

Permit Fact Sheet

**** The permit is being modified (10-1) for changes in effluent limitations for an effective date of November 1, 2025. Changes associated with this modification are highlighted in gray. ****

General Information

Permit Number:	WI-0070645-10-1
Permittee:	Westby Coop Creamery, 615 N Main St, Westby, WI 54667-1394
Discharge Location:	707 Highland St., Westby, WI NW ¼ of the NE ¼ of Section 32, T14N, R4W, City of Westby, Vernon County, WI
Receiving Water:	A noncontinuous stream to the North Fork of the Bad Axe River and the groundwaters of the Bad Axe River Watershed all located in the Bad Axe-La Crosse River Basin in Vernon County.
StreamFlow (Q _{7,10}):	0 cfs
Stream Classification:	Limited Aquatic Life, Non-public Water Supply

Facility Description

Westby Co-op Creamery is a dairy processing plant manufacturing cottage cheese, sour cream, butter, yogurt and hard cheeses. Waste generated includes whey, cottage cheese rinse and wastewaters from the cleaning of plant equipment and operations. Whey is sold, cottage cheese rinse and wastewaters are treated via an aerated lagoon system and polishing pond prior to discharge to the noncontinuous stream. The City of Westby and Westby Coop Creamery both discharge to the same noncontinuous stream which leads to the North Fork of the Bad Axe River. Operational changes that occurred during the last permit term are as follows: The permittee has indicated all waste from Outfall 003 is no longer land applied as whey is now being processed through an ultrafiltration-reverse osmosis (RO) polisher. Whey protein from the ultrafiltration process is sold for further processing, permeate from the ultrafiltration process is concentrated with the RO and sold for animal feed, water is recovered from the RO process and polished and then sent to the pond treatment system. Significant operational changes proposed in the upcoming term are as follows: Westby Co-op Creamery will be installing a dissolved air flotation (DAF) unit that will be running by summer of 2023. Significant effluent monitoring and/or limit changes in the upcoming permit term is as follows: 1) is a reduction in the approved alternate phosphorus limit, 2) addition of ammonia limits and a compliance schedule to meet them, 3) addition of annual acute WET testing, 4) a change in the flow sample frequency from continuous to daily for reporting purposes. The influent flow sample frequency has also been changed to daily. Compliance schedules are included in the permit that require the permittee submit an updated land management plan and conduct quarterly waterway inspections & submit annual reports of those inspections. Because the permittee has changed the method in which they handle the liquid waste that was land applied “via” Outfall 003 that outfall has been removed from the permit. The permittee does not intend to remove pond sludge this permit term, but in case they do, sludge monitoring and reporting requirements have changed.

Substantial Compliance Determination

Per Julia Stephenson, 2/15/2023:

Enforcement During Last Permit: There have been no formal enforcement actions taken at this facility during the previous permit term. In August of 2022 Westby Creamery had BOD5 issues with Pond 3 sludge floating a couple of times during the month. It seems to be settled down now. They will be installing a dissolved air flotation (DAF) unit that will be running by summer of 2023 that will eliminate this problem in the future.

After a desk top review of all: discharge monitoring reports, land app reports, compliance schedule items, and a site visit on 11/29/2022, this facility has been found to be in substantial compliance with their current permit.

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)
702	0.095 MGD (2022)	Representative influent samples shall be collected at the Palmer Bowlus Flume prior to discharge to the aerated lagoons.
002	0.102 MGD (2022)	Representative effluent samples shall be collected at the post aeration manhole prior to mixing with the City of Westby effluent. Discharge is limited to process wastewater.
008	Sludge was removed and landspread in 2021.	If sludge is to be removed from the ponds, at least 60 days prior to initiation of landspreading activities, the permittee shall 1) notify the Department, 2) representative samples shall be collected from a truckload of waste and monitored for the parameters below, 3) new land application sites shall be approved, and 4) an updated land application management plan shall be submitted. All land application forms (3400-49, 3400-52 & 3400-55) shall be submitted annually, regardless if sludge is removed from the ponds. During years that no sludge is removed, the permittee shall submit forms & indicate "no discharge". Discharge is limited to lagoon sludge. Discharge to manure pits is prohibited.

1 Influent - Monitoring

Sample Point Number: 702- INFLUENT @ PALMER BOWLUS FLUME

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	2/Week	24-Hr Comp	
Suspended Solids, Total		mg/L	2/Week	24-Hr Comp	

Changes from Previous Permit:

The sample frequency for flow has been changed from “continuous” to “daily” for eDMR reporting purposes.

Explanation of Limits and Monitoring Requirements

Sample point 702 assists in comparing influent to the pond system to the effluent exiting the pond system, as well as treatment considerations. “Normally” this would be numbered & named as an Inplant sample point, however it has been labeled an influent sample point for many permit terms, so the department has determined to leave the numbering and naming as an influent sample point as is.

2 Surface Water - Monitoring and Limitations

Sample Point Number: 002- PROCESS WW @ POST AERATION

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Total Daily	
BOD5, Total	Daily Max	40 mg/L	2/Week	24-Hr Comp	
BOD5, Total	Monthly Avg	20 mg/L	2/Week	24-Hr Comp	
BOD5, Total	Daily Max	29.4 lbs/day	2/Week	Calculated	
BOD5, Total	Monthly Avg	14.7 lbs/day	2/Week	Calculated	
BOD5, Total	Daily Max	58 lbs/day	2/Week	Calculated	
BOD5, Total	Monthly Avg	23 lbs/day	2/Week	Calculated	
Suspended Solids, Total	Monthly Avg	60 mg/L	2/Week	24-Hr Comp	Effective through May 31, 2028.
Suspended Solids, Total	Daily Max	36.8 lbs/day	2/Week	Calculated	
Suspended Solids, Total	Monthly Avg	18.4 lbs/day	2/Week	Calculated	
Suspended Solids, Total	Weekly Avg	30 mg/L	2/Week	24-Hr Comp	Limit effective 06/01/2028 per the associated compliance schedule.
Suspended Solids, Total	Monthly Avg	20 mg/L	2/Week	24-Hr Comp	Limit effective 06/01/2028 per the associated compliance schedule.
Suspended Solids, Total	Daily Max	87 lbs/day	2/Week	Calculated	
Suspended Solids, Total	Monthly Avg	32 lbs/day	2/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	
Phosphorus, Total	Rolling 12 Month Avg	7.7 mg/L	Weekly	24-Hr Comp	
Nitrogen, Ammonia Variable Limit		mg/L	2/Week	See Table	Look up the variable ammonia limit from the 'Variable Ammonia Limitation' table and report the variable limit in the

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Ammonia Variable Limit column on the eDMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	2/Week	24-Hr Comp	Limits effective 06/01/2028 per the associated compliance schedule. Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the eDMR. See Ammonia Limitation Section.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	17 mg/L	2/Week	24 Hr Comp	Limit applies May – Oct beginning 2028. See the associated compliance schedule.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	41 mg/L	2/Week	24 Hr Comp	Limit applies May – Oct beginning 2028. See the associated compliance schedule.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	46 mg/L	2/Week	24 Hr Comp	Limit applies Nov – April beginning in 2028. See the associated compliance schedule.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	11 mg/L	2/Week	24-Hr Comp	Limit applies May – Oct beginning June 2028. See the associated compliance schedule.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	28 mg/L	2/Week	24-Hr Comp	Limit applies May – Oct beginning June 2028. See the associated compliance schedule.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	21 mg/L	2/Week	24-Hr Comp	Limit applies Nov – April beginning in June 2028. See the associated compliance schedule.
Chlorine, Total Residual	Daily Max	19 ug/L	2/Week	Grab	
Chlorine, Total Residual	Weekly Avg	7.3 ug/L	2/Week	Grab	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Chlorine, Total Residual	Monthly Avg	7.3 ug/L	2/Week	Grab	
Chloride		mg/L	Quarterly	24-Hr Comp	
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Comp	See permit section on nitrogen series monitoring for more info.
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	
Temperature Maximum		deg F	2/Week	Multiple Grab	Monitoring required July 2026 - June 2027. See temperature section in permit.
Acute WET	Daily Max	1.0 TUa	See Listed Qtr(s)	24-Hr Comp	See WET testing section below.

