

Permit Fact Sheet

General Information

Permit Number:	WI-0031526-10-0	
Permittee Name:	Eagle Lake Sewer Utility	
Address:	P O Box 595	
City/State/Zip:	Kansasville WI 53139	
Discharge Location:	South Bank of Eagle Creek, approximately ½ mile east of Highway “N”, Sunnyside Dr., Kansasville	
Receiving Water:	Eagle Creek (Middle Fox (IL) River Watershed, Fox (IL) River Basin) in Racine County	
StreamFlow (Q _{7,10}):	<0.01 cfs	
Stream Classification:	Limited Aquatic Life, then Limited Forage Fish about 3 miles downstream of discharge	
Discharge Type:	Existing, Continuous	
Design Flow(s)	Weekly Maximum	0.88 MGD
	Monthly Maximum	0.62 MGD
	Annual Average	0.4 MGD
Significant Industrial Loading?	No	
Operator at Proper Grade?	Yes, this basic plant requires A1, B, C, P, and SS subclass. Jeffrey Bratz, Certification No. 17996, is the operator in charge	
Approved Pretreatment Program?	No	

Facility Description

Eagle Lake Sewer Utility owns and operates a 0.4 MGD extended aeration activated sludge wastewater treatment facility originally built in 1977 and improved significantly in 2003/2004 without an increase in its hydraulic capacity. Eagle Lake SUD treats wastewater from Kansasville and a portion of the Town of Dover around Eagle Lake for a population of approximately 2,000 people and no industrial contributions. Treatment units include fine screening (rotary), compact plant aeration (with a separate clarifier – the originally built-in compact plant clarifier now serves as back-up during maintenance); and fine bubble diffusers (installed in the aeration tank and the aerobic digestion tank to provide air). Chemtrade Hyper-Ion (Aluminum Chloride) is added to influent prior to the aeration chamber for chemical phosphorus removal. Effluent from the package plant receives aeration via cascade steps before discharging into Eagle Creek, and finally to the Fox River via Outfall 001. Waste sludge from the aerobic digester is hauled by Pats Sanitary Services to its sludge lagoon. The Department has found the facility to be in substantial compliance with the current permit (WI-0031526-09-0).

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on June 1, 2023, this facility has been found to be in substantial compliance with their current permit.

Compliance determination entered by Jacob Van Susteren-Wedesky on June 1, 2023.

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
701	0.31 MGD from 04/01/2019 – 10/31/2023	Influent 24-hour flow-proportional composite samples collected just prior to the rotary screen.
001		Effluent 24-hour composite and pH grab samples shall be collected in the channel before the final aeration steps. Grab samples for DO shall be collected at the bottom of the aeration steps.
002	An average of 18 dry U.S. tons are generated per year according to permit application	Samples shall be collected from the digester while mixing. Test results shall be reported on Form 3400-49 'Waste Characteristics Report'. Hauled sludge reports shall be submitted on Form 3400-52 'Other Methods of Disposal or Distribution Report' following each year that the sludge is hauled.

1 Influent – Monitoring Requirements

Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD ₅ , Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

Changes from Previous Permit:

No change from current permit.

Explanation of Limits and Monitoring Requirements

BOD₅ and Total Suspended Solids: Tracking of BOD₅, and Suspended Solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code and in subsection 5.4.6 of the permit.

2 Surface Water - Monitoring and Limitations

Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
BOD5, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Comp	
BOD5, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Comp	
pH Field	Daily Min	6.0 su	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	5/Week	Grab	
Phosphorus, Total	Monthly Avg	0.4 mg/L	3/Week	24-Hr Comp	This is an interim MDV limit effective upon reissuance.
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 'Appropriate Formulas' 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, Ammonia (NH3-N) Total	Daily Max	13 mg/L	Weekly	24-Hr Comp	Effective November - April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	13 mg/L	Weekly	24-Hr Comp	Effective November - April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	6.8 mg/L	Weekly	24-Hr Comp	Effective May - September
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	14 mg/L	Weekly	24-Hr Comp	Effective during the month of October

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	8.8 mg/L	Weekly	24-Hr Comp	Effective October - April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.7 mg/L	Weekly	24-Hr Comp	Effective May - September
Chloride	Weekly Avg	400 mg/L	4/Month	24-Hr Comp	Sampling shall be done on four consecutive days each month. See chloride section in the permit.
Chloride	Monthly Avg	400 mg/L	4/Month	24-Hr Comp	Sampling shall be done on four consecutive days each month. See chloride section in the permit.
Chloride	Weekly Avg - Variable	lbs/day	4/Month	Calculated	Report the chloride mass result in the Chloride Weekly Average Mass column on the DMR. Compare to the Variable Chloride Mass Limitation table in the permit to determine compliance.
Chloride, Variable Limit		lbs/day	4/Month	Calculated	Look up variable chloride mass limit from the table in this section. Report variable limit in the Chloride Variable Limit in the variable limit column on the DMR form.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section in the permit.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section in the permit.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

Changes from Previous Permit

Phosphorus MDV - The permittee has applied for a multi-discharger variance (MDV) for phosphorus for this permit term and the application has been approved by the Department. An MDV interim limit of 0.4 mg/L will be effective upon reissuance. 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(s) to participating county(s) of \$64.75 per pound of phosphorus discharged during the previous year in excess of the target value of **0.2 mg/L**.

Total Nitrogen Monitoring (TKN, N02+N03 and Total N): Annual monitoring in rotating quarters throughout the permit term was added to the proposed permit.

Chloride: The wet weather limit was reduced from 3,500 lbs/day in the current permit to 2,900 lbs/day in the proposed permit based on the current permit compliance schedule and reflect the final chloride WQBELs. A weekly average mass limit of 1,300 lbs/day ($395 \text{ mg/L} \times 0.4 \text{ MGD} \times 8.34$); and an alternative wet weather mass limit of 2,900 lbs/day ($395 \text{ mg/L} \times 0.88 \text{ MGD} \times 8.34$) based on the peak weekly design flow are also recommended per s. NR 106.07(2), Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

Categorical Limits

Total Suspended Solids, BOD5, pH: Standard municipal wastewater requirements for total suspended solids and pH are included based on ch. NR 210, Wis. Adm. Code, 'Sewage Treatment Works' requirements for discharges to fish and aquatic life streams. Tracking of BOD5 and total suspended solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code and in the Standard Requirements section of the permit. Chapter NR 102, Wis. Adm. Code, 'Water Quality Standards for Surface Waters' also specifies requirements for pH for fish and aquatic life streams.

Water Quality Based Limits

Refer to the WQBEL memo for the detailed calculations, prepared by the Water Quality Bureau dated January 3, 2024 used for this reissuance,

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 fairness and 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.

