 9.17 s.u. (Standard pH Units). The effluent pH was 9.02 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.52 s.u. The mean plus the standard deviation multiplied by a factor of 2.326, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.43 s.u. Therefore, a value of 9.0 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 9.0 s.u. into the equation above yields an ATC = 2.0 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method

In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the the 1-Q₁₀ receiving water low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q₁₀ (estimated as 80 % of 7-Q₁₀) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	4.0
1-Q ₁₀	2.0

The 1-Q₁₀ method yields the most stringent limits for the Unity Wastewater Treatment Facility.

Presented below is a table of daily maximum limitations corresponding to various effluent pH values. This table is required year-round and is recommended in place of a single daily maximum of 2.0 mg/L.

Daily Maximum Ammonia Nitrogen Limits – LAL

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	83	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	8.8
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	40	8.2 < pH ≤ 8.3	7.3
6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	35	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	4.9
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	26	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	22	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.8
6.8 < pH ≤ 6.9	60	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	2.0

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

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

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as Limited Aquatic Life is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

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

E = 1.0,

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

T = the temperature of the receiving (°C)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q₁₀ (4-Q₃, if available) to derive weekly average limitations. The 30-day criteria are used with the 30-Q₅ (estimated as 85% of the 7-Q₂ if the 30-Q₅ is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 °C, 25% of the flow is used if the Temperature < 11 °C, and 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

The “default” basin assumed values are used for Temperature and pH because minimum ambient data is available. These values are shown in the table below, with the resulting criteria and effluent limitations.

Weekly and Monthly Ammonia Nitrogen Limits – LAL

		April & May	June - September	October - March
Effluent Flow	Qe (MGD)	0.089	0.089	0.089
Background Information	7-Q ₁₀ (cfs)	0	0	0
	7-Q ₂ (cfs)	0	0	0
	Ammonia (mg/L)	N/A	N/A	N/A
	Average Temperature (°C)	13	19	6.3
	Maximum Temperature (°C)	15	21	13
	pH (s.u.)	7.76	7.84	7.54
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	0	0	0
	Reference Monthly Flow (cfs)	0	0	0
Criteria mg/L	4-day Chronic	52.88	32.55	75.84
	30-day Chronic	21.15	13.02	30.34
Effluent Limits mg/L	Weekly Average	53	33	76
	Monthly Average	21	13	30

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from July 2020 to June 2026.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April & May	June - September	October - March
1-day P ₉₉	25.4	12.9	35.5
4-day P ₉₉	14.9	7.1	19.8
30-day P ₉₉	9.2	3.2	11.4
Mean	6.8	1.7	7.8
Std	5.1	2.9	7.3
Sample size	51	106	149
Range	0.1 - 18.6	0.1 - 14.2	0.1 - 27

Reasonable Potential

The need to include ammonia limits in the permit is determined by calculating 99th upper percentile (or P₉₉) values for ammonia during the month ranges and comparing those to the calculated limits. Based on this comparison, daily limits are required year-round. However, since the permit currently has daily, weekly, and monthly limits, **the limits must be retained regardless of reasonable potential**, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

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

With the adjustment to the monthly ranges, the monthly average ammonia limit for June -September should be updated to the calculated limit of 13 mg/L.

Expression of Limits

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

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

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

In this case, the current weekly and monthly average limits for November – September are already more restrictive than the greatest daily maximum of 83 mg/L. Since the daily maximum limit will apply to October, the weekly and month average limits for November – March should also apply.

Conclusions and Recommendations

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

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
April & May	Variable	26	16
June – September	Variable	29	13
October – March	Variable	26	26

Additional limits to meet the requirements in s. NR 106.07, Wis. Adm Code, are denoted in bold text.

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

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

The Unity Wastewater Treatment Facility had previously been exempted from disinfection based on the limited aquatic life or limited forage fish 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., limited forage fish, limited aquatic life - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for the wetland tributary adjacent to the Little Eau Pleine River is listed in ch. NR 104, Wis. Adm. Code, as a wetland.

