Permit Fact Sheet

General Information

Permit Number	WI-0066672-01-0
Permittee Name and Address	City of Antigo 700 Edison St, Antigo, WI 54409
Permitted Facility Name and Address	Antigo Waterworks 520 1st Ave, Antigo, WI 54409
Permit Term	November 01, 2025, to September 30, 2030
Discharge Location	Discharge leaves the eastern end of the settling pond. NE¼, NW¼, Section 29; T31N-R11E
Receiving Water	Unnamed tributary to Spring Brook in the Springbrook Creek watershed of Upper Wisconsin River Basin in Langlade County
Stream Flow ($Q_{7,10}$)	1.93 cfs
Stream Classification	**Unnamed Tributary** - Warm Water Sport Fish (WWSF) community. Tributary length approximately 790 ft. **Spring Brook** - Cold Water (CW) community, class 1 trout water, exceptional resource water (ERW) Both are non-public water supply, within the Wisconsin River Basin Total Maximum Daily Load (TMDL) and within the ceded territory.
Discharge Type	Existing continuous discharge

Facility Description

The Antigo Waterworks provides the water supply for the City of Antigo. Water treatment consists of water softening and disinfection before proceeding to the water distribution system. Wastewater generated from this process is sent to a man-made pond which consists of softening tank water (blow off and wasted lime slurry) and backwash water from the anthracite filters. Flow going to the pond is assumed to equal the flow overflowing the dike on the east end of the pond. Effluent is discharged on a continuous basis via Outfall 002 to an unnamed tributary to Spring Brook.

Substantial Compliance Determination

The facility was previously permitted under WPDES general permit WI-0046540-06-0 Water Treatment and/or Conditioning. This is the first issuance under an individual WPDES permit.

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)**
002	An estimate of 0.024 MGD. (Jan. 2020 to Feb. 2025 data)	Representative samples shall be taken at the east end of the settling pond prior to discharging to the unnamed tributary to Spring Brook.

Permit Requirements

1 Surface Water - Monitoring and Limitations

1.1 Sample Point Number: 002- WATER TREATMENT EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Total Daily	
BOD5, Total		mg/L	Monthly	Grab	
Suspended Solids, Total	Daily Max	16 mg/L	Monthly	Grab	
Suspended Solids, Total	Weekly Avg	10 mg/L	Monthly	Grab	
Suspended Solids, Total	Monthly Avg	10 mg/L	Monthly	Grab	
pH Field	Daily Max	9.0 su	Monthly	Grab	
pH Field	Daily Min	6.0 su	Monthly	Grab	
Temperature		deg F	Weekly	Multiple Grab	See the permit Effluent Temperature Monitoring section and Temperature Limits schedule.
Phosphorus, Total	Monthly Avg	0.14 mg/L	Weekly	Grab	
Phosphorus, Total	6-Month Avg	0.048 mg/L	Weekly	Grab	
Phosphorus, Total	Monthly Avg	0.039 lbs/day	Weekly	Grab	
Phosphorus, Total	6-Month Avg	0.01 lbs/day	Weekly	Grab	
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the total monthly discharge of phosphorus and report on the last day of the month on the eDMR. See the Total Maximum Dailly Load (TMDL) Limitations permit section.
Phosphorus, Total		lbs/yr	Annual	Calculated	Beginning November 2026, calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the eDMR. See the Total Maximum Daily Load (TMDL) Limitations permit

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					section.

Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the WPDES general permit WI-0046540-06-0 Water Treatment and/or Conditioning. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

- **Total suspended solids** limits are based on the receiving water classification and replace the limit of 40 mg/l (daily maximum and monthly average) that is included in the general permit.
- **Temperature** monitoring is not currently required in the general permit therefore it is unknown if the permittee is able to meet limits based on the receiving water classification. A schedule to collect data and if necessary, upgrade to meet calculated limitations has been included.
- **Phosphorus** monitoring in the general permit is only required if phosphate addition occurs during or ahead of water treatment. The facility does not add phosphate but is included this permit term because the facility is within the boundaries of the Wisconsin River Basin TMDL. Monitoring and limits are included.

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 April 4, 2025, and the Phosphorus Water Quality-Based Effluent Limitations for the Antigo Waterworks memo dated August 7, 2025.

Phosphorus – Phosphorus requirements are based on the Phosphorus Rules as detailed in NR 102 (water quality standards) and NR 217, Wis. Adm. Code (effluent standards and limitations for phosphorus). Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters.

- Spring Brook is an Exceptional Resource Water (ERW) therefore, the phosphorus limit is set equal to the existing level found upstream of the convergence of the tributary and the brook. The monthly average and six-month average concentration limits are 0.14 mg/L and 0.048 mg/L respectively. The six-month average mass limit of 0.010 lbs/day is also based on Spring Brook.

