



February 11, 2016

File No. 15-0321-01

Conservation and Water Stewardship
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ATTENTION: Ms. Tracey Braun
Director

RE: St. Laurent Lagoon Assessment
Notice of Alteration - Sandy Bar Road Wastewater Treatment Facility

Dear Ms. Braun:

This Notice of Alteration letter and enclosed \$500 application fee are being submitted to Manitoba Conservation and Water Stewardship (MCWS) to request an amendment to the Clean Environment Commission Order 744 (CEC744) for the Manitoba Housing Authority Sandy Bar Road Wastewater Treatment Facility (commonly referred to as the St. Laurent Lagoon, See Figure 1 Site Plan). This Notice of Alteration is being submitted to request an amendment respecting the discharge practices and procedures in response to the MCWS letter, dated February 26, 2015. Details of how the discharge operations vary from the license requirements and associated effects are given in the following sections, to obtain formal authorization from MCWS and for inclusion in the Client File No. 318.15.

1.0 EFFLUENT DISCHARGE PRACTICE

The CEC744 requires Manitoba Housing Authority to:

- Ensure that effluent is discharged to Lake Manitoba by means of an enclosed pipe.

The February 26, 2015 letter from MCWS indicates that the current effluent discharge practice is to pump effluent over the berm from the Secondary Cell in to the surrounding marshy area encircled by the flood protection dike. This practice is inconsistent with the requirements of CEC744. It is understood that there is a 2 inch buried pipe extending from the Secondary Cell to Lake Manitoba to facilitate discharge; however, mechanical failure of this system resulted in the above noted deviation from licensed discharge practices many years ago.

As discussed with local Environment Officer Kurt Dorward, discharge from the Secondary Cell directly to Lake Manitoba is no longer considered to be the best practice or most practical option for the facility with many cabins along the shoreline. The current practice of discharging to the adjacent wetland has not raised concerns from the local residents even with a regular summer/warm weather discharge over the past several years.

Surface release of treated lagoon effluent is a commonly accepted practice, when in a suitable operational setting. The following factors have been considered when evaluating the application at this facility:

- Lagoon loading from the senior's residence, the local school, and eight homes operated by Manitoba Housing Authority;
- Lagoon capacity including use of the flood protection dike as a holding cell for treated effluent; and
- Discharge schedule.

1.1 LAGOON LOADING ESTIMATES

It is understood that the Sandy Bar Road Wastewater Treatment Facility once serviced the local school, a senior's residence, and thirty-four houses along Buffalo Drive and Louis Riel Drive. According to a Sewage Lagoon Data Sheet, dated April 23, 1979, that was provided to KGS Group by Kurt Dorward for review, the design capacity of the facility considered a population of 197 residents and 512 persons at the school. The facility was designed for a hydraulic loading of 18,000 m³ per 196 days, with discharge twice per year. The Primary Cell and Secondary Cell were designed to have capacities of 19,000 m³ and 12,000 m³, respectively.

The loading on this facility has recently been reduced by the closure of many of the homes. Eight homes, each with an average of four residents, the senior's residence, and the school will continue to use this facility for wastewater treatment. An estimated total daily flow is detailed below.

WASTEWATER CONTRIBUTION CATEGORIES	ESTIMATED NUMBER OF INDIVIDUALS	HYDRAULIC LOADING RATE (L/person/day)	ESTIMATED TOTAL DAILY FLOW (L/day)	ESTIMATED TOTAL YEARLY FLOW, m ³
Senior Residents	22	350	8,750	3,200
Students and Faculty	150	200	30,000 (210 days/year)	6,300
Manitoba Housing Authority Homes	8 houses, 32 persons	350	11,200	4,100
TOTAL			49,950	13,600

Based on the current use of the facility, the total yearly flow is approximately 40% of the maximum design capacity.

1.2 LAGOON CAPACITY AND RETENTION TIMES

It is proposed that the area between the flood protection dike and the existing cells be used as a holding cell for treated effluent before surface release occurs. This can be accomplished by installing a new interconnecting valve on the Secondary Cell of the lagoon and converting the culvert through the flood protection dike to a valve. The location of the new valves (as shown on Figure 1) will be documented and marked within the facility. By introducing a holding cell, the capacity of the facility will be increased approximate total capacity of 52,000 m³.