Wetlands are surface waters of the state, are therefore designated as recreational use and disinfection should not be exempted based solely on this hydrological classification.

Detention Time

The last permit term's flow data shows that, as a rolling average, > 180-d detention time was not provided at all times during the permit term. The greatest 180 day rolling average at Outfall 001 was 0.063 MGD (July 2020 to June 2026). Using a total pond volume of 3,680,000 gallons, the minimum detention time was 59 days. Since data shows that the facility provides < 180-d detention time, **disinfection is required and effluent limits and monitoring are needed in the permit.**

$$\text{Detention Time [days]} = \frac{\text{Total Pond Volume [MG]}}{180\text{-d average flow rate[mgd]}}$$

Compliance Schedule

At this time, there is no effluent *E. coli* data available to determine if these limits are currently met. The permit will include a compliance schedule to meet these limits.

PART 5 – PHOSPHORUS

Technology-Based Effluent Limit

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

Since the Unity Wastewater Treatment Facility has a phosphorus limit equal to 1.0 mg/L, the need for a TBEL will not be considered further.

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

TMDL Limits

Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (April 2020)* and are based on the annual phosphorus wasteload allocation (WLA) given in lbs/yr. This WLA is found in Appendix K of the *Total Maximum Daily Loads for Total Phosphorus in the Wisconsin River Basin Report (April 2019)* and is expressed as a maximum annual load (lbs/year). For the Unity Wastewater Treatment Facility, this WLA is 16 lbs/yr and 0.044 lbs/day.

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

$$\begin{aligned}\text{TP Equivalent Effluent Concentration} &= \text{Daily WLA} \div (\text{Flow Rate} * \text{Conversion Factor}) \\ &= 0.044 \text{ lbs/day} \div (0.045 \text{ MGD} * 8.34) \\ &= 0.12 \text{ mg/L}\end{aligned}$$

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

$$\begin{aligned}\text{TP Six-Month Average Permit Limit} &= \text{Daily WLA} * \text{Six-Month Average Multiplier} \\ &= 0.044 \text{ lbs/day} * 1.30 \\ &= 0.057 \text{ lbs/day}\end{aligned}$$

$$\begin{aligned}\text{TP Monthly Average Permit Limit} &= \text{TP Six-Month Average Permit Limit} * 3 \\ &= 0.057 \text{ lbs/day} * 3 \\ &= 0.171 \text{ lbs/day}\end{aligned}$$

The multiplier used in the six-month average calculation was used as recommended in TMDL implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 0.84. The facility is not able to meet the permit limits based on the WLA so a standard CV of 0.6 is used. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

The WRB TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards, for tributaries to the Wisconsin River. Therefore, WLA-based WQBELs are protective of immediate receiving waters and TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required.

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

The following table lists the statistics for effluent phosphorus levels from July 2020 to June 2026 for informational purposes. In the cases where reporting the mass discharge is not required in the current permit, the mass is calculated using the reported phosphorus concentration and the effluent flow rate for that day.

Effluent Data

	Phosphorus mg/L	Phosphorus lbs/day
1-day P ₉₉	8.37	2.70
4-day P ₉₉	4.82	1.53
30-day P ₉₉	3.01	0.91
Mean	2.22	0.65
Std	1.66	0.54
Sample size	305	310
Range	0.04 - 6.98	0.00 - 3.42

Conclusion:

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

- Six-month average Total Phosphorus mass limit of 0.057 lbs/day
- Monthly average Total Phosphorus mass limit of 0.171 lbs/day

Multi-Discharger Variance Interim Limit

With the permit application, the Unity Wastewater Treatment Facility has re-applied for the phosphorus multi-discharger variance (MDV). Conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL. The recommended interim limit during the 2nd permit under MDV approval, pursuant to s. 283.16(6)(am), Wis. Stats., is **1.0 mg/L as a monthly average**.

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.