  Please note: Compliance with the 6-month average is measured each April and October.
- The facility lies within the boundaries of the Wisconsin River TMDL area. The TMDL was developed to address phosphorus water quality impairments. The Wisconsin River TMDL for total phosphorus was approved by the U.S. Environmental Protection Agency on April 26, 2019. Additional site-specific criteria (SSC) for Lakes Petenwell, Castle Rock, and Wisconsin and the related waste load allocation (WLA) included in Appendix K of the TMDL report were approved by the U.S. Environmental Protection Agency (EPA) on July 9, 2020. More information about the TMDL can be found at https://dnr.wisconsin.gov/topic/TMDLs/TMDLReports.html. When a permittee discharges while under the WPDES general permit WI-0046540-06-0 Water Treatment and/or Conditioning, they are included in a WLA given to the combined discharge of all WPDES general permits within the TMDL boundary. When a permittee is regulated under an individual permit there is a mechanism to obtain a WLA from the TMDL's reserve capacity. The permittee has been granted an allocation of 3.6 pounds per year. All calculated TMDL based limits except the monthly average mass limit of 0.039 lbs/day are less restrictive than the limits based on Spring Brook, therefore, the limits based on the receiving water are in effect.

Calculation and reporting of the total mass of phosphorus discharged over the past 12 months is required to track progress in meeting the overall TMDL requirements. The 12-month rolling sum equals the sum of the most recent 12 consecutive months of total monthly discharges. This value should be reported on the eDMR on the last day of each month.

Calculations needed to determine compliance with the waste load allocation are:

- **Total Monthly Discharge (lbs/month)** = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.
- **12-Month Rolling Sum of Total Monthly Discharge (lbs/year)** = the sum of the most recent 12 consecutive months of total monthly discharges. This value should be reported on the eDMR on the last day of each month. Recording will begin after 12-months (November 2026).

Please note: Any time the permittee can maintain a discharge below the limit of detection (LOD) of 30 ug/L (0.03 mg/L) will be an equivalent to zero. This is the LOD is identified in the "Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges" dated June 1, 2020.

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.

2 Schedules

2.1 Temperature Limits

This compliance schedule requires the permittee to achieve compliance by the specified date

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent temperature with conclusions regarding compliance. If the Department determines that because of data variability, 24 months of monitoring data is required to determine the need for temperature limits, the Department will so notify the permittee in writing and all dates in the permit schedule will be extended by 12 months. Informational Note - Refer to the Surface Water subsection regarding 'Determination of Need for Effluent Limits' for information concerning a Department determination on the need for limits and pursuing re-evaluation of limits per NR 106 Subchapters V & VI or NR 102.26, Wis. Adm. Code.	09/30/2026
Action Plan: Submit an action plan for complying with all effluent temperature limits that remain following the Department's review for necessity.	09/30/2027
Construction Plans: Submit construction plans (if construction is required for complying with effluent temperature limits) and include plans and specifications with the submittal.	09/30/2028
Initiate Actions: Initiate actions identified in the plan.	09/30/2029
Complete Actions: Complete actions necessary to achieve compliance with effluent temperature limits.	09/30/2030

Explanation of Schedule

Temperature - A compliance schedule is included in the permit to provide time for the permittee to monitor and investigate as needed options for meeting new effluent thermal water quality-based effluent limits while coming into compliance with the limits as soon as reasonably possible.

Other Comments

This facility was previously permitted under the WPDES general permit WI-0046540-06-0 Water Treatment and/or Conditioning. A decision was made to provide coverage under a WPDES individual permit based on the volume discharged and the proximity to an Exceptional Resource Water (ERW).

Attachments

Water Quality Based Effluent Limits memo dated April 14, 2025

Phosphorus Water Quality-Based Effluent Limitations for the Antigo Waterworks memo dated August 7, 2025

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Sheri A. Snowbank Wastewater Specialist **Date:** May 19, 2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: April 14, 2025

TO: Sheri Snowbank – NOR/Spooner Service Center

FROM: Michael Polkinghorn – NOR/Rhinelander Service Center

SUBJECT: Water Quality-Based Effluent Limitations for the Antigo Water Treatment Facility
WPDES Permit No. WI-0066672-01-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Antigo Water Treatment Facility in Langlade County. This industrial facility discharges to an unnamed tributary to Spring Brook, located in the Spring Brook Watershed in the Central Wisconsin River Basin. This discharge is inside the Wisconsin River Basin (WRB) Total Maximum Daily Load (TMDL) as approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 002:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1
BOD_5					2
TSS	**16 mg/L**		10 mg/L	**10 mg/L**	3, 4
pH	9.0 s.u.	6.0 s.u.			1, 3
Phosphorus				0 lbs/day	5
Temperature	Variable		Variable		6

Footnotes:

1. Monitoring whenever the discharge occurs.
2. Monthly BOD_5 monitoring is recommended during the first permit term to better determine the need for BOD_5 limits at the next permit issuance.
3. These limits are based on the protection of the WWSF community of the unnamed tributary.
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. Outfall 002 was not included during the development of the WRB TMDL, which addresses phosphorus water quality impairments within the TMDL area. The Antigo WTF must offset any discharge of phosphorus either by being granted a WLA from reserve capacity and/or pursue a water quality trade to permit the discharge of phosphorus to the unnamed tributary.
6. In accordance with s. NR 106.56(12), Wis. Adm. Code, when representative effluent temperature data is not available at the time of permit reissuance, the permit shall include effluent temperature monitoring (for at least one year), WQBELs for temperature, and a compliance schedule to meet the temperature limits.