Changes from Previous Permit

Reissuance -10: 1) reduction in the approved alternate phosphorus limit, 2) addition of ammonia limits and a compliance schedule to meet them, 3) addition of annual acute WET testing, and 4) the sample frequency for flow has been changed from “continuous” to “daily” for eDMR reporting purposes.

Modification -10-1: 1) technology based effluent limits increased for BOD and TSS, 2) water quality based effluent limits for TSS and ammonia decreased, 3) WET limit added

Explanation of Limits and Monitoring Requirements

The effluent monitoring frequency for all parameters was considered. Monitoring frequencies are based on the size and type of the facility and are established to best characterize effluent quality and variability, to detect events of noncompliance, and to ensure fairness and consistency in permits issued across the state. Requirements in administrative code (NR 108, 205, 210 and 214 Wis. Adm. Code) and Section 283.55, Wis. Stats. were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. For more information see the March 22, 2021 version of the Bureau of Water Quality Program Guidance Document “Monitoring Frequencies for Individual Wastewater Permits”. After consideration of the above factors, the department determined that no changes to monitoring frequencies for parameters with limits are necessary at this time.

Limits were determined for Westby Coop Creamer’s existing discharge to the non-continuous stream using chs. NR 102, 104, 105, 106, 207, 210, 212 and 217 of the Wisconsin Administrative Code (where applicable). For more information see the following May 16, 2023 memos from Benjamin Hartenbower to Holly Heldstab: 1) “Technology-Based Effluent Limitations for Westby Coop Creamery WPDES Permit No. WI-0070645” and 2) “Water Quality-Based Effluent Limitations for the Westby Coop Creamery WPDES Permit No. WI-0070645”. Also see the memo “Westby Co-op Creamery APL” from Nate Willis to Holly Heldstab dated November 7, 2022.

More information on categorical and water quality-based limits is found in the Water Quality Based Effluent Limitations (WQBEL) and Technology Based Effluent Limits (TBEL) memos for the Westby Co-op Creamery prepared by Ben Hartenbower dated June 30, 2025, and used for this modification.

Industrial Effluent Limits –In accordance with the federal regulation 40 CFR 122.45(d), limits in this permit are to be expressed as daily maximum and monthly average limits whenever practicable. Minor changes have been made to chlorine and ammonia limits.

BOD, TSS, and pH: Categorical limits for BOD, total suspended solids, and pH were evaluated based on updated production data. Chapter NR 240, Wis. Adm. Code, specifies effluent guidelines for discharges from dairy product categories of point sources and subcategories. The Westby Coop Creamery falls under the “Cultured Products”, “Cottage Cheese and Cultured Cream Cheese”, and “Natural and Processed Cheese” 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 K and L.

Westby Co-op Creamery began having effluent limit violations of the newly effective TSS and BOD technology-based limits at permit reissuance date of August 1, 2023. During compliance discussions with Westby, the department determined that there was production information that was not available at the time of permit reissuance. Therefore, the TBELs were recalculated utilizing the now available production values. This resulted in increased TSS and BOD mass limitation. As part of the recalculation process, the department identified that Westby had been granted a TSS algae variance of 60 mg/L monthly average pursuant s. NR 210.07(2), Wis. Adm. Code. However, since the discharge from Westby Coop Creamery is not categorized as publicly owned treatment works or privately owned domestic sewage treatment works, this facility does not qualify for the TSS variance limitation.

Phosphorus: Phosphorus requirements are based on the Phosphorus Rules that became effective 12/1/2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. The code categorically limits industrial dischargers of more than 60 pounds of phosphorus per month and municipal dischargers of more than 150 pounds of phosphorus per month to 1.0 mg/L unless an alternative limit is approved. NR 217 also specifies WQBELs (water quality based effluent limits) for discharges of phosphorus to surface waters of the state from publicly and privately owned wastewater facilities, noncontact cooling water discharges which contain phosphorus, concentrated animal feeding operations that discharge through alternative treatment facilities and a facility/site that is regulated under NR 216 where the standards in NR151 and 216 are not sufficient to meet phosphorus criteria. 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. Westby Coop Creamery discharges to a noncontinuous stream that is classified on a limited aquatic life surface water. Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to limited aquatic life waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. Therefore, no WQBEL are included in the permit.

The Westby Coop Creamery exceeded the 150 lbs. per month threshold and had an alternative phosphorus limit (APL) of 8.75 mg/L in the current permit based on the provisions in s. NR 217.04(2)(b), Wis. Adm. Code. In their permit reissuance application, the permittee requested the APL apply in this permit also, citing that the 1.0 mg/L effluent standard will not result in an environmentally significant improvement in water quality. The department determined that continuance of an APL is justified and recommended a limit of 7.7 mg/L, applied as a 12-month rolling average, as stated in the November 7, 2022 APL Memo from Nate Willis. Therefore, a technology-based limit (TBEL) of 7.7 mg/L is included in the permit.

Ammonia: Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia. Based on effluent ammonia data submitted with the permit reissuance application, daily maximum, and seasonal weekly & monthly average ammonia limits are required. Daily maximum limits vary with effluent pH and are stated in the table below. A compliance schedule is included in the permit giving the permittee time to make operational changes to comply with the new limits by April 1, 2028.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	83	7.0 < pH ≤ 7.1	51	8.0 < pH ≤ 8.1	11
6.1 < pH ≤ 6.2	82	7.1 < pH ≤ 7.2	46	8.1 < pH ≤ 8.2	8.8
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	40	8.2 < pH ≤ 8.3	7.3

6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	35	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	4.9
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	26	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	22	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.8
6.8 < pH ≤ 6.9	60	7.8 < pH ≤ 7.9	16	8.8 < pH ≤ 8.9	2.4
6.9 < pH ≤ 7.0	56	7.9 < pH ≤ 8.0	13	8.9 < pH ≤ 9.0	2.0

Water quality-based ammonia limits were recalculated within the WQBEL memo dated June 30, 2025, utilizing default basin values for the Bad Axe River Watershed and limited aquatic life streams. There was already a compliance schedule for complying with ammonia limitations by April 1, 2028, but the schedule was extended until June 1, 2028 and also updated to mirror the general treatment plant compliance schedule deliverables and due dates.

Chlorine: Available effluent data submitted with the permit application indicates the discharge contains concentrations of chlorine or halogen above the applicable calculated WQBELs. Therefore, limits are included in the permit.

Chloride: Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter VII of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride. Based on a comparison of effluent chloride concentration data and calculated effluent limitations, neither effluent limits nor monitoring are required. However, quarterly monitoring continues to ensure that enough effluent data and sample results are available next permit reissuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.

