

## **SUMMARY OF COMMENTS/RECOMMENDATIONS**

**PROPONENT:** Rural Municipality of Alexander  
**PROPOSAL NAME:** R.M. of Alexander - Great Falls Lagoon  
**CLASS OF DEVELOPMENT:** 2  
**TYPE OF DEVELOPMENT:** Wastewater Treatment Lagoon  
**CLIENT FILE NO.:** 4630.00

### **OVERVIEW:**

On April 12, 2001, the Department received an Environment Act Proposal (EAP) on behalf of the Rural Municipality of Alexander to construct and operate a new 2-cell wastewater treatment lagoon to serve the community of Great Falls. The proposed wastewater treatment lagoon would be located in parts of NE 20 - 17 - 11EPM and NW 21 - 17 - 11EPM in the Rural Municipality of Alexander. Effluent (treated wastewater) from the wastewater treatment lagoon would be discharged to an existing municipal drain that empties to the Winnipeg River. Effluent would be discharged between June 15<sup>th</sup> and November 1<sup>st</sup> of any year. The existing wastewater treatment plant will be decommissioned and the site restored to surrounding conditions once the wastewater treatment lagoon is commissioned.

The Proposal and supporting documentation, prepared by Cochrane Engineering Ltd., indicates that the soils at the site of the proposed lagoon consists of lacustrine clay over bedrock. Supporting documentation indicates that clay soil available at the site is expected to meet provincial standards regarding hydraulic conductivity of soils used for construction of wastewater treatment lagoons.

A preliminary review of the Proposal determined that some information, necessary for the Technical Advisory Committee (TAC) review, was not provided. On April 26, 2001 a letter was sent to Cochrane Engineering Ltd. requesting that additional information be submitted in support of the Proposal. On May 28, 2001 Cochrane Engineering Ltd. submitted a response to the request for additional information.

The Department, on June 12, 2001, placed copies of the EAP report in the Public Registries located at 123 Main St. (Union Station); the Centennial Public Library and the Bibliotheque Allard and provided copies of the EAP report to the Canadian Environmental Assessment Agency, the Clean Environment Commission, and TAC members. As well, the Department placed public notifications of the EAP in the Lac du Bonnet Leader, Pinawa Paper and Winnipeg River Echo on Tuesday, June 19, 2001. The newspapers and TAC notifications invited responses until July 11, 2001.

On July 12, 2001 and July 23, 2001 Manitoba Conservation forwarded comments that had been received from the public and TAC to the proponent. Additional

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information that would address the concerns presented in the comments was requested from the proponent.

On July 23, 2001 Manitoba Conservation submitted responses from the public and TAC members to the appropriate Public Registries.

On August 13, 2001, Manitoba Conservation received a response to the request wherein the proponent responded to the concerns presented. The response was dated August 10, 2001.

On August 29, 2001 the response was distributed to the representatives of the TAC and the public who had generated questions during the initial assessment for review and comment.

On August 30, 2001 Manitoba Conservation received a response from Environment Canada - Environmental Protection indicating that there previous comments had been addressed in the proponents August 10, 2001 response.

On September 21, 2001 Manitoba Conservation received a response from TAC indicating that their review of the proponents August 10, 2001 response had not produced any concerns.

On September 24, 2001 an update of the EAP review activities was sent to the Canada-Manitoba Infrastructure Secretariat in conformity with their request following their initial review.

On September 26, 2001 Manitoba Conservation forwarded a letter from the public, dated September 25, 2001, to the proponent requesting that the comments and concerns contained in the letter be specifically addressed.

On October 24, 2001 the proponent held a public meeting to discuss outstanding concerns. Manitoba Conservation did not attend the meeting because notification of the scheduling of such a meeting was not provided.

On December 11, 2001 Manitoba Conservation received a letter from the proponent suggesting that the concerns raised by the public had been sufficiently addressed.

On January 10, 2002 and January 14, 2002 Manitoba Conservation received two letters from representatives of different water co-ops indicating that issues pertaining to the EAP had not yet been resolved.

On January 22, 2002 a meeting was held with the purpose of addressing the concerns of the water co-ops. Following discussions and review, the concerns were addressed. One water co-op group was satisfied that their concerns were alleviated. The other water co-op suggested that an amicable agreement, regarding a variable connection to the proposed municipal water distribution system, between their water co-op and the R.M. of Alexander would be the only way their concerns could be satisfied. Manitoba Conservation indicated that a copy of such an agreement must be provided to the Environmental Approvals Section before an Environment Act Licence would be issued.

On February 12, 2002 the Rural Municipality of Alexander passed Resolution 73/02 wherein the R.M. resolved that it agreed to enter into a water system connection agreement with Bruneauville Water Co-op under the terms and conditions detailed in correspondence dated February 6, 2002.

