Permit Fact Sheet

General Information

Permit Number	WI-0031160-10-0
Permittee Name and Address	Randolph, Village 248 West Stroud Street, Randolph, WI 53956-1272
Permitted Facility Name and Address	Randolph Wastewater Treatment Facility 692 Jones Dr, Randolph WI 53956
Permit Term	October 01, 2025 to September 30, 2030
Discharge Location	West bank of Spring Creek tributary to Beaver Creek, approximately 400 feet south of Jones Drive at sewerage plant.
Receiving Water	Tributary of Beaver Creek in Beaver Dam River of Rock River (upper) in Dodge County
Stream Flow ($Q_{7,10}$)	0.03 cfs
Stream Classification	Limited Aquatic Life (LAL)
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	0.30 MGD
Industrial or Commercial Contributors	Two categorical pretreatment industrial contributors: Neogen Inc (formerly Hacco Inc) and Busse/SJI Corporation.
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; L - Laboratory; SS - Sanitary Sewage Collection System. Subclass P - Total Phosphorus must be obtained. Subclass D – Disinfection will be required 12 months after installation of disinfection equipment as required by the compliance schedule.
Approved Pretreatment Program?	N/A

Facility Description

The Village of Randolph operates a wastewater treatment facility that serves a population of approximately 1800.

Treatment consists of a mechanical fine screen to an oxidation ditch followed by two final clarifiers operated in parallel. The facility currently uses phosphorus treatment chemical at the oxidation ditches. Sludge that is produced is aerobically digested and held on-site prior to being hauled off-site by contract haulers and land applied on Department approved sites.

Flow from the clarifiers goes through a decommissioned chlorine contact tank prior to metering and discharge. A schedule has been included in this permit for compliance with disinfection requirements.

Substantial Compliance Determination

Enforcement During Last Permit: No enforcement actions were taken by the department in the previous permit term. The facility has completed all previously required actions as part of the enforcement process.

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on 6/3/2025, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Jordan Main on 7/15/25.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	0.44 MGD (11/1/2019 – 3/31/2025	Influent: 24-Hr flow proportional composite sampler located in the influent channel, past the parshall flume. Flow meter located in the parshall flume channel.
001	Flow requirement added with this permit term.	Effluent: 24-Hr flow proportional composite sampler and grab samples taken at the disinfection tank discharge prior to discharge to a Tributary of Beaver Creek. Flow meter located at the disinfection tank discharge.
006	21.5 US dry Tons (per 2025 permit application)	Class B, Liquid Sludge. A composite of multiple representative grab samples shall be collected from the tank. Metals and PCB shall be monitored from this outfall.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

Changes from Previous Permit:

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

- **Flow-** The sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes.
- **BOD & TSS-** The sample frequency increased to 3/Week to match the frequency of effluent sampling.

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

2.1 Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	75 lbs/day	3/Week	Calculated	
Suspended Solids, Total	Monthly Avg	50 lbs/day	3/Week	Calculated	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	5/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	13 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia	Weekly Avg	3.6 mg/L	3/Week	24-Hr Flow	May - September

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
(NH3-N) Total				Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	12 mg/L	3/Week	24-Hr Flow Prop Comp	October - April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.0 mg/L	3/Week	24-Hr Flow Prop Comp	May - September
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	6.6 mg/L	3/Week	24-Hr Flow Prop Comp	October - April
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.
Chloride	Weekly Avg	400 mg/L	4/Month	24-Hr Flow Prop Comp	Monitoring upon reissuance. Limit effective July 2030. See Chloride schedule.
Chloride	Monthly Avg	400 mg/L	4/Month	24-Hr Flow Prop Comp	Monitoring upon reissuance. Limit effective July 2030. See Chloride schedule.
Chloride, Variable Limit		lbs/day	4/Month	See Table	Report mass upon reissuance. Limit effective July 2030. See Chloride schedule. Look up the chloride mass from the 'Variable Chloride Mass' table and report the variable limit in the Chloride Variable Limit column on the eDMR.
Chloride	Weekly Avg - Variable	lbs/day	4/Month	Calculated	Report mass upon reissuance. Limit effective July 2030. See Chloride

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					schedule. Report the weekly average mass Chloride result in the Chloride column of the eDMR. See Chloride Mass Limit – Non-Wet Weather and Alternative Wet Weather Mass Limit Section.
Phosphorus, Total	Monthly Avg	0.6 mg/L	3/Week	24-Hr Flow Prop Comp	This is an interim limit. See the MDV/Phosphorus subsections and phosphorus schedules of the permit.
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' in the permit to calculate the Total Monthly Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum of the total monthly discharges (for the months that the MDV is in effect) for the calendar year on the Annual report form.
Phosphorus, Total	Monthly Avg	2.96 lbs/day	3/Week	Calculated	January
Phosphorus, Total	Monthly Avg	6.91 lbs/day	3/Week	Calculated	February
Phosphorus, Total	Monthly Avg	6.58 lbs/day	3/Week	Calculated	March
Phosphorus, Total	Monthly Avg	5.27 lbs/day	3/Week	Calculated	April
Phosphorus, Total	Monthly Avg	4.59 lbs/day	3/Week	Calculated	May
Phosphorus, Total	Monthly Avg	4.27 lbs/day	3/Week	Calculated	June
Phosphorus, Total	Monthly Avg	3.1 lbs/day	3/Week	Calculated	July
Phosphorus, Total	Monthly Avg	2.08 lbs/day	3/Week	Calculated	August
Phosphorus, Total	Monthly Avg	0.89 lbs/day	3/Week	Calculated	September
Phosphorus, Total	Monthly Avg	0.58 lbs/day	3/Week	Calculated	October
Phosphorus, Total	Monthly Avg	1.09 lbs/day	3/Week	Calculated	November

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total	Monthly Avg	1.16 lbs/day	3/Week	Calculated	December
Temperature Maximum		deg F	Daily	Continuous	Monitoring only in 2029.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section of the permit.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section of the permit.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section of the permit. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Chronic WET	Monthly Avg	1.1 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET section.

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.

- **Flow-** The sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes.
- **BOD, TSS, Ammonia, pH, DO and TP-** Sample frequency increased.

- **Disinfection & E. coli-** At the end of the compliance schedule, Disinfection requirements and E. coli limits of 126 #/100 ml as a monthly geometric mean that may not be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply. Monitoring is not required until the limit becomes effective and the end of the compliance schedule.
- **Phosphorus MDV-** The permittee has applied for a multi-discharger variance (MDV) for phosphorus for this permit term and the application has been approved by the Department. An MDV interim limit of 0.6 mg/L has been added that goes into effect per a compliance schedule. The permittee is required to report the total amount of phosphorus discharged in lbs/month and lbs/year. By March 1 of each year the permittee shall make a payment(s) to participating county(s) of $66.62 per pound of phosphorus discharged during the previous year in excess of the target value of 0.2 mg/L.
- **Temperature-** Sampling year updated to be only in 2029 for this permit term.
- **PFOS and PFOA** – Monitoring once every two months is included in the permit in accordance with s. NR 106.98(2)(c), Wis. Adm. Code.
- **Total Nitrogen Monitoring (TKN, N02+N03 and Total N)**- Annual monitoring is required in specific quarters as outlined in the permit.
- **WET**- Acute WET testing requirements removed, and Chronic WET testing added annually with a WET limit expressed as a monthly average.

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 June 20, 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. The sample frequency for BOD, TSS, Ammonia, TP were increased from 2/Week to 3/Week. Sample frequency for pH and DO increased from Weekly to 5/Week. These are the minimum sample frequencies for a facility of this type and size.

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

Disinfection & E. coli- Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020.

Section NR 102.04(5)(a), Wis. Adm. Code, states that all surface waters shall be suitable for recreational use and meet the E. coli criteria established to protect this use. Section NR 102.04(5)(b), Wis. Adm. Code, states that exceptions to the disinfection requirement can be made if the department determines, in accordance with the procedures specified in s. NR 210.06(3), Wis. Adm. Code, that disinfection is not required to meet water quality criteria. As part of the reissuance process, the requirements for disinfection were reviewed under s. NR 210.06(3), Wis. Adm. Code.

It was determined that the permittee is required to meet E. coli criteria through disinfection. A schedule for compliance has been included in the permit.

