The Regional Municipality of Durham
To: Joint Finance and Administration, Health and Social Services and Works Committee
From: C. R. Curtis, Commissioner of Works
Report: 2013-J-26
Date: September 19, 2013

SUBJECT:
Energy from Waste (EFW) Facility Environmental Monitoring Program Review

RECOMMENDATIONS:
THAT the Joint Finance and Administration, Health and Social Services and Works Committee recommends to Regional Council that:

a) Since the existing Energy from Waste Facility Environmental Monitoring Program meets all regulatory requirements and exceeds Regional Council approved monitoring plans, no changes to the Environmental Monitoring Program are required or warranted;

b) Following the first full year of monitoring during operations, and subsequent to the Ministry of the Environment review of the monitoring results, staff report back on any recommended revisions to the Energy from Waste Facility Environmental Monitoring Program; and

c) The three motions from the Energy from Waste-Waste Management Advisory Committee (Host Community Committee), Municipality of Clarington and Township of Uxbridge, with respect to additional monitoring, be received for information, with a copy of this report to be forwarded to these municipalities.

REPORT
Attachment No. 1: Approved Environmental Plans: EFW
Attachment No. 2: Approved Monitoring Plans: EFW

1. BACKGROUND

The Energy from Waste (EFW) Environmental Monitoring Program was first approved by the Regional Municipality of Durham (Durham) Council in 2008. Since that time, the Program evolved and the final outline of the Environmental
Monitoring Program was defined by the Ministry of the Environment (MOE) through the Certificate of Approval (CofA) process.

The original Environmental Monitoring Program approved by Durham Council was based on the most scientifically defensible and justifiable option available, ensuring the protection of the public and environmental health. Durham Council directed the plan be more stringent than the revised Ontario A-7 guidelines "Air Pollution Control, Design and Operation Guidelines for Municipal Waste Thermal Treatment Facilities" and the European Union standards for waste incineration. The recommended program, subsequently approved by Durham Council on April 1, 2009, surpassed both standards and included the legislatively required stack monitoring with enhanced emission standards adherence and continuous sampling for dioxins and furans. Further, staff ensured the plan also exceeded the US Environmental Protection Agency (EPA) standards.

In addition, as part of the EFW Risk Assessment and Environmental Surveillance Report (Committee of the Whole Report 2009-COW-01 dated June 16, 2009), Durham Council approved the addition of independent ambient air and soil testing for a minimum of three years at which time its effectiveness would be evaluated. Budget approval (Committee of the Whole Report 2009-COW-03 dated June 16, 2009) was based on one ambient air station. The final MOE approved Ambient Air Monitoring Plan, however, was upgraded to include two full stations (with a four year monitoring program) and one partial station (one year monitoring program).

Further, with MOE acceptance of the Environmental Assessment (EA) and the CofA, additional and more specific monitoring plans (soil, groundwater, surface water, odour and noise testing) were mandated with their development subject to MOE approval. These documents augmented the already approved Durham Council ambient air and soil monitoring programs. Operational parameters and residue testing were also mandated within the CofA.

All sampling will be performed by qualified independent third parties with results processed by accredited laboratories. Results will be posted to the project website and provided to the MOE and the EFW advisory committees.

The Air Emissions Monitoring Plan, which represents the last monitoring plan mandated by the EA, was approved by the MOE on April 9, 2013.

Attachment No. 1 lists the various modifications to the Program directed by the associated approval document and illustrates that the current program already exceeds Regional Council direction, meeting all regulatory requirements.
2. **RECENT MOTIONS**

As a result of a staff presentation and the forthcoming staff report on the Ambient Air Monitoring and Reporting Plan, the Energy from Waste-Waste Management Advisory Committee (EFW-WMAC) (Host Community Committee) passed the following resolution on November 21, 2012:

"a) THAT two additional ambient air and soil monitoring stations (fixed or mobile) be applied to the EFW project for a minimum of five years, at locations to be determined by the Region, and approved by the EFW-WMAC before being forwarded to the Ministry of the Environment for approval, and

b) THAT the continuous monitoring of heavy metals and all particulate matter be undertaken at the incinerator stack."

