# Permit Fact Sheet

## General Information

| | |
|---|---|
| Permit Number | WI-0021555-11-0 |
| Permittee Name and Address | Village of Saukville Sewer Utility<br>1600 Cottontail Drive, Saukville, WI 53080 |
| Permitted Facility Name and Address | Saukville Village Sewer Utility<br>1600 Cottontail Drive |
| Permit Term | October 01, 2025 to September 30, 2030 |
| Discharge Location | East bank of the Milwaukee River (South), ¼ mile south of the Hwy 33 bridge and approximately 300 feet west of the WWTP UV disinfection building at 1600 Cottontail Drive (Lat: 43.37514° Long: -87.94204°W) |
| Receiving Water | Milwaukee River South (Milwaukee River South Watershed of Milwaukee River Basin) in Ozaukee County |
| Stream Flow ($Q_{7,10}$) | 24 cfs |
| Stream Classification | Warm water sport fish community; non-public water supply. The Milwaukee River South is on the 303(d) impaired waters list for low dissolved oxygen, elevated temperature, pathogens, and PCBs. |
| Discharge Type | Existing and Continuous |
| Annual Average Design Flow (MGD) | 1.61 MGD |
| Industrial or Commercial Contributors | Yes, Jeniel Biotechnology (food processes, flavors and preservatives). Charter Rolling steel mill (produces steel coils) contributes significant hydraulic loading. Arkema plastics and resin manufacturing. |
| Plant Classification | A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory; SS - Sanitary Sewage Collection System |
| Approved Pretreatment Program? | N/A |

## Facility Description

The Village of Saukville Sewer Utility operates a 1.61 MGD wastewater treatment facility that serves a population of approximately 4,400 residents with one categorical industrial user that contributes nearly 20% of the facility's daily flow. The facility is an extended aeration activated sludge wastewater treatment facility (WWTF) and underwent major plant upgrades in 2002 and 2023. Waste stream processes include mechanical fine screening with a compactor, grit removal, biological treatment in a three-ring Orbal oxidation ditch and settling in two final clarifiers. PAC is added prior to the Aqua aerobic filters for phosphorus removal. Disinfection is achieved through an ultraviolet system. Waste sludge from clarifiers is aerobically digested and sent to a belt press. Cake sludge is stored onsite and land applied onto agricultural sites by a contract hauler. The Department has found the facility to be in substantial compliance with the current permit.

# Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on **October 16, 2024**, this facility has been found to be in substantial compliance with their current permit.

**Compliance determination made by Curt Nickels, Wastewater Engineer on November 27, 2024.**

# 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 | 1.1 MGD (2024) | INFLUENT WITH RECYCLED FLOWS: 24-hr flow proportional composite samples shall be collected at the discharge manifold in the sludge pump room. Flow monitoring shall be conducted via mag meter just prior to the grit chamber. Includes recycled flows. |
| 702 | 1.0 MGD (2024) | INFLUENT WITHOUT RECYCLED FLOWS: Flow monitoring shall be conducted via 10" Palmer Bowlus flume upstream of the bar screen. Sample point does not include recycled flows. |
| 001 | 1.2 MGD (2024) | Effluent: 24-hr flow proportional composite sampler located in the last channel of the UV system prior to UV treatment. Grab samples taken at the bottom of the cascade aeration steps. |
| 003 | 130 dry US tons (per 2025 application) | Class B, aerobically digested, belt press thickened, cake sludge. Representative samples shall be taken from the belt press during the pressing process. |
| 110 | N/A | IN PLANT: Collect the field blank using standard sample handling procedures. |

# Permit Requirements

# 1 Influent – Monitoring Requirements

## 1.1 Sample Point Number: 701- INFLUENT With Recycled Flows

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | MGD | Daily | Continuous | |
| BOD5, Total | | mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | | mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Mercury, Total Recoverable | | ng/L | Annual | 24-Hr Flow Prop Comp | See "Mercury Monitoring" section in permit |

### 1.1.1 Changes from Previous Permit:

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

### 1.1.2 Explanation of Limits and Monitoring Requirements

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

## 1.2 Sample Point Number: 702- INFLUENT W/O Recycled Flows

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | MGD | Daily | Measure | |

### 1.2.1 Changes from Previous Permit:

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

# 2 Inplant - Monitoring and Limitations

## 2.1 Sample Point Number: 110- MERCURY FIELD BLANK

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Mercury, Total Recoverable | | ng/L | Annual | Blank | See "Mercury Monitoring" in permit. |

### 2.1.1 Changes from Previous Permit:

In-plant limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

### 2.1.2 Explanation of Limits and Monitoring Requirements

**Mercury Field Blank-** Monitoring is included in the permit pursuant to s. NR 106.145, Wis. Adm. Code. Field blanks must meet the requirements under s. NR 106.145(9) and (10), Wis. Adm. Code. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). Field blanks are required to verify a sample has not been contaminated during collection, transportation or analysis.

**Precipitation** – This is an operational parameter, not a permit requirement and is not listed within the permit but is available on the eDMR. Measuring wet weather events is a tool that assists the facility in maintaining a healthy treatment system.

# 3 Surface Water - Monitoring and Limitations

## 3.1 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 | 3/Week | 24-Hr Flow Prop Comp | November – April |
| BOD5, Total | Weekly Avg | 35 mg/L | 3/Week | 24-Hr Flow Prop Comp | May – October |
| BOD5, Total | Monthly Avg | 30 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| BOD5, Total | Weekly Avg | 470 lbs/day | 3/Week | Calculated | |
| Suspended Solids, Total | Weekly Avg | 45 mg/L | 3/Week | 24-Hr Flow Prop Comp | November |
| Suspended Solids, Total | Weekly Avg | 12 mg/L | 3/Week | 24-Hr Flow Prop Comp | December – October |
| Suspended Solids, Total | Monthly Avg | 12 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | Weekly Avg | 222.24 lbs/day | 3/Week | Calculated | November |
| pH Field | Daily Max | 9.0 su | Daily | Grab | |
| pH Field | Daily Min | 6.0 su | Daily | Grab | |
| Dissolved Oxygen | Daily Max | 5.0 mg/L | 5/Week | Grab | |
| Nitrogen, Ammonia (NH3-N) Total | Daily Max | 9.6 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 6.5 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 9.6 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 9.6 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| E. coli | Geometric Mean - Monthly | 126 #/100 ml | Weekly | Grab | May - September |
| E. coli | % Exceedance | 10 Percent | Monthly | Calculated | May - September. No more than 10% of E.coli bacteria samples collected in any |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| | | | | | calendar month may exceed 410 count/100 mL. |
| Phosphorus, Total | Monthly Avg | 1.0 mg/L | 3/Week | 24-Hr Flow Prop Comp | Technology based effluent limit. |
| Phosphorus, Total | Monthly Avg | 2.83 lbs/day | 3/Week | Calculated | January |
| Phosphorus, Total | Monthly Avg | 3.11 lbs/day | 3/Week | Calculated | February |
| Phosphorus, Total | Monthly Avg | 2.40 lbs/day | 3/Week | Calculated | March |
| Phosphorus, Total | Monthly Avg | 2.76 lbs/day | 3/Week | Calculated | April |
| Phosphorus, Total | Monthly Avg | 2.35 lbs/day | 3/Week | Calculated | May |
| Phosphorus, Total | Monthly Avg | 3.04 lbs/day | 3/Week | Calculated | June |
| Phosphorus, Total | Monthly Avg | 2.55 lbs/day | 3/Week | Calculated | July |
| Phosphorus, Total | Monthly Avg | 2.50 lbs/day | 3/Week | Calculated | August |
| Phosphorus, Total | Monthly Avg | 2.53 lbs/day | 3/Week | Calculated | September |
| Phosphorus, Total | Monthly Avg | 2.05 lbs/day | 3/Week | Calculated | October |
| Phosphorus, Total | Monthly Avg | 2.82 lbs/day | 3/Week | Calculated | November |
| Phosphorus, Total | Monthly Avg | 2.52 lbs/day | 3/Week | Calculated | December |
| Mercury, Total Recoverable | | ng/L | Annual | Grab | See 'Mercury Monitoring' section in permit. |
| PFOS | | ng/L | 1/ 2 Months | Grab | Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule in permit. |
| PFOA | | ng/L | 1/ 2 Months | Grab | Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule in permit. |
| Nitrogen, Total Kjeldahl | | mg/L | Quarterly | 24-Hr Flow Prop Comp | |
| Nitrogen, Nitrite + Nitrate Total | | mg/L | Quarterly | 24-Hr Flow Prop Comp | |
| Nitrogen, Total | | mg/L | Quarterly | Calculated | Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen. |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Acute WET | | TUa | See Listed Qtr(s) | 24-Hr Flow Prop Comp | See 'Wet Testing' Section in permit. |
| Chronic WET | Monthly Avg | 3.4 TUc | See Listed Qtr(s) | 24-Hr Flow Prop Comp | See "Wet Testing' Section in permit. |
| Chloride | | mg/L | Monthly | 24-Hr Flow Prop Comp | Monitoring only in 2029. |