**COMMENTS FROM THE PUBLIC:**

<b><u>Name</u></b>	<b><u>Address</u></b>	<b><u>Date</u></b>	<b><u>Comment(s)</u></b>
Caya, Denis President, Maple Creek Water Co-op	Box 93 St. George, MB R0E 1V0	02/01/14	- Expressing interest and concerns regarding characteristics and potential impacts of effluent to be discharged.
Caya, Denis President, Maple Creek Water Co-op	Box 93 St. George, MB R0E 1V0	02/01/26	- Expressing thanks for having the opportunity to voice their concerns in a meeting forum; - Indicating that they are comfortable that their concerns have been alleviated; - Specifying that they have no other valid reason to oppose the undertaking.
Postnicks, Heather and Kelly Bruneauville Water Co- op	Box 96 Great Falls, MB R0E 0V0	01/07/20	- Intake for water co-op is in close proximity to discharge point of proposed lagoon the Winnipeg River; - Requesting a meeting to answer any questions respecting water quality and health concerns.
Postnicks, Heather and Kelly Bruneauville Water Co- op	Box 96 Great Falls, MB R0E 0V0	01/09/25	- Matters pertaining to concerns presented in letter of July 20, 2001 have yet to be addressed.
Postnicks, Heather and Kelly Bruneauville Water Co- op	Box 96 Great Falls, MB R0E 0V0	02/01/09	- A satisfactory agreement/arrangement, between the Bruneauville Water Co-op and the R.M. of Alexander, respecting existing equipment and future maintenance of such equipment has not been attained.
Postnicks, Heather and Kelly Bruneauville Water Co- op	Box 96 Great Falls, MB R0E 0V0	02/02/06	- The members of the Bruneauville Water Co-op have come to an agreement with the RM and the questions and concerns have been addressed adequately.
Tokar, Walter	Box 114 Great Falls, MB	01/07/11	- Requesting a Public Hearing regarding why the lagoon is necessary.

Disposition:

- The R.M. of Alexander Council selected a wastewater treatment lagoon as the most viable option for the necessary replacement of the existing wastewater treatment plant that is nearing the extent of its useful life;
- A new regional water system is expected to be installed over the long-term. Short-term mitigation will be dependent on deliberation with the Co-op. It is proposed that the water will be hooked up to an existing water system. Alternatively the intake could be relocated to an upstream location;
- The concerns of the Bruneauville Water Co-op have been alleviated by the agreement that is in place between the Rural Municipality of Alexander and the Co-op;
- The strawberry farmer pumps water out of the creek and holds it in a water storage pond on his property until it is used for irrigation. Depending on weather conditions, water may be pumped from the creek several times during the strawberry season. The R.M. has consulted with the farmer and has agreed to advise the farmer when the discharge will take place. One mitigation option would be to postpone pumping the irrigation water for a period when the lagoon is discharged. The R.M. may also be able to postpone the discharge until late July when the strawberry season is over. This will add to the required storage capacity, however, the 20-year population of the lagoon (600 people) is much higher than the present population (470 people), and the lagoon will have sufficient storage capacity to accommodate for the late discharge period;

**COMMENTS FROM THE TECHNICAL ADVISORY COMMITTEE:**

**Historic Resources**

- *No concerns.*

**Environment-Water Quality/Terrestrial Quality Management**

- *It would have been more appropriate to use only the water quality data and the flow data from McArthur generating station (MB05PF068) in the dilution estimation since it likely best reflects the conditions at Great Falls. It also would have been more appropriate to use minimum river flows in the estimation since this would provide a "worse case scenario". Instead, the proposal combined water quality data from a number of sites along the river and used average flows from hydrometric station MB05PR063 at Slave Falls in order to estimate the dilution of the effluent in the river. However, even minimum flows in the Winnipeg River at McArthur are very high in comparison to the effluent flow and the dilution factor afforded by the river is very large;*
- *Since some of the soil test holes encountered bedrock at varying depths, care should be taken during construction to ensure that a clay line of appropriate*

*thickness is maintained across the entire site to prevent seepage and potential contamination of soils and groundwater in the area;*

- *As part of a nutrient management strategy that is being developed the Department is concerned with any point source discharges that have the potential to impact the aquatic environment. As such, the proponent may be asked to take part in a watershed-based management plan should one be developed for the Winnipeg River drainage basin in the future.*

Disposition:

- The dilution factor in the Winnipeg River near any monitor station point in the vicinity of Great Falls is substantial. The impacts of using results from another nearby station point on analysis results are generally insignificant. The same can be said about the impacts of applying averaged, minimum or maximum flow rates in the river to dilution;
- Balance cut and fill or removal of a bedrock outcrop would be options if bedrock were encountered during construction;
- The R.M. of Alexander is committed to be involved with a watershed-based management plan.

