Dairy State Cheese Permit Fact Sheet

General Information

Permit Number	WI-0055751-09-0
Permittee	Dairy State Cheese, Inc., P O Box 215, Rudolph, WI 54475
Permitted Facility Name and Address	Dairy State Cheese, Inc., Corner of Hwy 34 & County Hwy C, Rudolph, WI
Permit Term	July 01, 2025 to June 30, 2030
Discharge Location	44.637 degrees North, 89.844 degrees West; Approx. 200 feet E of treatment plant.
Receiving Water	an effluent ditch to Flick Creek, located in the Wisconsin Rapids Watershed in the Central Wisconsin River Basin in Wood County
Stream Flow ($Q_{7,10}$)	0 cfs
Stream Classification	Limited Aquatic Life, Non-public Water Supply
Discharge Type	Existing, continuous

Facility Description

Dairy State Cheese (DSC) operates a natural cheese production facility and a whey processing plant. Process wastewater and whey permeate from the reverse osmosis along with clean in place (CIP) wastewater are treated at an onsite activated sludge wastewater treatment facility. Upgrades completed in September of 2022 converted the existing sequencing batch reactor (SBR) to an equalization tank and added an aeration basin and ultra filtration membrane system. The old equalization tank is now being used as a selector tank to precipitate phosphorus removal. A dissolved air floatation (DAF) is used for solid/liquid separation and sludge is stored in an onsite sludge storage tank. The facility has an annual average design flow of 0.250 million gallons per day (MGD) and had an actual annual average flow of 0.154 MGD from Jan – Dec 2024. Treated effluent is discharged to an effluent ditch to Flick Creek. Sludge from the treatment system, unprocessed whey, and whey permeate are disposed of in several ways including land application on Department approved sites, hauling to other wastewater treatment facilities, and hauling to department approved manure pits. Sanitary wastewaters are segregated and discharged to the Wisconsin Rapids Wastewater Treatment Facility.

Substantial Compliance Determination

Enforcement During Last Permit:

- November 8th, 2018: Notice of Noncompliance (NON) issued for effluent BOD, TSS, and Chronic WET Test exceedances.
- August 27th, 2019: NON issued for spill resulting from a high strength waste release at the production facility. Levels of *E.coli* in excess of the human health criteria and BOD in excess of permit limits were observed in samples taken by the department.
- June 16th, 2021: Notice of Violation (NOV) issued for landspreading on unapproved sites, landspreading on sites with less than 36 inches of separation between the ground surface and groundwater and failing to submit accurate landspreading reporting forms.

- September 9th 2021: NOV issued for failure to report noncompliance and discharge of hazardous substances as well as BOD, TSS, WET and *E.coli* violations. Other items included in the NOV were surface water use criteria violations resulting from a spill on June 12th 2021 that produced a noticeable odor and foam in Flick Creek.
- February 15th, 2022: NOV issued for landspreading on unapproved fields and winter landspreading on snow covered fields.
- February 22nd, 2023: Referral to DOJ for violations in June 2021, September 2021, and February 2022 NOV's. An Order for Judgment was issued on February 22nd, 2023 and Satisfaction of Judgment on April 6th, 2023.
- October 23rd, 2023: NOV issued for unauthorized landspreading and nonconformance to their land application management plan (LAMP) as well as failure to properly document landspreading activities. Dairy State Cheese was issued a DATCP fertilizer license on June 1st, 2023 for their sludge and began spreading under the requirements of said license. The DNR issued letters on October 5th, 2023 and March 14th, 2024 informing DSC that the DATCP license does not exempt them from the requirements of NR 214 and they need to return to compliance. The facility has since largely done so.
- March 31st 2025: A spill occurred at the treatment facility resulting in approximately 10,600 gallons of untreated wastewater overflowing from the sludge tank of which an estimated 1646 gallons made it to the Flick Creek tributary. No fish kill was witnessed in the creek and the remaining wastewater was removed from the site and disposed of.

The facility has made upgrades to its treatment facility which have addressed several of the ongoing issues. *E.coli* sampling has shown no exceedances from May 2024 forward, however the facility has *E.coli* monitoring and limits in this permit to address ongoing concerns. TSS and BOD levels have also remained mostly below permit limits other than during periods of equipment failure. The facility has implemented a communication plan between the treatment and production facilities so when high strength waste is expected it can be diverted to an EQ tank so it does not overwhelm the plant. The facility is mostly following its LAMP and following the 10/15/2024 inspection agreed to keep logs of chloride and nitrogen loadings on fields to avoid overloading them. Chronic WET testing continues to show toxicity issues in the effluent and a TRE with a compliance schedule has been added in this permit to address it.

After a desktop review of all discharge monitoring reports, land application reports and a site visit on 10/15/2024 completed by Logan Rubeck the Dairy State Cheese Wastewater Treatment Facility has been found to be in substantial compliance with their current permit.

Compliance determination entered by Logan Rubeck on 11/11/2024.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
001	0.154 MGD (2024)	Representative composite effluent samples shall be collected after the effluent flow meter and prior to the post aeration manhole before the effluent ditch to Flick Creek. Grab samples shall be collected at the post aeration manhole.
002	2,578,600 MGD (2024)	Representative samples shall be collected from a truckload of liquid waste that is representative of all the liquid being land applied, hauled to another facility or hauled to an approved manure structure. Discharge is limited to unprocessed whey and whey permeate.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
003	3,108,000 gallons (2024)	Representative samples shall be collected from the sludge storage tank sludge prior to land application on Department approved sites, being hauled to another facility or being hauled to an approved manure storage structure. Discharge is limited to wastewater treatment plant sludge.

