

Permit Fact Sheet

General Information

Permit Number	WI-0028894-10-0
Permittee Name and Address	Village of Forestville PO Box 6, Forestville, WI 54213
Permitted Facility Name and Address	Forestville Wastewater Treatment Facility 255 Gaede Rd, Forestville, WI 54213
Permit Term	July 01, 2026 to June 30, 2031
Discharge Location	East bank of the Ahnapee River in the Ahnapee River Watershed, approximately 750 feet west of the treatment plant
Receiving Water	Ahnapee River in Ahnapee River Watershed of Twin - Door - Kewaunee River Basin in Door County
Stream Flow (Q _{7,10})	1.1 cfs
Stream Classification	Warm Water Sportfish Community, Non-public Water Supply
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	0.077 MGD
Industrial or Commercial Contributors	N/A
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; P - Total Phosphorus; D - Disinfection; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Forestville owns and operates the Forestville Wastewater Treatment Facility (WWTF). The WWTF treats residential and commercial domestic wastewater from the Village sanitary sewer collection system. The WWTF consists of a covered treatment lagoon with three treatment zones (complete/partial mix cell, partial mix cell, and settling cell), an aerated polishing reactor with four attached growth media modules and seasonal disinfection using ultraviolet radiation prior to discharge to Ahnapee River via Outfall 001. A Flow equalization/emergency storage lagoon is also available. Ferric chloride is added for phosphorus removal at the influent lift station prior to the treatment lagoon. There are no biosolids or sludge treatment and storage systems. All settled sludge is stored in the lagoons. The sludge from the lagoons is removed on an infrequent basis. Any sludge removed from the treatment lagoons is to be land applied to department approved sites or hauled to another permitted facility and is tracked under Outfall 002. The solids that settle in the equalization ponds are regulated under Outfall 003.

During the permit term, the Maplewood Sanitary District 1 plans on regionalizing with the Village of Forestville.

Substantial Compliance Determination

After a desktop review of all discharge monitoring reports, compliance maintenance annual reports, land application reports, compliance schedule items, and a site visit on May 11, 2026, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Trevor Moen, Wastewater Engineer on May 12, 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	0.05 MGD (2025)	INFLUENT – 24-hour flow proportional samples shall be collected from the wet well. Flow is monitored with a magnetic flow meter prior to the aeration lagoon.
001	0.04 MGD (2025)	EFFLUENT - 24-hour flow proportional samples shall be collected just prior to the chlorine contact tank, grab samples shall be collected downstream of the UV banks. Flow is measured using a V-notch weir and transducer prior to the UV disinfection system.
002	N/A – No land app in previous permit term	LAND APPLICATION - Liquid sludge that accumulates in the treatment lagoons. Representative samples shall be collected from various locations and depths then composited for analysis. At the time of sample collection the permittee shall evaluate the depth or quantity of sludge in the lagoons and shall submit these findings with the characteristics report form.
003	N/A – New outfall	LAND APPLICATION - Liquid sludge that accumulates in the emergency storage lagoon. Representative samples shall be collected from various locations and depths then composited for analysis. At the time of sample collection the permittee shall evaluate the depth or quantity of sludge in the lagoons and shall submit these findings with the characteristics report form.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- Influent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
BOD5, Total		mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	2/Week	24-Hr Flow Prop Comp	

1.1.1 Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under “Explanation of Limits and Monitoring Requirements” below.

BOD, Total – Sample frequency was changed from “weekly” to “2/week”.

Suspended Solids, Total – Sample frequency was changed from “weekly” to “2/week”.

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit. Influent sample frequencies were updated to align with frequencies for Outfall 001.

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 001- Effluent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	45 mg/L	2/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	93 lbs/day	2/Week	Calculated	
Suspended Solids, Total	Monthly Avg	57 lbs/day	2/Week	Calculated	
Suspended Solids,		lbs/month	Monthly	Calculated	Calculate the Total

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Total					Monthly Discharge of TSS and report on the last day of the month on the DMR. See TMDL Calculations section in the permit.
Suspended Solids, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of TSS discharged and report on the last day of the month on the DMR. See TMDL Calculations section in the permit.
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
E. coli	Monthly Avg	126 #/100 ml	Weekly	Grab	Effective May - September, each year.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Effective May - September, each year. See the E.coli Percent Limit section. Enter the result in the DMR on the last day of the month.
Nitrogen, Ammonia Variable Limit		mg/L	Weekly	See Table	Look up variable ammonia limit from the "Variable Ammonia Limitation" table 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 eDMR. See Ammonia Limitation Section.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	9.2 mg/L	Weekly	24-Hr Flow Prop Comp	Effective October - March.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	6.7 mg/L	Weekly	24-Hr Flow Prop Comp	Effective April - May.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	13 mg/L	Weekly	24-Hr Flow Prop Comp	Effective June - September.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.1 mg/L	Weekly	24-Hr Flow Prop Comp	Effective October - March.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.6 mg/L	Weekly	24-Hr Flow Prop Comp	Effective April - May.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	7.4 mg/L	Weekly	24-Hr Flow Prop Comp	Effective June - September.
Phosphorus, Total	Monthly Avg	0.47 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	0.3 lbs/day	Weekly	Calculated	Calculate the daily mass discharge of Phosphorus in lbs/day on the same days phosphorus sampling occurs.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See TMDL Calculations section in the permit.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL Calculations section in the permit.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring in 2028.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop 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 Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section in the permit.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section below.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Temperature Maximum		deg F	3/Week	Grab	Monitoring in 2028. See Effluent Temperature Monitoring section for temperature monitoring requirements.

2.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under “Explanation of Limits and Monitoring Requirements” below.

- **BOD, Total; Suspended Solids, Total-** The sample frequency has been changed from “weekly” to “2/week”.
- **Total Suspended Solids TMDL Limits-** Mass based TSS limits of 93 lbs/day as a weekly average and 57 lbs/day as a monthly average have been added to the permit to comply with requirements of the Northeast Lakeshore TMDL. Effluent concentration (mg/L) shall be monitored and reported 2 times per week upon permit reissuance and will be used to calculate amounts reported for mass-based limits. An additional reporting requirement for lbs/month will be used to calculate the facility’s 12-month rolling sum of total monthly discharge, which can be compared directly to the facility’s designated WLA.
- **E. coli-** Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits.
- **Chloride** – Monthly monitoring in 2028 has been added.
- **Total Nitrogen Monitoring (TKN, N02+N03 and Total N)-** Annual monitoring is required in specific quarters as outlined in the permit.
- **Temperature** – Monthly monitoring in 2028 has been added.

2.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated May 8, 2025.