### 3.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

**DO**-monitoring frequency increased.

**Ammonia Nitrogen**-monitoring frequency increased.

**Phosphorus**-all limits became final in last permit. The 1 mg/L remains as a technology-based effluent limit.

**PFOS and PFOA** monitoring was added at a frequency of once every two months in accordance with s. NR 106.98(2) Wis. Adm. Code.

**Chloride** monitoring was changed to 2029.

### 3.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated March 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. DO and Ammonia Nitrogen monitoring frequency was increased to meet the minimum frequencies listed in the guidance.

**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 and monthly average limits whenever practicable.

**TSS**-The Milwaukee River Basin TMDL was approved by the EPA on March 9, 2018 and has wasteload allocations (WLAs) for total suspended solids (TSS). Consistent with Section 6.4.1 of the Milwaukee River TMDL Report, in cases where the equivalent TSS concentration limit is < 12 mg/L, the effluent limit will be expressed as a concentration of 12 mg/L monthly average. November has an equivalent weekly average TSS concentration limit greater than 12 mg/L, so the weekly mass TMDL limit for November is continued along with the current weekly concentration limit of 45 mg/L. The 45 mg/L limit must be retained to meet antibacksliding requirements in ch. NR 207, Wis. Adm. Code.

**Phosphorus-Technology-Based Effluent Limit**

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

approved alternative concentration limit.

**Phosphorus-The Milwaukee River Basin TMDL** is an integrated watershed management planning approach that sets Waste Load Allocations (WLAs) for all permitted point sources and Load Allocations (LAs) for all contributing nonpoint sources to impaired waterbodies as required through Section 303(d) of the Clean Water Act. Calculated monthly average mass-based effluent limits replace the former s. NR 217.13 Wis. Adm. Code limits for phosphorus and are consistent with how the mass-based limits are calculated for other dischargers in the Milwaukee River Basin. These limits are already effective, and no changes are recommended in the reissued permit.

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

**PFOS and PFOA** – NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for major municipal dischargers with an average flow rate greater than 1 MGD but less than 5 MGD, at a minimum sample effluent once every two-months for PFOS and PFOA pursuant s. NR 106.98(2)(b), Wis. Adm. Code.

A sample frequency of 1/2 months means one sample is taken during any two-month period. Examples of 1/2 month sample would be every other month (Jan, March, May, etc.) or back-to-back months with a break in between (February & March, May & June, Aug & Sept, etc.). DMR Short Forms will be generated for the following time periods: January-February, March-April, May-June, July-August, September-October, and November-December. At a minimum one sample result will be present on each form.

The initial determination of the need for sampling shall be conducted for up to two years in order to determine if the permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code.

# 4 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 | Class B | Cake | Fecal Coliform | Incorporation | Land Application | 130 dry US tons (per 2025 application) |
| 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**<br><br>If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in land applying sludge from this facility | | | | | | |
| Is a priority pollutant scan required? **No, design flow is less than 5 MGD** | | | | | | |

| 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)** |
| Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD. | | | | | | |

## 4.1 Sample Point Number: 003- CAKE SLUDGE

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Solids, Total | | Percent | Annual | Composite | |
| Arsenic Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Arsenic Dry Wt | High Quality | 41 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | Ceiling | 85 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | High Quality | 39 mg/kg | Annual | Composite | |
| Copper Dry Wt | Ceiling | 4,300 mg/kg | Annual | Composite | |
| Copper Dry Wt | High Quality | 1,500 mg/kg | Annual | Composite | |
| Lead Dry Wt | Ceiling | 840 mg/kg | Annual | Composite | |
| Lead Dry Wt | High Quality | 300 mg/kg | Annual | Composite | |
| Mercury Dry Wt | Ceiling | 57 mg/kg | Annual | Composite | |
| Mercury Dry Wt | High Quality | 17 mg/kg | Annual | Composite | |
| Molybdenum Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Nickel Dry Wt | Ceiling | 420 mg/kg | Annual | Composite | |
| Nickel Dry Wt | High Quality | 420 mg/kg | Annual | Composite | |
| Selenium Dry Wt | Ceiling | 100 mg/kg | Annual | Composite | |
| Selenium Dry Wt | High Quality | 100 mg/kg | Annual | Composite | |
| Zinc Dry Wt | Ceiling | 7,500 mg/kg | Annual | Composite | |
| Zinc Dry Wt | High Quality | 2,800 mg/kg | Annual | Composite | |
| Nitrogen, Total Kjeldahl | | Percent | Annual | Composite | |
| Nitrogen, Ammonium (NH4-N) Total | | Percent | Annual | Composite | |
| Phosphorus, Total | | Percent | Annual | Composite | |
| Phosphorus, Water | | % of Tot P | Annual | Composite | |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Extractable | | | | | |
| Potassium, Total Recoverable | | Percent | Annual | Composite | |
| PCB Total Dry Wt | Ceiling | 50 mg/kg | Once | Composite | Sample once during 2026 |
| PCB Total Dry Wt | High Quality | 10 mg/kg | Once | Composite | Sample once during 2026 |
| PFOA + PFOS | | ug/kg | Once | Calculated | |
| PFAS Dry Wt | | | Once | Grab | Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information. |

### 4.1.1 Changes from Previous Permit:

**PCB** -Monitoring once in 2026.

**PFAS** –Monitoring is required **annually** pursuant to s. NR 204.06(2)(b)9, Wis. Adm. Code.

### 4.1.2 Explanation of Limits and Monitoring Requirements

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

**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."

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.