Chlorine – Monitoring requirements for total residual chlorine and associated limits shall only become effective if the facility starts chlorinating for disinfection requirements.

Chloride- Effluent limits are necessary in accordance with the reasonable potential analysis, and those limits are applied during this permit term. The permit includes a compliance schedule to provide time for the permittee to complete source

reduction measure to ensure compliance with the limits. Additionally, the permittee may request a reevaluation of the reasonable potential analysis after collecting additional data to determine if limits are warranted after source reduction measures are implemented. The final concentration and mass limits become effective January 1, 2030.

Phosphorus – Phosphorus rules became effective December 1, 2010 per NR 217, Wis. Adm. Code, that required the permittee to comply with water quality based effluent limits (WQBELs) for total phosphorous. The final phosphorus WQBELs are 0.225 mg/L as a monthly average and 0.075 mg/L as a six-month average and were to become effective as scheduled unless a variance was granted. For this permit term, the permittee has 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 interim effluent limit for total phosphorus is 0.6 mg/L as an average monthly limit.

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.

TMDL (Total Maximum Daily Load) Derived Limits – Waste load allocations specified in TMDLs are expressed as WQBELs (water quality based effluent limits). The waste load allocated-derived WQBELs are consistent with the assumptions and requirements of the approved Rock River TMDL. The Rock River TMDL waste load allocations became effective in 2021 and remain in effect.

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 municipal dischargers with an average flow rate less than 1 MGD, to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(c), 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 proposed permit was drafted, it was identified that the POTW has an indirect discharger(s) that may be a potential source of PFOS/PFOA.

Therefore, monitoring once every two months is included. 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.

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)**
006	B	Liquid	Aerobic Digestion	Injection	Land Application	21.5 (2025 permit 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** 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 (0.45 MGD). 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.						

3.1 Sample Point Number: 006- Sludge Liquids

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	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2026.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2026.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

3.1.1 Changes from Previous Permit:

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

PCB – Sample year updated.

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

3.1.2 Explanation of Limits and Monitoring Requirements

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

4 Schedules

4.1 Water Quality Based Effluent Limits (WQBELs) for Chloride

The permittee shall comply with the WQBELs for Chloride as specified.

Required Action	Due Date
Annual Chloride Progress Report: Submit an annual chloride progress report. The annual chloride progress report shall: Identify sources of chloride contributions to the collection system. Indicate which chloride source reduction measures or activities have been implemented; Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries and road salt intrusion into the collection system. Provide conclusions regarding compliance with final chloride WQBEL of 400 mg/L as a weekly and monthly average, and the weekly average variable mass loading limits.	10/01/2026
Annual Chloride Progress Report: Submit the chloride progress report as defined above.	10/01/2027
Annual Chloride Progress Report: Submit the chloride progress report as defined above.	10/01/2028
Final Chloride Report: Submit the chloride progress report as defined above.	10/01/2029
Chloride WQBELs Effective Date: The chloride WQBELs become effective (see the Surface Water Section for the Chloride WQBELs).	10/01/2030

4.1.1 Explanation of Schedule

The compliance schedule for chloride WQBELs provides a schedule for conducting source reduction measures to support compliance with those limits.

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	09/30/2026

optimizing removal of phosphorus by the Due Date.	
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	09/30/2027
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	09/30/2028
Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	09/30/2029
Progress Report #5: Submit a progress report on optimizing removal of phosphorus.	09/30/2030

4.2.1 Explanation of 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

4.3 Disinfection and Effluent Limitations for E. coli

Required Action	Due Date
Progress Report: The permittee shall submit a progress report on development and submittal of a facility plan for upgrades to meet disinfection requirements and E. coli limits.	06/30/2026
Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	04/30/2027
Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to meet disinfection requirements per s. NR 210.06(1), Wis. Adm Code, achieve compliance with final E. coli limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below.	03/31/2028
Treatment Plant Upgrade to Meet Limitations: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	09/30/2027
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	09/30/2028
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	03/31/2030
Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.	04/30/2030

4.3.1 Explanation of Schedule

A compliance schedule is included in the permit to provide time for the permittee to submit plans and specs and install disinfection treatment for meeting effluent E. coli water quality-based effluent limits and disinfection requirements pursuant s. NR 210.06, Wis. Adm. Code.

4.4 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.	10/01/2026

4.4.1 Explanation of Schedule

An up-to-date Land Application Management Plan is required that documents how the permittee will manage the land application of biosolids consistent with ch. NR 204, Wis. Adm. Code

Other Comments

None

Attachments

Water Quality Based Effluent Limits dated 6/7/2025

MDV Conditional Approval Letter dated 6/6/2024

MDV Checklist dated 6/6/2024

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By:

Jennifer Jerich – Wastewater Specialist

Date: 7/17/2025

Revision date post fact check: 8/8/2025, editorial changes made for clarity.

Revision date post public notice:

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DEPARTMENT OF NATURAL RESOURCES
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WISCONSIN DEPT. OF NATURAL RESOURCES

6/6/2024

Glenn Scharp, Committee Chair
248 West Stroud Street
Randolph, WI 53956

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Tributary of Beaver Creek in Dodge County
Permittee: Village of Randolph, WPDES WI-0031160

Dear Mr. Scharp:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for the Randolph Wastewater Treatment Facility in an application dated 4/4/2024. 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 Justin Parks, Village of Randolph
Jordan Main, WDNR
BetsyJo Howe, WDNR
Tim Elkins, EPA Region 5
Micah Bennett, EPA Region 5

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

Multi-Discharger Variance Application Evaluation Checklist

Form 3200-145 (R 5/16)

Notice: This checklist is meant to be a tool to help Department of Natural Resources (DNR) staff review municipal and industrial multi-discharger variance (MDV) applications (Forms 3200-149 and 3200-150). Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

Permittee Name

Randolph Wastewater Treatment Facility

WPDES Permit Number	County
WI- 0 | 0 | 3 | 1 | 1 | 6 | 0	Dodge

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

7. What is the current effluent level achievable?

Outfall Number(s)	Conc. (mg/L)	Method for calculation:	Does this concur with application?	
001	0.67	(•) 30-day P99 ( ) Other, specify:	( ) Yes (•) No, why not: Application used smaller data subset	*DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.*

Save

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

0.6 mg/L as a monthly average, pursuant to s. 283.16(6)(a)1., Wis. Stats.
Target Value = 0.2 mg/L

Provide Rationale:

The past three years of total phosphorus effluent results(5/1/2021 - 4/30/2024, n=304) yield a 30-day P99 value of 0.67 mg/L. This value includes years 2021 and 2022 prior to optimization of phosphorus treatment. Throughout 2023, effluent phosphorus concentrations were lower, in the 0.2 - 0.4 mg/L range. This may not be achievable in wetter years, however. Regardless, it is assumed that 0.6 mg/L can be met immediately, without a schedule. The WQBEL memo may recommend a different value.

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.

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:	$ 4,770,000.00 MDV Application, capital costs. See note below regarding inelegible costs.	*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, prepared by MSA Professional Services Inc in December 2016 and amended in April of 2018, evaluated options for compliance with the 0.075 mg/L WQBEL. The reports identified high-rate clarification as the lowest cost feasible treatment technology and was used for the economic demonstration. Water quality trading and adaptive management were evaluated and not pursued in 2018. These need to be reevaluated in the coming permit term, now that credit need is lower. During the current permit term, the facility installed ferric chloride chemical phosphorus removal with good results.

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.*

Save

Comments on economic demonstration:

An updated site-specific cost estimate for Actiflo clarification tertiary treatment was submitted with the MDV application. Capital costs totaled to $4,770,000 with $90,000 as an annual O&M cost increase. These were adjusted by DNR due to chemical feed system components and O&M costs included in the estimate, which are already present at the current facility. Updated are values are $4,638,000.00 and $64,910.00, respectively. Annual payments on $4,638,000.00 capital costs, assuming a 20-year CWFP loan at 2.1% interest amount to $284,198. With O&M costs, annual total costs are $349,108. Residential use is 89%, so the residential cost is $310,706.12. Divided amongst 618 residential users, the per-user cost increase is $502.76. Current sewer rates are $771.00, bringing projected rates to $1,273.76. This value is 2.40% of Randolph's $53,098.00 median household income. In Dodge County with a secondary indicator score of 6, sewer rates at 1% of MHI meet the primary screener. The application meets the 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.

