Permit Fact Sheet

General Information

Permit Number:	WI-0020877-11-0
Permittee Name:	Village of Suring
Address:	PO Box 31, 604 E Main St
City/State/Zip:	Suring WI 54174
Discharge Location:	NE¼ of NW¼, Sec 13, T29N-Rl7E, Tn of How, Oconto County Lat 44° 59' 45" N: Lon 88° 22' 45" W
Receiving Water:	Oconto River, Lower Oconto River Watershed, Green Bay Basin, Oconto County
Stream Flow ($Q_{7,10}$):	157 cubic feet per second
Stream Classification:	Cold Water community, non-public water supply
Discharge Type:	Existing, Continuous
Annual Average Design Flow	0.100 MGD
Industrial or Commercial Contributors	No significant contributors.
Plant Classification	Basic - A1, B, C, D, L & SS
Approved Pretreatment Program?	N/A

Facility Description

The Village of Suring owns and operates a package wastewater treatment facility (Suring WWTF) that serves a population of approximately 545 people and is a combination of commercial and domestic wastewater. The Suring WWTF does accept hauled in waste, typically just domestic holding tanks. Treatment consists of a bar screen, 2 activated sludge aeration basins operated in series, secondary clarification, and seasonal ultraviolet (UV) disinfection (May – September). The WWTF was constructed in 1963, the UV system in 1990, and pH adjustment in 2014 (though not utilized). Effluent is discharged on a continuous basis via Outfall 001 to the east bank of the Oconto River, approx. 1,265 ft south of the Highway 32 Bridge. Wasted sludge is treated in an aerobic digester and stored within the digester. Sludge is then hauled to another facility for further treatment and disposal on a regular basis throughout the year.

Substantial Compliance Determination

Enforcement During Last Permit: The Suring WWTP received an NON in 2022 related to effluent limit violations that continued for some time due to an indirect discharger that has since been found and eliminated. The facility has completed all previously required actions as part of the enforcement process and there is nothing outstanding.

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on 8/6/2024, the Suring WWTF has been found to be in substantial compliance with their current permit.

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	Flow is not monitored at this sample point.	INFLUENT: Grab samples shall be taken from influent channel just before bar screen.
001	0.040 MGD, October 2017- June 2023	EFFLUENT: Grab samples shall be taken from effluent channel weir after final clarifier prior to discharge to the Oconto River. pH and E. coli samples shall be taken after UV disinfection.
003	10.77 dry US Tons per year estimated in permit application.	Representative liquid sludge samples shall be collected from the aerobic digester prior to hauling and test results shall be reported on Form 3400-49 'Waste Characteristics Report'. Hauled sludge shall be reported on Form 3400-52 'Other Methods of Disposal or Distribution Report' each year. Limits listed for outfall 003 only apply when sludge is land applied.

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**
BOD5, Total		mg/L	Monthly	Grab	
CBOD5		mg/L	2/Week	Grab	
Suspended Solids, Total		mg/L	2/Week	Grab	

1.1.1 Changes from Previous Permit:

Influent 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.

- Sample type changed from 3-Hr composite to Grab for all parameters monitored at Sample Point 701.

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of 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.

$CBOD_5$- Since the facility has met the requirements of s. NR 210.07(4), Wis. Adm. Code, sampling for $CBOD_5$ at Sample Point 001 has been substituted for BOD_5. $CBOD_5$ is monitored at Sample Point 701 to demonstrate percent removal prior to discharge.

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	
CBOD5	Weekly Avg	40 mg/L	2/Week	3-Hr Comp	
CBOD5	Monthly Avg	25 mg/L	2/Week	3-Hr Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	2/Week	3-Hr Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	2/Week	3-Hr Comp	
pH Field	Daily Min	6.0 su	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit effective May through September annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May through September annually. See the E. coli Percent Limit section in the permit. Enter the result in the DMR on the last day of the month.
Nitrogen, Ammonia Variable Limit		mg/L	2/Month	See Table	Look up the 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	2/Month	3-Hr Comp	Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the eDMR. See Ammonia Limitation permit section.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	66 mg/L	2/Month	3-Hr Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	66 mg/L	2/Month	3-Hr Comp	
Hardness, Total as CaCO3 Dissolved		mg/L	Monthly	3-Hr Comp	Monitoring only in 2028.
Phosphorus, Total		mg/L	Monthly	3-Hr Comp	Monitoring only in 2028.
Copper, Total Recoverable		mg/L	Monthly	3-Hr Comp	Monitoring only in 2028.
Chloride		mg/L	Monthly	3-Hr Comp	Monitoring only in 2028.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	3-Hr Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	3-Hr Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	

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.

