



The Regional
Municipality of
Durham

Works Department

Memorandum

Date: April 26, 2024

To: Regional Chair Henry and Members of Regional Council

From: Ramesh Jagannathan, M.B.A, M. Eng., P.Eng., P.T.O.E.
Commissioner of Works

Copy: Elaine Baxter-Trahair, Chief Administrative Officer
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Subject: Durham York Energy Centre
Quarterly (Q4 – 2023-2024) Long-Term Sampling System
Report

The attached report for the fourth quarter (Q4) of 2023 to 2024 provides details with respect to data related to the Long-Term Sampling System (LTSS) at the Durham York Energy Centre (DYEC), referred to as the AMESA system.

This report includes AMESA data collected from October 6, 2023, to January 23, 2024 and is structured as follows:

1. Sections 1 and 2 provide background,
2. Sections 3 to 8 provide specific quarterly AMESA data,
3. Section 9 provides ambient air data for the same time period.

End of Memo

Attachment: DYEC LTSS Quarterly (Q4 – 2023-2024) Report
(October 6, 2023, to January 23, 2024)



Durham York Energy Centre
Long-Term Sampling System
Quarterly (Q4) Report
October 2023-January 2024

Prepared by

The Regional Municipality of Durham

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1. Introduction

This report provides additional details with respect to the reporting of operational data related to the AMESA Long-Term Sampling System (LTSS) for dioxins and furans at the Durham York Energy Centre (DYEC).

This report covers the fourth quarter (Q4) of 2023 and includes AMESA data collected from October 6, 2023, to January 23, 2024.

2. Background

To meet the requirements of Environmental Compliance Approval (ECA) Condition 7(3), a continuous sampling system (the Adsorption Method for Sampling dioxins and furans (AMESA) LTSS), is installed on each of the two boiler units at the DYEC to sample dioxins and furans.

The operation of the AMESA system was initiated in 2015 and has been maintained in accordance with current guidance from the AMESA manufacturer, the North American vendor ENVEA, and the AMESA Technical Manual.

The AMESA system is used only for the purpose stated in ECA Condition 7(3), which relates to dioxins and furans emissions trend analysis and evaluation of Air Pollution Control equipment performance. The AMESA results themselves do not constitute a compliance point for the facility operations.

ECA Condition 7(3), Testing, Monitoring and Auditing Long-Term Sampling for dioxins and furans, states:

- a) The Owner shall develop, install, maintain, and update as necessary a long-term sampling system, with a minimum monthly sampling frequency, to measure the concentration of dioxins and furans in the Undiluted Gases leaving the Air Pollution Control (APC) Equipment associated with each boiler.
- b) The Owner shall evaluate the performance of the long-term sampling system in determining dioxins and furans emission trends and/or fluctuations as well as demonstrating the ongoing performance of the APC Equipment associated with the boilers.

AMESA results are available at the site when requested by the Ministry of Environment, Conservation and Parks (MECP) and reported to the MECP as part of the Annual Report required by ECA Approval Condition 15 and posted to the DYEC website.

As the results of the LTSS AMESA sampling are reported annually as a 12-month rolling average to the MECP and contained in the Annual Report, a request from the public was suggested to provide more frequent updates. In 2021, Council issued a directive to enhance the frequency of updates. Hence, verified, and calculated results for every AMESA sampling run across both boiler units are prepared quarterly. These reports are prepared for the Council and subsequently published on the website.

3. Cartridge Replacement Schedule

The AMESA sampling cartridge duration is approximately 30 days before it is removed and sent to the laboratory for analysis. As each boiler unit is independent, the duration may differ due to such things as alternating maintenance activities.

Table 1: AMESA Cartridge Replacement Schedule

Unit #	Run #	Start Date	End Date	Duration (days)
1	89	6-Oct-23	3-Nov-23	21
2	89	17-Oct-23	3-Nov-23	11
1	90*			
2	90	27-Nov-23	15-Dec-23	16
1	91*			
2	91	18-Dec-23	23-Jan-24	26

Note 1:The cartridge duration times may differ even though the start and end dates are the same for both boiler units.

