Permit Fact Sheet

General Information

Permit Number	WI-0023183-11-0
Permittee Name and Address	VILLAGE OF ALMENA 131 Soo Ave E, PO Box 277, ALMENA, WI 54805
Permitted Facility Name and Address	Village of Almena 1449 6½ Street, Almena, WI 54805
Permit Term	October 01, 2025 to September 30, 2030
Discharge Location	West bank of the Hay River approximately 200 feet downstream of the Soo Line railroad bridge. NWQ, SWQ, Section 20, T34N-R13W, Town of Clinton, Barron County
Receiving Water	Hay River in Hay River of Chippewa River (lower) in Barron County
Stream Flow ($Q_{7,10}$)	7cfs
Stream Classification	Cold Water (CW) community, non-public water supply and within the ceded territory.
Wild Rice Impacts: *(no specific wild rice standards exist at this time)*	No impacts identified at this location. No wild rice water inventoried on the surface water. (Evaluation completed March 2017)
Discharge Type	Existing continuous discharger
Annual Average Design Flow (MGD)	0.143 MGD
Industrial or Commercial Contributors	None identified.
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; D - Disinfection; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Almena owns and operates a domestic wastewater treatment system. The plant designed to treat 143,000 gallons per day currently treats an average of 51,000 gallons per day (2020-2025 data). The treatment system discharges year-round and consists of two aerated ponds and a holding pond operated in series. Within these ponds naturally occurring bacteria and organisms already present in the wastewater metabolize the organic matter. Ferric chloride is added prior to the holding pond for additional phosphorus treatment. The cleaned wastewater (effluent) is seasonally disinfected (May 1 through September 30 annually) by a UV system before discharging to the Hay River.

Substantial Compliance Determination

There have been a few minor violations, including one effluent limit violation, two missed samples, and inadequate operator certification since the previous inspection. However, in response to this inspection report, the department is working with the facility to correct any outstanding violations and to prevent future occurrences.

After a review of all Discharge Monitoring Reports, CMARs, and a site visit on 08/05/2025 by Carson Johnson, WDNR, the Village of Almena WWTF has been found to be in substantial compliance with their current WPDES permit.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	INFLUENT An average of 0.051 MGD (2020-2025 data)	Representative samples shall be collected at the influent weir in the blower building.
001	EFFLUENT An average of 0.053 MGD (2020-2025 data)	Representative samples shall be collected at the effluent weir in the blower building. The permittee is authorized to discharge to the Hay River.
002	SLUDGE 4.251 metric tons was removed in 2020. Sludge is not anticipated to be removed this permit term.	Representative samples shall be collected from the accumulated sludge in the ponds at various locations and depths that are composited for analysis.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	Weekly	Grab	
Suspended Solids, Total		mg/L	Weekly	Grab	

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. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

The Flow Rate sample frequency has changed from "Continuous" to "Daily" to reflect currently acceptable practices at the facility.

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate compliance with 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	Total Daily	
BOD5, Total	Monthly Avg	30 mg/L	Weekly	Grab	
BOD5, Total	Weekly Avg	45 mg/L	Weekly	Grab	
Suspended Solids, Total	Monthly Avg	30 mg/L	Weekly	Grab	
Suspended Solids, Total	Weekly Avg	45 mg/L	Weekly	Grab	
pH Field	Daily Max	9.0 su	Weekly	Grab	
pH Field	Daily Min	6.0 su	Weekly	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit and monitoring required May through September.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit and monitoring required May through September. See the E. coli Percent Limit permit section. Enter the result in the DMR on the last day of the month.
Phosphorus, Total	Monthly Avg	0.88 mg/L	Weekly	Grab	INTERIM LIMIT based on LCA through 6/30/2027. See the MDV (Multi-Discharger Variance) Requirements permit section and Phosphorus schedule for more information.
Phosphorus, Total	Monthly Avg	0.8 mg/L	Weekly	Grab	INTERIM MDV LIMIT begins 7/1/2027. See the MDV (Multi-Discharger Variance) Requirements permit section and Phosphorus schedule for more information.
Phosphorus, Total	Monthly Avg	2.3 lbs/day	Weekly	Calculated	See the Total Maximum Daily Load (TMDL)

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Limitations permit section.
Phosphorus, Total		lbs/month	Monthly	Calculated	See the Total Maximum Daily Load (TMDL) Limitations permit section
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See the Total Maximum Daily Load (TMDL) Limitations permit section for more information.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	28 mg/L	Weekly	Grab	Limit is effective April through May.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	87 mg/L	Weekly	Grab	Limit is effective June through September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	52 mg/L	Weekly	Grab	Limit is effective October through March.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	69 mg/L	Weekly	Grab	Limit is effective April through May.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	108 mg/L	Weekly	Grab	Limit is effective June through March.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	Weekly	Grab	Enter the daily ammonia result on the eDMR and compare it to the Nitrogen, Ammonia Variable Limit column to determine compliance.
Nitrogen, Ammonia Variable Limit		mg/L	Weekly	See Table	Using the daily pH result look up the applicable ammonia limit using the table in the Ammonia Limitation permit section and report the variable limit on the eDMR.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	Grab	See the Nitrogen Series Monitoring permit section for testing schedule.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	Grab	See the Nitrogen Series Monitoring permit section for testing schedule.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Total Nitrogen = Total Nitrogen Kjeldahl (mg/L) + Nitrite + Nitrate Nitrogen (mg/L). See the Nitrogen Series Monitoring permit section for testing schedule.
Acute WET		TUa	See Listed Qtr(s)	Grab	Two tests are required during the permit term. See the Whole Effluent Toxicity (WET) testing permit section for monitoring schedule.
Copper, Total Recoverable		ug/L	Quarterly	Grab	Monitoring is required during the 2028 calendar year.
Hardness, Total as CaCO3		mg/L	Quarterly	Grab	Monitoring is required during the 2028 calendar year.
Chloride		mg/L	Once	Grab	Monitoring is required during the 2028 calendar year.
Arsenic, Total Recoverable		ug/L	Once	Grab	Monitoring is required during the 2028 calendar year.
Cadmium, Total Recoverable		ug/L	Once	Grab	Monitoring is required during the 2028 calendar year.
Chromium, Total Recoverable		ug/L	Once	Grab	Monitoring is required during the 2028 calendar year.
Lead, Total Recoverable		ug/L	Once	Grab	Monitoring is required during the 2028 calendar year.
Nickel, Total Recoverable		ug/L	Once	Grab	Monitoring is required during the 2028 calendar year.
Zinc, Total		ug/L	Once	Grab	Monitoring is required during the 2028 calendar

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

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. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

- **The flow** limit of 0.08 MGD was used to help control effluent phosphorus concentrations. This is no longer needed and has been removed. And the Flow Rate sample frequency and sample type has changed from "Continuous" to "Daily" and "Total Daily" to reflect currently acceptable practices at the facility.
- **Fecal Coliform** monitoring and limits have been replaced by **Escherichia coli (E. coli)** based on revisions to multiple rules
- The permittee has applied for a **multi-discharger variance (MDV) for phosphorus** for this permit term and the application has been approved by the department. An MDV interim limit of 0.8 mg/L has been added that goes into effect per a compliance schedule.
- The parameter **phosphorus** as pounds per month has been added to assist in calculating the 12-month phosphorus rolling sum. It is not a permit requirement.
- Annual **Total Nitrogen (TKN, N02+N03 and Total N)** monitoring is required in specific quarters as outlined in the permit.
- Two **Acute Whole Effluent Toxicity (WET)** tests are required in specific quarters as outlined in the permit.
- **Metals** monitoring was not completed during the permit application process. Sampling is required in 2028.

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 dated March 24, 2025.

Phosphorus – Phosphorus rules became effective December 1, 2010, per NR 217, Wis. Adm. Code, that required the permittee to comply with water quality based effluent limits (WQBELs) for total phosphorous. The final phosphorus WQBELs are 0.225 mg/L (monthly average) and 0.075 mg/L (6-month average) were to become effective as scheduled unless a variance was granted. The permittee applied for a Multi-Discharger Variance (MDV) for phosphorus as provided for in s. 283.16, Wis. Stats., and approved by USEPA on February 6, 2017, for a 10-year duration during the previous permit term. The permittee has applied again for a second term and continues to qualify for the MDV because it is an existing source and a major facility upgrade is needed to comply with the applicable phosphorus WQBELs, thereby creating a financial burden.

An MDV interim limit of 0.8 mg/L has been added that goes into effect per a compliance schedule. Until that time the permittee shall not exceed the level currently achievable (LCA) of 0.88 mg/L as an average monthly limit. The LCA was derived using eDMR data from October 2023 to January 2025. The permittee is now required to report the total amount of phosphorus discharged in lbs/month and lbs/year. By March 1 of each year the permittee shall make a payment(s) to participating county(s) of $66.62 per pound of phosphorus discharged during the previous year in excess of the target value of 0.2 mg/L. The required payments will be detailed in the yearly phosphorus MDV payment statement.

Conditions of the MDV require the permittee to optimize phosphorus removal throughout the proposed permit term, comply with interim limits and make annual payments to participating county(s) by March 1 of each year based on the

pounds of phosphorus discharged during the previous year in excess of the specified target value. A reopener clause is included in the permit to address the current MDV's expiration date, as a permit action may be required to update or remove variance provisions if the MDV is altered or unavailable after February 6, 2027.

The "price per pound" value is $50.00 adjusted for CPI annually during the first quarter as defined by s. 283.16(8)(a)2, Wis. Stats and takes effect for reissued permits with effective dates starting April 1. This may differ from the "price per pound" that is public noticed; however, the price per pound is set upon reissuance and is applicable for the entire permit term. The participating county(s) uses these payments to implement non-point source phosphorus control strategies at the watershed level.