Monthly Temperature Effluent Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN				120
FEB				120
MAR				120
APR				120
MAY				120
JUN				120
JUL				120
AUG				120
SEP				120
OCT				120
NOV				120
DEC				120

Reasonable Potential

At temperatures above ~103°F, conventional biological treatment systems stop functioning properly and experience upsets. There is no indication that this has ever occurred at this treatment system. This information, coupled with the lack of significant industrial heat load, lead to the conclusion that there is no reasonable potential for the discharge to exceed the 120°F limitation. **Therefore, no limits or monitoring for temperature are recommended to be included in the reissued permit**

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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

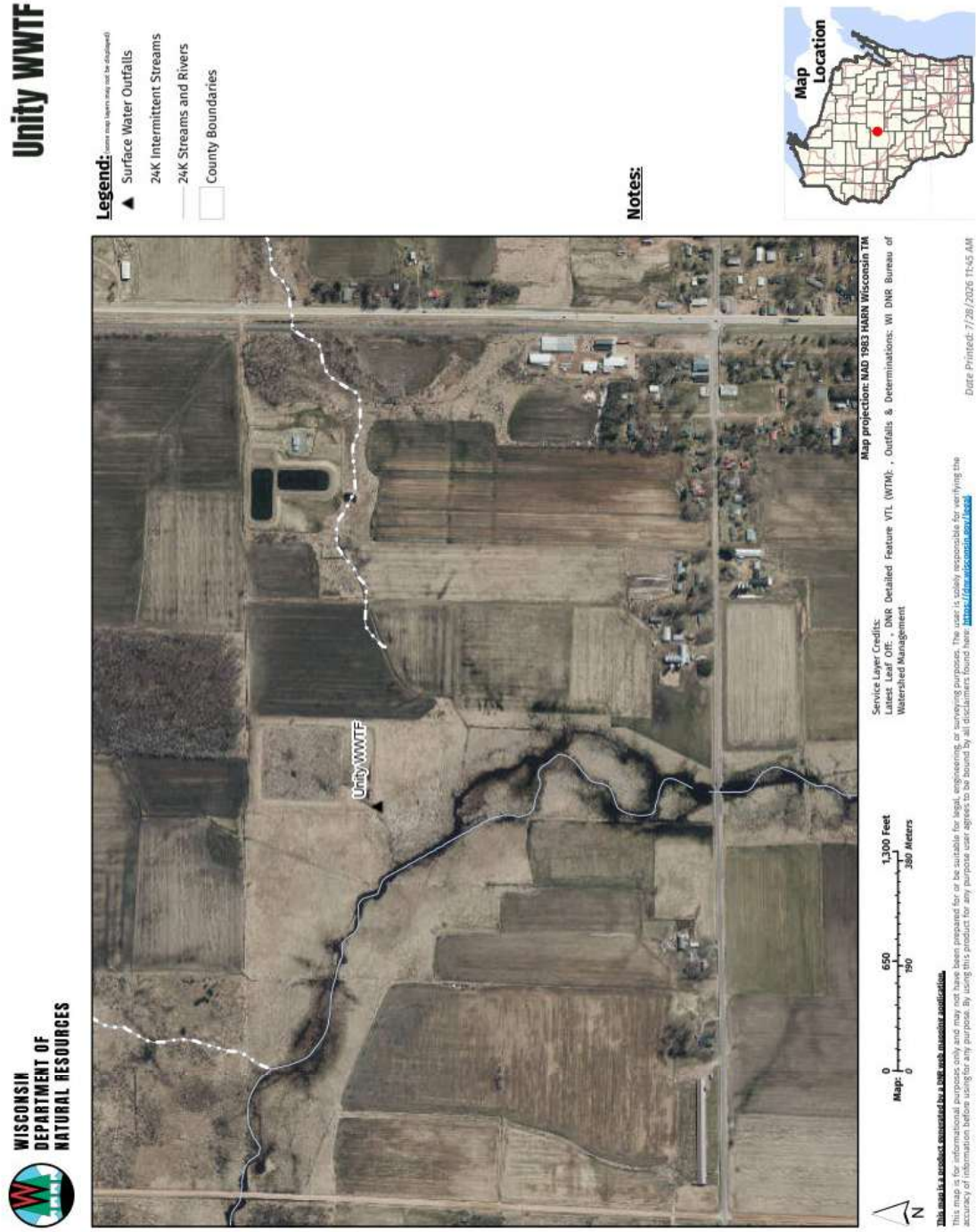
- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC50 (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic testing is usually not recommended because the immediate receiving water is LAL classified wetland that is not channelized between the outfall and the point where the receiving water becomes a non-variance waterbody (i.e., one that supports a cold water, warm water sport fish, or warm water forage fish community). Therefore, there is believed to be little potential for chronic toxicity effects in the Little Eau Pleine River associated with the discharge from the Unity Wastewater Treatment Facility, so the need for chronic WET testing was not considered further.
- 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.

