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November 18, 2005

**Re: Initial Review respecting Water Quality Management Zones for Nutrients**

Dear Mr. Williamson:

Please consider this as our initial comments for the development of Manitoba's first regulation under the Water Protection Act. Until further detailed information is made available, we will be brief in our remarks.

1. The *Background Document* stipulates that these Water Quality Management Zones (WQMZ) are intended to protect water systems including those used for drinking purposes, from excessive run-off of nitrogen and phosphorus and takes into account the permeability of the soil and distance to groundwater. It appears however that groundwater protection is not manifested in the maps generated in the document known as *Consultation Document for Initial Review*. As an example, Manitoba initiated a sustainable irrigation development strategy to identify areas in the province with adequate soil suitability and water for growing root crops.<sup>1</sup> This strategy identifies a region known as the "wet sands area" which extends from the Carman area to north of Plumas. Cutting through the RM's of Lansdowne, Westbourne, North Norfolk, Portage la Prairie, South Norfolk, Grey and Dufferin, the wet sands area is 370,960 hectares in size and is characterized as having coarser-textured Almassippi soils suitable for irrigated potato production.<sup>2</sup> However 220,000 hectares or 60% of the wet sands area is designated as having a "high" potential environmental impact class. Another 16% (60,000 hectares) of the wet sands area is designated as having a "moderate" potential environmental impact class. And the remaining 24% is designated as "low" or "no" potential environmental impact classes. (See attached wet sands area map – Map 1) The wet sands area is depicted in Map 2 (attached), which is a reconstruction of adjoining municipalities taken from the *Consultation Document for Initial Review*. If one compares Map 1 to Map 2, we find that the majority of the wet sands area is classified as mostly WQMZ 2 with smaller pockets of zones 1, 3 and 4. WQMZ 2 roughly corresponds with areas in the *Manitoba Sustainable Irrigation Development Strategy* identified as having high potential environmental impact under irrigation. WQMZ 2 allows up to 224 kg/ha of nitrogen to be applied during the growing season for root crops. WQMZ 1 corresponds to moderate areas of potential environmental impact and can conceivably allow up to an application of 336 kg/ha of nitrogen for root crops, 280 kg/ha for perennials and 157 kg/ha for all crops. While only Water Stewardship and Conservation can determine

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<sup>1</sup> Manitoba Agriculture and Food, *Manitoba Sustainable Irrigation Development: A discussion paper*, November 2001.

<sup>2</sup> Ibid.

the true impacts to the groundwater source in the wet sands area, as they have the data, similar conclusions can be drawn from research conducted on the Assiniboine Delta Aquifer.

*“Unconfined shallow aquifers have long been identified as susceptible to groundwater nitrate impacts since they are often associated with coarse textured, well drained soils. The coarse-textured soils have little capacity to retain dissolved nitrate near the root zone due to low field capacities. They also rarely develop waterlogged or anaerobic conditions to facilitate nitrate loss by denitrification. Ironically, regions with shallow sand aquifers tend to be also highly groundwater dependent. Increased groundwater nitrate concentrations tend to occur at higher concentrations and more frequently in agricultural regions, under more permeable soils, in more shallow aquifers and/or more shallow (dug/bored) wells, can be correlated on a regional basis with fertilizer use. Indeed, relatively sever impacts are found in regions with sandy, shallow aquifers.”<sup>3</sup>*

Burton and Ryan (2000) reference 12 other studies conducted in North America which report elevated levels of nitrates above the drinking water guideline of 10 mg/L in areas of coarse soils (p. 55).

Manitoba conducted a three-year investigation by randomly sampling approximately 1000 private rural wells.<sup>4</sup> 43% of the samples tested positive for total coliform bacteria and 16% of the samples exceeded 10 mg/L of Nitrate-N. For those municipalities, which encompass the wet sands area, positive counts of total coliform are present in 64% of the samples while 24% exceeded 10 mg/L of Nitrate-N.

