Permit Fact Sheet

General Information

Permit Number	WI-0025038-10-0
Permittee Name and Address	City of Oshkosh 233 N. Campbell Road Oshkosh WI 54901-1130
Permitted Facility Name and Address	Oshkosh Wastewater Treatment Plant 233 N. Campbell Road Oshkosh WI 54901-1130
Permit Term	July 01, 2025 to June 30, 2030
Discharge Location	Outfall 001: SE ¼ of the NW ¼, Section 23, T18N, R16E, City of Oshkosh, Winnebago County, State of Wisconsin, southwest shore of the Fox River, approximately 1200 feet upstream of the Wisconsin Street Bridge in Oshkosh. Outfall 003: SW ¼ of the NW ¼, Section 23, T18N, R16E, City of Oshkosh, Winnebago County, State of Wisconsin, southeast shore of Campbell Creek, approximately 1000 feet upstream of Campbell Road in Oshkosh.
Receiving Water	Upper Fox River in Fox River of Fox River (upper) in Winnebago county
Stream Flow ($Q_{7,10}$)	930 cfs
Stream Classification	Fish and aquatic life biological use (warm water sport fish community in the Great Lakes Basin), recreation and non-public water supply. To evaluate potential downstream impacts, the classification of Lake Winnebago as a public water supply is also considered.
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	20 MGD
Industrial or Commercial Contributors	12 categorical industrial and 27 other significant (non-categorical) industrial users.
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?	Yes

Facility Description

The City of Oshkosh operates an advanced secondary wastewater treatment facility (WWTF) designed for an average daily flow of 20 million gallons per day (MGD), providing regional service to the City of Oshkosh and sanitary districts in the towns of Algoma, Blackwolf and Oshkosh. The sanitary sewer collection system is separate from the storm sewer system in the Oshkosh WWTF's service area. The facility receives domestic, commercial, and industrial wastewater and the permittee administers an industrial pretreatment program that regulates the industrial contributors. The facility accepts

domestic holding tank wastes, septic tank wastes, commercial septage, and landfill leachate. Upon reaching the WWTF, wastewater is screened and then pumped to one of two identical trains for treatment. Each train consists of an aerated grit chamber, two primary clarifiers, an aeration basin (secondary biological treatment with an activated sludge system), two secondary clarifiers, and a chlorine contact basin. Dechlorination is accomplished by the addition of liquid sodium bisulfite. Phosphorous removal is accomplished by the chemical addition of ferric chloride to the raw influent line. The facility's primary effluent discharge is to the Fox River, and it has an emergency overflow which discharges to Campbell Creek during conditions of high flow in either the river or the WWTF. The facility also has the capability of diverting flow around the biological treatment process during periods of high flow to the WWTF. By-product solids (biosolids) are anaerobically digested, thickened by centrifuge, then stored off-site until land application to agricultural land or landfilled.

BLENDING- The permittee has requested blending approval to continue as part of their permit application. Based on an evaluation of their request and associated documentation, blending is conditionally approved per s. NR 210.12(2), Wis. Adm. Code.

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on April 4, 2024, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Mark Stanek on April 8, 2024.

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	11.7 MGD (January 2024-December 2024)	Influent: 24-hour flow proportional composite sample collected from the influent channel prior to the bar screens.
001	11.7 MGD (January 2024-December 2024)	Effluent: 24-hour flow proportional composite sample collected from the channel prior to the chlorine contact chamber. Chlorine residual and fecal samples shall be collected after dechlorination. The discharge reported at Outfall 001 represents the total effluent discharge from the facility. The flow rate reported at Outfall 001 is the total effluent discharge from the facility to the Fox River and Campbell Creek, and effluent characteristics reported at Outfall 001 are also representative of any discharge via Outfall 003.
002	1,725 Metric Tons (2024)	Cake Sludge: Representative samples of the anaerobically digested and centrifuge thickened cake.
003	0.39 MGD (January 2024-December 2024)	Emergency Effluent Overflow: This outfall is a fixed weir located about two feet below the top of the effluent channel wall on the outlet side of the chlorine contact basins. Under high flow conditions the WWTF loses some of its normal discharge capacity due to an increase in river elevation. This factor combined with increased flow through the chlorine contact basins can cause the effluent channel to back up and sometimes reach and overflow the weir which then discharges to Campbell Creek. Discharges to Campbell Creek through Outfall 003 may occur only when the flow rate at Outfall 001 reaches 32 MGD. The sampling location for

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
		Outfalls 001 and 003 are the same, results will be reported under the actual location discharged.
105		Field Blank: Sample point for reporting results of Mercury field blanks collected using standard sample handling procedures.
199	0.15 MGD (January 2024-December 2024)	BLENDING: Sample point for reporting diverted flow from the primary clarifiers during high flow events. Wastewater flow bypasses the aeration basins and final clarifiers and then receives disinfection prior to discharge. The permittee shall notify the Department when blending occurs. See "Blending" requirements in the Standard Requirements section of the permit.

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	2/Month	24-Hr Flow Prop Comp	
CBOD5		mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Chromium, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Lead, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Zinc, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Quarterly	24-Hr Flow Prop Comp	

1.1.1 Changes from Previous Permit:

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

2 Inplant - Monitoring and Limitations

2.1 Sample Point Number: 105- Field Blank

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Quarterly	Blank	

2.1.1 Changes from Previous Permit:

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

2.1.2 Explanation of Limits and Monitoring Requirements

Mercury Field Blank- Monitoring is included in the permit pursuant to s. NR 106.145, Wis. Adm. Code. Field blanks must meet the requirements under ss. NR 106.145(9) and (10), Wis. Adm. Code. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). Field blanks are required to verify a sample has not been contaminated during collection, transportation or analysis.

2.2 Sample Point Number: 199- Blending

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Per Occurrence	Continuous	See “Blending Flow” permit section.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Time		hours	Per Occurrence	Calculated	Report the total duration of blending within a given day (12:00am-11:59pm) in which blending occurs. See "Blending Flow" permit section.

2.2.1 Changes from Previous Permit:

- Sample point name was changed to "Blending" to reflect blending requirements.
- **Flow rate:** Sample frequency changed to "per occurrence".
- **Time:** Time parameter added to meet blending requirements.

2.2.2 Explanation of Limits and Monitoring Requirements

- **Blending Monitoring:** Section NR 205.07(1)(u), Wis. Adm. Code, requires that the department approve all blending and comply with requirements of s. NR 210.12, Wis. Adm. Code. The facility submitted a request for blending approval with supporting documentation on August 8, 2018 with permit reissuance application. The department determined the submitted documentation demonstrates that the facility complies with the general provisions to justify blending under s. NR 210.12(1) and (2), Wis. Adm. Code, and has the physical capability and necessary equipment in place to practice blending. The department approved the blending request on August 16, 2018. See the attached "Approval of Response to Supplemental Diversion Information Request" letter dated August 16, 2018.

  The department included this sampling point to constitute permitting and approval of the blending provided the blending monitoring requirements and conditions are followed. The reporting and monitoring requirements are based on s. NR 210.12(6), Wis. Adm. Code. Any blending shall be reported to the department by telephone, fax or email no later than 24 hours from the time each blending operation ceases at the sewage treatment facility. Permittees shall also report the time, duration, and volume of wastewater routed around the biological treatment process or routed through an alternative treatment process on the wastewater discharge monitoring report forms required by the permit. A bypass that is defined as a controlled diversion in s. NR 205.07(1)(v), Wis. Adm. Code, is not covered under this sample point.