E. coli- Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits.

Hardness, Phosphorus, Copper, and Chloride- Monthly monitoring is required in 2028 to provide adequate data to determine the need for limits at the next permit issuance.

Total Nitrogen Monitoring (TKN, N02+N03 and Total N)- Quarterly monitoring is required as outlined in the permit.

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 August 28, 2023.

Monitoring Frequencies- The 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 CBOD5, Total Suspended Solids, and pH fall below the standard monitoring frequency outlined in guidance. To better assess whether the facility is consistently complying with permit limitations, the sampling method will be upgraded from grab to 24-hr flow proportional during the permit term. In the meantime, current monitoring frequencies will be maintained as they are still consistent with the requirements of state

code. 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.

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

E. coli- The WQBEL memo suggests a schedule is needed prior to limits for E. coli going into effect. Through conversations with the facility, it was determined that issues taking place with the lab analyzing the E. coli samples may have caused errors in the data submitted to the department. The facility confirmed these issues have been resolved and they will be able to comply with final effluent limits at the start of the permit term. As a result, no schedule has been added to the permit.

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)**
003	N/A	Liquid	Aerobic digestion	N/A	Hauled to another facility	10.77
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. Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

3.1 Sample Point Number: 003- 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	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
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	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	Monitoring only required when sludge is land applied.
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	Monitoring only required when sludge is land applied.
Phosphorus, Total		Percent	Annual	Composite	Monitoring only required when sludge is land applied.
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	Monitoring only required when sludge is land applied.
Potassium, Total Recoverable		Percent	Annual	Composite	Monitoring only required when sludge is land applied.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS permit sections for more information.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PFAS Dry Wt			Annual	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.

List 1 parameters- Limits have been added for total solids and metals to be consistent with other permits drafted across the state and to allow land application without the need for a permit modification if the facility chooses to switch disposal methods during the permit term. Limits only apply if land application takes place.

List 2 parameters- Nutrient monitoring has been added to the permit, however, is only required if land application takes place.

PFAS- Monitoring is required annually pursuant to s. NR 204.06(2)(b)9., 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). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Radium requirements are addressed in s. NR 204.07(3)(n).

All sludge generated is hauled to another facility for further treatment and disposal, therefore it isn't necessary to evaluate nutrient values, pathogen reduction, vector attraction, PCB monitoring or the presence of radium. These areas will be addressed by the receiving facility. The metals and PFAS analyses are recommended to maintain a database for evaluation of effluent limits and assist the permittee during investigations of potential toxic dischargers to its collection system.

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 Installation of Effluent Monitoring Equipment at Sampling Point 001

The permittee shall install effluent monitoring equipment consistent with 24-hour, flow-proportional composite effluent sampling, including sample refrigeration, at Sampling Point 001 in accordance with the following schedule.

Required Action	Due Date
Plan Submittal: The permittee shall submit plans for installation of 24-hr, flow-proportional composite effluent monitoring equipment at Sample Point 001. Plans for the monitoring equipment shall comply with chs. NR 108 and NR 218, Wis. Adm. Code.	12/31/2025
Complete Installation: The permittee shall complete installation of 24-hour, flow-proportional composite effluent monitoring equipment in accordance with approved plans.	12/31/2026

4.1.1 Explanation of Schedules

After considering all factors outlined in s. NR 210.04(4), Wis. Adm. Code, the department has determined the facility should install a 24-hour, flow-proportional composite effluent sampler in order to adequately characterize the effluent quality. This schedule provides the facility time to plan for and install the required sampling equipment.

Once required equipment is installed, the department will modify sampling requirements for Outfall 001 to require 24-hour, flow-proportional samples for parameters currently monitored using 3-hour composite samples.

5 Attachments:

Water Quality-Based Effluent Limitations for the Suring Wastewater Treatment Facility WPDES Permit No. WI-0020877-11-0, dated August 28, 2023

6 Expiration Date:

December 31, 2029

7 Justification of Any Waivers from Permit Application Requirements:

No waivers requested or granted as part of this permit reissuance.

