



Environment, Climate and Parks

Environmental Approvals Branch
1007 Century Street, Winnipeg MB R3H 0W4
T 204-945-8321 F 204-045-5229
www.manitoba.ca/sd

File No.: 3440.20

July 11, 2022

Dave Howes, Director of Regulatory Affairs
Miller Environmental Corporation
1803 Hekla Ave., Winnipeg MB R3N 0T1
daveh@millerenvironmental.mb.ca

Dear Dave Howes:

Re: Miller Environmental Corporation – Leachate Crop Irrigation Pilot Project Approval – Dangerous Goods Handling and Transportation Act Licence No. 58 HW S2 RRRR

Thank you for your pilot project proposal dated May 13, 2022. The proposal is requesting approval to assess the viability of leachate crop irrigation as an alternative leachate treatment. The pilot project will be conducted at Miller's hazardous waste management facility located on NE 2-3-1 EPM within the Rural Municipality of Montcalm.

I am satisfied that the environmental effects resulting from the proposed pilot project would be insignificant. I approve the implementation of the proposal in accordance with Schedule A of this approval.

All clauses of Dangerous Goods Handling and Transportation Act Licence No. 58 HW S2 RRRR remain in effect.

If you have any questions about this approval, please contact Edwin Yazon, Environmental Engineer, Environmental Approvals Branch at Edwin.Yazon@gov.mb.ca or 431-335-2554.

Sincerely,

Original signed by,
James Capotosto
Director

Enclosures

- c. Paul Bauer, Yolo Ortiz – Miller Environmental Corporation
Arman Vahedi - Crocus Environmental Inc.
Kristal Harman, Yvonne Hawryliuk, Tyler Kneeshaw - Environmental Compliance and Enforcement
Asit Dey, Edwin Yazon - Environmental Approvals
Public Registry

Schedule A to July 11, 2022 Leachate Crop Irrigation Pilot Project Approval

SPECIFICATIONS, LIMITS, TERMS, AND CONDITIONS

1. This approval is valid until December 31, 2023.
2. The licensee shall construct a pre-treatment system and irrigation plots:
 - a) in a pilot crop area described in the May 13, 2022 proposal, unless otherwise approved by the director of Environmental Approvals Branch;
 - b) in a suitable compacted clay area to prevent leachate contaminating groundwater; and
 - c) with berms described in the May 13, 2022 proposal to prevent escape of leachate in the pilot crop area.
3. The licensee shall, prior to commencement of drip irrigation, submit to the director for approval record drawings and specification of the pilot crop area, including:
 - a) size;
 - b) thickness of the compacted clay base;
 - c) height of the berms;
 - d) depth of soil over the compacted clay base; and
 - e) drip irrigation lateral layout and spacing.
4. The licensee shall, in the event of an accidental spill of leachate, take all necessary actions to report the spill by calling the Environmental Emergency Response Line at 204-944-4888 (toll free 1-855-944-4888) in accordance with regulatory requirements, contain the spill, manage the impacted environment, and restore the environment to the satisfaction of the director of the Environmental Compliance and Enforcement Branch.
5. The licensee:
 - a) shall carry out leachate crop irrigation using drip irrigation method, unless otherwise approved by the director of the Environmental Approvals Branch;
 - b) shall reduce the irrigation application rate when ponding or surface runoff occurs during irrigation; and
 - c) shall not carry out the leachate crop irrigation:
 - i. when soil is frozen;
 - ii. when crop is not actively growing;
 - iii. for more than 10 continuous hours in any 24 hour period;
 - iv. within 300 metres of any dwelling not owned or not lawfully controlled by the licensee;
 - v. within 15 metres of a groundwater feature covered by permanent vegetation or 20 metres of a groundwater feature without any permanent vegetation;
 - vi. between the water's edge and the high water mark of a wetland, bog, marsh, or swamp other than a major wetland, bog, marsh or swamp;
 - vii. within 30 metres of a lake or reservoir, not designated as vulnerable;
 - viii. within 15 metres of a river, creek or stream designated as vulnerable;
 - ix. within 3 metres of a river, creek or stream designated as vulnerable, a 3rd order drain or higher, a major wetland, bog, marsh or swamp, or a constructed retention; or
 - x. where there is escape of leachate from the containment berms or property boundary.