3 Surface Water - Monitoring and Limitations

3.1 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	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
CBOD5	Weekly Avg	40 mg/L	5/Week	24-Hr Flow Prop Comp	
CBOD5	Monthly Avg	25 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	8,907 lbs/day	5/Week	Calculated	
Suspended Solids, Total	Monthly Avg	6,755 lbs/day	5/Week	Calculated	
Suspended Solids, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of TSS and report on the last day of the month on the DMR. See TMDL Calculations section.
Suspended Solids, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of TSS discharged and report on the last day of the month on the DMR. See TMDL Calculations section.
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Chlorine, Total Residual	Daily Max	38 ug/L	5/Week	Grab	
Chlorine, Total Residual	Weekly Avg	38 ug/L	5/Week	Grab	
Chlorine, Total Residual	Monthly Avg	38 ug/L	5/Week	Grab	
E. coli	Geometric Mean	126 #/100 ml	Weekly	Grab	Limit effective year-round.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective year-round. See the *E. coli* Percent Limit section. Enter the

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					result in the DMR on the last day of the month.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	92 mg/L	5/Week	24-Hr Flow Prop Comp	Applies January-March.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	35 mg/L	5/Week	24-Hr Flow Prop Comp	Applies during April.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg		5/Week	24-Hr Flow Prop Comp	Monitor only May-October.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	67 mg/L	5/Week	24-Hr Flow Prop Comp	Applies November-December.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	38 mg/L	5/Week	24-Hr Flow Prop Comp	Applies January-March.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	23 mg/L	5/Week	24-Hr Flow Prop Comp	Applies during April.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg		5/Week	24-Hr Flow Prop Comp	Monitor only May-October.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	39 mg/L	5/Week	24-Hr Flow Prop Comp	Applies November-December.
Phosphorus, Total	Monthly Avg	0.6 mg/L	5/Week	24-Hr Flow Prop Comp	See the MDV/Phosphorus sections and phosphorus schedules.
Phosphorus, Total	Monthly Avg	96 lbs/day	5/Week	Calculated	Limit effective 1/1/2028. Final TMDL-based mass limits go into effect per the phosphorus compliance schedule. See Phosphorus TMDL section.
Phosphorus, Total	6-Month Avg	32 lbs/day	5/Week	Calculated	Limit effective 1/1/2028. Final TMDL-based mass limits go into effect per the phosphorus compliance schedule. See Phosphorus TMDL section.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See TMDL Calculations section.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					For MDV reporting see Standard Requirements for 'Appropriate Formulas' to calculate the Total Monthly Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL Calculations section. Report the sum of the total monthly discharges (for the months that the MDV is in effect) for the calendar year on the Annual report form.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
PFOS		ng/L	Monthly	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need Section.
PFOA		ng/L	Monthly	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need Section.
Cadmium, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Chromium, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Lead, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Quarterly	Grab	Monitoring only.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	
Chronic WET	Monthly Avg	8.5 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	

3.1.1 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.
- **Phosphorus-** MDV interim limit is recommended to continue as a backstop per antibacksliding requirements in s. NR 207.12, Wis. Adm. Code. Final TMDL WLA-based effluent limits of 32 lbs/day as a six-month average and 96 lbs/day as a monthly average will go into effect in accordance with a compliance schedule.
- **Total Nitrogen Monitoring (TKN, N02+N03 and Total N)-** Quarterly monitoring was added to the proposed permit.
- **PFOS and PFOA –** Monthly monitoring is included in the permit in accordance with s. NR 106.98(2)(a), Wis. Adm. Code.
- **Mercury-** Interim limits from the mercury variance removed during the reissued permit term and replaced with required continued PMP implementation and quarterly monitoring.

3.1.3 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 December 9, 2024 and updated 3/14/2025.

- **Total Suspended Solids:** Permittee was given approval to remove daphnia from the suspended solids sample in order to provide a more accurate value of TSS. Total Suspended Solids (TSS) SOP, dated January 20, 2025, was approved by the Department on February 3, 2025.
- **Total Nitrogen Monitoring (NO2+NO3, TKN and Total N):** The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for

this monitoring to be collected during the permit term. Quarterly effluent monitoring for Total Nitrogen is included in the permit because of the potential for higher nitrogen loading resulting from higher flows (major facilities), higher concentrations, or both. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019.

- **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 major municipal dischargers, with an average flow rate greater than or equal to 5 MGD, at a minimum sample effluent on a monthly basis for PFOS and PFOA pursuant s. NR 106.98(2)(a), Wis. Adm. Code. 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.
- **Mercury:** Permittee is coming off a mercury variance and limits are not recommended during the reissued permit term. Quarterly monitoring and PMP monitoring efforts are recommended to continue during the reissued permit term to maintain effluent quality at or below current levels.

3.2 Sample Point Number: 003- Emergency Effluent Overflow

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Calculated	
CBOD5	Weekly Avg	40 mg/L	5/Week	24-Hr Flow Prop Comp	
CBOD5	Monthly Avg	25 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	8,907 lbs/day	5/Week	Calculated	
Suspended Solids, Total	Monthly Avg	6,755 lbs/day	5/Week	Calculated	
Suspended Solids, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of TSS and report on the last day of the month on the DMR. See TMDL Calculations section below.
Suspended Solids, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of TSS discharged and report on the last day of

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					the month on the DMR. See TMDL Calculations section below.
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Chlorine, Total Residual	Daily Max	38 ug/L	5/Week	Grab	
Chlorine, Total Residual	Weekly Avg	38 ug/L	5/Week	Grab	
Chlorine, Total Residual	Monthly Avg	38 ug/L	5/Week	Grab	
E. coli	Geometric Mean	126 #/100 ml	Weekly	Grab	Limit effective year-round.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective year-round. See the E. coli Percent Limit section. Enter the result in the DMR on the last day of the month.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	92 mg/L	5/Week	24-Hr Flow Prop Comp	Applies January-March.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	35 mg/L	5/Week	24-Hr Flow Prop Comp	Applies during April.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg		5/Week	24-Hr Flow Prop Comp	Monitor only May-October.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	67 mg/L	5/Week	24-Hr Flow Prop Comp	Applies November-December.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	38 mg/L	5/Week	24-Hr Flow Prop Comp	Applies January-March.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	23 mg/L	5/Week	24-Hr Flow Prop Comp	Applies during April.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg		5/Week	24-Hr Flow Prop Comp	Monitor only May-October.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	39 mg/L	5/Week	24-Hr Flow Prop Comp	Applies November-December.
Phosphorus, Total	Monthly Avg	0.6 mg/L	5/Week	24-Hr Flow Prop Comp	See the MDV/Phosphorus sections and phosphorus schedules.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total	Monthly Avg	96 lbs/day	5/Week	Calculated	Limit effective 1/1/2028. Final TMDL-based mass limits go into effect per the phosphorus compliance schedule. See Phosphorus TMDL section.
Phosphorus, Total	6-Month Avg	32 lbs/day	5/Week	Calculated	Limit effective 1/1/2028. Final TMDL-based mass limits go into effect per the phosphorus compliance schedule. See Phosphorus TMDL section.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See TMDL Calculations section. For MDV reporting see Standard Requirements for 'Appropriate Formulas' to calculate the Total Monthly Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL Calculations section. Report the sum of the total monthly discharges (for the months that the MDV is in effect) for the calendar year on the Annual report form.

3.2.1 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.

- Effluent limits were added for this emergency effluent outfall, and they are equal to the applicable limits from Outfall 001.

3.2.2 Explanation of Limits and Monitoring Requirements

Effluent limits were added to this outfall equal to the applicable limits at Outfall 001 due to the discharge occurring from a different pipe. Sampling location is the same; however, compliance needs to be tracked at each discharge location. If the emergency outfall is utilized, the sampling results will also be reported under Outfall 003. See Explanations under Outfall 001 for further explanation on individual limitations. Only standard sampling requirements with limits were added due to outfall only being used in emergency situations.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Cake	Anaerobic Digestion	Volatile Solids Reduction	Land Application and Landfill	1875
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? **Yes** 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.						