Total Nitrogen Monitoring (NO₂+NO₃, TKN and Total N): The Department has included quarterly effluent monitoring for Total Nitrogen in the permit through the authority under §§ 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.

Thermal: Requirements for Temperature are included in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature. 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 Based on the procedures in s. NR 106.55(2), Wis. Adm. Code, and an evaluation of available effluent data, no temperature effluent limits are required. Temperature monitoring is required June 2026 – July 2027 so that an adequate number of samples are available for calculation of limits during the next permit reissuance.

Whole Effluent Toxicity: Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised August 2016. See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at <http://dnr.wi.gov/topic/wastewater/wet.html>. Acute tests shall be conducted during the following quarters:

- 4th quarter (Oct – Dec) 2023
- 3rd quarter (July – Sept) 2024
- 2nd quarter (April – June) 2025
- 1st quarter (Jan – March) 2026
- 4th quarter (Oct - Dec) 2027

Whole Effluent Toxicity (WET) was reevaluated in the WQBEL memo dated June 30, 2025, utilizing the most up to date WET test information. Due to a WET test failure in 2023, an acute WET limit is now applicable.

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 proposed 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.

3 Land Application

Sample Point Number: 008- POND SLUDGE

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Grab	Monitoring for these parameters is only required if the permittee land applies, or intends to remove pond sludge & land apply the waste on their own approved fields themselves. If waste is hauled by a licensed hauler and land applied on that hauler's approved fields, monitoring is not required. All land app forms shall be submitted annually (3400-49, 3400-52 and 3400-55) regardless of how the sludge is handled. See the appropriate schedule in the Schedules section for additional info.
Nitrogen, Total Kjeldahl		Percent	Annual	Grab	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Grab	
Chloride		Percent	Annual	Grab	
Phosphorus, Total		Percent	Annual	Grab	
Phosphorus, Water Extractable		% of Tot P	Annual	Grab	
Potassium, Total Recoverable		Percent	Annual	Grab	
pH Field		su	Annual	Grab	

Changes from Previous Permit:

Land application outfall 003 has been removed from the permit because the permittee now sends that liquid waste for animal feed instead of having it hauled or landspreading it themselves. Pond sludge (outfall 008) was removed from the pond in 2021, but the permittee has indicated they do not intend to remove sludge in the next permit term. The sludge was hauled and land applied by a licensed hauler. Westby Coop Creamery no longer has their own approved sites for land applying sludge themselves. They are still required to submit the proper land app forms annually (3400-49, 3400-52 and 3400-55). If they wish to remove sludge from the ponds in the upcoming permit term and land apply on their own approved fields, there are a number of requirements that must be met at least 60 days in advance. See the sample point description and the Updated Land Application Management Plan schedule in the Schedules section for more information.

Explanation of Limits and Monitoring Requirements

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

4 Schedules

4.1 Ammonia Compliance Schedule

This compliance schedule requires the permittee to achieve compliance by the specified date

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent discharges of ammonia with conclusions regarding compliance.	06/30/2024
Action Plan: Submit an action plan for complying with the effluent limitation.	01/31/2026
Submit Design Report for Upgrade: The permittee shall submit a Final Engineering Design Report per s. NR 108.04(1), Wis. Adm. Code.	09/30/2026
Submit Final Plans and Specifications: The permittee shall submit final construction plans and specifications to the department for approval pursuant to s. 281.41, Wis. Stats., consistent with the approved Engineering Design Report and a schedule for completing construction of the upgrades by the 'Complete Construction' date specified.	09/30/2026
Initiate Construction: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	04/30/2027
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	11/30/2027
Complete Construction: The permittee shall complete construction of system upgrades necessary to achieve compliance with the effluent limitations starting June 1, 2028, and notify the department of completion via email.	05/31/2028

Explanation of Schedules: The compliance schedule for ammonia 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.

4.2 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Updated Land Application Management Plan: Westby Coop Creamery has indicated it does not intend to land apply during this permit term. If Westby Coop Creamery decides to land apply, it will notify the department at least 60 days prior to land application. In addition, Westby Coop Creamery will update its Land Application Management Plan to include additional storage, sampling, transport and land application information to comply with its WPDES permit and ch. NR 214, Wis. Adm. Code. This plan and all fields will be approved prior to land application. 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.	

Explanation of Compliance 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.

4.3 Quarterly Waterway Inspection, Follow-up Repair Actions and Reporting

The Department will accept combined (City of Westby and Westby Coop Creamery) WPDES required work-products (Performed, produced and submitted) related to waterway issues. These work products must have formal resolution of acceptance at the board level of both organizations and submitted as such, with resolutions, to the Department.

Required Action	Due Date
Waterway Inspection: In the reach of waterway beginning at the outfall pipe and extending downstream until water is no longer present, the permittee shall conduct quarterly inspections. Inspections shall follow the May 8, 2007 DNR approved “Waterway Maintenance Management Plan” and documented on the approved inspection form in this plan. Modifications or amendments to this plan must be approved by the Department prior to implementation. The inspections shall take place at a time when stormwater and snowmelt is least likely to affect waterway flow and shall include identification, location and documentation of any holes in the streambed into which water is flowing. They also shall document the downstream extent of effluent on the ground surface. On an annual basis, the permittee shall contact owners of all property adjacent to the effluent waterway to find out if they are aware of any problem areas in the waterway or if they have any concerns that need to be addressed.	
Waterway Follow-up Repair Actions: The permittee shall take the following follow-up actions by the time frame specified whenever effluent is observed to be flowing into a hole in the bed of the waterway: 1) Notify the Department within 24 hours of discovery. 2) Implement a temporary remedy as soon as possible but no later than 14 days after discovery. Details as to what the temporary remedy was and when it was implemented shall be provided in the annual report. 3) Implement a permanent remedy within 60 days of discovery, unless weather conditions prevent an appropriate remedy within that time frame. The Department shall be notified in writing, by email or by phone seven days prior to starting the permanent remedy. Details as to what the permanent remedy was and when it was implemented shall be provided in the annual report detailed below. Remedies implemented shall be those approved in management plan listed below, or individually approved later.	
Annual Waterway Inspection Reports: The permittee shall produce annual reports that include the items mentioned under Waterway Inspection and Waterway Follow-up Repair Actions and submit them to the Department by January 31 of the following year.	
Annual Waterway Inspection Report: Permittee shall submit the 2023 annual report discussed above.	01/31/2024
Annual Waterway Inspection Report: Permittee shall submit the 2024 annual report discussed above.	01/31/2025
Annual Waterway Inspection Report: Permittee shall submit the 2025 annual report discussed above.	01/31/2026

Annual Waterway Inspection Report: Permittee shall submit the 2026 annual report discussed above.	01/31/2027
Annual Waterway Inspection Report: Permittee shall submit the 2027 annual report discussed above.	01/31/2028
Annual Inspections After Permit Expiration: In the event that this permit is not reissued by the date the permit expires, the permittee shall continue to conduct the Waterway Inspections and submit reports on the annual Waterway Inspections following the due dates listed above. The reports shall include the information as defined above.	

Explanation of Compliance Schedule: This compliance schedule is included because the permittee discharges to a disappearing stream.

