

# Public Noticed Augusta Draft Permit Fact Sheet

## General Information

Permit Number:	WI-0023272-10-0	
Permittee Name:	City of Augusta	
Address:	145 W Lincoln PO Box 475	
City/State/Zip:	Augusta WI 54722	
Discharge Location:	800 STH 27 N Side Bridge Creek, Augusta, WI 54722	
Receiving Water:	Bridge Creek, in the Lower Eau Claire Watershed of the Lower Chippewa River Basin located in Eau Claire County	
StreamFlow (Q <sub>7,10</sub> ):	2.2 cfs	
Stream Classification:	Cold Water (Trout II), Non-public Water Supply	
Discharge Type:	Continuous, existing	
Design Flow(s)	Daily Maximum	0.533 MGD
	Weekly Maximum	0.434 MGD
	Monthly Maximum	0.405 MGD
	Annual Average	0.212 MGD
Significant Industrial Loading?	No	
Operator at Proper Grade?	Yes	
Approved Pretreatment Program?	N/A	

## Facility Description

The City of Augusta owns and operates an Enhanced Biological Nutrient Removal (EBNR) wastewater treatment facility that treats domestic wastewater from the City of Augusta. The facility consists of primary screening, preanoxic/anaerobic treatment tank, anoxic/aeration tanks, supplemental chemical feed, final clarification, ultraviolet disinfection, and a sludge storage tank. Biological treatment is the principal method of phosphorus removal with the option provided for additional removal with chemical (alum). Ultraviolet light treatment is used for seasonal disinfection prior to discharge. The annual average design flow of the facility is 0.212 MGD, with an actual average flow in 2022 of 0.181 MGD. Sludge generated in treatment and clarification is stored in a glass-fused-to-steel tank and land applied on Department approved sites. No upcoming operational changes are proposed. The City of Augusta has submitted a request for consideration of dissipative cooling, referencing a previous dissipative cooling study and a statement that there have been not substantial changes to the facility. Based on this information, the department has found that it is not necessary to include temperature limits in the reissued permit. However, temperature monitoring is required per the requirements of s. NR 106.59(7), Wis. Adm.

Code. Proposed monitoring and/or limit changes for this permit issuance include the following: 1) the addition of annual effluent monitoring for total nitrogen, nitrite + nitrate nitrogen and TKN, 2) ammonia nitrogen monitoring frequency has increased to 3/Week to better align with the standard for similar facilities with limits, 3) seasonal fecal coliform limits have been replaced with E. coli limits, 4) copper and zinc monitoring, 5) addition of Chronic WET testing, and 6) phosphorus limit has changed from only a single monthly average limit to compliance with an approved water quality plan that includes other phosphorus mass reporting requirements that are consistent with tracking compliance with the water quality trading plan. In addition, a new receiving water sample point (601) with total recoverable and dissolved copper and total suspended solids sampling has been added to further support the dissolved-based copper compliance calculations for the next permit term. PFAS sludge sampling has also been included pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code to quantitate risk.

## Substantial Compliance Determination

**Enforcement During Last Permit:** While there were no enforcement actions this permit term, Augusta WWTF (Augusta) had some missing data, exceedances, and late report issues that have been addressed.

After a desk top review of all discharge monitoring reports, land app reports, compliance schedule, and a compliance inspection on October 5, 2023, this facility has been found to be in substantial compliance with their current permit.

Compliance determination entered by Adebowale Adesanwo on 10/05/2023.

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)
701	0.240 MGD (Jan-Nov 2023)	Representative influent samples shall be collected from the flume following the fine screen.
001	0.245 MGD (Jan-Nov 2023)	Representative composite effluent samples shall be collected after UV disinfection. Grab samples shall be collected after the post aeration tank.
002	50 tons generated	Representative sludge samples shall be collected from the sludge storage tank prior to landspreading and monitored for Lists 1, 2, 3, 4, and PFAS parameters, and once in 2025 for PCBs.
601	NEW – receiving water	Representative samples shall be taken from Bridge Creek downstream of the WWTF discharge, after complete mixing with the receiving water.

## 1 Influent – Monitoring Requirements

### Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

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

### Changes from Previous Permit:

None

### Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit. Influent monitoring requirements are in accordance with NR 206.09(2), Wis. Adm. Code.

## 2 Surface Water - Monitoring and Limitations

### Sample Point Number: 001- AFTER FINAL CLARIFIER

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies May-Oct annually.
BOD5, Total	Weekly Avg	29 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies May-Oct annually.
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies Nov-Apr annually.
BOD5, Total	Weekly Avg	36 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies Nov-Apr annually.
BOD5, Total	Weekly Avg	51 lbs/day	3/Week	Calculated	Limit applies May-Oct annually.
BOD5, Total	Weekly Avg	64 lbs/day	3/Week	Calculated	Limit applies Nov-Apr annually.
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies May-Oct annually.
Suspended Solids, Total	Weekly Avg	29 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies May-Oct annually.

<b>Monitoring Requirements and Limitations</b>					
<b>Parameter</b>	<b>Limit Type</b>	<b>Limit and Units</b>	<b>Sample Frequency</b>	<b>Sample Type</b>	<b>Notes</b>
Suspended Solids, Total	Weekly Avg	36 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies Nov-Apr annually.
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies Nov-Apr annually.
Suspended Solids, Total	Weekly Avg	51 lbs/day	3/Week	Calculated	Limit applies May-Oct annually.
Suspended Solids, Total	Weekly Avg	64 lbs/day	3/Week	Calculated	Limit applies Nov-Apr annually.
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Dissolved Oxygen	Daily Min	7.0 mg/L	3/Week	Grab	
Temperature		deg F	3/Week	Multiple Grab	Monitoring in 2028 only.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	14 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies Oct - Apr annually.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	28 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies Oct - Apr annually.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit and monitoring apply May - Sept annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit and monitoring apply May - Sept annually. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Monitoring in 2027 only.
Hardness, Total as CaCO3		mg/L	Monthly	24-Hr Flow Prop Comp	Sample concurrently with Copper and WET tests.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section below.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section below.

<b>Monitoring Requirements and Limitations</b>					
<b>Parameter</b>	<b>Limit Type</b>	<b>Limit and Units</b>	<b>Sample Frequency</b>	<b>Sample Type</b>	<b>Notes</b>
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section below. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET section below.
Phosphorus, Total	Monthly Avg	0.35 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective throughout the permit term, as it represents a minimum control level.
Phosphorus, Total		lbs/day	3/Week	Calculated	Report daily mass discharged using Equation 1a. in the 'Water Quality Trading (WQT)' section.
WQT Credits Used (TP)		lbs/month	Monthly	Calculated	Report WQT TP Credits used per month using Equation 2c. in the 'Water Quality Trading (WQT)' section. Available TP Credits are specified in the approved Water Quality Trading Plan.
WQT Computed Compliance (TP)	6-Month Avg	0.075 mg/L	Monthly	Calculated	Value entered on the last day of the month. Value entered at the end of the six-month period (June 30 and December 31).
WQT Computed Compliance (TP)	Monthly Avg	0.225 mg/L	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 4a. in the 'Water Quality Trading (WQT)' section. Value entered on the last day of the month.
WQT Computed Compliance (TP)	6-Month Avg	0.13 lbs/day	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 4b. in the 'Water Quality Trading

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					(WQT)' section. Value entered at the end of the six-month period (June 30 and December 31).
WQT Credits Used (TP)	Annual Total	211 lbs/yr	Annual	Calculated	The sum of total monthly credits used may not exceed Table 2 values listed in the permit.