# 5 Compliance Schedule

## 5.1 PFOS and PFOA Minimization Plan

| Required Action | Due Date |
|---|---|
| **Report on Effluent Discharge:** Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), | 09/30/2026 |

| | |
|---|---|
| Wis. Adm. Code.<br><br>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. | |
| **Report on Effluent Discharge and Evaluation of Need:** Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan.<br><br>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.<br><br>The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan.<br><br>If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued.<br><br>If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit. | 09/30/2027 |

## 5.2 Land Application Management Plan

A management plan is required for the land application system.

| Required Action | Due Date |
|---|---|
| **Land Application Management Plan Submittal:** Submit an update to the management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes. | 09/30/2026 |

# Attachments

Water Quality Based Effluent Limits Memo -March 28, 2025

# Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

**Prepared By: Susan Eichelkraut Wastewater Specialist Date: July 30, 2025**

# CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 03/28/2025

TO: Bryan Hartsook - SER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for Saukville Village Sewer Utility
WPDES Permit No. WI-0021555-11

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 Saukville Sewer Utility in Ozaukee County. This municipal wastewater treatment facility (WWTF) discharges to the Milwaukee River, located in the Lower Milwaukee River Watershed in the Milwaukee River Basin. This discharge is included in the Milwaukee River Basin TMDL as approved by EPA on 03/09/2018. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Footnotes |
|---|---|---|---|---|---|
| Flow Rate | | | | | 1,2 |
| $BOD_5$<br>November – April<br>May – October | | | <br>45 mg/L<br>35 mg/L<br>470 lbs/day | <br>30 mg/L<br>30 mg/L | 1 |
| TSS<br>November<br>Dec – Oct | | | <br>45 mg/L<br>See Table | <br>See Table<br>See Table | 3 |
| pH | 9.0 s.u. | 6.0 s.u. | | | 1 |
| Dissolved Oxygen | | 5.0 mg/L | | | 1 |
| Ammonia Nitrogen<br>April – May<br>June – September<br>October – March | <br>9.6 mg/L<br>9.6 mg/L<br>9.6 mg/L | | <br>**9.6 mg/L**<br>**9.6 mg/L**<br>**9.6 mg/L** | <br>**9.6 mg/L**<br>**9.6 mg/L**<br>**6.5 mg/L** | 4 |
| *E. coli*<br>May – September | | | | 126 #/100 mL<br>geometric mean | 5 |
| Phosphorus<br>TBEL<br>TMDL | | | | <br>1.0 mg/L<br>See Table | 1,3 |
| Mercury | | | | | 1,2 |
| PFOS & PFOA | | | | | 6 |
| TKN,<br>Nitrate+Nitrite, and<br>Total Nitrogen | | | | | 1,7 |
| Acute WET | | | | | 8,9 |
| Chronic WET | | | | 3.4 TUc | 8,9 |
| Chloride | | | | | 10 |

Footnotes:

1. No changes from the current permit.

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2. Monitoring only.
3. The TSS and phosphorus limits below are based on the Total Maximum Daily Load (TMDL) for the Milwaukee River Basin to address phosphorus water quality impairments within the TMDL area.

| Month | Monthly Average TP Effluent Limit (lbs/day) | Weekly Average TSS Effluent Limit (mg/L) | Weekly Average TSS Effluent Limit (lbs/day) | Monthly Average TSS Effluent Limit (mg/L) |
|---|---|---|---|---|
| Jan | **2.83** | **12** | **-** | **12** |
| Feb | **3.11** | **12** | **-** | **12** |
| Mar | **2.40** | **12** | **-** | **12** |
| Apr | **2.76** | **12** | **-** | **12** |
| May | **2.35** | **12** | **-** | **12** |
| Jun | **3.04** | **12** | **-** | **12** |
| Jul | **2.55** | **12** | **-** | **12** |
| Aug | **2.50** | **12** | **-** | **12** |
| Sep | **2.53** | **12** | **-** | **12** |
| Oct | **2.05** | **12** | **-** | **12** |
| Nov | **2.82** | | **222.24** | **12** |
| Dec | **2.52** | **12** | **-** | **12** |

4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. Additional bacteria limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. PFOS and PFOA monitoring is recommended at a frequency of once every two months in accordance with s. NR 106.98(2), Wis. Adm. Code.
7. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all municipal major permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate ($NO_3$), nitrite ($NO_2$), and total Kjeldahl nitrogen (TKN) (all expressed as N).
8. Annual acute and chronic WET testing is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 29%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 30%, 10%, 3% & 1%. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a grab sample collected from the Milwaukee River.
9. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge. Testing should continue after the permit expiration date (until the permit is reissued).
10. Monitoring at a frequency to ensure that at least 11 samples are available at the next permit issuance.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (4) – Narrative, Outfall Map, 2020 Ammonia Limits Calculations, & Thermal Table

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Attachment #1

**Water Quality-Based Effluent Limitations for**
**Saukville Village Sewer Utility**

**WPDES Permit No. WI-0021555-11**

Prepared by: Nicole Krueger

## PART 1 – BACKGROUND INFORMATION

### Facility Description

The Village of Saukville Sewer Utility serves a population of approximately 4400 with one categorical industrial user that contributes about 25% of the facility's daily flow. The facility is an extended aeration activated sludge wastewater treatment facility (WWTF) and underwent a major plant upgrade in 2002. Waste stream processes include mechanical fine screening, grit removal, biological treatment in a three-ring Orbal oxidation ditch and settling in two final clarifiers. Ferrous chloride is added prior to the clarifier for phosphorus removal. Disinfection is achieved through an ultraviolet system.

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

### Existing Permit Limitations

The current permit, expiring on 09/30/2025, includes the following effluent limitations and monitoring requirements.

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Footnotes |
|---|---|---|---|---|---|
| Flow Rate | | | | | 1 |
| $BOD_5$<br>November – April<br>May – October | | | <br>45 mg/L<br>35 mg/L<br>470 lbs/day | <br>30 mg/L<br>30 mg/L | 2,3 |
| TSS<br>November<br>Dec – Oct | | | <br>45 mg/L<br>Table | <br>Table<br>Table | 4 |
| pH | 9.0 s.u. | 6.0 s.u. | | | 2 |
| Dissolved Oxygen | | 5.0 mg/L | | | 2 |
| Ammonia Nitrogen<br>April – May<br>June – September<br>October – March | <br>9.6 mg/L<br>9.6 mg/L<br>9.6 mg/L | | <br>**9.6 mg/L**<br>**9.6 mg/L**<br>**9.6 mg/L** | <br>**9.6 mg/L**<br>**9.6 mg/L**<br>**6.5 mg/L** | 5 |
| *E. coli* | | | | 126 #/100 mL geometric mean | 2,6 |
| Mercury | | | | | 1 |
| Phosphorus<br>TBEL<br>TMDL | | | | <br>1.0 mg/L<br>Table | 4 |
| TKN, Nitrate+Nitrite, and Total Nitrogen | | | | | 1 |
| Acute WET | | | | | 7 |

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| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Footnotes |
|---|---|---|---|---|---|
| Chronic WET | | | | 3.4 $TU_c$ | 7 |

Footnotes:

1. Monitoring only.
2. 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.
3. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
4. The TSS and phosphorus limits in the table below are based on the Total Maximum Daily Load (TMDL) for the Milwaukee River Basin to address phosphorus water quality impairments within the TMDL area.

| Month | Monthly Average TP Effluent Limit (lbs/day) | Weekly Average TSS Effluent Limit (mg/L) | Weekly Average TSS Effluent Limit (lbs/day) | Monthly Average TSS Effluent Limit (mg/L) |
|---|---|---|---|---|
| Jan | **2.83** | **12** | **-** | **12** |
| Feb | **3.11** | **12** | **-** | **12** |
| Mar | **2.40** | **12** | **-** | **12** |
| Apr | **2.76** | **12** | **-** | **12** |
| May | **2.35** | **12** | **-** | **12** |
| Jun | **3.04** | **12** | **-** | **12** |
| Jul | **2.55** | **12** | **-** | **12** |
| Aug | **2.50** | **12** | **-** | **12** |
| Sep | **2.53** | **12** | **-** | **12** |
| Oct | **2.05** | **12** | **-** | **12** |
| Nov | **2.82** | | **222.24** | **12** |
| Dec | **2.52** | **12** | **-** | **12** |

5. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
6. Additional bacteria limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
7. Annual acute and chronic WET testing is required in the current permit. The IWC for chronic WET was 29%.

