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Final Report

Ambient Air Quality Monitoring Program
Version 1

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SUBMITTED TO

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Attachments

1. INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by Waste Management of Canada Corporation (WM) to prepare an ambient air quality monitoring plan for the West Carleton Environmental Centre (WCEC). The ambient quality monitoring program is developed to determine impacts of particulate matter, volatile organic compound, reduced sulphurs (odour) and total hydrocarbons (THC) from the existing and expansion footprints on their surrounding areas.

It is intended that this ambient air quality monitoring plan be reviewed on an annual basis and modified as necessary based upon the results of the ambient air quality monitoring program. If the results of the monitoring show a net exceedance of ambient air quality criteria, the frequency of monitoring will be increased. Conversely, if monitored concentrations show a minimal impact due to the presence of the proposed landfill expansion project, then the frequency of monitoring may be reduced.

2. DUST MONITORING

Monitoring for Total Suspended Particulate (TSP) will be conducted on an on-going basis at three (3) locations around the landfill footprint. The proposed monitoring locations will be near the northeast corner, the southeast corner and the west side of the WCEC (also shown in Appendix A).

TSP Samples will be taken on a six day interval, during the months between May and September, inclusive, in concurrence with the United States Environmental Protection Agency's (U.S. EPA) National Air Pollutant Surveillance (NAPS) monitoring schedule.

The monitoring method will comply with the methods specified by U.S. EPA Method IO-2 as well as the Ontario Ministry's Operations Manual for Air Quality Monitoring in Ontario, March, 2008 PIBS 6687e (found on MOE's Website). The 24-hour samples would be collected on standard hi-volume air samplers. The station siting requirements and sampling procedures will follow the most recent version of the U.S. EPA methods as well as the Ministry of the Environment's Operation Manual for Point Source Air Quality Monitoring as approved by the MOE at the on-set of the monitoring.

The results will be presented in the annual report in tabular format with a description of the program, quality assurance documentation, details regarding data recovery, abnormal site conditions, etc. As well, any days when the ambient air quality criteria for TSP was exceeded will be reported graphically showing a site plan, sample concentrations and wind conditions for the day.

Waste Management will take responsive action if test results from ambient air monitoring program indicate that any of the parameters in O. Reg. 419/05 are exceeded. The dust (particulate matter) has a 24 hour standard of 120 $\mu g/m^3$. The responsive action shall be as follows:

1. Provide notification to the MOE within 2 weeks after receiving the laboratory reports.
2. Retain qualified consultants to carry out an assessment of the source of the unexpected emissions, determine whether increased monitoring should be carried out and submit a report to the MOE with recommended corrective actions as soon as practicably possible.

3. VOC MONITORING

Monitoring for target VOCs will be carried out monthly for a total of five (5) samples between May and September, inclusive. These five (5) sample sets will be taken in upwind/downwind pairs for a total of 10 samples total. No more than 2 sample sets be collected in any calendar month. Samples will only be collected on weekdays during normal operating hours. The five (5) sample sets will be 30-minutes in duration and compared to POI standards.

The samples will be collected and analysed using methods defined in U.S. EPA Method TO-14/15. Vinyl chloride is of particular concern with these types of samples and vinyl chloride will be analysed in selective ion mode (SIM).

The VOC sampling will be completed using the U.S. EPA TO14/15 methods using Summa canisters and mass flow controllers. The MOE Operations Manual for Ambient Air Quality Monitoring in Ontario – March 2008 (MOE Manual) will be followed to ensure proper QA/QC procedures with respect to the operation and maintenance of the ambient monitoring stations.

Sampling for VOC will be collected during periods of light wind conditions (less than 15 kilometers per hour) and during dry conditions (no measurable precipitation for the proceeding 48 hours prior to sampling).

The list of VOCs to be monitored is presented in Table 1.

Waste Management will provide 24-hour prior notice of intention to carry out ambient testing to the local District Office of the MOE.

