Permit Fact Sheet

General Information

Permit Number	WI-0002518-10-0
Permittee Name and Address	Nestle Purina PetCare Co 150 Riverview Dr. Jefferson WI 53549
Permitted Facility Name and Address	Nestle Purina PetCare Co 150 Riverview Dr. Jefferson, WI 53549
Permit Term	April 01, 2025 to March 31, 2030
Discharge Location	South bank of the Rock River, approximately 30 feet downstream of railroad bridge west of Highway 26 bridge. NE ¼ SW ¼ Section 11 T6N R14E
Receiving Water	Rock River via short storm sewer (Middle Rock River Watershed, UR01 – Upper Rock River Basin) in Jefferson County
Stream Flow ($Q_{7,10}$)	31 cfs
Stream Classification	Warm water sport fish community, non-public water supply
Discharge Type	Existing, Continuous

Facility Description

The Nestle Purina PetCare Company in Jefferson, WI produces canned pet foods. The plant operates 24 hours a day, seven days a week year-round with minor shut down periods. Major industrial processes include grain storage and handling, frozen meat grinding, cooking, extrusion, sterilization, packaging, warehousing, and shipping. Bulk liquid and dry ingredients are delivered by tank truck. Water supply consists of an average flow rate of 63,000 gallons per day (gpd) from the City of Jefferson and 400,000 gpd from a private well. The wastewater discharged under this permit consists of only can cooling water. Boiler blowdown, retort condensate, reverse osmosis permeate, and sanitary wastewater are discharged to the City of Jefferson Wastewater Treatment Facility. Outfall 001 is located on the south bank of the Rock River.

Nestle Purina PetCare Company is currently working to complete construction on a third manufacturing line that will start up in early 2025. Cooling water usages are expected to increase by 50%, for an average daily flow of 600,000 gpd as a conservative estimate. The factory will also install a granulated activated carbon (GAC) system to eliminate the intermittent whole effluent toxicity issues the factory has experienced in recent years. See the Water Quality-Based Effluent Limitations (WQBEL) Memo for more information.

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, the Toxicity Reduction Evaluation progress reports, and a site visit on April 25, 2023, this facility has been found to be in substantial compliance with their current permit.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
001	0.41 MGD (Average January 2019 – June 2024)	Effluent: 24-hr flow proportional composite sampler located in the pipe prior to the manhole at the northwest end of the property. Grab samples are collected from the boiler room. Representative samples consist of contact cooling water. Flow rates are calculated via continuous meters installed on well water and city water intake lines.

Permit Requirements

1 Surface Water - Monitoring and Limitations

1.1 Sample Point Number: 001- Cooling

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Calculated	See Flow Rate Monitoring section.
BOD5, Total	Daily Max	20 mg/L	Weekly	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	10 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	12 mg/L	Weekly	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Phosphorus, Total	Monthly Avg	0.3 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	6-Month Avg	0.1 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	6-Month Avg	0.97 lbs/day	Weekly	Calculated	
Temperature Maximum	Daily Max	120 deg F	Daily	Continuous	See Effluent Temperature Monitoring section.
Chlorine, Total Residual	Daily Max	38 ug/L	5/Week	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Chlorine, Total Residual	Monthly Avg	38 ug/L	5/Week	Grab	
Acute WET	Daily Max	1.0 TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Whole Effluent Toxicity (WET) Testing section.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Whole Effluent Toxicity (WET) Testing section.

1.1.1 Changes from Previous Permit

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

Total Suspended Solids (TSS): A monthly average limit is included in the permit.

pH, Temperature, Chlorine: Changes have been made to the sample frequency for these parameters.

Phosphorus: The mass limit has been corrected to a six-month average limit; in the previous permit the limit was erroneously expressed as a monthly average.

Acute WET: A daily maximum limit is included in the permit. Quarterly monitoring will occur during the first year of the permit term followed by annual testing if no failures occur in the first year.

Chronic WET: The Instream Waste Concentration (IWC) to assess chronic tests is updated to 11%. Annual chronic WET test to be performed in rotating quarters is included in the permit.