Prepared By: Amanda Perdzock, Wastewater Specialist **Date:** October 01, 2024

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: August 28, 2023

TO: Sarah Adkins – NER/Oshkosh Service Center

FROM: Michael Polkinghorn – NOR/Rhinelander Service Center Michael Polkinghorn

SUBJECT: Water Quality-Based Effluent Limitations for the Suring Wastewater Treatment Facility
WPDES Permit No. WI-0020877-11-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Suring Wastewater Treatment Facility in Oconto County. This municipal wastewater treatment facility (WWTF) discharges to the Oconto River, located in the Lower Oconto River Watershed in the Green Bay Basin. 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
$CBOD_5$			40 mg/L	25 mg/L	1, 2
TSS			45 mg/L	30 mg/L	1, 2
pH	9.0 s.u.	6.0 s.u.			1, 2
Bacteria					3
Interim Limit Fecal Coliform				400 #/100 mL geometric mean	
Final Limit *E. coli*				126 #/100 mL geometric mean	
Ammonia Nitrogen	Variable		**66 mg/L**	**66 mg/L**	4, 5
Phosphorus					6
Copper (Total Recoverable)					7
Chloride					8
Hardness (Total as $CaCO_3$)					9
TKN, Nitrate+Nitrite, and Total Nitrogen					10

Footnotes:

1. No changes from the current permit.
2. These limits are based on the Cold Water (CW) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code. The facility had met the requirements of s. NR 210.07(4), Wis. Adm. Code.
3. Bacteria limits apply during the disinfection season of May – September. The fecal coliform interim limit will apply until the end of the compliance schedule when *E. coli* limits take effect. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.

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

Daily Maximum Ammonia Nitrogen Limits

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

5. 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.
6. Monthly monitoring for 1 year is recommended during the reissued permit term to better determine the need for phosphorus limits at the next permit issuance.
7. Monthly copper monitoring is recommended for 1 year during the reissued permit term.
8. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
9. Hardness monitoring is recommended because of the relationship between hardness and daily maximum limits based on acute toxicity criteria.
10. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all minor municipal permittees with total nitrogen concentrations greater than 40 mg/L. Total nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), 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 Michael Polkinghorn at (715) 360-3379 or Michael.Polkinghorn@wisconsin.gov and Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, discharge area map, & weekly/monthly average ammonia nitrogen limits.

PREPARED BY: Michael A. Polkinghorn, E.I.T. – Water Resources Engineer

E-cc: Roy Van Gheem, P.E., Wastewater Engineer – NER/Green Bay Service Center
Heidi Schmitt-Marquez, Regional Wastewater Supervisor – NER/Green Bay Service Center
Diane Figiel, P.E., Water Resources Engineer – WY/3
Nathanial Willis, P.E., Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Suring Wastewater Treatment Facility

WPDES Permit No. WI-0020877-11-0

Prepared by: Michael A. Polkinghorn, E.I.T.

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Suring owns and operates a package wastewater treatment facility (Suring WWTF). Treatment consists of a bar screen, 2 activated sludge aeration basins operated in series, secondary clarification, and seasonal ultraviolet (UV) disinfection (May – September). The WWTF was constructed in 1963, the UV system in 1990, and pH adjustment in 2014. Effluent is discharged on a continuous basis via Outfall 001 to the east bank of the Oconto River, approx. 1,265 ft south of the Highway 32 Bridge.

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

Existing Permit Limitations

The current permit, expired on 09/30/2022, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					
$CBOD_5$			40 mg/L	25 mg/L	1, 2
TSS			45 mg/L	30 mg/L	2
pH	9.0 s.u.	6.0 s.u.			2
Fecal Coliform May – September			**656#/100 mL** **geometric mean**	400#/100 mL geometric mean	3
Ammonia Nitrogen	Variable		**66 mg/L**	**66 mg/L**	3, 4

