
2025 Annual Report for Authorization 8808

Atlantic Power - Williams Lake Power Plant

Jacob Steyl

4455 Mackenzie Ave N, Williams Lake, V2G 5E8

Executive Summary

This Report details the Environmental Emissions from January 1, 2025 to January 1, 2026 and fulfills the requirement of section 3.6 of Authorization 8808 [1].

No rail ties or greater than 1% construction and demolition (C&D) waste were used as feedstock during the reporting period. A total of 277,058 wet tonnes of clean biomass was incinerated during 3,846 hours of normal operation.

During this time two discrete monitoring sessions (one for Air Discharge from the Stack and one for Ash Analysis) were performed. The test results were compared against the levels in Permit 8808 and the Hazardous Waste Regulation, and no exceedances of any of the parameters in Schedules A and D of the Permit measured.

Continuous Emissions Monitoring System (CEMS) measurements were also taken as required by the Permit throughout this Period, with no exceedances recorded.

Respectfully,

A handwritten signature in blue ink, appearing to read "Jacob Steyl".

Jacob Steyl, P.Eng

January 14, 2026

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Nomenclature and Abbreviations

C&D - Construction and Demolition waste

MoE - Ministry of Environment

NO₂ - Nitrogen Dioxide

NO_x - Nitrogen Oxides

O₂ - Molecular Oxygen

PAH - Polycyclic Aromatic Hydrocarbons

TEQ - Toxic Equivalency

USEPA - United States Environmental Protection Agency

hr - Hour

kg/s - Kilograms per Second

lb/hr - Pounds per Hour

m³/s - Cubic Meter per second

mg/kg - Milligrams per Kilogram (1 ppm)

mg/L - Milligrams per Liter

mg/m³ - Milligrams per cubic Meter

pg/g - Picogram per Gram (0.001 ppb)

ppb - Parts Per Billion

ppm - Parts Per Million (1,000 ppb)

ton/hr - Imperial Ton per Hour

tonnes/hr - Metric Tonnes per Hour

1 Introduction

An amendment was issued for permit 8808 on 18 September 2019 to Atlantic Power Preferred Equity Ltd located at 4455 Mackenzie Ave N, Williams Lake, B.C., V2G 4R7. The revised permit calls for an Annual Report outlined in Section 3.6 of the Permit [1].

Jacob Steyl P.Eng, Maintenance Manager and Jason Lahey, Controls Technician, were responsible for collecting data and compiling this report. A. Lanfranco & Associates Inc. and Bureau Veritas conducted discrete monitoring outlined in sections 3.1.2 Schedule A and 3.1.3 Schedule D of the Permit [1].

The reporting window for this Report is 00:00 on 1 January 2025 to 00:00 1 January 2026. The Plant was curtailed for extended periods during the year, as shown in Figure 1-1 and Table 2-1.

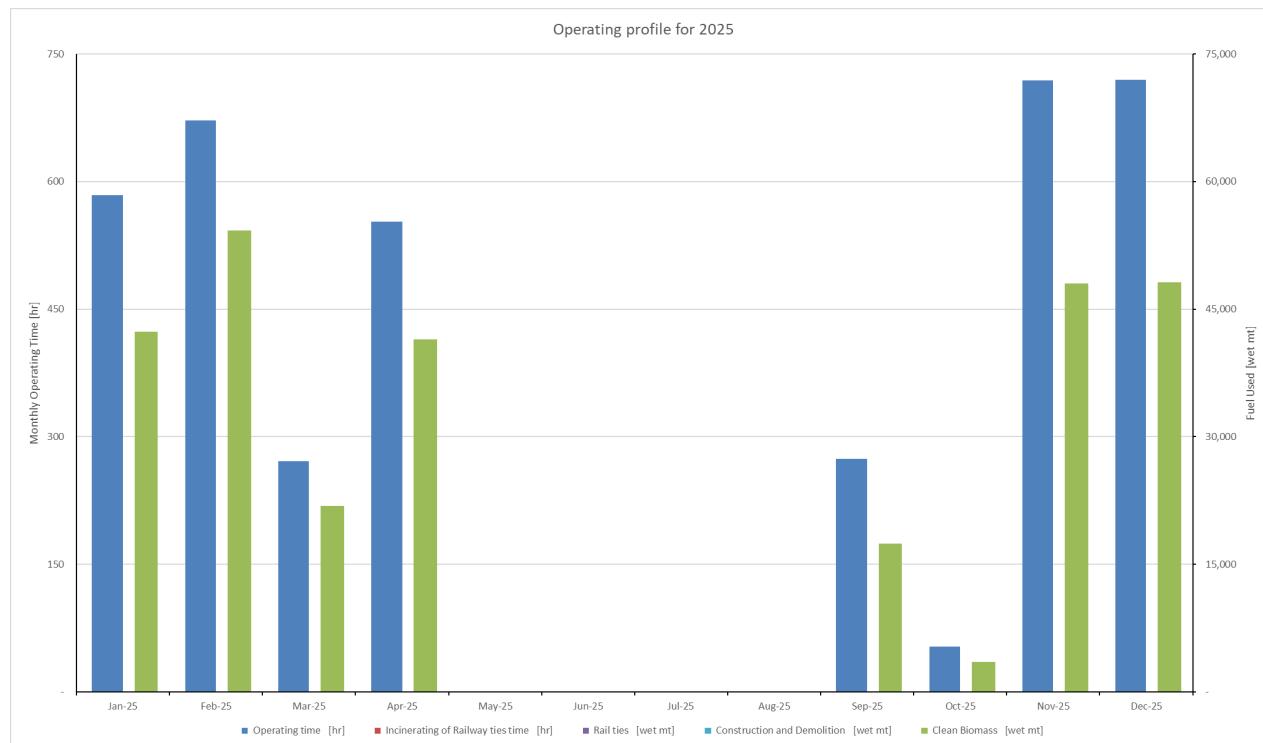


Figure 1-1: Normal Operating Profile for 2025

As no rail tie material was used as feedstock during the reporting period – Test Regimes Schedule A and D apply.

Corrective and preventative maintenance, as well as calibrations, were performed on the Air Emissions Controls and Continuous Emissions Monitoring System (CEMS) equipment of the Authorized Works during the reporting period.

Note that an application to amend the air permit to allow for the use of construction and demolition waste sourced from outside of the Cariboo Region was submitted on November 4, 2025.

2 Monthly Operating Hours

Table 2-1 shows the operating time and time incinerating railway ties for each month.

Table 2-1: Operating hours per month

	Operating time¹ <i>hr</i>	Incinerating of Railway ties time² <i>hr</i>
Jan-2025	584	0
Feb-2025	672	0
Mar-2025	271	0
Apr-2025	553	0
May-2025	-	0
Jun-2025	-	0
Jul-2025	-	0
Aug-2025	-	0
Sep-2025	274	0
Oct-2025	53	0
Nov-2025	719	0
Dec-2025	720	0
2025 Totals	3,846	0

3 Fuel

The fuel usage for the reporting period is shown in Table 3-1.

Table 3-1: Monthly and Annual Amounts of Fuel

	Rail ties <i>wet tonnes</i>	Construction and Demolition <i>wet tonnes</i>	Clean Biomass <i>wet tonnes</i>
Jan-2025	0	0	42,340
Feb-2025	0	0	54,247
Mar-2025	0	0	21,831
Apr-2025	0	0	41,418
May-2025	0	0	-
Jun-2025	0	0	-
Jul-2025	0	0	-
Aug-2025	0	0	-
Sep-2025	0	0	17,646
Oct-2025	0	0	3,520
Nov-2025	0	0	48,048
Dec-2025	0	0	48,109
2025 Totals	0	0	277,058

¹ Operating time for Figure 1-1 and Table 2-1 is taken as combusting-biomass and breaker-closed time

² Number of hours incinerating rail ties or greater than 1% construction and demolition waste

4 Continuous Emissions Monitoring

4.1 Sulphur Oxides

No rail ties or greater than 1% C&D waste was used as feedstock during the reporting period, therefore no monitoring for Sulphur Oxides was required or conducted.

4.2 Nitrogen Oxides

The maximum hourly Nitrogen Oxides (NO_x) as Nitrogen Dioxide (NO₂) per month and average for the month at 8% O₂ is shown Table 4-1. The Permitted hourly average is 320 mg/m³ at 8% O₂ [1].

