Permit Fact Sheet

General Information

Permit Number	WI-0031658-09-0
Permittee Name and Address	VILLAGE OF BLUE MOUNDS PO Box 189, 11011 Brigham Avenue, Blue Mounds, WI 53517
Permitted Facility Name and Address	Blue Mounds Wastewater Treatment Facility 10961 County Highway ID, Blue Mounds, WI
Permit Term	January 01, 2027 to December 31, 2031
Discharge Location	SW ¼ of NW ¼ of Section 7, T6N, R6E
Receiving Water	Williams-Barneveld Creek, in the Ridgeway Branch-East Branch Pecatonica River Watershed in the Sugar-Pecatonica Basin, in Dane County
Stream Flow ($Q_{7,10}$)	0 cfs
Stream Classification	Limited Forage Fish (LFF) community, non-public water supply
Discharge Type	Existing; Continuous
Annual Average Design Flow	0.075 MGD
Industrial or Commercial Contributors	None
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

Blue Mounds Wastewater Treatment Facility currently serves a population of approximately 987 people with no significant industrial contributors. The treatment facility consists of fine screen, activated sludge-oxidation ditch, and final clarification. Phosphorus removal is achieved using a chemical feed system (completed in December 2023). Sludge handling and treatment consists of gravity settling, aerobic digestion, and 180-day storage.

Substantial Compliance Determination

Enforcement During Last Permit: There were four Notices of Noncompliance (NONs) sent during the previous permit term. A NON was sent in 2023 for several effluent limit violations and underreporting in 2022. Another NON was sent in 2023 for phosphorus effluent limit violations and underreporting in 2023. A NON was sent in 2024 for additional phosphorus effluent limit violations in 2023. Another NON was sent in 2024 for failure to implement the phosphorus adaptive management plan from July 2021-May 2024. The facility has completed all previously required actions as part of the enforcement process.

After a desktop review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on 7/24/2024, this facility has been found to be in substantial compliance with their current permit. *Note that an additional site inspection will be performed prior to permit reissuance.* **Compliance determination made by Kenzie Ostien, Wastewater Engineer, on 7/21/2026.**

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	N/A – the previous permit did not include influent flow monitoring	Influent: 24-hr flow proportional composite samples shall be collected from the influent manhole. An ultrasonic flow meter and Parshall flume are located after screening and prior to the influent composite sampler.
001	0.044 MGD (Avg. January 2021 – May 2026)	Effluent: 24-hr flow proportional composite samples and grab samples shall be collected at the splitter box, prior to discharge to the headwaters of Williams-Barneveld Creek. An ultrasonic flow meter and V-notched weir are located in the splitter box after the clarifier.
002	Did not land apply in 2021 nor 2024. In 2022-2023 and 2025 an avg. of 1.6 Metric Tons/Year was land applied.	Sludge: Aerobically digested, thickened liquid, Class B. Representative samples shall be collected from the sludge storage tank.

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	

1.1.1 Changes from Previous Permit

Influent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

- Addition of influent flow monitoring because a flow meter has been installed.
- Increased the sample frequency for BOD_5 and TSS to align with effluent monitoring.

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD_5 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	Daily Max	30 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	15 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Daily Max	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	5/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	3/Week	24-Hr Flow Prop Comp	Daily Max - Variable Limit applies December-February. See the Daily Maximum Ammonia Nitrogen (NH_3-N) Limits permit section.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	7.1 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies March-September.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	11 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies October-November.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	13 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies December-February.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.8 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies March-September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.5 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies October-November.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	6.2 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies December-February.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September per the Effluent Limitations for E. coli Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit permit section. Enter the result in the DMR on the last day of the month.
Chloride	Weekly Avg	470 mg/L	4/Month	24-Hr Flow Prop Comp	This is an interim limit. Sampling shall be conducted on four consecutive days one week per month. See the Chloride Variance - Implement Source Reduction Measures section and the Chloride SRM (Target Value) Schedule.
Chloride		lbs/day	4/Month	Calculated	Calculate the daily mass discharge of chloride in lbs/day on the same days chloride sampling occurs. Mass (lbs/day) = Concentration (mg/L) x Flow (MGD) x 8.34
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective throughout the permit term, as it represents a minimum control level.
Phosphorus, Total	6-Month Avg	0.6 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective throughout the permit term, to prevent backsliding per ch. NR 207, subchapter II, Wis. Adm. Code.
Phosphorus, Total		lbs/day	3/Week	Calculated	Report daily mass discharged using Equation 1a. in the Water Quality

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Trading (WQT) permit section.
WQT Credits Used (TP)		lbs/month	Monthly	Calculated	Report WQT TP Credits used per month using Equation 2c. in the Water Quality Trading (WQT) permit section. Available TP Credits are specified in Table 2 of the permit and in the approved Water Quality Trading Plan.
WQT Computed Compliance (TP)	Monthly Avg	0.225 mg/L	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3a. in the Water Quality Trading (WQT) permit section. Value entered on the last day of the month.
WQT Computed Compliance (TP)	6-Month Avg	0.075 mg/L	Monthly	Calculated	Compliance with the six-month average limit is evaluated at the end of the six-month period on June 30 and Dec 31.
WQT Computed Compliance (TP)	6-Month Avg	0.047 lbs/day	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3b. in the Water Quality Trading (WQT) permit section. Compliance with the six-month average limit is evaluated at the end of the six-month period on June 30 and Dec 31.
WQT Credits Used (TP)	Annual Total	131 lbs/yr	Annual	Calculated	The sum of total monthly credits used may not exceed Table 2 values listed in the permit.
Temperature Maximum		deg F	Daily	Continuous	Monitoring only until limits become effective per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule. See also the

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Effluent Temperature Monitoring and Limitations sections and the Dissipative Cooling Demonstration section of the permit.
Temperature Maximum	Daily Max	84 deg F	Daily	Continuous	Limit applies in May and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature Maximum	Daily Max	85 deg F	Daily	Continuous	Limit applies in June and September and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature Maximum	Daily Max	86 deg F	Daily	Continuous	Limit applies in July-August and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature Maximum	Daily Max	83 deg F	Daily	Continuous	Limit applies in October and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature Maximum	Weekly Avg	63 deg F	Daily	Continuous	Limit applies in April and October and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature Maximum	Weekly Avg	70 deg F	Daily	Continuous	Limit applies in May and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature	Weekly Avg	77 deg F	Daily	Continuous	Limit applies in June and becomes effective in 2031

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Maximum					per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature Maximum	Weekly Avg	81 deg F	Daily	Continuous	Limit applies in July and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature Maximum	Weekly Avg	79 deg F	Daily	Continuous	Limit applies in August and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature Maximum	Weekly Avg	73 deg F	Daily	Continuous	Limit applies in September and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Temperature Maximum	Weekly Avg	54 deg F	Daily	Continuous	Limit applies in November and becomes effective in 2031 per the Temperature Limits Compliance and Dissipative Cooling Evaluation Schedule.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring permit section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring permit section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring permit section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

2.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

- The sample frequency for flow has been changed from continuous to daily for DMR reporting purposes.
- The sample frequency has been increased to 3/Week for BOD_5, TSS, Ammonia, and Phosphorus, and increased to 5/Week for pH and DO.
- Addition of Escherichia coli (E. coli) monitoring and limits. At the end of the compliance schedule, disinfection requirements and E. coli limits of 126 #/100 mL as a monthly geometric mean that may not be exceeded and 410 #/100 mL as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply. Monitoring is not required until the limit becomes effective at the end of the compliance schedule.
- The permittee has applied for a chloride variance. The chloride variance interim effluent limit of 470 mg/L as a weekly average has been retained and updated source reduction measures are included throughout the permit term.
- Compliance with the phosphorus effluent limits will be achieved through Water Quality Trading (WQT). The monthly average limit of 1.0 mg/L is retained this permit term as it represents the minimum control level (MCL). The 6-month average limit of 0.6 mg/L is retained this permit term to prevent backsliding per ch. NR 207, subchapter II, Wis. Adm. Code. Several calculated parameters were added in order to demonstrate compliance. See explanation (below) for more details.
- Increased temperature monitoring frequency to daily, effective year-round. Addition of temperature limits, to become effective in 2031 at the end of the compliance schedule. See explanation (below) for more details.
- Addition of annual total nitrogen monitoring, required in specific quarters as outlined in the permit.

2.1.2 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, by Sarah Luck, Water Resources Engineer, dated June 19, 2026.

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. Changes have been made to the monitoring frequencies for BOD_5, TSS, Ammonia, Phosphorus, pH, and DO.

Expression of Limits – In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable.

Disinfection and E. coli – Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020. Section NR 102.04(5)(a), Wis. Adm. Code, states that all surface waters shall be suitable for recreational use and meet the E. coli criteria established to protect this use. Section NR 102.04(5)(b), Wis. Adm. Code, states that exceptions to the disinfection requirement can be made if the Department determines, in accordance with the procedures specified in s. NR 210.06(3), Wis. Adm. Code, that disinfection is not required to meet water quality criteria. As part of the reissuance process, the requirements for disinfection were reviewed under s. NR 210.06(3), Wis. Adm. Code. It was determined that the permittee is required to disinfect, during the months of May – September. See the WQBEL memo for further explanation.

Chlorine – If Blue Mounds Wastewater Treatment Facility decides to use chlorination for disinfection, effluent limitations would be required to ensure proper operation of the de-chlorination system and would become effective May 1, 2031, with the E. coli limitations. See the WQBEL memo for further explanation and limits.

Chloride – The permittee has applied for a chloride variance, under the provisions of s. NR 106.83, Wis. Adm. Code, with its application for permit reissuance. The Department reviewed the permittee's application for a chloride variance and the information supplied in the application supports the establishment of an interim effluent limit. The proposed permit includes an interim chloride limit of 470 mg/L (expressed as a weekly average), a target value of 420 mg/L (weekly average), implementation of the chloride source reduction measures identified in the Village of Blue Mounds Source Reduction Measures Plan dated 1/15/2026, and submittal of annual progress reports each year by January 31st. The Department concludes that the Village of Blue Mounds is qualified for a variance from the water quality standard for chloride and proposes reissuance of this permit with the proposed variance.

Phosphorus – Phosphorus requirements are based on the Phosphorus Rules that became effective December 1, 2010, as detailed in chs. NR 102, Water Quality Standards, and NR 217, Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. Currently in ch. NR 217, Wis. Adm. Code, there are two methods used to determine if a phosphorus limit is needed: a technology based effluent limit (TBEL) and a water quality-based effluent limit (WQBEL). Based on the size and classification of the stream, the water quality criteria for the William-Barneveld Creek is 0.075 mg/L. In this case, the WQBELs are 0.225 mg/L (monthly average), 0.075 mg/L (6-month average) and 0.047 lbs/day (6-month average). For the reasons explained in the April 30, 2012 paper entitled 'Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin', WDNR has determined that it is impracticable to express the phosphorus WQBEL for the permittee as a maximum daily, weekly or monthly value. The final effluent limit for phosphorus is expressed as a six-month average. It is also expressed as a monthly average equal to three times the derived WQBEL (which equates to 0.3 mg/L). Final effluent limits were derived from and comply with the applicable water quality criterion. The monthly average limit of 1.0 mg/L is retained this permit term as it represents the minimum control level (MCL). The 6-month average limit of 0.6 mg/L is also retained to prevent backsliding during the permit term per ch. NR 207, subchapter II, Wis. Adm. Code.

The wastewater treatment facility is not able to meet the WQBELs. 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-2026-0006) or approved amendments thereof. The total 'WQT TP Credits' available are designated in the approved WQT Plan. The Village is installing permanent grass cover on fields previously used for agricultural row crops. A 49-acre field was planted as tall grass prairie in 2025. An additional 13 acres are planned to be planted as alfalfa for the 2026 growing season. Following the alfalfa rotation, the 13 acres will be converted to prairie in 2031. The WQT Plan proposes the generation of 131 lbs/yr of phosphorus credits for the next five years.

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

Thermal – Requirements for Temperature are included in ch. NR 102, Subchapter II, Water Quality Standards for Temperature, and ch. NR 106, Subchapter V, Effluent Limitations for Temperature, Wis. Adm. Code. Thermal discharges must meet the Public Health criterion of 120 ºF and the Fish and Aquatic Life criteria that are established to protect aquatic communities from lethal and sub-lethal thermal effects. The current permit did not contain temperature limits because there was not reasonable potential for the permittee's discharge to exceed the calculated limits. Temperature limits for this permit reissuance are calculated based on the procedures in s. NR 106.56, Wis. Adm. Code. Based on the data reported throughout the permit term, there is reasonable potential to exceed the daily maximum temperature limits in May-October and the weekly average temperature limits in April-November. However, the permittee also reported the potential for unreliable data due to the need to replace batteries in the thermal probe and the location in which the probe was mounted. Given the questionable accuracy of the reported data in 2024, a compliance schedule is included which allows for an additional year of temperature monitoring to ensure the probe is operating correctly, properly submerged in the effluent, and not being impacted or influenced by external factors. The compliance schedule also allows time for another dissipative cooling study to be conducted. See the Schedules section (below) for more details.

Effluent temperature monitoring is required daily, year-round, throughout the permit term. Temperature limits are scheduled to become effective on January 1, 2031. If the permittee submits additional thermal data and/or a dissipative cooling study and requests a re-evaluation of the need for limits, the permit may be modified to remove temperature

maximum limits and the remaining compliance schedule items if the Department determines there is no reasonable potential and the temperature maximum limits are no longer necessary.

Total Nitrogen Monitoring (TKN, NO2+NO3, and Total N) – The Department has continued effluent monitoring for total nitrogen in the permit through the authority under s. 283.55(1)(e), Wis. Stats. Testing is required during the following quarters: October – December 2027; July – September 2028; April – June 2029; January – March 2030; and July – September 2031.

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; Aerobic Digestion	SOUR	Land Application	Approx. 6.3
Does sludge management demonstrate compliance? Yes.						
Is additional sludge storage required? No.						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? Yes; special monitoring and recycling conditions are included in the permit to track any potential problems in land applying sludge from this facility.						
Is a priority pollutant scan required? N/A; priority pollutant scans are only 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	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
Radium 226 Dry Wt		pCi/g	Annual	Composite	
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS permit sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS permit sections for more information.

3.1.1 Changes from Previous Permit

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

- Removed PCB monitoring requirements. PCB monitoring may be required at the next permit reissuance.
- Annual monitoring for PFAS is required pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

3.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5), Wis. Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6), Wis. Adm. Code, 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 Chloride Source Reduction Measures (Target Value)

As a condition of the variance to the water quality based effluent limitation(s) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Chloride Progress Report: Submit an annual chloride progress report related to the source reduction activities for the previous year. The annual chloride progress report shall: Indicate which chloride source reduction measures or activities in the Source Reduction Plan have been implemented and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why. Include an assessment of whether each implemented source reduction measure appears to be effective or ineffective at reducing pollutant discharge concentrations and identify actions planned for the upcoming year; Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and Include an analysis of how effluent chloride varies with time and with significant loadings of chloride. Note that the interim limitation listed in the Surface Water section of this permit remains enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Date Due.	01/31/2028
Annual Chloride Progress Report #2: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2029
Annual Chloride Progress Report #3: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2030
Final Chloride Report: Submit the final chloride report documenting the success in meeting the chloride target value of 420 mg/L (weekly avg), as well as the anticipated future reduction in chloride sources and chloride effluent concentrations. The report shall: Summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why; Include an assessment of which source reduction measures appear to have been effective or	01/31/2031

ineffective. Evaluate any needed changes to the pollutant reduction strategy accordingly; Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data during the current permit term; and Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride as identified in the source reduction plan. If the permittee intends to reapply for a chloride variance, for the reissued permit, proposed target limits and a detailed source reduction measures plan, outlining the source reduction activities proposed for the upcoming permit term, shall also be included per ss. NR 106.90(5) and NR 106.83(4), Wis. Adm. Code. An updated source reduction measures plan shall: Include an explanation of why or how each source reduction measure will result in reduced discharge of the target pollutant; and Evaluate any available information on pollutant sources, timing, and concentration to update the mass balance assumptions and expected sources of the pollutant, and Identify any information needs that would help to better determine pollutant sources and make plans to collect that information. Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures but is not an enforceable limitation under the terms of this permit.	
Annual Chloride Reports After Permit Expiration: In the event that this permit is not reissued by the date the permit expires the permittee shall continue to submit annual chloride reports for the previous year following the due date of Annual Chloride Progress Reports listed above. Annual Chloride Progress Reports shall include the information as defined above.	

4.1.1 Explanation of Schedule

Chloride Source Reduction Measures (Target Value) – This schedule is required to ensure that the permittee maintains compliance with the conditions and requirements of receiving a variance from the water quality-based chloride effluent limit. Since a compliance schedule is being granted, an interim limit is required, and that limit is established as 470 mg/L as a weekly average. The schedule requires that annual reports indicate which source reduction measures have been implemented during each calendar year, and an analysis of chloride concentration and mass discharge data based on chloride sampling and flow data. The annual reports shall document progress made towards meeting the chloride target value of 420 mg/L (weekly average) by the end of the permit term.

4.2 Disinfection and Effluent Limitations for E. coli

The permittee shall install disinfection treatment and comply with surface water limitations for E. coli as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification requirement.

Required Action	Due Date
Progress Report: The permittee shall submit a progress report on development and submittal of a facility plan for upgrades to meet disinfection requirements and E. coli limits.	09/30/2027
Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code, for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	04/30/2028

Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to meet disinfection requirements per s. NR 210.06(1), Wis. Adm Code, achieve compliance with final E. coli limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below.	03/31/2029
Treatment Plant Upgrade to Meet Limitations: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	09/30/2029
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	09/30/2030
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	03/31/2031
Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.	04/30/2031

4.2.1 Explanation of Schedule

Disinfection and Effluent Limitations for E. coli – A compliance schedule is included in the permit to provide time for the permittee to submit plans and specs and install disinfection treatment for meeting E. coli water quality-based effluent limits and disinfection requirements pursuant to s. NR 210.06, Wis. Adm. Code. If Blue Mounds Wastewater Treatment Facility decides to use chlorination for disinfection, effluent limitations would be required to ensure proper operation of the de-chlorination system and would become effective May 1, 2031, with the E. coli limitations. See the WQBEL memo for further explanation and limits.

4.3 Water Quality Trading (WQT) Annual Report

Required Action	Due Date
Annual WQT Report: Submit an annual WQT report that shall cover the first year of the permit term. The WQT Report shall include: The number of pollutant reduction credits (lbs/month) used each month of the previous year to demonstrate compliance; The source of each month's pollutant reduction credits by identifying the approved water quality trading plan that details the source; A summary of the annual inspection of each nonpoint source management practice that generated any of the pollutant reduction credits used during the previous year; and Identification of noncompliance or failure to implement any terms or conditions of this permit with respect to water quality trading that have not been reported in discharge monitoring reports.	01/31/2028
Annual WQT Report #2: Submit an annual WQT report that shall cover the previous year.	01/31/2029
Annual WQT Report #3: Submit an annual WQT report that shall cover the previous year.	01/31/2030
Annual WQT Report #4: Submit the 4th annual WQT report. If the permittee wishes to continue to comply with phosphorus limits through WQT in subsequent permit terms, the permittee shall submit a revised WQT plan including a demonstration of credit need, compliance record of the existing	01/31/2031

WQT, and any additional practices needed to maintain compliance over time.	
Annual WQT Report Required After Permit Expiration: In the event that this permit is not reissued by the expiration date, the permittee shall continue to submit annual WQT reports by January 31 each year covering the total number of pollutant credits used, the source of the pollution reduction credits, a summary of annual inspection reports performed, and identification of noncompliance or failure to implement any terms or conditions of the approved water quality trading plan for the previous calendar year.	

4.3.1 Explanation of Schedule

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

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

4.4 Temperature Limits Compliance and Dissipative Cooling Evaluation

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

Required Action	Due Date
Preliminary Compliance Report: Submit a preliminary compliance report indicating alternatives to achieve the final temperature limits. Informational Note: Refer to the Surface Water subsection titled 'Dissipative Cooling Demonstration - POTW Weekly Average Limits' regarding requests for Department consideration of dissipative cooling per s. NR 106.59, Wis. Adm. Code, as well as re-evaluation of the limits pursuant to ch. NR 106, Subchapters V and VI, or s. NR 102.26, Wis. Adm. Code.	12/31/2027
Action Plan: Submit an action plan for complying with all applicable effluent temperature limits.	12/31/2028
Construction Plans: Submit construction plans (if construction is required for complying with effluent temperature limits) and include plans and specifications with the submittal.	06/30/2029
Initiate Actions: Initiate actions identified in the plan.	12/31/2029
Complete Actions: Complete actions necessary to achieve compliance with effluent temperature limits.	12/31/2030

4.4.1 Explanation of Schedule

Temperature Limits Compliance and Dissipative Cooling Evaluation – This schedule requires the permittee to achieve compliance with temperature limits as soon as possible but no later than December 31, 2030. The permittee must identify alternatives for achieving final temperature limits, including whether construction would be required. The permittee may submit information to the Department that demonstrates through a dissipative cooling study that sub-lethal temperature limitations are not necessary because sub-lethal in-stream temperature criteria are not exceeded outside of a small area of mixing and cooling. If the permittee successfully demonstrates that sub-lethal temperature limits are unnecessary due to dissipative cooling of the effluent, the Department will modify the permit to remove the temperature limits. This schedule is authorized by s. NR 106.62, Wis. Adm. Code.

4.5 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan Submittal: Submit a management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes.	03/31/2027

4.5.1 Explanation of Schedule

Land Application Management Plan – 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.

Attachments

Water Quality-Based Effluent Limitations for the Blue Mounds Wastewater Treatment Facility WPDES Permit No. WI-0031658-09-0, by Sarah Luck, Water Resources Engineer, dated June 19, 2026

Chloride Variance EPA Data Sheet

Village of Blue Mounds Source Reduction Measures Plan, dated 1/15/2026

Water Quality Trading (WQT) Plan, dated April 2026

WQT Plan, Conditional Approval for WQT-2026-0006, dated April 21, 2026

Justification Of Any Waivers From Permit Application Requirements

No waivers from permit application requirements were requested or granted.

Prepared By: Sarah Donoughe, Wastewater Specialist-Adv **Date:** July 27, 2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: June 19, 2026

TO: Sarah Donoughe – SER/Green Bay

FROM: Sarah Luck – SCR/Fitchburg

SUBJECT: Water Quality-Based Effluent Limitations for the Blue Mounds Wastewater Treatment Facility
WPDES Permit No. WI-0031658-09-0

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 Blue Mounds Wastewater Treatment Facility in Dane County. This municipal wastewater treatment facility (WWTF) discharges to the Williams-Barneveld Creek, located in the Ridgeway Branch - East Branch Pecatonica River Watershed in the Sugar-Pecatonica Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5	30 mg/L			15 mg/L		2
TSS	30 mg/L			20 mg/L		2
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen		4.0 mg/L				2
Ammonia Nitrogen March - September October - November December - February	 - - Variable		 7.1 mg/L **11 mg/L** **13 mg/L**	 2.8 mg/L 5.5 mg/L **6.2 mg/L**		2,3
E. coli May – September				126 #/100 mL geometric mean		4
Chlorine, Total Residual	19 µg/L		7.3 µg/L	**7.3 µg/L**		5
Chloride Concentration Limit Mass limit	 760 mg/L 950 lbs/day		 400 mg/L 250 lbs/day	 **400 mg/L** -		6
Phosphorus WQT MCL Final Conc. Limits Final Mass Limits				 1.0 mg/L 0.225 mg/L -	 0.6 mg/L 0.075 mg/L 0.047 lbs/day	7
Temperature						8
TKN, Nitrate+Nitrite, and Total Nitrogen						9

Footnotes:

1. Monitoring only.
2. No changes from the current permit.
3. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. Additional limits to comply with

the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, are included in bold text.

Effluent pH (s.u.)	**Limit (mg/L)**	**Effluent pH (s.u.)**	**Limit (mg/L)**	**Effluent pH (s.u.)**	**Limit (mg/L)**
6.0 < pH ≤ 6.1	54	7.0 < pH ≤ 7.1	33	8.0 < pH ≤ 8.1	6.9
6.1 < pH ≤ 6.2	53	7.1 < pH ≤ 7.2	30	8.1 < pH ≤ 8.2	5.7
6.2 < pH ≤ 6.3	52	7.2 < pH ≤ 7.3	26	8.2 < pH ≤ 8.3	4.7
6.3 < pH ≤ 6.4	51	7.3 < pH ≤ 7.4	23	8.3 < pH ≤ 8.4	3.9
6.4 < pH ≤ 6.5	49	7.4 < pH ≤ 7.5	20	8.4 < pH ≤ 8.5	3.2
6.5 < pH ≤ 6.6	47	7.5 < pH ≤ 7.6	17	8.5 < pH ≤ 8.6	2.7
6.6 < pH ≤ 6.7	45	7.6 < pH ≤ 7.7	14	8.6 < pH ≤ 8.7	2.2
6.7 < pH ≤ 6.8	42	7.7 < pH ≤ 7.8	12	8.7 < pH ≤ 8.8	1.8
6.8 < pH ≤ 6.9	39	7.8 < pH ≤ 7.9	10	8.8 < pH ≤ 8.9	1.6
6.9 < pH ≤ 7.0	36	7.9 < pH ≤ 8.0	8.4	8.9 < pH ≤ 9.0	1.3

4. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. Total residual chlorine limits apply only if chlorine is used to disinfect in order to meet *E. coli* limits. An additional limit to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, is included in bold.
6. These are the WQBELs for chloride; an additional limit to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, is included in bold. If these limits are included in the permit, a wet weather mass limit would also need to be included. An alternative effluent limitation of 470 mg/L as a weekly average, which represents the 4-day P_{99} of representative effluent data (after rounding), may be included in the permit in place of the WQBELs if the chloride variance application that was submitted is approved by EPA.
7. The facility is pursuing water quality trading (WQT) as an alternative compliance option to offset any total phosphorus discharged that exceeds the final phosphorus WQBELs. The phosphorus WQBELs may be expressed as computed compliance limits, but a minimum control level (MCL) must be set as a limit not to be exceeded at the outfall. Therefore, the MCL of 1.0 mg/L as a monthly average and should not be exceeded during the permit term. The current 6-month average limit of 0.6 mg/L should also be retained to prevent backsliding per ch. NR 207 subchapter II, Wis. Adm. Code.
8. The following temperature limits are required in addition to year-round temperature monitoring. A compliance schedule may be given before limits go into effect during which time the effluent data can be verified and a new dissipative cooling study may be conducted.

Month	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
APR	63	-
MAY	70	84
JUN	77	85
JUL	81	86
AUG	79	86
SEP	73	85
OCT	63	83
NOV	54	-

9. The *Guidance for Total Nitrogen Monitoring in Wastewater Permits* (October 1, 2019) recommends annual total nitrogen monitoring 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. Code, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), 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 Sarah Luck (Sarah.Luck@wisconsin.gov) or Diane Figiel (Diane.Figiel@wisconsin.gov).

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

PREPARED BY: Sarah Luck _____ Date: June 19, 2026

Sarah Luck
Water Resources Engineer

E-cc: Kenzie Ostien, Wastewater Engineer – SCR/Fitchburg
Lisa Creegan, Regional Wastewater Supervisor – SCR/Fitchburg
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Section Manager – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Blue Mounds Wastewater Treatment Facility

WPDES Permit No. WI-0031658-09-0

PART 1 – BACKGROUND INFORMATION

Facility Description

Blue Mounds Wastewater Treatment Facility currently serves a population of approximately 987 people with no significant industrial contributors. The treatment facility consists of fine screen, activated sludge-oxidation ditch, and final clarification. Phosphorus removal is achieved using a chemical feed system (completed in December 2023). Sludge handling and treatment consists of gravity settling, aerobic digestion, and 180-day storage. There are plans to control phosphorus through installation of a chemical feed system.

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

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5	30 mg/L			15 mg/L		2
TSS	30 mg/L			20 mg/L		2
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen		4.0 mg/L				2
Ammonia Nitrogen March - September October - November December - February	 - - Variable		 7.1 mg/L **11 mg/L** **13 mg/L**	 2.8 mg/L 5.5 mg/L **6.2 mg/L**		3,4
Chloride			470 mg/L			5
Phosphorus Interim AM Interim Final				 5.7 mg/L 1.0 mg/L 0.225 mg/L -	 - 0.6 mg/L 0.075 mg/L 0.047 lbs/day	6
Temperature						1

Footnotes:

1. Monitoring only.
2. These limits are based on the Limited Forage Fishery community of the immediate receiving water as described in s. NR 104.02(3)(a), Wis. Adm. Code.