4.1 Sample Point Number: 002- Cake sludge

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	1/ 2 Months	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	1/ 2 Months	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Cadmium Dry Wt	Ceiling	85 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	High Quality	300 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	1/ 2 Months	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	1/ 2 Months	Composite	
Radium 226 Dry Wt		pCi/g	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	1/ 2 Months	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	1/ 2 Months	Composite	
Phosphorus, Total		Percent	1/ 2 Months	Composite	
Phosphorus, Water Extractable		% of Tot P	1/ 2 Months	Composite	
Potassium, Total Recoverable		Percent	1/ 2 Months	Composite	
PCB Total Dry Wt		mg/kg	Once	Composite	Once in 2026.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Calculated	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Permit Sections for more information.
Municipal Sludge Priority Pollutant Scan			Once	Composite	As specified in ch. NR 215.03 (1-4), Wis. Adm. Code

4.1.1 Changes from Previous Permit:

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

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

4.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5), Wis. Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6) 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 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 this WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9, Wis. Adm. Code.

5 Schedules

5.1 Mercury Pollutant Minimization Program

As a condition of the variance to the water quality based effluent limitation(s) for mercury granted in accordance with s. NR 106.145(6), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Mercury Report: Submit a final report documenting the success in reducing mercury concentrations in the effluent, as well as the anticipated future reduction in mercury sources and mercury effluent concentrations. The report shall summarize mercury pollutant minimization activities that have been implemented during the current permit term. The report shall include an analysis of trends in quarterly and annual	07/01/2029

total effluent mercury concentrations based on mercury sampling during the current permit term. The report shall also include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system.	

5.1.1 Explanation of Schedule

The permittee is required to continue the actions in the pollutant minimization plan to maintain effluent quality at or below current levels. This schedule requires a report once prior to permit reissuance documenting the continued measures.

5.2 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 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.	06/30/2026
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.	06/30/2027

5.2.1 Explanation of Schedule

PFOS/PFOA Minimization Plan Determination of Need- 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.

5.3 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 implementing the changes.	07/01/2026

5.3.1 Explanation of Schedule

Land Application Management Plan (municipal)- 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.

5.4 Phosphorus Payment per Pound to County

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

Required Action	Due Date
Annual Verification of Phosphorus Payment to County: The permittee shall make a total payment to the participating county or counties approved by the Department by March 1 of each calendar year. The amount due is equal to the following: [(lbs of phosphorus discharged minus the permittee's target value) times ($66.62 per pound)] or $640,000, whichever is less. See the payment calculation steps in the Surface Water section. The permittee shall submit Form 3200-151 to the Department by March 1 of each calendar year indicating total amount remitted to the participating counties to verify that the correct payment was made. The first payment verification form is due by the specified Due Date. Note: The applicable Target Value is the TMDL derived limit as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value is $50.00 adjusted for CPI.	03/31/2026
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/31/2027
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/31/2028

5.4.1 Explanation of Schedule

Subsection 283.16(6)(b), Wis. Stats., requires permittees that have received approval for the multi-discharger variance (MDV) to implement a watershed project that is designed to reduce non-point sources of phosphorus within the HUC 8 watershed in which the permittee is located. The permittee has selected the "Payment to Counties" watershed option described in s. 283.16(8), Wis. Stats. Under this option the permittee shall make annual payment(s) to participating county(s) that are calculated based on the amount of phosphorus actually discharged during a calendar year in pounds per year less the amount of phosphorus that would have been discharged had the permittee discharged phosphorus at the TMDL derived limits. The pounds of phosphorus discharged in excess of the target value is multiplied by a per pound phosphorus charge that will equal $66.62 per pound. This schedule requires the permittee to submit Form 3200-151 to the Department indicating the total amount remitted to the participating county(s).

5.5 Phosphorus Schedule - Continued Optimization

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

Required Action	Due Date
Optimization: The permittee shall continue to implement the optimization plan as previously approved to optimize performance to control phosphorus discharges. Submit a progress report on optimizing removal of phosphorus by the Due Date.	07/01/2026
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	07/01/2027
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	07/01/2028
Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	12/31/2028

5.5.1 Explanation of Schedule

Per s. 283.16(6)(a), Wis. Stats. the Department may include a requirement that the permittee optimize the performance of a point source in controlling phosphorus discharges, which may be necessary to achieve compliance with multi-discharger variance interim limits. This compliance schedule requires the permittee to continue to implement the optimization plan that was approved during the previous permit term.

Attachments

Water Quality-Based Effluent Limitations for Oshkosh Wastewater Treatment Plant WPDES Permit No. WI-0025038-10, dated December 9, 2024, prepared by Nicole Krueger, DNR Water Resources Engineer

Justification Of Any Waivers From Permit Application Requirements

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

Prepared By: Ashley Clark, Wastewater Specialist

Date: April 2, 2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 11/26/2024 – updated 03/14/2025 for typos

TO: Ashley Clark – NER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for Oshkosh Wastewater Treatment Plant
WPDES Permit No. WI-0025038-10

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from Oshkosh Wastewater Treatment Plant in Winnebago County. This municipal wastewater treatment facility (WWTF) discharges to the Fox River, located in the Lake Butte des Morts Watershed in the Upper Fox River Basin. This discharge is included in the Upper Fox and Wolf River Basin TMDL as approved by EPA in February 2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
$CBOD_5$			40 mg/L	25 mg/L		1
TSS			45 mg/L 8,907 lbs/day	30 mg/L 6,755 lbs/day		1,3
pH	9.0 s.u.	6.0 s.u.				1
Residual Chlorine	38 µg/L		**38 µg/L**	**38 µg/L**		4
Bacteria						5
Fecal Coliform				400 #/100 mL geometric mean		
E. coli				126 #/100 mL geometric mean		
Ammonia Nitrogen Nov – Dec January – March April			 67 mg/L 92 mg/L 35 mg/L	 39 mg/L 38 mg/L 23 mg/L		1,6
Phosphorus MDV Interim TMDL				 0.6 mg/L 96 lbs/day	 32 lbs/day	3,7
Mercury						8
PFOS and PFOA						9
TKN, Nitrate+Nitrite, and Total Nitrogen						10
Acute WET						11,12
Chronic WET				8.5 TUc		11,12
Metals						13

Footnotes:

1. No changes from the current permit.
2. Monitoring only.

3. The TSS and phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Upper Fox and Wolf River Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA in February 2020.
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. Bacteria limits apply year round and no compliance schedule is needed. The E. coli limit applies May – September. The E. coli limit may apply October – April, or the current fecal coliform limit may apply October – April instead. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. Monitoring only for May – October.
7. Under the phosphorus MDV, an interim limit of 0.6 mg/L should be effective upon permit reissuance. The TMDL limits shall become effective on 01/01/2028 and the concentration limit should continue.
8. Quarterly monitoring and PMP efforts are recommended to continue during the reissued permit term to maintain effluent quality at or below current levels.
9. Monthly monitoring is required in accordance with s. NR 106.98(2), Wis. Adm. Code.
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 municipal major permittees. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).
11. Annual acute and chronic WET testing is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 12%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 30%, 10%, 3% & 1% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the Fox River.
12. 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 and should continue after the permit expiration date (until the permit is reissued).
13. Continued monitoring for total recoverable cadmium, chromium, copper, lead, nickel and zinc is also required because Oshkosh operates a local pretreatment program for the many industries that discharge to the treatment facility.

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

Attachments (4) – Narrative, Outfall Map, 2011 Ammonia Limits, & Thermal Table

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

E-cc: Mark Stanek, Wastewater Engineer – NER
Heidi Schmitt Marquez, Regional Wastewater Supervisor – NER
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Oshkosh Wastewater Treatment Plant

WPDES Permit No. WI-0025038-10

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The City of Oshkosh operates an advanced secondary wastewater treatment facility (WWTF) designed for an average daily flow of 20 million gallons per day (MGD), providing regional service to the City of Oshkosh and sanitary districts in the towns of Algoma, Blackwolf and Oshkosh. The facility receives domestic, commercial, and industrial wastewater and the permittee administers an industrial pretreatment program that regulates the industrial contributors. The facility accepts domestic holding tank wastes, septic tank wastes, commercial septage, landfill leachate, and currently accepts remediation water from a gas plant. Upon reaching the WWTF, wastewater is screened and then pumped to one of two identical trains for treatment. Each train consists of an aerated grit chamber, two primary clarifiers, an aeration basin (secondary biological treatment with an activated sludge system), two secondary clarifiers, and a chlorine contact basin. Dechlorination is accomplished by the addition of liquid sodium bisulfite. Phosphorous removal is accomplished by the chemical addition of pickle liquor (ferrous chloride) to the raw influent line. The facility's primary effluent discharge is to the Fox River, and it has an emergency overflow which discharges to Campbell Creek during conditions of high flow in either the river or the WWTF. The facility also has the capability of diverting flow around the biological treatment process during periods of high flow to the WWTF. By-product solids (biosolids) are anaerobically digested, thickened by centrifuge, then stored off-site until land application to agricultural land or landfilled.