Similar conflicting examples can be drawn from Manitoba’s Soil Sustainable Study.<sup>5</sup> This study indicates that approximately 51% of agro-Manitoba has a high leaching risk of 1.0 to 10.0 cm/hour (p. 20).

2. Our second concern relates to the province of Manitoba’s assistance that it provides to Rural Municipal councils and Planning Districts when a community forms its development plan. It has been brought to our attention that the designation of environmental sensitive areas for the purposes of a development plan by-law is accomplished in a manner, which favors development over environmental integrity. The example that has been brought to our attention relates to By-law No. 3-2003 – The South Central Planning Development Plan.

In this example, Manitoba Agriculture, Food and Rural Initiatives (MAFRI) took the initiative to disregard the use of Groundwater Pollution Hazard Maps (otherwise

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<sup>3</sup> Burton, D.L. & Ryan, M.C, *Environmental Fate of Nitrate in the Assiniboine Delta Aquifer*, Prepared for Manitoba Horticulture Productivity Enhancement Centre Inc. December 2000.

<sup>4</sup> Manitoba Conservation, *Manitoba Rural Groundwater Quality Initiative: September 1999 to September 2000*, Unpublished data. Compiled 2001-02-15

<sup>5</sup> AXYS Agronomics, *Manitoba Conservation Soil Sustainability Study Model Parameters*, October 2002

know as Environmental Sensitivity Maps and utilized their own map which designated Nutrient Management Areas. The Minister of Intergovernmental Affairs and Trade sided with agriculture, and rejected an appeal to this discrepancy in By-law No.3-2003 by indicating that,

*“The Province was not in agreement with using the Environmentally Sensitive Map as originally proposed in the draft Plan, because it made assumptions not supported by the methodology used in developing the map.”<sup>6</sup>*

There was no further justification or explanation for the reasoning behind this decision.

Groundwater Pollution Hazard Maps were constructed by the Manitoba Water Resources Branch in the late 1970's and are as follows,

*“A pollution hazard zone was defined as an area where fresh water aquifers are overlain by less than 5 meters of clays tills or other low permeability materials...and ...pollution hazard zones were mapped using available information from bedrock and surficial geological maps and water well logs.”<sup>7</sup>*

We are under the impression that much of the same information was used to develop the environmental impact maps that were utilized by the federal and provincial governments in the development of Manitoba's Sustainable Irrigation Strategy.<sup>8</sup> As mentioned, the Sustainable Irrigation Strategy depicted areas in the province that range from “no potential” to “high potential” areas of environmental impact classes under irrigation. The same classification scheme was utilized by the Land Resources Unit of the Brandon Research Centre. They, along with the Department of Soil Science, University of Manitoba and Manitoba Agriculture, all partnered to develop new digital soil databases and interpretive map products for agricultural land use planning application for individual rural municipalities in Manitoba. These products are called Information Bulletins.<sup>9</sup>

As part of the collection, the Information Bulletins provide a “Potential Environmental Impact under Irrigation” map for each rural municipality. In these particular maps, several factors are specifically considered: soil texture, hydraulic conductivity, salinity, geological uniformity, depth to water table and topography.<sup>10</sup> We also understand that these bulletins re-interpreted the Canada Land Inventory maps developed by the Lands Directorate of Environment Canada in the 1960's.

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<sup>6</sup> Honorable Scott Smith, Minister of Intergovernmental Affairs and Trade, correspondence to Garry Verniest in appeal to South Central Planning District Development Plan By-law No.3-2003, November 30, 2004.

<sup>7</sup> Betcher, R, Grove, G & Pupp, C. “*Groundwater in Manitoba: Hydrogeology, Quality Concerns, Management*”, Environment Canada, March 1995

<sup>8</sup> Manitoba Agriculture and Food, “*Manitoba Sustainable Irrigation Development – A Discussion Paper*”, November 2001

<sup>9</sup> Agriculture and Agri-Food Canada, Land Resource Unit, Brandon Research Centre, “*Soils and Terrain: An Introduction to the Land Resources*” Information Bulletin 99-7, October 1999.