**Receiving Water Information**

- Name: Milwaukee River
- Waterbody Identification Code (WBIC): 15000
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. Note: Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-$Q_{10}$ and 7-$Q_2$ values are from USGS for Station M19, where Outfall 001 is located.

  7-$Q_{10}$ = 24 cubic feet per second (cfs)

7-$Q_2$ = 52 cfs
90-$Q_{10}$ = 44.2 cfs
Harmonic Mean Flow = 105 cfs using a drainage area of 457 $mi^2$

- Hardness = 301 mg/L as $CaCO_3$. This value represents the geometric mean of data from chronic WET (n=4) testing from 12/01/2020 – 03/07/2023.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%. A mixing zone is not allowed for discharges of bioaccumulating compounds of concern (BCCs) in the Great Lakes system as described in s. NR 106.06(2)(br), Wis. Adm. Code.
- Source of background concentration data: Metals data from the Milwaukee River at Batavia is used for this evaluation. This data is from the '*DNR Water Quality Rules Implementation Plan', Chapter 4, January 1998; Background of the Milwaukee River at Batavia*. Background chloride data from the Milwaukee River at Hwy 33 in Saukville. 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 Milwaukee 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 Milwaukee River at the outfall is 303(d) listed as impaired for PCBs and total phosphorus.

**Effluent Information**

- Design flow rate(s):
  Annual average = 1.61 million gallons per day (MGD)
  Peak daily = 3.41 MGD
  Peak weekly = 2.97 MGD
  Peak monthly = 2.51 MGD
  For reference, the actual average flow from 01/01/2020 – 02/28/2025 was 1.02 MGD.
- Hardness = 580 mg/L as $CaCO_3$. This value represents the geometric mean of four samples collected in August 2024 which were reported on the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Domestic wastewater with 2 industrial contributors (Charter Rolling and Jeniel Biotech).
- Water supply: Municipality waterworks and private wells.
- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the "priority pollutants" except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code. The permit-required monitoring for mercury, phosphorus, and ammonia is used in this evaluation.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

**Chloride Effluent Data**

| | Chloride (mg/L) |
|---|---|
| 1-day $P_{99}$ | 997 |
| 4-day $P_{99}$ | 786 |

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| | Chloride (mg/L) |
|---|---|
| 30-day $P_{99}$ | 670 |
| Mean | 610 |
| Std | 137 |
| Sample size | 52 |
| Range | 362 – 960 |
| Dates | 01/13/2019 – 02/21/2025 |

**Mercury Effluent Data**

| Sample Date | Mercury (ng/L) |
|---|---|
| 05/27/2020 | <0.20 |
| 08/12/2021 | <0.20 |
| 06/01/2022 | <0.20 |
| 03/08/2023 | <0.50 |
| 02/22/2024 | <0.20 |
| Average* | 0 |

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

The following table presents the average concentrations and loadings at Outfall 001 from 01/01/2020 – 02/28/2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

**Parameters with Effluent Limits**

| | Average Measurement | Average Mass Discharged |
|---|---|---|
| $BOD_5$ | 2.62 mg/L* | 18 lbs/day |
| TSS | 2.68 mg/L* | 20 lbs/day |
| pH field | 7.68 s.u. | |
| Dissolved Oxygen | 8.91 mg/L | |
| Ammonia Nitrogen | 0.02 mg/L* | |
| *E. coli* | 1.6 #/100 mL** | |
| Phosphorus | 0.34 mg/L* | 1.41 lbs/day |

*Results below the limit of detection (LOD) were included as zeroes in calculation of average.
** The average measurement for bacteria is calculated as a geometric mean. Values reported below the LOD are replaced with a value of 1 for the calculation of the geometric mean.

## 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 99$^{th}$ 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 Saukville, 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 for all the detected substances. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury (ng/L).

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**

RECEIVING WATER FLOW = 19.2 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 $P_{99}$ | 1-day MAX. CONC. |
|---|---|---|---|---|---|---|---|---|
| Arsenic | | 340 | | 680 | 136 | 2.1 | | |
| Cadmium | 457 | 58.9 | 0.02 | 118 | 23.6 | <0.15 | | |
| Chromium | 301 | 4446 | 0.5 | 8892 | 1778 | <2.5 | | |
| Copper | 495 | 70.2 | 1.26 | 140 | 28.1 | <1.9 | | |
| Lead | 356 | 365 | 0.65 | 729 | 146 | <0.24 | | |
| Mercury (ng/L) | | 830 | 4.11 | 1660 | 332 | <0.2 | | |
| Nickel | 268 | 1080 | | 2161 | 432 | 2.5 | | |
| Zinc | 333 | 345 | 2.61 | 689 | 138 | <10.3 | | |

| SUBSTANCE | REF. HARD.* mg/L | ATC | MEAN BACK-GRD. | MAX. EFFL. LIMIT** | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 1-day $P_{99}$ | 1-day MAX. CONC. |
|---|---|---|---|---|---|---|---|---|
| Chloride (mg/L) | | 757 | 83.5 | 1514 | | | 997 | 960 |

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.
* * 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 =6.0 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 $P_{99}$ |
|---|---|---|---|---|---|---|---|
| Arsenic | | 152 | | 519 | 104 | 2.1 | |
| Cadmium | 175 | 3.82 | 0.02 | 13.0 | 2.59 | <0.15 | |
| Chromium | 301 | 326 | 0.5 | 1109 | 222 | <2.5 | |
| Copper | 301 | 26.6 | 1.26 | 87.6 | 17.5 | <1.9 | |
| Lead | 301 | 81.2 | 0.65 | 275 | 55.1 | <0.24 | |
| Mercury (ng/L) | | 440 | 4.11 | 1490 | 298 | <0.2 | |
| Nickel | 268 | 120 | | 410 | 81.9 | 2.5 | |
| Zinc | 301 | 316 | 2.61 | 1069 | 214 | <10.3 | |
| Chloride (mg/L) | | 395 | 83.5 | 1145 | | | 786 |

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

**Monthly Average Limits based on Wildlife Criteria (WC)**

RECEIVING WATER FLOW = 11 cfs (¼ of the 90-$Q_{10}$), as specified in s. NR 106.06(4), Wis. Adm. Code

| SUBSTANCE | WC | MEAN BACK-GRD. | MO'LY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 30-day $P_{99}$ |
|---|---|---|---|---|---|---|
| Mercury (ng/L) | 1.3 | 4.11 | 1.3 | 0.26 | <0.2 | |

**Monthly Average Limits based on Human Threshold Criteria (HTC)**

RECEIVING WATER FLOW = 26 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 | 0.02 | 4274 | 854.8 | <0.15 |
| Chromium (+3) | 3818000 | 0.5 | 44106226 | 8821245 | <2.5 |
| Lead | 140 | 0.65 | 1610 | 322.1 | <0.24 |
| Mercury (ng/L) | 1.5 | 4.11 | 1.5 | 0.30 | <0.5 |
| Nickel | 43000 | | 496744 | 99349 | 2.5 |

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**Monthly Average Limits based on Human Cancer Criteria (HCC)**

RECEIVING WATER FLOW = 26 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 | | 154 | 30.7 | 2.1 |

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

**Conclusions and Recommendations**

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are not required for any toxic substances in this section. Limits and/or monitoring recommendations are made in the paragraphs below:

Chloride – Considering available effluent data from the current permit term (01/13/2019 – 02/21/2025), the 1-day $P_{99}$ chloride concentration is 997 mg/L, and the 4-day $P_{99}$ of effluent data is 786 mg/L.

