Permit Fact Sheet

General Information

Permit Number	WI-0022161-11-0
Permittee Name and Address	VILLAGE OF JOHNSON CREEK P O Box 238 125 Depot Street, Johnson Creek, WI 53038
Permitted Facility Name and Address	Johnson Creek Wastewater Treatment Facility 200 AZTALAN STREET, JOHNSON CREEK, WISCONSIN
Permit Term	October 01, 2025 to September 30, 2030
Discharge Location	East bank of Rock River, 40' north of Hwy B bridge. NW ¼ of SW ¼, Section 13, T7N R13E. (Lat: 43.07177º N / Lon: 88.79389º W)
Receiving Water	Rock River in Johnson Creek of Rock River (upper) in Jefferson County
Stream Flow ($Q_{7,10}$)	20 cfs
Stream Classification	Warm Water Sport Fish (WWSF), non-public water supply
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	0.401 MGD
Industrial or Commercial Contributors	Doosan Bobcat
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Johnson Creek Wastewater Treatment Facility treats domestic, commercial, and industrial wastewater generated within the Village. The facility consists of mechanical fine screening, vortex grit removal, oxidation ditch, chemical addition, secondary clarification, and UV disinfection. The oxidation ditch includes biological nutrient removal capabilities along with the current chemical feed of aluminum sulfate (alum). Sludge is aerobically digested and stored in liquid sludge storage before being spread on DNR-approved agricultural fields.

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on 5/22/24, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Ashley Brechlin on 6/11/24.

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	0.41 MGD (2024)	Influent: 24-Hr flow proportional composite samples shall be collected after screening in the grit tank.
001	0.26 MGD (2024)	Effluent: 24-Hr flow proportional composite samples shall be collected in the UV channel prior to UV disinfection and grab samples shall be collected after UV disinfection prior to discharge to the Rock River.
005	118 dry US Ton (per 2024 permit application)	Aerobically digested, Cake, Class B. Representative samples shall be collected of the Class B sludge from the cake sludge storage area.

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	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

Explanation of Limits and Monitoring Requirements

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

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT

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	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	236 lbs/day	3/Week	Calculated	Effective January, March, May, June, August, October, and December
Suspended Solids, Total	Weekly Avg	271 lbs/day	3/Week	Calculated	Effective February
Suspended Solids, Total	Weekly Avg	248 lbs/day	3/Week	Calculated	Effective April, June, September, and November
Suspended Solids, Total	Monthly Avg	167 lbs/day	3/Week	Calculated	Effective January, March, May, July, August, October, and December
Suspended Solids, Total	Monthly Avg	192 lbs/day	3/Week	Calculated	Effective February
Suspended Solids, Total	Monthly Avg	176 lbs/day	3/Week	Calculated	Effective April, June, September, and November
pH Field	Daily Max	9.0 su	3/Week	Grab	
pH Field	Daily Min	6.0 su	3/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	24 mg/L	3/Week	24-Hr Flow Prop Comp	Monitoring is year-round. Limits are effective November - April.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	24 mg/L	3/Week	24-Hr Flow Prop Comp	Monitoring is year-round. Limits are effective November - April.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	24 mg/L	3/Week	24-Hr Flow Prop Comp	Monitoring is year-round. Limits are effective November - April.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	
E. coli	% Exceedance	10 Percent	Monthly	Calculated	May - September. See the E. coli Percent Limit section. Enter the result in the DMR on the last day of the month.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring in 2029 only.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	1.21 lbs/day	3/Week	Calculated	January
Phosphorus, Total	Monthly Avg	1.91 lbs/day	3/Week	Calculated	February
Phosphorus, Total	Monthly Avg	1.97 lbs/day	3/Week	Calculated	March
Phosphorus, Total	Monthly Avg	2.19 lbs/day	3/Week	Calculated	April
Phosphorus, Total	Monthly Avg	2.11 lbs/day	3/Week	Calculated	May
Phosphorus, Total	Monthly Avg	2.14 lbs/day	3/Week	Calculated	June
Phosphorus, Total	Monthly Avg	1.81 lbs/day	3/Week	Calculated	July
Phosphorus, Total	Monthly Avg	1.55 lbs/day	3/Week	Calculated	August
Phosphorus, Total	Monthly Avg	1.38 lbs/day	3/Week	Calculated	September
Phosphorus, Total	Monthly Avg	1.14 lbs/day	3/Week	Calculated	October
Phosphorus, Total	Monthly Avg	0.99 lbs/day	3/Week	Calculated	November and December
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section below. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET Section.

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.

- **pH-** Sampling frequency increased.
- **E. coli-** Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits.
- **Chloride-** Monitoring added.
- **PFOS and PFOA** – Monitoring once every two months is included in the permit in accordance with s. NR 106.98(2)(c), Wis. Adm. Code.
- **WET-** Testing periods changed.

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 July 10, 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. Sampling for pH was increased to 5/week which is the standard sampling frequency for this parameter.