1.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo for Nestle Purina PetCare Co, prepared by Sarah Luck, dated October 11, 2024.

TSS: The concentration limit was derived by the department to address sediment impacts in Total Maximum Daily Load (TMDL) areas and is based on the same approach and data used to develop Wisconsin's phosphorus criteria. This numeric target is intended to meet the narrative criteria in s. NR 102.04, Wis. Adm. Code.

Phosphorus: A mass limit is required pursuant to s. NR 217.14(1)(a), Wis. Adm. Code. The current mass limit is based on the maximum effluent flow rate, expressed as a 30-day rolling average, recorded from 2003 – 2013, of 1.165 MGD. In anticipation of the third canning line and the new water reuse system being installed, a flow rate of 0.60 MGD is estimated. The mass limit will be reevaluated based on more recent and representative flow data at the next permit reissuance.

Acute WET: Monthly acute WET testing is required to complete the TRE currently in progress. Quarterly acute WET compliance testing will occur during the first 12 months (April 2025 – March 2026) to cover the possibility that toxicity could reoccur. If no toxicity occurs in the first 12 months, acute WET monitoring may be reduced to annual. If there is a failure of any tests in the first 12 months, quarterly monitoring would continue for the rest of the permit term.

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. Changes have been made to the monitoring frequencies for pH, temperature, and chlorine to align Nestle Purina PetCare Co with similar facilities to ensure fairness and in consideration of department guidance on sampling frequencies. The frequencies for pH and chlorine are set at the minimum sample frequency outlined in guidance. In evaluating the monitoring frequency for parameters with limits in the permit, the department considered the potential public health impacts, probable environmental impact, and past operating performance. The department may re-evaluate current sampling frequencies and implement more frequent monitoring via a permit modification or at permit reissuance.

Requirements in administrative code (NR 108, 205, 210, and 214, Wis. Adm. Code) and Sections 283.55, Wis. Stats., were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term.

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 daily maximum and monthly average limitations whenever practicable.

Other Comments

Granulated activated carbon (GAC) system construction scheduled to be complete in January 2025.

Attachments

Water Quality Based Effluent Limits, date October 11, 2024

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance.

Prepared By: BetsyJo Howe, Wastewater Specialist **Date:** 02/11/2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: October 11, 2024

TO: BetsyJo Howe – SCR/Fitchburg

FROM: Sarah Luck – SCR/Fitchburg

SUBJECT: Water Quality-Based Effluent Limitations for Nestle Purina PetCare Co
WPDES Permit No. WI-0002518-10-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from Nestle Purina PetCare Co in Jefferson County. This industrial facility discharges contact cooling water and boiler blowdown to the Rock River, located in the Middle Rock River Watershed (UR01) in the Upper Rock River Basin. Limits for this discharge considers the Rock River TMDL as approved by EPA. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5	20 mg/L			10 mg/L		2
TSS				12 mg/L		3
pH	9.0 s.u.	6.0 s.u.				2
Residual Chlorine	38 µg/L			**38 µg/L**		2,4
Phosphorus				0.30 mg/L	0.10 mg/L 0.97 lbs/day	-
Temperature	120°F					2
Acute WET	1.0 TU_a					5,6,7,9
Chronic WET						8,9

Footnotes:

1. Monitoring only.
2. No changes from the current permit.
3. This target concentration limit of 12 mg/L was derived by the Department to address sediment impacts in Total Maximum Daily Load (TMDL) areas and is based on the same approach and data used to develop Wisconsin's phosphorus criteria. This numeric target is intended to meet the narrative criteria in s. NR 102.04, Wis. Adm. Code.
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7) are included in bold.
5. Monthly acute WET testing is required as part of completion of the TRE currently in progress. 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.
6. Quarterly acute WET compliance testing for the first 12 months (WET monitoring trigger) to cover the possibility that toxicity could reoccur. If no toxicity occurs in the first 12 months, acute WET monitoring may be reduced to once per year. If there is a failure of any tests in the first 12 months, quarterly monitoring would continue for the rest of the permit term. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis.

Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests.

7. The acute WET limit should be in place for the entire term, regardless of the monitoring results.
8. Annual chronic WET tests are required. The Instream Waste Concentration (IWC) to assess chronic test results is 11%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 30%, 10%, 3% & 1%, and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the Rock River.
9. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Sarah Luck (Sarah.Luck@wisconsin.gov) or Diane Figiel (Diane.Figiel@wisconsin.gov).

Attachments (2) – Narrative and Site Map

PREPARED BY: Sarah Luck _____ Date: October 11, 2024

Sarah Luck
Water Resources Engineer

E-cc: Ashley Brechlin, Wastewater Engineer – SCR/Fitchburg
Diane Figiel, Water Resources Engineer – WY/3
Kari Fleming, Environmental Toxicologist – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Nestle Purina PetCare Co

WPDES Permit No. WI-0002518-10-0

PART 1 – BACKGROUND INFORMATION

Facility Description

The Nestle Purina PetCare Company in Jefferson, WI produces canned pet foods. The plant operates 24 hours a day, seven days a week year-round with minor shut down periods. Major industrial processes include grain storage and handling, frozen meat grinding, cooking, extrusion, sterilization, packaging, warehousing, and shipping. Bulk liquid and dry ingredients are delivered by tank truck.

The wastewater discharged under this permit consists of only can cooling water. Boiler blowdown, retort condensate, reverse osmosis permeate, and sanitary wastewater are discharged to the City of Jefferson Wastewater Treatment Facility. Outfall 001 is located on the south bank of the Rock River approximately 30 feet downstream of the railroad bridge, west of Highway 26.

Nestle Purina PetCare Company is currently working to complete construction on a third manufacturing line that will start up in early 2025. The new line will be another 3.0 oz canning line that is similar to the existing operations. Cooling water usages are expected to increase by 50%, for an average daily flow of 600,000 gpd as a conservative estimate. The new cooling system will be equipped with a water reuse system that should improve on this performance. As part of the overall project, the factory will install a granulated activated carbon (GAC) system to eliminate the intermittent whole effluent toxicity issues the factory has experienced in recent years. From the toxicity reduction evaluation (TRE) work completed thus far and demonstrated in the pilot trial in 2022, the GAC system is expected to be 100% effective in eliminating the toxic impact towards Ceriodaphnia. The dual GAC tanks (operated in parallel) will be protected by a bag filter. Backwash from the GAC units will be directed into an outdoor tank (with containment) before the backwash water is routed to the sanitary sewer. During planning, Nestle committed to conducting acute toxicity screens with Ceriodaphnia on a monthly basis in the first year after construction is complete to verify that toxic compounds have not broken through the GAC system.

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

Existing Permit Limitations

The current permit, which expired on December 31, 2023, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5	20 mg/L			10 mg/L		2
TSS						1
pH	9.0 s.u.	6.0 s.u.				2

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Residual Chlorine	38 µg/L			**38 µg/L**		3
Phosphorus				0.3 mg/L 0.97 lbs/day	0.1 mg/L	-
Temperature Maximum	120°F					-
Acute & Chronic WET						4

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7) are included in bold.
4. Three acute and three chronic WET tests were required. The IWC for chronic WET was 10%.

Receiving Water Information

- Name: Rock River (via a storm sewer)
- Waterbody Identification Code (WBIC): 788800
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
- Low Flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS station at Jefferson, below the mouth of Crawfish River and downstream from the Highway 26 Bridge.

  7-Q_{10} = 31 cfs (cubic feet per second)
  7-Q_2 =113 cfs
  90-Q_{10} = 96 cfs
  Harmonic Mean Flow = 240 cfs using a drainage area of 1850 mi^2
  The Harmonic Mean has been estimated based on average flow and the 7-Q_{10} using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).