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

Expression of Limits- In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly and monthly average limits whenever practicable.

Northeast Lakeshore Total Maximum Daily Load (TMDL): The permitted facility is located within the Northeast Lakeshore Total Maximum Daily Load (NEL TMDL), which was approved by EPA October 30, 2023. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amounts of phosphorus and total suspended solids that can be discharged and still protect water quality. The final effluent limits and monitoring expressed in the permit were derived from and comply with the applicable water quality criterion and are consistent with the assumptions and requirements of the EPA-approved WLAs in the TMDL, which is 10,916 lbs/year for TSS for the permitted facility.

The approved TMDL expresses WLAs as lbs/year and lbs/day (maximum annual load divided by 365 days). As outlined in Section 4.6 of the department’s 2023 *TMDL Implementation Guidance for Wastewater Permits*, TMDL limits must be given in the permit that are consistent with the TMDL WLA permit limits derived from the TMDL and need to be expressed as specified by 40 CFR 122.45 (d), s. NR 212.76 (4), and s. NR 205.065 (7), Wis. Adm. Code, unless determined to be impracticable. Impracticability has already been determined for phosphorus limits as laid out in the phosphorus impracticability agreement that was approved by USEPA in 2012 (see NPDES MOA Addendum dated July 12, 2012 at <https://apps.dnr.wi.gov/swims/Documents/DownloadDocument?id=167886175>).

For TSS, continuously discharging municipal facilities covered by the NEL TMDL are given monthly and weekly average mass limits.

Facilities with NEL TMDL based effluent limits for TSS must report the 12-month rolling sum of total monthly discharge (lbs/yr). If reported 12-month rolling sums exceed the facility’s max annual WLA, the facility’s mass limits (monthly average and six-month average) may be recalculated using more appropriate CVs or monitoring frequencies when the permit is reissued to bring discharge levels into compliance with the facility’s given WLA.

3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Liquid	Fecal coliform	Injection	Land Application	No land app since 2010
003	B	Liquid	Fecal coliform	Injection	Land Application	New outfall
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: 002- Lagoon Sludge

Monitoring Requirements and Limitations						
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes	
Solids, Total		Percent	Once	Composite	Monitoring required in 2027 of sludge. Limits apply to land application.	
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		When land application occurs.
Phosphorus, Total		Percent	Per Application	Composite		
Phosphorus, Water Extractable		Percent	Per Application	Composite		
Potassium, Total Recoverable		Percent	Per Application	Composite		
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Monitoring required in 2027. Limits apply to land application of sludge.	
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite		
PFOA + PFOS		ug/kg	Once	Calculated	Monitoring required in 2027. 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.

3.1.1 Changes from Previous Permit:

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under “Explanation of Limits and Monitoring Requirements” below.

PFAS –Monitoring is required once in 2027 pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

PCB – Monitoring required once in 2027 pursuant to s. NR 204.07(3)(k), Wis. Adm. Code.

3.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5), Wis. Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6), Wis. Adm. Code and in s. NR 204.07 (7), Wis. Adm. Code for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k), Wis. Adm. Code.

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.

3.2 Sample Point Number: 003- Emergency Lagoon Sludge

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Once	Composite	Monitoring required in 2027 of sludge. Limits apply to land application.
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	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
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	
Phosphorus, Total		Percent	Per Application	Composite	
Phosphorus, Water Extractable		Percent	Per Application	Composite	
Potassium, Total Recoverable		Percent	Per Application	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Monitoring required in 2027. Limits apply to land application of sludge.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	
PFOA + PFOS		ug/kg	Once	Calculated	Monitoring required in 2027. Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

3.2.1 Changes from Previous Permit:

N/A – New outfall

3.2.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5), Wis. Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6), Wis. Adm. Code and in s. NR 204.07 (7), Wis. Adm. Code for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k), Wis. Adm. Code.

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 Treatment Lagoon Leakage Assessment

Required Action	Due Date
<p>Influent and Effluent Flow Meter Calibration Report: Submit a report evaluating the standard operating procedures, including calibration, of the influent and effluent flow meters and their capable of taking consistent representative effluent and influent flow data to the department for review and approval. The report shall include a corrective action plan for repairing or replacement of the flow meters if not meeting calibration or unable to collect representative influent and/or effluent flow data. If construction is planned this report shall include an implementation schedule to prepare final plans and specifications.</p> <p>If the report concludes that influent and effluent flow meter calibration is acceptable and collecting representative flow data, the permittee shall prepare a lagoon leakage study plan.</p>	12/31/2026
<p>Leakage Study Plan: The permittee shall submit a work plan to study and test the leakage of the treatment lagoon to department for review and approval.</p>	06/30/2027
<p>Final Lagoon Leakage Report: The permittee shall submit a final report summarizing the results of the leakage study plan to the department for review and approval. The leakage report should include data collected, estimated evaporation and precipitation, supporting calculations, and the determined leakage rate. Include any historical data believed to be relevant to the study. If the study confirms that treatment lagoon is found to have high leakage rates, the report shall include a corrective action plan for the lagoon system. If construction is planned, this report shall include an implementation schedule to prepare a facility plan and final plans and specifications.</p>	06/30/2028

4.1.1 Explanation of Schedule

A treatment lagoon leakage assessment was determined to be necessary following the compliance inspection.

4.2 Installation of Permanent Chemical Feed System at Sampling Point 001

The permittee shall install a permanent chemical feed system at Sampling Point (Outfall) 001 in accordance with the following schedule.

Required Action	Due Date
Plan Submittal: The permittee shall submit final construction plans and specifications for the installation of a permanent chemical feed system at Sampling Point (Outfall) 001 to the department for approval pursuant to s. 281.41, Wis. Stats. Plans and specifications for the permanent chemical feed system shall comply with chs. NR 108 and NR 110, Wis. Adm. Code.	06/30/2027
Complete Installation: The permittee shall complete the installation of the permanent chemical feed system at Sampling Point (Outfall) 001 in accordance with the approved plans and specifications to achieve compliance with s. NR 110.22, Wis. Adm. Code.	12/31/2027

4.2.1 Explanation of Schedule

The installation of a permanent chemical feed system at Sampling Point 001 was identified as necessary following the compliance inspection.

4.3 Sludge Management Plan

If the lagoons are to be desludged during this permit term, a sludge management plan is required to demonstrate compliance with ch. NR 204, Wis. Adm. Code.

Required Action	Due Date
<p>Sludge Management Plan Submittal: The permittee shall submit a sludge management plan for approval if removal of sludge from the lagoons will occur during the 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.</p> <p>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.</p> <p>The plan is due at least 60 days prior to desludging.</p>	

4.3.1 Explanation of Schedule

An up-to-date sludge management plan is required for the desludging of the lagoons in accordance with ch. NR 204, Wis. Adm. Code.