Monthly Temperature Limits

		Daily Maximum Effluent Limitation (°F)
JAN	49	76
FEB	50	76
MAR	52	77
APR	55	79
MAY	65	82
JUN	76	84
JUL	81	85
AUG	81	84
SEP	73	82
OCT	61	80
NOV	49	77
DEC	49	76

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

Antidegradation

Outfall 002 is considered a "new discharge" under chapter NR 207, Wis. Adm. Code and is subject to the antidegradation requirements in NR 207.04, Wis. Adm. Code. To receive permit coverage for the discharge of any pollutant, the facility must submit a demonstration that one or more of the important economic or social development conditions listed in s. NR 207.04(c), Wis. Adm. Code, will be accommodated by the new discharger:

a. The discharger will be increasing its employment.
b. The discharger will be increasing its production level.
c. The discharger will be avoiding a reduction in its employment level.
d. The discharger will be increasing its efficiency.
e. There will be industrial, commercial, or residential growth in the community.
f. The discharger will be providing economic or social benefit to the community.
g. The discharger will be correcting an environmental or public health problem.

Outfall 002 will not result in a significant lowering of water quality as defined in s. NR 207.05, Wis. Adm. Code, because the receiving water does not have any assimilative capacity and limits are set equal to criteria. Therefore, the requirements of s. NR 207.04(1)(d), Wis. Adm. Code, do not apply in this case.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Michael Polkinghorn at (715) 360-3379 or Michael.Polkinghorn@wisconsin.gov and Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, discharge area map, & thermal table.

PREPARED BY: Michael A. Polkinghorn – Water Resources Engineer

E-cc: Michelle BalkLudwig, Regional Wastewater Supervisor – NOR/Spooner Service Center
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Antigo Water Treatment Facility

WPDES Permit No. WI-0066672-01-0

Prepared by: Michael A. Polkinghorn

PART 1 – BACKGROUND INFORMATION

Facility Description

The Antigo Water Treatment Facility provides the water supply for the City of Antigo. Water treatment consists of water softening and disinfection before proceeding to the water distribution system. Wastewater generated from this process is sent to a man-made seepage pond which consists of softening tank water (blow off and wasted lime slurry) and backwash water from the anthracite filters. Flow going to the seepage pond is assumed to equal the flow overflowing the dike on the east end of the pond. Effluent is discharged on a continuous basis via Outfall 002 to an unnamed tributary (UT) to Spring Brook.

Attachment #2 is a discharge area map of Outfall 002.

Existing Permit Limitations

The Antigo Water Treatment Facility's discharge at Outfall 002 is currently covered under the Water Treatment and Conditioning General Permit as a groundwater discharge. This permit specifies the conditions under which the prior stated wastewaters may be discharged to waters of the state that need to be met in order to meet water quality standards contained in chs. NR 102 through 105, NR 140, and NR 207, Wis. Adm. Code. In this case the discharge was only required to monitor flow rate on a daily basis.

Receiving Water Information

- Name: UT to Spring Brook
- Waterbody Identification Code (WBIC): None available for UT. 1440800 for Spring Brook.
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code:
  - UT: Warm Water Sport Fish (WWSF) community, non-public water supply.
  - Spring Brook: Cold Water (CW) community, class 1 trout water, exceptional resource water (ERW), non-public water supply. This is approx. 0.15 mi downstream of Outfall 002.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: Low flows for the UT are zero. The following 7-Q_{10} and 7-Q_2 values for Spring Brook are estimated from Surface Water Data Viewer, approx. 0.15 mi upstream the confluence with the UT.
  - 7-Q_{10} = 1.93 cubic feet per second (cfs)
  - 7-Q_2 = 3.31 cfs
- Hardness: Effluent hardness is used in place of receiving water because there is no receiving water flow upstream of the discharge.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero.
- Source of background concentration data: Background concentrations are not included because they do not impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None to UT. There are several other dischargers to Spring Brook 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: There are no known impairments for the UT. Spring Brook is on the Clean Water Act Section 303(d) list for phosphorus and metals impairments. This discharge is inside the WRB TMDL to address phosphorus impairments within the TMDL area.

Effluent Information

- Flow rate(s):
  365-day maximum annual average = 0.025 million gallons per day (MGD)
  For reference, the actual average flow from January 2020 – February 2025 was 0.024 MGD.
- Hardness = 246 mg/L as $CaCO_3$. This value is from a single sample taken on 01/08/2025.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water supply: Antigo Waterworks.
- Additives: None.
- Effluent characterization: This facility is categorized as a secondary industry, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

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

Where:

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

Code.

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

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

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

Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for Antigo WTF and the limits are set based on the 1-Q_{10} method.