3. Variable daily maximum effluent limits for ammonium are dependent on pH. For the discharge of Outfall 001 to a limited forage fish community with a low flow of 0 cfs, the following variable limits apply from December - February:

Effluent pH (s.u.)	Limit (mg/L)	Effluent pH (s.u.)	Limit (mg/L)	Effluent pH (s.u.)	Limit (mg/L)
6.0 < pH ≤ 6.1	54	7.0 < pH ≤ 7.1	33	8.0 < pH ≤ 8.1	6.9
6.1 < pH ≤ 6.2	53	7.1 < pH ≤ 7.2	30	8.1 < pH ≤ 8.2	5.7
6.2 < pH ≤ 6.3	52	7.2 < pH ≤ 7.3	26	8.2 < pH ≤ 8.3	4.7
6.3 < pH ≤ 6.4	51	7.3 < pH ≤ 7.4	23	8.3 < pH ≤ 8.4	3.9
6.4 < pH ≤ 6.5	49	7.4 < pH ≤ 7.5	20	8.4 < pH ≤ 8.5	3.2
6.5 < pH ≤ 6.6	47	7.5 < pH ≤ 7.6	17	8.5 < pH ≤ 8.6	2.7
6.6 < pH ≤ 6.7	45	7.6 < pH ≤ 7.7	14	8.6 < pH ≤ 8.7	2.2
6.7 < pH ≤ 6.8	42	7.7 < pH ≤ 7.8	12	8.7 < pH ≤ 8.8	1.8
6.8 < pH ≤ 6.9	39	7.8 < pH ≤ 7.9	10	8.8 < pH ≤ 8.9	1.6
6.9 < pH ≤ 7.0	36	7.9 < pH ≤ 8.0	8.4	8.9 < pH ≤ 9.0	1.3

4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and 205.065(7) are included in bold.
5. This is an alternative effluent limitation that was included in the permit in place of the WQBELs since a chloride variance was approved by EPA.
6. The facility pursued adaptive management to achieve compliance with the phosphorus WQBELs.

Receiving Water Information

- Name: Williams-Barneveld Creek
- Waterbody Identification Code (WBIC): 915100
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code:
  - Limited forage fish community, non-public water supply. The waterbody is listed in ch. NR 104 from the outfall location "downstream to the east line of Sec. 14, T6N, R5E" which is approximately 2.2 miles downstream.
  - Coldwater, from Highway 18 downstream to its confluence to the East Branch of the Pecatonica River, Class II trout stream as listed in the "Wisconsin Trout Streams Publication 6-3600" (1980) and recently (January 2023) upgraded to a Class I trout stream. The trout stream classification is located 0.3 miles from the outfall location. Should revisions to ch. NR 104, Wis. Adm. Code, be made, effluent limits may become more restrictive in order to be protective of the coldwater community.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code:
  - The following 7-Q_{10} and 7-Q_2 values are from the Sugar Pecatonica Rivers Water Quality Management Plan (March 1995), where Outfall 001 is located.
    - 7-Q_{10} = 0 cfs (cubic feet per second)
    - 7-Q_2 = 0 cfs
  - At point of classification change (approx. 2.2 miles downstream), the following 7-Q_{10} and 7-Q_2 were estimated using regression equations developed in the USGS publication "Low-Flow Characteristics of Streams in the Pecatonica-Sugar River Basin, Wisconsin"
    - 7-Q_{10} = 0.43 cfs (cubic feet per second)
    - 7-Q_2 = 0.74 cfs
- Hardness = 301 mg/L as $CaCO_3$. 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: 25%
- 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.
- Impaired water status: Williams-Barneveld Creek is not listed as impaired. However, the East Branch Pecatonica River, located approximately 7.4 miles downstream of the discharge, is impaired for Total Phosphorus.

Effluent Information

- Flow rate:
  Design annual average = 0.075 Million Gallons per Day (MGD)
  Peak daily = 0.150 MGD
  For reference, the actual average flow from January 2021 through April 2026 was 0.044 MGD.
- Hardness = 301 mg/L as $CaCO_3$. This value represents the geometric mean of four samples collected in June 2025 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.
- Water supply: Village of Blue Mounds.
- Additives: Blue Mounds Wastewater Treatment Facility has included one additive in the permit application that has the potential to be present in the effluent. This additive is listed below:
  - Aluminum Sulfate – Aluminum sulfate is currently added during storage tank decanting and can be added during periods of a biological upset for phosphorus removal.
    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 additive.
- 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 hardness.
- 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)
05/06/25	<5.2	05/23/25	<5.2	06/08/25	<5.2
05/10/25	<5.2	05/27/25	<5.2	06/12/25	<5.2
05/15/25	<5.2	05/31/25	<5.2	06/16/25	<5.2
05/19/25	<5.2	06/04/25	<5.2		

"<" means that the pollutant was not detected at the indicated limit of detection.

Chloride Effluent Data

	Chloride (mg/L)
1-day P_{99}	610
4-day P_{99}	474

Attachment #1

	Chloride (mg/L)
30-day P_{99}	400
Mean	361
Std	86.81
Sample size	256
Range	77 - 780

The following table presents the average concentrations and loadings at Outfall 001 from January 2021 through April 2026 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_5	4 mg/L*	
TSS	4 mg/L*	
pH field	7.9 s.u.	
Dissolved Oxygen	5.0 mg/L	
Ammonia Nitrogen	0.22 mg/L	
Chloride	361 mg/L	
Phosphorus	2.45 mg/L	0.91 lbs/day

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

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

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

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

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. 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_{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.

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 (mg/L) 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	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19.0	19.0	3.81	-		
Arsenic		340	339.8	68.0	<7.7		
Cadmium	301	36.4	36.4	7.3	<0.41		
Chromium	301	4,442	4,441.5	888	<1.1		
Copper	301	43.8	43.8	8.8	<5.2		
Lead	301	310	309.7	61.9	<1.4		
Nickel	268	1080	1080.3	216	1.7		
Zinc	301	315	315.2	63.0	30.4		
Chloride (mg/L)		757	757.0			610	**780**

* 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.

* * 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.	4-day P_{99}	4-day Max
Chlorine		7.28	7.29	1.46	-		
Arsenic		152.2	152	30.5	<7.7		
Cadmium	175	3.82	3.82	0.8	<0.41		

Attachment #1

SUBSTANCE	REF. HARD.* mg/L	CTC	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}	4-day Max
Chromium	301	325.43	325	65.1	<1.1		
Copper	301	26.55	26.6	5.31	<5.2		
Lead	301	81.12	81.1	16.2	<1.4		
Nickel	268	120.18	120	24.0	1.7		
Zinc	301	315.21	315	63.0	30.4		
Chloride (mg/L)		395	395			**474**	**527**

* 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	<0.41
Chromium (+3)	3,818,000	3,818,000	777,703	<1.1
Lead	140	140	28.0	<1.4
Nickel	43,000	43,000	8,600	1.7

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	<7.7

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 required for chloride**. Limits and monitoring recommendations are made in the paragraphs below.

Chloride – Considering available effluent data from the current permit term (January 2021 through April 2026), summarized in the table below, the 1-day P_{99} concentration is 610 mg/L, the 4-day P_{99} is 474 mg/L, and the peak weekly average is 527 mg/L (week of 11/02/2025).

Attachment #1

Chloride Effluent Data

	Concentration (mg/L)	Mass (lbs/day)
1-day P_{99}	610	312.59
4-day P_{99}	474	207.69
30-day P_{99}	400	153.94
Mean	361	128.08
Std	86.81	56.50
Sample size	256	248
Range	77 - 780	8.43 - 856.94

Since the discharge concentration for any day and 4-day P_{99} exceed the calculated daily maximum and weekly average WQBELs, respectively, an effluent limit is needed in accordance with ss. NR 106.05(3)(a) and NR 106.05(4)(b), Wis. Adm. Code.

However, Subchapter VII of ch. NR 106, Wis. Adm. Code, provides for a variance from water quality standards for this substance, and Blue Mounds Wastewater Treatment Facility has requested such a variance. That variance may be granted subject to the following conditions:

1) The permit shall include an "Interim" limitation intended to prevent an increase in the discharge of chloride;
2) The permit shall specify "Source Reduction Measures" to be implemented during the permit term, with periodic progress reports; and
3) The permit shall include a "Target Limit" or "Target Value" to gage the effectiveness of the Source Reduction Measures, and progress toward the WQBELs.

Interim Limit for Chloride

Section NR 106.82(9), Wis. Adm. Code, defines a "Weekly average interim limitation" as either the 4-day P_{99} concentration or 105% of the highest weekly average concentration of the representative data.

Ideally, the effluent chloride concentration at facilities with variances will trend downward as time goes on as a result of source reduction measures, and the recalculated interim limit will decline until the plant can meet the WQBEL. Effluent concentrations have remained mostly consistent (the 4-day P_{99} from January 2021 through April 2026 is 474 mg/L which, after rounding to two significant figures, is equal to the current interim limit of 470 mg/L). **Therefore, the current weekly average interim chloride limit of 470 mg/L is recommended for permit reissuance.**

A target limit and permit language for Source Reduction Measures are not recommended as part of this evaluation. These should follow contact with Blue Mounds Wastewater Treatment Facility. Though if the Department and Blue Mounds Wastewater Treatment Facility are unable to reach agreement on all the terms of a Chloride Variance, the calculated limits described earlier should be included in the permit, in accordance with s. NR 106.83(3), Wis. Adm. Code.

Chloride Monitoring Recommendations

Four samples per month (on consecutive days) are recommended. This allows for averaging of the results to compare with the interim limit and allows the use of the average in determining future interim limits, and degree of success with chloride reduction measures.

In the absence of a variance, Blue Mounds Wastewater Treatment Facility would be subject to the WQBELs of:

- 760 mg/L (757 mg/L, rounded) and 950 lbs/day (947 lbs/day, rounded) (757 mg/L × 0.150 MGD × 8.34) as daily maximums, and
- 400 mg/L (395 mg/L, rounded), 250 lbs/day (247 lbs/day, rounded) (395 mg/L × 0.075 MGD × 8.34), and an alternative wet weather mass limit as weekly averages. The peak weekly design flow would be needed to calculate the wet weather mass limit. The wet weather mass limit applies when the dry weather mass limit is exceeded and the facility demonstrates to the Department the exceedance occurred during a wet weather event.

Mercury – The permit application did not require monitoring for mercury because Blue Mounds Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. Three samples were collected in 2021, 2023, and 2025 – all were below the level of detection of 0.40 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 Blue Mounds Waterworks (PWS ID: 11300234) is provided in the table below:

Water Supply PFAS Data

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
06/12/2023	2306120-04	NY871	ND	ND
06/12/2023	2306120-03	BF483	ND	ND

The limited data above shows the municipal water supply is below one-fifth of the applicable PFOS and PFOA criteria.

Based on the type of discharge, 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 CONVENTIONAL POLLUTANTS

BOD, TSS, DO, and pH

The current biological oxygen demand (BOD), total suspended solids (TSS), dissolved oxygen (DO), and pH limits are the limits given in s. NR 104.02(3)(a), Wis. Adm. Code, for discharges to limited forage fishery receiving waters. **No changes are recommended for BOD, TSS, DO, and pH limits.**

It should be noted that Williams-Barneveld Creek, from Highway 18 downstream to its confluence to the East Branch of the Pecatonica River, is listed as a Class II trout stream in "Wisconsin Trout Streams Publication 6-3600" and has recently (January 2023) been upgraded to a Class I trout stream. The trout stream classification is located 0.3 miles from the outfall location. Should revisions to ch. NR 104, Wis. Adm. Code, be made, effluent limits may become more restrictive in order to be protective of the coldwater community.

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. The current permit has daily maximum, weekly average, and monthly average limits. These limits are re-evaluated at this time due to the following change:

- The maximum expected effluent pH has changed.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

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

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

Where:

A = 0.411 and B = 58.4 for a Limited Forage Fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 559 sample results were reported from January 2021 through April 2026. The maximum reported value was 8.5 s.u. (Standard pH Units). The effluent pH was 8.4 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.6 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 8.5 s.u. Therefore, a value of 8.5 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.5 s.u. into the equation above yields an ATC = 3.2 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method

In accordance with s. NR 106.32(2), Wis. Adm. Code, daily maximum ammonia limitations are calculated using the 1-Q_{10} receiving water low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q_{10} (estimated as 80 % of 7-Q_{10}) and the 2×ATC approach are shown below.

Attachment #1

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit (mg/L)
2×ATC	6.4
1-Q_{10}	3.2

The 1-Q_{10} method yields the most stringent limits for Blue Mounds Wastewater Treatment Facility.

The current permit has variable daily maximum effluent limits based on effluent pH, shown in the table below, applicable during December through February.

Daily Maximum Limits – LFF

Effluent pH (s.u.)	Limit (mg/L)	Effluent pH (s.u.)	Limit (mg/L)	Effluent pH (s.u.)	Limit (mg/L)
6.0 < pH ≤ 6.1	54	7.0 < pH ≤ 7.1	33	8.0 < pH ≤ 8.1	6.9
6.1 < pH ≤ 6.2	53	7.1 < pH ≤ 7.2	30	8.1 < pH ≤ 8.2	5.7
6.2 < pH ≤ 6.3	52	7.2 < pH ≤ 7.3	26	8.2 < pH ≤ 8.3	4.7
6.3 < pH ≤ 6.4	51	7.3 < pH ≤ 7.4	23	8.3 < pH ≤ 8.4	3.9
6.4 < pH ≤ 6.5	49	7.4 < pH ≤ 7.5	20	8.4 < pH ≤ 8.5	3.2
6.5 < pH ≤ 6.6	47	7.5 < pH ≤ 7.6	17	8.5 < pH ≤ 8.6	2.7
6.6 < pH ≤ 6.7	45	7.6 < pH ≤ 7.7	14	8.6 < pH ≤ 8.7	2.2
6.7 < pH ≤ 6.8	42	7.7 < pH ≤ 7.8	12	8.7 < pH ≤ 8.8	1.8
6.8 < pH ≤ 6.9	39	7.8 < pH ≤ 7.9	10	8.8 < pH ≤ 8.9	1.6
6.9 < pH ≤ 7.0	36	7.9 < pH ≤ 8.0	8.4	8.9 < pH ≤ 9.0	1.3

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 January 2021 through April 2026.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen (mg/L)	March – September	October – November	December – February
1-day P_{99}	1.78	0.83	0.68
4-day P_{99}	0.97	0.46	0.37
30-day P_{99}	0.47	0.26	0.19
Mean	0.27	0.18	0.12
Std	0.38	0.17	0.14
Sample size	324	87	198
Range	0.03 - 3.65	0.01 - 1.27	0.03 - 1.25

Reasonable Potential

The need to include ammonia limits in the [facility name] permit is determined by calculating 99th upper percentile (or P_{99}) values for ammonia 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.

Final Ammonia Nitrogen Limits

	Daily Maximum (mg/L)	Weekly Average (mg/L)	Monthly Average (mg/L)
March – September	-	7.1	2.8
October – November	-	**11**	5.5
December – February	Variable	**13**	**6.2**

Additional limits to meet the requirements in s. NR 106.07, Wis. Adm Code, are denoted in bold text.

PART 5 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

Section NR 102.04(5), Wis. Adm. Code, states that all surface waters shall be suitable for supporting recreational use and shall meet *E. coli* criteria during the recreation season. Section NR 102.04(5)(b), Wis. Adm. Code, allows the Department to make exceptions when it determines, in accordance with s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to meet *E. coli* limits and protect the recreational use. Section NR 210.06(3), Wis. Adm. Code, tasks the Department with determining the need for disinfection using a site-specific analysis based on potential risk to human or animal health. It sets out the factors that must be considered in determining the necessity to disinfect municipal wastewater or to change the length of the disinfection season.

Blue Mounds Wastewater Treatment Facility has previously been exempted from disinfection based on the limited forage classification of the immediate receiving water. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis. Adm. Code (not on the water quality classifications - i.e., limited aquatic life, limited forage fish - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for Williams-Barneveld Creek at the outfall location is listed in ch. NR 104, Wis. Adm. Code, as noncontinuous. Discharges to noncontinuous streams with $7Q_{10}$ values < 0.1 cfs usually result in effluent-dominated situations. The risk of illness is related to the concentration of *E. coli,* and therefore, dilution is an important consideration when considering risk to human health. Since little to no dilution is present in these situations, disinfection should not be exempted based solely on this hydrological classification.

The Department has considered the information required by s. NR 210.06(3), Wis. Adm. Code, and has determined that the discharge cannot meet bacteria limits without disinfection. Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

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

These limits are required during May through September.

Total Residual Chlorine – **If Blue Mounds Wastewater Treatment Facility decides to upgrade to use chlorination for disinfection, effluent limitations would be recommended to assure proper operation of the de-chlorination system.** Section NR 210.06(2)(b), Wis. Adm. Code, states, "When chlorine is used for disinfection, the daily maximum total residual chlorine concentration of the discharge may not exceed 0.10 mg/L." Because the WQBELs are more restrictive, they are recommended instead. Specifically, **a daily maximum limit of 19 µg/L would be required if Blue Mounds Wastewater Treatment Facility decides to use chlorination for disinfection.** Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. The calculated **weekly average effluent limitation of 7.3 µg/L would also be included in the permit because it is more restrictive than the daily maximum limit.**

Sections NR 106.07(3) and NR 205.067(7), Wis. Adm. Code, require WPDES permits contain weekly average and monthly average limitations for municipal dischargers whenever practicable and necessary to protect water quality. **Therefore, a weekly average and monthly average limit of 7.3 µg/L would also be required** to meet expression of limits requirements in addition to the daily max limit.

PART 6 – 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.

Since Blue Mounds Wastewater Treatment Facility currently has a phosphorus limit of 1.0 mg/L as a monthly average, the need for a TBEL will not be considered further.

In addition, the need for a WQBEL for phosphorus must be considered.

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

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

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

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

Where:

WQC = 0.075 mg/L for Williams-Barneveld Creek
Qs = 100% of the 7-Q_2 of 0 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.075 MGD = 0.116 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

The effluent limit is set equal to criteria because the receiving water flow is equal to zero.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from January 2021 through April 2026 and effluent data since the chemical phosphorus upgrade was considered fully complete (December 2023).

Total Phosphorus Effluent Data

	January 2021 through April 2026		**Dec 2023 through April 2026** (data since chemical phosphorus removal was fully implemented)	
	Concentration (mg/L)	**Mass (lbs/day)**	**Concentration (mg/L)**	**Mass (lbs/day)**
1-day P_{99}	11.15	5.13	0.52	0.30
4-day P_{99}	6.17	2.78	0.36	0.18
30-day P_{99}	3.57	1.45	0.28	0.12
Mean	2.45	0.91	0.24	0.09
Std	2.25	1.07	0.09	0.06
Sample size	126	108	58	58
Range	0.1 - 6.50	0.02 - 5.65	0.1 - 0.46	0.02 - 0.30

Reasonable Potential Determination

The discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion because the 30-day P_{99} of reported effluent total phosphorus data is greater than the calculated WQBEL**.** Therefore, **a WQBEL is required.**

Limit Expression

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

Mass Limits
A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that upstream of a phosphorus-impaired water (East Branch of the Pecatonica River). **This final mass limit shall be 0.075 mg/L × 8.34 × 0.075 MGD = 0.047 lbs/day expressed as a six-month average.**

Water Quality Trading Minimum Control Level
Blue Mounds Wastewater Treatment Facility has elected to shift from an Adaptive Management approach to Water Quality Trading (WQT) to maintain compliance with phosphorus limits. The phosphorus WQBELs may be expressed as computed compliance limits, but a minimum control level (MCL) must be set as a limit not to be exceeded at the outfall. Therefore, the previous interim phosphorus limits of **1.0 mg/L as a monthly average and 0.6 mg/L as a six-month average are recommended during the reissued permit term to serve as the MCL.**

PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from January 2021 through April 2026.

The table below summarizes the maximum temperatures reported during monitoring from January 2024 through December 2024.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	46	48	54	78
FEB	48	48	54	79
MAR	50	51	57	80
APR	76	78	**63**	81
MAY	87	93	**70**	**84**
JUN	94	96	**77**	**85**

Attachment #1

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JUL	90	94	**81**	**86**
AUG	98	100	**79**	**86**
SEP	91	95	**73**	**85**
OCT	84	88	**63**	**83**
NOV	62	62	**54**	80
DEC	51	52	54	79

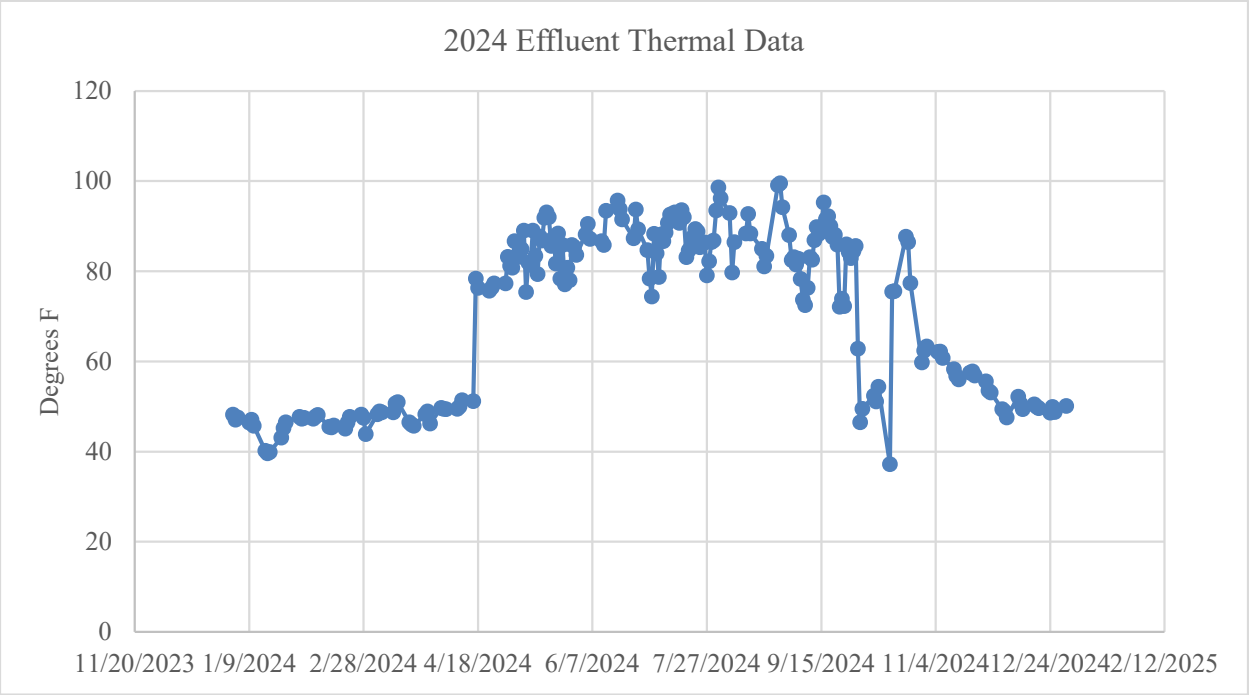
Reasonable Potential
Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

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

Comparing the representative highest effluent temperature to the calculated effluent limits determines the reasonable potential of exceeding the effluent limits. The months in which limitations are recommended are shown in bold. Based on this analysis, **daily maximum temperature limits are needed for the months of May through October, and weekly average temperature maximum limits are necessary April through November. Thermal monitoring year-round is also recommended.** The complete thermal table can be found in Attachment #4.

Data Reliability
The thermal effluent data collected in 2024, specifically in the spring and summer, is much higher than it has been in the past. Given that there are no industrial contributors to the system, the reported temperatures appear uncharacteristic for a system of this type and do not seem to be accurate or representative of normal operating conditions. When asked in 2026, the facility reported that batteries in the thermal probe were replaced in the spring. At some point the thermal probe was also mounted but not actually in the effluent. The facility also noted that the probe failed at some point and a new one was ordered and that there was a space heater in the room during the winter to prevent freezing (but it is

unclear to the Department if the heater would have impacted temperature readings). The graph below shows the effluent temperature data that was reported in 2024.



Given the questionable accuracy of the data, **further monitoring is recommended while ensuring the probe is operating correctly and is appropriately submerged in the effluent and not being impacted or influenced by external factors.**

Dissipative Cooling
Blue Mounds Wastewater Treatment Facility has submitted a request for consideration of dissipative cooling, referencing a previous dissipative cooling study (conducted on 11/20/2015) and a statement that there have not been substantial changes to the facility. However, given the significant increase in reported effluent temperatures and the downstream trout (coldwater) habitat, the **Department does not find it appropriate to use the existing dissipative cooling study to waive thermal limits at this time. If a consideration of dissipative cooling is requested in the future, a new study is required.** Please reach out to Department staff prior to conducting the study.

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

- Effluent monitoring data: Verification or additional effluent monitoring (flow and/or temperature) may be appropriate if there were questions on the representativeness of the current effluent data.
- Monthly low receiving water flows: Contract with USGS to generate monthly low flow estimates for the receiving water to be used in place of the annual low flow.
- Mixing zone studies: A demonstration of rapid and complete mixing may allow for the use of a mixing zone other than the default 25%.

- Dissipative cooling demonstration: Effluent limitations based on sub-lethal criteria may be adjusted based on the potential for heat dissipation from municipal treatment plants as described in s. NR 106.59(4), Wis. Adm. Code. **A new study would need to be completed** if this option is chosen.
- Collection of site-specific ambient temperature: default background temperatures for streams in Wisconsin, so actual data from the direct receiving water may provide for relaxed thermal limits but only if the site-specific temperatures are lower than the small stream defaults used in the above tables
- A variance to the water quality standard: This is typically considered to be the least preferable and most complex option as it requires the evaluation of the other alternatives.

These options are explained in additional detail in the August 15, 2013 Department *Guidance for Implementation of Wisconsin's Thermal Water Quality Standards*
https://dnr.wisconsin.gov/topic/Wastewater/Thermal.html

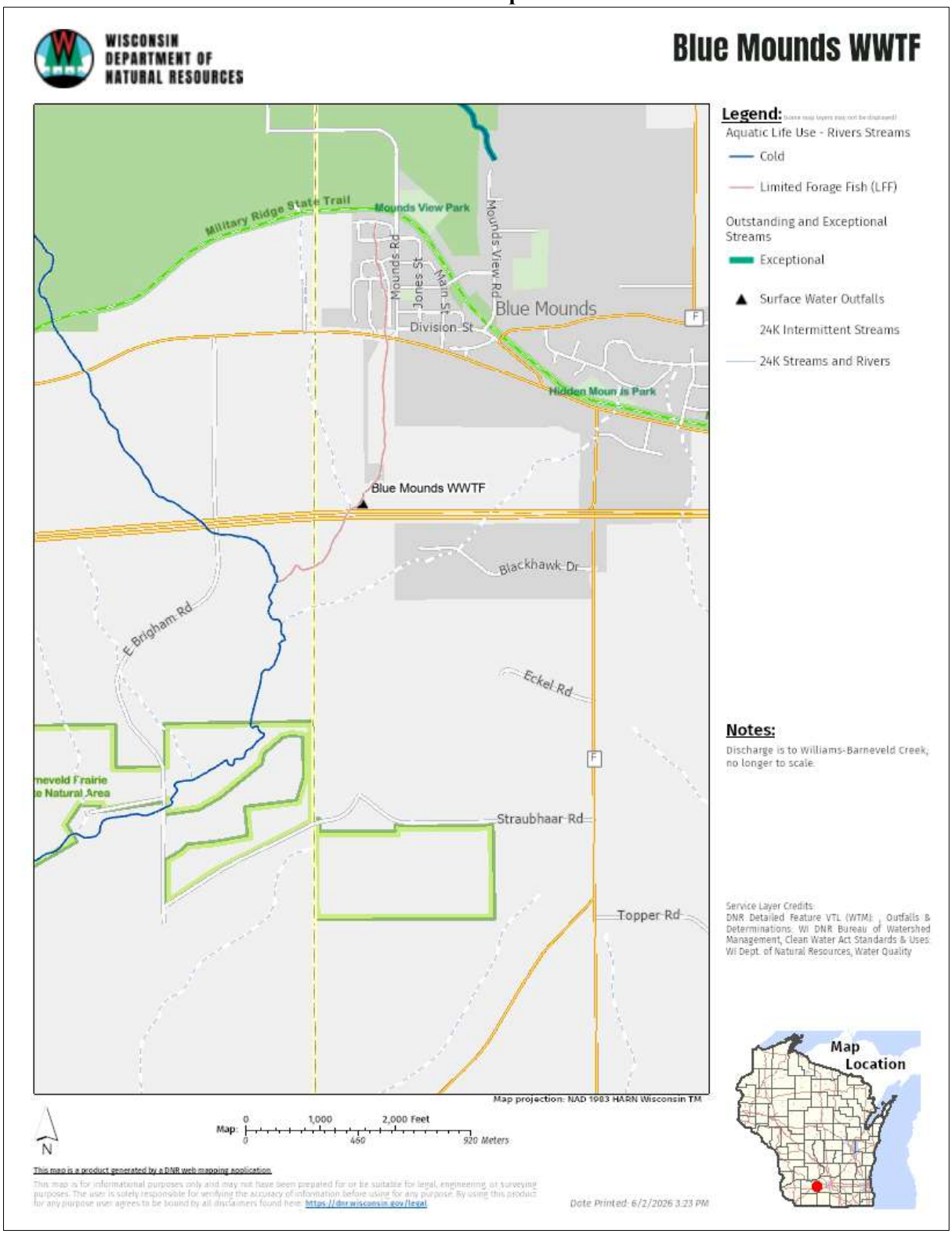
PART 8 – WHOLE EFFLUENT TOXICITY (WET)

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

Guidance in Chapter 1.11 ("WET Testing of Minor Municipal Discharges") of the *WET Guidance Document* was consulted. This is a minor municipal discharge (< 1.0 MGD) comprised solely of domestic wastewater. While there was one chloride effluent concentration of 780 mg/L, the rest of the 255 results were below 570 mg/L. One chronic WET failure occurred on 08/15/2000, but significant changes in WET test methods have been made since the time of this test. The facility also has a SOP on file for the phosphorus removal chemical. **No WET testing is recommended at this time** because of the low risk in effluent toxicity.