These effluent concentrations are below the calculated WQBELs for chloride, therefore no effluent limits are needed. **Chloride monitoring is recommended to ensure that at least 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.**

Mercury – The WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L.

The current permit requires annual monitoring of the influent and effluent for total recoverable mercury. A total of 5 effluent sampling results are available from 05/27/2020 – 02/22/2024 for total recoverable mercury. The average concentration was <0.2 ng/L. Because the average of available data is less than 1/5$^{th}$ the most stringent WQBEL of 1.3 ng/L, **no WQBEL for mercury is required for permit reissuance. A minimum of annual mercury monitoring is recommended for permit reissuance.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Available monitoring sample data from Saukville Waterworks (PWS ID: 24601346) is provided in the table below:

**Water Supply PFAS Data**

| Sample Date | Sample ID | Well # | PFOS (ng/L) | PFOA (ng/L) |
|---|---|---|---|---|
| 02/11/2025 | MW4 | BG659 | 23 | 1.2 |
| 02/11/2025 | MW1 | BG656 | 4.5 | 2.9 |
| 02/11/2025 | MW5 | KW480 | 0 | 8.7 |
| 10/21/2024 | MW4 | BG659 | 28 | 1.5 |
| 10/08/2024 | MW1 | BG656 | 4.9 | 2.7 |

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| Sample Date | Sample ID | Well # | PFOS (ng/L) | PFOA (ng/L) |
|---|---|---|---|---|
| 07/10/2024 | MW1 | BG656 | 5.9 | 3.3 |
| 07/10/2024 | MW4 | BG659 | 23 | 1.3 |
| 04/24/2024 | MW4 | BG659 | 32 | 1.9 |
| 04/08/2024 | MW1 | BG656 | 6.5 | 4.3 |
| 02/12/2024 | MW5 | KW480 | 0 | 0.78 |
| 02/06/2024 | MW1 | BG656 | 5.8 | 3.8 |
| 02/06/2024 | MW4 | BG659 | 32 | 1.5 |
| 10/11/2023 | MW4 | BG659 | 27 | 1.3 |
| 10/11/2023 | MW5 | KW480 | 0 | 1.1 |
| 10/11/2023 | MW1 | BG656 | 5.4 | 2.6 |
| 08/02/2023 | MW4 | BG659 | 0 | 1.4 |
| 08/02/2023 | MW1 | BG656 | 28 | 1.5 |
| 08/02/2023 | MW5 | KW480 | 5.4 | 2.9 |
| 05/16/2023 | MW1 | BG656 | 5.7 | 3.2 |
| 05/16/2023 | MW4 | BG659 | 31 | 1.5 |
| 05/15/2023 | MW5 | KW480 | 0 | 9.2 |
| 05/15/2023 | MW3 | BG658 | 0 | 0 |
| 05/15/2023 | MW6 | YO930 | 0 | 0 |
| 07/21/2022 | MW4 | BG659 | 27.7 | 1.25 |
| 07/19/2022 | MW1 | BG656 | 4.64 | 1.91 |
| 06/27/2022 | MW3 | BG658 | 0 | 0 |
| 06/21/2022 | MW4 | BG659 | 25.2 | 0 |
| 06/21/2022 | MW6 | YO930 | 0 | 0 |
| 06/21/2022 | MW1 | BG656 | 6.29 | 2.22 |
| 06/21/2022 | MW5 | KW480 | 0 | 5.24 |
| | | Average = | 11 | 2.3 |

The limited data above shows the municipal water supply is above 1/5$^{th}$ of the applicable PFOS criteria. Previous monitoring produced a PFOS result of 2.60 ng/L and a PFOA result of 3.59 ng/L. The PFOS result is greater than one fifth of the respective criteria for each substance. Based on the effluent flow rate, the available PFOS/PFOA monitoring data, and known levels of PFOS/PFOA in the source water, **PFOS and PFOA monitoring is recommended at a once every two months frequency.**

## 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.
- 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 1886 sample results were reported from 01/02/2020 – 02/28/2025. The maximum reported value was 8.90 s.u. (Standard pH Units). The effluent pH was 8.43 s.u. or less 99% of the time. The 1-day $P_{99}$, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.19 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.18 s.u. Therefore, a value of 8.2 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.2 s.u. into the equation above yields an ATC = 5.7 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 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 | 11 |
| 1-$Q_{10}$ | 50 |

The 2×ATC method yields the most stringent limits for Saukville.

This limit is greater than the current daily maximum limit of 9.6 mg/L. If Saukville would like to request an increase to the existing permit limits an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter by parameter basis and includes consideration of operations, maintenance and temporary upsets. Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limits must be continued in the reissued permit. The Department would be unable to increase the limit due to the lack of need as shown via the antidegradation rule (ch. NR 207, Wis. Adm. Code) because the highest reported concentration was 1.05 mg/L during the previous permit term. **No changes are recommended in any of the permit limits for ammonia.**

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**Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)**

**The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change** because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in Attachment #3.

**Effluent Data**

The following table evaluates the statistics based upon ammonia data reported from 01/05/2020 – 02/24/2025.

**Ammonia Nitrogen Effluent Data**

| Ammonia Nitrogen mg/L | April – September | October - March |
|---|---|---|
| 1-day $P_{99}$ | 0.27 | 0.12 |
| 4-day $P_{99}$ | 0.16 | 0.06 |
| 30-day $P_{99}$ | 0.07 | 0.03 |
| Mean* | 0.02 | 0.01 |
| Std | 0.09 | 0.04 |
| Sample size | 261 | 278 |
| Range | <0.012 - 1.049 | <0.012 - 0.3 |

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

**Reasonable Potential**

The need to include ammonia limits in Saukville's permit is determined by calculating 99th upper percentile (or $P_{99}$) values for ammonia and comparing those to the calculated limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. However, since the permit currently has weekly and monthly average limits year-round, **the limits must be retained regardless of reasonable potential**, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

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

**Conclusions and Recommendations**

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code. Limits to meet the requirements in s. NR 106.07, Wis. Adm. Code, are denoted in bold text.

**Final Ammonia Nitrogen Limits**

| | Daily Maximum mg/L | Weekly Average mg/L | Monthly Average mg/L |
|---|---|---|---|
| April – September | 9.6 | **9.6** | **9.6** |
| October – March | 9.6 | **9.6** | 6.5 |

## PART 5 – PHOSPHORUS

**Technology-Based Effluent Limit**

Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities

that discharge greater than 150 pounds of total phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

**Because Saukville currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit.**

**Milwaukee River TMDL**
The Milwaukee River Basin TMDL report addresses phosphorus water quality impairments within the basin and provides waste load allocations (WLAs) required to meet water quality standards. Effluent limitations based on these WLAs must be included in WPDES permits according to s. NR 217.16, Wis. Adm. Code.

