

# Permit Fact Sheet

## General Information

Permit Number	WI-0026930-10-0
Permittee Name and Address	TOWN OF BELOIT 2445 S Afton Rd, Beloit, WI 53511
Permitted Facility Name and Address	Beloit Town Wastewater Treatment Facility 3629 S Walters Rd, Beloit WI 53511
Permit Term	April 01, 2026 to March 31, 2031
Discharge Location	West bank of Rock River, across from Town of Beloit Preservation Park boat landing.
Receiving Water	Rock River in Bass Creek Watershed of Lower Rock River Basin in Rock County
Stream Flow (Q <sub>7,10</sub> )	219 cfs
Stream Classification	Warm Water Sport Fish (WWSF), non-public water supply
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	1.0 MGD
Industrial or Commercial Contributors	None
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

## Facility Description

The Town of Beloit operates a wastewater treatment facility that serves both the Town of Beloit and the Town of Rock for a population of approximately 7800 people. Treatment consists of screening, grit removal, and activated sludge Sanitare package plants; one with a rated capacity of 650,000 gallons/day and the other with a rated capacity of 350,000 gallons/day. Only the larger of the two plants is currently used and the smaller unit is used for sludge storage and is available for use. The outer ring is the activated sludge plant, the center ring is the final clarifier, and a portion of the outer ring is an aerobic digester for sludge stabilization. Sludge that has been produced is stored on-site prior to land application on Department approved sites. Disinfection is achieved with UV disinfection. The facility uses alum sulfate for chemical phosphorus removal.

## Substantial Compliance Determination

**Enforcement During Last Permit:** Facility received an NON on 12/5/2025 for failure to sample pathogen densities in sludge prior to land application.

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on 5/14/2025, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Ashley Brechlin on 5/29/2025.

## Sample Point Descriptions

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
701	0.68 MGD (2024)	Influent: 24-hr Flow Proportional Composite samples shall be collected after preliminary screening and grit removal. Flow is measured with a Parshall flume and ultrasonic flow meter in the headworks building.
001	0.54 MGD (2024)	Effluent: 24-hr Flow Proportional Composite samples shall be collected at the UV Disinfection channel and grab samples shall be collected after UV Disinfection prior to discharge to the Rock River. Flow is measured with a Parshall flume and ultrasonic flow meter after disinfection.
002	81.4 Dry US Tons (per 2025 permit application)	Aerobically digested, Liquid, Class B. Representative sludge samples shall be collected from the truck fill pipe location.

## Permit Requirements

### 1 Influent – Monitoring Requirements

#### 1.1 Sample Point Number: 701- INFLUENT

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

#### Changes from Previous Permit:

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

#### Explanation of Limits and Monitoring Requirements

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

## 2 Surface Water - Monitoring and Limitations

### 2.1 Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	148.3 lbs/day	3/Week	Calculated	January
Suspended Solids, Total	Weekly Avg	183.3 lbs/day	3/Week	Calculated	February
Suspended Solids, Total	Weekly Avg	205.6 lbs/day	3/Week	Calculated	March
Suspended Solids, Total	Weekly Avg	193.6 lbs/day	3/Week	Calculated	April
Suspended Solids, Total	Weekly Avg	178.3 lbs/day	3/Week	Calculated	May
Suspended Solids, Total	Weekly Avg	168.3 lbs/day	3/Week	Calculated	June
Suspended Solids, Total	Weekly Avg	132.8 lbs/day	3/Week	Calculated	July
Suspended Solids, Total	Weekly Avg	103.7 lbs/day	3/Week	Calculated	August
Suspended Solids, Total	Weekly Avg	70.5 lbs/day	3/Week	Calculated	September
Suspended Solids, Total	Weekly Avg	113.7 lbs/day	3/Week	Calculated	October
Suspended Solids, Total	Weekly Avg	174.8 lbs/day	3/Week	Calculated	November
Suspended Solids, Total	Weekly Avg	145.5 lbs/day	3/Week	Calculated	December

<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	Monthly Avg	105.16 lbs/day	3/Week	Calculated	January
Suspended Solids, Total	Monthly Avg	130 lbs/day	3/Week	Calculated	February
Suspended Solids, Total	Monthly Avg	145.81 lbs/day	3/Week	Calculated	March
Suspended Solids, Total	Monthly Avg	137.33 lbs/day	3/Week	Calculated	April
Suspended Solids, Total	Monthly Avg	126.45 lbs/day	3/Week	Calculated	May
Suspended Solids, Total	Monthly Avg	119.33 lbs/day	3/Week	Calculated	June
Suspended Solids, Total	Monthly Avg	94.19 lbs/day	3/Week	Calculated	July
Suspended Solids, Total	Monthly Avg	73.55 lbs/day	3/Week	Calculated	August
Suspended Solids, Total	Monthly Avg	50 lbs/day	3/Week	Calculated	September
Suspended Solids, Total	Monthly Avg	80.65 lbs/day	3/Week	Calculated	October
Suspended Solids, Total	Monthly Avg	124 lbs/day	3/Week	Calculated	November
Suspended Solids, Total	Monthly Avg	103.23 lbs/day	3/Week	Calculated	December
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	7.9 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	7.9 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	7.9 mg/L	3/Week	24-Hr Flow Prop Comp	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit effective May - September.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May - September. See the E. Coli

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Percent Limit section of the permit. Enter the result in the DMR on the last day of the month.
Chloride		mg/L	3/Week	24-Hr Flow Prop Comp	Monitoring only in 2029.
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	5.2 lbs/day	3/Week	Calculated	January and April
Phosphorus, Total	Monthly Avg	5.6 lbs/day	3/Week	Calculated	February
Phosphorus, Total	Monthly Avg	4.9 lbs/day	3/Week	Calculated	March
Phosphorus, Total	Monthly Avg	5.0 lbs/day	3/Week	Calculated	May
Phosphorus, Total	Monthly Avg	4.8 lbs/day	3/Week	Calculated	June
Phosphorus, Total	Monthly Avg	3.7 lbs/day	3/Week	Calculated	July
Phosphorus, Total	Monthly Avg	3.2 lbs/day	3/Week	Calculated	August and October
Phosphorus, Total	Monthly Avg	2.9 lbs/day	3/Week	Calculated	September
Phosphorus, Total	Monthly Avg	3.9 lbs/day	3/Week	Calculated	November
Phosphorus, Total	Monthly Avg	4.7 lbs/day	3/Week	Calculated	December
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section of the permit.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section of the permit.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section of the permit. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

### Changes from Previous Permit

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

- **pH-** The sample frequency for pH increased to 5/week.
- **Chloride-** Sampling for one year to provide 11 sample points for permit reissuance purposes.

### 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 November 17, 2025.

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

**Phosphorus-** 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-2025-0020) or approved amendments thereof. The total ‘WQT TP Credits’ available are designated in the approved WQT Plan. The WQT plan indicates that the Town of Beloit will utilize WQT to comply with the effluent limitations for total phosphorus for their discharge to the Rock River through trading with an upstream point source (City of Columbus) for Rock River TMDL allocations. Additional WQT subsections in the permit provide information on compliance determinations and re-opening of the permit.

## 3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Liquid	Fecal Coliform	Incorporation	Land Application	81.4
Does sludge management demonstrate compliance? <b>Yes</b>						
Is additional sludge storage required? <b>No</b>						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? <b>No</b>						
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? <b>No</b>						
Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

### 3.1 Sample Point Number: 002- SLUDGE

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2027.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2027.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

**Changes from Previous Permit:**

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

**PCB** – Sampling year updated.

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

**Explanation of Limits and Monitoring Requirements**

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

**PFAS-** The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment to determine future land application rates and released this risk assessment in January of 2025. The department is evaluating this new information. Until a decision is made, the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS” should be followed

Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department’s implementation of EPA’s recommendations. To quantitate this risk, PFAS sampling has been included in this WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9, Wis. Adm. Code.

**4 Schedules**

**4.1 Land Application Management Plan**

A management plan is required for the land application system.

Required Action	Due Date
<b>Land Application Management Plan Submittal:</b> 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	04/01/2027

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.	
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### **Explanation of Schedule**

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

### **Other Comments**

None

### **Attachments**

Water Quality Based Effluent Limits dated 11/7/2025

WQT Plan dated June 2019 addendum dated 9/10/2025

WQT Approval Letter dated 11/7/2025

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

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

### **Prepared By:**

Jennifer Jerich, Wastewater Specialist

**Date:** 1/21/2026

**Date amended post Fact Check:** 2/4/2026

**Date amended post Public Notice:**

**CORRESPONDENCE/MEMORANDUM**

DATE: 11/17/2025

TO: Jennifer Jerich – SCR

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for Beloit Town Wastewater Treatment Facility  
WPDES Permit No. WI-0026930-10

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 Beloit Town in Rock County. This municipal wastewater treatment facility (WWTF) discharges to the Rock River, located in the Bass Creek Watershed in the Lower Rock River Basin. This discharge is included in the Rock River Total Maximum Daily Load (TMDL) as approved by EPA on 09/28/2011.

The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD <sub>5</sub>			45 mg/L	30 mg/L	1
TSS TMDL			45 mg/L See Table	30 mg/L See Table	1,3
pH	9.0 s.u.	6.0 s.u.			1
Ammonia Nitrogen	7.9 mg/L		<b>7.9 mg/L</b>	<b>7.9 mg/L</b>	1,4
<i>E. coli</i>				126 #/100 mL geometric mean	5
Chloride					6
Phosphorus MCL TMDL				1.0 mg/L See Table	1,3,7
TKN, Nitrite+Nitrate, and Total Nitrogen					8

Footnotes:

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

Month	Monthly Ave TSS Effluent Limit lbs/day	Weekly Ave TSS Effluent Limit lbs/day	Monthly Ave Total P Effluent Limit lbs/day
Jan	105.16	148.3	5.2
Feb	130.00	183.3	5.6

Month	Monthly Ave TSS Effluent Limit lbs/day	Weekly Ave TSS Effluent Limit lbs/day	Monthly Ave Total P Effluent Limit lbs/day
March	145.81	205.6	4.9
April	137.33	193.6	5.2
May	126.45	178.3	5.0
June	119.33	168.3	4.8
July	94.19	132.8	3.7
Aug	73.55	103.7	3.2
Sept	50.00	70.50	2.9
Oct	80.65	113.7	3.2
Nov	124.00	174.8	3.9
Dec	103.23	145.5	4.7

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. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
7. The minimum control level (MCL) is equal to the technology-based effluent limit (TBEL) and acts as the end of pipe backstop for water quality trading.
8. 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. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrite (NO<sub>2</sub>), nitrate (NO<sub>3</sub>), and total Kjeldahl nitrogen (TKN) (all expressed as N).

**No WET testing is required because information related to the discharge indicates low to no risk for toxicity.**

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

Attachments (3) – Narrative, Outfall Map, & 2007 Ammonia Limits Calculations

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

E-cc: Ashley Brechlin, Wastewater Engineer – SCR  
 Lisa Creegan, Regional Wastewater Supervisor – SCR  
 Diane Figiel, Water Resources Engineer – WY/3  
 Nate Willis, Wastewater Engineer – WY/3

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

**WPDES Permit No. WI-0026930-10**

Prepared by: Nicole Krueger

**PART 1 – BACKGROUND INFORMATION**

**Facility Description**

The Town of Beloit operates a wastewater treatment facility that serves both the Town of Beloit and the Town of Rock for a combined population of approximately 7800 people. There is no significant industry contribution and no significant anticipated growth. The wastewater treatment facility consists of an activated sludge facility with Sanitare package plants; one with a rated capacity of 650,000 gallons/day and the other with a rated capacity of 350,000 gallons/day. The outer ring is the activated sludge plant, the center ring is the final clarifier, and a slice of the outer ring is an aerobic digester for sludge stabilization. Biosolids are stored in a liquid sludge storage tank until it is land applied on approved fields. Disinfection is achieved with UV disinfection. The facility uses alum sulfate for chemical phosphorus removal.