Attachment #2

Site Map



Attachment #3

Ammonia Nitrogen Calculations from the WQBEL Memo Dated February 5, 2019

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a Limited Forage Fish Community is calculated by the following equation.

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

Where:

pH = the pH (s.u.) of the effluent,
E = 1.0,
C = the minimum of 3.09 or $3.73 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or
C = $3.73 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and
T = the temperature (ºC) of the receiving water – (Early Life Stages Present), or
T = the maximum of the actual temperature (ºC) and 7 - (Early Life Stages Absent)

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified for a Cold Water Community is calculated by the following equation.

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

Where:

pH = the pH (s.u.) of the receiving water,
E = 0.854,
C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$,
T = the temperature (ºC) of the receiving water

The 4-day criterion is simply equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q_{10} (4-Q_3, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q_5 (estimated as 85% of the 7-Q_2 if the 30-Q_5 is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 ºC, 25% of the flow is used if the Temperature < 11 ºC, and 50% of the flow is used if the Temperature ≥ 11 ºC but < 16 ºC.

The rules provide a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 ºC, during the winter and spring months. Burbot, an early spawning species, are not believed to be present in Williams-Barneveld Creek, based on conversations with local fisheries biologists. So “ELS Absent” criteria apply from October through February, and “ELS Present” criteria will apply from March through September for a Limited Forage Fish classification.

Since minimal ambient data is available, the “default” basin assumed values are used for Temperature, pH and background ammonia concentrations, shown in the table below, with the resulting criteria and effluent limitations. Ambient pH was estimated from local sites at the E. Branch of the Pecatonica River, Williams-Barneveld Creek at Mounds View Rd, and Bohn Creek (HUC 0707000506). These field pH values were averaged (n=9) to estimate ambient stream pH of 8.23 with a range of 7.7-8.6. Due to high hardness (>151 mg/L) of the surface waters in the watershed, ambient pH are estimated to be 8.06 and 7.95, for the months of March-November, December-February respectively.

Attachment #3

LFF Classification		Seasons		
		Mar-Sep	Oct-Nov	Dec-Feb
Effluent Flow	Qe (MGD)	0.075	0.075	0.075
Background Information	7-Q_{10} (cfs)	0	0	0
	7-Q_2 (cfs)	0	0	0
	Ammonia (mg/L)	-	-	-
	Max Temperature (°C)	21	13	4
	Effluent pH (s.u.)	8.3	8.3	8.3
	pH (s.u.) used for Chronic	8.06	8.06	7.95
	% of Flow used	-	-	-
	Reference Weekly Flow (cfs)	0	0	0
	Reference Monthly Flow (cfs)	0	0	0
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	7.07		
	Early Life Stages Absent		18.50	31.94
	30-day Chronic			
	Early Life Stages Present	2.83		
	Early Life Stages Absent		7.40	12.78
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	**7.07**		
	Early Life Stages Absent		**18.50**	**31.94**
	Monthly Average			
	Early Life Stages Present	**2.83**		
	Early Life Stages Absent		**7.40**	**12.78**

At Classification Change to Cold Water - Prior to Ammonia Decay		Seasons		
		Mar-Sep	Oct-Nov	Dec-Feb
Effluent Flow	Qe (MGD)	0.075	0.075	0.075
Background Information	7-Q_{10} (cfs)	0.423	0.423	0.423
	7-Q_2 (cfs)	0.74	0.74	0.74
	Ammonia (mg/L)	0.08	0.05	0.14
	Max Temperature (°C)	18	9	3
	Average Temperature	13	7	2
	pH (s.u.)	8.06	8.06	7.95
	% of Flow used	50	25	25
	Reference Weekly Flow (cfs)	0.211	0.108	0.108
	Reference Monthly Flow (cfs)	0.314	0.15725	0.15725
Criteria mg/L	4-day Chronic	4.45	5.57	6.53
	30-day Chronic	1.78	2.23	2.61
Effluent Limits mg/L	Weekly Average	12.43	10.61	12.36
	Monthly Average	6.39	5.18	5.96

Ammonia Decay: Because the calculated limits are more restrictive than the current limits ammonia decay is considered to determine limits at the outfall to protect the downstream classification. The more restrictive calculated limits should be used to protect at the point of discharge and downstream uses. Where the calculated limits are more restrictive based on downstream uses, ammonia decay can be considered to determine if these more restrictive limits are needed or if the ammonia will decay before it reaches the point of the classification change.

Ammonia decay rates are dependent on temperature with in-stream nitrification essentially non-existent in the winter. In-stream decay is expected so a first order decay model will be used. Based on the available literature, a decay rate of 0.25 day^{-1} at 20°C has been suggested as a default rate. A temperature correction factor of $\theta = 1.08$ is ($k_{.t} = k_{20}\,\theta^{(T-20)}$).

$$N_{Limit} = \left(\frac{N_{down}}{EXP(-k_t T)} \right)$$

Where: N_{Limit} = Ammonia limit needed to protect downstream use (mg/L)
N_{down} = Ammonia limit calculated based on downstream classification and flow (mg/L)
$-k_t$ = Ammonia decay rate at background stream temperature (day^{-1})
T = Travel time from outfall to downstream use (day)

The velocity of receiving water is assumed to be 5 miles per day and the distance from the point of discharge to the classification change is approximately 2.2 miles for a travel time of 0.4 days. This equation shows that at the location where the classification change, 93%, 95%, and 97% of the ammonia is remaining during March to September, October to November, and December to February respectively. After decay, the limits are increased as shown in the following table.

	LFF		Cold Water After decay		Current Limits	
Months Applicable	Weekly Average (mg/L)	Monthly Average (mg/L)	Weekly Average (mg/L)	Monthly Average (mg/L)	Weekly Average (mg/L)	Monthly Average (mg/L)
Mar-Sep	**7.07**	**2.83**	13.4	6.9	14	5.5
Oct-Nov	18.50	7.40	**11.2**	**5.5**	No Limit	18
Dec-Feb	31.94	12.8	**12.8**	**6.2**		21

Attachment #4

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Blue Mounds WWTF		**7-Q_{10}:**	0 cfs			
Outfall(s):	001		**Dilution:**	25%	**Start:**	01/02/24	01/01/21
Date Prepared:	5/26/2026		**f:**	0	**End:**	12/31/24	04/30/26
Design Flow (Qe):	0.075	MGD	**Stream type:**	Limited forage fish community			
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	37	54	78	0	0.113	0.520	0	46	48	54	78
FEB	39	54	79	0	0.062	0.070	0	48	48	54	79
MAR	43	57	80	0	0.084	0.089	0	50	51	57	80
APR	50	63	81	0	0.081	0.094	0	76	78	**63**	81
MAY	59	70	84	0	0.081	0.087	0	87	93	**70**	**84**
JUN	64	77	85	0	0.082	0.089	0	94	96	**77**	**85**
JUL	69	81	86	0	0.068	0.079	0	90	94	**81**	**86**
AUG	68	79	86	0	0.048	0.059	0	98	100	**79**	**86**
SEP	63	73	85	0	0.088	0.361	0	91	95	**73**	**85**
OCT	55	63	83	0	0.044	0.057	0	84	88	**63**	**83**
NOV	46	54	80	0	0.066	0.078	0	62	62	**54**	80
DEC	40	54	79	0	0.056	0.079	0	51	52	54	79

Facility Specific Chloride Variance Data Sheet

Directions: Please complete this form electronically. Record information in the space provided. Select checkboxes by double clicking on them. Do not delete or alter any fields. For citations, include page number and section if applicable. Please ensure that all data requested are included and as complete as possible. Attach additional sheets if needed.

Section I: General Information

A. Name of Permittee: Village of Blue Mounds

B. Facility Name: Blue Mounds Wastewater Treatment Facility

C. Submitted by: Wisconsin Department of Natural Resources

D. State: Wisconsin **Substance:** Chloride **Date completed:** August 13, 2026

E. Permit #: WI-0031658-09-0 **WQST#:** (EPA USE ONLY)

F. Duration of Variance **Start Date:** January 1, 2027 **End Date:** December 31, 2031

G. Date of Variance Application: June 30, 2025

H. Is this permit a: ☐ **First time submittal for variance**
☒ **Renewal of a previous submittal for variance** *(Complete Section IX)*

I. Description of proposed variance: The Village of Blue Mounds WWTF (Blue Mounds) discharges to the Williams-Barneveld Creek, in the Ridgeway Branch - East Branch Pecatonica River Watershed in the Sugar-Pecatonica River Basin, in Dane County. The proposed variance for chloride is from the water quality-based effluent limits (WQBELs) of 400 mg/L expressed as a weekly and monthly average, and 760 mg/L and 950 lbs/day expressed as a daily maximum. The proposed permit includes an interim limit of 470 mg/L expressed as a weekly average, a target value of 420 mg/L (weekly average), and the requirement to implement source reduction measures (SRMs). The term of the proposed variance is five years, concurrent with the term of the proposed WPDES permit. The underlying designated uses and criteria of Wisconsin's chloride water quality standards (WQS) will be retained, and all other applicable WQS will remain in effect with adoption of the proposed variance.

Citation: An interim chloride effluent limitation under s. NR 106.83(2), Wis. Adm. Code, represents a variance to water quality standards authorized by s. 283.15, Wis. Stats., and 40 CFR §131.14.

J. List of all who assisted in the compilation of data for this form

Name	Email	Phone	Contribution
Sarah Donoughe	Sarah.Donoughe@Wisconsin.gov	920-366-6076	Permit Drafter/Variance Coordinator
Kenzie Ostien	Kenzie.Ostien@Wisconsin.gov	608-516-6487	Compliance Staff
Sarah Luck	Sarah.Luck@Wisconsin.gov	608-843-3876	Limits Calculator

Section II: Criteria and Variance Information

A. Water Quality Standard from which variance is sought: 395 mg/L (Chloride CTC)

B. List other criteria likely to be affected by variance: None.

C. Source of Substance: Residential, commercial and institutional water softener regeneration backwash (brine) with infiltration and inflow of road salt during the winter road maintenance season likely responsible for significant spikes in chloride effluent concentrations in the winter months.

D. Ambient Substance Concentration: Unknown ☐ **Measured** ☐ **Estimated** ☐ **Default** ☒ **Unknown**

E. If measured or estimated, what was the basis? Include citation. N/A

F. Average effluent discharge rate: 0.044 MGD (average of data reported from January 2021 through April 2026) **Maximum effluent discharge rate:** 0.0943 MGD (4/17/2023)

G. Effluent Substance Concentration: 1-day P99 = 610 mg/L; 4-day P99 = 474 mg/L; 30-day P99 = 400 mg/L; Mean = 361 mg/L ☒ **Measured** ☐ **Estimated** ☐ **Default** ☐ **Unknown**

H. If measured or estimated, what was the basis? Include Citation. Effluent concentration data collected from January 2021 through April 2026 (256 samples).

I. Type of HAC:
- ☐ **Type 1: HAC reflects waterbody/receiving water conditions**
- ☐ **Type 2: HAC reflects achievable effluent conditions**
- ☒ **Type 3: HAC reflects current effluent conditions**

J. Statement of HAC: The Department has determined the highest attainable condition of the receiving water is achieved through the application of the variance limit in the permit, combined with a permit requirement that the permittee implement its Chloride SRM plan. Thus, the HAC at commencement of this variance is 470 mg/L, which reflects the greatest chloride reduction achievable with the current treatment processes, in conjunction with the implementation of the permittee's Chloride SRM plan. The current effluent condition is reflective of on-site optimization measures that have already occurred. This HAC determination is based on the economic feasibility of available compliance options for Blue Mounds WWTF at this time (see Economic Section below). The permittee may seek to renew this variance in the subsequent reissuance of this permit; the Department will reevaluate the HAC in its review of such a request. A subsequent HAC cannot be defined as less stringent than this HAC.

K. Variance Limit: 470 mg/L as a weekly average

L. Level currently achievable (LCA): 470 mg/L as a weekly average

M. What data were used to calculate the LCA, and how was the LCA derived? (*Immediate compliance with LCA is required.)*
The 4-day P99 effluent chloride concentration from January 2021 through April 2026 of 470 mg/L (474 mg/L rounded to two significant figures) as a weekly average is recommended as the LCA.

N. Explain the basis used to determine the variance limit (which must be ≤ LCA). Include citation.
The variance limit = 4-day P99 (after rounding to two significant figures). The limit is established in accordance with s. 283.15 (5), Wis. Stats., and ch. NR 106, Subchapter II, Wis. Adm. Code.

Chapter NR 106, Subchapter VII, Wis. Adm. Code, allows for a variance, the imposition of a less restrictive interim limit, a compliance schedule that stresses source reduction and public education, and allowance for a target value or limit to be a goal for reduction.

O. Select all factors applicable as the basis for the variance provided under 40 CFR 131.10(g). Summarize justification below: ☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☒ **6**

The use of a reverse osmosis system was evaluated. The cost of the system was estimated at an average cost per household that would result in 2.23% of the MHI. Installing lime softening on the current municipal water supply system was also evaluated. The cost of installing lime softening was estimated at an average cost per household that would result in 4.95% of the MHI. Without a variance, meeting the water quality standard of 400 mg/L would result in substantial and widespread economic and social impacts.

Section III: Location Information

A. Counties in which water quality is potentially impacted: Dane

B. Receiving waterbody at discharge point: Williams-Barneveld Creek

C. Flows into which stream/river? East Branch Pecatonica River **How many miles downstream?** 7.39 mi.

D. Coordinates of discharge point (UTM or Lat/Long): Lat: 43.01077º N / Long: 89.83602º W

E. What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the chronic criterion of the substance for aquatic life protection?
It is estimated that compliance with the criterion would occur before the point of classification change, which is approximately 2.2 miles downstream of the outfall. The 7-Q10 low flow estimate at the point of classification change is 0.43 cfs. Using an effluent flow rate of 0.075 MGD (0.116 cfs) at 470 mg/L mixed with 0.43 cfs (assuming complete mixing at the downstream location) and no background chloride concentration gives a mix concentration of 100 mg/L, which is below the chronic criterion of 395 mg/L.

F. Provide the equation used to calculate that distance *(Include definitions of all variables, identify the values used for the clarification, and include citation):*
([interim limit in mg/L x effluent design flow in cfs) + (background concentration mg/L x background stream flow in cfs)] / (effluent design flow in cfs + background stream flow in cfs) = < 395 mg/L.

G. What are the designated uses associated with the direct receiving waterbody, and the designated uses for any downstream waterbodies until the water quality standard is met?
Williams-Barneveld Creek is listed as Limited Forage Fish (LFF) community, non-public water supply. The East Branch Pecatonica River is listed as a Class II trout stream where Williams-Barneveld Creek flows into the river 2.2 miles from the point of discharge.

H. Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody: None.

Permit Number	Facility Name	Facility Location	Variance Limit [mg/L]
N/A			

I. Please attach a map, photographs, or a simple schematic showing the location of the discharge point as well as all variances for the substance currently draining to this waterbody on a separate sheet.
See the "Blue Mounds WWTF – Current Variance Outfalls" map.

J. Is the receiving waterbody on the CWA 303(d) list? If yes, please list the impairments below. ☐ Yes ☒ No ☐ Unknown

River Mile	Pollutant	Impairment
N/A		

K. Please list any contributors to the POTW in the following categories:

Food processors (cheese, vegetables, meat, pickles, soy sauce, etc.)	**None**
Metal Plating/Metal Finishing	**None**
Car Washes	**None**
Municipal Maintenance Sheds (salt storage, truck washing, etc.)	**Village of Blue Mounds salt storage shed**
Laundromats	**Coin Laundromat**
Other presumed commercial or industrial chloride contributors to the POTW	**None**

L. If the POTW does not have a DNR-approved pretreatment program, is a sewer use ordinance enacted to address the chloride contributions from the industrial and commercial users? If so, please describe.

The Village of Blue Mounds does not have language in their sewer use ordinance (SUO) specific to chlorides but the SUO does have language regarding the discharge of water or wastes containing substances that are not amenable to treatment or reduction…or cause the WWTF to exceed the limits presented by the WPDES permit. In 2013 the Village added water softening requirements to their SUO.

Section IV: Pretreatment (complete this section only for POTWs with DNR-Approved Pretreatment Programs. See w:\Variances\Templates and Guidance\Pretreatment Programs.docx)

A. Are there any industrial users contributing chloride to the POTW? If so, please list.
N/A

B. Are all industrial users in compliance with local pretreatment limits for chloride? If not, please include a list of industrial users that are not complying with local limits and include any relevant correspondence between the POTW and the industry (NOVs, industrial SRM updates and timeframe, etc)
N/A

C. When were local pretreatment limits for chloride last calculated?
N/A

D. Please provide information on specific SRM activities that will be implemented during the permit term to reduce the industry's discharge of the variance pollutant to the POTW
N/A

Section V: Public Notice

A. Has a public notice been given for this proposed variance? ☒ **Yes** ☐ **No**

B. If yes, was a public hearing held as well? ☒ **Yes** ☐ **No** ☐ **N/A**

C. What type of notice was given?
☒ **Notice of variance included in notice for permit** ☐ **Separate notice of variance**

D. Date of public notice: August 27, 2026 **Date of hearing:** October 13, 2026

E. Were comments received from the public in regards to this notice or hearing? *(If yes, see notice of final determination)* ☐ **Yes** ☐ **No**

Section VI: Human Health

A. Is the receiving water designated as a Public Water Supply? ☐ **Yes** ☒ **No**

B. Applicable criteria affected by variance: No human health criteria for chloride.

C. Identify any expected impacts that the variance may have upon human health, and include any citations:
None.

Section VII: Aquatic Life and Environmental Impact

A. Aquatic life use designation of receiving water: Limited Forage Fish (LFF)

B. Applicable criteria affected by variance: Chronic Toxicity Criteria for Chloride = 395 mg/L from ch. NR 105, Wis. Adm. Code; applicable in all waters in Wisconsin

C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations:
The proposed variance limit of 470 mg/L results in an instream concentration that exceeds the genus mean chronic values for *Ceriodaphnia* (417 mg/L). No genus mean chronic values are exceeded by the 395 mg/L criterion

D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations:
There are no Endangered or Threatened species known that would affect the water quality criterion, as the chronic toxicity criterion for chloride is more stringent than all genus mean chronic values for organisms with chloride toxicity data. As a result, no endangered species with data would need more protection than already provided by the existing criterion.

Citation: U.S. Fish and Wildlife Service – Environmental Conservation Online System (http://www.fws.gov/endangered/) and National Heritage Index (http://dnr.wi.gov/topic/nhi/)

Section VIII: Economic Impact and Feasibility

A. Describe the permittee's current pollutant control technology in the treatment process:
Blue Mounds Wastewater Treatment Facility currently serves a population of approximately 987 people with no significant industrial contributors. The treatment facility consists of fine screen, activated sludge-oxidation ditch, and final clarification. Phosphorus removal is achieved using a chemical feed system (completed in December 2023). Sludge handling and treatment consists of gravity settling, aerobic digestion, and 180-day storage.

B. What modifications would be necessary to comply with the current limits? Include any citations.
Installation of a reverse osmosis system or lime softening on the current municipal water supply system.

C. How long would it take to implement these changes?
N/A – The costs of providing reverse osmosis (RO) at the wastewater treatment facility or installing lime softening on the current municipal water supply system were evaluated and determined to be prohibitively expensive. See Section II:O.

D. Estimate the capital cost *(Citation)***:** $84,375 for RO treatment (*WDNR Form 3400-193 Chloride Variance Application from permittee*)

E. Estimate additional O & M cost *(Citation)*: $27,375 for RO treatment (*WDNR Form 3400-193 Chloride Variance Application from permittee*)

F. Estimate the impact of treatment on the effluent substance concentration, and include any citations:
A RO system at the WWTF could potentially remove chloride from the effluent to achieve levels below the water quality standard. Installing a centralized lime softening system would eliminate the need for ion exchange softeners and the associated chloride brine generated during the regeneration/backwash cycle that is ultimately discharged to the wastewater treatment system. However, neither option is considered to be economically feasible.

G. Identify any expected environmental impacts that would result from further treatment, and include any citations:
End-of-pipe RO wastewater treatment technology for chloride produces concentrated brine that can be as much or more of an environmental liability than the untreated effluent. Since the concentrated brine cannot be further treated, the only recourse for the disposal of the brine is transfer to another community, which is often not feasible. Appropriate chloride source reduction activities are preferable environmentally to effluent end-of-pipe treatment in most cases, since the end product of treatment (production of a concentrated brine) does not remove the load of chloride from the environment.

There would be some impacts based on disposal of brine from RO. These include air pollution impacts from trucking brine and increased chloride impacts at the point where brine is discharged.

H. Is it technically and economically feasible for this permittee to modify the treatment process to reduce the level of the substance in the discharge? ☐ **Yes** ☒ **No** ☐ **Unknown**
RO treatment of the Blue Mounds WWTF effluent to meet the WQBEL is technically feasible. However, it is not economically feasible. See WDNR Variance Application and Municipal RO Screening Tool for costs of RO. Use of RO was evaluated. The resulting total cost for sewer user rates was estimated to result in an average cost to households that would be 2.23% of the MHI. An increase of this magnitude would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located.

Lime softening treatment of Blue Mounds' water supply is technically feasible and would potentially enable the WWTF effluent to meet the chloride WQBEL. However, lime softening is not economically feasible. See the Chloride Variance Economic Eligibility Tool (Lime Softening) for costs of lime softening. Use of municipal lime softening was evaluated; the resulting cost for sewer user rates was estimated to result in an average cost to households that would be 4.95% of the MHI. An increase of this magnitude would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located.

I. If treatment is possible, is it possible to comply with the limits on the substance? ☒ **Yes** ☐ **No** ☐ **Unknown**

J. If yes, what prevents this from being done? Include any citations.
See Section VIII:H. The costs associated with RO and lime softening treatment are prohibitively expensive.

K. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations:
Reverse Osmosis (RO) Treatment – not economically feasible (2.23% of the MHI)
Centralized Lime Softening Treatment – not economically feasible (4.95% of the MHI)

Section IX: Compliance with Water Quality Standards

A. Describe all activities that have been, and are being, conducted to reduce the discharge of the substance into the receiving stream. This may include existing treatments and controls, consumer education, promising centralized or remote treatment technologies, planned research, etc. Include any citations.

During the previous permit term, the Village of Blue Mounds' permit included the following SRMs:
1. Select village public works employees to complete chloride training to increase knowledge on potential chlorides reduction measures.
2. Present an annual update to Village Board of Trustees on chloride source reduction efforts.

3. Create village welcome packet for new residents that includes information on reducing chlorides.
4. Mail chloride educational pamphlet with sewer customers' sewer bills annually. Post chlorides educational pamphlet on website.
5. Post chlorides educational pamphlets on website.
6. Offer tours of the WWTF to help educate about the issues excess chlorides cause downstream.
7. Encourage local winter maintenance professionals to participate in City of Madison's Winter Salt Certification Program.
8. Survey residents on water softening equipment and practices. Survey could be conducted by village's building inspectors and local plumbers.
9. During visits to residential customers (sanitary surveys, water meter replacements), type of softening system will be documented and tracked, with the goal of reaching 20% of the community annually.
10. Meet with all industrial & commercial customers to evaluate and document softening equipment.
11. Continue monitoring and recording the WWTF's effluent chloride concentration data.
12. Continue rehabilitation of sanitary manholes, and record information as part of the village's Capacity, Management, Operation, and Maintenance (CMOM) program.
13. Submit annual updates to DNR describing work completed on the village's chlorides source reduction measures.
14. Additional chloride source reduction measures will be added if necessary for the village to comply with the WWTF's chlorides variance.

Citation: Village of Blue Mounds WWTF Chloride Annual SRM Reports 2021-2024

B. Describe all actions that the permit requires the permittee to complete during the variance period to ensure reasonable progress towards attainment of the water quality standard. Include any citations.

As conditions of this variance the proposed permit requires the permittee to (a) maintain effluent quality at or below the interim effluent limitation in the proposed permit, (b) implement the chloride source reduction measures specified in the Village of Blue Mounds Source Reduction Measures Plan dated 1/15/2026, and (c) perform the actions listed in the Schedule section of the proposed permit.

Citation: Village of Blue Mounds Source Reduction Measures Plan dated 1/15/2026

Section X: Compliance with Previous Permit *(Variance Reissuances Only)*

A. Date of previous submittal: November 30, 2020 **Date of EPA Approval:** December 30, 2020

B. Previous Permit #: WI-0031658-08-0 **Previous WQSTS #:** (EPA USE ONLY)

C. Effluent substance concentration: 474 mg/L (4-day P99) **Variance Limit:** 470 mg/L (weekly average)

D. Target Value(s): 420 mg/L **Achieved?** ☐ **Yes** ☐ **No** ☒ **Partial**

E. For renewals, list previous steps that were to be completed. Show whether these steps have been completed in compliance with the terms of the previous variance permit. Attach additional sheets if necessary.

Condition of Previous Variance	Compliance
Select village public works employees to complete chloride training to increase knowledge on potential chlorides reduction measures.	☒ **Yes** ☐ **No**
Present an annual update to Village Board of Trustees on chloride source reduction efforts.	☒ **Yes** ☐ **No**
Create village welcome packet for new residents that includes information on reducing chlorides.	☐ **Yes** ☒ **No**
Mail chloride educational pamphlet with sewer customers' sewer bills annually. Post chlorides educational pamphlet on website.	☒ **Yes** ☐ **No**
Post chlorides educational pamphlets on website.	☐ **Yes** ☒ **No**

Offer tours of the WWTF to help educate about the issues excess chlorides cause downstream.	☒ **Yes** ☐ **No**
Encourage local winter maintenance professionals to participate in City of Madison's Winter Salt Certification Program.	☐ **Yes** ☒ **No**
Survey residents on water softening equipment and practices. Survey could be conducted by village's building inspectors and local plumbers.	☐ **Yes** ☒ **No**
During visits to residential customers (sanitary surveys, water meter replacements), type of softening system will be documented and tracked, with the goal of reaching 20% of the community annually.	☐ **Yes** ☒ **No**
Meet with all industrial & commercial customers to evaluate and document softening equipment.	☒ **Yes** ☐ **No**
Continue monitoring and recording the WWTF's effluent chloride concentration data.	☒ **Yes** ☐ **No**
Continue rehabilitation of sanitary manholes, and record information as part of the village's Capacity, Management, Operation, and Maintenance (CMOM) program.	☒ **Yes** ☐ **No**
Submit annual updates to DNR describing work completed on the village's chlorides source reduction measures.	☒ **Yes** ☐ **No**
Additional chloride source reduction measures will be added if necessary for the village to comply with the WWTF's chlorides variance.	☒ **Yes** ☐ **No**

Village of Blue Mounds

Chlorides Report Additional information:

1/15/2026

Section II:

Self-regenerating residential water softeners are identified as a potential controllable source of chloride to the Village of Blue Mounds wastewater treatment facility. While chloride loading from this source may be reduced through equipment optimization and improved salt efficiency, these systems are privately owned and operated, which substantially limits the Village's ability to directly control or enforce reductions. Accordingly, the Village's actions related to residential water softeners have been limited to reasonable and practicable measures, including public education and voluntary promotion of demand-initiated regeneration (DIR) softeners. These efforts represent a good-faith approach to chloride minimization consistent with Wisconsin DNR guidance, while recognizing the practical limitations of municipal authority over private residential equipment.

