



Sustainable Development

Environmental Stewardship Division
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October 23, 2017

Jayne Sheppard, P.Eng.
Canadian Kraft Paper Industries Ltd.
Box 1590
The Pas, MB R9A 1L4
Email: jayne.sheppard@ckpi.com

Dear Jayne Sheppard:

**Re: Canadian Kraft Paper Industries Ltd. - Land Application of Industrial Sludge
(Pilot Study) – Minor Alteration Approval - Environment Act Licence No. 1339 RR**

I am responding to the October 16, 2017 Notice of Alteration, submitted by Kristiina Cusitar, with AECOM, relative to a request for alteration to Environment Act Licence No. 1339 RR (licence), originally issued for operation of the Development being an existing 400 tonne per day Kraft Pulp Mill and the proposed 500 tonne per day Bleached Kraft Mill at The Pas, Manitoba. The October 16, 2017 submission along with additional information submitted on October 20, 2017 and October 23, 2017 is considered a Notice of Alteration (NoA) pursuant to Section 14 of The Environment Act.

The intent of the NoA is to conduct a pilot study to determine the feasibility to land apply the industrial biosolids generated at the Development for pasture production and to reduce reliance on the landfill. It was proposed to remove biosolids from the north settling basin of the Development and land apply them on portions of 26-56-26WPM at an approved agronomic rate for pasture production.

Upon review of the NoA, I am satisfied that the identified changes in the environmental effects of the pilot study are insignificant. Therefore, pursuant to Section 14(2) of The Environment Act, I hereby approve the proposed pilot study activities pursuant to the following conditions:

1. The Licencee shall not stockpile biosolids at any location prior to being introduced to the pilot study activities.
2. The Licencee shall not cause or permit an odour nuisance to be created as a result of the pilot study, and shall take such steps as the Director may require to eliminate or mitigate an odour nuisance.

"odour nuisance" means a continuous or repeated odour, smell or aroma, in an affected area, which is offensive, obnoxious, troublesome, annoying, unpleasant or disagreeable to a person:

- a) residing in an affected area;
 - b) working in an affected area; or
 - c) present at a location in an affected area which is normally open to members of the public; if the odour, smell or aroma
 - d) is the subject of at least 5 written complaints, received by the Director in a form satisfactory to the Director and within a 90-day period, from 5 different persons falling within clauses a), b) or c), who do not live in the same household; or
 - e) is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses a), b) or c) and the Director is of the opinion that if the odour, smell or aroma had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90-day period, from 5 different persons who do not live in the same household.
3. The Licencee shall land apply the biosolids to Site No. 2 located on portions of 26-56-26 WPM as identified in Schedule "A" of this authorization for pasture production at an average application rate of 156 tons per hectare.
 4. The Licencee shall confirm that a pasture crop is grown on portions of 26-56-26 WPM after the biosolids are applied.
 5. The Licencee shall submit a Notice of Alteration with information on proposed application rates if there is any change in crop types.
 6. The Licencee shall transport biosolids in containers in such a manner to prevent loss of biosolids and associated liquids to the satisfaction of an Environment Officer.
 7. The Licencee shall notify the assigned Environment Officer not less than ten days prior to the commencement of removal, transportation and land incorporation or land injection of biosolids. The notification shall include the intended starting date of the activities and the name of the contractor responsible for the activities.
 8. The Licencee shall locate all fuel storage and equipment servicing areas established for the construction and operation of the Development a minimum distance of 100 metres from any waterbody, and shall comply with the requirements of Manitoba Regulation 188/2001 respecting Storage and Handling of Petroleum Products and Allied Products Regulation or any future amendment thereof.
 9. The Licencee shall:
 - a) apply the biosolids originating from the north settling basin of the Development to the identified agricultural land by broadcasting from a spreader followed by incorporation into the soil using a disc or cultivator within two days of spreading such that the depth at which the biosolids are introduced into the soil is a minimum of 15 centimetres below the soil surface and there is no surface expression; and
 - b) complete the incorporation of the biosolids such that it is acceptable to an Environment Officer.