### Changes from Previous Permit

Changes include 1) the addition of annual effluent monitoring for total nitrogen, nitrite + nitrate nitrogen and TKN, 2) ammonia nitrogen monitoring frequency has increased to 3/Week to better align with the standard for similar facilities with limits 3) seasonal fecal coliform limits have been replaced with E. coli limits, 4) copper and zinc monitoring, 5) addition of Chronic WET testing, and 6) phosphorus limit has changed from only a single monthly average limit to compliance with an approved water quality plan that includes other phosphorus mass reporting requirements that are consistent with tracking compliance with the water quality trading plan.

### Explanation of Limits and Monitoring Requirements

**MUNICIPAL EFFLUENT LIMITS** – In accordance with the federal regulation 40 CFR 122.45(d), and to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable.

The effluent monitoring frequency for all parameters were considered. Monitoring frequencies are based on the size and type of the facility and are established to best characterize effluent quality and variability, to detect events of noncompliance, and to ensure fairness and consistency in permits issued across the state. Requirements in administrative code (NR 108, 205, 210 and 214 Wis. Adm. Code) and Section 283.55, Wis. Stats. were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. For more information see the March 22, 2021 version of the Bureau of Water Quality Program Guidance Document “Monitoring Frequencies for Individual Wastewater Permits”. The department has determined at this time that ammonia nitrogen monitoring frequency increase to 3/Week to better align with the standard for similar facilities with limits.

Limits were determined for this existing discharge using chs. NR 102, 105, 106, 205, 210 and 217 of the Wisconsin Administrative Code (where applicable). For additional information on any of the limits see the December 8, 2023 memo from Ben Hartenbower to Angela Parkhurst titled “Water Quality-Based Effluent Limitations for the Augusta Wastewater Treatment Facility WPDES Permit No. WI-0023272”.

**BOD, TSS and pH:** Monitoring and limits for BOD, TSS and pH correspond to the requirements in the current permit since the facility has not increased the capacity of the wastewater treatment system since the last permit issuance, nor are increases expected during the term of the proposed permit.

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

Therefore ammonia nitrogen limitations for the winter months of October-April continue to be required. No mass limitations are required in accordance with s. NR 106.32(5), Wis. Adm Code. In addition, ammonia nitrogen monitoring frequency has increased to 3/Week to better align with the standard for similar facilities with limits.

**E. Coli:** Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for E. coli while facilities are disinfecting during the recreation period, and establish effluent limitations for E. coli established in s. NR 210.06 (2), Wis. Adm Code. The administrative code rule changes included the following actions: revised the bacteria water quality criteria from fecal coliform to E. coli to protect recreation in ch. NR 102, Wis. Adm. Code.; removed fecal coliform criteria for certain individual waters from ch. NR 104, Wis. Adm. Code.; revised permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code.; and, updated approved analytical methods for bacteria in ch. NR 219, Wis. Adm. Code.

**Phosphorus:** Phosphorus requirements are based on the Phosphorus Rules that became effective December 1, 2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. Currently in NR 217 Wis. Adm. Code there are two methods used to determine if a phosphorus limit is needed: a technology based effluent limit (TBEL) and a water quality based effluent limit (WQBEL). Based on the size and classification of the stream, the water quality criteria for Bridge Creek is 0.075 mg/L. In this case, the WQBEL is 0.225 mg/L (monthly average), 0.075 mg/L & 0.13 lbs/day (6-month average). For the reasons explained in the April 30, 2012 paper entitled 'Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin', WDNR has determined that it is impracticable to express the phosphorus WQBEL for the permittee as a maximum daily, weekly or monthly value. The final effluent limit for phosphorus is expressed as a six-month average. It is also expressed as a monthly average equal to three times the derived WQBEL (which equates to 0.3 mg/L). This final effluent limit was derived from and complies with the applicable water quality criterion. A phosphorus concentration limit is necessary to prevent backsliding during the term of the permit. The limit of 0.35 mg/L will be retained in the permit as a minimum control limit to prevent antibacksliding and antidegradation requirements of ch. NR 207 Wis. Adm. Code.

The wastewater treatment facility is not able to meet the WQBEL. This permit authorizes the use of trading as a tool to demonstrate compliance with the phosphorus WQBELs. This permit includes terms and conditions related to the Water Quality Trading Plan (WQT-2021-0006) or approved amendments thereof. The total 'WQT TP Credits' available are designated in the approved WQT Plan. The City is implementing a variety of management practices including streambank stabilization and buffer projects. The WQT Plan proposes the generation of 211 lbs/yr of phosphorus credits for the next five years.

Additional WQT subsections in the permit provide information on compliance determinations, annual reporting and re-opening of the permit.

**Total Nitrogen Monitoring (NO<sub>2</sub>+NO<sub>3</sub>, TKN and Total N):** The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019. Monitoring for total nitrogen, nitrite + nitrate nitrogen and TKN is required annually in specific quarters to obtain seasonal variation.

**Disinfection/E. Coli/Fecal Coliform:** Fecal coliform monitoring and limits have been replaced with *Escherichia coli* (*E. coli*) monitoring and limits. Revisions to bacteria surface water quality criteria to protect recreational uses and

accompanying *E. coli* WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for *E. coli* while facilities are disinfecting during the recreation period and establish effluent limitations for *E. coli* established in s. NR 210.06 (2), Wis. Adm. Code. The administrative code rule changes included the following actions: revised the bacteria water quality criteria from fecal coliform to *E. coli* to protect recreation in ch. NR 102, Wis. Adm. Code.; removed fecal coliform criteria for certain individual waters from ch. NR 104, Wis. Adm. Code.; revised permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code.; and, updated approved analytical methods for bacteria in ch. NR 219, Wis. Adm. Code.

**Copper:** If the dissolved based effluent limit calculations are requested in accordance with the procedures in s. NR 106.06(7)(b), Wis. Adm. Code, monitoring conditions in s. NR 106.06(7)(c), Wis. Adm. Code may be included in lieu of weekly copper limits. The permittee requested this approach, which resulted in the weekly average copper limit of 14.9 µg/L. The 4-day P<sub>99</sub> concentration of 11.9 µg/L is below this calculated limit, therefore limits would not be required using the dissolved-based copper calculations. By using this approach, additional sampling is required which includes receiving water sampling, and is included in the permit.

The permittee will collect on-site information at a new receiving water sampling point in Bridge Creek (601) to support either the estimated dissolved-based criteria or some alternate criteria. The following monitoring is required for copper at or near the Augusta Wastewater Treatment Facility outfall:

- At least two rounds of monitoring of total suspended solids and both total recoverable and filterable copper in the receiving water would be needed. This information would be used to further verify a site-specific translator for each metal. The monitoring (grab sampling) should take place at a point downstream that is representative of mixed receiving water and effluent, where chemical equilibrium has been reached.

**Zinc:** Using effluent data from the current permit term, the effluent concentrations are below the calculated WQBELs for copper and therefore no effluent limits are needed. To ensure that representative sample results are available at the next permit issuance, monthly copper monitoring continues in 2027.

**Whole Effluent Toxicity (WET):** Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised August 2016. (See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at <http://dnr.wi.gov/topic/wastewater/wet.html>). Using this guidance, 3 Chronic WET tests are required.

**PFOS and PFOA:** NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

**Mercury:** The permit application did not require monitoring for mercury because the Augusta Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3., Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5). A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 2019 to 2022 was 0.68 mg/kg, with a maximum reported concentration of 0.90 mg/kg. Therefore, no mercury monitoring is required.



