Permit Fact Sheet

General Information

Permit Number	WI-0032051-08-0
Permittee Name and Address	VILLAGE OF BROWNTOWN PO Box 7, Browntown, WI 53522-0007
Permitted Facility Name and Address	Browntown Wastewater Treatment Facility 319 East Murray Street, Browntown, WI
Permit Term	January 01, 2026 to December 31, 2030
Discharge Location	North bank of Skinner Creek approximately ¼ mile SW of Murray Street in the SE ¼ of the SE ¼ of Section 4, T1N, R6E
Receiving Water	Skinner Creek (Jordan & Skinner Creek Watershed, SP02 – Sugar-Pecatonica River Basin) in Green County
Stream Flow ($Q_{7,10}$)	11 cfs
Stream Classification	Warm Water Sport Fish (WWSF) community, non-public water supply
Discharge Type	Existing; Continuous
Annual Average Design Flow	0.0405 MGD
Industrial or Commercial Contributors	None
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; P - Total Phosphorus; D - Disinfection; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Browntown Wastewater Treatment Facility is a two-cell aerated lagoon system with disinfection and dechlorination during the months of May – September. The aerated lagoon system was constructed in 1980. Chemical phosphorus removal was installed in October 2022.

Substantial Compliance Determination

Enforcement During Last Permit: Four Notices of Noncompliance (NONs) were issued during the previous permit term to address limit exceedances, under reporting, late submittals, failure to have a certified operator, and other standard requirement violations. The facility has completed all previously required actions as part of the enforcement process.

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on July 16, 2025, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Kenzie Ostien, Wastewater Engineer, on July 16, 2025.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	0.015 MGD (Avg. April 1, 2020 to May 31, 2025)	Influent: 24-hr flow proportional composite samples shall be collected in the pit at the Village lift station. Flow monitoring is located at the Village lift station prior to the Parshall flume.
001	0.011 MGD (Avg. April 1, 2020 to May 31, 2025)	Effluent: 24-hr flow proportional composite samples shall be collected in the monitoring shed prior to disinfection. Grab samples are collected at the end of the weir and metering system. Flow monitoring is located at the end of the chlorination pit prior to the v-notched weir.
002	N/A – no lagoon sludge was removed or land applied during the previous permit term	Lagoon Sludge: Representative composite grab samples shall be taken from each lagoon and then combined for one sample. If a lagoon is scheduled for desludging additional sampling may be required.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

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

1.1.1 Changes from Previous Permit:

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

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD_5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	45 mg/L	Weekly	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	60 mg/L	Weekly	24-Hr Flow Prop Comp	See the TSS Effluent Limits Schedule.
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	Weekly	24-Hr Flow Prop Comp	Applies year-round. See the Daily Maximum Ammonia Nitrogen (NH3-N) Limits permit section.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	108 mg/L	Weekly	24-Hr Flow Prop Comp	Applies year-round.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	108 mg/L	Weekly	24-Hr Flow Prop Comp	Applies year-round.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Applies May-September.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Applies May-September. See the E. coli Percent Limit permit section. Enter the result in the eDMR on the last day of the month.
Chlorine, Total Residual	Daily Max	38 ug/L	Daily	Grab	Applies May-September.
Chlorine, Total Residual	Weekly Avg	38 ug/L	Daily	Grab	Applies May-September.
Chlorine, Total Residual	Monthly Avg	38 ug/L	Daily	Grab	Applies May-September.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Chloride		mg/L	4/Month	24-Hr Flow Prop Comp	Monitoring only in 2028. Sampling shall be conducted on four consecutive days one week per month.
Phosphorus, Total	Monthly Avg	2.0 mg/L	Weekly	24-Hr Flow Prop Comp	Interim limit. See the Phosphorus Variance - Implement Pollutant Minimization Plan permit section and the Phosphorus PMP Schedule.
Phosphorus, Total		lbs/day	Weekly	Calculated	Calculate the daily mass discharge of phosphorus on the same days phosphorus sampling occurs. Mass (lbs/day) = Concentration (mg/L) x Flow (MGD) x 8.34
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring permit section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring permit section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring permit section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See the Whole Effluent Toxicity (WET) Testing permit section.

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.