SRMs PMPS

1. The Village has reduced its typical salt use over time, moving from around 120 tons per year down to about 80–100 tons in most recent winters. Last year shows very low usage (~20 tons) due to an unusually mild winter, but that year is not reflective of normal conditions. Overall, the data show steady progress in reducing salt use while maintaining safe winter road conditions. The Village makes a brine solution of 86% salt.
2. Please see the attached meeting minutes of the January 8th board meeting.
3. Please see the attached educational pamphlet.
4. The Village has not obtained a solid waste low hazard exemption and will not be considering reuse of reclaimed chloride solution for winter maintenance purposes at this time. The Village will continue to evaluate this option in the future as resources, and regulatory considerations allow.
5. The educational information that is sent out in the newsletter is the same as the educational pamphlet sent out with the sewer bills.
6. N/A
7. The CMOM has not yet been updated with the new manholes, but I have attached the As-Built plans of the Division Street Project.

The Village of Blue Mounds has reviewed regional best practices for winter road salt management, including the City of Madison's Winter Salt Certification Program. While the Village does not participate in this program due to differences in staffing, equipment, and operational scale, its winter maintenance practices incorporate appropriate application rates and operator awareness consistent with available resources. Given the limited extent of municipal roadways, winter maintenance activities represent a relatively minor source of chloride loading. The Village will continue to consider reasonable and practicable measures to minimize chloride contributions from winter maintenance activities consistent with Wisconsin DNR guidance.

The previous chloride report identified surveying residential water softening equipment as a potential future action. After further consideration, the Village determined that conducting formal surveys would be difficult to implement given the small size of the community and the privately owned nature of residential softeners. Instead, the Village has focused on informal outreach and sharing information on efficient softener operation and demand-initiated regeneration (DIR) softeners, which are considered reasonable and appropriate measures for this community.

New SRM Plan

Village of Blue Mounds Source Reduction Measures Plan

Anticipated Project Timeline for 2027-2031 WPDES Permit

Source Reduction Measure	Year 1 (2027)	Year 2 (2028)	Year 3 (2029)	Year 4 (2030)	Year 5 (2031)
Education					
Provide periodic public information on efficient residential water softener operation, including proper salt settings and promotion of demand-initiated regeneration (DIR) softeners.	x	x	x	x	x
Present an annual update to Village Board of Trustees on chloride source reduction efforts.	x	x	x	x	x

Create village welcome packet for new residents that includes information on reducing chlorides					
Post chlorides educational pamphlet on website.	x	x	x	x	x
Offer tours of the WWTF to help educate about the issues excess chlorides cause downstream.	x	x	x	x	x
Encourage local winter maintenance professionals to participate in City of Madison's Winter Salt Certification Program	x	x	x	x	x
Monitoring					
Continue monitoring and recording the WWTF's effluent chloride concentration data.	x	x	x	x	x
Maintenance					
Continue rehabilitation of sanitary manholes, and record information as part of the Village's Capacity, Management, Operation, and Maintenance (CMOM) program.	x	x	x	x	x
Reporting					
Submit annual updates to DNR describing work completed on the village's chlorides source reduction measures	x	x	x	x	x
Additional					
Additional chloride source reduction measures will be added if necessary for the village to comply with the WWTF's chlorides variance	x	x	x	x	x

WATER QUALITY TRADING PLAN

Village of Blue Mounds

April 2026

TOWN & COUNTRY ENGINEERING, INC.

WATER QUALITY TRADING PLAN

Village of Blue Mounds, Wisconsin
Wastewater Treatment Facility

April 2026

TOWN & COUNTRY ENGINEERING, INC.
Madison ♦ Rhinelander ♦ Kenosha ♦ Platteville
6264 Nesbitt Road • Madison, WI 53719 • (608) 273-3350 • tce@tcengineers.net

WATER QUALITY TRADING PLAN

Village of Blue Mounds, Wisconsin
Wastewater Treatment Facility

OCTOBER 2025
(Revised April 2026)

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EXECUTIVE SUMMARY

General Overview

In 2010 the State of Wisconsin modified NR 102 and NR 217 to include new water quality-based effluent limits for phosphorus. As a result, wastewater treatment facilities (WWTF) have begun to receive water quality-based phosphorus limits in their new or re-issued Wisconsin Pollutant Discharge Elimination System (WPDES) permits from the Department of Natural Resources (DNR). As a part of the new rule, WPDES permits include a compliance schedule to evaluate compliance with these new effluent limits. The Blue Mounds WWTF received a re-issued permit in December of 2013. The current permit includes an interim phosphorus limit of 7.5 mg/L for monthly averages, a compliance schedule of 7-9 years with annual requirements, and target effluent limits of 0.075 mg/L for a 6-month average and 0.225 mg/L for monthly averages.

The Village of Blue Mounds evaluated compliance options in the January 2018 Phosphorus Compliance Alternatives Plan and selected Adaptive Management, after a pilot study with SorbX, (RE-100) did not achieve the WWTF's goal of consistently reaching phosphorus concentrations below 0.075 mg/L.

Blue Mounds has been involved with their Watershed Adaptive management approach since 2018. Since that time the Village has explored a handful of potential projects with limited success. Chemical treatment began in December of 2023, with the use of Alum, and has successfully achieved the interim phosphorus limit of 0.60 mg/L.

Although reductions have been successful, the WWTF effluent data and instream phosphorus levels at their point of compliance still land above levels of permit compliance. As a result, the Village has elected to shift from an Adaptive Management Approach and has opted to pursue Water Quality Trading to maintain compliance with their WPDES phosphorus limits. The associated documents with this shift are provided in the appendices of this report, including a signed WDNR Form 3400-206 (Notice of Intent to Conduct Water Quality Trading) and a signed WDNR Form 3400-208 (WQT Checklist).

Point Source and Receiving Waters

The Village of Blue Mounds WWTF is located on the southwest side of the Village and was constructed in 1996. In the spring of 2015, the Village completed the installation of a new mechanical bar screen and enclosure structure at the headworks of the facility. Following screening, wastewater flows by gravity to the two-channel oxidation ditch for treatment. Mixed liquor flows from the ditch to a splitter box where flow is diverted to the 24-foot diameter final clarifier before being discharged to the headwaters of the Williams-Barneveld Creek. Effluent disinfection is currently not required at the facility. Effluent flow is measured and sampled before flowing by gravity to the receiving water.

Wastewater flowing to the WWTF comes from a combination of residential and commercial sources. The population of the Village is 950 people based according to the 2020 United States Census Bureau data. The Village does not include any significant industrial dischargers and hauled waste is limited to holding tank waste from Dairyfood, USA, a user that is not connected to the sewer.

Historically, this facility was not designed with dedicated biological or chemical phosphorus removal processes. Consequently, any phosphorus uptake occurring within the oxidation ditch was incidental, and due to biomass assimilation and occasional favorable conditions for luxury uptake by phosphorus-accumulating organisms (PAOs). This passive uptake was limited and inconsistent, providing only minimal phosphorus removal. Beginning in December 2023, to be in compliance with their permit, the Blue Mounds facility implemented a chemical phosphorus removal strategy by introducing an aluminum sulfate (alum) feed system. Alum effectively binds soluble orthophosphate in the wastewater, forming insoluble aluminum-phosphate precipitates. These precipitates settle with the biological solids and are removed in the center clarifier. The settled solids are subsequently directed to the aerobic digesters for further stabilization.

Supernatant (liquid decant) from the digesters is returned to the headworks for additional treatment, allowing for internal recapture of nutrients and load balancing. The thickened, stabilized sludge is then transferred to the sludge storage facility, where it remains until it is hauled for land application in accordance with regulatory guidelines.

The Blue Mounds WWTF discharges into the headwaters of Williams-Barneveld Creek. At the point of discharge, the tributary is classified as a LFF (Limited Forage Fish) community. Per NR 102.06 Section (3) Paragraph (a), Williams-Barneveld Creek is not listed as having a total phosphorus criterion of 0.1 mg/L, so it shall meet a total phosphorus WQC of 0.075 mg/L.

Target Phosphorus Water Quality Trading Credits

The assessment of credits needed is based on the highest anticipated effluent offset since the installation of chemical treatment. The credit trading target value is determined by the difference between the added annual average pounds produced and the new WQBEL relative to the typical average flow for the same period. In 2023 the WWTF generated an excess above their future WQBEL of approximately 550 pounds of phosphorus for the year. However, this assessment focused on data following the completion of chemical feed upgrades, finalized in December of 2023.

In 2024 the facility demonstrated a significant reduction in effluent phosphorus. Due to the successful activation of their chemical removal system for phosphorus, the facility only generated an excess of approximately 30 pounds of phosphorus. It assumed that these numbers will be the new standard for the WWTF, greatly reducing its impact within the watershed. The Blue Mounds WWTF plans to account for variability and aims to have a 100 pounds of WQT credit on hand. This topic is further explored in Section 3 of this document.

Phosphorus Water Quality Trade

In the summer of 2024 Town & Country Engineering Inc., on behalf of the Village of Blue Mounds, began engaging in dialogue with The Prairie Enthusiasts (TPE). TPE Empire-Sauk Board Representative, Rich Henderson, agreed to pursue a project funded by the Village with the intention to conduct Water Quality Trading with a project to generate a sufficient number of credits required maintain compliance as outlined in the village's WPDES permit. An MOU detailing the content of those conversations, signed by Rich Henderson of TPE, can be found in Appendix A.

The Village elected to pursue a project based on the conversion of approximately 62 acres of leased agricultural land into perennial vegetation. The 62 acres is currently operated as A-to-Z farms and is located in the Williams Barneveld Creek-East Branch Pecatonica River HUC-12 #070900030602, occupying an upland bluff to the Williams-Barneveld creek. For this trade, a total

of 49 acres are set to be planted as a tall grass prairie by December of 2025. An additional 13 acres are planned to be planted as alfalfa for the 2026 growing season for a total of four years. Following the alfalfa rotation, these 13 acres will be converted to prairie with a planting anticipated no later than December of 2031. Further details associated with this project are defined in Section 4 of this plan.

Modeling and quantification for this Water Quality trade was completed using SNAP Plus. This modeling was submitted and verified as accurate by WDNR in April of 2026. It results in a total of 175.2 pounds of phosphorus reduction, resulting in 146.2 Water Quality Trading Credits or the WWTF.

Implementation

Implementation for this project will be funded by the Village of Blue Mounds with installation completed by TPE. Planting for project components is set to occur no later than December of 2025 and expects credits to become available starting 2026. The Water Quality Trade agreement is signed between the Village of Blue Mounds and the property owners, The Prairie Enthusiasts. The current agreement has a duration of 25 years and will be valid until 2051, upon which time the contract will auto renew for 5-year periods unless termination is chosen.

1. INTRODUCTION

1.1 Selected Phosphorus Compliance Alternative

Per the requirements of the 2013 WPDES permit Phosphorus Compliance Schedule, the Village of Blue Mounds conducted a phosphorus compliance evaluation for the treatment facility which consisted of a series of annual reports.

The year one report consisted of generating an Optimization Plan for the facility. This Optimization Plan identified the following "Action Plans" to improve (reduce) phosphorus discharges from the WWTF:

1. Influent Phosphorus Testing
a. Bi-weekly sampling of influent
2. Collect Hauled Waste Data
3. Review and Optimize Aerobic Digestion Decant

The year two report consisted of a phosphorus planning update, which summarized the progress on the plant optimization, as well as identified the possible compliance options for the facility. The compliance options included:

1. Mechanical upgrade to the existing facility
2. New treatment technologies-alternate chemical addition
3. Consolidation with nearby sewerage system
4. Alternative discharge locations
5. Watershed-based approaches
a. Water Quality Trading
b. Watershed Adaptive Management
6. Water quality variance
7. Multi-discharger phosphorus variance

The year three report consisted of a Phosphorus Compliance Alternatives Plan. In this plan, the alternatives from the year two report were evaluated based on economic and non-economic factors. Economic evaluations considered capital and operational costs through a present worth analysis. Non-economic evaluation considered the feasibility, long term benefit to the Village, and environmental benefits of each alternative.

The lowest cost, feasible alternative was found to be Advanced Treatment using SorbX® (now RE-100), Water Quality Trading without treatment, followed by Watershed Quality Trading with treatment. It was recommended that RE-100 be pilot tested to confirm that it can effectively remove phosphorus to achieve the 0.075 mg/L WQBEL. In summer of 2017, a pilot test for RE-100 was completed onsite for four months. The intent of the pilot study was to determine the feasibility and dose required to achieve an effluent total phosphorus concentration less than the proposed 6-month average limit of 0.075 mg/L. The average effluent total phosphorus concentration during the study was 0.10 mg/L, with only 3 of the 18 sample results having a concentration less than 0.075 mg/L. Based on the results of the pilot test using RE-100, achieving future permit limits did not appear to be feasible based upon the originally estimated dosages.

The year four report consisted of an updated evaluation of the compliance alternatives, with RE-100 having been ruled out as a feasible option. The results of the alternatives comparison were that the lowest cost feasible alternatives for compliance with the Blue Mounds WWTF's WPDES permit effluent phosphorus limit of 0.075 mg/L was Water Quality Trading, followed by Water Quality Trading with supplemental traditional treatment, then Watershed Adaptive Management. These alternatives had a present worth value within 10% and therefore were deemed equal in terms of estimated costs. The recommended alternative was to pursue a Watershed Adaptive Management Plan. This alternative was the lowest cost commitment for the Village's next permit term and allowed the Village to better assess the viability of the plan after the first 5 years. As the 5-year permit term ends, the Village of Blue Mounds is now electing to formally pursue Water Quality Trading as their WPDES Compliance option.

1.2 Community Background

The Village of Blue Mounds is in the far southwestern part of Dane County and has an approximate total area of 0.91 square miles. The Village can be found West of the Village of Mt. Horeb and East of the Village of Barneveld, on County HWY ID, just north of State HWY 18/US HWY 151. The 2020 US Census indicates that the Village has a population of 950. The Village is limited in expansion with a State Hwy 18/151 to the South (Figure 1-1), and future growth is expected to be minimal.

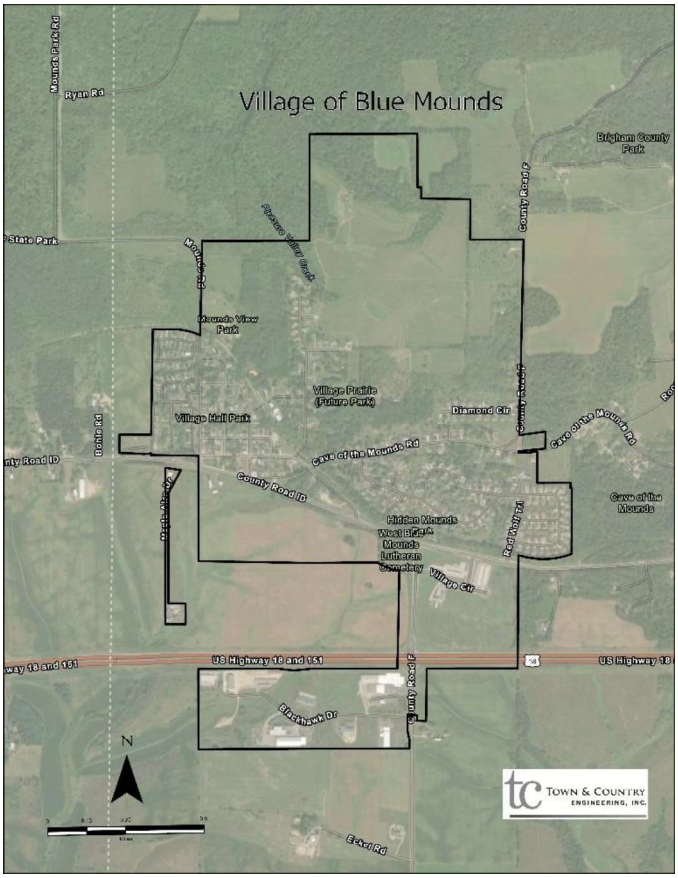

Figure 1-1. Village of Blue Mounds Municipal Boundaries

1.3 Existing Wastewater Facilities

The Village of Blue Mounds WWTF was constructed in 1996 and is located on the southwest side of the Village (Figure 1-2). In the spring of 2015, the Village completed the installation of a new mechanical bar screen and enclosure structure at the headworks of the facility. Following screening, wastewater flows by gravity to the two-channel oxidation ditch for treatment. Mixed liquor flows from the ditch to a splitter box where flow is diverted to the 24-foot diameter final clarifier before being discharged to the headwaters of the Williams-Barneveld Creek. Effluent disinfection is currently not required at the facility. Effluent flow is measured and sampled before flowing by gravity to the receiving water.

Biological or chemical phosphorus treatment was not part of the initial design for this facility; any uptake of phosphorus that was occurring within the oxidation ditch was inherent to the activated sludge process. A chemical phosphorus treatment facility was added December 2023. Solids are removed by the center clarifier and wasted solids are pumped to aerobic digesters. Liquid decant from the digesters is returned for processing. Thickened sludge is pumped to sludge storage until land application occurs.

Wastewater flowing to the WWTF comes from a combination of residential and commercial sources. The Village does not include any significant industrial dischargers and hauled waste is limited to holding tank waste from Dairyfood, USA, a user that is not connected to the sewer system.

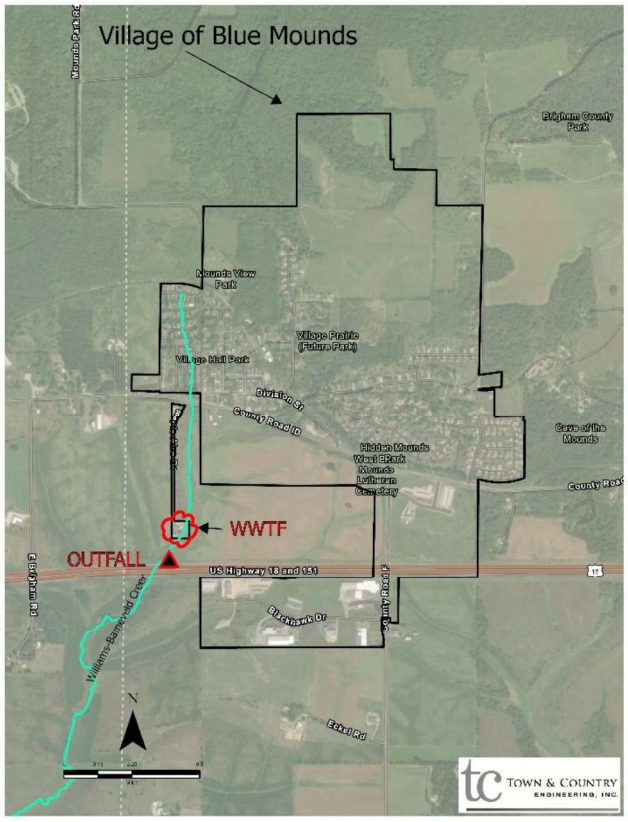

Figure 1-2. The Village of Village of Blue Mounds WWTF Outfall Location. The WWTF discharges into an unnamed tributary to the Williams-Barneveld Creek, just north of State Highway 18/151.

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1.4 Village of Blue Mounds WWTF Effluent Discharge Summary

Table 1-1 is a summary of the annual average effluent discharges from the Village of Blue Mounds WWTF from January 2020 – December 2024.

Table 1-1 Summary of Annual Average Effluent Discharges

Parameter	Max Year	Ave. Year	Min Year	Max Month	Min Month
Flow (MGD)	0.52	0.046	0.026	0.073	0.032
BOD (mg/L)	8.40	5.36	3.30	18.63	2.00
Suspended Solids (mg/L)	6.76	4.94	2.95	9.75	2.00
Ammonia Nitrogen (mg./L)	0.750	0.030	0.111	4.30	0.042
Phosphorus (mg/L)	4.65	3.35	0.27	6.39	0.145
Phosphorus (lbs./day)	3.26	1.36	0.07	5.50	0.035

1.5 Applicable Effluent Limits

In 2010 the State of Wisconsin modified NR 102 and NR 217 to include new water quality-based effluent limits for phosphorus. As a result, wastewater treatment facilities (WWTF) began to receive water quality-based phosphorus limits in their new or re-issued Wisconsin Pollutant Discharge Elimination System (WPDES) permits from the Department of Natural Resources (DNR). As a part of the new rule, WPDES permits include a compliance schedule to evaluate compliance with these new effluent limits. The Blue Mounds WWTF received a re-issued permit in December of 2013. The current permit includes an interim phosphorus limit of 0.60 mg/L for a six-month average.

1.6 Receiving Water Description and Conditions

The Blue Mounds WWTF discharges into the headwaters of Williams-Barneveld Creek. At the point of discharge, the tributary is classified as a LFF (Limited Forage Fish) community. Per NR 102.06 Section (3) Paragraph (a), Williams-Barneveld Creek is not listed as having a total phosphorus criterion of 0.1 mg/L, so it shall meet a total phosphorus WQC of 0.075 mg/L.

1.7 Watershed Description and Conditions

Covering approximately 35.4 square miles, the Williams Creek-East Branch Pecatonica River watershed includes Williams-Barneveld Creek, a spring-fed tributary that originates on the Military Ridge and flows south into the East Branch Pecatonica River. The Blue Mounds Wastewater Treatment Facility (WWTF) discharges treated effluent into the headwaters of this creek, which is classified as a Limited Forage Fish (LFF) community at the discharge point. According to the DNR PRESTO-Lite model results, point sources were previously estimated to contribute approximately

69% of the phosphorus load within the watershed. However, following a current effluent loading data review, new data suggests that the facility now contributes less than 25 percent of the load within the watershed. This was verified by WNDR staff in December of 2024. Current PRESTO and WDNR correspondence can be found in Appendix B.

Land Use

Land use data was gathered using the WDNR WaterExplorer, using Wiscland 2.0 land cover data. The watershed's land use is predominantly agricultural, with agricultural activities making up over 70 percent of the land use. Deciduous forest and wetland type ecosystems make up the remainder of undeveloped land. This mix of land use influences the watersheds hydrology and nutrient loading patterns (Appendix B).

Soil Characteristics

The dominant soil types in the watershed are silt loam and sandy loam, which are moderately to highly erodible. These soils contribute to sedimentation issues in streams, especially when combined with steep slopes and agricultural activities. The NRCS Web Soil Survey and SSURGO databases provide detailed soil maps and classifications for the area (Appendix B). This watershed characteristic is applicable to the project site for this Water Quality Trade, helping to solidify its importance in implementation.

Watershed Conditions

The hilly terrain leads to environmental challenges relating to sedimentation of the creeks and habitat degradation in the surrounding streams due to polluted agricultural runoff and erodible soil types. Deviating from agricultural practices within the watershed will help to reduce the associated effects. Conversion of the A-to-Z farm presents a unique opportunity in this area.

The Blue Mounds WWTF is in the Upper East Branch Pecatonica River Watershed of the Sugar-Pecatonica River Basin. The WWTF discharges into the Williams Creek-East Branch Pecatonica River HUC-12 watershed and into the headwaters of Williams-Barneveld Creek. (Figure 1-3) According to the DNR website, Williams-Barneveld Creek is a spring fed stream which begins on the Military Ridge and flows southerly into the upper section of the East Branch of the Pecatonica River. The tributary to which the WWTF discharges is classified as a LFF (Limited Forage Fish) community, and is currently 303d listed for Total Phosphorus (Appendix B).

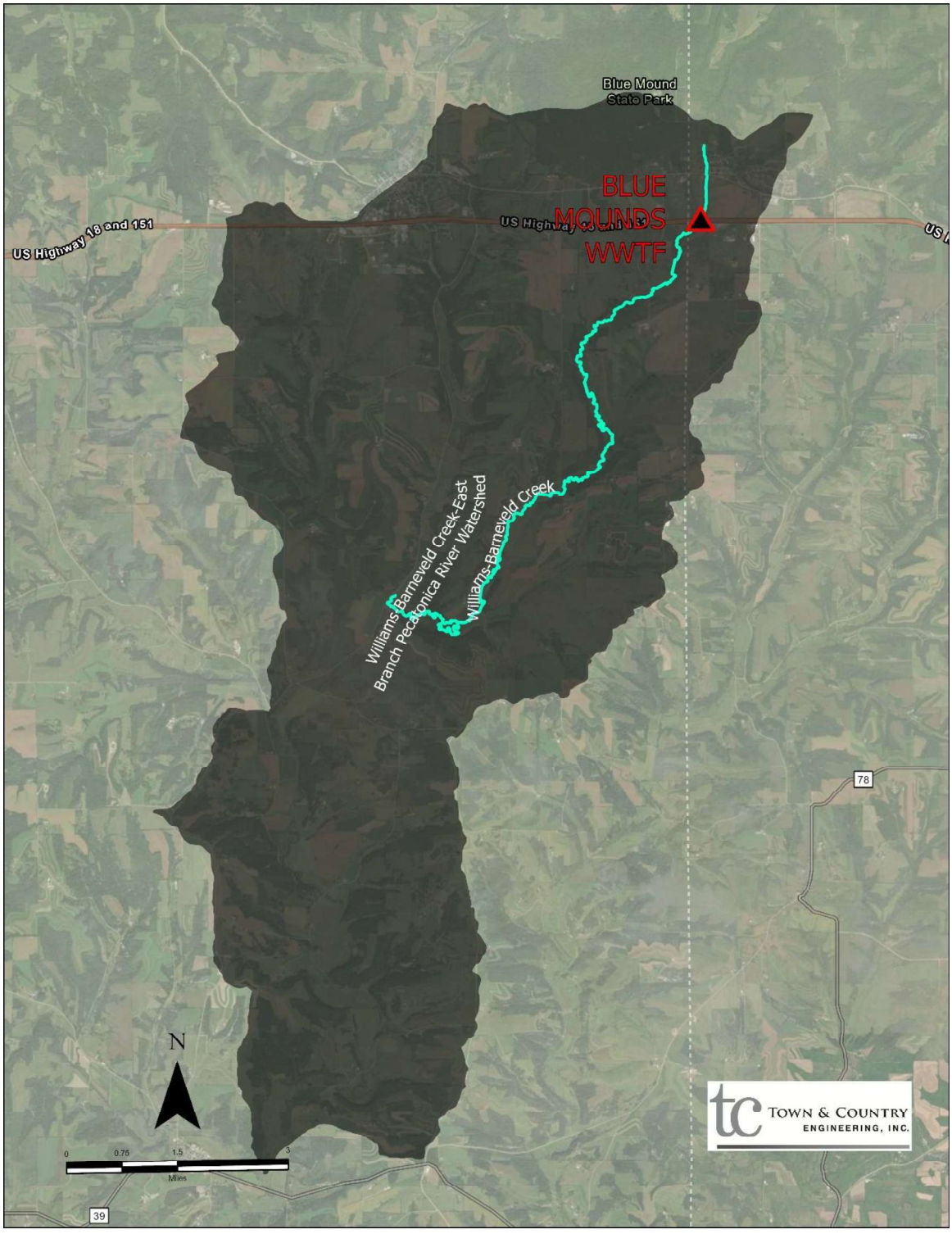

Figure 1-3. Village of Blue Mounds WWTF Outfall Relative to HUC-12 Watershed

2. WATER QUALITY TRADING BACKGROUND

This chapter provides background on WQT, including calculation of the target number of WQT credits, pollution reduction activities that can result in WQT credits, trade ratios, and a description of additional environmental benefits of WQT. Subsequent chapters will describe the Village of Village of Blue Mounds phosphorus WQT strategy.

Wisconsin Statutes Section 283.84 and Chapter NR 217 of the Wisconsin Administrative Code allows for alternative compliance through two watershed-based compliance alternatives – WQT and watershed adaptive management (WAM). Both alternatives involve working outside of the service boundaries of the WWTF (and potentially the municipal limits) to reduce phosphorus discharges to the receiving water, allowing for an increase in the mass of phosphorus discharged.

Water quality trading credits must be generated before they can be used to offset a permit limit. In other words, pollution reduction practices must be established and effective before a reduced permit limit takes effect.

2.1 Calculation of Target Water Quality Trading Credits

The target amount of WQT credits can be calculated by comparing the amount of phosphorus discharged by the WWTF to the amount allowed by the WQBEL.

A reduction in WWTF effluent concentrations through additional phosphorus treatment could significantly reduce the amount of WQT credits required. However, the cost of additional phosphorus removal at the WWTF would need to be balanced against the cost of WQT. Once WQT has been selected as the phosphorus compliance alternative, a municipality generally commits itself to achieving the necessary reductions primarily through WQT, but additional phosphorus treatment can be used as necessary if enough WQT credits cannot be obtained.

2.2 Pollution Reduction Activities to Generate Trading Credits

Water quality trades can occur on either a point-to-point or nonpoint-to-point basis, as described below.

2.2.1 Point-to-Point Source Water Quality Trading

Point-to-point water quality trading involve trading credits with other point sources within the same watershed as the discharger who has selected WQT as a phosphorus compliance alternative. The point source with whom trading is to occur must have excess water quality credits to trade.