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

**Existing Permit Limitations**

The current permit, which expired on 06/30/2025, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1
BOD <sub>5</sub>			45 mg/L	30 mg/L	2,3
TSS			45 mg/L See Table	30 mg/L See Table	3,4
pH	9.0 s.u.	6.0 s.u.			2
Ammonia Nitrogen	7.9 mg/L		<b>7.9 mg/L</b>	<b>7.9 mg/L</b>	5
<i>E. coli</i>				126 #/100 mL geometric mean	6
Phosphorus MCL TMDL				1.0 mg/L See Table	4
TKN, Nitrite+Nitrate, and Total Nitrogen					1

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.

Attachment #1

4. Additional phosphorus and TSS mass limitations are required in accordance with the waste load allocations specified in the Rock River TMDL.

Month	Monthly Ave TSS Effluent Limit lbs/day	Weekly Ave TSS Effluent Limit lbs/day	Monthly Ave Total P Effluent Limit lbs/day
Jan	105.16	148.3	5.2
Feb	130.00	183.3	5.6
March	145.81	205.6	4.9
April	137.33	193.6	5.2
May	126.45	178.3	5.0
June	119.33	168.3	4.8
July	94.19	132.8	3.7
Aug	73.55	103.7	3.2
Sept	50.00	70.5	2.9
Oct	80.65	113.7	3.2
Nov	124.00	174.8	3.9
Dec	103.23	145.5	4.7

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. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.

**Receiving Water Information**

- Name: Rock River
- Waterbody Identification Code (WBIC): 788800
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply and recreational use.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q<sub>10</sub> and 7-Q<sub>2</sub> values are from USGS for Station #05430500 at Afton in Rock County, upstream of Outfall 001.
  - 7-Q<sub>10</sub> = 219 cubic feet per second (cfs)
  - 7-Q<sub>2</sub> = 448 cfs
  - 90-Q<sub>10</sub> = 381 cfs
  - Harmonic Mean Flow = 874 cfs using a drainage area of 3460 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 = 329 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of data from the City of Beloit's chronic WET testing from 12/12/2024 – 12/21/2024.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%
- Source of background concentration data: Metals data from the Rock River at Afton (Station ID 543001) is used for this evaluation. This station is approximately 5 miles upstream of Outfall 001. 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.

Attachment #1

- Multiple dischargers: There are several other dischargers to the Rock River; however, they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The Rock River is 303(d) listed as impaired for *E. coli*, total phosphorus, and total suspended solids. The Rock River TMDL addresses the total phosphorus and total suspended solids impairments.

**Effluent Information**

- Design flow rate(s):
  - Annual average = 1.0 million gallons per day (MGD)
  - Peak daily = 1.8 MGD
  - Peak monthly = 1.2 MGD

For reference, the actual average flow from 04/01/2021 – 08/31/2025 was 0.43 MGD.

- Hardness = 413 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of four samples collected in February 2024 which were reported on the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Domestic wastewater with zero industrial contributors.
- Water supply: Municipality waterworks and private wells.
- Additives: Beloit has included 1 additive in the permit application that has the potential to be present in Outfall 001. This additive is listed below:
  - Chemtrade Chemicals – Alum sulfate
  - An additive review is not necessary for any additives where either the toxicity is well documented and understood, can be controlled by a WQBEL, or are not believed to be present in the discharge. This is the case upon initial review of the listed additives. Therefore, an additive review is not needed at this time.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

**Copper Effluent Data**

Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)
02/06/2024	<6	02/21/2024	<6	03/04/2024	<6
02/12/2024	<6	02/24/2024	<6	03/07/2024	<6
02/15/2024	8	02/27/2024	<6	03/11/2024	<6
02/18/2024	<6	03/01/2024	<6		
Average = 0.73 µg/L					

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

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**Chloride Effluent Data**

Sample Date	Chloride mg/L
02/06/2024	264
02/12/2024	240
02/15/2024	247
02/18/2024	229
Average	245

The following table presents the average concentrations and loadings at Outfall 001 from 04/01/2021 – 08/31/2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

**Parameters with Effluent Limits**

	Average Measurement	Average Mass Discharged
BOD <sub>5</sub>	8.3 mg/L	
TSS	8.2 mg/L	29.5 lbs/day
pH field	7.3 s.u.	
Ammonia Nitrogen	0.19 mg/L*	
<i>E. coli</i>	20 #/100 mL**	
Phosphorus	0.48 mg/L	1.66 lbs/day

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

\*\* The average measurement for bacteria is calculated as a geometric mean. Values reported below the LOD are replaced with a value of 1 for the calculation of the geometric mean.

**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. Adm. 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.

Qs = 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>).

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<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 Town of Beloit, 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 = 175.2 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 P <sub>99</sub>	1-day MAX. CONC.
Arsenic		340	0.79	680	136	1.7		
Cadmium	413	52.4	0.015	105	21.0	<1		
Chromium	301	4446	0.42	8892	1778	<2		
Copper	413	59.15	1.52	118	23.7	0.73		8
Lead	356	365	0.83	729	146	<1		
Nickel	268	1080	1.34	2161	432	<9		
Zinc	333	345	5.15	689	138	36		
Chloride (mg/L)		757	54.3	1514	303	245		264

\* 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<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 = 54.75 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 P <sub>99</sub>
Arsenic		152	0.79	5359	1072	1.7	
Cadmium	175	3.82	0.015	135	26.9	<1	

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SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P <sub>99</sub>
Chromium	301	326	0.42	11512	2302	<2	
Copper	329	28.7	1.52	963	193	0.73	
Lead	329	88.5	0.83	3103	621	<1	
Nickel	268	120	1.34	4207	841	<9	
Zinc	329	341	5.15	11891	2378	36	
Chloride (mg/L)		395	54.3	12110	2422	245	

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

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

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

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

RECEIVING WATER FLOW = 218.5 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.015	52248	10450	<1
Chromium (+3)	3818000	0.42	539164729	107832946	<2
Lead	140	0.83	19653	3931	<1
Nickel	43000	1.34	6072124	1214425	<9

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

RECEIVING WATER FLOW = 218.5 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	0.79	1768	354	1.7

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

**Conclusions and Recommendations**

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are not required for any toxic parameters in this section. Limits and/or monitoring recommendations are made in the paragraphs below:

**Chloride** – Considering available effluent data from the permit application (02/06/2024 – 02/18/2024), the average was 245 mg/L which is less than 1/5<sup>th</sup> of the lowest calculated limit based on ATC; therefore, **no effluent limits are needed. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.**

**Mercury** – The permit application did not require monitoring for mercury because the Beloit Town is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, “there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code.” A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 04/01/2021 – 08/31/2025 was 1.06 mg/kg, with a maximum reported concentration of 3.31 mg/kg. Therefore, **no mercury monitoring is recommended at Outfall 001.**

**PFOS and PFOA** – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code.

Available monitoring sample data from the Beloit Town Wastewater Treatment Facility (PWS ID: 15401122) is provided in the table below:

**Water Supply PFAS Data**

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
05/19/2022	620936001	WK866	ND	ND
05/19/2022	620932001	BG795	ND	ND
05/19/2022	620934001	AY339	ND	ND
05/19/2022	620930001	BG792	1.41	ND
05/19/2022	620931001	BY797	2.52	ND
05/19/2022	620935001		ND	ND
05/19/2022	620933001	BG793	1.24	ND
02/06/2023	CB01093-07	WK866	ND	ND
02/06/2023	CB01093-03	BG792	ND	ND
02/06/2023	CB01093-05	BG793	1.3	0.83
02/06/2023	CB01093-12	BG797	2.9	1.3
02/06/2023	CB01093-01	AY339	ND	ND
02/06/2023	CB01093-15		0.47	0.68
02/06/2023	CB01093-09	BG795	0.79	ND
09/10/2024	CC10671-10	BG797	2.8	1.2
09/17/2024	CC11055-01	BG793	1.3	2.19
03/12/2025	CD02802-09	BG797	2.2	1.1
Average =			1.06	0.43

The limited data above shows the municipal water supply is below 1/5<sup>th</sup> of the applicable PFOS and PFOA criteria.

Based on the effluent flow rate, the lack of indirect dischargers contributing to the collection system and known levels of PFOS/PFOA in the source water, **PFOS and PFOA monitoring is not recommended.** The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

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

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

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- The maximum expected effluent pH has changed

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

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

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 693 sample results were reported from 04/01/2021 – 08/29/2025. The maximum reported value was 8.15 s.u. (Standard pH Units). The effluent pH was 7.76 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 7.76 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 7.75 s.u. Therefore, a value of 7.76 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 7.76 s.u. into the equation above yields an ATC = 13 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	26

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	Ammonia Nitrogen Limit mg/L
1-Q <sub>10</sub>	1474

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

This limit is greater than the current daily maximum limit of 13 mg/L. Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limits must be continued in the reissued permit. The Department would be unable to increase the limit due to the lack of need as shown because the highest reported concentration was 2.5 mg/L during the previous permit term. **No changes are recommended in any of the permit limits for ammonia.**

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

**The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change** because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in Attachment #3.

**Effluent Data**

The following table evaluates the statistics based upon ammonia data reported from 04/05/2021 – 08/31/2025.

**Ammonia Nitrogen Effluent Data**

	Ammonia Nitrogen mg/L
1-day P <sub>99</sub>	1.25
4-day P <sub>99</sub>	0.68
30-day P <sub>99</sub>	0.33
Mean*	0.19
Std	0.27
Sample size	683
Range	<0.073 - 2.51

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

**Reasonable Potential**

The need to include ammonia limits in Beloit Town’s permit is determined by calculating 99<sup>th</sup> upper percentile (or P<sub>99</sub>) values for ammonia year-round and comparing those to the calculated limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. However, since the permit currently has weekly and monthly average limits year-round, **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. Additional limits to meet the requirements in s. NR 106.07, Wis. Adm Code, are denoted in bold text.

**Final Ammonia Nitrogen Limits**

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
Year-round	7.9	<b>7.9</b>	<b>7.9</b>

**PART 4 – 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 Beloit Town currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

**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 ch. NR 102 (s. NR 102.06), which establish phosphorus standards for surface waters. Revisions to ch. NR 217 (s. NR 217, Subchapter III) establish procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102.

The Department has developed a TMDL for the Upper and Lower Rock River Basins. The US EPA approved the Rock River TMDL on September 28, 2011. The document, along with the referenced appendices can be found at: <https://dnr.wi.gov/topic/tmdls/rockriver/> .

Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL-derived water quality-based effluent limit (WQBEL) for phosphorus in addition to, or in lieu of, a s. NR 217.13 WQBEL in a WPDES permit. Because the Rock River Basin TMDL was developed to protect and improve the water quality of phosphorus impaired waters within the basin, and the discharge from the Town of Beloit Wastewater Treatment Facility flows directly into the Rock River, which was listed as impaired at the time of TMDL development, the TMDL-based limits can be included in the WPDES permit absent the s. NR 217.13 WQBEL. This limit should be expressed in a manner consistent with the wasteload allocation and assumptions of the TMDL.

The monthly average total phosphorus (Total P) effluent limits in lbs/day are calculated based on the monthly phosphorus wasteload allocation (WLA) given in pounds per month as suggested in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* dated April 15, 2013. The WLA for this facility is found in the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin* report dated July 2011.

The Town of Beloit has been complying with the TMDL-based limits through water quality trading (WQT) since 2021. Beloit has a WQT agreement with the City of Columbus. The current monthly average limits based on the monthly WLAs plus the trading credits purchased from Columbus are shown in the table below. The previously determined trade ratio is 1.1. **No changes are recommended to the monthly average limits.**

**TMDL- based Total Phosphorus Effluent Limitations**

Month	Monthly Total P WLA <sup>1</sup> lbs/month	Monthly Ave Total P Effluent Limit lbs/day	WQT Credits Purchased from Columbus lbs/day	Final Monthly Ave Total P Effluent Limit <sup>2</sup> lbs/day
Jan	60.49	1.95	3.25	5.2
Feb	58.07	2.07	3.53	5.6
March	56.45	1.82	3.08	4.9
April	58.54	1.95	3.25	5.2
May	57.30	1.85	3.15	5.0
June	53.81	1.79	3.01	4.8
July	42.99	1.39	2.31	3.7
Aug	37.28	1.20	2.00	3.2
Sept	32.75	1.09	1.81	2.9
Oct	36.91	1.19	2.01	3.2
Nov	43.32	1.44	2.46	3.9
Dec	54.05	1.74	2.96	4.7

Footnotes:

- 1- Appendix P. Monthly Total Phosphorus Allocations by Wastewater Treatment Facility (p. 147)
- 2- Monthly average Total Phosphorus Allocation plus WQT credits purchased from Columbus

These limits are equivalent to concentrations ranging from 0.35 mg/L to 0.67 mg/L at the facility design flow of 1.0 MGD.

**Effluent Data**

The following table summarizes effluent total phosphorus monitoring data from 04/05/2021 – 08/31/2025.

**Total Phosphorus Effluent Data**

	Concentration mg/L	Mass lbs/day
1-day P <sub>99</sub>	0.99	3.28
4-day P <sub>99</sub>	0.70	2.40
30-day P <sub>99</sub>	0.55	1.93
Mean	0.48	1.69
Std	0.17	0.53
Sample size	683	683
Range	0.143 - 1.1	0.63 - 3.73

**Water Quality Trading Minimum Control Level**

A WQT plan has been submitted as an alternative compliance option to offset any total phosphorus discharged from Outfall 001 that exceed the TMDL-based phosphorus limits. The phosphorus limits may be expressed as computed compliance limits, but an MCL must be set as a limit not to be exceeded at the outfall location. **Therefore, the phosphorus MCL of 1.0 mg/L as a monthly average is recommended to continue in the reissued permit.**

**PART 5 – TOTAL SUSPENDED SOLIDS**

The Rock River TMDL includes wasteload allocations (WLA) for total suspended solids (TSS) which shall be expressed as both weekly and monthly limits for a municipal facility. **The Town of Beloit is already complying with the TMDL limits for TSS and there are no changes recommended from the current permit for the monthly or weekly limits, shown below:**

**TMDL-based TSS Limitations**

<b>Month</b>	<b>Monthly Average TSS Effluent Limit (lbs/day)</b>	<b>Weekly Average TSS Effluent Limit (lbs/day)</b>
January	105.16	148.3
February	130.00	183.3
March	145.81	205.6
April	137.33	193.6
May	126.45	178.3
June	119.33	168.3
July	94.19	132.8
August	73.55	103.7
September	50.00	70.50
October	80.65	113.7
November	124.00	174.8
December	103.23	145.5

**The Town of Beloit also has concentration limits of 45 mg/L as a weekly average and 30 mg/L as a monthly average (per s. NR 210.05(1), Wis. Adm. Code) which are also recommended to continue in the reissued permit.**

The table below summarizes the TSS data submitted during the current permit term (04/05/2021 – 08/27/2025):

**Total Suspended Solids Effluent Data**

	<b>Concentration mg/L</b>	<b>Mass lbs/day</b>
1-day P <sub>99</sub>	20.8	77.2
4-day P <sub>99</sub>	13.6	49.9
30-day P <sub>99</sub>	9.94	36.0
Mean	8.20	29.5
Std	3.80	14.3
Sample size	689	689
Range	1.2 – 24.6	4.9 – 101

**PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL**

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

depending on the receiving water classification.

Due to the amount of upstream flow available for dilution in the limit calculation ( $Q_s:Q_e >20:1$ ), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code).

At temperatures above ~103°F, conventional biological treatment systems stop functioning properly and experience upsets. There is no indication that this has ever occurred at this treatment system. This information, coupled with the lack of significant industrial heat load, lead to the conclusion that there is no reasonable potential for the discharge to exceed the 120°F limitation. **No limits or monitoring are recommended to be included in the reissued permit for temperature.**

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

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

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC<sub>50</sub> (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations. 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. Data collected prior to July 1, 2005 is excluded in this evaluation.

**WET Data History**

Date Test Initiated	Acute Results LC <sub>50</sub> %				Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	
02/01/2006	>100	>100	Pass	No	1
08/12/2009	>100	>100	Pass	No	1
11/04/2015	>100	>100	Pass	Yes	
02/22/2017	>100	>100	Pass	Yes	
10/09/2019	>100	>100	Pass	Yes	

Footnotes:

Attachment #1

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.
- 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.**

According to s. NR 106.08(6)(d), Wis. Adm. Code, T<sub>Ua</sub> and T<sub>Uc</sub> effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC<sub>50</sub>, IC<sub>25</sub> or IC<sub>50</sub> ≥ 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**

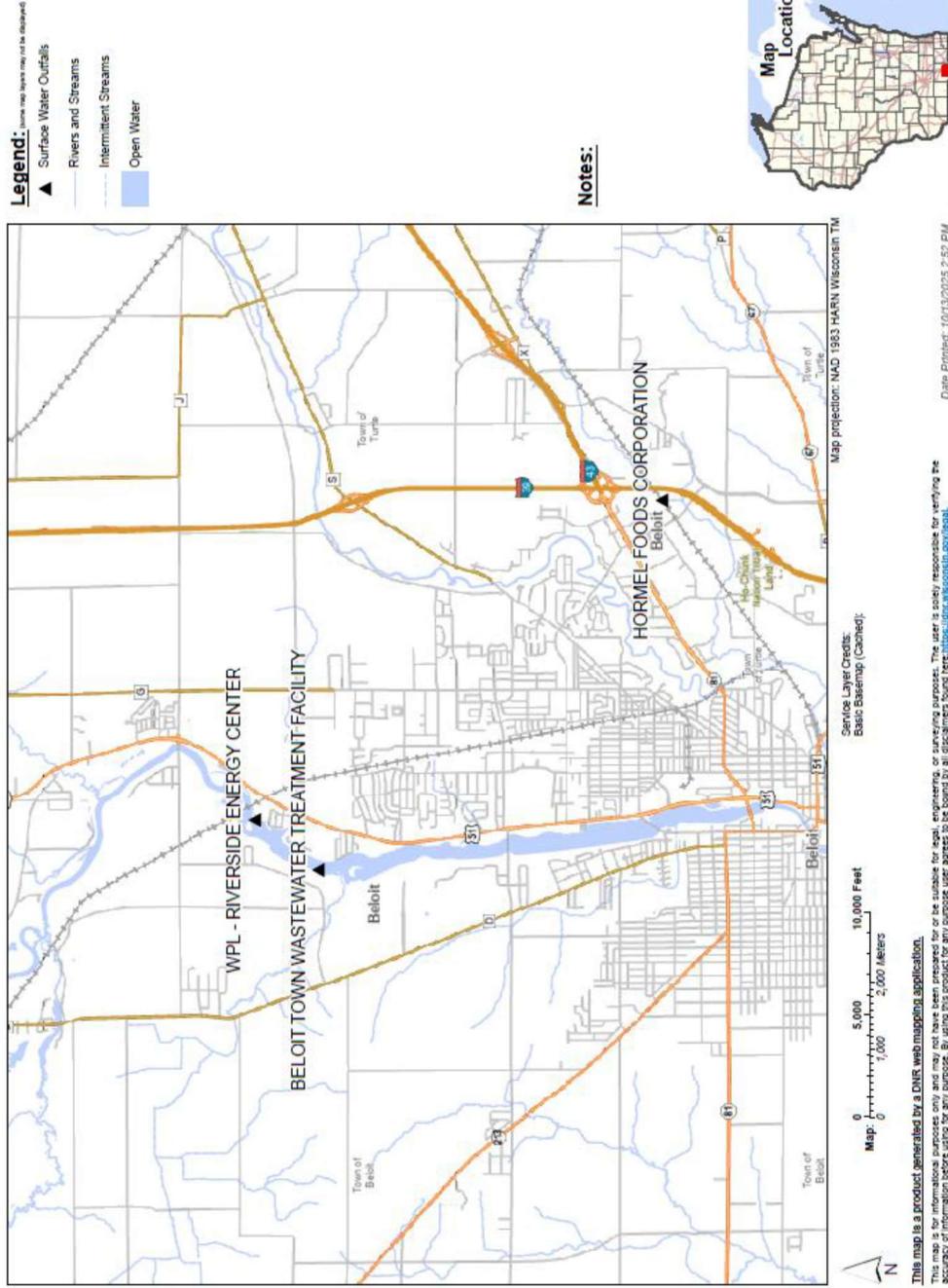
	<b>Acute</b>
<b>AMZ/IWC</b>	Not Applicable. <b>0 Points</b>
<b>Historical Data</b>	3 tests used to calculate RP – over 5 years old No tests failed. <b>5 Points</b>
<b>Effluent Variability</b>	Little variability, no violations or upsets, consistent WWTF operations. <b>0 Points</b>
<b>Receiving Water Classification</b>	WWSF <b>5 Points</b>
<b>Chemical-Specific Data</b>	No reasonable potential for limits based on ATC; Ammonia nitrogen limit carried over from the current permit. Ammonia, arsenic, copper, zinc, and chloride detected. Additional Compounds of Concern: None.

## Attachment #1

<b>Acute</b>	
	<b>3 Points</b>
<b>Additives</b>	1 Water Quality Conditioner added. Permittee has proper P chemical SOPs in place <b>1 Point</b>
<b>Discharge Category</b>	0 Industrial Contributors. <b>0 Points</b>
<b>Wastewater Treatment</b>	Secondary or Better <b>0 Points</b>
<b>Downstream Impacts</b>	No impacts known <b>0 Points</b>
<b>Total Checklist Points:</b>	<b>14 Points</b>
<b>Recommended Monitoring Frequency (from Checklist):</b>	No tests recommended.
<b>Limit Required?</b>	No
<b>TRE Recommended? (from Checklist)</b>	No

- No WET testing is required because information related to the discharge indicates the potential for effluent toxicity is believed to be low.