- Addition of a schedule to meet the new, more stringent total suspended solids (TSS) weekly average effluent limit and updated monthly average limit. The TSS effluent limits of 45 mg/L (weekly avg) and 30 mg/L (monthly avg) are scheduled to become effective on January 1, 2031.
- Increased sample frequency for pH monitoring from weekly to 5/Week.
- Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits.
- The permittee has applied for an individual phosphorus variance (IPV) for this permit term. An IPV interim limit of 2.0 mg/L as a monthly average is included throughout the permit term.
- The year in which chloride effluent monitoring is required has been updated to calendar year 2028.
- Addition of Acute Whole Effluent Toxicity (WET) testing three times during the permit term.

2.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo, by Sarah Luck, Water Resources Engineer, dated May 28, 2025.

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

Expression of Limits – In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable. Minor changes have been made to ammonia nitrogen and total residual chlorine.

TSS – Since significant improvements to treatment quality have occurred at the facility (addition of phosphorus removal chemical), TSS limits are now based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1)(b), Wis. Adm. Code. Because these limits are more stringent that the previous permit limits, a compliance schedule has been included in the permit. See the TSS Effluent Limits Schedule.

Disinfection and E. coli – Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020. Section NR 102.04(5)(a), Wis. Adm. Code, states that all surface waters shall be suitable for recreational use and meet the E. coli criteria established to protect this use. As part of the reissuance process, the requirements for disinfection were reviewed under s. NR 210.06(3), Wis. Adm. Code. The permittee is required to disinfect, during the months of May – September each year. Upon permit reissuance, disinfection requirements and E. coli limits of 126 #/100 mL as a monthly geometric mean that may not be exceeded and 410 #/100 mL as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month apply.

Phosphorus – The permittee has applied for an individual phosphorus variance in accordance with s. 283.15, Wis. Stats. Conditions for this variance include maintaining phosphorus effluent concentrations below the interim limit of 2.0 mg/L as a monthly average, implementing the phosphorus pollutant minimization program (PMP) plan dated August 12, 2025, continued optimization for control of phosphorus, and calculating, reporting and tracking phosphorus mass discharge. If approved by EPA, compliance with state water quality standards would be met through the interim limit along with all additional phosphorus variance provisions.

Acute WET – Testing is required during the following three quarters: January – March 2027; April – June 2028; and July – September 2030.

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

3.1 Sample Point Number: 002- LAGOON 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	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
Nitrogen, Total Kjeldahl		Percent	Once	Composite	
Nitrogen, Ammonia (NH3-N) Total		Percent	Once	Composite	
Phosphorus, Total		Percent	Once	Composite	
Phosphorus, Water Extractable		% of Tot P	Once	Composite	
Potassium, Total Recoverable		Percent	Once	Composite	
Radium 226 Dry Wt		pCi/g	Once	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Monitoring required once in 2027.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Monitoring required once in 2027.
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.

- The year in which PCB monitoring is required has been updated to calendar year 2027.
- Addition of one time PFAS (PFOA + PFOS) monitoring pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

3.1.2 Explanation of Limits and Monitoring Requirements

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

PFAS – The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates. In the interim, the Department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS."

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

4 Schedules

4.1 Phosphorus Pollutant Minimization Program

As a condition of the variance to the water quality-based effluent limitation (WQBEL) for phosphorus granted in accordance with s. 283.15, Wis. Stats., the permittee shall implement the Phosphorus PMP including any subsequent updates.

Required Action	Due Date
Annual Phosphorus Progress Report: Submit an annual progress report that shall discuss which phosphorus pollutant minimization measures have been implemented during the prior calendar year. The report shall include an analysis of trends in weekly average, monthly average and annual total influent and effluent phosphorus concentrations and mass discharge of phosphorus based on phosphorus sampling and flow data. The report shall provide an update on the permittee's: (1) progress in implementing pollutant minimization measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges and, (2) status of evaluating feasible alternatives for meeting phosphorus WQBELs. Note that the monthly average interim limitation listed in the permit's Surface Water section remains enforceable until new enforceable limits are established in the next permit reissuance. The first annual phosphorus progress report is to be submitted by the Date Due.	06/30/2026
Annual Phosphorus Progress Report #2: Submit a phosphorus progress report as defined above for the previous calendar year.	06/30/2027
Annual Phosphorus Progress Report #3: Submit a phosphorus progress report as defined above for the previous calendar year.	06/30/2028
Annual Phosphorus Progress Report #4: Submit a phosphorus progress report as defined above for the previous calendar year.	06/30/2029
Final Phosphorus Report: Submit a final report documenting the success in reducing phosphorus concentrations in the effluent, as well as the anticipated future reduction in phosphorus sources and phosphorus effluent concentrations. The report shall summarize phosphorus pollutant minimization activities that have been implemented during the current permit term and state which, if any, pollutant minimization activities from the approved pollutant minimization program plan were not pursued and why. The report shall include an analysis of trends in monthly and annual total influent and effluent phosphorus concentrations based on phosphorus sampling during the current permit term. The permittee shall also re-evaluate all available compliance options for meeting the final phosphorus WQBELs. If the report concludes Adaptive Management will be implemented, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 and an adaptive	06/30/2030