Nitrogen Series - (nitrate +nitrite, total Kjeldahl nitrogen and total nitrogen) **–** In 2011, the Upper Mississippi River Basin Association (UMRBA) completed the report "Upper Mississippi River Nutrient Monitoring, Occurrence, and Local Impacts: A Clean Water Act Perspective". Among the many recommendations of this report was that the states should expand their NPDES discharge monitoring requirements to include both phosphorus and nitrogen as they have important impacts on the mainstem upper Mississippi River as well as in the Gulf of Mexico. Consequently, the department developed the "Guidance for Total Nitrogen Monitoring in WPDES Permits" document dated October 2019, where annual effluent monitoring for total nitrogen (total nitrogen = total Kjeldahl + (nitrite+nitrate)) is required for municipal and industrial facilities discharging to surface waters. Section 283.55(1)(e) Wis. Stats. allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and s. NR 200.065 (1)(h) Wis. Adm. Code allows for this monitoring to be collected during the permit term.

Metals (Total Recoverable Copper, Total Hardness as CaCO3, Chloride, Total Recoverable Arsenic, Total Recoverable Cadmium, Total Recoverable Chromium, Total Recoverable Lead, Total Recoverable Nickel, and Total Recoverable Zinc) – Metals monitoring is required during the application process to determine if additional monitoring and limits are needed during the permit term. This monitoring was not completed and is required during the 2028 calendar year at the frequency identified in the monitoring table.

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.

Previously permitted monitoring frequencies for pH and ammonia fall below the standard monitoring frequency outlined in guidance. Since data submitted during the previous permit term shows consistent compliance with permit limitations, and the set monitoring frequency is consistent with requirements of state code, the reduced monitoring frequency is continued in the proposed permit. If performance levels begin to vary during the permitted term, the department may re-evaluate current sampling frequencies and implement more frequent monitoring via permit modification or at permit reissuance.

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	Sludge was last removed in 2020, and removal is not anticipated this permit term. If removal is needed see the land application and schedules of the permit for more information.			
Does sludge management demonstrate compliance? Yes						

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)**
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No, the most recent set of samples taken in 2023 were 0.48 pCi/liter.						
Is a priority pollutant scan required? No						

3.1 Sample Point Number: 002- Municipal Sludge

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
Nitrogen, Total Kjeldahl		Percent	Per Application	Composite	
Nitrogen, Ammonia (NH3-N) Total		Percent	Per Application	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total		Percent	Per Application	Composite	
Phosphorus, Water Extractable		% of Tot P	Per Application	Composite	
Potassium, Total Recoverable		Percent	Per Application	Composite	
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS permit sections for more information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS 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. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

- **List 1** (Metals) monitoring is required during the third year of the permit term (2028).
- Because it's recommended that **List 2** (Nutrients) are monitored with the List 1 monitoring, they have been added to the table.
- **PFAS** –Monitoring is required once pursuant to s. NR 204.06(2)(b)9, Wis. Adm. Code.
- Due to changes within the land application forms, the 3400-049 ("Characteristics Report"), 3400-052 ("Other Methods of Disposal") and 3400-055 (Annual Land Application") will need to be submitted each year.

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). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k).

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" will 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.

List 2 Nutrient monitoring – Monitoring for list 2 (nutrients) is highly recommended at the same time as the monitoring of List 1 (metals) in year 3 of the permit (2028). Results will assist in the determination of the acres needed for land application of sludge should it be necessary. The number of acres needed is also required for the Sludge Management Schedule (see schedules for more information).

Change in form submittal – In prior permit reissuances when it has been noted in the application that sludge would not be removed during the permit term, the department required sampling during the second year of the permit term and the sludge characteristic report (3400-049) would be generated only during that year. Due to moving to electronic submittal of forms via Switchboard, forms 3400-049 ("Characteristics Report"), 3400-052 ("Other Methods of Disposal") and 3400-055 ("Annual Land Application") will now be generated by the department and the permittee will be required to submit all three reports each year of the permit term. This change was adopted to provide the permittee flexibility because many lagoon desludging projects can be unexpected, are delayed or staggered over multiple years. Additionally, it is used to officially report that no land application of sludge has occurred, and annual submittal of the forms is required per the standard requirements section.

- Sludge analysis during the third year of the permit term has been included. There are check boxes available on the electronic forms to identify if desludging didn't occur.
- Sludge characteristics report (3400-049) – at the top of the form check "yes" or "no" in the box identifying if any land application occurred that year. Complete the form if required or identify the year samples will be or have been taken in the comments section.
- 3400-052 ("Other Methods of Disposal") and 3400-055 ("Annual Land Application") - The reports are technically 2 separate forms that are now combined in one location but separated onto two different tabs. If you answer "No" to both listed questions the forms are complete. If you need to answer "Yes" to either question the corresponding form tabs will go from gray to blue indicting information can be entered on the report.

4 Schedules

4.1 Phosphorus Multi-Discharger Variance Interim Limit (0.8 mg/L)

This compliance schedule requires the permittee to achieve compliance with the specified MDV interim effluent limit in accordance with s. 283.16(6), Wis. Stats., by the due date.

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent discharges of phosphorus with conclusions regarding compliance.	12/31/2025
Action Plan: Submit an action plan for complying with the specified interim effluent limit. If construction is required, include plans and specifications with the submittal.	06/30/2026
Initiate Actions: Initiate actions identified in the plan.	12/31/2026
Complete Actions: Complete actions identified in the plan and achieve compliance with the specified interim effluent limit.	06/30/2027

4.1.1 Explanation of Schedule

Interim Limit - Subsection 283.16(6), Wis. Stats., establishes required interim phosphorus effluent limits that must be met for multi-discharger variance (MDV) eligibility. The schedule above provides the permittee with two years to comply with that limit.

4.2 Phosphorus Schedule - Continued Optimization

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

Required Action	Due Date
Optimization: The permittee shall continue to implement the optimization plan as previously approved to optimize performance to control phosphorus discharges. Submit a progress report on optimizing removal of phosphorus by the Due Date.	06/30/2026
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	06/30/2027
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	06/30/2028
Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	06/30/2029
Progress Report #5: Submit a progress report on optimizing removal of phosphorus.	06/30/2030

4.2.1 Explanation of Schedule

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

4.3 Phosphorus Payment per Pound to County

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

Required Action	Due Date
Annual Verification of Phosphorus Payment to County: The permittee shall make a total payment to the participating county or counties approved by the Department by March 1 of each calendar year. The amount due is equal to the following: [(lbs of phosphorus discharged minus the permittee's target value) times ($66.62 per pound)] or $640,000, whichever is less. See the payment calculation steps in the Surface Water section. The permittee shall submit Form 3200-151 to the Department by March 1 of each calendar year indicating total amount remitted to the participating counties to verify that the correct payment was made. The first payment verification form is due by the specified Due Date. Note: The applicable Target Value is 0.2 mg/L as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value is $50.00 adjusted for CPI.	03/31/2026
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/31/2027
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/31/2028
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2029
Annual Verification of Payment #5: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2030
Continued Coverage: If the permittee intends to seek a renewed variance, an application for the MDV	

(Multi Discharger Variance) shall be submitted as part of the application for permit reissuance in accordance with s. 283.16(4)(b), Wis. Stats.	
Annual Verification of Payment After Permit Expiration: In the event that this permit is not reissued prior to the expiration date, the permittee shall continue to submit Form 3200-151 to the Department indicating total amount remitted to the participating counties by March 1 each year.	

4.3.1 Explanation of Schedule

County Payment - Subsection 283.16(6)(b), Wis. Stats., requires permittees that have received approval for the multi-discharger variance (MDV) to implement a watershed project that is designed to reduce non-point sources of phosphorus within the HUC 8 watershed in which the permittee is located. The permittee has selected the "Payment to Counties" watershed option described in s. 283.16(8), Wis. Stats. Under this option the permittee shall make annual payment(s) to participating county(s) that are calculated based on the amount of phosphorus actually discharged during a calendar year in pounds per year less the amount of phosphorus that would have been discharged had the permittee discharged phosphorus at a target value concentration of 0.2 mg/L. The pounds of phosphorus discharged in excess of the target value is multiplied by a per pound phosphorus charge that will equal $66.62 per pound. This schedule requires the permittee to submit Form 3200-151 to the Department indicating the total amount remitted to the participating county(s).

4.4 Sludge Management Plan

Required Action	Due Date
Submit a Sludge Management Plan: The permittee shall submit an update to the management plan for approval if removal of sludge will occur during this permit term. The plan shall demonstrate compliance with ch. NR 204 Wis. Adm. Code and at minimum address 1) How and where is sludge sampled; 2) Available sludge storage details and location(s); 3)How will the sludge be removed with details on volume, characterization and how will the treatment plant continue to function during the drawdown; 4) Describe the type of transportation and spreading vehicles and loading and unloading practices; 5) Identify approved land application sites, apply for needed sites, site limitations, total acres needed and vegetative cover management; 6) Specify record keeping procedures including site loading; 7) Address contingency plans for adverse weather and odor/nuisance abatement; and 8) Include any other pertinent information such as other disposal options that may be used or specifications of any pretreatment processes Once approved, all sludge management 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. No desludging may occur unless approval from the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed. The plan is due at least 60 days prior to desludging.	

4.4.1 Explanation of Schedule

Sludge Management Plan (municipal facility with a lagoon)- If the lagoons are to be de-sludged during this permit term a management plan is needed to show compliance with ch. NR 204, Wis. Adm. Code. There are outlines available to assist in plan development.