Save

Comments:

Section 5. Payment to the County(ies)

24. At this time, the appropriate per pound payment is: $ 64.75

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: 6/6/2024

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...]

[Save]

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 06/20/2025

TO: Jennifer Jerich – SCR

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for the Village of Randolph
WPDES Permit No. WI-0031160-10

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 Randolph in Dodge County. This municipal wastewater treatment facility (WWTF) discharges to an unnamed tributary to Beaver Creek, located in the Beaver Dam River Watershed in the Upper Rock River Basin. This discharge is included in the Rock River Total Maximum Daily Load (TMDL) as approved by EPA on 09/28/2011.

The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
BOD_5			30 mg/L	20 mg/L		1
TSS TMDL			30 mg/L 75 lbs/day	20 mg/L 50 lbs/day		1,2
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1
PFOS and PFOA						3
Ammonia Nitrogen May – September October – March	 13 mg/L 13 mg/L		 3.6 mg/L 12 mg/L	 2.0 mg/L 6.6 mg/L		1
Bacteria						4
E. coli				126 #/100 mL geometric mean		
Chloride Dry weather Wet weather			400 mg/L 990 lbs/day 5,600 lbs/day	**400 mg/L**		5,6,7
Phosphorus MDV Interim Limit Final WQBEL TMDL				 0.6 mg/L 0.225 mg/L See Table	 0.075 mg/L 0.19 lbs/day	8,9
TKN, Nitrate+Nitrite, and Total Nitrogen						10,11
Chronic WET				1.1 TUc		12,13
Chlorine	19 µg/L		7.3 µg/L	**7.3 µg/L**		4,14

Footnotes:

1. No changes from the current permit.
2. The mass-based TSS limits are based on waste load allocations specific in the Rock River TMDL.

3. 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.
4. Bacteria limits apply during the disinfection season of May through September. A compliance schedule to meet these limits is recommended in the reissued permit. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. A compliance schedule is recommended to meet the chloride limits.
6. 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.
7. The wet weather mass limit applies when the dry weather mass limit is exceeded and the facility demonstrates to the Department the exceedance occurred during a wet weather event.
8. Under the second permit term of the phosphorus MDV, the interim limit is recommended to be 0.6 mg/L as a monthly average. The final WQBELs remain at 0.225 mg/L as a monthly average and 0.075 mg/L and 0.19 lbs/day as six-month averages.
9. Additional phosphorus mass limitations are required in accordance with the waste load allocations specified in the Rock River TMDL:

Month	Monthly Ave TP Effluent Limit (lbs/day)
Jan	2.96
Feb	6.91
March	6.58
April	5.27
May	4.59
June	4.27
July	3.10
Aug	2.08
Sept	0.89
Oct	0.58
Nov	1.09
Dec	1.16

10. 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. 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).
11. Monitoring only.
12. The Instream Waste Concentration (IWC) to assess chronic test results is 98%. 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%, 75%, 50%, 25% & 12.5%. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water, upstream of the discharge.
13. 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).
14. The chlorine limits shall only become effective if Randolph starts chlorinating for disinfection requirements.

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, 2007 Ammonia Limits, & Thermal Table

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

E-cc: Jordan Main, Wastewater Engineer – SCR
Lisa Creegan, Regional Wastewater Supervisor – SCR
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Randolph Wastewater Treatment Facility

WPDES Permit No. WI-0031160-10

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Randolph operates a wastewater treatment facility that serves a population of approximately 1800 with two significant industrial contributors with pretreatment notifications (Neogen Inc and Busse/SJI Corp). Treatment consists of a mechanical fine screen, an oxidation ditch followed by two final clarifiers operated in parallel. The facility currently uses the Rare Earth additive for phosphorus treatment at the oxidation ditches. Sludge that is produced is aerobically digested and held on-site prior to being hauled off-site by contract haulers and land applied on Department approved sites. The Department has found the permittee to be in substantial compliance with the current permit.

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

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
BOD_5			30 mg/L	20 mg/L		1,2
TSS TMDL			30 mg/L 75 lbs/day	20 mg/L 50 lbs/day		1,2,3
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1,2
Ammonia Nitrogen May – September October – March	 13 mg/L 13 mg/L		 3.6 mg/L 12 mg/L	 2.0 mg/L 6.6 mg/L		
Phosphorus MDV Interim Final TMDL				 1.0 mg/L 0.225 mg/L See Table	 0.075 mg/L	3,4
Chloride						5
Copper						5
Temperature						5
Acute WET						6
Chronic WET				1.1 TUc		6

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. The concentration limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. The mass limits for TSS and phosphorus are required in accordance with the wasteload allocations specified in the Rock River TMDL. The monthly phosphorus limits are shown below.

Month	Monthly Ave TP Effluent Limit (lbs/day)
Jan	2.96
Feb	6.91
March	6.58
April	5.27
May	4.59
June	4.27
July	3.10
Aug	2.08
Sept	0.89
Oct	0.58
Nov	1.09
Dec	1.16

4. The monthly average phosphorus limit of 1.0 mg/L acts as an interim limit for the phosphorus compliance schedule to meet the WQBELs of 0.075 mg/L and 0.225 mg/L.
5. Monitoring only.
6. Acute WET testing is required twice during the permit term and chronic WET testing is required annually. The IWC for chronic WET was 94%.

Receiving Water Information

- Name: Unnamed Tributary of Beaver Creek
- Waterbody Identification Code (WBIC): 836550
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: The unnamed tributary is shown in Table 3 as Limited Aquatic Life (LAL) at the outfall. At some point downstream, the unnamed tributary classification changes to a Limited Forage Fish (LFF) community. At Beaver Creek, approximately 3.7 miles downstream of Outfall 001, the classification is considered Warm Water Sport Fish (WWSF). All sections of these waters are classified as non-public water supply and recreational use.
- 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 estimates from USGS, where Outfall 001 is located.

    - Unnamed tributary LAL classification
      7-Q_{10} = 0 cubic feet per second (cfs)
      7-Q_2 = 0 cfs
    - Unnamed tributary LFF classification at Highway G (2.4 miles southwest of Randolph)
      7-Q_{10} = 0.03 cfs
      7-Q_2 = 0.15 cfs

- Hardness = 385 mg/L as $CaCO_3$. This value represents the geometric mean of data from chronic WET testing from 09/12/2017 – 05/10/2022.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero. At the LFF classification, the default flow of 100% is used.
- Source of background concentration data: Background concentrations are not included because they do not impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None.
- Impaired water status: Beaver Creek, approximately 3.7 miles downstream of Outfall 001, is currently listed as impaired due to phosphorus.