# Beloit Town Outfall Location



Attachment #3  
**2007 Ammonia Nitrogen Limits Calculations**

<b>AMMONIA (as N) LIMITS</b>			
<b>CLASSIFICATION:</b>	<b>WARMWATER SPORTFISH</b>		
EFFLUENT FLOW (MGD)	1.0		
EFFLUENT FLOW (cfs)	1.547		
MAX. EFFLUENT pH (s.u.)	8.39		
<b>BACKGROUND INFORMATION:</b>	<i>May-Sept</i>	<i>Oct-March</i>	<i>April</i>
7-Q <sub>10</sub> (cfs)	219	219	219
7-Q <sub>2</sub> (cfs)	448	448	448
Ammonia (mg/L)	0.07	0.17	0.09
Temperature (deg C)	23	3	9
pH (std. units)	8.21	7.97	7.97
% of river flow used	100	25	25
Reference weekly flow	219	54.75	54.75
Reference monthly flow	380.8	95.2	95.2
<b>CRITERIA (in mg/L):</b>			
4-day Chronic (@ backgrd. pH)			
early life stages present	2.55		6.35
early life stages absent		10.31	
30-day Chronic (@ backgrd. pH)			
early life stages present	1.02		2.54
early life stages absent		4.12	
<b>EFFLUENT LIMITS (in mg/L):</b>	<i>May-Sept</i>	<i>Oct-March</i>	<i>April</i>
<b>Weekly average</b>			
early life stages present	354.06		227.87
early life stages absent		369.17	
<b>Monthly average</b>			
early life stages present	235.17	148.37	153.29
early life stages absent		247.44	221.16

**Note:** Early life stages present limits apply during the months of April through September and the early life stages absent limits apply to October through March for warm water sport fish community streams where burbot are not expected to be present.



November 07, 2025

Joseph Rose, Director of Public Works  
714 E Morning Glory Ln  
Beloit, WI 53511

Subject: Beloit Town Wastewater Treatment Facility - WPDES Permit WI-0026930  
Water Quality Trading Plan – CONDITIONAL APPROVAL

Dear Joseph Rose:

The Department recently received an addendum to the Town of Beloit water quality trading plan (WQT Plan) for compliance with phosphorus effluent limits at the Beloit Town Wastewater Treatment Facility. The initial plan was received in June of 2019 and approved in September of 2019 (WQT-2019-0014). The addendum was received in September of 2025. Based on WDNR review, the final WQT Plan (dated June 2019) and addendum (dated September 2025) is in general conformance with the WDNR Water Quality Trading Guidance and Section 283.84 of the Wisconsin Statutes. The WQT plan indicates that the Town of Beloit will utilize WQT to comply with the effluent limitations for total phosphorus for their discharge to the Rock River through trading with an upstream point source (City of Columbus) for Rock River TMDL allocations. The WQT Plan proposes the purchase of a total of 1,100 lbs/year of phosphorus credits for the next five years. These credits will be incorporated into the reissued WPDES permit and will be used to demonstrate compliance with final phosphorus effluent limits.

The Department conditionally approves the WQT Plan as a basis for water quality trading during the next WPDES permit term. The Department has assigned the WQT plan a tracking number of WQT-2025-0020 and 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 for total phosphorus.

If you have any questions or comments, please contact me at 608-419-4155 or at [betsyjo.howe@wisconsin.gov](mailto:betsyjo.howe@wisconsin.gov).

Thank You,

BetsyJo Howe  
South Central Region WQT Coordinator  
Wisconsin Department of Natural Resources

e-CC:

Richard Saari, Town of Beloit  
Jen Jerich, WDNR  
Ashley Brechlin, WDNR



Town of Beloit WWTP  
3629 S. Walters Rd. | Beloit, WI, 53511

# Town of Beloit Water Quality Trading Plan

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June 2019

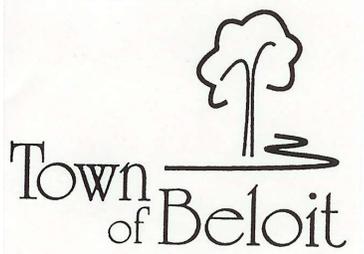


Prepared by:

**Donohue & Associates, Inc.**

3311 Weeden Creek Road  
Sheboygan, WI 53081  
donohue-associates.com

Donohue Project No.: 13267



**Joe Rose – Director of Public Works**

3640 S Walters Rd. • Beloit, Wisconsin 53511-8666 • (608) 473-0512 • email [jrose@town.beloit.wi.us](mailto:jrose@town.beloit.wi.us)

9/10/2025

To: Wisconsin DNR

REGARDING: Water Quality Trading Review for permit reissuance

The Town of Beloit has a water quality trading agreement in 2020 and will expire in 2040. As of today, we have no changes to our facility, the phosphorus loadings, projected flows to our treatment plant, that would require us to have issues with meeting our limits with the number of credits we currently are purchasing from the City of Columbus. No changes have been made to the agreement with Columbus, nor do we anticipate that to occur. The water quality plan that was submitted to the department has been reviewed and determined to be accurate. We have had no issues meeting our limits with the plan in place.

We look forward to continuing this partnership with the City of Columbus as outlined in the agreement. We also appreciate the Wisconsin DNR staff and department as a whole for finding a fair and equitable solution to the hurdles we face throughout the state.

A handwritten signature in cursive script that reads "Joe Rose".

Joe Rose  
Director of Public Works  
Town of Beloit  
[jrose@town.beloit.wi.us](mailto:jrose@town.beloit.wi.us)

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## **APPENDICES**

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Appendix A – Water Quality Trading Notice of Intent

Appendix B – Water Quality Trading Checklist

Appendix C – Water Quality Trading Agreement

## ABBREVIATIONS

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BOD	Biochemical Oxygen Demand
HUC	Hydrologic Unit Code
mg/L	milligrams/liter
mgd	Million Gallons per Day
MDV	Multi-Discharger Variance
No.	Number
ppd	Pounds per Day
RA	Running Average
TBEL	Technology Based Effluent Limit
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TPW	Total Present Worth
TSS	Total Suspended Solids
UV	Ultraviolet
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System
WQBEL	Water Quality Based Effluent Limit
WQT	Water Quality Trading
WWTP	Wastewater Treatment Plant

## 1. BACKGROUND

### 1.1 GENERAL INFORMATION

Permittee WPDES Permit Number: WI-0026930-08-0

Permittee Contact Information: Joe Rose  
Public Works Director  
Town of Beloit WWTP  
3629 S Walters Road  
Beloit, WI 53511

Pollutant for which credits will be generated: Phosphorus

### 1.2 INTRODUCTION

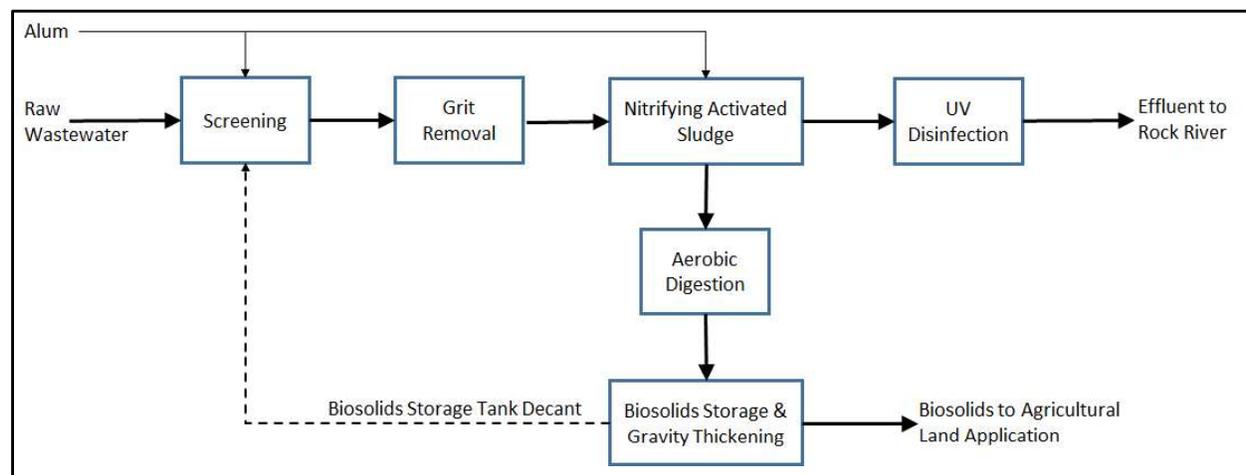
The Town of Beloit, Wisconsin owns and operates the Beloit Wastewater Treatment Plant (WWTP), which serves a population of approximately 7,800. The plant has an average day design flow capacity of 1.0 million gallons per day (mgd). The treatment plant operates under the Wisconsin Pollution Discharge Elimination System Permit (WPDES) permit No. WI-0026930-08-0. The permit was reissued on January 1, 2015. As part of the permit, the WWTP is required to meet a monthly average effluent total phosphorus (TP) interim limit of 1.0 mg/L. The permit also included water quality based effluent limits (WQBEL) derived from the Rock River Total Maximum Daily Load (TMDL) allocations for the Rock River Basin as shown in Table 1. The Rock River TMDL-derived effluent limits become effective on January 1, 2024. Lastly, a compliance schedule and required actions for meeting the limits are also in the permit. A Final Compliance Alternatives Plan was submitted on March 31, 2019. The Plan outlined the final strategy to achieve phosphorus compliance. Specifically, the Plan selected WQT to achieve compliance, and identified the City of Columbus WWTP as a potential trade partner. This report is being submitted as a follow-up to the Final Compliance Alternatives Plan and outlines how the proposed trading will comply with s. 283.84, Wis. Stats., that credits are generated in an acceptable manner and correctly calculated, and that the permittee will comply with their WQBELs. The Town of Beloit notice of intent (NOI) for WQT is provided in Appendix A and the WQT checklist is provided in Appendix B.

**Table 1. Future WPDES Monthly Average TMDL Allocations**

Month	Monthly Average TP Effluent Limit (ppd)
January	1.95
February	2.07
March	1.82
April	1.95
May	1.85
June	1.79
July	1.39
August	1.20
September	1.09
October	1.19
November	1.44
December	1.74

### 1.3 EXISTING CONDITIONS

The WWTP consists of raw wastewater screening and grit removal, nitrifying activated sludge treatment in two package plants, and ultraviolet (UV) disinfection. Phosphorus is removed chemically by multi-point alum addition. Specifically, chemical is added to preliminary treatment and to the activated sludge systems via the clarifier inlets. Waste activated sludge is aerobically digested. The digested biosolids are stored on site in a tank and are land applied to local agricultural land, most of which is owned by the Town and leased to local farmers. Stored biosolids thicken and separate over time. Decant from the top of the tanks is occasionally pumped back to preliminary treatment. Figure 1 presents a simple flow schematic of the plant. As for phosphorus removal, the Town uses alum addition (i.e., chemical phosphorus removal) in combination with activated sludge secondary treatment to achieve compliance. For the period of record, the Town has fed an average of 50 gallons per day of alum for phosphorus removal.