4.4 Operator Certification

The permittee is required to have a designated operator-in-charge that shall be certified at the level and in all subclasses of the treatment facility pursuant to s. NR 114.53(1), Wis. Adm. Code.

Required Action	Due Date
Operator Certification: The permittee shall have the designated operator-in-charge (OIC) obtain the A2 (Attached Growth Processes) subclass at the basic level. The OIC will have 12 months to pass the exam for the A2 (Attached Growth Processes) subclass and gain one year of subclass specific experience to be certified at the basic level pursuant to s. NR 114.53(4), Wis. Adm. Code.	06/30/2027

4.4.1 Explanation of Schedule

The certification of an operator-in-charge in the subclasses of the treatment facility has been identified as a requirement following the compliance inspection.

4.5 Capacity, Management, Operation, and Maintenance (CMOM) Program

The permittee shall have written documentation of the CMOM program components in accordance with s. NR 210.23(4), Wis. Adm. Code.

Required Action	Due Date
Revised CMOM Program: Review and revise the Capacity, Management, Operation and Maintenance (CMOM) Program to meet the requirements of s. NR 210.23, Wis. Adm. Code. A revised copy of the program shall be submitted to the department by the due date.	10/31/2026

4.5.1 Explanation of Schedule

An up-to-date CMOM that meets the requirements of s. NR 210.23, Wis. Adm. Code, has been identified as a requirements following the compliance inspection.

Attachments

Water Quality Based Effluent Limitations for Forestville Wastewater Treatment WPDES Permit No. WI-002884-10, by Nicole Krueger, dated May 8, 2025

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Ashley Clark, Wastewater Specialist

Date: April 20, 2026

CORRESPONDENCE/MEMORANDUM

DATE: 05/08/2025

TO: Sarah Adkins – NER

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for Forestville Wastewater Treatment
WPDES Permit No. WI-002884-10

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 Forestville Wastewater Treatment in Door County. This municipal wastewater treatment facility (WWTF) discharges to the Ahnapee River, located in the Ahnapee River Watershed in the Door-Kewaunee Basin. This discharge is included in the Northeast Lakeshore TMDL as approved by EPA in October 2023. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD ₅			45 mg/L	30 mg/L	1
TSS TMDL			45 mg/L 93 lbs/day	30 mg/L 57 lbs/day	3
pH	9.0 s.u.	6.0 s.u.			1
Bacteria					4
<i>E. coli</i>				126 #/100 mL geometric mean	
Ammonia Nitrogen October – March April – May June – September	Variable Variable Variable		9.2 mg/L 6.7 mg/L 13 mg/L	5.1 mg/L 3.6 mg/L 7.4 mg/L	1,5
Phosphorus				0.47 mg/L 0.3 lbs/day	1
Chloride					6
TKN, Nitrate+Nitrite, and Total Nitrogen					7

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. The TSS and phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Northeast Lakeshore Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA in October 2023.
4. Bacteria limits apply during the disinfection season of May through September. The fecal coliform interim limit will apply until the end of the compliance schedule when *E. coli* limits take effect. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.

5. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

6. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
7. 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).

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 (4) – Narrative, Map, 2006 Ammonia Calculations, & Thermal Table

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Attachment #1
**Water Quality-Based Effluent Limitations for
 Forestville Wastewater Treatment Facility**

WPDES Permit No. WI-0028894-10

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The Forestville WWTP consists of a covered aerated lagoon consisting of three treatment zones with a floating mixer in the initial zone, an aerated polishing reactor with four attached growth media modules and disinfection using ultraviolet radiation. A Flow Equalization/Emergency Storage lagoon is also available. The most recent upgrade was completed in 2012. Ferric chloride is added for phosphorus removal at the lift station prior to the two lagoons.

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

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1
BOD ₅			45 mg/L	30 mg/L	2,3
TSS			45 mg/L	30 mg/L	3
pH	9.0 s.u.	6.0 s.u.			2
Fecal Coliform May – September			656#/100 mL geometric mean	400#/100 mL geometric mean	4
Ammonia Nitrogen October – March April – May June – September	Variable Variable Variable		9.2 mg/L 6.7 mg/L 13 mg/L	5.1 mg/L 3.6 mg/L 7.4 mg/L	5
Phosphorus				0.47 mg/L 0.3 lbs/day	6

Footnotes:

1. Monitoring only.
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. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. The variable daily maximum limits table is shown below:

Attachment #1

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 < pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

6. The phosphorus limits became effective July 1, 2019.

Receiving Water Information

- Name: Ahnapee River
- Waterbody Identification Code (WBIC): 94800
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. Note: Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- 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 for Station TK27, where Outfall 001 is located.
 - 7-Q₁₀ = 1.1 cubic feet per second (cfs)
 - 7-Q₂ = 2.1 cfs
 - Harmonic Mean Flow = 5.96 cfs using a drainage area of 32 mi²

The Harmonic Mean has been estimated based on average flow and the 7-Q₁₀ using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).
- Hardness = 217 mg/L as CaCO₃. This value represents the geometric mean of data from chronic WET testing from 07/29/2003 – 04/10/2018.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%
- Source of background concentration data: Chloride data from the Ahnapee River is used. Metals data from the Fox River is used for this evaluation because there is no data available for the Ahnapee River. The Fox River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: There are several other dischargers to the Ahnapee River, however they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The immediate receiving water is 303(d) listed as impaired for PCBs, total phosphorus, and an unknown pollutant.

Effluent Information

- Design flow rate(s):
Annual average = 0.077 million gallons per day (MGD)
For reference, the actual average flow from 10/01/2019 – 12/31/2024 was 0.06 MGD.
- Hardness = 293 mg/L as CaCO₃. This value represents the geometric mean of four samples collected in December 2023 which were reported on 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.
- Water supply: Private wells.
- Additives: Ferric chloride is added 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.