**Schedule A to July 11, 2022 Leachate Crop Irrigation Pilot Project
Approval (cont'd)**

6. The licensee shall not, unless otherwise approved by the director:
 - a) recirculate any liquid to the repository cells; and
 - b) release any liquid from the pilot crop area.

7. The licensee shall conduct a monitoring and analysis program, in accordance with Schedules B and C of this approval to determine the following:
 - a) leachate composition;
 - b) background levels of selected soil parameters of the irrigation plots before leachate crop irrigation;
 - c) levels of selected soil parameters of the irrigation plots after each harvesting period; and
 - d) total metals accumulated in the crops in the irrigation plots after each harvesting period.

8. The licensee shall not allow pollutants in the soil to exceed CCME Tier 1 Guidelines for Agricultural Soils, unless approved by the director.

9. The licensee shall, in the event that metal accumulation results in contaminated and unsuitable soil conditions or that any pollutants exceed CCME Tier 1 Guidelines for Agricultural Soils or Nutrient Management Regulation:
 - a) restrict land use; and
 - b) take necessary actions to restore the soil to the satisfaction of the director.

10. The licensee shall submit to the director of the Environmental Approvals Branch a final report on the findings and recommendations of the pilot project by February 28, 2024. The final report shall include, but not limited to, the following:
 - a) details of the field monitoring programs on the leachate crop irrigation pilot project;
 - b) a study about full-cycle biomass solutions including bio-enhancement additive;
 - c) volume of leachate;
 - d) scheduling of leachate crop irrigation;
 - e) fertilizer applications (if applicable);
 - f) type of crops grown on the irrigation plots;
 - g) mass of crops harvested;
 - h) copies of the laboratory analytical results in accordance with clause 7 of Schedule A;
 - i) summary of laboratory analytical results in accordance with clause 7 of Schedule A; and
 - j) discussion of the results of monitoring and analysis carried out in accordance with clause 7 of Schedule A.

Schedule B to July 11, 2022 Leachate Crop Irrigation Pilot Project Approval

Monitoring and analysis requirements pursuant to clause 7 of Schedule A

A. Pretreated Leachate

1. Representative samples of treated leachate shall be collected from the pre-treatment system.
2. The sample of leachate shall be analyzed for the following parameters*:
 - a. conductivity
 - b. pH
 - c. polycyclic aromatic hydrocarbons (PAHs)
 - d. petroleum hydrocarbons fractions – F1 to F4
 - e. BTEX
 - f. sodium adsorption ratio
 - g. total organic carbon
 - h. total solids
 - i. volatile solids
 - j. nitrate nitrogen
 - k. ammonia nitrogen
 - l. total phosphorus
 - m. total hardness
 - n. aluminum
 - o. antimony
 - p. arsenic
 - q. barium
 - r. beryllium
 - s. bismuth
 - t. boron
 - u. cadmium
 - v. calcium
 - w. cesium
 - x. chromium
 - y. cobalt
 - z. copper
 - aa. iron
 - bb. lead
 - cc. lithium
 - dd. magnesium
 - ee. manganese
 - ff. mercury
 - gg. molybdenum
 - hh. nickel
 - ii. potassium
 - jj. rubidium
 - kk. selenium
 - ll. silicon
 - mm. silver
 - nn. sodium
 - oo. strontium
 - pp. sulfur
 - qq. tellurium
 - rr. thallium
 - ss. thorium
 - tt. titanium
 - uu. tungsten
 - vv. uranium
 - ww. vanadium
 - xx. zinc
 - yy. zirconium

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

**Schedule B to July 11, 2022 Leachate Crop Irrigation Pilot Project
Approval (cont'd)**

B. Soil Metals (Analysis for heavy metals must be carried out in accordance with Schedule C of this approval.

- | | |
|--------------|---------------|
| a. aluminum | t. molybdenum |
| b. antimony | u. nickel |
| c. arsenic | v. potassium |
| d. barium | w. rubidium |
| e. beryllium | x. selenium |
| f. bismuth | y. silicon |
| g. boron | z. silver |
| h. cadmium | aa. sodium |
| i. calcium | bb. strontium |
| j. cesium | cc. sulfur |
| k. chromium | dd. tellurium |
| l. cobalt | ee. thallium |
| m. copper | ff. thorium |
| n. iron | gg. titanium |
| o. lead | hh. tungsten |
| p. lithium | ii. uranium |
| q. magnesium | jj. vanadium |
| r. manganese | kk. zinc |
| s. mercury | ll. zirconium |