Permit Requirements

1 Surface Water - Monitoring and Limitations

1.1 Sample Point Number: 001- DISCHARGE to EFFLUENT DITCH

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	
BOD5, Total	Daily Max	59 lbs/day	3/Week	Calculated	
BOD5, Total	Monthly Avg	25 lbs/day	3/Week	Calculated	
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	Daily Max	88 lbs/day	3/Week	Calculated	
Suspended Solids, Total	Monthly Avg	36 lbs/day	3/Week	Calculated	
pH Field	Daily Min	6.0 su	Daily	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	Daily	Grab	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	
E. coli	Geometric	126 #/100 ml	Weekly	Grab	Limit & monitoring apply

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
	Mean - Monthly				May-Sept
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit & monitoring apply May-Sept. See the E. coli Percent Limit section in the permit. Enter the result in the DMR on the last day of the month.
Chlorine, Total Residual	Daily Max	19 ug/L	Daily	Grab	Monitoring required at permit effective date. Limit effective 07/01/2026. See chlorine section in permit & associated schedule.
Chlorine, Total Residual	Weekly Avg	7.3 ug/L	Daily	Grab	
Chlorine, Total Residual	Monthly Avg	7.3 ug/L	Daily	Grab	
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	1.11 lbs/day	3/Week	Calculated	See TMDL section in permit
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See TMDL section in permit.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL section in permit.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET testing section in permit for specific quarters.
Chronic WET	Monthly Avg	1.0 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET testing section in permit

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.

- **Flow-** The sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes.
- **E. coli-** Seasonal (May – Sept) E. coli monitoring and limits have been added
- **Chlorine** – chlorine limits added with a compliance schedule
- **Total Nitrogen Monitoring (TKN, N02+N03 and Total N)**- quarterly monitoring added
- **Ammonia**- ammonia monitoring added
- **Phosphorus** – lower monthly average limit
- **Acute WET testing** – increase in frequency from twice/permit term to twice annually
- **Sample Frequency**: Increase in DO frequency from monthly to daily, increase in pH frequency from 3/week to daily, increase in BOD & TSS frequency from 2/week to 3/week

1.1.2 Explanation of Limits and Monitoring Requirements

Additional detailed discussions of limits and monitoring requirements can be found in the February 3, 2025 water quality-based effluent limits (WQBEL) memo and the technology based effluent limits (TBEL) memo described in the "Comments" section at the end of this fact sheet.

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.

Based on the factors discussed above, sample frequency for DO was increased from monthly to daily, pH from 3/week to daily, and the BOD & TSS frequency was increased 2/week to 3/week. These monitoring frequency increases are necessary in order to effectively characterize the effluent quality and variability, and to best determine compliance with effluent limitations

Phosphorus - Chapter NR 217, Wis. Adm. Code. specifies WQBELs for discharges of phosphorus to surface waters of the state. WQBELs for phosphorus are needed whenever the discharge contains phosphorus at concentrations or loadings that will cause or contribute to an exceedance of the water quality standards.

Dairy State Cheese is included within the Wisconsin River Basin (WRB) total maximum daily load (TMDL), which was approved by EPA April 26, 2019. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amount of phosphorus that can be discharged and still protect water quality. The final effluent limits and monitoring expressed in the permit were derived from Site-Specific Criteria (SSC) for Lakes Petenwell, Castle Rock, and Wisconsin originally included in Appendix K of the TMDL report and approved by the U.S. Environmental Protection Agency on July 9, 2020.

The permittee's approved SSC-based WLA for this permittee is 279 lbs/yr and results in a calculated phosphorus mass limit of 1.11 lbs/day expressed as a monthly average. The 12-month rolling sum of total monthly phosphorus (lbs/yr) shall be reported each month for direct comparison to the facility's WLA.

Facilities with WRB TMDL based effluent limits for phosphorus must report the 12-month rolling sum of total monthly discharge (lbs/yr). If reported 12-month rolling sums exceed the facility's max annual WLA, the facility's mass limits (monthly average) may be recalculated using more appropriate CVs or monitoring frequencies when the permit is reissued to bring discharge levels into compliance with the facility's given WLA.

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N) - The Department has included quarterly effluent monitoring for Total Nitrogen through the authority under s. 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code., which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019.

PFOS and PFOA - NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the department evaluated the need for PFOS and PFOA monitoring. Based on information available at the time the permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

2 Land Application - Sludge

2.1 Sample Point Number: 002- LAND APPLICATION OF LIQUID WASTE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab	
Chloride		mg/L	Monthly	Grab	
Phosphorus, Total		mg/L	Monthly	Grab	
Phosphorus, Water Extractable		Percent	Monthly	Grab	
Potassium, Total Recoverable		mg/L	Monthly	Grab	

2.1.1 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.

To better determine compliance and track impacts to groundwater, monitoring for water extractable phosphorus and total recoverable potassium has been added as a requirement at Outfall 002.

2.1.2 Explanation of Limits and Monitoring Requirements

Requirements for land application of industrial sludge are determined in accordance with ch. NR 214 Wis. Adm. Code.

WATER EXTRACTABLE PHOSPHORUS - Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

2.2 Sample Point Number: 003- LAND APPLICATION of SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Monthly	Grab	
Nitrogen, Total Kjeldahl		Percent	Monthly	Grab	
Nitrogen, Ammonium (NH4-N) Total		Percent	Monthly	Grab	
Chloride		Percent	Monthly	Grab	
Phosphorus, Total		Percent	Monthly	Grab	
Phosphorus, Water Extractable		Percent	Monthly	Grab	
Potassium, Total Recoverable		Percent	Monthly	Grab	
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.

2.2.1 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.

To better determine compliance and track impacts to groundwater, monitoring for ammonium nitrogen, water extractable phosphorus and total recoverable potassium has been added as a requirement at Outfall 003. Also, the units for many parameters were changed from mg/L to percent. PFAS monitoring was added annually pursuant to s. NR 214.18(5)(b), Wis. Adm. Code.

2.2.2 Explanation of Limits and Monitoring Requirements

Requirements for land application of industrial sludge are determined in accordance with ch. NR 214 Wis. Adm. Code.

WATER EXTRACTABLE PHOSPHORUS - Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment to determine potential risks associated with land applying residuals which contain PFOA and/or PFOS. The DNR is evaluating this information and may alter the current approach based on this review. 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.

3 Schedules

3.1 Chlorine Limits

The permittee shall comply with the chlorine limits as specified.