2.2.2 Nonpoint-to-Point Source Water Quality Trading

Nonpoint-to-point water quality trading involves trading credits with nonpoint sources within the same watershed as the discharger who has selected WQT as a phosphorus compliance alternative.

Nonpoint source management practices that can generate trading water quality credits include agricultural practices, urban practices, and lake/reservoir dredging or wetland restoration. Agricultural practices include whole field management / nutrient management planning, planting of companion crops, changes in tilling options, buffers strips and conservation easements, barnyard improvements, and streambank stabilization. Urban practices include stormwater infiltration structures, sedimentation devices, and detention ponds. Dredging is intended to

remove in-situ sediment and nutrients to the original or native soil layer and may be done in concert with water quality treatment (e.g., use of alum as a coagulant) and restoration of lake/reservoir aquatic habitat or installation of streambank buffer strips.

The credits generated by the practice are determined by using modeling to predict the difference in phosphorus load between the improved condition and the baseline prior to improvements.

2.3 Trade Ratios

Water quality trading has a higher level of uncertainty associated with it as compared to treatment-based compliance alternatives due to the need for a large number of outside partnerships with trading partners, particularly non-point source contributors. Obtaining the required credits for WQT generally requires partnering with several landowners in the watershed and a significant effort by municipalities to identify practices, broker agreements, negotiate cost sharing, inspect, and verify implementation, and prepare annual reports to the Wisconsin DNR. A municipality pursuing WQT as a phosphorus compliance alternative would be ultimately responsible for obtaining the required credits and must devote the necessary staff and resources required to support these efforts and to meet the timeline required for permit compliance.

Given inherent uncertainties with WQT, trade ratios must be applied to each WQT project to provide certainty that water quality is actually being improved. A trade ratio is like a multiplier, such that a trade ratio of 3:1 means three pounds of pollution reduction is needed to take one pound of WQT credit.

Trade ratios can vary between 1 and 5 (or higher) depending upon the type of practice installed, location within the watershed, and type of trade being performed. Point-to-point trades generally have the lowest trade ratios (a minimum of 1.1) while nonpoint-to-point trades have higher trade ratios (1.2 to 5). Further, trade ratios are most favorable for phosphorus credits generated upstream of the WWTF discharge and within the same HUC-12 sub-watershed, with pollution reduction practices that have a high probability of success.

Trade ratios are calculated for each WQT project, and are based on five factors: delivery, downstream, equivalence, uncertainty, and habitat adjustment. The trade ratio for a particular WQT project is calculated by adding the delivery, downstream, equivalence and uncertainty factors, while subtracting the habitat adjustment factor.

2.3.1 Delivery Factor

A delivery factor is required if trading partners are in different HUC-12 sub watersheds to account for the fate and transport of the traded pollutant in the surface water. The delivery factor would be zero for trades within the same HUC-12 sub-watershed, except if there is a lake or reservoir between the credit generator and user. If a delivery factor is necessary, it would be calculated during the Total Maximum Daily Load (TMDL) development process or using the computer model known as SPARROW (Spatially Referenced Regressions On Watershed Attributes).

A TMDL is in essence a pollution “budget” for a water body or watershed that establishes reductions needed from each pollutant source to meet water quality goals. Information on Wisconsin’s TMDL development process is available online at https://dnr.wi.gov/topic/TMDLs/.

SPARROW is a USGS model that relates in-stream water quality measurements to spatially referenced characteristics of watersheds, including contaminant sources and factors influencing terrestrial and aquatic transport. SPARROW empirically estimates the origin and fate of

contaminants in river networks and quantifies uncertainties in model predictions. Additional information concerning SPARROW is available online at http://water.usgs.gov/nawqa/sparrow/ and the Great Lakes, Ohio, Upper Mississippi, Red River Basins (MRB3) SPARROW Mapper is accessible online at https://wim.usgs.gov/sparrowmrb3/sparrowmrb3mapper.html#. The output from SPARROW is the SPARROW number. A delivery factor can be calculated using the following formula: (Delivery Factor) = [1 / (SPARROW #)] – 1.

2.3.2 Downstream Factor

A downstream factor is necessary if the credit generator is downstream of the credit user. The downstream factor is a function of the difference between the average annual load discharged by the credit user to the overall load at the credit user's point of discharge, and ranges from 0.1 to 0.8. If the credit generator is upstream of the credit user, then the downstream factor is zero.

2.3.3 Equivalence Factor

An equivalence factor is not needed (or zero) for phosphorus water quality trades.

2.3.4 Uncertainty Factor

An uncertainty factor accounts 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. A list of example uncertainty factors is shown in Table 2-1.

The uncertainty factor applicable for each management practice may vary depending on how it is implemented. A more descriptive table of uncertainty factors is provided in DNR's "Guidance for Implementing Water Quality Trading In WPDES Permits", available online at https://dnr.wi.gov/topic/wastewater/WaterQualityTrading.html.

Table 2-1 Uncertainty Factors

Pollution Reduction Activities	Uncertainty Factor
Agricultural Management Practices	
Whole Field Management	1
Companion Crops	1
Conservation Easement	1
Nutrient Management	2 – 3
Production Area Diversion or Roof Runoff Structure	2
Vegetated Treatment System or Constructed Wetland	4
Sediment Control Basin	2
Streambank Stabilization & Shoreline Protection	2 – 3
Dredging, Lake Treatment and Wetland Restoration	
Dredging Lakes or Reservoirs	2 – 3
Dredging Rivers or Streams	1 – 3
Wetland Restoration	1
Urban Practices	
Infiltration, Stormwater Sedimentation Devices, Detention Ponds	2

2.3.5 Habitat Adjustment Factor

A habitat adjustment factor is only used for aquatic habitat restoration efforts that meet applicable DNR and NRCS technical standards. If no aquatic habitat restoration is done as part of a trade, this factor is zero.

2.4 Environmental Benefits

Water quality trading offers greater environmental benefit through nonpoint source reductions as compared to additional wastewater treatment. Water quality trading results in greater theoretical reduction of phosphorus loadings within the watershed, and therefore, greater potential environmental benefit. In addition, nonpoint source phosphorus reduction activities have the potential to improve the efficiency of the agricultural practices within the watershed including reducing fertilizer application rates and energy required to create, transport, and apply the fertilizer.

3. TARGET PHOSPHORUS WATER QUALITY TRADING CREDITS

The amount of phosphorus WQT credits required can be calculated by comparing the amount of phosphorus discharged by a WWTF to the amount allowed by the WQBEL. Historical effluent flow and phosphorus loadings are provided in Appendix B.

3.1 Village of Blue Mounds WWTF's Current Phosphorus Effluent Discharge

Table 3-1 tabulates the monthly average effluent flow rate from the Village of Blue Mounds WWTF for the period of January 2020 through December 2024.

Table 3-1 Monthly Average Effluent Flow Rate

Month	Village of Blue Mounds WWTF Monthly Average Effluent Flow Rate (MGD)				
	Year				
	2020	2021	2022	2023	2024
January	0.041	0.036	0.040	0.053	0.039
February	0.036	0.036	0.037	0.051	0.044
April	0.062	0.055	0.050	0.073	0.037
April	0.057	0.055	0.058	0.073	0.062
May	0.052	0.042	0.054	0.050	0.061
June	0.063	0.044	0.044	0.041	0.069
July	0.048	0.045	0.042	0.042	0.060
August	0.044	0.044	0.040	0.042	0.036
September	0.046	0.038	0.044	0.038	0.045
October	0.045	0.038	0.037	0.039	0.032
November	0.045	0.036	0.040	0.036	0.057
December	0.037	0.037	0.043	0.037	0.050
Annual Avg	**0.048**	**0.042**	**0.044**	**0.048**	**0.049**
Max	0.063	0.055	0.058	0.073	0.069
Min	0.036	0.036	0.037	0.036	0.320

The Village of Blue Mounds WWTF had an average effluent flow rate of 0.046 million gallons per day over the period of January 2020 through December 2024.

Table 3-2 tabulates the monthly average phosphorus effluent concentrations from the Village of Blue Mounds WWTF for the period of January 2020 through December 2024.

Table 3-2 Monthly Average Phosphorus Effluent Concentrations (mg/L)

Month	Year				
	2020	2021	2022	2023	2024
January	2.89	4.56	3.63	3.6	0.21
February	4.22	4.11	4.56	1.38	0.30
April	2.12	2.77	3.8	2.12	0.18
April	2.45	2.77	3.00	2.28	0.25
May	2.85	4.20	4.32	3.74	0.23
June	3.88	4.85	6.00	6.34	0.40
July	5.22	5.45	5.93	5.47	0.41
August	4.64	4.97	6.39	5.67	0.46
September	4.53	5.18	3.86	5.46	0.25
October	4.24	3.70	6.01	4.93	0.15
November	4.18	3.58	4.74	4.77	0.22
December	4.24	4.56	3.61	0.30	0.20
Annual Avg	**3.80**	**4.22**	**4.65**	**3.84**	**0.27**
Max	5.22	5.45	6.39	6.34	0.46
Min	2.12	2.77	3.00	0.30	0.15

The Village of Blue Mounds WWTF discharged an average of 3.35 mg/L of phosphorus over the period of January 2020 through December 2024.

Table 3-3 tabulates the monthly average phosphorus loading from the Village of Blue Mounds WWTF for the period of January 2020 through December 2024.

Table 3-3 Monthly Average Pounds of Phosphorus (Pounds/Day)

Month	Year				
	2020	2021	2022	2023	2024
January	0.99	1.37	1.23	2.13	0.07
February	1.27	1.23	1.39	1.27	0.11
April	1.10	1.27	1.39	1.55	0.06
April	1.16	1.27	1.46	1.52	0.12
May	1.24	1.47	2.18	1.84	0.10
June	2.04	1.78	2.13	2.08	0.29
July	2.09	2.05	2.11	1.89	0.25
August	1.70	1.82	2.06	2.18	0.12
September	1.74	1.64	2.28	2.07	0.09
October	1.59	1.17	1.90	1.53	0.04
November	1.57	1.07	1.44	1.30	0.12
December	1.31	1.41	1.11	0.08	0.08
Annual Avg	**1.48**	**1.46**	**1.72**	**1.62**	**0.12**
Max	2.09	2.05	2.28	2.18	0.29
Min	0.99	1.07	1.11	0.08	0.04

The Village of Blue Mounds WWTF discharged an average of 1.28 pounds of phosphorus per day over the period of January 2020 through December 2024.

3.2 Amount of Phosphorus Discharge Allowed by WQBEL

The current discharge permit for the Village of Blue Mounds Wastewater Treatment Facility (WWTF) is Wisconsin Permit Discharge Elimination System (WPDES) number WI-0031658-08-0. The permit an effective date of January 01, 2021 – December 31, 2025. The adaptive management total phosphorus interim limit of 0.6 mg/L went into effect beginning the period from May 1, 2021 through October 31, 2021. The averaging periods are May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6-month period on April 30 and October 31 annually. Because Blue Mounds discharges into an unnamed tributary, which gravity feeds into the Williams-Barneveld Creek, it is expected that the permit will reflect State regulations relative to the water body and effluent limits will be 0.075 mg/L.

3.3 Calculation of Target Phosphorus Water Quality Trading Credits and Safety Factor

Calculation of WQT credits is based exclusively on data from January 1, 2024 - December 31, 2024, with the activation of a chemical feed. Current data suggest that Blue Mounds WWTF will need to offset approximately 30 pounds of phosphorus. Fewer than 5 years of data exist with the new system active. Due to its infancy in activation, the WWTF sought to maintain no fewer than 100 pounds of WQT credits on hand to account for any future facility operation variances.

Table 3-4 Targeted Annual WQT Credits: WWTF Average Above WLA

Design Flow 2.28 (MGD)		EFFL C (mg/L)	EFFL Q (MGD)	Six Month Total (Lbs.)	Added Average Annual (Lbs.)	Future WQBEL (0.075 (mg/L)) Pounds Generated	Pounds of Credit Needed to Offset
2020	Jan-June	3.066	0.052	241	546	11	535
	July-Dec	4.507	0.044	305			
2021	Jan-June	3.876	0.045	261	538	10	528
	July-Dec	4.574	0.039	277			
2022	Jan-June	4.217	0.047	300	622	10	612
	July-Dec	5.093	0.041	321			
2023	Jan-June	3.473	0.057	298	563	11	552
	July-Dec	4.430	0.039	264			
2024	Jan-June	0.260	0.052	21	41	11	29
	July-Dec	0.280	0.047	20			
5-year Annual Avg.		3.834	0.057	312	N/A	13	N/A

4. WATER QUALITY TRADES

In the summer of 2024 Town & Country Engineering Inc., on behalf of the Village of Blue Mounds, began engaging in dialogue with The Prairie Enthusiasts (TPE). TPE Empire-Sauk Board Representative, Rich Henderson, agreed to pursue a project funded by the Village with the intention to conduct a conservation practice with the intention to generate the pounds of Water Quality Trading Credits required compliance as outlined in the village's WPDES permit. An MOU detailing the content of those conversations, signed by Rich Henderson of TPE, can be found in Appendix A. The Village elected to pursue a project focused on the conversion of approximately 64 acres of leased agricultural land to prairie. The 64 acres is currently held by TPE and operated as A-to-Z farms. The associated cost estimate for the Village of Blue Mounds, provided by TPE, can be found in Appendix C. A-to-Z farm is in Iowa County, nested within the Williams Creek-East Branch Pecatonica River watershed #070900030602 and is an upland bluff to the Williams-Barneveld creek (Figure 4-1).

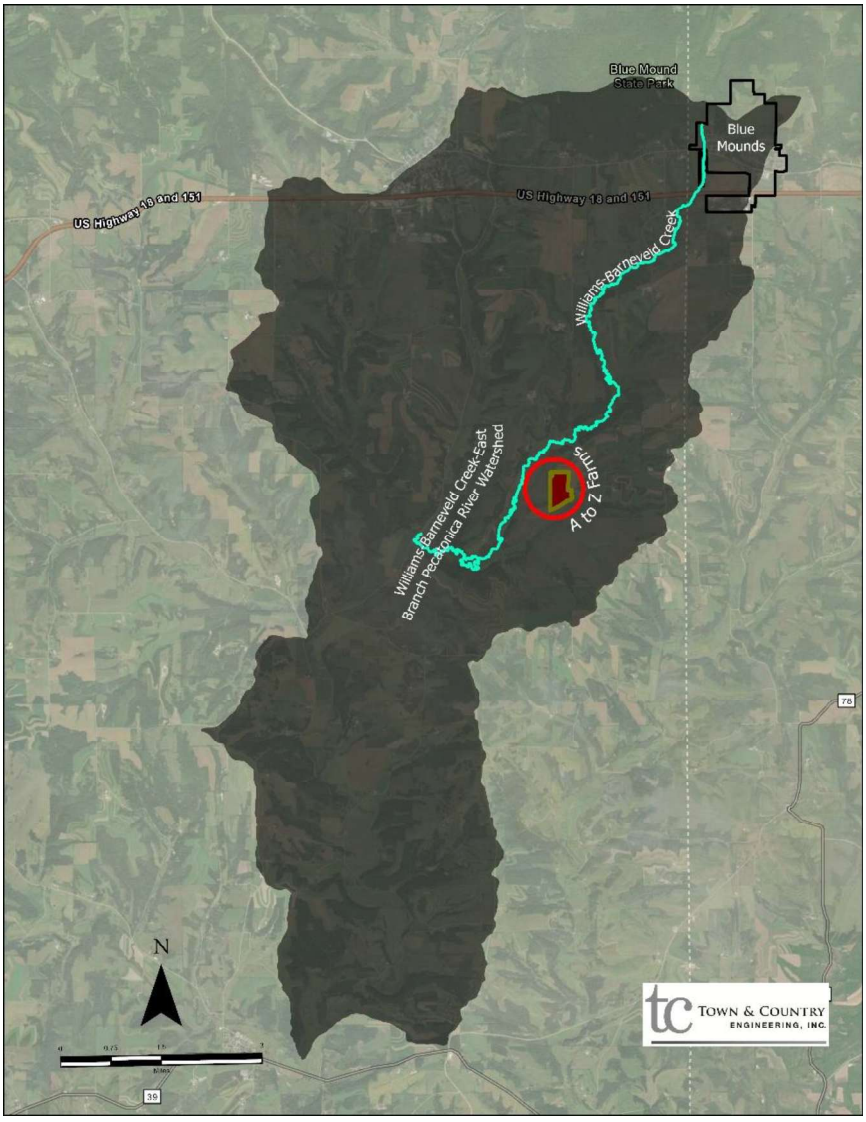

Figure 4-1. General project location of the TPE A-Z WQT project relative to the Village of Blue Mounds

A total of 49 acres is set to be planted into perennial grass in the fall of 2025. This acreage will naturally be converted into prairie through maintenance over time. An additional 13 acres are planned to be planted as alfalfa following the 2025 growing season for a total of four years. Following the alfalfa rotation, these 13 acres will be converted to prairie with a planting set for the fall of 2030.

SNAP Plus was used to model and quantify the phosphorus reduction for this Water Quality Trade. This modeling was submitted to WDNR in January of 2025. A total of 175.2 pounds of phosphorus reduction, resulting in 131 Water Quality Trading Credits in the first permit term and a final total of 146.2 following final prairie implementation, to be reflected in permit 2.

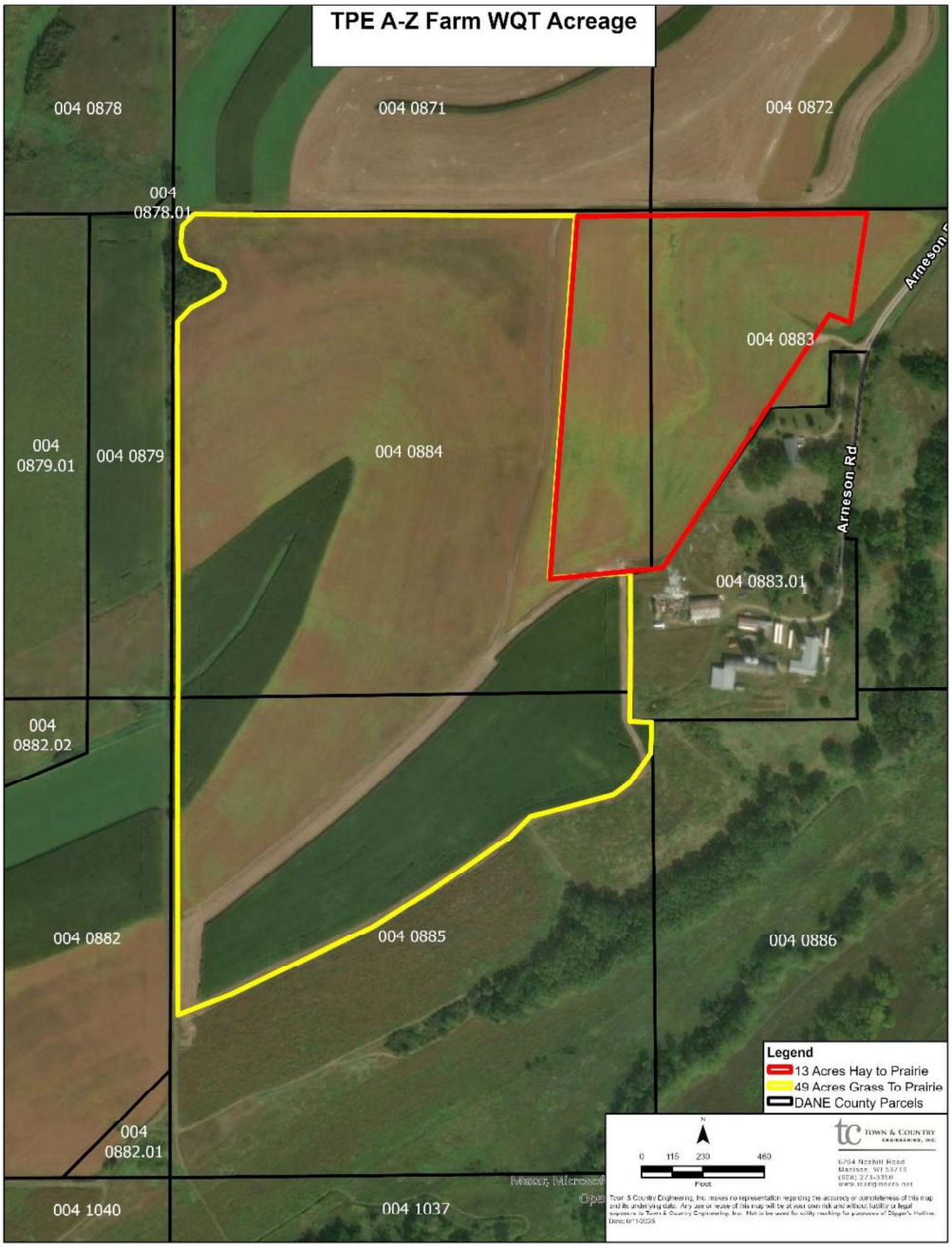

Figure 4-2. Field acreage and boundaries associated with the TPE A-to-Z WQT

4.1 2026 Prairie Restoration

Modeling for this project was completed using SNAP Plus. Model inputs for this project required historical cropping harvests, farming practices, and soil sampling for the entire project area. Cropping history and farming practices were provided by TPE and verified directly with the long-standing leasing farmer for A-to-Z Farms. Guidance was provided by WDNR Water Quality Trading staff throughout the modeling process. Modeling inputs were submitted to WDNR staff on January 24th, 2025 as an iterative process. In April of 2026 WDNR WQT staff gave concurrence with modeling inputs and credits generated from implementation.

4.1.1 Soil Sampling

Soil sampling of the A-Z farms occurred late in October of 2024. A total of 13 samples were taken (APPENDIX C). Each sample was comprised of 10 cores taken in 'W' pattern within 5-acre sections. Each section was assigned a section number (Figure 4-3).

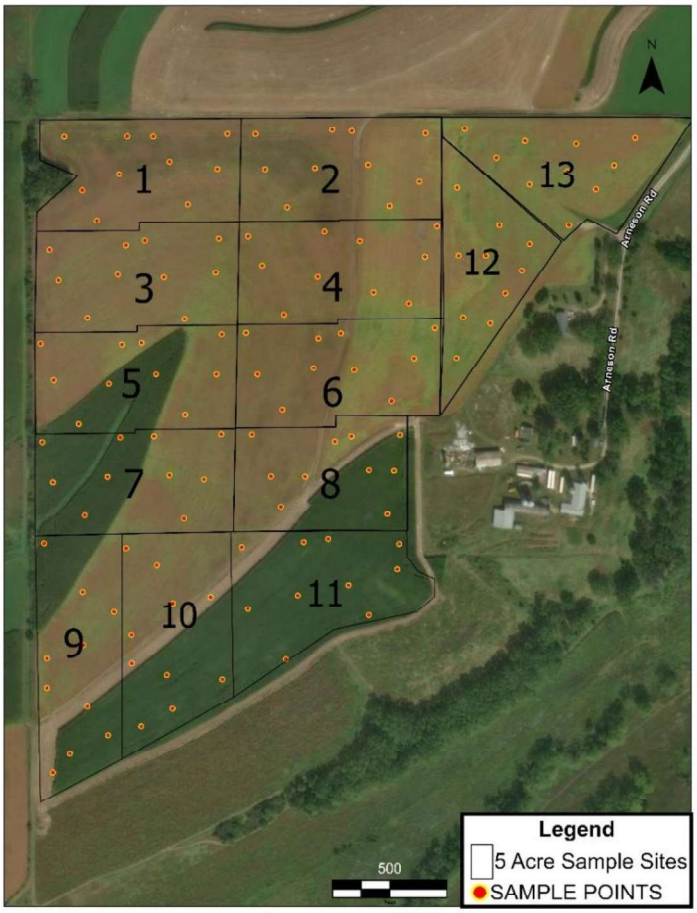

Figure 4-3. Soil sample collection points within the associated 5-acre sample sites

4.1.2 Modeling

Modeling was completed using SNAP Plus. Inputs into the model included crop history, soil sampling, soil type (APPENDIX C), and farming practice history. Historical field numbers and associated cropping history provided a diverse and complicated approach to developing the baseline scenario for the project (Figure 4-2). Following WDNR guidance, field 6 was chosen as modeling representative that corresponded to the closest overall average crop history. The corresponding crop history associated with each field number can be found APPENDIX C.

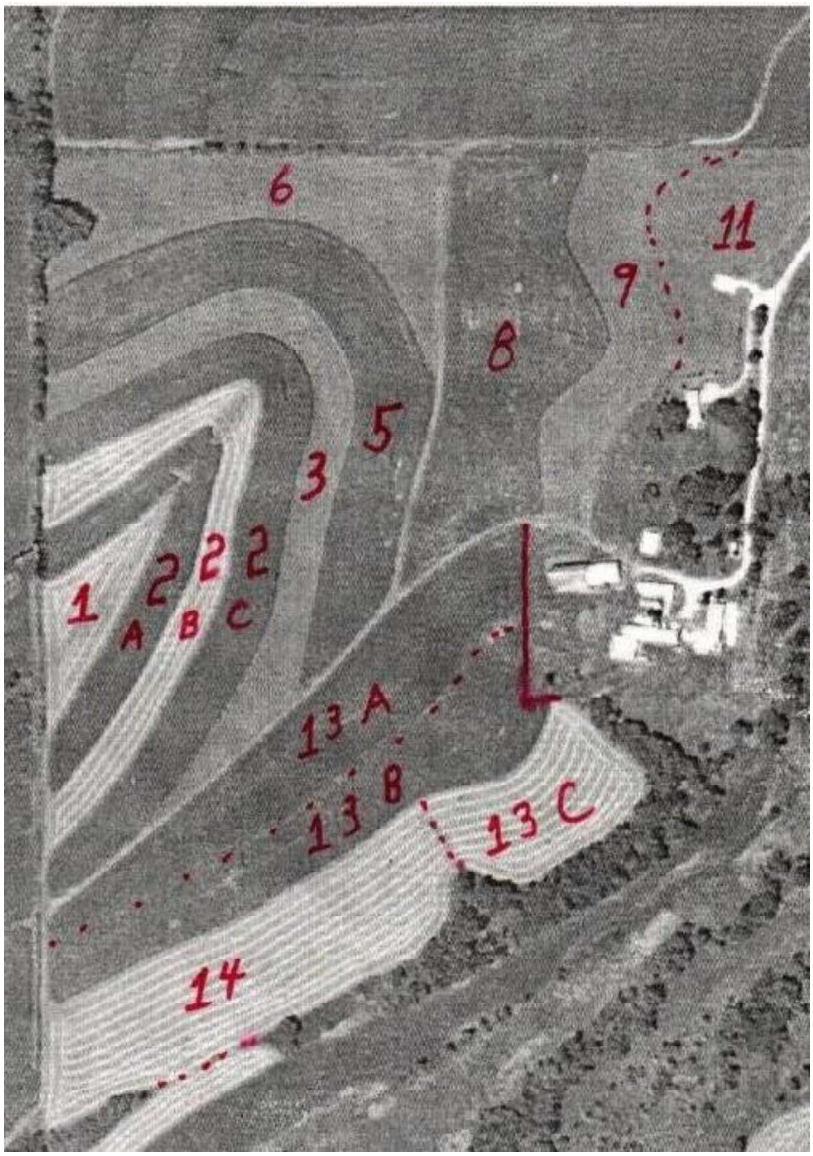

Figure 4-4. TPE A-Z farm historical field numbers

Soil sample phosphorus concentrations corresponding to each field conversion were averaged using SNAP Plus soil sample tab. The 49-acre grass conversion is associated with sample sites 1-11. The 13-acre alfalfa to prairie conversion is associated with soil even numbered sample sites 2-8 as well as sites 12 and 13.