4.4 Total Suspended Solids Compliance Schedule

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Action Plan: Submit an action plan for complying with the effluent limitation.	01/31/2026
Submit Design Report for Upgrade: The permittee shall submit a Final Engineering Design Report per s. NR 108.04(1), Wis. Adm. Code.	09/30/2026
Submit Final Plans and Specifications: The permittee shall submit final construction plans and specifications to the department for approval pursuant to s. 281.41, Wis. Stats., consistent with the approved Engineering Design Report and a schedule for completing construction of the upgrades by the 'Complete Construction' date specified.	09/30/2026
Initiate Construction: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	04/30/2027
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	11/30/2027
Complete Construction: The permittee shall complete construction of system upgrades necessary to achieve compliance with the effluent limitations starting June 1, 2028, and notify the department of completion via email.	05/31/2028

Explanation of Schedules: The compliance schedule for TSS 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.

4.5 General Treatment Plant Compliance Schedule

Required Action	Due Date
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Submit Progress/Action Report: The permittee shall submit a report determining if the modernization project will still require a WWTP upgrade to meet all applicable effluent limits. This report shall include an evaluation of data available and calculations to justify the conclusion. This action report shall also include a schedule for the modernization project. <i>If the current WWTP design is expected to meet all applicable limits after the modernization project, no further steps are needed with this compliance schedule. If the current WWTP design is not expected to be able to meet the current and future limits after the modernization project, the remainder of the schedule applies.</i>	01/31/2026
Submit Design Report for Upgrade: The permittee shall submit a Final Engineering Design Report per s. NR 108.04(1), Wis. Adm. Code.	09/30/2026
Submit Final Plans and Specifications: The permittee shall submit final construction plans and specifications to the department for approval pursuant to s. 281.41, Wis. Stats., consistent with the approved Engineering Design Report and a schedule for completing construction of the upgrades by the 'Complete Construction' date specified.	09/30/2026
Initiate Construction: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	04/30/2027
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	11/30/2027
Complete Construction: The permittee shall complete construction of system upgrades necessary to achieve compliance with the effluent limitations starting June 1, 2028, and notify the department of completion via email.	05/31/2028

Explanation of Schedules: This compliance schedule is for addressing ongoing effluent limit violations and scheduled production modernization plans. The compliance schedule lays out a timeline for the permittee to investigate the modernization project and construct an upgrade treatment plan if necessary.

Special Reporting Requirements

Effluent Waterway Maintenance Management Plan: The Permittee shall operate in accordance with its May 8, 2007 DNR approved plan "Effluent Waterway Management Plan". Modifications or amendments to this plan must be approved by the Department prior to implementation.

Other Comments:

Publishing Newspaper: Westby Times, PO Box 140, Westby, WI 54667-0140

Attachments:

Categorical Limits Calculations: Technology-Based Effluent Limitations for Westby Coop Creamery WPDES Permit No. WI-0070645

Water Quality Based Effluent Limits: Water Quality-Based Effluent Limitations for the Westby Coop Creamery WPDES Permit No. WI-0070645

Alternate Phosphorus Limit (APL) Memo: Westby Co-op Creamery APL” from Nate Willis to Holly Heldstab dated November 7, 2022

Categorical Limits Calculations: Technology-Based Effluent Limitations for Westby Coop Creamery WPDES Permit No. WI-0070645 – June 30, 2025

Water Quality Based Effluent Limits: Water Quality-Based Effluent Limitations for the Westby Coop Creamery WPDES Permit No. WI-0070645 – June 30, 2025

Proposed Expiration Date:

June 30, 2028

Justification Of Any Waivers From Permit Application Requirements

N/A

Prepared By: Holly Heldstab, Wastewater Specialist

Date: July 28, 2023

Modification Prepared By: Amy Garbe, Wastewater Engineer

Date: November 7, 2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: June 27, 2025

TO: Holly Heldstab – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Technology-Based Effluent Limitations for Westby COOP Creamery
WPDES Permit No. WI-0706045

Technology-Based Effluent Limitations (TBELs) Recommended for Outfall 002:

Parameter	Daily Maximum	Daily Minimum	Monthly Average
BOD ₅ , Total	58 lbs/day		23 lbs/day
TSS	87 lbs/day		35 lbs/day
pH	9.0 s.u.	6.0 s.u.	

PART 1 – BACKGROUND INFORMATION

Westby Coop Creamery processes raw milk to produce a variety of dairy products including cottage cheese, sour cream, and yogurt. Receiving station routines are also currently active for the bulk reshipment of raw milk to other facilities. Wastewater is treated by three lagoons operated in series and a DAF unit. The first and second lagoons are aerated and the third lagoon is a polishing pond. Following the second lagoon, wastewater is routed to the DAF unit for treatment and discharged to the third lagoon. The facility utilizes aluminum sulfate for phosphorus removal. Effluent is discharged through Outfall 002, located SW ¼ SW ¼, Sec 29 T14NR4W, east of Hegge Road.

PART 2 – INDUSTRIAL CATEGORIES

Chapter NR 240, Wis. Adm. Code, specifies effluent guidelines for discharges from dairy product categories of point sources and subcategories. Westby COOP Creamery would fall under the Receiving Stations, Cultured Products, and Cottage Cheese and Cultured Cream Cheese 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 A, C, and E. 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

Cottage Cheese (Historic) production lines which commenced construction prior to May 28, 1974 are not subject to NSPS standards. Therefore, BPT, BCT, and BAT standards for the Cottage Cheese and Cultured Cream Cheese subcategory are applicable as specified in 40 CFR Part 405 Subpart E and ch. NR 240, Wis. Adm. Code.

Milk Receiving, Sour Cream, Yogurt, Cottage Cheese (Current and Expansion) 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 Receiving Stations, Cultured Products, and Cottage Cheese and Cultured Cream Cheese subcategories are applicable as specified in 40 CFR Part 405 Subparts A, C, and E and ch. NR 240.12, Wis. Adm. Code.

PART 4 – CURRENT PRODUCTION LEVELS

The current levels of production for each Subcategory are provided by Westby COOP Creamery

Receiving Stations

Process	Material Used (lbs/day)	Flow % Discharged to Surface Water	Material Used for Calculation¹ (lbs/day)	Material Used for Calculation² (lbs/month)
Milk Receiving	3,156 (Milk, 3.5%)	100%	3,156	96,061

Cultured Products

Process	Material Used (lbs/day)	Flow % Discharged to Surface Water	Material Used for Calculation¹ (lbs/day)	Material Used for Calculation² (lbs/month)
Sour Cream	26,420 (Heavy Cream)	100%	26,420	804,159
Yogurt	15,342 (Milk, 4.3%)	100%	15,342	466,972

Cottage Cheese and Cultured Cream 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)
Cottage Cheese (Historic)	168,873 (Milk, 4.3%)	100%	168,873	5,140,068
Cottage Cheese (Current)	40,623 (Milk, 4.3%)	100%	40,623	1,236,466
Cottage Cheese (Expansion)	84,663 (Milk, 4.3%)	100%	84,663	2,576,930

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 BOD₅ 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.