Effluent Information

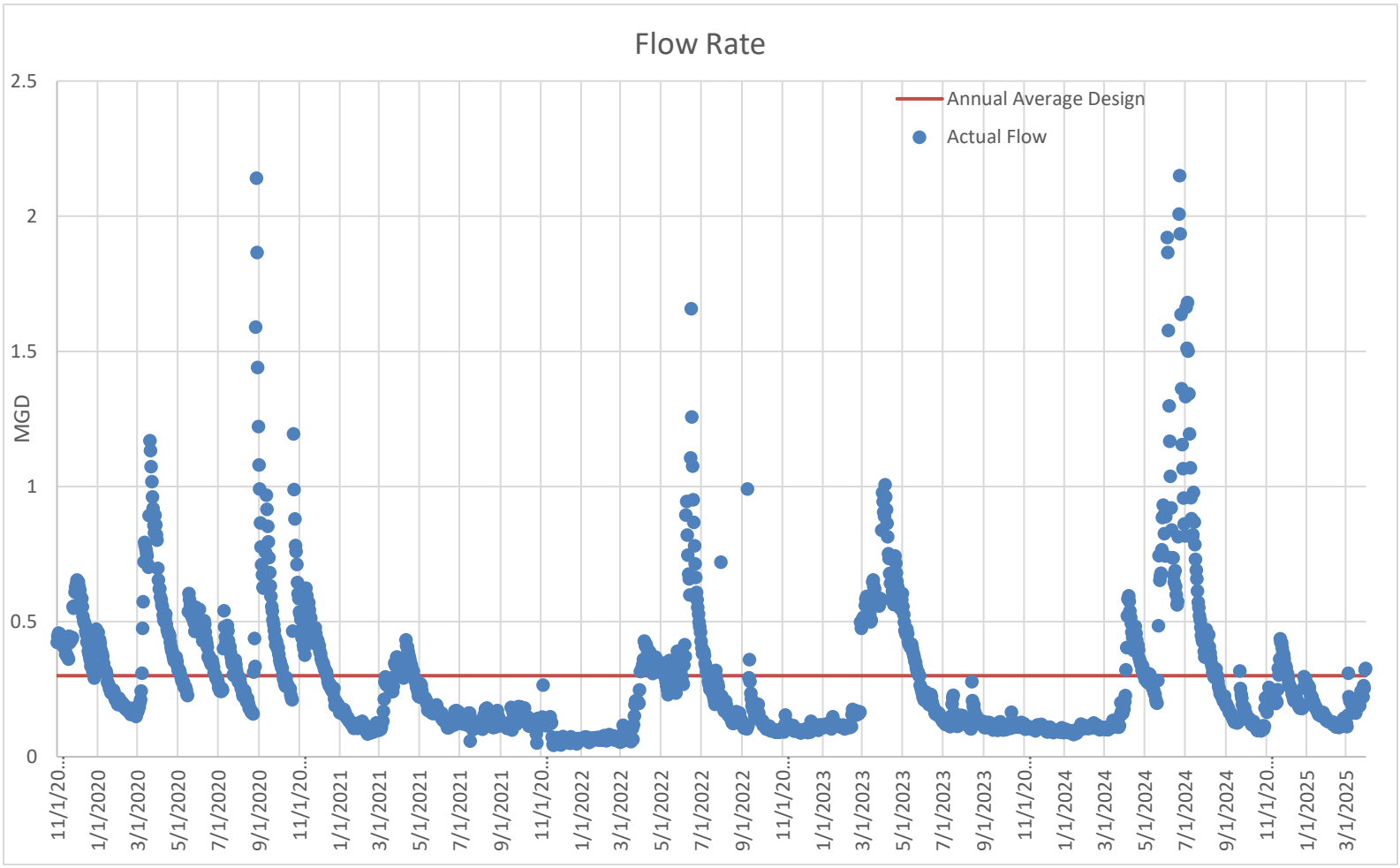
- Design flow rate(s):

  Annual average = 0.3 million gallons per day (MGD)
  Peak daily = 1.03 MGD
  Peak weekly* = 1.7 MGD

  *The peak weekly design flow was estimated from the annual average design flow and a peaking factor based on data from 11/01/2019 – 03/31/2025.

  For reference, the actual average flow from 11/01/2019 – 03/31/2025 was 0.44 MGD. For informational purposes, the graph below shows the actual flow rates in comparison to the annual average design flow.

Attachment #1



- Hardness = 334 mg/L as $CaCO_3$. This value represents the geometric mean of four samples collected in February and March 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 1 industrial contributor with process wastewater (Busse/SJI Corp). Neogen Inc. does not discharge process wastewater to Randolph but does hold a pretreatment notification.
- Water supply: Municipality waterworks and private wells.
  - Additives: Randolph is using Rare Earth for phosphorus removal.
  - An additive review is not necessary for any additives where either the toxicity is well documented and understood, can be controlled by a WQBEL, or are not believed to be present in the discharge. This is the case upon initial review of Randolph's additive.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- 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}	608
4-day P_{99}	432
30-day P_{99}	340
Mean	294
Std	102
Sample size	22
Range	140 - 440

Copper Effluent Data

	Copper (µg/L)
1-day P_{99}	29.7
4-day P_{99}	22.2
30-day P_{99}	18.1
Mean	16.1
Std	4.6
Sample size	22
Range	6.6 - 24.8

The following table presents the average concentrations and loadings at Outfall 001 from 11/01/2019 – 03/31/2025 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	2.7 mg/L*	
TSS	5.2 mg/L*	15.0 lbs/day
pH field	7.3 s.u.	
Dissolved Oxygen	8.1 mg/L	
Ammonia Nitrogen	0.051 mg/L*	
Phosphorus	0.42 mg/L*	0.71 lbs/day

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

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

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

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

3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

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

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 = 0 cfs

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.
Chlorine		19.0		19.0	3.81			
Arsenic		340		340	68.0	<7.7		
Cadmium	334	115		115	23.0	<0.41		
Chromium	301	4446		4446	889	<1.1		
Copper	334	48.4		48.4			29.7	24.8
Lead	334	343		343	68.6	6.4		
Nickel	268	1080		1080	216	7.1		
Zinc	333	345		345	68.9	49.9		

Attachment #1

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		757			608	440

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.
* * Per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016 consideration of ambient concentrations and 1-Q_{10} flow rates yields a more restrictive limit than the 2 × ATC method of limit calculation.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chlorine		7.28		7.28	1.46		
Arsenic		152		152	30.4	<7.7	
Cadmium	175	3.82		3.82	0.76	<0.41	
Chromium	301	326		326	65.2	<1.1	
Copper	385	32.8		32.8			22.2
Lead	356	95.5		95.5	19.1	6.4	
Nickel	268	169		169	33.8	7.1	
Zinc	333	345		345	68.9	49.9	
Chloride (mg/L)		395		395			**432**

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

Monthly Average Limits based on Wildlife Criteria (WC)

The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	880		880	176	<0.41
Chromium (+3)	8400000		8400000	1680000	<1.1
Lead	2240		2240	448	6.4
Nickel	110000		110000	22000	7.1

Attachment #1

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	40		40	8.0	<7.7

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

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for chloride. Limits and/or monitoring recommendations are made in the paragraphs below:

Copper – Considering available effluent data from the current permit term (02/14/2023 – 12/20/2023), the 1-day P_{99} concentration is 29.7 µg/L, the 4-day P_{99} concentration is 22.2 µg/L, and a maximum concentration of 24.8 µg/L. These do not exceed the calculated daily maximum limit or weekly average limit. Therefore, **no limits or monitoring are recommended in the reissued permit.**

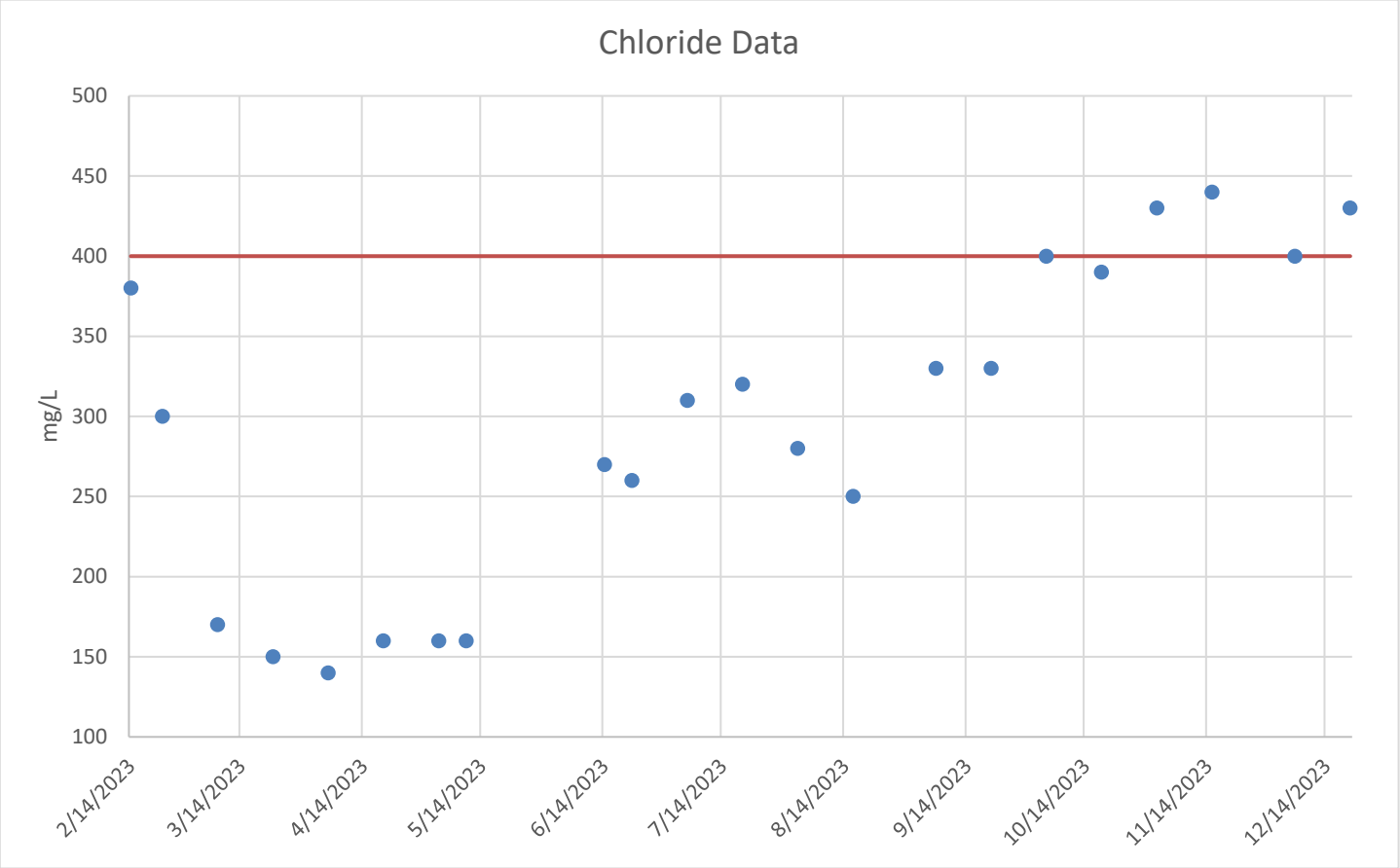
Chloride – Considering available effluent data from 02/14/2023 – 12/20/2023, summarized in the table below, the 4-day P_{99} concentration exceeds the calculated weekly average limit.