Attachments

Water Flow Schematic created December 2012

"Water Quality Based Effluent Limitations for the Village of Almena WPDES Permit No. WI-0023183-11-0" memo dated Mach 24, 2025

MDV Application

MDV Conditional Approval

MDV Evaluation Checklist

Justification Of Any Waivers From Permit Application Requirements

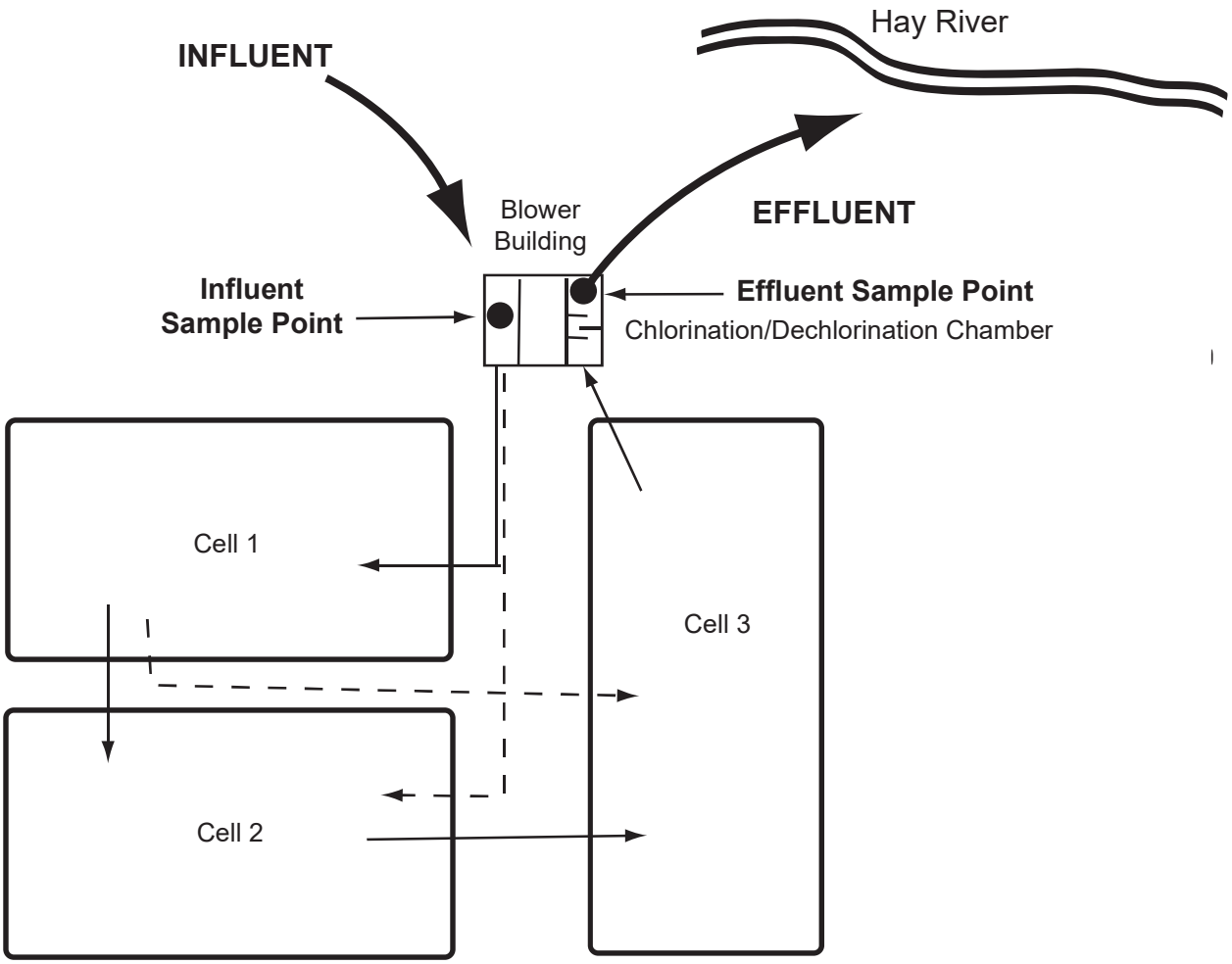
No waivers requested or granted as part of this permit reissuance

Prepared By: Sheri A. Snowbank Wastewater Specialist **Date:** August 4, 2025

WPDES Permit WI-0023183

VILLAGE OF ALMENA
Wastewater Treatment Plant

The Almena wastewater treatment facility consists of two aerated ponds and a holding cell operated in series. Chlorination and dechlorination are provided seasonally. Effluent is discharged to the Hay River in Barron County. The diagram below shows the treatment units and sampling locations.



Not to Scale

– – ► Denotes alternate piping

Flow: 0.143 MGD
BOD: 77.5 lbs/day
Construction Yr: 1978

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: March 24, 2025

TO: Sheri Snowbank – NOR/Spooner Service Center

FROM: Michael Polkinghorn – NOR/Rhinelander Service Center

SUBJECT: Water Quality-Based Effluent Limitations for the Village of Almena
WPDES Permit No. WI-0023183-11-0

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 Village of Almena in Barron County. This municipal wastewater treatment facility (WWTF) discharges to the Hay River, located in the Hay River Watershed in the Lower Chippewa River Basin. This discharge is included in the Tainter Lake/Lake Menomin (TL/LM) Total Maximum Daily Load (TMDL) as approved by EPA on 09/14/2012. 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			45 mg/L	30 mg/L		2, 3
TSS			45 mg/L	30 mg/L		2, 3
pH	9.0 s.u.	6.0 s.u.				2, 3
E. coli May – September				126 #/100 mL geometric mean		4
Ammonia Nitrogen April – May June – September October – March	 Variable Variable Variable		 **69 mg/L** **108 mg/L** **108 mg/L**	 28 mg/L **87 mg/L** **52 mg/L**		2, 5
Phosphorus						6
LCA Interim Limit HAC Interim Limit				0.88 mg/L 0.6 mg/L		
Final (TMDL) Final (WQBEL)				2.3 lbs/day 0.225 mg/L	 0.075 mg/L 0.09 lbs/day	
Copper (Total Recoverable)						7
Hardness (Total as $CaCO_3$)						7
Toxic substances – Multiple						8
TKN, Nitrate+Nitrite, and Total Nitrogen						9
Acute WET						10, 12
Chronic WET						11, 12

Footnotes:

1. Monitoring whenever the discharge occurs.
2. No changes from the current permit.
3. These limits are based on the Cold Water (CW) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
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. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
6. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 0.88 mg/L should be effective upon permit reissuance. A compliance schedule may be included in the permit until the highest attainable condition (HAC) limit of 0.6 mg/L can be met. The phosphorus mass limits are based on the TL/LM TMDL to address phosphorus water quality impairments within the TMDL area.
7. Four samples collected at least 3 days apart is required during the reissued permit term.
8. One sample each of chloride, arsenic, cadmium, chromium, lead, nickel, and zinc are required during the reissued permit term.
9. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).
10. Three acute whole effluent toxicity (WET) tests are recommended during the reissued permit term. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests.
11. Three chronic WET tests are recommended during the reissued permit term. The Instream Waste Concentration (IWC) to assess chronic test results is 11%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 30%, 10%, 3% & 1% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the Hay River upstream of the confluence of Outfall 001.
12. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued). If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then acute WET testing can be reduced to 2x and no chronic WET testing in the reissued permit.

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

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

PREPARED BY: Michael A. Polkinghorn – Water Resources Engineer

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Attachment #1

Water Quality-Based Effluent Limitations for
Village of Almena

WPDES Permit No. WI-0023183-11-0

Prepared by: Michael A. Polkinghorn

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Almena owns and operates a domestic wastewater treatment system. The treatment system consists of 2 aerated ponds and a holding pond operated in series. Ferric chloride is used as an additive prior to pond 3. Wastewater is disinfected seasonally during May – September via ultraviolet (UV) light. Effluent is discharged on a continuous basis via Outfall 001 to the west bank of the Hay River, approx. 200ft downstream of the Soo Line Railroad bridge.

WWTF upgrades during the current permit term (2020) include new blower, vertical fine screening, lagoon sludge removal, lagoon liner replacement, fine bubble diffuser aeration system, and UV light disinfection. A new chemical feed system, new flow monitors, and new samplers were also added.

Attachment #2 is a discharge area map of Outfall 001.

Existing Permit Limitations

The current permit, expired on 09/30/2024, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Annual Total	Footnotes
Flow Rate	0.08 MGD						1
BOD_5			45 mg/L	30 mg/L			2, 3
TSS			45 mg/L	30 mg/L			2, 3
pH	9.0 s.u.	6.0 s.u.					2, 3
Fecal Coliform May – September			**656#/100 mL** **geometric mean**	400#/100 mL geometric mean			4
Ammonia Nitrogen April – May June – September October – March	 Variable Variable Variable		 **69 mg/L** **108 mg/L** **108 mg/L**	 28 mg/L **87 mg/L** **52 mg/L**			3, 4, 5
Phosphorus LCA Interim Limit HAC Interim Limit Final (TMDL) Final (WQBEL)				 8.1 mg/L 1.0 mg/L 2.3 lbs/day 0.225 mg/L	 0.075 mg/L 0.09 lbs/day	 435 lbs	6

Footnotes:

1. Originated in the permit fact sheet (December 2008) of the 8th issued permit of this WWTF. Based on monthly average effluent of mass phosphorus loading to ensure that the technology based effluent limit (TBEL) is not required as described in ch. NR 217. This limit can be increased or removed once phosphorus treatment is demonstrated to meet a 1.0 mg/L effluent limit.
2. These limits are based on the Cold Water (CW) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
3. **These limitations are not being evaluated as part of this review.** Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7) are included in bold.
5. The variable daily maximum table corresponding to various effluent pH values is included in the permit in place of the single limit.

Daily Maximum Ammonia Nitrogen Limits

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

6. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 8.1 mg/L was effective upon permit reissuance. A compliance schedule was included in the permit until the highest attainable condition (HAC) limit of 1.0 mg/L is met on 09/30/2023. The phosphorus mass limits are based on the TL/LM TMDL to address phosphorus water quality impairments within the TMDL area.

Receiving Water Information

- Name: Hay River
- Waterbody Identification Code (WBIC): 2068600
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Cold Water (CW) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} is from USGS for Station N ¼ - SE ¼ of Section 19; T34N – R13W, where Outfall 001 is located. The 7-Q_2 is estimated using Surface Water Data Viewer (SWDV) at the Outfall 001 location.

  7-Q_{10} = 7 cubic feet per second (cfs)

7-Q_2 = 8.69 cfs

Harmonic Mean Flow = 14.8 cfs using a drainage area of 31 mi^2

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

- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%.
- Source of background concentration data: Metals data from the Hay River is used for this evaluation. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for phosphorus are described later.
- Multiple dischargers: The City of Cumberland discharges to the Hay River; however, they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The Hay River is on the Clean Water Act Section 303(d) list for a phosphorus impairment (stream mi 37.68 – 63.98). This discharge is included in the TL/LM TMDL to address phosphorus impairments within the TMDL area.