Receiving Stations

Process	Material Used (lbs/month)	BOD Factor ¹ (lbs/100 lbs)	Adjusted Total BOD Input ² (lbs/month)	Adjusted Total BOD Input (lbs/day)
Milk Receiving	96,061	10.23	9,827	323
Total				323

Cultured Products

Process	Material Used (lbs/month)	BOD Factor ¹ (lbs/100 lbs)	Adjusted Total BOD Input ² (lbs/month)	Adjusted Total BOD Input (lbs/day)
Sour Cream	804,159	37.87	304,535	10,005
Yogurt	466,972	10.89	50,853	1,671
Total				11,676

Cottage Cheese and Cultured Cream 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)
Cottage Cheese (Historic)	5,140,068	10.89	559,753	18,390
Cottage Cheese (Current)	1,236,466	10.89	134,651	4,424
Cottage Cheese (Expansion)	2,576,930	10.89	280,628	9,220
Total				32,034

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 RECEIVING STATIONS

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 Milk Receiving commenced construction after May 28th, 1974.

Therefore, the NSPS limitations of 40 CFR Part 405.15 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
322.86	0.050	0.100	0.063	0.126	0.016	0.032	0.020	0.041

Footnotes:

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

PART 7 – TBEL CALCULATIONS FOR CULTURED PRODUCTS

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 Sour Cream and Yogurt commenced construction after May 28th, 1974.

Therefore, the NSPS limitations of 40 CFR Part 405.35 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
11,676.00	0.370	0.740	0.463	0.925	4.320	8.640	5.400	10.800

Footnotes:

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

PART 8 – TBEL CALCULATIONS FOR COTTAGE CHEESE AND CULTURED CREAM 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 Cottage Cheese (Current) and Cottage Cheese (Expansion) commenced construction after May 28th, 1974.

Therefore, the NSPS limitations of 40 CFR Part 405.55 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
13,643.66	0.740	1.480	0.925	1.850	10.096	20.193	12.620	25.241

Footnotes:

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

Best Practicable Treatment (BPT)

Cottage Cheese (Historic) production commenced construction prior to May 28th, 1974 and is the best practicable control technology currently available, so NSPS standards do not apply.

Westby COOP Creamery has a BOD input of greater than 2,600 lbs/day, therefore the BPT limitations of 40 CFR Part 405.52(a) would apply.

Total BOD Input (lbs/day)	BPT 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
18,390.26	2.68	6.7	4.02	10.05	49.286	123.215	73.929	184.822

Footnotes:

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

Best Conventional Pollutant Control (BCT)

Per 40 CFR Part 405.57, the BCT limitations are set to be the same as BPT standards in 40 CFR Part 405.52.

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)
Receiving Stations	0.016	0.032	0.020	0.041
Cultured Products	4.320	8.640	5.400	10.800
Cottage Cheese and Cultured Cream Cheese	59.382	143.407	86.549	210.063
Total	63.72	152.08	91.97	220.90

Final Calculated Effluent Limitations			
Parameter & Units	Daily Maximum	Daily Minimum	Monthly Average
BOD ₅	152 lbs/day		64 lbs/day
TSS	221 lbs/day		92 lbs/day
pH	9.0 s.u.	6.0 s.u.	

Current TBELs for BOD and TSS

	Daily Maximum	Monthly Average
BOD ₅	29.4 lbs/day	14.7 lbs/day
TSS	36.8 lbs/day	18.4 lbs/day

Previous TBELs for BOD and TSS

	Daily Maximum	Monthly Average
BOD ₅	58 lbs/day	23 lbs/day
TSS	87 lbs/day	35 lbs/day

Effluent Data for BOD and TSS (August 2023 to May 2025)

	BOD₅ lbs/day	TSS lbs/day
1-day P ₉₉	93.7	159.0
4-day P ₉₉	55.1	92.5
30-day P ₉₉	35.6	59.0
Mean	26.9	44.0
Std	18.4	31.3
Sample size	191	191
Range	1-114	1-187

Antidegradation and Antibacksliding

The effluent data from August 2023 to May 2025 indicates that Westby Coop Creamery was never capable of complying with the current TBELs for BOD or TSS. Therefore, adjusting the daily maximum and monthly average mass limits to the previously calculated TBELs, will not increase the concentration, level, or loading of BOD and TSS to the receiving water. Therefore, antidegradation would not be applicable. To be consistent with antibacksliding requirements, the current limits may be relaxed in accordance with s. NR 207.12(4)(b), Wis. Adm. Code.

CORRESPONDENCE/MEMORANDUM**State of Wisconsin**

DATE: June 30, 2025

TO: Holly Heldstab – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for Westby Coop Creamery
WPDES Permit No. WI-0070645

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 Westby Coop Creamery in Vernon County. This industrial discharge is to the non-continuous stream to the North Fork of the Bad Axe River, located in the Bad Axe River Watershed in the Bad Axe - La Crosse 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	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD ₅	58 lbs/day		30 mg/L	20 mg/L, 23 lbs/day	3,4
TSS	87 lbs/day		30 mg/L	20 mg/L, 35 lbs/day	3,4
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		4.0 mg/L			1,4
Ammonia Nitrogen May - October November - April	Variable Variable		28 mg/L	11 mg/L 21 mg/L	5
Chlorine	19 µg/L		7.3 µg/L	7.3 µg/L	1,6
Chloride					1,2
Temperature					1,7
Phosphorus				7.7 mg/L	1,8
TKN, Nitrate+Nitrite, and Total Nitrogen					1,9
Acute WET	1.0 TUa				10

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 and were adjusted to prevent a lowering of water quality in ch NR 207, Wis. Adm. Code in place of the fully calculated TBEL limits.
4. Concentration limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.

5. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq \text{pH} \leq 6.1$	83	$7.0 < \text{pH} \leq 7.1$	51	$8.0 < \text{pH} \leq 8.1$	11
$6.1 < \text{pH} \leq 6.2$	82	$7.1 < \text{pH} \leq 7.2$	46	$8.1 < \text{pH} \leq 8.2$	8.8
$6.2 < \text{pH} \leq 6.3$	80	$7.2 < \text{pH} \leq 7.3$	40	$8.2 < \text{pH} \leq 8.3$	7.3
$6.3 < \text{pH} \leq 6.4$	78	$7.3 < \text{pH} \leq 7.4$	35	$8.3 < \text{pH} \leq 8.4$	6.0
$6.4 < \text{pH} \leq 6.5$	75	$7.4 < \text{pH} \leq 7.5$	31	$8.4 < \text{pH} \leq 8.5$	4.9
$6.5 < \text{pH} \leq 6.6$	72	$7.5 < \text{pH} \leq 7.6$	26	$8.5 < \text{pH} \leq 8.6$	4.1
$6.6 < \text{pH} \leq 6.7$	69	$7.6 < \text{pH} \leq 7.7$	22	$8.6 < \text{pH} \leq 8.7$	3.4
$6.7 < \text{pH} \leq 6.8$	65	$7.7 < \text{pH} \leq 7.8$	19	$8.7 < \text{pH} \leq 8.8$	2.8
$6.8 < \text{pH} \leq 6.9$	60	$7.8 < \text{pH} \leq 7.9$	16	$8.8 < \text{pH} \leq 8.9$	2.4
$6.9 < \text{pH} \leq 7.0$	56	$7.9 < \text{pH} \leq 8.0$	13	$8.9 < \text{pH} \leq 9.0$	2.0

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. Monitoring during the 4th year of the permit term.
8. The rolling 12-month average phosphorus limit is a technology-based limit.
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 Class A cheese plants. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total Kjeldahl nitrogen (TKN) (all expressed as N).
10. Annual Acute WET tests are recommended in the modified permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended and should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact 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: _____
Benjamin Hartenbower, PE,
Water Resources Engineer

E-cc: Katie Jo Jerzak, Wastewater Engineer – WCR/Eau Claire
Geisa Bittencourt, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3
Kim Kuber, Water Quality Biologist – SCR/Dodgeville

**Water Quality-Based Effluent Limitations for
Westby Coop Creamery**

WPDES Permit No. WI-0070645

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description

Westby Coop Creamery processes raw milk to produce a variety of dairy products including cottage cheese, sour cream, cream, and yogurt. Receiving station routines are also currently active for the bulk reshipment of raw milk to other facilities. Wastewater is treated by three lagoons operated in series and a DAF unit. The first and second lagoons are aerated and the third lagoon is a polishing pond. Following the second lagoon, wastewater is routed to the DAF unit for treatment and discharged to the third lagoon. The facility utilizes aluminum sulfate for phosphorus removal. Effluent is discharged through Outfall 002, located SW ¼ SW ¼, Sec 29 T14NR4W, east of Hegge Road.