	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
7-Q_{10} (cfs)	71	71	172	172	172	43	43	43	35	35	35	71
7-Q_2 (cfs)	242	242	455	455	455	149	149	149	139	139	139	242

- Hardness = 312 mg/L as $CaCO_3$. This value represents the geometric mean of data (n=4) from WET tests conducted by Jefferson Wastewater Treatment Facility, located approximately 0.34 mile downstream, from September 2019 through January 2023.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%
- Source of background concentration data: Metals data from the Rock River below Davy Creek (upstream of the outfall location) is used for this evaluation. Since no mercury data is available at an upstream station, mercury data from 2014 and 2015 in the Rock River at Afton is also used in this evaluation. The geometric means of these values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the

computations.

- Multiple dischargers: Jefferson Wastewater Treatment Facility discharges approximately 0.34 miles downstream. However, it is assumed the mixing zones do not overlap, so this does not impact the evaluation.
- Impaired water status: The Rock River is listed as impaired for phosphorus at the point of discharge. An EPA-approved TMDL addresses the phosphorus and TSS impairments in this waterbody and downstream waters.

Effluent Information

- Flow rate:
  Maximum annual average = 0.60 MGD* (Million Gallons per Day)
  For reference, the overall average flow from January 2019 through June 2024 was 0.41 MGD.
  **A third canning line, which is currently under construction, is expected to increase effluent flows by 50% for an average daily flow of 0.60 MGD. Although, this increase in flows has not taken place yet, effluent limits considering the increase in flow to 0.60 MGD are considered in this memo.*
- Hardness = 268 mg/L as $CaCO_3$. This value represents the geometric mean (n=4) of data from June 2023 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).
- Water source: Water supply from the City of Jefferson and a private well.
- Additives: PureCide E and sodium bisulfite (dechlorination).
- Effluent characterization: This facility is categorized as a secondary industry, 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 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Copper Effluent Data

Sample Date	Copper (µg/L)
06/05/23	7
06/08/23	<2
06/12/23	5
06/15/23	<4
Average	3

"<" means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected results.

The following table presents the average concentrations and loadings at Outfall 001 from January 2019 through June 2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD_5	0.36 mg/L*	

Attachment #1

	Average Measurement	Average Mass Discharged
pH field	8.0 s.u.	
Phosphorus	0.06 mg/L	0.21 lbs/day
Chlorine, total residual	<100 µg/L	
Temperature	109 °F	

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

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

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

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

Acute Limits based on 1-Q_{10}

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

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

Where:

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

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

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

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

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

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

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 25 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT*	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Chlorine		19.0	38.1	7.61	<100
Arsenic		340	679.6	135.9	<40
Cadmium	268	32.0	64.0	12.8	<4
Chromium	268	4048	8096.6	1619	<6
Copper	268	39.4	78.8	15.8	3
Lead	268	278	555.3	111.1	<40
Nickel	268	1080	2160.6	432	<6
Zinc	268	286	571.0	114.2	<60
Chloride (mg/L)		757	1514.0	303	47.9

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

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 7.8 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Chlorine		7.28		68.05	13.61	<100
Arsenic		152.2		1423	284.6	<40
Cadmium	175	3.82	0.31	33.12	6.6	<4
Chromium	301	325.75	1.8	3030	606.0	<6
Copper	312	27.40	2.0	239.4	47.89	3
Lead	312	84.07		785.9	157.2	<40
Nickel	268	120.18	2.6	1102	220.3	<6
Zinc	312	325.56	2.5	3022	604.5	<60
Chloride (mg/L)		395	63	3167	633.3	47.9

* 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 = 60 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.31	24306	4861.3	<4
Chromium (+3)	3818000	1.8	251022067	50204413	<6
Lead	140		9205	1840.9	<40
Nickel	43000	2.6	2826954	565391	<6

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 60 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	874.4	174.89	<40

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 total residual chlorine.**

Total Residual Chlorine – Since chlorine is added as a disinfectant, effluent limitations are 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." Since the WQBELs are more restrictive, they are recommended instead. Specifically, **a daily maximum limit of 38 µg/L is required.** Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required.