management plan. If the report concludes water quality trading will be used, the submittal shall include a Water Quality Trading Plan. Additionally, if the permittee intends to seek to re-apply for a phosphorus variance per s. 283.15, Wis. Stats for the reissued permit, a detailed pollutant minimization program plan outlining the pollutant minimization activities proposed for the upcoming permit term should be submitted along with the final report.	
Annual Phosphorus Progress Reports After Permit Expiration: In the event that this permit is not reissued by the date the permit expires, the permittee shall continue to submit reports for the previous calendar year following the due date of annual phosphorus progress reports listed above. Annual phosphorus progress reports shall include information as defined above.	

4.1.1 Explanation of Schedule

Phosphorus Pollutant Minimization Program – This schedule is to be implemented as a condition of the permittee's variance to the water quality standards for phosphorus. Annual phosphorus progress reports update the Department on the progress made in implementing the Pollutant Minimization Program Plan as well as quantifying reductions achieved through plant optimization and from contributing sources within the collection system.

4.2 TSS Effluent Limits

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

Required Action	Due Date
Report on Effluent Discharges: The permittee shall prepare and submit to the Department for approval a report on effluent discharges. The report shall include an evaluation of collected effluent data and the facility's ability to comply with the final Total Suspended Solids (TSS) limits. The report shall conclude whether current treatment, operational improvements, or a facility upgrade will result in compliance with the final TSS limits. FACILITY PLAN - If the Report on Effluent Discharges concludes that current treatment or operational improvement does not result in compliance with the final TSS limits and a facility upgrade is required, the permittee shall initiate development of a facility plan for meeting final TSS limits and comply with the remaining required actions in this schedule.	09/30/2026
Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code, for complying with the TSS limits. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	09/30/2027
Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to achieve compliance with final TSS limits, and a schedule for completing construction of the upgrades by the complete construction date specified below.	09/30/2028
Treatment Plant Upgrade to Meet Limits: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Wis. Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule, the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	03/31/2029
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	03/31/2030

Complete Construction: The permittee shall complete construction of the wastewater treatment system upgrades.	11/30/2030
Achieve Compliance: The permittee shall achieve compliance with the final TSS limits.	12/31/2030

4.2.1 Explanation of Schedule

TSS Effluent Limits – This schedule is included in the permit to provide time for the permittee to submit plans and specs and complete any necessary changes at the facility in order to come into compliance with the new, more stringent water quality-based effluent limits for TSS.

4.3 Lagoon Leakage Assessment

Required Action	Due Date
Influent Flow Meter Calibration: Submit a report on standard operating procedures, including calibration, capable of taking consistent representative influent data.	03/31/2026
Leakage Report: Submit a report evaluating lagoon leakage. The report shall include an evaluation of both influent and effluent data, supporting calculations, and determination of leakage rate.	12/31/2026
Final Lagoon Leakage Report: Submit a written report summarizing the results of the evaluation if the lagoons are found to have a sub-standard leakage rate. The report shall include a final compliance plan for mediation of the lagoon system. If construction is planned, this report shall include plans and specifications and/or facility plans.	06/30/2027

4.3.1 Explanation of Schedule

Lagoon Leakage Assessment – This schedule requires the permittee to assess lagoon system leakage and submit plans and specs for corrective actions based on the evaluation report.

