Village of Melrose Draft Permit Fact Sheet

General Information

Permit Number:	WI-0024678-11-0
Permittee Name:	Village of Melrose, P O Box 117, Melrose, WI 54642-0117
Discharge Location:	Melrose Wastewater Treatment Facility, W13985 State Highway 54, Melrose, WI North bank of the Black River approximately ½ mile west of the Highway 108 bridge NW1/4 NW1/4, T15N R05W, Section 20, Town of Melrose, Jackson County, WI
Receiving Water:	the Black River, located in the Big and Douglas Creeks Watershed of the Black River Basin in Jackson County
StreamFlow ($Q_{7,10}$):	96.0 cfs
Stream Classification:	Warmwater Sportfish, Non-public Water Supply
Discharge Type:	Existing, continuous
Design Flow(s)	0.054 MGD Annual Average
Significant Industrial Loading?	None
Operator at Proper Grade?	The operator in charge is due for the Sanitary Sewer certification on March 31, 2024 per Wis Adm. NR 114.57 (5). If the certification is not achieved prior to the permit expiration, it will be due within 60 days of the reissuance date. In addition, due to the operational changes at the facility for phosphorus, the facility has received the phosphorus subclass. The phosphorus subclass will be due on October 31, 2024, this is one year after notification to the facility of the subclass addition.
Approved Pretreatment Program?	N/A

Facility Description

The Village of Melrose owns and operates the Melrose Wastewater Treatment Facility (WWTF) for treatment of domestic wastewater. The facility has an annual average design flow of 0.054 million gallons per day (MGD) and had an actual annual average influent flow of 0.025 MGD in 2023. The WWTF provides secondary treatment via an aerated lagoon system and seasonal disinfection May – September by chlorination (and subsequent dechlorination). Phosphorus treatment is achieved by the addition of ferric at Manhole A with aeration mixing. The WWTF was upgraded in 2020, including new aeration equipment, the addition of a permanent chemical feed system for ferric chloride addition, new flow control valves, and a new standby generator. The quantity and quality of the effluent discharge has not changed significantly, as the facility previously had a temporary ferric chloride feed system in place for phosphorus reduction. No major operational changes are expected this permit term. Significant effluent monitoring and/or limit changes in this permit term are as follows: 1) the addition of annual monitoring for total nitrogen, nitrite + nitrate nitrogen and total Kjeldahl nitrogen, 2) fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits, 3) the variable daily maximum ammonia limit table has been expanded to include applicable limits at a lower effluent pH, 4) the ammonia & total suspended solids (TSS) monitoring frequencies have increased and 5) the conditional reapproval of a multi-discharger variance (MDV) for phosphorus and the inclusion of the associated compliance schedules to comply with s. 283.16, Wis. Stats. requirements for phosphorus. The influent flow monitoring frequency has been changed from

"continuous" to "daily", and the influent monitoring frequency for BOD_5 & TSS has increased. Clarification language has been added notifying the permittee they must monitor sludge for List 2 nutrients and meet the requirements of List 3 (Pathogen Control) and List 4 (Vector Attraction Reduction) prior to landspreading if they remove sludge from the lagoon(s). Additionally, to quantitate the risk, PFAS sludge sampling has been included in the permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code. A schedule has been included in the permit requiring the permittee submit a sludge management plan prior to removal and land application of sludge from the lagoon(s). A schedule has also been added that requires the permittee have an operator certified in the SS Subclass (Sanitary Sewage Collection System) and the P Subclass (Phosphorus).

Substantial Compliance Determination

Enforcement During Last Permit: The facility received an NON in 2021 due to land applying sludge that had been sampled and shown an exceedance of the high-quality limit. They were instructed to retest and failed to do so prior to land applying the sludge. No further land application is anticipated in the next permit term.

After a desk top review of all discharge monitoring reports, land application reports & compliance schedule items, and an inspection on 09/11/2023, Melrose WWTF has been found to be in substantial compliance with their current permit.

Compliance determination entered by Jenna Monahan on 10/25/2023.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
702	0.025 MGD (2023)	Representative influent samples shall be collected after the influent flume and before the primary pond.
002	0.025 MGD (2023)	Representative effluent samples, except those for chlorine and E. coli, shall be collected from the second aerated lagoon prior to the chlorine contact tank. Representative effluent samples for chlorine and E. coli analysis shall be collected after the chlorine contact tank.
003	Facility removed sludge from the lagoon in 2020 during facility upgrade and they do not plan to remove again in the upcoming permit term.	Representative composite sludge samples shall be collected in 2025 and monitored for the parameters as listed in the table below. If the permittee plans to remove sludge, they shall monitor sludge for Lists 1, 2, 3 & 4 prior to land application. The Department shall be notified at least 30 days in advance of sludge removal so that appropriate monitoring forms can be provided. Approval of landspreading sites must be completed prior to sludge removal.