On December 7, 2012, the Municipality of Clarington passed the following resolution:

"THAT the presentation of Margaret Clayton, Chair, and Ted Baker, Vice-Chair, Energy-From-Waste, Waste Management Advisory Committee (EFW-WMAC), be received with thanks;

THAT the resolution of the Energy from Waste, Waste Management Advisory Committee requesting that additional air monitoring stations be considered, be endorsed; and

THAT the Regional Municipality of Durham and all area municipalities within Durham Region be advised of Council's decision."

On January 16, 2013, the Township of Uxbridge passed the following motion:

"THAT the Council of the Township of Uxbridge support the Municipality of Clarington's resolution that additional air monitoring stations be considered with respect to the Energy from Waste Facility;

AND THAT the Region of Durham be requested to report back to Council on this matter."
3. DISCUSSION

The 2008 Durham Council approved emission limits and monitoring plans evolved throughout the EA and CofA processes, such that each successive process strengthened the plans beyond the already stringent 2008 Durham Council directive. The final CofA approved monitoring plans of June 2011 are more stringent than the 2010 EA requirement, or the previously approved 2008 Durham Council plans. Within each monitoring plan, the parameters monitored meet or exceed the scope mandated by the EA and/or CofA, thereby ensuring individual parameters monitored within each plan demonstrate a robust program of monitoring.

Each of the monitoring plans was prepared by subject matter experts, in consultation with the MOE, and subjected to review and comment by the MOE mandated Energy from Waste Advisory Committee (EFWAC), comprised of local municipality staff representatives and three public members. The monitoring plans and the associated documentation have been included on the project website.

Implementation of the approved monitoring program is detailed in the CofA and the monitoring data will be reported and reviewed by the MOE on an annual basis. The MOE may revise the monitoring plans in response to information gaps or specific events (spills or releases) as circumstances dictate. The entire MOE approved Environmental Monitoring Program can be divided into three existing components:

a. Ambient Air and Soil Monitoring;
b. In-Plant Monitoring: Air Emissions; and

The annual cost of the current approved program for emissions control and monitoring represents 30 to 40 per cent of the facility net operating costs.

The EA and CofA also require third party oversight of the EFW Environmental Monitoring Program. A third party audit will confirm legislative compliance including adherence to the EA and CofA conditions. Additional oversight is also incorporated into the Project Agreement through stringent Performance Guarantees and the Environmental Management System (International Organization for Standardization (ISO) 14001).

3.1 Ambient Air and Soil Monitoring

Durham Council project approvals were based upon the installation of one ambient air station to be monitored for three years during EFW operations.
Report 2009-COW-03 estimated Durham’s share of this annual monitoring cost to be $250,000.

The MOE augmented the Durham Council approved plan and accepted the final Ambient Air Monitoring Plan (AAMP) which includes two ambient air stations to be monitored for a minimum four years - one year of baseline monitoring prior to operations and a three-year monitoring program during operations. In addition, a partial ambient air monitoring station will be installed at the site boundary to be monitored for at least one year of operations. In November 2012, Durham Council approved the award of Request for Proposal (RFP) 723-2012 to implement the AAMP with commencement of baseline monitoring in 2013. The total capital and operating costs to implement the AAMP in accordance with the CofA (Report 2012-WR-9) was approved at a cost of $1.2 million for the four-year program.

