SUMMARY OF COMMENTS/RECOMMENDATIONS

PROPONENT:	**Rural Municipality of Rosser**
PROPOSAL NAME:	**Rural Municipality of Rosser Wastewater Treatment Lagoon**
CLASS OF DEVELOPMENT:	**2**
TYPE OF DEVELOPMENT:	**Wastewater Treatment Lagoon**
CLIENT FILE NO.:	**5270.00**

OVERVIEW:

On May 8, 2007, the Department received an Environment Act Proposal (EAP) on behalf of the Rural Municipality of Rosser for the construction and operation of a wastewater treatment lagoon to serve the Rural Municipality of Rosser and the Community of Grosse Isle. The proposed wastewater treatment lagoon will be located in SW 19 - 12 - 1 EPM in the Rural Municipality of Rosser. Treated wastewater from the wastewater treatment lagoon will be discharged to an existing municipal drain that discharges into Colony Creek that discharges into Sturgeon Creek that discharges into the Assiniboine River between June 15th and October 31st of any year.

The Department, on May 28, 2007, placed copies of the EAP report in the Public Registries located at 123 Main St. (Union Station), the Millennium Public Library, the Manitoba Eco-Network, and the Rural Municipality of Rosser office and provided copies of the EAP report to the Canadian Environmental Assessment Agency (CEAA), and TAC members. As well, the Department placed public notifications of the EAP in the Headingley Headliner on Friday, June 1, 2007 and in the Winnipeg Free Press on Saturday, June 2, 2007. The newspaper and TAC notifications invited responses until June 29, 2007.

On July 31, 2007, Manitoba Conservation forwarded requests for additional information from the TAC and the public to the proponent's consultant.

On September 6, 2007, the proponent's consultant provided responses to the requests for additional information. Manitoba Conservation forwarded the response to the public and the TAC for review and comment on September 26, 2007.

On the evening of Monday, October 15, 2007 a meeting organized by residents of the municipality was held. A representative of the Assessment and Licensing Branch presented information regarding the Environment Act Proposal review process and answered related questions. The RM of Rosser did not officially participate in the meeting and the municipality's engineering consultant was not in attendance.

On November 5, 2007, Manitoba Conservation forwarded requests for additional information from the TAC and the public to the proponent's consultant.

On December 12, 2007, the proponent's consultant provided responses to the requests for additional information. Manitoba Conservation forwarded the response to the public and the TAC for review and comment on December 17, 2007.

The public and the participating TAC reviewed the responses and submitted supplementary comments and requests for additional information. The comments provided in the consultant's responses did not satisfy all of the concerns and requests for additional information presented by the public. Several members of the public remain in opposition to the EAP and requested an additional opportunity to discuss outstanding environment related issues with the proponent and their consultant and had also requested that Manitoba Conservation participate. The proponent did not support the concept of organizing a special meeting to discuss these issues.

In a February 27, 2008 letter, the Rural Municipalities of Rockwood and Rosser requested that an Environment Act License be issued for the proposed wastewater treatment lagoon with supplementary requirements to undertake a study that would assess the impact of the lagoon's operation on the receiving environment. In addition, the letter requested that a requirement to add additional storage capacity for the lagoon, if determined necessary by the study, be integrated to the Environment Act Licence.

Comments from the public and the TAC have been incorporated to this summary.

COMMENTS FROM THE PUBLIC:

The principle concerns of the public regarding the proposed wastewater treatment lagoon related to the May 2007 Environment Act Proposal and subsequent responses to requests for additional information or discussion can be summarized as follows:

1. Concern about impacts on quality of air, surface water and groundwater;
2. Concern about inability of the lagoon to meet changing wastewater treatment requirements;
3. Concern about nutrients contained in the lagoon discharge and impact on Sturgeon Creek respecting fish and wildlife habitats;
4. Concern about proposed lagoon location relative to the most significant source of wastewater (i.e. Grosse Isle);
5. Changing influent characteristics and sources over time;
6. Concern about creating an environment favorable for breeding mosquitoes; and
7. Potential impacts on property value.

During two separate exchanges of correspondence, the concerns of the public regarding the lagoon were presented to the consultant. On both occasions the consultant responded with comments and information relating to the items included in these requests.

A meeting on the evening of Monday, October 15, 2007 regarding the proposed wastewater treatment lagoon was organized by residents of the municipality. The RM of Rosser did not officially participate in the meeting and the municipality's engineering consultant was not in attendance.

Some of the concerns presented by the public are common to an EAP of this nature and can be satisfied through specific clauses in any licence(s) that may be generated relative to this EAP. However, the comments provided in the consultant's responses have not satisfied all of the concerns and requests for additional information presented by the public. Several members of the public remain in opposition to the EAP and requested an additional opportunity to discuss outstanding environment related issues with the proponent and their consultant and had also requested that Manitoba Conservation participate. The proponent did not support the concept of organizing a special meeting to discuss these issues.

See Appendix A for summaries of comments from the public.

See Appendix B for the consultant's responses to the public comments.

Disposition:

- Limits, terms and conditions of Environment Act Licences respecting wastewater treatment lagoons present operating criteria regarding hydraulic and organic loads, odours, containment and quality of treated wastewater that are conventional for lagoons in Manitoba.
- The draft Environment Act Licence contains a clause that requires the Licencee to maintain the discharge route of the wastewater treatment lagoon such that it effectively performs its intended service.
- The draft Environment Act Licence contains a clause that requires that the Licencee monitor effluent being discharged during each discharge campaign for a period of at least five years. The liquids shall be analyzed for total Kjeldahl nitrogen, nitrate-nitrite nitrogen, ammonia nitrogen, total dissolved phosphorus, total particulate phosphorus, total inorganic phosphorus, pH, temperature, and total suspended solids. Effluent samples shall be obtained at the beginning, middle and end of each discharge period. The results of the analyses shall be reported to the Director in accordance with the requirements of Clause 3 c) of the Licence;
- The draft Environment Act Licence contains a clause that requires that the Licencee:

  - conduct a monitoring program for the Sodium Adsorption Ratio (SAR) of effluent, prior to each discharge, for a minimum of three years;
  - not less than 30 days after the results of the sample analysis are available, submit to the Director the results of the SAR monitoring program; and
  - as may be requested by the Director, propose a plan, for approval by the Director, that the Licencee will implement to reduce the concentrations of effluent constituents that create SAR levels that exceed SAR levels of Manitoba Water Quality Standards, Objectives, and Guidelines.

- The draft Environment Act Licence contains a clause that requires the Licencee to propose and undertake a groundwater quality investigation and monitoring plan approved by the Director;

- The draft Environment Act Licence contains clauses that require the Licencee to submit to the Director for approval, to be obtained prior to commencement of operation of the wastewater treatment lagoon, a proposal for a study on the discharge route and the land that is adjacent to the drains included in the discharge route that will:
  - include the collection of background information regarding ecological characteristics that may be influenced by operation of the wastewater treatment lagoon;
  - assess and report on the environment related impact(s) of the wastewater treatment lagoon on:
    - the discharge route and land that is adjacent to it;
    - receiving surface bodies of water; and
    - groundwater in associated underlying aquifers; and
  - provide resulting recommendations; and,
  - once approved by the Director and within two years of such approval, undertake required alterations to the wastewater treatment lagoon construction and operation arising from the results of the study.

- The draft Environment Act Licence contains a clause that requires that the Licencee actively participate in any future watershed based management study, plan/or nutrient reduction program, approved by the Director, for Sturgeon Creek, the Assiniboine River and associated waterways.

COMMENTS FROM THE TECHNICAL ADVISORY COMMITTEE:

Agriculture, Food and Rural Initiatives

- *No concerns.*

Conservation

- *No concerns.*

Historic Resources

- *No concerns.*

Water Stewardship

June 29, 2007

- *Test drilling has shown the clays at this site to be relatively thin and underlain by silt. Water levels in some of the test holes indicate these silts to be saturated and extensive sand/gravel deposits a mile or so to the north and east of the proposed site indicate that sand/gravel units may extend under the site. Given the relatively thin clays separating the base of the lagoon from the silts and the expectation that these clays may be fractured, the inclusion of a groundwater monitoring network around the lagoon would be prudent. These monitoring wells should be completed into the saturated silts underlying the clays at the site.*
- *Given the lack of local water well information at this site, a test hole to at least 10 m would have been a valuable expenditure of money. The limestone bedrock surface is not uniform and local bedrock highs may occur. As well, characterization of the deposits lying between the base of the clay and the bedrock surface would have been good engineering practice.*
- *The proposed lagoon will replace septic fields currently serving residents in the surrounding community. It is preferable to discontinue the use of septic fields especially in areas where fields are overloaded or where they are not functioning adequately to allow for uptake of the nutrients by the surrounding vegetation. However, steps should be taken to ensure that nutrient release to Sturgeon Creek, the Assiniboine River and ultimately Lake Winnipeg is minimized. The Lake Winnipeg Stewardship Board has recommended that all small wastewater treatment facilities, including municipal lagoons, should meet a phosphorus limit of 1.0 mg/L. The proposed phosphorus limit of 1.0 mg/L is consistent with efforts underway across Manitoba and in upstream jurisdictions to reduce nutrient loads to Lake Winnipeg and its watershed. It is desirable to recycle these nutrients on land, rather than releasing them to waterways. In the Lake Winnipeg Stewardship Board's December 2006 report to the Minister of Water Stewardship, the Board provides several strategies on how nutrient reduction could be achieved for small wastewater treatment facilities (see recommendations 14-20). It appears that the proponent has not considered any alternative wastewater disposal strategies which would reduce nutrients reaching downstream waterways. It would be desirable for the proponent to evaluate the feasibility of using one or more of these alternative treatment strategies for the RM of Rosser wastewater. In particular, effluent irrigation and trickle discharge should be explored as alternative disposal strategies which could replace or at least supplement the traditional disposal practices.*
- *The proponent has not evaluated the potential impact of the lagoon discharge to downstream water uses in Sturgeon Creek. This waterway supports a healthy fishery,*

and is accessed for recreational purposes. The proponent should also determine if the downstream waterway is used for irrigation, and if so, what impact the effluent discharge will have on the suitability of that water for irrigation purposes (i.e. conductivity, SAR, etc.).

- *In accordance with the proposed Nutrient Management Regulations under The Water Protection Act the proponent should meet the minimum setback distance needed between the lagoon and the second order drain.*
- *The Water Quality Management Section is concerned with any discharges that have the potential to impact the aquatic environment and/or restrict present and future uses of the water. Therefore it is recommended that the license require the proponent to actively participate in any future watershed based management study, plan/or nutrient reduction program, approved by the Director, for Sturgeon Creek, the Assiniboine River and associated waterways.*

Proponent Response – September 6, 2007

- To monitor the impact of the wastewater from the lagoon on the surrounding groundwater monitoring wells will be installed around the lagoon extending into the saturated silts below the clays, if required by Manitoba Conservation. If monitoring wells are to be installed a groundwater monitoring program will be implemented to provide a means of assessing future impact, if any, to the groundwater from the lagoon effluent.
- Based on May 2006 Drillers Reports for Groundwater Wells by Manitoba Water Stewardship Groundwater Management Section, there are 21 production wells surrounding the lagoon site predominantly used for domestic purposes. The abovementioned report was reviewed as part of a geotechnical investigation of the lagoon site. Results of the review were documented in the "R.M. of Rosser Geotechnical Investigation for Wastewater Treatment Lagoon, December 2006" report prepared by J.R. Cousin Consultants Ltd. In the geotechnical investigation report, as referenced in section 2.5 of the EAP, it was indicated that soils in the vicinity of the lagoon site (SW $^{1}/4$ 19-12-1EPM) generally consist of approximately 2.4 m of clay underlain by till. According to the Drillers Reports the limestone bedrock surface is located at approximately 8 m to 23 m (average 12 in) below the ground surface.
- We have reviewed the strategies on how to reduce nutrient from small wastewater treatment facilities as recommended in the Lake Winnipeg Stewardship Board - Report to the Minister of Water Stewardship, December 2006, with particular emphasis to the effluent irrigation and trickle discharge options. The effluent irrigation option is not advisable for a small lagoon such as that proposed for the R.M of Rosser. The initial required high capital cost, high operation cost, lack of trained man power, and insufficient amount of effluent to reliably meet crop water requirement from such a small lagoon make the option unfeasible.
- The trickle discharge (slower discharge) option is related to appropriate lagoon design, operation, and storage capacity. The proposed lagoon for the R.M. of Rosser will be designed to Manitoba Conservation requirements of a 230 day storage period with a minimum hydraulic storage capacity of 57,108 m^3 to meet a projected year 20 hydraulic loading of 248 m^3/day. The effluent will be discharged from the lagoon between June 15

and October 31. During discharge the treated effluent from the lagoon would flow through the 2nd order Provincial Drain that meanders for approximately 13.9 km before draining into Sturgeon Creek. This may provide opportunity for nutrients to be absorbed by plants growing in the drainage system. As described in section 4.4 of the EAP the treated effluent will be discharged only upon meeting Manitoba Conservation discharge criteria.