Required Action	Due Date
Submit Report: Permittee shall submit a report on effluent discharges of chlorine with conclusions regarding compliance with the daily maximum, weekly average and monthly average limitations.	12/31/2025
Complete Actions: Complete actions to achieve compliance with the chlorine limits. Limitations becomes effective 07/01/2026.	06/30/2026

Explanation of Schedule: The compliance schedule for chlorine provides a schedule for conducting the actions necessary to comply with the new limits. The compliance schedule lays out a timeline for the permittee to investigate and implement a plan to comply with the limits by the end of the schedule.

3.2 Chronic Toxicity Reduction Evaluation (TRE) Schedule

Required Action	Due Date
Toxicity Reduction Evaluation (TRE) - Submit an updated TRE: The permittee shall submit an updated TRE plan to account for changes and to extend due dates. Provisions for monthly monitoring and TIE studies on all failed tests should be included for at least 6 months. The updated TRE is due within 30 days of a chronic WET failure.	
Toxicity Reduction Evaluation (TRE) - Submit Progress Report #1: Submit a progress report identifying the progress and status of the TRE plan.	07/01/2026
Toxicity Reduction Evaluation (TRE) – Final Report: Complete all actions to find and fix the source(s) of toxicity.	07/01/2027

Explanation of Schedule: The compliance schedule for the Toxicity Reduction Evaluation is to be triggered if a chronic WET test failure occurs within the first year after permit reissuance. The schedule provides a timeline for the facility to complete an investigation into and resolve WET limit violations.

3.3 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan: Submit an update to the management plan to optimize the land application system performance and demonstrate compliance with Wisconsin Administrative Code NR 214. The plan shall specify information on pretreatment processes, site identification on plat and soil maps, aerial photographs, if available, description of all site limitations, vegetative cover management and removal, availability of storage, type of transporting and spreading vehicle, load and rest schedules, monitoring procedures, contingency plans for periods of adverse weather or odor or nuisance abatement and any other pertinent information. If operational changes are needed, the Land Application Management Plan shall be amended by submitting a written request to the Department for approval of such amendments.	09/30/2025

Explanation of Schedule: An up-to-date Land Application Management plan is a standard requirement in reissued industrial permits per s. NR 214.17(6)(c) Wis. Adm. Code.

Other Comments

Publishing Newspaper: The Daily Tribune, 220 1st Ave South, Wisconsin Rapids, WI 54494-8090

Attachments

- Water Quality-Based Effluent Limitations for Dairy State Cheese, WPDES Permit No. WI-0055751, written by Ben Hartenbower February 13, 2025
- Technology-Based Effluent Limitations for Dairy State Cheese, WPDES Permit No. WI-0055751, written by Ben Hartenbower February 13, 2025

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Holly Heldstab, Wastewater Specialist **Date:** May 2, 2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: February 13, 2025

TO: Holly Heldstab – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Technology-Based Effluent Limitations for Dairy State Cheese
WPDES Permit No. WI-0055751

Technology-Based Effluent Limitations (TBELs) Recommended for Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Monthly Average
BOD_5, Total	59.0 lbs/day		25.0 lbs/day
TSS	88.0 lbs/day		36.0 lbs/day
pH	9.0 su	6.0 su	

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PART 1 – BACKGROUND INFORMATION

Dairy State Cheese, Inc. (DSC) operates a natural cheese production facility as well as a whey processing plant at their Rudolph, WI facility. DSC will be able to process approximately 1,500,000 pounds of raw milk per day into a variety of American style cheese products, including cheddar and Colby with new wastewater treatment plant (WWTP) upgrades. In 2025, production rates are expected to increase to process 3,000,000 pounds of raw milk per day. Approximately 10% of the raw milk intake mass is converted to cheese products with the remaining 90% by mass as whey by-product. The whey is processed to extract protein, minerals, and lactose as salable product. Whey processing includes ultrafiltration, reverse osmosis, and evaporation. DSC operates raw material receiving, cheese production, whey filtration and evaporation, packaging, and cold storage for processing of their products. Wastewater generated from the production facility is treated in the onsite process wastewater treatment system. All process wastewater from the facility is treated for direct discharge to the effluent ditch to Flick Creek surface water via Outfall 001 under the current WPDES permit.

PART 2 – INDUSTRIAL CATEGORIES

Chapter NR 240, Wis. Adm. Code, specifies effluent guidelines for discharges from dairy product categories of point sources and subcategories. Dairy State Cheese would fall under the Natural and Processed Cheese, Condensed Whey, and Dry Whey subcategories as defined in s. NR 240.02, Wis. Adm. Code. These guidelines are based on federal effluent guidelines in 40 CFR Part 405 Subparts F, K, and L. The permittee must meet the applicable effluent limit guidelines as described in this chapter. These effluent limit guidelines include:

- Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT) in s. NR 240.10, Wis. Adm. Code.
- Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT) in s. NR 240.11, Wis. Adm. Code.
- If determined to be a new source, new source performance standards (NSPS) in s. NR 240.12, Wis. Adm. Code.

If the calculated limits are less than or equal to the limits in the current permit, then the limits would be set equal to the recalculated limits. If the recalculated limits are less restrictive than the limits from the current permit, they cannot be increased unless the antidegradation and anti-backsliding provisions of ch. NR 207, Wis. Adm. Code, are met.

Section NR 220.13, Wis. Adm. Code, includes provisions that address cases where federal and state rule differ. Section 283.11, Wis. Stats., address compliance with federal standards. In this case, the state rules are consistent with federal rules with a few exceptions. In such cases, the permit will in all cases be based on the state rule notwithstanding the federal regulations. The omissions are described below.

- The state or federal rules do not specify a date for the definition for a new source. Therefore, it is necessary to review available federal guidance. The Boornazian memo (September 28, 2006) specifies a new source date for 40 CFR Part 405 Subparts A – L of May 28, 1974. The Department relies on the Boornazian memo to establish date of applicability for NSPS.
- State rules incorrectly list best available treatment (BAT) standards for BOD, TSS, and pH. BAT applies to priority pollutants and nonconventional pollutants and does not apply to BOD, TSS or pH.
- The federal standard rule lists revised BCT standards requirements. All BCT limitations are set to be the same as the best practicable control technology (BPT) standards. State rules in ch. NR 240, Wis. Adm. Code, do not list standards for BCT.