1 Influent – Monitoring Requirements

Sample Point Number: 702- AFTER FLUME, PRIOR TO POND

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	2/Week	24-Hr Comp	
Suspended Solids, Total		mg/L	2/Week	24-Hr Comp	

Changes from Previous Permit:

The sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes. The monitoring frequency for BOD5 & TSS has been increased from weekly to 2/week to match the frequency of these parameters at the effluent.

Explanation of Limits and Monitoring Requirements

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

2 Surface Water - Monitoring and Limitations

Sample Point Number: 002- EFFLUENT AT MANHOLE B

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	2/Week	24-Hr Comp	
BOD5, Total	Weekly Avg	45 mg/L	2/Week	24-Hr Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	2/Week	24-Hr Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	2/Week	24-Hr Comp	
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Nitrogen, Ammonia Variable Limit		mg/L	2/Week	24-Hr Comp	Daily maximum limit varies with effluent pH. See ammonia section below for

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					limits.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	2/Week	24-Hr Comp	Daily maximum limit varies with effluent pH. See ammonia section below for limits.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	59 mg/L	2/Week	24-Hr Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	59 mg/L	2/Week	24-Hr Comp	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit & monitoring apply May - Sept
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit & monitoring apply May - Sept. See the E. coli Percent Limit section in the permit. Enter the result in the DMR on the last day of the month.
Chlorine, Total Residual	Daily Max	38 ug/L	2/Week	Grab	Limit & monitoring effective May-Sept
Chlorine, Total Residual	Weekly Avg	38 ug/L	2/Week	Grab	
Chlorine, Total Residual	Monthly Avg	38 ug/L	2/Week	Grab	
Phosphorus, Total	Monthly Avg	1.0 mg/L	Weekly	24-Hr Comp	This is an interim MDV limit effect through 03/31/2025. See the MDV/Phosphorus sections and phosphorus schedules
Phosphorus, Total	Monthly Avg	0.6 mg/L	Weekly	24-Hr Comp	This is an interim MDV limit effective 04/01/2025. See the MDV/Phosphorus sections and phosphorus schedules.
Phosphorus, Total		lbs/month	Monthly	Calculated	Report the total monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See Standard Requirements for 'Appropriate Formulas' to calculate the Total Monthly

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum of the total monthly discharges for the calendar year on the Annual report form.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Monitoring required in specific quarters. See Nitrogen Series Monitoring section for more info.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	

Changes from Previous Permit

1) the addition of annual monitoring for total nitrogen, nitrite + nitrate nitrogen and total Kjeldahl nitrogen, 2) the variable daily maximum ammonia limit table has been expanded to include applicable limits at a lower effluent pH, 3) fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits, 4) the ammonia & total suspended solids monitoring frequencies have increased, and 5) the conditional reapproval of a multi-discharger variance (MDV) for phosphorus and the inclusion of the associated compliance schedules to comply with s. 283.16, Wis. Stats. requirements for phosphorus.

Explanation of Limits and Monitoring Requirements

The effluent monitoring frequency for all parameters were considered. Monitoring frequencies are based on the size and type of the facility and are established to best characterize effluent quality and variability, to detect events of noncompliance, and to ensure fairness and consistency in permits issued across the state. Requirements in administrative code (NR 108, 205, 210 and 214 Wis. Adm. Code) and Section 283.55, Wis. Stats. were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. For more information see the March 22, 2021 version of the Bureau of Water Quality Program Guidance Document "Monitoring Frequencies for Individual Wastewater Permits". Using the criteria previously stated, the department has determined monitoring frequency increases are needed for ammonia and total suspended solids; both have been increased from weekly to 2/week.

Limits were determined for Melrose's existing discharge to the Black River using chs. NR 102, 104, 105, 106, 207, 210, 212 and 217 of the Wisconsin Administrative Code (where applicable). For additional information on any of the limits see the December 21, 2023 memo from Ben Hartenbower to Holly Heldstab titled "Water Quality-Based Effluent Limitations for the Melrose Wastewater Treatment Facility WPDES Permit No. WI-0024678"

MUNICIPAL EFFLUENT LIMITS –In accordance with the federal regulation 40 CFR 122.45(d), and to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable.

BOD, TSS and pH: Other than the increase in monitoring frequency for TSS from weekly to 2/week, monitoring and limits for these pollutants correspond to the requirements of the current permit since the facility has not increased the capacity of the wastewater treatment system since the last permit issuance, nor are increases expected during the term of the proposed permit.

Ammonia: Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia. Daily maximum ammonia limits that vary with effluent pH apply year-round. See table below for more information. Samples for ammonia shall be collected at the same time as the pH samples.

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

Disinfection/*E. Coli*/Fecal Coliform: Melrose disinfects the effluent May-Sept using chlorination/dechlorination, prior to discharge to the Black River. Fecal coliform monitoring and limits have been replaced with *Escherichia coli (E. coli*) monitoring and limits. Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying *E. coli* WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for E. coli while facilities are disinfecting during the recreation period and establish effluent limitations for *E. coli* established in s. NR 210.06 (2), Wis. Adm Code. The administrative code rule changes included the following actions: revised the bacteria water quality criteria from fecal coliform to *E. coli* to protect recreation in ch. NR 102, Wis. Adm. Code.; removed fecal coliform criteria for certain individual waters from ch. NR 104, Wis. Adm. Code.; revised permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code.; and, updated approved analytical methods for bacteria in ch. NR 219, Wis. Adm. Code.