The monthly average total phosphorus (TP) effluent limits in lbs/day are calculated based on the maximum monthly phosphorus WLA given in pounds per month as suggested in the TMDL report and implementation guidance. The monthly maximum TP WLAs for this facility are found in Appendix A of the Milwaukee River Basin TMDL report. **The monthly average limits shown in the table below are recommended in place of the s. NR 217.13, Wis. Adm. Code, limit, and should be expressed in pounds per day.**

**Total Phosphorus Wasteload Allocations and Effluent Limits**

| Month | Monthly Maximum TP WLA[1] (lbs/month) | Days Per Month | Monthly Average TP Effluent Limit[2] (lbs/day) |
|---|---|---|---|
| Jan | 87.64 | 31 | **2.83** |
| Feb | 87.07 | 28 | **3.11** |
| Mar | 74.46 | 31 | **2.40** |
| Apr | 82.77 | 30 | **2.76** |
| May | 72.74 | 31 | **2.35** |
| Jun | 91.13 | 30 | **3.04** |
| Jul | 79.07 | 31 | **2.55** |
| Aug | 77.54 | 31 | **2.50** |
| Sep | 75.80 | 30 | **2.53** |
| Oct | 63.59 | 31 | **2.05** |
| Nov | 84.66 | 30 | **2.82** |
| Dec | 78.21 | 31 | **2.52** |

Footnotes:
1- Milwaukee River Basin TMDL Appendix A. Monthly Total Suspended Solids Wasteload Allocation by Permitted Point Source. Table A.17 for the Milwaukee River Watershed
2- Monthly Average Total P effluent limit (lbs/day) = monthly Total P WLA (lbs/month) ÷ days per month

**These limits are already effective and no changes are recommended in the reissued permit.**

**Effluent Data**
The following table summarizes effluent total phosphorus monitoring data from 01/05/2020 – 06/25/2024 for the concentration and 07/01/2024 – 02/25/2025 for the mass loading.

Attachment #1

**Total Phosphorus Effluent Data**

| | Concentration mg/L | Mass lbs/day |
|---|---|---|
| 1-day $P_{99}$ | 0.74 | 2.95 |
| 4-day $P_{99}$ | 0.52 | 2.32 |
| 30-day $P_{99}$ | 0.41 | 1.97 |
| Mean | 0.35 | 1.79 |
| Std | 0.13 | 0.41 |
| Sample size | 674 | 104 |
| Range | 0.148 - 0.734 | 1.05 - 2.95 |

## PART 6 – TOTAL SUSPENDED SOLIDS

The Milwaukee River Basin TMDL also has wasteload allocations (WLAs) for total suspended solids (TSS). For a municipal facility, the limits for TSS must be expressed as weekly and monthly averages. The current permit includes a monthly average limit of 12 mg/L year-round and weekly average limits of 45 mg/L and 222.24 lbs/day for November and 12 mg/L for December – October.

The monthly TMDL WLAs according to the TMDL report is shown in the table below.

**Total Suspended Solids Wasteload Allocations**

| Month | Monthly TSS WLA[1] (lbs/month) |
|---|---|
| Jan | 3,494.38 |
| Feb | 2,433.93 |
| Mar | 2,377.64 |
| Apr | 2,495.66 |
| May | 2,872.92 |
| Jun | 3,508.78 |
| Jul | 2,922.71 |
| Aug | 2,479.73 |
| Sep | 3,209.79 |
| Oct | 3,332.90 |
| Nov | 5,128.58 |
| Dec | 3,593.46 |

Footnotes:
1- Milwaukee River Basin TMDL Appendix A. Monthly Total Suspended Solids Wasteload Allocation by Permitted Point Source. Table A.19 for the Milwaukee River Watershed

Consistent with Section 6.4.1 of the Milwaukee River TMDL Report, in cases where the equivalent TSS concentration limit is $\leq$ 12 mg/L, the effluent limit will be expressed as a concentration of 12 mg/L monthly average. November has an equivalent weekly average TSS concentration limit greater than 12 mg/L, so the weekly mass TMDL limit for November is continued along with the current weekly concentration limit of 45 mg/L. The 45 mg/L limit must be retained to meet antibacksliding requirements in ch. NR 207, Wis. Adm. Code.

Attachment #1

**The currently effective TMDL-based limits are shown below and no changes are recommended.**

**Total Suspended Solids Limits**

| Month | Weekly Average TSS Effluent Limit (mg/L) | Weekly Average TSS Effluent Limit (lbs/day) | Monthly Average TSS Effluent Limit (mg/L) |
|---|---|---|---|
| Jan | **12** | **-** | **12** |
| Feb | **12** | **-** | **12** |
| Mar | **12** | **-** | **12** |
| Apr | **12** | **-** | **12** |
| May | **12** | **-** | **12** |
| Jun | **12** | **-** | **12** |
| Jul | **12** | **-** | **12** |
| Aug | **12** | **-** | **12** |
| Sep | **12** | **-** | **12** |
| Oct | **12** | **-** | **12** |
| Nov | **45** | **222.24** | **12** |
| Dec | **12** | **-** | **12** |

## PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from 01/01/2020 – 02/28/2025.

The table below summarizes the maximum temperatures reported during monitoring from 01/01/2019 – 12/31/2019.

Attachment #1

**Monthly Temperature Effluent Data & Limits**

| Month | Representative Highest Monthly Effluent Temperature | | Calculated Effluent Limit | |
|---|---|---|---|---|
| | Weekly Maximum (°F) | Daily Maximum (°F) | Weekly Average Effluent Limitation (°F) | Daily Maximum Effluent Limitation (°F) |
| JAN | 52 | 52 | 93 | 120 |
| FEB | 52 | 52 | 91 | 120 |
| MAR | 50 | 51 | 82 | 120 |
| APR | 53 | 53 | 67 | 119 |
| MAY | 55 | 56 | 75 | 110 |
| JUN | 62 | 63 | 96 | 115 |
| JUL | 65 | 67 | 111 | 120 |
| AUG | 67 | 67 | NA | 120 |
| SEP | 66 | 66 | 116 | 120 |
| OCT | 62 | 65 | 101 | 120 |
| NOV | 58 | 58 | 80 | 120 |
| DEC | 53 | 53 | 98 | 120 |

**Reasonable Potential**

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

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

Based on the available effluent data, **no effluent limits or monitoring are recommended for temperature.** The complete thermal table used for the limit calculation is shown in Attachment #4.

## PART 8 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency

and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document* (2022).

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid $LC_{50}$ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid $IC_{25}$ (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The **IWC of 29%** shown in the WET Checklist summary below, was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

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

Where:

$Q_e$ = annual average flow = 1.61 MGD = 2.491 cfs
f = fraction of the $Q_e$ withdrawn from the receiving water = 0
$Q_s$ = ¼ of the 7-$Q_{10}$ = 24 cfs ÷ 4 = 6 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations. Significant changes were made to WET test methods in 2004 and these changes were assumed to be fully implemented by certified labs by no later than June 2005. Data collected before July 1, 2005 is excluded in this evaluation.

**WET Data History**

| Date Test Initiated | Acute Results $LC_{50}$ % | | | | Chronic Results $IC_{25}$ % | | | | Footnotes or Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *C. dubia* | Fathead minnow | Pass or Fail? | Used in RP? | *C. dubia* | Fathead Minnow | Pass or Fail? | Use in RP? | |
| 08/22/2006 | >100 | >100 | Pass | Yes | 44.07 | 34.15 | Pass | Yes | |
| 10/25/2007 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 08/12/2008 | >100 | >100 | Pass | No | >100 | >100 | | No | 1 |