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

Existing Permit Limitations

The current permit, which expired on December 31, 2023, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
$CBOD_5$			40 mg/L	25 mg/L		2,3
TSS TMDL			45 mg/L 8,907 lbs/day	30 mg/L 6,755 lbs/day		3
pH	9.0 s.u.	6.0 s.u.				2
Residual Chlorine	38 µg/L		**38 µg/L**	**38 µg/L**		4
Fecal Coliform			**656#/100 mL** **geometric mean**	400#/100 mL geometric mean		4
Ammonia Nitrogen Nov – Dec January – March April			 67 mg/L 92 mg/L 35 mg/L	 39 mg/L 38 mg/L 23 mg/L		5
Phosphorus						6

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Interim TMDL				0.8 mg/L 95 lbs/day	 32 lbs/day	
Mercury	3.6 ng/L					7
Acute WET						8
Chronic WET				8.5 TUc		8
Metals						9

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. These concentration limits are based on s. NR 210.05, Wis. Adm. Code.
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. Monitoring only for May – October.
6. A compliance schedule is in the current permit to meet the final TMDL limits by 01/01/2025.
7. This is a variance interim limit to the monthly average WQBEL of 1.3 ng/L.
8. The IWC for chronic WET was 11.9%
9. Monitoring for total recoverable cadmium, chromium, copper, lead, nickel and zinc is also required because Oshkosh operates a local pretreatment program for the many industries that discharge to the treatment facility.

Receiving Water Information

- Name: Fox River
- Waterbody Identification Code (WBIC): 117900
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. Note: Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS for Station 04082400, from 01/06/2006, where Outfall 001 is located.
  7-Q_{10} = 930 cfs (cubic feet per second)
  7-Q_2 = 1350 cfs
  90-Q_{10} = 1190 cfs
  Harmonic Mean Flow = 2100 cfs
- Hardness = 176 mg/L as $CaCO_3$. This value represents the geometric mean of data from 09/20/2018 – 11/09/2021 from the chronic WET testing during the permit term.
- % 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 Fox River (at the De Pere Dam) is used for this evaluation. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.

- Multiple dischargers: There are several other dischargers to the Fox 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 Fox River at Oshkosh is 303(d) listed as impaired for PAHs. Lake Winnebago is 303(d) listed as impaired for mercury, total phosphorus, total suspended solids, and PCBs.

Effluent Information

- Design flow rate(s):
  Annual average = 20 MGD (Million Gallons per Day)
  Peak daily = 69 MGD
  Peak weekly = 45 MGD
  Peak monthly = 35 MGD

  For reference, the actual average flow from 07/01/2019 – 07/31/2024 was 11.5 MGD.

- Hardness = 367 mg/L as $CaCO_3$. This value represents the geometric mean of data from the permit reissuance application from 02/15/2023 – 05/02/2023.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from surface water and groundwater.
- Additives: Ferric chloride is used for phosphorus removal.
- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the "priority pollutants" except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code. The permit-required monitoring for ammonia, mercury, cadmium, chromium, copper, lead, nickel, and zinc from 07/01/2019 – 07/31/2024 is used in this evaluation.
- 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.

Permit Required Effluent Data

	Chromium µg/L		Copper µg/L
1-day P_{99}	7.27	1-day P_{99}	80.2
4-day P_{99}	3.76	4-day P_{99}	43.3
30-day P_{99}	1.67	30-day P_{99}	22.2
Mean*	0.73	Mean	13.5
Std	2.11	Std	16.8
Sample size	61	Sample size	61
Range	<0.83 - 11	Range	6.3 - 140
	Lead µg/L		Nickel µg/L
1-day P_{99}		1-day P_{99}	22.7
4-day P_{99}		4-day P_{99}	14.0
30-day P_{99}		30-day P_{99}	9.36
Mean*	<4.3	Mean*	7.23
Std		Std	4.39

Sample size	61	Sample size	61
Range		Range	<1.2 - 23
	Mercury ng/L		Zinc µg/L
1-day P_{99}	1.82	1-day P_{99}	133
4-day P_{99}	1.29	4-day P_{99}	78.3
30-day P_{99}	1.02	30-day P_{99}	50.6
Mean	0.88	Mean	38.2
Std	0.31	Std	26.1
Sample size	20	Sample size	61
Range	0.5 – 1.5	Range	1.3 - 190
	Cadmium µg/L		
1-day P_{99}			
4-day P_{99}			
30-day P_{99}			
Mean*	0.0097		
Std	0.0058		
Sample size	61		
Range	<0.098 – 0.2		

*"<" 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.
**There were less than 11 detected samples for lead and cadmium so P_{99}'s cannot be calculated.

Effluent Chloride Data

Sample Date	Chloride mg/L
02/15/2023	280
04/24/2023	210
04/29/2023	220
05/02/2023	190
Average	225

The following table presents the average concentrations and loadings at Outfall 001 from 07/01/2019 – 07/31/2024 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
$CBOD_5$	3.6 mg/L*	
TSS	7.0 mg/L*	640 lbs/day
pH field	7.0 s.u.	
Phosphorus	0.37 mg/L	35 lbs/day
Ammonia Nitrogen	0.57 mg/L*	
Mercury	0.88 ng/L	
Chlorine	<100 µg/L	

Attachment #1

	Average Measurement	Average Mass Discharged
Fecal Coliform	23.2 #/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 Oshkosh 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. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury ng/L .

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Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 744 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	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19.0		38.1	7.61	<100		
Arsenic		340		680	136	<1.1		
Cadmium	367	45.8	0.02	91.6	18.3	0.0097		
Chromium	301	4446	0.79	8892			7.27	11
Copper	367	52.9	1.51	106			80.2	**140**
Lead	356	365	0.94	729	146	<4.3		
Mercury		830	5.52	830			1.82	1.5
Nickel	268	1080		2161			22.7	23
Zinc	333	345	5.75	689			133	190
Di-n-butyl-phthalate		320		320	64.0	14		
Chloride (mg/L)		757	26.4	1514	303	225		

* 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.

* * * The limit for this substance is based on a secondary value. Acute limits are set equal to the secondary value rather than two times or using the 1-Q_{10} s. NR 106.06(3)(b)2 and s. NR 105.05(2)(f)6), Wis. Adm Code.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 232.5 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}
Chlorine		7.28		61.98	12.4	<100	
Arsenic		152		1296	259	<1.1	
Cadmium	175	3.82	0.02	32.4	6.48	0.0097	
Chromium	176	210	0.79	1781			3.76
Copper	176	16.8	1.51	132			43.3
Lead	176	48.4	0.94	405	80.9	<4.3	
Mercury		440	5.52	440			1.29
Nickel	176	84.2		717			14.0
Zinc	176	197	5.75	1637			78.3
Di-n-butyl-phthalate		74.5		633.8	127	<14	
Chloride (mg/L)		395	26.4	3164	633	225	

* 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)
RECEIVING WATER FLOW = 297.5 cfs (¼ of the 90-Q_{10}), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Mercury (ng/L)	1.3	5.52	1.3			1.02

Monthly Average Limits based on Human Threshold Criteria (HTC)
RECEIVING WATER FLOW = 525 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.	30-day P_{99}
Antimony	373		6701	1340	0.33	
Cadmium	370	0.02	6647	1329	0.0097	
Chromium (+3)	3818000	0.79	68591788			1.67
Lead	140	0.94	2499	500	<4.3	
Mercury	1.5	5.52	1.5			1.02
Nickel	43000	0.00	772511			9.36

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 525 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		239	47.8	<1.1
Chloroform	1960		35212	7042	0.25
1,4-Dichlorobenzene	163		2928	585.7	0.22

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

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

Total Residual Chlorine – Because chlorine is added as a disinfectant, effluent limitations are recommended to assure proper operation of the de-chlorination system. Section NR 210.06(2)(b), Wis. Adm. Code, states, "When chlorine is used for disinfection, the daily maximum total residual chlorine concentration of the discharge may not exceed 0.10 mg/L." Because the WQBELs are more restrictive, they are recommended instead. Specifically, **a daily maximum limit of 38 µg/L is required. The current weekly and monthly average effluent limitations of 38 µg/L are recommended to continue per ss. NR 106.07(3) and NR 205.067(7), Wis. Adm. Code.**

Mercury – The WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L.

