ENGINEERING CONSULTANTS

October 16, 2018

600\607 The Pas, Town\607.05\01\183\Ltr - Response to MBSD.docx

Mr. Asit Dey, P.Eng.
Environmental Approvals Branch
Manitoba Sustainable Development
1007 Century Street
Winnipeg, Manitoba
R3H 0W4

Via Email and Mail

T-607.05

Dear Mr. Dey,

RE: Town of the Pas – Wastewater Treatment Lagoon Upgrade and Sludge Land Application EAP (File No: 144.40) – Response to Comments from Manitoba Sustainable Development - Environmental Approvals Branch

The following comments were provided in an email from Mr. Asit Dey, of Manitoba Sustainable Development - Environmental Approvals Branch, dated September 7, 2018, which required responses. The comments provided are bolded and are followed by the response.

1. **Please update the engineering drawings with the cross section details including the type of liner material present in the existing aerated cell and in the dewatering cell.**

   Due to the age of the original lagoon construction there are no design drawings which show details of the lagoon liner, however it is estimated that the lagoon dikes were constructed from excavated and compacted soil material from the cell construction area. To our understanding no geotechnical investigation has occurred on the existing lagoon dikes to confirm the liner composition, therefore detailed cross section drawings of the existing lagoon dikes cannot be produced at this time. A 1996 design drawing from UMA Engineering (attached) indicated that muskeg was removed from the construction and replaced with a minimum of 0.9 m of compacted clay.

2. **Please comment on whether the existing aeration cell is able to treat the proposed design year 20 organic load. Does the existing aeration cell require any alteration?**

   Based on the 2010 Wastewater Assessment by AECOM, the existing aeration cell an organic treatment capacity of 1,020 kg BOD_5/day. From Section 2.7.1 of the EAP, it is projected that the daily organic load to the lagoon in design year 20 will be 669.5 kg BOD_5/day, therefore the existing aeration cell should have sufficient organic treatment capacity. The only alteration to the aeration cell will be the installation of a baffle curtain in the middle of the cell to promote more consistent flow through the cell.

3. **Does the Town have an enforceable Industrial Services Use Agreement with Berscheid Meat Industries?**

   The Town of the Pas does not have a specific service use agreement with Berscheid Meat Industries.

4. **Per Table A in Section 2.5.2 of the EAP, the dykes of the proposed SAGR cells will be constructed to an elevation above the 100 year flood elevation from Grace Lake. Please comment on the 100-year flood plain elevation for the proposed site and please indicate the elevation of the top of the dykes of the proposed SAGR cells and the existing aerated cell.**

   Based on information provided by Manitoba Infrastructure, the 100 year flood protection level from Grace Lake is 261.48 m. The elevation of the SAGR cells top of dike will be determined during the design phase,

based on cut and fill requirements, however the average existing ground surface elevation in the development area was measured at 262.20 m. Therefore, the top of dike elevation will be greater than the 100 year flood protection elevation for Grace Lake. The average elevation of the existing aeration cell top of dike is 264.70 m.

5. **Section 2.9 of the EAP states that Environment Act Licence No. 2209 S1 issued to operate the lagoon after the 1996 upgrades limited the lagoon to an organic capacity of 510 kg BOD_5/day at a flow rate of 3,563 m^3 per day and a useable lagoon volume of 82,030 m^3. Could you please comment on whether the discharge pipe is located at least 0.3 m above the floor and whether the usable volume calculation excluded the volume associated with the dead space below the discharge pipe?**

   The Pas lagoon is a mixed aerated cell and there is no dead space volume to consider below the discharge pipe, as the lagoon is never completely discharged. The invert depth of the discharge pipe is not known and no record drawings of the lagoon construction were available from the licencee.

6. **Per the Environment Act Proposal, the wastewater treatment lagoon will be operated like a wastewater treatment plant; please comment what will be the project's biosolid management strategy after commissioning of the SAGR cells?**

   Sludge accumulation in the aeration cells will be measured every 10 years. If required, the sludge would be removed from the cell floor and placed in the adjacent dewatering cell. After dewatering, the sludge would be applied to agricultural land (if available), upon approval of Manitoba Sustainable Development.