At a combined total yearly flow of approximately 13,600 m³/year, the combined maximum hydraulic retention time for the Primary Cell and Secondary cell is approximately 24 months. By introducing the holding cell, this retention time increases to more than 3.5 years.

1.3 DISCHARGE SCHEDULE

The CEC744 requires Manitoba Housing Authority to:

- Ensure that no discharge of effluent takes place between the 1st day of November in any one year and the 15th day of May in the following year; and,
- Ensure that no discharge of effluent takes place between the 15th day of June and the 15th day of September in any one year.

Based on the increased retention time provided by the holding cell, it is recommended that effluent discharge from the holding cell to the marshy area immediately west of the dike be conducted once annually within the month of October and prior to freezing conditions, which is consistent with the requirements of CEC744. In the recent past, discussions with Kurt Darward indicated that this lagoon system has been discharged twice per year and has had some difficulty meeting the effluent discharge standards, especially in the fall. The proposed alteration will mitigate these concerns.

1.4 DISCHARGE PATH

The sections above indicate that the Sandy Bar Road Wastewater Treatment Facility is in a position of reduced loading, while also being able to increase retention times of treated effluent with minor alterations to the facility. These conditions will combine to produce a more polished final effluent with 50% smaller volume that is suitable for surface discharge to the marshy land immediately west of the flood protection dike. This area is within the Manitoba Housing Authority right of way and has been the practice for the past decade or more. The proposed discharge location in relation to the Manitoba Housing right of way is shown on Figure 1. Manitoba Housing Authority requests that the use of the holding cell and annual discharge to the marshy area be considered an acceptable treatment and discharge process for the effluent at the facility.

2.0 LAGOON FACILITY IMPROVEMENTS

The MCWS letter dated February 26, 2015, identified specific areas for improvement at the Sandy Bar Road Wastewater Treatment Facility. In addition to correcting these conditions, Manitoba Housing Authority has identified additional areas for improvement. These are discussed in more detail below.

2.1 ACCESS ROAD

The facility access road runs from Buffalo Drive, between two Manitoba Housing Authority homes, over the flood protection dike, and up to the facility gate. The road passes through a low-lying area that is commonly wet, and often difficult to pass. Additionally, there is no turnaround point for vehicles other than the lagoon berms.

In consideration of the long-term use of the facility, Manitoba Housing Authority has proposed a relocation of the access road. Therefore, the existing road will not be repaired, but a new road will be constructed to suitable conditions. The proposed road alignment is shown on Figure 1.

2.2 FENCING

The facility is surrounded by a chain link fence with a single access gate to the east of the Primary Cell. The fence is intended to discourage trespassing and prevent wildlife from entering the facility. As identified in the February 26, 2015 letter from MCWS, sections of the fence are in poor condition and warrant repair. Manitoba Housing will complete these repairs, and also relocate the access gate to the location of the new access road.

2.3 INTERCONNECTING VALVES

The February 26, 2015 letter from MCWS indicated that the interconnecting valve between the Primary Cell and Secondary Cell needed to be checked for functionality. It has been confirmed that this valve is not currently operational and the other valve could not be located. Both of these valves will be replaced, and the locations will be documented and marked within the facility. A third valve will be adapted into the current culvert to allow discharge from the holding cell to the marsh area.

2.4 DREDGING OF THE PRIMARY CELL

During the installation of the interconnecting valves, the level of water within the Primary and Secondary cells will be lowered. During this time, the sludge accumulation within the Primary Cell will be assessed. It is proposed that the sludge be dredged and evenly redistributed across the base of the Primary Cell to maintain a uniform lagoon bottom. Should the accumulation be so great that it has begun to interfere with the required capacity of the lagoon, the material will be removed for external disposal. If external disposal is required, the composition of the sludge will be evaluated and an appropriate disposal location (ie. landfill vs land application) will be selected in consideration with MCWS.