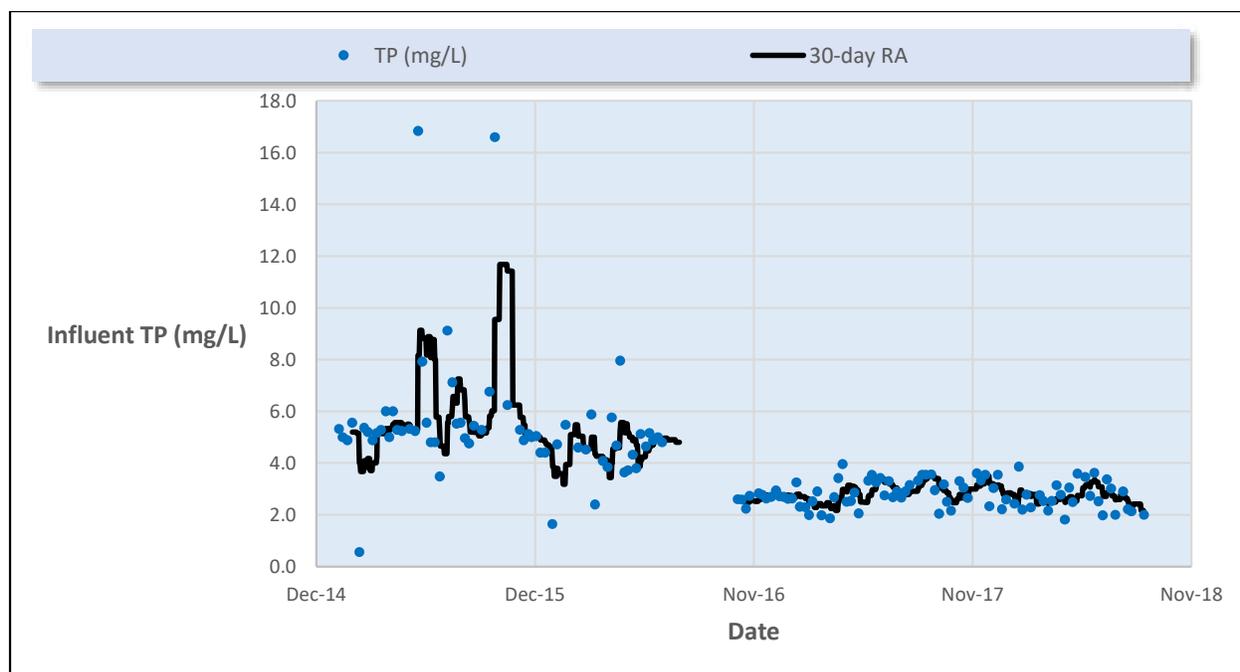
**Figure 1. Beloit WWTP Flow Diagram**

### 1.3.1 CURRENT FACILITY LOADINGS & PERFORMANCE

Table 2 provides an updated summary of current influent and effluent flows and loadings for the Town of Beloit WWTP from January 1, 2015 to August 31, 2018. As discussed in the Preliminary Compliance Alternatives Plan, Loadings are consistent with a primarily domestic wastewater, both in terms of per capita flow and average influent concentration. Table 2 shows that from 2015 through 2018, effluent phosphorus has consistently been below the interim effluent limit. The effluent phosphorus 30-day running average (RA), which is used to approximate average monthly performance capabilities, ranged from 0.55 mg/L to as high as 1.03 mg/L. However, the 1.03 mg/L 30-day RA straddled two months, both of which had monthly averages below the interim permit limit of 1.0 mg/L. The Town uses alum addition (i.e., chemical phosphorus removal) in combination with activated sludge secondary treatment to achieve compliance. For the period of record, the Town has fed an average of 50 gallons per day of alum for phosphorus removal. Influent and effluent TP concentrations and masses from January 1, 2015 to August 31, 2018 are shown graphically in Figures 2, 3, 4, and 5.

**Table 2. Beloit WWTP Influent and Effluent Flows and Loadings (2015-2018)**

Location	Flow	BOD5	TSS	TP
Influent Wastewater	0.512 mgd	252 mg/L 1,081 ppd	255 mg/L 1,094 ppd	3.9 mg/L 16.4 ppd
Final Effluent	0.460 mgd	12.3 mg/L 45.1 ppd	10.9 mg/L 37.7 ppd	0.81 mg/L 3.1 ppd



**Figure 2. Beloit WWTP Influent TP (mg/L)**

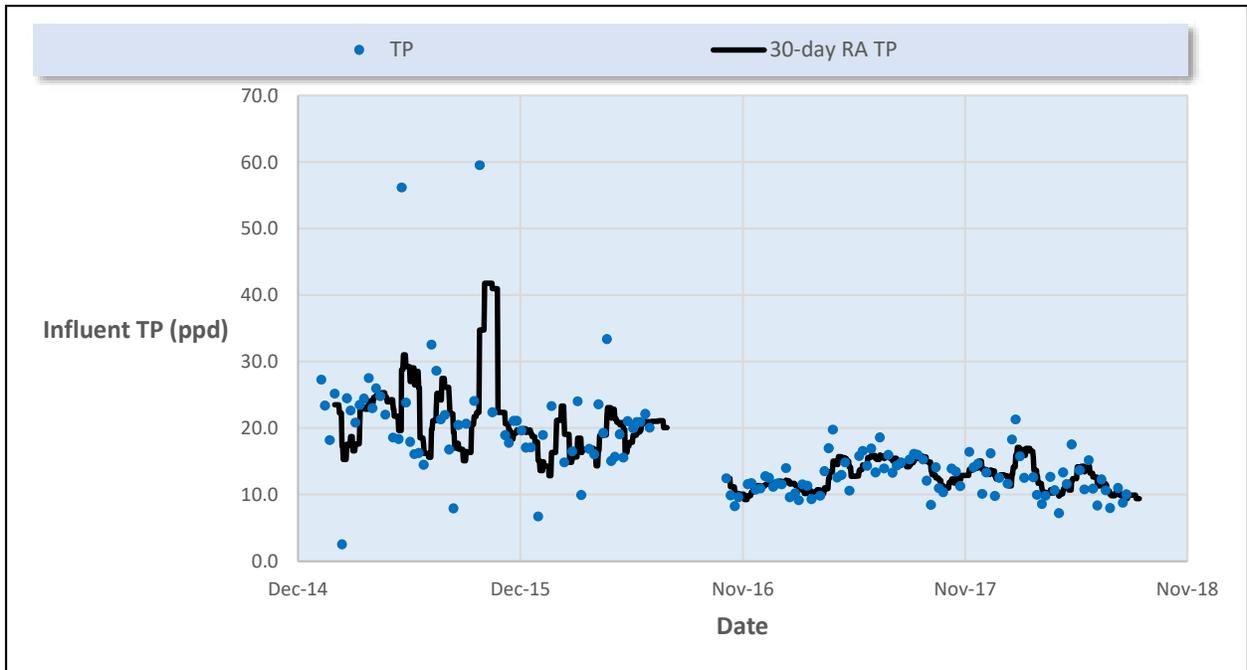


Figure 3. Beloit WWTP Influent TP (ppd)

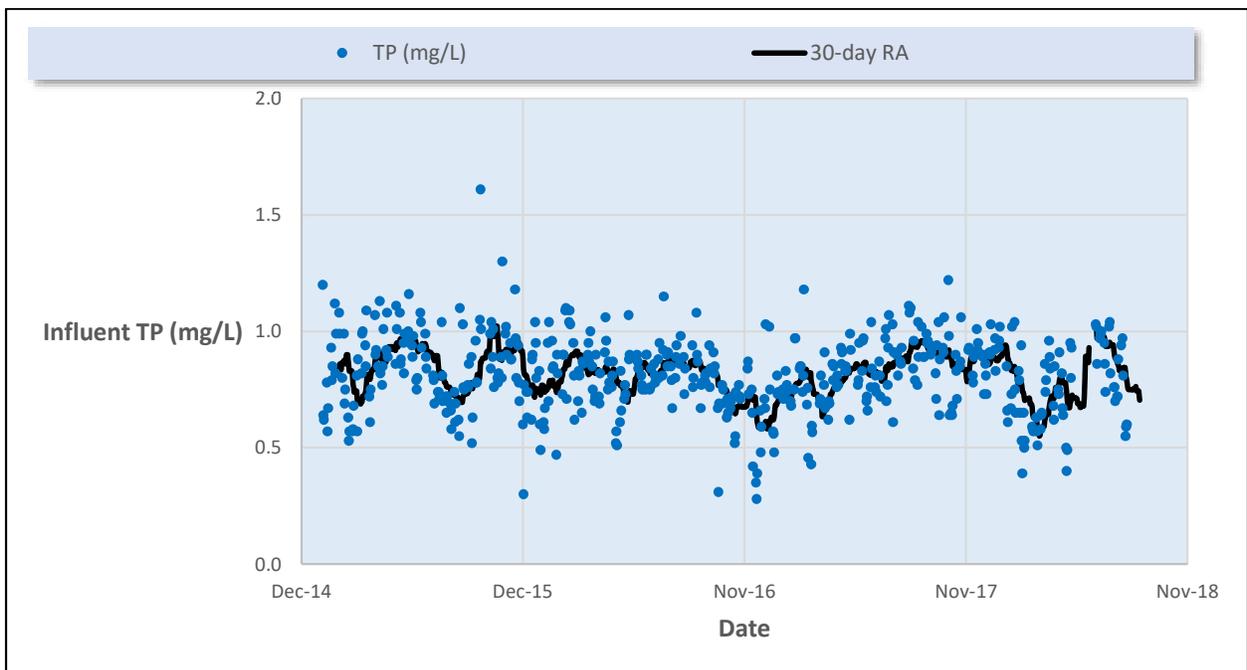
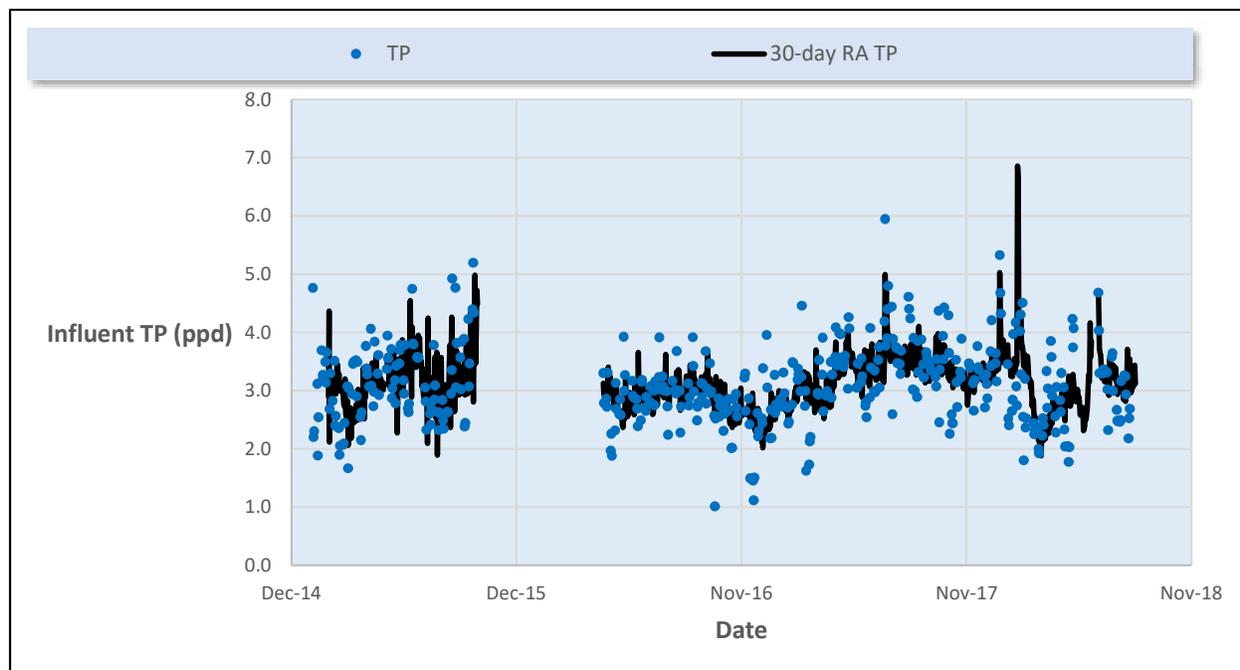


Figure 4. Beloit WWTP Effluent TP (mg/L)



**Figure 5. Beloit WWTP Effluent TP (ppd)**

### 1.3.2 HISTORICAL PHOSPHORUS LOADINGS

The average monthly flows, TP loadings, and TP concentrations for the most recent complete year (2017) of data are provided in Table 3. Also provided in Table 3 is a comparison of the average monthly phosphorus loadings compared to the pending TMDL. The annual offset, which was also calculated on the 2017 total annual effluent phosphorus loadings and pending TMDL allocations, is provided in Table 4. This offset is the amount of phosphorus that the facility would need to mitigate in the future to meet the TMDL. The required annual offset was calculated to be 606 lb/yr. Data from 2017 was used because it is the most recent complete year of data and because phosphorus concentrations and loadings remain consistent from 2016 to 2018.

