

Permit Fact Sheet

General Information

Permit Number:	WI-0053015-11-0
Permittee Name:	SPRINGSIDE CHEESE CORPORATION
Address:	7989 Arndt Rd
City/State/Zip:	Oconto Falls WI 54154
Discharge Location:	NW ¼ of NW ¼ Sec 26 T29N R19E (Town of Spruce)
Receiving Water:	An unnamed tributary of the Little River via a wetland, Little River Watershed (GB04), and the groundwater of the Oconto River Drainage Basin via land application in Oconto County
Stream Flow (Q _{7,10}):	0 cfs
Stream Classification:	Limited aquatic life, non-public water supply based on wetland discharge
Discharge Type:	Existing; non-continuous

Facility Description

This facility is a small, family-owned cheese factory that processes about 45,000 lbs of milk each day to make about 4,500 lbs of cheese daily, primarily cheddar. They operate 13 hours/day, 4-5 days/week, year-round. This activity results in the discharge of approximately 6,500 gallons/day of noncontact cooling water generated from the cooling of whey, via a wetland to an unnamed tributary to surface water, and an annual average of 800,325 gallons of process washwater disposed of via landspreading on Department approved land application sites. Cooled whey is hauled to another site for processing.

Substantial Compliance Determination

Enforcement During Last Permit: A Notice of Noncompliance (NON) was sent on 9/8/23 for a late permit application submittal. The facility has completed all previously required actions as part of the enforcement process.

After a desk top review of all discharge monitoring reports, land application reports, and a site visit on 8/22/23, this facility has been found to be in substantial compliance with their current permit.

Compliance determination entered by Teresa Hall, Wastewater Specialist, on 8/22/23.

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	Annual Average: 800,325 gallons (2019-2022)	Representative samples of process wastewater combined with truck washwater shall be obtained prior to discharge from the truck.
002	Average Flow Rate: 6,572 gpd (2019-2022)	Representative samples of noncontact cooling water shall be obtained prior to discharge into the wetland which drains to the unnamed tributary.

1 Surface Water - Monitoring and Limitations

Sample Point Number: 002- NONCONTACT COOLING WATER

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Weekly	Total Daily	

Changes from Previous Permit:

- Removal of effluent temperature monitoring.

Explanation of Limits and Monitoring Requirements

Water Quality-Based Limits and WET Requirements

Refer to the WQBEL memo, Water Quality-Based Effluent Limitations for the Springside Cheese Corporation WPDES Permit No. WI-0053015-11-0, for the detailed calculations, prepared by the Water Quality Bureau, Michael Polkinghorn, EIT, Water Resources Engineer, dated November 9, 2023, used for this reissuance.

No Whole Effluent Toxicity (WET) testing is required because information related to the discharge indicates low to no risk for toxicity.

2 Land Application - Liquid Wastewater (industrial only)

Sample Point Number: 001- PROCESS WW & TRUCK WASHWATER

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Total Kjeldahl		mg/L	Quarterly	Grab Comp	
Chloride		mg/L	Quarterly	Grab Comp	
Phosphorus, Total		mg/L	Quarterly	Grab Comp	
Phosphorus, Water Extractable		% of Tot P	Quarterly	Grab Comp	
Potassium, Total Recoverable		mg/L	Quarterly	Grab Comp	

Changes from Previous Permit:

- No changes from the previous permit.

Explanation of Limits and Monitoring Requirements

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

Water Extractable Phosphorus (WEP) – 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.

3 Schedules

3.1 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.	12/31/2028

Explanation of Schedules

This schedule is included for the permittee to review and update the land application management plan at least once during the permit term.

Attachments:

WQBEL Memo: Water Quality-Based Effluent Limitations for the Springside Cheese Corporation WPDES Permit No. WI-0053015-11-0, by Michael Polkinghorn, EIT, Water Resources Engineer, dated November 9, 2023

Expiration Date:

March 31, 2029

Justification Of Any Waivers From Permit Application Requirements:

No waivers from permit application requirements were granted.

Notice of reissuance is published in the Oconto County Times Herald, PO Box 87, Oconto Falls, WI 54154-0087.

Prepared By: Sarah Donoughe, Wastewater Specialist-Adv

Date: December 15, 2023

CORRESPONDENCE/MEMORANDUM**State of Wisconsin**

DATE: November 9, 2023

TO: Sarah Donoughe – NER/Green Bay Service Center

FROM: Michael Polkinghorn – NOR/Rhineland Service Center

SUBJECT: Water Quality-Based Effluent Limitations for the Springside Cheese Corporation
WPDES Permit No. WI-0053015-11-0

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 the Springside Cheese Corporation in Oconto County. This secondary industry discharges to an unnamed tributary to the North Branch Little River, located in the Little River Watershed in the Oconto River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Footnotes
Flow Rate	1

Footnotes:

1. Monitor whenever the discharge occurs.

No WET testing is required because information related to the discharge indicates low to no risk for toxicity. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are not required due to the non-continuous nature of the discharge.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Michael Polkinghorn at (715) 360-3379 or Michael.Polkinghorn@wisconsin.gov and Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (2) – Narrative & discharge area map.