Attachment #2 is a map of the area showing the approximate location of Outfall 002.

Existing Permit Limitations

The current permit, expiring on 06/30/2028, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD ₅	40 mg/L, 29.4 lbs/day			20 mg/L, 14.7 lbs/day	3
TSS	36.8 lbs/day			60 mg/L, 18.4 lbs/day	3
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		4.0 mg/L			
Ammonia Nitrogen May - October November - April	Variable Variable		41 mg/L	17 mg/L 46 mg/L	4,5
Chlorine	19 µg/L		7.3 µg/L	7.3 µg/L	5
Chloride					2
Temperature					2
Phosphorus				7.7 mg/L	6
TKN, Nitrate+Nitrite, and Total Nitrogen					2
Acute WET					7

Footnotes:

Attachment #1

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. The mass limits are categorical limits based on ch. NR 240, Wis. Adm. Code.
4. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq \text{pH} \leq 6.1$	83	$7.0 < \text{pH} \leq 7.1$	51	$8.0 < \text{pH} \leq 8.1$	11
$6.1 < \text{pH} \leq 6.2$	82	$7.1 < \text{pH} \leq 7.2$	46	$8.1 < \text{pH} \leq 8.2$	8.8
$6.2 < \text{pH} \leq 6.3$	80	$7.2 < \text{pH} \leq 7.3$	40	$8.2 < \text{pH} \leq 8.3$	7.3
$6.3 < \text{pH} \leq 6.4$	78	$7.3 < \text{pH} \leq 7.4$	35	$8.3 < \text{pH} \leq 8.4$	6.0
$6.4 < \text{pH} \leq 6.5$	75	$7.4 < \text{pH} \leq 7.5$	31	$8.4 < \text{pH} \leq 8.5$	4.9
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$6.8 < \text{pH} \leq 6.9$	60	$7.8 < \text{pH} \leq 7.9$	16	$8.8 < \text{pH} \leq 8.9$	2.4
$6.9 < \text{pH} \leq 7.0$	56	$7.9 < \text{pH} \leq 8.0$	13	$8.9 < \text{pH} \leq 9.0$	2.0

5. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
6. The rolling 12-month average technology-based phosphorus limit is an Alternate Effluent Limit (AEL) based on the provisions in s. NR 217.04(2)(b), Wis. Adm. Code.
7. Acute WET testing required: July - September 2024, October - December 2023, April - June 2025, January - March 2026, and October - December 2027.

Receiving Water Information

- Name: Non-continuous stream to the North Fork of the Bad Axe River
- Waterbody Identification Code (WBIC): 1643220
- 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-Q₁₀ = 0 cubic feet per second (cfs)
 - 7-Q₂ = 0 cfs
 - Harmonic Mean Flow = 0 cfs using a drainage area of 0 mi²
 - The Harmonic Mean has been estimated based on average flow and the 7-Q₁₀ using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).
- Hardness = 244 mg/L as CaCO₃. 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: The Westby Wastewater Treatment Facility also discharges to the same receiving water. However, with estimated receiving water flows of zero, the other discharger does not impact this evaluation.
- Impaired water status: None.

Effluent Information

- Flow rates:
Peak Annual Average = 0.126 million gallons per day (MGD)
For reference, the actual average flow from 04/01/2018 to 05/31/2025 was 0.113 MGD.
- Hardness = 244 mg/L as CaCO₃ This value represents the geometric mean of four samples collected in June 2022.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Wastewater generated from dairy products processing.
- Additives: Aluminum Sulfate, Polyfloc AE1702, and Klaraid IC1172
- 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 Hardness. The permit-required monitoring for Ammonia Nitrogen, Chloride, Chlorine, and Phosphorus from 04/03/2018 to 05/28/2025 is used in this evaluation.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Copper Effluent Data

Sample Date	Copper µg/L
06/09/2022	12.3
06/13/2022	5.4
06/16/2022	5.6
06/20/2022	<5.2
02/27/2023	12.0
03/02/2023	11.2
03/05/2023	<5.2
03/08/2023	18.2
03/11/2023	7.0
03/14/2023	13.3
03/17/2023	<5.2
03/20/2023	6.2
04/21/2023	19.1
04/24/2023	5.2
04/28/2023	6.3
05/01/2023	<5.2
1-day P ₉₉	25.5
4-day P ₉₉	17.3

Effluent Data

	Chloride (mg/L)	Chlorine (µg/L)
1-day P ₉₉	302	48
4-day P ₉₉	211	34
30-day P ₉₉	163	17
Mean	140	3
Std	52	26
Sample size	28	148

The following table presents the average concentrations and loadings at Outfall 002 from April 2018 to May 2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameters with Effluent Limits

	Average Measurement	Average Mass Discharged
BOD ₅	19.7 mg/L	16.52 lbs/day
TSS	34.1 mg/L	27.72 lbs/day
pH	7.91 s.u.	
Dissolved Oxygen	8.02 mg/L	
Ammonia Nitrogen*	28.66 mg/L	
Chlorine*	3 µg/L	
Phosphorus	9.14 mg/L	

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

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

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

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

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 Westby Coop Creamery, 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. 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-Q₁₀ (estimated as 80% of 7-Q₁₀)), 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		19.07			48	160
Arsenic		340		340	68	<7.7		
Cadmium	244	80.34		80.49	16.10	<0.41		
Chromium (+3)	244	3745		3752	750	3		
Copper	244	36.01		36.08			25.5	19.1
Lead	244	253.25		253.74	50.75	<1.4		
Nickel	244	998.21		1000.14	200.03	<1.5		
Zinc	244	262.71		263.22	52.64	28.3		
Chloride (mg/L)		757		758			302	270

* * 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.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)RECEIVING WATER FLOW = 0.00 cfs (¼ of the 7-Q₁₀), as specified in s. NR 106.06(4), 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			34
Arsenic		152		152	30	<7.7	
Cadmium	175	3.82		3.82	0.76	<0.41	
Chromium (+3)	244	274		274	55	3	
Copper	244	22.21		22.21			17.3
Lead	244	66.33		66.33	13.27	<1.4	
Nickel	244	156.24		156.24	31.25	<1.5	
Zinc	244	262.71		262.71	52.54	28.3	
Chloride (mg/L)		395		395			211

* 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 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	880.00		880.00	176.00	<0.41	
Chromium (+3)	8400000		8400000	1680000	3	
Lead	2240.0		2240.0	448.0	<1.4	
Nickel	110000		110000	22000	<1.5	

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	40.00		40.00	8.00	<7.7	

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

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for Chlorine. Limit and monitoring recommendations are made in the paragraphs below:

Chlorine - Available effluent data 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 average limit of 7.3 µg/L are needed for permit reissuance.**

Sections NR 106.07(4) and NR 205.067(7), Wis. Adm. Code require WPDES permits contain daily maximum and monthly average limitations for industrial dischargers whenever practicable and necessary to protect water quality. **Therefore a monthly average limit of 7.3 µg/L is also required** to meet expression of limits requirements in addition to the daily max and weekly average limits.