The current permit requires quarterly monitoring of the influent and effluent for total recoverable mercury. A total of 20 effluent sampling results are available from 07/09/2019 – 04/10/2024 for total recoverable mercury. The average concentration was 0.88 ng/L, and the maximum was 1.5 ng/L. Because the 30-day P_{99} of available data (1.02 ng/L) is less than the most stringent WQBEL of 1.3 ng/L. Therefore, limits are not recommended during the reissued permit term. **Quarterly monitoring and PMP monitoring efforts are recommended to continue during the reissued permit term to maintain effluent quality at or below current levels.**

Antidegradation and Antibacksliding

Since current treatment capability and PMP/SRM measures are expected to remain in place, the removal of the daily maximum mercury variance limit will not increase the concentration, level, or loading of mercury to the Fox River. Therefore, antidegradation would not be applicable. To be consistent with antibacksliding requirements, **the current limit may be removed in accordance with s. NR 207.12(4)(b), Wis. Adm. Code.**

Copper – The data point of 140 µg/L (02/17/2021) is significantly higher than the rest of the data and likely not representative of normal conditions. Therefore, **there is not reasonable potential for copper limits and no limits are recommended.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Previous monitoring produced a PFOS result of 4.63 ng/L and a PFOA result of 6.92 ng/L. These result for PFOS is greater than one fifth of the criteria. Based on the effluent flow rate, the types of indirect dischargers contributing to the collection system, and the available PFOS/PFOA monitoring data, PFOS and PFOA monitoring is recommended at a monthly 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.
- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.
- The maximum expected effluent pH has changed

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

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

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 1855 sample results were reported from 07/02/2019 – 07/31/2024. The maximum reported value was 8.0 s.u. (Standard pH Units). The effluent pH was 7.7 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 7.5 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 7.5 s.u. Therefore, a value of 7.5 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 7.5 s.u. into the equation above yields an ATC = 20 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method
In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the the 1-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	40
1-Q_{10}	498

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

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)
The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in Attachment #3.

The previously calculated weekly and monthly average limits are shown below:

	Weekly Average mg/L	Monthly Average mg/L
November – December	67	39
January – March	92	38
April	35	23
May – October	49	22

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 07/01/2019 – 07/31/2024, with those results being compared to the calculated limits to determine the need to include ammonia limits in Oshkosh's 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
1-day P_{99}	5.98
4-day P_{99}	3.77
30-day P_{99}	1.57
Mean*	0.57
Std	1.63
Sample size	1853
Range	<0.018 – 12.49

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

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

The permit currently has weekly and monthly average 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

	Weekly Average mg/L	Monthly Average mg/L
November – December	67	39
January – March	92	38
April	35	23

Monitoring only is recommended to continue for May – October.

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 Oshkosh'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.

The current permit requires Oshkosh to disinfect year-round for protection of the public water supply at Lake Winnebago. Because the *E. coli* limits listed in NR 210.06(2)(a)1, Wis. Adm. Code, are set for protection of recreational uses and not drinking water supply, these *E. coli* limits do not necessarily need to be applied year-round. However, either *E. coli* or fecal coliform bacteria limits are needed year-round in order to ensure that there is no reduction from the current level of disinfection needed to protect the public drinking water source.

In accordance with s. NR 210.06(2)(a)2, Wis. Adm. Code, outside of the recreational season, bacteria limits may either be set equal to the previous fecal coliform limits or the listed *E. coli* limits. Therefore, the facility can select one of the two possible sets of permit limits:

- *E. coli* limits as listed above during the recreation period of May through September and a fecal coliform limit of 400 counts/100 mL as a monthly geometric mean in November through April. Any fecal coliform weekly geometric mean limit which was included in the previous permit for expression of limits purposes does not need to be included in the reissued permit.
- *E. coli* limits as listed above apply year-round.

Effluent Data
Oshkosh has monitored effluent *E. coli* from May 2016 – October 2024. A geometric mean of 126 counts/100 mL was never exceeded and had a maximum monthly geometric mean of 63 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

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 Oshkosh currently has a limit of 0.8 mg/L, which is more stringent than the TBEL 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.

TMDL Limits
Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (*April 2020) and are based on the annual phosphorus wasteload allocation (WLA) given in pounds per year. This WLA found in Appendix H of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf River Basins (UFW TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). The annual WLA is 10,384 lbs/year.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to facilities included in the Upper Fox and Wolf River Basins TMDL are given monthly average mass limits and, if the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

$$\text{TP Equivalent Effluent Concentration} = \text{WLA} \div (365\ \text{days/yr} * \text{Flow Rate} * \text{Conversion Factor})$$
$$= 10{,}384\ \text{lbs/yr} \div (365\ \text{days/yr} * 20\ \text{MGD} * 8.34)$$
$$= 0.17\ \text{mg/L}$$

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

$$\text{TP 6-Month Average Permit Limit} = \text{WLA} \div 365\ \text{days/yr} * \text{multiplier}$$
$$= (10{,}384\ \text{lbs/yr} \div 365\ \text{days/yr}) * 1.13$$
$$= 32\ \text{lbs/day}$$

$$\text{TP Monthly Average Permit Limit} = \text{TP 6-Month Average Permit Limit} * 3$$
$$= 32\ \text{lbs/day} * 3$$
$$= 96\ \text{lbs/day}$$

The multiplier used in the six-month average calculation was determined according to the implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 0.6. This is the standard deviation divided by the mean of mass data. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as 5/weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

Six-month average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to a concentration of 0.19 mg/L and 0.58 mg/L, respectively, at the facility design flow of 20 MGD.

The calculated TMDL-based limits are slightly different than the limits in the current permit due to the change in the calculated CV based on updated data since the previous evaluation. Because the TMDL-

based limits are not currently effective, antidegradation and antibacksliding requirements per ch. NR 207, Wis. Adm. Code are not applicable for the increased limit.

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

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

Effluent Data
The following table summarizes effluent total phosphorus monitoring data from 07/01/2019 – 07/31/2024.