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 = 0 cfs

SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT*	1/5 OF EFFL. LIMIT	1-day MAX. CONC.
Arsenic		340	339.8	68.0	<1.1
Cadmium	246	28.9	28.9	5.8	<0.17
Chromium	246	3769	3,768.6	754	<1.1
Copper	246	36.3	36.3	7.3	<3.2
Lead	246	255	255.2	51.0	<5.4
Nickel	246	1,005	1,004.8	201	<4.7
Zinc	246	264	264.5	52.9	<2.0
Chloride (mg/L)		757	757.0	151	39

* Per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016 consideration of ambient concentrations and 1-Q_{10} flow rates yields a more restrictive limit than the 2 × ATC method of limit calculation.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD.* mg/L	CTC	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic		152.2	152	30.4	<1.1
Cadmium	175	3.82	3.82	0.8	<0.17
Chromium	246	276.13	276	55.2	<1.1
Copper	246	22.36	22.4	4.47	<3.2
Lead	246	66.83	66.8	13.4	<5.4
Nickel	246	111.78	112	22.4	<4.7
Zinc	246	264.49	264	52.9	<2.0

Attachment #1

SUBSTANCE	REF. HARD.* mg/L	CTC	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Chloride (mg/L)		395	395	79.0	39

* 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 = 0 cfs

SUBSTANCE	HTC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	370	74.0	<0.17
Chromium	3,818,000	3,818,000	763,600	<1.1
Lead	140	140	28.0	<5.4
Nickel	43,000	43,000	8,600	<4.7

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	13.3	2.66	<1.1

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

Conclusions and Recommendations
Based on a comparison of the effluent data and calculated effluent limitations, **effluent limitations are not recommended for any toxic substances.** Monitoring recommendations are made in the paragraphs below:

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Previous monitoring produced a PFOS result of 1.1 ng/L and a PFOA result of 0.64 ng/L. These results are less than one fifth of the respective criteria for each substance. Based on the type of discharge and the known levels of PFOS/PFOA in the source water, **PFOS and PFOA monitoring is not recommended during the first permit term.** The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR CONVENTIONAL POLLUTANTS

In establishing BOD_5 limitations, the primary intent is to prevent a lowering of dissolved oxygen levels in the receiving water below water quality standards as specified in ss. NR 102.04(4)(a) and (b), Wis. Adm. Codes. The 26-lb method is the most frequently used approach for calculating BOD_5 limits when resources are not available to develop a detailed water quality model. This simplified model was developed in the 1970's by the Wisconsin Committee on Water Pollution on the Fox, Wisconsin, Oconto, and Flambeau Rivers. Further studies throughout the 1970's proved this model to be relatively accurate. The model has since then been used by the Department on many occasions when resources are not available to perform a site-specific model. The "26" value stems from the following equation:

$$\frac{26\ {}^{\text{lbs}}/_{\text{day}}}{{}^{\text{ft}^3}/_{\text{sec}}} * \frac{1\,\text{day}}{86{,}400\,\text{sec}} * \frac{454{,}000\,\text{mg}}{\text{lbs}} * \frac{1\,\text{ft}^3}{28.32\,\text{L}} = 4.8 = 2.4 * 2\ {}^{\text{mg}}/_{\text{L}}$$

The 4.8 mg/L has been calculated by taking 2.4 mg/L which is the number one receives when converting 26 lbs. of BOD/day/cfs into mg/L, multiplied by 2.0 which is the change in the DO level. A typical background DO level for Wisconsin waters is 7 mg/L, so a 2 mg/L decrease is allowed to meet the 5 mg/L standard for warm water streams. The above relationship is temperature dependent and an appropriate temperature correction factor is applied. The 26-lb method is based on a typical 24°C summer value for warm water streams. Adjustments for temperature are made using the following equation:

$$k_t = k_{24}\left(0.967^{(T-24)}\right)$$

Where k_{24} = 26 lbs. of BOD/day/cfs

Calculations based on Full Assimilative Capacity at 7-Q_{10} Conditions:

$$Limitation(mg/L) = 2.4\left(DO_{stream} - DO_{std}\right)\left(\frac{\left({}_7Q_{10} + Q_{eff}\right)}{Q_{eff}}\right)\left(0.967^{(T-24)}\right)$$

Where:

Q_{eff} = effluent flow = 0.28 MGD
DO_{stream} = background dissolved oxygen = 7.0 mg/L
DO_{std} = dissolved oxygen criteria from s. NR 102.04(4), Wis. Adm. Code = 5.0 mg/L
7-Q_{10} = 0 cfs
T = Receiving water temperature from s. NR 102.25, Wis. Adm. Code

Because no dilution is available in the receiving water, the calculated limits would be the lowest that the Department typically gives to facilities per standing policy. These effluent limitations are 5.0 mg/L during May – October and 10 mg/L during November – April, expressed as weekly average limits. A dissolved oxygen limit of 7.0 mg/L as a daily minimum would also be recommended. This is consistent with the assumed dissolved oxygen effluent concentration in the calculation of the BOD_5 limitations. Mass limits for BOD_5 are not required because the receiving water will be effluent dominated.