Attachments

WQBEL Memo: Water Quality-Based Effluent Limitations for the Browntown Wastewater Treatment Facility WPDES Permit No. WI-0032051-08-0, by Sarah Luck, Water Resources Engineer, dated May 28, 2025

Phosphorus Variance EPA Data Sheet

Phosphorus PMP (Pollutant Minimization Program) Plan, Village of Browntown, dated June 28, 2024

Justification Of Any Waivers From Permit Application Requirements

No waivers from permit application requirements were requested or granted as part of this permit reissuance.

Prepared By: Sarah Donoughe, Wastewater Specialist-Adv **Date:** August 12, 2025

needed.

Section I: General Information

A. Name of Permittee: Village of Browntown

B. Facility Name: Browntown Wastewater Treatment Facility

C. Submitted by: Wisconsin Department of Natural Resources

D. State: Wisconsin **Substance:** Phosphorus **Date completed:** August 12, 2025

E. Permit #: WI-0032051-08-0 **WQSTS #:** (EPA USE ONLY)

F. Duration of Variance **Start Date:** January 1, 2026 **End Date:** December 31, 2030

G. Date of Variance Application: November 25, 2024

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

I. Description of proposed variance:
Skinner Creek is listed as a Warm Water Sport Fish (WWSF) community, non-public water supply. The WQC for creeks like Skinner Creek is 0.075 mg/L and the phosphorus WQBEL calculation formula is cited in s. NR 217.13 (2)(a), Wis. Adm. Code. The calculated phosphorus WQBELs include 0.075 mg/L as a 6-month average and 0.225 mg/L as a monthly average. A phosphorus interim limit of 4.8 mg/L as a monthly average was included in the previous permit along with a schedule to meet a more stringent interim limit of 2.0 mg/L as a monthly average (effective July 1, 2022). During the previous permit term, Browntown completed an upgrade to meet the interim limit of 2.0 mg/L as a monthly average because it was deemed economically feasible to do so along with the ongoing reduction and optimization efforts. An interim limit of 2.0 mg/L as a monthly average remains effective upon reissuance of the proposed permit.

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

Name	Email	Phone	Contribution
Sarah Donoughe	Sarah.Donoughe@Wisconsin.gov	920-366-3076	Permit Drafter/Variance Coordinator
Kenzie Ostien	Kenzie.Ostien@Wisconsin.gov	608-516-6487	Compliance Staff/Wastewater Engineer
Sarah Luck	Sarah.Luck@Wisconsin.gov	608-843-3876	Limits Calculator

Section II: Criteria and Variance Information

A. Water Quality Standard from which variance is sought: 0.075 mg/L

B. List other criteria likely to be affected by variance: N/A

C. Source of Substance: The Village of Browntown (Browntown) discharges to Skinner Creek in the Jordan & Skinner Creek Watershed which is 69.2 mi². Land use in the watershed is grassland (41%), agriculture (41%), forest (12%), and other mixed uses (5%). According to the Pollutant Load Ratio Estimation Tool (PRESTO) model, 99% of the phosphorus is coming from nonpoint sources.

Citation: PRESTO is a statewide GIS-based tool that compares the average annual phosphorus loads originating from point and nonpoint sources within a watershed. More information about this model is available at http://dnr.wi.gov/topic/surfacewater/presto.html.

D. Ambient Substance Concentration: 0.075 mg/L (median) ☒ **Measured** ☐ **Estimated** ☐ **Default** ☐ **Unknown**

E. If measured or estimated, what was the basis? Include citation.
The ambient concentration of 0.102 mg/L is the median of 6 data points from monitoring station #10012085 at Skinner Creek – Upstream of Klondike Rd., located upstream of the outfall. Monitoring was conducted from 5/29/2002 to 10/18/2002. No recent monitoring data are available.

F. Average effluent discharge rate: 0.012 MGD (April 2020 through March 2025); design rate = 0.0405 MGD **Maximum effluent discharge rate:** 0.10 MGD (11/30/2020)

G. Effluent Substance Concentration: Mean = 1.80 mg/L; 1-day P_{99} = 7.30 mg/L; 4-day P_{99} = 4.13 mg/L; 30-day P_{99} = 2.51 mg/L — ☒ **Measured** ☐ **Default** ☐ **Estimated** ☐ **Unknown**

H. If measured or estimated, what was the basis? Include Citation. Measured from reported effluent data from July 2022 through March 2025 (current IPV interim limit of 2.0 mg/L went into effect on July 1, 2022).