Previously permitted monitoring frequencies for **BOD, TSS, Phosphorus, DO and pH** fell below the standard monitoring frequency outlined in guidance. Since data submitted during the previous permit term shows consistent compliance with permit limitations, and the set monitoring frequency is consistent with requirements of state code, the reduced monitoring frequency is continued in the proposed permit. If performance levels begin to vary during the permitted term, the department may re-evaluate current sampling frequencies and implement more frequent monitoring via permit modification or at permit reissuance.

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 0.225 mg/L and were to become effective as scheduled unless a variance was granted. For this permit term,

the permittee has applied for the Multi-Discharger Variance (MDV) for phosphorus as provided for in s. 283.16, Wis. Stats., and approved by USEPA on February 6, 2017 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 0.4 mg/L as an average monthly limit. The limit was derived using DMR data from 04/01/2019 to 10/31/2023.

Conditions of the MDV require the permittee to optimize phosphorus removal throughout the proposed permit term, comply with interim limits and make annual payments to participating county(s) by March 1 of each year based on the pounds of phosphorus discharged during the previous year in excess of the specified target value. A reopener clause is included in the permit to address the current MDV’s expiration date, as a permit action may be required to update or remove variance provisions if the MDV is altered or unavailable after February 6, 2027.

The “price per pound” value is \$50.00 adjusted for CPI annually during the first quarter 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 non-point source phosphorus control strategies at the watershed level.

Ammonia- Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia.

Chloride- Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter VII of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride.

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N)- The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the “Guidance for Total Nitrogen Monitoring in Wastewater Permits” dated October 1, 2019. Annual tests are scheduled in the following rotating quarters: **October - December 2024, April – June 2025, January – March 2026, July – September 2027, October – December 2028**

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 proposed 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)
002	B	Liquid	Sludge is hauled to another facility for disposal			18 dry US tons

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)
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No						
Is a priority pollutant scan required? No						

Sample Point Number: 002- Hauled Sludge

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Sample once in 2025
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Sample once in 2025
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA

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

Changes from Previous Permit:

PCB - Updated monitoring year to 2025.

PFAS – Annual monitoring is included in the permit pursuant s. NR 204.06(2)(b)9., Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

Requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Limitations for PCBs are addressed in s. NR 204.07(3)(k).

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS”.

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

4 Schedules

4.1 Phosphorus Schedule - Continued Optimization

The permittee is required to optimize performance to control phosphorus discharges per the following schedule.

Required Action	Due Date
Optimization: The permittee shall continue to implement the optimization plan as previously approved to optimize performance to control phosphorus discharges. Submit a progress report on optimizing removal of phosphorus by the Due Date.	06/30/2025

Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	06/30/2026
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	06/30/2027
Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	06/30/2028
Progress Report #5: Submit a progress report on optimizing removal of phosphorus.	06/30/2029

4.2 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
<p>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 (\$64.75 per pound)] or \$640,000, whichever is less. See the payment calculation steps in the Surface Water section.</p> <p>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.</p> <p>Note: The applicable Target Value is 0.2 mg/L as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value is \$50.00 adjusted for CPI.</p>	03/01/2025
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2026
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2027
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2028
Annual Verification of Payment #5: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2029
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 Schedules

4.1 Phosphorus Schedule - Continued Optimization

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 multi-discharger variance interim limits. This compliance schedule requires the permittee to continue to implement the optimization plan that was approved during the previous permit term.

4.2 Phosphorus Payment per Pound to County

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 non-point 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 concentration of 0.2 mg/L. The pounds of phosphorus discharged in excess of the target value is multiplied by a per pound phosphorus charge that will equal \$64.75 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).

Special Reporting Requirements

None

Attachments:

Water Quality-Based Effluent Limitations Memo dated January 3, 2024 and prepared by Nicole Krueger.
Multi-Discharger Variance Application, dated February 14, 2024
Multi-Discharger Variance Evaluation Checklist, dated March 19, 2024
Multi-Discharger Variance Conditional Approval, dated March 19, 2024

Expiration Date:

June 30, 2029

Prepared By: Susan Eichelkraut, Wastewater Specialist

Date: April 15, 2024

Date (post fact check): May 3, 2024

Date (post public notice):

CORRESPONDENCE/MEMORANDUM

DATE: 01/03/2024

TO: Melanie Burns – SER

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for the Eagle Lake Sewer Utility
 WPDES Permit No. WI-0031526-10

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 Eagle Lake Sewer Utility in Racine County. This municipal wastewater treatment facility (WWTF) discharges to Eagle Creek, located in the Middle Fox (IL) River Watershed in the Fox (IL) River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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
BOD ₅			30 mg/L	20 mg/L		1
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
Phosphorus LCA Interim Limit HAC Interim Limit Final WQBEL				0.8 mg/L 0.6 mg/L 0.225 mg/L	0.075 lbs/day 0.25 lbs/day	2,3
Ammonia Nitrogen November – April May – September October	13 mg/L		13 mg/L 6.8 mg/L 14 mg/L	8.8 mg/L 2.7 mg/L 8.8 mg/L		1
Chloride Dry-weather Wet-weather			400 mg/L 1,300 lbs/day 2,900 lbs/day	400 mg/L		4
TKN, Nitrate+Nitrite, and Total Nitrogen						5

Footnotes:

1. No changes from the current permit.
2. A Total Maximum Daily Load (TMDL) is being developed for the Fox (IL) River Basin to address total phosphorus water quality impairments within the TMDL area. This TMDL will likely result in limitations for TSS and phosphorus that must be included in WPDES permits, which may be different than those calculated for this reissuance. TMDL-derived limits may be included in lieu of or in addition to the calculated limits upon permit reissuance or modification once the TMDL has been approved by U.S. EPA, according to s. NR 217.16, Wis. Adm. Code.
3. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 0.8 mg/L should be effective upon permit reissuance. A compliance schedule may be included in the permit until the highest attainable condition (HAC) limit of 0.6 mg/L can be met. The final WQBELs remain

at 0.225 mg/L as a monthly average and 0.075 mg/L as a six-month average, as well as a respective mass limit.

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. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total kjeldahl nitrogen (TKN) (all expressed as N).

No WET testing is required because information related to the discharge indicates low to no risk for toxicity.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (2) – Narrative & Map

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

E-cc: Jacob Wedesky, Wastewater Engineer – SER
Bryan Hartsook, Regional Wastewater Supervisor – SER
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1
**Water Quality-Based Effluent Limitations for
Eagle Lake Sewer Utility**

WPDES Permit No. WI-0031526-10

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

Eagle Lake Sewer Utility owns and operates a 0.4 MGD activated sludge package plant originally built in 1977 and improved significantly in 2003/2004 without an increase in its hydraulic capacity. Eagle Lake SUD treats wastewater from Kansasville and a portion of the Town of Dover around Eagle Lake for a population of approximately 2,000 people and no industrial contributions. Treatment units include fine screening (rotary), compact plant aeration (with a separate clarifier – the originally built-in compact plant clarifier now serves as back-up during maintenance), and fine bubble diffusers. Poly-aluminum chloride is added for phosphorus removal. Effluent from the package plant receives aeration via cascade steps before discharging into Eagle Creek. Waste sludge from the aerobic digester is hauled by Pats Sanitary Services to its sludge lagoon.