Effluent Information

- Design flow rate(s):

  Annual average = 0.143 million gallons per day (MGD)

  For reference, the actual average flow from October 2019 – January 2025 was 0.0489 MGD.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with no industrial contributors. Water supply from municipal waterworks.
- Additives: Ferric chloride for chemical phosphorus treatment.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus chloride and hardness. In this case the facility did not complete the sampling required by the permit application. **Therefore, the reissued permit will have the permit application sampling as a permit requirement in the final limits table of the permit.** This sampling is independent of any additional sampling required by the permit application for the following permit reissuance.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation. Effluent ammonia nitrogen data is shown below for informational purposes.

Ammonia Nitrogen Effluent Data

Statistics (mg/L)	April - May	June - September	October - March
1-day P_{99}	53.5	44.2	80.0
4-day P_{99}	40.7	24.0	44.1
30-day P_{99}	33.7	12.0	23.8
Mean*	30.2	7.2	15.4
Std	8.0	9.5	16.8

Attachment #1

Sample size	43	85	133
Data Range	0.1 - 44.3	<0.1 - 35	<0.1 - 51.5
Date Range	October 2019 – January 2025		

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

The following table presents the average concentrations and loadings at Outfall 001 from October 2019 – January 2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement*
Flow Rate	0.0489 MGD
BOD_5	13 mg/L
TSS	9.9 mg/L
pH field	6.7 s.u.
Fecal Coliform	135 #/100 mL
Ammonia Nitrogen	15.1 mg/L
Phosphorus	1.4 mg/L

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

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

Mercury – The permit application did not require monitoring for mercury because the Village of Almena 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." The concentration in the sludge from 04/23/2020 was 0.6 mg/kg. **Therefore, mercury monitoring is not recommended during the reissued permit term.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of discharge, the effluent flow rate, the lack of indirect dischargers contributing to the collection system and known nondetectable levels of PFOS/PFOA in the source water, **PFOS and PFOA monitoring is not recommended during the reissued permit term.** The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

On May 1, 2020, revisions to chs. NR 102 and NR 210, Wis. Adm. Codes, became effective which replace fecal coliform limits with new *Escherichia coli* (*E. coli*) limits for protection of recreational uses.

Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

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

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

These limits are required during May – September. No changes are recommended to the current recreational period and the required disinfection season.

Effluent Data
The Village of Almena has monitored effluent *E. coli* from July 2023 – June 2024 and a total of 22 results are available. A geometric mean of 126 counts/100 mL was never exceeded, with a maximum monthly geometric mean of 1.8 counts/100 mL. Effluent data has never exceeded 410 counts/100 mL, with a maximum reported value was 10 counts/100 mL. **Based on this effluent data it appears that the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.**

PART 4 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of total phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

The Village of Almena has the monthly average limit of 1.0 mg/L effective in the current permit since 09/30/2023 as part of their phosphorus multi-discharger variance (MDV) to achieve compliance with their phosphorus WQBELs. Because their current and future permit limit are at least as stringent as 1.0 mg/L, **the technology-based limit in not recommended during the reissued permit term.**

The current permit has the daily maximum flow rate limit of 0.08 MGD. This limit is based on monthly average effluent of mass phosphorus loading to ensure that the prior stated limit is not required in the permit. Because the facility is currently meeting an effluent phosphorus concentration of at least 1.0 mg/L, **the flow rate limit is recommended to be removed during the reissued permit term.**

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.

The TL/LM TMDL report was written to ensure that phosphorus water quality criteria are attained in

Tainter Lake and Lake Menomin and are not necessarily protective of phosphorus water quality of other surface waterbodies in the TMDL area. Therefore, the need for a phosphorus WQBEL as described in s. NR 217.13, Wis. Adm. Code, must be considered in addition to any limits required by the TMDL report.

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 the Hay River.

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 Hay River.
Qs = 100% of the 7-Q_2 of 8.69 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 = 0.143 MGD = 0.221 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall be calculated as a median using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Code. All representative data from the most recent 5 years shall be used, but data from the most recent 10 years may be used if representative of current conditions.

The previous limit evaluation (April 2019) resulted in a WQBEL of 0.075 mg/L using a background concentration of 0.127 mg/L. This value is representative of the Hay River 10 meters downstream of 15th Avenue (SWIMS station ID: 10016689). This is a 10-year median total phosphorus assessment value from the 2018 Clean Water Act Impairment Assessment Project recorded on 10/09/2012. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. Additional data were considered in estimating the background phosphorus concentration.

A review of all available in stream total phosphorus data stored in the Surface Water Integrated Monitoring System database indicates the median background total phosphorus concentration in Hay River is 0.067 mg/L at the Hay River at CTH T (SWIMS station ID: 10042541), approx. 8.6 mi upstream of Outfall 001. However, the impaired water listing of the Hay River points towards the notion that effluent phosphorus limits equal to the water quality criterion are needed to prevent the discharge from contributing to further impairment of the receiving water. *The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020)* suggests setting effluent limits equal to the criterion in the absence of an EPA approved total maximum daily load for discharges of phosphorus to phosphorus impaired waters.

Effluent Data & Reasonable Potential

The following table summarizes effluent total phosphorus monitoring data from October 2023 – January

2025 since the monthly average HAC limit became effective in the permit on 10/01/2023:

Total Phosphorus Effluent Data

Statistics	Conc. (mg/L)
1-day P_{99}	1.5
4-day P_{99}	0.88
30-day P_{99}	0.54
Mean	0.39
Std	0.31
Sample size	66
Range	0.09 - 1.5

The determination of reasonable potential for the need of a phosphorus WQBEL is not needed as the Village of Almena has a compliance schedule in the current permit to achieve compliance with the phosphorus WQBELs in the future.

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 6-month average.** If a concentration limitation expressed as a 6-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 6-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 Hay River has a phosphorus impairment. **This final mass limit shall be 0.075 mg/L × 8.34 × 0.143 MGD = 0.09 lbs/day expressed as a 6-month average.**

TMDL Limit
The TL/LM TMDL expresses WLAs for TP as maximum annual loads (lbs/yr) and maximum daily loads (lbs/day), which equal the maximum annual loads divided by the number of days in the year. For the Village of Almena, these phosphorus WLAs are 435 lbs/yr and 1.19 lbs/day.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to facilities included in the TL/LM TMDL are given monthly average mass limits since the TL/LM TMDL WLAs are derived on an effluent concentration of 1 mg/L or greater. The monthly average limit of 2.3 lbs/day was determined in the previous limit evaluation (April 2019). The multiplier of 1.9 was chosen utilizing the parameters of CV = 0.6 and a weekly or less effluent monitoring scheme as described in the Department guidance document, "*TMDL Implementation Guidance for Wastewater Permits Edition No. 6, (March 2024)".*

This TMDL-based WQBEL will be reevaluated if the annual WLA is not being met as described in the prior stated guidance. This is done by comparing each rolling sum of 12 consecutive months of total

monthly mass discharges over the current permit term directly against the annual WLA. In this case, the TMDL limits are not effective because there is a phosphorus MDV in the current permit to achieve compliance with them in the future, so they do not need to be reevaluated at this time. **Therefore, the monthly average limit of 2.3 lbs/day will remain unchanged during the reissued permit term.**

Multi-Discharge Variance Interim Limit
With the permit application, the Village of Almena has re-applied for the phosphorus MDV. Conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL. Section 283.16(6)1, Wis. Stats., **requires an interim limit of 0.6 mg/L as a monthly average for the second permit term under the MDV.** However, if 0.6 mg/L does not represent the highest attainable condition, a more stringent limit should be met by the end of the permit term pursuant s. 283.16 (7), Wis. Stats. A compliance schedule may be appropriate to meet this interim limit but shall be no later than the end of the reissued permit.

The effluent data indicates that 4-day P_{99} value of 0.88 mg/L is the level currently achievable (LCA) for the discharge based on effluent phosphorus data from October 2023 – January 2025. **Therefore, the monthly average limit of 0.88 mg/L is recommended and should not be exceeded during the compliance schedule.**

PART 5 – 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 October 2019 – January 2025.

The table below summarizes the calculated temperature limits. The complete temperature limit calculations are included as attachment #3.

Monthly Temperature Limits

Month	Calculated Effluent Limit	
	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	NA	120

Attachment #1

Month	Calculated Effluent Limit	
	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
FEB	NA	120
MAR	NA	120
APR	NA	120
MAY	NA	120
JUN	NA	103
JUL	102	120
AUG	74	85
SEP	77	92
OCT	118	120
NOV	NA	120
DEC	NA	120

* NA denotes "not applicable" when the calculated weekly average limit is greater than or equal to 120 ºF.

Lagoon-based systems utilize long hydraulic detention times and discharge small volumes of effluent consisting of domestic wastewater; therefore, elevated effluent temperatures are unlikely and discharge temperatures are expected to be similar to ambient conditions below 74 ºF. There is no reasonable potential for the discharge to exceed this limit; **therefore, temperature limits or monitoring are not recommended during the reissued permit term.**

PART 6 – WHOLE EFFLUENT TOXICITY (WET)

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

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC_{50} (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent).

The IWC of 11% shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

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

Where:

Q_e = annual average flow = 0.143 MGD = 0.221 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 7 cfs ÷ 4 = 1.8 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC_{50} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	
11/02/2010	>100	>100	Pass	Yes	
10/23/2012	>100	>100	Pass	Yes	

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.

  Acute Reasonable Potential = [(TUa effluent) (B)(AMZ)]
  Chronic Reasonable Potential = [(TUc effluent) (B)(IWC)]

  According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

Acute Reasonable Potential = **0 < 1.0, reasonable potential is not shown, so an acute limit is not required.**

Chronic Reasonable Potential: No chronic WET data is available so the need for a chronic WET limit cannot be determined at this time.