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC) and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. These limits are based on the Cold Water (CW) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code. The facility had met the requirements of s. NR 210.07(4), Wis. Adm. Code, and the need for $CBOD_5$ limits will not be re-evaluated as part of this review unless influent characteristics have changed from the time $CBOD_5$ limits were implemented in the permit.
3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
4. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Variable Limits Table *Daily maximum ammonia limits based on Effluent pH*			
Effluent pH (std. units)	**Daily Maximum Limit**	**Effluent pH (std. units)**	**Daily Maximum Limit**
		7.9 < pH ≤ 8.0	17 mg/L
pH ≤ 7.0	> 66 mg/L	8.0 < pH ≤ 8.1	14 mg/L
7.0 < pH ≤ 7.1	66 mg/L	8.1 < pH ≤ 8.2	11 mg/L
7.1 < pH ≤ 7.2	59 mg/L	8.2 < pH ≤ 8.3	9.4 mg/L
7.2 < pH ≤ 7.3	52 mg/L	8.3 < pH ≤ 8.4	7.8 mg/L
7.3 < pH ≤ 7.4	46 mg/L	8.4 < pH ≤ 8.5	6.4 mg/L
7.4 < pH ≤ 7.5	40 mg/L	8.5 < pH ≤ 8.6	5.3 mg/L
7.5 < pH ≤ 7.6	34 mg/L	8.6 < pH ≤ 8.7	4.4 mg/L
7.6 < pH ≤ 7.7	29 mg/L	8.7 < pH ≤ 8.8	3.7 mg/L
7.7 < pH ≤ 7.8	24 mg/L	8.8 < pH ≤ 8.9	3.1 mg/L
7.8 < pH ≤ 7.9	20 mg/L	8.9 < pH ≤ 9.0	2.6 mg/L

Receiving Water Information

- Name: Oconto River
- Waterbody Identification Code (WBIC): 440200
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Cold Water (CW) community, non-public water supply. 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 representative 7-Q_{10} and 7-Q_2 low flow values are reevaluated at this time because the low flows determined in the previous limit evaluation (January 2016) were not clear and could not be recreated. The following 7-Q_{10} and 7-Q_2 values are from USGS for the Oconto River at Gillett, WI, approx. 19 mi downstream of Outfall 001. The drainage area is 705 mi^2.

  7-Q_{10} = 185 cubic feet per second (cfs)
  7-Q_2 = 247 cfs
  Harmonic Mean Flow = 425 cfs

  - Because Outfall 001 is upstream of where the low flows are estimated, the respective flows at its locations will be lower in magnitude. Lows flows at Outfall 001 can be estimated by proportionally adjusting the known low flows by the ratio of each location's drainage area. The drainage area for Outfall 001's location is approximately 598 mi^2 estimated by the Purdue Watershed Delineation Tool. Therefore, the drainage area ratio is 598 mi^2/705 mi^2 = 0.848. The previous low flows are multiplied by the drainage area ratio and are provided below. These will be used in the limit calculations for Outfalls 001:
    7-Q_{10} = 157 cfs
    7-Q_2 = 209 cfs
    Harmonic Mean Flow = 307 cfs using a drainage area of 598 mi^2.

The Harmonic Mean has been estimated based on average flow and the 7-Q_{10} 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 = 150 mg/L as $CaCO_3$. This value represents the geometric mean of data (n = 93) from sampling done in the Oconto River (January 1988 – June 2015), from the mouth upstream to Gillett, WI.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%.
- Source of background concentration data: Metals data from the Wolf River in Langlade, WI, is used for this evaluation because there is no data available for the Oconto River. The Wolf 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 in Part 2 of this evaluation, in the columns titled "MEAN BACK-GRD.". 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 and phosphorus are described later.
- Multiple dischargers: There are several other dischargers to the Oconto 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: None at Outfall 001. The Oconto River, approx. 13 mi downstream of Outfall 001, is on the Clean Water Act Section 303(d) list for elevated water temperature (stream mi: 30.96 – 35.35). There is also a mercury impairment (stream mi 0 – 14.16) approx. 34 mi downstream of Outfall 001.

Effluent Information

- Design flow rate(s):
  Annual average = 0.1 million gallons per day (MGD)
  For reference, the actual average flow from October 2017 – June 2023 was 0.040 MGD.
- Hardness = 200 mg/L as $CaCO_3$. This value represents the geometric mean of data (n = 4, March 2022) from 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).
- Water source: Domestic wastewater with no industrial contributors. Water supply from Suring Water Works and Red Maple Golf Course.
- Additives: None.
- 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 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.
- The effluent copper sample of 69 µg/L (03/01/2022) is not used in this evaluation because it is believed to be unrepresentative of the discharge. Correspondence from the facility operator indicates the high copper levels are from an entity dumping metals in the sewershed. The Suring WWTF had multiple upsets during January 2022 – July 2022 from unknown slugs donated to the sewershed causing the facility to be reseeded multiple times. An additional effluent copper sample of 7.4 µg/L (08/21/2015) from the previous limit evaluation (January 2016) will be utilized in this evaluation to

better determine the need for copper limits for permit reissuance.