**Table 3. 2017 Average Monthly flows and TP Loadings and Concentrations**

Month	Influent Flow (mgd)	Effluent Flow (mgd)	Influent TP (mg/L)	Influent TP (ppd)	Effluent TP (mg/L)	Effluent TP (ppd)	TMDL TP Allocation (ppd)	Comparison to Pending TMDL
January	0.534	0.465	12.0	53.6	0.734	2.84	1.95	Greater Than
February	0.525	0.450	11.3	49.6	0.777	2.91	2.07	Greater Than
March	0.554	0.472	10.3	47.8	0.730	2.87	1.82	Greater Than
April	0.606	0.501	15.0	76.0	0.756	3.16	1.95	Greater Than
May	0.612	0.521	12.7	65.1	0.840	3.65	1.85	Greater Than
June	0.559	0.469	15.9	74.2	0.833	3.26	1.79	Greater Than
July	0.624	0.526	15.5	80.5	0.847	3.71	1.39	Greater Than
August	0.564	0.484	14.4	68.0	0.927	3.74	1.20	Greater Than
September	0.524	0.444	14.9	65.0	0.916	3.39	1.09	Greater Than
October	0.531	0.460	11.0	48.6	0.890	3.41	1.19	Greater Than
November	0.522	0.449	12.9	56.2	0.836	3.13	1.44	Greater Than
December	0.515	0.438	13.8	59.3	0.888	3.24	1.74	Greater Than
<b>Average</b>	0.556	0.473	13.324	61.988	0.831	3.277	1.623	-

**Table 4. Required TP Offset Based on 2017 Flows and TP Loadings and Concentrations**

Month	Influent Flow (mgd)	Effluent Flow (mgd)	Effluent TP (ppd)	TMDL TP Allocation (ppd)	Monthly TP Offset (ppd)	Monthly TP Offset (lb)
January	0.534	0.465	2.84	1.95	0.89	27.7
February	0.525	0.450	2.91	2.07	0.84	23.6
March	0.554	0.472	2.87	1.82	1.05	32.6
April	0.606	0.501	3.16	1.95	1.21	36.2
May	0.612	0.521	3.65	1.85	1.80	55.9
June	0.559	0.469	3.26	1.79	1.47	44.0
July	0.624	0.526	3.71	1.39	2.32	72.1
August	0.564	0.484	3.74	1.20	2.54	78.9
September	0.524	0.444	3.39	1.09	2.30	69.0
October	0.531	0.460	3.41	1.19	2.22	69.0
November	0.522	0.449	3.13	1.44	1.69	50.7
December	0.515	0.438	3.24	1.74	1.50	46.5
<b>Total Offset =</b>					<b>606</b>	<b>lb/yr</b>

## 1.4 SUMMARY OF PREVIOUS OPTIMIZATION ACTIVITIES

The Town of Beloit implemented several activities aimed at assessing the ability of the existing WWTP to be optimized to reduce effluent phosphorus and potentially meet the future WQBELs without further upgrade of the plant. These activities are listed below and were summarized in the Preliminary Compliance Alternatives Plan. An update was provided in the Final Compliance Alternatives Plan.

- Increase Alum Dosage
- Implement Multi-Point Alum Feed
- Install an Effluent Orthophosphate Analyzer

- Characterize Effluent Phosphorus as Dissolved or Suspended

One of the main conclusions drawn from the optimization actions was that optimized chemical polishing would be able to convert much of the reactive phosphorus to particulate, which would then be amenable to meeting the WQT scenarios, which were outlined in the Final Compliance Alternatives Plan and will be discussed later in this Plan.

## 2. WATER QUALITY TRADING

WQT is a compliance method consisting of directly adjusting permit levels to be less restrictive by reducing pounds of phosphorus discharged into the water body elsewhere. These trades can be with point sources or non-point sources. Non-point source and point source trading were evaluated as part of the Preliminary and Final Compliance Alternatives Plan. Nonpoint credits can be generated by implementing agricultural BMPs, dredging, lake treatment, wetland restoration, and through urban practices to reduce phosphorus from entering the Rock River. Due to limited areas for improvement, and thus, limited potential for significant credit generation, non-point source options were eliminated in the Preliminary Compliance Alternatives Plan and not pursued further in the Final Plan. Point source WQT was identified as the recommended alternative to achieve phosphorus compliance in the Final Compliance Alternatives Plan and will be discussed in more detail in this section.

The first step in assessing WQT involves quantifying the pounds of phosphorus that need to be offset through a trade. Several scenarios were evaluated in the Final Compliance Alternatives Plan with varying levels of chemical treatment and water quality trading. The estimated current and design required phosphorus offsets for WQT for the selected scenario is provided in Table 5. Design conditions were quantified by adjusting the monthly average flows by the same factor, so the annual average of all twelve months equaled the design average flow of 1.0 mgd. It should be noted that the offsets in Table 5 do not include any trade ratio factors. The actual mass to be traded would have to be greater to account for trade ratios, which will be discussed later in this plan.

**Table 5. Required Phosphorus Offsets for WQT Trading**

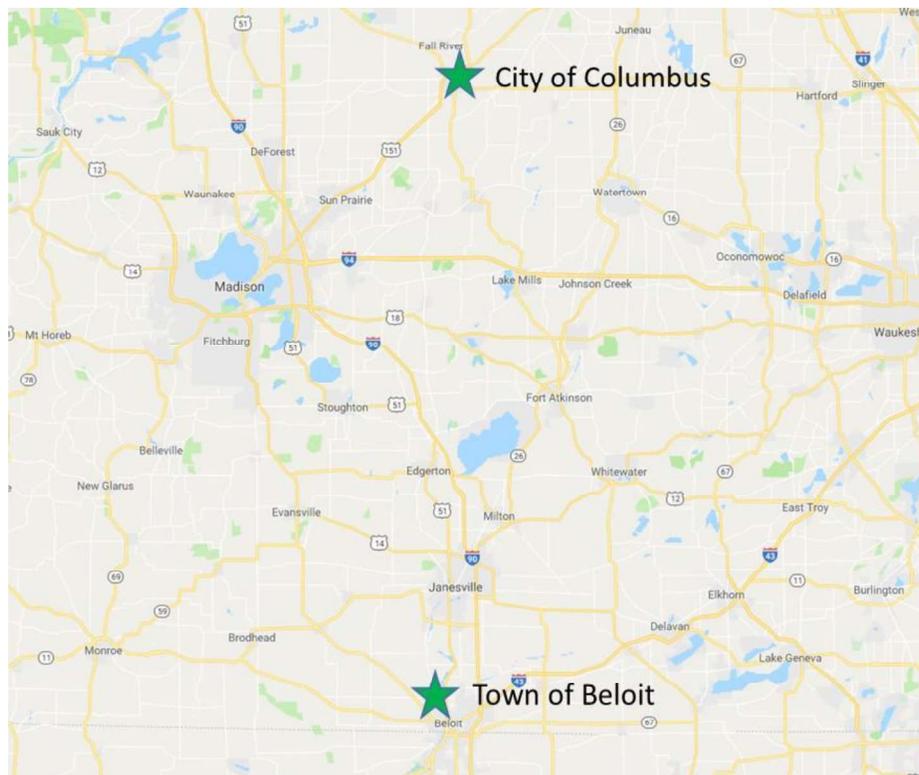
Month	Required Phosphorus Offsets	
	Current <sup>1</sup> (lbs P)	Design <sup>1</sup> (lbs P)
January	27.7	125.8
February	23.6	114.4
March	32.6	131.6
April	36.2	141.6
May	50.5	170.6
June	40.2	149.5
July	65.7	186.9
August	63.0	174.5
September	56.2	160.3
October	58.3	164.2
November	46.7	151.6
December	36.6	137.5
<b>Total</b>	<b>537</b>	<b>1,808</b>

<sup>1</sup>. Offsets do not include a point source trade ratio.

### 2.1 IDENTIFIED POINT SOURCE WQT PARTNERS

Potential point source credit generators include WWTPs, industrial dischargers, and MS4s. No significant industrial or MS4 dischargers were identified as potential credit generators. However, there are several WWTPs upstream of the Town of Beloit WWTP discharge in a position to generate phosphorus credits and

possibly trade. Of the potential WWTP that can generate credits, the City of Columbus was selected as the optimal, mutually beneficial trading partner. Note that the City of Columbus already has an established trade with NASCO. Figure 6 provides the location of the City of Columbus with respect to the Town of Beloit.



**Figure 6. Location of Credit Generator**

## 2.2 TRADE RATIO CALCULATION AND CREDIT QUANTIFICATION

The trade ratio for the potential point source phosphorus credit generators can be calculated using the equation below.

$$\text{Trade Ratio} = (\text{Delivery} + \text{Downstream} + \text{Equivalency} + \text{Uncertainty} - \text{Habitat Adjustment}):1$$

Delivery = A factor determined using the USGS SPARROW model that accounts for trading partners located in a different HUC-12

Downstream = A factor used if the credit generator is downstream of the credit user

Equivalency = A factor used for trades involving pollutants other than TSS or phosphorus

Uncertainty = A factor used to account for uncertainties associated with nonpoint source trades that originate from climatic variability, potential inaccuracies in field testing or modeling of the

amount of pollutant controlled by a management practice, and the reliability of the management practice to perform

Habitat Adjustment = A factor that accounts for aquatic habitat restoration efforts that meet applicable WDNR and Natural Resource Conservation Service (NRCS) technical standards

For upstream point source credit generators, the City of Columbus, the Downstream, Equivalency, and Habitat Adjustment factors are 0. The delivery factor is also set to 0, as the TMDL did not assume a delivery factor, although the City of Columbus is located in a different HUC-12. The Town of Beloit HUC-12 is 070900021502. The HUC-12 of the City of Columbus is 070900011001. The only factor taken into account in the trade ratio equation is uncertainty, which is set to 1 for traditional point sources. Thus, the estimated trade ratio is set at the minimum of 1.1:1. It is also important to note that any credits generated by point source need to be used in the same month they are generated in.