Disinfection of the effluent is not required at this time. It should be noted that recreational use surveys and other information may be re-evaluated in the future to ensure the conditions of s. NR 210.06(3), Wis. Adm. Code, are being met. This re-evaluation could result in requiring disinfection of the effluent at that time.

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

Existing Permit Limitations

The current permit, expiring on 03/31/2024, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
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.				2
Dissolved Oxygen		4.0 mg/L				1,2
Phosphorus MDV Interim				0.8 mg/L		3
Ammonia Nitrogen November – April May – September October	13 mg/L		13 mg/L 6.8 mg/L 14 mg/L	8.8 mg/L 2.7 mg/L 8.8 mg/L		
Chloride Final Dry-weather Wet-weather			400 mg/L 1,300 lbs/day 3,500 lbs/day			4
Temperature						5

Footnotes:

1. 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.
2. 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.
3. The MDV interim limit became effective March 31, 2021.
4. A compliance schedule is in the current permit to meet the final chloride WQBELs by March 31, 2024.
5. Monitoring only.

Receiving Water Information

- Name: Eagle Creek
- Waterbody Identification Code (WBIC): 759500
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Eagle Creek is classified as Limited Aquatic Life (LAL) in Table 4 in ch. NR 104, Wis. Adm. Code until CTH J where the classification changes to Limited Forage Fish (LFF) approximately 3 miles downstream of Outfall 001. The Fox River approximately 4.5 miles downstream of Outfall 001 is classified as Water Sport Fish (WWSF) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q₁₀ and 7-Q₂ values are estimates from USGS where Outfall 001 is located.
 - 7-Q₁₀ = 0 cfs (cubic feet per second)
 - 7-Q₂ = 0 cfs
 - Fox River (WWSF classification 4.5 downstream)
 - 7-Q₁₀ = 39 cfs
 - 7-Q₂ = 58 cfs
- Hardness = 363 mg/L as CaCO₃ from effluent hardness monitoring from 05/03/2023 – 05/12/2023. 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 don't impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None.
- Impaired water status: Eagle Creek is 303(d) listed as impaired for total phosphorus.

Effluent Information

- Design flow rate(s):
 - Annual average = 0.4 MGD (Million Gallons per Day)
 - Weekly maximum = 0.88 MGD
 - Monthly maximum = 0.62 MGDFor reference, the actual average flow from 04/01/2019 – 10/31/2023 was 0.31 MGD.
- Hardness = 363 mg/L as CaCO₃. This value represents the geometric mean of data from permit application monitoring from 05/03/2023 – 05/12/2023.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells.

Attachment #1

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

Effluent Chloride Data

	Chloride mg/L
1-day P ₉₉	506
4-day P ₉₉	400
30-day P ₉₉	341
Mean	311
Std	69.3
Sample size	220
Range	120 – 456

The following table presents the average concentrations and loadings at Outfall 001 from 04/01/2019 – 10/31/2023 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD ₅	4.2 mg/L	
TSS	5.4 mg/L	
pH field	7.3 s.u.	
Phosphorus	0.25 mg/L	
Ammonia Nitrogen	0.08 mg/L	
Dissolved oxygen	7.6 mg/L	
Chloride	311 mg/L	738 lbs/day

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P₉₉) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q₁₀

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q₁₀ receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

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

Where:

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

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Eagle Lake and the limits are set based on two times the acute toxicity criteria.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340		340	68.0	<11		
Cadmium	363	127		127	25.3	<6		
Chromium	301	4446		4446	889	<12		
Copper	363	52.4		52.4	10.5	<14		
Lead	356	365		365	72.9	<8		
Nickel	268	1080		1080	216	<6		
Zinc	333	345		345	68.9	<15		
Chloride (mg/L)		757		757			506	456

Attachment #1

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

** 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 (¼ of the 7-Q₁₀), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉	4-day MAX. CONC.
Arsenic		152		152	30.4	<11		
Cadmium	175	3.82		3.82	0.76	<6		
Chromium	301	326		326	65.2	<12		
Copper	495	40.7		40.7	8.14	<14		
Lead	356	95.5		95.5	19.1	<8		
Nickel	268	169		169	33.8	<6		
Zinc	333	345		345	68.9	<15		
Chloride (mg/L)		395		395			400	448

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

Monthly Average Limits based on Wildlife Criteria (WC)

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

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 0 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	880		880	176	<6
Chromium (+3)	8400000		8400000	1680000	<12
Lead	2240		2240	448	<8
Nickel	110000		110000	22000	<6

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 0 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	40		40	8.0	<11

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent

limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations

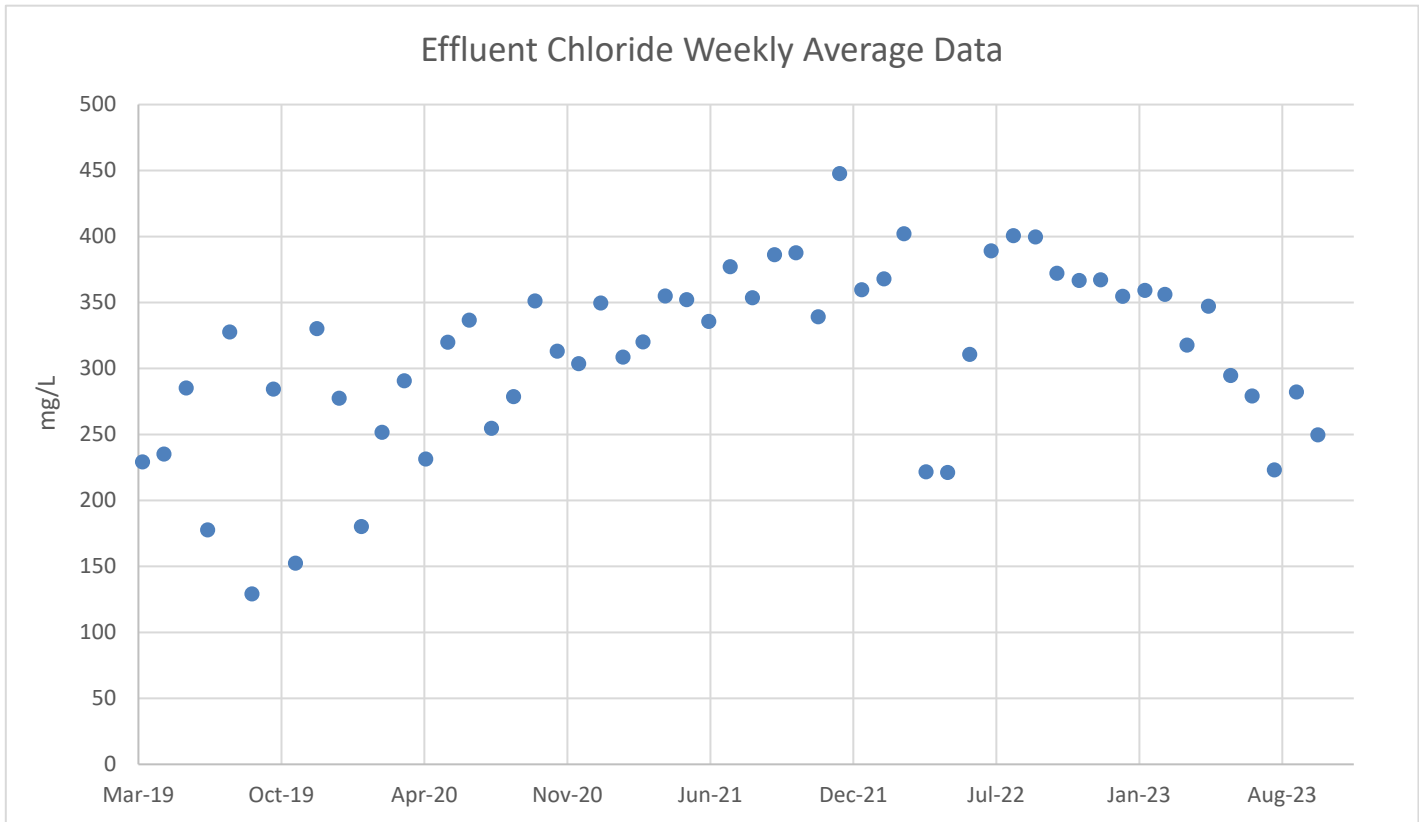
Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for chloride.