- As stated in section 4.4.1, the proposed lagoon will be designed to treat the wastewater to meet Manitoba Conservation discharge criteria. The treated effluent will be sampled and analysed prior to discharge. The effluent will be discharged only if it meets the license requirements for discharge. Moreover, since the proposed facility is located 13.9 km from the Sturgeon Creek, some additional polishing by plant uptake could occur, furthermore the discharge date of June 15 by Manitoba Conservation has been established to discharge after the fish spawning period.
- We have reviewed the proposed Nutrient Management Regulations under the Water Protection Act. According to the regulation, the minimum setback distance between a lagoon and a 2nd order Provincial Drain is satisfied as long as the lagoon is not constructed in the nutrient buffer zone, i.e. land within the 2nd order Provincial Drain (confirmed with Ms. Nicole Armstrong of Manitoba Water Stewardship). The distance between the proposed lagoon at the R.M. of Rosser and the 2nd order Provincial Drain is approximately 215 m. Thus the proponent meets the minimum setback distance between the lagoon and the 2nd order drain in question.
- The proponent would be willing to participate in any future watershed based management study, plan/or nutrient reduction program, approved by the Director, for the Sturgeon Creek, the Assiniboine River and associated waterways.

<u>November 1, 2007</u>

- *Steps should be taken to ensure that nutrient release to Sturgeon Creek, the Assiniboine River, and ultimately Lake Winnipeg, is reduced to the extent possible through the use of best practicable technology. The total nitrogen concentration in wastewater lagoon effluent such as that proposed to be discharged from Rosser is typically within the range of limits proposed for larger wastewater treatment facilities such as the City of Winnipeg (<15 mg/L) and so, additional measures are not necessary. However, additional measures are recommended to reduce phosphorus concentrations in the wastewater effluent that reaches Sturgeon Creek and downstream waterways. Since the discharge route is approximately 14 km in length and if properly operated and maintained, will act as an engineered wetland, we believe that significant reductions in phosphorus can be achieved along with additional reductions in nitrogen. Therefore, we recommend that the proposed wastewater treatment lagoon be discharged slowly over the June 15 to October 31st discharge period - preferably such that the discharge is equally distributed over the entire discharge period. Given the long discharge route and the slow rate of discharge, it is anticipated that a considerable amount of nutrient removal will occur. In addition, during dry periods, much of the effluent will likely not make its way to Sturgeon Creek but will evaporate or infiltrate into the stream bed.*

- *To support nutrient removal from the discharge channel, the proponent should be required to develop a plan for managing vegetation (including cutting and removing vegetation) along the discharge channel. In addition, water quality monitoring should be conducted at the effluent discharge point and where the second order drain reaches Sturgeon Creek (when flow is present) once per month for the following variables:*

  Total phosphorus
  Total dissolved phosphorus
  Total kjeldahl nitrogen
  Ammonia nitrogen
  Nitrate-nitrite nitrogen
  pH
  temperature

- *It is recommended that the proponent maintain a log that includes dates and volumes of discharge. Results from all water quality monitoring along with discharge volumes should be provided to the Water Quality Management Section at Suite 160, 123 Main Street, Winnipeg, Manitoba R3C 1A5.*

- *It should be noted that Manitoba Water Stewardship has accepted the recommendations of the Lake Winnipeg Stewardship Board in its final report released on February 6, 2007. This report recommends that the province implement nutrient limitations on all municipal wastewater facilities to meet discharge limits for phosphorus of 1 mg/L. We are in the process of developing regulations to implement this recommendation. In the meantime, it is believed that the above measures will either achieve these standards or position the community of Rosser to achieve the standards with minor additional alteration. In addition, the community of Rosser should agree to participate in additional pilot nutrient reduction measures if required.*

- *Groundwater Management Section had indicated that it would be a good idea to install monitoring wells, given the local geology. The comment was passed on to the consultant by Manitoba Conservation. The consultant said they would install monitoring wells if required to do so by Conservation. They did not in any way address the issue of whether it would be sound practice to install monitoring wells in this type of geologic situation. So it is left to Conservation to decide if they wish to follow Water Stewardship's recommendation to install monitoring wells or if their own protocols would require monitoring wells in this instance.*

- *A second comment from Groundwater Management Section was, given the variability of the subsurface conditions, that it would have been good practice under these conditions to drill a test hole and determine what really underlies the site. The consultant has simply repeated the discussion that was in the report which indicates considerable variability in regional conditions which means local conditions remain unknown since no test hole was drilled. They state that bedrock is found at 8 to 23 m below ground in the area – what is the depth to bedrock at the lagoon site?*

Therefore the recommendation still stands – good engineering practice would have had a test hole drilled to determine site specific conditions.

- *Sturgeon Creek provides nursery, rearing and feeding habitat for a number of fish species and a lot of effort and dollars has been invested in maintaining and improving fish habitat and water quality. Similarly regarding discharge timing windows and habitat related components of this proposal Fisheries Branch defers to the Federal Department of Fisheries and Oceans as they have jurisdiction over fish habitat.*

Proponent Response – November 1, 2007

- The lagoon would be discharged as required within the permissible discharge period of June 15 to October 31, established by Manitoba Conservation. The flow of the effluent through the discharge route for approximately 14 km before it is discharged into the Sturgeon Creek would impact the phosphorus concentration in the effluent reaching the Creek.
- Based on our discussion with the R.M. of Rosser, it was indicated that the discharge channel would be maintained by the R.M. The maintenance would include cleaning of the discharge route and cutting and removing of vegetation as required.
- Normally receipt of an Environment Act Licence from Manitoba Conservation includes stipulated requirements for monitoring treated effluent quality, maintaining a log of the dates and volumes of discharge, and providing results of the treated effluent analysis. The recommendations forwarded by the Ecological Services Division of Manitoba Water Stewardship regarding water quality monitoring and record keeping as well as data sharing are similar to the standard requirements in the licences that are issued by Manitoba Conservation. Thus the concerns related to the water quality monitoring and data handling would be addressed sufficiently as part of fulfilling the licence requirements. The analysis would be conducted on the treated effluent samples to be collected from the secondary cell prior to discharge as required by Manitoba Conservation.
- The proponent would be willing to participate in any future nutrient reduction programs, if required and approved by the Director, for the Sturgeon Creek, the Assiniboine River, and associated waterways. This was also indicated in JRCC's September 6, 2007 letter response to previously received comments from the Ecological Services Division of Manitoba Water Stewardship in a letter dated June 29, 2007.
- The concerns regarding monitoring wells and test holes were addressed in JRCC's September 06, 2007 letter response to the correspondence from the Ecological Services Division in a letter dated June 29, 2007. If the Groundwater Management Section has any concerns related to the EAP please have them forward their concerns.
- In response to the question "what is the depth to bedrock at the lagoon site", a "Groundwater Availability Map Series, Selkirk Area (621)" prepared by Robert Betcher of Manitoba Water Resource Branch in 1986 was reviewed. Based on the review the

depth to bedrock at the proposed lagoon site for the R.M. of Rosser is approximately 5 m below surface.

January 8, 2008

- *The proponent has not provided any reason why trickle discharge could not be implemented for this facility. Therefore, the Department recommends that the proposed wastewater treatment lagoon be licensed to discharge the effluent slowly over the June 15th to October 31st discharge period – preferably such that the discharge is equally distributed over the entire discharge period. Given the long discharge route and the slow rate of discharge, it is anticipated that a considerable amount of nutrient removal will occur. In addition, during dry periods, much of the effluent will likely not make its way to Sturgeon Creek but will evaporate or infiltrate into the stream bed;*
- *To support nutrient removal from the discharge channel, an Environment Act licence should require the proponent to manage the vegetation (including cutting and removing vegetation) along the discharge channel. Additionally, an Environment Act licence should prohibit the proponent from implementing dredging as a method to manage vegetation and/or maintain the discharge channel, dredging is not an acceptable maintenance technique.*

Disposition:

- The draft Environment Act Licence contains clauses that require the Licencee to submit to the Director for approval, to be obtained prior to commencement of operation of the wastewater treatment lagoon, a proposal for a study on the discharge route and the land that is adjacent to the drains included in the discharge route that will:
  - include the collection of background information regarding ecological characteristics that may be influenced by operation of the wastewater treatment lagoon;
  - assess and report on the environment related impact(s) of the wastewater treatment lagoon on:
    - the discharge route and land that is adjacent to it;
    - receiving surface bodies of water; and
    - groundwater in associated underlying aquifers; and
  - provide resulting recommendations; and,
  - once approved by the Director and within two years of such approval, undertake required alterations to the wastewater treatment lagoon construction and operation arising from the results of the study.
- The draft Environment Act Licence contains a clause that requires the Licencee to propose and undertake a groundwater quality investigation and monitoring plan approved by the Director.

- The draft Environment Act Licence contains a clause that requires the Licencee to maintain the discharge route of the wastewater treatment lagoon such that it effectively performs its intended service.
- The draft Environment Act Licence contains a clause that requires that the Licencee monitor effluent being discharged during each discharge campaign for a period of at least five years. The liquids shall be analyzed for total Kjeldahl nitrogen, nitrate-nitrite nitrogen, ammonia nitrogen, total dissolved phosphorus, total particulate phosphorus, total inorganic phosphorus, pH, temperature, and total suspended solids. Effluent samples shall be obtained at the beginning, middle and end of each discharge period. The results of the analyses shall be reported to the Director in accordance with the requirements of Clause 3 c) of the Licence.
- The draft Environment Act Licence contains a clause that requires that the Licencee:
  - conduct a monitoring program for the Sodium Adsorption Ratio (SAR) of effluent, prior to each discharge, for a minimum of three years;
  - not less than 30 days after the results of the sample analysis are available, submit to the Director the results of the SAR monitoring program; and
  - as may be requested by the Director, propose a plan, for approval by the Director, that the Licencee will implement to reduce the concentrations of effluent constituents that create SAR levels that exceed SAR levels of Manitoba Water Quality Standards, Objectives, and Guidelines.
- Limits, terms and conditions of Environment Act Licences respecting wastewater treatment lagoons present operating criteria regarding hydraulic and organic loads, odours, containment and quality of treated wastewater that are conventional for lagoons in Manitoba.
- Limits, terms and conditions of Environment Act Licences respecting wastewater treatment lagoons require the Licencee to construct and operate the wastewater treatment lagoon in such a manner as to prevent the disruption of natural wildlife and fish habitats.
- The draft Environment Act Licence contains a clause that requires that the Licencee actively participate in any future watershed based management study, plan/or nutrient reduction program, approved by the Director, for Sturgeon Creek, the Assiniboine River and associated waterways.

COMMENTS FROM FEDERAL REPRESENTATION:

Canadian Environmental Assessment Agency

- *Based on the responses to the CEAA survey, application of The Canadian Environmental Assessment Act with respect to this proposal will be required.*

Health Canada would like to participate in the provincial review and has requests for additional information. Fisheries and Oceans Canada also has requests for additional information and will provide specialist advice.

Fisheries and Oceans

- *Please ensure that the following additional measures are incorporated into the plans:*
  - *All excavated materials (i.e. from the construction of the new perimeter drains) should be disposed on land above the high water mark in a manner that will prevent the re-entry of the material into any watercourse. This could include covering stockpiles with biodegradable mats or tarps or planting stockpiles with grass or shrubs;*
  - *Use only clean rock for the outlet protection and haul it in from an appropriate land-based source. Avoid using poor quality limestone that breaks down quickly when exposed to the elements. All rock should be clean and free of fine materials that could be washed away during high flow events;*
  - *Install effective temporary and long-term sediment and erosion control measures and re-vegetate any exposed soils in order to prevent the entry of sediment into the drain. Inspect these measures regularly and ensure that they are functioning properly until vegetation is re-established. Make all necessary repairs and adjustments if any damage is discovered or if these measures are not effective in controlling erosion and sedimentation; and*
  - *The proponent should minimize the distribution of soils adjacent to the new drain and should retain as much of the existing vegetation as possible. Construction should occur when water levels are low or under frozen conditions and the drain construction should be isolated from flowing water or construction in the dry.*

Disposition:

- Limits, terms and conditions of Environment Act Licences respecting wastewater treatment lagoons require the Licencee to construct and operate the wastewater treatment lagoon in such a manner as to prevent the disruption of natural wildlife and fish habitats.

Health

- *The wastewater treatment operators should be certified according to Manitoba Provincial Regulations; and*
- *Sewage haulers should be registered according to Manitoba Provincial Regulations.*

Disposition:

- Operators of wastewater treatment lagoons are required to be certified in accordance with the requirements of *Manitoba Regulation 77/2003, Water and Wastewater Facility Operators Regulation; and*

- Sewage haulers are required to be registered in accordance with the requirements of *Manitoba Regulation 83/2003, Onsite Wastewater Management Systems Regulation.*

PUBLIC HEARING:

A public hearing was not requested. Although the public made requests that the Rural Municipality of Rosser provide a public forum to review outstanding concerns of the public, the Rural Municipality of Rosser did not support the request.

RECOMMENDATION:

Issue an Environment Act Licence in accordance with the attached draft. Enforcement of the Licence should be assigned to the Environmental Assessment and Licensing Branch until testing of the soil liner has been completed.