#### **Transportation and Government Services**

- *No concerns.*

#### **Environment Canada - Environmental Protection**

- *The data in Table 7.1 on untreated effluent quality appear to be erroneous;*
- *Environment Canada's position on wastewater discharges is that they must be non-deleterious at the point of discharge to water frequented by fish in order to avoid possible violations of the Fisheries Act. Streams are generally considered as water frequented by fish even if they are used seasonally. If the drainage channel is considered as water frequented by fish, the discharge of elevated concentrations of un-ionized ammonia or other deleterious substances may be in violation of The Act. The Act does not allow for mixing zones or dilution in the receiving water;*

*Although it is stated in a number of areas in the report that there will be little or no impact as a result of the lagoon construction, there is generally no background information to substantiate these conclusions. We recommend that the proponent be requested to provide additional information on the above areas of concern, as follows:*

- *A description of the drainage creek leading to the Winnipeg River, including information on seasonal flows, fish species present and possible uses of the drainage route by fish (such as spawning);*
- *Predicted concentrations of ammonia (total and un-ionized) in the effluent prior to release in the spring and fall;*

- *Anticipated impacts of the wastewater to fish and other aquatic species along the drainage creek; and*
- *A description of the lagoon construction activities, including construction method, timing, anticipated impacts to migratory birds and other wildlife from vegetation removal/land clearing and any associated mitigative measures to be undertaken during construction, such as erosion control, scheduling to avoid impacts to possible nesting/rearing sites, etc.*

Disposition:

- Effluent quality data was available for biological parameters (including BOD<sub>5</sub>, Suspended Solids, Fecal Coliform and Total Coliform), but the wastewater has not been analysed for chemical parameters. Untreated municipal wastewater chemistry is well documented and there is no significant industrial activity in the area. Therefore chemical parameters from the water treatment plant would be similar to those expected in municipal wastewater resulting from domestic usage. The data for mineral pickup was obtained from the McGraw-Hill Series in Water Resources and Environmental Engineering and describe medium strength wastewater. Table 3.16 of the below referenced document provided average chemical parameters for effluent chemistry.

The water treatment plant draws in water from the Winnipeg River where it is filtered through a pressure filter and disinfected. Therefore the water chemical parameters from the water treatment plant would be similar to those from the Winnipeg River.

Typical effluent data on individual parameters found in domestic wastewater were estimated using Winnipeg River water quality and the incremental range of mineral pickup resulting from water use. The data displayed shows the typical mineral pickup in medium strength wastewater. Where mineral pickup data was unavailable, average concentrations of parameters in medium strength wastewater were used.

- Water in the drainage creek flows north into the Winnipeg River. The water level in the creek is at its peak in the spring due to runoff. During the summer the water level is fairly low (approximately 1 meter). Where the creek meets the river it is approximately 10 meters wide and the width upstream is variable (between 5 to 10 m). Beaver dams are common along the creek. Local residents believe that there are likely no fish living in the creek. This, they suggest is likely a result of the “rocky bottom and the fluctuating water levels”. However, it is possible that fish could enter the creek from the Winnipeg River. Downstream of the proposed lagoon water is in the creek year round and freezes in the winter.

On August 8, 2001 a site visit to the proposed lagoon and discharge creek was conducted. A beaver dam was spotted on the creek approximately 500 m from the mouth of the Winnipeg River. Upstream of the dam water was stagnant, warm and full of algae. Downstream water was free flowing. It is unlikely that water upstream from the creek would be suitable for fish acclimatized to the Winnipeg River.

- In facultative stabilization ponds, ammonia gas may be removed by natural aeration.



Removal of ammonia in facultative stabilization ponds may approach 99%, with the majority of the removal occurring in the primary cell of the facility. The degree of ammonia removal is dependent on the wastewater pH, surface to volume ratio, temperature, and mixing conditions.

Ammonia removal in ponds can be estimated by assuming the 1<sup>st</sup> order reaction (EPA design manual municipal wastewater stabilization ponds).

No ammonia removal would occur in the winter when the lagoon is covered in ice. Climatic records were obtained from Environment Canada. Two discharges are expected to take place: one in late June and one in October, thus two average temperatures were obtained for the period prior to discharge and two  $C_e$  values were calculated. The average temperatures from March to June and from July to October were 10.6°C and 14.3°C, respectively.