Polycyclic Aromatic Hydrocarbons

- | | |
|---------------------------|---------------------------|
| a. Acenaphthene | k. Fluoranthene |
| b. Acenaphthylene | l. Fluorene |
| c. Bntracene | m. Indeno(1,2,3-cd)pyrene |
| d. Benzo(a)anthracene | n. 1+2-Methylnaphthalenes |
| e. Benzo(a)pyrene | o. 1-Methylnaphthalene |
| f. Benzo(b&j)fluoranthene | p. 2-Methylnaphthalene |
| g. Benzo(g,h,i)perylene | q. Naphthalene |
| h. Benzo(k)fluoranthene | r. Phenanthrene |
| i. Chrysene | s. Pyrene |
| j. Dibenz(a,h)anthracene | |

Other parameters

- | | |
|---|----------------------------|
| a. agronomic soil texture | k. sodium adsorption ratio |
| b. conductivity | l. total organic carbon |
| c. pH | m. total solids |
| d. alkalinity | n. volatile solids |
| e. chloride | o. nitrate nitrogen |
| f. sulphate | p. total Kjeldahl nitrogen |
| g. petroleum hydrocarbons
fractions – F1 to F4 | q. ammonia nitrogen |
| h. BTEX | r. organic nitrogen |
| i. COD | s. total phosphorus |
| j. BOD | t. Olsen phosphorus |
| | u. total hardness |

**Schedule B to July 11, 2022 Leachate Crop Irrigation Pilot Project
Approval (cont'd)**

C. Crops

1. The type of crops grown on the irrigation plots shall be identified.
2. Each type of crop samples shall be analyzed for the following parameters:
 - a. aluminum
 - b. antimony
 - c. arsenic
 - d. barium
 - e. beryllium
 - f. bismuth
 - g. boron
 - h. cadmium
 - i. calcium
 - j. cesium
 - k. chromium
 - l. cobalt
 - m. copper
 - n. iron
 - o. lead
 - p. lithium
 - q. magnesium
 - r. manganese
 - s. mercury
 - t. molybdenum
 - u. nickel
 - v. phosphorus
 - w. potassium
 - x. rubidium
 - y. selenium
 - z. Silicon
 - aa. silver
 - bb. sodium
 - cc. strontium
 - dd. sulfur
 - ee. tellurium
 - ff. thallium
 - gg. thorium
 - hh. titanium
 - ii. tungsten
 - jj. uranium
 - kk. vanadium
 - ll. zinc
 - mm. zirconium

Schedule C to July 11, 2022 Leachate Crop Irrigation Pilot Project Approval

The analysis for all samples obtained pursuant to clause 7 of Schedule A shall be carried out in accordance with the following requirements:

1. The laboratory performing these analysis shall:
 - a) possess and maintain accreditation with the Canadian Association for Laboratories Inc. (CALA);
 - b) operate a quality assurance program acceptable to the assigned environment officer;
 - c) monitor the accuracy of the leachate and soil analyses for each set of samples of leachate or soil through the use of a suitable reference material acceptable to the assigned environment officer; and
 - d) analyze field duplicates of samples with acceptance criteria of ± 10 percent.

2. A copy of the analytical procedures and the analytical results for associated reference materials used in the laboratory, and any other controls used in the analysis, shall be submitted with the field sample results.

3. If the analytical results of any associated materials do not meet the following criteria, the leachate and/or soil samples must re-analyzed:
 - a. Arsenic ± 35 percent from the reference value
 - b. Cadmium ± 25 percent from the reference value
(for values above 1 microgram/gram)
 - c. Cadmium ± 35 percent from the reference value
(for values below 1 microgram/gram)
 - d. Chromium ± 25 percent from the reference value
 - e. Copper ± 25 percent from the reference value
 - f. Lead ± 25 percent from the reference value
 - g. Mercury ± 25 percent from the reference value
 - h. Nickel ± 25 percent from the reference value
 - i. Zinc ± 25 percent from the reference value