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

J. Statement of HAC: The Department has determined the highest attainable condition of the receiving water is achieved through the application of the variance limit in the permit, combined with a permit requirement that the permittee implement its Phosphorus PMP. Thus, the HAC at commencement of this variance is 2.0 mg/L, which reflects the greatest phosphorus reduction achievable with the current treatment processes, in conjunction with the implementation of the permittee's Phosphorus PMP. The current effluent condition is reflective of on-site optimization measures that have already occurred. This HAC determination is based on the economic feasibility of available compliance options for the Browntown WWTF at this time (see Economic Section below). The permittee may seek to renew this variance in the subsequent reissuance of this permit; the Department will reevaluate the HAC in its review of such a request. A subsequent HAC cannot be defined as less stringent than this HAC.

K. Variance Limit: 2.0 mg/L as a monthly average

L. Level currently achievable (LCA): 2.0 mg/L as a monthly average

M. What data were used to calculate the LCA, and how was the LCA derived? (*Immediate compliance with LCA is required.)*
The current IPV interim limit of 2.0 mg/L went into effect on July 1, 2022. The limit of 2.0 mg/L reflects the greatest phosphorus reduction achievable with the proposed chemical upgrade treatment process, in conjunction with the implementation of the permittee's facility upgrade and optimization measures.

N. Explain the basis used to determine the variance limit (which must be ≤ LCA). Include citation.
Based on the monitoring data since the 2.0 mg/L interim limit went into effect on July 1, 2022, the facility is still not able to consistently meet the interim limit of 2.0 mg/L (4-day P_{99} = 4.13 mg/L and the 30-day P_{99} = 2.51 mg/L based on 135 sample results) although great reduction has occurred. Given that the facility is still optimizing the use of the chemical in phosphorus removal and to ensure backsliding does not occur, 2.0 mg/L as a monthly average represents the LCA.

O. Select all factors applicable as the basis for the variance provided under 40 CFR 131.10(g). Summarize justification below: ☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☒ **6**
During the previous permit term, Browntown performed minor WWTF improvements to achieve the variance interim limit of 2.0 mg/L for the two-cell stabilization lagoon treatment process. A chemical addition system was installed. Chemical addition was the most economically feasible option but was originally eliminated as an alternative due to inefficiency concerns, and that chemical addition alone does not result in meeting final phosphorus limits. An additional upgrade to meet the WQBEL of 0.075 mg/L (as a 6-month average) with sand filtration would force user rates to exceed 2% MHI (at 2.84%). Browntown approved an increase in user rates that allowed for facility upgrades during the previous permit term to add chemical addition to meet the 2.0 mg/L interim limit with continued optimization.

Citation: See the Village of Browntown "Reductions and Optimizing Control of Phosphorus" report dated June 2024, for the initial economic justification evaluation and updated alternatives analysis. See also the "Individual Phosphorus Variance Request for Additional Information" memo dated February 13, 2025, for the updated economic justification evaluation and updated alternatives analysis.

Section III: Location Information

A. Counties in which water quality is potentially impacted: Green County

B. Receiving waterbody at discharge point: Skinner Creek

C. Flows into which stream/river? Pecatonica River **How many miles downstream?** Approx. 3.5 mi.

D. Coordinates of discharge point (UTM or Lat/Long): Lat: 42.58319°N / Long: 89.78450°W

E. What are the designated uses associated with this waterbody?
Warm Water Sport Fish (WWSF) community; non-public water supply

F. Describe downstream waters:
The median ambient phosphorus concentration of 0.102 mg/L in Skinner Creek, monitored at the Cheese County Recreational Trail (SWIMS ID 233237) and upstream of Klondike Road (SWIMS ID 10012085), is greater than the applicable phosphorus criteria (0.075 mg/L). As previously stated, about 99% of the total phosphorus load to Skinner Creek at the confluence with the tributary is from nonpoint sources. For these reasons, this facility is not believed to significantly impact downstream waters.

G. What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the applicable criterion of the substance?
There is no downstream water where the phosphorus concentration falls below criteria. Skinner Creek flows into the Pecatonica River, which flows into the Rock River, which lastly flows into the Mississippi Rivers. All rivers downstream are impaired for total phosphorus.