Copper – The current permit application had an limit of detection (LOD) for copper of 14 µg/L and all samples were reported as nondetect. Because the LOD is greater than 1/5th of the calculated copper limits based on ATC and CTC, reasonable potential cannot be determined and copper data from the previous permit application is used in this evaluation and summarized below:

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
12/16/2017	4.1	12/29/2017	5.4	01/10/2018	4.0
12/19/2017	4.6	01/01/2018	7.7	01/13/2018	3.7
12/22/2017	4.1	01/04/2018	5.1	01/17/2018	4.06
12/26/2017	4.0	01/07/2018	4.4		
1-day P ₉₉ = 7.9 µg/L					
4-day P ₉₉ = 6.1 µg/L					

Based on the previous data, there is no reasonable potential for copper limits. Therefore, **no limits or monitoring is recommended in the reissued permit. A more stringent LOD is recommended to be used in the next permit reissuance application.**

Chloride – Considering available effluent data from the current permit term (04/22/2019 – 10/05/2023), the 1-day P₉₉ chloride concentration is 506 mg/L, and the 4-day P₉₉ of effluent data is 400 mg/L. The graph below shows the weekly average chloride data from the current permit term as well.



Because the 4-day P₉₉ exceeds the calculated weekly average WQBEL, an effluent limit is needed in accordance with s. NR 106.05(4)(b), Wis. Adm. Code. The current permit has a compliance schedule to meet the chloride WQBEL of 400 mg/L as a weekly average (rounded) by March 31, 2024 which is recommended to continue.

A weekly average mass limit of 1,300 lbs/day ($395 \text{ mg/L} \times 0.4 \text{ MGD} \times 8.34$); and an alternative wet weather mass limit of 2,900 lbs/day ($395 \text{ mg/L} \times 0.88 \text{ MGD} \times 8.34$) based on the peak weekly design flow are also recommended per s. NR 106.07(2), Wis. Adm. Code.

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 whenever practicable and necessary to protect water quality. **Therefore, a monthly average limit of 400 mg/L is required** to meet expression of limits requirements in addition to the weekly average limit.

Mercury – The permit application did not require monitoring for mercury because the 04/03/2019 – 10/05/2023 is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, “there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code.” A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. All concentrations from 04/03/2019 – 10/05/2023 were nondetect. 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 type of discharge and the effluent flow rate, PFOS and PFOA monitoring is not recommended. 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. These limits are re-evaluated at this time due to the following changes:

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

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

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 1197 sample results were reported from 04/02/2019 – 10/31/2023. The maximum reported value was 7.8 s.u. (Standard pH Units). The effluent pH was 7.7 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.6 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.6 s.u. Therefore, a value of 7.7 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.7 s.u. into the equation above yields an ATC = 22 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.

Attachment #1

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	45
1-Q ₁₀	22

The 1-Q₁₀ method yields the most stringent limits for Eagle Lake.

This limit is greater than the current daily maximum limit of 13 mg/L for November – April. If Eagle Lake would like to request an increase to the existing permit limits an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter-by-parameter basis and includes consideration of operations, maintenance and temporary upsets. Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limits must be continued in the reissued permit. The Department would be unable to increase the limit due to the lack of need as shown via the antidegradation rule (ch. NR 207, Wis. Adm. Code) because the highest reported concentration was 6.0 mg/L during the previous permit term. No changes are recommended to the daily maximum limits for ammonia.

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

The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in Attachment #3.

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 04/02/2019 – 10/31/2023, with those results being compared to the calculated limits to determine the need to include ammonia limits in Eagle Lake’s permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or P₉₉) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

Effluent Ammonia Data

Ammonia Nitrogen mg/L	Nov – April	May – Sept	October
1-day P ₉₉	1.4	0.30	0.10
4-day P ₉₉	1.1	0.16	0.07
30-day P ₉₉	0.52	0.09	0.05
Mean	0.10	0.06	0.04
Std	0.58	0.06	0.02
Sample size	107	105	22
Range	0.01 – 6.03	0.01 – 0.42	0.02 – 0.09

Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits.

The permit currently has daily maximum limits November – April and weekly average and monthly average limits year-round. Where there are existing ammonia nitrogen limits in the permit, 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.

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
November – April	13	13	8.8
May – September		6.8	2.7
October		14	8.8

PART 4 – 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 Eagle Lake currently has a limit of 0.8 mg/L, which is more stringent than the TBEL, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

Water Quality-Based Effluent Limits (WQBEL)

Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to s. NR 102.06, Wis. Adm. Code, which establish phosphorus standards for surface waters. Subchapter III of NR 217, Wis. Adm. Code, establishes procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to limited aquatic life waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. These waters were not included in the USGS/WDNR stream and river studies and, therefore, the Department lacked the technical basis to determine and propose applicable criteria. At some time in the future, the Department may adopt phosphorus criteria based on new studies focusing on limited aquatic life waters. The Guidance for Implementing Wisconsin’s Phosphorus Water Quality Standards for Point Source Discharges (2020) suggests that during the interim, WQBELs should be based on the criteria and flow conditions for the next stream segment downstream (or downstream lake or reservoir, if appropriate), because ss. 217.12 and 217.13, Wis. Adm. Code, state that the Department must set WQBELs to protect downstream waters. The discharge location of the wastewater from Eagle Lake is classified as limited aquatic life downstream from the point of discharge downstream to Eagle Creek at CTH J where the classification changes to limited forage fish.