Table 4-1: Maximum hourly NO_x as NO₂ per month and average for the Month

	Maximum Hourly Average <i>mg/m³</i>	Monthly Average <i>mg/m³</i>
Jan-2025	276	234
Feb-2025	302	268
Mar-2025	81	241
Apr-2025	298	230
May-2025	-	-
Jun-2025	-	-
Jul-2025	-	-
Aug-2025	-	-
Sep-2025	299	246
Oct-2025	272	205
Nov-2025	296	253
Dec-2025	296	250

The average NO_x emissions for the year was 247 mg/m³ at 8% O₂. The maximum hourly average for the year is 302 mg/m³ at 8% O₂, below the Permitted level.

4.3 Hydrochloric Acid

No rail ties or greater than 1% C&D waste were used as feedstock during the reporting period, therefore no monitoring for Hydrochloric Acid was required or conducted.

4.4 Combustion Temperature

No rail ties or greater than 1% C&D waste were used as feedstock during the reporting period, therefore no monitoring of Combustion Temperature was required or conducted.

5 Discrete Monitoring

5.1 Air Emissions Stack Test

No rail ties or greater than 1% C&D waste were used as feedstock during the reporting period: Only Schedule A applies.

The permitted levels under Schedule A [1] is stated in Table 5-1.

A. Lanfranco & Associates Inc was retained to perform an Emission Compliance Survey and Monitoring Report, as per Schedule A of the Permit. The Triplicate test average results for the listed parameters for the Main Stack on November 04, 2025 are summarised in Table 5-1. The complete report can be found in Appendix A – Stack Particulate Test.

Table 5-1: Schedule A Discrete Monitoring Results

Parameter	Test Average	Permit Limits
Rate of Discharge (m ³ /s)	77.5	110
Particulate (mg/m ³ @ 8% O ₂)	4.61	20

Both parameter measures are below permitted levels. The particulate test result was within the expected range ($\pm 1\sigma$) from historical stack particulate tests.

5.2 Ash Testing

No rail ties or greater than 1% C&D waste were used as feedstock during the reporting period: Only Schedule D applies.

The permitted levels as per Schedule D [1] are stated in Table 5-2.

Bureau Veritas was commissioned to perform ash analysis on a single ash sample collected before ash conditioning during normal operation. The sample was taken on December 04, 2025 and the results are summarised in Table 5-2. The complete report can be found in Appendix B - Ash Analysis Report.

The results from the test are summarised in Table 5-2.

Table 5-2: Schedule D Discrete Monitoring Results

Parameter	04 Dec 2025	Permitted Limits [2]
Arsenic (mg/L)	0.5	2.5
Barium (mg/L)	2.07	100
Boron (mg/L)	2.47	500
Cadmium (mg/L)	<0.1	0.5
Chromium (mg/L)	<0.1	5
Copper (mg/L)	<0.1	100
Lead (mg/L)	<0.1	5
Mercury (mg/L)	<0.0020	0.1
Selenium (mg/L)	<0.1	1
Silver (mg/L)	<0.01	5
Uranium (mg/L)	<0.1	10
Zinc (mg/L)	0.23	500
Dioxin/Furan TEQ (ppb)	0.064	100
PAH TEQ (ppm)	0.026	100

Parameter values marked with a less-than sign (<) are below the Reportable Detection Limit.

All the parameters measured were well below the values stipulated in the Hazardous Waste Regulation [2].

Only Barium at 2.07mg/L was outside the expected range ($+1.4\sigma$), but it is still well below the Permitted level of 100mg/L. All the other parameters were within the expected range (1σ) from historical ash testing results.

5.3 Discrete testing conditions

The average steam flow for the Stack Particulate test on November 04, 2025 was 539 klb/hr (67.9 kg/s). The average steam flow when the Ash Test sample was collected on December 04, 2025 was 541 klb/hr (68.2 kg/s).

This meets the Operating Conditions requirements stipulated in section 3.3 of the Permit.

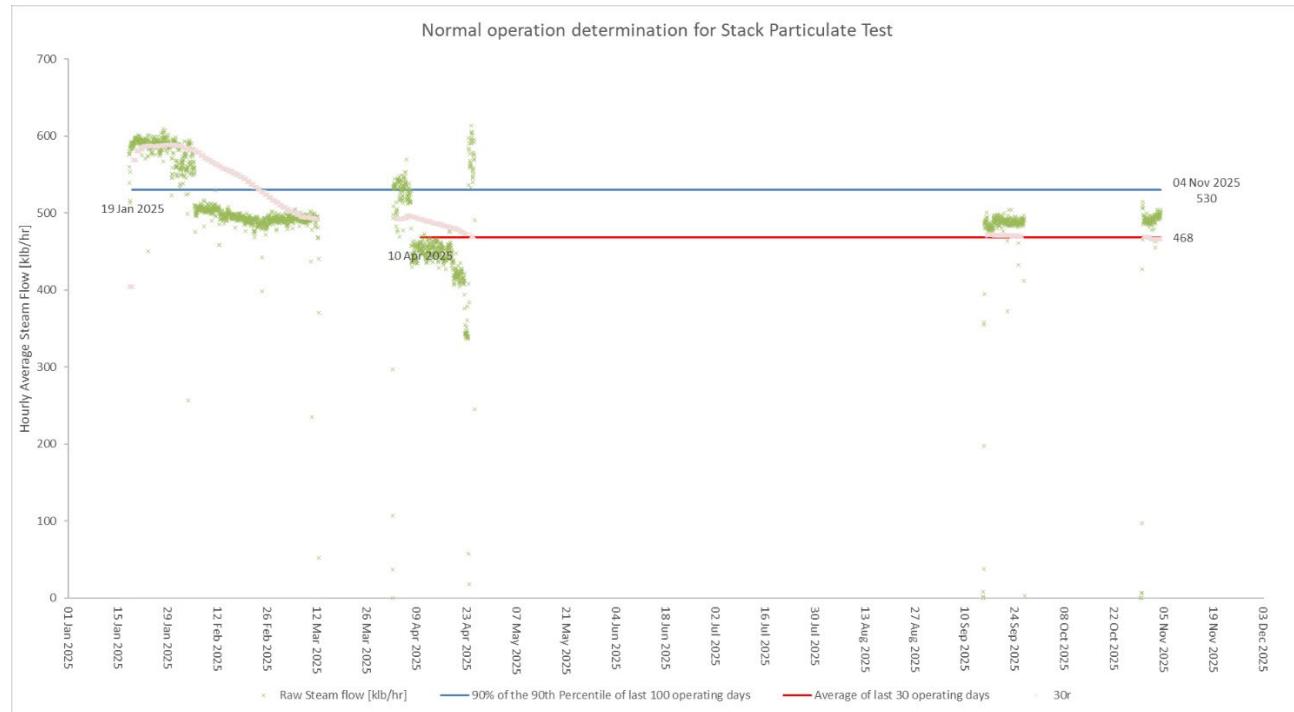


Figure 5-1: Hourly Average Steam Production data for November 4, 2025 Discrete Testing

6 Exceedances

No exceedances were recorded under normal operating conditions during the reporting period.

7 References

- [1] Ministry of Environment, "Permit 8808 Amended 18 September 2019," Environment Canada, Williams Lake, 2016.
- [2] Ministry of Attorney General, Hazardous Waste Regulation BC Reg 63/88, Victoria: Queen's Printer, 1988.

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Appendix A – Stack Particulate Test



**A.Lanfranco
& Associates Inc.**

Environmental Consultants

**Prepared for
ATLANTIC POWER LTD.
POWER PLANT
Williams Lake, BC**

EMISSION MONITORING REPORT

**November 4 2025, Survey
Authorization No. 8808 Prepared
by: Mr. Carter Lanfranco
Issued: November 28, 2025**



Appendix A – Stack Particulate Test



CERTIFICATION

The field monitoring for this survey was conducted by certified stack test technicians as required by the British Columbia Ministry of Environment and Parks (BC MOE) Field Sampling Manual. The field crew consisted of:

Mr. S. Verby (certified) and Mr. J. Dennis.

The report was prepared by Mr. C. Lanfranco using reporting principles and guidelines generally acceptable to BC MOE.

The field crew and A. Lanfranco and Associates Inc. certify that the test methods used were BC MOE approved reference methods for the parameters investigated.

Report reviewed on November 27, 2025 by:

A handwritten signature in black ink, appearing to read 'Mark Lanfranco'. Below the signature, the text 'Mr. Mark Lanfranco' is printed in a small, sans-serif font, followed by 'President | Owner' in a smaller font.

A. Lanfranco and Associates Inc.
Surrey, BC, (604) 881-2582



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Appendix A – Stack Particulate Test



SUMMARY

The following table presents the triplicate test average results for the listed parameters for the Biomass fuelled boiler stack on November 4, 2025.