Attachment #1

| Date Test Initiated | Acute Results $LC_{50}$ % | | | | Chronic Results $IC_{25}$ % | | | | Footnotes or Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *C. dubia* | Fathead minnow | Pass or Fail? | Used in RP? | *C. dubia* | Fathead Minnow | Pass or Fail? | Use in RP? | |
| 11/10/2009 | >100 | >100 | Pass | No | >100 | >100 | | No | 1 |
| 08/10/2010 | >100 | >100 | Pass | No | >100 | >100 | | No | 1 |
| 05/12/2011 | >100 | >100 | Pass | No | >100 | >100 | Pass | No | 2 |
| 10/22/2013 | >100 | >100 | Pass | Yes | | | | | |
| 11/05/2013 | | | | | 72 | >100 | Pass | Yes | |
| 10/20/2015 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 08/09/2016 | >100 | >100 | Pass | Yes | 74.1 | >100 | Pass | Yes | |
| 04/18/2017 | >100 | >100 | Pass | Yes | 61.2 | >100 | Pass | Yes | |
| 03/06/2018 | >100 | >100 | Pass | Yes | 75.9 | >100 | Pass | Yes | |
| 11/05/2019 | >100 | >100 | Pass | Yes | 82.3 | >100 | Pass | Yes | |
| 12/01/2020 | >100 | >100 | Pass | Yes | 55.2 | >100 | Pass | No | 2 |
| 05/04/2021 | >100 | >100 | Pass | Yes | 47.3 | >100 | Pass | Yes | |
| 09/20/2022 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 03/07/2023 | >100 | >100 | Pass | Yes | 54.2 | >100 | Pass | Yes | |
| 12/10/2024 | >100 | >100 | Pass | Yes | 46.1 | >100 | Pass | Yes | |

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.
2. *Qualified or Inconclusive Data.* Data quality concerns were noted during testing which calls into question the reliability of the test results.

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

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

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

  Acute Reasonable Potential = $0 < 1.0$, reasonable potential is not shown, and a limit is not required.

  Chronic Reasonable Potential = [($TU_c$ effluent) (B)(IWC)]

Attachment #1

**Chronic WET Limit Parameters**

| **TUc** (maximum) $100/IC_{25}$ | **B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4) | IWC |
|---|---|---|
| 100/34.15 = 2.9 | 1.8 Based on 9 detects | 29% |

[(TUc effluent) (B)(IWC)] = 1.53 > 1.0

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from 08/22/2006 – 12/10/2024.

Expression of WET limits

Chronic WET limit = [100/IWC] $TU_c$ = 3.4 $TU_c$ expressed as a monthly average

This is equivalent to the current chronic WET limit.

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

**WET Checklist Summary**

| | **Acute** | **Chronic** |
|---|---|---|
| **AMZ/IWC** | Not Applicable.<br><br>**0 Points** | IWC = 29%.<br><br>**0 Points** |
| **Historical Data** | 13 tests used to calculate RP.<br>No tests failed.<br><br>**0 Points** | 12 tests used to calculate RP.<br>No tests failed.<br><br>**0 Points** |
| **Effluent Variability** | Little variability, no violations or upsets, consistent WWTF operations.<br><br>**0 Points** | Same as Acute.<br><br>**0 Points** |
| **Receiving Water Classification** | WWSF<br><br>**5 Points** | Same as Acute.<br><br>**5 Points** |
| **Chemical-Specific Data** | No reasonable potential for limits based on ATC; Ammonia nitrogen limit carried over from the current permit. detected. Additional Compounds of Concern: None.<br><br>**3 Points** | No reasonable potential for limits based on CTC; Ammonia nitrogen limit carried over from the current permit. detected. Additional Compounds of Concern: None.<br><br>**3 Points** |

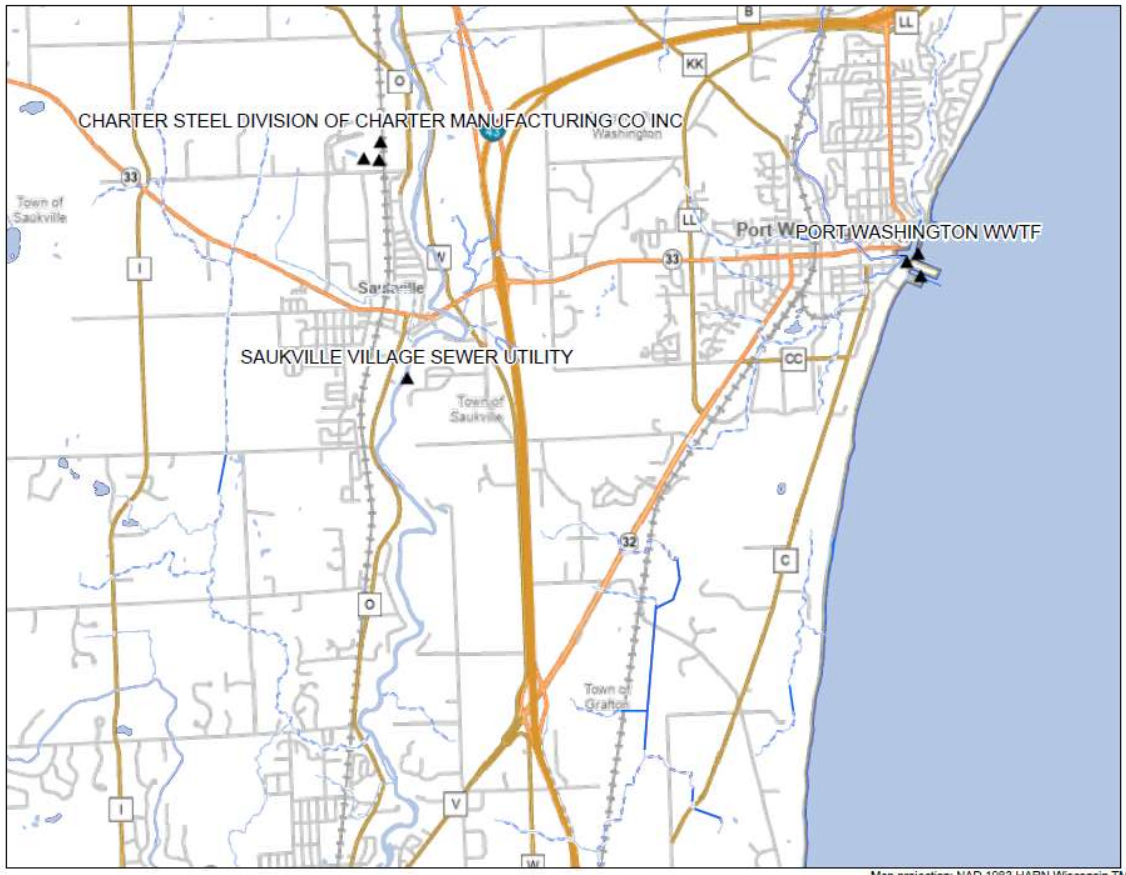
Attachment #1

| | Acute | Chronic |
|---|---|---|
| **Additives** | 1 Water Quality Conditioner added. Permittee has proper P chemical SOPs in place.<br><br>**1 Point** | Additive is used more than once per 4 days.<br><br>**1 Point** |
| **Discharge Category** | 2 Industrial Contributors.<br><br>**6 Points** | Same as Acute.<br><br>**6 Points** |
| **Wastewater Treatment** | Secondary or Better.<br><br>**0 Points** | Same as Acute.<br><br>**0 Points** |
| **Downstream Impacts** | No impacts known<br><br>**0 Points** | Same as Acute.<br><br>**0 Points** |
| **Total Checklist Points:** | **15 Points** | **15 Points** |
| **Recommended Monitoring Frequency (from Checklist):** | 1x yearly | 1x yearly |
| **Limit Required?** | No | Yes<br>Limit = 3.4 $TU_c$ |
| **TRE Recommended? (from Checklist)** | No | No |

- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, 1x annual acute and chronic WET tests are recommended in the reissued permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge. Testing should continue after the permit expiration date (until the permit is reissued).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit shall be expressed as 3.4 TUc as a monthly average in the effluent limits table of the permit.
- A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.
- A minimum of annual acute and chronic monitoring is recommended because Saukville is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