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a),

Attachment #1

Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.075 mg/L applies for Eagle Creek.

The conservation of mass equation is described in s. NR 217.13(2)(a), Wis. Adm. Code, for phosphorus WQBELs and includes variables of water quality criterion (WQC), receiving water flow rate (Qs), effluent flow rate (Qe), and upstream phosphorus concentrations (Cs) provided below.

$$\text{Limitation} = [(WQC)(Qs+(1-f) Qe) - (Qs-f Qe) (Cs)]/Qe$$

Where:

WQC = 0.075 mg/L for Eagle Creek

Qs = 100% of the 7-Q₂ of 0 cfs

Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code

Qe = effluent flow rate = 0.40 MGD = 0.619 cfs

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

The effluent limit is set equal to criteria because the receiving water flow is equal to zero.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 04/01/2019 – 10/31/2023.

Total Phosphorus Effluent Data

	Phosphorus mg/L
1-day P ₉₉	0.59
4-day P ₉₉	0.39
30-day P ₉₉	0.30
Mean	0.25
Std	0.10
Sample size	718
Range	0.08 – 0.92

Reasonable Potential Determination

The calculated WQBEL of 0.075 mg/L is less than the current limit of 0.8 mg/L, so the WQBEL must be included in the permit per s. NR 217.15(2), Wis. Adm. Code.

In accordance with s. NR 217.15(1), Wis. Adm. Code, there is reasonable potential for the discharge to cause or contribute to an exceedance of the water quality criteria. The data suggest that a compliance schedule will be necessary for the facility to meet the given phosphorus limits.

Limit Expression

According to s. NR 217.14(2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, the effluent limit of 0.075 mg/L may be expressed as a six-month average. If a concentration limitation expressed as a six-month average is included in the permit, a monthly average concentration

limitation of 0.225 mg/L, equal to three times the WQBEL calculated under s. NR 217.13, Wis. Adm. Code shall also be included in the permit. The six-month average should be averaged during the months of May – October and November – April.

Mass Limits

A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that is to or upstream of a phosphorus-impaired water. **This final mass limit shall be 0.075 mg/L × 8.34 × 0.4 MGD = 0.25 lbs/day expressed as a six-month average.**

Multi-Discharge Variance Interim Limit

With the permit application, Eagle Lake 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) (a), Wis. Stats., is 0.6 mg/L as a monthly average. A compliance schedule may be appropriate to meet this interim limit but compliance with 0.6 mg/L shall be no later than the end of the reissued permit. The previous interim limit of 0.8 mg/L should not be exceeded during the compliance schedule.

TMDL Under Development

A Total Maximum Daily Load (TMDL) is being developed for the Fox (IL) River Basin for phosphorus. The TMDL will address phosphorus water quality impairments within the basins and provide waste load allocations (WLA) required to meet water quality standards. This TMDL will likely result in phosphorus limitations that must be included in WPDES permits, which may be different than those calculated in this WQBEL memo. TMDL-derived phosphorus limits may be included in lieu of or in addition to the calculated limits upon permit reissuance or modification once the TMDL has been approved by U.S. EPA, according to s. NR 217.16, Wis. Adm. Code.

PART 5 – 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 86 °F limit applies because the hydrologic classification is not listed as wetland wastewater effluent channel in ch. NR 104, Wis. Adm. Code.

Reasonable Potential

Based on the available discharge temperature data from 01/02/2012 – 10/31/2023 shown below, the maximum daily effluent temperature reported was 68 °F; therefore, no reasonable potential for exceeding the daily maximum limit exists, and **no limits are recommended. Monitoring is not recommended in the reissued permit.**

Monthly Temperature Effluent Data & Limits

Attachment #1

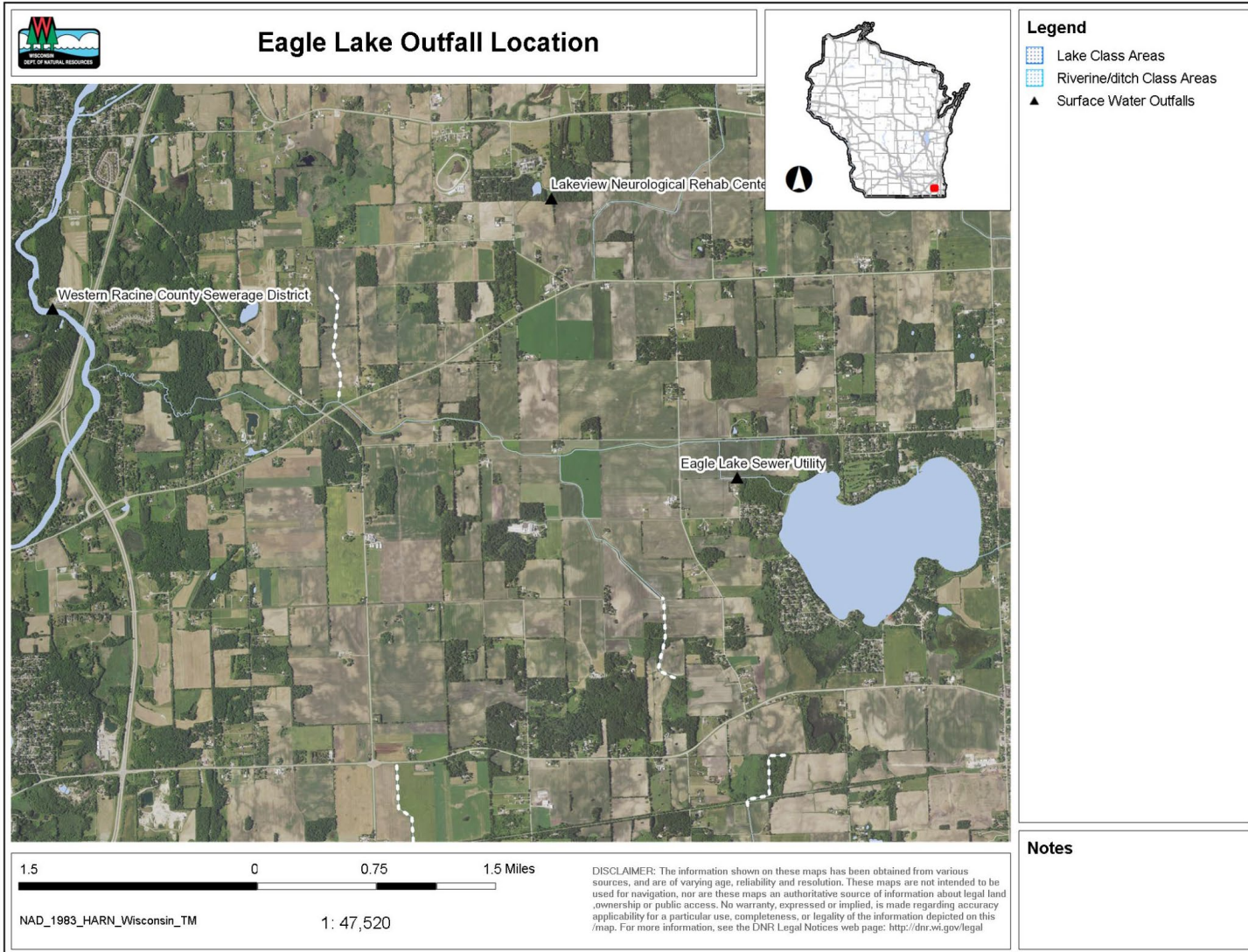
Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	51	54	-	86
FEB	49	50	-	86
MAR	52	52	-	86
APR	53	54	-	86
MAY	57	59	-	86
JUN	63	66	-	86
JUL	66	67	-	86
AUG	66	67	-	86
SEP	67	68	-	86
OCT	62	63	-	86
NOV	58	58	-	86
DEC	55	56	-	86

PART 6 – 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)*.