Chloride Effluent Data

	mg/L
1-day P_{99}	608
4-day P_{99}	432
30-day P_{99}	340
Mean	294
Std	102
Sample size	22
Range	140 – 440

The graph below shows the weekly average effluent data compared to the calculated WQBEL during the permit term (02/14/2023 – 12/20/2023) which shows some of the winter months exceeded the limit of 400 mg/L:

Attachment #1



A weekly average concentration limit of 400 mg/L (rounded) **is required** per s. NR 106.05(4)(b), Wis. Adm. Code, since the 4-day P_{99} (432 mg/L) exceeds the calculated limitation based on the chronic toxicity criterion (395 mg/L). **A weekly average mass limitation of 990 lbs/day** (rounded) **is also required** and is based on the concentration limit and the design annual average flow rate of 0.30 MGD (395 mg/L × 0.30 MGD × 8.34) in accordance with s. NR 106.07(2)(c), Wis. Adm. Code.

An alternative wet weather mass limit of 5,600 lbs/day (395 mg/L × 1.7 MGD × 8.34) (rounded) **should also be included** in accordance with s. NR 106.07(9), Wis. Adm. Code. The peak weekly flow was used to calculate the wet weather mass limit. **The wet weather mass limit applies when the dry weather mass limit is exceeded and the facility demonstrates to the Department the exceedance occurred during a wet weather event.**

A **monthly average limit of 400 mg/L** should be included in the permit for expression of limit requirements per s. NR 106.07(4), Wis. Adm. Code, as follows:

> Whenever a weekly average limitation is determined necessary to protect water quality, a monthly average limitation shall also be included in the permit and set equal to the weekly average limit unless a more restrictive limit is already determined necessary to protect water quality.

Mass limitations are not subject to the limit expression requirements if concentration limits are given. A summary of the chloride limits are shown below.

Chloride Limits Summary

	Weekly Average	Monthly Average
Chloride		
Concentration limit	400 mg/L	400 mg/L*
Mass limit	990 lbs/day	
Wet weather mass limit	5,600 lbs/day	

*Limit needed to meet the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code.

Mercury – The permit application did not require monitoring for mercury because Randolph 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 average concentration in the sludge from 10/06/2020 – 10/24/2024 was 1.1 mg/kg, with a maximum reported concentration of 3.8 mg/kg. Therefore, **no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Available monitoring sample data from the Randolph Water Department (PWS ID: 11101255) is provided in the table below:

Water Supply PFAS Data

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
06/07/2023	2306117-04	YI080	ND	ND
06/07/2023	2306117-03	NY646	ND	ND
		Average =	ND	ND

The limited data above shows the municipal water supply is below 1/5th of the applicable PFOS and PFOA criteria.

However, based on the nondomestic contributions to the treatment system, **PFOS and PFOA monitoring is recommended at a frequency of every other month.**

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 = 0.633 and B = 90.0 for Limited Aquatic Life, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 547 sample results were reported from 11/05/2019 – 03/27/2025. The maximum reported value was 8.73 s.u. (Standard pH Units). The effluent pH was 8.05 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 7.93 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 7.91 s.u. Therefore, a value of 8.0 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 8.0 s.u. into the equation above yields an ATC = 13 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	26
1-Q_{10}	13

The 1-Q_{10} method yields the most stringent limits for Randolph.

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 11/05/2019 – 03/26/2025.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April – September*	October – March
1-day P_{99}	N/A	1.97
4-day P_{99}	N/A	1.07
30-day P_{99}	N/A	0.42
Mean**	0.018	0.079
Std	0.572	1.46
Sample size	254 (246 ND)	296 (275 ND)
Range	<0.14 – 1.9	<0.14 – 5.5

*There were less than 11 detects in May – September, so P_{99}'s cannot be calculated
**Values lower than the limit of detection were substituted with a zero

Conclusions and Recommendations
In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
May – September	13	3.6	2.0
October – April	13	12	6.6

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

Randolph had previously been exempted from disinfection based on the limited aquatic life or limited forage fish classification of the receiving water. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis. Adm. Code (not on the water quality classifications - i.e., limited forage fish, limited aquatic life - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for the unnamed tributary to Beaver Creek is listed in ch. NR 104, Wis. Adm. Code, as continuous. Continuous streams have a higher

likelihood of providing opportunities for full contact recreational activities. Therefore, **disinfection should not be exempted based solely on this hydrological classification.**

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

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

These limits are required during May through September. The permit will include a compliance schedule to meet these limits.

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

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

PART 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 Randolph currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

Water Quality-Based Effluent Limits (WQBEL)

Revisions to the administrative rules for phosphorus discharges took effect on December 1, 2010. These rule revisions include additions to ch. NR 102 (s. NR 102.05), which establish phosphorus standards for surface waters. Revisions to ch. NR 217 (s. NR 217, Subchapter III) establish procedures for determining water quality based effluent limits for phosphorus, based on the applicable standards in ch. NR 102.

The Department has developed a TMDL for the Upper and Lower Rock River Basins. The US EPA approved the Rock River TMDL on September 28, 2011. The document, along with the referenced

appendices can be found at: https://dnr.wisconsin.gov/topic/TMDLs/RockRiver/index.html

Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL-derived water quality based effluent limit (WQBEL) for phosphorus in addition to, or in lieu of, a s. NR 217.13 WQBEL in a WPDES permit. This limit should be expressed in a manner consistent with the wasteload allocation and assumptions of the TMDL. If after two permit terms, the Department determines the nonpoint source load allocation has not been substantially reduced, the Department may include the s. NR 217.13 WQBEL unless these reductions are likely to occur.