PART 3 – LEVELS OF CONTROL

Cheese, Condensed Whey, and Dry Whey production lines have processes which construction commenced after May 28, 1974. Therefore, the process wastewater from these lines is subject to BPT, BCT, BAT and NSPS standards for the Natural and Processed Cheese, Condensed Whey, and Dry Whey subcategories are applicable as specified in 40 CFR Part 405 Subparts F, K, and L and ch. NR 240.12, Wis. Adm. Code.

PART 4 – CURRENT PRODUCTION LEVELS

The levels of production for each Subcategory are provided by Dairy State Cheese

Natural and Processed Cheese

Process	Material Used (lbs/day)	Flow % Discharged to Surface Water	Material Used for Calculation[1] (lbs/day)	Material Used for Calculation[2] (lbs/month)
Cheese	3,000,000 (milk)	95%	2,859,779	87,044,511

Condensed Whey

Process	Material Used (lbs/day)	Flow % Discharged to Surface Water	Material Used for Calculation[1] (lbs/day)	Material Used for Calculation[2] (lbs/month)
Whey	2,700,000 (whey)	95%	2,573,801	78,340,060

Dry Whey

Process	Material Used (lbs/day)	Flow % Discharged to Surface Water	Material Used for Calculation[1] (lbs/day)	Material Used for Calculation[2] (lbs/month)
Whey	2,700,000 (whey)	95%	2,573,801	78,340,060

Footnotes:

1. Material used for daily calculations were based on a reasonable measure of actual daily production.
2. Average monthly measure of material used was based on a 7 days/week production level.

PART 5 – BOD INPUT

The BOD_5 input is the 5-day biochemical oxygen demand of raw materials that enter the process. The current production levels in Part 4 are converted to BOD input equivalents by multiplying the amount of raw material by BOD factors specified in s. NR 240.03(1) or s. NR 240.07 Wis. Adm. Code and 40 CFR Part 405.

Natural and Processed Cheese

Process	Material Used (lbs/month)	BOD Factor[1] (lbs/100 lbs)	Adjusted Total BOD Input[2] (lbs/month)	Adjusted Total BOD Input (lbs/day)
Cheese	87,044,511	10.39	9,043,925	297,131
Total				**297,131**

Condensed Whey

Process	Material Used (lbs/month)	BOD Factor[1] (lbs/100 lbs)	Adjusted Total BOD Input[2] (lbs/month)	Adjusted Total BOD Input (lbs/day)
Whey	78,340,060	4.72	3,697,651	121,483
Total				**121,483**

Dry Whey

Process	Material Used (lbs/month)	BOD Factor[1] (lbs/100 lbs)	Adjusted Total BOD Input[2] (lbs/month)	Adjusted Total BOD Input (lbs/day)
Whey	78,340,060	4.72	3,697,651	121,483
Total				**121,483**

Footnotes:

1. The BOD Factors are listed in ch. NR 240.07 Wis. Adm. Code, Table 1 for generally accepted published values for protein, fat, and carbohydrate content.
2. Adjusted Total BOD input = BOD input * BOD factor / 100

PART 6 – TBEL CALCULATIONS FOR NATURAL AND PROCESSED CHEESE

pH

Any discharge subject to BPT, BCT, or NSPS limitations or standards in this part must remain within the pH range of 6.0 to 9.0.

New Source Performance Standards (NSPS)

The production processes for Cheese commenced construction after May 28th, 1974.

Therefore, the NSPS limitations of 40 CFR Part 405.65 would apply.

Total BOD Input (lbs/day)	NSPS Effluent Limitations				Calculated Limits			
	BOD (lbs/1,000 lbs)		TSS (lbs/1,000 lbs)		BOD (lbs/day)[1]		TSS (lbs/day)[1]	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
297,131.00	0.080	0.160	0.100	0.200	23.770	47.541	29.713	59.426

Footnotes:

1. The limits (lbs/day) = total BOD input (lbs/day) / 1000 * NSPS limitations

PART 7 – TBEL CALCULATIONS FOR CONDENSED WHEY

pH

Any discharge subject to BPT, BCT, or NSPS limitations or standards in this part must remain within the pH range of 6.0 to 9.0.

New Source Performance Standards (NSPS)

The production processes for Whey commenced construction after May 28th, 1974.

Therefore, the NSPS limitations of 40 CFR Part 405.115 would apply.

Total BOD Input (lbs/day)	NSPS Effluent Limitations				Calculated Limits			
	BOD (lbs/1,000 lbs)		TSS (lbs/1,000 lbs)		BOD (lbs/day)[1]		TSS (lbs/day)[1]	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
121,483.39	0.110	0.220	0.138	0.276	13.363	26.726	16.765	33.529

Footnotes:

1. The limits (lbs/day) = total BOD input (lbs/day) / 1000 * NSPS limitations

PART 8 – TBEL CALCULATIONS FOR DRY WHEY

pH

Any discharge subject to BPT, BCT, or NSPS limitations or standards in this part must remain within the pH range of 6.0 to 9.0.

New Source Performance Standards (NSPS)

The production processes for Whey commenced construction after May 28th, 1974.

Therefore, the NSPS limitations of 40 CFR Part 405.125 would apply.

Total BOD Input (lbs/day)	NSPS Effluent Limitations				Calculated Limits			
	BOD (lbs/1,000 lbs)		TSS (lbs/1,000 lbs)		BOD (lbs/day)[1]		TSS (lbs/day)[1]	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
121,483.39	0.110	0.220	0.138	0.275	13.363	26.726	16.704	33.408

Footnotes:

1. The limits (lbs/day) = total BOD input (lbs/day) / 1000 * NSPS limitations

PART 9 – FINAL CALCULATED LIMITS

Per s. NR 240.06(3) Wis. Adm. Code, the total discharge limits shall be the total of the amounts calculated from the BOD input in the final product subcategory and all of the other subcategories with intermediate products in Parts 6 , 7, and 8 of this memo.