Total Suspended Solids – Weekly average and monthly average mass limits for total suspended solids were required to comply with the Rock River TMDL and were derived consistent with the assumptions and requirements of the EPA-approved WLA for the Rock River. There are no changes proposed in current concentration limits. The treatment plant is easily meeting the mass limits (see limits below). The approved total suspended solids TMDL limits for this permittee are included in the following table, expressed as weekly average and monthly average effluents limits:

Month	Monthly Ave TSS Limit lbs/day	Weekly Ave TSS Limit lbs/day
Jan	167	236
Feb	192	271
March	167	236
April	176	248
May	167	236
June	176	248
July	167	236
Aug	167	236
Sept	176	248
Oct	167	236
Nov	176	248
Dec	167	236

Total Phosphorus – Recent revisions to the administrative rules for phosphorus discharges took effect on December 1, 2010. Details may be found at: http://dnr.wi.gov/topic/surfacewater/phosphorus.html. Mass limits were calculated to comply with the Rock River TMDL and were derived consistent with the assumptions and requirements of the EPA-approved WLA for the Rock River. Limits for the permit were determined using the code changes and the provisions of the TMDL. 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 it is impracticable to express the phosphorus WQBEL for the permittee as daily maximum or weekly average values. The final effluent mass limits for phosphorus are expressed as monthly averages and are effective starting April 1, 2021. The TBEL limit of 1.0 mg/L will remain in the permit. The approved total phosphorus TMDL mass limits for this permittee are included in the following table below:

Month	Monthly Ave TP Limit lbs/day
Jan	1.21
Feb	1.91
March	1.97
April	2.19
May	2.11
June	2.14
July	1.81
August	1.55
Sept	1.38

Oct	1.14
Nov	0.99
Dec	0.99

PFOS and PFOA – NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for municipal dischargers with an average flow rate less than 1 MGD, to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(c), 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, it was identified that the POTW has an indirect discharger(s) that may be a potential source of PFOS/PFOA.

Therefore, monitoring once every two months is included. A sample frequency of 1/2 months means one sample is taken during any two-month period. Examples of 1/2 month sample would be every other month (Jan, March, May, etc.) or back-to-back months with a break in between (February & March, May & June, Aug & Sept, etc.). DMR Short Forms will be generated for the following time periods: January-February, March-April, May-June, July-August, September-October, and November-December. At a minimum one sample result will be present on each form.

The initial determination of the need for sampling shall be conducted for up to two years in order to determine if the permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code.

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)**
005	B	Cake	pH Adjustment	Incorporation	Hauling all waste	118
007	B	Liquid	pH Adjustment	Incorporation	Hauling all waste	118
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? **Yes** If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
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: 005- CLASS B CAKE SLUDGE and 007- CLASS B LIQUID SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
Radium 226 Dry Wt		pCi/g	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2026.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2026.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

Changes from Previous Permit:

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.

PCB – Sampling year updated.

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

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) 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. Radium requirements are addressed in s. NR 204.07(3)(n), 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 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This	10/01/2026

analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.	
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan. If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued. If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	10/01/2027

4.1.1 Explanation of Schedule

As stated above, ch. NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Section NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge.

If the Department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

4.2 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan Submittal: Submit an update to the management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to	10/01/2026

implementing the changes.	

4.2.1 Explanation of Schedule

An up-to-date Land Application Management Plan is required that documents how the permittee will manage the land application of biosolids consistent with ch. NR 204, Wis. Adm. Code.

Other Comments

None

Attachments

Water Quality Based Effluent Limits dated 7/10/2025

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Jennifer Jerich, Wastewater Specialist

Date: 8/6/25

Revision date after Fact Sheet: 8/13/2025

Revision date after Public Notice:

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: July 10, 2025

TO: Jennifer Jerich– SCR/Horicon

FROM: Zainah Masri – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the Johnson Creek Wastewater Treatment Facility
WPDES Permit No. WI-0022161-11-0

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 Johnson Creek Wastewater Treatment Facility in Jefferson County. This municipal wastewater treatment facility (WWTF) discharges to the Rock River located in the Johnson Creek Watershed in the Upper Rock River Basin (UR-07). This discharge is included in the Rock River TMDL as approved by EPA. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD_5			45 mg/L	30 mg/L		1
TSS			45 mg/L	30 mg/L		1,3
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen May – October November – April	- 24 mg/L		- **24 mg/L**	- **24 mg/L**		4,5,6
Bacteria						
Final Limit *E. coli*				126 #/100 mL geometric mean		7
Chloride						8
PFOS and PFOA						9
Phosphorus Concentration Limit Mass TMDL Limit				1.0 mg/L TMDL		3,10
TKN, Nitrate+Nitrite, and Total Nitrogen						11
Acute WET						12,13

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. Additional phosphorus and TSS mass limitations are required in accordance with the waste load allocations specified in the Rock River TMDL