# Saukville WWTF Discharge Location




**Legend:** (some map layers may not be displayed)

- Surface Water Outfalls
- 24K Streams and Rivers
- 24K Lakes and Open Water
- Intermittent Streams
- Assessment Units - Lake Reservoir Impoundment Wetland
- Assessment Units - River Stream Beach Shore
- IWL - River Stream Beach Shore
- WIRL - River Stream Beach Shore
- Rivers and Streams
- Intermittent Streams
- Open Water
- water

**Latest Leaf Off Imagery**

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

**Notes:**
Not to scale


N

Map: 0 4,000 8,000 Feet
0 1,000 2,000 Meters

Map projection: NAD 1983 HARN Wisconsin TM

Service Layer Credits:
Latest Leaf Off Imagery: , Basic Basemap (Cached): , WPDES Outfall Variances: WDNR, Water Division, Lynn Singletary

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

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

*Date Printed: 3/12/2025 12:31 PM*

Attachment #3

## 2020 Ammonia Calculations

**Weekly Average & Monthly Average Limits based on Chronic Toxicity Criteria (CTC)**
Weekly and monthly average limits based on chronic toxicity criteria for ammonia are also calculated to determine the weekly and monthly average limits to meet the requirements of s. NR 106.07(3), Wis. Adm. Code.

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 a 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-$Q_3$, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-$Q_5$ (estimated as 85% of the 7-$Q_2$ if the 30-$Q_5$ is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 ºC, 25% of the flow is used if the Temperature < 11 ºC, and 50% of the flow is used if the Temperature ≥ 11 ºC but < 16 ºC.

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 the Milwaukee River, based on conversations with local fisheries biologists. So "ELS Absent" criteria apply from October through March, and "ELS Present" criteria will apply from April through September for a warm water sport fish classification.

Since minimal ambient data is available, the "default" basin assumed values are used for Temperature, pH and background ammonia concentrations, shown in the table below, with the resulting criteria and effluent limitations.

| | | Spring | Summer | Winter |
|---|---|---|---|---|
| | | April & May | June – Sept. | Oct. - March |
| **Effluent Flow** | Qe (MGD) | 1.61 | 1.61 | 1.61 |
| **Background Information** | 7-Q (cfs) | 24 | 24 | 24 |
| | 7-Q (cfs) | 52 | 52 | 52 |
| | Ammonia (mg/L) | 0.04 | 0.03 | 0.08 |

Attachment #3

| | | Spring | Summer | Winter |
|---|---|---|---|---|
| | | April & May | June – Sept. | Oct. - March |
| | Average Temperature (°C) | 12 | 19 | 4 |
| | Max Temperature (°C) | 12 | 19 | 4 |
| | pH (s.u.) | 8.31 | 8.22 | 8.58 |
| | % of Flow used | 25 | 25 | 25 |
| | Reference Weekly Flow (cfs) | 12 | 24 | 6 |
| | Reference Monthly Flow (cfs) | 22 | 44 | 11 |
| **Criteria mg/L** | 4-day Chronic | | | |
| | Early Life Stages Present | 3.75 | 2.93 | |
| | Early Life Stages Absent | | | 3.16 |
| | 30-day Chronic | | | |
| | Early Life Stages Present | 1.50 | 1.17 | |
| | Early Life Stages Absent | | | 1.26 |
| **Effluent Limitations mg/L** | Weekly Average | | | |
| | Early Life Stages Present | 21.6 | 30.9 | |
| | Early Life Stages Absent | | | 10.6 |
| | Monthly Average | | | |
| | Early Life Stages Present | 14.4 | 21.4 | |
| | Early Life Stages Absent | | | 6.51 |

**Effluent Data**

The following table evaluates the statistics based upon ammonia data reported from 07/01/2015 to 11/30/2019, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Saukville permit for the respective month ranges. That need is determined by calculating 99$^{th}$ upper percentile (or $P_{99}$) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit. Based on this comparison, no limits are required.

| Ammonia Nitrogen mg/L | April - May | June - September | October - March |
|---|---|---|---|
| 1-day $P_{99}$ | 0.1 | 0.3 | 0.1 |
| 4-day $P_{99}$ | 0.1 | 0.1 | 0.1 |
| 30-day $P_{99}$ | 0.03 | 0.07 | 0.04 |
| Mean* | 0.02 | 0.04 | 0.02 |
| Std | 0.02 | 0.05 | 0.03 |
| Sample size | 71 | 168 | 224 |
| Range | <0.025 – 0.1 | <0.025 – 0.367 | <0.025 – 0.41 |

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

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.

Attachment #4

# Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

| | | | | | | Temp Dates | Flow Dates |
|---|---|---|---|---|---|---|---|
| **Facility:** | Saukville Village Sewer Utility | **7-$Q_{10}$:** | 24 | cfs | | | |
| **Outfall(s):** | 001 | **Dilution:** | 25% | | **Start:** | 01/01/19 | 01/01/20 |
| **Date Prepared:** | 3/12/2025 | **f:** | 0 | | **End:** | 12/31/19 | 02/28/25 |
| **Design Flow (Qe):** | 1.61 MGD | **Stream type:** | Small warm water sport or forage fish co | | | | |
| **Storm Sewer Dist.** | 0 ft | **Qs:Qe ratio:** | 2.4 | :1 | | | |
| | | **Calculation Needed?** | YES | | | | |

| Month | Water Quality Criteria | | | Receiving Water Flow Rate (Qs) | Representative Highest Effluent Flow Rate (Qe) | | f | Representative Highest Monthly Effluent Temperature | | Calculated Effluent Limit | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ta (default) | Sub-Lethal WQC | Acute WQC | | 7-day Rolling Average (Qesl) | Daily Maximum Flow Rate (Qea) | | Weekly Average | Daily Maximum | Weekly Average Effluent Limitation | Daily Maximum Effluent Limitation |
| | (°F) | (°F) | (°F) | (cfs) | (MGD) | (MGD) | | (°F) | (°F) | (°F) | (°F) |
| JAN | 33 | 49 | 76 | 24.00 | 1.411 | 1.680 | 0 | 52 | 52 | 93 | 120 |
| FEB | 34 | 50 | 76 | 24.00 | 1.527 | 2.229 | 0 | 52 | 52 | 91 | 120 |
| MAR | 38 | 52 | 77 | 24.00 | 1.785 | 2.635 | 0 | 50 | 51 | 82 | 120 |
| APR | 48 | 55 | 79 | 24.00 | 2.357 | 3.031 | 0 | 53 | 53 | 67 | 119 |
| MAY | 58 | 65 | 82 | 24.00 | 2.623 | 3.351 | 0 | 55 | 56 | 75 | 110 |
| JUN | 66 | 76 | 84 | 24.00 | 1.960 | 2.268 | 0 | 62 | 63 | 96 | 115 |
| JUL | 69 | 81 | 85 | 24.00 | 1.472 | 1.756 | 0 | 65 | 67 | 113 | 120 |
| AUG | 67 | 81 | 84 | 24.00 | 1.175 | 1.303 | 0 | 67 | 67 | NA | 120 |
| SEP | 60 | 73 | 82 | 24.00 | 1.163 | 1.238 | 0 | 66 | 66 | 116 | 120 |
| OCT | 50 | 61 | 80 | 24.00 | 1.079 | 1.140 | 0 | 62 | 65 | 101 | 120 |
| NOV | 40 | 49 | 77 | 24.00 | 1.127 | 1.869 | 0 | 58 | 58 | 80 | 120 |
| DEC | 35 | 49 | 76 | 24.00 | 1.114 | 1.225 | 0 | 53 | 53 | 98 | 120 |