Waste Management will take responsive action if test results from ambient air monitoring program indicate that any of the parameters in O. Reg. 419/05 are exceeded. The responsive action shall be as follows:

1) Provide notification to the MOE within 2 weeks after receiving the laboratory reports.

2) Retain qualified consultants to carry out an assessment of the source of the unexpected emissions, determine whether increased monitoring should be carried out and submit a report to the MOE with recommended corrective actions as soon as practicably possible.

As the MOE updates POI standards in the Province of Ontario, the measured values will be compared to the most stringent limits available at the time of testing. For compounds that do not have a POI standard, the measured values should be compared to the predicted concentrations provided and approved by the MOE for the Section 9 EPA approval supporting documentation to demonstrate compliance. As all compounds identified without POI standards are subject to review by the MOE's Standard Development Branch, these levels should be considered acceptable.

Table 3.1: Summary of Proposed Target List for VOCs

CAS No.	Compound	CAS No.	Compound
75-01-4	Vinyl Chloride	56-23-5	Carbon Tetrachloride
75-00-3	Chloroethane	71-43-2	Benzene
75-35-4	1,1-Dichloroethylene	107-06-2	1,2-Dichloroethane
75-09-2	Dichloromethane	79-01-6	Trichloroethylene
156-60-5	1,2-Dichloroethene (Trans)	75-27-4	Bromodichloromethane
156-59-2	1,2-Dichloroethene (Cis)	111-65-9	Octane
74-34-3	1,1-Dichloroethane	79-00-5	1,1,2-Trichloroethane
78-92-2	n-Butanol	127-18-4	Tetrachloroethylene
67-66-3	Chloroform	106-93-4	Ethylene Dibromide
71-55-6	1.1.1-Trichloroethane	79-34-5	1,1,2,2-Tetrachloroethane

Note: na - no applicable CAS Number.

4. REDUCED SULPHUR COMPOUNDS (ODOUR) MONITORING

Total reduced sulfur (TRS) samples will be collected in tedlar bags at the same locations as the VOC samples. The samples will be collected over a 30-minute period. Once collected, the samples will be transported to a continuous TRS analyzer. The samples will be analyzed for TRS as hydrogen sulfide. The instrument will be a USEPA reference method equivalent device and operates on the UV fluorescence principal.Sampling for reduced sulphurs will be collected during periods of light wind conditions (less than 15 kilometers per hour) and during dry conditions (no measurable precipitation for the proceeding 48 hours prior to sampling). This analysis will account for all speciated sulphurs (as TRS) including Methyl Mercaptan, Ethyl Mercaptan, Dimethyl Sulphide, and Hydrogen Sulphide. TRS values will be expressed as Hydrogen Sulphide.

Waste Management will take responsive action if test results from ambient air monitoring program indicate that TRS samples are excess of the O. Reg. 419/05 standard. The responsive action shall be as follows:

1) Provide notification to the MOE within 2 weeks after receiving the laboratory reports; and

2) Retain qualified consultants to carry out an assessment of the source of the unexpected emissions, determine whether increased monitoring should be carried out and submit a report to the MOE with recommended corrective actions as soon as practicably possible.

5. TOTAL HYDROCARBON "WALKABOUT" SURVEY

The "Walkabout" survey will consist of a grid survey of the existing and expansion final capped areas using a handheld THC (total hydrocarbon) analyzer (FID). A portable FID will be used throughout the surveys. The FID will be calibrated using a methane gas standard and zeroed using ultra zero pure air. Measured THC concentrations will be measured as methane. The instrument used will have the following characteristics:

- a response time of at least 15 seconds
- an accuracy of 3 percent or better
- a minimum detectable limit of 5 ppmv (or lower)
- a flame-out indicator, audible and visual

The "Walkabout" survey will be completed in a grid like formation gathering data at 7.6 cm or lower (3 inches or lower) above the ground. "Hotspots" of "breakout points" consisting of cracks, fissures, areas of bubbling surface water, or patches of dead (brunt) vegetation on the mound will be visually observed and notes for THC concentrations exceeding 500 ppm (methane). Only reading of 500 ppm or greater should be noted during the instantaneous monitoring survey. The "walkabout" surveys should be completed at winds less the 8 kilometers per hour (5 miles per hour) and during dry conditions (no measurable precipitation for the proceeding 48 hours prior to sampling). In addition, for the instantaneous readings, the surveys should be completed when the ambient temperatures are within 0 to 50 degrees Celsius. A typical grid formation is provided in Appendix B.