Total Maximum Daily Load

The approved Rock River TMDL report provides effluent limitations that are given in lbs/month in the document *Final Rock River TMDL Report with Tables*. The monthly WLA were calculated as monthly averages in lbs/day as shown in the table below. **These limits are already effective and there are no changes recommended from the current permit.**

TMDL-based Phosphorus Limits

Month	Monthly TP WLA[1] (lbs/month)	Monthly Average TP Effluent Limit (lbs/day)
January	91.70	2.96
February	193.42	6.91
March	204.03	6.58
April	158.16	5.27
May	142.29	4.59
June	128.16	4.27
July	96.11	3.10
August	64.59	2.08
September	26.61	0.89
October	17.90	0.58
November	32.76	1.09
December	35.93	1.16

Footnotes:
1. Rock River TMDL Appendix P. Monthly Total Phosphorus Allocations by Wastewater Treatment Facility

Point of Discharge Limits

Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to limited aquatic life waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. These waters were not included in the USGS/WDNR stream and river studies and, therefore, the Department lacked the technical basis to determine and propose applicable criteria. At some time in the future, the Department may adopt phosphorus criteria based on new studies focusing on limited aquatic life waters. *The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020)* suggests that during the interim, WQBELs should be based on the criteria and flow conditions for the next stream segment downstream (or downstream lake or reservoir, if appropriate), because ss. 217.12 and 217.13, Wis. Adm. Code, state that the Department must set WQBELs to protect downstream waters. The discharge location of the wastewater from Randolph is classified as limited aquatic life downstream from the point of discharge downstream. The tributary is classified as limited forage fish uses at some point in the tributary.

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus

criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a), Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.075 mg/L applies for the tributary to Beaver Creek.

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

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

Where:

WQC = 0.075 mg/L for the unnamed tributary to Beaver Creek.
Qs = 100% of the 7-Q_2 of 0 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.3 MGD = 0.464 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

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

A previous evaluation resulted in a WQBEL of 0.075 mg/L using a background concentration of 1.13 mg/L upstream of the outfall at Highway 73 (SWIMS station ID 10020833). Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance.

There is not additional background phosphorus data for Randolph, so the same background concentration of 1.13 mg/L that was used in the previous evaluation will also be used in this evaluation.

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 0.075 mg/L. However, s. NR 217.13(7), Wis. Adm. Code, specifies that "if the WQBEL 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."

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 11/05/2019 – 03/26/2025.

Total Phosphorus Effluent Data

	Concentration mg/L	**Mass lbs/day**
1-day P_{99}	2.06	5.16
4-day P_{99}	1.13	2.82
30-day P_{99}	0.64	1.34
Mean	0.43	0.74

Attachment #1

	Concentration mg/L	Mass lbs/day
Std	0.42	1.12
Sample size	534	406
Range	0.034 - 3.5	0.04 - 9.89

Reasonable Potential Determination
The calculated WQBEL of 0.075 mg/L is less than the current technology-based limit of 1.0 mg/L, so the WQBEL must be included in the permit per s. NR 217.15(2), Wis. Adm. Code.

In accordance with s. NR 217.15(1), Wis. Adm. Code, there is reasonable potential for the discharge to cause or contribute to an exceedance of the water quality criteria. The data suggest that a compliance schedule will be necessary for the facility to meet the given phosphorus limits.

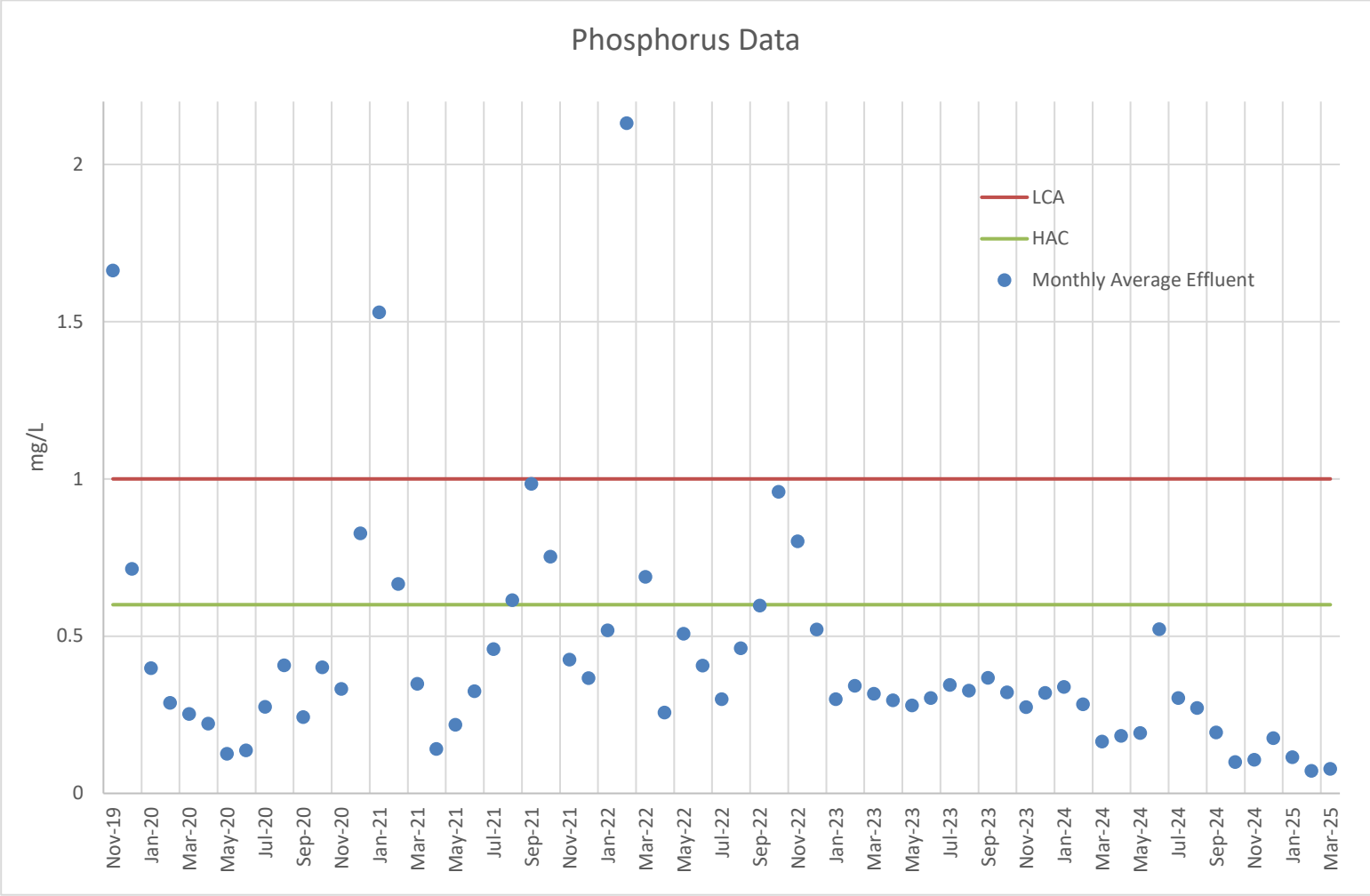
Limit Expression
According to s. NR 217.14(2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, the effluent limit of 0.075 mg/L may be expressed as a six-month average. If a concentration limitation expressed as a six-month average is included in the permit, a monthly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

Mass Limits
A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that is to or upstream of a phosphorus impaired water. **This final mass limit shall be 0.075 mg/L × 8.34 × 0.3 MGD = 0.19 lbs/day expressed as a six-month average.**

Multi-Discharge Variance Interim Limit
With the permit application, Randolph 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) (a), Wis. Stats., is 0.6 mg/L as a monthly average. **A compliance schedule may be appropriate to meet this interim limit but compliance with 0.6 mg/L (highest attainable condition (HAC)) shall be no later than the end of the reissued permit. The previous interim limit of 1.0 mg/L should be included as the limit currently achievable (LCA) and should not be exceeded during the compliance schedule.**

Randolph began to use ferric chloride in the oxidation ditch in December 2019 as a temporary system. The chemical feed was permanently installed and in use at the end of 2020 and changed to Rare Earth in 2024. The effluent data is graphed below in comparison to the current and recommended limits which shows that the HAC can be met upon permit reissuance under the current treatment conditions.