Month	Monthly Ave TSS Effluent Limit (lbs/day)	Weekly Ave TSS Effluent Limit (lbs/day)	Monthly Ave Total P Effluent Limit (lbs/day)
Jan	167	236	1.21
Feb	192	271	1.91
March	167	236	1.97
April	176	248	2.19
May	167	236	2.11
June	176	248	2.14
July	167	236	1.81
Aug	167	236	1.55
Sept	176	248	1.38
Oct	167	236	1.14
Nov	176	248	0.99
Dec	167	236	0.99

4. Monitoring for Ammonia nitrogen from May through October.
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. 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. When a variable limit is included in the permit in place of a 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
$6.0 \leq pH \leq 6.1$	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

7. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
8. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
9. PFOS and PFOA monitoring is recommended at an every other month frequency in accordance with s. NR 106.98(2), Wis. Adm. Code.
10. The monthly average phosphorus limit is a technology-based limit which also functions as a concentration limit for phosphorus.
11. 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 (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).

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

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

Attachments (4) – Narrative, Ammonia Nitrogen Calculations, Map and Thermal Table

PREPARED BY: Zainah Masri, Water Resources Engineer Zainah Masri

APPROVED BY: Diane Figiel Date: 07/10/2025
Diane Figiel, PE,
Water Resources Engineer

E-cc: Ashley Brechlin, Wastewater Engineer – SCR/Fitchburg
Lisa Creegan, Regional Wastewater Supervisor – SCR/Fitchburg
Diane Figiel, Water Resources Engineer – WY/3
Kari Fleming, Natural Resources Program Manager – WY/3
Nate Willis, Environmental Engineer Supervisor – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Johnson Creek Wastewater Treatment Facility

WPDES Permit No. WI-002261-11-0

Prepared by: Zainah Masri – WY/3

PART 1 – BACKGROUND INFORMATION

Facility Description

The Johnson Creek Wastewater Treatment Facility treats domestic, commercial, and industrial wastewater generated within the Village. The facility consists of mechanical fine screening, vortex grit removal, oxidation ditch, chemical addition, secondary clarification, and UV disinfection. The oxidation ditch includes biological nutrient removal capabilities along with the current chemical feed of aluminum sulfate (alum). Sludge is aerobically digested and stored in liquid sludge storage before being spread on DNR-approved agricultural fields.

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

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						3
BOD_5			45 mg/L	30 mg/L		1,2
TSS			45 mg/L	30 mg/L		1,2,9
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen November – April	24 mg/L		**24 mg/L**	**24 mg/L**		4,5
Fecal Coliform May – September			**656#/100 mL** **geometric mean**	400#/100 mL geometric mean		4,6
E Coli						3
Chloride						7
Phosphorus Interim TMDL				1.0 mg/L		8,9
TKN, Nitrate+Nitrite, and Total Nitrogen						10
Acute WET						11
Chronic WET						12

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
3. Monitoring only
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7) are included in bold.
5. Ammonia Nitrogen monitoring during May through October throughout the permit term.
6. Bacteria limits apply during the disinfection season of May through September.
7. Chloride monitoring from January 2022 – December 2022.
8. The monthly average phosphorus limit is a technology-based effluent limit (TBEL) which also functions as a limit for phosphorus.
9. Additional phosphorus and TSS mass limitations are required in accordance with the waste load allocations specified in the Rock River TMDL.

Month	Monthly Ave TSS Effluent Limit (lbs/day)	Weekly Ave TSS Effluent Limit (lbs/day)	Monthly Ave Total P Effluent Limit (lbs/day)
Jan	167	236	1.21
Feb	192	271	1.91
March	167	236	1.97
April	176	248	2.19
May	167	236	2.11
June	176	248	2.14
July	167	236	1.81
Aug	167	236	1.55
Sept	176	248	1.38
Oct	167	236	1.14
Nov	176	248	0.99
Dec	167	236	0.99

10. 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 (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).
11. Acute tests shall be conducted twice during the permit term in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters. Acute: April 1, 2022 June 30, 2022; October 1, 2024 December 31, 2024. Acute WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit.
12. Chronic tests shall be conducted twice during the permit term in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters. Chronic: April 1, 2022 June 30, 2022; October 1, 2024 December 31, 2024. Chronic WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit.

Receiving Water Information

- Name: Rock River

- Waterbody Identification Code (WBIC): 861300
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS for Station located at Highway B west of Johnson Creek where Outfall 001 is located.
  7-Q_{10} = 20 cfs (cubic feet per second)
  7-Q_2 = 60 cfs
  90-Q_{10} = 51 cfs
  Harmonic Mean Flow = 146 cfs *The Harmonic Mean has been estimated as recommended in State of Wisconsin Water Quality Rules Implementation Plan (Publ. WT-511-98)*
- Hardness = 328 mg/L as $CaCO_3$. This value represents the geometric mean of data from the receiving water data taken on February 27, 2024.
- % 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 Rock River below Davy Creek (upstream of the outfall location) is used for this evaluation. The geometric means of these 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.
- Multiple dischargers: There are several other dischargers to the Rock 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 Rock River is listed as impaired for total phosphorus and total suspended solids at the point of discharge and has an EPA-approved TMDL in effect.