Revisions to chs. NR 106 and 205, Wis. Adm. Code, align Wisconsin's WQBELs with 40 CFR 122.45(d), which requires WPDES permits to contain daily maximum and monthly average limits for

industrial discharges. In this case, whenever a weekly average limitation is determined necessary to protect water quality:

- A monthly average limitation shall also be included in the permit and set equal to the weekly average limit unless a more restrictive limit is already determined necessary to protect water quality.
- A daily maximum limitation shall also be included in the permit and set equal to the daily maximum WQBEL calculated under s. NR 106.06, Wis. Adm. Code, or a daily maximum limitation calculated using the following procedure, whichever is more restrictive:

Daily Maximum Limitation = Weekly average WQBEL × DMF

Where:

DMF = Daily Multiplication Factor as defined in Table 2

CV = coefficient of variation (CV) as calculated in s. NR 106.07(5m), Wis. Adm. Code. = 0.6 due to lack of effluent BOD_5 data.

s. NR 106.07 (4) (e). Table 2 — Daily Multiplication Factor

CV	0.1	0.2	0.3	0.4	0.5	**0.6**	0.7	0.8	0.9	1.0
DMF	1.114	1.235	1.359	1.460	1.557	**1.639**	1.712	1.764	1.802	1.828

CV	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
DMF	1.842	1.849	1.851	1.843	1.830	1.815	1.801	1.781	1.751	1.744

Note: This methodology is based on the *Technical Support Document for Water Quality-based Toxics Control* (March 1991). PB91-127415.

Therefore, the daily maximum and monthly average BOD_5 limits of 8.2 and 5.0 mg/L, respectively, would be required during May – October. The daily maximum and monthly average BOD_5 limits of 16 and 10 mg/L, respectively, would be required during November – April.

The facility has an effluent BOD_5 sample of nondetectable at <2 mg/L (01/08/2025). Based on this effluent data, there is no reasonable potential for the discharge to exceed the calculated BOD_5 limits. **Therefore, BOD_5 limits are not recommended during the first permit term.** One sample is not enough effluent data to obtain an accurate indication of effluent variability over time. In addition, it is uncertain if process wastewater generated from water treatment would be a significant source of BOD_5 especially when compared to the most stringent BOD_5 limits the Department would implement to a discharge. **Therefore, monthly BOD_5 monitoring is recommended during the first permit term to better determine the need for BOD_5 limits at the next permit issuance.**

Total Suspended Solids (TSS)

Total suspended solids (TSS) effluent limits are regulated via narrative standards described in NR 102.04(1), Wis. Adm. Code. TSS effluent limits are included whenever BOD_5 WQBELs are needed and are set equal to the BOD_5 limits but no lower than 10 mg/L per Department policy. Because BOD_5 WQBELs are not recommended, typically the weekly average TSS limit of 10 mg/L would also not be recommended.

Effluent TSS data was sampled at 109 mg/L (03/06/2020) and nondetectable at <2 mg/L (01/08/2025). Previous discussions between the Department and the facility have determined the backwash procedure can produce significantly high concentrations of TSS depending on the number of consecutive backwashing cycles in a session. TSS concentrations sent to the pond during a backwash session ranged from 24 – 15,517 mg/L, with the final concentration in the pond being nondetectable at <2 mg/L at the

end of the session. Based on the potential variability demonstrated by the effluent TSS samples and the significant range of TSS concentrations sent to the pond, it is likely TSS water quality standards would be exceeded. **Therefore, the weekly average limit of 10 mg/L is recommended during the first permit term.**

Similar to BOD_5, daily maximum and monthly average TSS limits are also needed to satisfy expression of limits requirements. **Therefore, the daily maximum and monthly average TSS limits of 16 and 10 mg/L, respectively, are required during the first permit term.**

pH
The daily minimum and daily maximum limit range of 6.0 – 9.0 s.u. are required to meet the pH water quality standards as described in s. NR 102.04(4)(c), Wis. Adm. Code. **Therefore, the pH limits are recommended during the first permit term.**

PART 4 – 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. Given the fact that the Antigo WTF does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

The facility has an effluent ammonia nitrogen sample of nondetectable at <0.06 mg/L (01/08/2025). Based on this effluent data, there is no reasonable potential for the discharge to exceed the most stringent ammonia nitrogen limits that would be calculated. **Therefore, ammonia nitrogen limits are not recommended during the first permit term.** Although one sample is typically not enough effluent data to obtain an accurate indication of effluent variability, the process wastewater generated from water treatment is also not expected to be a source of nutrients such as ammonia nitrogen. **Therefore, monitoring is also not recommended during the first permit term.**

PART 5 – PHOSPHORUS

Outfall 002 was not included during the development of the WRB TMDL, which addresses phosphorus water quality impairments within the TMDL area. The Antigo WTF must offset any discharge of phosphorus either by being granted a WLA from reserve capacity and/or pursue a water quality trade to permit the discharge of phosphorus to the UT. **Because any discharge of phosphorus is not allowed, the need for phosphorus limits will not be evaluated at this time.** For informational purposes, effluent phosphorus data was sampled at nondetectable levels of <0.076 mg/L (03/06/2020) and <0.093 mg/L (01/08/2025).

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.