Subcategory	Monthly average BOD (lbs/day)	Daily maximum BOD (lbs/day)	Monthly average TSS (lbs/day)	Daily maximum TSS (lbs/day)
Natural and Processed Cheese	23.770	47.541	29.713	59.426
Condensed Whey	13.363	26.726	16.765	33.529
Dry Whey	13.363	26.726	16.704	33.408
Total	**50.50**	**100.99**	**63.18**	**126.36**

Final Calculated Effluent Limitations			
Parameter & Units	**Daily Maximum**	**Daily Minimum**	**Monthly Average**
BOD_5	101.0 lbs/day		50.5 lbs/day
TSS	126.4 lbs/day		63.2 lbs/day
pH	9.0 su	6.0 su	

The Department has determined that the calculated limits are less restrictive than the limits calculated in the previous permit. Therefore, these limits remain the same as in the current permit. If Dairy State Cheese would like to request an increase to the existing permit limits, an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter by parameter basis and includes consideration of operations, maintenance and temporary upsets.

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: February 13, 2025

TO: Holly Heldstab– WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for Dairy State Cheese
WPDES Permit No. WI-0055751

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 Dairy State Cheese in Wood County. This discharge is to an effluent ditch to Flick Creek, located in the Wisconsin Rapids Watershed in the Central Wisconsin River Basin. This discharge is included in the Wisconsin River TMDL as approved by EPA on April 26, 2019 with site-specific criteria approved by EPA on July 9, 2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD_5	59 lbs/day		30 mg/L	20 mg/L, 25 lbs/day	1,3,4
TSS	88 lbs/day		30 mg/L	20 mg/L, 36 lbs/day	1,3,4
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		4.0 mg/L			1,4
Ammonia					2
E. coli				126 #/100 mL geometric mean	5
Chlorine	19 µg/L		**7.3 µg/L**	**7.3 µg/L**	6
Chloride					2
Phosphorus TBEL TMDL Limit				 1.0 mg/L 1.11 lbs/day	7,8
TKN, Nitrate+Nitrite, and Total Nitrogen					9
Acute WET					10
Chronic WET				1.0 TUc	10,11

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. The mass limits are categorical limits based on ch. NR 240, Wis. Adm. Code. These limits are not addressed in this memo and may need to be adjusted based on current production.
4. These 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.

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5. Bacteria limits apply during the disinfection season of May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
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. This technology-based phosphorus limit is expressed as a 12-month rolling average in accordance with s. NR 217.04(1)(a), Wis. Adm. Code.
8. The phosphorus mass limit is based on the Total Maximum Daily Load (TMDL) for the Wisconsin River Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA on April 26, 2019 with site-specific criteria approved by EPA on July 9, 2020.
9. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all Class A dairy product Processors. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).
10. Twice annual acute and quarterly 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 and should continue after the permit expiration date (until the permit is reissued).
11. The Instream Waste Concentration (IWC) to assess chronic test results is 100%. 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% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from effluent ditch to Flick Creek.

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

Attachments (2) – Narrative & Map

PREPARED BY: _____ Date: 02/13/2025

Benjamin Hartenbower, PE,
Water Resources Engineer

E-cc:

Logan Rubeck, Wastewater Engineer – WCR/Eau Claire
Geisa Thielen, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Scott Provost, Water Quality Biologist – WCR/Wisconsin Rapids
Kari Fleming, Environmental Toxicologist – WY/3
Michael Polkinghorn, Water Resources Engineer – NOR/Rhinelander
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Dairy State Cheese
WPDES Permit No. WI-0055751

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description:
Process wastewater is collected for treatment in the wastewater treatment system owned and operated by Dairy State Cheese, Inc. The wastewater treatment facility is comprised of the following unit processes: Lift station, Influent Equalization Selector Tank, Aeration Basin, Equalization Tank, Membrane System, and Dissolved Air Flotation (DAF) for solid liquid separation and waste sludge thickening. Effluent is discharged to an effluent ditch leading to Flick Creek in the Wisconsin Rapids Watershed of the Central Wisconsin River Basin.

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, 2022, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD_5	59 lbs/day		30 mg/L	20 mg/L, 25 lbs/day	1,3
TSS	88 lbs/day		30 mg/L	20 mg/L, 36 lbs/day	1,3
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		4.0 mg/L			1,3
Chloride					2
Phosphorus TBEL TMDL Limit				 2.0 mg/L 1.11 lbs/day	4
Acute WET					5
Chronic WET				1.0 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. Monitoring only.
3. These 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.

4. A compliance schedule is in the current permit to meet the TMDL Limit by April 1, 2022.
5. Acute WET testing required: July - Sept 2019 and Jan - March 2022.
6. Chronic WET testing required: Apr - June 2018, July - Sept 2019, Oct - Dec 2020, Apr - June 2021, and Jan - March 2022. The IWC for chronic WET was 100%.

Receiving Water Information

- Name: effluent ditch to Flick Creek
- Waterbody Identification Code (WBIC): 1397200
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Limited Aquatic Life (LAL), non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code:
  $7\text{-}Q_{10} = 0$ cfs
  $7\text{-}Q_2 = 0$ cfs
  Harmonic Mean Flow = 0 cfs
- Hardness = 181 mg/L as $CaCO_3$. This value represents the geometric mean effluent data. Effluent hardness is used in place of receiving water because there is no receiving water flow upstream of the discharge.
- % 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.
- 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: This discharge is located within the WI River TMDL for phosphorus.

Effluent Information:

- Flow Rates(s):
  Maximum Annual Average = 0.148 MGD (Million Gallons per Day)
  For reference, the actual average flow from January 2022 to October 2024 was 0.121 MGD.
- Hardness = 181 mg/L as $CaCO_3$. This value represents the geometric mean of 4 effluent samples collected from 06/12/2023 to 06/27/2023.
- Acute dilution factor used in accordance with s. NR 106.06 (3) (c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water Source: wastewater from cheese and whey processing
- Additives: One biocide and two water quality conditioners.
- Total Phosphorus Wasteload Allocation: 279 lbs/year = 0.764 lbs/day
- 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 and Hardness. The permit-required monitoring for Chloride and Phosphorus from January 2022 to October 2024 is used in this evaluation.