Copper & Chloride Effluent Data

Sample Date	Copper (µg/L)	Chloride (mg/L)
08/21/2015	7.4	
03/01/2022		81
03/08/2022	15	95
03/15/2022	9.9	71
03/22/2022	9.9	150
03/29/2022	7.5	
04/05/2022	7.5	
04/12/2022	5.5	
04/19/2022	12	
04/26/2022	7	
05/03/2022	11	
05/09/2022	8.8	
Mean		99
1-day P_{99}	17	
4-day P_{99}	13	

The following table presents the average concentrations and loadings at Outfall 001 from October 2017 – June 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

Parameter	Average Measurement*
$CBOD_5$	11 mg/L
TSS	13 mg/L
pH field	7.10 s.u.
Fecal Coliform	30 #/100 mL
Ammonia Nitrogen	14 mg/L

*Any results below the level of detection (LOD) are 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 P_{99}) 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-Q_{10}

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-Q_{10} 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.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

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

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

Qe = 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

Cs = 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-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for the Suring WWTF and the limits are set based on two times the ATC.

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 = 126 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT*	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340	680	135.9	<4.9		<4.9
Cadmium	200	9.6	19.3	3.9	<0.19		<0.19
Chromium	200	3,179	6,359	1,272	3.4		3.4
Copper	200	29.8	59.6			15	15
Lead	200	209	418	83.5	<4.3		<4.3
Nickel	200	843	1,686	337	1.3		1.3
Zinc	200	221	441.1	88.2	51		51
Chloride (mg/L)		757	1,514	303	99		150

* The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} 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 = 39 cfs (¼ of the 7-Q_{10}), 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		148.0		37,666	7,533	<4.9	
Cadmium	150	3.38	0.083	839	168	<0.19	
Chromium	150	120.16	0.125	30,549	6,110	3.4	
Copper	150	14.64	0.26	3,660			13
Lead	150	41.44	0.182	10,500	2,100	<4.3	
Nickel	150	73.55		18,718	3,744	1.3	
Zinc	150	171.61	0.631	43,514	8,703	51	
Chloride (mg/L)		395		100,526	20,105	99	

Monthly Average Limits based on Wildlife Criteria (WC)

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

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 77 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	0.083	184,158	36,832	<0.19
Chromium	3,818,000	0.125	1,900,734,551	380,146,910	3.4
Lead	140	0.182	69,606	13,921	<4.3
Nickel	43,000		21,406,912	4,281,382	1.3

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 77 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		6,621	1,324	<4.9

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 recommended for any toxic substances.** Limits and monitoring recommendations are made in the paragraphs below:

Copper – Considering available effluent data historically and from the current permit term (August 2015 – May 2022), the 1-day P_{99} and 4-day P_{99} concentrations are 15 and 13 µg/L respectively. These effluent concentrations are below the calculated copper WQBELs; **therefore, no effluent limits are needed.** Because historic effluent data was used to determine reasonable potential and the probability of the mean effluent copper concentration being greater than $1/5^{th}$ of the daily maximum copper WQBEL, **monthly copper monitoring is recommended for 1 year during the reissued permit term.**

Chloride – Considering available effluent data from the current permit term (March 2022), the mean effluent concentration and 1-day maximum concentrations are 99 and 150 mg/L respectively. These effluent concentrations are below the calculated chloride WQBELs; **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 the Suring WWTF 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 and all samples taken October 2017 – December 2022 being nondetectable. **Therefore, mercury monitoring is not recommended at Outfall 001 during the reissued permit term.**

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

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

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

- Expansion of the variable daily maximum ammonia nitrogen limit table in the current permit to included ammonia nitrogen limits throughout the pH range.

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 ATC for ammonia is calculated using the following equation:

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

Where:

A = 0.411 and B = 58.4 for a CW community (category 5), and
pH (s.u.) = that characteristic of the effluent.

The Suring WWTF has the variable daily maximum pH limits table based on effluent pH in the current permit. Those ammonia nitrogen limits are based on the protection of a CW community (category 5) using the 2 times the ATC method of calculation. Because the receiving water classification is unchanged and the 7-Q_{10} low flow has increased, the magnitudes of daily maximum limits for the pH range in the current permit do not change in this respect.