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 0.300 monthly average and 0.100 mg/L 6-month average and were to become effective as scheduled unless a variance was granted. For this permit term, the permittee has re-applied for the 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. The permittee qualifies 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. The monthly average interim effluent limit for total phosphorus of 1.0 mg/L carries over from the current permit until the new interim monthly average highest attainable limit (HAC) of 0.6 mg/L becomes effective on 04/01/2025. See the associated compliance schedule for details. The permittee was approved for the MDV on April 12, 2023.

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.

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N): The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which 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 through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019. Monitoring for total nitrogen, nitrite + nitrate nitrogen and TKN is required in the following quarters:

- 2nd quarter (April-June) 2024
- 4th quarter (Oct – Dec) 2025
- 3rd quarter (July-Sept) 2026
- 1st quarter (Jan-March) 2027
- 2nd quarter (April-June) 2028

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. 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.

Whole Effluent Toxicity (WET): Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised in August 2016. (See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at http://dnr.wi.gov/topic/wastewater/wet.html). No WET testing is required because information related to the discharge indicates low to no risk for toxicity**.**

Mercury: The permit application did not require monitoring for mercury because the Melrose Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The concentration in the sludge from 2020 was 0.16 mg/kg. Therefore, no mercury monitoring is required at Outfall 002.

Chloride: Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter VII of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride. Effluent chloride concentrations submitted with the permit application indicate low to no risk for toxicity, therefore no effluent limits or monitoring are required.

Thermal: Requirements for Temperature are included in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature. Thermal discharges must meet the Public Health criterion of 120º F and the Fish & Aquatic Life criteria which are established to protect aquatic communities from lethal and sub-lethal thermal effects. Due to the amount of upstream flow available for dilution in the limit calculation (Qs:Qe >20:1), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code). For lagoon treatment systems of

domestic waste, there is no reasonable potential for the discharge to exceed this limit. Therefore, temperature limits and monitoring are not required.

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)**
003	B	Liquid	Fecal Coliform	Injection & Incorporation	Land Application	Lagoon sludge was last removed 10/17/2020. Sludge removal is not anticipated this permit term.
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? No						
Is a priority pollutant scan required? No						

Sample Point Number: 003- 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	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
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	Required prior to land application
Nitrogen, Ammonia (NH3-N) Total		Percent	Per Application	Composite	Required prior to land application
Phosphorus, Total		Percent	Per Application	Composite	Required prior to land application
Phosphorus, Water Extractable		% of Tot P	Per Application	Composite	Required prior to land application
Potassium, Total Recoverable		Percent	Per Application	Composite	Required prior to land application
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	
PCB Total Dry Wt	High Quality	10 mg/kg	Once	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.

Changes from Previous Permit:

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 2 of the permit. 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.

PFAS – Monitoring is required once during the permit term pursuant s. NR 204.06(2)(b)9., Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

Requirements for 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 is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS".

4 Schedules

4.1 Phosphorus Multi-Discharger Variance Interim Limit (0.6 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 with the 0.6 mg/L monthly average interim phosphorus limit that becomes effective on 04/01/2025.	09/30/2024
Complete Actions: Complete actions identified in the plan and achieve compliance with the monthly average phosphorus limit of 0.6 mg/L. Limit becomes effective 04/01/2025.	03/31/2025

Explanation of Schedule: 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 one year 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.	03/31/2025
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	03/31/2026
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	03/31/2027
Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	03/31/2028
Progress Report #5: Submit a progress report on optimizing removal of phosphorus.	03/31/2029

Explanation of Continued Optimization Schedule: 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.

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 ($64.75 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.	03/01/2025
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2026
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2027
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2028
Annual Verification of Payment #5: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2029
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.	

Explanation of County Payment Schedule: 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 $ 64.75 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).

4.3 Sludge Management Plan

Required Action	Due Date
Submit a Sludge Management Plan: The permittee shall submit a 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.	

Explanation of Sludge Management Plan Schedule: 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 by clearly explains how the sludge will be safely removed, what contingencies are in place, the type of equipment that will be used and how the sludge will be land applied to ensure the proper precautions are in place to prevent any negative impacts to surface water or groundwater.

4.4 Operator Certification

Required Action	Due Date
Operator Certification- SS Subclass: Per s. NR 114.53 Wis. Adm. Code, the permittee shall have an operator in charge certified in the SS Subclass (Sanitary Sewage Collection System) by the due date. Within 30 days of receiving certification, the permittee shall notify the department in writing of the certified operator's name and certification number with the SS Subclass certification.	06/30/2024
Operator Certification- P Subclass: Per s. NR 114.53 Wis. Adm. Code, the permittee shall have an operator in charge certified in the P Subclass (Phosphorus) by the due date. Within 30 days of receiving certification, the permittee shall notify the department in writing of the certified operator's name and certification number with the P Subclass certification.	10/31/2024

Explanation of Schedule: Per s. NR 114.53 Wis. Adm. Code, Melrose WWTF must have an operator in charge that holds all certifications at the proper level.