Attachment #1

Chemical Specific Effluent Data at Outfall 001

Sample Date	Copper µg/L
06/12/2023	<0.718
06/17/2023	<0.718
06/22/2023	<0.718
06/27/2023	<0.718
mean	<0.718

"<" 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.

Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.".

The following table presents the average concentrations and loadings at Outfall 001 from January 2022 to October 2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6):

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD_5	3.4 mg/L*	4.95 lbs/day
TSS	3.0 mg/L*	3.80 lbs/day
pH	7.37 s.u.	
Dissolved Oxygen	5.32 mg/L	
Phosphorus	0.50 mg/L*	0.43 lbs/day

*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 the case for Dairy State Cheese.

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 = 0.00 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19.03		19.03	3.81	156		
Arsenic		340		340	68	<0.989		
Cadmium	181	57.07		57.07	11.41	<0.025		
Chromium (+3)	181	2933		2933	587	<1.518		
Copper	181	27.18		27.18	5.44	<0.718		
Lead	181	189.86		189.86	37.97	<1.401		
Nickel	181	775.7		775.7	155.1	2.2		
Zinc	181	202.41		202.41	40.48	24		
Chloride		757		757			433	384

* * 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 = 0.00 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chlorine		7.28		7.28	1.46	156	
Arsenic		152		152	30	<0.989	
Cadmium	175	3.82		3.82	0.76	<0.025	
Chromium (+3)	181	215		215	43	<1.518	
Copper	181	17.21		17.21	3.44	<0.718	
Lead	181	49.73		49.73	9.95	<1.401	
Nickel	181	121.4		121.4	24.3	2.2	
Zinc	181	202.41		202.41	40.48	24	
Chloride		395		395			368

* 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 = 0.00 cfs (¼ of the 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.	30-day P_{99}
Cadmium	880.0		880.0	176.0	<0.025	
Chromium (+3)	8400000		8400000	1680000	<1.518	
Lead	2240		2240	448	<1.401	
Nickel	110000		110000	22000	2.2	

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 0.00 cfs (¼ of the Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Arsenic	40.0		40.0	8.0	<0.989	

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

Conclusions and Recommendations: Based on a comparison of the effluent data and calculated effluent limitations, limits are required for Chlorine.

Chlorine – Available data/information indicates the discharge contains concentrations of chlorine or halogen above the applicable WQBELs. Therefore, a daily maximum effluent limit of 19 µg/L and weekly and monthly average limits of 7.3 µg/L are needed for permit reissuance.

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

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. Given the fact that Dairy State Cheese does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

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 468 sample results were reported from January 2022 to October 2024. The maximum reported value was 8.67 s.u. (Standard pH Units). The effluent pH was 8.31 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.27 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.23 s.u. Therefore, a value of 8.31 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 8.31 s.u. into the equation above yields an ATC = 4.62 mg/L.

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

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

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	9.25
1-Q_{10}	4.62

The 1-Q_{10} method yields the most stringent limits for Dairy State Cheese.

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

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

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

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

Where:

pH = the pH (s.u.) of the receiving water,
E = 1.0,
$C = 8.09 \times 10^{(0.028 \times (25 - T))}$
T = the temperature (ºC) of the receiving water$\times 10^{(0.028 \times (25 - T))}$

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

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

Weekly and Monthly Ammonia Nitrogen Limits – LAL

		April & May	June-September	October-March
Effluent Flow	Qe (MGD)	0.148	0.148	0.148
Background Information	7-Q_{10} (cfs)	0.00	0.00	0.00
	7-Q_2 (cfs)	0.00	0.00	0.00
	Ammonia (mg/L)	0.07	0.07	0.14
	Temperature (°C)	15.0	20.6	12.8
	pH (s.u.)	7.64	7.86	7.36
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	0.00	0.00	0.00
	Reference Monthly Flow (cfs)	0.00	0.00	0.00
Criteria mg/L	4-day Chronic	60.31	32.51	89.17
	30-day Chronic	24.13	13.00	35.67
Effluent Limitations mg/L	Weekly Average	60	33	89
	Monthly Average	24	13	36

Effluent Data

Four samples for ammonia nitrogen were taken, and their results were as follows:

Ammonia Nitrogen Effluent Data

	Ammonia Nitrogen mg/L
06/12/2023	0.384
06/17/2023	<0.127
06/22/2023	0.15
06/27/2023	0.266

Conclusions and Recommendations

Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. **No limits are needed however monthly monitoring is recommended.**

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS

On May 1, 2020, revisions to ch. NR 102, Wis. Adm. Codes, became effective which replace fecal coliform criteria with new *Escherichia coli* (*E. coli*) criteria for protection of recreational uses. Section NR 102.04(6), Wis. Adm. Code, includes criteria that must be met for all surface waters in accordance with s. NR 102.04(5)(a), Wis. Adm. Code.

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.

With a weekly monitoring frequency, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit. These limits are required during May through September.

PART 5 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires industries that discharge greater than 60 pounds of Total Phosphorus per month to comply with a 12-month rolling average of 1.0 mg/L, or an approved alternative concentration limit.

Because Dairy State Cheese currently has an existing technology-based limit, a limit of 1.0 mg/L is applicable unless a more stringent WQBEL is given.