<sup>10</sup> Ibid

In March of 2000 the government announced the first steps of the Livestock Stewardship Initiative.<sup>11</sup> In this initiative, there was a commitment that,

*“The province’s groundwater sensitivity maps will be updated to identify areas where additional protective measures may be needed.”*

On January 9, 2002, correspondence from Al Beck, Manager of the Livestock Program, indicated that,

*“Updating of the provincial groundwater database has been completed. Production of maps is not a function of this exercise as the intent is to provide current data for site specific assessments. The database contains results of individual private well samples and, as such, this personal information is not available for public release.”<sup>12</sup>*

Then on April 21<sup>st</sup>, 2003<sup>13</sup> and again on March 4<sup>th</sup> 2004,<sup>14</sup> Manitoba announced that it intends to develop and map nutrient management zones across the province.

*“The province is developing new nutrient management zones based on soil classification and topographical features to identify areas more vulnerable to nutrient loss to ground and surface water.”<sup>15</sup>*

We have now been told that government intends to withdraw the groundwater pollution hazard maps and adopt a product, which is currently under development by the Prairie Farm Rehabilitation Administration (PFRA).<sup>16</sup>

Our questions are as follows:

- 1) Are nutrient management area maps utilized by MAFRI the same maps which Water Stewardship intends to use for defining water quality management zones for nutrients?**
- 2) How will water quality management zones for nutrients be incorporated into “Development Plans” under the Planning Act?**
- 3) Why have the groundwater pollution hazard maps been withdrawn for use?**
- 4) What methodology and base information will PFRA be utilizing to develop water quality management zones for nutrients?**

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<sup>11</sup> Manitoba Government News Release, “Government Announces First Steps of Livestock Stewardship Initiative”, Information Services, Legislative Building March 3, 2000.

<sup>12</sup> Beck, A., Manager, Livestock Program, Manitoba Conservation, “Letter to Fred Tait, Chair, Hog Watch Manitoba with respect to Livestock Stewardship Initiative”, January 9, 2002.

<sup>13</sup> Manitoba Government News Release, “Protecting Manitoba’s Water Key part of new Province Wide Water Strategy” News Media Services, Legislative Building, April 21, 2003.

<sup>14</sup> Manitoba Government News Release, “Province Proposes Legislative Action to Protect Manitoba’s Water Supply”, News Media Services, Legislative Building, March 4, 2004.

<sup>15</sup> Ibid

<sup>16</sup> Williamson, Dwight, “Presentation to the Manitoba Eco-Network Water Caucus with respect to Water Quality Management Zones for Nutrients”, September 6, 2005.

**5) What modifications have occurred to the Canada Land Inventory maps and are these modifications part of the strategy to develop water quality management zones for nutrients?**

3. We are concerned that the regulatory threshold of 60 ppm for Phosphorus is too permissive as it will allow for the over accumulation of P in the soil, which will invariably move into Manitoba's surface waters. 60 ppm translates to a soil concentration of 120 pounds per acre of P (or 275 pounds of phosphate per acre). We are supportive of the Citizens for the Responsible Application of Phosphorus' suggestion that,

*“the Province regulate manure application based on actual soil testing and actual crop utilization requirements up to the 60 ppm residual threshold where upon manure application would be prohibited. As such, producers whose soil test results already exceed the 60 ppm threshold would be required to apply manure on a crop utilization basis that would begin reducing the amount of residual phosphorus in an effort to eventually meet such a scientifically determined threshold.”*<sup>17</sup>

This view is supported by Technical Review Reports, which provides advice to reduce phosphorus at concentrations higher than 60 ppm as, *“there will be no crop response and excessive phosphorus may accumulate in the soil ...and can potentially runoff into surface water.”*<sup>18</sup>