At this time, staff does not support additional ambient air monitoring stations outside of the approved AAMP, for the following reasons:

- There is no scientific or supportable evidence or benefit to increasing the number of ambient air monitoring stations. The sites selected and approved by the MOE are based on their ability to provide the best scientific evidence to validate existing models;
- The data collected from the currently approved monitoring stations is, and will be sufficient to validate or refute existing ambient air modeling as well as support analysis of plant performance;
- The decision to undertake additional monitoring would require approvals from York Regional Council with respect to cost sharing. However, if it is the MOE that requires the Regions to increase monitoring following its annual reviews of the monitoring program, York Region would be contractually required to contribute to the additional costs under the terms of the Co-owners’ Agreement; and,
- Additional stations, at this time, will not enhance data collection or analysis. If the accumulated data subsequently suggests that additional stations are warranted, they should be established at that time in accordance with MOE guidelines and expert advice.

3.2 In-Plant Monitoring: Air Emissions

Durham Council directed that the contractual guarantees for emissions from the EFW meet or exceed the most stringent of the Ontario guidelines or the European Union (EU) limits, and that the EFW design principles for emissions controls incorporate the Maximum Achievable Control Technology. The CofA limits and Project Agreement guarantees have achieved this direction. The estimated costs associated with Project Agreement implementation are directly related to the current CofA limits.
The Air Emissions Monitoring Plan at the stack has followed Durham Council direction and includes an annual stack test conducted by an independent third party agency to be approved and overseen by the MOE and Regional Municipalities of Durham and York. Stack testing must be performed in accordance with the MOE Source Testing Procedures and analysis of the data collected must be done by an accredited MOE approved laboratory. The cost of the stack test is incorporated into the annual operating cost of the facility. The MOE must approve the source test plan for each test to ensure that it meets their regulations. The first stack test will be conducted within six months of first receipt of waste and then annually thereafter. Additional stack tests outside the current contract specifications can be ordered by the MOE or additional stack tests can be conducted by Durham and York (Owners) at their sole additional cost. Stack tests are estimated to cost approximately $100,000 per test.

One of the main principles of the Project Agreement is to ensure that Covanta Energy Corporation (Covanta) is responsible and accountable for EFW plant operations and onsite activities. Therefore, Covanta must meet all contractual performance guarantees including the stringent emission standards. All the risks associated with failure to meet these performance guarantees currently rests with Covanta. This was incorporated in the Project Agreement to stabilize the operating costs to the Owners and to transfer the operating compliance risk to Covanta. Staff must ensure that any revision to the in-plant monitoring program will not transfer risks or associated costs back to the Owners.

Continuous emissions monitors (CEM) for parameters listed in the CofA exceed Durham Council direction and include additional monitoring of total hydrocarbons, ammonia and various combustion parameters. Any change to the CEM suite, guarantee limits or averaging times will require a change order and will lead to contractual negotiations with Covanta. Any variation to the testing parameters can be very expensive. The potential of the financial impacts to CEM changes was illustrated when the MOE revised the carbon monoxide limits from 45 to 40 mg/Rm³ which resulted in a change order costing an additional $1.2 million in capital costs and $60,000 in additional annual operating costs.

The selection and proper application for these CEMs is dependent on many factors, including the characteristics of the pollutant being targeted for measurement and the conditions of the flue gas stream being sampled. The CEMs data produced must be sufficiently accurate and reliable for use in ensuring compliance or adjusting operational parameters. Staff does not support modifications to the CEM suite. In particular, the CEM additions suggested by the EFW-WMAC (Host Community Committee) for heavy metals and all particulate matter (PM) are not recommended for the following reasons:
- CEMs for heavy metals are not yet a proven and reliable technology;
- CEMs for all PM (condensable and filterable) are not technically feasible and
  CEMs cannot differentiate between PM$_{10}$ and PM$_{2.5}$. These PM parameters
  can only be measured during the annual stack test;
- Experts, including the Municipality of Clarington’s consultant, Senes
  Consultants Limited, Durham and York’s consultant HDR Corporation, and
  the MOE environmental regulators, support the use of an Opacity CEMs as
  the appropriate method of PM monitoring; and
- Additional, monitoring and their associated compliance standards could result
  in the transfer of significant costs and risk from Covanta to the Region.