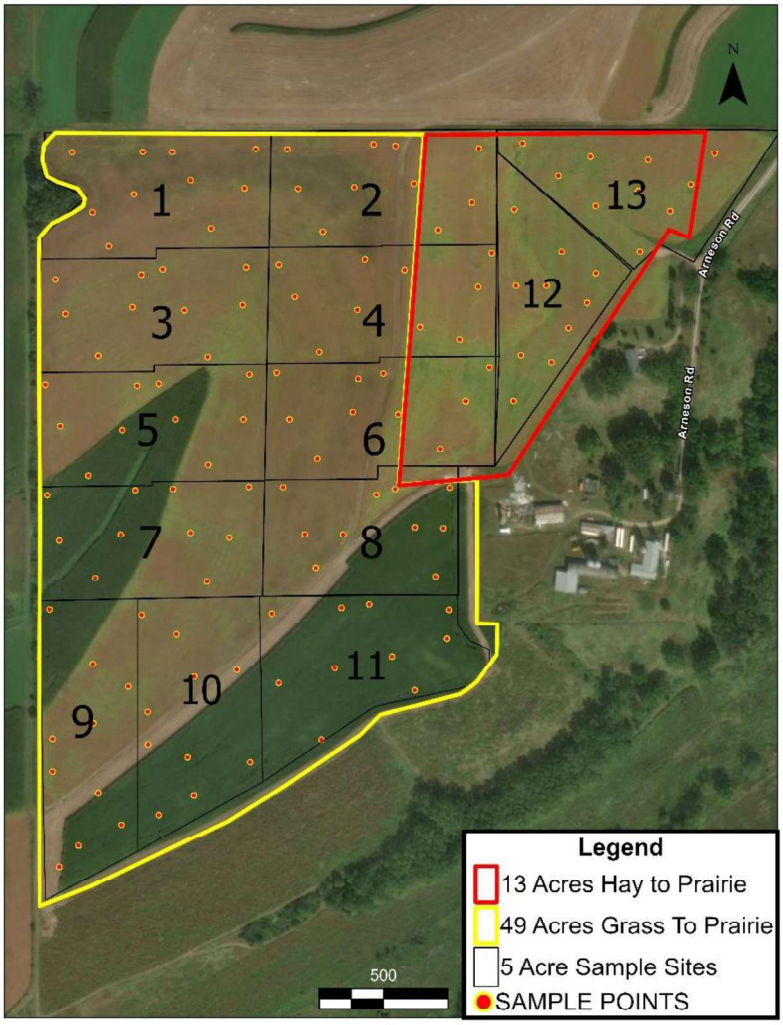

Figure 4-5. Corresponding soil sample collection sites for each field conversion

Cropping history was provided by TPE. Anecdotal farming practice history was provided through an interview with the leasing farmer. These values were then entered into the cropping tabs of SNAP Plus to generate a baseline phosphorus value for each field conversion for years 2021-2025. The 49-acre proposed trade value reductions were generated by selecting ten years of 'Grassland/Permanent Vegetation'. For the 13-acre "Alfalfa to Prairie" proposed reductions, 'Alfalfa' was selected for the years of 2026-2030. Following five years of alfalfa cropping permanent grass land was selected as a modeling input to arrive at the final state for this water quality trade.

4.1.3 Calculation of Trade Ratio

Table 4-1 Calculation of the Trade Ratio

Delivery Factor	Downstream Trading Factor	Equivalence Factor	Uncertainty Factor	Habitat Adjustment Factor	Calculated Trade Ratio	*Minimum Trade Ratio
0	0.10	0	1	0	1.1	1.2

Delivery Factor: A Delivery Factor is not necessary as both the credit generator and credit user are both located within the same HUC-12.

Downstream Trading Factor: This value is 0.10 because the project location is downstream of the WWTF. Based on current effluent discharge numbers of approximately 30 pounds of phosphorus annually and the reported nonpoint load of 161 pounds of phosphorus, the WWTF contributes <25% of the Total Phosphorus load to the creek. This value was discussed with WDNR in December of 2024.

Equivalence Factor: This value is zero because phosphorus is being traded.

Uncertainty Factor: Perennial vegetation uncertainty factor carries a value of 1.

Habitat Adjustment Factor: The value for this factor is zero as this perennial vegetation practice does not qualify for this adjustment.

*The minimum trade ratio for a non-point to point trade is 1.2

4.1.4 Operations and Maintenance

Operations and maintenance for the field conversions to perennial vegetation will be conducted by The Prairie Enthusiasts. Their expertise in prairie planting and general installation and maintenance was sought in the generation of an Operations and Maintenance plan. The primary method of maintenance used in maintenance of these fields will consist of regular burning, mowing, and seeding per a schedule that is agreed upon in the WQT agreement between TPE and the Village of Blue Mounds. The drafted Operations and Maintenance Plan can be found in APPENDIX C.

4.1.5 Project Summary

The total amount of WQT Credits generated by these two field conversions will provide the Village of Blue Mounds with 131 pounds of Credits to be used in their first permit term. Snap Plus pre-and-post trade narratives as well as the P-trade report used to determine credits can be found in Appendix C. Implementation of this installation is set to occur in the late fall of 2025, with initial credits becoming available at the start of 2026. The additional credits generated at the start of permit term two, with the final transition of 13 acres of alfalfa to perennial prairie. This will provide an additional 15.2 credits for a final total of 146.2 WQT Credits.

Project	Baseline Phos. Load	Proposed Phosphorus Load	Phosphorus Load Reduction	Trade Ratio	WQT Credits
49 Acre Perennial Grass	123.4	8.4	115	1.2	95.8
13 Acre Alfalfa (Permit term 1)	62.2	19.8	42.4	1.2	35.2
Permit Term 1 Total					**131**
13 Acre Alfalfa to Perennial Prairie (Permit term 2)	19.8	1.6	18.2	1.2	15.2
Permit Term 2 Total					**146.2**

5. IMPLEMENTATION SCHEDULE AND MILESTONES

5.1 Implementation Timeline

The proposed implementation timeline for this phosphorus WQT plan is as follows:

Implement WQT Management Practices	January 2026
Submit Draft WQT Plan to DNR	July 2025
Submit Management Practice Registration Form to DNR	April 2026
Submit Final WQT Plan to DNR	January 2026
Village of Blue Mounds WWTF WPDES Permit Expires	December 31, 2025

5.2 Water Quality Trade Practice Installation and Registration

The signed DNR Form 3400-207 (WQT Management Practice Registration) for the proposed water quality trades are provided Appendix A.

The purpose of the WQT management practice registration is to ratify to DNR that a management practice identified in the plan has been properly installed and is effective. This information is expected to be used by the DNR to track implementation progress, verify compliance, and perform audits, as necessary.

Management practice registration forms will not be submitted for point-to-point source trades. Any point-to-point source water quality trade will be demonstrated via effluent monitoring and will have documentation and effective date requirements specified in the WPDES permits.

5.3 Tracking, Verification, and Inspection

The Village of Village of Blue Mounds staff will coordinate with TPE for annual site inspections and verify progress and plantings are sufficient. The performance of the perennial vegetation will be assessed during annual site inspections, and inspections following extreme weather events. This inspection will occur to ensure the terms of the maintenance plan are being complied with appropriately. Additionally, these staff are responsible for ensuring that both the field conversion projects are conducted within the confines of the agreements. To do this, annual inspections of the former farm field will be conducted. The Village will take necessary action if it is notified of any non-compliance. In addition, the Village of Village of Blue Mounds will make its personnel available to assist the DNR with any inspections it chooses to perform of the perennial vegetation project site locations.

5.4 Annual Water Quality Trade Report

The Village of Blue Mounds will submit an annual report to the DNR for each of its Water Quality Trade. The purpose of the annual report is to inform the DNR of the status of management practices, provide the DNR with an update of the trading project overall, and submit any needed changes to the plan to DNR. The annual report will include verification of the site inspections that occurred, including photographs, a summary of site inspection findings, any applicable notices of termination or practice registration, the amount of credit used each month over the calendar year; and other requirements as stated in the WPDES permit.

5.5 Notification of Termination

If the Water Quality Trade Agreements or this WQT Plan needs to be modified or terminated during the permit term, the Village of Village of Blue Mounds will submit DNR Form 3400-209 (Notice of Water Trade Agreement Termination) to the DNR. If the Water Quality Trade Agreement is modified or terminated, the phosphorus WQT credits it generates will change accordingly and may result in non-compliance with the Village of Village of Blue Mounds WPDES permit. The information on the notice of termination form will be used by the DNR to determine if a permit modification is required due to the termination, the termination will result in non-compliance, or other permit actions are required due to the termination.

An unsigned version of the notice of termination form is provided in Appendix A. If this form is to be used, details concerning the nature of the termination will need to be added and the form signed by the Village's authorized representative.

Appendix A

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

Notice: Pursuant to s. 283.84, Wis. Stats., 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	Permit Number	Facility Site Number
Village of Blue Mounds	WI- 0031658-08-0	

Facility Address	City	State	ZIP Code
10961 CTH ID	Blue Mounds	WI	53517

Project Contact Name (if applicable)	Address	City	State	ZIP Code

Project Name
Blue Mounds Water Quality Trading Plan: "The Prairie Enthusiasts" - A to Z Farm

Broker/Exchange Information (if applicable)

Was a broker/exchange be used to facilitate trade? ○ Yes ◉ No

Broker/Exchange Organization Name	Contact Name	
Address	Phone Number	Email

Trade Registration Information (Use a separate form for each trade agreement)

Type	Trade Agreement Number	Practices Used to Generate Credits	Anticipated Load Reduction	Trade Ratio	Method of Quantification
○ Urban NPS ◉ Agricultural NPS ○ Other	001	(Perennial Vegetation)	171.3	1.2	Snap Plus

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Iowa	Williams-Barneveld Creek	004-0884,004-0883,004-0885	Phosphorus

The preparer certifies all of the following:

- 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
Patrick Quinn	05/28/2025

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
Paul Baum	2-19-2026

Leave Blank – For Department Use Only

Date Received		Trade Docket Number
Entered in Tracking System ☐ Yes	Date Entered	Name of Department Reviewer

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

Water Quality Trading Checklist

Form 3400-208 (1/14)

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	Permit Number	Facility Site Number
Village of Blue Mounds	WI- 0031658-08-08	

Facility Address	City	State	ZIP Code
10961 CTH ID	Blue Mounds	WI	53517

Project Contact Name (if applicable)	Address	City	State	ZIP Code

Project Name
Blue Mounds Water Quality Trading Plan: "The Prairie Enthusiasts"- A-to-Z Farm

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Williams-Barneveld Creek	Phosphrous	070900030602

Credit Generator Information

Credit generator type (select all that apply):
- ☐ Permitted Discharge (non-MS4CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☒ Agricultural nonpoint source discharge
- ☐ Other - Specify: _____

Are any of the credit generators in a different HUC 12 than the applicant?
- ○ Yes; HUC 12: _____
- ◉ 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 WDPES permit requirements?
- ○ Yes
- ○ No

Discharge Type	Permit Number	Name	Contact Information	Trade Agreement Number
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				

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

Does plan have a narrative that describes:	Yes	No	Plan Section
a. Summary of discharge and existing treatment including optimization	◯ Yes	◯ No	
b. Amount of credit being generated	◯ Yes	◯ No	
c. Timeline for credits and agreements	◯ Yes	◯ No	
d. Method for quantifying credits	◯ Yes	◯ No	
e. Tracking and verification procedures	◯ Yes	◯ No	
f. Location of credit generator in proximity to receiving water and credit user	◯ Yes	◯ No	
g. Other: ______________________	◯ Yes	◯ 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?
◯ Urban NPS ◯ Agricultural NPS ◯ Other	Perennial Veg.	Snap Plus	01	◉ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part

Does plan have a narrative that describes:	Yes	No	Plan Section
a. Description of existing land uses	◉ Yes	◯ No	1.7
b. Management practices used to generate credits	◉ Yes	◯ No	4
c. Amount of credit being generated	◉ Yes	◯ No	4
d. Description of applicable trade ratio per agreement/management practice	◉ Yes	◯ No	4
e. Location where credits will be generated	◉ Yes	◯ No	4
f. Timeline for credits and agreements	◉ Yes	◯ No	4 & 5
g. Method for quantifying credits	◉ Yes	◯ No	4

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	4&5
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	5
j. Reporting requirements should the management practice fail	◉ Yes	○ No	5
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	4
l. Location of credit generator in proximity to receiving water and credit user	◉ Yes	○ No	4
m. Practice registration documents, if available	◉ Yes	○ No	Appendix A
n. History of project site(s)	◉ Yes	○ No	4
o. Other: _____	○ Yes	○ 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
Peter C. Rowe	06/27/2025

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
Paul Baum	2-19-2026

Save... Print... Clear Data

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

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.).

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Project Contact Name (if applicable)	Address	City	State	ZIP Code

Project Name
Blue Mounds Water Quality Trading Plan

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Williams-Barneveld Creek	Phosphorus	070900030602

Is the permittee in a point or nonpoint source dominated watershed? (See PRESTO results - http://dnr.wi.gov/topic/surfacewater/presto.html)
- ○ Point source dominated
- ◉ Nonpoint source dominated

Credit Generator Information

Credit generator type (select all that apply):
- ☐ Permitted Discharge (non-MS4/CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☒ Agricultural nonpoint source discharge
- ☐ Other - Specify:

Are any of the credit generators in a different HUC 12 than the applicant?
- ○ Yes; HUC 12:
- ◉ No
- ○ Unsure

Are any of the credit generators downstream of the applicant?
- ◉ Yes
- ○ No
- ○ Unsure

Will a broker/exchange be used to facilitate trade?
- ○ Yes; Name:
- ◉ No
- ○ 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?
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure

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

List the practices that will be used to generate credits:

Practices potentially associated with NRCS 590, NRCS 340 Field Conversions modeled with SNAP Plus, Whole Field Management, and NRCS 580 & 395 associated with Streambank Stabilization.

Method for quantifying credits generated:
- ☒ Monitoring
- ☒ Modeling, Names: SNAP Plus, NRCS Erosion Est.
- ☐ Other: _____

Projected date credits will be available: 01/01/2026

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	Date Signed
Peter C. Anderson	05/12/2025

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
Paul Bauer	5-19-25

MEMORANDUM OF UNDERSTANDING

INVOLVED PARTIES: THE VILLAGE OF BLUE MOUNDS, WISCONSIN – TPE (A TO Z FARMS)

SUBJECT: INTENTION TO CONDUCT WATER QUALITY TRADING

DATE:

This Memorandum of Understanding serves as the first step in documenting a developing agreement between the Village of Blue Mounds and 'The Prairie Enthusiasts' (TPE) , to conduct conservation activities with the intention of Water Quality Trading. The Village of Blue Mounds intends to pursue Water Quality Trading (WQT) as a means to comply with the Wisconsin Department of Natural Resources (WDNR) imposed stringent effluent phosphorus limits at the Village owned wastewater treatment facility (WWTF). In order for the Village to offset effluent phosphorus at the WWTF, water quality trades within the watershed must be established with a credit generator who then enters an agreement with the Village, the credit user. Trading of water pollution credits requires a binding, written agreement between the credit generator and credit user, as required by s. 283.84, Wis. Stats.

In February and August of 2024, Town & Country Engineering, on behalf of the Village, met with the TPE (Credit Generator). The meeting's intention was to introduce the means and methods to Water Quality Trading between TPE and the Village of Blue Mounds. Town & Country Engineering will be present throughout the entire process to facilitate trading on behalf of the Village of Blue Mounds. The conservation activities intended to conduct Water Quality Trading have been discussed and center around farm field practices, crop changes and conversion to perennial grass prairie. Other practices such as streambank armoring, streambank shaping, habitat restoration, grazing practice alterations and streambank exclusions were also discussed and remain possibilities. The current practice installation revolves around TPE property that currently exists as "A to Z Farms," a 64-acre cropland withing the Williams-Barneveld watershed.

The Village of Blue Mounds and TPE intend to enter the agreement process in 2024-2025 crop years. TPE will serve as the credit generator by implementing pasture conversion to PID's: 049.004.0884, and 049.004.0885.

Any binding trade agreement is suggested by the WDNR to include the following content:

- Identify credit user and credit generator
- Identify the pollutant load being traded
- The amount of the pollutant load reduction that the credit generator agrees to provide
- The start date and, if necessary, the end date of the availability of pollutant reduction credits
- The types and frequency of verification needed as well as the parties responsible for monitoring
- Financial conditions of the trade
- Liability conditions of the trade

- Procedures for terminating the trade
- Duration of the agreement
- Reporting requirements for the credit generator or any anticipated circumstances when pollutant reduction credits would not be available
- Signature and date by authorized representatives of the credit user and credit generator

In addition, for a trade agreement between a point source and nonpoint source, between the Village of Blue Mounds and TPE, the following content is also suggested:

- Installation/construction schedule of each management practice
- The date when credits become available for each management practice
- The amount of pollutant reduction credits available from each location
- Conditions under which the practice may be inspected by the credit user or a third party
- Reporting requirements for the credit generator should the management practice fail
- Deeded registration on parcels for future land ownership

To date, parties involved in the discussion associated with this conservation effort include, The Village of Blue Mounds, representatives of TPE (Rich Henderson), Town & Country Engineering Inc., (Ben Heideman and Peter Riddle).

The signatures on this document indicate that the information provided within is accurate and current and are not intended to serve as any legally binding agreement. This MOU is between the Village of Blue Mounds, and TPE -A to Z Farms.

TPE Representatives

Rich Henderson — Name

Rich Henderson — Signature

Received by e-mail 10/10/24
correspondence to be attached in WQT plan

Name

Signature

Name

Signature

Public Works Committee, Chair

DATE:

From:	Richard Henderson
To:	Peter Riddle
Subject:	Re: TPE Blue Mounds MOU for Signature
Date:	Thursday, October 10, 2024 4:12:21 PM
Attachments:	MOU - Village Blue Mounds - P mitigation.pdf

Here is the signed MOU

Richard Henderson
TPE Board Member & Chair Land Management
2845 Timber Lane
Verona, WI 53593
608-845-7065 (land)

From: "Peter Riddle" <priddle@tcengineers.net>
To: "Rich Henderson" <tpe.rhenderson@tds.net>
Sent: Thursday, October 10, 2024 3:28:57 PM
Subject: Re: TPE Blue Mounds MOU for Signature

Rich, everything is fair game. We just need the MOU signed to establish a conservation timeline.

We should set up a day/time to talk over your ideas. Next week is free for me. The silt banks sound good. Let's talk.

Best,

Peter Riddle
608-217-5540

> On Oct 10, 2024, at 3:21 PM, Richard Henderson <tpe.rhenderson@tds.net> wrote:
>
> Peter,
>
> The 64 acres include part of parcel 0883 as well.
>
> Can the un-named stream east of Arneson RD, which goes into the Williams-Barneveld Creek, be used for mitigation? We plan to stop grazing its watershed next year.
>
> Also, there are some large raw silt banks on the Williams-Barneveld, on parcels 0880.01 and 0881.01, which we are looking to stabilize. Any interest in those?
>
> Richard Henderson

TPE Board Member & Chair Land Management
2845 Timber Lane
Verona, WI 53593
608-845-7065 (land)

From: "Peter Riddle" <priddle@tcengineers.net>
To: "Rich Henderson" <tpe.rhenderson@tds.net>
Sent: Wednesday, October 9, 2024 2:25:00 PM
Subject: TPE Blue Mounds MOU for Signature

Rich,

The attached is a non-binding acknowledgement of the conversations we have had regarding Water Quality Trading between TPE and the Village of Blue Mounds. Please review and reach out to me with any questions. If you don't have any questions, please feel free to sign and return.

Thanks,

Peter

Peter Riddle
priddle@tcengineers.net
Town & Country Engineering, Inc.
6264 Nesbitt Road
Madison, WI 53719
(608) 273-3350

Appendix B

2025 Values From Table 1. 2026 Adaptive Mgmt. Annual Report

	WWTF Effluent Phosphorus Conc (mg/L)	WWTF Discharge Stream Flow (MGD)	WWTF Discharge Phosphorus Loading (lbs/d)	Downstream Phosphorus Conc (mg/L)	Downstream Flow (cfs)	Downstream Phosphorus Loading (lbs/day)
28-Jan	0.27	0.0368	0.0828662		N/A	N/A
29-Jan	0.25	0.0308	0.064218		N/A	N/A
4-Feb	0.23	0.031	0.0594642		N/A	N/A
5-Feb	0.23	0.0274	0.0525587		N/A	N/A
25-Mar	0.17	0.0518	0.073442		N/A	N/A
26-Mar	0.15	0.0411	0.0514161		N/A	N/A
9-Apr	0.17	0.0431	0.0611072		N/A	N/A
15-Apr	0.14	0.0476	0.0555778		N/A	N/A
7-May	0.3	0.0557	0.1393614	0.11	10.75	6.37
28-May	0.28	0.0426	0.0994795	0.12	20.22	13.08
2-Jun	0.25	0.0451	0.0940335	0.11	14.56	8.63
3-Jun	0.25	0.0434	0.090489	0.09	8.03	3.90
21-Jul	0.24	0.0392	0.0784627	0.11	10.17	6.03
23-Jul	0.22	0.0339	0.0621997	0.17	*9.17*	*8.40*
19-Aug	0.29	0.0538	0.1301207	0.44	10.5	24.90
20-Aug	0.25	0.0576	0.120096	0.44	10.5	24.90
9-Sep	0.43	0.029	0.1039998	0.1	10.5	5.66
10-Sep	0.37	0.0294	0.0907225	0.08	7	3.02
28-Oct	0.26	0.0292	0.0633173	0.11	10.17	6.03
29-Oct	0.25	0.0249	0.0519165	0.1	10.5	5.66
11-Nov	0.25	0.0285	0.0594225		N/A	N/A
12-Nov	0.19	0.0261	0.0413581		N/A	N/A
16-Dec	0.14	0.0284	0.0331598		N/A	N/A
17-Dec	0.13	0.0279	0.0302492		N/A	N/A

*Corrected values

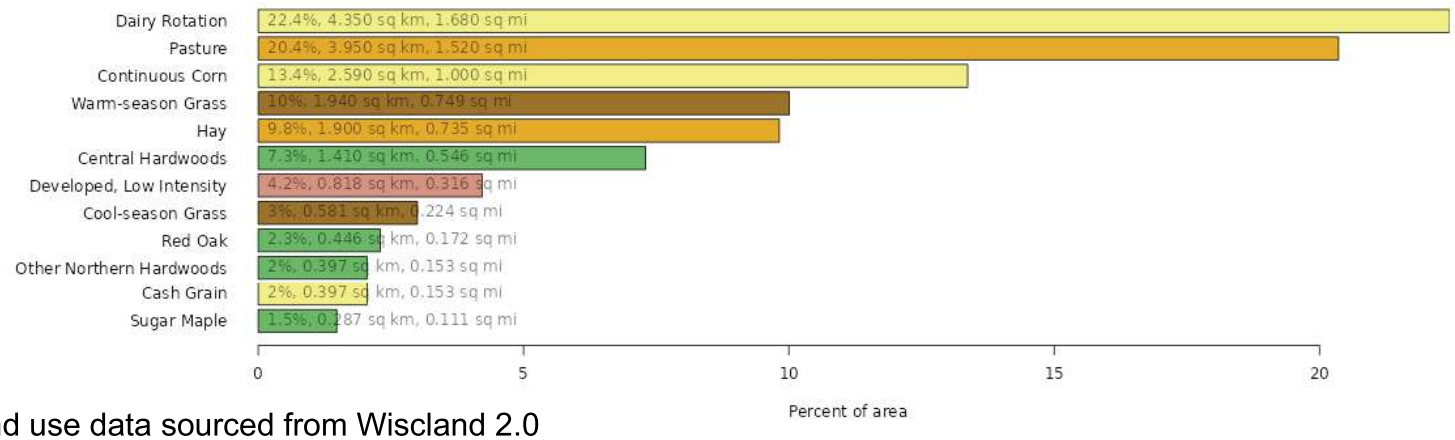
WWTF Design Flow: 0.075 (MGD)		EFFL C (mg/L)	EFFL Q (MGD)	Six Month Total (Lbs.)	Added Annual (Lbs)
2021	Jan-June	3.876	0.045	261	538
	July-Dec	4.574	0.039	277	
2022	Jan-June	4.217	0.047	300	622
	July-Dec	5.093	0.041	321	
2023	Jan-June	3.473	0.057	298	563
	July-Dec	4.430	0.039	264	
2024	Jan-June	0.260	0.052	21	41
	July-Dec	0.280	0.047	20	
2025	Jan-June	0.224	0.043	15	24
	July-Dec	0.200	0.032	10	

* Values used to consider updated PRESTO load volume as described in the correspondences (PG 45-46)

TPE WQT SOIL MAP

Farm: TPE ACTUAL, V20 Generated:6/11/2025, Crop year: 2025, Township Range Section:6N 5E s26

- Counties
- Township/Range
- Soils
- Nutrient prohibited buffers
- Nutrient prohibited drawn areas
- Nutrient prohibited winter only
- Fields



Land use data sourced from Wiscland 2.0

From: Howe, Betsyjo M - DNR
To: Peter Riddle
Cc: Ben Heidemann; Cassie Elmer; Claucherty, Matthew L - DNR
Subject: RE: Blue Mounds TPE A to Z Farms Water Quality Trade
Date: Thursday, December 19, 2024 11:02:53 AM

Hello Peter,

I have reviewed the Snap Plus database file received on December 10th. The department concurs with the inputs and outputs used in the model.

The uncertainty factor for perennial vegetation is 1, but the minimum trade ratio for a non-point to point trade is 1.2:1. Other factors of the trade ratio need to be considered, as we discussed, the downstream factor is one of them. Each factor should be addressed in the trading plan, but it appears the credit user and credit generator are in the same HUC-12 therefore a deliver factor should not need to be calculated. The equivalency factor is also zero.
When using PRESTO results as a basis for calculating total in-stream load, the updated point source load (as you stated, ~50 lbs.) is added to the PRESTO non-point load (161). The downstream factor of 0.1 seems appropriate, but I will need to look at the WWTF's data to determine the pollutant loading.
Based on your estimate of point source load of 50 pounds, the credit user's load as a percent of total in-stream load is still in the <25% category.

A complete WQT Plan will need to be submitted for approval.

Best,

BetsyJo Howe
(she/her)
Phone: 608-419-4155
betsyjo.howe@wisconsin.gov

From: Peter Riddle <priddle@tcengineers.net>
Sent: Tuesday, December 10, 2024 11:12 AM
To: Howe, Betsyjo M - DNR <betsyjo.howe@wisconsin.gov>
Cc: Ben Heidemann <ben@tcengineers.net>; Cassie Elmer <celmer@tcengineers.net>
Subject: Blue Mounds TPE A to Z Farms Water Quality Trade

BetsyJo,

Attached is the updated (Check Box Filled) Snap Plus file.

Per our discussion with calculation of the Trade Ratio. The baseline Trade Ratio for this type of practice is 1.2. The presto value we discussed came to >25% given that the facility is now producing what will amount to under ~50 lbs. of phosphorus annually. This 50 lbs. out of the total load (Listed as 709 lbs) gives us 50/709= 7.0%. Per WDNR Guidance we agreed in our conversation that this would apply an additional downstream trading factor of 0.10 to the trade ratio bringing the Trade Ratio for this project to a total of 1.3. The A to Z P Trade Report (Attached) calculates a Reduction of 72.54 pounds of phosphorus. Application of 1.3:1 Trade Ratio will provide Blue Mounds With a WQT Credit of 55.80 (56) pounds.

Will you please review these calculations. Following a signed trade agreement, and your approval of these calculations we will submit form 3400-207 to register this trade agreement.