*** Note 2:** There is no result for boiler unit #1 for Runs #90 and 91 due to malfunction of AMESA unit #1.

4. Laboratory Analysis

There were no issues identified with the AMESA sample cartridges or the analysis at the laboratory; however, the laboratory continues to experience delays in analysis and reporting.

5. Durham and York Regions and Covanta Monthly Data and Operations Review

Regional staff meet with Covanta both weekly and monthly on an established schedule to discuss facility operations, and to review environmental monitoring results, trends

and calculations where required for all monitoring programs, and the available AMESA results.

6. Oversight of AMESA Results

The Regional Municipality of Durham and the Regional Municipality of York Region staff and Covanta meet with the MECP on a quarterly basis to discuss all items pertinent to the ECA and the Environmental Monitoring Programs and facility operations. Any concerns which are not determined to be reportable incidents in accordance with the ECA are discussed along with day-to-day operations and monitoring.

Any events which the ECA deems reportable are done in accordance with the appropriate ECA condition.

Results of the AMESA LTSS are reported to the MECP in the DYEC Annual Reports and posted to the DYEC website. AMESA trends of validated data are presented as a 12-month rolling average together with an analysis to demonstrate the ongoing performance of the APC Equipment. The MECP had no concerns with the AMESA results detailed in the [2022 Annual Report](#) as posted via this link: [MECP Review of the DYEC 2022 Annual Report](#). [The 2023 Annual Report](#) has been posted to the website.

7. AMESA Performance

The measured concentrations for each of the 17 dioxins and furans congeners identified in the laboratory certificate of analysis are applied to established computations to obtain a result. These calculations quantify the dioxins and furans per cubic metre of gas at reference conditions. Additionally, standard temperature, pressure and oxygen correction factors are also applied to the measured concentration to obtain a value for regulatory comparison. Finally, each of the 17 dioxins and furans congeners are multiplied by their respective toxic equivalency factor (TEF) and added together to obtain a total dioxins and furans total toxic equivalence (TEQ). The ECA for the DYEC specifies the use of the NATO classification scheme for dioxins and furans and therefore the NATO TEF factors are applied to obtain the TEQ calculation. Table 2 shows each of the AMESA sampling runs, the start and end time the cartridge was in-situ for each boiler unit, and the calculated result.

Table 2: AMESA Calculated Results

Unit #	Run #	Start Date	End Date	Calculated Result (pg TEQ/Rm ³)
1	89	6-Oct-23	3-Nov-23	4.665
2	89	17-Oct-23	3-Nov-23	1.567
1	90*			
2	90	27-Nov-23	15-Dec-23	1.872
1	91*			
2	91	18-Dec-23	23-Jan-24	1.662

***Note 1: There is no result for boiler unit #1 for Runs #90 and 91 due to malfunction of AMESA unit #1.**

While AMESA has no regulatory limit associated for compliance as it is used to supplement source testing, the ECA directs that, “The Owner shall evaluate the performance of the long-term sampling system in determining dioxins and furans emission trends and/or fluctuations as well as demonstrating the ongoing performance of the APC Equipment associated with the boilers.” The Regions, their Engineering and Air Emissions oversight consultants and Covanta will continue to monitor DYEC performance as it relates to AMESA results and trends. Figure 2 displays the results of the AMESA sampling runs conducted in the fourth quarter (Q4) of 2023.