Total Phosphorus Effluent Data

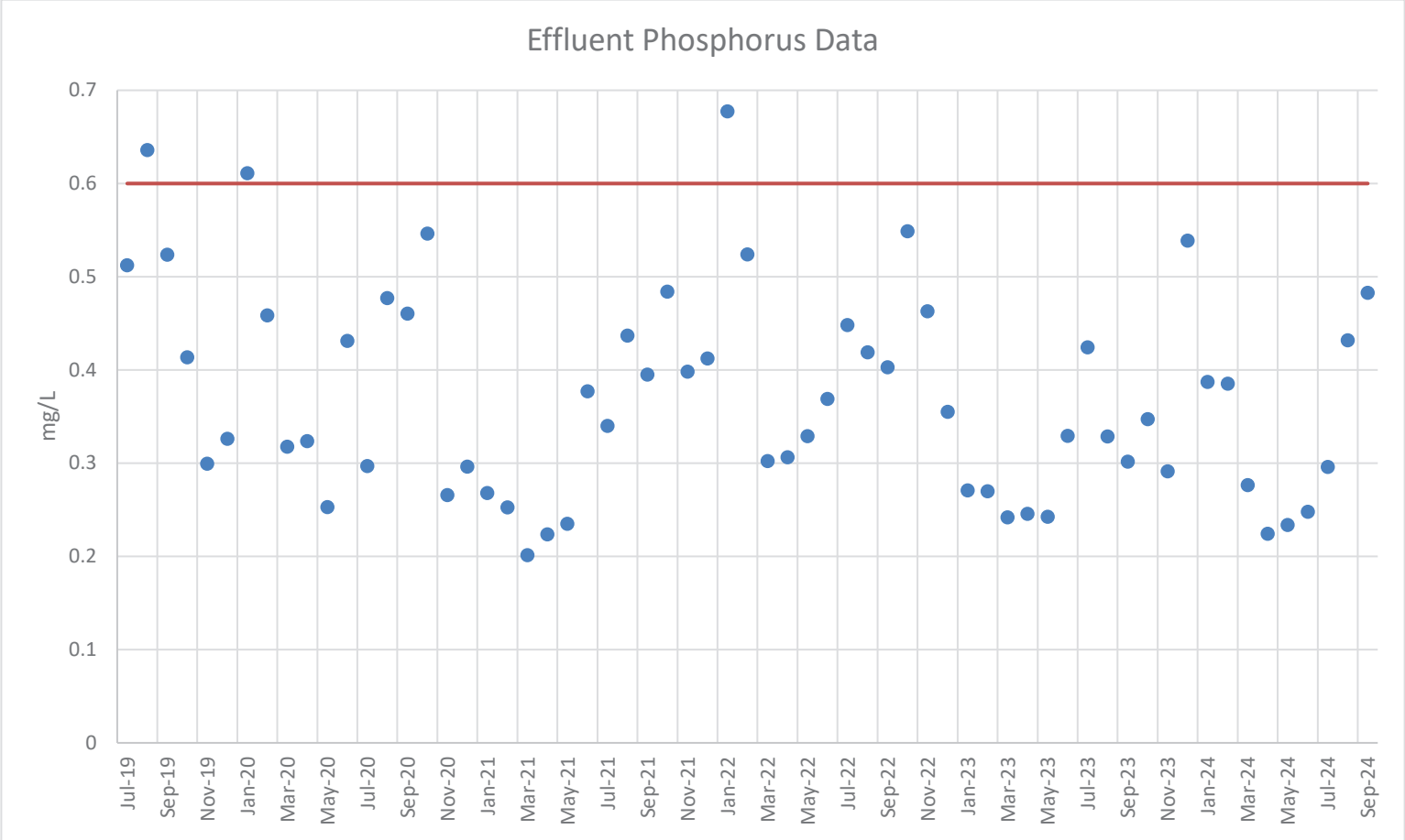
	Phosphorus mg/L	Phosphorus lbs/day
1-day P_{99}	0.92	114
4-day P_{99}	0.61	68.2
30-day P_{99}	0.45	45.2
Mean	0.37	34.7
Std	0.17	22.1
Sample size	1913	1913
Range	0.111 – 1.9	9 – 527

The data from 10/22/2020 was removed in this evaluation because it was significantly greater than the rest of the data and not representative of normal conditions.

Multi-Discharge Variance Interim Limit
With the permit application, Oshkosh has applied for the phosphorus multi-discharger variance (MDV). Conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL. Section 283.16 (6) 1, Wis. Stats. requires an interim limit of 0.8 mg/L as a monthly average for the first permit term under the MDV. However, if 0.8 mg/L does not represent the highest attainable condition, a more stringent limit should be met by the end of the permit term pursuant s. 283.16 (7), Wis. Stats. Since Oshkosh has shown the ability to treat below 0.8 mg/L, a more stringent limit is required. The recommended interim limit is 0.6 mg/L as a monthly average which can be met immediately upon reissuance.

The monthly average data compared with this recommended interim limit is shown below:

Attachment #1



Oshkosh is going through major upgrades to meet the final TMDL limits by 01/01/2028. Therefore, the TMDL limits are recommended to become effective on 01/01/2028. The MDV interim limit of **0.6 mg/L is recommended to continue as a backstop per antibacksliding requirements in s. NR 207.12, Wis. Adm. Code.**

PART 6 – TOTAL SUSPENDED SOLIDS

Total Suspended Solids (TSS) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (*April 2020). This WLAs found in Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf Basins (UFW TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). The TSS WLA for Oshkosh is 1,827,844 lbs/year. The following table summarizes Oshkosh's annual loading from the current permit term:

Annual TSS Loading

Year	TSS lbs/year
2020	231,012
2021	210,664
2022	249,997
2023	220,864

Because Oshkosh is already meeting the annual WLA of 1,827,844 lbs/year, the **current TMDL-based limits of 8,907 lbs/day as a weekly average and 6,755 lbs/day as a monthly average is recommended to continue in the reissued permit.**

Effluent Data

The following table summarizes effluent total suspended solids monitoring data from 07/01/2019 – 09/30/2024.

Total Suspended Solids Effluent Data

	TSS mg/L	TSS lbs/day
1-day P_{99}	27.0	2,735
4-day P_{99}	15.5	1,542
30-day P_{99}	9.65	923
Mean*	7.06	655
Std	5.37	549
Sample size	1650	999
Range	<2 – 95	0 – 9949

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

PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from 07/01/2019 – 09/30/2024.

The table below summarizes the maximum temperatures reported during monitoring from 07/04/2011 – 12/31/2012.

Attachment #1

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	52	53	NA	120
FEB	51	52	NA	120
MAR	55	56	NA	120
APR	56	57	96	120
MAY	62	64	111	120
JUN	69	70	NA	120
JUL	73	74	NA	120
AUG	72	73	NA	120
SEP	72	74	NA	120
OCT	67	69	NA	120
NOV	61	62	NA	120
DEC	57	58	NA	120

Reasonable Potential

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

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

Based on the available effluent data, **no effluent limits or monitoring are recommended for temperature.** The complete thermal table used for the limit calculation is attached.

PART 8 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency

and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (2022).*

- 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 **12%** 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 = 20 MGD = 31 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 930 cfs ÷ 4 = 233 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.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location 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. 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.

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?	
07/12/2005	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
11/06/2007	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
08/19/2008	>100	>100	Pass	No	>100	>100		Pass	No	1
05/07/2009	>100	>100	Pass	No	>100	>100		Pass	No	1

Attachment #1

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?	
02/09/2010	>100	>100	Pass	No	>100	>100		Pass	No	1
05/19/2011	>100	>100	Pass	Yes		>100		Pass	No	2
09/20/2011					>100			Pass	Yes	
08/21/2012	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
08/19/2014	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
05/12/2015	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
02/23/2016	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
12/12/2017	>100	>100	Pass	Yes	>100	**13.2**		Pass	Yes	
09/20/2018	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
05/07/2019	>100	>100	Pass	Yes	**96.6**	>100		Pass	Yes	
02/11/2020	>100	>100	Pass	Yes	>100	**25.2**		Pass	Yes	
11/09/2021	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
08/23/2022	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
06/13/2023	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
02/13/2024	>100	>100	Pass	Yes	**17.3**	>100		Pass	Yes	

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.
2. *Qualified or Inconclusive Data.* Data quality concerns were noted during testing which calls into question the reliability of the test results.

- 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 WET Limit Parameters

TUc (maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/13.2 = 7.6	2.6 Based on 4 detects	12%

[(TUc effluent) (B)(IWC)] = 2.17 > 1.0

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6) and representative data from 07/12/2005 – 02/13/2024.