**Chloride:** Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter VII of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride. The mean effluent concentration of chloride samples submitted with the permit application is below the acute and chronic WQBELs for chloride, therefore, no effluent limits or monitoring is required.

**Thermal:** Requirements for Temperature are included in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature. Thermal discharges must meet the Public Health criterion of 120° F and the Fish & Aquatic Life criteria which are established to protect aquatic communities from lethal and sub-lethal thermal effects.

The City of Augusta has submitted a request for consideration of dissipative cooling, referencing a previous dissipative cooling study and a statement that there have been not substantial changes to the facility. Based on this information, the department has found that it is not necessary to include temperature limits in the reissued permit. However, temperature monitoring is required per the requirements of s. NR 106.59(7), Wis. Adm. Code.

Dissipative cooling requests must be re-evaluated every permit reissuance. The permittee is responsible for submitting an updated DC request prior to permit reissuance. Such a request must either include:

- a) A statement by the permittee that there have been no substantial changes in operation of, or thermal loadings to, the treatment facility and the receiving water; or
- b) New information demonstrating DC to supplement the information used in the previous DC determination. If significant changes in operation or thermal loads have occurred, additional DC data must be submitted to the Department.

**Sample Point Number: 601- Bridge Creek**

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Suspended Solids, Total		mg/L	See Listed Qtr(s)	Grab	Sampling required once in April-June 2025, and again in July-Sept 2027.
Copper, Total Recoverable		ug/L	See Listed Qtr(s)	Grab	Sampling required once in April-June 2025, and again in July-Sept 2027.
Copper Dissolved		ug/L	See Listed Qtr(s)	Grab	Sampling required once in April-June 2025, and again in July-Sept 2027.

**Changes from Previous Permit**

A new receiving water sample point (601) with total recoverable and dissolved copper and total suspended solids sampling has been added to further support the dissolved-based copper compliance calculations for the next permit term.

**Explanation of Limits and Monitoring Requirements**

**Water Quality Based Limits and WET Requirements and Disinfection (if applicable)**

Limits were determined for this existing discharge using chs. NR 102, 105, 106, 205, 210 and 217 of the Wisconsin Administrative Code (where applicable). For additional information on any of the limits see the December 8, 2023 memo from Ben Hartenbower to Angela Parkhurst titled “Water Quality-Based Effluent Limitations for the Augusta Wastewater Treatment Facility WPDES Permit No. WI-0023272”.

**Copper:**

Using the dissolved-based approach for copper limits, the weekly average copper limit would be 14.9 µg/L. The 4-day P<sub>99</sub> concentration of 11.9 µg/L is below this calculated limit, therefore limits would not be required if the permittee requests dissolved-based copper limits. The permittee requested this approach, which also includes receiving water sampling, and is included in the permit.

The permittee will collect on-site information at a receiving water sampling point in Bridge Creek (601) to support either the estimated dissolved-based criteria or some alternate criteria. The following monitoring is required for copper at or near the Augusta Wastewater Treatment Facility outfall:

- At least two rounds of monitoring of total suspended solids and both total recoverable and filterable copper in the receiving water would be needed. This information would be used to further verify a site-specific translator for each metal. The monitoring (grab sampling) should take place at a point downstream that is representative of mixed receiving water and effluent, where chemical equilibrium has been reached.

### 3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Liquid	Aerobic Digestion	Injection	Landsread	50
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No, they have enough storage (430,000 gallons) for 180 days.						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No.						
Is a priority pollutant scan required? No since the facility has a design flow less than 5 MGD.						

### Sample Point Number: 002- LIQUID SLUDGE TANK

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

<b>Monitoring Requirements and Limitations</b>					
<b>Parameter</b>	<b>Limit Type</b>	<b>Limit and Units</b>	<b>Sample Frequency</b>	<b>Sample Type</b>	<b>Notes</b>
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH <sub>4</sub> -N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Sample once in 2025
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Sample once in 2025
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Permit Sections for more information.

### Changes from Previous Permit:

PFAS sludge sampling has been included pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code to quantitate risk.

### Explanation of Limits and Monitoring Requirements

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

**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” which for this facility includes annual monitoring.

**Water Extractable Phosphorus-** Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that “tie-up” phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin’s nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

## 4 Schedules

### 4.1 Annual Water Quality Trading (WQT) Report

Required Action	Due Date
<p><b>Annual WQT Report:</b> Submit an annual WQT report that shall cover the first year of the permit term. The WQT Report shall include:</p> <p>The number of pollutant reduction credits (lbs/month) used each month of the previous year to demonstrate compliance;</p> <p>The source of each month’s pollutant reduction credits by identifying the approved water quality trading plan that details the source;</p> <p>A summary of the annual inspection of each nonpoint source management practice that generated any of the pollutant reduction credits used during the previous year; and</p>	01/31/2025

Identification of noncompliance or failure to implement any terms or conditions of this permit with respect to water quality trading that have not been reported in discharge monitoring reports.	
<b>Annual WQT Report #2:</b> Submit an annual WQT report that shall cover the previous year.	01/31/2026
<b>Annual WQT Report #3:</b> Submit an annual WQT report that shall cover the previous year.	01/31/2027
<b>Annual WQT Report #4:</b> Submit an annual WQT report that shall cover the previous year.	01/31/2028
<b>Annual WQT Report #5:</b> Submit the 5th annual WQT report. If the permittee wishes to continue to comply with phosphorus limits through WQT in subsequent permit terms, the permittee shall submit a revised WQT plan including a demonstration of credit need, compliance record of the existing WQT, and any additional practices needed to maintain compliance over time.	01/31/2029
<b>Annual WQT Report Required After Permit Expiration:</b> In the event that this permit is not reissued by the expiration date, the permittee shall continue to submit annual WQT reports by January 31 each year covering the total number of pollutant credits used, the source of the pollution reduction credits, a summary of annual inspection reports performed, and identification of noncompliance or failure to implement any terms or conditions of the approved water quality trading plan for the previous calendar year.	

## Explanation of Schedules

**Annual Water Quality Trading (WQT) Reports** - Reports are required that include the following information:

- Verification that site inspections occurred;
- Brief summary of site inspection findings;
- Identification of noncompliance or failure to implement any terms or conditions of the permit or trading plan that have not been reported in discharge monitoring reports;
- Any applicable notices of termination or management practice registration; and
- A summary of credits used each month over the calendar year

## Special Reporting Requirements

None

## Fact Check Comments:

The effluent minimal control level limit for phosphorus was clarified in the fact sheet, the sludge sample point description was updated in both the fact sheet and permit based on new information, and a few grammatical errors were corrected.

## Attachments:

Water Quality Based Effluent Limits - December 8, 2023 memo from Ben Hartenbower to Angela Parkhurst titled “Water Quality-Based Effluent Limitations for the Augusta Wastewater Treatment Facility WPDES Permit No. WI-0023272”.