Parameter	Average	Permit Limits
Particulate (mg/m ³)	5.46	
Particulate (mg/m ³ @ 8% O ₂)	4.61	20
Particulate (kg/hr)	1.52	
Flowrate (m ³ /min)	4650	
Flowrate (m ³ /sec)	77.5	110
O ₂ (vol % dry)	5.60	
CO ₂ (vol % dry)	15.2	

All results are at standard conditions of 20 °C and 101.325 kPa (dry)

The 3-run average boiler stack result for filterable particulate is marginally higher than the previous results from April 2024 (3.32 mg/m³ @ 8% O₂).

The 3-run average flowrate on the boiler stack for this survey is less than April 2024 (77.5 compared to 81.5 m³/min) and is below the permitted limit. The variability year to year is not significant and well within the range of outcomes during representative operating conditions.

Appendix A – Stack Particulate Test



1 TEST PROGRAM ORGANIZATION and INTRODUCTION

Plant Testing Coordinator:	Mr. Jacob Steyl Maintenance Manager 4455 Mackenzie Avenue North Williams Lake, B.C. Canada V2G 5E8 Tel: (250) 267-2281 Email: steyl@atlanticpower.com
Project Manager/Sampling Contractor:	Mr. Mark Lanfranco President Owner A. Lanfranco and Associates Inc. 101-9488 189 St Surrey, B.C. Canada V4N 4W7 Tel: (604) 881-2582 Email: mark.lanfranco@alanfranco.com
Sampling Crew:	Mr. S. Verby - A. Lanfranco and Associates Inc. Mr. J. Dennis - A. Lanfranco and Associates Inc.

Atlantic Power Corporation commissioned A. Lanfranco & Associates Inc. to conduct an emission survey at their Power Plant in Williams Lake, BC. Emission tests were conducted on a waste-wood fired co-generation power plant authorized by British Columbia Ministry of Environment (BC MOE) Permit PA-8808.

On November 4, 2025, triplicate emission tests were performed for the following parameters:

- particulate concentration and emission rate
- discharge rate (flow rate)
- gas composition (CO₂, O₂ and moisture)

A. Lanfranco and Associates was responsible for the gravimetric analysis for this survey. Justin Ching, the lab manager for Lanfranco can be reached at 604-881-2582.

This report contains details of the test results and methodologies utilized.



2 PROCESS DESCRIPTION

The process under investigation during this survey is a wood fuelled Boiler (E218415) discharging through a 3.5-meter stack. The process discharges to atmosphere following emission control by multi-clones, and a five-field electrostatic precipitator.

On November 4, 2025, the facility was operating at the 92nd percentile capacity relative to the previous 100 days. Operational data can be found in Table 2 of the results section.

3 METHODOLOGY

The sampling and analytical methods used throughout this survey conform to the procedures outlined in the BC source testing code and the BC air analytical manual. The following table shows the methodology followed.

<u>Parameter</u>	<u>Reference Method</u>
Sample and Velocity traverse points	EPS 1/RM/8 A Determination of Sampling Site and Traverse Points
Velocity and flowrate	EPS 1/RM/8 B Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)
Gas molecular weight (O ₂ /CO ₂)	EPA Method 3 Gas Analysis for the Determination of Dry Molecular Weight
Flue gas Moisture	EPS 1/RM/8 D Determination of Moisture Content
Particulate Matter	EPA Method 5 Determination of Particulate Matter Emissions from Stationary Sources

3.1 Sampling Techniques

Sampling of particulate (EPA Method 5) from the Main Stack was conducted using CAE and Apex sampling trains equipped with heated filter assemblies and a heated five-foot probe (Fig. 1). The impinger sections of the sampling trains were charged with de-ionized water for moisture determination. Cyclones were not used as part of the sampling apparatus.

Appendix A – Stack Particulate Test



The stack was checked for cyclonic flow using methods outlined in the source test code. No cyclonic flow condition existed.

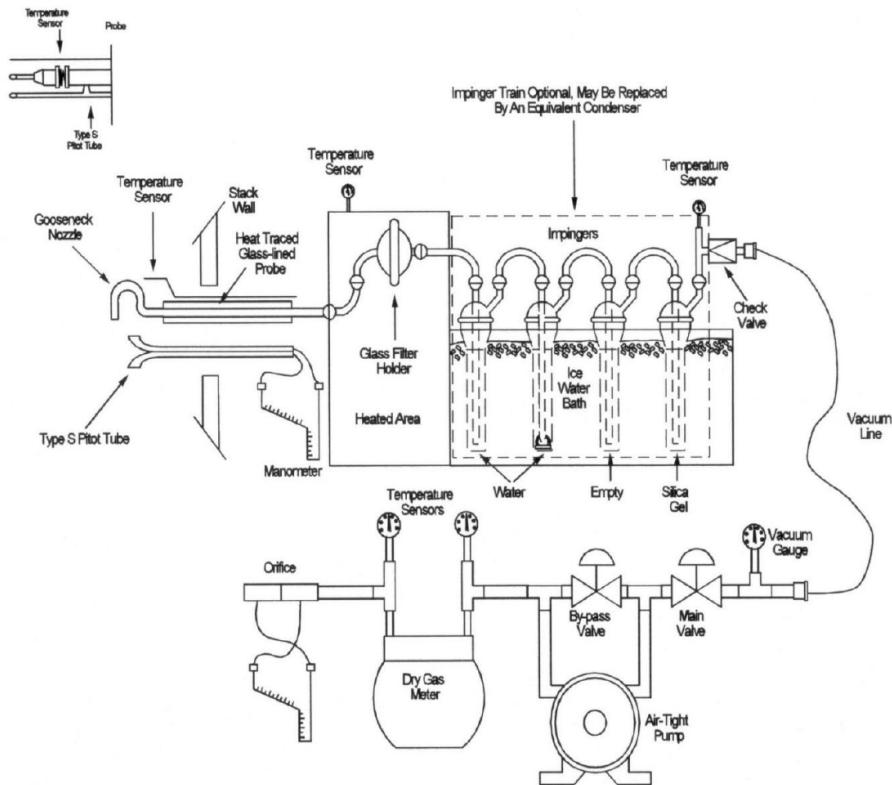


Figure 1: Method 5 Particulate Train

Appendix A – Stack Particulate Test



Sampling Site and Traverse Points

Primary: EPA Method 1

This method is designed to aid in the representative measurement of pollutant emissions and/or total volumetric flow rate from a stationary source. A measurement site where the effluent stream is flowing in a known direction is selected, and the cross-section of the stack is divided into a number of equal areas. Traverse points are then located within each of these equal areas. At Williams Lake, four traverses of 3 points for a total of 12 points were measured per test.

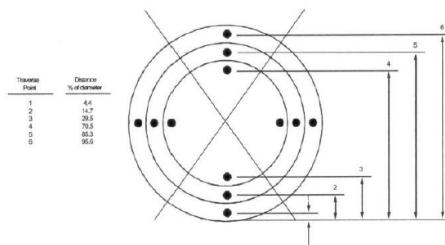


Figure 2. Example showing circular stack cross section divided into 12 equal areas, with location of traverse points.

Each point (equal area method) was sampled for 5 minutes (figure 4/4a) resulting in final sample volumes of about 1.0 cubic meters.

Stack Gas Velocity and Volumetric Flow Rate

Primary: EPA Method 2

The average gas velocity in a stack or duct is determined from the gas density and from the measurement of velocity pressure with an S-type pitot tube. A standard pitot tube may be used where plugging of the tube openings due to particulate matter and/or moisture is not likely to occur. Stack gas volumetric flow rate is determined from measurements of stack gas velocity, temperature, absolute pressure, dry gas composition, moisture content, and stack diameter.

