REGIONAL MUNICIPALITY OF WATERLOO

WATERLOO REGION LANDFILL LIAISON COMMITTEE (WRLLC)
MEETING SUMMARY

DATE: Tuesday September 8, 2020
TIME: 7:00 P.M.
LOCATION: Virtual meeting

Attendees
Neil & Trudy Haffner
David Hollinger
Deb Hayes
Lillian Bass
Bridget Mills - BCX

Distribution
All Attendees – via email
Peggy Boettger
Harald Drewitz
Elaine Mortensen
Kim Hulm
John Strong
Trevor Mahoney
Eric Boyd
Ernst Alge
Rob Parent
Judy Rys
Rick Wallace
Robert Milligan
Jessica Alessio
Garry Bezruki
Mark Burns
Judith Lodi
H. Kayser
Fred Veller
Jivco Velimironii
Christine Saboutin
Nesib & Ljiliana Omerasevic
Aliya Malik
Mark Christensen
Jeremy Hetherington
Chris Spraakman
Dante Trigiani

Wilf Ruland – Hydrogeology Consultant
Brittney Crawford – RMOW
Tracy Annett – RMOW
Mike Greenhill – RMOW
Linda Churchill – RMOW

Ajoy Opal
Pam Kaur
Greg Voisin
Dale Ross
Anne Childs & Gary Hale
Henrik Noesgaard
Zahra Chuhtai
Tony Lea
Celia Valente & John Tracey
Cheryl Madill
Gerry Wettlaufer
Holly Corrigan
Gert Hardman & Angus McCleod
James Jackson – Waterloo Chronicle
Jennifer Yessis
Dana Mohammed - MOE, Guelph
Elizabeth Clarke – RMOW Councillor
Westvale Comm. Assoc. – c/o Eric Boyd
Sean Strickland – RMOW Councillor
Thomas Schmidt - RMOW
Dave Hardy – Hardy Stevenson & Associates
Bil Ioannidis – City of Kitchener Councillor
Albert Hovingh – RMOW
Kaoru Yajima – RMOW, Water Services
Tim Ware – RMOW
Brenna MacKinnon - RMOW
Linda welcomed everyone to the first landfill liaison meeting being held virtually due to the pandemic. Linda, Tracy and Mike were at the Waste Management Centre in the conference room as there is a maximum of four people allowed in the room to allow for social distancing. Residents were able to participate in the virtual meeting by using the chat function or by unmuting and speaking.

To begin the meeting, the Region gave a presentation on the leachate and gas collection systems at the Waterloo Landfill. The presentation covered an overview of the Waterloo Landfill Site, how waste decomposes, the by-products from decomposition and how the Region handles these by-products (leachate and landfill gas). The Region gave a brief demonstration of the SCADA (Supervisory Control and Data Acquisition) system the Region uses in the operation of the leachate and gas systems and spoke of the current challenges in operating these systems.

Lillian asked if there was currently a way to automate the systems to determine if odours are present and be more proactive in responding to the odours by automatically adjusting the gas collection system. Linda said that the monitoring is of the gas and leachate and it would be unable to determine if odours are present in the ambient air. The current ambient air monitoring is done at discrete, specific times. There is a 2019 Odour Abatement Program that Linda will forward to Lillian that outlines the Region’s strategies to reduce odours. The Region is also updating the Landfill Gas Action Plan to address best practices in landfill gas collection as the Region moves into developing the final cells in the landfill.

Bridget added that she is part of the committee to assess the site odour impacts and review how the Region addresses the odour impacts. Bridget highlighted one of the areas the Region has been working on is linking neighbourhood odours with the site operations and mitigative measures taken to control odours. This information is summarized and tracked in order to continuously improve how the Region operates the Site and environmental controls. She added that the Region is working hard to reduce odours and improve leachate management.

The Region’s presentation is attached.

1. Review of Previous Minutes & Business Arising

There were no comments on the previous minutes from February 4, 2020. The May meeting was cancelled due to the pandemic.

Previous minutes and agendas can be found on the Region website.

2. Complaints

There have been seven communications from March to August 2020; most during August (five) when the weather was hot and humid. In addition, there have also been complaints received in early September with the first cool night and warm day when the air has been very still.

The summary of complaints is attached to the minutes.
3. **Submittals from Local Residents**

There were no submittals from the residents.

