



NEWTRIENT SNAPSHOT



McLanahan Corporation

Sand-Manure Separation Technology



BUSINESS OVERVIEW

McLanahan Corporation is a global provider of processing solutions, dedicated to helping customers meet the standards of safety and sustainability across industries such as minerals, aggregates, agriculture, and others. Renowned for longevity and reliability, McLanahan is committed to advancing their equipment, design, and processes to uphold top-tier engineering and manufacturing excellence. In the dairy sector, McLanahan recognizes the complexities farmers face in manure management and addresses them through innovations designed to support transferring, separating, dewatering, and drying manure and sand bedding.

PROJECT

TECHNOLOGY OVERVIEW

Sand is a safe and comfortable bedding option for dairy cows; however, when mixed with manure, it can be abrasive and difficult to manage. Utilizing proven mechanical separation technology within a larger sand separation system, McLanahan Sand-Manure Separators (SMS) produce two separate recyclable products: clean recycled sand suitable for cow bedding and sand-free manure effluent that is easy to manage and can be stored, land applied, or sent to a digester.

PROJECT SIZE

McLanahan SMS systems can be configured for dairies with as few as 200 cows, with no upper limit. System size is not dependent on technical feasibility, but rather on economic viability. A study at a 2,000-cow dairy in northern Wisconsin demonstrated that approximately 230,000 gallons of flush manure per day was directed through the SMS, recovering about 30 tons of sand per day¹.

REQUIREMENTS

Sand-laden manure is the ideal feedstock for the SMS system. Access to reliable air, water, and electrical connections is vital for system functionality. For adverse weather conditions and freezing temperatures, equipment should be covered. Quality dilution water will achieve desired sand purity for reuse. Recovered sand must be handled properly to ensure that pathogens and moisture are not reintroduced into the barn. For optimal performance, operators should be thoroughly trained and continuous system maintenance and monitoring, including daily walk-through inspections and response to system downtimes are crucial.

KEY CALL-OUTS



Improved Water Quality:

Separating large solids like sand and organic matter from the waste stream reduces the risk of nutrient leaching and runoff into nearby waterways.



Reduced Bedding Costs:

Recycling clean sand bedding lowers costs for new bedding, transport, and disposal.



Minimized Manure Storage

Maintenance: Removing sand before storage prevents clogging, settling, and costly cleanouts.



Effective Pretreatment: Manure effluent is suitable for use in downstream treatment technologies such as anaerobic digestion and solid-liquid separation.

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 McLanahan Corporation Sand-Manure Separator Technology Evaluation Summary on the [Newtrient website](#).

FINANCIAL OVERVIEW



CAPITAL INVESTMENT & OPERATIONAL COSTS

As of 2025, a McLanahan SMS flush-compatible system costs an estimated \$936,855 for 1,500 cows, excluding freight or shipping, electrical, plumbing, installation, building, concrete, and startup. Annual operation and maintenance costs typically range from \$5,000 to \$10,000 in the first five years, with years four and five being on the higher end of that scale. Costs may vary based on farm size, capacity, project specifics, market conditions, existing infrastructure, and additional features.



DOWNSTREAM BENEFITS

Recovered sand is clean and reusable within days after separation, reducing bedding, disposal, and transport costs, while supporting cow comfort and productivity. Effluent is suitable for further treatment. Sand removal reduces downstream equipment wear, clogs, storage settling, and eases agitation and pumping, minimizing maintenance. Separation lowers application and hauling costs and enhances the fertilizer value of manure.

ENVIRONMENTAL IMPACT

WATER QUALITY AND SOIL HEALTH

Sand particles are removed during the sand separation process, helping reduce conditions that promote pathogen survival and growth for bedding. The sand removal improves nutrient use efficiency and handling of the remaining manure solids. If manure solid separation is desired, additional waste separation technologies should be implemented. Long-term application of sand-laden manure can degrade soil texture and lower water holding capacity; therefore, separation can preserve soil health.

REDUCED GHG EMISSIONS

Through the removal of sand particles, SMS enhances downstream manure treatment efficiencies such as solid-liquid separation and anaerobic digestion. This preliminary treatment allows for reduced greenhouse gas (GHG) emissions and the production of renewable energy from an otherwise untreatable stream.

Sand-Manure Separator²



REFERENCES:

¹ Langolf, B., and R. A. Larson. *Sand Recovery System Performance Evaluation*. Nelson Institute for Environmental Studies, University of Wisconsin–Madison. Final report prepared for Newtrient, updated 25 Apr. 2025. Included as Appendix to NRCS Practice Standard 629: *For Acceptance of Sand-Manure Separation Technology*, <https://www.newtrient.com/about/our-work/grant-funded-projects/2020-nrcs-conservation-innovation-grant/>.

² McLanahan Corporation. (2025). Dairy Sand-Manure Separation. <https://www.mclanahan.com/solutions/dairy>.

NEWTRIENT'S 9-POINT TECHNOLOGY SCORING



For McLanahan Corporation Sand-Manure Separator Technology

McLanahan Corporation Sand-Manure Separator Technology is designated as **Newtrient Recognized**, meaning it is a solution that demonstrates high marks on the 9-Point Criteria and does what it claims to do.

Visit the **McLanahan Corporation Sand-Manure Separator Technology** 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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