H. Provide the equation used to calculate that distance.
Surface Water Data Viewer (SWDV) was used to analyze the flow of water from one river to the next; all waters downstream are 303(d)-listed waters.

I. Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody:
There are no other permittees that discharge to Skinner Creek that have a phosphorus variance (see attached map "Browntown WWTF - Outfall 001"). On the Pecatonica there is the Village of Gratiot with an approved variance.

Please attach a map, photographs, or a simple schematic showing the location of the discharge point as well as all variances for the substance currently draining to this waterbody on a separate sheet. See attached map "Browntown WWTF - Outfall 001"

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

River Mile	Pollutant	Impairment
0-14	Total Phosphorus	Water Quality Use Restrictions

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

A. Are there any industrial users contributing phosphorus to the POTW? If so, please list.
The Village of Browntown is too small to have local pretreatment authority (Design flow < 5 MGD). All users in the Village are billed as residential. There are no significant commercial, institutional or industrial sources. All influent waste is domestic strength.

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

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

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

Section V: Public Notice

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

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

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

D. Date of public notice: August (20, 23, or 27), 2025 **Date of hearing:** October 13, 2025

E. Were comments received from the public in regards to this notice or hearing? ☐ Yes ☐ No
(If yes, please attach on a separate sheet)

Section VI: Human Health

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

B. Applicable criteria affected by variance: N/A

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

Section VII: Aquatic Life and Environmental Impact

A. Aquatic life use designation of receiving water: Warm Water Sport Fish (WWSF)

B. Applicable criteria affected by variance: 75 ug/L (0.075 mg/L), Fish and Aquatic Life Criteria

C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations:
Skinner Creek (WBIC 894500) was placed on the impaired waters list for total phosphorus in 2012. The 2016 assessments showed continued impairment by phosphorus. The total phosphorus sample data exceeded 2016 WisCALM listing criteria for the Fish and Aquatic Life use; however, available biological data did not indicate impairment (i.e. no macroinvertebrate or fish Index of Biotic Integrity (IBI) scored in the "poor" condition category).

The watershed is dominated by agriculture, although it does have some areas of woodlots and grasslands. The habitat in all of the streams is impacted by agricultural nonpoint source pollution. The population of this mostly rural watershed is expected to remain steady over the next several decades. One municipality, Browntown, discharges to Skinner Creek.

On-site optimization will help ensure that further degradation of the environment will not occur with the variance. Continued phosphorus reduction measures will be implemented to improve water quality and minimize environmental impacts.

Citation: PRESTO - http://dnr.wi.gov/topic/surfacewater/presto.html.

D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations:
The following list contains the Federally Endangered, Threatened, Proposed, and Candidate Species in Green County, Wisconsin From U.S. Fish and Wildlife Service, Region 3, July 2025.

BIRDS
Piping Clover (E)
CLAMS
Higgins Eye (E)
Sheepnose Mussel (E)
Snuffbox Mussel (E)
Spectaclecase (mussel) (E)
Winged Mapleleaf (E)
MAMMALS
Indiana bat (E)
Norther Long-eared Bat (E)
REPTILES
Eastern Massasauga (T)
SNAILS
Iowa Pleistocene snail (E)
INSECTS
Hine's emerald dragonfly (E)
Karner Blue Butterfly (E)
Poweshiek skipperling (E)

Rusty Patched Bumble Bee (E)
FLOWERING PLANTS
Dwarf lake iris (T)
Eastern prairie fringed orchid (T)
Fassett's locoweed (T)
Mead's Milkweed (T)
Northern wild monkswood (T)
Pitcher's thistle (T)
Prairie Bush Clover (T)

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

Section VIII: Economic Impact and Feasibility

A. Describe the permittee's current pollutant control technologies (treatment processes):
The Browntown Wastewater Treatment Facility is a two-cell aerated lagoon system with disinfection and dechlorination during the months of May – September. The facility annually treats approximately 0.012 MGD of wastewater with a design flow of 0.0405 MGD. The aerated lagoon system was constructed in 1980. Chemical phosphorus removal was installed in October 2022 and Aluminum Sulfate (Alum) is added to wastewater prior to the secondary lagoon.