10. The Licencee shall apply biosolids such that the amounts of residual nitrate-nitrogen in the 0-24 inch soil depth and Olsen-P phosphorus in the 0-6 inch soil depth do not exceed the limits of the most limiting Nutrient Management Zone, regardless of size, set forth in the Nutrient Management Regulation under The Water Protection Act or any future amendment thereof.
11. The Licencee shall not permit the application of biosolids:
 - a) between November 10th of any year and April 10th of the following year, unless otherwise authorized in writing by the Director;
 - b) to frozen soil;
 - c) less than 75 metres from any occupied residence (other than the residence occupied by the owner of the land on which the sludge solids are to be applied);
 - d) less than 400 m from a residential area;
 - e) less than 8 metres from a major wetland, bog, marsh or swamp;
 - f) less than the distance between the water's edge and the high water mark from a wetland, bog, marsh or swamp other than a major wetland, bog, marsh or swamp;
 - g) less than 15 metres from a first order waterway;
 - h) less than 30 metres from a second, or higher order waterway;
 - i) less than 50 metres from any groundwater well used for drinking water purposes; or
 - j) on land that is subject to flooding.
12. The Licencee shall not apply biosolids on land:
 - a) with a depth of clay or clay till of less than 1.5 metres between the soil surface and the water table;
 - b) within 100 metres of an identifiable boundary of an aquifer which is exposed to the ground surface;
 - c) where, prior to the application of biosolids, the soil pH is less than 6.0;
 - d) where the surface slope of the land is greater than 5 percent;
 - e) where, prior to the application of biosolids, the level of nitrate- nitrogen exceeds 100 kilograms per hectare in the upper 60 centimetres of the soil; or
 - f) where, prior to the application of biosolids, the concentration of sodium bicarbonate extractable phosphorous, as P, exceeds 60 micrograms per gram in the upper 15 centimetres of the soil.
13. The Licencee shall apply biosolids onto agricultural land such that the cumulative weight per hectare of each heavy metal in the soil, as calculated by adding the amount of each heavy metal in the sludge solids applied to the background level of the same metal, does not exceed the following levels:*

<u>Metal</u>	<u>Kilogram per Hectare</u>
Arsenic	21.6
Cadmium	2.5
Chromium (total)	115.2
Copper	113.4
Lead	126
Mercury	11.9
Nickel	90
Zinc	360

*Calculated values shall be based on a soil bulk density of 1200 kilograms per cubic metre and a soil depth of 15 centimetres. Analysis for heavy metals must be carried out in accordance with Schedule "C" of this NoA approval.

14. The Licencee shall not allow cattle to pasture on land on which biosolids have been applied, for a period of three years from the date of application of the biosolids.
15. The Licencee shall submit to the Director, not later than the 1st day of December in the year of biosolids applications, the details of the biosolids sampling and analysis programs used to determine the volumes and solids contents of the biosolids removed on a daily basis and the volume and the solids contents of biosolids applied to each field.
16. The Licencee shall submit to the Director, not later than the 30th day of December in the year of biosolids, the details of the field monitoring programs on the biosolids disposal operations used to determine:
 - a) the sodium bicarbonate extractable phosphorous, as P, in the upper 15 centimetres of the soil;
 - b) the nitrate-nitrogen and total nitrogen in the upper 60 centimetres of the soil;
 - c) the pH of the soil;
 - d) the surface slope of the land;
 - e) the presence of clay and clay till to a depth of 1.5 metres;
 - f) the number of hectares in each field that can receive sludge solids in accordance with the NoA approval; and
 - g) the number of hectares on which sludge solids were applied on a daily basis.
17. The Licencee shall conduct a monitoring and analysis program that is acceptable to the Director, and in accordance with Schedules "B" and "C" of this NoA approval to determine:
 - a) the composition of the biosolids;
 - b) the background levels of selected soil parameters for each parcel of land; and
 - c) the crops grown on land on which biosolids have been applied during the previous 3-year period.
18. The Licencee shall, on or before the 30th day of December of each year that this NoA approval is in effect, submit to the Director a report, which will include the following:
 - a) details of the biosolids land application programs carried out during the previous 12 month period including:
 - i) a description of each parcel of land on which biosolids were distributed;
 - ii) the background levels of soil parameters as listed in Schedule "B" of this NoA approval, for each parcel of land;
 - iii) the dry weight of biosolids and sludge solids applied per hectare;
 - iv) the weight of each heavy metal, in milligrams per kilogram of soil, added to each parcel of land for the metals listed in Schedule "B" of this NoA approval; and
 - v) the cumulative weight, in kilograms per hectare, of each heavy metal for each parcel of land as calculated by adding the amount of each heavy metal applied to the background level of the same metal;
 - b) the amount of nitrogen, phosphorus, and potassium which was added per hectare for each parcel of land;

- c) the results of analysis of the biosolids and sludge solids and soil required by this NoA approval;
 - d) a copy of the analytical procedures used and the results of analysis of reference materials in accordance with Schedule “C” of this NoA approval; and
 - e) the type of crops grown on land on which biosolids and sludge solids were applied during the previous 3-year period.
19. The Licencee shall undertake annual post harvest soil testing of each field for Nitrate N (0- 24”) and phosphorus using the Olsen-P test (0- 6”) for 3 years following biosolids and sludge solids application. Additionally, the Licencee shall supply information from the producer regarding the amounts of nutrients from other sources (fertilizer, manure, etc.) being added to the field. Such soil test, fertilization, and cropping information shall be submitted to the Director on or before the 15th day of March of each year following a year when application of sludge solids occurred.
20. The Licencee shall, upon completion of this pilot study, submit an Environment Act Proposal for the Land Application of Biosolids generated from the facility in order to obtain an Environment Act Licence for any future land applications of biosolids generated from the Development.
21. This NoA authorization shall terminate on the 30th day of April, 2018.