Effluent Information

- Design flow rates: Approved in December 2017 as part of upgrade plan & specification approval:
  Annual average = 0.401 MGD (Million Gallons per Day)
  Peak daily = 1.42 MGD
  Peak weekly = 1.00 MGD
  Peak monthly = 0.742 MGD
  Peak instantaneous flow = 2.1 MGD
  For reference, the actual average flow from March 2019 to April 2025 is 0.26 MGD.
- Hardness = 337 mg/L as $CaCO_3$. This value represents the geometric mean of data from the permit application with data points taken during July 2024.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells located in the Village of Johnson Creek.
- Waste Water Source: 3 industrial contributors, Doosan Bobcat lawn equipment manufacturing (known as formerly Schiller Grounds Care a lawn equipment manufacturing plant), Master Mold, a mold component manufacturing company, and Avon Hi-Life, a rubber fabrication manufacturer no longer discharge at the facility).
- Additives: Alum for Phosphorus Removal. Please note that on the permit application for Johnson Creek Wastewater Treatment Facility, they have indicated that they list 0 for water quality conditioners total but list Alum as a chemical used within their facility.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit

application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.

- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Effluent Copper Data

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
06/10/2024	3.6	06/24/2024	3.6	07/07/2024	5.9
06/13/2024	4.8	06/27/2024	4.1	07/11/2024	4.4
06/16/2024	6.3	07/01/2024	3.2	07/16/2024	<3.2
06/19/2024	4.6	07/04/2024	3.8		
Mean = 4.0 µg/L					

"<" means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected results.

Effluent Chloride Data

Sample Date	Chloride mg/L	Sample Date	Chloride mg/L	Sample Date	Chloride mg/L
01/18/2022	360	05/17/2022	350	09/04/2022	340
02/14/2022	360	06/17/2022	350	10/04/2022	340
03/08/2022	420	07/19/2022	310	11/01/2022	350
04/05/2022	300	08/09/2022	340	12/06/2022	350
1-day P_{99} = 421 mg/L					
4-day P_{99}= 383 mg/L					

The following table presents the average concentrations and loadings at Outfall 001 from March 2019 to April 2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD_5	6.0 mg/L*	-
TSS	6.0 mg/L*	14.2 lbs/day
pH field	7.3 s.u.	-
Phosphorus	0.25 mg/L	0.55 lbs/day
Ammonia Nitrogen	0.55 mg/L*	-
Fecal Coliform	2.1 #/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 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 =Acute toxicity criterion 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 Johnson Creek Wastewater Treatment Facility and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling for all the detected substances. 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 = 16 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	136	<1.1		

Attachment #1

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.
Cadmium	337	42	83	17	<0.39		
Chromium	301	4,446	8,892	1,778	<3.3		
Copper	337	49	98	20	4.0		
Lead	337	346	692	138	<5.4		
Nickel	268	1,080	2,161	432	<4.7		
Zinc	333	345	689	138	27		
Chloride (mg/L)		757	1,514			421	420

* 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-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 = 5.0 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		7.3	-	66	13	<1.1	
Cadmium	175	3.8	0.31	32	6.4	<0.39	
Chromium	301	326	1.8	2,936	587	<3.3	
Copper	328	29	2.0	243	49	4.0	
Lead	328	88	-	799	160	<5.4	
Nickel	268	120	2.6	1,068	214	<4.7	
Zinc	328	340	2.5	3,061	612	27	
Chloride (mg/L)		395	63	3,070	614		383

* 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 = 37 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	0.31	22,118	4,424	<0.39
Chromium (+3)	3,818,000	1.8	228,422,455	45,684,491	<3.3
Lead	140	-	8,376	1,675	<5.4

Attachment #1

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Nickel	43,000	2.6	2,572,443	514,489	<4.7

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 37 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	-	796	159	<1.1

Conclusions and Recommendations
Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are not required, but **chloride monitoring is recommended.**

Copper – Considering available effluent data from the permit application from June 2024 to July 2024 the mean concentration is 4.0 µg/L, with a maximum concentration of 6.3 µg/L. The maximum effluent concentration and the mean of the effluent data does not exceed the calculated daily maximum limit, **therefore concentration and mass limits, as well as monthly monitoring, are not required.**

Chloride – Considering available effluent data from the DMR taken from January 2022 – December 2022, the 1-day P_{99} chloride concentration is 421 mg/L, and the 4-day P_{99} of effluent data is 383 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 the Johnson Creek Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past 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. The average concentration in the sludge from February 2020 to March 2024 was 0.07 mg/kg, with a maximum reported concentration of 0.34 mg/kg. Therefore, **no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the non-domestic contributions to the sewerage system, **PFOS and PFOA monitoring is recommended at an every other month frequency.**

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:

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 888 sample results were reported from March 2019 to April 2025 The maximum reported value was 7.92 s.u. (Standard pH Units). The effluent pH was 7.72 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.63 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.61 s.u. Therefore, a value of 7.72 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.72 s.u. into the equation above yields an ATC =14 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 1-Q_{10} 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-Q_{10} (estimated as 80 % of 7-Q_{10}) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	28
1-Q_{10}	372

The 2×ATC method yields the most stringent limits for Johnson Creek Wastewater Treatment Facility.