Public Notice in: Augusta Area Times, PO Box E, Augusta, WI 54722

## Expiration Date:

March 31, 2029

## **Justification Of Any Waivers From Permit Application Requirements**

None

**Prepared By: Angela Parkhurst      Wastewater Specialist      Date: January 24, 2023**

**Notice of reissuance will be published in the Augusta Area Times, PO Box E, Augusta, WI 54722.**

# CORRESPONDENCE/MEMORANDUM

DATE: December 8, 2023

TO: Angela Parkhurst– WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for the Augusta Wastewater Treatment Facility  
WPDES Permit No. WI-0023272

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Augusta Wastewater Treatment Facility in Eau Claire County. This municipal wastewater treatment facility (WWTF) discharges to Bridge Creek, located in the Lower Eau Claire Watershed in the Lower Chippewa River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD <sub>5</sub> May-October			29 mg/L, 51 lbs/day	20 mg/L		1
November-April			36 mg/L, 64 lbs/day	30 mg/L		
TSS May-October			29 mg/L, 51 lbs/day	20 mg/L		1
November-April			36 mg/L, 64 lbs/day	30 mg/L		
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		7.0 mg/L				1
Ammonia Nitrogen October - April			28 mg/L	14 mg/L		
Bacteria <i>E. coli</i>				126#/100 mL geometric mean		3
Copper			8.0 µg/L, 0.014 lbs/day	<b>8.0 µg/L</b>		4,5,6
Zinc						7
Temperature						1,2
Phosphorus MCL WQT Computed (TP)				0.350 mg/L 0.225 mg/L	0.075 mg/L, 0.13 lbs/day	8
TKN, Nitrate+Nitrite, and Total Nitrogen						9
Chronic WET						10,11

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. Bacteria limits apply during the disinfection season of May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
4. If the dissolved based effluent limit calculations are requested in accordance with the procedures in s. NR 106.06(7)(b), Wis. Adm. Code, monitoring conditions in s. NR 106.06(7)(c), Wis. Adm. Code may be included in lieu of weekly copper limits.
4. An alternative wet weather limit of 0.021 lbs/day would also be needed in the permit.
5. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
6. If the dissolved based effluent limit calculations are requested in accordance with the procedures in s. NR 106.06(7)(b), Wis. Adm. Code, monitoring conditions in s. NR 106.06(7)(c), Wis. Adm. Code may be included in lieu of weekly and monthly copper limits.
7. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
8. WQT computed compliance limits also require corresponding Minimum Control Levels (MCL) that are to be met at the discharge.
9. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO<sub>3</sub>), nitrite (NO<sub>2</sub>), and total kjeldahl nitrogen (TKN) (all expressed as N).
10. Three chronic WET tests are recommended in the reissued permit. 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).
11. The Instream Waste Concentration (IWC) to assess chronic test results is 37%. 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%, 75%, 50%, 25% & 12.5% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from Bridge Creek.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Benjamin Hartenbower at (715) 225-4705 or Benjamin.Hartenbower@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Thermal Table, & Map

PREPARED BY: \_\_\_\_\_ Date: \_\_\_\_\_  
Benjamin Hartenbower, PE,  
Water Resources Engineer

E-cc: Adebowale Adesanwo, Wastewater Engineer – WCR/Eau Claire  
Geisa Thielen, Regional Wastewater Supervisor – WCR/Eau Claire  
Diane Figiel, Water Resources Engineer – WY/3  
Chris Willger, Water Quality Biologist – WCR/Eau Claire  
Kari Fleming, Permit Section Chief – WY/3  
Michael Polkinghorn, Water Resources Engineer – NOR/Rhineland  
Nate Willis, Wastewater Engineer – WY/3



Attachment #1  
**Water Quality-Based Effluent Limitations for  
the Augusta Wastewater Treatment Facility  
WPDES Permit No. WI-0023272**

Prepared by: Benjamin P. Hartenbower

**PART 1 – BACKGROUND INFORMATION**

**Facility Description:**

The Augusta Wastewater Treatment Facility consists of an Enhanced Biological Nutrient Removal (EBNR) system with aluminum sulfate chemical polishing and Ultraviolet (UV) disinfection. Outfall 001 is located at the north side of Bridge Creek approximately 600 ft. downstream of the STH 27 bridge.

Attachment #3 is a map of the area showing the approximate location of Outfall 001.

**Existing Permit Limitations**

The current permit, expiring 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
BOD <sub>5</sub> May-October			29 mg/L, 51 lbs/day	20 mg/L		1
November-April			36 mg/L, 64 lbs/day	30 mg/L		
TSS May-October			29 mg/L, 51 lbs/day	20 mg/L		1
November-April			36 mg/L, 64 lbs/day	30 mg/L		
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		7.0 mg/L				1
Ammonia Nitrogen October - April			28 mg/L	14 mg/L		2
Fecal Coliform May-September			<b>656#/100 mL geometric mean</b>	400#/100 mL geometric mean		
Temperature						2
Phosphorus Interim				0.350 mg/L		3

Footnotes:

Attachment #1

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. Monitoring only.
3. Under the phosphorus variance, an interim limit of 0.350 mg/L was effective upon permit reissuance.

**Receiving Water Information**

- Name: Bridge Creek
- Waterbody Identification Code (WBIC): 2130600
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Cold Water (Category 5), non-public water supply.

Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: USGS for Station 05366300 at Augusta, in Bridge Creek

7-Q<sub>10</sub> = 2.20 cfs (cubic feet per second)

7-Q<sub>2</sub> = 4.70 cfs

Harmonic Mean Flow = 8.89 cfs using a drainage area of 35.6 mi<sup>2</sup>.

The Harmonic Mean has been estimated based on average flow and the 7-Q<sub>10</sub> using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).

- Hardness = 30 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of 9 samples collected in Bridge Creek from 10/06/1988 to 06/12/1989.
- % 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 Chippewa River at Durand is used for this evaluation because there is no data available for Bridge Creek and the Chippewa River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: None
- Impaired water status: Bridge Creek is listed as impaired for phosphorus.

**Effluent Information:**

- Design Flow Rates(s):
  - Annual Average = 0.212 MGD (Million Gallons per Day)
  - Peak daily = 0.553 MGD
  - Peak weekly = 0.434 MGD
  - Peak monthly = 0.405 MGD

For reference, the actual average flow from January 2019 to August 2023 was 0.261 MGD.

- Hardness = 67 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of 4 effluent samples collected from 02/09/2023 to 03/02/2023.
- 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 wells

Attachment #1

- Additives: Aluminum Sulfate
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus Chloride and hardness. The permit-required monitoring for Ammonia, and Phosphorus from January 2019 to August 2023 is used in this evaluation.

**Chemical Specific Effluent Data at Outfall 001**

Sample Date	Chloride mg/L	Sample Date	Copper µg/L	Sample Date	Zinc µg/L
02/09/2023	73	02/09/2023	4.41	02/09/2023	64.3
02/16/2023	53.9	02/13/2023	4.49	10/24/2023	78.9
02/23/2023	78.2	02/16/2023	4.89	10/27/2023	48.1
03/02/2023	98.9	02/20/2023	13.5	10/31/2023	33.2
		02/23/2023	3.85	11/03/2023	44.8
		02/27/2023	3.78	11/07/2023	29.1
		03/02/2023	3.83	11/10/2023	29.9
		03/06/2023	6.26	11/14/2023	110
		03/09/2023	12.5	11/17/2023	48.7
		03/13/2023	5.08	11/21/2023	42.8
		03/16/2023	6.08	11/24/2023	43.9
				11/28/2023	51.1
mean	76	1-day P <sub>99</sub>	18.2	1-day P <sub>99</sub>	127.3
		4-day P <sub>99</sub>	11.3	4-day P <sub>99</sub>	84.5

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.”.

The following table presents the average concentrations and loadings at Outfall 001 from January 2019 to August 2023 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6):

**Parameter Averages with Limits**

	Average Measurement
BOD <sub>5</sub>	2 mg/L*
TSS	2 mg/L*
pH	6.75 s.u.
Dissolved Oxygen	10.71 mg/L
Ammonia Nitrogen	0.4 mg/L*
Fecal Coliform	526#/100 mL
Phosphorus	0.20 mg/L

\*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 99<sup>th</sup> percentile (or P<sub>99</sub>) 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<sub>10</sub>**

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<sub>10</sub> receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

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

Where:

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

Q<sub>s</sub> = average minimum 1-day flow which occurs once in 10 years (1-day Q<sub>10</sub>)  
if the 1-day Q<sub>10</sub> flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q<sub>10</sub>).