Copper Effluent Data

Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)
12/10/2023	25	12/26/2023	18	01/18/2023	5.0
12/14/2023	20	01/02/2024	18	01/23/2023	16
12/17/2023	19	01/06/2024	14	01/30/2023	15
12/21/2023	19	01/09/2023	14		
1-day P ₉₉ = 31.5 µg/L					
4-day P ₉₉ = 23.3 µg/L					

Chloride Effluent Data

Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)
07/29/2011	220	02/14/2019	250	12/14/2023	337
08/01/2011	226	03/13/2019	219	12/17/2023	349
08/04/2021	226	03/16/2019	222	12/21/2023	413
08/08/2011	235	03/19/2019	174	01/14/2024	351
1-day P ₉₉ = 485 mg/L					
4-day P ₉₉ = 366 mg/L					

The following table presents the average concentrations and loadings at Outfall 001 from 10/01/2019 – 12/31/2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Averages of Parameters with Limits

	Average Measurement	Average Mass Discharged
BOD ₅	6.0 mg/L*	
TSS	4.1 mg/L*	

Attachment #1

	Average Measurement	Average Mass Discharged
pH field	7.5 s.u.	
Phosphorus	0.37 mg/L	0.22 lbs/day
Ammonia Nitrogen	0.30 mg/L*	
Fecal Coliform	3.1 #/100 mL*	

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

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

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

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

Acute Limits based on 1-Q₁₀

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

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

Where:

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

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

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

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

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

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

Attachment #1

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 = 0.88 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340		680	136	<14		
Cadmium	293	35.4	0.02	70.7	14.1	<0.3		
Chromium	293	4349	1.44	8698	1740	<1.3		
Copper	293	42.8	2.33	85.6			31.5	25
Lead	293	302	2.39	604	121	<3.5		
Nickel	268	1080	2.42	2161	432	5.9		
Zinc	293	308	14.88	616	123	55		
Chloride (mg/L)		757	23.4	1514			485	413

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

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

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0.275 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
Arsenic		152		504	101	<14	
Cadmium	175	3.82	0.02	12.6	2.52	<0.3	
Chromium	217	249	1.44	821	164	<1.3	
Copper	217	20.1	2.33	61.1			23.3
Lead	217	59.2	2.39	190	38.1	<3.5	
Nickel	217	101	2.42	327	65.4	5.9	
Zinc	217	237	14.88	750	150	55	
Chloride (mg/L)		395	23.4	1253			366

* 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 = 1.49 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	370	0.02	4994	999	<0.3
Chromium (+3)	3818000	1.44	51540237	10308047	<1.3
Lead	140	2.39	1860	372	<3.5
Nickel	43000	2.42	580439	116088	5.9

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 1.49 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	13.3		180	35.9	<14

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 not required for any toxic parameters in this section.

Chloride – Considering available effluent data from the last three permit applications (07/29/2011 – 01/14/2024), the 1-day P₉₉ chloride concentration is 485 mg/L, and the 4-day P₉₉ of effluent data is 366 mg/L.

These effluent concentrations are below the calculated WQBELs for chloride, therefore no effluent limits are needed. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.

Mercury – The permit application did not require monitoring for mercury because Forestville 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).” However, sludge sampling is not available because Forestville is a lagoon and generates solids which have not been removed since before the last plant upgrade in 2012. It is not expected that there are exceedances of the high-quality mercury concentration based on similar municipal treatment plants and the lack of industries. **No monitoring is recommended.**

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, the effluent flow rate, and the lack of indirect dischargers contributing to the collection system, 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.
- 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:

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 1413 sample results were reported from 10/02/2019 – 12/30/2024. The maximum reported value was 8.3 s.u. (Standard pH Units). The effluent pH was 7.9 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 8.1 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 8.1 s.u. Therefore, a value of 8.1 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.1 s.u. into the equation above yields an ATC = 7.0 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	14
1-Q ₁₀	58

The 2×ATC method yields the most stringent limits for Forestville.

The current permit has variable daily maximum effluent limits based on effluent pH which may be continued in the reissued permit. Presented below is a table of daily maximum limitations corresponding to various effluent pH values.

Daily Maximum Ammonia Nitrogen Limits – WWSF

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

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

The 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 10/02/2019 – 12/29/2024, with those results being compared to the calculated limits to determine the need to include ammonia limits in Forestville’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.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April - May	June - September	October - March
1-day P ₉₉	4.99	0.23	4.37
4-day P ₉₉	2.74	0.12	2.48
30-day P ₉₉	1.33	0.05	1.03
Mean *	0.75	0.01	0.34
Std	1.17	0.11	1.53
Sample size	41	84	137
Range	<0.099 - 3.6	<0.099 - 0.44	<0.099 - 6.44

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

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, 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
April & May	Variable	6.7	3.6
June – September	Variable	13	7.4
October – March	Variable	9.2	5.1

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

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

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Because Forestville’s permit requires weekly monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

These limits are required during May through September. No changes are recommended to the current recreational period and the required disinfection season.

Effluent Data

Forestville has monitored effluent *E. coli* from 05/03/2023 – 09/28/2023 and a total of 22 results are available. A geometric mean of 126 counts/100 mL was not exceeded, with a maximum monthly geometric mean of 6.6 counts/100 mL. Effluent data did not exceed 410 counts/100 mL. The maximum reported value was 20 counts/100 mL. Based on this effluent data it appears that the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.

Attachment #1
PART 5 – PHOSPHORUS

Technology-Based Effluent Limit

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

Because Forestville currently has a limit of less than 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

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

Northeast Lakeshore TMDL

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 pounds per year. This WLA found in Appendix K of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Northeast Lakeshore Region* report are expressed as maximum annual loads (lbs/year). The WLA for Forestville is 364 lbs/year.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to facilities included in the Northeast Lakeshore Basin TMDL are given monthly average mass limits and, 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:

$$\begin{aligned} \text{TP Equivalent Effluent Concentration} &= \text{WLA} \div (365 \text{ days/yr} * \text{Flow Rate} * \text{Conversion Factor}) \\ &= 364 \text{ lbs/yr} \div (365 \text{ days/yr} * 0.077 \text{ MGD} * 8.34) \\ &= 1.6 \text{ mg/L} \end{aligned}$$

Since this value is greater than 0.3 mg/L, the WLA should be expressed as a monthly average mass limit for total phosphorus and no six-month average limit is required.

$$\begin{aligned} \text{TP Monthly Average Permit Limit} &= \text{WLA} \div 365 \text{ days/yr} * \text{multiplier} \\ &= (364 \text{ lbs/yr} \div 365 \text{ days/yr}) * 1.90 \\ &= 1.9 \text{ lbs/day} \end{aligned}$$

The multiplier used in the six-month average calculation was determined according to the implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 2.0. This is the standard deviation divided by the mean of mass data. However, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by the facility is 0.6. 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.

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.