Calculated limits are set equal to criteria based on a WWSF classification due to estimated zero low-flow in the receiving water. The complete thermal table used for calculations is included as attachment #3. The calculated limits are shown in the table below:

Monthly Temperature Limits

		Daily Maximum Effluent Limitation (°F)
JAN	49	76
FEB	50	76
MAR	52	77
APR	55	79
MAY	65	82
JUN	76	84
JUL	81	85
AUG	81	84
SEP	73	82
OCT	61	80
NOV	49	77
DEC	49	76

Reasonable Potential

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

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

In accordance with s. NR 106.56(12), Wis. Adm. Code, when representative effluent temperature data is not available at the time of permit reissuance, **the proposed permit shall include effluent temperature monitoring (for at least one year), WQBELs for temperature, and a compliance schedule to meet the temperature limits.**

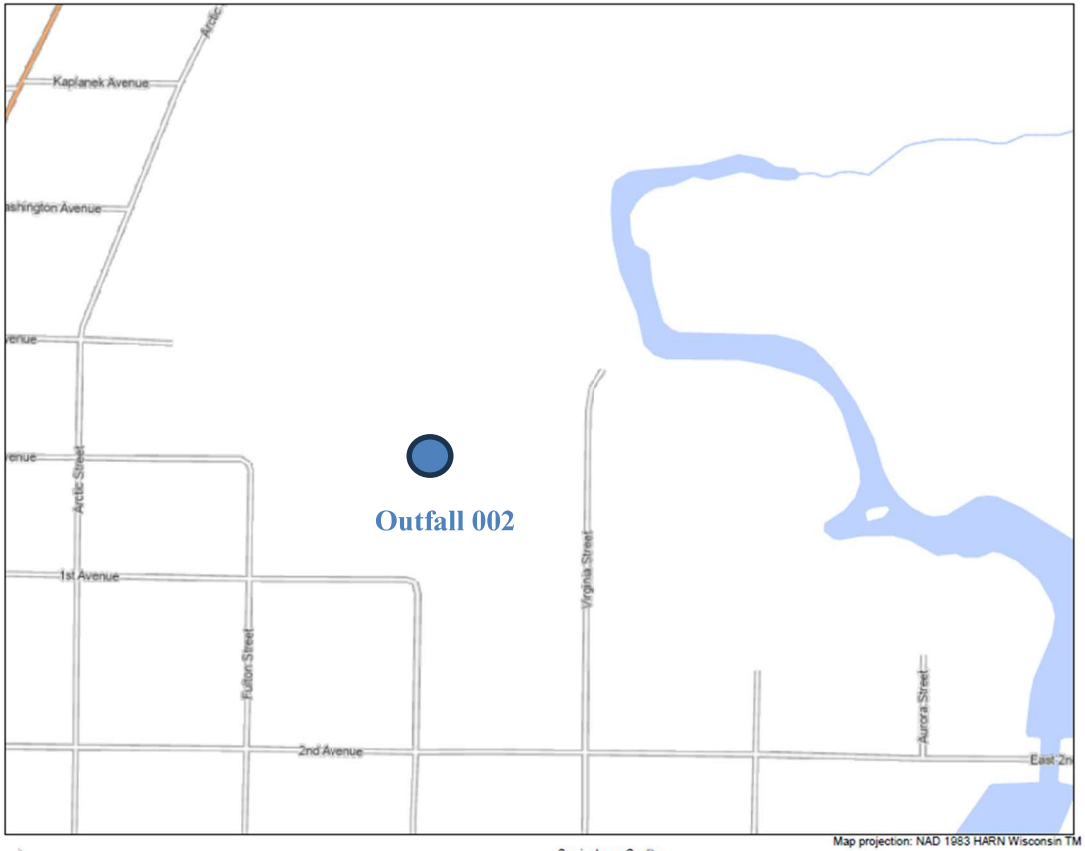
PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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).*

Outfall 002 is comprised of softening tank water (blow off and wasted lime slurry) and backwash water from the anthracite filters. This discharge does not have any toxic compounds expected at levels of concern and no additives. Since there is believed to be a very low risk of toxicity, **WET testing is not recommended during the reissued permit term.**

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Antigo WTF Outfall 002 Discharge Area



Legend: (some map layers may not be displayed)

- Rivers and Streams
- Intermittent Streams
- Open Water

Latest Leaf Off Imagery

- Red: Band_1
- Green: Band_2
- Blue: Band_3

Notes:
WPDES viewer, WDNR

Map projection: NAD 1983 HARN Wisconsin TM

N

Map: 0 350 700 Feet
0 100 200 Meters

Service Layer Credits:
Latest Leaf Off Imagery: , Basic Basemap (Cached):

This map is a product generated by a DNR web mapping application.