Guidance in Chapter 1.11 of the WET Guidance Document (WET Testing of Minor Municipal Discharges) was consulted. This is a minor municipal discharge (< 1.0 MGD) comprised solely of domestic wastewater, with no history of WET failures and no toxic compounds detected at levels of concern. No WET testing is recommended at this time because of the low risk in effluent toxicity.

Eagle Lake is currently using poly-aluminum chloride for phosphorus removal and has an SOP in place to avoid overdosing.



Attachment #3
2018 Ammonia Limits Calculations

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

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

Ammonia limits were last calculated in 2013. At that time, default stream pH and temperatures were used to calculate limits. At this time, though, more specific information is available for both parameters which warrant a re-calculation of weekly and monthly average limits. New default temperature data are available for relatively small warmwater streams as part of the state's new thermal standards; the new default ambient stream temperatures are contained in Table 2 of ch. NR 102. Seasonal mean pH values are now available for Eagle Creek in Racine County. The new ambient values are used in conjunction

with the effluent and stream low flows to re-calculate limits using the procedure in s. NR 106.32, Wis. Adm. Code.

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.

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

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.

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

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

C = $3.73 \times 10^{(0.028 \times (25 - T))}$ – (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 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.

Attachment #3

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 Eagle Creek, 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.

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.

Limited Aquatic Life		Summer	Winter	Spring
		June – Sept.	Oct. - March	April & May
Background Information	7-Q ₁₀ (cfs)	0.0	0.0	0.0
	7-Q ₂ (cfs)	0.0	0.0	0.0
	Ammonia (mg/L)	0.07	0.17	0.09
	Temperature (°C)	19	7	15
	pH (s.u.)	8.08	7.98	8.09
	% of Flow used	100	25	50
	Reference Weekly Flow (cfs)	0	0	0
	Reference Monthly Flow (cfs)	0	0	0
Criteria mg/L	4-day Chronic	26.64	66.42	33.72
	30-day Chronic	10.66	26.57	13.49
Effluent Limits mg/L	Weekly Average	26.64	66.42	33.72
	Monthly Average	10.66	26.57	13.49

Limited Forage Fish		Summer	Winter	Spring
		June – Sept.	Oct. - April	May
Background Information	7-Q ₁₀ (cfs)	0.0	0.0	0.0
	7-Q ₂ (cfs)	0.0	0.0	0.0
	Ammonia (mg/L)	0.07	0.17	0.09
	Temperature (°C)	19	7	15
	pH (s.u.)	8.08	7.98	8.09
	% of Flow used	100	25	50
	Reference Weekly Flow (cfs)	0	0	0
	Reference Monthly Flow (cfs)	0	0	0
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	6.86		6.76
	Early Life Stages Absent		20.80	
	30-day Chronic			
	Early Life Stages Present	2.74		2.70
	Early Life Stages Absent		8.32	
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	6.86		6.76
	Early Life Stages Absent		20.80	
	Monthly Average			
	Early Life Stages Present	2.74		2.70
	Early Life Stages Absent		8.32	

Attachment #3

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 ($k_t = k_{20} \theta^{(T-20)}$).

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

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

The velocity of receiving water is assumed to be 5 miles per day and the distance from the point of discharge to the classification change is approximately 3 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 during April. After decay, the limits are increased as shown in the following table.

Months Applicable	LAL			LFF			After decay			Current Limits		
	Daily Maximum (mg/L)	Weekly Average (mg/L)	Monthly Average (mg/L)	Daily Maximum (mg/L)	Weekly Average (mg/L)	Monthly Average (mg/L)	Daily Maximum (mg/L)	Weekly Average (mg/L)	Monthly Average (mg/L)	Daily Maximum (mg/L)	Weekly Average (mg/L)	Monthly Average (mg/L)
May	19	34	14	12	6.8	2.7	14	7.5	3.0	-	6.8	2.7
April	19	34	14	12	21	8.4	13	22	8.8	26	29	12
June – Sept	19	27	11	12	7.0	2.8	14	8.0	3.2	-	6.8	2.7
October	19	67	27	12	21	8.4	13	22	8.8	-	-	12
Nov - March	19	67	27	12	21	8.4	13	22	8.8	25	32	13

Mail Complete Application to:

Wisconsin Department of Natural Resources
 Permits Section-WQ/3
 PO Box 7921
 Madison, WI 53707-7921

**Phosphorus Multi-Discharger
 Variance Application for Municipal
 Facilities** - s. 283.16, Wis. Stats.

Form 3200-150 (R 03/17)

Notice: Pursuant to s. 283.16, Wis. Stats, an owner of an existing permitted wastewater treatment system may apply for a variance to a phosphorus water quality based effluent limits (WQBEL). Complete this form and submit to the Department of Natural Resources (DNR) to request coverage under the multi-discharger variance (MDV) for phosphorus. Personal information collected will be used for administrative purposes and may be provided to requestors to the extent required by Wisconsin's Open Records law [ss. 19.31-19.39, Wis. Stats.]

Facility and Permit Information				Facility Contact Information			
WPDES Permit No. WI- 0 0 3 1 5 2 6				Contact Name JEFF BRATZ			
Facility Name EAGLE LAKE SEWER UTILITY DISTRICT				Title SUPERINTENDENT			
Facility Street Address 25300 KICKAPOO DR				Address PO BOX 595			
City KANSASVILLE		State WI	ZIP Code 53139	City KANSASVILLE		State WI	ZIP Code 53139
Receiving Water EAGLE CREEK		County Racine		Phone No. (incl. area code) (262) 534-5910		Fax Number	
Source of Water Supply PRIVATE WELLS		Average Discharge Flow Rate .250 MGD		Email Address EAGLELAKE@TDS.NET			

Variance Request Schedule **Check all that apply:**

1. This variance is being requested at the time of application for permit reissuance pursuant to s. 283.16(4)(b)1, Wis. Stat.
2. This variance is being requested within 60 days after the department reissues or modifies the permit to include a phosphorus WQBEL pursuant to s. 283.16(4)(b)2, Wis. Stat.
3. This variance is being requested from a current WPDES Permit pursuant to 283.16(4)(b)3, Wis. Stat.