Current Limits

The current permit has a monthly average limit of 0.47 mg/L and 0.3 lbs/day. **The TMDL-based limit is less stringent than the current monthly average mass limit of 0.3 lbs/day, therefore the current limit is recommended to continue.** If Forestville 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.**

Effluent Data

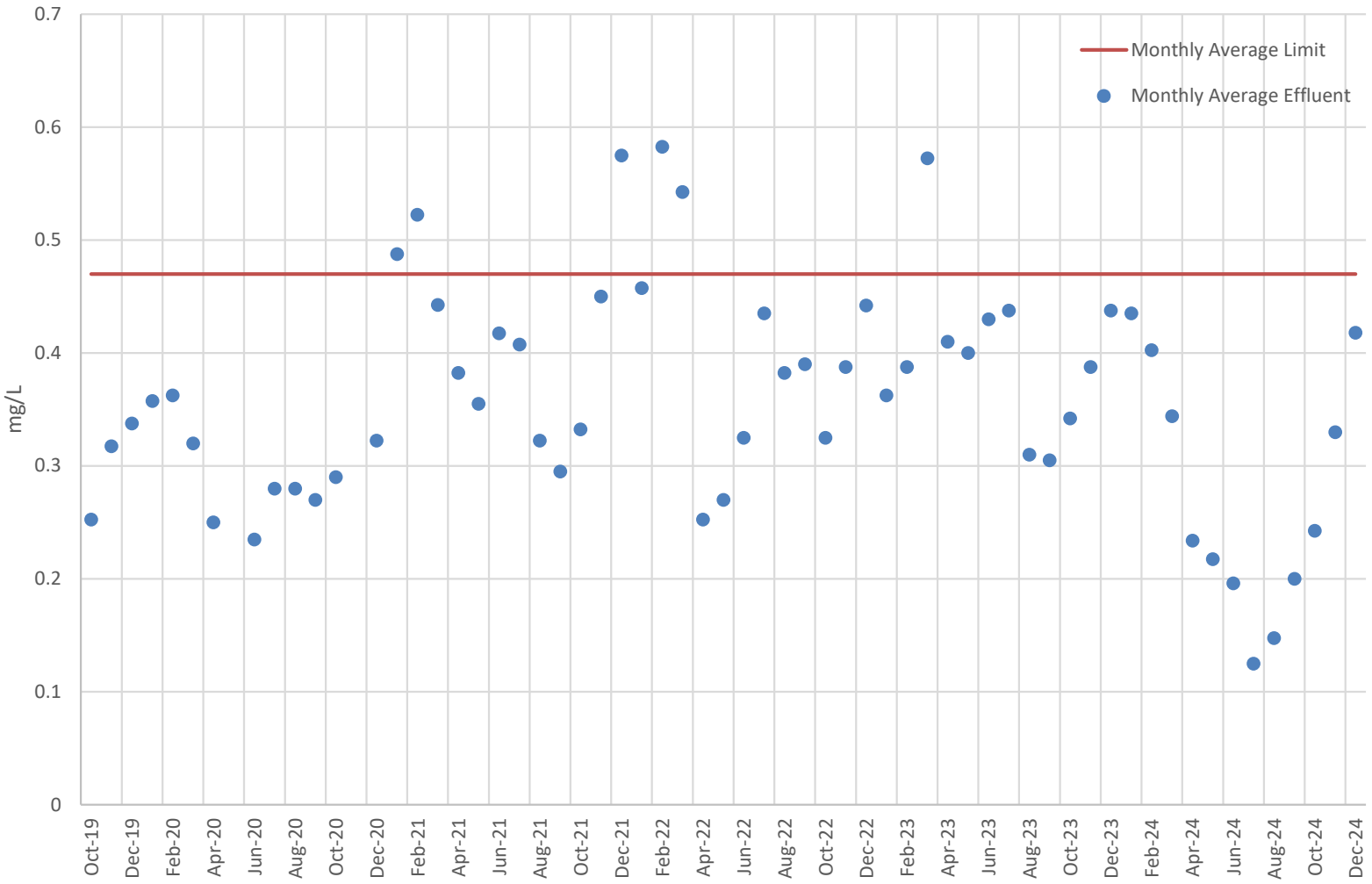
The following table summarizes effluent total phosphorus monitoring data from 10/02/2019 – 12/29/2024. Data from May and November 2020 is not included in this evaluation due unusually high effluent that is likely not representative of normal conditions.

Total Phosphorus Effluent Data

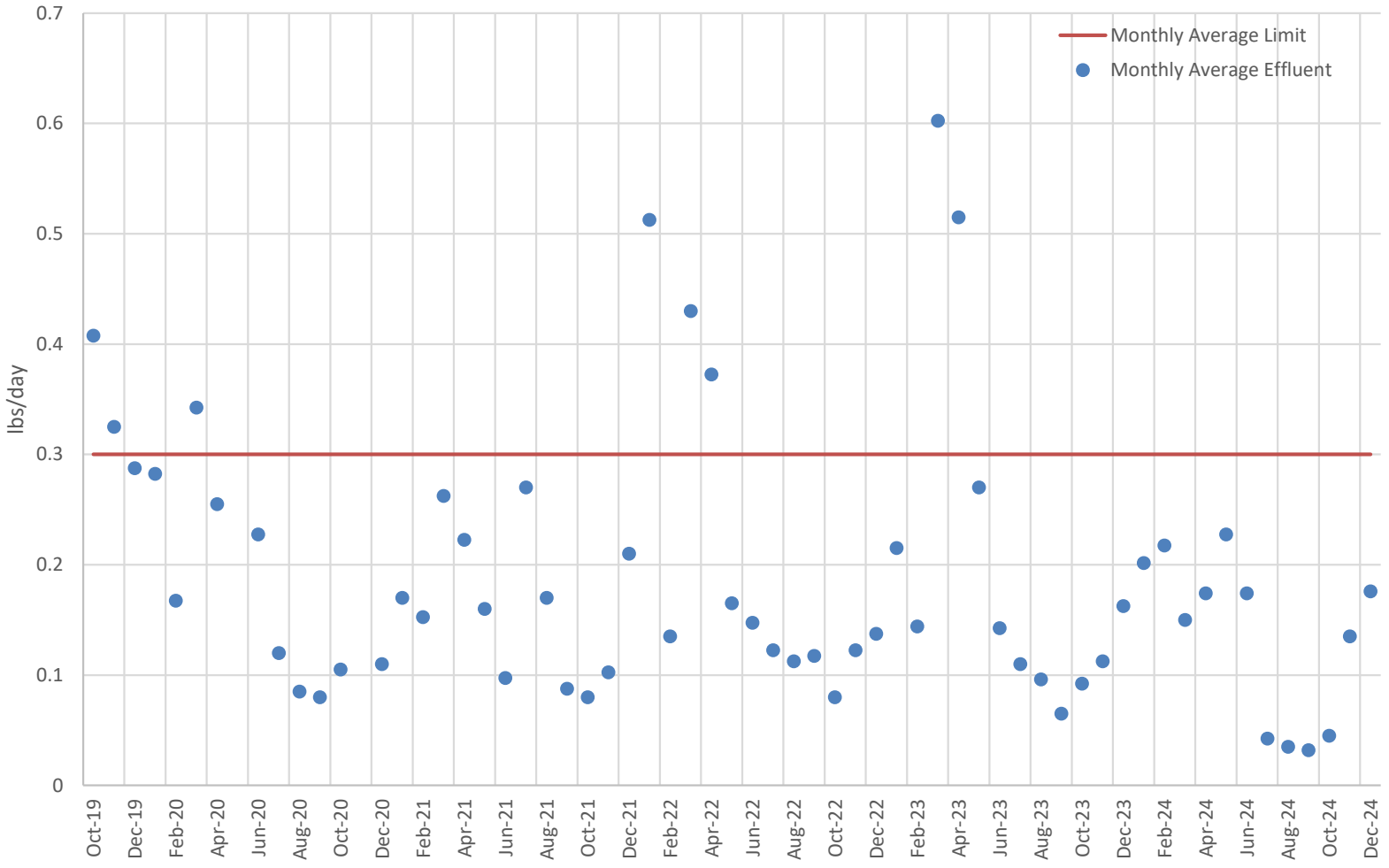
	Concentration mg/L	Mass lbs/day
1-day P ₉₉	0.69	0.91
4-day P ₉₉	0.50	0.50
30-day P ₉₉	0.40	0.28
Mean	0.36	0.19
Std	0.11	0.19
Sample size	255	254
Range	0.04 – 0.67	0.02 – 1.7