Should you have any questions concerning this approval, please contact Asit Dey, Environmental Engineer at (204) 945-2614 or at Asit.Dey@gov.mb.ca.

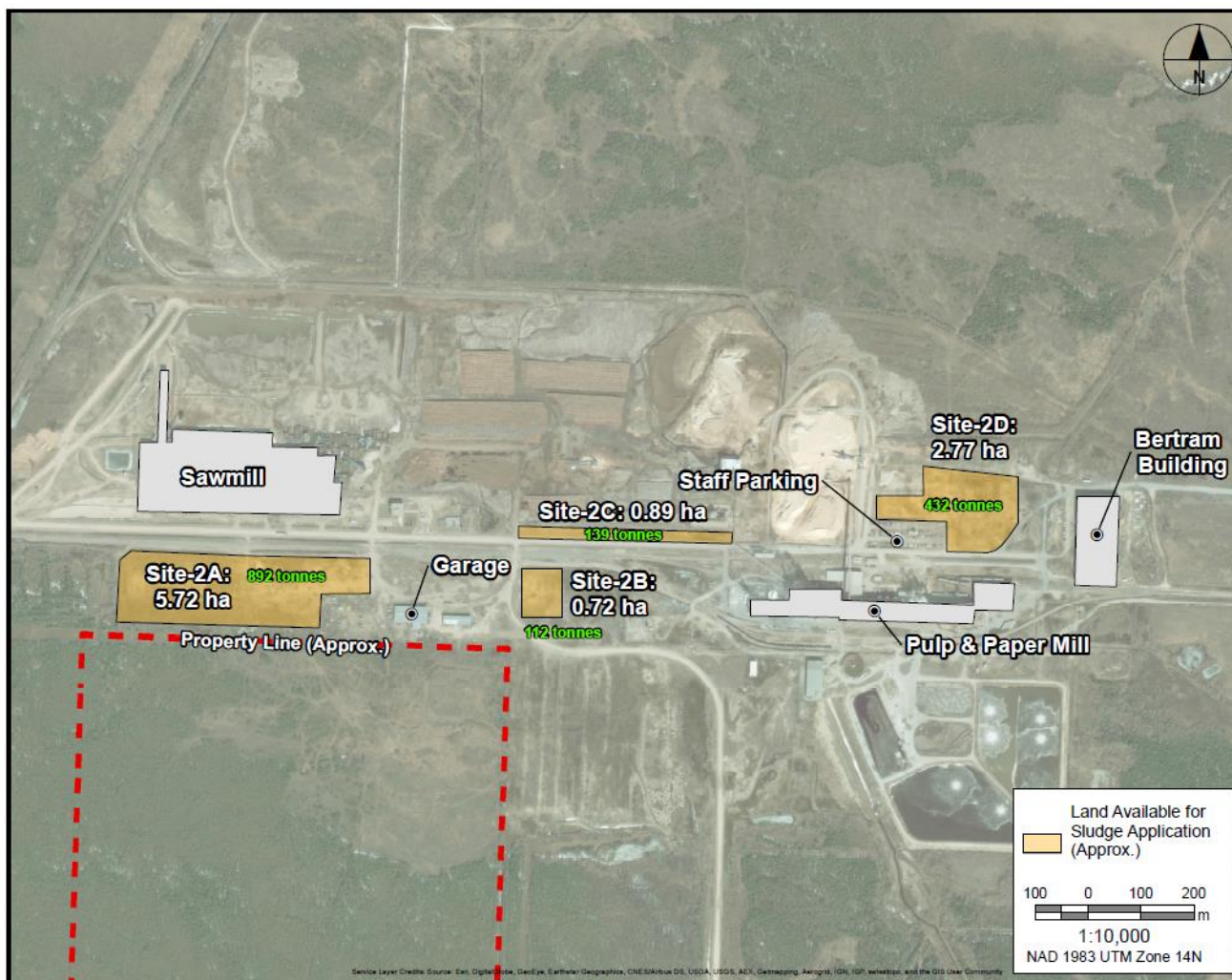
Yours sincerely,



Tracey Braun, M.Sc.
Director

- c. Clifton Samoiloff/ Kristiina Cusitar, AECOM
Don Labossiere/ Tim Prawdzik/ Cristal Huculak, Environmental Compliance and Enforcement
Public Registries