PREPARED BY:

Robert Boswick, P. Eng.
Environmental Engineer
Environmental Assessment and Licensing Branch
Manitoba Conservation
March 5, 2008

Telephone: (204) 945-6030
Fax: (204) 945-5229
E-mail Address: robert.boswick@gov.mb.ca

Appendix A

COMMENTS FROM THE PUBLIC:

Following Public Advertisement:

Name	Address	Date	Comment(s)
City of Winnipeg	110-1199 Pacific Avenue Wpg, MB R3E 3S8	07/07/16	- Expressing concerns regarding lack of discussion on ammonia and nutrient limits, preventing or minimizing emergency discharges to, and total loads on, Sturgeon Creek, disinfection, impact on Lake Winnipeg and upstream monitoring of Total Kjeldahl Nitrogen or ammonia.
Fetterman, Wm. W. and Agnes	Box 27 Grosse Isle, MB R0C 1G0	07/06/25	- Expressing concerns regarding location and required piping distances; and - Suggesting alternatives.
Palmer, Mike	mpalmer@freightliner.mb.ca	07/06/29	- Expressing concern regarding drainage, odours, monitoring of influent, groundwater contamination, noise resulting from waterfowl, and potential lack of consideration of alternatives.
Nolting, Heinz	hnolting@mts.net	07/06/29	- Conveying concerns regarding financial plans, spills and contamination, and mosquitoes.
Van De Walle, Andre	vdw@mts.net	07/06/28	- Expressing concerns regarding timing of application and non-sharing of information, financial implications, proposed location, and the selected wastewater treatment option.
Morris, Steve	samorris@mts.net	07/06/28	- Expressing concern over: inaccurate land description, site selection, proximity to residences, potential forcemain failures, groundwater and surface water contamination, impacts on wildlife, land, fish habitat, forestry and vegetation, odours, aesthetic impacts, environment and public health related drainage issues, proximity to businesses and residences (and potential impact on), limited control of truck handled sewage delivery, effluent quality limits, other sources of treated wastewater discharging to Sturgeon Creek, lack of interest in public

Name	Address	Date	Comment(s)
			opinion of site selection, and mosquitoes and other nuisance insects.
Fisher, Joan	Box 31 Grosse Isle, MB R0C 1G0	07/06/28	- Expressing concern regarding financial requirements and impacts for lagoon and sewer and water systems, limited discussion on alternative systems.
Gidney, Jeff	Jeffgdney@hotmail.com	07/06/28	- Expressing concerns regarding site selection, potential groundwater impacts, and drainage to Sturgeon Creek.
Barsanti, Chris	Box 500 Grosse Isle, MB R0C 1G0	07/06/27	- Expressing concerns regarding odours, impacts on drainage route, increased habitat for mosquito breeding, limited consideration of alternative treatment processes, changing regulatory requirements, related wastewater collection system, financial implications, inaccuracies of information presented relative to public opinions and forums; and - Suggesting there are still many unanswered questions.
Hunter, Shane	Box 37 Grosse Isle, MB R0C 1G0	07/06/21	- Inquiring about public interest in connecting to sewer and water, associated costs.
Crothers, Lynn	Box 133 Grosse Isle R0C 1G0	07/06/21	- Suggesting the project should go to a referendum.
Minaker, Loraine	Box 76 Rosser, MB R0H 1E0	07/06/21	- Expressing concern about leakage and associated potential for groundwater contamination, odours, and mosquitoes and drainage matters.
Barsanti, Loris	Box 108 Rosser, MB R0H 1E0	07/06/21	- Expressing an understanding of the need for a lagoon, concerns regarding drainage route, odours, mosquitoes, diseases, proximity to school, interest in alternatives.
Barsanti, Gail R.	Box 108 Rosser, MB R0H 1E0	07/06/21	- Expressing concerns regarding odours, mosquitoes, weed growth, and suggesting other alternatives should be considered.
Oliver, Tyler	Box 121 Grosse Isle, MB R0C 1G0	07/06/21	- Expressing approval of the proposal.
Harper, Stu	11 Glengarry Drive	07/06/23	- Expressing opposition to the proposal.

Name	Address	Date	Comment(s)
Stagerman, Murrary	Box 106 Rosser, MB R0H 1E0	N/A	- Expressing concerns and desire to see a complete financial plan.
Kryon, Lynden	Box 56 Rosser, MB R0H 1E0	N/A	- Suggesting there is no need for lagoon and larger lots should be used.
Thevenot, James	Box 27 RR 2 Wpg, MB R3C 2E6	N/A	- Suggesting alternatives should be assessed.
Oliver, Mandy	Box 121 Grosse Isle, MB R0C 1G0	07/06/21	- Requesting a complete financial plan.
N/A	N/A	N/A	- Expressing concern of groundwater contamination, costs and impacts on surface water quality.
Palmer, Bryan and Bernice	Box 103 Grosse Isle, MB R0C 1G0	07/06/21	- Identifying concerns regarding odours, mosquitoes, groundwater impacts, proposed location, lack of attention to new technology, costs.
Fetterman, Nancy	Box 500 Grosse Isle, MB R0C 1G0	07/06/27	- Inquiring about mosquito control plans, groundwater monitoring plans, control of hydrocarbon contaminated wastewater, municipal growth projections.
Barsanti, Loris	lbarsanti@prairie.ca	07/06/07	- Expressing concerns regarding odours, mosquitoes, impact of discharge of treated wastewater, groundwater and surface water impacts.
Witt, Carl	cwitt@freightliner.mb.ca	07/06/05	- Expressing concerns regarding proposed location, drainage from the lagoon, groundwater monitoring, property values, odours.

Following First Request For Additional Information:

Name	Address	Date	Comment(s)
Nolting, Heinz	Box 87 Rosser, MB R0H 1E0	07/10/24	- Recommending other alternatives be explored; - Expressing concerns over lagoon discharges, drainage, public health.
Assiniboine Watershed Network Wain, Duncan Tuchscherer,	5006 Roblin Blvd. Wpg, MB R3R 0G7	07/10/24 07/11/02	- Expressing concerns regarding impacts on Sturgeon Creek and downstream receiving waters and respecting nutrients, vegetation, ammonia; and

Name	Address	Date	Comment(s)
Kristin			- Suggesting alternatives or tertiary treatment should be considered.
Nichol, Carol L.	Box 97 Grosse Isle, MB R0C 1G0	07/10/24	- Suggesting alternatives should be considered; - Expressing concerns regarding hazards of lagoon operation, potential failure, surface water quality, inadequate buffer zones, buffer zone maintenance, potential lack of monitoring the operation of the lagoon.
Barsanti, Chris	Box 500 Grosse Isle, MB R0C 1G0	07/10/23	- Indicating response to concerns initially presented is not sufficient; and - Expressing concern that the consultant did not seek input from the proponent for responding to initial requests for options on alternatives, other potential sites, or supplementary treatment, drainage may not be effective, mosquito breeding may be supported, odours will be generated, disease transfer, pending regulatory changes have not been adequately addressed; and - Questioning control of influent to the lagoon.
Nichol, David W.	200E-1485 Portage Ave. Wpg, MB R3G 0W4	07/10/22	- Expressing concern about ability of proposed facility to meet changing treatment requirements, lack of wetland supplementary polishing, impacts on surface water quality, and wanting to make sure impacts to the environment are minimized.
Fetterman, Nancy	Box 500 Grosse Isle, MB R0C 1G0	07/10/22	- Indicating original questions were not answered; - Questioning if monitoring and control of mosquitoes is a component of the operating plan, if monitoring of groundwater in the area will be undertaken, how effectiveness of drainage will be maintained, if monitoring for inappropriate constituents such as fuels or oils in the wastewater stream will occur, if accurate population changes have been included, if odours have been considered, if leakage monitoring is proposed, and why only one lagoon is

Name	Address	Date	Comment(s)
			proposed for the area.
Barsanti, Loris	lbarsanti@prairie.ca	07/10/18	- Expressing concerns about odours, mosquitoes, discharge to Sturgeon Creek, nutrients, groundwater impacts.
Palmer, B.	bbpalmer@mts.net	07/10/16	- Expressing concern about mosquitoes.
Morris, Steve	Box 104 Rosser, MB R0H 1E0 samorris@mts.net	07/10/16	- Indicating responses did not sufficiently satisfy his initial concerns; - Expressing concerns about distances to residences, future expansion of lagoon, forcemain, discharge route, quality of discharges, potential lack of control of truck handled wastewater, socio-economic impacts, potentially inadequate treatment of wastewater, groundwater and surface water impacts, impacts on land values, and mosquitoes; and - Suggesting the proposed installation of services is not fully supported by the public.
Shkolny, Michael City of Winnipeg	110-1199 Pacific Ave. Wpg, MB R3E 3S8	07/10/09	- Suggesting nutrient reduction criteria should be a requirement.

Following Second Request For Additional Information:

Name	Address	Date	Comment(s)
Morris, Steve	Box 104 Rosser, MB R0H 1E0	08/01/07	- Suggesting the proponent; reconsider the location for a site closer to population centre and at least 1 km from any residence, be required to fence the discharge route; relocate the proposed lagoon to a site closer to the source of the majority of the effluent to be treated (i.e. Grosse Isle), a new proposal be required to be submitted, have a larviciding and pest control plan, and arrange for long-term service for wastewater treatment by other treatment facilities;

Name	**Address**	**Date**	**Comment(s)**
			- Expressing concerns about; future expansion(s) of the lagoon, location of lagoon on property, forcemain operation, risks to animal, fish and humans from discharge and along the discharge route, sources of wastewater being delivered by truck to the lagoon, impact on a local business, lagoon liner design requirements, seepage potential, and groundwater contamination, impact on Sturgeon Creek; - Questioning buffer zone designs, the existence of public support for the proposal; and - Requesting the RM of Rosser provide reasons for the site selection, information on all options that have been considered.
Nichol, David	200E-1485 Portage Ave. Winnipeg, MB R3G 0W4	08/01/07	- Suggesting previous concerns have not been addressed, land be sown with grass and trees planted to minimize visual impacts; and - Requesting reconsideration of wetlands as a treatment component.
Palmer, Mike	mpalmer@freightliner.mb.ca	08/01/07	- Questioning why the RM of Rosser doesn't seek a location in closer proximity to where development is occurring, why there is no inclusion of an engineered wetland, - Expressing concern about groundwater contamination, surface water impacts, odours, and impacts of nutrients on receiving waters.
Barsanti, Chris	Box 500 Grosse Isle, MB R0C 1G0	08/01/06	- Expressing concern regarding limited assessment of options and site selections, limited amount of interactive communication opportunities between the public and proponent, dissatisfaction with responses from the consultant, cost of project, odours, mosquitoes, sources and control of wastewater being deposited into the lagoon, - Suggesting the RM consider aerators, recording and reporting wastewater hauling information be required,

Name	Address	Date	Comment(s)
			inspections of discharge route be required, new quality limits such as those presented by the Lake Winnipeg Stewardship Board be imposed, - Requesting monitoring of mosquitoes and larvae at lagoon and along discharge route, tertiary treatment as a requirement, the lagoon be designed with an eye to the future.
Fetterman, Nancy	Box 500 Grosse Isle, MB R0C 1G0	08/01/06	- Suggesting that the RM of Rosser be required to monitor for mosquitoes larvae in the lagoon and discharge route, monitor water quality in area residential wells as well as the aquifer in the area of the lagoon, have a plan to deal with odours, meet recommendations of the Lake Winnipeg Stewardship Board regarding phosphorus, nitrogen, TSS and cBOD, and maintain the drainage route as components of any Licence.
Barsanti, Loris	lbarsanti@ prairie.ca	07/12/28	- Expressing concern that overload of the lagoon could lead to odour generation, groundwater and surface water contamination, increased maintenance costs may reduce likelihood that funds may not be available to properly maintain related components including mosquito control.

Appendix B

September 6, 2007 – Responses to Initial Requests For Additional Information

Following is in response to the correspondence dated July 16, 2007 from Mr. Michael A. Shkolny of the City of Winnipeg, Water and Waste Department.

As discussed in section 4.4.1 of the EAP the effluent discharge were determined base on Manitoba Water Quality Standards, Objectives an Guidelines (November 2002) and discussions with Manitoba Conservation and Manitoba Water Stewardship. Accordingly, at this time the more stringent compliance limits for nutrients in effluent discharge are not imposed for smaller facilities such as the proposed wastewater treatment lagoon for the R.M. of Rosser.

Emergency Discharge

The lagoon for the R.M. of Rosser will be designed to Manitoba Conservation Design Objectives for Standard Sewage Lagoon. It will be sized to treat wastewater from a projected year 20 population with a storage capacity for 230 days each year. Furthermore, the lagoon will have a minimum freeboard of 1 m above the operating liquid level as required by Manitoba Conservation. Therefore, under proper operation no emergency discharge from the lagoon is anticipated.

Effluent Disinfection

As stated in section 4.4.1 of the EAP the proposed lagoon will be designed to treat the wastewater to meet Manitoba Conservation effluent discharge requirements for facultative municipal wastewater treatment lagoons. The effluent will be sampled and tested prior to discharge to determine whether or not the requirements are met. The effluent will be kept in the storage cell of the lagoon until the Manitoba Conservation requirements (200 fecal colifolm/100 mL) are achieved. Therefore, effluent disinfection is not required.

Lake Winnipeg Stewardship Board's Recommendations

We have reviewed the strategies on how to reduce nutrient from small wastewater treatment facilities as recommended in the Lake Winnipeg Stewardship Board - Report to the Minister of Water Stewardship, December 2006 with particular emphasis to effluent irrigation and trickle discharge. The effluent irrigation option is not advisable for a small lagoon such as that proposed for the R.M. of Rosser. The initial required high capital cost, high operation cost, lack of trained man power, and insufficient amount of effluent to reliably meet crop water requirement from such a small lagoon make the option unfeasible.