The following graphs show the monthly average effluent concentrations and mass from the current permit term (10/02/2019 – 12/29/2024):

Monthly Average Effluent Phosphorus



Monthly Average Mass Phosphorus



PART 6 – TOTAL SUSPENDED SOLIDS

Total Suspended Solids (TSS) 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). This WLA found in Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Northeast Lakeshore Region* report are expressed as maximum annual loads (lbs/year). The WLA for Forestville is 10,916 lbs/year.

Revisions to chs. NR 106 and 205, Wis. Adm. Code align Wisconsin water quality-based effluent limits with 40 CFR 122.45(d), which requires WPDES permits to contain the following concentration limits, whenever practicable and necessary to protect water quality:

- Weekly average and monthly average limitations for continuous discharges subject to ch. NR 210.

Attachment #1

- Daily maximum and monthly average limitations for all other discharges.

Forestville is a municipal treatment facility and is therefore subject to weekly average and monthly average TSS limits derived from TSS annual WLAs.

$$\begin{aligned} \text{TSS Monthly Average Permit Limit} &= \text{WLA} \div 365 \text{ days/yr} * \text{multiplier} \\ &= (10,916 \text{ lbs/yr} \div 365 \text{ days/yr}) * 1.90 \\ &= 57 \text{ lbs/day} \end{aligned}$$

$$\begin{aligned} \text{TSS Weekly Average Permit Limit} &= \text{WLA} \div 365 \text{ days/yr} * \text{multiplier} \\ &= (10,916 \text{ lbs/yr} \div 365 \text{ days/yr}) * 3.11 \\ &= 93 \text{ lbs/day} \end{aligned}$$

The multiplier used in the weekly average and monthly average calculation was determined according to implementation guidance. A coefficient of variation was calculated, based on TSS mass monitoring data, to be 1.7. This is the standard deviation divided by the mean of mass data. However, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by the facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies TSS monitoring as weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

Weekly average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to concentrations of 145 mg/L and 88 mg/L, respectively, at the facility design flow of 0.077 MGD.

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 TSS. Rolling 12-month sums can be compared directly to the annual wasteload allocation.

Effluent Data

The following table summarizes effluent total suspended solids monitoring data from 10/02/2019 – 12/29/2024.

Total Suspended Solids Effluent Data

	TSS mg/L	TSS lbs/day
1-day P ₉₉	15.1	17.1
4-day P ₉₉	9.32	9.36
30-day P ₉₉	5.72	4.37
Mean*	4.14	2.35
Std	3.02	3.90
Sample size	273	273
Range	<2 – 21.2	0 – 35

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

Forestville can currently meet the TSS mass limits and a compliance schedule is not needed.

PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from 05/02/2012 – 05/21/2014.

The table below summarizes the maximum temperatures reported during monitoring from 10/01/2019 – 12/31/2024.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	45	46	67	109
FEB	41	41	82	120
MAR	41	42	63	97
APR	43	44	60	91
MAY	52	55	70	90
JUN	62	64	85	95
JUL	69	70	100	96
AUG	69	70	107	103
SEP	69	69	110	116
OCT	63	64	69	96
NOV	57	58	59	105
DEC	50	51	63	97

Reasonable Potential

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:

Attachment #1

- (a) The highest recorded representative daily maximum effluent temperature
- (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub-lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
 - (a) The highest weekly average effluent temperature for the month.
 - (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