SCHEDULE "A"



SCHEDULE “B”

Biosolids and Sludge Solids

1. A representative sample of biosolids and sludge solids shall be collected from each cell of the wastewater treatment lagoon from which biosolids and sludge solids will be removed. A representative sample of biosolids and sludge solids shall be a composite of sludge samples taken from a minimum of 5 locations distributed over the surface of the cell.
2. The sample of biosolids and sludge solids shall be analyzed for the following parameters:*

a.	conductivity	j.	lead
b.	pH	k.	mercury
c.	total solids	l.	nickel
d.	volatile solids	m.	potassium
e.	nitrate nitrogen	n.	cadmium
f.	total Kjeldahl nitrogen	o.	copper
g.	ammonia nitrogen	p.	zinc
h.	organic nitrogen	q.	chromium
i.	total phosphorus by very strong acid digestion (EPA 3050b or EPA 200.2)	r.	arsenic

*Analysis for heavy metals must be carried out in accordance with Schedule “C” of this NoA approval.

Soil

1. Composite samples from each field onto which biosolids and sludge solids will be applied shall be taken prior to application of biosolids and sludge solids. Each field of twenty-four hectares or less shall be sampled from a minimum of twelve representative sites or a minimum of one sample site per two hectares for larger fields. Each sample site shall be sampled from 0 to 15 centimetres and from 0 to 60 centimetres. The entire core extracted for each sample shall be collected. All samples from similar depths within a field shall be bulked in one container for thorough mixing prior to analysis yielding two samples per field.
2. Soil samples from 0 centimetres to 15 centimetres shall be analyzed for the following:
*

- | | | | |
|----|---|----|----------|
| a. | pH | g. | cadmium |
| b. | potassium | h. | chromium |
| c. | nickel | i. | copper |
| d. | mercury | j. | lead |
| e. | zinc | k. | arsenic |
| f. | sodium bicarbonate extractable phosphorus, as P | | |

*Analysis for heavy metals must be carried out in accordance with Schedule “C” of this NoA approval.

3. Soil samples from 0 to 60 centimetres shall be analyzed for the following:
 - a. nitrate nitrogen
 - b. total nitrogen

Crops

1. The type of crop grown on lands on which biosolids and sludge solids have been applied during the previous 3-year period shall be listed along with the legal description of the land and the date of application of sludge solids.

SCHEDULE “C”

The analysis for all metals shall be carried out in accordance with the following requirements:

1. Soil and sludge samples shall be prepared using non-contaminating grinding and sieving procedures such as agate or porcelain mortar and pestle along with nylon sieves. Soil samples shall be ground to at least 100 mesh size prior to digestion or sample pretreatment.
2. Analysis for heavy metals must be carried out following strong acid digestion.
3. The laboratory performing these analyses shall operate an acceptable quality assurance program including the following:
 - a) Samples of reference material shall be analyzed to monitor the accuracy of the sludge and soil analyses and each set of ten or less samples of sludge or soil shall include, a minimum of the following:
 - i) For sludge samples:
 - one NIST domestic sludge sample (SRM 2781);
 - ii) For soil samples:
 - one NIST Estuarine Sediment sample (SRM 1646a); or
 - one NIST San Joaquin Soil sample (SRM 2709); or
 - a replacement reference soil sample, acceptable to the Director, with analyte concentrations that reflect values found in the field samples; and
 - b) Field duplicates of samples shall be analyzed based on a frequency of one in each set of ten or less field samples and that the acceptance criteria for duplicate analysis should be within ± 10 percent.
4. A copy of the analytical procedures and the analytical results for the reference materials, and any other controls used in the analysis, shall be submitted with the field sample results.
5. If the analytical results of the reference materials do not meet the following criteria, the soil and/or sludge samples must be re-analyzed:

- Arsenic	± 35 percent from the reference value
- Cadmium	± 25 percent from the reference value (for values above 1 $\mu\text{g/g}$)
- Cadmium	± 35 percent from the reference value (for values below 1 $\mu\text{g/g}$)
- Chromium	± 25 percent from the reference value
- Copper	± 25 percent from the reference value
- Lead	± 25 percent from the reference value
- Mercury	± 35 percent from the reference value
- Nickel	± 25 percent from the reference value
- Zinc	± 25 percent from the reference value