Expression of WET limits
Chronic WET limit = [100/IWC] TU_c = 100/12= 8.5 TU_c expressed as a monthly average

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 = 12%. **0 Points**
Historical Data	15 tests used to calculate RP. No tests failed. **0 Points**	15 tests used to calculate RP. No tests failed. **0 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	Warmwater sport fish. **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	No reasonable potential for limits based on ATC; Ammonia nitrogen limit carried over from the current permit. Cadmium, copper, mercury, nickel, zinc, chloride, and ammonia detected. Additional Compounds of Concern: Di-n-butyl Phthalate **5 Points**	No reasonable potential for limits based on CTC; Ammonia nitrogen limit carried over from the current permit. Cadmium, copper, mercury, nickel, zinc, chloride, and ammonia detected. Additional Compounds of Concern: Di-n-butyl Phthalate **5 Points**
Additives	1 Biocide and 2 Water Quality Conditioners added. Permittee has proper P chemical SOPs in place: Yes **5 Points**	All additives used more than once per 4 days. **5 Points**
Discharge	27 Industrial Contributors.	Same as Acute.

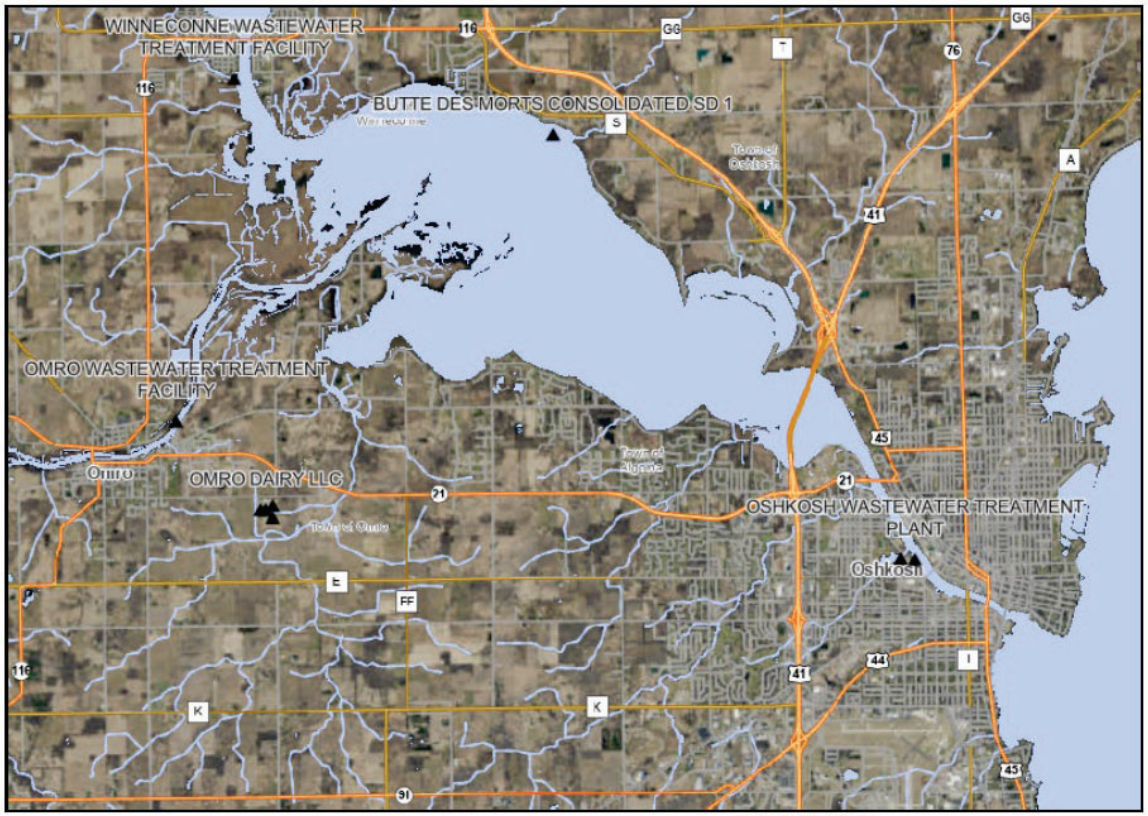
Attachment #1

	Acute	Chronic
Category	**15 Points**	**15 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:	**30 Points**	**30 Points**
Recommended Monitoring Frequency (from Checklist):	1x yearly	1x yearly
Limit Required?	No	Yes Limit = 8.5 TU_c
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, 1x yearly acute and chronic WET tests are recommended in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit shall be expressed as 8.5 TUc as a monthly average in the effluent limits table of the permit.
- A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.
- A minimum of annual acute and chronic monitoring is recommended because Oshkosh is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Oshkosh WWTP Outfall Location



Legend

Permits

Surface Water Outfalls

Basemaps

Hydro

24K Hydro (Cached) Inland

Water Resources

Rivers and Streams

Intermittent Streams

Open Water

Great Lakes water

Imagery

Latest Leaf Off Imagery

Red: Band_1

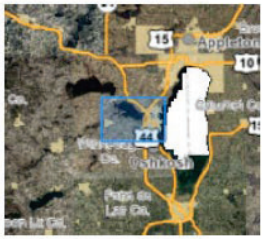
Notes

Not to scale

1:100,000

0 1.5 3 mi

Service layer credits:
WI DNR, Water Division | WI Dept. of Natural Resources, Division of Water



Date Printed: 11/05/2024

Ammonia) As part of the previous permit limit evaluation in 2011, ammonia limits were only recommended as monthly averages for some months of the year because the remaining limits exceeded the seasonal municipal permit thresholds of 20 and 40 mg/L above which ammonia limits weren't needed pursuant to s. NR 106.33(2). However, as of September 1, 2016, revisions to ch. NR 106 became effective which effectively removed the 20/40 thresholds. As a result, the monthly average limits currently in Oshkosh's permit will not change based on new language in s. NR 106.33(1)(b). As for daily maximum and weekly average limits in all twelve months and monthly average limits in May – October which are not currently limited in the permit, the need for those limits shall be based on a comparison of effluent concentrations to limits, similar to the process used for metals and other toxic substances earlier in this attachment.

Daily maximum limits are calculated based on acute toxicity criteria in ch. NR 105, which in turn are based on effluent pH since ammonia is more toxic in higher-pH waters. Since the current Oshkosh permit limits are applied over certain months, the same monthly divisions are used to evaluate effluent pH for purposes of determining daily maximum limits. The following table summarizes the effluent pH data reported during the current permit term, covering the period of July 1, 2013 through November 30, 2017 (all pH values are in standard units).

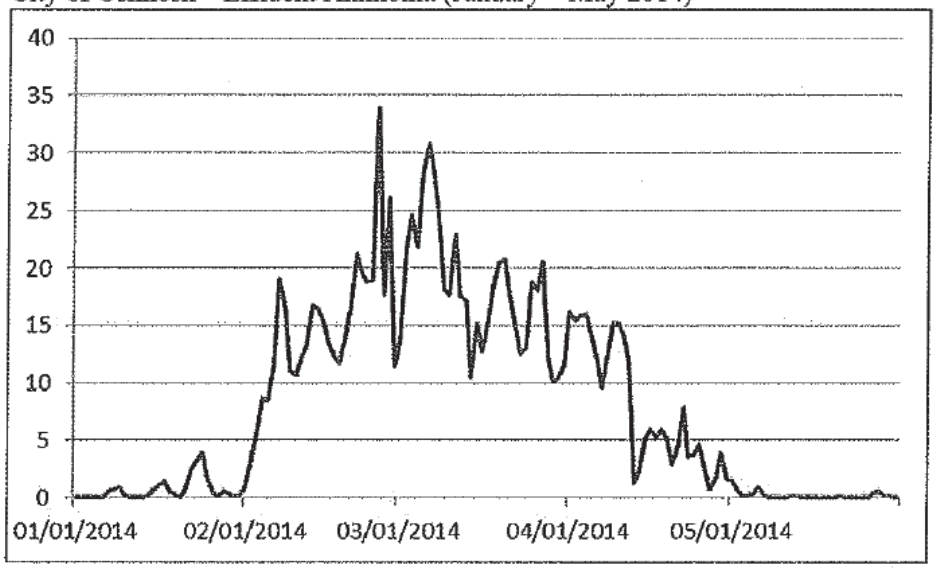
	Year-round	Jan. – March	April	May – October	Nov. – Dec.
# of Results	1614	361	120	859	274
Minimum	6.2	6.6	6.6	6.2	6.6
Maximum	8.1	8.1	7.7	7.9	7.8
99th percentile	7.8	7.4 to 7.8	7.7	7.8	7.7

The 99th percentile, which typically is the number used to calculate daily maximum ammonia limits, is based on the number of results. Year-round with 1614 results, the 16th highest value is considered to be the 99th percentile, but for April with only 120 results, the highest result is the 99th percentile. In April, the 3rd highest result was 7.8 while the 4th was 7.6; technically for 361 results the 99th percentile would be between those two. Looking at the database overall, both year-round and for the monthly divisions, the 99th percentile is around 7.7 or 7.8 s.u. At pH 7.7, the daily maximum ammonia limit is 29 mg/L while at pH 7.8 the limit is 24 mg/L. According to the effluent ammonia summary on page 3 of this attachment, the 1-day P99 is 11.20 mg/L which is well below these limits, but the maximum value is 33.92 mg/L from February of 2014.