3.3 Monitoring of Various Media

In Durham’s Committee of the Whole Report 2009-COW-01, dated June 16,
2009, Durham Council approved soil testing for a minimum of three years. No
other environmental testing was recommended by Durham Council. The EA and
CofA have mandated the following additional monitoring programs:

- Groundwater: to detect any releases (spills leaks from the pit);
- Surface water: to assess the effectiveness of the stormwater management
  system;
- Odour: to assess the effectiveness of the negative pressure system; and
- Noise: to assess the noise level at the property limits and sensitive receptors.

Additional media monitoring was addressed in Durham’s Committee of the Whole
Report 2009-COW-01 report which states that:

“The independent testing of flora and fauna be considered if in-stack,
ambient air and soil test results regularly exceed levels predicted by the
Site Specific Human Health Risk Assessment (SSHHRA).”

Staff does not recommend increased monitoring of the off-site environmental
media at this time, but based upon the results of the enhanced monitoring
programs will make future recommendations as appropriate.

4. FINANCIAL CONSIDERATION

Costs for any additional monitoring undertaken voluntarily by Durham Council,
would require approval by York Council to qualify as a shared cost under the
terms of Co-Owners’ Agreement. Regardless of any cost-sharing subsequently
approved by York Region, additional monitoring costs based upon the current
request for additional monitoring would fall outside of the approved EFW project
budget, requiring additional financing approvals.
If additional monitoring stations or a longer monitoring program are considered, costs are currently estimated at up to $0.2 million per additional station per year, based upon existing monitoring program costs. Costs could also be higher, depending upon site availability and required infrastructure, given MOE guidelines which provide several requirements that must be met at selected monitoring sites. It is currently estimated that three added ambient air stations and extension to a five-year monitoring program, as proposed by EFW-WMAC (Host Community Committee), could exceed $3 million, in additional project costs.

Monitoring program modifications also have potential to impact the contractual terms and conditions detailed in the Project Agreement with Covanta, and would be subject to negotiations with Covanta that could significantly increase capital and operational costs beyond this estimate. This is particularly relevant to any additions to the CEM suite. As previously noted, any transfer of risk back to the Regions, through added measures not contemplated within the existing Project Agreement, could result in additional costs and liabilities to the Region over the term of the Project Agreement.

5. **CONCLUSION**

The current approved monitoring program already exceeds the direction provided by Regional Council. The final Energy from Waste Facility Environmental Monitoring Program has been developed in cooperation with the Ministry of the Environment as part of the Environmental Protection Act permitting process. The Energy from Waste Advisory Committee (Environmental Assessment - Ministry of the Environment Committee) was provided the appropriate monitoring plans for review and comment in accordance with the Environmental Assessment requirement.

The Regional Municipality of York’s contractual obligation to share in monitoring costs is limited to the final Ministry of the Environment mandated monitoring program, which already exceeds previously defined parameters of the Regional Councils. Cost sharing for any additional voluntary monitoring would require approval by the Regional Municipality of York Council. Also, any new arrangements for cost sharing will require negotiation and amendment of the Co-owners’ Agreement. Furthermore, both the Regional Municipality of Durham and Regional Municipality of York Councils will have to approve the new cost sharing formula.

Additional monitoring that affects the conditions of the Project Agreement will require contractual negotiations with Covanta Energy Corporation and could have the potential to impact both capital and operational costs in a significant way. The transfer of costs/risk from Covanta Energy Corporation to the Regional Municipalities of Durham and York is also a possibility.
Recent requests from the Energy from Waste-Waste Management Advisory Committee (Host Community Committee) to increase monitoring are not based on scientific substantiation. The requests are either not technically feasible as no such Continuous Emissions Monitors devices exist, or they would rely on unproven technology not approved by the Ministry of the Environment.