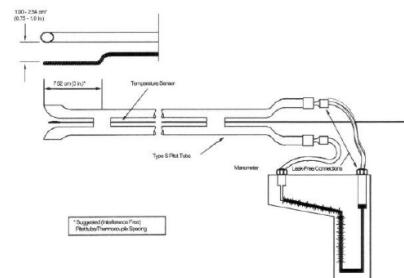


Figure 3. Type S Pitot Tube Manometer Assembly

Appendix A – Stack Particulate Test



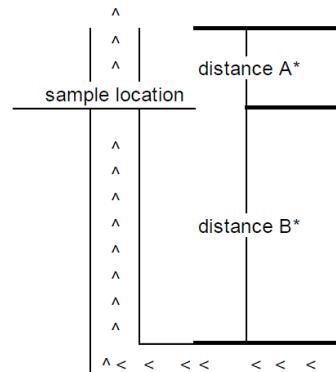
Figure - 4 Location of Traverse Points in Circular Stacks

(inches from inside wall to traverse point)

Client Stack I.D.: Atlantic Power

Diameter (inches)	138	Diameters Upstream: > 2
Total Points	12	
# of Ports Used	4	
Points / Traverse	3	Diameters Downstream: > 8

Point	Distance from Wall
1	6.1
2	20.1
3	40.8



* distance A : duct diameters upstream from flow disturbance

* distance B : duct diameters downstream from flow disturbance

\leftarrow \leftarrow \leftarrow \leftarrow : flow direction

Figure 4a Location of Traverse Points in Circular Stacks

(percent of diameter from inside wall to traverse point)

Traverse Point Number on a Diameter	Number of Traverse Points on a Diameter					
Diameter	2	4	6	8	10	12
1	14.6%	6.7%	4.4%	3.2%	2.6%	2.1%
2	85.4%	25.0%	14.6%	10.5%	8.2%	6.7%
3		75.0%	29.6%	19.4%	14.6%	11.8%
4		93.3%	70.4%	32.3%	22.6%	17.7%
5			85.4%	67.7%	34.2%	25.0%
6			95.6%	80.6%	65.8%	35.6%
7				89.5%	77.4%	64.4%
8				96.8%	85.4%	75.0%
9					91.8%	82.3%
10					97.4%	88.2%
11						93.3%
12						97.9%

Appendix A – Stack Particulate Test



<u>Molecular Weight by Gas Analysis</u>	Primary:	EPA Method 3/3a
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An integrated or grab sample is extracted from a single point in the gas stream and analyzed for its components using a Fyrite analyzer, a gas chromatograph, or calibrated continuous analyzers.

<u>Moisture Content</u>	Primary:	EPA Method 4
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A gas sample is extracted from a single point in the enclosed gas stream being sampled. The moisture is condensed and its weight measured. This weight, together with the volume of gas sampled, enables the stack gas moisture content to be calculated.

3.2 Analytical Techniques

Gravimetric analysis of the particulate samples was conducted by A. Lanfranco and Associates Inc. at their Surrey laboratory. All filters were conditioned by 105 °C drying, desiccation for 24 hours, and weighing of the particulate.

Probe washings were evaporated to dryness in porcelain dishes, desiccated for 24 hours and weighed. Blanks were carried through all procedures.

4 RESULTS

The results of the particulate and stack parameters were calculated using a computer program consistent with reporting requirements of BC MOE. Standard conditions used were 20 °C and 101.325 kPa (dry). Particulate concentrations were corrected to 8% O₂.

The "actual" flowrates results are volumetric flowrates at stack conditions. Detailed test results are presented in Table 1. Table 2 shows the operating conditions. Supporting data is presented in the Appendices. Calculations are presented in Appendix 2.

Appendix A – Stack Particulate Test



TABLE 1: MAIN STACK EMISSION RESULTS

Parameter	Test 1	Test 2	Test 3	Average
Test Date	4-Nov-25	4-Nov-25	4-Nov-25	
Test Time	10:45 - 11:56	12:14 - 13:31	13:37 - 14:42	
Duration (minutes)	60	60	60	60
Particulate (mg/m ³)	4.77	4.83	6.78	5.46
Particulate (mg/m ³ @ 8% O ₂)	4.03	4.06	5.73	4.61
Particulate (kg/hr)	1.30	1.37	1.90	1.52
Particulate (kg/day)	31.3	32.9	45.6	36.6
Flowrate (m ³ /min)	4551	4728	4670	4650
Flowrate (m ³ /sec)	75.9	78.8	77.8	77.5
Flowrate (A m ³ /min)	8346	8688	8599	8544
Temperature (°C)	140	140	139	140
O ₂ (vol % dry)	5.64	5.56	5.62	5.60
CO ₂ (vol % dry)	15.3	15.3	15.0	15.2
H ₂ O (vol %)	16.4	16.6	16.9	16.6
Isokinetic Variation (%)	97.1	103	103	101

All results are at standard conditions of 20 °C and 101.325 kPa (dry)

Appendix A – Stack Particulate Test



TABLE 2: OPERATING CONDITIONS

Steam Flow 4-Nov-25 (K lbs./hour)	90th percentile of Steam Flow Prev. 100 days (K lbs./hour)	Steam Flow Prev. 30 days (K lbs./hour)
Boiler Stack	539	530

The average steam flow for the tests was 539 klb/hr, which is 92% of the 90th percentile of the last 100 operating days and 115% of the average steam flow for the last 30 full operating days.

According to authorization number 8808, the sampling must be conducted when the operating conditions are as close as reasonably practical to the 90th percentile for the previous 100 operating days and greater than the average for the previous 30 full operating days.



5 DISCUSSION OF RESULTS

The average particulate result for this survey was 4.61 mg/Sm³ @ 8% O₂ and is well below the permitted level of 20 mg/Sm³ @ 8% O₂. The results for particulate matter are quite comparable to previous results from this source. The results do not include condensable particulate matter.

The average flow rate measurement of 77.5 Sm³/sec was also within the allowable limit of 110 Sm³/sec.

On the test day there were no environmental factors which impacted the testing.

There were no technical problems encountered in sample collection or analysis. Samples were collected isokinetically at all points and sampling equipment was operated in a normal steady manner during testing. The test results, therefore, are considered to be an accurate representation of emission characteristics for the process conditions maintained on the test date.

APPENDIX 1
COMPUTER OUTPUTS OF MEASURED
AND CALCULATED DATA

Appendix A – Stack Particulate Test

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	Date:	4-Nov-25
Jobsite:	Williams Lake, B.C.	Run:	1 - Particulate
Source:	Main Stack	Run Time:	10:45 - 11:56

Particulate Concentration:	4.8 mg/dscm 2.6 mg/Acm	0.0021 gr/dscf 0.0011 gr/Acf
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	4.0 mg/dscm (@ 8% O ₂)	0.0018 gr/dscf (@ 8% O ₂)
--	------------------------------------	---------------------------------------

Emission Rate: 1.30 Kg/hr 2.871 lb/hr

Sample Gas Volume:	1.1112 dscm	39.243 dscf
Total Sample Time:	60.0 minutes	

Average Isokineticity: 97.1 %

Flue Gas Characteristics

Moisture:	16.44 %	
Temperature	140.0 °C	283.9 °F
Flow	4551.0 dscm/min 75.85 dscm/sec 8345.8 Acm/min	160719 dscf/min 2678.6 dscf/sec 294732 Acf/min
Velocity	14.415 m/sec	47.29 f/sec
Gas Analysis	5.64 % O ₂	15.25 % CO ₂
	30.665 Mol. Wt (g/gmole) Dry	28.584 Mol. Wt (g/gmole) Wet

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Appendix A – Stack Particulate Test

A. Lanfranco and Associates Inc. - Emission Report

Client: Atlantic Power **Date:** 4-Nov-25
Jobsite: Williams Lake, B.C. **Run:** 1 - Particulate
Source: Main Stack **Run Time:** 10:45 - 11:56

Control Unit (V)	1.0230	Gas Analysis (Vol. %):		Condensate Collection:
Nozzle Diameter (in.)	0.2825	CO ₂	O ₂	Impinger 1 (grams) 115.0
Pitot Factor	0.8375	15.00	5.89	Impinger 2 (grams) 25.0
Baro. Press. (in. Hg)	27.54	16.00	5.26	Impinger 3 (grams) 15.0
Static Press. (in. H ₂ O)	-0.35	15.00	5.77	Impinger 4 (grams) 9.0
Stack Height (ft)	200	15.00	5.62	
Stack Diameter (in.)	138.0	<u>Average = 15.25</u>		
Stack Area (sq.ft.)	103.869	<u>5.64</u>		
Minutes Per Reading	5.0			
Minutes Per Point	5.0			
Port Length (inches)	8.0	Collection:		
		Filter (grams)	0.0001	
		Washings (grams)	0.0053	
		<u>Impinger (grams)</u>	<u>0.0000</u>	
		Total (grams)	0.0053	Total Gain (grams) 164.0

