

LAKE WINNIPEG FOUNDATION

Submission to Manitoba Sustainable Development: Livestock Manure and Mortalities Management Regulation

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Photo: Paul Murch

Executive Summary

Lake Winnipeg, the world's 10th largest freshwater lake, is suffering from eutrophication, a condition caused by excess phosphorus from sources across the lake's vast watershed. As a result, algae blooms on Lake Winnipeg have been increasing in size and frequency, with negative impacts on water quality, tourism and recreation, subsistence and commercial fisheries, and local economies. Evidence-based solutions are required to ensure phosphorus-producing activities do not result in increased phosphorus loading to Lake Winnipeg.

Environmentally sound manure management is a critical pollution-prevention measure for Manitoba's hog industry, and must be based on strong evidence. In 2006 and 2007, the Manitoba Phosphorus Expert Committee¹ and the Manitoba Clean Environment Commission², respectively, recommended that a full-scale regulatory review of the hog industry be undertaken within five years. Such a review would examine the impacts of current practices on phosphorus loading to the province's waterways and inform regulatory improvements.

To date, no such review has been published. Without such a comprehensive review, it is not possible to quantify the impact of Manitoba's hog industry on phosphorus loading to Lake Winnipeg, nor to conclusively identify best management practices which could enable industry expansion without also increasing loading to Lake Winnipeg.

Before undertaking any amendments to the Livestock Manure and Mortalities Management Regulation (LMMMR) and associated legislation, the government of Manitoba must provide robust evidence to Manitobans to demonstrate that increased manure application to agricultural fields – as a result of expansion of the hog industry – will not increase phosphorus loading to Lake Winnipeg.

Specific research and monitoring needs have previously been identified and are reiterated below. Commitment to undertake and publicly release the results of necessary research and monitoring activities is an important step in fulfilling the Manitoba government's responsibility to safeguard provincial water quality and maintain public trust in our agricultural industry.

¹ Recommendations for regulating phosphorus from livestock operations in Manitoba. 2006. Manitoba Phosphorus Expert Committee.

² Environmental Sustainability and Hog Production in Manitoba. 2007. Manitoba Clean Environment Commission.

Research needs: factors determining phosphorus retention and loss

Hog manure, a waste product of the hog industry that contains phosphorus, is currently applied to fields as a fertilizer for agricultural crops. Where, when and how manure is applied determines how much phosphorus is available to promote crop growth, and how much is at risk of being lost from soils and flushed into waterways during spring melt and heavy rains. Further research is required on the factors that determine phosphorus retention and loss under different manure application conditions:

- 1) **Phosphorus levels in agricultural soils prior to manure application.** In its 2007 report, the Clean Environment Commission reviewed the thresholds for soil phosphorus that are currently used to determine acceptable manure application rates under the LMMMR. Citing soil fertility guidelines published by the provincial government, the Commission notes that “there is no agronomic benefit from the application of phosphorus when the soil test phosphorus levels are above 20 ppm [parts per million]³.” Yet, application rates for manure in the LMMMR are based on soil phosphorus thresholds of 60, 120 and 180 ppm, well above the level at which agronomic benefits are expected for crops. The Commission questioned the long-term environmental sustainability of the current regulation, which allows manure application at twice the rate of crop phosphorus uptake at levels between 60 and 120 ppm soil phosphorus, and does not prohibit manure application until soil phosphorus levels reach 180 ppm. The Commission called for additional research to quantify phosphorus loss from soils at these high levels, and to identify the relationship between soil phosphorus levels and phosphorus levels in surface water. Soil phosphorus thresholds for manure application should be determined based on Manitoba-based research that considers local soils, climate and topography.
- 2) **Manure application rates.** To increase practicality for manure applicators, the LMMMR currently allows manure application at rates of up to five times crop removal rates, as long as manure is not re-applied for five years. The Clean Environment Commission expressed concern regarding the assumption that this excess phosphorus will remain in place for five years to supply future crops. The phosphorus losses resulting from such over-application in a single year must be quantified, and any cumulative effects of this practice identified.
- 3) **Methods of manure application.** Currently, most manure applied to agricultural fields is done using two methods: injection of liquid manure under the soil surface, or spraying of manure onto the soil surface followed by physical incorporation within 48 hours. In 2014, an expert panel from the University of Manitoba called for research to compare these two methods to examine their effectiveness at preventing phosphorus

³ Environmental Sustainability and Hog Production in Manitoba. 2007. Manitoba Clean Environment Commission.

losses to water⁴. The Clean Environment Commission also called for additional research to determine when surface application of manure (20-30 per cent of manure applied) is acceptable, given that this application method results in the least amount of manure-soil contact.