PREPARED BY: Michael A. Polkinghorn, E.I.T. – Water Resources Engineer

E-cc: Teresa Hall, Wastewater Engineer – NER/Appleton Service Center
Heidi Schmitt Marquez, Regional Wastewater Supervisor – NER/Green Bay Service Center
Diane Figiel, Water Resources Engineer – WY/3
Nathanial Willis, P.E., Wastewater Engineer – WY/3

**Water Quality-Based Effluent Limitations for
Springside Cheese Corporation**

WPDES Permit No. WI-0053015-11-0

Prepared by: Michael A. Polkinghorn, E.I.T.

PART 1 – BACKGROUND INFORMATION

Facility Description

Springside Cheese Corporation (Springside Cheese) is a small, family-owned cheese factory that processes about 45,000 lbs of milk each day to make about 4,500 lbs of cheese daily, primarily cheddar. They operate 13 hours/day, 4-5 days/week, year-round. This activity results in the discharge of noncontact cooling water (NCCW) from the cooling of whey and is discharged on a noncontinuous basis (1 day/wk) to an unnamed tributary (UT) to the North Branch Little River. Process wastewater is land spread on Department approved land application sites. Cooled whey is hauled to another site for processing.

Attachment #2 is a discharge area map of Outfall 002.

Existing Permit Limitations

The current permit, expiring on 12/31/2023, includes the following effluent limitations and monitoring requirements.

Parameter	Footnotes
Flow Rate	1
Temperature	1

Footnotes:

1. Monitoring only.

Receiving Water Information

- Name: UT to the North Branch Little River
- Waterbody Identification Code (WBIC):
 - o UT: 443400
 - o North Branch Little River: 442800
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code:
 - o UT: Limited Aquatic Life (LAL) community. This fish and aquatic life classification was used historically for the UT in Springside Cheese's permit although it is not listed in the current or proposed April 2003 changes of ch. NR 104, Wis. Adm. Code. The LAL community classification will continue to be utilized in this evaluation because the small magnitude and frequency of the discharge is likely only supporting a macroinvertebrate community in the UT. This classification will be reevaluated at the next permit reissuance with a future fish survey to

Attachment #1

determine if an LAL community is an appropriate classification for the UT.

- o North Branch Little River: Warm Water Sport Fish (WWSF) community, approx. 3.3 mi downstream of Outfall 002.
- o All surface waterbodies are considered non-public water supplies. Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: Low flows for the UT are zero. The following 7-Q₁₀ and 7-Q₂ values are estimated for the North Branch Little River from the WPDES viewer at the confluence with the UT, approx. 3.3 mi downstream of Outfall 002.
7-Q₁₀ = 0.23 cubic feet per second (cfs)
7-Q₂ = 0.47 cfs
- % 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. Background data for calculating effluent limitations for phosphorus is described later in this evaluation.
- Multiple dischargers: None.
- Impaired water status: There are no known impairments to the UT or the North Branch Little River. Approx. 14 mi downstream of Outfall 002, the Little River is on the Clean Water Act Section 303(d) list impaired by phosphorus.

Effluent Information

- Flow rate(s):
Maximum monthly average = 0.00942 MGD million gallons per day (MGD)
The maximum monthly average flow of 0.00942 MGD is used in place of a 365-day maximum annual average flow to account for the noncontinuous nature of the discharge. For reference, the actual average flow from January 2019 – September 2023 was 0.00679 MGD excluding days discharge did not occur. This flow becomes 0.000957 MGD including days discharge did not occur in the average.
- 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: One private well.
- Additives: None.
- Effluent characterization: This facility is categorized as a NCCW discharge, 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, plus chloride, phosphorus, chlorine, and ammonia nitrogen. The current permit required temperature monitoring during July – September of 2022.
- 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.

**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 P₉₉) 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)

Springside Cheese discharges only 1 day/wk. Therefore, only daily maximum limits based on acute toxicity criteria (ATC) will be evaluated for because the discharge duration does not meet the toxicity conditions for chronic toxicity, wildlife, human threshold, and human cancer criteria in ch. NR 105, Wis. Adm. Code.

Acute Limits based on 1-Q₁₀

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-Q₁₀ 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.

$$\text{Limitation} = \frac{(\text{WQC}) (Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)}{Q_e}$$

Where:

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

Q_s = average minimum 1-day flow which occurs once in 10 years (1-day Q₁₀)
if the 1-day Q₁₀ flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q₁₀).

Q_e = 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

C_s = 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-Q₁₀ 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 Springside Cheese and the limits are set based on the 1-Q₁₀ method.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day MAX. CONC.
Chlorine (µg/L)	19	19	3.8	<42	<42
Chloride (mg/L)	757	757	151	1.35	1.35

* Per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016 consideration of ambient concentrations and 1-Q₁₀ flow rates yields a more restrictive limit than the 2 × ATC method of limit calculation.