Attachment #1



PART 6 – TOTAL SUSPENDED SOLIDS

The Rock River TMDL includes wasteload allocations (WLA) for total suspended solids (TSS) which shall be expressed as both weekly and monthly limits for a municipal facility. **Randolph is already complying with the TMDL limits for TSS and there are no changes from the current permit for the monthly or weekly WLAs.**

TMDL-based TSS Limits

Month	Monthly TSS WLA[1] (tons/month)	Monthly Average TSS Effluent Limit (lbs/day)	Weekly Average TSS Effluent Limit (lbs/day)
January	0.78	50	75
February	0.70	50	75
March	0.78	50	75
April	0.75	50	75
May	0.78	50	75

Attachment #1

Month	Monthly TSS WLA[1] (tons/month)	Monthly Average TSS Effluent Limit (lbs/day)	Weekly Average TSS Effluent Limit (lbs/day)
June	0.75	50	75
July	0.78	50	75
August	0.78	50	75
September	0.75	50	75
October	0.78	50	75
November	0.75	50	75
December	0.78	50	75

Footnotes:

1. From the Rock River TMDL Appendix Q.

For informational purposes, the effluent TSS data from the current permit term (11/01/2019 – 03/26/2025) is shown below:

Total Suspended Solids Effluent Data

	Concentration mg/L	Mass lbs/day
1-day P_{99}	18.6	128
4-day P_{99}	10.9	72.9
30-day P_{99}	6.92	31.9
Mean	5.15	15.0
Std	3.7	29.8
Sample size	561	566
Range	<2 – 36.2	<0 – 326.8

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

PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

LAL discharge

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in Chapters NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The daily maximum effluent temperature limitation shall be 86 °F for discharges to surface waters classified as Limited Aquatic Life according to s. NR 104.02(3)(b)1, Wis. Adm. Code, except for those classified as wastewater effluent channels and wetlands regulated under ch. NR 103 and described in s. NR 106.55(2), Wis. Adm. Code, which has a daily maximum effluent temperature limitation of 120 ºF. The 86 °F limit applies because the hydrologic classification is not listed as wetland in ch. NR 104, Wis. Adm. Code.

LFF downstream 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 11/01/2019 – 03/31/2025.

A heat loss equation is used to adjust the calculated limit based upon the length of the tributary before discharge to the LFF classification of the unnamed tributary. The discharge from Outfall 001 travels through at least 12,672 feet before reaching the LFF classification. Under s. NR 106.55(5), Wis. Adm. Code, the default cooling rate is estimated as 1º F for every 400 feet. 100% mixing is also used at the LFF classification. The adjusted limits are shown in the table.

The table below summarizes the maximum temperatures reported during monitoring from 02/25/2023 – 12/29/2023.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		**LAL** Calculated Effluent Limit		**LFF** Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Weekly Average Effluent Limitation (°F)	Weekly Average Effluent Limitation (°F)	Weekly Average Effluent Limitation (°F)
JAN			-	86	87	113
FEB	43	46	-	86	87	112
MAR	49	51	-	86	89	113
APR	51	52	-	86	95	113
MAY	56	59	-	86	102	116
JUN	65	67	-	86	109	117
JUL	69	71	-	86	113	118
AUG	70	71	-	86	111	118
SEP	70	71	-	86	105	117
OCT	68	70	-	86	95	115
NOV	59	60	-	86	86	113
DEC	50	51	-	86	86	113

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 this comparison, there is no reasonable potential for any thermal limits. **No monitoring or limits are recommended in the reissued permit.**

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 94%** shown in the WET Checklist summary below, was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

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

Where:

Q_e = annual average flow = 0.3 MGD = 0.464 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = 100% of the 7-Q_{10} = 0.03 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 was excluded in this evaluation.

Attachment #1

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?	
09/25/2008	>100	>100	Pass	No	>100	>100	Pass	No	1
12/08/2009	>100	>100	Pass	No	>100	>100	Pass	No	1
02/25/2010					>100	>100	Pass	No	1
04/17/2012	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
07/24/2012	>100	>100	Pass	Yes	56.8	>100	Fail	Yes	
10/09/2012					>100	>100	Pass	Yes	
11/13/2012					>100	>100	Pass	Yes	
11/11/2014					>100	>100	Pass	Yes	
09/12/2017					>100	95.38	Pass	Yes	
11/02/2021	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
02/22/2022					80.7	>100	Fail	Yes	
04/26/2022					>100	>100	Pass	Yes	
05/10/2022					>100	>100	Pass	Yes	
05/15/2023					>100	>100	Pass	Yes	
09/17/2024					>100	>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.

- 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
100/56.8 = 17	3.0 Based on 3 detects	94%

[(TUc effluent) (B)(IWC)] = 4.96 > 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 04/17/2012 – 09/17/2024.

Expression of WET limits

Chronic WET limit = [100/IWC] TU_c = 1.1 TU_c expressed as a monthly average

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

WET Checklist Summary

	Acute	**Chronic**
AMZ/IWC	Not Applicable. **0 Points**	IWC = 94%. **15 Points**
Historical Data	3 tests used to calculate RP. No tests failed. **0 Points**	12 tests used to calculate RP. 2 tests failed. **0 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	Less than 4 miles to WWSF **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	No reasonable potential for limits based on ATC; Ammonia, copper, lead, nickel, zinc, and chloride detected. Ammonia nitrogen limit carried over from the current permit. Additional Compounds of Concern: None. **3 Points**	Reasonable potential for limits for chloride based on CTC; Ammonia nitrogen limit carried over from the current permit. Ammonia, copper, lead, nickel, and zinc detected. detected. Additional Compounds of Concern: None. **8 Points**

Attachment #1

	Acute	Chronic
Additives	1 Water Quality Conditioner (ferric chloride) added. Permittee has proper P chemical SOPs in place: Yes. **1 Point**	Ferric chloride is used more than once per 4 days. **1 Point**
Discharge Category	1 Industrial Contributor: Busse/SJI Corp. **5 Points**	Same as Acute. **5 Points**
Wastewater Treatment	Secondary or Better **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**14 Points**	**34 Points**
Recommended Monitoring Frequency (from Checklist):	No tests recommended	1x yearly
Limit Required?	No	Yes Limit = 1.1 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 yearly 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 1.1 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.

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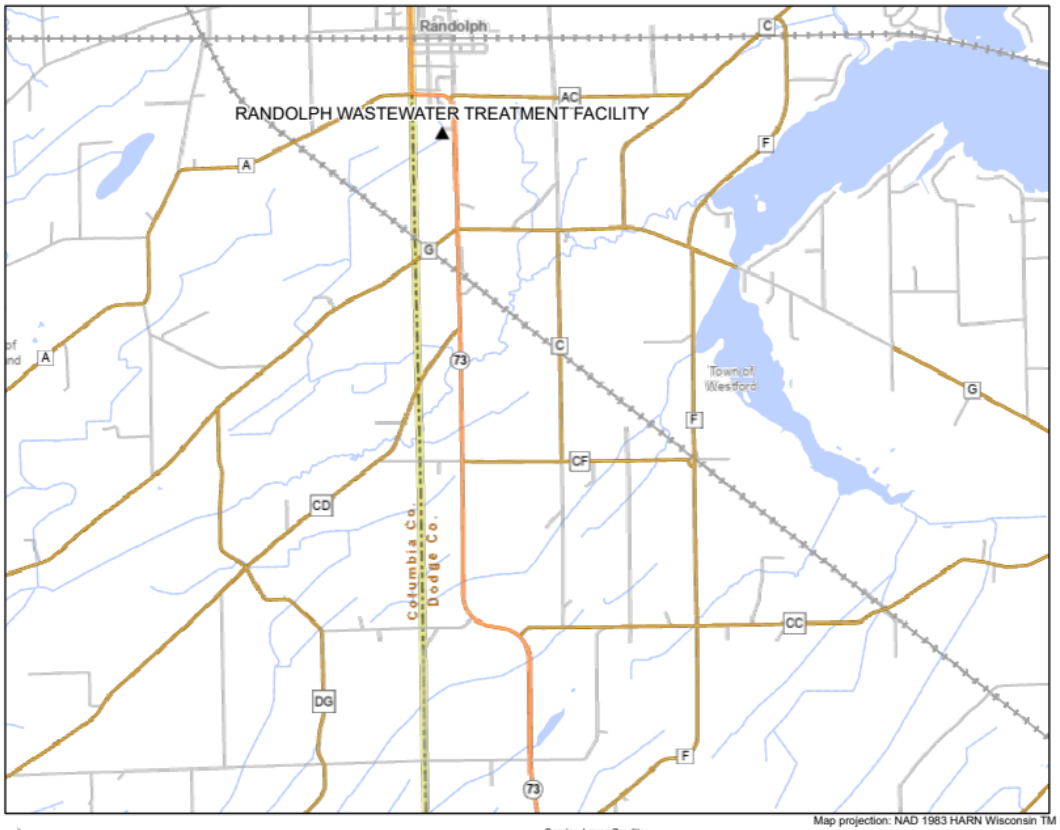
Randolph WWTF Discharge Location