Date of Current Permit Issuance: _____

Note: WPDES permit must be issued prior to April 2014.

4. Has the MDV been included in previously issued WPDES Permits?
 Yes
 How many permits has the MDV been approved for? 1
 No

Variance Requirements

5. Has this point source discharge been authorized by a WPDES permit prior to December 1, 2010? Yes No
Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat. STOP
6. Has this point source relocated its outfall location since December 1, 2010? Yes No
7. Is the point source located in an eligible MDV county as specified in Appendix H of the MDV Implementation Guidance? Yes No

Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat.

8. Does this limit require a major facility upgrade in order to achieve compliance? Yes
 No

Justify:

To meet the limit of .075 mg/l the treatment plant would have to add tertiary treatment at a cost of about \$5,339,241.

Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat. STOP. A major facility upgrade means that a facility needs to install new equipment and a new process such as installing filtration or equivalent technology.

9. Phosphorus Water Quality-Based Effluent Limitation from which variance is sought:
- Concentration-based WQBEL pursuant to s. NR 217.13, Wis. Adm. Code
 - TMDL mass-based WQBEL pursuant to s. NR 217.16, Wis. Adm. Code

Check all months for which variance is requested:

All months

- | | | | |
|---|---|---|---|
| <input checked="" type="checkbox"/> Jan | <input checked="" type="checkbox"/> Apr | <input checked="" type="checkbox"/> Jul | <input checked="" type="checkbox"/> Oct |
| <input checked="" type="checkbox"/> Feb | <input checked="" type="checkbox"/> May | <input checked="" type="checkbox"/> Aug | <input checked="" type="checkbox"/> Nov |
| <input checked="" type="checkbox"/> Mar | <input checked="" type="checkbox"/> Jun | <input checked="" type="checkbox"/> Sep | <input checked="" type="checkbox"/> Dec |

10. Do you believe these limits could be achieved during the term of the permit? Yes
 No

11. Current effluent quality

Note: Use 30-day P99 if 11 or more representative effluent samples are present. Only include effluent data for those outfall(s) a variance is being requested for.

Outfall Number(s)	Conc. (mg/L)	Number of Samples Results Used	Sample Time Period Used	
1	0.29	627	04/02/2019	03/30/2023

12. Are applicable phosphorus limits currently effective in the WPDES permit more restrictive than 1 mg/L? Yes
 No

Facility Information (provide attachments as necessary)

13. What are the average phosphorus levels within your influent TP concentration? 2.35 mg/L

14. Has the treatment process at the facility been optimized to maximize its phosphorus removal capabilities?

Yes

Completion date: 11/28/2018

- No, but in process of completing
- No, not yet started

15. Has a facility planning or evaluation study for phosphorus been approved by the Department?

Yes

Approval date: 01/10/2019

No, but in process of completing

No, not yet started

16. Briefly describe the technology that would need to be added to comply with phosphorus limits in your permit:
Implementation of a cloth membrane disc filter system would be required.

Attach any new or additional information that you would like to provide the Department regarding optimization measures and/or compliance alternatives planning efforts.

Projected Compliance Costs

17. What is the projected net present value cost for complying with the phosphorus WQBELs? \$ 3,200,000

Source of cost projection:

Manufacturer's quotations plus recent projects. See Final Compliance Alternatives Plan for details. This includes an adjustment for the cost increases provided by the Engineering News Record Index.

Note: If a facility uses projected compliances costs provided in the Economic Impacts Analysis, they 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.

18. Has the feasibility of water quality trading or adaptive management been evaluated for the facility? Yes
 No

19. Is the facility eligible for adaptive management or water quality trading? Yes
 No

20. What is the needed offset to comply with AM/WQT? 1,210 lbs/year
 Unknown at this time

21. Is adaptive management or water quality trading a viable compliance option? Yes
 No

Describe:

Effluent loading would have to be reduced by 1,210 lbs/year under current conditions under WQT. There are no other point source sources or MS4's within the same HUC-12, which would necessitate a very large number of non-point source credits to ensure compliance via WQT.

Service Area Information- Provide the following information for each municipality included in the wastewater facility service area.

Municipality Name	County	Population Served	Customer Households Served	Median Household Income (MHI)
Eagle Lake Sewer Utility District	Racine		797	\$86,389.00

Non-Residential Customers:

Percent of wastewater flow attributed to commercial industrial, large institutional and any other special customer category:

0 %

Describe types of non-domestic wastewater contributions that constitute a significant phosphorus contribution or that significantly affect the capabilities of the treatment facility. Examples include: large food processors, dairies, or industries with unique wastewater.

The is no businesses that discharge differently than domestic waste.

Affordability to Municipal Dischargers

22. What is the projected household user charge, expressed as a percent of MHI, once phosphorus compliance costs are factored in?

1.12 %

Attach supporting information on a separate attachment to this form. The applicant may also provide additional information on impacts to commercial, industrial, or other special customers or any other information regarding affordability.

23. What is the secondary indicator score for the county (counties) in which the service area is located in?

4

Note: See Appendix A of the MDV Implementation Guidance for details.
If the service area is located in multiple counties, provide the weighted average value.

Watershed Project. Select one of the following watershed project options:

Option A. County payment contribution

Option B. Binding, written agreement with the DNR to construct a project or implement a watershed plan.

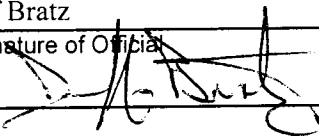
Submit Form 3200-148 with MDV application

Option C. Binding, written agreement with another entity that is approved by the DNR to construct a project or implement a watershed plan.

Submit Form 3200-148 with MDV application.

Certification

Based on the information provided, I believe that my permitted facility qualifies for coverage under the multi-discharger phosphorus variance based on the requirements of s. Wis. Stat. 283.16 (4). Wis. Stat. I understand that as a condition of the variance, the Department will impose interim limitations and require a watershed project or plan to be completed as part of the phosphorus reduction measures for phosphorus during the term of the variance in accordance with s. Wis. Stat. 283.16(6). I understand that these conditions will be included in the WPDES permit issued to this facility and I agree to comply with all applicable permit conditions for this variance. I hereby certify that the determination in Wis. Stat. 283.16(2)(a) applies to my permitted facility and that my permitted facility cannot otherwise comply with its phosphorus water quality based effluent limitations without a major facility upgrade. To the best of my knowledge, the information in this application is true, accurate, and complete.