Traverse	Point	Time (min.)	Dry Gas Meter (ft ³)	Pitot ^P (in H ₂ O)	Orifice ^H (in H ₂ O)	Dry Gas Temperature			Wall Dist. (in.)	Isokin. (%)
						Inlet (°F)	Outlet (°F)	Stack (°F)		
1		0.0	46.250							
	1	5.0	49.820	0.500	1.92	63	63	281	6.1	97.1
	2	10.0	53.310	0.470	1.82	67	67	283	20.1	97.3
	3	15.0	56.370	0.360	1.41	70	70	280	40.8	96.6
2		0.0	56.370							
	1	5.0	59.970	0.490	1.91	73	73	287	6.1	97.5
	2	10.0	63.450	0.460	1.80	75	75	286	20.1	96.8
	3	15.0	66.610	0.370	1.46	77	77	280	40.8	97.1
3		0.0	66.610							
	1	5.0	70.240	0.490	1.43	78	78	283	6.1	97.0
	2	10.0	73.830	0.480	1.88	78	78	287	20.1	97.3
	3	15.0	77.110	0.400	1.58	79	79	282	40.8	96.8
4		0.0	77.110							
	1	5.0	81.010	0.560	2.21	81	81	286	6.1	97.3
	2	10.0	84.850	0.540	2.14	82	82	287	20.1	97.4
	3	15.0	88.319	0.440	1.75	83	83	285	40.8	97.1
			Average:	0.463	1.776	75.5	75.5	283.9		97.1

Appendix A – Stack Particulate Test

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	Date:	4-Nov-25
Jobsite:	Williams Lake, B.C.	Run:	2 - Particulate
Source:	Main Stack	Run Time:	12:14 - 13:31

Particulate Concentration:	4.8 mg/dscm 2.6 mg/Acm	0.0021 gr/dscf 0.0011 gr/Acf
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4.1 mg/dscm (@ 8% O₂) 0.0018 gr/dscf (@ 8% O₂)

Emission Rate:	1.37 Kg/hr	3.021 lb/hr
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Sample Gas Volume:	1.2216 dscm	43.140 dscf
Total Sample Time:	60.0 minutes	

Average Isokineticity:	102.8 %
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Flue Gas Characteristics

Moisture:	16.64 %	
Temperature	139.8 °C	283.6 °F
Flow	4728.0 dscm/min 78.80 dscm/sec 8688.0 Acm/min	166971 dscf/min 2782.8 dscf/sec 306818 Acf/min
Velocity	15.006 m/sec	49.23 f/sec
Gas Analysis	5.56 % O ₂	15.25 % CO ₂
	30.662 Mol. Wt (g/gmole) Dry	28.555 Mol. Wt (g/gmole) Wet

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Appendix A – Stack Particulate Test

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	Date:	4-Nov-25
Jobsite:	Williams Lake, B.C.	Run:	2 - Particulate
Source:	Main Stack	Run Time:	12:14 - 13:31

Control Unit (Y)	1.0230	Gas Analysis (Vol. %):		Condensate Collection:		
Nozzle Diameter (in.)	0.2825	<u>CO₂</u> <u>O₂</u>				
Pitot Factor	0.8375	16.00 5.12				
Baro. Press. (in. Hg)	27.54	15.00 5.76				
Static Press. (in. H ₂ O)	-0.35	15.00 5.59				
Stack Height (ft)	200	15.00 5.75				
Stack Diameter (in.)	138.0	<u>Average = 15.25</u> <u>5.56</u>				
Stack Area (sq.ft.)	103.869				Total Gain (grams) <u>183.0</u>	
Minutes Per Reading	5.0					
Minutes Per Point	5.0					
Port Length (inches)	8.0	Collection:				
		<u>Filter (grams)</u> <u>0.0003</u>				
		<u>Washings (grams)</u> <u>0.0056</u>				
		<u>Impinger (grams)</u> <u>0.0000</u>				
		<u>Total (grams)</u> <u>0.0059</u>				

Traverse	Point	Time (min.)	Dry Gas Meter (ft ³)	Pitot △P (in. H ₂ O)	Orifice △H (in. H ₂ O)	Dry Gas Temperature Inlet (°F)	Dry Gas Temperature Outlet (°F)	Stack (°F)	Wall Dist. (in.)	Isokin. (%)
		0.0	88.616							
1	1	5.0	92.820	0.580	2.56	82	82	283	6.1	103.0
	2	10.0	96.950	0.560	2.46	83	83	288	20.1	103.1
	3	15.0	100.620	0.440	1.95	84	84	284	40.8	102.7
		0.0	100.620							
2	1	5.0	104.660	0.530	2.36	85	85	283	6.1	102.9
	2	10.0	108.550	0.490	2.17	86	86	286	20.1	103.0
	3	15.0	112.070	0.400	1.78	86	86	282	40.8	102.8
		0.0	112.070							
3	1	5.0	116.040	0.510	2.27	87	87	285	6.1	102.8
	2	10.0	119.870	0.470	2.10	88	88	282	20.1	102.9
	3	15.0	123.520	0.430	1.93	88	88	281	40.8	102.4
		0.0	123.520							
4	1	5.0	127.780	0.590	2.63	88	88	285	6.1	102.5
	2	10.0	131.960	0.570	2.54	87	87	284	20.1	102.4
	3	15.0	135.706	0.450	2.02	87	87	280	40.8	102.9
			Average:	0.502	2.231	85.9	85.9	283.6		102.8

Appendix A – Stack Particulate Test

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	Date:	4-Nov-25
Jobsite:	Williams Lake, B.C.	Run:	3 - Particulate
Source:	Main Stack	Run Time:	13:37 - 14:42

Particulate Concentration:	6.8 mg/dscm	0.0030 gr/dscf
	3.7 mg/Acm	0.0016 gr/Acf

5.7 mg/dscm (@ 8% O₂) 0.0025 gr/dscf (@ 8% O₂)

Emission Rate:	1.90 Kg/hr	4.191 lb/hr
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Sample Gas Volume:	1.2086 dscm	42.682 dscf
Total Sample Time:	60.0 minutes	

Average Isokineticity:	103.0 %
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Flue Gas Characteristics

Moisture:	16.87 %	
Temperature	139.5 °C	283.1 °F
Flow	4670.2 dscm/min 77.84 dscm/sec 8599.1 Acm/min	164926 dscf/min 2748.8 dscf/sec 303677 Acf/min
Velocity	14.852 m/sec	48.73 f/sec
Gas Analysis	5.62 % O ₂	15.00 % CO ₂
	30.625 Mol. Wt (g/gmole) Dry	28.495 Mol. Wt (g/gmole) Wet

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Appendix A – Stack Particulate Test

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	Date:	4-Nov-25
Jobsite:	Williams Lake, B.C.	Run:	3 - Particulate
Source:	Main Stack	Run Time:	13:37 - 14:42

Control Unit (Y)	1.0230	Gas Analysis (Vol. %):		Condensate Collection:	
Nozzle Diameter (in.)	0.2825	<u>CO₂</u>	<u>O₂</u>	Impinger 1 (grams)	140.0
Pitot Factor	0.8375	15.00	5.54	Impinger 2 (grams)	30.0
Baro. Press. (in. Hg)	27.54	15.00	5.74	Impinger 3 (grams)	5.0
Static Press. (in. H ₂ O)	-0.35	15.00	5.66	Impinger 4 (grams)	9.0
Stack Height (ft)	200	15.00	5.53		
Stack Diameter (in.)	138.0	<u>Average = 15.00</u>	<u>5.62</u>		
Stack Area (sq.ft.)	103.869				
Minutes Per Reading	5.0				
Minutes Per Point	5.0				
Port Length (inches)	8.0	Collection:		Total Gain (grams) <u>184.0</u>	
		Filter (grams)	0.0004		
		Washings (grams)	0.0078		
		Impinger (grams)	0.0000		
		Total (grams)	<u>0.0082</u>		

Traverse	Point	Time (min.)	Dry Gas Meter (ft ³)	Pitot △P (in. H ₂ O)	Orifice △H (in. H ₂ O)	Dry Gas Temperature Inlet (°F)	Outlet (°F)	Stack (°F)	Wall Dist. (in.)	Isokin. (%)
		0.0	136.122							
1	1	5.0	140.220	0.560	2.49	84	84	282	6.1	101.9
	2	10.0	144.430	0.560	2.49	86	86	284	20.1	104.4
	3	15.0	148.080	0.430	1.93	87	87	277	40.8	102.5
		0.0	148.080							
2	1	5.0	152.290	0.570	2.54	88	88	286	6.1	103.3
	2	10.0	156.400	0.540	2.41	89	89	284	20.1	103.2
	3	15.0	160.040	0.420	1.89	91	91	282	40.8	103.0
		0.0	160.040							
3	1	5.0	164.030	0.510	2.29	91	91	283	6.1	102.6
	2	10.0	167.910	0.480	2.15	92	92	285	20.1	102.8
	3	15.0	171.430	0.390	1.76	92	92	280	40.8	103.0
		0.0	171.430							
4	1	5.0	175.510	0.530	2.37	92	92	287	6.1	103.0
	2	10.0	179.450	0.490	2.20	93	93	285	20.1	103.1
	3	15.0	183.050	0.410	1.85	93	93	282	40.8	102.7
			Average:	0.491	2.198	89.8	89.8	283.1		103.0

APPENDIX 2

CALCULATIONS



Appendix 2 Calculations

The following sections show the equations and define the variables that were used for this survey. The equations are organized in three sections. Equations 1-12 were used to calculate particulate concentration at standard conditions on a dry basis. Equations 13-27 were used to sample within the $100 \pm 10\%$ isokinetic variation and to confirm that sampling meets this isokinetic variation threshold. Equations 28-30 were used to calculate the volumetric flowrate of the stack flue gas.