Q<sub>e</sub> = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

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

C<sub>s</sub> = 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<sub>10</sub> method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for the City of Augusta Wastewater Treatment Facility and the limits are set based on two times the acute toxicity criteria.

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

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**

RECEIVING WATER FLOW = 1.76 cfs, (1-Q<sub>10</sub> (estimated as 80% of 7-Q<sub>10</sub>)), 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 P99	1-day MAX. CONC.
Arsenic		339.8		679.6	135.9	<0.77		
Cadmium	67	2.76	0.010	5.5	1.1	<0.084		
Chromium	67	1302.76	0.500	2605.5	521.1	<0.7		
Copper	67	10.67	1.210	21.3			18.2	13.5
Lead	67	72.87	0.338	145.7	29.1	<1.08		
Nickel	67	335.38		670.8	134.2	4.5		
Zinc	67	85.08	1.143	170.2			127.3	110
Chloride		757		1514	303	76		99

\* \* The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q<sub>10</sub> flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

**Weekly Average Limits based on Chronic Toxicity Criteria (CTC)**

RECEIVING WATER FLOW = 0.55 cfs (¼ of the 7-Q<sub>10</sub>), 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 P99
Arsenic		148		396.2	79.2	<0.77	
Cadmium	30	0.97	0.010	2.6	0.5	<0.084	
Chromium	30	32.52	0.500	86.2	17.2	<0.7	
Copper	30	3.74	1.210	8.0			<b>11.3</b>
Lead	30	8.87	0.338	23.2	4.6	<1.08	
Nickel	30	19.07		51	10.2	4.5	
Zinc	30	42.51	1.143	111.9			84.5
Chloride		395		1057	211	76	

**Monthly Average Limits based on Wildlife Criteria (WC)**

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

**Monthly Average Limits based on Human Threshold Criteria (HTC)**

RECEIVING WATER FLOW = 2.22 cfs (1/4 of Harmonic Mean), as specified in s. NR 106.06 (4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.010	2876	575	<0.084
Chromium	3818000	0.500	29672776	5934555	<0.7
Lead	140	0.338	1085.8	217.2	<1.08
Nickel	43000		334188	66838	4.5

**Monthly Average Limits based on Human Cancer Criteria (HCC)**

RECEIVING WATER FLOW = 2.22 cfs (1/4 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		103.4	20.7	<0.77

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, limits are required for Copper.

Copper – Considering available effluent data from the permit application, the 4-day P<sub>99</sub> concentration is 11.3 µg/L, and the 1-day P<sub>99</sub> concentration is 18.2 µg/L, with a maximum concentration of 13.5 µg/L. These values exceed the calculated weekly average limits, therefore concentration and mass limits, as well as monthly monitoring, would be required.

The weekly mass limitation of 0.014 lbs/day is based on the concentration limit and the annual average flow of 0.212 MGD (8.0 µg/L \* 0.212 MGD \* 8.34/1000) in accordance with s. NR 106.07(2)(c), Wis. Adm. Code. The wet weather mass limit of 0.021 lbs/day is based on the weekly average design flow of 0.434 MGD.

Sections NR 106.07(3) and NR 205.067(7), Wis. Adm. Code require WPDES permits contain weekly average and monthly average limitations for municipal dischargers whenever practicable and necessary to protect water quality. **Therefore a monthly average limit of 8.0 µg/L would be required** to meet expression of limits requirements in addition to the weekly average limits.

Dissolved-based limits may be evaluated for the Augusta Wastewater Treatment Facility pursuant to chs. NR 105 and 106, Wis. Adm. Code. Consideration of dissolved-based limits will be according to procedures in s. NR 106.06(7)(b), Wis. Adm. Code.

Information required for the calculation of dissolved-based limits includes the conversion factors from ss. NR 105.05(5) (for acute criteria), or NR 105.06(8) (for chronic criteria), Wis. Adm. Code. Background data is also required to translate the dissolved criteria into a site-specific number (the “translator”) from which a total recoverable limit may be calculated based on the fraction of the discharged metal which would be dissolved in the receiving water. To perform this translation the following background data is required:

$$\text{Translator} = \frac{M_{tr}}{M_d}$$

Where:

$M_d$ : Dissolved metals concentration in the receiving water ( $\mu\text{g/L}$ )

$M_{Tr}$ : Total Recoverable metals concentration in the receiving water ( $\mu\text{g/L}$ )

Unfortunately, there is not this type of metals data available for the receiving water for the Augusta Wastewater Treatment Facility effluent. However, the nearest site with such data is in a nearby basin, namely Pigeon Creek at York. Use of a data from nearby basins may be considered per s. NR 106.06(4)(e)1, Wis. Adm. Code. There are data on total recoverable and dissolved copper such that translators may be estimated at the site:

<b>Background Dissolved Copper Data</b>			
Date	Total Recoverable Copper ( $\mu\text{g/L}$ )	Dissolved Copper ( $\mu\text{g/L}$ )	Translator
10/09/2007	1.13	0.64	1.77

Multiplying the translator, the conversion factor from ch. NR 105, Wis. Adm. Code, and the applicable criterion will give an indication of the amount of “relief” potentially available to the recommended permit limits if the dissolved fraction is considered from the available data:

$$\text{Translated Criteria} = \text{NR 105 Criterion} * \text{Conversion Factor} * \text{Translator}$$

$$\text{Dissolved-Based CTC (Copper)} = 3.74 \mu\text{g/L} * 0.960 * 1.77 = 6.34 \mu\text{g/L}$$

Using the dissolved-based approach for copper limits, the weekly average copper limit would be 14.9  $\mu\text{g/L}$ . The 4-day  $P_{99}$  concentration of 11.9  $\mu\text{g/L}$  is below this calculated limit, therefore limits would not be required if the permittee requests dissolved-based copper limits.

The permittee can collect on-site information to support either the estimated dissolved-based criteria or some alternate criteria. The following monitoring would be recommended for copper at or near the Augusta Wastewater Treatment Facility outfall:

- At least two rounds of monitoring of total suspended solids and both total recoverable and filterable copper in the receiving water would be needed. This information would be used to further verify a site-specific translator for each metal. The monitoring (grab sampling) should take place at a point downstream that is representative of mixed receiving water and effluent, where chemical equilibrium has been reached.

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98, Wis. Adm. Code. Based on the annual design flow and lack of nondomestic contributions, it is unlikely that the effluent will contain PFOS or PFOA. **Therefore, monitoring is not recommended.** If information becomes available that indicates PFOS or PFOA may be present in the effluent or source water, the monitoring requirements may change.

Mercury – The permit application did not require monitoring for mercury because the Augusta Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3., Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5). A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 2019 to 2022 was 0.68 mg/kg, with a maximum reported concentration of 0.90 mg/kg. **Therefore, no mercury monitoring is recommended** at Outfall 001.

### **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 weekly average and monthly average limits. These limits are re-evaluated at this time due to the following changes:

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

#### **Daily Maximum Limits based on Acute Toxicity Criteria (ATC):**

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

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

Where:

A = 0.411 and B = 58.4 for a Cold-Water Category 5 fishery, and  
pH (s.u.) = that characteristic of the effluent.