Expression of Limits

Revisions to ch. NR 106, Wis. Adm. Code, align Wisconsin's water quality-based effluent limitations with 40 CFR 122.45(d), which requires Daily maximum and monthly average limitations for industrial discharges.

The methods for calculating limitations for industrial discharges to conform to 40 CFR 122.45(d) are specified in s. NR 106.07(4), Wis. Adm. Code, as follows:

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

Therefore**, a monthly average chlorine limit of 38 µg/L is also required**.

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of industrial activity, **PFOS and PFOA monitoring is not recommended.** The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for this substance effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. Given the fact that the Nestle Purina PetCare Co does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time. Four samples for ammonia nitrogen were taken in June 2023, and the results are as follows:

Ammonia Nitrogen Effluent Data

Sample Date	Ammonia Nitrogen mg/L
06/05/23	<0.30
06/08/23	<0.30
06/12/23	<0.30
06/15/23	<0.30

"<" means that the pollutant was not detected at the indicated level of detection.

Ammonia was not detected in the effluent, and the limit of detection is much lower than the most restrictive ammonia limits that would be calculated. **No ammonia limits or monitoring are recommended** in the reissued permit.

PART 4 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires industrial facilities that discharge greater than 60 pounds of total phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Since Nestle Purina PetCare Co has phosphorus limits in effect that are more stringent than 1.0 mg/L, the need for a TBEL will not be considered further.

In addition, the need for a WQBEL for phosphorus must be considered.

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

The Department has developed a TMDL for the Upper and Lower Rock River Basins. The U.S. 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.

The Nestle Purina PetCare Co is located on Reach 54 of the Rock River from Bark River to Crawfish River. The phosphorus load reduction target from wastewater discharges for this reach is 77%, but no wasteload allocation was specified for Nestle Purina PetCare Co. Therefore, the s. NR 217.13, Wis. Adm. Code, phosphorus WQBEL is used in lieu of a TMDL-derived limit in order to protect local and downstream water quality.

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a), Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.100 mg/L applies for the Rock River (from the outlet of Sinissippi Lake downstream to the state line) where Outfall 001 is located. Therefore, the **water-quality based effluent limit for phosphorus of 0.10 mg/L**, expressed as a six-month average, **is recommended.**

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from January 2019 through June 2024.

Total Phosphorus Effluent Data

	mg/L	lbs/day
1-day P_{99}	0.30	1.05
4-day P_{99}	0.17	0.57
30-day P_{99}	0.09	0.32
Mean	0.06	0.21
Std	0.06	0.21
Sample size	278	278
Range	0.01 - 0.62	0.01 - 2.125

Reasonable Potential Determination

The current permit has phosphorus WQBELs of 0.30 mg/L as a monthly average and 0.10 mg/L as a six-month average. These limits are in effect and are recommended to continue.

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 has an approved TMDL. The previous mass limit of 0.97 lbs/day was based on the maximum effluent flow, expressed as a 30-day rolling average, recorded from 2003-2013, of 1.165 MGD. However, looking at effluent flow data from 2019 to 2024, the peak daily flow rate was 0.83 MGD and the maximum 30-day rolling average was 0.53 MGD. In anticipation of the third canning line and the new water reuse system being installed, a flow rate of 0.60 MGD is estimated but not yet certain. Therefore, the current mass limit of 0.97 lbs/day is recommended to continue but will be reevaluated at the next permit reissuance, which may result in a lower limit based on more recent and representative flow data. Additionally, the mass limit was erroneously expressed as a monthly average when it should have been expressed as a six-month average.

PART 5 – TOTAL SUSPENDED SOLIDS

TSS TMDL Limits

The Rock River TMDL also has wasteload allocations (WLA) for total suspended solids (TSS). A TSS load reduction target is not specified for Nestle Purina PetCare Co in the TMDL report.

For informational purposes, the following table lists the statistics for total suspended solids in the discharge from January 2019 through June 2024.