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not applicable. **0 Points**	IWC = 11%. **0 Points**
Historical Data	Two tests used to calculate RP. No tests failed. No acute tests within last 5 years. **5 Points**	No chronic tests available. **5 Points**
Effluent Variability	NONs sent for BOD_5 and phosphorus limit exceedances. **5 Points**	Same as acute. **5 Points**
Receiving Water Classification	CW community. **5 Points**	Same as acute. **5 Points**
Chemical-Specific Data	Permit application sampling not completed Ammonia nitrogen limit carried over from the current permit. **1 Point**	Permit application sampling not completed Ammonia nitrogen limit carried over from the current permit. **1 Point**
Additives	No biocides and 1 water quality conditioners added. Permittee has proper P chemical SOPs in place: No. **16 Points**	All additives used more than once per 4 days. **16 Points**
Discharge Category	No industrial contributors. **0 Points**	Same as acute. **0 Points**
Wastewater Treatment	Secondary or better. **0 Points**	Same as acute. **0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as acute. **0 Points**
Total Checklist Points:	**32 Points**	**32 Points**

Attachment #1

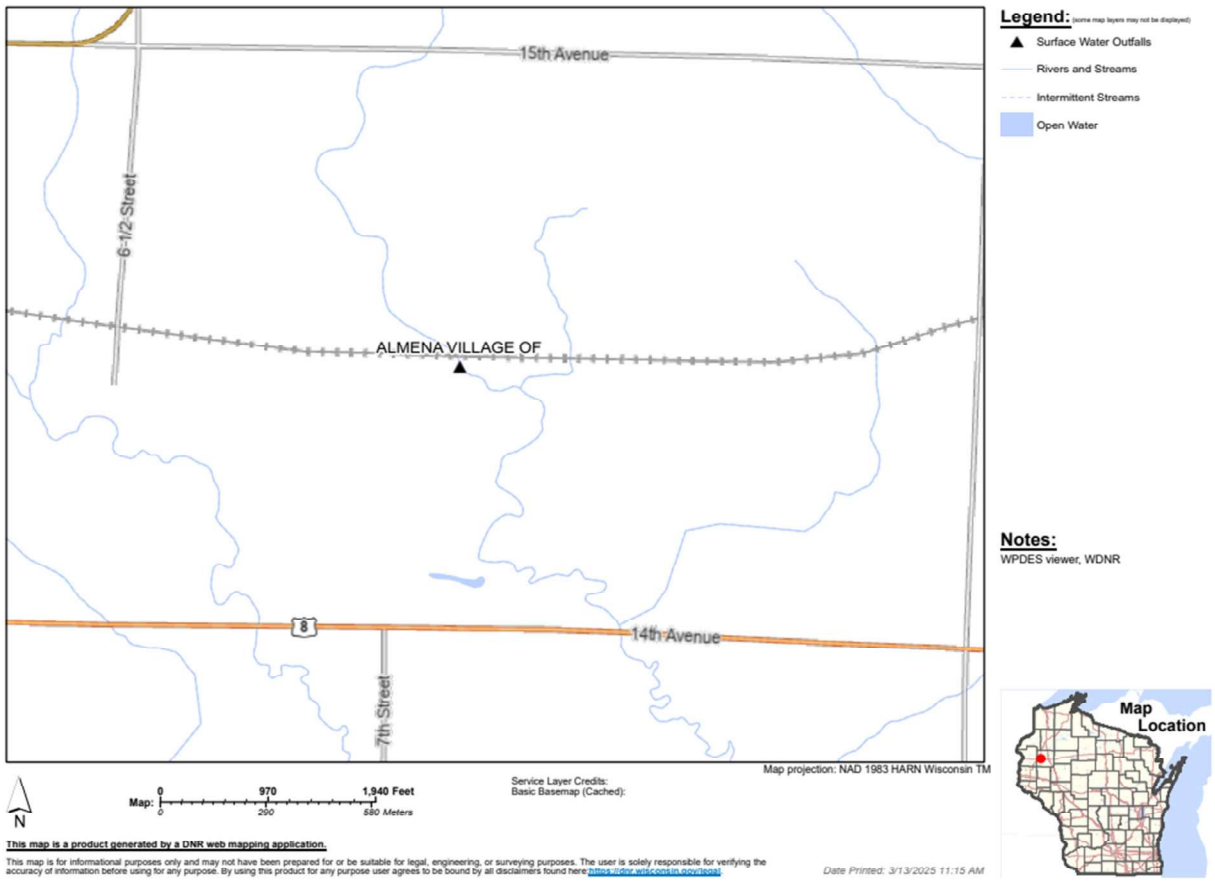
	Acute	Chronic
Recommended Monitoring Frequency (from Checklist):	Three acute tests during permit term.	Three chronic tests during permit term.
Limit Required?	No.	No.
TRE Recommended? (from Checklist)	No.	No.

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above, **3x acute and chronic WET tests are recommended in the reissued permit.** Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued). **If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then acute WET testing can be reduced to 2x and no chronic WET testing in the reissued permit.**

Attachment #2

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Almena Outfall 001 Discharge Area



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

This map is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. The user is solely responsible for verifying the accuracy of information before using for any purpose. By using this product for any purpose user agrees to be bound by all disclaimers found here https://dnr.wisconsin.gov/legal

Date Printed: 3/13/2025 11:15 AM

Attachment #3

Temperature Limits for Receiving Waters with Unidirectional Flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Village of Almena		**7-Q_{10}:**	7	cfs		
Outfall(s):	001		**Dilution:**	25%		**Start:** NA	10/01/19
Date Prepared:	3/13/2025		**f:**	0		**End:** NA	01/31/25
Design Flow (Qe):	0.143	MGD	**Stream type:**	Cold water community			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	7.9	: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	35	47	68	7	0.071	0.079	0			NA	120
FEB	36	47	68	7	0.072	0.080	0			NA	120
MAR	39	51	69	7	0.098	0.148	0			NA	120
APR	47	57	70	7	0.142	0.153	0			NA	120
MAY	56	63	72	7	0.125	0.162	0			NA	120
JUN	62	67	72	7	0.091	0.367	0			NA	103
JUL	64	67	73	7	0.097	0.136	0			102	120
AUG	63	65	73	7	0.245	0.920	0			74	85
SEP	57	60	72	7	0.200	0.850	0			77	92
OCT	49	53	70	7	0.070	0.088	0			118	120
NOV	41	48	69	7	0.070	0.086	0			NA	120
DEC	37	47	69	7	0.065	0.074	0			NA	120

Mail Complete Application to:
Wisconsin Department of Natural Resources
Permits Section-WQ/3
PO Box 7921
Madison, WI 53707-7921

Phosphorus Multi-Discharger Variance Application for Municipal Facilities - s. 283.16, Wis. Stats.

Form 3200-150 (R 03/17)

Notice: Pursuant to s. 283.16, Wis. Stats, an owner of an existing permitted wastewater treatment system may apply for a variance to a phosphorus water quality based effluent limits (WQBEL). Complete this form and submit to the Department of Natural Resources (DNR) to request coverage under the multi-discharger variance (MDV) for phosphorus. Personal information collected will be used for administrative purposes and may be provided to requestors to the extent required by Wisconsin's Open Records law [ss. 19.31-19.39, Wis. Stats.]

Facility and Permit Information

WPDES Permit No.
WI- 0 | 0 | 2 | 3 | 1 | 1 | 8 | 3

Facility Name
Village of Almena Wastewater Treatment Facility

Facility Street Address
1449 6-1/2 St.

City	State	ZIP Code
Almena	WI	54805

Receiving Water	County
Hay River	Barron

Source of Water Supply	Average Discharge Flow Rate
Groundwater	0.055

Facility Contact Information

Contact Name
Wayne Becker

Title
WWTF Operator

Address
131 Soo Ave E

City	State	ZIP Code
Almena	WI	54805

Phone No. (incl. area code)	Fax Number
(715) 357-6600	

Email Address
publicworks@vi.almena.wi.gov

Variance Request Schedule

Check all that apply:

1. This variance is being requested at the time of application for permit reissuance pursuant to s. 283.16(4)(b)1, Wis. Stat. ☒
2. This variance is being requested within 60 days after the department reissues or modifies the permit to include a phosphorus WQBEL pursuant to s. 283.16(4)(b)2, Wis. Stat. ☐
3. This variance is being requested from a current WPDES Permit pursuant to 283.16(4)(b)3, Wis. Stat. ☐

   Date of Current Permit Issuance: _____

Note: WPDES permit must be issued prior to April 2014.

4. Has the MDV been included in previously issued WPDES Permits?

   Yes ◉
   How many permits has the MDV been approved for? 1
   No ○

Variance Requirements

5. Has this point source discharge been authorized by a WPDES permit prior to December 1, 2010? ◉ Yes ○ No

Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat. STOP

6. Has this point source relocated its outfall location since December 1, 2010? ○ Yes ◉ No

7. Is the point source located in an eligible MDV county as specified in Appendix H of the MDV Implementation Guidance? ◉ Yes ○ No

Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat.

8. Does this limit require a major facility upgrade in order to achieve compliance?
   - (●) Yes
   - ( ) No

Justify:

To achieve compliance with the final WQBEL of 0.075 mg/L, a tertiary filtration upgrade is needed. This upgrade would entail significant capital and operating expense, and may also require a separate upgrade to stop use of the existing lagoon system and construct a new activated sludge mechanical WWTF upstream of the tertiary filter.

Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat. STOP. A major facility upgrade means that a facility needs to install new equipment and a new process such as installing filtration or equivalent technology.

9. Phosphorus Water Quality-Based Effluent Limitation from which variance is sought:
   - (●) Concentration-based WQBEL pursuant to s. NR 217.13, Wis. Adm. Code
   - ( ) TMDL mass-based WQBEL pursuant to s. NR 217.16, Wis. Adm. Code

   Check all months for which variance is requested:

   - (●) All months

☒ Jan	☒ Apr	☒ Jul	☒ Oct
☒ Feb	☒ May	☒ Aug	☒ Nov
☒ Mar	☒ Jun	☒ Sep	☒ Dec

10. Do you believe these limits could be achieved during the term of the permit?
    - ( ) Yes
    - (●) No

11. Current effluent quality

Note: Use 30-day P99 if 11 or more representative effluent samples are present. Only include effluent data for those outfall(s) a variance is being requested for.