AXYS Agronomics references research conducted by Dr. Don Flaten of the University of Manitoba, which collaborates the need to reduce phosphorus below the 60 ppm level.<sup>19</sup>

*“Fortunately for agricultural crop production, soil test P concentrations that are optimum for crop production are frequently lower than those that cause unacceptable P loss (Sibbeson and Sharpley 1997, Sharpley and Tunney 2000). In Idaho, for example, the agronomic optimum soil test P concentration for non-vegetable crops, using the Olsen test is set at 12 mg P/kg\*, while the environmental threshold is set at 50 or 100 mg P/kg for sandy and silt loam soils, respectively (Sharpley et al. 1999) (p. 25).*

*\* 12 mg P/kg = 55 lbs/acre of phosphate*

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<sup>17</sup> Citizens for the Responsible Application of Phosphorus, “Letter to Honourable Stan Struthers from Mr. Alan Baron”, April 25, 2005.

<sup>18</sup> Southwest Regional Technical Review Committee, “A Technical Review Report Prepared for the Rural Municipality of Daly: Daly Feeders, SE 23-11-20WPM” Province of Manitoba, June 2005.

<sup>19</sup> AXYS Agronomics

4. We are concerned that there are no special precautions placed on farm operations, which utilize tile drainage. Tile drainage increases nutrient and other pollutant loadings into the surface and groundwater.<sup>20 21 22</sup>
5. The buffer setbacks are woefully inadequate, especially for water bodies used directly for human drinking water. The setback for drinking water should be set at a minimum of 100 metres. There is also no mention of fencing off livestock from riparian zones, drinking groundwater sources and surface waterways.
6. While the draft regulation focuses on nutrient reduction, there is no indication as to which nutrient will be prioritized, what reductions will occur with best management practices and what areas of the province that will be targeted. We suggest that protecting drinking water sources from nitrates and other pollutants such as bacteria be considered a high priority. In this respect, we feel that the application of up to 336 kg/ha of nitrogen on irrigated fields is excessive and considerations should be given to splitting applications. We are asking that special management areas (such as floodplains and areas that are regularly inundated with surface water) be identified under this regulation. These areas will require further reductions in nutrient application and special management practices such as timing applications to avoid spring runoff. The next priority should focus on phosphorus reduction. We understand that researchers at the Lake Winnipeg Research Consortium are calling for a reduction of phosphorus loadings in Lake Winnipeg of 40 to 60 %.<sup>23 24</sup> As we mentioned, the starting threshold of 60 ppm P will not solve the excessive phosphorus build up in soils.

Thank-you for your consideration. We look forward to the next step in this process. On a related matter, we have enclosed our correspondence to Mr. Tellet, Director of Provincial Planning Services, Intergovernmental Affairs and International Trade for your perusal. Manitoba is currently updating the Provincial Land Use Policy for Agriculture.

Sincerely,

Glen Koroluk Volunteer, Coalition to Save the Assiniboine River  
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<sup>20</sup> Burton, D. and Ryan, C.

<sup>21</sup> Madramootoo, C, Wiyo, K & Enright, P., “*Nutrient Losses Through Tile Drains From Two Potato Fields*”, Applied Engineering in Agriculture, Vol 8(5) September 1992.

<sup>22</sup> Reston, Virginia. “*Water Quality in the Upper Mississippi River Basin: Minnesota, Wisconsin, South Dakota, Iowa, and North Dakota 1995-98*”, US Department of the Interior, US Geological Survey Circular 1211, 2000.

<sup>23</sup> Stainton, M. et al., “*Evidence from Ecosystem Research by Fisheries and Oceans Canada for the Need to Protect Lake Winnipeg from the Red River Basin*”, submission to the Manitoba Clean Environment Commission, April 2003.

<sup>24</sup> Salki, A., “*Presentation to the Red River Basin Commission on Lake Winnipeg*”, Gimli, Manitoba, August 4, 2005.