Over a period of February through April of 2014, very high ammonia results were reported at Oshkosh compared to the remainder of the current permit term. Those results are shown in the chart below along with the preceding and following months (January and May) in order to show the increase over that period. Outside of February through April of 2014, all of the remaining ammonia results reported at Oshkosh during this permit term were below 10 mg/L and therefore well below any daily maximum effluent limits.

Attachment #3

City of Oshkosh – Effluent Ammonia (January – May 2014)



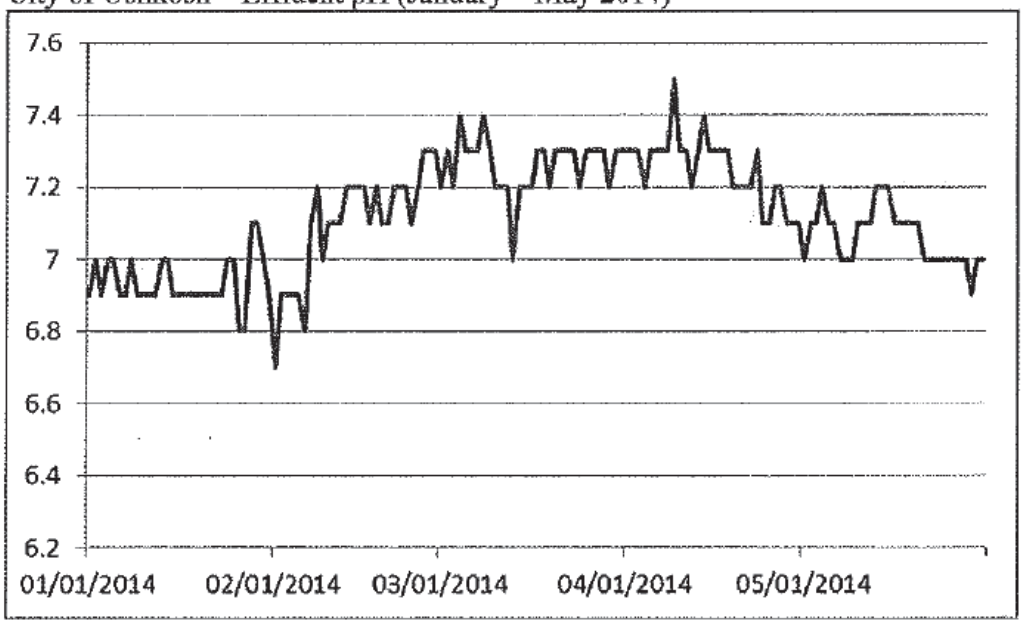
The pH values reported over the same period are summarized in the chart on the following page.

Over the months of February through April, effluent pH was consistently 7.4 or less except for one day at 7.5. At pH 7.4, the daily maximum ammonia limit is 46 mg/L while at pH 7.5 the limit is 40 mg/L. The effluent ammonia results during these months are actually below the daily-specific effluent pH-based limits. As a result, it does not appear necessary to recommend daily maximum ammonia limits for the reissued WPDES permit during any month of the year. Because of the monthly average limits already in the permit for January through April, monitoring shall be on-going which means future effluent results can be tracked to determine if daily maximum limits are needed in the future.

It is also noted that there are 4-day chronic toxicity criteria for ammonia in ch. NR 105 which can be used to calculate weekly average limits as well. Because of the relatively large amount of dilution in the Fox River, the calculated weekly average limits are well in excess of any of the daily maximum limits mentioned above. Since the 4-day P99 values are less than the 1-day P99s, weekly average limits are also not needed in the reissued permit.

(discussion continues following the effluent pH chart)

City of Oshkosh – Effluent pH (January – May 2014)



Next, it is noted that the permit contains no monthly average limit for the months of May through October. As noted earlier, this is essentially because the calculated limit was above the old seasonal threshold of 20 mg/L and therefore was not required in permits under the previous version of s. NR 106.33(2). Given that all results for ammona outside of February through April of 2014 are below 10 mg/L, this means monthly average limits in May through October are still not needed in the reissued permit even without the 20 mg/L threshold.

The summary of the above discussion is that **no changes in the permit limits for ammonia from the expiring permit are required at this time**. However, later in this attachment is a discussion of the need for weekly and monthly limits in municipal permits resulting from 40 CFR 122.45(d). This language was built into the new version of s. NR 106.33(2) which was part of the rule changes that became effective on September 1, 2016. In order to determine what weekly average limits are needed based on that rule revision, it is necessary to present the actual effluent limitations calculated for the months addressed in Oshkosh's current permit, essentially summarizing the basis for the above recommendations. These limits are based on the 20 MGD effluent annual average design flow, seasonal background temperatures for large warmwater streams (such as the Fox River) from Table 2 of ch. NR 102, seasonal background pH values fo rthe Fox River at Oshkosh, and for daily maximum limits the effluent pH values discussed earlier. The actual permit recommendations (if any) are discussed later in this attachment in the section dealing with 40 CFR 122.45(d).

Calculated Ammonia Limits at Oshkosh:

Daily Maximum)

January – March = 24 mg/L in January at pH 7.8, 40 mg/L in February and March based on pH 7.5

April = 40 mg/L based on pH 7.5

May – October = 24 mg/L based on pH 7.8

November – December = 24 mg/L based on pH 7.8

Weekly Average)

January – March = 107 mg/L (same limit for all three months)

April = 35 mg/L

May – October = 49 mg/L, lowest limit is in the month of July

November – December = 67 mg/L (same limit for both months)

Monthly Average)

January – March = 38 mg/L in current permit

April = 23 mg/L in current permit

May – October = 22 mg/L, lowest limit is in the month of July

November – December = 39 mg/L in current permit

Attachment #4

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Oshkosh WWTP	**7-Q_{10}:**	930	cfs			
Outfall(s):	001	**Dilution:**	25%		**Start:**	07/04/11	07/01/19
Date Prepared:	11/6/2024	**f:**	0		**End:**	12/31/12	07/31/24
Design Flow (Qe):	20 MGD	**Stream type:**	Small warm water sport or forage fis				
Storm Sewer Dist.	0 ft	**Qs:Qe ratio:**	7.5	: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	930	14.1	15.9	0	52	53	NA	120
FEB	34	50	76	930	13.4	25.9	0	51	52	NA	120
MAR	38	52	77	930	22.9	41.8	0	55	56	NA	120
APR	48	55	79	930	25.5	34.3	0	56	57	96	120
MAY	58	65	82	930	22.6	35.8	0	62	64	111	120
JUN	66	76	84	930	27.2	44.3	0	69	70	NA	120
JUL	69	81	85	930	27.6	46.4	0	73	74	NA	120
AUG	67	81	84	930	25.4	39.6	0	72	73	NA	120
SEP	60	73	82	930	15.4	25.6	0	72	74	NA	120
OCT	50	61	80	930	24.3	46.0	0	67	69	NA	120
NOV	40	49	77	930	15.3	23.3	0	61	62	NA	120
DEC	35	49	76	930	16.1	20.0	0	57	58	NA	120