The trickle discharge (slower discharge) option is related to appropriate lagoon design, operation, and storage capacity. The proposed lagoon for the R.M. of Rosser will be designed to Manitoba Conservation requirements of a 230 day storage period with a minimum hydraulic storage capacity of 57,108 m^3 to meet a projected year 20 hydraulic loading of 248m^3/day. The effluent will be discharged from the lagoon between June 15 and October 31. During discharge the treated effluent from the lagoon would flow in the 2nd order Provincial Drain that meanders for approximately 13.9 km before draining into Sturgeon Creek. This may provide opportunity for nutrients to be absorbed by plants growing in the drainage system. As described in section 4.4 of the EAP the treated effluent will be discharged only upon meeting

Manitoba Conservation discharge criteria.

Total Loads on Sturgeon Creek

Discharge from the proposed lagoon for the R.M. of Rosser will not occur unless the Manitoba Conservation Discharge Criteria as outlined in section 4.4 of the EAP are attained. Since the effluent would travel such a long distance in the meandering Provincial Drain it may receive further treatment before draining into the Sturgeon Creek in addition to a possible plant uptake of nutrients as described ¯above. Thus the contribution to the total.loads placed on the Sturgeon Creek of the proposed lagoon for the R.M. of Rosser would be negligible.

Upstream Monitoring Results

The water chemistry analysis data reported in Tables 2 and 3 (as attached in Appendix E of the EAP) were obtained from a report compiled by the Department of the Environment (Inland Waters Directorate, Water Survey of Canada). The constituents in question were not included in the abovementioned report hence were not included in Tables 2 and 3 of the EAP due to lack of data.

Following is in response to the email correspondence dated June 29, 2007 from Mr. Mike Palmer of the Freightliner Manitoba Ltd.

Absence of Water Flow in Proposed Discharge Ditch

The proposed lagoon will be designed to treat the wastewater to meet Manitoba Conservation effluent discharge requirements for facultative municipal wastewater treatment lagoons. The effluent will be sampled and tested prior to discharge to determine whether or not the requirements are met. The effluent will not be discharged unless the Manitoba Conservation requirements are achieved. Discharging of treated effluent as such to the discharge ditch from a lagoon designed in accordance with Manitoba Conservation Design Objectives for Standard Sewage Lagoons should not cause a concern as long as the discharge criteria are met.

Excessive Smell

As long as any conventional lagoon is operated within its design capacity odour should occur only for a short time during the spring surface ice break up. As part of odour mitigation Manitoba Conservation Design Objectives for Standard Sewage Lagoon requires minimum distances of 460 m and 300 m from the nearest community centre and individual residence, respectively. To mitigate odour problems the proposed lagoon for the R.M. of Rosser will be located at least 420 m from the nearest residence. An organically overloaded lagoon can create excessive odour. The lagoon for the R.M. of Rosser would be designed to Manitoba Conservation permissible organic loading criteria hence will not be overloaded until significant growth occurs in the Municipality. With separation distances and the permissible organic loading met as required by Manitoba Conservation, excessive smell from the lagoon is unlikely to occur.

Wastewater from Industrial Areas

As reported in section 2.6.5 of the EAP the R.M. of Rosser has indicated that there are no significant commercial or industrial water users/wastewater producers in the Municipality that would be utilizing the proposed lagoon. The proposed lagoon would service the Communities of Grosse Isle, Rosser, and Gordon, as well as rural residents (including bussed-in students). Therefore, the proposed lagoon will be sized to service a total projected year 2027 equivalent population of 559 persons with a

piped wastewater collection system.

Well Contamination

Based on the geotechnical investigation a medium to high plastic clay soil with varying thickness to depths ranging from 2 to 4 m was observed underlying the top soil. Thus the site was found suitable for construction of a lagoon with an in situ clay liner. As discussed in section 2.6.7 of the EAP, the lagoon will be constructed with the in situ clay soils forming a one metre thick clay liner at the cell bottom and in the centre of the dikes. The clay liner will have a hydraulic conductivity of 1 * 101^{7} cm/sec or less, consistent with the Manitoba Conservation Design Objectives for Standard Sewage Lagoon requirement.

Driller's Reports were reviewed to determine the location of wells in the vicinity of the proposed lagoon site. Based on the Reports your well is located in the NW'/ of Section 20-12-1E at least 1000 m from the proposed lagoon site (SW'/ 19-12-1EPM). The well draws water from an open hole in limestone at 12-30 m below the surface cased in a PVC casing to a depth of 0-12 m below the surface. A review of the groundwater wells in the vicinity of the lagoon site indicates presence of clay overburden with similar varying thickness as the clay at the lagoon site.

With the lagoon constructed with the clay liner achieving a minimum hydraulic conductivity of 1 *10^{-7} cm/sec and the presence of clay overburden in the area seepage from the lagoon will be minimal Therefore, it is unlikely that your well or any other well in the surrounding will be contaminated due to seepage from the lagoon. Moreover, if advised by Manitoba Conservation, monitoring wells will be installed around the lagoon to monitor impacts of the wastewater from the lagoon on the surrounding groundwater.

Noise from Waterfowl

As stated above, the lagoon site is located at acceptable distances from communities and residences in accordance with Manitoba Conservation distance from habituation requirements. Therefore, no significant noise problem is anticipated that affects the community

Green / Enviro Friendly Waste Systems

Sewage treatment plant (STP) and wetlands associated with lagoons were also considered for the R.M. of Rosser wastewater treatment. Sewage treatment plants require continuous discharge with sufficient flow in the discharge route; in the absence of sufficient flow a holding pond for the treated effluent is required until discharge is permitted and thus STPs are considerably more costly. Wetlands are used to polish treated effluent from a lagoon. They require large land areas for construction, have increased odour potential, favour mosquito breeding (due to desired vegetation, very shallow effluent, and minimal wind action), create environment for increased wildlife thereby increasing the potential for raised E-coli levels, and add cost to the project. Wastewater treatment in a lagoon occurs naturally by the action of sunlight, wind, and bacteria. All with no power requirement hence the operation and maintenance costs of a lagoon are minimal Therefore, a lagoon is considered both environmentally and economically reasonable.

Following is in response to the email correspondence dated June 29, 2007 from Mr.

Heinz Nolting of Mei - West Enterprises.

Financial Plan

The R.M. of Rosser has the complete budget information for the project and the pertaining grants that apply to the project from which the financial responsibility of the taxpayers can be calculated. Moreover prior to proceeding with any construction project the Municipality has to notify the public of their intention to proceed and the borrowing by-laws that are required according to the Municipal Act.

Effluent Spills on Farmland Downstream

With proper lagoon operation effluent spills on farmland downstream can not occur as the effluent would be discharged from the storage cell via gravity through a valved discharge pipe into a 2nd order Provincial Drain and then into the Sturgeon Creek as described in section 2.6.3 of the EAP. Therefore, no procedure is established for cleanup and compensation.

Effluent Flow through Provincial Drain

The wastewater in the proposed lagoon will be treated to meet Manitoba Conservation effluent discharge requirements for facultative municipal wastewater treatment lagoons. The effluent will be sampled and tested prior to discharge to determine whether or not the requirements are met. The effluent will not be discharged unless the Manitoba Conservation requirements are achieved. Discharging of treated effluent as such to the discharge ditch from a lagoon designed in accordance with Manitoba Conservation Design Objectives for Standard Sewage Lagoons should not cause a concern as long as the discharge criteria are met. In fact this may be viewed positively as it may provide opportunity for nutrients to be absorbed by plants growing in the drainage system whereby treated effluent would be further polished.

Risk of Mosquito Population

To reduce the potential for mosquito breeding environment the lagoon will be constructed in an open area and any vegetation in the immediate vicinity will be mowed to obtain the greatest wind impact in the lagoon surface. The wind on any portion of the liquid surface will create waves that disturb the entire liquid surface impacting the environment for mosquitoes. Seeded grass on the inside and outside of the lagoon dikes to control erosion will also be mowed as part of the lagoon maintenance operation thereby impacting the environment for mosquitoes and contributing to keeping the mosquito population down.

Following is in response to the email correspondence (1tctl wile 28, 2007 from Mr.

Andre Van De Walle.

Timing of the Application

As stated in section 2.6.5 of the EAP the proposed lagoon will service the Communities of Grosse Isle, Rosser, Gordon, and rural residents including bussed-in students. The lagoon project was generally favoured by the public according to a public open house conducted on July 13, 2005 (indicated in section 4.6 of the EAP) but the site proposed at that time was not accepted. Furthermore, following an open house presentation that was held on April 16, 2007, where JRCC representatives

discussed the project with residents touring at the public open house, there was an overall impression that the public felt the project was required. Members of two Councils (the R.M. of Rosser and R.M. of Rockwood) also attended the open house presentation and had the same impression. A small number of individuals of small groups came forward saying that they were not in favour of the project, however, based on the overall assessment of basic survey information and from speaking to individuals and groups, the decision was made to proceed with the project. Consequently, the Council of the R.M. of Rosser voted to proceed with the project at the current proposed lagoon site ($SW^1/4$ 19-12-1 EPM).

Council Consensus

Based on correspondence with the R.M. of Rosser, J. R. Cousin Consultants Ltd. was authorized by the majority of the Council to submit the EAP to the Government on behalf of the Municipality. The authorization was based on a resolution passed by the Council.

Financial Plan

The R.M. of Rosser has the complete budget information for the project and the pertaining grants that apply to the project from which the financial responsibility of the taxpayers can be calculated. Moreover prior to proceeding with any construction project the Municipality has to notify the public of their intention to proceed and the borrowing by-laws that are required according to the Municipal Act. Please refer to the above headings with regard to public and Council consensus.

Location of the Lagoon

As discussed under *Timing of Application* above the public was generally in favour of the current proposed lagoon location. Other sites were also investigate, however, the current proposed location was selected based upon the basis for the proposed lagoon site selection as presented in detail in section 2.6.2 of the EAP.

Wastewater Treatment

Sewage treatment plant (STP) and wetlands associated with lagoons were also considered for the R.M. of Rosser wastewater treatment. Sewage treatment plants require continuous discharge with sufficient flow in the discharge route; in the absence of sufficient flow a holding pond for the treated effluent is required until discharge is permitted and thus STPs are considerably more costly. Wetlands are used to polish treated effluent from a lagoon. They require large land areas for construction, have increased odour potential, favour mosquito breeding (due to desired vegetation, very shallow effluent, and minimal wind action), create environment for increased wildlife thereby increasing the potential for raised E-coli levels, and add cost to the project. Wastewater treatment in a lagoon occurs naturally by the action of sunlight, wind, and bacteria. All with no power requirement hence the operation and maintenance costs of a lagoon are minimal. Therefore, a lagoon is considered both environmentally and economically reasonable.

Following is in response to the email correspondence dated June 28, 2007 from Mr. Steve Morris and Ms. Barb Morris. Numbered headings in the response coincide with the numbered headings as provided in the comments.

Environmental Act Proposal Form

The legal description of the lagoon site recorded incorrectly in the EAP form as submitted with the May 2007 EAP was corrected shortly after the submission. A revised EAP form with the correct legal description of the land (SW 19-12-1 EPM) that matches with the description in the Environmental Submission was forwarded to Manitoba Conservation on June 29, 2007.

2. Section 2.5 Description of Previous Studies

The basis for selection of the proposed site was detailed in section 2.6.2 of the EAP which includes more items of consideration than just soil conditions and distance from the closest resident. Based on the geotechnical investigation, the selected site was found suitable for construction of the lagoon with an in situ clay liner. The selected site also meets the minimum separation distance set by Manitoba Conservation. Furthermore the site was favoured due to land availability, proximity to a 2nd order Provincial Drain for use as part of the discharge route, accessibility, proximity to agricultural land, and minimal potential for air pollution.

3. Section 2.5 Description of Previous Studies

Upon request from the R.M. of Rosser in 2003, J.R. Cousin Consultants Ltd. (JRCC) conducted an assessment of potential sites for the wastewater treatment lagoon for the Municipality. Site #2 was identified in the NE Section of 18-12-1E as reported in the "R.M. of Rosser Proposed Wastewater Treatment Lagoon Sitting Report, July 2003" compiled by JRCC. Based on the assessment site #2 would not allow for future expansion of a lagoon if constructed at that site. Thus site #2 was excluded from the geotechnical investigation.

4. Section 2.5 Description of Previous Studies

The seven test holes drilled at site #3 of which only two fall in the proposed property refer to test holes drilled in the 2003 geotechnical investigation conducted by JRCC. An additional set of seven test holes were drilled at site #3 as documented in the "R.M. of Rosser - Geotechnical Investigation for Wastewater Lagoon, December 2006" report completed by JRCC. Thus information from both the abovementioned geotechnical investigations was used to determine suitability of the site for construction of the wastewater treatment lagoon with an in situ clay liner.

5. Section 2.5 Description of Previous Studies

The Manitoba Conservation Design Objectives for Standard Sewage Lagoons states that "individual residences should not be any closer than 300 m" to lagoons; the recommended minimum distance from a property line is 30 m. As indicated in section 2.6.2 the lagoon site is located approximately 420 m from the nearest residence (well in excess of the 300 m requirement).

6. Section 2.6.1 Description of Development - General

The forcemain that is anticipated to be used to pump the wastewater from Grosse Isle to the proposed lagoon is not part of the work to be completed in this project. When the R.M of Rosser decides to proceed with the forcemain connection another environmental submission will be required requesting for Manitoba Conservation approval pertaining to the forcemain project. At that time the potential environmental impacts/risks associated with the forcemain as well as possible mitigation measures

would be addressed.