7. **Please comment on the installation method for the baffle curtain.**

   The baffle curtain will float on the surface of the lagoon and will be anchored into the dikes and to the lagoon floor. Installation would require a boat in the lagoon cell and equipment for anchoring. Details of the installation will not be available until the works are tendered to a construction contractor.

8. **During our site visit on June 27, 2018, severe erosion was observed on the inside dyke of the lagoon near the truck dumping station. Please note that the truck dumping station and the inside slope of the dyke are required to be repaired. Please submit a Notice of Alteration at your earliest convenience.**

   The licencee will be made aware of the need for a Notice of Alteration for the repair of the dike and truck dump spillway.

9. **Please comment on how the wastewater will be treated during desludging of the existing aerated lagoon. It appears from Section 2.8.2.3 that the biosolids from the existing dewatering cell will be land applied. Is there any plan to decommission the existing dewatering cell?**

   The continuous discharge of effluent will be temporarily suspended during the desludging process to avoid releasing high quantities of suspended solids. The freeboard capacity in the aeration cell will be utilized to temporarily store the incoming effluent. After desludging, time will be given to allow solids settling in the cell prior to continuing the lagoon discharge. There is no plan to decommission the existing dewatering cell and it will continue to be used for future desludging of the lagoon.

10. **Can the proponent provide information on the other water uses of Grace Lake?**

    Grace Lake is primarily used for float planes at the Grace Lake airport.

11. **Can the proponent demonstrate that the volume of the mixing zone does not exceed 10% of volume of those portions of the receiving waters available for mixing or a 100 m radius, whichever is less?**

    There is unsufficient data to determine the mixing zone in Grace Lake, however since the effluent quality requirements will be met upon discharge, there is a low risk for impacts to aquatic life in the Lake.

12. **The proposal indicates that alum is the proposed method of phosphorus removal using an alum addition system into the gravity sewer system upstream. Can the proponent indicate where in the gravity sewer system alum will be added? Can the proponent describe how the alum dosage would be determined?**

    The alum would be added into the last manhole prior to leaching the lagoon cell, which is located approximately 18 m from the lagoon. The alum dosage would be calculated from the phosphorus levels in grab samples of the lagoon influent, assuming a mole ratio of 3:1. The phosphorus testing will be completed on the treated effluent and the dosage adjusted as needed.

13. **Maps from detailed soils reports indicate that the proposed system located on NW 2-56-26 EPM is a nutrient management zone N4. Under Section 14(1) of the Nutrient Management Regulation (62/2008), a wastewater system cannot be located in a Zone N4. The proponent should obtain services of a pedologist to confirm the classification of the land parcel. Attached is the most recent listing of pedologists. If a pedologist reports that the site is confirmed to be a Zone N4 and the Proponent still wants to locate a wastewater treatment and disposal system in this location, the Proponent will need to apply in writing to the Director of the Water Science and Watershed Management Branch, Box 14, 200 Saulteaux Cres, Winnipeg, Manitoba, R3J 3W3 for authorization.**

    The proponent will be contacting the Water Science and Watershed Management Branch to discuss locating the SAGR cells on this proposed land parcel.

14. **Biosolids application rate calculations were made using an incorrect phosphorus test. As a result, the application rates are too high. The Proponent has used the Olsen-P test on biosolids as available phosphorus; this test is for soil and provides an index of the likelihood of crop response to phosphorus fertilizer. It is not appropriate for biosolids and even in soils it does not measure plant available P. The Proponent should estimate plant available P in the biosolids as a percentage of total phosphorus (total phosphorus is under "metals in Soil by CRC ICPMS" in the lab analysis they provided. The proposal refers to an EPA 1995 application rate of 2x crop P removal for canola of 74 kg P_2O_5/ha (2x37 hg/ha – Table 2.4 in the proposal), the correct primary cell rate is 7.5 dry tonnes/ha and the dewatering cell rate is 10.6 dry tonnes/ha. Please note, biosolid application is not permitted on land with a soil test which is above 60 ppm Olsen-P in the top 15 cm.**

    After reassessing the biosolids application rate for phosphorus utilizing 50% of the total phosphorus and 2 x the crop P removal for canola (74 kg P_2O_5/ha), the application rate for the primary cell would be 7.5 dry tonnes/ha and 10.6 dry tonnes/ha for the dewatering cell. Based on this revised calculation, Phosphorus would then be the limiting factor for the sludge application rate and the total land requirement would then be 460 hectares for both the lagoon cell and the dewatering cells.