Special Reporting Requirements

N/A

Other Comments:

Publishing newspaper: The Banner Journal, PO Box 129, Black River Falls, WI 54615

Attachments:

- WQBEL memo from Ben Hartenbower to Holly Heldstab dated December 21, 2023: "Water Quality-Based Effluent Limitations for the Melrose Wastewater Treatment Facility WPDES Permit No. WI-0024678".
- MDV Evaluation Checklist, completed by Matt Claucherty, dated 9/18/2023
- MDV Conditional Approval Letter, completed by Matt Claucherty, dated 9/18/2023

Expiration Date:

March 31, 2029

Justification Of Any Waivers From Permit Application Requirements

N/A

Prepared By: Holly Heldstab, Wastewater Specialist **Date:** February 14, 2024

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: December 21, 2023

TO: Holly Heldstab– WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for the Melrose Wastewater Treatment Facility WPDES Permit No. WI-0024678

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 Melrose Wastewater Treatment Facility in Jackson County. This municipal wastewater treatment facility (WWTF) discharges to the Black River, located in the Big and Douglas Creeks Watershed in the Black River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD_5			45 mg/L	30 mg/L		1
TSS			45 mg/L	30 mg/L		1
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen	Variable		59 mg/L	59 mg/L		3
Bacteria *E. coli*				126#/100 mL geometric mean		4
Chlorine	38 µg/L		38 µg/L	38 µg/L		1
Phosphorus Interim HAC Interim Limit Final WQBEL				 1.0 mg/L 0.6 mg/L 0.300 mg/L	 0.100 mg/L	5
TKN, Nitrate+Nitrite, and Total Nitrogen						6

Footnotes:

1. No changes from the current permit.
2. Monitoring only.

3. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values. These limits apply year-round.

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

4. Bacteria limits apply during the disinfection season of May-September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. Under the phosphorus MDV, the current interim limit of 1.0 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 final WQBELS remain at 0.300 mg/L as a monthly average and 0.100 mg/L as a six-month average.
6. 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).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Benjamin Hartenbower at (715) 225-4705 or Benjamin.Hartenbower@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (2) – Narrative & Map

PREPARED BY: _____ Date: 12/21/2023

Benjamin Hartenbower, PE,
Water Resources Engineer

E-cc:

Jenna Monahan, Wastewater Engineer – WCR/Eau Claire
Geisa Thielen, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Kurt Rasmussen, Water Quality Biologist – WCR/La Crosse
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for the Melrose Wastewater Treatment Facility WPDES Permit No. WI-0002678

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description:
The Village of Melrose owns and operates the Melrose Wastewater Treatment Facility (WWTF) for treatment of domestic wastewater. The WWTF provides secondary treatment via an aerated lagoon system. Ferric chloride is added at the transfer manhole with aeration mixing between the two lagoons for phosphorus reduction. The wastewater then flows by gravity to a chlorine contact tank where sodium hypochlorite is added for disinfection and sodium bisulfite is added for de-chlorination. Treated effluent is discharged through an outfall pipe to the Black River.

Attachment #2 is a map of the area showing the approximate location of Outfall 002.

Existing Permit Limitations
The current permit, expiring on March 31, 2024, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD_5			45 mg/L	30 mg/L	1
TSS			45 mg/L	30 mg/L	1
pH	9.0 s.u.	6.0 s.u.			1
Ammonia Nitrogen	Variable		59 mg/L	59 mg/L	
Fecal Coliform May-September			656#/100 mL geometric mean	400#/100 mL geometric mean	
Chlorine	38 µg/L		38 µg/L	38 µg/L	
Phosphorus Interim HAC Interim Limit				 6.5 mg/L 1.0 mg/L	3

Footnotes:

1. 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.
2. Monitoring only.
3. Under the phosphorus MDV, a highest attainable condition (HAC) limit of 1.0 mg/L was effective May 1, 2023.

Receiving Water Information

- Name: The Black River
- Waterbody Identification Code (WBIC): 1676700
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
  Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: USGS for Station 053813595 at Black River Falls, in the Black River below the dam
  $7\text{-}Q_{10}$ = 96.0 cfs (cubic feet per second)
  $7\text{-}Q_{2}$ = 165 cfs
  Harmonic Mean Flow = 392 cfs using a drainage area of 1590.0 mi^2.

The Harmonic Mean has been estimated based on average flow and the $7\text{-}Q_{10}$ 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).

- Hardness = 42 mg/L as $CaCO_3$. This value represents the geometric mean of 105 samples collected in the Black River between the Hatfield and Black River Falls Dams from 10/04/1989 to 01/21/2015.
- % 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 East Fork Black River at Hatfield is used for this evaluation because there is no data available for the Black River and the East Fork Black River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: There are several other dischargers to the Black 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 Black River is listed as impaired for PCBs, Total Phosphorus, and Mercury.