Annual reporting to the Ministry of the Environment and the subsequent analysis of the data by experts should be used to assess and address the issue of monitoring program effectiveness and ensure protection of the environment. Additional monitoring should only be considered after fulsome analysis of monitoring program results by experts, including by the MOE. To be clear, the MOE has the ability to annually review and revise the CoFA, if required to improve the effectiveness of the Energy from Waste Facility Environmental Monitoring Program.

Additional monitoring is not recommended at this time given that:

- The approved plans already exceed the Durham Council approved environmental monitoring direction and are state-of-the-art;
- The Ministry of the Environment has reviewed the plans and granted approval of all monitoring plans based on scientific criteria and proven technologies;
- Each monitoring plan will be evaluated at least annually and amended as required to ensure environmental protection and the well-being of the public;
- The value of additional monitoring is best evaluated following the analysis of data obtained once the Energy from Waste Facility has been operational for at least one year;
- Monitoring amendments, which trigger change orders to the Project Agreement, will require contractual negotiations which could lead to significant capital and operational cost increases and/or risk/liability transfer back to the Regions;
- Cost sharing of additional monitoring, not mandated by the Ministry of the Environment, will require approval by York Region Council; and,
- The MOE will also evaluate monitoring plans and enforce amendments as required.
This report has been reviewed by Corporate Services (Legal).

Clifford Curtis, P.Eng., MBA,
Commissioner of Works

Recommended for Presentation to Committee

G.H. Gubitt, M.S.W.,
Chief Administrative Officer
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<tr>
<th>Monitored Media</th>
<th>Testing</th>
<th>Location</th>
<th>Frequency</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Air Emissions</td>
<td>Annual stack testing Continuous emissions monitoring Continuous sampling Dioxins and Furans</td>
<td>Onsite</td>
<td>Annual and Continuous</td>
<td>Conducted by an Independent Agency and follows the MOE Ontario Source Test Code</td>
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<tr>
<td>Ambient Air</td>
<td>Continuous monitoring (PM$_{2.5}$, NO$_x$,SO$_2$) Non-continuous: Metals (every 6 days); PAHs (every 12 days) Dioxins and Furans (every 24 days)</td>
<td>Upwind Downwind Onsite</td>
<td>Continuous and non-continuous</td>
<td>Stack testing model assessment and ambient air monitoring results used as comparatives</td>
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<td>Noise</td>
<td>Acoustic Assessment Summary Table Noise Monitoring: (perimeter) and most sensitive Points of Reception during peak Facility activity</td>
<td>Onsite Offsite</td>
<td>Annual (one week monitoring period)</td>
<td>Potential for event triggered monitoring</td>
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<tr>
<td>Odour</td>
<td>Based on the maintenance of Negative Pressure in the Tipping Area: instrumentation and alarms for air flow measured during worst case scenario</td>
<td>Onsite</td>
<td>Continuous monitoring of airflow</td>
<td>Potential for event triggered monitoring</td>
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<td>Groundwater</td>
<td>Five wells will be installed on site to monitor ground water – changes within the water shed during construction and operation phases</td>
<td>Onsite Offsite</td>
<td>Three times per year (spring, summer, fall)</td>
<td>Four monitors during construction and Five monitors during Operations</td>
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<tr>
<td>Surface water</td>
<td>Surface water monitoring will be done on Tooley Creek tributary</td>
<td>Offsite</td>
<td>Continuous in-stream</td>
<td>Two locations: upstream and downstream of the tributary and the storm water outfall</td>
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<td>Soils</td>
<td>Testing for metals, Polycyclic Aromatic Hydrocarbons (PAHs) and Dioxins &amp; Furans</td>
<td>Offsite</td>
<td>Once per year for 1st three years and every 3rd year thereafter</td>
<td>At location of Ambient Air stations</td>
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<tr>
<td>Operations</td>
<td>Monitoring of temperature, oxygen, carbon monoxide, opacity and residuals</td>
<td>Onsite</td>
<td>Continuous and event specific</td>
<td>CofA requirements and operational performance objectives</td>
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### Approved Monitoring Plans: EFW

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