A2.1 Contaminant Concentration Calculations

$$c = \frac{m}{V_{std}} \quad \text{Equation 1}$$

$$m_{part} = m_{filter} + m_{pw} \quad \text{Equation 2}$$

$$m_i = m_{ana,i} - m_{blank} \quad \text{Equation 3}$$

$$V_{std} = \frac{V_{std(imp)}}{35.315} \quad \text{Equation 4}$$

$$V_{std(imp)} = \frac{V_{samp} \times y \times P_m \times (T_{std} + 459.67)}{P_{std} \times (T_{m(ave)} + 459.67)} \quad \text{Equation 5}$$

$$V_{samp} = V_{final} - V_{init} \quad \text{Equation 6}$$

$$P_m = P_B + \frac{\Delta H_{ave}}{13.6} \quad \text{Equation 7}$$

$$\Delta H_{ave} = \frac{1}{n} \sum_{i=1}^n \Delta H_{i(act)}, \text{ where } n = \text{the number of points} \quad \text{Equation 8}$$

$$OC = \frac{20.9 - \%O_{2c}}{20.9 - \%O_{2m}} \quad \text{Equation 9}$$

$$CO2C = \frac{\%CO_{2c}}{\%CO_{2m}} \quad \text{Equation 10}$$

$$\%O_{2m} = \frac{1}{n} \sum_{i=1}^n \%O_{2i}, \text{ where } n = \text{the number of } O_2 \text{ measurements} \quad \text{Equation 11}$$

$$\%CO_{2m} = \frac{1}{n} \sum_{i=1}^n \%CO_{2i}, \text{ where } n = \text{the number of } CO_2 \text{ measurements} \quad \text{Equation 12}$$



Appendix 2 Calculations

Where,

c	= Contaminant concentration
m	= Contaminant mass
m_i	= Net analytical mass (mg, ng, or μ g)
$m_{ana,i}$	= Analytical mass (mg, ng, or μ g)
m_{blank}	= Blank analytical mass (mg, ng, or μ g)
m_{part}	= Total particulate mass (mg)
m_{filter}	= Net particulate gain from filter (mg)
m_{pw}	= Net particulate gain from probe wash (mg)
$V_{std(imp)}$	= Sample volume at standard conditions (ft^3)
V_{std}	= Sample volume at standard conditions (m^3)
V_{samp}	= Sample volume at actual conditions (ft^3)
V_{final}	= Final gas meter reading (ft^3)
V_{init}	= Initial gas meter reading (ft^3)
T_{std}	= Standard temperature (68 °F)
T_m	= Gas meter temperature (°F)
$T_{m(ave)}$	= Average gas meter temperature (°F)
P_m	= Absolute meter pressure (inches of Hg)
P_B	= Barometric pressure (inches of Hg)
ΔH_{ave}	= Average of individual point orifice pressures (inches of H_2O)
$\Delta H_{i(act)}$	= Individual recorded point orifice pressures (inches of H_2O)
OC	= Oxygen correction factor (dimensionless)
$CO2C$	= Carbon dioxide correction factor (dimensionless)
$\%O_{2c}$	= Oxygen concentration to correct to (% dry basis)
$\%O_{2m}$	= Average measured stack gas oxygen concentration (% dry basis)
$\%CO_{2c}$	= Carbon dioxide concentration to correct to (% dry basis)
$\%CO_{2m}$	= Average measured stack gas oxygen concentration (% dry basis)

Equation 1 is the general concentration calculation used for all contaminants. The contaminant mass, m , is the net analytic mass for the given contaminant. For particulate, m is the sum of the mass contributed from probe washing and filter particulate.



Appendix 2 Calculations

A2.2 Isokinetic Variation Calculations

$$\Delta H_i = \frac{2.62 \times 10^7 \times c_p \times A_n \times (1 - B_{wo}) \times M_D \times (T_m + 459.67) \times \Delta p_i}{k_o \times M_w \times (T_{stk} + 459.67)} \quad \text{Equation 13}$$

$$R_m = 85.49 \times c_p \times \sqrt{\Delta p_i} \times \sqrt{\frac{(T_{stk_i} + 459.67)}{M_w \times P_B}} \times 60 \times A_n \times \frac{(T_{m_i} + 459.67) \times (1 - B_{wo})}{(T_{stk_i} + 459.67) \times y} \quad \text{Equation 14}$$

$$A_n = \pi \left(\frac{d_n}{24} \right)^2 \quad \text{Equation 15}$$

$$M_w = M_D \times (1 - B_{wo}) + 18 \times B_{wo} \quad \text{Equation 16}$$

$$M_D = 0.44 \times \%CO_2 + 0.32 \times \%O_2 + 0.28 \times (100 - \%CO_2 - \%O_2) \quad \text{Equation 17}$$

$$T_{stk} = \frac{1}{n} \sum_{i=1}^n T_{stk_i}, \text{ where } n = \text{the number of points} \quad \text{Equation 18}$$

$$B_{wo} = \frac{V_{cond}}{V_{cond} + V_{std(imp)}} \quad \text{Equation 19}$$

$$V_{cond} = 0.04707 \times V_{gain} \quad \text{Equation 20}$$

$$Iso = \frac{1}{n} \sum_{i=1}^n Iso_i, \text{ where } n = \text{the number of points} \quad \text{Equation 21}$$

$$Iso_i = \frac{v_{nzi}}{v_i} \quad \text{Equation 22}$$

$$v_i = 85.49 \times c_p \times \sqrt{\Delta p_i} \times \sqrt{\frac{(T_{stk_i} + 459.67)}{(P_{stk} \times M_w)}} \quad \text{Equation 23}$$

$$v_{nzi} = \frac{(V_i - V_{i-1}) \times y \times (T_{stk_i} + 459.67) \times (P_B + \frac{\Delta H_i(\text{act})}{13.6})}{A_n \times t_i \times 60 \times (T_{m(i)} + 459.67) \times P_{stk} \times (1 - B_{wo})} \quad \text{Equation 24}$$

$$P_{stk} = P_B + \frac{P_g}{13.6} \quad \text{Equation 25}$$



Appendix 2 Calculations

$$v_{stk} = \frac{1}{n} \sum_{i=1}^n v_i, \text{ where } n = \text{the number of points}$$

Equation 26

$$v_{nz} = \frac{1}{n} \sum_{i=1}^n v_{nzi}, \text{ where } n = \text{the number of points}$$

Equation 27

Where,

A_n	= Nozzle area (ft^2)
d_n	= Diameter of nozzle (inches)
c_p	= Pitot coefficient (dimensionless)
Δp_i	= Individual point differential pressures (inches of H_2O)
T_{stk}	= Average flue gas temperature ($^{\circ}\text{F}$), second subscript i , indicates individual point measurements
$\Delta H_{i(act)}$	= Calculated individual point orifice pressures (inches of H_2O)
P_g	= Stack Static pressure (inches of H_2O)
P_{stk}	= Absolute stack pressure (inches of Hg)
M_w	= Wet gas molecular weight (g/gmol)
M_D	= Dry gas molecular weight (g/gmol)
$\%CO_2$	= Stack gas carbon dioxide concentration (% dry basis)
$\%O_2$	= Stack gas oxygen concentration (% dry basis)
B_{wo}	= Stack gas water vapour, proportion by volume
V_{cond}	= Total volume of water vapor collected, corrected to standard conditions (ft^3)
V_{gain}	= Condensate gain of impinger contents (mL)
P_{std}	= Standard pressure (29.92 inches of Hg)
V_{stk}	= Average flue gas velocity (ft/sec)
v_i	= Individual point flue gas velocity (ft/sec)
v_{nz}	= Average velocity at nozzle(ft/sec)
v_{nzi}	= Individual point velocity at nozzle(ft/sec)
Iso_i	= Individual point isokinetic variation (%)
Iso	= Average isokinetic variation (%)
R_m	= Isokinetic sampling rate (ft^3/min)



Appendix 2 Calculations

A2.3 Volumetric Flowrate Calculations

$$Q_s = Q_A \times \frac{(T_{Std} + 459.67)}{(T_{Stk} + 459.67)} \times \frac{P_{Stk}}{P_{Std}} \quad \text{Equation 28}$$

$$Q_A = \frac{v_{stk} \times 60 \times A_{stk}}{35.315} \quad \text{Equation 29}$$

$$A_{stk} = \pi \left(\frac{d}{24} \right)^2 \quad \text{Equation 30}$$

Where,

Q_A	= Actual flowrate (Am^3/min)
Q_s	= Flowrate (m^3/min) at standard conditions on a dry basis
A_{stk}	= Area of stack (ft^2)
d	= Diameter of stack (inches)

APPENDIX 3

ANALYTICAL DATA

Appendix A – Stack Particulate Test

Appendix 3

Analytical Data



GRAVIMETRIC ANALYTICAL RESULTS

Client: Atlantic Power **Sample Date:** 4-Nov-25
Source: Main Stack **Location:** Williams Lake, B.C.