Effluent Information:

- Design Flow Rates(s):
  Annual Average = 0.054 MGD (Million Gallons per Day)
  For reference, the actual average flow from May 2019 to November 2023 was 0.024 MGD.
- Hardness = 148 mg/L as $CaCO_3$. This value represents the geometric mean of 4 effluent samples collected from 07/25/2023 to 08/15/2023.
- 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 water supply from wells
- Additives: sodium hypochlorite, sodium bisulfite, and ferric chloride
- 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. The permit-required monitoring for Ammonia, Chlorine, and Phosphorus from April 2019 to November 2023 is used in this evaluation.

Attachment #1

Chemical Specific Effluent Data at Outfall 002

Sample Date	Chloride mg/L	Sample Date	Copper µg/L
07/25/2023	163	07/25/2023	5.45
08/01/2023	153	07/28/2023	4.80
08/08/2023	152	08/01/2023	4.70
08/15/2023	158	08/04/2023	4.90
		08/08/2023	5.26
		08/11/2023	6.50
		08/15/2023	5.03
		08/18/2023	5.88
		08/22/2023	6.56
		08/28/2023	4.66
		08/29/2023	4.85
mean	157	1-day P_{99}	7.1
		4-day P_{99}	6.2

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.".

The following table presents the average concentrations and loadings at Outfall 002 from May 2019 to November 2023 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6):

Parameter Averages with Limits

	Average Measurement
BOD_5	14 mg/L*
TSS	9 mg/L*
pH	7.18 s.u.
Ammonia Nitrogen	27.76 mg/L
Fecal Coliform	11#/100 mL
Chlorine	<100 µg/L
Phosphorus	0.497 mg/L

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

Attachment #1

PART 2 – WATER QUALITY-BASED Effluent Limitations for Toxic Substances – EXCEPT AMMONIA NITROGEN

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

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

Acute Limits based on 1-Q_{10}

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

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

Where:

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

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for the Village of Melrose Wastewater Treatment Facility and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)
RECEIVING WATER FLOW = 76.8 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06 (3) (bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P99	1-day MAX. CONC.
Chlorine		19.03		38.1	7.6	<100		
Arsenic		339.8		679.6	135.9	1.17		
Cadmium	148	16.22	0.047	32.4	6.5	<0.084		
Chromium	148	2492.47	0.995	4984.9	997	1.1		
Copper	148	22.53	1.237	45.1			7.1	6.56
Lead	148	156.66	0.647	313.3	62.7	<1.08		
Nickel	148	655.53		1311.1	262.2	7.6		
Zinc	148	170.09	8.012	340.2	68	<26		
Chloride		757		1514	303	157		163

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

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)
RECEIVING WATER FLOW = 24.0 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06 (4) (c), Wis. Adm. Code

SUBSTANCE	REF. HARD. mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P99
Chlorine		7.28		2098.4	419.7	<100	
Arsenic		152.2		43870.8	8774.2	1.17	
Cadmium	42	1.23	0.047	341.1	68.2	<0.084	
Chromium	42	64.33	0.995	18257	3651.4	1.1	
Copper	42	4.88	1.237	1051.3			6.2
Lead	42	11.98	0.647	3267.3	653.5	<1.08	
Nickel	42	24.82		7154.2	1430.8	7.6	
Zinc	42	55.82	8.012	13788.4	2757.7	<26	
Chloride		395		113857	22771	157	

Monthly Average Limits based on Wildlife Criteria (WC)
The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)
RECEIVING WATER FLOW = 98.1 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06 (4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.047	434572	86914	<0.084
Chromium	3818000	0.995	4.485E+09	896975396	1.1
Lead	140	0.647	163693.9	32738.8	<1.08
Nickel	43000		50510676	10102135	7.6

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 98.1 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06 (4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3		15623.07	3124.61	1.17

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

Conclusions and Recommendations: Based on a comparison of the effluent data and calculated effluent limitations, **limits are not required for toxic substances**.

Total Residual Chlorine – When chlorine is added as a disinfectant, effluent limitations are recommended to assure proper de-chlorination. Section NR 210.06(2)(b), Wis. Adm. Code, states, "When chlorine is used for disinfection, the daily maximum total residual chlorine concentration of the discharge may not exceed 0.10 mg/L." Because the WQBELs are more restrictive, they are recommended instead. Specifically, **a daily maximum limit of 38 µg/L is required**. Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. Weekly average limitations are not needed based on reasonable potential as the daily maximum limitations will provide adequate protection of the resource.

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98, Wis. Adm. Code. Based on the annual design flow and lack of nondomestic contributions, it is unlikely that the effluent will contain PFOS or PFOA. **Therefore, monitoring is not recommended**. If information becomes available that indicates PFOS or PFOA may be present in the effluent or source water, the monitoring requirements may change.