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

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. 0 Points	Chronic not evaluated.
Historical Data	No tests available. 5 Points	
Effluent Variability	Little variability, no upsets, consistent WWTF operations. Ammonia Nitrogen, BODs, Phosphorus, TSS, and pH exceedances 5 Points	
Receiving Water Classification	LAL 0 Points	
Chemical-Specific Data	Reasonable potential for limits for Ammonia based on ATC (5 pts) Copper, Nickel, Zinc, and Chloride detected. (3 pts) Additional Compounds of Concern: None 8 Points	
Additives	One Water Quality Conditioner added. (1 pt) Permittee has proper P chemical SOPs in place 1 Point	
Discharge Category	No Industrial Contributors. 0 Points	
Wastewater Treatment	Secondary or Better 0 Points	
Downstream Impacts	No impacts known 0 Points	
Total Checklist Points:	18 Points	
Recommended Monitoring Frequency (from Checklist):	2 tests during permit term	
Limit Required?	No	
TRE Recommended? (from Checklist)	No	

- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, two acute WET tests are recommended in the reissued permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge.





8/11/2025

Tony Johnson
PO Box 47
Unity, WI 54488

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Little Eau Pleine River in Clark County
Permittee: Village of Unity, WPDES WI-0060526

Dear Mr. Johnson:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for Village of Unity Wastewater Treatment Facility in an application dated 5/22/2025. Wisconsin's multi-discharger phosphorus variance was approved by EPA on February 6, 2017. Coverage under the multi-discharger phosphorus variance may only be granted to an existing source that demonstrates a major facility upgrade is necessary to achieve phosphorus compliance and the upgrade will result in economic hardship as defined in the federally approved variance. The water quality criterion for which you are seeking a variance is contained in s. NR 102.06, Wis. Adm. Code.

After review of the application materials, the Department is tentatively approving coverage under the phosphorus multi discharger variance because the applicant has demonstrated that a major facility upgrade would be required to comply with the phosphorus water quality based effluent limitation, and the applicant meets the economic hardship eligibility criteria delineated in the federally approved variance. In addition, the permitted facility has agreed to comply with the interim limitations that will be included in the WPDES permit, and has agreed to reduce the amount of phosphorus entering surface waters by making payments to the counties pursuant to s. 283.16(6)(b)1., Wis. Stats.

Public comment on this decision will be solicited at the time of permit reissuance after which a final decision will be made. The Department appreciates your attention and interest in Wisconsin's multi-discharger phosphorus variance. Should you have further questions regarding this matter, please contact me at (608) 400 – 5596 or by email at matthew.claucherty@wisconsin.gov.

Sincerely,

Matt Claucherty, MDV Point Source Coordinator
Bureau of Water Quality

e-cc Angela Edblom, Village of Unity
 Holly Heldstab, WDNR
 Jenna Monahan, WDNR
 Michelle Woods, EPA Region 5
 Tim Elkins, EPA Region 5

Multi-Discharger Variance Application Evaluation Checklist

Form 3200-145 (R 5/16)

Page 1 of 4

Notice: This checklist is meant to be a tool to help Department of Natural Resources (DNR) staff review municipal and industrial multi-discharger variance (MDV) applications (Forms 3200-149 and 3200-150). Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