Outfall Number(s)	Conc. (mg/L)	Number of Samples Results Used	Sample Time Period Used	
1	0.66	102	01/01/2023	12/31/2024

12. Are applicable phosphorus limits currently effective in the WPDES permit more restrictive than 1 mg/L?
    - (●) Yes
    - ( ) No

Facility Information (provide attachments as necessary)

13. What are the average phosphorus levels within your influent TP concentration? 6.65 mg/L

14. Has the treatment process at the facility been optimized to maximize its phosphorus removal capabilities?
    - ( ) Yes

      Completion date: _____
    - (●) No, but in process of completing
    - ( ) No, not yet started

15. Has a facility planning or evaluation study for phosphorus been approved by the Department?

- (●) Yes
  Approval date: 01/29/2019
- ( ) No, but in process of completing
- ( ) No, not yet started

16. Briefly describe the technology that would need to be added to comply with phosphorus limits in your permit:
To achieve compliance with the final WQBEL of 0.075 mg/L, a tertiary filtration upgrade is needed. This upgrade would entail significant capital and operating expense, and may also require a separate upgrade to stop use of the existing lagoon system and construct a new activated sludge mechanical WWTF upstream of the tertiary filter.

Attach any new or additional information that you would like to provide the Department regarding optimization measures and/or compliance alternatives planning efforts.

Projected Compliance Costs

17. What is the projected net present value cost for complying with the phosphorus WQBELs? $ 4,912,000

Source of cost projection:
Cost estimate from a recent project for a community with an aerated lagoon WWTF which treats a flow which is approximately equal to flow for Almena. Conversations with the vendor of the tertiary filtration equipment have indicated that the same filter model can be used for average flows below 0.1 MGD.

Note: If a facility uses projected compliances costs provided in the Economic Impacts Analysis, they must certify that these costs are reasonable for the facility in question. See "projected compliance costs" in Section 2.02 of the MDV Implementation Guidance for details.

18. Has the feasibility of water quality trading or adaptive management been evaluated for the facility?
- (●) Yes
- ( ) No

19. Is the facility eligible for adaptive management or water quality trading?
- (●) Yes
- ( ) No

20. What is the needed offset to comply with AM/WQT? 250 lbs/year
- ☐ Unknown at this time

21. Is adaptive management or water quality trading a viable compliance option?
- (●) Yes
- ( ) No

Describe:
Water quality trading may be a viable option, but there is uncertainty regarding available projects in the watershed. As a result, the Village must reapply for the MDV to maintain compliance for the upcoming WPDES permit term. During this permit term, the Village can further evaluate WQT through the Wisconsin Water Quality Trading Clearinghouse and potentially enter into a WQT agreement, eliminating the need for participation in the

MDV in future permit terms, if a sufficient number of WQT credits can be purchased at an economical price. The Village is currently evaluating registering as a buyer with the Clearinghouse as a first step for WQT evaluation.

Service Area Information- Provide the following information for each municipality included in the wastewater facility service area.

Municipality Name	County	Population Served	Customer Households Served	Median Household Income (MHI)
Village of Almena	Barron	746	295	$43,720.00

Non-Residential Customers:

Percent of wastewater flow attributed to commercial industrial, large institutional and any other special customer category: 0 %

Describe types of non-domestic wastewater contributions that constitute a significant phosphorus contribution or that significantly affect the capabilities of the treatment facility. Examples include: large food processors, dairies, or industries with unique wastewater.

There are no significant non-domestic wastewater contributors.

Affordability to Municipal Dischargers

22. What is the projected household user charge, expressed as a percent of MHI, once phosphorus compliance costs are factored in? 2.21 %

Attach supporting information on a separate attachment to this form. The applicant may also provide additional information on impacts to commercial, industrial, or other special customers or any other information regarding affordability.

23. What is the secondary indicator score for the county (counties) in which the service area is located in? 6

Note: See Appendix A of the MDV Implementation Guidance for details.
If the service area is located in multiple counties, provide the weighted average value.

Watershed Project. Select one of the following watershed project options:

Option A. County payment contribution ◉

Option B. Binding, written agreement with the DNR to construct a project or implement a watershed plan. ○

Submit Form 3200-148 with MDV application

Option C. Binding, written agreement with another entity that is approved by the DNR to construct a project or implement a watershed plan. ○

Submit Form 3200-148 with MDV application.

Certification

Based on the information provided, I believe that my permitted facility qualifies for coverage under the multi-discharger phosphorus variance based on the requirements of s. Wis. Stat. 283.16 (4), Wis. Stat. I understand that as a condition of the variance, the Department will impose interim limitations and require a watershed project or plan to be completed as part of the phosphorus reduction measures for phosphorus during the term of the variance in accordance with s. Wis. Stat. 283.16(6). I understand that these conditions will be included in the WPDES permit issued to this facility and I agree to comply with all applicable permit conditions for this variance. I hereby certify that the determination in Wis. Stat. 283.16(2)(a) applies to my permitted facility and that my permitted facility cannot otherwise comply with its phosphorus water quality based effluent limitations without a major facility upgrade. To the best of my knowledge, the information in this application is true, accurate, and complete.

Print or type name of person submitting request (Individual must be an Authorized Representative)	Title
Wayne Becker	Director of Public Works
Signature of Official: Wayne Becker	Date Signed: 3-18-2025

Village of Almena Effluent Phosphorus P99 Calculations

EFFLUENT VARIABILITY ANALYSIS -				result_amt
=	= = = =	= = = =		0.16
SUBSTANCE:				0.2
NUMBER OF VALUES:	------			0.3
TOTAL	102			0.45
DETECTED	**102**			0.56
NON-DETECTED	0			0.64
				1.7
d	0			1.44
				1
m	**0.441471**			1.76
				1.12
mean of all data	0.441471			0.84
				0.61
s	**0.440071**			1.67
				2.29
	------	------	------	1.29
n	1	4	30	0.8
				0.54
d^n	0	0	0	0.31
				0.29
p	0.99	0.99	0.99	0.29
				0.3
Z_p	2.326785	2.326785	2.326785	0.1
				0.15
				0.05
1+(s/m)^2	1.993668	1.993668	1.993668	0.08
				0.09
(sigma_d)^2	0.689976	0.689976	0.689976	0.08
				0.25
mu_d	-1.16263	-1.16263	-1.16263	0.12
				0.12
				0.15
(sigma_dn)^2	0.689976	0.221876	0.032586	0.13
				0.14
mu_dn	-1.16263	-0.92858	-0.83394	0.08
				0.16
				0.12
P_99 exponent	0.770108	0.167421	-0.41392	0.11
				0.16
	-------	-------	-------	0.43
P_99	2.16	1.18	0.66	0.45
	-------	-------	-------	0.41
				0.31
minimum	**0.050**			0.37
maximum	**2.290**			0.22
				0.16
				0.15
NOTES: For purposes of this summary, ^ represents an exponent				0.13
or superscript while _ represents a subscript.				0.11
				0.09
				0.09

Village of Almena, Wisconsin
Cost Estimate Summary
Disc Cloth Media Filtration Preliminary Cost Estimate

Item	Design Life	Estimated Quantity	Units	Unit Price	Capital Cost	Salvage Value
Tertiary Treatment - Disc Filtration						
Building, Complete (30' L x 45' W)	40	1,350	SF	$700	$945,000	$472,500
Rapid Mix, Coagulation, Flocculation, and Disc Filtration Equipment and Tankage, complete	20	1	LS	$843,750	$844,000	$0
Filter Instrumentation and Control, SCADA, On-line Orthophosphate Analyzers (2)	20	1	LS	$150,000	$150,000	$0
Chemical and Polymer Storage and Containment	20	1	LS	$25,000	$25,000	$0
Secondary Lagoon Improvements to Allow Filtration						
Insulated Lagoon Cover, Complete	20	1	LS	$0	$0	$0
Miscellaneous						
Earthwork (Structures)	20	535	CY	$10	$6,000	$0
Site Work, Erosion Control, Stormwater, Restoration	20	1	LS	$50,000	$50,000	$0
Dewatering	20	1	LS	$10,000	$10,000	$0
Process Piping (8")	40	60	LF	$200	$12,000	$6,000
Plug Valves	40	6	EA	$5,000	$30,000	$15,000
Chemical Building Potable Water Supply (2")	40	1,400	LF	$45	$63,000	$31,500
Yard Hydrants and Associated Piping	20	2	EA	$2,500	$5,000	$0
General Electrical	20	1	LS	$311,000	$311,000	$0
Subtotal					**$2,451,000**	
Mobilization, Demobilization, Bonds, and Insurance					$172,000	
General Conditions					$197,000	
Contractor Profit & Overhead					$368,000	
Subtotal					**$3,188,000**	
Contingencies					$797,000	
Subtotal					**$3,985,000**	
Design, Bidding, Construction, Engineering Services (Placeholder)					$877,000	
Loan/Grant Application and Administration (Placeholder)					$50,000	
Total Capital Cost of Improvements					**$4,912,000**	$525,000

Annual Operation and Maintenance Costs	Quantity	Units	Unit Cost	Annual Cost
Electrical Costs for Phosphorus Removal Equipment	19,053	KWH	$0.11	$2,096
Tertiary Filtration System Maintenance, Cleaning, Chemicals & Consumables	1	LS	$10,000	$10,000
Equipment Maintenance - Additional Labor	1	LUMP SUM	$5,000	$5,000
Phosphorus Removal Chemical Usage	14	GPD	$3.50	$18,000
Equipment Replacement Fund	2%	of equipment costs	$1,019,000.00	$20,380
				$55,500

20 Year Present Worth	Cost	Present Worth
Initial Capital Cost	$4,912,000	$4,912,000
Annual O & M Cost	$55,500	$855,000
Salvage Value	$525,000	($313,000)
TOTAL ESTIMATE OF PRESENT WORTH		**$5,460,000**
Present Worth estimated using discount rate =	2.625%	

	Total Cost	PF-Eligible Cost Estimate
Total Project Cost:	$ 4,912,000	
Rural Development Grant:	$ -	
Other (specify):	$ -	
Focus On Energy Award		
Net Total Project Cost	$ 4,912,000	$ 4,912,000
Phosphorus Cost	$ 4,912,000	$ 4,912,000
Regionalization Cost	$ -	$ -

Parallel Cost Percent:	100%	
General PF Percent:	40%	
Project Cost Eligible for general PF:	$3,912,000	*Total eligible cost - Non-General PF below*

	Grants	Eligible for Grant?				PF Funding CAPS:	
CWF PF - WQBEL P	$1,000,000	Yes	<=== yes or no	<===only ONE of these two options can be yes		$ 1,000,000	50% of Phos Costs
CWF PF - Interim P	$0	No	<=== yes or no			$ 500,000	25% of Phos Costs
Regionalization CWF-PF	$0	No	<=== yes or no	No. Discharges Eliminated:	0	$ -	
Focus On Energy Match CWF-PF	$0	No	<=== yes or no			$ 50,000	1:1 Match
CWF PF	$1,564,800					$ 2,100,000	
Sum Possible PF:	$2,564,800						