Section NR 106.33(2), Wis. Adm. Code, was updated effective September 1, 2016. As a result, seasonal 20 and 40 mg/L thresholds for including ammonia limits in municipal discharge permits are no longer applicable under current rules. As such, the table has been expanded from the table in the current permit to included ammonia nitrogen limits throughout the pH range. Presented below is the updated table of daily maximum limitations corresponding to various effluent pH values.

Daily Maximum Ammonia Nitrogen Limits – CW Community (category 5)

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 average ammonia nitrogen WQBELs calculation from the previous limit evaluation (February 2011) is included as attachment #3. The 7-Q_{10} and 7-Q_2 low flows of the receiving water have both increased, which would increase the weekly and monthly average ammonia nitrogen WQBELs respectively. However, these WQBELs will not be reevaluated as the current weekly and monthly average ammonia nitrogen limits (both 66 mg/L) are significantly more stringent than any of the calculated WQBELs.

Effluent Data

The following table summarizes effluent ammonia nitrogen data from October 2017 – June 2023 for informational purposes.

Attachment #1

Ammonia Nitrogen Effluent Data

Statistics	Conc. (mg/L)
1-day P_{99}	63
4-day P_{99}	35
30-day P_{99}	21
Mean*	14
Std	13
Sample size	138
Range	0.039 - 66

*Any values lower than the level of detection are substituted with a zero.

Reasonable potential to exceed any ammonia nitrogen WQBELs does not need to be evaluated as the current permit 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.

Antidegradation

The weekly and monthly average ammonia nitrogen limits equal to 66 mg/L in the current permit would increase to 108 mg/L as a result of expanding the pH range of the variable daily maximum ammonia nitrogen limits table based on effluent pH to equal the pH range of the pH limits in the current permit. Those weekly and monthly average ammonia nitrogen limits are also required by the expression of limits requirements and are based on the highest daily maximum ammonia nitrogen limit in the table.

Because an effective limit(s) in the permit are proposed to be made less stringent, the Suring WWTF would be considered an increased discharge as described in s. NR 207.02(6)(a), Wis. Adm. Code. Therefore, the applicable antibacksliding and antidegradation requirements in ch. NR 207, Wis. Adm. Code, must be met before the limits can be increased. An initial review of effluent ammonia nitrogen data from Outfall 001 shows the Suring WWTF can currently meet the current weekly and monthly average ammonia nitrogen limits. **Therefore, the weekly and monthly average ammonia nitrogen limits in the current permit cannot be increased and are recommended to continue during the reissued permit term.**

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
Year round	Variable	**66 mg/L**	**66 mg/L**

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 the Suring WWTF'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 – September. No changes are recommended to the current recreational period and the required disinfection season.

Effluent Data
The Suring WWTF has monitored effluent *E. coli* from June 2021 – September 2021 and a total of 17 results are available. A geometric mean of 126 counts/100 mL was not exceeded with a maximum monthly geometric mean of 120 counts/100 mL. Effluent data has exceeded 410 counts/100 mL 5 times (which is 29% of the total sample results). The maximum reported value was 2,087 counts/100 mL. Based on this effluent data it appears that the facility cannot meet new *E. coli* limits and a compliance schedule is needed in the reissued permit.

Interim Limit
During the compliance schedule, an interim limit applies to prevent back-sliding from the current level of disinfection during the compliance schedule period. Therefore, the current **fecal coliform limit shall be included in the reissued permit as an interim limit of 400 counts/100 mL as a monthly geometric mean**. **Any weekly geometric mean limit which was included in the current permit for expression of limits purposes does not need to be included in the permit as an interim limit.**

PART 5 – PHOSPHORUS

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

Because Suring WWTF does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. Effluent phosphorus data is only available for April 2022 – May 2022. The maximum phosphorus concentration is 4.4 mg/L (05/11/2022) and the maximum total monthly flow

is 1.82 MG/month (March 2020). Therefore, the theoretical calculated maximum total monthly mass phosphorus loading is 4.4 mg/L × 1.82 MG/month × 8.34 = 67 lbs/month. This loading implies the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance with s. NR 217.04(1)(a)1, Wis. Adm. Code. **Therefore, a technology-based limit is not recommended during the reissued permit term.** In addition, the need for a WQBEL for phosphorus must be considered.

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.

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), 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 0.100 mg/L applies for Oconto River as described in s. NR 102.06(3)(a)29, Wis. Adm. Code.