Permittee Name				
Village of Unity				
WPDES Permit Number			County	
WI- 0 0 6 0 5 2 6			Clark	
1. Did the point source apply for the MDV at the appropriate time?	☒ Yes ☐ No. <i>STOP- facility not eligible at this time.</i>			See Questions 1-3.
2. This operation is (check one):	☐ New or relocated outfall. <i>STOP- facility not eligible.</i> ☒ Existing outfall			See Questions 5-6.
3. Is the point source is located in an MDV eligible area?	☒ Yes ☐ No. <i>STOP- facility not eligible.</i>			Apply County information to Appendix H. Additional information provided in Q7 on municipal form & Q7-8 on industrial form.
4. The secondary indicator score for the county (counties) the discharge is located is:	4			See Appendices A-F. If the score is less than 2, stop; the facility is not eligible. See Q23 on municipal form & Q28 on industrial form.
5. Is a major facility upgrade required to comply with phosphorus limits?	☒ Yes ☐ No. <i>STOP- facility not eligible.</i>			See Q8 on municipal form/Q9 on industrial form.
6. List the months where phosphorus limits cannot be achieved during the permit term:	☒ All ☒ Jan ☒ Apr ☒ Jul ☒ Oct ☒ Feb ☒ May ☒ Aug ☒ Nov ☒ Mar ☒ Jun ☒ Sep ☒ Dec			Consider checking with limit calculator. If this does not match information in application, the application should be updated prior to approval.
7. What is the current effluent level achievable?				
Outfall Number(s)	Conc. (mg/L)	Method for calculation:	Does this concur with application?	DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.
001	3.11	☒ 30-day P99 ☐ Other, specify: _____	☐ Yes ☒ No, why not: Application used smaller data subset	
8. What is the appropriate interim limitation(s) for the permit term? 0.6 mg/L as a monthly average, pursuant to s. 283.16(6)(a)(2)., Wis. Stats. Target Value = 0.2 mg/L A schedule may be required prior to the limit becoming effective. Provide Rationale: Effluent total phosphorus data from the prior three years (7/1/2022 - 6/30/2025, n=149) yields a 30-day P99 value of 3.11. It appears that phosphorus treatment did not begin until late 2023, so the 3-year window is not representative of current treatment abilities. More recently, 1.0 mg/L is generally being complied with, and some months average in the 0.5 - 0.6 mg/L range. A schedule is warranted prior to 0.6 mg/L becoming effective.				
Note: See description in Section 2.02 of the MDV implementation guidance. Interim limitations should reflect the "highest attainable condition" for the permittee in question pursuant to s. 283.16(7), Wis. Stat.				

9. <i>For Industries Only</i> - Where does the phosphorus in the effluent come from? (check all that apply)	☐ Process ☐ Additive Usage ☐ Water supply <i>Can intake credits be given or can the facility use an alternative water supply?</i> ☐ Not feasible ☐ Possibly, but further analysis needed ☐ Not evaluated at this time	See Q14-15 & 19 on industrial form. If the answer is "possibly" or "not evaluated", the schedule section of the MDV permit should contain a requirement to perform this analysis.
10. Has this facility optimized?	☐ Yes ☒ In progress ☐ No	See Q14 on municipal form & Q16 & 20 on industrial form. Facility must optimize and operate at an optimize treatment level (s. 283.16(6)(a), Wis. Stat.) If no will need compliance schedule.
11. Has a facility plan/compliance alternative plan been completed for the facility?	☒ Yes ☐ In progress ☐ No	See Q15 on municipal form & Q17 on industrial form.
12. What is the projected cost for complying with phosphorus? Source:	\$ <u>1,225,000.00</u> Final Compliance Alternatives Plan	Facility must submit site-specific compliance costs. If cost projections are used from EIA, the permittee must certify that these costs are reasonable for the facility in question. See "projected compliance costs" in Section 2.02 of the MDV Implementation Guidance for details.