7. Section 2.6.1 Description of Development - General

As in 6 above this is also an issue to be addressed in a separate project upon decision by the R.M. to go ahead with piped wastewater collection systems from the Communities of Gordon and Rosser.

8. Section 2.6.1 Description of Development - General

As stated in section 4.4.1, the proposed lagoon will be designed to treat the wastewater to meet Manitoba Conservation discharge criteria. The treated effluent will be sampled and analysed prior to discharge. The effluent will be discharged only if it meets the license requirements for discharge. Since the proposed facility is located 13.9 km from the Sturgeon Creek, some additional polishing by plant uptake could occur; furthermore the discharge date of June 15 by Manitoba Conservation has been established to discharge after the fish spawning period.

9. Treated Effluent Release into the 2nd Order Provincial Drain

The effluent will not be discharged unless the Manitoba Conservation requirements are achieved. Discharging of treated effluent to the discharge ditch from a lagoon designed in accordance with Manitoba Conservation Design Objectives for Standard Sewage Lagoons should not cause a concern as long as the discharge criteria are met.

10. Section 2.6.2 Basis for Proposed Lagoon Site Selection

The minimum distances from the proposed lagoon to the nearest communities and residents were met as required by Manitoba Conservation lagoon design objectives. Manitoba Conservation may be contacted for their definitions and rational of design requirements. Required distance from operating business is not included in the objectives. However, from experience the 300 m separation distance between individual residences and a lagoon would be considered an acceptable distance of a lagoon from a business and that distance can be encroached upon depending on the type of the enterprise.

11. Section 2.6.2 Basis for Proposed Lagoon Site Selection

As described in section 3.1.1 the lagoon may generate odours for a short time in the spring of each year following ice break ups. The mitigation measure for such odours was indicated in section 4.1 of the EAP.

12. Section 2.6.4.2 Geotechnical Investigation

Please refer to response provided for item #4 above.

13. Section 2.6.6 Wastewater Production

As stated in section 2.6.1 the lagoon will be fenced and a locked access gate will be installed where the access road meets the lagoon truck turnaround to prevent unauthorized access to the lagoon. Also as required by Manitoba Conservation, signs will be provided along the fence to advise against trespassing.

14. Section 2.6. 7 Lagoon Construction Detail

Discharge from the lagoon will be controlled manually by a valve fitted to the discharge pipe. In the unlikely event that the Provincial Drain becomes plugged discharge can be delayed or stopped until the Provincial Drain is cleaned of material that plugged it.

15. Section 3.3 Fisheries

Please refer to the response provided to item #8 above.

16. Section 3.8 Socio-Economic Implications

There are no known socio-economic impacts to the S.A. Morris Enterprises as the lagoon will be constructed to Manitoba Conservation requirements.

17. Section 4.1 Management Practice - Mitigation of Odours

As noted in section 3.1.1 nuisance odours occur in improperly sized or organically overloaded lagoons. The lagoon for the R.M. of Rosser will be designed to accommodate the organic loading from a projected year 20 population in the R.M. Thus excessive odour generation from the lagoon would not occur.

Sewage treatment plant (STP) and wetlands associated with lagoons were also considered for the R.M. of Rosser wastewater treatment. Sewage treatment plants require continuous discharge with sufficient flow in the discharge route; in the absence of sufficient flow a holding pond for the treated effluent is required until discharge is permitted and thus STPs are considerably more costly. Wetlands are used to polish treated effluent from a lagoon. They require large land areas for construction, have increased odour potential, favour mosquito breeding (due to desired vegetation, very shallow effluent, and minimal wind action), create environment for increased wildlife thereby increasing the potential for raised E-coli levels, and add cost to the project. Wastewater treatment in a lagoon occurs naturally by the action of sunlight, wind, and bacteria. All with no power requirement hence the operation and maintenance costs of a lagoon are minimal. Therefore, a lagoon is considered both environmentally and economically reasonable.

18. Section 4.1 Management Practice - Mitigation of Odours

Required distance from an operating business has not been identified in the Manitoba Conservation Lagoon Design Objectives. Please also refer to the response provided to item #10 above.

19.Section 4.4.1 Surface Water and the Facultative Lagoon Discharge Criteria

The standards used in Manitoba are described as follows in the Manitoba Water Quality Standards, Objectives, and Guidelines, November 2002. "The standards form the basis of the technology-based approach to the prevention of pollution, consistent with the general historical practice in Manitoba, and ensure that the best available, economically achievable treatment technologies for each sector are utilized to treat all wastes that are amenable to treatment, regardless of location". The 30 m buffer zone between the lagoon and the adjacent Provincial Drain is a requirement by Manitoba Conservation. The 55 m distance in question would not increase any risk of contamination; please also refer to the response provided to item #14 above.

20. Section 4.4.2 Groundwater

Based on May 2006 Drillers Reports for Groundwater Wells by Manitoba Water Stewardship Groundwater Management Section, there are 21 production wells surrounding the lagoon site predominantly used for domestic purposes. The abovementioned report was reviewed as part of a geotechnical investigation of the lagoon site. Results of the review were documented in the "R.M. of Rosser Geotechnical Investigation for Wastewater Treatment Lagoon, December 2006" report prepared by J.R. Cousin Consultants Ltd. In the geotechnical investigation

report, as referenced in section 2.5 of the EAP, it was indicated that soils in the vicinity of the lagoon site (SW1/4 19-12-1EPM) generally consist of approximately 2.4 m of clay underlain by till. According to the Drillers Reports the limestone bedrock surface is located at approximately 8 m to 23 m (average 12 m) below the ground surface. The Report includes three wells that exist in Section 13-12-4W, where the nearest resident is located.

Respecting seepage, Manitoba Conservation requires sewage lagoons be constructed with the interior surfaces of the lagoon underlain by at least one metre of soil having a permeability of $1 * 10^{-7}$ cm/sec or less to protect water resources. Thus with the lagoon constructed with the clay liner achieving a minimum hydraulic conductivity of $1 *10^{-7}$ cm/sec and the presence of clay overburden in the area seepage from the lagoon will be minimal Therefore, it is unlikely that any well in the surrounding will be contaminated due to seepage from the lagoon. Moreover, if advised by Manitoba Conservation, monitoring wells will be installed around the lagoon to monitor impacts of the wastewater from the lagoon on the surrounding groundwater.

21. Section 4.5 Watershed and Drainage Basin Information

The Sturgeon Creek Hutterite Colony, referred to as "Sturgeon Creek Colony" in the section 4.5 of the EAP empties their lagoon into the Sturgeon Creek. However, other animal waste lagoons do not empty into the Sturgeon Creek watershed.

22. Section 4.6 Public Open House

The lagoon project was generally favoured by the public according to a public open house conducted on July 13, 2005 (indicated in section 4.6 of the EAP) but the site proposed at that time was not accepted. Furthermore, following an open house presentation that was held on April 16, 2007, where JRCC representatives discussed the project with residents touring at the public open house, there was an overall impression that the public felt the project was required. Members of two Councils (the R.M. of Rosser and R.M. of Rockwood) also attended the open house presentation and had the same impression. A small number of individuals of small groups came forward saying that they were not in favour of the project, however, based on the overall assessment of basic survey information and from speaking to individuals and groups, the decision was made to proceed with the project. Consequently, the Council of the R.M. of Rosser voted to proceed with the project at the current proposed lagoon site (SW 1/4 19-12-1 EPM).

Regarding the cost figures the R.M. of Rosser has the complete budget information for the project and the pertaining grants that apply to the project from which the financial responsibility of the taxpayers can be calculated. Moreover prior to proceeding with any construction project the Municipality has to notify the public of their intention to proceed and the borrowing by-laws that are required according to the Municipal Act.

23. Section 5.1 Commencement Dates and Section 5.2 Environment Approval Date

The commencement date and environmental approval dates will be corrected so as to reflect the current status, if re-submission of the EAP is required.

24. Mosquito Control

To reduce the potential for mosquito breeding environment the lagoon will be constructed in an open area and any vegetation in the immediate vicinity will be

mowed to obtain the greatest wind impact in the lagoon surface. The wind on any portion of the liquid surface will create waves that disturb the entire liquid surface impacting the environment for mosquitoes. Seeded grass on the inside and outside of the lagoon dikes to control erosion will also be mowed as part of the lagoon maintenance operation thereby impacting the environment for mosquitoes and contributing to keeping the mosquito population down.

Following is in response to the email correspondence dated June 28, 2007 from Ms. Joan Fisher.

Financial Report

The R.M. of Rosser has the complete budget information for the project and the pertaining grants that apply to the project from which the financial responsibility of the taxpayers can be calculated. Moreover prior to proceeding with any construction project the Municipality has to notify the public of their intention to proceed and the borrowing by-laws that are required according to the Municipal Act.

Wastewater Treatment Options Explored

In addition to Lagoons, sewage treatment plants (STPs) and wetlands associated with lagoons were also considered for the R.M. of Rosser wastewater treatment. Sewage treatment plants require continuous discharge with sufficient flow in the discharge route; in the absence of sufficient flow a holding pond for the treated effluent is required until discharge is permitted and thus STPs are considerably more costly. Wetlands are used to polish treated effluent from a lagoon or mechanical sewage plant. They require large land areas for construction, have increased odour potential, favour mosquito breeding (due to desired vegetation, very shallow effluent, and minimal wind action), create environment for increased wildlife thereby increasing the potential for raised E-coli levels, and add cost to the project. Wastewater treatment in a lagoon occurs naturally by the action of sunlight, wind, and bacteria. All with no power requirement hence the operation and maintenance costs of a lagoon are minimal Therefore, a lagoon is considered both environmentally and economically reasonable.

Following is in response to the email correspondence June 28, 2007 from Mr. Jeff Gidney.

Risk to Groundwater Body

Manitoba Conservation requires sewage lagoons be constructed with the interior surfaces of the lagoon underlain by at least one metre of soil with a permeability of $1 * 10^{-7}$ cm/sec or less to protect water resources.

Based on the geotechnical investigation of the proposed lagoon site a medium to high plastic clay soil with varying thickness to depths ranging from 2 to 4 m was observed underlying the top soil. Thus the site was found suitable for construction of a lagoon with an in situ clay liner. As discussed in section 2.6.7 of the EAP, the lagoon will be constructed with the in situ clay soils forming a one metre thick clay liner at the cell bottom and in the centre of the dikes. The clay liner will have a hydraulic conductivity of $1 * 10^{-}$' cm/sec or less, consistent with the Manitoba Conservation Design Objectives for Standard Sewage Lagoon requirement.

Driller's Reports were reviewed to determine the location of wells in the vicinity of

the proposed lagoon site. The review of the groundwater wells in the vicinity of the lagoon site indicates presence of clay overburden with similar varying thickness as the clay at the lagoon site.

With the lagoon constructed using a clay liner achieving a minimum hydraulic conductivity of 1 $*10^{-7}$ cm/sec and the presence of clay overburden in the area, seepage from the lagoon will be minimal. Therefore, it is unlikely that groundwater body in the surrounding area will be contaminated due to seepage from the lagoon. Moreover, if advised by Manitoba Conservation, monitoring wells will be installed around the lagoon to monitor impacts of the wastewater from the lagoon on the surrounding groundwater.

Discharge from the Lagoon into Sturgeon Creek

This response is with the understanding that the phrase "RUN OFF from the LAGOON into STURGEON CREEK" was used to refer to Discharge from the lagoon into the Sturgeon Creek.

As stated in section 4.4.1, the proposed lagoon will be designed to treat the wastewater to meet Manitoba Conservation discharge criteria. The treated effluent will be sampled and analysed prior to discharge. The effluent will be discharged only if it meets the license requirements for discharge. Moreover, since the proposed facility is located 13.9 km from the Sturgeon Creek, some additional polishing by plant uptake could occur, furthermore the discharge date of June 15 by Manitoba Conservation has been established to discharge after the fish spawning period.

Following is in response to the letter with attachments correspondence dated June 27, 2007 from Mr. Chris Barsanti.

Odour Mitigation /Aerator Inclusion to the Lagoon Plans

An aerated lagoon is an alternative design to conventional lagoons such as that proposed for the R.M. of Rosser. Compared to the conventional lagoons, aerated lagoons require high capital cost and high operation cost. Thus inclusion of an aerator to the R.M. of Rosser Lagoon is not warranted. As long as any conventional lagoon is operated within its design capacity odour should occur only for a short time during the spring surface ice break up.

Provincial Drain

The wastewater in the proposed lagoon will be treated to meet Manitoba Conservation effluent discharge requirements for facultative municipal wastewater treatment lagoons. The effluent will be sampled and tested prior to discharge to determine whether or not the requirements are met. The effluent will not be discharged unless the Manitoba Conservation requirements are achieved. Discharging of treated effluent as such to the discharge ditch from a lagoon designed in accordance with Manitoba Conservation Design Objectives for Standard Sewage Lagoons should not cause a concern as long as the discharge criteria are met. In fact this may be viewed positively as it may provide opportunity for nutrients to be absorbed by plants growing in the drainage system whereby treated effluent would be further polished.

To reduce the potential for mosquito breeding environment the lagoon will be constructed in an open area and any vegetation in the immediate vicinity will be

mowed to obtain the greatest wind impact in the lagoon surface. The wind on any portion of the liquid surface will create waves that disturb the entire liquid surface impacting the environment for mosquitoes. Seeded grass on the inside and outside of the lagoon dikes to control erosion will also be mowed as part of the lagoon maintenance operation thereby impacting the environment for mosquitoes and contributing to keeping the mosquito population down.