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, **effluent limitations are not recommended for any toxic substances.** Monitoring recommendations for PFOS and PFOA are made in the paragraph below:

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 discharge, PFOS and PFOA monitoring is not recommended during the reissued permit term. 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 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 Springside Cheese does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

The effluent ammonia sample provided in the permit application is nondetectable at <0.14 mg/L (06/21/2023). The previous sample was also nondetectable at <0.25 mg/L (06/05/2018). Based on this effluent data, there is no reasonable potential for the discharge to exceed the most stringent ammonia nitrogen limits that would be calculated. **Therefore, ammonia nitrogen limits or monitoring are not recommended during the reissued permit term.**

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 12-month rolling average limit of 1.0 mg/L, or an approved alternative concentration limit.

An initial review of effluent phosphorus and flow data show the maximum monthly phosphorus loading during the current permit term was 0.025 lbs/month in July 2023. This loading was calculated using the effluent phosphorus monthly average of 0.092 mg/L, the total monthly flow of 0.033 MG/month, and a

conversion factor of 8.34. Assuming this maximum monthly loading for the current permit term, the annual monthly average phosphorus loading is less than 60 lbs/month, in accordance with s. NR 217.04(1)(a)1, Wis. Adm. Code. **Therefore, a technology-based limit is not recommended during the reissued permit term.** 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.

Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to LAL community waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. These waters were not included in the USGS/WDNR stream and river studies and, therefore, the Department lacked the technical basis to determine and propose applicable criteria. At some time in the future, the Department may adopt phosphorus criteria based on new studies focusing on LAL community waters. The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020) suggests that during the interim, WQBELs should be based on the criteria and flow conditions for the next stream segment downstream (or downstream lake or reservoir, if appropriate), because ss. 217.12 and 217.13, Wis. Adm. Code, state that the Department must set WQBELs to protect downstream waters. The North Branch Little River is a WWSF community and is approx. 3.3 mi downstream of Outfall 002.

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a), Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.075 mg/L applies for the North Branch Little River.

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

$$\text{Limitation} = [(WQC)(Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)]/Q_e$$

Where:

WQC = 0.075 mg/L for the North Branch Little River.

Qs = 100% of the 7-Q₂ of 0.47 cfs.

Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code.

Qe = effluent flow rate = 0.00942 MGD = 0.0146 cfs.

f = the fraction of effluent withdrawn from the receiving water = 0.

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

A review of all available in stream total phosphorus data stored in the Surface Water Integrated Monitoring System (SWIMS) database indicates the median background total phosphorus concentration

Attachment #1

in the North Branch Little River upstream of the confluence of the UT is 0.0359 mg/L (n = 5, June 2018 – May 2019). The background sampling was conducted at 200 m downstream of CTH B crossing (SWIMS station ID: 10051152). Substituting a median value of 0.0359 mg/L into the limit calculation equation above, the calculated limit is 1.3 mg/L.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from June 2023 – July 2023.

Total Phosphorus Effluent Data	
Sample Date	Conc. (mg/L)
06/17/2023	<0.050
06/21/2023	<0.050
06/23/2023	<0.050
06/26/2023	<0.050
06/28/2023	<0.050
06/30/2023	<0.050
07/03/2023	<0.050
07/05/2023	0.55
07/07/2023	<0.050
07/10/2023	<0.050
07/12/2023	<0.050
07/14/2023	<0.039
Mean	0.046

Reasonable Potential Determination

Comparing the mean effluent concentration to 1/5th of the phosphorus WQBEL (0.27 mg/L), Outfall 002 does not have reasonable potential to exceed the limit. **Therefore, phosphorus limits or monitoring is not recommended during the reissued permit term.**

**PART 5 – 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 86 °F limit applies because the hydrologic classification is not listed as a wetland or wastewater effluent channel in ch. NR 104, Wis. Adm. Code.

Reasonable Potential

Based on the available discharge temperature data from July 2022 – September 2022 (permit required monitoring) and June 2023 (permit application) shown below, the maximum daily effluent temperature

reported was 79.3 °F (08/17/2022). Effluent temperature monitoring was only required during July – September because historic monitoring had shown the maximum temperature occurs during this season of the year for Outfall 002. **Therefore, temperature limits or monitoring are not recommended during the reissued permit term.**

Monthly Temperature Effluent Data & Limits

Month	Daily Maximum (°F)
JAN	NA
FEB	NA
MAR	NA
APR	NA
MAY	NA
JUN	75
JUL	79
AUG	79
SEP	77
OCT	NA
NOV	NA
DEC	NA

* NA denotes “not available” for months where effluent temperature data is not available.

PART 6 – 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)*.

Outfall 002 is comprised solely of NCCW where discharges occurred 1 day/wk during the current permit term. This discharge does not have a history of WET failures, contains no additives, and no toxic compounds are expected at levels of concern. Since there is believed to be a very low risk of toxicity, **WET testing is not recommended during the reissued permit term.**

Attachment #2

