



March 12, 2019

WSP Project No. 151-12617-00

Ms. Siobhan Burland Ross, M. Eng., P. Eng., A/Director
Manitoba Sustainable Development
1007 Century Street
Winnipeg, MB R3H 0W4

Dear Ms. Burland Ross:

**Subject: R.M. of Ritchot – St. Adolphe Wastewater Treatment Lagoon – Clause 18 Response –
EAL No. 2776 R
Client ref.: File No. 2633.10**

The original two-cell St. Adolphe wastewater treatment lagoon was constructed in 1983. Expansion occurred in 2007, where the Primary Cell was expanded and a new Secondary Cell was constructed to the east of the existing cells, resulting in a three-cell facility. In 2016, the existing Primary Cell was converted to a Secondary Cell and the larger Secondary Cell (on the east side) was converted into a Primary Cell to better accommodate growth with the Community. The Environment Act Licence (EAL) was updated to reflect this change and was issued as EAL No. 2776 R on July 22, 2016.

Clause 18 of this latest EAL addresses the need for a sludge assessment report to be submitted to the Director prior to the conversion of the existing lagoon cells and has been copied below:

The Licencee shall, prior to putting the converted cells of the wastewater treatment lagoon into operation, submit a report to the Director for approval respecting the impact of sludge buildup on the total operating depth of the wastewater treatment lagoon along with a complete assessment of options for the beneficial reuse of sludge including details of the sampling and analysis results, and proposed actions relative to the ultimate disposal of the sewage sludge.

A response to this Clause was overlooked and therefore was not completed within the timeframe established in the EAL. Recent correspondence from the Environmental Approvals Branch inquiring as to the status of this report has prompted the R.M of Ritchot (RM) to retain WSP Canada Inc. (WSP) to complete this work.

On behalf of the RM, WSP has prepared this letter report for review and approval by Manitoba Sustainable Development in an effort to satisfy the requirements of Clause 18.

Sludge Investigation

On February 14, 2019, representatives from WSP were onsite at the St. Adolphe lagoon to conduct a sludge depth assessment. Within the former Primary Cell, a total of sixteen (16) holes were augered through the ice in various locations to assess the depth of sludge with a graduated probe. The area of the cell floor is approximately 2.21 ha.

As was mentioned, the former Primary Cell was expanded in the 2007. Fourteen (14) of the sludge depth testing locations were in the original Primary Cell area and two (2) were in the expansion area.

As would be anticipated, the sludge thickness was greatest around the former forcemain outlet into the cell, with a maximum thickness of 0.53 m. However, in the other areas of the original Primary Cell, the sludge depth ranged between 0.10 – 0.16 m. In the expansion area of this cell, the sludge depth was 0.02 m. In total, the cell has approximately 3,000 m³ of sludge with an average sludge depth of 0.12 m over the cell bottom area. The total remaining volume of the deadspace (i.e. beneath a depth of 0.3 m) in the original Primary Cell is approximately 4,000 m³.

Based on the 0.02 m thickness of sludge in the expansion area of the former Primary Cell, it is reasonable to conclude that the sludge thickness in the former Secondary Cell (now the current Primary Cell) will be at or lower than this depth. Therefore, the current Primary Cell has up to 1,500 m³ of sludge and a total remaining deadspace volume of 20,400 m³ (at minimum).

Sludge Removal

Regarding its removal, the RM of Ritchot has four options for the sludge in the converted cells, including:

- agricultural land application,
- placement on the existing or expansion lagoon cell dykes,
- use as a soil amendment to establish vegetation at the RM's Class 1 waste disposal facility, or
- burial in a landfill

Land application

The R.M. of Ritchot has 53.5 acres of agricultural land available directly to the east of the St. Adolphe lagoon. This land would be available for the land application of the sludge when the time comes for its removal.

Dyke placement

As approved in a past, a second option is for the RM to place and compact dried sludge above the maximum water level or rip rap in any of the existing cells or future expansion cells. This type of application benefits the establishment of vegetation (grass seed and alfalfa) on the dykes.

Soil amendment

The RM has a Class 1 waste disposal facility located in the south half of 32-8-4 EPM. A composting facility is also established at this site. Dried sludge could be mixed with compost and used as a soil amendment on top of a capped disposal cell for the purpose of establishing vegetation.

Burial

The least desirable option is burial of the sludge in a landfill. All other uses of the sludge would be exhausted before this option would be considered as it does not provide a beneficial end use of the product.

WSP Recommendation

It is our opinion that there is no pressing need to remove the sludge from the former or the current Primary Cell based on the sludge depth assessment. Sludge begins to pose operational problems when it nears 0.30 m in thickness, which is the typical height of intercell and discharge piping inverts within lagoon cells. As discussed, the average sludge accumulation in both cells is well below 0.30 m. The forcemain area in the former Primary Cell is well removed from any active piping and therefore the sludge in this area does not affect the operation of the lagoon.

As such, WSP has recommended to the RM of Ritchot that they initiate a reserve fund to deal with the sludge in the St. Adolphe lagoon as well as all lagoons within the RM. Realistically, the sludge within the current or former primary cells will not require removal for 10-20 years, even with the use of chemical dosing for phosphorus

reduction. Growth within the Community will dictate the next lagoon expansion in the next 5-10 years. At this time, the RM will have an opportunity to revisit the sludge accumulation within the lagoon cells. Sludge sampling and analysis will only be performed at the time of its removal.

We trust that this report satisfies the requirements of Clause 18 of the current EAL No. 2776 R. If you would like to discuss this matter further, please contact the undersigned.

Kind Regards,

A handwritten signature in black ink, appearing to read 'Jason Bunn', with a stylized flourish at the end.

Jason Bunn, P.Eng.
Engineer, Wastewater Infrastructure

cc: Mike Dumaine – Public Works Manager, Municipality of Ritchot
Asit Dey, P.Eng. – Manitoba Sustainable Development