Sturgeon Creek versus Grassmere Creek Drain

Although the R.M. of Rosser is on the two watersheds (Sturgeon Creek and Grassmere Creek Drain), the proposed lagoon site is on the Sturgeon Creek watershed. A lagoon constructed at that site cannot be discharged into the Grassmere Creek Drain by gravity due to elevations. Pumping effluent from the lagoon to the Grassmere Creek Drain would increase both the capital and operating costs of the lagoon. Thus it is preferable to discharge the lagoon into the Sturgeon Creek.

Lagoon versus Newer Technologies

Wastewater treatment in a lagoon occurs naturally by the action of sunlight, wind, and bacteria. All with no power requirement hence the operation and maintenance costs of a lagoon are minimal. As such a lagoon is considered both environmentally and economically sensible and hence it is not anticipated to become obsolete in the near future. Other wastewater treatment methods considered for the R.M. of Rosser include sewage treatment plants (STP) and wetlands associated with lagoons. Sewage treatment plants require continuous discharge with sufficient flow in the discharge route; in the absence of sufficient flow a holding pond for the treated effluent is required until discharge is permitted and thus STPs are considerably more costly. Wetlands are used to polish treated effluent from a lagoon or mechanical sewage plant. They require large land areas for construction, have increased odour potential, favour mosquito breeding (due to desired vegetation, very shallow effluent, and minimal wind action), create environment for increased wildlife thereby increasing the potential for raised E-coli levels, and add cost to the project.

Piped Wastewater System

As indicated in sections 1.3 continued use of the current wastewater disposal sites is not guaranteed as are subject to saturation. Based upon this the Municipality proposed to have a wastewater treatment lagoon constructed to service the residents. The anticipated piped wastewater collection system is not within the scope of this project and is yet to be determined by the Municipality.

Socio-Economic Implications

The socio-economic implications associated with not having a wastewater treatment lagoon are much more than that with having a lagoon. As stated above, the continued use of the current wastewater disposal sites is under question due to concerns for well water contamination. Thus the socio-economic impact related to health and replacement cost would be worse with the current disposal sites in use than with a better wastewater treatment facility (lagoon).

Public Consultation

The lagoon project was generally favoured by the public according to a public open house conducted on July 13, 2005 (indicated in section 4.6 of the EAP) but the site proposed at that time was not accepted. Furthermore, following an open house

presentation that was held on April 16, 2007, where JRCC representatives discussed the project with residents touring at the public open house, there was an overall impression that the public felt the project was required. Members of two Councils (the R.M. of Rosser and R.M. of Rockwood) also attended the open house presentation and had the same impression. A small number of individuals of small groups came forward saying that they were not in favour of the project, however, based on the overall assessment of basic survey information and from speaking to individuals and groups, the decision was made to proceed with the project. Consequently, the Council of the R.M. of Rosser voted to proceed with the project at the current proposed lagoon site (SW1/4 19-12-1 EPM).

Following is in response to the email correspondence dated June 07, 2007 from Ms. Loris Barsanti.

Odour

As long as any conventional lagoon is operated within its design capacity odour should occur only for a short time during the spring surface ice break up. As part of odour mitigation Manitoba Conservation Design Objectives for Standard Sewage Lagoon requires minimum distances of 460 m and 300 m from the nearest community centre and individual residence, respectively. To mitigate odour problems the proposed lagoon for the R.M. of Rosser will be located at least 420 m from the nearest residence. An organically overloaded lagoon can create excessive odour. The lagoon for the R.M. of Rosser would be designed to Manitoba Conservation permissible organic loading criteria hence will not be overloaded until significant growth occurs in the Municipality. With separation distances and the permissible organic loading met as required by Manitoba Conservation, excessive smell from the lagoon is unlikely to occur.

Mosquitoes

To reduce the potential for mosquito breeding environment the lagoon will be constructed in an open area and any vegetation in the immediate vicinity will be mowed to obtain the greatest wind impact in the lagoon surface. The wind on any portion of the liquid surface will create waves that disturb the entire liquid surface impacting the environment for mosquitoes. Seeded grass on the inside and outside of the lagoon dikes to control erosion will also be mowed as part of the lagoon maintenance operation thereby impacting the environment for mosquitoes and contributing to keeping the mosquito population down.

Discharge

As stated in section 2.6.3 the effluent will be discharged from the storage cell of the lagoon into the adjacent $2n^d$ order Provincial Drain and then into the Sturgeon Creek. The speed of the flow through the Provincial Drain depends on several variables such as the volume of effluent released and the slope gradient and surface roughness in the ditch. The wastewater in the proposed lagoon will be treated to meet Manitoba Conservation effluent discharge requirements and tested prior to releasing. Discharging of treated effluent as such to the discharge ditch and the Sturgeon Creek should not cause any problem. Maintenance of the ditch is important and if excessive weed growth or stagnant effluent (pool) occurs in the drainage ditch, it needs to be cleaned.

Well Contamination

As discussed above only treated effluent to Manitoba Conservation requirements would be discharged to the discharge route. This may provide opportunity for further polishing of the effluent as some of the nutrients contained in the discharged effluent could be absorbed by plants growing in the ditch. Driller's Reports (GWdrill May 2006) compiled by Manitoba Water Stewardship Groundwater Management Section were reviewed to determine the types of soils in the vicinity of the 2nd order Provincial Drain.

Results of the review indicated the presence of an average of approximately 5 m thick clay overburden at varying depths ranging from top to 9 m below the ground surface in most of the lands adjacent to the Drain. Thus contamination of well water should not occur.

Lagoon

Wastewater treatment in a lagoon occurs naturally by the action of sunlight, wind, and bacteria. All with no power requirement hence the operation and maintenance costs of a lagoon are minimal. Regardless of being a traditional method of wastewater treatment a lagoon is considered both environmentally and economically reasonable. Hence it is not anticipated to lead into problems in the future as long as it is designed to Manitoba Conservation design requirements and operated within its design capacities. The proposed lagoon for the R.M. of Rosser would be designed to serve the Community for 20 years and major repairs other than normal maintenance are not anticipated.

Following is in response to the email correspondence dated June 05, 2007 from Mr. Carl Witt.

Groundwater

Manitoba Conservation requires sewage lagoons be constructed with the interior surfaces of the lagoon underlain by at least one metre of soil with a permeability of 1 * 10^{-7} cm/sec or less to protect water resources.

Based on the geotechnical investigation of the proposed lagoon site a medium to high plastic clay soil with varying thickness to depths ranging from 2 to 4 m was observed underlying the top soil. Thus the site was found suitable for construction of a lagoon with an in situ clay liner. As discussed in section 2.6.7 of the EAP, the lagoon will be constructed with the in situ clay soils forming a one metre thick clay liner at the cell bottom and in the centre of the dikes. The clay liner will have a hydraulic conductivity of 1 * 10^{-7} cm/sec or less, consistent with the Manitoba Conservation Design Objectives for Standard Sewage Lagoon requirement.

Driller's Reports were reviewed to determine the location of wells in the vicinity of the proposed lagoon site. The review of the groundwater wells in the vicinity of the lagoon site indicates presence of clay overburden with similar varying thickness as the clay at the lagoon site.

With the lagoon constructed using a clay liner achieving a minimum hydraulic conductivity of 1 *10^{-7} cm/sec and the presence of clay overburden in the area, seepage from the lagoon will be minimal Therefore, it is unlikely that groundwater in the surrounding area will be contaminated due to seepage from the lagoon. Moreover, if advised by Manitoba Conservation, monitoring wells will be installed around the

lagoon to monitor impacts of the wastewater from the lagoon on the surrounding groundwater.

Drainage Ditch and Sturgeon Creek

As stated in section 4.4.1 of the EAP the wastewater in the proposed lagoon will be treated to meet Manitoba Conservation effluent discharge requirements for facultative municipal wastewater treatment lagoons. The effluent will be sampled and tested prior to discharge to determine whether or not the requirements are met. The effluent will not be discharged unless the Manitoba Conservation requirements are achieved. Discharging of treated effluent as such to the Sturgeon Creek via the drainage ditch from a lagoon designed in accordance with Manitoba Conservation Design Objectives for Standard Sewage Lagoons should not cause a concern as long as the discharge criteria are met. Also since the proposed facility is located 13.9 km from the Sturgeon Creek, some additional polishing by plant uptake could occur. Furthermore the discharge date of June 15 by Manitoba Conservation has been established to discharge after the fish spawning period.

Taxes

The R.M. of Rosser has the complete budget information for the project and the pertaining grants that apply to the project from which the financial responsibility of the taxpayers can be calculated. Moreover prior to proceeding with any construction project the Municipality has to notify the public of their intention to proceed and the borrowing by-laws that are required according to the Municipal Act.

Odour

As long as any conventional lagoon is operated within its design capacity odour should occur only for a short time during the spring surface ice break up. As part of odour mitigation Manitoba Conservation Design Objectives for Standard Sewage Lagoon requires minimum distances of 460 m and 300 m from the nearest community centre and individual residence, respectively. To mitigate odour problems the proposed lagoon for the R.M. of Rosser will be located at least 420 m from the nearest residence. An organically overloaded lagoon can create excessive odour. The lagoon for the R.M. of Rosser would be designed to Manitoba Conservation permissible organic loading criteria hence will not be overloaded until significant growth occurs in the Municipality. With separation distances and the permissible organic loading met as required by Manitoba Conservation, excessive smell from the lagoon is unlikely to occur.

Following is in response to the letter correspondence dated June 26, 2007 from Ms. Zeena Mohammed of Health Canada.

Wastewater Treatment Operators

According to the Facility Classification Criteria in Schedule A (Part 4) of The Environment Act Regulation 77/2003 the proposed wastewater treatment lagoon for the R.M. of Rosser is classified as a Class 1 facility. The operator certification level is determined based on the facility classification hence under the mandatory operator certification regulation the level of operator certification required for operating the proposed lagoon is a Certified Class I. Therefore, recommendation by way of this letter is provided to the Municipality that the proper operation of the wastewater

treatment facility requires Certified Class I operators in the methods of operating the facility.

Sewage Haulers

Section 21(1) of the Onsite Wastewater Management Systems Regulation 83/2003 under The Environment Act requires sewage haulers be registered. Thus recommendation by way of this letter is made to the Municipality that the sewage haulers need be registered according to the abovementioned mandatory regulation.

Following is in response to the email correspondence dated June 5, 2007 from Mr. Vaughn Kachanoski of Fisheries and Oceans Canada.

The 2nd order Provincial Drain

Based on information from residents of the R.M. of Rosser nearby the 2nd order Provincial Drain, flow through the Drain between June 15 and October 31 is minimal to none existent. With the 200 mm discharge pipe the maximum anticipated discharge flow from the lagoon would be approximately 0.8 m^3/min. The 2n^d order Provincial Drain that would receive discharge from the lagoon has a width of approximately 3 m (confirmed with the Municipality) at the bottom. At 1 m depth of flow the capacity of the Drain was estimated to be approximately 400 m^3/min. Thus the Drain is anticipated to have enough capacity to accommodate discharge from the lagoon between June 15 and October 31 without exceeding the maximum capacity.

Outlet Protection

As stated in section 2.6.7 of the EAP the discharge ditch to the Provincial Drain would be seeded with grass in addition to the outlet protection of the grouted rip rap to mitigate potential erosion of the banks of the discharge ditch when treated effluent is discharged into the ditch.

Sediment and Erosion Control Measures

As stated in section 4.4.1. of the EAP silt fencing, installed between the Provincial Drain and areas exposed as a result of the lagoon construction, would be utilized to minimize erosion and prevent sedimentation in the drain. The tender specification document will indicate to the contractor that the silt fence must be installed before the construction begins and maintained until vegetation has been re- established along the discharge ditch and the area surrounding the lagoon construction zone.

Vegetation to Prevent Erosion

As stated above grass would be seeded in the discharge ditch to prevent the banks from erosion.

The following is in response to the letter correspondence dated June 25, 2007 from Agnes and Wm. W. Fetterman.

Methods Explored

Wastewater treatment in a lagoon occurs naturally by the actions of sunlight, wind, and bacteria. All with no power requirement hence the operation and maintenance costs of a lagoon are minimal. Thus a lagoon is considered both environmentally and economically reasonable.

Other wastewater treatment methods considered for the R.M. of Rosser include sewage treatment plants (STP) and wetlands associated with lagoons. Sewage treatment plants require continuous discharge with sufficient flow in the discharge

route; in the absence of sufficient flow a holding pond for the treated effluent is required until discharge is permitted and thus STPs are considerably more costly. Wetlands are used to polish treated effluent from a lagoon or mechanical sewage plant. They require large land areas for construction, have increased odour potential, favour mosquito breeding (due to desired vegetation, very shallow effluent, and minimal wind action), create environment for increased wildlife thereby increasing the potential for raised E-coli levels, and add cost to the project. There have been already complaints from the public regarding potential costs of building a wastewater treatment facility within the Municipality. Use of sewage handling facilities such as that described in the pamphlet attached with the letter from Agnes and Wm. W. Fetterman would be more costly to the community than the proposed lagoon. Thus based on the above assessment and concerns relating to costs a lagoon is the best option to treat the wastewater in the R. M. of Rosser.

