INNOCYCLONE
SEPARATION WITHOUT FILTRATION

InnoCyclone — Clarification of Dairy Processing Wastewater

Case Study | Lactalis Canada, St. Claude, Manitoba

97.1%	90.6%	96.6%	71.9%
TSS Removal	TP Removal	FOG Removal	BOD Reduction

Project Background and Challenge

In the town of St. Claude, located in the Rural Municipality of Grey, Manitoba, Lactalis Canada — with over 140 years of heritage in the Canadian dairy industry — operates a dairy processing facility. The facility generates significant volumes of wastewater discharged into the municipal sewer system and treated by the town's lagoon system. This industrial discharge accounts for up to 25% of the municipality's hydraulic treatment capacity.

The dairy processing wastewater contains high concentrations of the following contaminants:

- Total Suspended Solids (TSS)
- Chemical Oxygen Demand (COD)
- Biochemical Oxygen Demand (BOD)
- Total Phosphorus (TP)
- Fat, Oil, and Grease (FOG)
- Elevated pH

Due to the strength and variability of the wastewater, the discharge placed a significant burden on the municipal lagoon system. As part of its sustainability strategy, Lactalis sought an effective solution to reduce pollutant loads, improve wastewater quality, and enable beneficial reuse of nutrient-rich solids.

The Innovantage Solution

Innovantage installed the InnoCyclone wastewater clarification system to remove contaminants from the dairy processing effluent before discharge to the municipal system. The system uses Charged Bubble Flotation (CBF) technology to separate suspended solids, fats, and nutrients from the wastewater.

The treated effluent consistently met municipal discharge requirements and was safely discharged into the municipal sewer system. Captured solids were thickened and dewatered before being transported to a composting facility, where they were blended with organic waste to produce a nutrient-rich soil amendment — supporting Lactalis' sustainability objectives through resource recovery and beneficial reuse.

To ensure reliable year-round operation — including under Manitoba winter conditions — Innovantage implemented a thermal management system that utilizes heat from the wastewater to maintain process temperatures above freezing. This approach eliminated the need for a fully insulated building while maintaining stable treatment performance.

The system is fully automated, enabling continuous operation with minimal operator intervention and reduced labour requirements.

Project Information	
Location	St. Claude, Manitoba, Canada
Project Type	Industrial Wastewater Treatment and Clarification

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Completion Date	December 2026
Design Flow	150 m³/day

Results — Treated Dairy Wastewater Quality

The InnoCyclone technology installed by Innovantage effectively reduced contaminant levels in the treated effluent to meet discharge targets. This treatment significantly reduced the load on the municipal lagoon system, helping to avoid costly infrastructure upgrades while supporting Lactalis' sustainable dairy processing objectives.

Contaminant	Influent (mg/L)	Effluent Target (Permit)	InnoCyclone Effluent	Removal Efficiency (%)
BOD	2,072.73	2,000	583	**71.9%**
TSS	1,198.70	300	34.4	**97.1%**
TP	19.69	10	1.86	**90.6%**
Fat, Oil & Grease (FOG)	445.73	100	15	**96.6%**
pH	11.7	≤10	7.0	—

Sludge Recovery for Beneficial Use

Sludge is dewatered using a customized liner installed within a dewatering container, reducing volume and moisture content to below 80%. The dewatered sludge is then hauled to a composting facility, where it is blended with organic waste at optimized ratios to produce a nutrient-rich compost for use as a soil amendment to support crop growth.

Key Takeaways

- Strong performance: High removal efficiencies for TSS (97.1%), FOG (96.6%), TP (90.6%), and BOD (71.9%), consistently meeting municipal discharge requirements.
- Infrastructure savings: Significant reduction in load on the municipal lagoon system, helping to avoid costly upgrades.
- Reliable year-round operation: Thermal management system ensures stable performance even under Manitoba winter conditions.
- Minimal labour: Fully automated control reduces operator intervention.
- Circular economy: Captured solids beneficially reused as compost, supporting sustainable resource recovery.