4. **MECP Submittals**


In addition, the Region submitted an Updated Trigger Level Report March 27 and East Boundary Off-Site Vinyl Chloride Update March 27. There was also various correspondence regarding the monitoring well network and northwest corner works. Copies were generally provided to Wilf and Trudy and are available by request, please contact Linda or Tracy.

Upcoming submittals include an update on the East Boundary Status, and annual reports for the MRC air (due Sept 15) and compliance report (due October 1).

5. **Landfill Operations**

   i. The landfill gas control system ran at a monthly average flow of approximately 1120 cfm over the past six months. Attached is the table showing the monthly average gas flows for 2020.

   ii. The leachate pumping rates are also presented on the gas flow sheet (attached) under the column monthly total flow. Pumped volumes of leachate were quite a bit lower through the summer due to the dry and hot weather.

   iii. The south/east groundwater extraction system continues to operate with nine of ten wells pumping at a combined rate of approximately 1980 l/min. Most of the pumping rates have been increased in the 6 of 7 east side extraction wells since fall 2019. Monitoring has been ongoing to understand the influence that the increased pumping rates is having on the vinyl chloride on the eastern side of the Site. Extraction well EW361-09 was replaced and put back into operation on August 31st at a pumping rate of 460 L/min. This brings the total pumping rate to 2,440 L/min. On August 10th, the Region received an amended Permit to Take Water and with it, the approval to increase pumping rates at two extraction wells (EW379 and EW382). The Region will make a plan to increase the pumping rate at EW379 this fall. The pumping rates are available by request. They will be incorporated into the annual progress report.

   iv. The groundwater extraction building #2 upgrades are complete. The new vapour system was subsequently installed in July/August for odour control and is being programmed.

6. **Well Water Sample Results**

Private well samples were distributed in August, with May and July results. The next round of sampling will be collected this fall.
7. Landfill Studies

i. Tracy reported work is progressing on the East Side Vinyl Chloride Action Plan and an update will be submitted this fall to the MECP and Wilf. CRA will provide an update to the committee in November.

ii. The Landfill Development Sequencing and Landfill Gas Action plan committee had a socially distanced meeting in June. Bridget attended the meeting with the consultant, Golder Associates, and Regional staff. This work will determine the development of the remaining cells in the south expansion area as well as a detailed landfilling plan for the next five years including road works, capping, soil movement requirements and landfill gas system planning.

8. Other Business

i. The November 2020 and 2021 meetings were discussed. It is likely the November meeting will be held virtually in the same format. CRA Landfill Operations is planning on a groundwater update at the November meeting.

Bridget requested 10 minutes at the beginning of the November meeting to discuss air quality. The Region will put this on the agenda as well.

In 2021, the February meeting agenda will include the discussion from Wilf on his comments on the 2020 Annual Progress Report. Then the May meeting will discuss the final landfill development program being completed by Golder.

If any of the residents have any ideas on upcoming meetings and topics, please let Linda know.

ii. David Hollinger said that he has spoken to his MPP regarding the issue of the 1,4-dioxane limit that had previously been discussed by Wilf and the Committee. He also learned that the Region is doing a study on the Erb Street Well Field. Tracy said this would be through Water Services. David asked about leachate well LW162 that had a result of 153 ppb and any subsequent sampling that had been done. Tracy will look up the 1,4-dioxane results and follow up with an email to David.

Next Meeting: Tuesday, November 17, 2020 at 7:00 pm

This meeting summary was prepared by Linda Churchill.
WATERLOO LANDFILL – LEACHATE & GAS SYSTEMS

Waterloo Region Landfill Liaison Committee

September 8, 2020
Presentation Outline

- Waterloo Landfill Site
- What happens to the waste in the landfill?
- Various environmental control systems
- This presentation covers:
  - Leachate Collection System
  - Landfill Gas Collection System
- Discussion
Waterloo Waste Management Facility - 2018

October 29, 2018 - Photo 215
Waterloo Landfill Site Overview

- 142,000 tonnes landfilled in 2019
- 618,000 current Region of Waterloo population
- 50/50 split between Industrial/Commercial/Institutional and Residential Waste (54% ICI / 46% Residential)
- 65% Residential diversion rate
- Overall trend to lower tonnages
What happens to the waste in the landfill?