2.5 BERM CONDITION

The Golder Associates Ltd. report titled "Lagoon Assessment, St. Laurent, Manitoba" dated October 24, 2013 (reference number 12-1380-0086) documents the findings of an investigation intended to evaluate the apparent stability of the lagoon berms. The report indicated that the berms were constructed of low permeability clay and silty clay. Although minor erosion and sloughing was observed, no significant stability issues were identified at the time.

However, from an operational standpoint, Manitoba Housing Authority has identified that the berm between the Primary and Secondary cells is both low and narrow. In order to preserve freeboard conditions and improve access for maintenance equipment, it has been proposed that this portion of the berm be improved upon during the overall facility upgrades.

The berm will be surveyed to determine the required surface elevation. This low area will be raised using local compacted clay at the same time the road improvements are completed.

3.0 LAGOON OPERATIONS

It is understood that operation of the Sandy Bar Road Wastewater Treatment Facility is to be completed by an operator certified through the MCWS Water & Wastewater Facility Operators Certification Program. Moving forward, a certified operator will be employed to complete monthly inspections of the facility, manage discharge events, and provide on-call services.

4.0 SCHEDULE FOR LAGOON IMPROVEMENTS

Manitoba Housing Authority intendeds to complete the above noted repairs and improvements within the 2016 calendar year. The planned schedule is to tender the work in April, and discharge from the Secondary Cell in May in order to facilitate the work that requires low water conditions within the lagoon.

5.0 CLOSURE

We trust the above information is adequate for an alteration notification and inclusion in the Client File. Should you have any questions or wish to discuss this letter further, please do not hesitate to contact the undersigned.

Prepared By:

Approved By:

Alex Beveridge, P.Eng.
Senior Environmental Engineer

Rob Sinclair, P.Eng.
Manager, Environmental Services

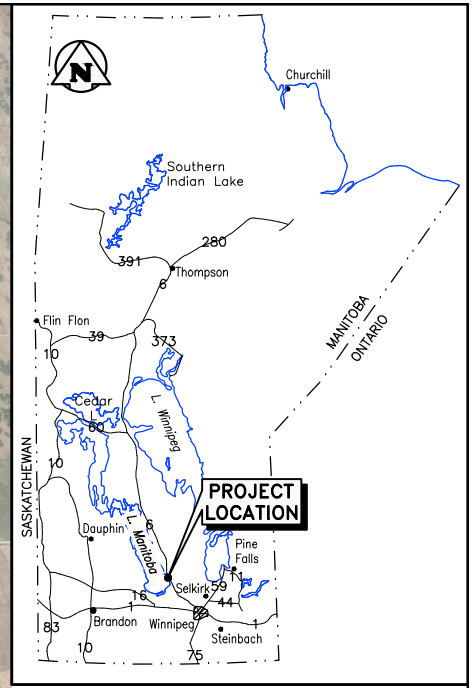
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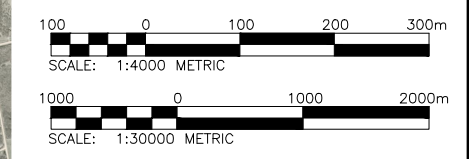
FIGURE 01

DRAFT

File Name: U:\FMS\15-0321-001\15-0321-001_601.dwg - Tab: 001 Plotted By: rmeilleur 16/02/11 [Thu 10:07am] 11x17" PLOT SCALE: 1"=2'



- LEGEND:**
- V-1 REPLACEMENT VALVE
 - V-2 NEW VALVE
 - V-3 NEW VALVE IN PLACE OF CULVERT
 - MANITOBA HOUSING RIGHT OF WAY
 - DISCHARGE AREA
 - PROPOSED ALIGNMENT OF ACCESS ROAD



NO.	YY/MM/DD	DESCRIPTION	ISSUED BY	CHECK BY
B	16/02/12	RE-ISSUED WITH DRAFT REPORT	ASB	RDS
A	15/11/07	ISSUED WITH DRAFT REPORT	ASB	RDS

REVISIONS / ISSUE

LAGOON ASSESSMENT
ST. LAURENT, MANITOBA

SITE PLAN

NOVEMBER 2015	FIGURE 01	REV: B
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