Chloride – Considering available effluent data from April 2018 to May 2025, the 1-day P₉₉ chloride concentration is 302 mg/L, and the 4-day P₉₉ of effluent data is 211 mg/L.

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

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, it is unlikely that the effluent will contain PFOS or PFOA. **Therefore, monitoring is not recommended.**

The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR CONVENTIONAL POLLUTANTS

In accordance with s. NR 104.02(3)(b)2, Wis. Adm. Code and based on the receiving water classification, the recommended limitations for BOD₅ are 30 mg/L weekly average and 20 mg/L monthly average. The recommended limitations for TSS are 30 mg/L weekly average and 20 mg/L monthly average. In order to maintain adequate dissolved oxygen, a dissolved oxygen limit of 4.0 mg/L daily minimum is recommended.

Since the discharge from Westby Coop Creamery is not categorized as publicly owned treatment works or privately owned domestic sewage treatment works, this facility does not qualify for the TSS variance limitation of 60 mg/L in accordance with s. NR 210.07(2), Wis. Adm. Code.

Technology Based Effluent Limits

Based on updated information provided by Westby Coop Creamery, the department has recalculated the BOD and TSS Technology-Based mass limits. These limit calculations are referenced in the June 27, 2025 TBEL Memo for Westby Coop Creamery.

Effluent Data for BOD and TSS (August 2023 to May 2025)

	BOD₅ lbs/day	TSS lbs/day
1-day P ₉₉	93.7	159.0
4-day P ₉₉	55.1	92.5
30-day P ₉₉	35.6	59.0
Mean	26.9	44.0
Std	18.4	31.3
Sample size	191	191
Range	1-114	1-187

Current TBELs for BOD and TSS

	Current Limits	Previous TBEL	Current Effluent Loading
Daily Max BOD ₅	29.4 lbs/day	58 lbs/day	94 lbs/day
Monthly Avg. BOD ₅	14.7 lbs/day	23 lbs/day	36 lbs/day
Daily Max TSS	36.8 lbs/day	87 lbs/day	159 lbs/day
Monthly Avg. TSS	18.4 lbs/day	35 lbs/day	59 lbs/day

TBEL Recommendations for BOD and TSS

	Daily Maximum	Monthly Average
BOD ₅	58 lbs/day	23 lbs/day
TSS	87 lbs/day	35 lbs/day

Antidegradation and Antibacksliding

Effluent data indicates Westby Coop Creamery was never capable of complying with the BOD and TSS mass limits in the current permit. Since current effluent loading is greater than the TBELs calculated prior to the current permit issuance, these mass limits would still prevent an increase in concentration, level and loading of BOD and TSS to the receiving water. Therefore, antidegradation would not be applicable. The recommended mass limits would be at least as stringent as the effluent guidelines calculated the June 27, 2025 TBEL Memo. To be consistent with antibacksliding requirements, the current limits may be relaxed in accordance with s. NR 207.12(4)(b), Wis. Adm. Code.

Conclusions and Recommendations

In summary, the following BOD₅ and TSS limitations are recommended.

Final BOD₅ and TSS Limits

	Daily Maximum	Weekly Average	Monthly Average
BOD ₅	58 lbs/day	30 mg/L	20 mg/L, 23 lbs/day
TSS	87 lbs/day	30 mg/L	20 mg/L, 35 lbs/day

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. The current permit has variable daily maximum, weekly, and monthly limits. These limits are re-evaluated at this time due to the following changes:

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- The maximum expected effluent pH has changed.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

Daily maximum limitations are based on acute toxicity criteria in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation:

$$\text{ATC in mg/L} = [A \div (1 + 10^{(7.204 - \text{pH})})] + [B \div (1 + 10^{(\text{pH} - 7.204)})]$$

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 2475 sample results were reported from 04/01/2018 to 05/31/2025. The maximum reported value was 8.99 s.u. (Standard pH Units). The effluent pH was 8.82 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.73 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 8.70 s.u. Therefore, a value of 8.82 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 8.82 s.u. into the equation above yields an ATC = 2.75 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method

In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the the 1-Q₁₀ 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.

Attachment #1

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q₁₀ (estimated as 80 % of 7-Q₁₀) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	5.49
1-Q ₁₀	2.75

The 1-Q₁₀ method yields the most stringent limits for Westby Coop Creamery.

The current permit has variable daily maximum effluent limits based on effluent pH. Presented below is a table of daily maximum limitations corresponding to various effluent pH values.

Daily Maximum Ammonia Nitrogen Limits – LAL

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	83	7.0 < pH ≤ 7.1	51	8.0 < pH ≤ 8.1	11
6.1 < pH ≤ 6.2	82	7.1 < pH ≤ 7.2	46	8.1 < pH ≤ 8.2	8.8
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	40	8.2 < pH ≤ 8.3	7.3
6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	35	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	4.9
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	26	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	22	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.8
6.8 < pH ≤ 6.9	60	7.8 < pH ≤ 7.9	16	8.8 < pH ≤ 8.9	2.4
6.9 < pH ≤ 7.0	56	7.9 < pH ≤ 8.0	13	8.9 < pH ≤ 9.0	2.0

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, because 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 of the receiving (°C)

Attachment #1

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-Q₁₀ (4-Q₃, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q₅ (estimated as 85% of the 7-Q₂ if the 30-Q₅ 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 °C, 25% of the flow is used if the Temperature < 11 °C, and 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

The “default” basin assumed values are used for Temperature, because minimum ambient data is available. Values for pH are from the Bad Axe River Watershed. These values are shown in the table below, with the resulting criteria and effluent limitations.

Weekly and Monthly Ammonia Nitrogen Limits – LAL

		May - October	November - April
Effluent Flow	Q _e (MGD)	0.326	0.326
Background Information	7-Q ₁₀ (cfs)	0.00	0.00
	7-Q ₂ (cfs)	0.00	0.00
	Ammonia (mg/L)	N/A	N/A
	Average Temperature (°C)	17.2	5.8
	Maximum Temperature (°C)	20.6	10.0
	pH (s.u.)	7.97	8.02
	% of Flow used	N/A	N/A
	Reference Weekly Flow (cfs)	0.00	0.00
	Reference Monthly Flow (cfs)	0.00	0.00
Criteria mg/L	4-day Chronic	27.98	52.04
	30-day Chronic	11.19	20.82
Effluent Limits mg/L	Weekly Average	28	52
	Monthly Average	11	21

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from April 2018 to May 2025:

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	May - October	November - April
1-day P ₉₉	155.76	81.20
4-day P ₉₉	93.03	44.18
30-day P ₉₉	61.40	23.43

Attachment #1

Ammonia Nitrogen mg/L	May - October	November - April
Mean*	47.08	14.84
Std	30.30	16.93
Sample size	84	112
Range	2.30 - 120.00	<0.20 - 84.00

Reasonable Potential

The need to include ammonia limits in the Westby Coop Creamery permit is determined by calculating 99th upper percentile (or P₉₉) values for ammonia and comparing those to the calculated limits. Based on this comparison, **daily and monthly limits are required year-round and weekly limits are required May through October.**

Conclusions and Recommendations

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

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
May – October	Variable	28	11
November – April	Variable		21

PART 5 – PHOSPHORUS

Technology Based Phosphorus 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 limit of 1.0 mg/L, or an approved alternative concentration limit.