Print or type name of person submitting request (Individual must be an Authorized Representative)	Title
Jeff Bratz	Superintendent
Signature of Official	Date Signed
	2-14-24

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

Eagle Lake Sewer Utility District

WPDES Permit Number WI- 0 0 3 1 5 2 6	County Racine
---	------------------

1. Did the point source apply for the MDV at the appropriate time?	<input checked="" type="radio"/> Yes <input type="radio"/> No. <i>STOP- facility not eligible at this time.</i>	See Questions 1-3.
2. This operation is (check one):	<input type="radio"/> New or relocated outfall. <i>STOP- facility not eligible.</i> <input checked="" type="radio"/> Existing outfall	See Questions 5-6.
3. Is the point source is located in an MDV eligible area?	<input checked="" type="radio"/> Yes <input type="radio"/> No. <i>STOP- facility not eligible.</i>	<i>Apply County information to Appendix H. Additional information provided in Q7 on municipal form & Q7-8 on industrial form.</i>
4. The secondary indicator score for the county (counties) the discharge is located is:	<u>5</u>	<i>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.</i>
5. Is a major facility upgrade required to comply with phosphorus limits?	<input checked="" type="radio"/> Yes <input type="radio"/> No. <i>STOP- facility not eligible.</i>	<i>See Q8 on municipal form/Q9 on industrial form.</i>
6. List the months where phosphorus limits cannot be achieved during the permit term:	<input checked="" type="checkbox"/> All <input checked="" type="checkbox"/> Jan <input checked="" type="checkbox"/> Apr <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Feb <input checked="" type="checkbox"/> May <input checked="" type="checkbox"/> Aug <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Mar <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Sep <input checked="" type="checkbox"/> Dec	<i>Consider checking with limit calculator. If this does not match information in application, the application should be updated prior to approval.</i>

7. What is the current effluent level achievable?				
Outfall Number(s) 001	Conc. (mg/L) 0.30	Method for calculation: <input checked="" type="radio"/> 30-day P99 <input type="radio"/> Other, specify: _____	Does this concur with application? <input checked="" type="radio"/> Yes <input type="radio"/> No, why not: _____	DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.

8. What is the appropriate interim limitation(s) for the permit term?
 0.4 mg/L as a monthly average, pursuant to s. 283.16(7), Wis. Stats.
 Target value = 0.2 mg/L

Provide Rationale:

Phosphorus effluent data for the past three years (2021, 2022, and 2023, n=468) yield a 30-day p99 value of 0.3 mg/L. One monthly average result has exceeded 0.4 mg/L during this three-year evaluation period. A schedule is not required. The WQBEL may recommend an interim limit that differs from that shown above.

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.

<p>9. <i>For Industries Only-</i> Where does the phosphorus in the effluent come from? (check all that apply)</p>	<p><input type="checkbox"/> Process <input type="checkbox"/> Additive Usage <input type="checkbox"/> Water supply</p> <p><i>Can intake credits be given or can the facility use an alternative water supply?</i></p> <p><input type="radio"/> Not feasible <input type="radio"/> Possibly, but further analysis needed <input type="radio"/> Not evaluated at this time</p>	<p><i>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.</i></p>
<p>10. Has this facility optimized?</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> In progress <input type="radio"/> No</p>	<p><i>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.</i></p>
<p>11. Has a facility plan/compliance alternative plan been completed for the facility?</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> In progress <input type="radio"/> No</p>	<p><i>See Q15 on municipal form & Q17 on industrial form.</i></p>
<p>12. What is the projected cost for complying with phosphorus?</p> <p style="text-align: right;">Source:</p>	<p>\$ <u>3,200,000.00</u></p> <p>MDV application - "manufacturers quotations plus recent projects"</p>	<p><i>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.</i></p>

Comments on planning efforts:

A Final Compliance Alternatives Plan, prepared by Applied Technologies, inc. in 2018 evaluated means for compliance with the 0.075 mg/L WQBEL. Watershed based alternatives were evaluated and deemed not feasible at the time. Regionalization was evaluated and due to the distance and costs associated with construction (4.5M capital only) and ongoing fees, deemed cost prohibitive. Dual-stage sand filter and cloth filter tertiary treatment options capable of meeting the 0.075 mg/L WQBEL were evaluated and priced. The lease expensive option, cloth disc filters, were used in the economic demonstration. During the current permit term, Eagle Lake has optimized phosphorus treatment to low levels, generally to the lower limits of traditional treatment. The need for tertiary treatment is still valid, and the technologies evaluated in 2018 are still the recognized standard for cost effectively meeting low phosphorus limits end-of-pipe. Accordingly, an updated cost estimate was provided using 2018 costs adjusted based on the ENR construction cost index.

<p>13. Are adaptive management and water quality trading viable?</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> Perhaps. Additional analysis required. <input type="radio"/> No</p>	<p><i>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.</i></p>
<p>14. Has the point source met the appropriate primary screener?</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No. <i>STOP- facility not eligible.</i></p>	<p><i>See Q4 of this form in addition to the "eligibility" guidance in Section 2.01 of the MDV Implementation Guidance.</i></p>

Comments on economic demonstration:

A site specific cost estimate for installation and operation of cloth disc filtration with chemical treatment was included in the Final Compliance Alternatives Plan and used as the economic demonstration for the MDV. The estimate arrived at capital costs of \$2,650,000.00 with annual O & M costs of \$140,000.00. Applying the ENR construction cost index to capital costs results in 3,200,000 as the new value. The permittee choose to keep O&M values the same, as a measure of conservatism in cost estimating. Assuming a 20-year loan at 2.145% interest, annual payments would amount to \$196,907. With O&M, total annual costs would be \$336,907. Divided amongst 797 users, per-user cost increases would be \$422.72 annually, on average. With current sewer rates at \$544.00, future rates at \$966.72 as an annual average can be anticipated. This value is 1.12% of Eagle Lake's median household income. In Racine County with a secondary indicator score of 5, projected sewer rates at 1% of MHI meet the primary screener. The applicant meets the primary screener.

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:

\$ 64.75

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

Save

Additional Justification (if needed):

Certification		
Preparer Name	Title	
Matt Claucherty	Water Resources Management Specialist	
Signature of Preparer	<input type="button" value="Sign"/> <input type="button" value="Clear"/>	Date

A copy of this completed checklist should be saved in SWAMP, and a notification of the decision should be sent to the Phosphorus Implementation Coordinator.

[Submit to Coordinator...](#)

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor
Telephone 608-266-2621
FAX 608-267-3579
TTY Access via relay - 711



3/19/2024

Jeff Bratz, WWTP Operator/Manager
2717 Sunnyside Dr
Kansasville, WI 53139

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Eagle Creek in Racine County
Permittee: Eagle Lake Sewer Utility District, WPDES WI-0031526

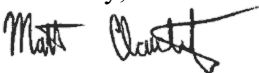
Dear Mr. Bratz:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for the Eagle Lake Sewer Utility Wastewater Treatment Facility in an application dated 2/14/2024. 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.

Sincerely,



Matt Claucherty, MDV Point Source Coordinator
Bureau of Water Quality

e-cc Susan Eichelkraut, WDNR
Jacob Van Susteren-Wedesky, WDNR
Tim Elkins, EPA Region 5
Micah Bennett, EPA Region 5