NEWTRIENT SNAPSHOT

Livestock Water Recycling

Polymer-Enhanced Solid Separation

LIVESTOCK WATER RECYCLING

BUSINESS OVERVIEW

Livestock Water Recycling (LWR) is a provider of livestock manure treatment technology for dairy, beef, swine, and anaerobic digester operations, with a vision to help livestock producers become more efficient while simultaneously being more environmentally stable. Based in Alberta, Canada, LWR works with farms to reduce greenhouse gas (GHG) emissions and concentrate nutrients from manure waste streams for precise use in fertilizer application and improvements to water conservation and quality.

PROJECT

TECHNOLOGY OVERVIEW

LWR's patented technology has two main components to separate liquids and solids from the manure waste stream – the "First Wave" and "PLANT" systems. After initial coarse solids separation, which is not included in the system, the separated liquid manure enters the "First Wave" process. This polymer-assisted separator removes finer suspended solids and separates them into a dough like solids product, rich in phosphorus and organic nitrogen, and a low suspended solids liquid stream. This liquid moves into the "PLANT" system for additional fine solids removal, filtration and conditioning, and lastly, dissolved solids removal. The "PLANT" system concentrates ammonium and potassium into one liquid fraction and extracts clean, reusable water as a second liquid stream.

PROJECT SIZE

LWR's system can be designed for herds from 100 to 10,000 cows or more. Depending on the dairy size, the "First Wave" can treat 15,000-264,000 gallons of manure daily, nearly 5-106 million gallons of manure annually can be processed[1].

REQUIREMENTS

The LWR system should be covered and enclosed for protection from adverse weather conditions. If sand bedding is used, removal of the sand and coarse solids from the waste stream are necessary as a preliminary treatment before entering the LWR system. Once treated, adequate storage for coarse solids, fine solids, and liquid nutrient fractions is required. Storage and equipment facilities should follow all environmental compliance, and operators should undergo thorough training and sustain consistent monitoring, maintenance, and record keeping for refined system functionality.

KEY CALL-OUTS

Water Recovery and Recycling: Clean water extracted from manure is suitable for flush and irrigation.

Separated Solids: Separated solids, rich in nutrients, can be field applied to build soil health.

Targeted Liquid Effluent: Concentrated liquid nutrients, nitrogen and potassium, can be applied as fertilizer to meet crop needs, reducing risks of runoff and leaching of excess nutrients.

Verified Carbon Credits: Generate credits from methane avoidance to create a new, measurable revenue stream.

Findings are based on an evaluation conducted under a Conservation Innovation Grant awarded to Newtrient. To view a more detailed description of these results, visit the Livestock Water Recycling Polymer-Enhanced Solid Separation Technology Evaluation Summary on the Newtrient website.

FINANCIAL OVERVIEW

CAPITAL INVESTMENT & OPERATIONAL COSTS

As of 2025, "First Wave" lease-to-own costs estimate from $3,567/month (100 cows) to $14,916/month (6,500 cows). "PLANT" pricing is available upon request. Estimated operating costs are $0.003/gallon ("First Wave") and $0.01/gallon ("PLANT"). Maintenance costs about 3-5% of system capital cost annually. Costs vary by capacity, farm size, market conditions, infrastructure, and customizable features.

DOWNSTREAM BENEFITS

Concentrated, low-volume solids and liquid fractions decrease handling and transportation expenses, while enabling precise nutrient application. This reduces field labor and reliance on commercial fertilizers. Solids removal lowers storage maintenance and costly cleanouts, preserving storage capacity. Reclaimed water reduces the need to acquire and treat water from external sources. LWR systems qualify for carbon credits, create a thickened manure feedstock for renewable natural gas production, and produce saleable fertilizers, potentially generating new revenue streams.

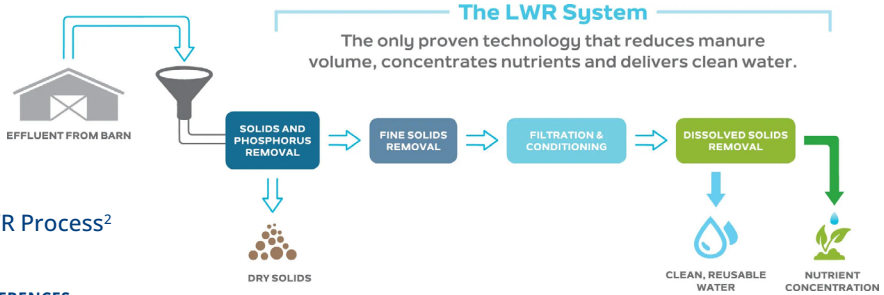
ENVIRONMENTAL IMPACT

WATER QUALITY AND SAVINGS

Application of concentrated nutrients from the right source and at the right rate, time, and place for crop growth reduces the risk of runoff and leaching into waterways. Recovery of clean, pathogen-reduced water from manure, according to vendor claims, can be safely used in cleaning, irrigation, sand washing, and flush flume systems, minimizing the potential for ground or surface water contamination. Recycling this water conserves natural resources and supports a circular system.

IMPROVED SOIL HEALTH

Storing manure with low solids content in holding ponds or anaerobic lagoons reduces methane emissions. Fewer trips to the field, enabled by LWR's concentrated, low-volume fertilizer byproducts, and water reuse decrease GHG emissions associated with fertilizer and water transport. Precise nutrient application lowers nitrous oxide emissions, often caused by overapplication of manure. Thickened manure feedstock is well-suited for integration into anaerobic digestion systems.



LWR Process[2]

REFERENCES:

[1] Livestock Water Recycling. 2018. Phosphorus and Nitrogen Capture and Removal. https://www.livestockwaterrecycling.com/media/pdf/First_Wave_System_2018.pdf.

[2] Livestock Water Recycling. 2025. The System. https://www.livestockwaterrecycling.com/the-system/plant.

NEWTRIENT'S 9-POINT TECHNOLOGY SCORING

For Livestock Water Recycling Polymer-Enhanced Solid Separation

Visit the Livestock Water Recycling Polymer Enhanced Solid Separation page in Newtrient's Solutions Catalog

Each solution can earn up to nine points, one for each criterion. Colored numbers indicate fulfilled criteria.

1 | **Operational History**
2 | **Operational Reliability**
3 | **Market Penetration**
4 | **Capital Cost**
5 | **Operations & Maintenance Cost**
6 | **Value Proposition**
7 | **Vendor Information Sharing**
8 | **Case Study**
9 | **Funding Availability**

Discover Newtrient's technology evaluation process: Learn more about Newtrient's 9-Point Technology Scoring System.

Newtrient's mission is to reduce the environmental footprint of dairy while making it economically viable to do so.

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