This limit is greater than the current daily maximum limit of 24 mg/L. If Johnson Creek Wastewater Treatment Facility would like to request an increase to the existing permit limits an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter by parameter basis and includes consideration of operations, maintenance and temporary upsets. Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limits must be continued in the reissued permit. The Department would be unable to increase the limit due to the lack of need as shown via the antidegradation rule (ch. NR 207, Wis. Adm. Code) because the highest reported concentration was 18.1 mg/L during the previous permit term. No changes are recommended in any of the permit limits for ammonia.

Presented below is a table of daily maximum limitations corresponding to various effluent pH values. Use of this table is not necessarily recommended in the permit, but it is presented herein for informational purposes.

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
$6.0 \leq pH \leq 6.1$	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

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 #2.

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from March 2019 to April 2025 with those results being compared to the calculated limits to determine the need to include ammonia limits in the Johnson Creek Wastewater Treatment Facility permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or P_{99}) 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 - October	November - March
1-day P_{99}	18	1.0	6.9
4-day P_{99}	11	0.5	4.8
30-day P_{99}	4.6	0.29	2.04

Attachment #1

Ammonia Nitrogen mg/L	April	May - October	November - March
Mean*	2.1	0.19	0.58
Std	4.3	0.19	2.19
Sample size	84	356	360
Range	0.0294 - 17	0.081 - 2.35	0.024 - 18.1

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

The permit currently has daily maximum from November – April as well as weekly and monthly limits from November – April. **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
May – October	-	-	-
November – April	24	**24**	**24**

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 Johnson Creek Wastewater Treatment Facility 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

Johnson Creek Wastewater Treatment Facility has monitored effluent *E. coli* from May 2019 to September 2024 and a total of 20 results are available. A geometric mean of 126 counts/100 mL was not exceeded with a maximum monthly geometric mean of 3 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.

PART 5 – PHOSPHORUS AND TSS TMDL LIMITATIONS

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 Johnson Creek Wastewater Treatment Facility currently has a limit of 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.

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.

TMDL Limits – Phosphorus

Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL-derived water quality based effluent limit (WQBEL) for phosphorus in addition to, or in lieu of, a s. NR 217.13, Wis. Adm. Code, WQBEL in a WPDES permit. Because the Village of Johnson Creek discharges directly to a phosphorus impaired water covered under an approved TMDL, the TMDL-based limit can be included in the WPDES permit absent the s. NR 217.13, Wis. Adm. Code, WQBEL. This limit should be expressed in a manner consistent with the wasteload allocation and assumptions of the TMDL. If after two permit terms, the Department determines the nonpoint source load allocation has not been substantially reduced, the Department may include the s. NR 217.13, Wis. Adm. Code, WQBEL unless these reductions are likely to occur.

The monthly average total phosphorus (Total P) effluent limits in lbs/day are calculated based on the monthly phosphorus wasteload allocation (WLA) given in pounds per month as suggested in the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin*, dated July 2011. These limits are equivalent to concentrations ranging from 0.30 mg/L to 0.64 mg/L at the facility design flow of 0.401 MGD. **Monthly average mass effluent limits with accordance to the following table are recommended for this discharge.**

Attachment #1

Total Phosphorus Limits

Month	Monthly Total P WLA[1] (lbs/month)	Days Per Month	Monthly Ave Total P Effluent Limit[2] (lbs/day)
Jan	37.61	31	**1.21**
Feb	53.58	28	**1.91**
March	60.93	31	**1.97**
April	65.83	30	**2.19**
May	65.49	31	**2.11**
June	64.05	30	**2.14**
July	56.23	31	**1.81**
Aug	48.16	31	**1.55**
Sept	41.35	30	**1.38**
Oct	35.26	31	**1.14**
Nov	29.79	30	**0.99**
Dec	30.56	31	**0.99**

Footnotes:
1- Appendix P. Monthly Total Phosphorus Allocations by Wastewater Treatment Facility (p. 147)
2- monthly average Total P effluent limit (lbs/day) = monthly Total P WLA (lbs/month) ÷ days per month

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from March 2019 to April 2025.

Total Phosphorus Effluent Data

	Phosphorus mg/L	Phosphorus lbs/day
1-day P_{99}	0.9	2.6
4-day P_{99}	0.5	1.4
30-day P_{99}	0.34	0.81
Mean	0.25	0.55
Std	0.19	0.52
Sample size	888	888
Range	0.01 - 1.5	0.028 - 3.5

TSS TMDL Limits

The Rock River TMDL also has wasteload allocations (WLA) for total suspended solids (TSS). For a POTW the limits for TSS must be expressed as weekly and monthly averages. The current permit includes a monthly average limit of 30 mg/L, and a weekly average limit of 45 mg/L and mass limitations based on the TMDL.