Max Allowable PF	$ 2,564,800	can not exceed 70% of total eligible project costs
Remainder to Finance:	$ 2,347,200	

Check Project Funding:	$ 4,912,000		
Rural Development Grant:	$ -		
Other (specify):	$ -		
Focus On Energy Award	$ -		
Max Allowable PF	$ 2,564,800		
Remainder to Finance:	$ 2,347,200	*48%*	
Sum:	$ 4,912,000	***OK***	

	$ 3,438,400.0

Village of Almena
MSA Project # 00505003
CWF Loan Repayment Schedule - Equipment Replacement Only - With PF

Project Cost	$	4,912,000	% of Project
Section 154 Reimbursement	$	-	0.0%
CWF Principle Forgiveness	$	2,564,800	52.2%
CWF Loan Amount	$	2,347,200	

Parallel Cost Ratio	1.00	
Tier 1 Costs	$2,347,200	
Tier 3 Costs	$0	
Tier 1 Interest Rate	2.200%	<=== 55% of market rate
Tier 3 Interest Rate	4.000%	<=== Market rate (hyperlink)
Composite interest rate (NR162.07 (6))	2.200%	

Assume: 20 year term; 2 Payments per year

Payment Schedule: 40 Total payments; $146,332 Total Annual Debt Service

Date	Payment	Principal	Interest	Balance
				$2,347,200.00
1-Jun-25	$146,332	-	$25,819	$2,347,200.00
29-Nov-25	-	94,694	25,819	$2,252,506.40
1-Jun-26	$146,332	-	24,778	$2,252,506.40
29-Nov-26	-	96,777	24,778	$2,155,729.54
1-Jun-43	$146,332	-	3,116	$283,293.01
29-Nov-43	-	140,100	3,116	$143,193.46
31-May-44	$146,332	-	1,575	$143,193.46
29-Nov-44	-	143,184	1,575	$10.00
Totals	$2,926,640	$2,347,190	$579,452	

Additional Revenue Required

Municipal Budget Item	2025	2026	2027	2028	Notes
New Debt Service	$146,332	$146,332	$146,332	$146,332	
Excess New Debt Coverage	$14,633	$14,633	$14,633	$14,633	10%
Existing Debt Service		$ -	$ -	$ -	
Existing Utility O&M		$0	$0	$0	3%
Additional O&M	$ 50,000.00	$51,500	$53,045	$54,636	3%
Total Revenue Required	**$210,965**	**$212,465**	**$214,010**	**$215,602**	

No. of REUs (res. and com.) 381

Assuming no growth in demand, and assuming no change in fixed administrative costs

2025 rates will need to be:	Additional Monthly Fixed Charge per REU	Existing Monthly Average Charge per REU	Total Monthly Charge per User
Class			
Cost Per REU	$46.09	$34.31	$80

MHI Year	2023
MHI	$43,720
2% MHI	$2
New Annual Sewer Rate	$965
Sewer Rate %	2.21%

Village of Almena

131 Soo Ave. East - PO Box 277
Almena, WI 54805-0277
715-357-6600

The Village of Almena has operated under an interim Multi Discharger Variance (MDV) limit of 1.0 mg/L during the previous Wisconsin Pollutant Discharge Elimination System (WPDES) permit term (October 2019-September 2024). The Village is requesting renewal of the MDV for the upcoming permit term. If MDV renewal is granted, the reissued permit will include the Village's second MDV interim limit. The Village is requesting the next MDV limit to remain at 1.0 mg/L, based on the guidelines in Wisconsin Administrative Code 283.16(6)(am).

Effluent phosphorus concentrations at the Village's wastewater treatment facility (WWTF) vary due to seasonality, sludge accumulation, and operational limits of the chemical feed system. Historical effluent phosphorus data tends to vary within the discharge season, as shown on the attached figure. Concentrations tend to be highest in the spring, likely due to higher flows and algae blooms. There are no significant sources of phosphorus in the collection system, and the Village has been working to optimize its chemical feed system, meaning significant improvements in treatment performance are unlikely over the next WPDES permit term.

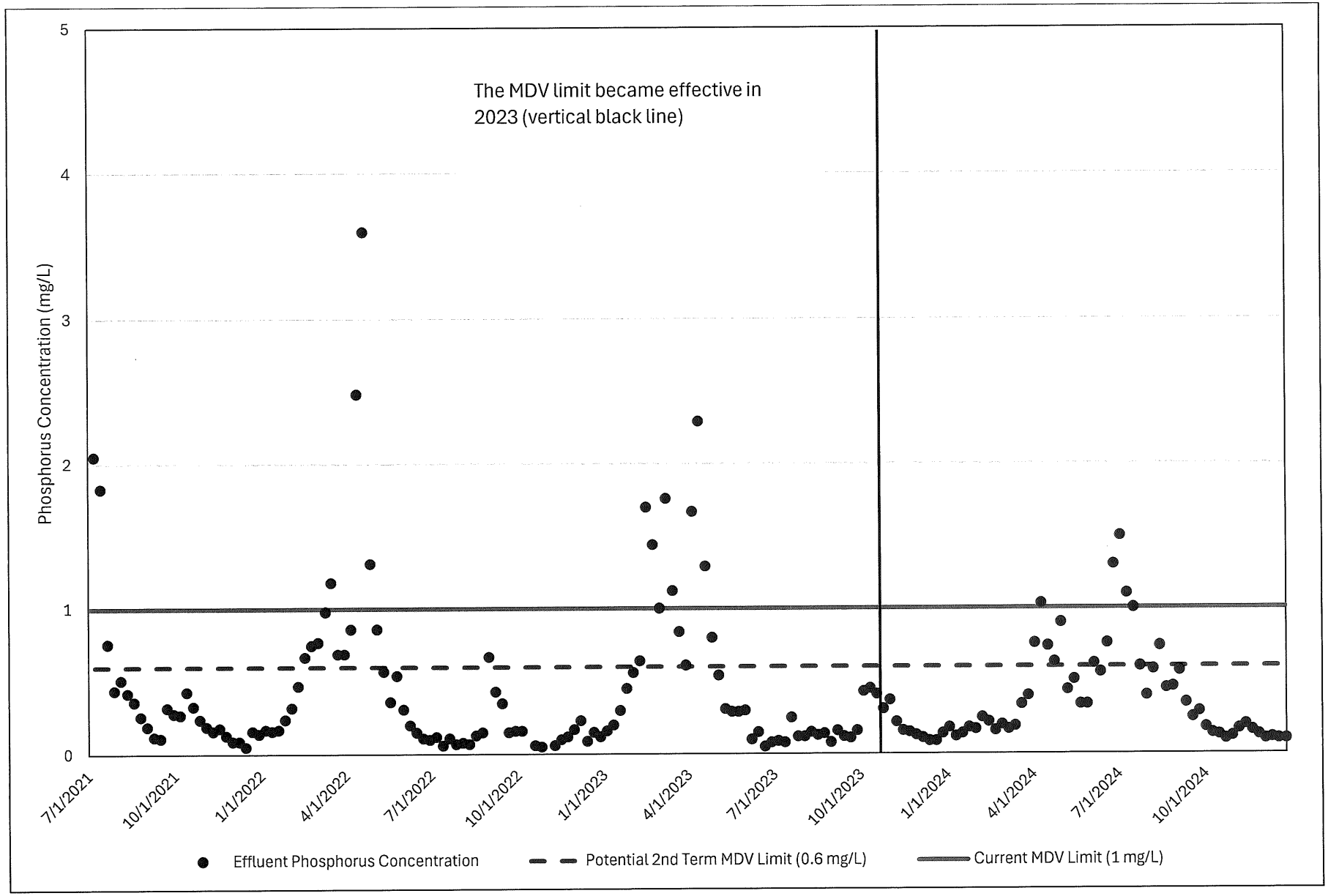
The chemical feed system adds ferric chloride to the lagoon system to facilitate phosphorus removal, resulting in chemical sludge accumulation in the secondary lagoon. Consistently achieving compliance with a more stringent limit in a lagoon treatment system is challenging due to the unique physical, chemical, and biological processes which occur in lagoons. Specific challenges for phosphorus removal which are unique to lagoons include seasonal turnover, anaerobic phosphorus re-release from the sludge layer, and long detention times (which make detailed day-to-day process control challenging). Due to these factors, the Village's 30-day P99 effluent phosphorus concentration from 2023 through 2024 was 0.66 mg/L, which is compliant with the 1 mg/L limit, but noncompliant with the presumed second term MDV limit of 0.6 mg/L.

As a result of the information presented above, the Village of Almena requests that the current 1.0 mg/L MDV limit be retained for the upcoming permit term. The Village has demonstrated consistent compliance with this limit and this compliance is expected to continue over the next permit term. If a more stringent limit is included with the next WPDES permit, compliance issues may occur which cannot be addressed by altering operation of the already-optimized chemical phosphorus removal system. Adding excess ferric chloride in pursuit of compliance with a more stringent limit would increase operating costs and could cause effluent pH violations and other compliance issues.

The included graph shows the historical total phosphorus effluent limit over the past four years and demonstrates the challenges of meeting a more stringent MDV limit in a lagoon system, even after optimization efforts. Thank you for your consideration.

Wayne Becker, Director of Public Works

Wayne Becker


The MDV limit became effective in 2023 (vertical black line)
Phosphorus Concentration (mg/L)
5
4
3
2
1
0
7/1/2021
10/1/2021
1/1/2022
4/1/2022
7/1/2022
10/1/2022
1/1/2023
4/1/2023
7/1/2023
10/1/2023
1/1/2024
4/1/2024
7/1/2024
10/1/2024
Effluent Phosphorus Concentration
Potential 2nd Term MDV Limit (0.6 mg/L)
Current MDV Limit (1 mg/L)

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

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

7/30/2025

Al Gabe
PO Box 277
Almena, WI 54805

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Hay River in Barron County
Permittee: Village of Almena, WPDES WI-0023183

Dear Mr. Gabe:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for the Village of Almena Wastewater Treatment Facility in an application dated 3/18/2025. Wisconsin's multi-discharger phosphorus variance was approved by EPA on February 6, 2017. Coverage under the multi-discharger phosphorus variance may only be granted to an existing source that demonstrates a major facility upgrade is necessary to achieve phosphorus compliance and the upgrade will result in economic hardship as defined in the federally approved variance. The water quality criterion for which you are seeking a variance is contained in s. NR 102.06, Wis. Adm. Code.