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Attachment #3

Temperature Limits for Receiving Waters with Unidirectional Flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Antigo WTF		**7-Q_{10}:**	0	cfs		
Outfall(s):	002		**Dilution:**	25%		**Start:** NA	01/01/20
Date Prepared:	3/24/2025		**f:**	0		**End:** NA	02/28/25
Design Flow (Qe):	0.025	MGD	**Stream type:**	Small warm water sport or forage fis			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	0.0	:1		
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	0	0.026	0.035	0			49	76
FEB	34	50	76	0	0.026	0.035	0			50	76
MAR	38	52	77	0	0.038	0.075	0			52	77
APR	48	55	79	0	0.140	0.140	0			55	79
MAY	58	65	82	0	0.032	0.055	0			65	82
JUN	66	76	84	0	0.038	0.055	0			76	84
JUL	69	81	85	0	0.029	0.055	0			81	85
AUG	67	81	84	0	0.035	0.055	0			81	84
SEP	60	73	82	0	0.026	0.035	0			73	82
OCT	50	61	80	0	0.026	0.055	0			61	80
NOV	40	49	77	0	0.035	0.095	0			49	77
DEC	35	49	76	0	0.026	0.035	0			49	76

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: August 7, 2025

TO: Sheri Snowbank – NOR/Spooner Service Center

FROM: Michael Polkinghorn – NOR/Rhinelander Service Center

SUBJECT: Phosphorus Water Quality-Based Effluent Limitations for the Antigo Water Treatment Facility
WPDES Permit No. WI-0066672-01-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Antigo Water Treatment Facility (WTF) in Langlade County. This industrial facility discharges to an unnamed tributary (UT) to Spring Brook, located in the Spring Brook Watershed in the Central Wisconsin River Basin. This discharge is inside the Wisconsin River Basin (WRB) Total Maximum Daily Load (TMDL) as approved by EPA on 04/26/2019 with site-specific criteria approved by EPA on 07/09/2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Outfall 002 was not included during the development of the WRB TMDL, which addresses phosphorus water quality impairments within the TMDL area. The Antigo WTF must offset any discharge of phosphorus either by being granted a WLA from reserve capacity and/or pursue a water quality trade to permit the discharge of phosphorus to the UT. Because Outfall 002 is considered a new discharge as described in s. 207.02(8), Wis. Adm. Code, determination of the wasteload allocation available to a new discharge will depend on the type and condition of the immediate or downstream receiving water. Because Spring Brook is an Exception Resource Water (ERW) approx. 0.15 mi downstream of Outfall 002, limitations for new discharges to ERWs which are not needed to prevent or correct either an existing surface or groundwater contamination situation, or a public health problem shall be based on s. NR 207.03(4)(b), Wis. Adm. Code. Outfall 002 is located within subbasin 216 of the TMDL area where up to approx. 170 lbs/yr of reserve capacity is available. This WQBEL addendum will evaluate the applicable phosphorus WQBELs to be consistent with the TMDL and chs. NR 207 and 217, Wis. Adm. Codes.

Receiving Water Information

- Name: UT to Spring Brook
- Waterbody Identification Code (WBIC): None available for UT. 1440800 for Spring Brook.
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code:
  - UT: Warm Water Sport Fish (WWSF) community, non-public water supply.
  - Spring Brook: Cold Water (CW) community, class 1 trout water, ERW, non-public water supply. This is approx. 0.15 mi downstream of Outfall 002.
- Multiple dischargers: None to UT. There are several other dischargers to Spring Brook 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: There are no known impairments for the UT. Spring Brook is on the Clean Water Act Section 303(d) list for phosphorus and metals impairments. This discharge is inside the WRB TMDL to address phosphorus impairments within the TMDL area.

Effluent Information

- Flow rate(s):
  365-day maximum annual average = 0.025 million gallons per day (MGD)
  For reference, the actual average flow from January 2020 – February 2025 was 0.024 MGD.

Technology-Based Effluent Limit

Subchapter II of Chapter NR 217, Wis. Adm. Code, requires industrial facilities that discharge greater than 60 pounds of total phosphorus per month to comply with a 12-month rolling average limit of 1.0 mg/L, or an approved alternative concentration limit. **Because the phosphorus WQBEL that will be required for the Antigo WTF will be more stringent than 1.0 mg/L, the need for a TBEL will not be considered further.**

Water Quality-Based Effluent Limits (WQBEL)

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

Because Spring Brook is an ERW approx. 0.15 mi downstream of Outfall 002, limitations for new discharges to ERWs which are not needed to prevent or correct either an existing surface or groundwater contamination situation, or a public health problem shall be based on s. NR 207.03(4)(b), Wis. Adm. Code. Therefore, the phosphorus WQBEL shall be set equal to the existing levels of these substances upstream of, or adjacent to, the discharge site.

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used for purposes of calculating the phosphorus WQBEL shall be calculated as a median using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Code. For flowing waters samples shall, whenever possible, be taken at least once per month for 6 months during the sampling period of May 1 to October 31. The department shall calculate the median total phosphorus concentration for a stream, river, or impounded flowing water using at least one year of data from the sampling period. All representative data from the most recent 5 years shall be used, but data from the most recent 10 years may be used if representative of current conditions. If fewer than the recommended number of samples are available, the department may be able to make an assessment determination on a case-by-case basis.

A review of all available in stream total phosphorus data from stored in the Surface Water Integrated Monitoring System (SWIMS) database upstream or adjacent to Outfall 002 indicates the median background total phosphorus concentration in Spring Brook is approx. 0.048 mg/L. This background median value was calculated (n = 24, May 1984 – September 2017) using 5 different monitoring locations on Spring Brook (SWIMS Station IDs: 343014, 343062, 3430 58, 343140, and 343111). **Therefore, the phosphorus WQBEL of 0.048 mg/L is required during the reissued permit term.**

Effluent Data

For informational purposes, effluent phosphorus data was sampled at nondetectable levels of <0.076 mg/L (03/06/2020) and <0.093 mg/L (01/08/2025).