B. What modifications would be necessary to comply with the current limits? List additional treatment processes and/or technologies available. Include any citations.
It is unlikely the Village will be able to meet current limits without the addition of tertiary filtration or polishing technology prior to discharge (Citation: *Reductions and Optimizing Control of Phosphorus* (Fehr Graham, June 2024)).

C. Identify any expected environmental impacts that would result from further treatment, and include any citations:
N/A

D. Is it technically and economically feasible for this permittee to modify the treatment process to comply with the water quality-based limits? ☐ **Yes** ☒ **No**

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

F. If yes, what prevents this from being done? Include any citations. N/A

G. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations:
The Village continues to pursue the use of AM or WQT to meet current limits. Spray irrigation, sand filtration, ultrafiltration, membrane bio reactors, cloth disc filters, and constructed wetlands post lagoons were considered as alternatives. Evaluation of costs and logistics determined cloth disc filtration was the most cost-effective technology; however, this option would increase user rates above 2% of the MHI (Citation: *Reductions and Optimizing Control of Phosphorus* (Fehr Graham, June 2024) and *Re: Individual Phosphorus Variance Request for Additional Information Memo* (Fehr Graham, February 2025)).

H. Describe the economic impacts of compliance: ***{applies only to municipalities; include other cost estimates for industries}***

Economic Factor		Source
MHI	$63,000	Census Bureau Data
Calculated preliminary screener	2.84	Browntown Economic Justification – Updated Alternatives Analysis
Secondary score value	N/A	N/A

A. Does the facility meet the economic indicators to qualify for the MDV? ☐ Yes ☒ No ☐ Unknown

MDV secondary indicator score: N/A

B. Is it technically and economically feasible for this permittee to comply with a phosphorus WQBEL of 1 mg/L or lower? ☐ Yes ☒ No ☐ Unknown

C. Justification for considering an individual variance in lieu of the MDV:
To qualify for the MDV a facility must meet an interim limit 1.0 mg/L. However, Browntown demonstrated that a limit of 1.0 mg/L was not consistently met with chemical addition. During the previous permit term, the facility upgraded to add chemical addition to meet the variance interim limit of 2.0 mg/L for their two-cell stabilization lagoon treatment process.

Section X: Compliance with Water Quality Standards

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

1. Installed chemical phosphorus removal system in October 2022. 2. Public notice for phosphorus posted at Village Hall and sent to users in quarterly bills. 3. Updated lift station with grinder pumps. 4. Performed a sludge depth analysis and sludge speciation (Citation: *Reductions and Optimizing Control of Phosphorus* (Fehr Graham, June 2024)).

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

The proposed permit contains a variance to the water quality-based effluent limit (WQBEL) for phosphorus approved in accordance with s. 283.15, Wis. Stats. As conditions of this variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the permit, (b) implement the phosphorus pollutant minimization measures specified in the Pollutant Minimization Program (PMP) Plan dated August 12, 2025, and (c) perform the actions listed in the schedule section (section 4.1) of the permit.

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

A. Date of previous submittal: February 26, 2020 **Date of EPA Approval:** March 3, 2020

B. Previous Permit #: WI-0032051-07-0 **Previous WQSTS #:** (EPA USE ONLY)

C. Effluent substance concentration: Avg. 3.14 mg/L and 0.34 lbs/day (April 2020 – March 2025) **Variance Limit:** 6.4 mg/L as a monthly avg until 6/30/22; 2.0 mg/L as a monthly avg effective 7/1/22

D. Target Value(s): N/A **Achieved?** ☒ Yes ☐ No ☐ Partial

compliance with the terms of the previous variance permit. Attach additional sheets if necessary.

Condition of Previous Variance	Compliance
Submit Facility Plan	☒ Yes ☐ No
Submit Plans & Specifications	☒ Yes ☐ No
Construction Upgrade Progress Report	☐ Yes ☒ No
Complete Construction	☒ Yes ☐ No
Achieve Compliance with 2.0 mg/L interim limit	☒ Yes ☐ No
Annual Optimization Report 1	☒ Yes ☐ No
Annual Optimization Report 2	☒ Yes ☐ No
Report on Reductions & Optimizing Control of Phosphorus	☒ Yes ☐ No

Annual Optimization Reports After Permit Expiration	☐ **Yes** ☐ **No** **N/A – The permit expiration date is 3/31/2025; therefore, the next annual report would be due 1/31/2026.**