Mercury – The permit application did not require monitoring for mercury because the Melrose Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3., Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5). A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 2020 was 0.16 mg/kg, with a maximum reported concentration of 0.33 mg/kg. Therefore, no mercury monitoring is recommended at Outfall 002.

PART 3 – WATER QUALITY-BASED Effluent Limitations for AMMONIA NITROGEN

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

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.
- The maximum expected effluent pH has changed

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

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 1617 sample results were reported from May 2019 to November 2023. The maximum reported value was 7.60 s.u. (Standard pH Units). The effluent pH was 7.50 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.63 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.62 s.u. Therefore, a value of 7.63 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.63 s.u. into the equation above yields an ATC = 16.23 mg/L.

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

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

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	32.45
1-Q_{10}	14875

The 2×ATC method yields the most stringent limits for the Melrose Wastewater Treatment Facility.

The current permit has variable daily maximum effluent limits based on effluent pH. Presented below is an updated table of daily maximum limitations corresponding to the full effluent pH range.

Daily Maximum Ammonia Nitrogen Limits – WWSF/WWFF

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

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)
The ammonia limit calculation also warrants evaluation of weekly and monthly average limits based on chronic toxicity criteria for ammonia, since those limits relate to the assimilative capacity of the receiving water.

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as Warm Water Sport Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

pH = the pH (s.u.) of the receiving water,
E = 0.854,
C = the minimum of 2.85 or $1.45\times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or
$C = 1.45\times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and
T= the temperature (ºC) of the receiving water – (Early Life Stages Present), or
T = the maximum of the actual temperature (ºC) and 7 - (Early Life Stages Absent)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q_{10} (4-Q3, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q_5 (estimated as 85% of the 7-Q_2 if the 30-Q_5 is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 ºC, 25% of the flow is used if the Temperature < 11 ºC, and 50% of the flow is used if the Temperature ≥ 11 ºC but < 16 ºC.

Section NR 106.32 (3), Wis. Adm. Code, provides a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 ºC, during the winter and spring months. Burbot, an early spawning species, are not believed to be present in Black River. So "ELS Absent" criteria apply from October through March, and "ELS Present" criteria will apply from April through September for a WWSF classification.

The "default" basin assumed values are used for temperature and background ammonia concentrations, because minimum ambient data is available. The values for pH are based on data collected from the Black River. These values are shown in the table below, with the resulting criteria and effluent limitations.

Attachment #1

Weekly and Monthly Ammonia Nitrogen Limits – WWSF/WWFF

		April & May	June-September	October-March
Effluent Flow	Qe (MGD)	0.054	0.054	0.054
Background Information	7-Q_{10} (cfs)	96	96	96
	7-Q_2 (cfs)	165	165	165
	Ammonia (mg/L)	0.06	0.03	0.10
	Temperature (°C)	14.4	20.6	10.0
	pH (s.u.)	7.26	7.59	7.42
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	48.0	96.0	24.0
	Reference Monthly Flow (cfs)	70.1	140.3	35.1
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	13.00	6.80	11.63
	Early Life Stages Absent	13.06	6.80	15.56
	30-day Chronic			
	Early Life Stages Present	5.20	2.72	4.65
	Early Life Stages Absent	5.23	2.72	6.23
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	7448.08	7781.19	
	Early Life Stages Absent			4457.24
	Monthly Average			
	Early Life Stages Present	4319.86	4515.67	
	Early Life Stages Absent			2576.65

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from May 2019 to November 2023, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Melrose Wastewater Treatment Facility permit for the respective month ranges.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April & May	June-September	October-March
1-day P_{99}	54.40	67.02	72.31
4-day P_{99}	42.80	41.37	48.39
30-day P_{99}	36.50	28.43	36.11
Mean	33.20	22.45	30.18
Std	7.50	12.80	12.98
Sample size	40	88	104
Range	21 - 55.9	0.22 - 43.2	1.12 - 56.1

Based on this comparison, daily limits are required.

The permit currently has daily maximum, weekly average, and monthly average limits. Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

> (b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

Conclusions and Recommendations

In summary, current ammonia nitrogen limitations and monitoring are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

Final Ammonia Nitrogen Limits

Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
Variable	59	59

PART 4 – 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 Melrose Wastewater Treatment Facility 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 through September. No changes are recommended to the required disinfection season.

Effluent Data

The Melrose Wastewater Treatment Facility has monitored effluent *E. coli* from May 2023 to September 2023 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 11 counts/100 mL. Effluent data never exceeded 410 counts/100 mL. The maximum reported value was 250 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 5 – PHOSPHORUS

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

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a), Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.100 mg/L applies for the Black 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 = 0.100 mg/L for the Black River.
Qs = 100% of the 7-Q_2 of 165 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 = 0.054 MGD = 0.084 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 using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Adm. Code. The median shall be calculated with at least one year of data using samples collected once per month during the period of May through October. 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 following data were considered in estimating the background phosphorus concentration:

SWIMS ID	103109
Station Name	Monitoring station at Hwy N
Waterbody	Black River
Sample Count	6
First Sample	05/12/2015
Last Sample	10/13/2015
Mean	0.206 mg/L
Median	0.192 mg/L

Substituting a background concentration above criteria into the limit calculation equation above would result in a calculated limit that is less than the applicable criterion of 0.100 mg/L. However, s. NR 217.13(7), Wis. Adm. Code, specifies that "if the water quality-based effluent limitation calculated pursuant to the procedures in this section is less than the phosphorus criterion specified in s. NR 102.06, Wis. Adm. Code, for the water body, the effluent limit shall be set equal to the criterion."