Based on a trade ratio of 1.1:1, the estimated monthly credits available for trade at current and design flows from the City of Columbus, is provided in Table 6. Table 6 shows that sufficient credits are available from the City of Columbus to offset all of the phosphorus in exceedance of the TMDL allocations.

**Table 6. Estimated Credits at Current and Future Flows from the City of Columbus WWTP**

Facility Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Current Flows</b>												
City of Columbus WWTP Credits Generated	445	516	514	411	390	370	383	422	423	422	418	395
Town of Beloit WWTP Credits Required	27.7	23.6	32.6	36.2	50.5	40.2	65.7	63.0	56.2	58.3	46.7	36.6
<b>Future Flows</b>												
City of Columbus WWTP Credits Generated	440	511	509	405	385	365	377	417	418	417	413	390
Town of Beloit WWTP Credits Required	126	114	132	142	171	150	187	175	160	164	152	126

Again, the City of Columbus WWTP can provide sufficient credits for the Town of Beloit WWTP to achieve phosphorus compliance. Table 7 shows the annual estimate of required total annual credits required for the next 5 years. A trade ratio of 1.1:1 was again used. To estimate future credit requirements, flows were assumed to increase linearly from current 2017 flows to the design flow (1.0 mgd) by year 2032. Flows from 2032 to 2037 were then assumed to increase at the same rate. Thus, credits required increased linearly from current (2017) to design by year 2032, and increased at the same rate thereafter to 2037.

**Table 7. Five Year Estimate of Required Total Annual Required Credits Generated**

Year #	Required Credits Generated
0	591
1	684
2	777
3	871
4	964
5	1,057 <b>(permit cycle 1)</b>

A trading agreement should be set up in five-year increments and be sufficiently conservative to cover monthly credits generated over the five-year period. Thus, for the first permit cycle (five years), the total annual credits required would be 1,100. Table 8 shows the distribution of the 1,100 required credits on a monthly basis. The credits in Table 8 were distributed based on the distribution of The Town of Beloit's future monthly average TMDL allocations, as shown in Table 1.

**Table 8. Monthly Distribution of Required Credits**

Month	Required Credits Generated
January	112.4
February	107.8
March	104.9
April	108.8
May	106.7
June	99.9
July	80.1
August	69.2
September	60.8
October	68.6
November	80.4
December	100.3
<b>Total</b>	<b>1,100</b>

With the required credits in Table 8 and a trade ratio of 1.1:1, the Town of Beloit will be reissued a permit with the TMDL limits in Table 9. The City of Columbus will also be reissued a permit. The Current City of Columbus WPDES monthly average TMDL allocations are provided in Table 10. The TMDL allocations in Table 10 include the existing trade with NASCO, which accounts for 0.28 ppd of credits. The adjusted TMDL limits in the reissued permit for the City of Columbus are shown in Table 11.

**Table 9. Town of Beloit Future WQT Adjusted WPDES Monthly Average TMDL Allocations**

Month	Adjusted Monthly Average TP Effluent Limit (ppd)
January	5.2
February	5.6
March	4.9
April	5.2
May	5.0
June	4.8
July	3.7
August	3.2
September	2.9
October	3.2
November	3.9
December	4.7

**Table 10. Current City of Columbus WPDES Monthly Average TMDL Allocations**

Month	Monthly Average TP Effluent Limit (ppd)
January	16.11
February	20.60
March	18.55
April	15.37
May	14.15
June	13.88
July	13.89
August	15.30
September	15.83
October	15.30
November	15.65
December	14.33

**Table 11. WQT Adjusted City of Columbus WPDES Monthly Average TMDL Allocations**

Month	Monthly Average TP Effluent Limit (ppd)
January	12.48
February	16.75
March	15.16
April	11.74
May	10.71
June	10.55
July	11.30
August	13.07
September	13.80
October	13.09
November	12.97
December	11.09

### 2.3 PROJECT TIMELINE

The Final WQT Plan and WQT Agreement will be submitted to the WDNR by July 1, 2019. WQT will begin January 1, 2020 with the reissuance of the Town of Beloit's next permit.

### 2.4 DURATION OF WQT AGREEMENT

A copy of the Draft WQT Agreement is provided in Appendix C. The WQT Agreement is expected to be approved in July of 2019 and will expire in 20 years on December 31, 2040. Both parties to the WQT Agreement will have an opportunity to amend and/or modify the WQT Agreement every five years.

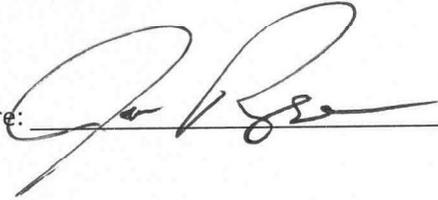
### 2.5 METHOD FOR QUANTIFYING CREDITS

Because the Town of Beloit and City of Columbus WWTP will be reissued permits with new TMDL limits that account for the WQT, the facilities will only need to meet the new permit limits to verify sufficient credits have been generated and used.

### 2.6 TRACKING AND VERIFICATION PROCEDURES

The Town of Beloit and City of Columbus WWTPs will verify credits required and generated through effluent monitoring reported to the WDNR on their respective monthly discharge monitoring reports (DMRs). WQT Certification

The Town of Beloit certifies that the information contained in this Water Quality Trading Plan and its attachments are accurate and correct to the best of their knowledge.

Signature:  \_\_\_\_\_

Date: 6-24-19

**Joe Rose**  
Public Works Director  
Town of Beloit WWTP  
3629 S Walters Road  
Beloit, WI 53511

# APPENDIX A

## WATER QUALITY TRADING NOTICE OF INTENT

---

## Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14)

**Notice:** Pursuant to s. 283.84, Wis. Stats., and ch. NR 217 Wis. Adm. Code, this form must be completed by any WPDES permittee that is using water quality trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

Applicant Information				
Permittee Name Town of Beloit WWTP		Permit Number WI- 0026930-08-0		Facility Site Number
Facility Address 271 South Afton Road			City Beloit	State WI
Project Contact Name (if applicable) Joe Rose			Address 3629 S. Walters Road	ZIP Code 53511
Project Name Water Quality Trading Plan			City Beloit	State WI
Receiving Water Name Rock River			Parameter(s) being traded Phosphorus	HUC 12(s) 070900021502
Is the permittee in a point or nonpoint source dominated watershed? (See PRESTO results - <a href="http://dnr.wi.gov/topic/surfacewater/presto.html">http://dnr.wi.gov/topic/surfacewater/presto.html</a> )			<input checked="" type="radio"/> Point source dominated <input type="radio"/> Nonpoint source dominated	

Credit Generator Information	
Credit generator type (select all that apply):	<input checked="" type="checkbox"/> Permitted Discharge (non-MS4/CAFO) <input type="checkbox"/> Urban nonpoint source discharge <input type="checkbox"/> Permitted MS4 <input type="checkbox"/> Agricultural nonpoint source discharge <input type="checkbox"/> Permitted CAFO <input type="checkbox"/> Other - Specify: _____
Are any of the credit generators in a different HUC 12 than the applicant?	<input checked="" type="radio"/> Yes; HUC 12: <u>070900011001</u> <input type="radio"/> No <input type="radio"/> Unsure
Are any of the credit generators downstream of the applicant?	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unsure
Will a broker/exchange be used to facilitate trade?	<input type="radio"/> Yes; Name: _____ <input checked="" type="radio"/> No <input type="radio"/> Unsure

Point to Point Trades (Traditional Municipal / Industrial Discharge, MS4, CAFO)				
Discharge Type	Permit Number	Name	Contact Address	Is the point source credit generator currently in compliance with their permit requirements?
<input checked="" type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO	WI-0021008-08-0	City of Columbus Wastewater Treatment Facility	PO Box 192, 105 North Dickason Boulevard	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure
<input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure
<input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure
<input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure
<input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure

Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14)

Page 2 of 2

**Point to Nonpoint Trades (Non-permitted Agricultural, Non-Permitted Urban, etc.)**

List the practices that will be used to generate credits:

Method for quantifying credits generated:  Monitoring  
 Modeling, Names: \_\_\_\_\_  
 Other: \_\_\_\_\_

Projected date credits will be available:

**The preparer certifies all of the following:**

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.

Signature of Preparer

*Ryan M. Allen*

Date Signed

4/17/19

**Authorized Representative Signature**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Authorized Representative

*Joe Rose*

Date Signed

6-24-19

# APPENDIX B

## WATER QUALITY TRADING CHECKLIST

---

**Notice:** Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that intends to pursue pollutant trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

**Applicant Information**

Permittee Name Town of Beloit WWTP		Permit Number WI- 0026930-08-0	Facility Site Number	
Facility Address 271 South Afton Road			City Beloit	State WI
Project Contact Name (if applicable) Joe Rose			Address 3629 S. Walters Road	City Beloit
			State WI	ZIP Code 53511
Project Name Water Quality Trading Plan				
Receiving Water Name Rock River		Parameter(s) being traded Phosphorus	HUC 12(s) 070900021502	

**Credit Generator Information**

Credit generator type (select all that apply):

Permitted Discharge (non-MS4CAFO)     Urban nonpoint source discharge  
 Permitted MS4     Agricultural nonpoint source discharge  
 Permitted CAFO     Other - Specify: \_\_\_\_\_

Are any of the credit generators in a different HUC 12 than the applicant?     Yes; HUC 12: 070900011001  
 No

Are any of the credit generators downstream of the applicant?     Yes  
 No

Will a broker/exchange be used to facilitate trade?     Yes (include description and contact information in WQT plan)  
 No

**Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO)**

Are each of the point source credit generators identified in this section in compliance with their WPDES permit requirements?     Yes  
 No

Discharge Type	Permit Number	Name	Contact Information	Trade Agreement Number
<input checked="" type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO	WI-0021008-08-0	City of Columbus WWTF	537 River Road, Columbus, WI 53925	
<input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO				
<input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO				
<input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO				
<input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO				

# Water Quality Trading Checklist

Form 3400-208 (1/14)

Page 2 of 3

## Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO) cont.