	Action Items	Year 1	Year 2	Year 3	Year 4	Year 5
1	**REDUCTION OF INFLUENT PHOSPHORUS**					
a	Distribute information to residents regarding TP reduction measures in Sewer Bill. Include copy of information distributed in annual report.	X	X	X	X	X
b	Post TP reduction measures poster in Village Hall - include photo of posting in annual report.	X	X	X	X	X
c	Research additional information that can be included in mailing/ posting for reduction of TP in community - include discussion of research and outcomes in report.		X		X	
d	Review changes in local business ventures and determine if TP reduction measures needed. include discussion of commercial changes in report.	X		X		X
e	Review Sewer Rates and adjust accordingly to provide adequate capital to cover the costs of future compliance.	X	X	X	X	X
2	**REDUCTION OF EFFLUENT PHOSPHORUS**					
a	Perform annual operations and maintenance to prevent regressing of current TP treatment capabilities.	X	X	X	X	X
b	See Optimization Section for additional detail on reduction of effluent phosphorus	X	X	X	X	X
c	*Review Facility Upgrade Technology (Feasibility and Cost)*					
i	Look at post filtration technology Disc Filtration and document in report	x				
ii	Review Post Filtration Technology Aqua Pyr and document outcome in report		x			
iii	Review feasibility of constructed wetlands and document outcome in report			x		
iv	Review feasibility of Baffle Curtains and document outcome in report				x	
v	Review Feasibility of in - lagoon wetlands (hydroponic technology) and document outcome in report.					x
d	Verify depths of sludge annually to properly plan for lagoon dredging.	X	X	X	X	X
3	**OPTIMIZATION**					
a	Assess flow and phosphorus variability - establish seasonal swings to identify timing of phosphorus swings. Goal will be have fewer swings in effluent phosphorus levels. Add analysis to report	X	X	X	X	X
b	Use information on seasonality to determine a schedule when to modify the CPR system dosing to attempt to eliminate increases in effluent phosphorus level.	X	X	X	X	X

	Action Items	Year 1	Year 2	Year 3	Year 4	Year 5
c	Review dosing levels monthly - this will be used in the variability assessment. Create table showing theoretical feed rate, actual feed rate, and recommended modifications. In addition to elimination of spikes in effluent work to maximize phosphorus removal.	X	X	X	X	X
d	Complete Annual Review of data and develop dosing recommendations for following year.	X	X	X	X	X
4	**REDUCTION OF NON-POINT SOURCE PHOSPHORUS IN VILLAGE**					
a	Investigate TP reduction measures within the Village's stormwater system. Document alternatives		X		x	
b	If TP reduction measure found to be viable - document progress towards installation			X		X
c	See Section 6 - Evaluate Phosphorus removal alternatives to meet WQBEL for additional action items	X	X	X	X	X
5	**SUBMIT COMPLIANCE REPORTs**	X	X	X	X	X
6	**EVALUATE PHOSPHORUS REMOVAL ALTERNATIVES TO MEET WQBEL**					
a	*Adaptive Management (AM)*			X	X	X
i	AM - review needed AM credits and document in report viability of AM			X		
ii	AM - if viable work with stockholders and document communication in report				X	X
b	*Water Quality Trading (WQT)*	X	X	X	X	X
i	WQT - Determine Credits Needed and document in annual report	X	X	X	X	X
ii	WQT - Discuss potential trades with Water Quality Clearinghouse and document discussions and outcomes in annual report.	X	X	X	X	X
iii	WQT - review potential projects in Village limits - document areas explored.	X	X	X	X	X
iv	WQT - Discuss potential trade partners with Green County Land Conservation and document discussion and outcomes in annual report.	X	X	X	X	X
c	Multi-Discharger Variance (MDV) - check eligibility and include discussion in report					X
d	Individual Phosphorus Variance (IPV) - check eligibility and include discussion in report					X
e	Alternative Discharge - review and document outcome of research in report				X	
f	Regionalization - review potential regionalization partners and document outcome in report				X	

	Action Items	Year 1	Year 2	Year 3	Year 4	Year 5
7	**FUNDING**					
a	Review Available Grants with Community Development Specialist at Fehr Graham. Including Grants through DNR and EPA.	X	X	X	X	X
b	Document correspondence in Annual Report.	X	X	X	X	X