Comments on planning efforts:

Davy Engineering prepared a facilities plan, dated August 2016, on behalf of the Village of Unity. The document provided planning details for achieving a low-level phosphorus WQBEL. Alternatives such as water reuse, adaptive management, and water quality trading are evaluated and deemed not feasible. Spray irrigation of wastewater was deemed feasible but more costly than tertiary filtration. A site specific cost estimate for tertiary filtration is provided. This represents the lowest-cost means of complying with the WQBEL. During the current permit term, Unity adopted chemical phosphorus removal.

13. Are adaptive management and water quality trading viable?	☐ Yes ☒ Perhaps. Additional analysis required. ☐ No	See Q18-21 on municipal form & Q22-25 on industrial form. If additional analyses required, the applicant may need to complete this analysis during the MDV permit term.
14. Has the point source met the appropriate primary screener?	☒ Yes ☐ No. <i>STOP- facility not eligible.</i>	See Q4 of this form in addition to the "eligibility" guidance in Section 2.01 of the MDV Implementation Guidance.

Comments on economic demonstration:

The site specific cost estimate provided by Davy Engineering arrives at capital costs for tertiary filtration of \$1,225,000 and increased O&M costs of \$46,100 annually. The statewide assessment (EIA Addendum, appendix G) has similar values of \$1.8 M (capital costs) and \$28 K (annual O&M). The values are both conservatively low, considering the cost increases that have occurred since 2016. Principle and interest payments on capital expenses would be \$78,394.78 for 20 years at a 2.475% CWF interest rate. Future annual costs would total to \$124,494.78. This cost, factored for 95% residential use and divided amongst 155 customer households, represents a per-user cost increase of \$763.03 per year. Current sewer rates are \$600 per year, and projected rates total to \$1,363.03 per year. This value is 2.35% of the community's \$58,125 median household income. In Clark County with a secondary indicator score of 6, this economic impact meets the primary screener for eligibility.

15. What watershed option was selected?

- ☒ County project option. *Complete Section 5.*
- ☐ Binding, written agreement with the DNR to construct a project or implement a watershed plan. *Complete Section 4.*
- ☐ Binding, written agreement with another person that is approved by the DNR to construct a project or implement a watershed plan. *Complete Section 4.*

Section 4. Watershed Plan Review

16. MDV Plan Number:

Note: This is for tracking purposes. Contact Statewide Phosphorus Implementation Coordinator for the plan number.

17. Did the point source complete Form 3200-148?

- ☐ Yes
- ☐ No

18. Is the project area in the same HUC 8 watershed as the point of discharge?

- ☐ Yes
- ☐ No. *STOP- Watershed plan must be updated.*

19. What is the annual offset required?

See Section 2.03 of the MDV implementation guidance. If this value is different from the offset target provided in form 3200-148, the watershed plan should be amended.

20. Does the plan ensure that the annual load is offset annually?

- ☐ Yes
- ☐ No. *STOP- Watershed plan must be updated.*

21. Are projects occurring on land owned/operated by a CAFO or within a permitted MS4 boundary?

- ☐ Yes. *Work with appropriate DNR staff to ensure projects are not working towards other permit compliance.*
- ☐ No.

22. Are other funding sources being used as part of the MDV watershed project?

- ☐ Yes. *Work with appropriate DNR staff to ensure that funding sources can be appropriately used in the plan area.*
- ☐ No.

23. Do you have any concerns about the watershed project?

Note: Coordinate with other DNR staff as appropriate.

- ☐ Yes. *STOP- Watershed plan must be updated.*
- ☐ No.

Comments:

Section 5. Payment to the County(ies)

24. At this time, the appropriate per pound payment is:

\$ 66.62

See "Payment Calculator" document at

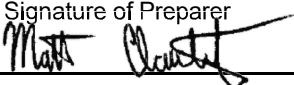
[\\central\\water\\WQWT_PROJECTS\\WY_CW_Phosphorus\\MDV.](#)

Section 6. Determination

Based on the available information, the MDV application is:

- ☒ Approved
- ☐ Request for more information
- ☐ Denied

Additional Justification (if needed):

Certification		
Preparer Name		Title
Matt Claucherty		Water Resources Management Specialist
Signature of Preparer		Date
		8/11/2025