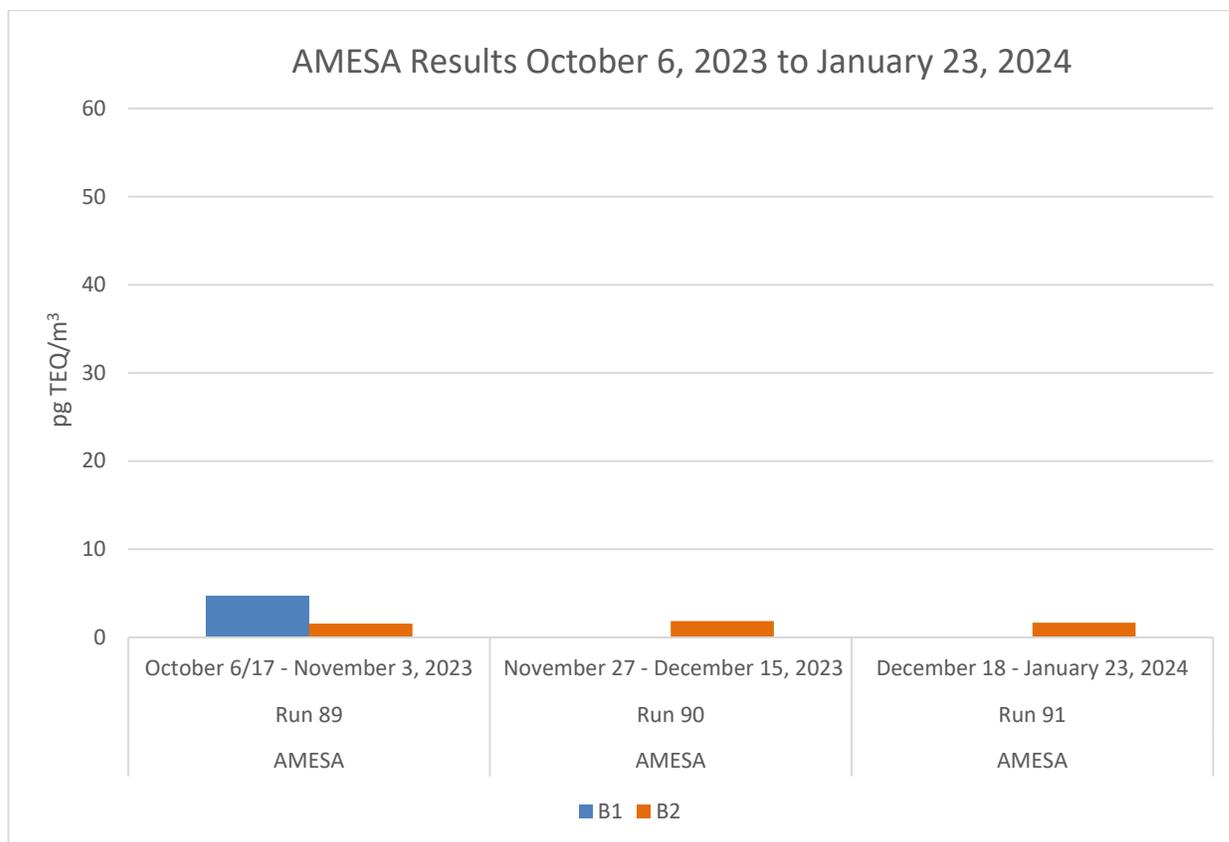


Figure 1: AMESA Results October 6, 2023, to January 23, 2024

7.1 Investigation

During the fourth quarter (Q4) of 2023, the AMESA Investigation Checklist did not yield any formal triggers, as outlined in the AMESA workplan. However, AMESA system errors were noted on November 27, 2023 on Boiler #1 . Ultimately on-site manufacturer support was required with several system components being serviced and or replaced to restore function.

8. AMESA relative to most current Source Testing Dioxins and Furans Results

AMESA is not used to assess compliance and should not be evaluated against Ministry standards, such as the dioxins and furans source testing limit. The testing methodology for AMESA and source testing sampling and analysis are different and are set out within their prescribed sampling method and manufacturer guidelines.

The AMESA results are presented in Figure 2 to show how the Q4 calculated values compare to the most current source testing results. The source test compliance limit for dioxins and furans is 60 pgTEQ/m³. The chart below shows the AMESA Q4, 2023

results as compared to the 2023 September source test results. Results from the September source test also indicated the dioxins and furans result is below the regulatory compliance limit.