- Waste decomposition: breaks the chemical bonds that hold material together
- Process is highly variable with variable outputs – can be a very slow process
- Produces a liquid (leachate)
  - Formed by the moisture that percolates through the waste
- Generates a gas (landfill gas)
  - Created by biological processes in the landfill
- Decomposition can result in waste settlement
Factors Affecting Waste Decomposition

- Type of waste (organic/plastic/metal)
- Moisture content (precipitation, wet waste)
- Temperature
- Oxygen availability
- Due to these factors, waste decomposes at different rates with variable by-products
Landfill Environmental Controls

- Daily/interim/final covers – reduce water infiltration, blowing litter, odour and vectors
- Groundwater monitoring/extraction
- Leachate and gas collection
- Environmental controls operating budget: $250K annually
Leachate Collection System

- Toe drain system retrofitted in OLA throughout the 1990's
- New engineered cells (NEA and SEA) include leachate collection layer across the clay base
Schematic Engineered Cell
Leachate Collection System

- Leachate drains through underground piping in the cell via gravity into a pump station
- Monthly samples are taken from the pump stations
Leachate Collection System

- Pumps at each station operate on a float system that are triggered as the leachate levels rise
- Leachate travels via a force main to each City's sanitary sewer
- Leachate is treated at the Kitchener and Waterloo wastewater treatment plants
- System is flushed and swabbed twice annually, pumps serviced annually
- SCADA system to monitor, store data and control operations – demo to follow
Leachate System Gas Collection

- Leachate system can provide preferential pathway for landfill gas
- Gas collected at leachate manholes
What are the Properties of Landfill Gas?

- Gas production/composition follows a bell curve as waste decomposes.
- Fresh waste can take 12-18 months to generate gas.
- Typical gas composition:
  - 45-60% methane
  - 40-60% carbon dioxide
  - Trace amounts of nitrogen, oxygen, ammonia, sulfides, hydrogen, carbon monoxide and other non-methane organic compounds.
More Landfill Gas Properties

- Methane is:
  - Odourless
  - Lighter than air
  - Combustible
  - Explosive in air at volume of 5-15%
  - Potent greenhouse gas

- Sulfides and ammonia (a small fraction of the gas) produces odour
Waterloo Gas Collection System

- Initially installed in 1995
- System grows as landfill expands
- Landfill gas is collected through a system of wells and trenches
- The trenches and wells provide preferential pathways for landfill gas to travel
Waterloo Gas Collection System

- Vertical wells drilled after capping
- Trenches installed as waste placed
- Gas collection field
  - 120 vertical wells
  - 40 horizontal trenches
  - 17 leachate system collection points
**Gas Collection Trench**

- Provide efficient gas collection across a larger area
- Installed within the waste, covered with wood chips/waste until gas is generated
Gas Collection Trench Grid

- Trenches are filled with stone
- 30 m horizontally
- 8-12 m vertically
- Oxygen and water can limit operations
Waterloo Gas Collection System

- The field is controlled at each location by adjusting the valve based on sampling of the methane/oxygen/carbon dioxide levels.
- The valve controls the suction at each location.
Waterloo Gas Collection System

- Suction applied to the collection field with blowers
Waterloo Gas Collection System

- Two enclosed flares burn landfill gas
- Total capacity of 2400 cfm
- Flares run independently or in conjunction with electrical generation plant
Schematic Engineered Cell
Gas Collection Operating Criteria

- Goal to collect gas from the waste as it is produced so it is a steady state system
- Maximize methane and minimize oxygen (which can cause explosive conditions: oxygen <1%)
- Continuous monitoring, control and data collected through the SCADA system
Use of Landfill Gas to Generate Electricity

- Long term agreement with Toromont
- Region maintains collection field
- No guarantee on gas quality
- Generates power for about 4,000 homes (6.2MW)
SCADA System Demo
SCADA System Demo
Leachate and Gas Collection Challenges

- Inconsistent gas quality – seasonality, changing waste composition (for example: less organics), moisture accumulation in wells
- Biofouling of leachate system – buildup in pipes, may cause blockages, ongoing study and pilot by consultants with University involvement and research
Closing Discussion
## Waterloo Waste Management Facility
### Annual Communication Summary
January 01, 2019 to August 31, 2020

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Date Printed: Sep 08, 2020
# Waterloo Waste Management Facility
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Total Projected Annual TEL Cummulative Flow Estimate: 16347385

Yearly Average

Yearly Total

Not included in "Monthly Total Average Gas Flow" (column B)