The effluent pH data was examined as part of this evaluation. A total of 1825 sample results were reported from July 2009 to June 2014. The maximum reported value was 7.90 s.u. (Standard pH Units). The effluent pH was 7.70 s.u. or less 99% of the time. The 1-day P<sub>99</sub>, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.69 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 7.64 s.u. Therefore, a value of 7.70 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.7 s.u. into the equation above yields an ATC = 14.44 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<sub>10</sub> 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<sub>10</sub> (estimated as 80 % of 7-Q<sub>10</sub>) and the 2×ATC approach are shown below.

**Daily Maximum Ammonia Nitrogen Determination**

	Ammonia Nitrogen Limit mg/L
2×ATC	28.88
1-Q <sub>10</sub>	91.55

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

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

**Daily Maximum Ammonia Nitrogen Limits – Coldwater (Category 5)**

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

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

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

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as Cold-water Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

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

E = 0.854,

C = the minimum of 2.85 or  $1.45 \times 10^{(0.028 \times (25 - T))}$

T = the temperature (°C) of the receiving water  $\times 10^{(0.028 \times (25 - T))}$

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q<sub>10</sub> (4-Q<sub>3</sub>, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q<sub>5</sub> (estimated as 85% of the 7-Q<sub>2</sub> if the 30-Q<sub>5</sub> is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 °C, 25% of the flow is used if the Temperature < 11 °C, and 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

The “default” basin assumed values are used for Temperature and background ammonia concentrations, because minimum ambient data is available. The values for pH are based on data collected from Bridge Creek. These values are shown in the table below, with the resulting criteria and effluent limitations.

**Weekly and Monthly Ammonia Nitrogen Limits – Coldwater (Category 5)**

		May	June-September	October-April
<b>Effluent Flow</b>	Qe (MGD)	0.212	0.212	0.212
<b>Background Information</b>	7-Q <sub>10</sub> (cfs)	2.20	2.20	2.20
	7-Q <sub>2</sub> (cfs)	4.70	4.70	4.70
	Ammonia (mg/L)	0.07	0.04	0.09
	Temperature (°C)	13.3	17.8	9.4
	pH (s.u.)	7.20	7.03	7.19
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	1.100	2.200	0.550
	Reference Monthly Flow (cfs)	1.998	3.995	0.999
<b>Criteria</b>	4-day Chronic	13.47	11.84	13.53
	30-day Chronic	5.39	4.74	5.41

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<b>Effluent</b>	Weekly Average	42.52	63.00	28.10
	Monthly Average	26.32	41.71	15.89

**Effluent Data**

The following table evaluates the statistics based upon ammonia data reported from , with those results being compared to the calculated limits to determine the need to include ammonia limits in the Augusta Wastewater Treatment Facility permit.

**Ammonia Nitrogen Effluent Data**

Ammonia Nitrogen mg/L	
1-day P <sub>99</sub>	4.50
4-day P <sub>99</sub>	2.20
30-day P <sub>99</sub>	1.00
Mean*	0.40
Std	1.50
Sample size	139
Range	<0.01 - 4.8

\*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 average and monthly average limits. Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

(b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

**Conclusions and Recommendations**

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

**Final Ammonia Nitrogen Limits**

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
October - April		28	14

## **PART 4 – WATER QUALITY-BASED Effluent Limitations for BACTERIA**

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

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

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

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

### **Effluent Data**

The Augusta Wastewater Treatment Facility has monitored effluent *E. coli* from August 2022 to July 2023 and a total of 19 results are available. A geometric mean of 126 counts/100 mL was never exceeded, with a maximum monthly geometric mean of 10 counts/100 mL. Effluent data never exceeded 410 counts/100 mL. The maximum reported value was 10 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**

### **Water Quality-Based Effluent Limits (WQBEL)**

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

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a), Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.075 mg/L applies for Bridge Creek.

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

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

Where:

WQC = 0.075 mg/L for Bridge Creek.

Qs = 100% of the 7-Q<sub>2</sub> of 4.7 cfs

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

Qe = effluent flow rate = 0.212 MGD = 0.328 cfs

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

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall be calculated using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Adm. Code. The median shall be calculated with at least one year of data using samples collected once per month during the period of May through October. All representative data from the most recent 5 years shall be used, but data from the most recent 10 years may be used if representative of current conditions.

The following data were considered in estimating the background phosphorus concentration:

SWIMS ID	183027
Station Name	Monitoring station at Hwy 27 Bridge
Waterbody	Bridge Creek
Sample Count	6
First Sample	05/07/2012
Last Sample	10/11/2012
Mean	0.137 mg/L
Median	0.131 mg/L

Substituting a background concentration above criteria into the limit calculation equation above would result in a calculated limit that is less than the applicable criterion of 0.075 mg/L. However, s. NR 217.13(7), Wis. Adm. Code, specifies that “if the water quality-based effluent limitation calculated pursuant to the procedures in this section is less than the phosphorus criterion specified in s. NR 102.06, Wis. Adm. Code, for the water body, the effluent limit shall be set equal to the criterion.”

The impaired water listing of Bridge Creek also points towards the notion that effluent phosphorus limits equal to the water quality criterion are needed to prevent the discharge from contributing to further impairment of the receiving water. The Guidance for Implementing Wisconsin’s Phosphorus Water Quality Standards for Point Source Discharges (2020) suggests setting effluent limits equal to the criterion in the absence of an EPA approved total maximum daily load for discharges of phosphorus to phosphorus impaired waters.

**Effluent Data**

The following table summarizes effluent total phosphorus monitoring data from January 2019 to August 2023.

	<b>Phosphorus mg/L</b>
1-day P <sub>99</sub>	0.61
4-day P <sub>99</sub>	0.38
30-day P <sub>99</sub>	0.26
Mean	0.20
Std	0.12
Sample size	732
Range	0.02 - 1.16

**Reasonable Potential Determination**

Since the 30-day P<sub>99</sub> of reported effluent total phosphorus data is greater than the calculated WQBEL, the discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion. Therefore, a WQBEL is required.

**Limit Expression**

According to s. NR 217.14 (2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, the effluent limit of 0.075 mg/L may be expressed as a six-month average. If a concentration limitation expressed as a six-month average is included in the permit, a monthly average concentration limitation of 0.225 mg/L, equal to three times the WQBEL calculated under s. NR 217.13, Wis. Adm. Code shall also be included in the permit. The six-month average should be averaged during the months of May – October and November – April.

**Mass Limits**

Because the discharge is to a surface water that is to or upstream of a phosphorus impaired water, a mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code. This final mass limit shall be  $0.075 \text{ mg/L} \times 8.34 \times 0.212 \text{ MGD} = 0.13 \text{ lbs/day}$  expressed as a six-month average.

**WQT Minimum Control Level (MCL).**

A water quality trading plan has been submitted as an alternative compliance option to offset any Total Phosphorus discharged from Outfall 001 that exceeds the WQBELs. The phosphorus WQBELs may be expressed as computed compliance limits, but a Minimum Control Level (MCL) must be set as a limit not to be exceeded at either outfall location. **The existing interim limit of 0.35 mg/L is recommended as the MCL.**

**PART 6 – WATER QUALITY-BASED Effluent Limitations  
for THERMAL**

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

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from January 2019 to August 2023.

The table below summarizes the maximum temperatures reported during monitoring from January 2022 to December 2022.