The typical concentration of ammonia in medium strength untreated domestic wastewater is 25 mg/L (McGraw-Hill Series in Water Resources and Environmental Engineering, 1991). The calculated concentration of ammonia in the effluent discharged from the secondary cell in June is 0.9 mg/L and in October is 0.5 mg/L.

- Effluent concentrations of ammonia were compared to the Manitoba Water Quality Standards, Objectives, and Guidelines (MWQSOG), Draft 2000. The MWQSOG were determined assuming average water temperatures of 20°C and 10°C for the June and October discharge periods, respectively.

Acute toxicity is dependent on the concentration that an organism is exposed to over a short time period from a point source. The concentration at the point source where the effluent is discharged would be reflected by the  $C_e$  following treatment in the total lagoon. The  $C_e$  values were compared to the MWQSOG Acute and the CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life.

The ammonia concentrations are much lower than the MWQSOG Acute values and the CCME Guidelines. No negative impacts of the ammonia to fish and other aquatic species along the drainage creek are anticipated.

In addition to ammonia, typical substances found in wastewater were compared to the CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life. The substances included Al,  $HCO_3$ , B, Ca, Cl,  $CO_3$ , F, Mg, Mn,  $NO_3$ ,  $PO_4$ , P, K, pH, Na, S, Total Dissolved Solids, Total Alkalinity, Total Organic carbon, Total Suspended Solids, Chemical Oxygen Demand, and Grease. All parameters expected to be in the discharge effluent, excluding Aluminium (Al) were either below or not included in the CCME Guidelines.

There was no fact sheet created for Al. The 1987 CCME Guideline was 100 µg/L for Al, however it is scheduled for review, revision or future development. Further, the guideline value is already exceeded by the current Winnipeg River concentration of 351 µg/L and it is likely that the water quality in the creek will be very similar to that of the river. The untreated wastewater is expected to contain 511 µg/L.

Aluminium is amphoteric, and may undergo hydrolysis in the following equilibrium equation:



Based on the above equation, the higher the pH, the higher the concentration of the product. Aluminum in the  $\text{Al}^{3+}$  form is toxic while the other forms are not toxic. At a pH of 8.04, the proportion of Al in the non-toxic form would be much higher than that of the toxic form  $\frac{[\text{Al}(\text{OH})^{2+}]}{[\text{Al}]^{3+}} = 10^{3.24}$ . As there will be extremely small quantities of Al available as  $\text{Al}^{3+}$  it is highly unlikely that there will be any adverse impact on aquatic life in the creek.

- Land use of the area is designated as a general agricultural zone, and land clearing and associated noise will be equivalent to that generated from general agricultural activity.

The construction will consist of clearing and excavation of a small portion of land in the vicinity of and adjacent to the area of the proposed lagoon. The clearing will disturb a narrow portion of land, including the movement of soils and vegetation. Heavy equipment will be used to excavate soil from the proposed cells. A buffer zone of vegetation approximately 30 m between the creek and construction area will mitigate against erosion and sedimentation.

Construction as described above may generate noise and other short-term disturbances, which may cause some emotional stress to mammals and lead to a temporal loss of habitat. However, as the land has been used for agriculture, the area has already been disturbed and already contains very little habitat. The impacts to large mammals will be minimal to nil. It is suggested that construction take place in the autumn when it will have the least impact on the breeding bird population as well as the flora and fauna communities.

#### **Canadian Environmental Assessment Agency**

- *The 2001 CEAA responses have indicated that application of The Canadian Environmental Assessment Act with respect to this proposal will be required. Environment Canada and Health Canada would be able to provide specialist advice in accordance with Section 12(3) of the Act.*
- *The Canada-Manitoba Infrastructure Secretariat has requested to be kept abreast of the environmental assessment activities related to this project.*

Disposition:

- The Canada-Manitoba Infrastructure Secretariat has been kept abreast of the environmental assessment activities and proposal activities in general.

#### **PUBLIC HEARING:**

A public hearing was requested. Although no public hearings were held, the concerns and interest of those requesting a public hearing were addressed and satisfied through discussions and public meetings. A meeting with representatives of water co-ops that draw water from the Winnipeg River at locations near to the location where the municipal

drain proposed for use as the discharge route was held to discuss issues and determine necessary efforts to alleviate concerns. The issues were resolved.

**RECOMMENDATION:**

An Environment Act Licence be issued in accordance with the attached draft. Enforcement of the Licence should be assigned to the Approvals Branch until the soil testing has been completed.

**PREPARED BY:**

Robert J. Boswick, P. Eng.  
Environmental Engineer  
Municipal & Industrial Approvals  
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Telephone: (204) 945-6030  
Fax: (204) 945-5229  
E-mail Address: rboswick@gov.mb.ca