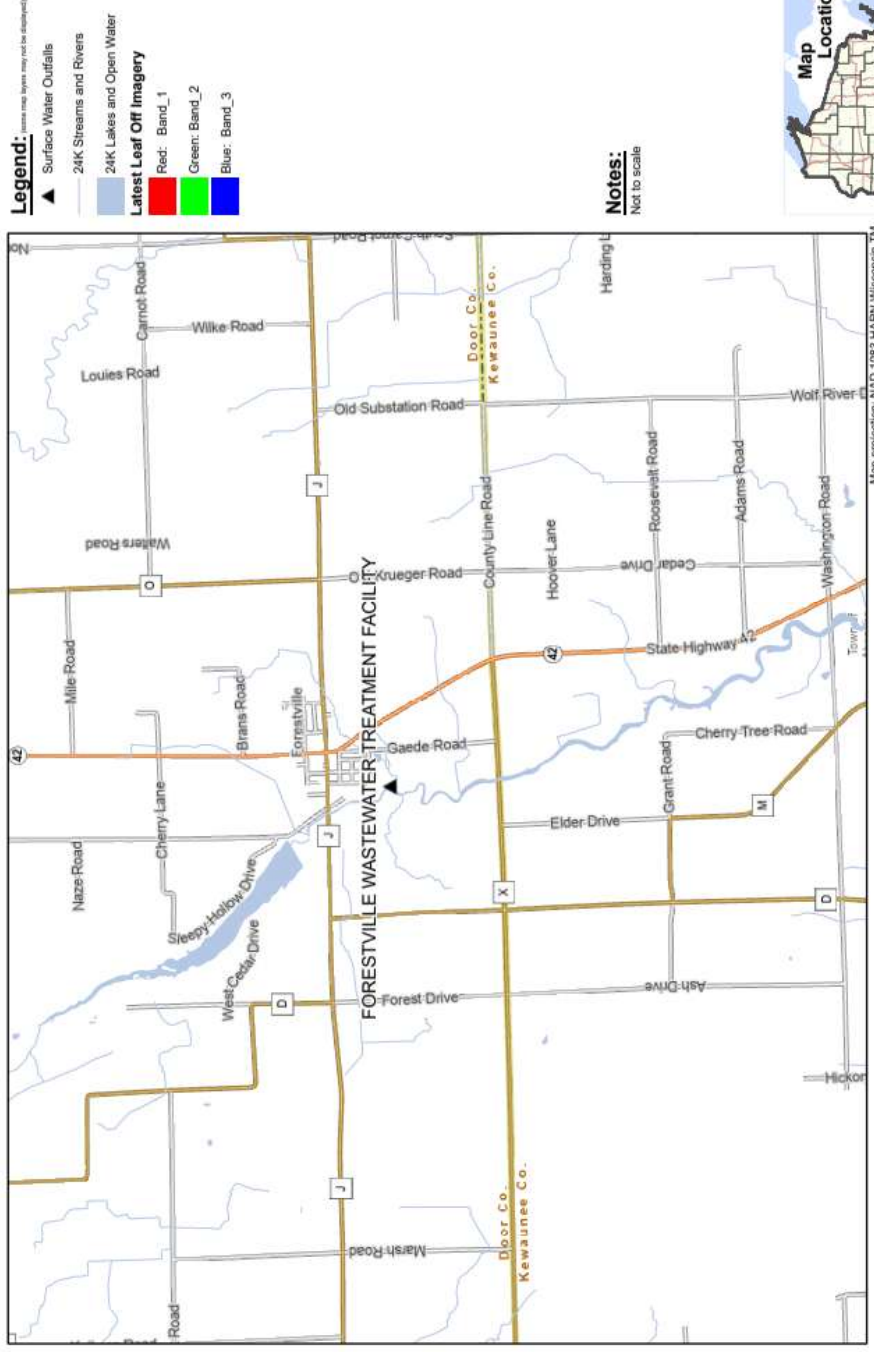
Based on the available effluent data no effluent limits are recommended for temperature. The complete thermal table used for the limit calculation is attached. **Monitoring only for one year is recommended in the reissued permit.**

PART 8 – 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.

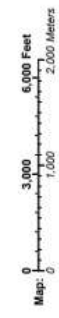
Forestville Outfall Map



Legend:

- ▲ Surface Water Outfalls
- 24K Streams and Rivers
- 24K Lakes and Open Water
- Latest Leaf Off Imagery**
- Red: Band_1
- Green: Band_2
- Blue: Band_3

Notes:
Not to scale



Service Layer Credits:
Latest Leaf Off Imagery, Basic Basemap (Cached)

Map projection: NAD 1983 HARN Wisconsin TM

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Attachment #3
2006 Ammonia Limits

The State of Wisconsin promulgated revised water quality standards for this substance during the term of the current permit. Those revisions became effective March 1, 2004, and include criteria based on both acute and chronic toxicity to aquatic life.

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

Where:

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

The effluent pH data for the past three years was examined as part of this evaluation. A total of 1064 sample results were reported from July 2003 through June 2006. The maximum reported value was 8.5 su (Standard pH Units), reported fourteen times. The one-day P₉₉, calculated in accordance with s. NR 106.05(5), is 8.39 su. And 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 8.36 su. A value of 8.5 is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.5 into the equation above yields an ATC = 3.20 mg/L, and a computed daily maximum limit of 6.4 mg/L.

However, the precision and accuracy of the pH monitoring data have not been verified. In addition, it is conceivable that modifications to the treatment process could alter the effluent pH. And finally, the rules allow manipulation of the effluent pH in order to comply with daily maximum limits for ammonia nitrogen. Consequently, presented below is a table of daily maximum limitations corresponding to various effluent pH values. Use of this table is not recommended in the permit, but it is presented herein for informational purposes.

Daily Maximum Limits

Effluent pH - s.u.	NH ₃ -N Limit - mg/L	Effluent pH - s.u.	NH ₃ -N Limit - mg/L
pH ≤ 7.5	No Limit	8.2 < pH ≤ 8.3	9.4
7.5 < pH ≤ 7.6	34*	8.3 < pH ≤ 8.4	7.8
7.6 < pH ≤ 7.7	29*	8.4 < pH ≤ 8.5	6.4
7.7 < pH ≤ 7.8	24*	8.5 < pH ≤ 8.6	5.3
7.8 < pH ≤ 7.9	20*	8.6 < pH ≤ 8.7	4.4
7.9 < pH ≤ 8.0	17	8.7 < pH ≤ 8.8	3.7
8.0 < pH ≤ 8.1	14	8.8 < pH ≤ 8.9	3.1
8.1 < pH ≤ 8.2	11	8.9 < pH ≤ 9.0	2.6

* During the months of May through October if the pH is less than or equal to 7.9 there is no daily maximum limit for NH₃-N for municipal WWTF's treating primarily domestic wastewater. Limits shown in the table above with an asterisk* apply from November through April only.

Attachment #3

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

Where:

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

E = 0.854,

C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present),

or C = $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and

T = the temperature (°C) of the receiving water – (Early Life Stages Present),

or T = the maximum of the actual temperature (°C) and 7 - (Early Life Stages Absent)

Ambient monitoring was performed on the Ahnapee River in 1994, consisting of sampling once per month. That data was tabulated in the June 18, 2003 memo, reference earlier. The background conditions utilized to calculate limits for Ammonia Nitrogen are included in the table below, with the resulting criteria and effluent limitations.