**Monthly Temperature Effluent Data & Limits**

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	48	48	59	102
FEB			64	112
MAR	45	46	60	85
APR	47	48	61	79
MAY	54	56	67	79
JUN	59	61	70	76
JUL	72	92	<b>69</b>	<b>77</b>
AUG	65	65	67	80
SEP	65	76	<b>62</b>	83
OCT	62	62	<b>56</b>	84
NOV	57	67	<b>56</b>	98
DEC	50	61	61	100

### 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

Comparing the representative highest effluent temperature to the calculated effluent limits determines the reasonable potential of exceeding the effluent limits. The months in which limitations are recommended are shown in bold. Based on this analysis, weekly average temperature maximum limits are necessary for July, September, October, and November and daily maximum temperature limits are needed for July. The complete thermal table used for the limit calculation is attached.

The following general options are available for a facility to explore potential relief from the temperature limits:

- Effluent monitoring data: Verification or additional effluent monitoring (flow and/or temperature) may be appropriate if there were questions on the representativeness of the current effluent data.
- Monthly low receiving water flows: Contract with USGS to generate monthly low flow estimates for the receiving water to be used in place of the annual low flow.
- Mixing zone studies: A demonstration of rapid and complete mixing may allow for the use of a mixing zone other than the default 25%.
- Dissipative cooling demonstration: Effluent limitations based on sub-lethal criteria may be adjusted based on the potential for heat dissipation from municipal treatment plants as described in s. NR 106.59(4), Wis. Adm. Code.
- Collection of site-specific ambient temperature: default background temperatures for streams in Wisconsin, so actual data from the direct receiving water may provide for relaxed thermal limits but only if the site-specific temperatures are lower than the small stream defaults used in the above tables
- A variance to the water quality standard: This is typically considered to be the least preferable and most complex option as it requires the evaluation of the other alternatives.

These options are explained in additional detail in the August 15, 2013 Department *Guidance for Implementation of Wisconsin's Thermal Water Quality Standards*

<http://dnr.wi.gov/topic/surfacewater/documents/ThermalGuidance2edition8152013.pdf>



The City of Augusta has submitted a request for consideration of dissipative cooling, referencing a previous dissipative cooling study and a statement that there have been not substantial changes to the facility. Based on this information, the department has found that it is not necessary to include temperature limits in the reissued permit. **Temperature monitoring is recommended** per the requirements of s. NR 106.59(7), Wis. Adm. Code.

**Future WPDES Permit Reissuance**

Dissipative cooling requests must be re-evaluated every permit reissuance. The permittee is responsible for submitting an updated DC request prior to permit reissuance. Such a request must either include:

- a) A statement by the permittee that there have been no substantial changes in operation of, or thermal loadings to, the treatment facility and the receiving water; or
- b) New information demonstrating DC to supplement the information used in the previous DC determination. If significant changes in operation or thermal loads have occurred, additional DC data must be submitted to the Department.

**PART 7 – WHOLE EFFLUENT TOXICITY (WET)**

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

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC50 (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<sub>25</sub> (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 **37%** 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:

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

Where:

- Q<sub>e</sub> = annual average flow = 0.212 MGD = 0.328 cfs
- f = fraction of the Q<sub>e</sub> withdrawn from the receiving water = 0
- Q<sub>s</sub> = ¼ of the 7-Q<sub>10</sub> = 2.20 cfs ÷ 4 = 0.55 cfs

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- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual*, 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.
- 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.

**WET Data History**

Date  Test Initiated	Acute Results LC50 %				C. dubia	Chronic Results IC25 %				Footnotes  or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?		Fathead Minnow	Algae (IC50)	Pass or Fail?	Use in RP?	
06/14/1994					36.8	28.5			No	1
08/29/1994										1
08/15/1995	>100	>100	Pass	No	>85	>85			No	1
05/07/1996	>100	>100	Pass	No	>85	>85			No	1
11/13/1997	>100	>100	Pass	No						1
04/07/1999	>100	>100	Pass	No						1
05/15/2001	>100	>100	Pass	No	>100	>100			No	1
09/11/2002	>100	>100	Pass	No						1
04/08/2004	>100	<100	Pass	No	>100	>100			No	1
09/14/2006	>100	>100	Pass	No	63.36	57.55			No	2
10/09/2013	>100	>100	Pass	Yes						
07/22/2015	>100	>100	Pass	Yes						

Footnotes:

1. *Data Not Representative.* Significant changes were made to WET test methods in 2004 and these changes were assumed to be fully implemented by certified labs by no later than June 2005.

Attachment #1

2. *Data Not Representative.* Significant upgrades were made to the the wastewater treatment facility in 2011. The system was upgraded from an RBC to an EBNR system. Effluent data prior to this upgrade is not included in the reasonable potential analysis.
- 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.**

$$\text{Acute Reasonable Potential} = [(TU_a \text{ effluent})(B)]$$

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

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

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**

	<b>Acute</b>	<b>Chronic</b>
<b>AMZ/IWC</b>	Not Applicable. <b>0 Points</b>	IWC = 37%. <b>10 Points</b>
<b>Historical Data</b>	Two tests used to calculate RP. No tests failed. No data available in past 5 yrs (5 pts) <b>5 Points</b>	No tests used to calculate RP. No data available in past 5 yrs (5 pts) <b>5 Points</b>
<b>Effluent Variability</b>	Little variability, no violations or upsets, consistent WWTF operations. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Receiving Water Classification</b>	Coldwater Community (5 pts) <b>5 Points</b>	Same as Acute. <b>5 Points</b>
<b>Chemical-Specific Data</b>	No reasonable potential for limits based on ATC; Ammonia, Chloride, Copper, Nickel, and Zinc detected. (3 pts) Additional Compounds of Concern: None <b>3 Points</b>	Reasonable potential for limits for Copper based on ATC; (5 pts) Ammonia nitrogen limit carried over from the current permit. Ammonia, Chloride, Nickel, and Zinc detected. (3 pts) Additional Compounds of Concern: None <b>8 Points</b>
<b>Additives</b>	One Water Quality Conditioners added. (1 pt) Permittee has proper P chemical SOPs in place. <b>1 Point</b>	Additive used more than once per 4 days. <b>1 Point</b>
<b>Discharge Category</b>	No Industrial Contributors. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Wastewater Treatment</b>	Secondary or Better <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Downstream Impacts</b>	No impacts known <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Total Checklist Points:</b>	<b>14 Points</b>	<b>29 Points</b>
<b>Recommended Monitoring Frequency (from Checklist):</b>	No acute monitoring recommended	3 tests during permit term
<b>Limit Required?</b>	No	No
<b>TRE Recommended? (from Checklist)</b>	No	No