The impaired water listing of the Black River also 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 to phosphorus impaired waters.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from May 2019 to November 2023.

	Phosphorus mg/L
1-day P_{99}	1.25
4-day P_{99}	0.82
30-day P_{99}	0.60
Mean	0.50
Std	0.23
Sample size	232
Range	0.11 - 1.62

Reasonable Potential Determination

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

Limit Expression

According to s. NR 217.14 (2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, the effluent limit of 0.100 mg/L may be expressed as a six-month average. If a concentration limitation expressed as a six-month average is included in the permit, a monthly average concentration limitation of 0.300 mg/L, equal to three times the WQBEL calculated under s. NR 217.13, Wis. Adm. Code shall also be included in the permit. The six-month average should be averaged during the months of May – October and November – April.

Mass Limits

Because the discharge is to a surface water that is to or upstream of a phosphorus impaired water, a mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code. This final mass limit shall be 0.100 mg/L × 8.34 × 0.054 MGD = 0.045 lbs/day expressed as a six-month average.

Multi-Discharge Variance Interim Limit
With the permit application, the Village of Melrose has re-applied for the phosphorus multi-discharger variance (MDV). Conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL. The recommended interim limit during the 2nd permit under MDV approval, pursuant to s. 283.16 (6), Wis. Stats., is 0.60 mg/L as a monthly average. A compliance schedule may be appropriate to meet this interim limit but compliance with 0.6 mg/L shall be no later than the end of the reissued permit. The current interim limit of 1.0 mg/L as a monthly average should not be exceeded during the compliance schedule.

PART 6 – WATER QUALITY-BASED Effluent Limitations for THERMAL

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

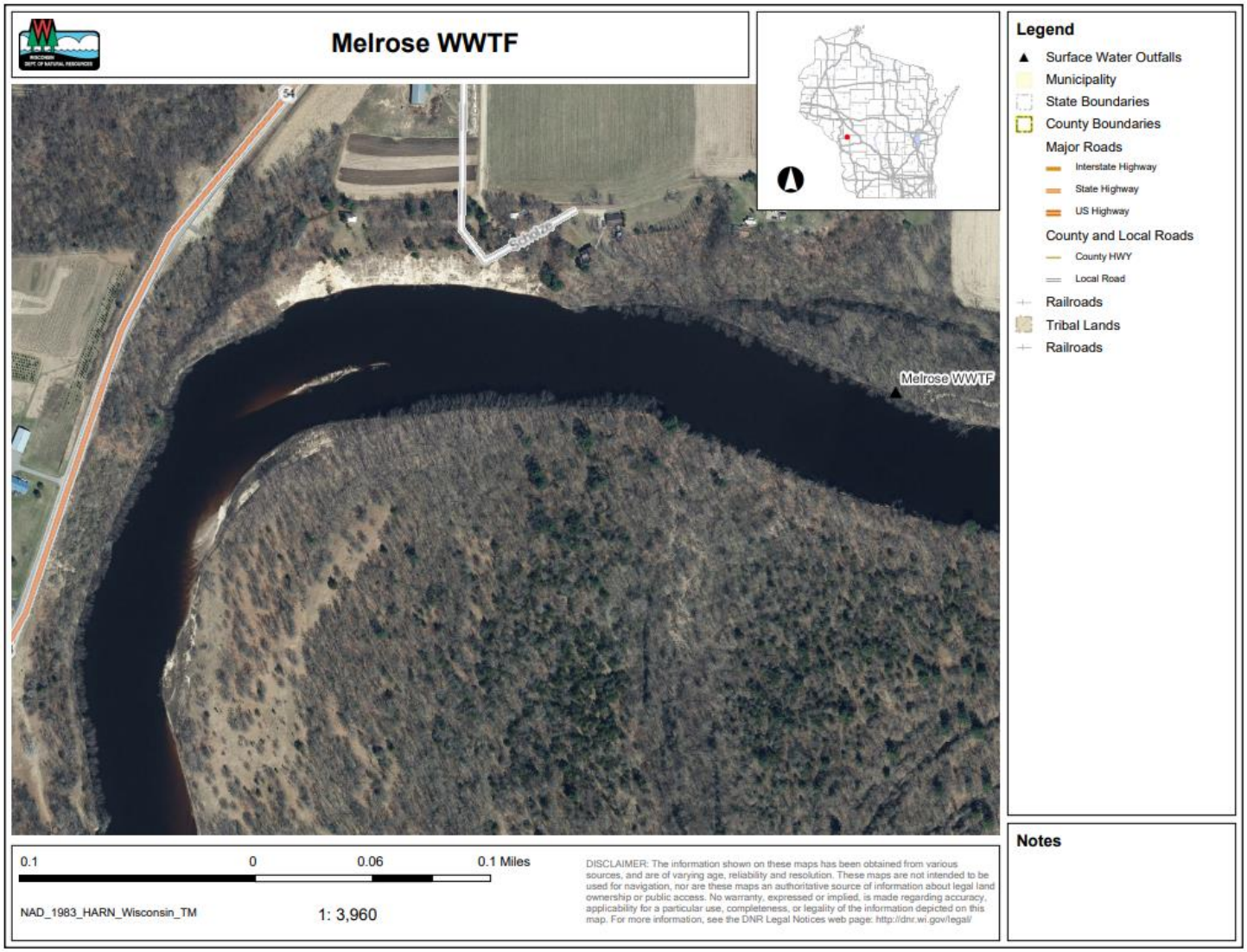
Due to the amount of upstream flow available for dilution in the limit calculation (Qs:Qe >20:1), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code). For lagoon treatment systems of domestic waste, there is no reasonable potential for the discharge to exceed this limit.