Ammonia Nitrogen Limitations Based on Chronic Toxicity		SUMMER	WINTER	SPRING
		June – Sept.	Oct. – March	April & May
BACKGROUND INFORMATION	7-Q ₁₀ (cfs)	1.1	1.1	1.1
	7-Q ₂ (cfs)	2.1	2.1	2.1
	Ammonia (mg/L)	0.065	0.1	0.095
	Temperature (° C)	25	7	12
	pH (standard units)	8.53	8.76	8.97
	% of river flow used	100	25	50
	Reference weekly flow	1.1	0.275	0.55
	Reference monthly flow	1.785	0.44625	0.8925
CRITERIA (in mg/L):	4-day Chronic (@ background pH)			
	early life stages present	1.32	1.76	1.27
	early life stages absent	1.32	2.86	1.49
	30-day Chronic (@ background pH)			
	early life stages present	0.53	0.71	0.51
	early life stages absent	0.53	1.15	0.60
EFFLUENT LIMITS (in mg/L):	Weekly average			
	early life stages present	12.88	5.60	6.70
	early life stages absent		9.24	7.96
	Monthly average			
	early life stages present	7.44	2.97	3.60
	early life stages absent		5.06	4.36

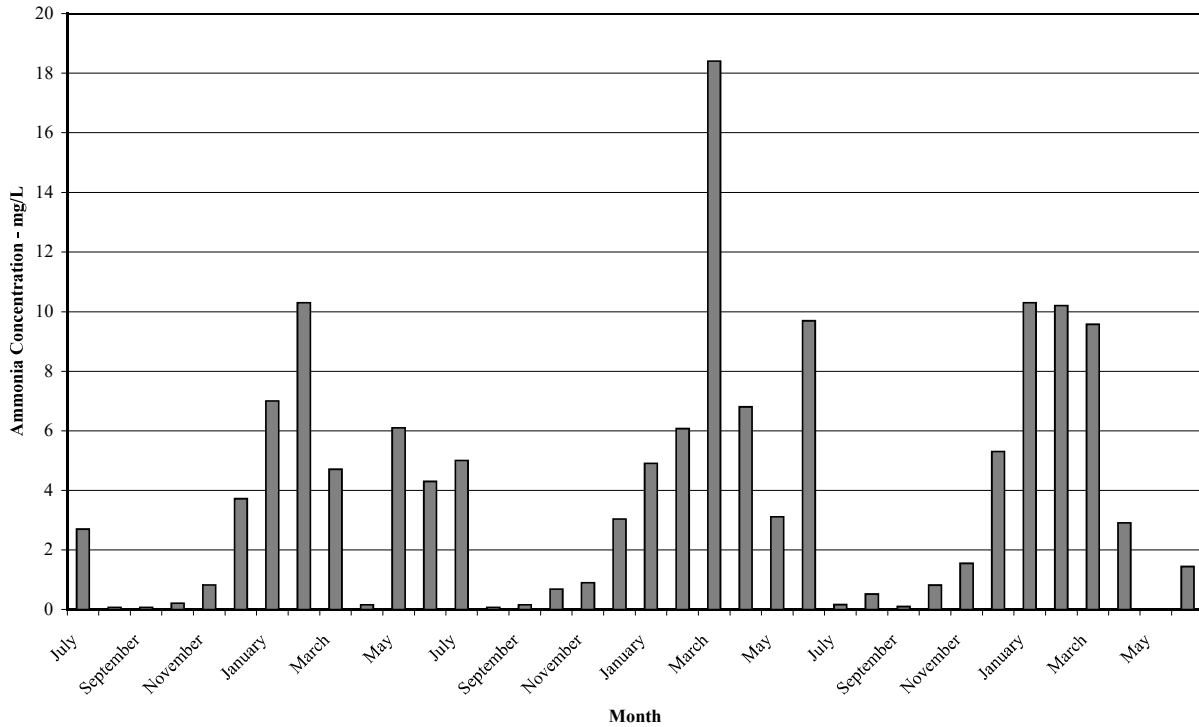
Attachment #3

In summary, after rounding to two significant figures, the following effluent limitations for Ammonia Nitrogen are calculated for the Forestville WWTF. No mass limitations are recommended in accordance with s. NR 106.32(5).

Months Applicable	Daily Maximum	Weekly Average	Monthly Average
April & May	6.4	6.7	3.6
June – September	6.4	13	7.4
October – March	6.4	9.2	5.1

As indicated earlier, the current permit requires effluent monitoring for Ammonia Nitrogen. Sampling once per month is required. Below is a chart with the sampling results for the past three years, from July 1, 2003 to June 30, 2006.

Forestville WWTF - Effluent Ammonia Data



From this chart it is clear that the monthly average effluent concentration (albeit a single sample result) has exceeded the seasonal monthly average effluent limits in winter and spring, and occasionally even in summer. The upper ninety-ninth percentile of the four-day average concentration (4-Day P₉₉) of the data from June through September equals 7.54 mg/L, and from October through March equals 13.35 mg/L, in excess of the respective monthly average limitations. And the mean effluent concentration from the months of April and May exceeds one-fifth of the monthly average limitations. Consequently, effluent limitations for Ammonia Nitrogen are apparently required in accordance with s. NR 106.05. The seasonal pattern of the effluent Ammonia Nitrogen concentration is typical of wastewater treatment facilities

Attachment #3

consisting of lagoons. This was understood during the development of the current water quality standards, and s. NR 106.38 provides for a one permit-term variance for wastewater treatment systems consisting of stabilization ponds and lagoons. The Village of Forestville has requested such a variance, and there is no known basis for denying it. Consequently, the above limits may be held in abeyance during the forthcoming permit term, but weekly monitoring shall be required, and completion of the Facilities Plan to address WWTF modifications to comply with these limits shall be required within 48 months of permit reissuance, if a variance is granted.

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

Facility:	Forestville WWTF	7-Q10:	1.10 cfs	Flow Dates	10/01/19
Outfall(s):	001	Dilution:	25%	Start:	05/02/12
Date Prepared:	2/6/2025	f:	0	End:	08/21/14
Design Flow (Qe):	0.08 MGD	Stream type: Small warm water sport or forage f			
Storm Sewer Dist.	0 ft	Qs:Qe ratio:	2.3 :1		

Calculation Needed? YES

Month	Water Quality Criteria		Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Rate (Qe)		f	Representative Highest Effluent Temperature		Calculated Effluent Limit	
	Ta (default) (°F)	Sub-Lethal WQC (°F)		Acute WQC (°F)	7-day Rolling Average (Qesl) (MGD)		Daily Maximum Flow Rate (Qea) (MGD)	Weekly Average (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)
JAN	33	49	76	0.162	0.232	0	45	46	67	109
FEB	34	50	76	0.088	0.111	0	41	41	82	120
MAR	38	52	77	0.218	0.340	0	41	42	63	97
APR	48	55	79	0.274	0.448	0	43	44	60	91
MAY	58	65	82	0.274	0.523	0	52	55	70	90
JUN	66	76	84	0.198	0.289	0	62	64	85	95
JUL	69	81	85	0.111	0.266	0	69	70	100	96
AUG	67	81	84	0.097	0.160	0	69	70	107	103
SEP	60	73	82	0.062	0.116	0	69	69	110	116
OCT	50	61	80	0.231	0.333	0	63	64	69	96
NOV	40	49	77	0.157	0.239	0	57	58	59	105
DEC	35	49	76	0.183	0.352	0	50	51	63	97