Hopefully the above responses sufficiently address your concerns regarding this project.

Sincerely,

JR Cousin Consultants Ltd.

Oswald Wohlgemut, M.Sc.
Environmental Scientist

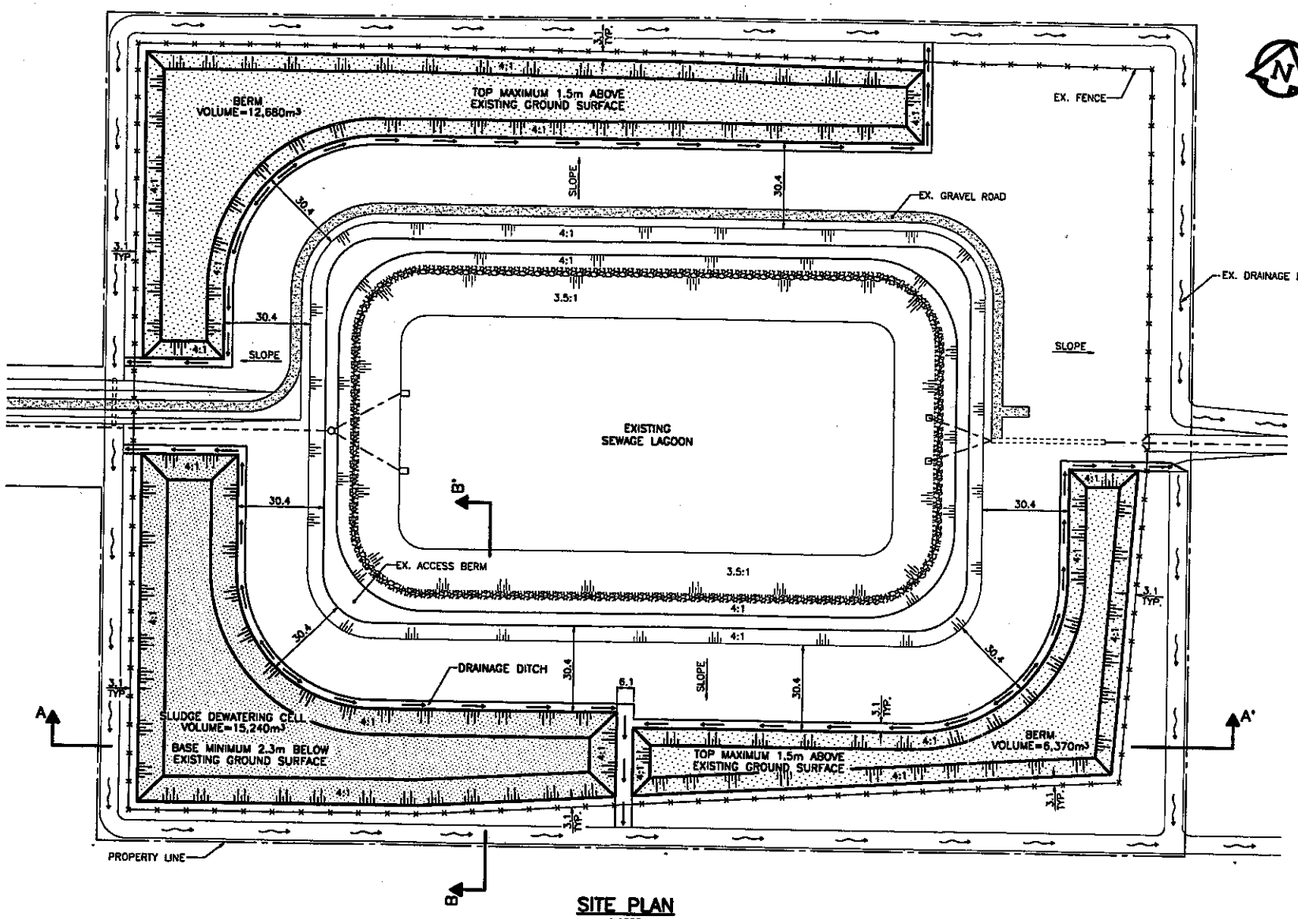
Reviewed by

Jason Cousin, P.Eng.
Municipal Engineer

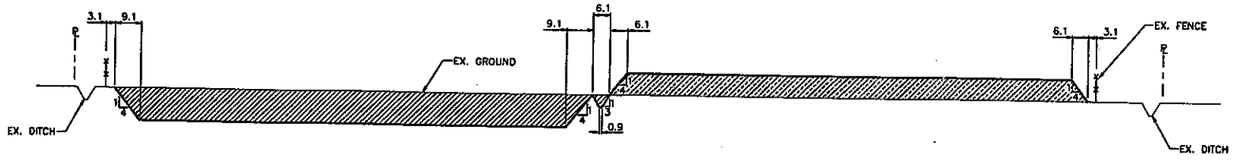
cc Sam Mirza-Agha, Town of the Pas – via email

Attachments

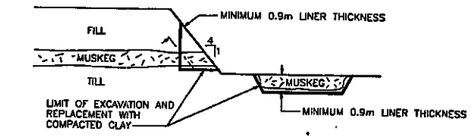
UMA Engineering Ltd. Lagoon Layout Plan, August 1996.



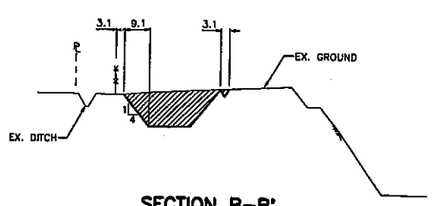
SITE PLAN
1:1000



SECTION A–A'
HORIZ = 1:1000
VERT = 1:200



TYPICAL CUT–OFF CONSTRUCTION
HORIZ = 1:500
VERT = 1:100



SECTION B–B'
HORIZ = 1:1000
VERT = 1:200

For Reference Only

CONSTRUCTION NOTES

1. Confirm dimensions of existing features prior to construction.
2. Position crest of sludge dewatering cell a minimum of 30.4m from the existing toe of the 4H:1V slope at the lagoon access berm.
3. Position berm toe of excavated material a minimum of 30.4m from crest of lagoon slope.
4. Position the crest of sludge drying bed and toe of berms at 3.1m from existing fence.
5. Construct slopes no steeper than 4H:1V.