Limit Expression

According to s. NR 217.14(2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, **the effluent limit of 0.048 mg/L may be expressed as a six-month average.**

If a concentration limitation expressed as a six-month average is included in the permit, **a monthly average concentration limitation of 0.14 mg/L, equal to three times the WQBEL calculated under s. NR 217.13, Wis. Adm. Code shall also be included in the permit.** The six-month average should be averaged during the months of May – October and November – April.

Mass Limits
A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because Spring Brook is an ERW approx. 0.15 mi downstream of Outfall 002. **This final mass limit shall be 0.048 mg/L × 8.34 × 0.025 MGD = 0.010 lbs/day expressed as a six-month average.**

TMDL Limits
Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (*May 2020). The wasteload allocations (WLA) that implement site-specific criteria for Lakes Petenwell, Castle Rock, and Wisconsin are found in Appendix K of the *Total Maximum Daily Loads for Total Phosphorus in the Wisconsin River Basin (WRB TMDL)* report dated April 26, 2019 and are expressed as maximum annual loads (lbs/year) and maximum daily loads (lbs/day). The WLA that implement statewide criteria found in Appendix J of the TMDL report are no longer applicable following approval of these site-specific criteria. The daily WLAs in the WRB TMDL equals the annual WLA divided by the number of days in the year. Therefore, the daily WLA is an annual average. Since the derivation of daily WLAs from annual WLAs does not take effluent variability or monitoring frequency into consideration, maximum daily WLAs from the WRB TMDL should not be used directly as permit effluent limits.

Outfall 002 was not included during the development of the WRB TMDL, which addresses phosphorus water quality impairments within the TMDL area. The Antigo WTF must offset any discharge of phosphorus either by being granted a WLA from reserve capacity and/or pursue a water quality trade to permit the discharge of phosphorus to the UT. Because Outfall 002 is considered a new discharge as described in s. 207.02(8), Wis. Adm. Code, determination of the wasteload allocation available to a new discharge will depend on the type and condition of the immediate or downstream receiving water. In this case because Spring Brook is an ERW approx. 0.15 mi downstream of Outfall 002, the WLA from reserve capacity shall be based on the phosphorus WQBELs as derived from s. NR 207.03(4)(b), Wis. Adm. Code. Since the mass phosphorus WQBEL is 0.010 lbs/day; **therefore, the annual WLA of 3.6 lbs/yr will be allocated to the Antigo WTF** since approx. 170 lbs/yr of reserve capacity is available in this subbasin.

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

$$\begin{aligned} \text{TP Equivalent Effluent Concentration} &= \text{Daily WLA} \div (\text{Flow Rate} * \text{Conversion Factor}) \\ &= 0.10 \text{ lbs/day} \div (0.025 \text{ MGD} * 8.34) \\ &= 0.048 \text{ mg/L} \end{aligned}$$

Since this value is less than 0.3 mg/L, both a six-month average mass limit and a monthly average

mass limit are applicable for total phosphorus. The monthly average limit is set equal to three times the six-month average limit.

TP Six-Month Average Permit Limit = Daily WLA * Six-Month Average Multiplier
= 0.010 lbs/day * 1.30
= 0.013 lbs/day

TP Monthly Average Permit Limit = TP Six-Month Average Permit Limit * 3
= 0.013 lbs/day * 3
= 0.039 lbs/day

The multiplier used in the six-month average calculation was used as recommended in TMDL implementation guidance. Due to small dataset available, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived phosphorus permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by any facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The reissued permit will plan to have weekly monitoring due to the size of the facility; if a different monitoring frequency is used, the stated limits should be reevaluated. **Because the 6-month average mass limit based on the background phosphorus concentration of Spring Brook is more stringent, the 6-month average mass limit from the TMDL is not needed. The monthly average limit of 0.039 lbs/day is required during the reissued permit term.**

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

The Antigo WTF is considered a "new discharger" as described in s. NR 217.11(3), Wis. Adm. Code, and cannot receive a compliance schedule or approval for a variance, as described in sections NR 217.17(4), and NR 217.19(1)(b), Wis. Adm. Codes, respectively. **Therefore, the required phosphorus limits will be effective upon permit reissuance.**

Conclusions:
In summary, the following phosphorus limits are recommended by this evaluation:

- **Monthly average limits of 0.14 mg/L and 0.039 lbs/day**
- **Six-month average limits of 0.048 mg/L and 0.010 lbs/day**

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Michael Polkinghorn at (715) 360-3379 or Michael.Polkinghorn@wisconsin.gov and Diane Figiel at Diane.Figiel@wisconsin.gov.

PREPARED BY: Michael A. Polkinghorn – Water Resources Engineer

E-cc: Michelle BalkLudwig, Regional Wastewater Supervisor – NOR/Spooner Service Center
Diane Figiel, Water Resources Engineer – WY/3