- 4) **Distance from waterways.** The LMMMR defines setback distances from surface and groundwater features within which no manure should be applied. These setbacks vary depending on the water feature in question, the method of application and the vegetation growing in the setback itself. The University of Manitoba Expert Panel recommended additional research into erosion risk, soil type, topography and other factors that may be more important than setback distance in determining phosphorus losses into waterways. In particular, the expert panel suggested that vegetated setbacks may not be as effective as previously believed in reducing phosphorus losses during early spring runoff periods.

Monitoring data needs

The most recent publicly available water-quality data for Lake Winnipeg is from 1997-2007, and was published by the governments of Manitoba and Canada in the 2011 State of Lake Winnipeg Report. Manitobans do not have up-to-date information on the ecological health of our great lake, nor on the sources of phosphorus that impact provincial water quality. This information is necessary to make informed regulatory decisions on activities that have the potential to reduce water quality.

The Lake Winnipeg Foundation recommends that no changes be made to the LMMMR and associated legislation prior to the release of comprehensive, up-to-date monitoring data on phosphorus loading to Lake Winnipeg and its tributaries.

⁴ University of Manitoba Expert Panel Review of Measures to Protect Lake Winnipeg. 2014. Watershed Systems Research Program

Strengthening established best management practices for water quality

Any amendments to the LMMMR should strengthen – not weaken – the following established best management practices to reduce phosphorus loss from manure application:

- 1) **Ban on winter spreading of manure.** The prohibition against winter spreading of manure is widely recognized as a best management practice and is arguably the most important pollution-prevention measure undertaken by the provincial government in the past two decades.

When manure is spread on saturated, frozen or snow-covered ground, the phosphorus it contains cannot be incorporated into the soil. On the surface of the soil, this phosphorus is highly susceptible to runoff during the spring melt. The majority of phosphorus loading to Lake Winnipeg occurs in the spring due to high water flows.

The ban on winter spreading of manure has the support of research and agricultural sectors, and must be maintained in the LMMMR and associated legislation. It is a critical environmental practice that safeguards water quality and builds public trust.

- 2) **Greater restrictions on fall spreading of manure within high-risk areas.** Additional restrictions on manure spreading apply in the fall in the Red River Valley Special Management Area, designated in the LMMMR due to high risk of overland flooding, which carries more phosphorus into receiving waterbodies.

These restrictions should be extended to additional high-risk areas listed in the Schedule of the Environment Act, including municipalities in the Interlake and southeast Manitoba. In these regions, both flooding and high phosphorus levels increase the risk of phosphorus loss, while adjacency to vulnerable surface waters increases potential loading to Lake Winnipeg.

- 3) **Industry expansion should be limited by the availability of suitable land for manure spreading.** Any proposal to expand Manitoba's hog industry must clearly demonstrate that a suitable cropped land base exists for manure application in compliance with established best management practices, and at rates that do not exceed the phosphorus removal rates of the growing crop. Suitable land can only be identified once the factors affecting phosphorus loss and retention (listed above) are better understood for Manitoba conditions.

Conclusion

Despite multiple calls for a regulatory review, including research on best management practices and up-to-date water monitoring data, no evidence has been provided to demonstrate that phosphorus loading to Lake Winnipeg will not increase with the expansion of Manitoba's hog industry and the corresponding increase in manure application to agricultural fields.

It is the responsibility of the government of Manitoba to provide its citizens with robust data on the effectiveness of current and proposed regulatory measures to protect water quality. No amendments to the LMMMR and associated legislation should be made until conclusive, peer-reviewed information has been provided.

About the Lake Winnipeg Foundation

The Lake Winnipeg Foundation (LWF) advocates for change and co-ordinates action to improve the health of Lake Winnipeg, now and for future generations.

Founded in 2005 as a volunteer coalition of concerned lake-lovers, LWF today is a leading organization working collaboratively with non-profit, academic, industry and government sectors, First Nations, and the public to restore and protect our great lake.

Guided by the expertise of our Science Advisory Council, a group of nationally recognized freshwater experts, LWF advances collaborative efforts in research, education, policy and stewardship.

LWF is the only membership-based freshwater organization in Manitoba. Our flagship initiative, the Lake Winnipeg Health Plan, identifies eight evidence-based actions to improve the health of Lake Winnipeg – providing a blueprint for cost-effective decision-making for the long-term health of Lake Winnipeg.