THC concentrations 500 ppm or greater should be considered of concern during the instantaneous measurements. Therefore, THC concentrations less than 500 ppm will not be noted during the survey. Locations where the THC concentrations are 500 ppm or greater should assist WM in determining all potential and existing landfill gas release points that require remedial action.

All THC concentrations measured will be expressed as methane on the calibration standard used. After the 'hotspot" or "breakout points" are fixed, documentation of the corrective actions taken as well as confirmation of adequate actions taken (THC concentrations less than 500 ppm) will be presented to the MOE. The "walkabout" survey will include the following:

- precise locations of all sampling sites on the site map
- identification of all data obtained in the field measurements
- documentation of all remedial action

The "walkabout" survey should be done in the spring and the early fall. The measured areas should include landfill final cover areas. Problem areas identified should be repaired within two (2) months of identification. Confirmatory measurements will be completed after each repair has been completed in order to confirm the success of the remediation action completed.

The "Walkabout" surveys will be performed twice per year or in response to otherwise unexplained odour events. As outlined in the Odour and Landfill Gas Best Management Practices Plan, routine visual inspections of the landfill cap integrity will also occur on a monthly basis to identify possible problem areas.

6. COMPLAINT RECORDING PROCESS

WM has prepared Best Management Practice Plans for Dust, Landfill Gas and Odour and combustion by-products. Each plan includes the procedures for outlining the responsibilities and record keeping. For further details, please refer to the most recent versions of the Best Management Practice Plans.

7. EA COMMITMENTS & EA CONDITIONS

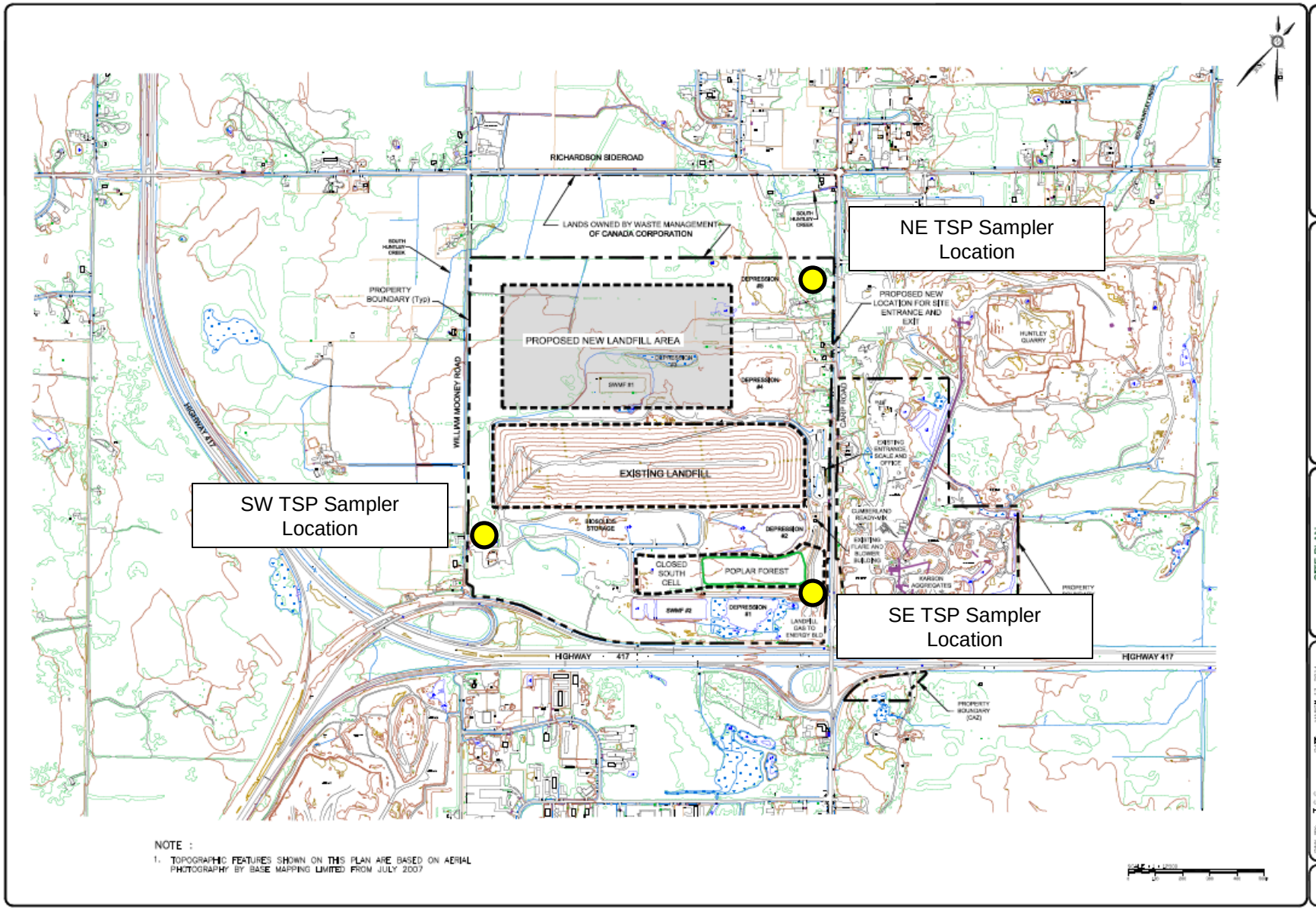
The following table provides a summary of EA commitments and EA Conditions that have been addressed through this Ambient Air Quality Monitoring Program:

EA Commitments	EA Conditions	Covered in BMPP

• Develop an Odour and Landfill gas BMP Plan that may include the following monitoring measures:
  • Total hydrocarbon or hydrogen sulphide surface surveys of both the existing and proposed alternative landfill mounds, as well as leachate collector cleanouts, to identify any cracks, fissures, or other hot-spots for escaping landfill gas;
  • Continuous monitoring for temperature and flow on the landfill gas flares and the landfill gas-to energy engine-generator sets to ensure proper operation;
  • Volatile organic compound and hydrogen sulphide ambient air quality monitoring programs to continue to track annual emissions and identify increases in emissions over time and
  • Source testing of the SBR for source validation
 	
• Develop a Dust BMP Plan that may include the following monitoring measures:
  • Annual Particulate monitoring (e.g., between May and September at 3 locations along the northeast, northwest, and southwest of the landfill property line);
  • Routine walkover surveys;
  • Record keeping of watering suppressants application and
  • Record keeping of waste and construction activity locations.
	• Condition 2.2: The proponent shall fulfill all commitments made during the environmental assessment process.
	
	• Section 4.0: Compliance Monitoring
	
	• Section 4.1: The proponent shall prepare and submit to the Director for the public record, an environmental assessment compliance monitoring plan.
	
	• Section 4.3: The program shall include monitoring of the proponent's implementation of the undertaking in accordance with the environmental assessment and the conditions in this Notice with respect to mitigation measures, public consultation and additional studies and work to be carried out. The program shall also include monitoring of compliance with all commitments made in the environmental assessment and the subsequent review assessment with respect to mitigation measures, public consultation and additional studies of work to be carried out.
		Section 5: Total Hydrocarbon "Walkabout" Surveys
		
		Section 3: VOC Monitoring
		Section 4: Reduced Sulphur Compounds (Odour) Monitoring
		
		Section 2 : Dust Monitoring

ATTACHMENT A

Appendix A – Proposed TSP Sampler Locations



ATTACHMENT B

Typical Landfill Walk Pattern for a 4500 Square Metre Grid