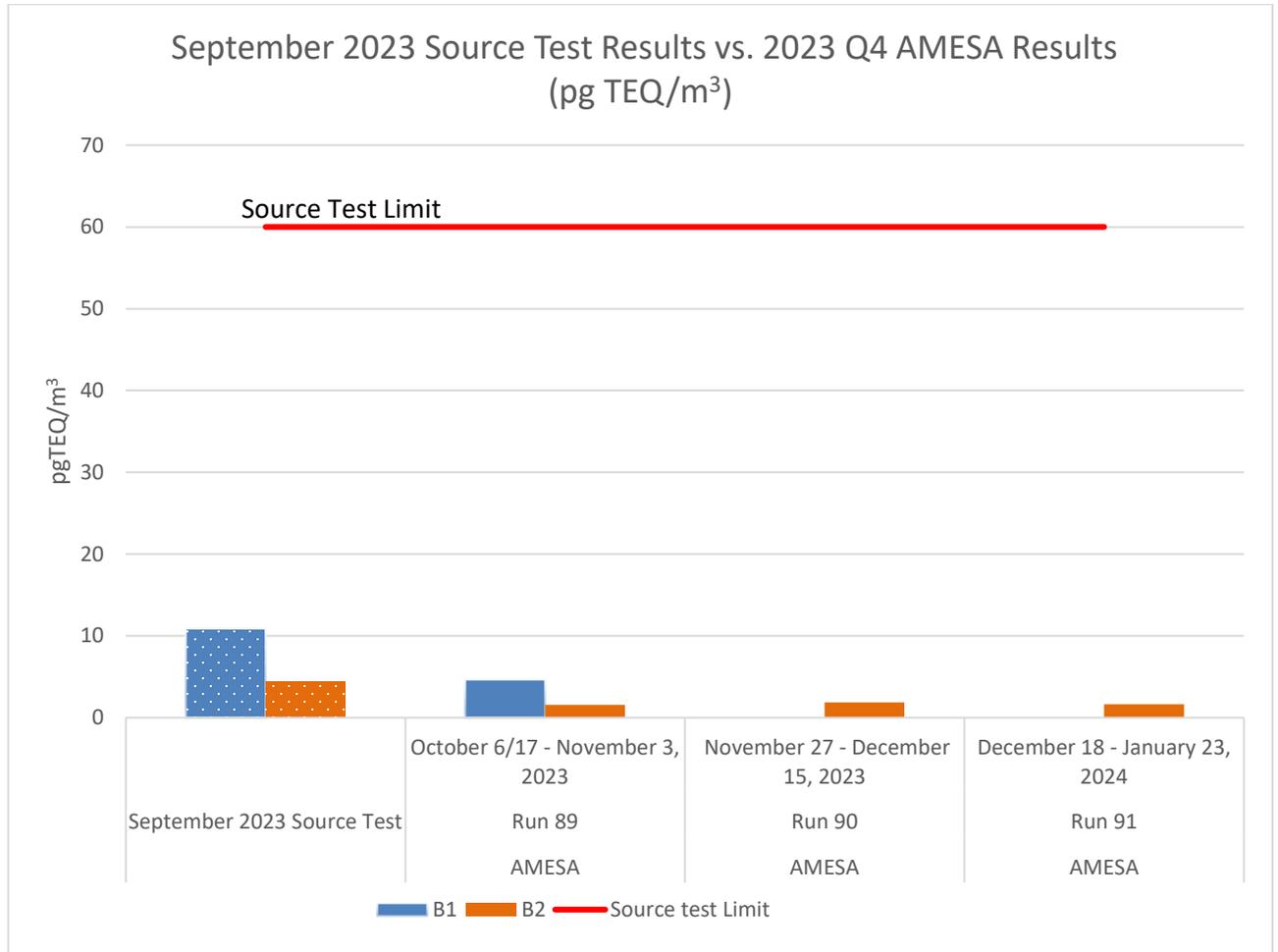


Figure 2: September 2023 Source Test Results vs. 2023 Q4 AMESA Results (pg TEQ/m³)

9. Ambient Air Dioxins and Furans Results –Fourth Quarter (Q4) 2023

The ambient air monitoring program samples for dioxins and furans. The sampling methodology, units of measurement and reporting limits are prescribed differently and cannot be compared directly to the source testing or AMESA results. The ambient air monitoring program does not measure point source emissions, but it does provide an indication of local air quality. The monitoring equipment collects air samples, capturing ambient air emissions originating from various sources within the vicinity. The results from the ambient air monitoring provide insights into local air quality and may indicate potential factors influenced by meteorological conditions, including wind speed and direction.