Monthly average and weekly average mass effluent limitations are included in the permit according to the table below, along with the currently imposed concentration limits. For reference, the mass limits shown are equivalent to concentrations ranging from 29 – 33 mg/L as a monthly average and 40 – 46 mg/L as a weekly average, at the facility design flow.

Total Suspended Solids (TSS) Effluent Limitations

Month	Monthly TSS WLA[1] (tons/month)	Days Per Month	Monthly Ave TSS Effluent Limit[2] (lbs/day)	Weekly Ave TSS Effluent Limit[3] (lbs/day)
Jan	2.59	31	**167**	**236**
Feb	2.69	28	**192**	**271**
March	2.59	31	**167**	**236**
April	2.64	30	**176**	**248**
May	2.59	31	**167**	**236**
June	2.64	30	**176**	**248**
July	2.59	31	**167**	**236**
Aug	2.59	31	**167**	**236**
Sept	2.64	30	**176**	**248**
Oct	2.59	31	**167**	**236**
Nov	2.64	30	**176**	**248**
Dec	2.59	31	**167**	**236**

Footnotes:
1- Appendix Q. Monthly Total Suspended Solids Allocations by Wastewater Treatment Facility (p. 149)
2- Monthly average TSS effluent limit (lbs/day) = maximum monthly TSS WLA (tons/month) ÷ days per month x 2,000 lbs/ton
3- Weekly average effluent limit (lbs/day) = monthly average limit (lbs/day) x multiplier

The multiplier used in the weekly average limit calculation was determined according to implementation guidance and the maximum anticipated variation expected by any facility, 0.6, is used to select the multiplier. Monitoring of TSS is specified in the current permit at three samples per week and it is believed this monitoring frequency will remain the same. Based on these two variables, table 3 of the implementation guidance is used to come up with a multiplier of 1.41. If there is a change in monitoring frequency, the stated limits should be reevaluated.

Limits based on a WLA should be given in a permit regardless of reasonable potential. However, for informational purposes, the following table lists the statistics for Total Suspended Solids discharge as both a concentration and a mass, from March 2019 through April 2025.

	TSS (mg/L)	TSS (lbs/day)
1-day P_{99}	28	92
4-day P_{99}	15	50
30-day P_{99}	8.8	24
Mean	6.0	14
Std	5.7	20
Sample Size	934	934
Range	0 - 74	0 - 233

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.

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 influent flow reported by from April 2020 through April 2025.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	-	-	-	120
FEB	-	-	-	120
MAR	-	-	-	120
APR	-	-	101	120
MAY	-	-	-	120
JUN	-	-	-	120
JUL	-	-	-	120
AUG	-	-	-	120
SEP	-	-	-	120
OCT	-	-	-	120
NOV	-	-	-	120
DEC	-	-	-	120

Conclusions

No thermal monitoring has occurred. Section NR 106.59(2)(b), Wis. Adm. Code, allows the use of temperature effluent data, on a case-by-case basis, from at least two other wastewater treatment facilities within a 100-mile radius that utilize similar wastewater treatment technology and have a similar ratio of domestic to industrial waste stream composition.

Thermal data for Fort Atkinson Wastewater Treatment Facility (maximum temperatures reported during monitoring from January 2023 through December 2023) and Lake Mills Wastewater Treatment Facility

(maximum temperatures reported during monitoring from January 2020 through December 2020) are presented in the table below.

Temperature Effluent Data for Similar Facilities

Month	**Fort Atkinson WWTF** Representative Highest Monthly Effluent Temperatures		**Lake Mills WWTF** Representative Highest Monthly Effluent Temperature	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	61	62	48	50
FEB	60	60	47	48
MAR	58	61	49	50
APR	62	64	53	55
MAY	67	68	63	65
JUN	73	75	68	70
JUL	75	77	72	73
AUG	77	78	73	75
SEP	75	76	67	70
OCT	75	75	62	65
NOV	70	70	60	62
DEC	67	68	52	53

Based on the thermal data from the two similar facilities and the calculated thermal limits for Johnson Creek Wastewater Treatment Facility, **no thermal limits or monitoring is necessary.** The complete thermal table used for the limit calculation is provided in Attachment #3.

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC_{50} (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms

during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 11% shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$IWC\ (as\ \%) = Q_e \div \{(1 - f)\ Q_e + Q_s\} \times 100$$

Where:

Q_e = annual average flow = 0.401 MGD = 0.622 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 20 cfs ÷ 4 = 5 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %					Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Algae (IC_{50})	Pass or Fail?	Use in RP?	
07/23/1996	>100	>100	Pass	No	-	>80	-	Pass	No	1
10/21/1997	>100	>100	Pass	No	73	>80	-	Pass	No	1
07/11/2002	>100	>100	Pass	No	>100	>100	-	Pass	No	1
10/30/2002	>100	>100	Pass	No	>100	>100	-	Pass	No	1
09/07/2016	>100	>100	Pass	No	-	-	-	-	-	2
08/21/2019	>100	>100	Pass	Yes	-	-	-	-	-	-
06/14/2022	>100	>100	Pass	Yes	74	>100	-	Pass	Yes	-
10/08/2024	>100	>100	Pass	Yes	>100	>100	-	Pass	Yes	-
04/29/2025	>100	>100	Pass	Yes	78.9	>100	-	Pass	Yes	-