6. Excavate muskeg encountered in the sideslopes and cell floor; replace with compacted clay to minimum thickness of 0.9m between the slope face and muskeg. Compact clay in horizontal lifts not thicker than 0.2m.
7. Compact clay backfill, sludge bed floor and sideslopes to a minimum of 95% of Standard Proctor Maximum Dry Density at a moisture content between 0% and 2% above optimum moisture content.
8. Construct drainage ditches at the sludge bed crest and berm toe to discharge into the existing drainage ditch. Establish the elevation and flow direction of the ditch at the time of construction.
9. Place topsoil and seed berms after construction with Canada No. 1 Grade seed using existing or imported topsoil.

DO NOT SCALE

REV.	DESCRIPTION	DWN.	APP.	DATE

SEAL

SEAL

UMA Engineering Ltd.
Engineers & Planners
1479 Buffalo Place, Winnipeg, Manitoba, Canada R3T 1L7

APPROVED BY _____ DATE _____

DRAWN BY: DML	DESIGNED BY: DY
CHECKED BY:	CHECKED BY:
SCALE: AS NOTED	JOB No. 0044-094-01

THE TOWN OF THE PAS

SLUDGE DEWATERING CELL

PLAN AND SECTIONS

DWG. No. 01 REV. -

AUG 21/96
PLOT SCALE: 1=1
SITEPLAN.dwg