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 = 0.100 mg/L for Oconto River.
Qs = 100% of the 7-Q_2 of 209 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 = 0.1 MGD = 0.15 cfs.
f = the fraction of effluent withdrawn from the receiving water = 0.

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall be calculated as a median using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Code. All representative data from the most recent 5 years shall be used, but data from the most recent 10 years may be used if representative of current conditions. The previous limit evaluation (January 2016) resulted in a WQBEL of 65 mg/L using a background concentration of 0.031 mg/L. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. Additional data were considered in estimating the background phosphorus concentration.

A review of all available in stream total phosphorus data from the Oconto River shows there has been no updated samples since September 2011. This evaluation will utilize the same background phosphorus data and location. The median of 0.034 mg/L is based on 5 sample results collected from October 2010 – September 2011 at the Oconto River – state highway 32 bridge in Suring, WI (SWIMS ID: 433019). This sample location is approximately 0.2 mi upstream of Outfall 001.

Substituting a median value of 0.034 mg/L into the limit calculation equation above, the calculated limit is 89 mg/L.

Effluent Data
The following table summarizes effluent total phosphorus monitoring data from April 2022 – May 2022.

Total Phosphorus Effluent Data

Sample Date	Conc. (mg/L)
04/12/2022	2.8
04/19/2022	2.9
04/26/2022	2.6
05/03/2022	3.9
05/09/2022	3.9
05/11/2022	4.4
05/13/2022	3.6
05/16/2022	2.6
05/18/2022	3.2
05/20/2022	3.6
Mean	3.4

Reasonable Potential Determination
The discharge does not have reasonable potential to cause or contribute to an exceedance of the water quality criterion because the mean effluent concentration of reported effluent total phosphorus data is less than 1/5th of the calculated WQBEL. **Therefore, a phosphorus WQBEL is not recommended during the reissued permit term. Monthly monitoring for 1 year is recommended during the reissued permit term to better determine the need for phosphorus limits at the next permit issuance.**

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

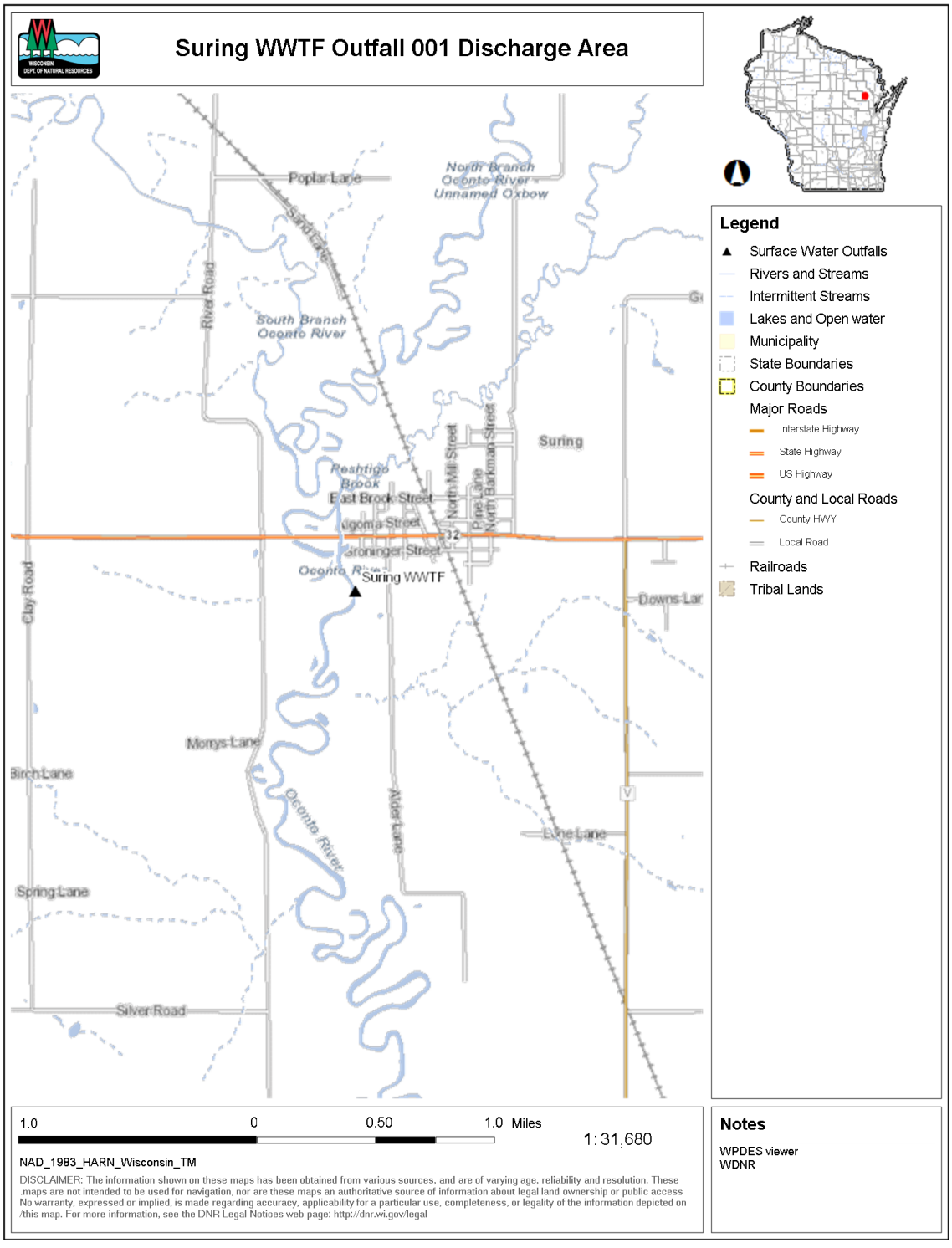
Due to the amount of upstream flow available for dilution in the limit calculation (Qs:Qe >30:1), the lowest calculated limitation is 120° F as a daily maximum as described in s. NR 106.55(6)(a), Wis. Adm. Code. At temperatures above approximately 103° F, conventional biological treatment systems do not function properly and experience upsets. There is no indication that this has ever occurred in this treatment system, so there is no reasonable potential for the discharge to exceed this limit. **Therefore, temperature limits or monitoring is not recommended during the reissued permit term.**