Peter

Peter Riddle
priddle@tcengineers.net
Town & Country Engineering, Inc.
6264 Nesbitt Road
Madison, WI 53719
(608) 273-3350

Barneveld-Williams Creek Impaired Waters

Legend

TMDL Category Lines

- Other or Multiple Factors
- Contaminated Sediment Dominated
- Atmospheric Deposition Dominated
- Physical or Habitat Dominated
- Nonpoint Source Dominated
- Point and Nonpoint Source Blend
- Point Source
- Proposed for 303d listing

TMDL Category Areas

- Other or Multiple Factors
- Contaminated Sediment Dominated
- Atmospheric Deposition Dominated
- Physical or Habitat Dominated
- Nonpoint Source Dominated
- Point and Nonpoint Source Blend
- Point Source
- Proposed for 303d listing

- 12-digit HUCs (Subwatersheds)
- Municipality
- State Boundaries
- County Boundaries

Major Roads

- Interstate Highway
- State Highway
- US Highway

County and Local Roads

- County HWY
- Local Road

- Railroads
- Tribal Lands

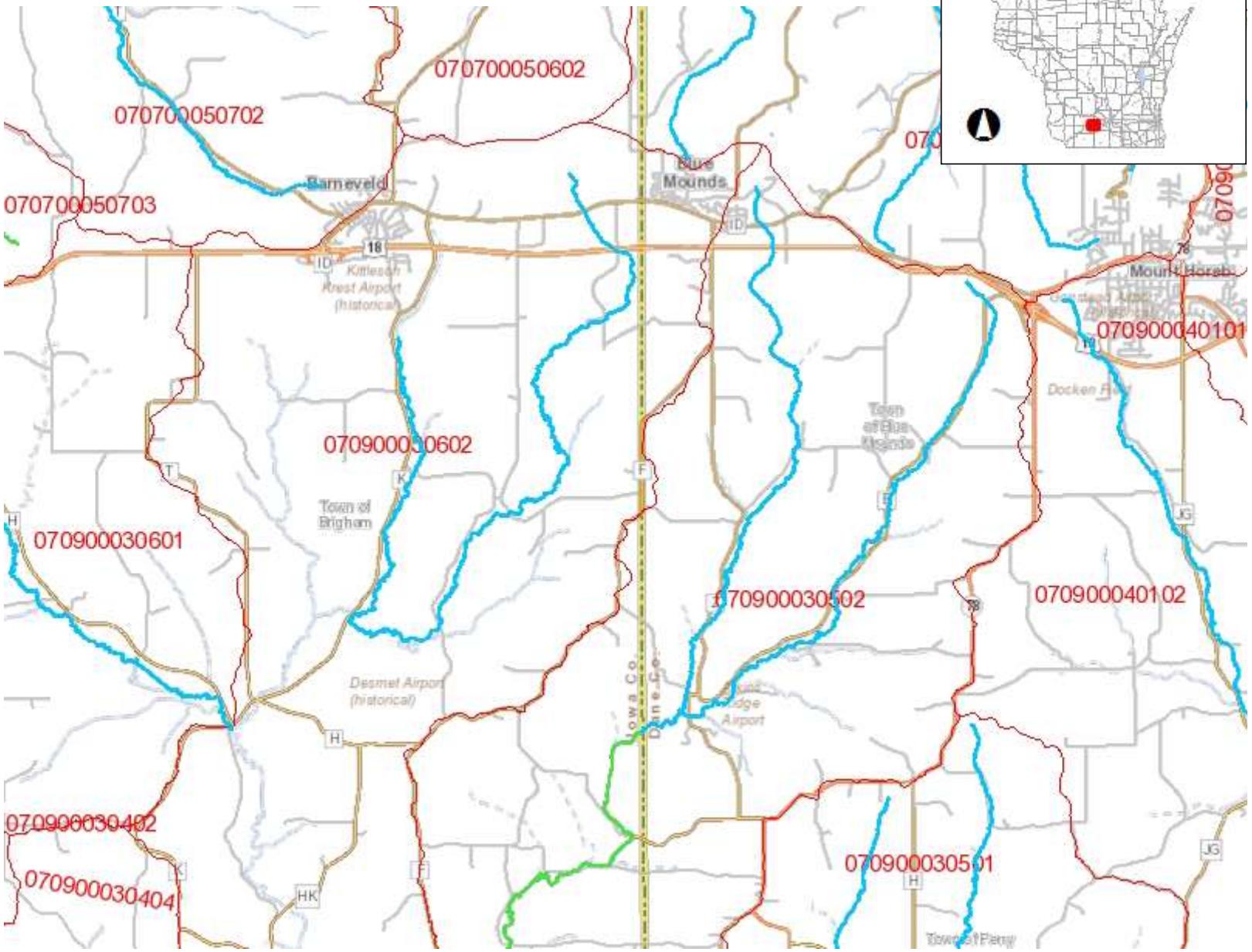
Notes

3.0 0 1.50 3.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 95,040

Barneveld-Williams Creek Trout Streams



Legend

- Smallmouth Bass Streams
  - Non-Wadable Coarse Substrate
  - Non-Wadable Fine Substrate
  - Wadable Cool Water
  - Wadable Nursery Waters
  - Wadable Warm Water
- Walleye Waters
  - Natural Reproduction Only
  - Natural Reproduction and Stocking Equal
  - Stocking Plus Natural Reproduction
- Trout Stream Lines
  - Class 1
  - Class 2
  - Class 3
- Trout Spring Ponds
  - Class 1
  - Class 2
  - Class 3
- 12-digit HUCs (Subwatersheds)
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams

Notes

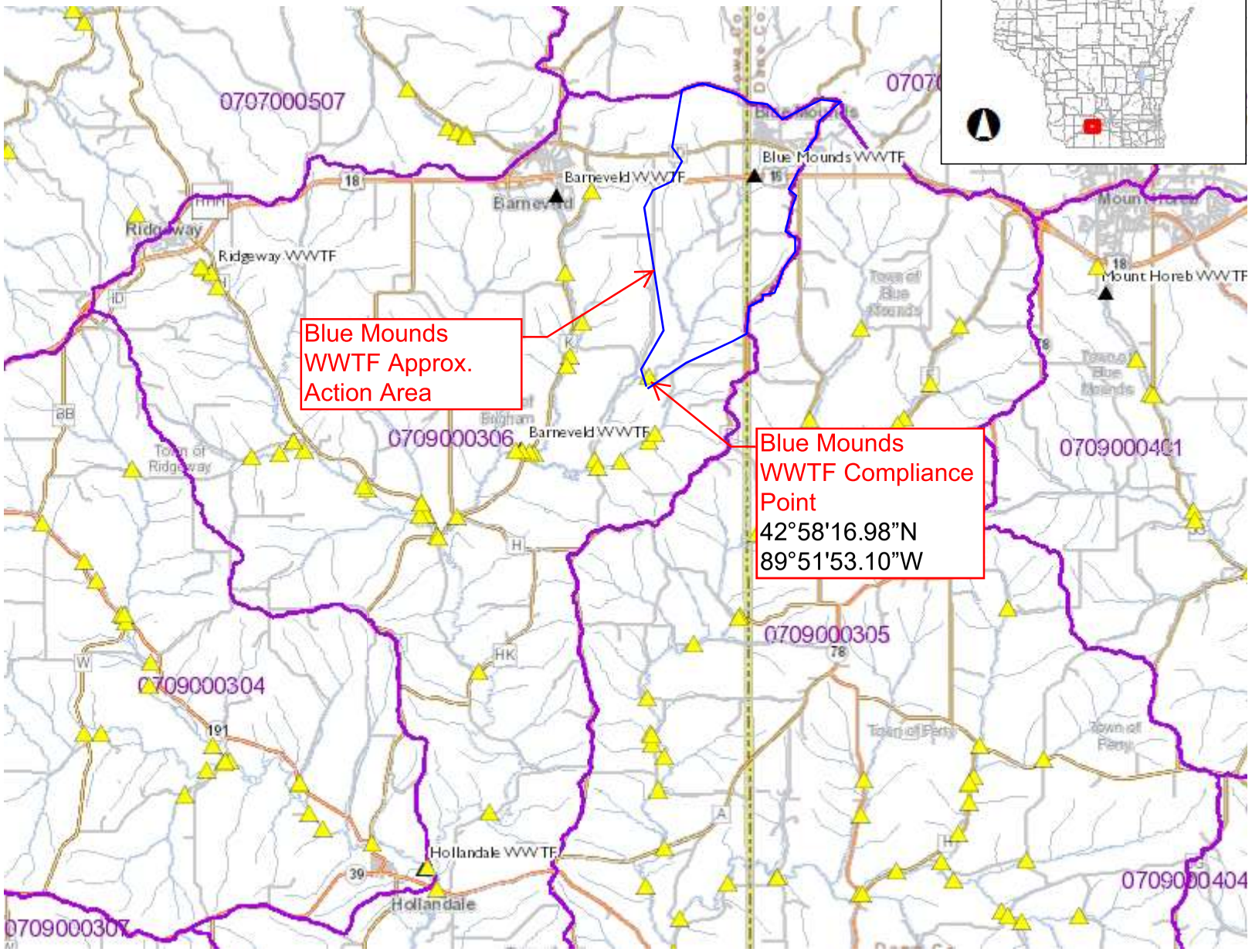
3.0 0 1.50 3.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 95,040

Row #	Waterbody Name	Local Waterbody Name	Water Type	Start Mile	End Mile	Size (Miles or Acres)	AU Listing Category	Cycle Listed	Source	Pollutants (Causes)	Impairments (Observed Effects)	Pollutant Listing Category	TMDL Priority	Use(s) Not Attained	WBIC	WDNR AU ID	EPA AU ID	Counties	Watershed Code	Watershed Name
1,378	Wapogasset Lake	Wapogasset Lake	LAKE			1,189	5W	2012	NPS	PHOSPHORUS, TOTAL	Eutrophication, Excess Algal Growth	5W	Low	FAL, REC	2618000	16486	WI10026576	Polk	SC05	Balsam Branch
1,379	Ward Lake	Ward Lake	LAKE			82.2	5W	2012	NPS	PHOSPHORUS, TOTAL	Impairment Unknown, Excess Algal Growth	5W	Low	FAL, REC	2599400	18912	WI10006733	Polk	SC12	Clam River
1,380	Warm Water Beach, Lake Michigan	Warm Water Beach, Lake Michigan	GREAT LAKES BEACH	0	0.8	0.8	5A	2006	Other	ESCHERICHIA COLI (E. COLI)	Recreational Restrictions - Pathogens	5A	Low	REC	20	1452984	WI10024776	Manitowoc	MA02	Lower Manitowoc River
1,381	Waumandee Creek	Waumandee Creek	RIVER	0	12.4	12.4	5A	2020	NPS	PHOSPHORUS, TOTAL	High Phosphorus Levels	5A	Low	FAL	1808300	14439	WI10036660	Buffalo	BT06	Waumandee Creek
1,382	Waupaca River	Tomorrow/Waupaca River	RIVER	32.8	38.6	5.8	5A	2016	PS/NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	257400	315909	WI10008441	Portage	WR05	Waupaca River
1,383	Waupaca River	Tomorrow/Waupaca River	RIVER	38.6	46.0	7.4	5A	2016	PS/NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	257400	315930	WI10008442	Portage	WR05	Waupaca River
1,384	Waupaca River	Waupaca River	RIVER	17.3	32.8	15.5	5A	2016	NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	257400	315887	WI10008440	Waupaca	WR05	Waupaca River
1,385	Wayne Creek	Wayne Creek	RIVER	0	3.1	3.1	5A	2012	NPS	PHOSPHORUS, TOTAL	High Phosphorus Levels	5A	Low	FAL	865500	1438861	WI10023256	Washington	UR13	East Branch Rock River
1,386	Wedde Creek	Wedde Creek	RIVER	0	5.1	5.1	5A	2016	NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	156000	11069	WI10001002	Marquette	UF09	Mecan River
1,387	West Branch Baraboo River	West Br Baraboo River	RIVER	0	7.2	7.2	5A	1998	PS/NPS	BIOCHEMICAL OXYGEN DEMAND (BOD)	Low DO	5A	Low	FAL	1288400	13026	WI10008116	Juneau, Vernon	LW24	Seymour Creek and Upper Baraboo River
1,388	West Branch Baraboo River	West Br Baraboo River	RIVER	0	7.2	7.2	5A	1998	PS/NPS	TOTAL SUSPENDED SOLIDS (TSS)	Low DO	5A	Low	FAL	1288400	13026	WI10008116	Juneau, Vernon	LW24	Seymour Creek and Upper Baraboo River
1,389	West Branch Blue Mounds Creek	West Br Blue Mounds Creek	RIVER	0	7.7	7.7	5P	2018	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5P	Low	FAL	1250400	13434	WI10010266	Iowa	LW15	Mill and Blue Mounds Creek
1,390	West Branch Fond Du Lac River	West Branch Fond Du Lac River	RIVER	0	26.8	26.8	5A	2016	PS/NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	134000	10990	WI10000947	Fond du Lac	UF03	Fond du Lac River
1,391	West Branch Little Black River	West Branch Little Black	RIVER	0	13.0	13.0	5P	2018	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5P	Low	FAL	1766200	14320	WI10003236	Taylor	BR13	Black and Little Black Rivers
1,392	West Branch Little Sugar River	Little Sugar River, West Branch	RIVER	0	6.9	6.9	5A	2014	PS/NPS	TOTAL SUSPENDED SOLIDS (TSS)	Degraded Habitat	5A	Medium	FAL	881400	13639	WI10038362	Green	SP14	Little Sugar River
1,393	West Branch Milwaukee River	West Branch Milwaukee River	RIVER	0	20.6	20.6	5P	2016	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5P	Low	FAL	40400	10117	WI10000294	Dodge, Washington, Fond du Lac	MI06	East and West Branches Milwaukee River
1,394	West Branch Rock River	Rock River, West Branch	RIVER	50.0	87.6	37.6	5A	2018	PS/NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	861300	11566	WI10001387	Dodge, Fond du Lac	UR12	Upper Rock River
1,395	West Branch Root River Canal	West Branch Root River Canal	RIVER	0	4.4	4.4	5W	1998	NPS	PHOSPHORUS, TOTAL	Low DO	5W	Medium	FAL	4500	9963	WI10008118	Racine	SE03	Root River
1,396	West Branch Root River Canal	West Branch Root River Canal	RIVER	0	4.4	4.4	5W	1998	NPS	TOTAL SUSPENDED SOLIDS (TSS)	Low DO	5W	Medium	FAL	4500	9963	WI10008118	Racine	SE03	Root River
1,397	West Branch Sugar River	West Branch Sugar River	RIVER	0	7.6	7.6	5A	2024	NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	886100	13658	WI10002825	Dane	SP16	West Branch Sugar River - Mt. Vernon Cre
1,398	West Branch Sugar River	West Branch Sugar River	RIVER	0	7.6	7.6	5A	2012	NPS	PHOSPHORUS, TOTAL	Degraded Biological Community	5A	Medium	FAL	886100	13658	WI10002825	Dane	SP16	West Branch Sugar River - Mt. Vernon Cre
1,399	West Branch Sugar River	West Branch Sugar River	RIVER	7.7	18.8	11.2	5A	2024	NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	886100	13659	WI10002826	Dane	SP16	West Branch Sugar River - Mt. Vernon Cre
1,400	West Branch Sugar River	West Branch Sugar River	RIVER	7.7	18.8	11.2	5A	2018	NPS	PHOSPHORUS, TOTAL	Degraded Biological Community	5A	Low	FAL	886100	13659	WI10002826	Dane	SP16	West Branch Sugar River - Mt. Vernon Cre
1,401	West Fork Kickapoo River	W. Fork Kickapoo River	RIVER	0	10.3	10.3	5P	2022	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5P	Low	FAL	1187900	13154	WI10002508	Vernon	LW04	West Fork Kickapoo River
1,402	West Thunder Creek	West Thunder Creek	RIVER	0	1.4	1.4	5C	2018	NPS	CAUSE UNKNOWN	Elevated Water Temperature	5C	Low	FAL	538100	11928	WI10001668	Oconto	GB10	Middle Peshtigo and Thunder Rivers
1,403	West Twin River	West Twin River	RIVER	0	5.9	5.9	5A	2016	PS/NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	87000	18050	WI10006087	Manitowoc	TK01	West Twin River
1,404	West Twin River	West Twin River	RIVER	0	5.9	5.9	5A	2012	Contam. Sed.	POLYCHLORINATED BIPHENYLS (PCBS)	PCBs Contaminated Fish Tissue	5A	Low	FC	87000	18050	WI10006087	Manitowoc	TK01	West Twin River
1,405	West Twin River	West Twin River	RIVER	17.1	18.4	1.3	5A	2016	NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	87000	18051	WI10006088	Manitowoc	TK01	West Twin River
1,406	White Ash Lake	White Ash Lake	LAKE			147.1	5W	2012	Other	PHOSPHORUS, TOTAL	Eutrophication, Excess Algal Growth	5W	Low	FAL, REC	2628600	16567	WI10005041	Polk	SC06	Upper Apple River
1,407	White Ash Lake	White Ash Lake, North	LAKE			115.8	5W	2014	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5W	Low	FAL, REC	2628800	16568	WI10005042	Polk	SC06	Upper Apple River
1,408	White Birch Lake	White Birch Lake (Ballard Chain)	LAKE			112.9	5B	1998	Atm. Dep.	MERCURY	Mercury Contaminated Fish Tissue	5B	Low	FC	2340500	15234	WI10003969	Vilas	UC16	Manitowish River
1,409	White Creek	White Creek	RIVER	0	3.1	3.1	5A	1998	NPS	TOTAL SUSPENDED SOLIDS (TSS)	Degraded Habitat	5A	Low	FAL	1691700	14119	WI10003085	Jackson	BR03	Big and Douglas Creeks
1,410	White Mound Lake	White Mound Lake	RESERVOIR			92.5	5A	2014	NPS	CAUSE UNKNOWN	Excess Algal Growth	5A	Low	REC	1258100	13469	WI10002687	Sauk	LW16	Honey Creek
1,411	White River	White River	RIVER	0	15.5	15.5	5P	2012	PS/NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5P	High	FAL	751200	10453	WI10000549	Racine, Walworth	FX03	White River and Nippersink Creek
1,412	White Tail Flowage	White Tail Flowage	RESERVOIR			94.0	5B	2002	Atm. Dep.	MERCURY	Mercury Contaminated Fish Tissue	5B	Low	FC	1717500	14201	WI10003143	Jackson	BR05	Morrison Creek
1,413	Whitefish Lake	Whitefish Lake	LAKE			198.8	5B	1998	Atm. Dep.	MERCURY	Mercury Contaminated Fish Tissue	5B	Low	FC	1613500	128378	WI10007517	Oneida	UW44	Eagle River
1,414	Whiteside Creek	Whiteside Creek	RIVER	0	1.6	1.6	5A	2018	NPS	CAUSE UNKNOWN	Degraded Biological Community	5A	Low	FAL	899700	13691	WI10002844	Lafayette	SP03	Lower East Branch Pecatonica Rivers
1,415	Wildcat Creek	Wildcat Creek	RIVER	0	5.1	5.1	5W	2022	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5W	Low	FAL	858600	11461	WI10001296	Dodge	UR08	Sinissippi Lake
1,416	Wildcat Creek	Wildcat Creek	RIVER	5.1	13.9	8.8	5W	2022	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5W	Low	FAL	858600	11462	WI10026119	Dodge	UR08	Sinissippi Lake
1,417	Williams-Barneveld Creek	Williams-Barneveld Creek	RIVER	0	8.1	8.1	5A	2024	PS/NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5A	Medium	FAL	915100	13767	WI10038762	Iowa	SP06	Upper East Branch Pecatonica River
1,418	Willow Creek	Willow Creek	RIVER	0	9.6	9.6	5A	2016	PS/NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	243700	10768	WI10034820	Waushara	WR02	Pine and Willow Rivers
1,419	Willow Creek	Willow Creek	RIVER	0	6.8	6.8	5P	2018	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5P	Low	FAL	871500	11581	WI10001399	Fond du Lac	UR12	Upper Rock River
1,420	Willow Creek	Willow Creek	RIVER	13.2	14.2	1.0	5A	2018	NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	243700	6902972	WI6902973	Waushara	WR02	Pine and Willow Rivers
1,421	Willow Creek	Willow Creek	RIVER	14.2	30.4	16.3	5A	2018	PS/NPS	CAUSE UNKNOWN	Elevated Water Temperature	5A	Low	FAL	243700	10769	WI10000792	Waushara	WR02	Pine and Willow Rivers
1,422	Willow Flowage	Willow Flowage	RESERVOIR			4,229	5B	2012	Atm. Dep.	MERCURY	Mercury Contaminated Fish Tissue	5B	Low	FC	1528300	128380	WI10007519	Oneida	UW37	Middle Tomahawk River
1,423	Willow Lake	Willow Lake	LAKE			409.6	5B	1998	Atm. Dep.	MERCURY	Mercury Contaminated Fish Tissue	5B	Low	FC	1529500	128381	WI10026528	Oneida	UW37	Middle Tomahawk River
1,424	Willow River	North Fork Willow River	RIVER	32.5	40.6	8.1	5W	2018	PS/NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5W	Low	FAL	2606900	16413	WI10038948	Saint Croix	SC03	Upper Willow River
1,425	Willow River	Willow River (140 St to 100th)	RIVER	13.8	15.7	2.0	5W	1998	PS/NPS	BIOCHEMICAL OXYGEN DEMAND (BOD)	Low DO	5W	Low	FAL	2606900	16411	WI10038943	Saint Croix	SC02	Lower Willow River
1,426	Willow River	Willow River (140 St to 100th)	RIVER	13.8	15.7	2.0	5W	1998	PS/NPS	PHOSPHORUS, TOTAL	Low DO	5W	Low	FAL	2606900	16411	WI10038943	Saint Croix	SC02	Lower Willow River
1,427	Willow River	Willow River (Mouth to Dam)	RIVER	2.6	5.1	2.5	5W	2020	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5W	Low	FAL	2606900	1468860	WI10033723	Saint Croix	SC02	Lower Willow River
1,428	Willow River	Willow River (to confluence of branches)	RIVER	26.3	32.5	6.2	5W	2020	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5W	Low	FAL	2606900	1525181	WI10038947	Saint Croix	SC03	Upper Willow River
1,429	Wilson Creek	Wilson Creek	RIVER	0	3.4	3.4	5P	2016	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5P	Medium	FAL	2066000	18788	WI10006631	Dunn	LC04	Wilson Creek
1,430	Wilson Creek	Wilson Creek	RIVER	3.4	14.4	11.0	5P	2012	PS/NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5P	Low	FAL	2066000	15662	WI10004326	Dunn	LC04	Wilson Creek
1,431	Wilson Lake	Wilson Lake (Wilson Ck Fl)	LAKE			348.0	5P	2012	NPS	PHOSPHORUS, TOTAL	Impairment Unknown	5P	Low	FAL, REC	2239400	14720	WI10003538	Price	UC09	Elk River
1,432	Wilson Park Creek	Wilson Park Creek	RIVER	0	3.5	3.5	5A	2018	PS/NPS	CHLORIDE	Chronic Aquatic Toxicity, Acute Aquatic Toxicity	5A	Low	FAL	15200	9975	WI10000203	Milwaukee	MI01	Kinnickinnic River
1,433	Windigo Lake	Windigo Lake (Bass)	LAKE			503.2	5B	1998	Atm. Dep.	MERCURY	Mercury Contaminated Fish Tissue	5B	Low	FC	2046600	15354	WI10004070	Sawyer	UC20	Couderay River
1,434	Wingra Creek	Murphy (Wingra) Creek	RIVER	0	1.2	1.2	5A	1998	Contam. Sed.	CAUSE UNKNOWN	Chronic Aquatic Toxicity	5A	Low	FAL	804700	11666	WI10001456	Dane	LR08	Yahara River and Lake Monona
1,435	Wingra Creek	Murphy (Wingra) Creek	RIVER	0	1.2	1.2	5A	2022	NPS	ESCHERICHIA COLI (E. COLI)	Recreational Restrictions - Pathogens	5A	Low	REC	804700	11666	WI10001456	Dane	LR08	Yahara River and Lake Monona
1,436	Wingra Creek	Murphy (Wingra) Creek	RIVER	0	1.2	1.2	5A	2022	NPS	PERFLUOROOCTANE SULFONATE (PFOS)	PFOS Contaminated Fish Tissue	5A	Low	FC	804700	11666	WI10001456	Dane	LR08	Yahara River and Lake Monona
1,437	Wingra Creek	Wingra Creek	RIVER	1.2	2.0	0.8	5A	2022	NPS	PERFLUOROOCTANE SULFONATE (PFOS)	PFOS Contaminated Fish Tissue	5A	Low	FC	804700	5533632	WI10033422	Dane	LR08	Yahara River and Lake Monona
1,438	Winnebago County Community Swim Area	Winnebago County Community Swim Area	INLAND BEACH	0	0.06	0.06	5A	2018	NPS	ESCHERICHIA COLI (E. COLI)	Recreational Restrictions - Pathogens	5A	Low	REC	5556614	6878159	WI10040617	Winnebago	UF01	Lake Winnebago - North and West
1,439	Winter Lake (Price Flowage)	Winter Lake (Price Flowage)	RESERVOIR			256.9	5B	1998	Atm. Dep.	MERCURY	Mercury Contaminated Fish Tissue	5B	Low	FC	2381100	15324	WI10004043	Sawyer	UC19	Weirgor Creek and Brunet River
1,440	Wisconsin Point Dutchman Creek, Lake Superior	Wisconsin Point Beach 3, Lake Superior	GREAT LAKES BEACH	0	0.1	0.1	5A	2014	NPS	ESCHERICHIA COLI (E. COLI)	Recreational Restrictions - Pathogens	5A	Low	REC	2751220	3897996	WI10027275	Douglas	LS01	St. Louis and Lower Nemadji River
1,441	Wisconsin Point Lot 1, Lake Superior	Wisconsin Point Beach 1, Lake Superior	GREAT LAKES BEACH	0	0.3	0.3	5A	2014	NPS	ESCHERICHIA COLI (E. COLI)	Recreational Restrictions - Pathogens	5A	Low	REC	2751220	3897974	WI10027274	Douglas	LS01	St Louis and Lower Nemadji River
1,442	Wisconsin Point Lot 3, Lake Superior	Lake Superior - Wisconsin Point Lot 12 Beach	GREAT LAKES BEACH	0	0.3	0.3	5A	2022	NPS	ESCHERICHIA COLI (E. COLI)	Recreational Restrictions - Pathogens	5A	Low	REC	2751220	6878341	WI10040623	Douglas	LS01	St. Louis and Lower Nemadji River

Blue Mounds HUC 10 Map



Legend

- Station Points with Recent Data (10 years)
- Surface Water Outfalls
- 24K Hydrography Streams and Rivers
- 24K Hydrography Lakes and Open Water
- 10-digit HUCs (Watersheds)
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

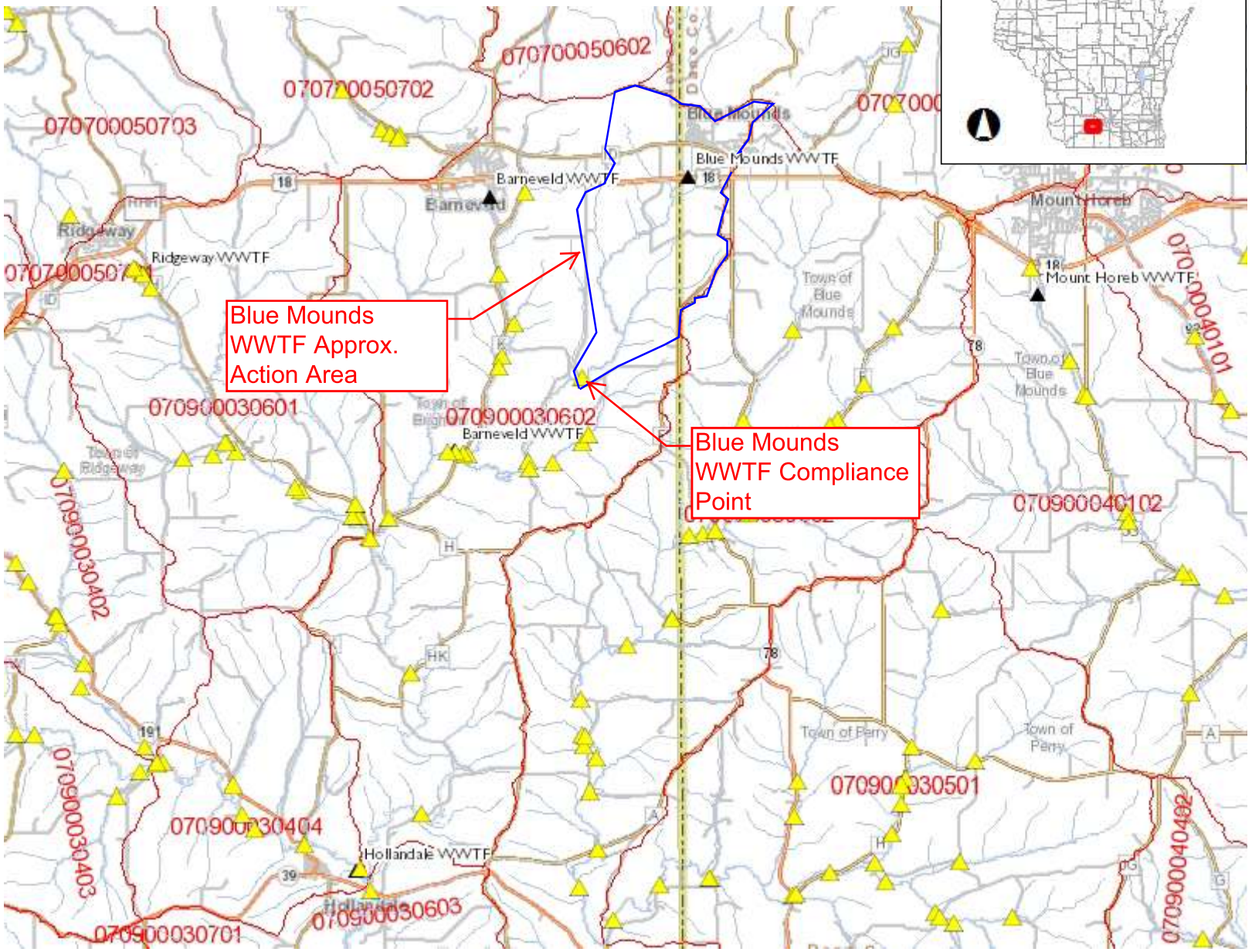
Notes

4.0 0 2.00 4.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 126,720

Blue Mounds HUC 12 Map



Legend

- Station Points with Recent Data (10 years)
- Surface Water Outfalls
- 24K Hydrography Streams and Rivers
- 24K Hydrography Lakes and Open Water
- 12-digit HUCs (Subwatersheds)
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