Total Suspended Solids Effluent Data

	TSS mg/L
1-day P_{99}	14
4-day P_{99}	7
30-day P_{99}	3
Mean*	1
Std	4.7
Sample Size	278 (197 ND)
Range	<2 - 31

*"<" means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected (ND) result.

The current permit only includes monitoring for TSS. However, a target **concentration of 12 mg/L as monthly average limit for TSS** was derived by the Department for use in TMDL areas to address sediment impacts and is based on the same approach and data used to develop Wisconsin's phosphorus criteria. This numeric target is intended to meet the narrative criteria in s. NR 102.04, Wis. Adm. Code, and **is recommended in the reissued permit**.

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

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 January 2019 through June 2024.

The table on the next page summarizes the maximum temperatures reported during monitoring from January 2019 through June 2024.

Attachment #1

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	113	114	-	120
FEB	112	113	-	120
MAR	111	113	-	120
APR	117	119	-	120
MAY	117	119	-	120
JUN	117	119	-	120
JUL	119	119	-	120
AUG	115	119	-	120
SEP	115	118	-	120
OCT	114	116	-	120
NOV	113	116	-	120
DEC	114	119	-	120

Reasonable Potential

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

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

Although temperatures did not exceed the daily maximum limit, **the daily maximum limit of 120°F and year-round monitoring is recommended to continue** since Nestle Purina PetCare Co was previously subject to a temperature limit and non-contact cooling water comprises this discharge. Once a limit is in effect, efforts to meet the temperature limit skew results used for reasonable potential determinations. Furthermore, if treatment or process configurations are or were made to not exceed an effective limit, the limit is recommended to continue regardless of reasonable potential pursuant to state implementation of water quality standards.

Attachment #1

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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

Nestle Purina PetCare Co has experienced intermittent toxicity since 2012. In response to WET test failures, the facility has performed a Toxicity Reduction Evaluations (TRE). The TRE included regular acute screening tests for *Ceriodaphnia dubia* over the course of the study plus additional tests for specific chemical trials with the results summarized in quarterly and annual reports. The final TRE report identified that treatment using a granulated activated carbon (GAC) system was effective in removing the toxicity, and Nestle Purina PetCare Co is installing a full-scale GAC treatment system, scheduled to be complete in December 2024. Nestle has committed to conducting acute toxicity screens with *Ceriodaphnia* on a monthly basis in 2025 to verify that toxic compounds are not breaking through the GAC system.

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

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 11%, shown in the WET Checklist summary below, was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

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

Where:

Q_e = annual average flow = 0.60 MGD = 0.93 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 31 cfs ÷ 4 = 7.8 cfs

- The IWC of 11% is higher than the previous IWC of 10% due to the expected increase in effluent flow rate from the addition of the third canning line (0.582 MGD to 0.60 MGD).

- 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 representative 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.

  As noted above, Nestle Purina PetCare Co has experienced intermittent toxicity since 2012. In response to WET test failures, the facility has performed several Toxicity Reduction Evaluations (TREs). Since the facility is actively installing a full-scale GAC treatment system, all previous WET tests are no longer considered representative of treatment capabilities and are therefore not used to assess WET recommendations. A pilot study to evaluate two GAC carbon types for full scale development was conducted in 2022, and those WET tests results are shown below.

WET Data History

Date Test Initiated	Acute Results LC_{50} % (% survival in 100% effluent)				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?	
09/24/2013	>100	>100	Pass	No	>100	>100	Pass	No	2
10/22/2013	>100	>100	Pass	No	71	>100	Pass	No	2
11/11/2014	>100	>100	Pass	No	-	-	-	No	1, 2
12/16/2014	-	-	-	-	>100	>100	Pass	No	2
07/21/2015	>100	>100	Pass	No	>100	>100	Pass	No	2
05/03/2016	>100	>100	Pass	Yes	>100	>100	Pass	No	2
03/28/2017	>100	>100	Pass	Yes	-	>100	Pass	No	1
05/15/2017	-	-	-	-	64.3	-	Pass	No	2
09/20/2022	>100	>100	Pass	Yes	>100	>100	Pass	No	3
09/20/2022	>100	>100	Pass	Yes	>100	>100	Pass	No	3