Attachment #1

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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

Chronic testing is usually not recommended where the ratio of the 7-Q_{10} to the effluent flow exceeds 100:1 and acute testing is not typically recommended if the ratio exceeds 1000:1. For the Suring WWTF, that ratio is approximately 1,014:1. With this amount of dilution, there is believed to be little potential for acute or chronic toxicity effects in the Oconto River associated with the discharge from the Suring WWTF. **Therefore, WET testing is not recommended during the reissued permit term.**


Suring WWTF Outfall 001 Discharge Area
WISCONSIN DEPT OF NATURAL RESOURCES
Poplar Lane
North Branch Oconto River - Unnamed Oxbow
Sand Lake
River Road
South Branch Oconto River
Suring
Reahtigo Brook
East Brook Street
North Mill Street
Pine Lane
North Bankman Street
Algoma Street
32
Groninger Street
Oconto River
Suring WWTF
Clay Road
Downs Lar
Morrys Lane
Birch Lane
Oconto River
Alder Lane
Evne Lane
Spring Lane
Silver Road
Legend
Surface Water Outfalls
Rivers and Streams
Intermittent Streams
Lakes and Open water
Municipality
State Boundaries
County Boundaries
Major Roads
Interstate Highway
State Highway
US Highway
County and Local Roads
County HWY
Local Road
Railroads
Tribal Lands
1.0 0 0.50 1.0 Miles
1:31,680
NAD_1983_HARN_Wisconsin_TM
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These .maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on /this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal
Notes
WPDES viewer
WDNR

Attachment #3

Weekly & Monthly Average Ammonia Nitrogen WQBELs – February 2011 WQBEL Evaluation

Ammonia Nitrogen Limitations Based on Chronic Toxicity		**SUMMER** June – Sept.	**WINTER** Oct. – March	**SPRING** April & May
BACKGROUND INFORMATION	7-Q_{10} (cfs)	75	75	75
	7-Q_2 (cfs)	75	75	75
	Ammonia (mg/L)	0.03	0.07	0.04
	Temperature (° C)	20	5	9
	pH (standard units)	8.21	7.97	8.21
	% of river flow used	100	25	25
	Reference weekly flow	75	18.75	18.75
	Reference monthly flow	63.75	15.9375	15.9375
CRITERIA (in mg/L):	4-day Chronic (@ background pH)	3.10	6.35	4.41
	30-day Chronic (@ background pH)	1.24	2.54	1.76
EFFLUENT LIMITS (in mg/L):	Weekly average	1490	767	534
	Monthly average	500	257	179