Notes

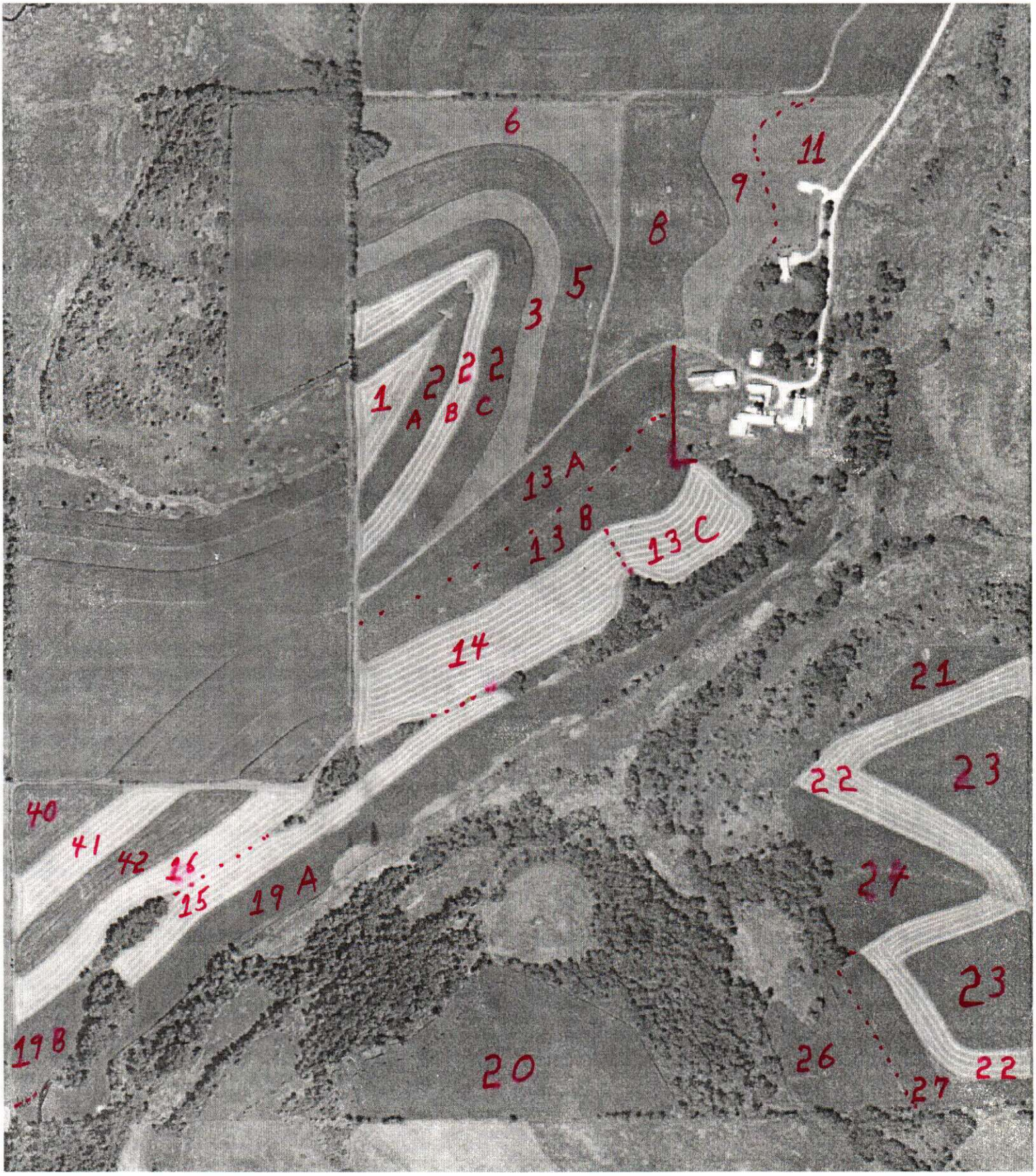
4.0 0 2.00 4.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 126,720

Appendix C

A to Z Farm fields



Village of Blue Mounds - Water Quality Trading
Cost Estimates (20-year period)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Grass seed mix (50 ac)*	$14,750											
Plant grass (50 ac)*	$3,250											
Prairie seed mix (1.7 ac)**	$8,500											
Plant prairie (1.7 ac)**	$100											
Prairie seed mix (13.2 ac)**				$66,000								
Plant prairie (13.2 ac)**				$300								
Mow weeds (1.7 ac)		$50	$50									
Mow weeds (13.2 ac)					$400	$400						
Spray board-leave weeds (50 ac)		$3,250	$3,250			$3,500						
Spray weeds (13.2 ac)				$900								
Prescribed burns (1.7 ac)			$370	$370								
Prescribed burns (50 ac)				$2,300								
Prescribed burns (64.9 ac)						$2,900		$2,900	$3,150	$3,150	$3,300	$3,300
Targeted weed/brush control***				$100	$100	$100	$500	$500	$1,000	$1,000	$1,000	$1,000
Total	$26,600	$3,300	$3,670	$69,970	$500	$6,900	$500	$3,400	$4,150	$4,150	$4,300	$4,300

* in fall 7 species (smooth brome, side oats gramma, little bluestem, prairie dropseed, redtop, Junegrass, Bicknell's sedge)

** in fall 65-80 species

*** backpack sprayer and hand work

2037	2038	2039	2040	2041	2042	2043	2044	2045	
$3,400	$3,400			$3,600			$3,700		
$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	
									Grand Total
$4,400	$4,400	$1,000	$1,000	$4,600	$1,000	$1,000	$4,700	$1,000	$154,840

Samples Analyzed By:
Soil & Forage Analysis Lab
4702 University Avenue
Madison, WI 53705
phone: 608-262-4364

SOIL TEST REPORT

COOPERATIVE EXTENSION
University of Wisconsin-Extension
University of Wisconsin-Madison
Department of Soil Science

Results also available on-line at http://not available
lab number: 4163 access code: 7stct

LAB #: 4163

This Report is for:
Peter Riddle

TC Engineering - Peter Riddle
6264 Nesbitt Road
Madison, WI 53719

County: Dane
Account No.: 563752
Date Received: 10/31/2024
Date Processed: 11/18/2024

Slope	Acres	Plow Depth	Irrigated
0%	0	7"	No

Soil Name: unknown, loamy soil
Tiled: No
Field Name: TPE AZ
Previous Crop: no crop

NUTRIENT RECOMMENDATIONS

Cropping Sequence	Yield Goal	Crop Nutrient Need			Fertilzer Credit				Nutrients to Apply		
		N	P2O5	K2O	Legume N	Manure N	P2O5	K2O	N	P2O5	K2O
	per acre	lbs/a			lbs/a	lbs/a			lbs/a		
Corn, grain	171-190 bu	see below	0	0	0	0	0	0	see below	0	0
Soybean, grain	56-65 bu	0	0	0	0	0	0	0	0	0	0
Alfalfa, seeding	1.5-2.5 ton	0	0	0	0	0	0	0	0	0	0
Alfalfa, established	5.6-6.5 ton	0	0	0	0	0	0	0	0	0	0

There is no lime recommendation.

SUGGESTED N APPLICATION RATES FOR CORN (GRAIN) AT DIFFERENT N:CORN PRICE RATIOS

Previous Crop	N:Corn Price Ratio ($/lb N:$/bu)							
Medium Yield Potential Soils **	0.05		0.10		0.15		0.20	
	Rate[1]	Range	Rate[1]	Range	Rate[1]	Range	Rate[1]	Range
	lb N/a (Total to Apply)[2]							
Corn, Forage legumes, Leguminous vegetables, Green manures[3]	145	130-160	125	115-140	115	105-125	105	95-110
Soybean, Small grains[4]	130	110-150	100	85-120	85	70-95	70	60-80

*** No soil information was provided, therefore, a medium soil yield potential was assumed for N application guidelines for corn. If you feel that you may have a high yield potential soil and may need higher N application rates, please determine your soil series and/or soil map unit then consult publication A2809. In the future, please submit samples with county and soil map unit or soil series name to obtain the nutrient application guidelines that are more appropriate for your soil.*

1 Rate is the N rate that provides the maximum return to N (MRTN). Range is the range of profitable N rates that provide an economic return to N within $1/a of the MRTN.
2 These rates are for total N applied including N in starter fertilizer and N used in herbicide applications.
3 Subtract N credits for forage legumes, leguminous vegetables, green manures and animal manures. This includes 1st, 2nd and 3rd year credits where applicable. Do not subtract N credits for leguminous vegetables on sand and loamy sand soils.
4 Subtract N credits for animal manures and 2nd year forage legumes.

Guidelines for choosing an appropriate N application rate for corn (grain)

1) If there is more than 50% residue cover at planting, use the upper end of the range.
2) If 100% of the N will come from organic sources, use the top end of the range. In addition, up to 20 lb N/a in starter fertilizer may be applied in this situation.
3) For medium and fine textured soils with 10% or more organic matter, use the low end of the range; for medium and fine textured soils with less than 2% organic matter, use the high end of the range.
4) If there is a likelihood of residual N, then use the low end of the range or use the high end of the range and subtract preplant nitrate test (PPNT) credits.
5) For corn following small grains on medium and fine textured soils, the middle to low end of the range is most appropriate.

For more information on the new N application rate guidelines for corn see http://uwlab.soils.wisc.edu/pubs/MRTN/

ADDITIONAL INFORMATION

Recommended rates are the total amount of nutrients to apply (N-P-K), including starter fertilizer.

Starter fertilizer (e.g. 10+20+20 lbs $N+P_2O_5+K_2O$/a) is advisable for row crops on soils slow to warm in the spring.

If alfalfa will be maintained for more than three years, increase recommended K_2O by 20% each year.

N.R.=Not required for calculation of lime requirement when soil pH is 6.6 or higher.

SOIL TEST INTERPRETATION FOR CROPPING SEQUENCE

	Very Low	Low	Optimum	High	Very High	Excessive
Phosphorus	PPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP					
Potassium	KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK					
Rotation pH	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX					

LABORATORY ANALYSIS

Sample Identification	Soil pH	O.M %	Phosphorus ppm	Potassium ppm	60-69 Lime Req (T/a)	Calcium ppm	Magnesium ppm	Est. CEC (cmol/kg)	Boron ppm	Manganese ppm	Zinc ppm	Sulfate-Sulfur ppm		Texture Code	Sample Density	Buffer pH
1	6.7	5.1	24	156	0									2	1.11	N.R.
2	6.8	5.2	45	248	0									2	1.10	N.R.
3	6.6	3.9	26	158	0									2	1.14	N.R.
4	6.7	5.2	77	284	0									2	1.11	N.R.
5	6.8	4.0	22	163	0									2	1.16	N.R.
6	6.8	4.7	81	305	0									2	1.13	N.R.
7	6.9	4.6	29	202	0									2	1.15	N.R.
8	6.9	4.6	89	323	0									2	1.11	N.R.
9	6.9	5.0	27	245	0									2	1.09	N.R.
10	7.0	4.5	51	272	0									2	1.11	N.R.
11	7.0	4.5	42	265	0									2	1.06	N.R.
12	7.0	5.0	65	315	0									2	1.05	N.R.
13	7.0	4.7	52	280	0									2	1.09	N.R.
Adjusted Averages	6.9	4.7	48	247												

WQ1: P Trade Report

Reported For	TPE ACTUAL
Printed	2026-04-17
Plan Completion/Update Date	2025-01-07
SnapPlus Version 20.4 built on 2021-06-03	
J:\JOB#S\Blue Mounds\BM-83-W1 Adaptive Management Plan\WQT \WQT PLAN\TPE\Snap reports used in WQT Plan\TPE ACTUAL FINAL (2026-03-09_15-08-36).snapDb\TPE ACTUAL FINAL.snapDb	

Prepared for:
TPE ACTUAL
attn:TPE

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

Questions? Please contact DNRphosphorus@wisconsin.gov

This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.

P Trade Report				PTP										
Field Name	Soil Series	Soil Symbol	Acres	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
TPE 2026 Trade	DODGEVILLE	DgC2	49	78	82	140	85	232	21	7	5	5	4	
TPE 2026 Trade Hay	DODGEVILLE	DgC2	13	25	31	78	31	146	22	31	23	14	9	3
Total			**62**	**103**	**113**	**217**	**116**	**378**	**43**	**38**	**28**	**19**	**13**	**3**

PTP			
2032	2033	2034	2035
2	1	1	1
2	**1**	**1**	**1**

Pre-trade years 2021-2025
Proposed Years 2026-2035

NM1: Narrative and Crops Report

Starting Year	**2021**
Reported For	**TPE ACTUAL**
Printed	**2026-04-17**
Plan Completion/Update Date:	**2025-01-07**
SnapPlus Version 20.4 built on 2021-06-03	
J:\JOB#S\Blue Mounds\BM-83-W1 Adaptive Management Plan\WQT\WQT PLAN\TPE\Snap reports used in WQT Plan\TPE ACTUAL FINAL (2026-03-09_15-08-36).snapDb\TPE ACTUAL FINAL.snapDb	

Prepared for:
TPE ACTUAL
attn:TPE

Farm has 2 fields totalling 62.3 cropped acres.
Farm Narrative: None

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: No spreader calibration rate documentation has been selected.

Narrative and Crops:

Field Name	Field Acres	2021	2022	2023	2024	2025	2026	2027	2028
TPE 2026 Trade	49.1	Corn grain Fall vertical tillage 191-210 bu/acre	Winter Rye (forage) to Soybeans, 15-20 inch row crop 1: No-till, crop 2: Vertical till 2.0-3.5/46-55 ton/acre/bu/acre	Winter Rye (forage) to Corn grain No Till 2.0-3.5/191-210 ton/acre/bu/acre	Winter Rye (forage) to Soybeans, 15-20 inch row crop 1: No-till, crop 2: Vertical till 2.0-3.5/46-55 ton/acre/bu/acre	Corn grain No Till 151-170 bu/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre
TPE 2026 Trade Hay	13.2	Corn grain Fall vertical tillage 191-210 bu/acre	Winter Rye (forage) to Soybeans g+s, 15 -20 inch row crop 1: No-till, crop 2: Vertical till 2.0-3.5/46-55 ton/acre/bu/acre	Winter Rye (forage) to Corn grain No Till 2.0-3.5/191-210 ton/acre/bu/acre	Winter Rye (forage) to Soybeans g+s, 15 -20 inch row crop 1: No-till, crop 2: Vertical till 2.0-3.5/46-55 ton/acre/bu/acre	Corn grain No Till 191-210 bu/acre	Alfalfa Seeding Spring No Till 3.6-4.5 ton/acre	Alfalfa None 3.6-4.5 ton/acre	Alfalfa None 3.6-4.5 ton/acre

Summary by Crop:
NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.

Pre-trade years 2021-2025
Proposed Years 2026-2035

NM1: Narrative and Crops Report

Starting Year	**2028**
Reported For	**TPE ACTUAL**
Printed	**2026-04-17**
Plan Completion/Update Date:	**2025-01-07**
SnapPlus Version 20.4 built on 2021-06-03	
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Prepared for:
TPE ACTUAL
attn:TPE

Farm has 2 fields totalling 62.3 cropped acres.
Farm Narrative: None

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: No spreader calibration rate documentation has been selected.

Narrative and Crops:

Field Name	Field Acres	2028	2029	2030	2031	2032	2033	2034	2035
TPE 2026 Trade	49.1	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre					
TPE 2026 Trade Hay	13.2	Alfalfa None 3.6-4.5 ton/acre	Alfalfa None 3.6-4.5 ton/acre	Alfalfa None 3.6-4.5 ton/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre

Summary by Crop:
NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.

	A to Z Farm Field crop history																																					
TPE field #	NRCS field # 2016	NRCS field # 2018	Acres	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	1	1	1.7	H	C	H	H	H	H	H	H	H	H	H	H	H	H	H	C	C	S	C	S	C											
	2A	4	2.7		H	H	H	?C	S	C	S	C	H	H	H	C	C	C	C	C	S	C	S	C											
	2B	2	4.8		H	H	H	H	H	C	C	C	C	C	C	C	C	C	H	H	H	H	C	S											
	2C	2	6.1		H	H	H	?C	S	C	C	C	C	C	C	C	C	C	H	H	H	H	C	S											
	3	3	4.9		S	H	H	H	H	H	H	C	H	H	H	H	H	C	C	C	C	S	C	S											
	5	5	8.3		C	S	C	?C/S	C	C	C	C	C	C	C	C	C	C	C	C	C	C	S	C	S											
	6	6	5.8		S	H	H	H	H	H	H	C	C	C	H	H	H	H	C	C	C	S	C	S											
	8	8	8.3		C	C	C	?C/S	C	C	C	C	C	H	H	H	H	H	C	C	C	C	C	S											
	9	9	4.5		C	S	H	H	H	H	H	H	C	C	C	C	C	H	H	H	C	C	C	S											
	11	11	3.4		C	S	H	H	H	H	H	H	C	C	C	C	C	H	H	H	C	C	C	S											
	13A	7	6.8		C	C/S	C	?C/S	C	S	C	C	C	C	C	C	C	C	C	C	C	S	C	C											
	13B	10	6.8		C	C/S	C	?C/S	S	H	H	H	H	H	H	C	C	C	C	C	C	S	C	C											
41	13C	12	3.7	H	C	H	H	H	H	C	C	C	C	H	H	H	H	CRP																		
40	14	14	7.5		H	H	H	H	H	C	C	C	CRP																							
38	15	15	4.4		C	H	H	H	H	H	H	H	CRP																							
34	16	16	4.4		H	H	H	H	C	S	CRP																									
39	19A	19	14.9		S	C	C	?C/S	C	C	C	C	CRP																							
33	19B	18	2.5		S	C	C	?C/S	fallow	C	CRP																									
25	20	20	12.4		S	C	S	?C/S	H	H	H	CRP																								
32	21	21	2.3		C	S	C	?C/S	C	H	H	CRP																								
28	22	17,21,22	9.9		C	H	H	H	H	H	C	CRP																								
29&31	23	23,25,28	10.4		H	H	H	?C/S	S	C	CRP																									
30	24	21,24	5.3	H	C	S	C	?C/S	C	H	H	CRP																								
26	26	21	4.6		S	C	S	?C/S	H	H	H	CRP																								
27	27	21,27	3.1	H	C	S	C	?C/S	C	H	H	CRP																								
37	40	13	2.4		C	S	C	?C/S	S	H	H	H	H	H	H	C	C	C	CRP																	
36	41	41	2.7		H	H	H	H	C	S	CRP																									
35	42	26	4.0	H	C	S	C	?C/S	S	H	H	H	H	H	H	C	C	C	CRP																	
	Total:		158.6					CRP enrolled acres:			20.0	37.6	26.8	0.0	0.0	0.0	0.0	3.7	6.4	0.0	0.0	0.0	0.0					94.5							
								Remaining crop acres:			138.6	101.0	74.2	74.2	74.2	74.2	74.2	70.5	64.1	64.1	64.1	64.1	64.1					64.1							
	H=alflafa hay																												158.6						
	C=corn																																		
	S=soybeans																																		
	?C/S=corn or soybeans																																		
	CRP = enrolled in CRP																																		
	? = possibly scheduled to enroll in CRP																																		

Exhibit F

Operation and Maintenance Plan

Operations and Maintenance Plan

Prairie/Grassland Restoration Project

1. Purpose

To guide the successful establishment and long-term maintenance of a native prairie planting for soil health, erosion control, wildlife habitat, and ecosystem resilience. This O&M plan outlines key management activities to ensure functionality and persistence of the restored prairie.

2. General Objectives

- Establish, within 20 years, a diverse, self-sustaining native plant community
- Reduce erosion and enhance soil health
- Suppress weeds and invasive species
- Provide pollinator and wildlife habitat
- Maintain vegetative cover and ecosystem services over time

3. Establishment Phase (Years 1-3)

Site Preparation:

- Remove or suppress existing non-native vegetation using appropriate herbicide or mechanical methods.
- Avoid soil disturbance unless needed to reduce compaction or to prepare a suitable seedbed.

Seeding:

- In Site 1, seed 7 species of graminoids (smooth brome, side oats gramma, little bluestem, prairie dropseed, redtop, Junegrass, Bicknell's sedge) in fall 2025.
- In Site 2, seed alfalfa in spring 2026.
- In Sites 3 & 4 seed a diverse, site-appropriate mix of native grasses and forbs, preferably sourced locally.
- In 2030 or 2031, seed into Sites 1 & 2, a diverse, site-appropriate mix of native grasses and forbs, preferably sourced locally.
- Seeding can be done via no-till drill, broadcast seeding followed by rolling, or dormant frost seeding.
- Avoid fertilizer use unless recommended by a soil test and consistent with restoration goals.

Early Maintenance:

- Mow periodically during the first growing season (possibly second if need be) to reduce competition from annual weeds (generally at 6-8 inches height). \
- Site 2 may be harvested for 4 years
- Vegetative cover will be kept to a minimum of 70% during the growing season
- Monitor for signs of erosion or invasive species.
- Reseed areas with poor establishment if necessary.
- Only non-phosphorus containing fertilizer will be used if necessary

4. Maintenance Phase (Years 3-5)

Vegetation Management:

- Begin periodic disturbance such as prescribed burning, mowing, or haying to prevent woody plant encroachment and stimulate native plant vigor.

Invasive Species Control:

- Continue monitoring and control efforts using spot treatment with herbicide, hand removal, or mowing.
- Focus on aggressive species such as Canada thistle, reed canary grass, or other local threats.

Monitoring:

- Evaluate plant cover, species composition, and site stability annually.
- Adjust management practices based on observed results.
- Continue to monitor

5. Long-Term Management (Year 5 and Beyond)

Ongoing Vegetation Management:

- Implement prescribed burning as need to establish and maintain the prairie vegetation.
- Once it is well established, leave at least one-third of the area unburned in a rotational regime.
- This vegetative practice should maintain at a minimum 90% live canopy cover during the growing season

Woody Plant Control:

- Monitor for woody encroachment and remove trees and shrubs as needed.
- Spot-treat with herbicide where mechanical removal is ineffective.

Documentation:

- Maintain records of all management actions, including dates and methods for burns, mowing, herbicide applications, and reseeding.

Erosion:

- Immediate action should be pursued to remedy areas of bare soil, erosion and concentrated flow paths, should they occur. Appropriate actions can include regrading and seeding to prevent the development of rills and gullies.

6. Schedule Overview

Activity | Frequency | Notes

Mowing (Establishment Phase) | 2-3 times per season | Cut to 6-8 inches to control weeds

Invasive Species Monitoring | At least twice annually | Spot-treat as needed

Prescribed Burning / Mowing | As needed to maintain health and vigor of the native prairie vegetation | Rotate areas; coordinate with local authorities

Vegetation Assessment | Annually | Note dominant species, bare areas, or erosion

Woody Species Removal | As needed | Prevent transition to shrubland or forest

7. Roles and Responsibilities

Landowner/Manager: Implement and oversee regular operations and maintenance.

8. Adaptive Management

This O&M plan should be reviewed every 3-5 years or following major disturbances (e.g., drought, flooding). Adjustments should be made to seeding composition, maintenance frequency, or treatment methods based on monitoring results and site performance.

Welcome to A to Z Farm

A Unit of the Mounds View Grassland Preserve. A project of The Prairie Enthusiasts

photo by U.S. Fish and Wildlife Service, S. Maslowski

Numerous brushy thickets were purposely left uncut on A to Z to provide important habitat for birds such as the state-threatened Bell's vireo.

When the original land survey was conducted in 1832, the 280-acre A to Z Farm was covered entirely by treeless prairie with the possible exception of a few small bur oaks near what became the homestead. At the heart of the property is a valley with a permanent, coldwater stream running through it. The valley bottom is kept wet throughout the year by an extensive system of springs and groundwater seeps. Many native sedge meadow and wet prairie species are supported by this continuous moisture. Most of the farm's slopes were too rocky and thin soiled to have been tilled, but were (and in some areas continue to be) grazed. These unplowed slopes harbor remnant prairie sod, about 20 acres of which is of moderate quality and has had a long rest from grazing. Some rare plant species are found in these remnant prairie areas.

photo by Jack Bartholmai

photo by Jack Bartholmai

As restoration work proceeds in coming years, the critical habitat that the site provides for pheasants, rare and declining non-game birds such as meadowlark, and other grassland animals such as badger will get bigger and better.

The Prairie Enthusiasts

CAUTION!

For your safety, enter grazing areas with caution! Note location of pastures on map, and watch for electric fences when out on the preserve.

photo by Rob Bailey

Over 800 Hill's Thistles, a state threatened plant (left), were counted on the prairies of A to Z Farms in 2009! This is not a weed, like non-native thistle species, but a short (one-foot-tall) native prairie species found only in a four-state area of the Midwest. It is now very rare. Hill's Thistle can be found blooming in June. Their basal leaves have a deep purple mid-vein.

Restoration Underway

The long-term goal for this preserve is to restore as much of the original prairie ecosystem as is feasible. Work is underway to remove trees and brush that have encroached over the past 60 years and to plant prairie vegetation where it is no longer present. Brush and weeds are held in check in areas not yet being restored by continuous cropping operation or by grazing. Gradually, these areas will be converted from agricultural uses to prairie restoration areas.

Protection of this site was made possible by The Nature Conservancy, the support and cooperation of the Arneson family and John Zauner, and a grant from the Wisconsin Knowles-Nelson State Stewardship Fund. With the help of State Stewardship funds, The Nature Conservancy acquired the site and transferred it to The Prairie Enthusiasts' Mounds View Grassland Preserve.

WILDLIFE CONSERVATION SOCIETY

Funding for this display provided by the Wildlife Conservation Society's Wildlife Action Opportunities Fund (supported by Doris Duke Charitable Foundation) to implement Wisconsin's Wildlife Action Plan.

A to Z Farm: Roads, Trails and Plant Commu

PRIVA
PROPE
DO N
ENTI

- Planned prairie plantings
- Wet meadow & springs
- Planned oak savanna
- Unnamed tributary to Willimans-Barneveld Creek
- Property
- Access land
- P Park
- Grazing p

Public use and rules

The preserve is open to the public. However, access is li travel and low impact activities only. Please clean boots entering to help limit introduction of invasive speci

Permitted activities:

- Hiking
- Bird watching
- Cross-country skiing
- Research, by permit only
- Limited hunting and trapping. *(check website for seas updates)*

Prohibited

- NO vehicles, includi
- NO camping, camp
- NO pets *(except for dogs used for*
- NO horseback ridin
- NO collecting seeds, rocks, or other natural element

serve is managed by the Empire ter of The Prairie Enthusiast

information, go to www.thep org/chapter/empire/empire.

TPE A-To-Z Farm: Welcome Sign describing the long term goal of the property.

TPE A-To-Z Farm: Looking East through Field 6.

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg, WI 53711

Tony Evers, Governor
Karen Hyun, Ph.D., Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

April 21, 2026

Paul Baum, Village President
11011 Brigham Ave.
PO Box 189
Blue Mounds, WI 53517

Subject: Blue Mounds Wastewater Treatment Facility - WPDES Permit WI-0031658
Water Quality Trading Plan – CONDITIONAL APPROVAL

Dear Paul Baum:

The Department recently received a water quality trading plan (WQT Plan) for compliance with phosphorus effluent limits at the Blue Mounds Wastewater Treatment Facility. The initial plan was received in October of 2025 and updated versions were received in February of 2026 and April of 2026. Based on WDNR review, the final WQT Plan (dated April 2026) is in general conformance with the WDNR Water Quality Trading Guidance and Section 283.84 of the Wisconsin Statutes. The WQT plan proposes installation of permanent grass cover on fields previously used for agricultural row crops. A 49-acre field has been planted as tall grass prairie in 2025. An additional 13 acres are planned to be planted as alfalfa for the 2026 growing season. Following the alfalfa rotation, the 13 acres will be converted to prairie in 2031. Credits generated from approved practices result in available credit quantities shown in Table 1. These credits will be incorporated into the reissued WPDES permit and will be used to demonstrate compliance with final phosphorus effluent limits upon permit reissuance.

Please note that this WQT plan approval is not to be construed as approval to commence work regulated under other state or local authorities, such as Chapter 30 waterways and wetlands permitting, floodplain, or construction activities.

Table 1: Total Phosphorus Credits Available per WQT-2026-0006

Year	Available Credits (lbs/yr) – Total
2026	131.0
2027	131.0
2028	131.0
2029	131.0
2030	131.0
2031	131.0
2032	146.2

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-2026-0006 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.

Thank You,

BetsyJo Howe

BetsyJo Howe
SCR WQT Coordinator
Wisconsin Department of Natural Resources

e-CC:

Peter Riddle, Town & Country Engineering, Inc.
Dan Foster, Village of Blue Mounds
Kenzie Ostien, WDNR
Sarah Donoughe, WDNR