Impact on Downstream of Discharge from the Lagoon

As stated in section 4.4.1, the proposed lagoon will be designed to treat the wastewater to meet Manitoba Conservation discharge criteria. The treated effluent will be sampled and analysed prior to discharge. The effluent will be discharged only if it meets the license requirements for discharge. Since the proposed facility is located 13.9 km from the Sturgeon Creek, some additional polishing by plant uptake could occur, furthermore the discharge date of June 15 by Manitoba Conservation has been established to discharge after the fish spawning period. Therefore, discharging of treated effluent from a lagoon designed in accordance with Manitoba Conservation requirements should not cause a concern downstream as long as the discharge criteria are met.

A Large Regional versus a Number of Smaller Localized Facilities

One large regional wastewater treatment facility is preferable to a number of smaller facilities within a given practicable area. There would always be concerns with any wastewater treatment facility that need to be addressed before construction and during operation of the facility (e.g. distance from habituation, public perception). Use of one large regional wastewater treatment facility rather than a few smaller facilities spread within the R. M. of Rosser would be advantageous in addressing the potential concerns associated with the facilities. For example the proposed regional wastewater treatment facility would reduce the impact on land use. Constructing one large facility within the R.M takes a piece of land out of agricultural production with a distance restriction whereas a number of smaller facilities would require multiple pieces of land with as many distance restrictions as the number of the facilities. Manitoba Conservation also prefers a regional wastewater treatment facility be employed rather than multiple facilities.

<u>December 5, 2007 – Responses to Second Requests For Additional Information</u>

The following responses are provided regarding concerns stated by Mr. Heinz Nolting of Mei - West Enterprises in the email correspondence dated October 24, 2007.

Effluent and Bacteria Dilution

The effluent would be tested in accordance with the recognized discharge effluent standards of the current Manitoba Conservation guidelines and as outlined in the licence to be issued by Manitoba Conservation. Since the effluent be would

discharged only after the current Manitoba Conservation discharge criteria are met dilution of the effluent in the discharge ditch is not required. However, in the course of the effluent flow through the ditch to the receiving water body, nutrients could likely be removed by plants growing in the ditch. This could provide additional treatment of the effluent.

Emergency Discharge

The lagoon for the R.M. of Rosser would be designed to Manitoba Conservation Design Objectives for Standard Sewage Lagoon. It would be sized to treat wastewater from a projected year 20 population with a storage capacity for 230 days each year. Furthermore, the lagoon will have a minimum freeboard of 1 m above the operating liquid level as required by Manitoba Conservation. Therefore, under proper operation no emergency discharge from the lagoon would be expected.

Effluent Discharge and Flooding

According to Manitoba Conservation requirements, the lagoon would not be discharged during a flood occurrence, if any. Thus backwash into the adjacent fields of the discharged effluent is not expected to occur. A review of the Lake Winnipeg Stewardship Board - Report to the Minister of Water Stewardship, December 2006, indicates that effluent irrigation is one the recommended strategies to reduce nutrient from small wastewater treatment facilities. The proposed Lagoon for the R.M. of Rosser is classified amongst the small wastewater treatment facilities as described in the aforementioned report. Based on the above, treated and discharged effluent is not expected to be a concern if at all it ends up in the fields after being diluted with such a significant volume of flood to cause a backwash to the adjacent fields.

Untreated Effluent

Untreated effluent from the proposed R.M. Rosser lagoon is not anticipated to be spread on farmlands under any circumstances.

Following is in response to the email correspondence dated October 24, 2007 from Mr. Duncan Wain submitted on behalf of the Assiniboine Watershed Network.

Number of Lagoons Discharging into Sturgeon Creek

The number of lagoons discharging into the Sturgeon Creek was mistakenly reported in the draft of Environment Act Proposal as being only the Headingley lagoon. However, correction was made and sent to Manitoba Conservation on June 20, 2007. In the current section 4.5 of the EAP Sturgeon Creek Colony lagoon, Rock Lake Colony lagoon, Keystone Colony lagoon, Wan¯en lagoon, and Woodlands lagoon are reported to be discharging into the Sturgeon Creek.

Wildlife

As indicated in section 3.2 of the EAP the Wildlife and Ecosystem Protection Branch of Manitoba Conservation was contacted regarding the impact of the lagoon on wildlife, if any. Based on the response from the branch no potential impacts to wild life were identified. Additional loading to the lagoon of the presumed migrating waterfowls would be difficult to calculate as the potential number of the waterfowls, if any, is not known. However, the effluent would be discharged only after the current Manitoba Conservation effluent discharge criteria are met. This would ensure that the treated effluent is of quality acceptable to be discharged per Manitoba Conservation requirements. Furthermore, in the course of the effluent flow through the ditch to the

receiving water body, additional polishing of the treated effluent would occur.

Following is in response to the fax correspondence dated October 24, 2007 from Ms. Carol Nichol of Gross Isle, Manitoba.

Alternatives to Lagoon

In addition to lagoons, sewage treatment plants (STPs) and wetlands associated with lagoons were also explored as potential options for the R.M. of Rosser a wastewater treatment facility. Sewage treatment plants require continuous discharge with sufficient flow in the discharge route. In the absence of sufficient flow a holding pond (similar to the secondary cells of the lagoon) for the treated effluent is required until discharge is permitted. Thus STPs are considerably more costly and still require effluent storage in an earthen structure. Wetlands are used to polish treated effluent from a lagoon or mechanical sewage plant. They require large land areas for construction, have increased odour potential, favour mosquito breeding (due to desired vegetation, very shallow effluent, and minimal wind action), create environment for increased wildlife thereby increasing the potential for raised E-coli levels, and add cost to the project. Wastewater treatment in a lagoon occurs naturally by the action of sunlight, wind, and bacteria. All with no power requirement hence the operation and maintenance costs of a lagoon are minimal. Therefore, a lagoon is considered both environmentally and economically reasonable for the R.M. of Rosser.

Buffer Zone

The design and construction of lagoons in Manitoba is regulated based on Manitoba Conservation Design Objectives for Standard Sewage Lagoon. Furthermore, the Manitoba Water Quality Standards, Objectives, and Guidelines, November 2002 are used in conjunction with the Design Objectives. The lagoon for the R.M. of Rosser would be designed and constructed according to the above Design Objectives and Water Quality Standards. Thus all the requirements for buffer zone and setback distances would be met as stipulated by Manitoba Conservation based on the above Design Objectives, Standards, and Guidelines.

Lagoon Operation and Maintenance

As it is customary practice and a licencing requirement, an operation and maintenance program would be developed and implemented for the R.M. of Rosser lagoon. The program would include but not be limited to the following; dike maintenance (i.e. mowing), effluent sampling and analysis, and documentation of discharge dates and effluent analysis results.

The following responses are provided regarding Mr. Chris Barsanti's concerns in relation to the R.M. of Rosser Wastewater Treatment Lagoon Environment Act Proposal as stated in the letter correspondence dated October 23, 2007.

Use of an Aerator

The response provided in the past regarding use of an aerator was based on comparison with conventional lagoons, not with mechanical treatment systems. Compared to conventional lagoon, higher capital cost and higher operation cost are associated with aerated lagoons. This being the case, there have been concerns raised by a few individuals from the R.M. of Rosser regarding the financial requirements

and responsibilities of constructing even a conventional lagoon, which is cheaper than an aerated lagoon.

Effluent Discharge

The treated effluent from the lagoon would be discharged such that there would be continuous flow to the 2' order Provincial Drain from the lagoon within the recommended discharge period of June 15 to October 31. Polishing is anticipated to occur during the effluent flow through the long discharge route to the receiving water body. This could be achieved by planned management (such as cutting and removing) of the vegetation along the discharge route thereby providing additional treatment of the effluent. Pooling is not expected to occur as long as the discharge route is graded properly resulting in a slope gradient that allows for positive drainage away from the lagoon to the treated effluent destination. If effluent pooling occurs and if cleaning and re-grading of the discharge route is required, the R.M. would make the necessary arrangements to clean and re-grade the discharge route.

Effluent Nutrient

The nutrient levels prior to discharge of the effluent would be reduced to Manitoba Conservation requirements. In addition, as part of the licencing requirement, an operation and maintenance program would be developed and implemented to control the vegetation growth resulting from the operation of the R.M. of Rosser lagoon.

Mosquitoes

As was indicated in the past response to concerns expressed in regards to mosquito breeding in the lagoon, the waves created in the centre of the lagoon would propagate to the edges of the lagoon. This is expected to create unfavourable environment for mosquito breeding over the entire lagoon surface.

If mosquitoes would still become a problem even with the proper maintenance of the lagoon the R.M. may be notified to assess potential measures that need to be taken such as larviciding and pesticide application. According to "Manitoba Health West Nile Virus Program 2007: Planning Documents for Municipalities" a cost-shared funding may be available to the R.M. of Rosser which could be used to cover expense related to larviciding.

Alternative Sites

In addition to the currently proposed lagoon site, other sites were also investigated. The current proposed location was selected based upon the basis for the proposed lagoon site selection as presented in detail in section 2.6.2 of the EAP.

Current Regulations

The effluent in the R.M. of Rosser proposed lagoon would be treated to Manitoba Water Quality Standards, Objectives, and Guidelines (November 2002) as it relates to small wastewater treatment facilities. At this time the Lake Winnipeg Stewardship recommendations for the more stringent compliance limits for nutrients in effluent discharge are not imposed for smaller facilities such as the proposed wastewater treatment lagoon for the R.M. of Rosser.

Puraflo Peat Systems

The Puraflo system is a system that could be used for an onsite wastewater treatment in conjunction with septic tanks as opposed to a much larger regional wastewater treatment lagoon. A review of the use of Puraflo systems indicates that cautionary

advisories have been issued by regulatory officials in some part of the US due to apparent clogging of the systems. There have been limited approvals for installation of the Puraflo systems in a few states. Whereas in some other states they are only in the experimental stages with no approval. The use of Puraflo peat systems for wastewater treatment is not common in Manitoba. There is no municipal wastewater treatment system known to be using the Puraflo peat system in Manitoba. Hence approval of such a system by Manitoba Conservation would likely be considered experimental. Moreover, replacement of such systems is a must. This may become a problem as land for onsite wastewater management is limited and the associated costs may be high.

The following responses are provided regarding concerns raised by Mr. David Nichol in relation to the R.M. of Rosser Wastewater Treatment Lagoon Environment Act Proposal as stated in the email correspondence dated October 22, 2007.

Alternatives to Lagoon

A lagoon was not the only wastewater treatment facility that was explored for the R.M. of Rosser. Sewage treatment plants (STPs) and wetlands associated with lagoons were also considered. Sewage treatment plants require continuous discharge with sufficient flow in the discharge route. In the absence of sufficient flow a holding pond (similar to the secondary cells of the lagoon) for the treated effluent is required until discharge is permitted. Thus STPs are considerably more costly and still require effluent storage in an earthen structure. Wetlands are used to polish treated effluent from a lagoon or mechanical sewage plant. They require large land areas for construction, have increased odour potential, favour mosquito breeding (due to desired vegetation, very shallow effluent, and minimal wind action), create environment for increased wildlife thereby increasing the potential for raised E-coli levels, and add cost to the project. Wastewater treatment in a lagoon occurs naturally by the action of sunlight, wind, and bacteria. All with no power requirement hence the operation and maintenance costs of a lagoon are minimal. It was based on the above that a lagoon was considered both environmentally and economically reasonable for the R.M. of Rosser.

Wastewater from other Sources

As stated in section 2.6.5 of the EAP no significant commercial/industrial developments would contribute wastewater to the proposed lagoon. The Municipality would take the necessary precautions to prevent illegal dumping of wastewater to the lagoon.

Land around the Proposed Lagoon

To minimize the environmental impact, disturbance of land around the proposed lagoon would be minimized during construction of the lagoon. Following the lagoon construction the disturbed land surrounding the lagoon would be returned back to the existing condition and vegetation prior to construction of the lagoon, in as much as possible.

Buffer Zone

The design and construction of lagoons in Manitoba is regulated based on Manitoba Conservation Design Objectives for Standard Sewage Lagoon. Furthermore, the

Manitoba Water Quality Standards, Objectives, and Guidelines, November 2002 are used in conjunction with the Design Objectives. The lagoon for the R.M. of Rosser would be designed and constructed according to the above Design Objectives and Water Quality Standards. Thus all the requirements for buffer zone and setback distances would be met as stipulated by Manitoba Conservation based on the above Design Objectives, Standards, and Guidelines.

The following is in response to the letter correspondence dated October 22, 2007 from Ms. Nancy Fetterman.

1. Mosquito Control

The lagoon will be constructed in an open area. Any vegetation in the immediate vicinity will be mowed to obtain the greatest wind impact on the lagoon surface. This will reduce the potential for mosquito breeding environment. When wind blows on any portion of the liquid surface, it will create waves that disturb the entire liquid surface impacting the environment for mosquitoes. Seeded grass on the inside and outside of the lagoon dikes will be mowed as part of the lagoon maintenance operation. Furthermore, grass and vegetation growing in the discharge route would be cut and removed by the R.M. as required. This will impact the environment for mosquitoes and will aid to control potential mosquito breeding.

If mosquitoes would still become a problem even with the proper maintenance of the lagoon the R.M. may be notified to assess potential measures that need to be taken such as larviciding and pesticide application. According to "Manitoba Health West Nile Virus Program 2007: Planning Documents for Municipalities" a cost-shared funding may be available to the R.M. of Rosser which could be used to cover expense related to larviciding.