TMDL Limits – Phosphorus
Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (May 2020). The wasteload allocations (WLA) that implement site-specific criteria for Lakes Petenwell, Castle Rock, and Wisconsin are found in Appendix K of the *Total Maximum Daily Loads for Total Phosphorus in the Wisconsin River Basin (WRB TMDL)* report dated April 26, 2019 and are expressed as maximum annual loads (lbs/year) and maximum daily loads (lbs/day). The WLA that implement statewide criteria found in Appendix J of the TMDL report are no longer applicable following approval of these site-specific criteria. The daily WLAs in the WRB TMDL equals the annual WLA divided by the number of days in the year. Therefore, the daily WLA is an annual average. Since the derivation of daily WLAs from annual WLAs does not take effluent variability or monitoring frequency into consideration, maximum daily WLAs from the WRB TMDL should not be used directly as permit effluent limits.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL.
Therefore, limits given to continuously discharging facilities covered by the WRB TMDL are given

monthly average mass limits. If the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

$$\text{TP Equivalent Effluent Concentration} = \text{Daily WLA} \div (\text{Flow Rate} * \text{Conversion Factor})$$
$$= 0.764 \text{ lbs/day} \div (0.148 \text{ MGD} * 8.34)$$
$$= 0.62 \text{ mg/L}$$

Since this value is greater than 0.3 mg/L, the WLA should be expressed as a monthly average mass limit for total phosphorus and no six-month average limit is required.

$$\text{TP Monthly Average Permit Limit} = \text{Daily WLA} * \text{Monthly average multiplier}$$
$$= 0.764 \text{ lbs/day} * 1.45$$
$$= 1.11 \text{ lbs/day}$$

The multiplier used in the monthly average calculation was determined according to TMDL implementation guidance. A standard coefficient of variation (CV) of 0.6, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as thrice weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

The WRB TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries to the Wisconsin River. Therefore, WLA-based WQBELs are protective of immediate receiving waters and TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required.

Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TP. Rolling 12-month sums can be compared directly to the annual wasteload allocation. Six-month average limits apply in the periods May – October and November – April.

Effluent Data

The following table lists the statistics for effluent phosphorus levels from January 2022 to October 2024 for informational purposes. In the cases where reporting the mass discharge is not required in the current permit, the mass is calculated using the reported phosphorus concentration and the effluent flow rate for that day.

Total Phosphorus Statistics

	Concentration (mg/L)	Mass Discharge (lbs/day)
1-day P_{99}	5.35	5.52
4-day P_{99}	3.38	3.44
30-day P_{99}	1.41	1.43
Mean	0.50	0.53
Std	1.47	1.48
Sample Size	428	425
Range	<0.011 - 20	0.00 - 21.18

Conclusions:

In summary, the following limits are recommended by this evaluation:

- 12-month rolling average Total Phosphorus concentration limit of 1.0 mg/L
- Monthly average Total Phosphorus mass limit of 1.11 lbs/day

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 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 °F. The 120° F limit applies because the hydrologic classification is a wastewater effluent channel.

Reasonable Potential

Based on the available discharge temperature data from the permit application, the maximum daily effluent temperature reported was 82 °F; therefore, no reasonable potential for exceeding the daily maximum limit exists, and **no limits or monitoring are recommended**.

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			-	120
FEB			-	120
MAR			-	120
APR			-	120
MAY			-	120
JUN			-	120
JUL			-	120
AUG			-	120
SEP			-	120
OCT			-	120
NOV			-	120
DEC			-	120

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).*

- 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 LC50 (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 **100%** 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:

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

  Where:
  - Qe = annual average flow = 0.148 MGD = 0.229 cfs
  - f = fraction of the Qe withdrawn from the receiving water = 0
  - Qs = ¼ of the 7-Q_{10} = 0.00 cfs ÷ 4 = 0.00 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual*, 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.

- 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.

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	Algae (IC_{50})	Pass or Fail?	Use in RP?	
08/08/2001	>100	>100	Pass	No						1
12/17/2002	>100	>100	Pass	No						1
05/14/2003	>100	>100	Pass	No						1
10/24/2006					>100	>100		Pass	Yes	
10/25/2007					>100	>100		Pass	Yes	
04/29/2008					>100	>100		Pass	Yes	
03/19/2013	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
08/05/2014	>100	>100	Pass	Yes	**16.5**	>100		Fail	Yes	
10/28/2014					>100	>100		Pass	Yes	
11/11/2014					>100	>100		Pass	Yes	
11/10/2015					>100	>100		Pass	Yes	
05/22/2018					**67**	>100		Fail	Yes	
05/14/2019					**31.8**	93.9		Fail	Yes	
09/24/2019	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
12/01/2020					**71.9**	>100		Fail	Yes	
02/23/2021					>100	>100		Pass	Yes	
03/09/2021					>100	>100		Pass	Yes	
09/21/2021					>100	>100		Pass	Yes	
11/02/2021					>100	>100		Pass	Yes	
03/01/2022	>100	>100	Pass	Yes	>100	>100		Fail	Yes	
03/29/2022					**51.6**	>100		Fail	Yes	
05/24/2022					>100	>100		Pass	Yes	
06/14/2022					**52.3**	>100		Fail	Yes	
07/19/2022					**17.4**	86.5		Fail	Yes	
08/16/2022					**15.5**	>100		Fail	Yes	
01/17/2023					>100	>100		Pass	Yes	
02/21/2023					>100	>100		Pass	Yes	
03/28/2023					>100	>100		Pass	Yes	
04/18/2023					>100	>100		Pass	Yes	
05/02/2023					>100	>100		Pass	Yes	
06/06/2023					**78.9**	>100		Fail	Yes	
09/23/2023					>100	>100		Pass	Yes	
11/28/2023					>100	>100		Pass	Yes	
12/12/2023					>100	>100		Pass	Yes	
01/23/2024					**65.9**	78.6		Fail	Yes	
03/04/2024					>100	>100		Pass	Yes	
04/30/2024					>100	>100		Pass	Yes	

Attachment #1

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %					Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Algae (IC_{50})	Pass or Fail?	Use in RP?	
05/14/2024	>100	>100	Pass	Yes	**96**	>100		Fail	Yes	
06/18/2024	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
07/30/2024					37.5	**10.1**		Fail	Yes	
09/24/2024					**23.3**	>100		Fail	Yes	
10/22/2024					>100	>100		Pass	Yes	
11/05/2024					>100	>100		Pass	Yes	

Footnotes:

1. *Data Not Representative.* 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.

- 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)]

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

  Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.
  Chronic Reasonable Potential = [(TUc effluent)(B)(IWC)]

Chronic WET Limit Parameters

TUc (maximum) 100/IC25	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/10.1 = 9.9 TUc	1.3 Based on 13 detects	100%

[(TUc effluent)(B)(IWC)] = 13.3 > 1.0

Therefore, reasonable potential is shown for a chronic WET limit using the procedures in s. NR 106.08(6) and representative data from 2006 to 2024.