Footnotes:

1. *Data Not Representative.* Significant changes were made to WET test methods in 2004, and these changes were assumed to be fully implemented by certified labs by no later than June 2005. It may be appropriate to exclude data collected before July 1, 2005, unless 1) it shows repeated toxicity that was never resolved or 2) older data is all that is available, and no significant changes have occurred which obviously make it unrepresentative.
2. *Data Not Representative.* Significant changes were made to the Johnson Creek Wastewater Treatment Facility through a series of upgrades completed in 2019.

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The

safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

Acute Reasonable Potential = [(TUa effluent) (B)(AMZ)]
Chronic Reasonable Potential = [(TUc effluent) (B)(IWC)]

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

Chronic Reasonable Potential = [(TU_c effluent) (B)(IWC)]

Chronic WET Limit Parameters

TUc (maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/74 = 1.4 TU_c	3.8 Based on 2 detects	11%

[(TUc effluent) (B)(IWC)] = 0.56 < 1.0

Therefore, **no reasonable potential is shown for a chronic WET limit** using the procedures in s. NR 106.08(6) and representative data from August 2019 to April 2025.

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

WET Checklist Summary

	Acute	**Chronic**
AMZ/IWC	Not Applicable. **0 Points**	IWC = 11%. **0 Points**
Historical Data	4 tests used to calculate RP. No tests failed. **0 Points**	3 tests used to calculate RP. No tests failed. **0 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations.	Same as Acute.

Attachment #1

	Acute	Chronic
	0 Points	**0 Points**
Receiving Water Classification	WWSF **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	No limits based on ATC; Ammonia nitrogen, copper, zinc, chloride detected. **3 Points**	No limits based on CTC; Ammonia nitrogen, copper, zinc, chloride detected. **3 Points**
Additives	1 Water Quality Conditioner added. Permittee has proper P chemical SOPs in place. **1 Point**	All additives used more than once per 4 days. **1 Point**
Discharge Category	3 industrial contributors (Doosan Bobcat, Master Mold, and Avon Hi-Life) **7 Points**	Same as Acute. **7 Points**
Wastewater Treatment	Secondary or Better **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**16 Points**	**16 Points**
Recommended Monitoring Frequency (from Checklist):	2 tests during permit term	No chronic WET tests needed
Limit Required?	No	No
TRE Recommended? (from Checklist)	No	No

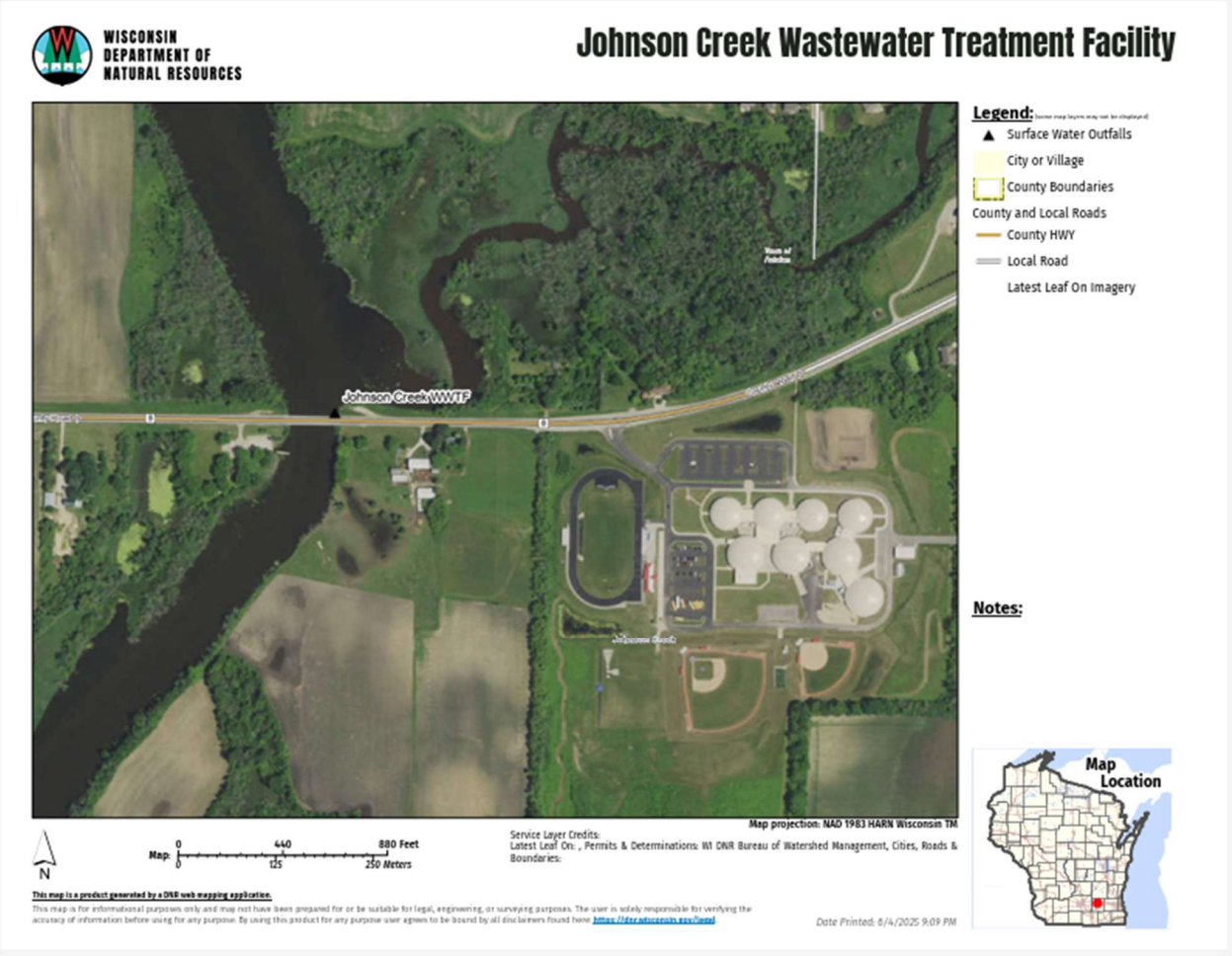
- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above **two acute WET tests during the permit term are recommended** in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge.