A. Lanfranco & Associates Standard Operating Procedure:
 SOP 1.2.1 Gravimetric determination of total particulate matter

	Initial (g)	Final (g)	Net (g)	Blank Corrected Net (g)
Filters				
Run 1	0.3478	0.3476	-0.0002	0.0001
Run 2	0.3483	0.3485	0.0002	0.0003
Run 3	0.3487	0.3490	0.0003	0.0004
Blank	0.3442	0.3441	-0.0001	
Probe Washes				
Run 1	120.9011	120.9053	0.0042	0.0053
Run 2	116.6752	116.6797	0.0045	0.0056
Run 3	127.0085	127.0152	0.0067	0.0078
Blank	118.6485	118.6474	-0.0011	
Run 1				
Silica Gels	9.0	8.0	9.0	
Task				
Filter Recovery:	Personnel	Date	Quality Control	Y/N
S. Verby	S. Verby	4-Nov-25	Adequate PW volume:	Y
PW Initial Analysis:	J. Ching	10-Nov-25	No sample leakage:	Y
PW, Filter and Gel Final Analysis:	J. Ching	24-Nov-25	Filter not compromised:	Y
Data entered to computer:	C. Lanfranco	25-Nov-25		

Comments:

No problems encountered in sample analysis.

APPENDIX 4

FIELD DATA SHEETS

Appendix A – Stack Particulate Test

A. Lanfranco and Associates Inc.

Appendix A – Stack Particulate Test

A. Lanfranco and Associates Inc.

CLIENT	Atlanta Power	NOZZLE PROBE	DIAMETER, IN. OP.	IMPINGER ¹ , INITIAL VOLUME (mL)	FINAL (mL)	TOTAL GAIN (mL)
SOURCE	NCiN Stack	835	835	100	240	
PARAMETER / RUN NO	Par Nov Run #2			Imp. #1		
DATE	04 Nov 23			Imp. #2	130	
OPERATOR:	SL			Imp. #3		
CONTROL UNIT	3U 14	5D	138.0	Imp. #4		
BAROMETRIC PRESSURE, IN. HG	27.54	1.0230	200	Imp. #5		
ASSUMED MOISTURE, Bw	15.6%	ΔH@		Imp. #6		
Upstream Diameters						
Downstream Diameters						
Point	Clock Time	Dry Gas Meter ft ³	Pilot ΔP IN. H ₂ O	Orifice Alt IN. H ₂ O	Dry Gas Outlet	Stack
1	1214	88.616	2.36	32	283	232
2	10	97.87	1.38	33	283	233
3	12	100.62	1.56	34	284	233
1	23	104.66	1.53	33	283	230
2	23	108.53	1.49	31	286	230
3	20	112.07	1.40	31	286	232
1	33	116.04	31	2.27	27	285
2	10	119.87	47	1.10	33	284
3	43	123.52	43	1.93	33	282
Temperature °F						
Probe						
Box						
Impinger Exit						
Pump Vac						
IN. HG						
CO ₂ Vol %						
O ₂ Vol %						
Furnaces						
END (0) 1321						

Appendix A – Stack Particulate Test

Lanfranco and Associates Inc.

CLIENT	Atlantic Power	NOZZLE	5740	DIAMETER, IN.	2825	IMPINGER	INITIAL	FINAL	TOTAL GAIN
SOURCE	Main Stack	PROBE	SA 5	Cp	8373	VOLUMES	(mL)	(mL)	(mL)
PARAMETER / RUN No	Stack Run #5	PORT LENGTH				Imp. #1	100	240	
DATE	04/08/25	STATIC PRESSURE, IN. H ₂ O	0.35			Imp. #2	100	150	
OPERATOR:	UV-1D	STACK DIAMETER	138.0"			Imp. #3			
CONTROL UNIT	SV-14	STACK HEIGHT	220			Imp. #4			
BAROMETRIC PRESSURE, IN. HG	27.54	INITIAL LEAK TEST	0.001	10"		Imp. #5			
ASSUMED MOISTURE, BW	16.6	FINAL LEAK TEST	0.001	10"		Imp. #6			
Upstream Diameters									
Downstream Diameters									
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Dry Gas outlet	Stack	Probe	Box	Impinger Exit
1	5	140.22	.56	7.49	84	282	254	7.50	6.7
2	10	144.43	.56	7.49	84	282	254	7.50	6.7
3	15	148.03	.43	7.93	83	284	277	7.50	6.7
1	20	152.29	.57	2.54	83	286	250	7.50	6.7
2	25	156.40	.54	2.41	83	286	252	7.50	6.7
3	30	160.04	.42	1.89	91	282			
1	35	164.03	.51	2.29	91	283	254	7.50	6.7
2	40	167.93	.48	2.15	92	285			
3	45	171.43	.39	1.76	92	280			
1	50	175.31	.53	2.37	92	287	250	7.50	6.7
2	55	179.45	.49	2.10	93	285			
3	60	183.05	.61	1.85	93	282			
Upstream Diameters									
Downstream Diameters									
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Dry Gas outlet	Stack	Probe	Box	Impinger Exit
1	5	140.22	.56	7.49	84	282	254	7.50	6.7
2	10	144.43	.56	7.49	84	282	254	7.50	6.7
3	15	148.03	.43	7.93	83	284	277	7.50	6.7
1	20	152.29	.57	2.54	83	286	250	7.50	6.7
2	25	156.40	.54	2.41	83	286	252	7.50	6.7
3	30	160.04	.42	1.89	91	282			
1	35	164.03	.51	2.29	91	283	254	7.50	6.7
2	40	167.93	.48	2.15	92	285			
3	45	171.43	.39	1.76	92	280			
1	50	175.31	.53	2.37	92	287	250	7.50	6.7
2	55	179.45	.49	2.10	93	285			
3	60	183.05	.61	1.85	93	282			
Upstream Diameters									
Downstream Diameters									
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Dry Gas outlet	Stack	Probe	Box	Impinger Exit
1	5	140.22	.56	7.49	84	282	254	7.50	6.7
2	10	144.43	.56	7.49	84	282	254	7.50	6.7
3	15	148.03	.43	7.93	83	284	277	7.50	6.7
1	20	152.29	.57	2.54	83	286	250	7.50	6.7
2	25	156.40	.54	2.41	83	286	252	7.50	6.7
3	30	160.04	.42	1.89	91	282			
1	35	164.03	.51	2.29	91	283	254	7.50	6.7
2	40	167.93	.48	2.15	92	285			
3	45	171.43	.39	1.76	92	280			
1	50	175.31	.53	2.37	92	287	250	7.50	6.7
2	55	179.45	.49	2.10	93	285			
3	60	183.05	.61	1.85	93	282			
Upstream Diameters									
Downstream Diameters									
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Dry Gas outlet	Stack	Probe	Box	Impinger Exit
1	5	140.22	.56	7.49	84	282	254	7.50	6.7
2	10	144.43	.56	7.49	84	282	254	7.50	6.7
3	15	148.03	.43	7.93	83	284	277	7.50	6.7
1	20	152.29	.57	2.54	83	286	250	7.50	6.7
2	25	156.40	.54	2.41	83	286	252	7.50	6.7
3	30	160.04	.42	1.89	91	282			
1	35	164.03	.51	2.29	91	283	254	7.50	6.7
2	40	167.93	.48	2.15	92	285			
3	45	171.43	.39	1.76	92	280			
1	50	175.31	.53	2.37	92	287	250	7.50	6.7
2	55	179.45	.49	2.10	93	285			
3	60	183.05	.61	1.85	93	282			
Upstream Diameters									
Downstream Diameters									
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Dry Gas outlet	Stack	Probe	Box	Impinger Exit
1	5	140.22	.56	7.49	84	282	254	7.50	6.7
2	10	144.43	.56	7.49	84	282	254	7.50	6.7
3	15	148.03	.43	7.93	83	284	277	7.50	6.7
1	20	152.29	.57	2.54	83	286	250	7.50	6.7
2	25	156.40	.54	2.41	83	286	252	7.50	6.7
3	30	160.04	.42	1.89	91	282			
1	35	164.03	.51	2.29	91	283	254	7.50	6.7
2	40	167.93	.48	2.15	92	285			
3	45	171.43	.39	1.76	92	280			
1	50	175.31	.53	2.37	92	287	250	7.50	6.7
2	55	179.45	.49	2.10	93	285			
3	60	183.05	.61	1.85	93	282			
Upstream Diameters									
Downstream Diameters									
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Dry Gas outlet	Stack	Probe	Box	Impinger Exit
1	5	140.22	.56	7.49	84	282	254	7.50	6.7
2	10	144.43	.56	7.49	84	282	254	7.50	6.7
3	15	148.03	.43	7.93	83	284	277	7.50	6.7
1	20	152.29	.57	2.54	83	286	250	7.50	6.7
2	25	156.40	.54	2.41	83	286	252	7.50	6.7
3	30	160.04	.42	1.89	91	282			
1	35	164.03	.51	2.29	91	283	254	7.50	6.7
2	40	167.93	.48	2.15	92	285			
3	45	171.43	.39	1.76	92	280			
1	50	175.31	.53	2.37	92	287	250	7.50	6.7
2	55	179.45	.49	2.10	93	285			
3	60	183.05	.61	1.85	93	282			
Upstream Diameters									
Downstream Diameters									
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Dry Gas outlet	Stack	Probe	Box	Impinger Exit
1	5	140.22	.56	7.49	84	282	254	7.50	6.7
2	10	144.43	.56	7.49	84	282	254	7.50	6.7
3	15	148.03	.43	7.93	83	284	277	7.50	6.7
1	20	152.29	.57	2.54	83	286	250	7.50	6.7
2	25	156.40	.54	2.41	83	286	252	7.50	6.7
3	30	160.04	.42	1.89	91	282			
1	35	164.03	.51	2.29	91	283	254	7.50	6.7
2	40	167.93	.48	2.15	92	285			
3	45	171.43	.39	1.76	92	280			
1	50	175.31	.53	2.37	92	287	250	7.50	6.7
2	55	179.45	.49	2.10	93	285			
3	60	183.05	.61	1.85	93	282			
Upstream Diameters									
Downstream Diameters									
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Dry Gas outlet	Stack	Probe	Box	Impinger Exit
1	5	140.22	.56	7.49	84	282	254	7.50	6.7
2	10	144.43	.56	7.49	84	282	254	7.50	6.7
3	15	148.03	.43	7.93	83	284	277	7.50	6.7
1	20	152.29	.57	2.54	83	286	250	7.50	6.7
2	25	156.40	.54	2.41	83	286	252	7.50	6.7
3	30	160.04	.42	1.89	91	282			
1	35	164.03	.51	2.29	91	283	254	7.50	6.7
2	40	167.93	.48	2.15	92	285			
3	45	171.43	.39	1.76	92	280			
1	50	175.31	.53	2.37	92	287	250	7.50	6.7
2	55	179.45	.49	2.10	93	285			
3	60	183.05	.61	1.85	93	282			
Upstream Diameters									
Downstream Diameters									
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Dry Gas outlet	Stack	Probe	Box	Impinger Exit
1	5</								