Footnotes:

1. *Qualified or Inconclusive Data.* QA concerns were noted during testing which calls into question the reliability of the test results.
2. *Data Not Representative.* Industrial processes or contributions, or other significant changes have occurred which renders data unrepresentative. Data collected prior to 2022 is no longer be representative of the discharge.
3. These results are from a pilot study conducted in 2022 that evaluated two different carbon GAC systems. Since both tests were conducted under pilot scenarios (not actual discharged effluent), neither test is used in the RP calculation.

- 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.**

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 **an acute WET limit is not required based on data, but is required as part of the WET trigger (see below).**

Chronic Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and **a chronic WET limit is not required.**

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

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. **0 Points**	IWC = 11% **0 Points**
Historical Data	No representative tests available to calculate RP. No tests failed. **5 Points**	Same as Acute. **5 Points**
Effluent Variability	Little variability, no violations or upsets, consistent operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	WWSF **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	Reasonable potential for chlorine limits based on ATC; copper and chloride detected. Additional Compounds of Concern: None. **7 Points**	Reasonable potential for chlorine limits based on CTC; copper and chloride detected. Additional Compounds of Concern: None. **7 Points**
Additives	1 biocide and 1 water quality conditioner added. **4 Points**	All additives used more than once per 4 days. **4 Points**
Discharge Category	Can cooling water. **5 Points**	Same as Acute. **5 Points**
Wastewater Treatment	NCCW, Boiler or Cooling Tower Blowdown **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as Acute. **0 Points**

	Acute	Chronic
Total Checklist Points:	**26 Points**	**26 Points**
Recommended Monitoring Frequency (from Checklist):	3 tests during permit term.	3 tests during permit term.
Limit Required?	Yes	No
TRE Recommended? (from Checklist)	No	No

The following acute WET recommendations apply:

- **Monthly acute WET testing is required** as part of completion of the TRE currently in progress.
- **Quarterly acute WET compliance testing for the first 12 months** (WET monitoring trigger) to cover the possibility that toxicity could reoccur. If no toxicity occurs in the first 12 months, acute WET monitoring may be reduced to once per year. If there is a failure of any tests in the first 12 months, quarterly monitoring would continue for the rest of the permit term.
- The acute WET limit of 1.0 TU_a should be in place for the entire term, regardless of the monitoring results.

The following chronic WET recommendations apply:

- **Annual chronic WET tests are recommended in the reissued permit.** Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).

PART 8 – ADDITIVE REVIEW

Unlike the metals and toxic substances evaluated in Part 2, most additives have not undergone the amount of toxicity testing needed to calculate water quality criteria. Instead, in cases where the minimum data requirements necessary to calculate a WQC are not met, a secondary value can be used to regulate the substance, according to s. NR 105.05, Wis. Adm. Code.

Additive Parameters

Additive Name	Manufacturer	Purpose of Additive including where added	Intermittent or Continuous Feed	Frequency of Use		Estimated Effluent Concentration mg/L	Is Additive Authorized in Current Permit?	Footnote
				Months per/yr.	Days/ week			
Purecide E	Veolia	Feed to the chlorine dioxide generator	Continuous	12	7	0	Yes	1
Sodium bisulfite	Veolia	Chlorine removal	Continuous	12	7	0	Yes	2

Footnotes:

1. Purecide E is the in-feed to the chlorine dioxide generator and does not come in contact with any water being discharged to the Rock River. Approximately 6lbs of Purecide E solution is required to generate 1lb of chlorine dioxide gas. This chlorine dioxide gas is entirely consumed in the can cooling

disinfection process or reduced to a zero residual with the effluent dechlorination system. Total residual chlorine limits are given to assure proper chlorination/dechlorination.

2. An additive review is not required due to the active ingredient.

Attachment #2
Site Map