Since minimal ambient data is available, the "default" basin assumed values are used for Temperature, pH and background ammonia concentrations, shown in the table below, with the resulting criteria and effluent limitations.

		Spring	Summer	Winter
		April	May – Oct.	Nov. - March
Effluent Flow	Qe (MGD)	0.401	0.401	0.401
Background Information	7-Q_{10} (cfs)	20	20	20
	7-Q_2 (cfs)	60	60	60
	Ammonia (mg/L)	0.09	0.07	0.14
	Temperature (°C)	14	21	10
	pH (s.u.)	8.09	8.21	7.97
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	10	20	5.0
	Reference Monthly Flow (cfs)	25	51	13
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	**5.32**	**2.99**	6.35
	Early Life Stages Absent	5.35	2.99	**8.50**
	30-day Chronic			
	Early Life Stages Present	**2.13**	**1.20**	2.54
	Early Life Stages Absent	2.14	1.20	**3.40**
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	**89.7**	**97.1**	56.4
	Early Life Stages Absent	90.1	97.1	**75.9**
	Monthly Average			
	Early Life Stages Present	**85.9**	**93.7**	51.9
	Early Life Stages Absent	86.4	93.7	**70.4**

These limits are well above the daily maximum limit and the respective effluent ammonia P_{99} values, and there is no reasonable potential to exceed the weekly average and monthly average limits. However, monthly average limits are required due to the expression of limits requirements in NR 106.07 Wis. Adm. Code. These are discussed in Part 7 of the report.

Site Map:


WISCONSIN DEPARTMENT OF NATURAL RESOURCES
Johnson Creek Wastewater Treatment Facility
Johnson Creek WWTF
Legend:
Surface Water Outfalls
City or Village
County Boundaries
County and Local Roads
County HWY
Local Road
Latest Leaf On Imagery
Notes:
Map Location
Map projection: NAD 1983 HARN Wisconsin TM
Map: 0 440 880 Feet
0 125 250 Meters
N
Service Layer Credits:
Latest Leaf On: , Permits & Determinations: WI DNR Bureau of Watershed Management, Cities, Roads & Boundaries:
This map is a product generated by a DNR web mapping application.
Date Printed: 6/4/2025 9:09 PM

Thermal Table:

Facility:	Johnson Creek		Small warm water sport or forage f			**Temp Dates**	**Flow Dates**
Outfall(s):	001		**Dilution:**	25%	**Start:**	01/00/00	04/01/20
Date Prepared:			**f:**	0	**End:**	01/00/00	04/30/25
Design Flow (Qe):	0.401	MGD	**Stream type:**				
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	8.1	:1		
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	20.00	0.290	0.364	0			NA	120
FEB	34	50	76	20.00	0.321	0.649	0			NA	120
MAR	38	52	77	20.00	0.337	0.495	0			NA	120
APR	48	55	79	20.00	0.489	0.623	0			101	120
MAY	58	65	82	20.00	0.328	0.383	0			NA	120
JUN	66	76	84	20.00	0.397	0.496	0			NA	120
JUL	69	81	85	20.00	0.466	0.538	0			NA	120
AUG	67	81	84	20.00	0.287	0.930	0			NA	120
SEP	60	73	82	20.00	0.477	0.833	0			NA	120
OCT	50	61	80	20.00	0.266	0.327	0			NA	120
NOV	40	49	77	20.00	0.250	0.321	0			NA	120
DEC	35	49	76	20.00	0.273	0.316	0			NA	120