The Westby Coop Creamery exceeded the 150 lbs. per month threshold and has an alternative effluent limit (AEL) of 7.7 mg/L in the current permit based on the provisions in s. NR 217.04(2)(b), Wis. Adm. Code. The AEL was requested, citing that the 1.0 mg/L effluent standard will not result in an environmentally significant improvement in water quality.

The department determined that continuance of an APL was justified and recommended a limit of 7.7 mg/L, applied as a 12-month rolling average, as stated in the November 7, 2022 APL Memo from Nate Willis. **Therefore, a TBEL of 7.7 mg/L is recommended.**

Water Quality-Based Effluent Limits (WQBEL)

Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to limited aquatic life waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. These waters were not included in the USGS/WDNR stream and river studies and, therefore, the Department lacked the technical basis to determine and propose applicable criteria. At some time in the future, the Department may adopt phosphorus criteria based on new studies focusing on limited aquatic life waters. The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020) suggests that during the interim, WQBELs should be based on the criteria and flow conditions for the next stream segment downstream (or downstream lake or reservoir, if appropriate), because ss. 217.12 and 217.13, Wis. Adm. Code, state that the Department must set WQBELs to protect downstream waters. The discharge location of the wastewater from Westby Coop Creamery is classified as limited aquatic life downstream from the point of discharge downstream to line between Sec. 35 and 36, T14N, R5W. The North Fork Bad Axe River is classified for warm water sport fishery uses. The immediate receiving water at the outfall location is a non-continuous "disappearing stream" that is non-contiguous to the downstream stretch for the majority of the year. Due to stream bed seepage, the effluent does not impact downstream surface water resources. **Therefore, no water-quality based phosphorus limits are warranted for inclusion in the permit.**

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in 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.

The table below summarizes the maximum temperatures reported during monitoring from January 2022 to July 2023.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	34	34	--	86
FEB	32	32	--	86
MAR	37	37	--	86
APR	64	64	--	86
MAY	68	70	--	86
JUN	78	79	--	86
JUL	79	81	--	86
AUG	79	81	--	86
SEP	77	77	--	86
OCT	63	63	--	86
NOV	55	55	--	86
DEC	34	34	--	86

Reasonable Potential

Based on the available discharge temperature data, the maximum daily effluent temperature reported was 81°F; therefore, no reasonable potential for exceeding the daily maximum limit exists, and **no limits are recommended. The monitoring scheduled in the current permit should be continued** in the permit modification to provide representative temperature data to review during the next permit reissuance cycle.

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.

Attachment #1

- Chronic testing is usually not recommended where the distance between the outfall and the point where the receiving water becomes a non-variance waterbody (i.e., one that supports a cold water, warm water sport fish, or warm water forage fish community) is greater than four miles. For Westby Coop Creamery, the effluent seeps into groundwater before the receiving water becomes a non-variance waterbody. There is believed to be little potential for chronic toxicity effects in the North Fork Bad Axe River associated with the discharge from the Westby Wastewater Treatment Facility so the need for chronic WET testing was not considered further.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 002. 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.

WET Data History

Date Test Initiated	Acute Results LC50 %				Chronic Results IC25 %					Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Algae (IC50)	Pass or Fail?	Use in RP?	
11/29/2023	16.8	<6.25	Fail	Yes						
02/06/2024	>100	>100	Pass	Yes						
02/21/2024	>100	>100	Pass	Yes						
08/14/2024	>100	>100	Pass	Yes						

- 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.**

$$\text{Acute Reasonable Potential} = [(TUa \text{ effluent}) (B)]$$

Acute WET Limit Parameters

TUa (maximum) 100/LC50	B (multiplication factor from s. NR 106.08(5)(c), Wis. Adm. Code, Table 4)
100/6.3 = 16.0 TUa	6.2 Based on 1 detect

Attachment #1

$$\text{Acute Reasonable Potential} = [(TU_a \text{ effluent}) (B)] = 99.2 > 1.0$$

Therefore, reasonable potential is shown for acute WET limits using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from 2023 to 2024.

Expression of WET limits

Acute WET limit = 1.0 TU_a (daily maximum)

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	Chronic not evaluated.
Historical Data	Four tests used to calculate RP. One test failed. 0 Points	
Effluent Variability	BOD ₅ , Phosphorus, and TSS exceedances. NONs sent in 2023, 2024, 2025. 10 Points	
Receiving Water Classification	Limited Aquatic Life (LAL) water > 4 miles to WWSF 0 Points	
Chemical-Specific Data	Reasonable potential for Ammonia and Chlorine limits based on ATC. (6 pts) Chromium, Copper, Zinc and Chloride detected. (3 pts) Additional Compounds of Concern: None 9 Points	
Additives	Three Water Quality Conditioner (3 pts) Permittee has proper P chemical SOPs in place. 1 Point	

Attachment #1

	Acute	Chronic
Discharge Category	Cheese, Natural and Processed (20 pts) 20 Points	
Wastewater Treatment	Secondary or Better 0 Points	
Downstream Impacts	No impacts known. 0 Points	
Total Checklist Points:	43 Points	
Recommended Monitoring Frequency (from Checklist):	1x yearly	
Limit Required?	Yes Limit = 1.0 TUa	
TRE Recommended? (from Checklist)	No	

- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, annual Acute WET tests are recommended in the modified permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended 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, an acute WET limit is required. The acute WET limit shall be expressed as 1.0 TUa as a daily maximum in the effluent limits table of the permit.
- A minimum of annual acute monitoring is required because an acute WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.

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)
BL2444 (Sodium Hydroxide)	Boiler Water Treatment	>4 days/week		4.9	N/A
BL1253 (Sodium Bisulfite)	Boiler Water Treatment	>4 days/week		18.1	N/A
BL1302 (Sodium Hydroxide)	Boiler Water Treatment	>4 days/week		13.5	N/A
CL6832	Condenser Water Treatment	>4 days/week		1.1	N/A
CL561 (Sulfuric Acid)	Condenser Water Treatment	>4 days/week		5.3	N/A
CL2150	Biocide	>4 days/week		0.4	N/A
CL497	Biocide	>4 days/week		1.0	N/A
Aluminum Sulfate	Phosphorus Control	>4 days/week		N/A	N/A
Polyfloc AE1702	Flocculant	>4 days/week	0.25 gal/day (for 35 gpm influent)	0.035	0.205
Klaraid IC1172	Coagulant	>4 days/week	7.6 gal/day (for 35 gpm influent) (maintain pH 6.2 - 9.0 s.u.)	10.5	12.56

BL1253, BL1302, CL6832, CL561, CL2150, and CL497 are used prior to the aerated lagoon system.

A review is not needed because these additives are not expected to be present in the effluent following the treatment process.

A review is not necessary for the Aluminum Sulfate because a Standard Operating Procedure (SOP) is in place to prevent any discharge to surface water.

Polyfloc AE1702 and Klaraid IC1172 are estimated to discharge below the secondary toxicity values at the proposed dosage rates.

Attachment #2