Figure 3 illustrates the results of the fourth quarter (Q4), at the two ambient air stations near the DYEC. The dioxins and furans levels consistently remain below the Ontario Ambient Air Quality Criteria of 0.1 picogram Toxic Equivalency per cubic meter (pgTEQ/m³).

Of additional note, the Ontario Ambient Air Quality Criteria is 10 times lower than the Ontario Regulation 419 Upper Risk Threshold of 1 pgTEQ/m³ for dioxins and furans.

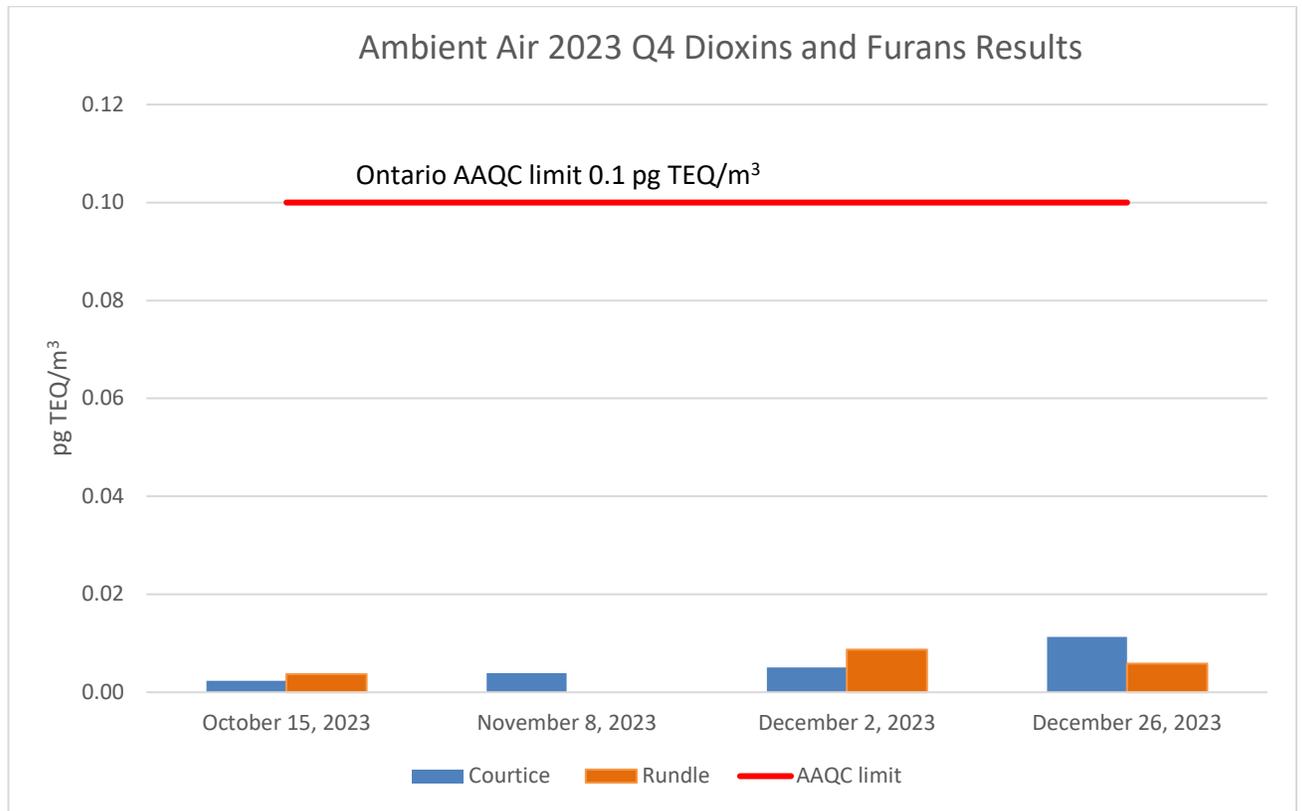


Figure 3: Ambient Air 2023 Q4 Dioxins and Furan Results
Note: The Rundle station does not have a reading for November due to equipment malfunction.

End of Report