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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

- Chronic testing is usually not recommended where the ratio of the 7-Q_{10} to the effluent flow exceeds 100:1 and acute testing is not typically recommended if the ratio exceeds 1000:1. For the Melrose Wastewater Treatment Facility, that ratio is approximately 1149:1. With this amount of dilution, there is believed to be little potential for acute or chronic toxicity effects in the Black River associated with the discharge from the Melrose Wastewater Treatment Facility, so the need for acute and chronic WET testing will not be considered further.

Attachment #2



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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 Melrose

WPDES Permit Number: WI- 0 | 0 | 2 | 4 | 6 | 7 | 8

County: Jackson

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?	
002	0.51	(●) 30-day P99 ( ) Other, specify:	( ) Yes (●) No, why not: Application used older 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?

0.5 mg/L as a monthly average, pursuant to s. 283.16 (7), Wis. Stats.
Target Value = 0.2 mg/L
The interim limit will be reevaluated for any future variance terms

Provide Rationale:

Effluent total phosphorus data from the past three years (9/1/2020 - 8/31/2023, n=149) yields a 30-day P99 value of 0.51 mg/L. This value represents a level achievable during the permit term (most months averaged below this value during the evaluation period), but a schedule may required to address treatment variability. The WQBEL memo may recommend a value different from that shown above.

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.

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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:	$ 5,300,000.00 July 2023 updated 20-year net present worth for tertiary filtration. See note on acceptable compliance costs below	*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:

A final compliance alternatives plan was submitted by MSA professional services in 2016 on behalf of the Village. Alternatives evaluation included trading, adaptive management, groundwater discharge, and regionalization. These were deemed not viable and appear to remain not viable at this time. The plan also provided site-specific cost estimates for tertiary filtration. The July 2023 cost update, submitted with the MDV application, provides an updated compliance cost for use in the economic demonstration.

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.*

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Comments on economic demonstration:

The July 2023 cost update places capital expenses at $3,957,000. The 2016 evaluation included capital costs of $1,094,000.00. This nearly quadrupling of costs over 7 years is unlikely. Based on the mortenson construction index, a 35.9% increase in construction costs has occurred since 2016. Therefore, a conservative approach is to apply the construction index to 2016 costs. This results in $1,497,686 and $56,129 Captial/O&M, respectively. If finances through a 20-year 2.15% CWF loan, annual payments on capital costs are $92,200. Total costs come to $148,329 after O&M. Resident use makes up 85% of the system, so the residential share should be $126,079.65. This cost, divided by 221 user households results in a per-user increase of $570.50. Current rates are 579.22, and future rates would be $1,149.72 as an annual average. This cost is 1.81% of the village's $63,472 median household income. In Jackson County with a secondary indicator score of 6, sewer rates at 1% of MHI meet the primary screener. The applicant meets the primary 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.

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Comments:

Section 5. Payment to the County(ies)

24. At this time, the appropriate per pound payment is: $ 62.56

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 [Sign] [Clear] Date 9/18/2023

A copy of this completed checklist should be saved in SWAMP, and a notification of the decision should be sent to the Phosphorus Implementation Coordinator.

Submit to Coordinator...

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

Tony Evers, Governor
Adam N. Payne, Secretary
Telephone 608-266-2621
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TTY Access via relay - 711

WISCONSIN
DEPT. OF NATURAL RESOURCES

9/18/2023

Ben Boardnan
PO Box 117
Melrose, WI 54642

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Black River in Jackson County
Permittee: Village of Melrose, WPDES WI-0024678

Dear Mr. Boardnan:

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 Melrose Wastewater Treatment Facility in an application dated 8/17/2023. 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 Ramon Knudtson, Village of Melrose
Holly Heldstab, WDNR
Jenna Monahan, WDNR
Tim Elkins, EPA Region 5
Micah Bennett, EPA Region 5