After review of the application materials, the Department is tentatively approving coverage under the phosphorus multi discharger variance because the applicant has demonstrated that a major facility upgrade would be required to comply with the phosphorus water quality based effluent limitation, and the applicant meets the economic hardship eligibility criteria delineated in the federally approved variance. In addition, the permitted facility has agreed to comply with the interim limitations that will be included in the WPDES permit, and has agreed to reduce the amount of phosphorus entering surface waters by making payments to the counties pursuant to s. 283.16(6)(b)1., Wis. Stats.

Public comment on this decision will be solicited at the time of permit reissuance after which a final decision will be made. The Department appreciates your attention and interest in Wisconsin's multi-discharger phosphorus variance. Should you have further questions regarding this matter, please contact me at (608) 400 – 5596 or by email at matthew.claucherty@wisconsin.gov.

Sincerely,

Matt Claucherty, MDV Point Source Coordinator
Bureau of Water Quality

e-cc Kim Bauer, Village of Almena
Wayne Becker, Village of Almena
Sheri Snowbank, WDNR
Carson Johnson, WDNR
Tim Elkins, EPA Region 5
Michelle Woods, EPA Region 5

State of Wisconsin
Department of Natural Resources
Bureau of Water Quality
Permits Section - WQ/3

Multi-Discharger Variance Application Evaluation Checklist

Form 3200-145 (R 5/16)

Notice: This checklist is meant to be a tool to help Department of Natural Resources (DNR) staff review municipal and industrial multi-discharger variance (MDV) applications (Forms 3200-149 and 3200-150). 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.).

Permittee Name

Village of Almena

WPDES Permit Number	County
WI- 0 | 0 | 2 | 3 | 1 | 8 | 3	Barron

1. Did the point source apply for the MDV at the appropriate time?	(•) Yes ( ) No. *STOP- facility not eligible at this time.*	*See Questions 1-3.*
2. This operation is (check one):	( ) New or relocated outfall. *STOP- facility not eligible.* (•) Existing outfall	*See Questions 5-6.*
3. Is the point source is located in an MDV eligible area?	( ) Yes ( ) No. *STOP- facility not eligible.*	*Apply County information to Appendix H. Additional information provided in Q7 on municipal form & Q7-8 on industrial form.*
4. The secondary indicator score for the county (counties) the discharge is located is:	6	*See Appendices A-F. If the score is less than 2, stop; the facility is not eligible.* *See Q23 on municipal form & Q28 on industrial form.*
5. Is a major facility upgrade required to comply with phosphorus limits?	(•) Yes ( ) No. *STOP- facility not eligible.*	*See Q8 on municipal form/Q9 on industrial form.*
6. List the months where phosphorus limits cannot be achieved during the permit term:	☒ All ☒ Jan ☒ Apr ☒ Jul ☒ Oct ☒ Feb ☒ May ☒ Aug ☒ Nov ☒ Mar ☒ Jun ☒ Sep ☒ Dec	*Consider checking with limit calculator. If this does not match information in application, the application should be updated prior to approval.*

7. What is the current effluent level achievable?

Outfall Number(s)	Conc. (mg/L)	Method for calculation:	Does this concur with application?	
001	0.88	( ) 30-day P99 (•) Other, specify: 4-day P99 from WQBEL memo	( ) Yes (•) No, why not: Application used smaller data subset	*DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.*

8. What is the appropriate interim limitation(s) for the permit term?

0.8 mg/L as a monthly average, pursuant to s. 283.16(6)(am), Wis. Stats.
Target Value = 0.2 mg/L

Provide Rationale:

The level currently achievable defined in the WQBEL memo is 0.88 mg/L. The Village has filed a certification that the facility cannot meet the statutory default interim limit of 0.6 mg/L. While the 30-day P99 is 0.54 mg/L, DNR agrees that the imposition of a 0.6 mg/L interim limit year-round could result in violations. The next permit term is recommended to step down to 0.8 mg/L as a monthly average via a schedule.

Note: See description in Section 2.02 of the MDV implementation guidance. Interim limitations should reflect the "highest attainable condition" for the permittee in question pursuant to s. 283.16(7), Wis. Stat.

Save

9. *For Industries Only*- Where does the phosphorus in the effluent come from? (check all that apply)	☐ Process ☐ Additive Usage ☐ Water supply *Can intake credits be given or can the facility use an alternative water supply?* ◯ Not feasible ◯ Possibly, but further analysis needed ◯ Not evaluated at this time	*See Q14-15 & 19 on industrial form. If the answer is "possibly" or "not evaluated", the schedule section of the MDV permit should contain a requirement to perform this analysis.*
10. Has this facility optimized?	◯ Yes ◉ In progress ◯ No	*See Q14 on municipal form & Q16 & 20 on industrial form. Facility must optimize and operate at an optimize treatment level (s. 283.16(6)(a), Wis. Stat.)If no will need compliance schedule.*
11. Has a facility plan/compliance alternative plan been completed for the facility?	◉ Yes ◯ In progress ◯ No	*See Q15 on municipal form & Q17 on industrial form.*
12. What is the projected cost for complying with phosphorus? Source:	$ _____ _____	*Facility must submit site-specific compliance costs. If cost projections are used from EIA, the permittee must certify that these costs are reasonable for the facility in question. See "projected compliance costs" in Section 2.02 of the MDV Implementation Guidance for details.*

Comments on planning efforts:

The Final Phosphorus Compliance Alternatives Evaluation (Plan) prepared by SEH and submitted on behalf of the Village of Almena in June of 2018 detailed alternatives for and approaches to meeting the 0.075 mg/L WQBEL. Adaptive management was evaluated and determined not practical due to the magnitude of standard exceedance in the receiving water. Other alternatives such as land application of wastewater, outfall relocation, and regionalization were evaluated. None of these were deemed feasible. A site specific cost estimate was provided for a new wastewater facility. The plan stated that simply adding filtration to the lagoon effluent was not suitable for compliance. Therefore, the cost estimate for a new facility was used in the economic demonstration. During the current permit term, Almena optimized chemical phosphorus removal and investigated water quality trading.

13. Are adaptive management and water quality trading viable?	◯ Yes ◉ Perhaps. Additional analysis required. ◯ No	*See Q18-21 on municipal form & Q22-25 on industrial form. If additional analyses required, the applicant may need to complete this analysis during the MDV permit term.*
14. Has the point source met the appropriate primary screener?	◯ Yes ◯ No. *STOP- facility not eligible.*	*See Q4 of this form in addition to the "eligibility" guidance in Section 2.01 of the MDV Implementation Guidance.*

Comments on economic demonstration:

The site specific cost estimate, prepared by SEH, included capital costs to construct a new facility capable of achieving 0.075 mg/L total phosphorus in effluent. Capital costs were estimated at $$2,347,200 and O & M costs were estimated at $ $50,000.00 annually. These are similar to the statewide estimate for Almena (EIA Addendum appendix G) with values of $2.8M (capital) and 26,000 (O&M). O&M differences likely stem from the new plant scenario differing from the statewide estimate assumptions. Additional costs for the new plant would be $196,332.47 , annually, for principal payments on a 20 year loan, interest payments at 2.2%, and O&M costs. Distributed amongst 295 residential customers with no industrial or commercial contributions, costs would be, on average $ $665.53 per year. Average residential sewer rates are currently $411.72 per year. Future rates of $1,077.25 per user per year would be 2.46% of Almena's $43,720 MHI. With Barron County's secondary indicator score of 6, requiring a 1% MHI impact, The Village of Almena meets the primary economic screener.

15. What watershed option was selected?

- (•) County project option. *Complete Section 5.*
- ( ) Binding, written agreement with the DNR to construct a project or implement a watershed plan. *Complete Section 4.*
- ( ) Binding, written agreement with another person that is approved by the DNR to construct a project or implement a watershed plan. *Complete Section 4.*

Section 4. Watershed Plan Review

16. MDV Plan Number: *Note: This is for tracking purposes. Contact Statewide Phosphorus Implementation Coordinator for the plan number.*	_____
17. Did the point source complete Form 3200-148?	( ) Yes ( ) No
18. Is the project area in the same HUC 8 watershed as the point of discharge?	( ) Yes ( ) No. *STOP- Watershed plan must be updated.*
19. What is the annual offset required? *See Section 2.03 of the MDV implementation guidance. If this value is different from the offset target provided in form 3200-148, the watershed plan should be amended.*	_____
20. Does the plan ensure that the annual load is offset annually?	( ) Yes ( ) No. *STOP- Watershed plan must be updated.*

21. Are projects occurring on land owned/operated by a CAFO or within a permitted MS4 boundary?

- ( ) Yes. *Work with appropriate DNR staff to ensure projects are not working towards other permit compliance.*
- ( ) No.

22. Are other funding sources being used as part of the MDV watershed project?

- ( ) Yes. *Work with appropriate DNR staff to ensure that funding sources can be appropriately used in the plan area.*
- ( ) No.

23. Do you have any concerns about the watershed project? *Note: Coordinate with other DNR staff as appropriate.*	( ) Yes. *STOP- Watershed plan must be updated.* ( ) No.

Comments:

Section 5. Payment to the County(ies)

24. At this time, the appropriate per pound payment is: $ 66.62

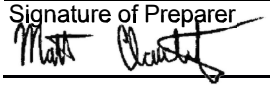
See "Payment Calculator" document at \\central\water\WQWT_PROJECTS\WY_CW_Phosphorus\MDV.

Section 6. Determination

Based on the available information, the MDV application is:

- (•) Approved
- ( ) Request for more information
- ( ) Denied

Additional Justification (if needed):

Certification		
Preparer Name	Title	
Matt Claucherty	Water Resources Management Specialist	
Signature of Preparer 		Date 7/30/2025