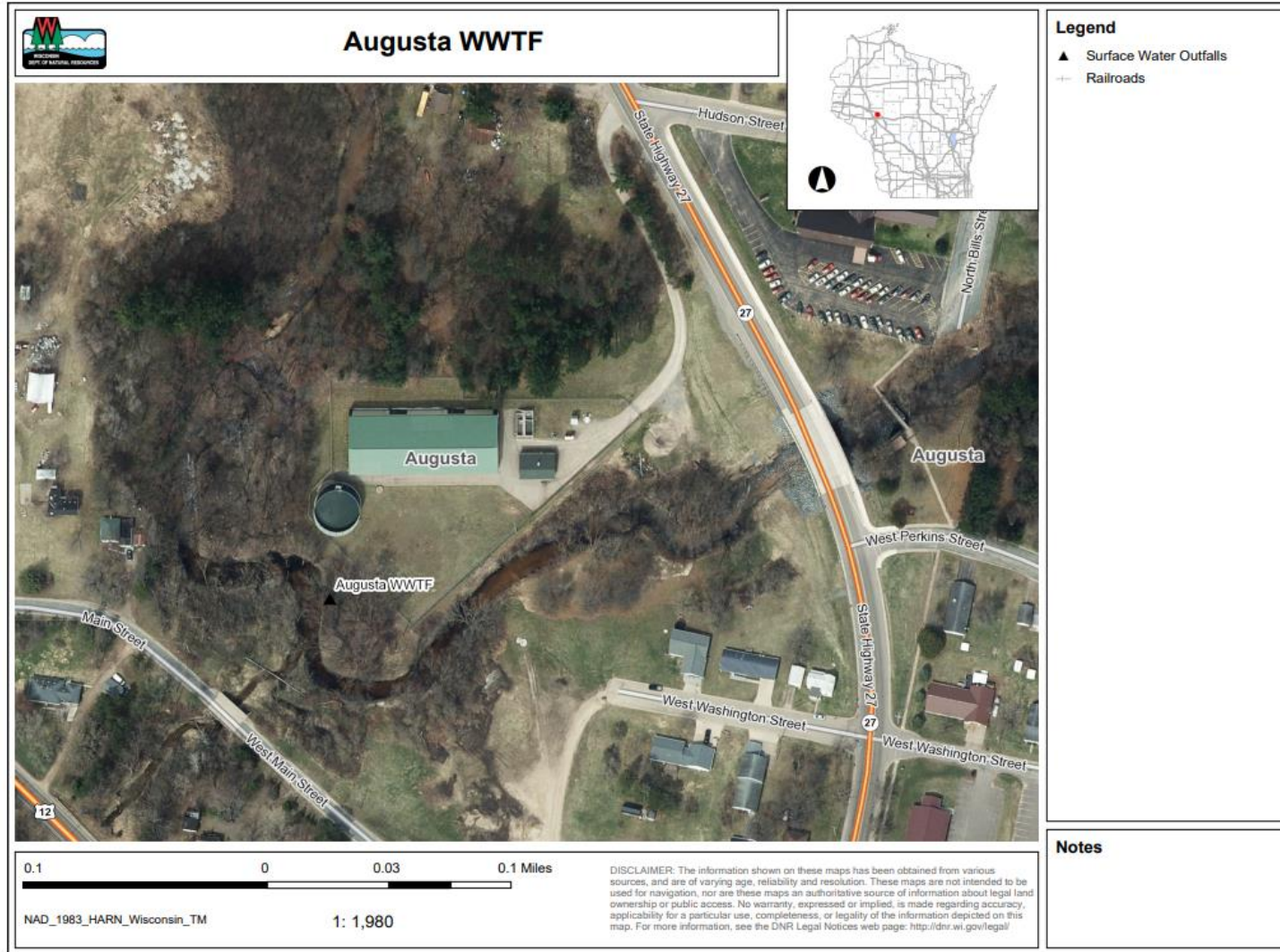
- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above, three chronic WET tests are recommended in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).

**Temperature limits for receiving waters with unidirectional flow**

(calculation using default ambient temperature data)

<b>Facility:</b>	Augusta WWTF	<b>7-Q<sub>10</sub>:</b>	2.20	cfs	<b>Temp Dates</b>		<b>Flow Dates</b>	
<b>Outfall(s):</b>	001	<b>Dilution:</b>	25%		<b>Start:</b>	01/04/22	01/01/19	
<b>Date Prepared:</b>	10/02/2023	<b>f:</b>	0		<b>End:</b>	12/29/22	08/31/23	
<b>Design Flow (Q<sub>e</sub>):</b>	0.212 MGD	<b>Stream type:</b>	Cold water community					
<b>Storm Sewer Dist.</b>	0 ft	<b>Q<sub>s</sub>:Q<sub>e</sub> ratio:</b>	1.7 :1					
		<b>Calculation Needed?</b>	YES					

Month	Water Quality Criteria			Receiving Water Flow Rate (Q <sub>s</sub> ) (cfs)	Representative Highest Effluent Flow Rate (Q <sub>e</sub> )		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	T <sub>a</sub> (default) (°F)	Sub-Lethal WQC (°F)	Acute WQC (°F)		7-day Rolling Average (Q <sub>esl</sub> ) (MGD)	Daily Maximum Flow Rate (Q <sub>ea</sub> ) (MGD)		Weekly Average (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	35	47	68	0.55	0.342	0.348	0	48	48	59	102
FEB	36	47	68	0.55	0.231	0.258	0			64	112
MAR	39	51	69	0.55	0.494	0.651	0	45	46	60	85
APR	47	57	70	0.55	0.794	0.862	0	47	48	61	79
MAY	56	63	72	0.55	0.628	0.806	0	54	56	67	79
JUN	62	67	72	0.55	0.653	0.856	0	59	61	70	76
JUL	64	67	73	0.55	0.565	0.769	0	72	92	69	77
AUG	63	65	73	0.55	0.407	0.498	0	65	65	67	80
SEP	57	60	72	0.55	0.431	0.507	0	65	76	62	83
OCT	49	53	70	0.55	0.469	0.539	0	62	62	56	84
NOV	41	48	69	0.55	0.321	0.338	0	57	67	56	98
DEC	37	47	69	0.55	0.263	0.362	0	50	61	61	100





March 25, 2021

Jason TePaske, Mayor  
City of Augusta  
P.O. Box 475  
Augusta, WI 54722

Subject: City of Augusta WPDES Permit #WI-0023272  
Water Quality Trading Plan – CONDITIONAL CREDIT CERTIFICATION

Dear Mr. TePaske:

The Department received a water quality trading plan (WQT Plan) for compliance with phosphorus effluent limits at the City of Augusta Wastewater Treatment Facility. Based on WDNR review, the final WQT Plan is in general conformance with the WDNR Water Quality Trading Guidance and Section 283.84 of the Wisconsin Statutes. The WQT plan proposes to generate 211 lbs/yr of phosphorus credits through streambank stabilization and buffer projects to improve water quality at Diamond Valley Creek. Contingent upon final agreements between the City of Augusta and the parties associated with credit generation, the table below summarizes the total proposed phosphorus credits. The WDNR certifies the credits in this WQT Plan as a basis for water quality trading during the next WPDES permit term. These credits are generated and expire on a calendar year basis.

Project	Reductions	Trade Ratio	Credits
Erdman Property at Diamond Valley Creek (Streambank Projects)	237	2:1	119
Erdman Property at Diamond Valley Creek (Buffer Project)	167	3:1	56
Hi-Crush Property at Diamond Valley Creek	73	2:1	37
<b>Total Credits</b>			<b>211 lbs./yr.*</b>

\*In the event that this permit is not reissued prior to the expiration date, 211 lbs./yr. of credits will be available in subsequent year(s).

The WDNR has assigned the WQT Plan a tracking number of WQT-2021-0006 which will be referenced as such in the draft WPDES permit. The final WQT plan will be included as part of the public notice package for permit reissuance. The draft WPDES permit will include a requirement for an annual trading report and effluent monitoring. WDNR will review the data provided by the City of Augusta to assess whether any additional modifications to the WQT Plan and associated water quality trades are required prior to reissuance of the next WPDES permit. Any modifications to the WQT Plan within the permit term will also require a modification to the permit and a public notification period.

If you have any questions or comments, please contact me at 715-225-4705 or at [Benjamin.Hartenbower@wisconsin.gov](mailto:Benjamin.Hartenbower@wisconsin.gov).

Sincerely,

Benjamin Hartenbower, PE  
Water Resources Engineer  
Wisconsin Department of Natural Resources

CC (email): Dan Marcheske, City of Augusta  
Mike Davy, Davy Engineering Co., Inc.  
Matt Claucherty, WDNR  
Geisa Thielen, WDNR  
Angela Parkhurst, WDNR