Does plan have a narrative that describes:		Plan Section
a. Summary of discharge and existing treatment including optimization	<input checked="" type="radio"/> Yes <input type="radio"/> No	Section 1.3
b. Amount of credit being generated	<input checked="" type="radio"/> Yes <input type="radio"/> No	Section 2.2
c. Timeline for credits and agreements	<input checked="" type="radio"/> Yes <input type="radio"/> No	Section 2.3
d. Method for quantifying credits	<input checked="" type="radio"/> Yes <input type="radio"/> No	Section 2.5
e. Tracking and verification procedures	<input checked="" type="radio"/> Yes <input type="radio"/> No	Section 2.6
f. Location of credit generator in proximity to receiving water and credit user	<input checked="" type="radio"/> Yes <input type="radio"/> No	Figure 6
g. Other: _____	<input type="radio"/> Yes <input type="radio"/> No	

## Point to Nonpoint Trades (Non-Permitted Urban, Agricultural, Other)

Discharge Type	Practices Used to Generate Credits	Method of Quantification	Trade Agreement Number	Have the practice(s) been formally registered?
<input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part
<input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part
<input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part
<input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part
<input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part
<input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part
<input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part
<input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part
<input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part

Does plan have a narrative that describes:		Plan Section
a. Description of existing land uses	<input type="radio"/> Yes <input type="radio"/> No	
b. Management practices used to generate credits	<input type="radio"/> Yes <input type="radio"/> No	
c. Amount of credit being generated	<input type="radio"/> Yes <input type="radio"/> No	
d. Description of applicable trade ratio per agreement/management practice	<input type="radio"/> Yes <input type="radio"/> No	
e. Location where credits will be generated	<input type="radio"/> Yes <input type="radio"/> No	
f. Timeline for credits and agreements	<input type="radio"/> Yes <input type="radio"/> No	
g. Method for quantifying credits	<input type="radio"/> Yes <input type="radio"/> No	

**Water Quality Trading Checklist**

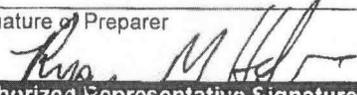
Form 3400-208 (1/14)

Page 3 of 3

Does plan have a narrative that describes:		Plan Section
h. Tracking procedures	<input type="radio"/> Yes <input type="radio"/> No	
i. Conditions under which the management practices may be inspected	<input type="radio"/> Yes <input type="radio"/> No	
j. Reporting requirements should the management practice fail	<input type="radio"/> Yes <input type="radio"/> No	
k. Operation and maintenance plan for each management practice	<input type="radio"/> Yes <input type="radio"/> No	
l. Location of credit generator in proximity to receiving water and credit user	<input type="radio"/> Yes <input type="radio"/> No	
m. Practice registration documents, if available	<input type="radio"/> Yes <input type="radio"/> No	
n. History of project site(s)	<input type="radio"/> Yes <input type="radio"/> No	
o. Other: _____	<input type="radio"/> Yes <input type="radio"/> No	

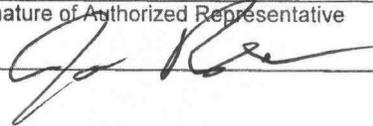
**The preparer certifies all of the following:**

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

Signature of Preparer 	Date Signed 6/21/19
--	------------------------

**Authorized Representative Signature**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Authorized Representative 	Date Signed 6-24-19
---	------------------------

# APPENDIX C

## WATER QUALITY TRADING AGREEMENT

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## WATER QUALITY TRADING AGREEMENT

This Water Quality Trading Agreement ("Agreement") is made by and between the Town of Beloit, Wisconsin ("Town") and the City of Columbus, Wisconsin ("City"), also referred to as the "parties." In consideration for the obligations and covenants set forth below, the parties agree as follows:

A. Water quality trading ("WQT") is an alternative compliance option for Wisconsin Pollutant Discharge Elimination System ("WPDES") permit holders and it is authorized by Section 283.84 of the Wisconsin Statutes.

B. The Wisconsin Department of Natural Resources ("WDNR") has issued Water Quality Trading Guidance ("Guidance"). The most recent version was published in August, 2013 and the United States EPA accepted it.

C. This Agreement sets forth an arrangement to meet the terms and requirements of WQT as set forth in Section 283.841 of the Wisconsin Statutes, so that the Town shall achieve compliance with its WPDES permit.

D. Funds exchanged as part of this Agreement shall be used to purchase credits that will reduce pollutant loads identified in the Rock River Total Maximum Daily Load ("TMDL").

E. Before WDNR can modify or reissue WPDES permits that allow trading, the Town must submit a trading plan ("WQT Plan") and checklist ("WQT Checklist"). The Town submitted its WQT Plan and WQT Checklist to WDNR by July 1, 2019.

F. The Town is a WPDES permit holder (Permit No. WI-0026930-08-0) that discharges to the Rock River. The Town will purchase total phosphorus ("TP") credits pursuant to this Agreement to fulfill its permit requirements.

G. The City is a WPDES permit holder (Permit No. WI-0021-008-09-0) in the Nolan Creek-Crawfish River Watershed and the City shall generate and sell TP credits pursuant to this Agreement to the Town.

H. All water quality credits generated and purchased pursuant to this Agreement shall be used for compliance within the month and year that the credits are generated and are not available for use before they are actually generated.

### 1. Purchase and Sale of TP Credits.

Subject to the conditions set forth in this Agreement, the City agrees to sell to the Town and the Town agrees to purchase from Seller 1,100 TP credits annually. The initial price per credit shall be \$55. The price per credit shall increase on January 1, 2021 and on January 1 every year thereafter during the term of this Agreement by the percent increase in the unit price used in the Multi-Discharger Variance (MDV) as calculated by the Wisconsin Department of Natural Resources (WDNR), or 2%, whichever is less. In the event that the MDV is no longer used by the WDNR, the increase shall be 2%. The City shall generate and otherwise make TP credits available for purchase pursuant to the Agreement no later than January, 2020.

2. Payment Terms.

The Town shall make two installments every year to the City for its TP credits. The first installment shall be made no later than January 31 of each year. The second installment shall be made no later than June 30 of each year.

The Town shall be prepaying for its annual TP credits.

If this Agreement fails to become effective within sixty (60) days of the Town making its initial payment to the City, the City shall reimburse the Town for the entire amount of its initial payment within ninety (90) days. If this Agreement terminates, regardless of the reason, and funds remain on account with the City for which TP credits have not yet been generated, the City shall refund to the Town the balance of the funds, prorated based on a monthly basis of pounds used, within thirty (30) days. The City shall notify The Town within ten (10) days of the City becoming aware that pollutant reduction credits provided by the City are unavailable for whatever reason.

3. Verification of Credit.

The City shall verify credit generation through effluent monitoring reported to the WDNR on monthly discharge monitoring reports ("DMRs"), with concentrations converted to a monthly mass, said mass to be compared to the monthly mass limit provided by the City's WPDES permit. The City shall comply with the WQT Plan submitted by the Town by July 1, 2019, subject to any conditions of approval by WDNR.

4. Agreement Timing, Termination and Renewal.

This Agreement shall be effective upon execution by the parties.

This Agreement shall expire on December 31, 2040, which is twenty (20) years from its start date of January 1, 2020, the date on which the Town begins to apply TP credits to meet its daily TMDL TP allocation. This Agreement may be mutually extended by both parties if done so in writing.

This Agreement may be modified only by a written amendment signed by both parties, or their agents.

The City may not opt out of the Agreement unless it provides the Town with three (3) years written notice of termination to the Town.

Every five (5) years during the term of this Agreement, the parties shall address any issues with this Agreement and amend, modify or mutually terminate as needed.

This Agreement and the terms contained herein shall be binding on and enforceable against the parties, their successors, and assigns for as long as this Agreement remains in effect.

5. City's Warranties.

The City hereby represents and warrants to the Town and such warranties shall be applicable and in full force and effect throughout the entire term of this Agreement:

a. The City has the authority to enter into this Agreement and to fulfill its obligations contemplated herein.

b. The City has not entered into any other Agreement that would impede the TP credit generation required by this Agreement. Should, for whatever reason, the City fail to generate the TP credits required in this Agreement, the Town shall be held harmless and not responsible for any detrimental results for the City's failure.

c. The City agrees to generate the TP credits in exchange for payment as outlined in this Agreement.

6. Default, Remedies and Dispute Resolution.

In the event that the parties are unable to reconcile a dispute arising out of or related to this Agreement, the parties agree to first submit the claim to mediation. The parties shall mutually agree on a mediator. The mediation process shall be held in the State of Wisconsin.

All disputes arising out of or relating to this Agreement not otherwise settled in mediation shall then move to arbitration.

The parties shall be responsible for their own attorney's fees related to mediation and/or arbitration, unless the mediator or arbitrator determine otherwise. The parties shall share equally the common costs associated with mediation and/or arbitration.

For any litigation arising out of or relating to this Agreement, including but not limited to enforcement of any term or condition of this Agreement, the prevailing party in any action brought for the purpose of enforcing this Agreement shall be entitled to recover attorney's fees, reasonable expenses and other costs associated with enforcement from the non-prevailing party.

Failure by either party to enforce any term or condition of this Agreement shall not constitute a waiver of that term or condition or of any other term or condition of this Agreement.

The parties agree that a cause of action for breach of any provision of this Agreement shall not accrue until the non-breaching party actually discovers the breach.

The breaching party agrees to indemnify, defend and hold the non-breaching party harmless from and for any and all losses, damages, penalties or fines incurred as a result of the breaching party's breach of this Agreement.

7. Representations.

The parties each make the following representations, as applicable:

a. Each party may authorize an agent to represent it on its behalf. Such agents must have notarized authorization to act on behalf of the City or the Town.

b. The parties (or their agents) warrant that the person signing this Agreement is individually authorized and competent to enter into this Agreement and bind his/her party to the terms herein.

c. The parties have read this Agreement and agree to be bound by its terms.

d. If either party knowingly makes a false or incorrect representation, upon which the other party materially relies, then such a false or incorrect representation shall constitute a material breach of this Agreement and the non-breaching party may terminate this Agreement or seek equitable relief, along with any other appropriate relief.

8. Miscellaneous.

This Agreement shall be governed under and construed pursuant to the laws of the State of Wisconsin and, as applicable, the laws of the United States. Each party acknowledges that it has been given the opportunity to obtain counsel, or that it is represented by counsel, and it has reviewed the entire Agreement and are fully informed of the contents and legal effects thereof.

This Agreement shall be terminated if the WDNR issues a letter disapproving the WQT Plan associated with this Agreement.

If any provisions of this Agreement are held illegal, invalid or unenforceable by a court of competent jurisdiction, such provision(s) shall be deemed severable and the remaining provisions of this Agreement shall remain in full force and effect.

This Agreement constitutes the entire agreement by the parties and supersedes all prior written or oral communications.

Except where specifically provided otherwise in this Agreement, whenever any notice, demand or request is required or provided for under this Agreement, such notice, demand or request shall be made in writing by either email, postage prepaid, certified or registered mail.

Town of Beloit  
Town Administrator  
2871 South Afton Road  
Beloit, Wisconsin 53511  
608-364-2980

City of Columbus  
City Administrator  
105 North Dickason Boulevard  
Columbus, Wisconsin 53925  
920-623-5900

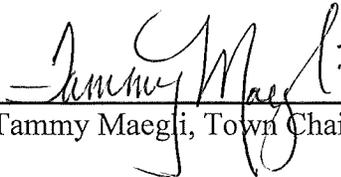
This Agreement may be executed in two or more counterparts, each of which is deemed original, but all constitute one and the same instrument. The parties agree that a facsimile copy of a signature, including a PDF of such signature, shall be deemed an original and binding.

By executing this Agreement, each party grants the other permission to share the price of pollution credits sold and purchased pursuant to the Agreement.

SIGNATURES

Town of Beloit:

City of Columbus

  
\_\_\_\_\_  
Tammy Maegli, Town Chair

Date: 6-17-19

\_\_\_\_\_  
Michael Thom, City Mayor

Date: \_\_\_\_\_

  
\_\_\_\_\_  
Gene Wright, Town Administrator

Date: 6-17-19

\_\_\_\_\_  
Patrick Vander Sanden, City Administrator

Date: \_\_\_\_\_

Attest:

Attest:

  
\_\_\_\_\_  
Karry DeVault, Town Clerk

\_\_\_\_\_  
Patricia Goebel, City Clerk