Expression of WET limits

Chronic WET limit = [100/IWC] TU_c = 1.0 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 = 100% **15 Points**
Historical Data	Six tests used to calculate RP. No tests failed. **0 Points**	40 tests used to calculate RP. 13/40 tests failed. **0 Points**
Effluent Variability	BOD_5, Dissolved Oxygen, and Phosphorus exceedances. NONs sent in 2018 and 2019. NOVs sent in 2021, 2022, and 2023. Frequent treatment plant upsets. **10 Points**	Same as Acute. **10 Points**
Receiving Water Classification	<4 miles to WWSF (5 pts) **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	Reasonable potential for Chlorine limits based on ATC; (5 pts) Ammonia, Nickel, Zinc, and Chloride detected. (3 pts) Additional Compounds of Concern: none **8 Points**	Reasonable potential for Chlorine limits based on CTC; (5 pts) Ammonia, Nickel, Zinc, and Chloride detected. (3 pts) Additional Compounds of Concern: none **8 Points**
Additives	One biocide (3 pts) and two water quality conditioners (2 pts) added. Permittee has proper P chemical SOPs in place. **5 Points**	All additives used more than once per 4 days. **5 Points**
Discharge Category	Dairy Processing (20 pts) **20 Points**	Same as Acute. **20 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:	**48 Points**	**63 Points**

	Acute	Chronic
Recommended Monitoring Frequency (from Checklist):	2x yearly	Quarterly
Limit Required?	No	Yes Limit = 1.0 Tu_c
TRE Recommended? (from Checklist)	No	Yes

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above, twice annual acute and quarterly 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 and 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 1.0 TUc as a monthly average in the effluent limits table of the permit.

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. Whenever an additive is discharged directly into a surface water without receiving treatment or an additive is used in the treatment process and is not expected to be removed before discharge, a review of the additive is needed. Secondary values should be derived according to s. NR 105.05, Wis. Adm. Code. Guidance related to conducting an additive review can be found in *Water Quality Review Procedures for Additives* (2019) (http://dnr.wi.gov/topic/wastewater/Guidance.html).

Additive Parameters

Additive Name	Purpose of Additive	Frequency of Use	Max Usage Rate	Max Effluent Concentration (mg/L)	Use Restriction (mg/L)
Chlorine dioxide	Biocide	>4 days/week	N/A	N/A	N/A
88E	Polymer	>4 days/week	4 gal/day	N/A	N/A
Alum	Coagulant-P Removal	>4 days/week	40 gal/day	N/A	N/A

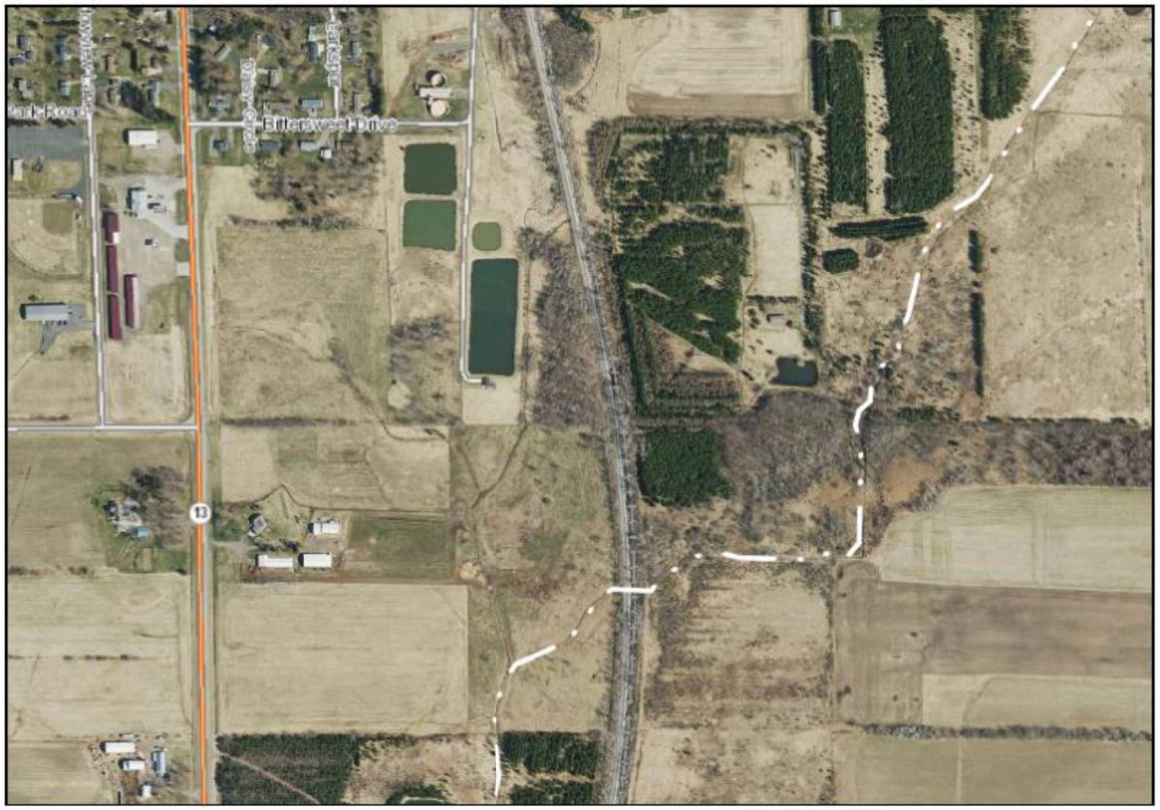
The discharge of chlorine dioxide will be regulated by permit limits for chlorine.

The usage of alum is addressed through the phosphorus chemical SOP requirement to prevent toxicity due to overdosing.

Chemtreat 88E is not expected to be present in the effluent under the current dosing procedure.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Wisconsin Dairy State Cheese, INC



Legend

Permits

Surface Water Outfalls

Surface Water

Intermittent Streams

Basemaps

Imagery

Latest Leaf Off Imagery

Red: Band_1

Green: Band_2

Blue: Band_3

Notes

1:6,855

0 500 1000 ft

Service layer credits:
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