Legend: (some map layers may not be displayed)

- Surface Water Outfalls
- Rivers and Streams
- Intermittent Streams
- Open Water

Latest Leaf Off Imagery

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

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

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

Service Layer Credits:
Latest Leaf Off Imagery: , Basic Basemap (Cached):

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Date Printed: 5/16/2025 11:20 AM

Attachment #3

2007 Ammonia Nitrogen Calculated Limits

Ammonia Nitrogen:

Water quality-based effluent limitations are evaluated in this report for Ammonia Nitrogen based upon water quality criteria in ch. NR 105 (as revised in March, 2004), including acute toxicity criteria (ATC) and chronic toxicity criteria (CTC). Effluent limitations for ammonia are calculated using the procedures in s. NR 106.32. The acute criteria relate to the pH of the effluent; the chronic criteria relate to both the pH and temperature of the receiving water body. This approach will establish criteria that are necessary to assure attainment of the designated use for the water body receiving the discharge.

A 99th percentile or a reasonable maximum value may be used for effluent pH to calculate the ammonia limit depending on the number of results available, the variability of those results, and the potential for outlier values. An effluent variability analysis was conducted according to the procedures of s. NR 106.05(5) and resulted in a one day P99 of 7.9 s.u. for effluent pH.

The following sections summarize the effluent quality and associated limitations calculated for ammonia in accordance with chs. NR 105, and 106 (Wis. Adm. Code) for two different stream classifications.

AMMONIA (as N) LIMITS			
CLASSIFICATION:		**LIMITED FORAGE FISH COMM**	
EFFLUENT FLOW (mgd):		0.3	
EFFLUENT FLOW (cfs):		0.464	
MAX. EFFLUENT pH (s.u.):		7.90	
f (withdrawal factor)		0.00	
BACKGROUND INFORMATION:		***summer***	***winter***
7Q10 (cfs)		0.03	0.03
7Q2 (cfs)		0.15	0.15
Ammonia (mg/L)		0.07	0.17
Temperature (deg C)		23	3
pH (std. units)		8.21	7.79
% of river flow used:		100	100
Reference weekly flow:		0.03	0.03
Reference monthly flow:		0.1275	0.031875
CRITERIA (in mg/L):			
Acute (@ effl. pH):		10.13	10.13
4-day Chronic (@ backgrd. pH):			
early life stages present		5.60	10.22
early life stages absent		7.69	39.39
30-day Chronic (@ backgrd. pH)			
early life stages present		2.24	4.09
early life stages absent		3.08	15.76
EFFLUENT LIMITS (in mg/L):			
Daily maximum (also see below)		20.26	20.26
Weekly average			
early life stages present		5.96	10.87

early life stages absent			41.93
Monthly average			
early life stages present		2.84	5.17
early life stages absent			20.04

Note: Early life stages present limits apply during the months of May through September and the early life stages absent limits apply to October through April for limited forage fish community streams where burbot are not expected to be present.

AMMONIA (as N) LIMITS				
CLASSIFICATION:		**WARMWATER SPORTFISH**		
EFFLUENT FLOW (mgd):		0.3		
EFFLUENT FLOW (cfs):		0.464		
MAX. EFFLUENT pH (s.u.):		7.90		
BACKGROUND INFORMATION:		***summer***	***winter***	***Spring***
7Q10 (cfs)		0.06	0.06	0.06
7Q2 (cfs)		0.3	0.3	0.3
Ammonia (mg/L)		0.07	0.17	0.09
Temperature (deg C)		23	3	9
pH (std. units)		8.21	7.97	7.97
% of river flow used:		100	100	100
Reference weekly flow:		0.06	0.06	0.06
Reference monthly flow:		0.255	0.255	0.255
CRITERIA (in mg/L):				
Acute (@ effl. pH):		10.13	10.13	10.13
4-day Chronic (@ backgrd. pH):				
early life stages present		2.55	6.35	6.35
early life stages absent		2.55	10.31	9.06
30-day Chronic (@ backgrd. pH)				
early life stages present		1.02	2.54	2.54
early life stages absent		1.02	4.12	3.63
EFFLUENT LIMITS (in mg/L):				
Daily maximum (also see below)		20.26	20.26	20.26
Weekly average				
early life stages present		2.87	7.15	7.16
early life stages absent			11.62	10.22
Monthly average				
early life stages present		1.54	3.84	3.89
early life stages absent			6.3	5.57

Acute ammonia limits are function of the effluent pH and it may be necessary depending on the effluent pH. The following table provides daily maximum limits throughout the pH range:

Daily Maximum Ammonia Limitations (mg/L) for (WWSF) & (LFF)					
pH	**Criterion**	**Limit**	**pH**	**Criterion**	**Limit**

Daily Maximum Ammonia Limitations (mg/L) for (WWSF) & (LFF)					
6	54.99	109.98	7.6	17.03	34.06
6.2	53.17	106.34	7.8	12.14	24.28
6.4	50.53	101.06	8	8.41	16.82
6.6	46.84	93.69	8.2	5.73	11.45
6.8	42.00	83.99	8.4	3.88	7.77
7	36.09	72.19	8.6	2.65	5.30
7.2	29.54	59.08	8.8	1.84	3.69
7.4	22.97	45.94	9	1.32	2.65

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

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

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

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

The velocity of receiving water is assumed to be 5 miles per day and the distance from the point of discharge to the classification change is approximately 3.8 miles for a travel time of 0.76 days. This equation shows that at the location where the classification change, 79% of the ammonia is remaining during summer, 95% during winter. The limits can be adjusted for decay as follows:

Ammonia Limits	Limited Forage Fish mg/L	Warm water mg/L	Recommended Limits mg/L
May – Sept.			
Daily max.	20.26	20.26	**20.3**
Weekly average	5.96	2.87	**3.6**
Monthly average	2.84	1.54	**2.0**
Oct. - April			
Daily max.	20.26	20.26	**20.3**
Weekly average	41.93	11.62	**12.2**
Monthly average	20.04	6.3	**6.6**

Attachment #3

RECOMMENDED AMMONIA LIMITATIONS:

Using the available information summarized earlier and pursuant to NR 106.33(2), the ammonia limitations would be as follows.

Recommended Ammonia Nitrogen Effluent Limits (rounded)			
	Daily Max.	**Weekly Avg.**	**Monthly Avg.**
May - September	no limit	3.6 mg/L	2.0 mg/L
October - April	20 mg/L	12 mg/L	6.6 mg/L

Attachment #4

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

Facility:	Randolph WWTF		**7-Q_{10}:**	0.03	cfs	**Temp Dates**	**Flow Dates**
Outfall(s):	001		**Dilution:**	100%	**Start:**	02/25/2023	11/01/19
Date Prepared:	6/4/2025		**f:**	0	**End:**	12/29/2023	03/31/25
Design Flow (Qe):	0.30	MGD	**Stream type:**	Limited forage fish community			
Storm Sewer Dist.	12,672	ft	**Qs:Qe ratio:**	0.0	:1		
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	37	54	78	0.03	0.253	0.269	0			87	113
FEB	39	54	79	0.03	0.254	0.498	0	43	46	87	112
MAR	43	57	80	0.03	0.619	0.838	0	49	51	89	113
APR	50	63	81	0.03	0.942	1.006	0	51	52	95	113
MAY	59	70	84	0.03	0.807	0.931	0	56	59	102	116
JUN	64	77	85	0.03	1.616	2.150	0	65	67	109	117
JUL	69	81	86	0.03	1.461	1.680	0	69	71	113	118
AUG	68	79	86	0.03	1.290	2.140	0	70	71	111	118
SEP	63	73	85	0.03	0.817	1.079	0	70	71	105	117
OCT	55	63	83	0.03	0.851	1.194	0	68	70	95	115
NOV	46	54	80	0.03	0.571	0.624	0	59	60	86	113
DEC	40	54	79	0.03	0.370	0.411	0	50	51	86	113