2. Well Testing

If necessary and if required monitoring wells would be installed and the associated monitoring program would be implemented to assess if seepage occurs from the lagoon.

3. Lagoon Drainage

The treated effluent from the lagoon would be discharged such that there would be continuous flow to the 2nd order Provincial Drain from the lagoon within the recommended discharge period of June 15 to October 31. Polishing is anticipated to occur during the treated effluent flow through the long discharge route to the receiving water body. This could be achieved by planned management (such as cutting and removing) of the vegetation along the discharge route. Pooling is not expected to occur as long as the discharge route is graded properly resulting in a slope gradient that allows for positive drainage away from the lagoon to the treated effluent destination. If effluent pooling occurs and if cleaning and regrading of the discharge route is required, the R.M. would make the necessary arrangements to clean and re-grade the discharge route.

4. Septage from Other Sources

As stated in section 2.6.5 of the EAP no significant commercial/industrial developments would contribute septage to the proposed lagoon. The Municipality would take the necessary precautions to prevent illegal dumping of septage to the

lagoon.

5. Growth Projections

The growth projections employed for the purpose of sizing the proposed lagoon for the Municipality are indicated in section 2.6.5 of the EAP. No commercial or industrial developments were identified for inclusion as significant wastewater producers and contributors to the proposed lagoon.

6. Excessive Smell

In a conventional lagoon that is operated within its design capacity odour is expected to occur only for a short time during the spring surface ice break up. The Manitoba Conservation Design Objectives for Standard Sewage Lagoon requires minimum distances of 460 m from the nearest community centre and 300 m from the nearest individual residence. To mitigate odour problems the proposed lagoon for the R.M. of Rosser will be located at least 420 m from the nearest residence. An organically overloaded lagoon can create excessive odour. The lagoon for the R.M. of Rosser would be designed to Manitoba Conservation permissible organic loading criteria. Hence it is not expected to be overloaded until significant population growth beyond the projections used to size the lagoon occurs at which time it will have to be expanded. With separation distances and the permissible organic loading met as required by Manitoba Conservation, excessive smell from the lagoon would be unlikely to occur.

7. *Lagoon Leakage*

Manitoba Conservation requires sewage lagoons be constructed with the interior surfaces of the lagoon underlain by at least one metre of soil with a permeability of $1 * 10^{-7}$ cm/see or less to protect water resources.

A geotechnical investigation of the proposed lagoon site was conducted to assess availability of suitable soils for the construction of a clay lined lagoon to Manitoba Conservation requirements. A medium to high plastic clay soils with varying thickness to depths ranging from 2 to 4 m were observed underlying the top soil. Based upon laboratory analysis results, the soils at the site could achieve the required permeability of $1 * 0^{-7}$ cm/sec or less in situ. Thus the site was found suitable for construction of a lagoon with an in situ clay liner. The lagoon will be constructed with the in situ clay soils forming a one metre thick clay liner at the cell bottom and in the centre of the dikes (indicated in section 2.6.7 of the EAP). The clay liner will have a hydraulic conductivity of $1 * 10^{-7}$ cm/sec or less, consistent with the Manitoba Conservation Design Objectives for Standard Sewage Lagoon requirement. Furthermore, the constructed lagoon would be tested for the integrity of the liner independently under the direction of Manitoba Conservation (i.e. whether or not the required hydraulic conductivity of $1 * 10^{-7}$ cm/see or less is achieved).

A review of groundwater wells (GWDrill Logs) in the vicinity of the lagoon site also indicates presence of clay overburden with similar varying thickness to the clay at the lagoon site.

With the lagoon constructed using a clay liner achieving a minimum hydraulic conductivity of $1 *10^{-7}$ cm/sec and the presence of clay overburden in the area, seepage from the lagoon will be minimal. Therefore, it would be unlikely that the

ground around the lagoon and the aquifer below it will be contaminated due to seepage from the lagoon. Furthermore, the impact of the lagoon to the surrounding could be monitored as in item # 2 above.

8. Wastewater Treatment Options

One large regional wastewater treatment facility is preferable to a number of smaller facilities within a given practicable area. There would always be concerns with any wastewater treatment facility that need to be addressed before construction and during operation of the facility (e.g. distance from habituation, public perception). Use of one large regional wastewater treatment facility rather than a few smaller facilities spread within the R. M. of Rosser would be advantageous in addressing the potential concerns associated with multiple facilities. For example the proposed regional wastewater treatment facility would reduce the impact on land use. Constructing one large facility within the R.M takes a piece of land out of agricultural production with a distance restriction whereas a number of smaller facilities would require multiple pieces of land with as many distance restrictions as the number of the facilities. Manitoba Conservation also prefers a regional wastewater treatment facility be employed rather than multiple facilities.

The following responses are provided regarding concerns raised by Ms. Loris Barsanti in relation to the R.M. of Rosser Wastewater Treatment Lagoon Environment Act Proposal as stated in the email correspondence dated October 18, 2007.

Odour

The 420 m distance from the nearest residence of the proposed lagoon site is considerably greater than the 300 m separation distance required by Manitoba Conservation. In addition to the separation distance, the design and proper operation of a lagoon also influences odour problems associated with a lagoon. A facultative lagoon operates under anaerobic condition during the winter periods and turns to aerobic in the spring. Under normal operation the lagoon would generate some odour for a short time each spring during the thawing (i.e. when the process changes from anaerobic to aerobic). The proposed lagoon to service the R.M. of Rosser will be designed and operated as per the current Manitoba Conservation Design Objectives and Environment Act Licence to be issued. Thus the lagoon is not expected to generate odour at other times of the year unless it is overloaded. The North Main treatment facility is not a lagoon. It is a sewage treatment plant (STP) and if overloaded or malfunctioning it can create odour year round.

Mosquitoes

If mosquitoes would still become a problem even with the proper maintenance of the lagoon the R.M. may be notified to assess potential measures that need to be taken such as larviciding and pesticide application. According to "Manitoba Health West Nile Virus Program 2007: Planning Documents for Municipalities" a cost-shared funding may he available to the R.M. of Rosser which could be used to cover expense related to larviciding.

Discharge

The treated effluent from the lagoon would be discharged such that there would be continuous flow to the 2nd order Provincial Drain from the lagoon within the

recommended discharge period of June 15 to October 31. Polishing is anticipated to occur during the treated effluent flow through the long discharge route to the receiving water body. This could be achieved by planned management (such as cutting and removing) of the vegetation along the discharge route. Pooling is not expected to occur as long as the discharge route is graded properly resulting in a slope gradient that allows for positive drainage away from the lagoon to the treated effluent destination. If effluent pooling occurs and if cleaning and re-grading of the discharge route is required, the R.M. would make the necessary arrangements to clean and re-grade the discharge route.

The following responses is provided regarding concerns raised by Mr. Mike Palmer in relation to the R.M. of Rosser Wastewater Treatment Lagoon Environment Act Proposal as stated in the email correspondence dated October 16, 2007.

Mosquitoes

To reduce the potential for mosquito breeding environment the lagoon will be constructed in an open area and any vegetation in the immediate vicinity will be mowed to obtain the greatest wind impact in the lagoon surface. Wind on any portion of the liquid surface will create waves that would propagate and disturb the entire liquid surface impacting the environment for mosquitoes. Seeded grass on the inside and outside of the lagoon dikes will also be mowed as part of the lagoon maintenance operation. This would impact the environment for mosquitoes and contributing to keeping the mosquito population down.

If mosquitoes would still become a problem even with the proper maintenance of the lagoon the R.M. may be notified to assess potential measures that need to be taken such as larviciding and pesticide application. According to "Manitoba Health West Nile Virus Program 2007: Planning Documents for Municipalities" a cost-shared funding may be available to the R.M. of Rosser which could be used to cover expense related to larviciding.

The following responses are provided regarding concerns raised by Mr. Steve Morris in relation to the R.M. of Rosser Wastewater Treatment Lagoon Environment Act Proposal as stated in the email correspondence dated October 16, 2007. The numbering herein the responses matches the numbering as provided in the e-mail for ease of cross-referencing.

1. *Environmental Act Proposal Form*

No response required.

2. *Section 2.5*

The site selection was based on more items (section 2.6.2 of the EAP) than just separation distances. Although in the last response it was stated that the minimum separation distances were met, the distances from the site to the nearest residence (approximately 420 m) and community centers (approximately 3 km) were greater than just the required minimum distances.

3. Section 2.5

The currently selected site has the potential for expansion to the east and west.

5. Section 2.5

As was indicated in the question, increasing the distance between the lagoon site and the nearest resident from 420 m to 445 m is unlikely to bring about significant difference. On the other hand, leaving the 55 in distance between the lagoon site and the adjacent 2nd order Provincial Drain would provide room for flexible mobility during construction activities.

6. Section 2.6.1

Potential issues related to the forcemain would be addressed if the R.M decides to proceed with the forcemain connection. At that time a separate Environment Act Proposal would have to be prepared and submitted to Manitoba Conservation for approval.

8. Section 2.6.1

The fact that the lagoon would be located 13.9 km from Sturgeon Creek was mentioned to indicate the potential for further polishing of the already treated effluent that would be discharged from the lagoon. The overall lagoon construction, maintenance, and operation including discharge would be based on meeting Manitoba Conservation requirements at minimum. Based on this no risk to animal, fish, and human is expected.

9. Treated Effluent Release into the 2"1 Order Provincial Drain

The treated effluent from the lagoon would be discharged such that there would be continuous flow to the 2nd order Provincial Drain from the lagoon within the recommended discharge period of June 15 to October 31. Polishing is anticipated to occur during the treated effluent flow through the long discharge route to the receiving water body. This could be achieved by planned management (such as cutting and removing) of the vegetation along the discharge route. Pooling is not expected to occur as long as the discharge route is graded properly resulting in a slope gradient that allows for positive drainage away from the lagoon to the treated effluent destination. If effluent pooling occurs and if cleaning and re-grading of the discharge route is required, the R.M. would make the necessary arrangements to clean and re-grade the discharge route.

10. Section 2.6.2 Please refer to response provided in item #5 above.

11. Section 2.6.2

In addition to the separation distance, the design and proper operation of a lagoon also influences odour problems associated with a lagoon. A facultative lagoon operates under anaerobic condition during the winter periods and turns to aerobic in the spring. Under normal operation the lagoon would generate some odour for a short time each spring during the thawing (i.e. when the process changes from anaerobic to aerobic). The proposed lagoon to service the R.M. of Rosser will be designed and operated as per the current Manitoba Conservation Design Objectives and Environment Act Licence to be issued. Thus the lagoon is not expected to generate odour at other times of the year unless it is overloaded. Thus no other action plan is required.

13. Section 2.6.6

As stated in section 2.6.5 of the EAP the R.M. has indicated that there are no significant commercial/industrial wastewater producers that would be contributing wastewater to the proposed lagoon. The Municipality would take the necessary precautions to prevent illegal dumping of wastewater to the lagoon. If necessary electronic gate with assigned passing privileges could be implemented and monitored by maintaining records from haulers. Furthermore, the licence also typically addresses such matters.

16. Section 3.8

No socio-economic impacts to the S.A. Morris Enterprises are expected from the proposed lagoon.

17. Section 4.1

A facultative lagoon operates under anaerobic condition during the winter periods and turns to aerobic in the spring. Under normal operation the lagoon would generate some odour for a short time each spring during the thawing (i.e. when the process changes from anaerobic to aerobic). The proposed lagoon to service the R.M. of Rosser will be designed and operated as per the current Manitoba Conservation Design Objectives and Environment Act Licence to be issued. Thus the lagoon is not expected to generate odour at other times of the year unless it is overloaded. Other methods of sewage treatment such as sewage treatment plants (STPs) Sewage treatment plants would still require a holding pond (similar to the secondary cells of the lagoon) for the treated effluent since there would not be continuous discharge through out the year. Moreover, if overloaded or malfunctioning STP can create odour year round.

It was based upon the above that a lagoon is considered a viable option for the R.M. of Rosser both environmentally and economically. The mitigation of potential odours from the proposed lagoon has been addressed in section 4.1 of the EAP, which is in accordance to Manitoba Conservation requirements.

19. Section 4.4.1

Please refer to response provided in item #5.

20. Section 4.4.2

To protect water resources Manitoba Conservation requires a lagoon be constructed with its interior surfaces underlain by at least one metre of soil having a permeability of $1 * 10^{-7}$ cm/sec or less. As the proposed lagoon would be constructed to Manitoba Conservation requirements, seepage from the lagoon could occur at a rate less than of $1 *10^{-7}$ cm/sec.

21. Section 4.5

Discharge from the proposed lagoon for the R.M. of Rosser will not occur unless the Manitoba Conservation Discharge Criteria as outlined in section 4.4 of the EAP are achieved. Since the treated effluent would travel such a long distance in the meandering Provincial Drain it may further be polished before draining into the Sturgeon Creek. Thus the contribution to the total loads placed on the Sturgeon Creek of the proposed lagoon for the R.M. of Rosser would be negligible.

22. Section 4.6

There is no one from JRCC who made the statement that is quoted.

24. Mosquito Control

If mosquitoes would still become a problem even with the proper maintenance of the lagoon the R.M. may be notified to assess potential measures that need to be taken such as larviciding and pesticide application. According to "Manitoba Health West Nile Virus Program 2007: Planning Documents for Municipalities" a cost-shared funding may be available to the R.M. of Rosser which could be used to cover expense related to-larviciding.