APPENDIX 5

SITE MAP

Appendix A – Stack Particulate Test



APPENDIX 5
CALIBRATION DATA AND CERTIFICATIONS

Appendix A – Stack Particulate Test

Appendix A – Stack Particulate Test

A. LANFRANCO and ASSOCIATES INC.						
ENVIRONMENTAL CONSULTANTS						
NOZZLE DIAMETER CALIBRATION FORM						
Calibrated by: Christian De La O						
Date: 25-Jun-25						
Signature: 						
Nozzle I.D.	d1 (inch)	d2 (inch)	d3 (inch)	difference (inch)	average dia. (inch)	average area (ft ²)
ST01	0.1280	0.1264	0.1280	0.0016	0.1275	0.0000886
ST05	0.1700	0.1720	0.1716	0.0020	0.1712	0.0001599
SS-1	0.1710	0.1714	0.1693	0.0021	0.1706	0.0001587
SS-7	0.1711	0.1685	0.1701	0.0026	0.1699	0.0001574
ST11	0.2113	0.2120	0.2115	0.0007	0.2116	0.0002442
SS-8	0.2070	0.2080	0.2065	0.0015	0.2072	0.0002341
ST10	0.2110	0.2109	0.2120	0.0011	0.2113	0.0002435
SS-18	0.2295	0.2310	0.2318	0.0023	0.2308	0.0002905
ST15	0.2409	0.2390	0.2400	0.0019	0.2400	0.0003141
SS-2	0.2370	0.2390	0.2380	0.0020	0.2380	0.0003089
SS-3	0.2415	0.2426	0.2435	0.0020	0.2425	0.0003208
SS-24	0.2417	0.2415	0.2420	0.0005	0.2417	0.0003187
B	0.2413	0.2408	0.2421	0.0013	0.2414	0.0003178
SS-14	0.2450	0.2445	0.2475	0.0030	0.2457	0.0003292
ST30	0.2465	0.2458	0.2441	0.0024	0.2455	0.0003286
ST20	0.2502	0.2498	0.2514	0.0016	0.2505	0.0003422
A	0.2515	0.2521	0.2506	0.0015	0.2514	0.0003447
SS-9	0.2675	0.2669	0.2706	0.0037	0.2683	0.0003927
ST40	0.2830	0.2835	0.2810	0.0025	0.2825	0.0004353
SS-30	0.2915	0.2919	0.2950	0.0035	0.2928	0.0004676
SS-13	0.3003	0.2996	0.3027	0.0031	0.3009	0.0004937
ST60	0.2999	0.3020	0.2990	0.0030	0.3003	0.0004919
ST50	0.3030	0.3044	0.3039	0.0014	0.3038	0.0005033
SS-10	0.3171	0.3209	0.3195	0.0038	0.3192	0.0005556
SS-327	0.3250	0.3278	0.3265	0.0028	0.3264	0.0005812
ST65	0.3332	0.3339	0.3343	0.0011	0.3338	0.0006077
ST66	0.3345	0.3365	0.3350	0.0020	0.3353	0.0006133
ST80	0.3630	0.3665	0.3652	0.0035	0.3649	0.0007262
ST75	0.3656	0.3642	0.3645	0.0014	0.3648	0.0007257
SS-5	0.3661	0.3687	0.3698	0.0037	0.3682	0.0007394
SS-16	0.3719	0.3721	0.3730	0.0011	0.3723	0.0007561
ST76	0.3758	0.3740	0.3745	0.0018	0.3748	0.0007660
ST85	0.3981	0.3960	0.3988	0.0028	0.3976	0.0008624
SS-15	0.4000	0.3988	0.4005	0.0019	0.3997	0.0008714
DD	0.4040	0.4045	0.4039	0.0006	0.4041	0.0008908
SS11	0.4150	0.4178	0.4190	0.0040	0.4173	0.0009496
ST70	0.4250	0.4255	0.4260	0.0010	0.4255	0.0009875
ST86	0.4550	0.4538	0.4562	0.0024	0.4550	0.0011291
C	0.4940	0.4928	0.4951	0.0023	0.4940	0.0013308
SS-491	0.4890	0.4930	0.4928	0.0040	0.4916	0.0013181
SS-49	0.4959	0.4965	0.4954	0.0011	0.4959	0.0013414
SS-6	0.4943	0.4965	0.4950	0.0022	0.4953	0.0013378
SS-492	0.4825	0.4862	0.4839	0.0037	0.4842	0.0012787
ST90	0.4925	0.4932	0.4952	0.0027	0.4936	0.0013290
ST92	0.5001	0.5015	0.5020	0.0019	0.5012	0.0013701
SS-558	0.5535	0.5550	0.5520	0.0030	0.5535	0.0016709
ST96	0.5565	0.5550	0.5525	0.0040	0.5547	0.0016780
SS-635	0.6350	0.6370	0.6330	0.0040	0.6350	0.0021993
SS-12	0.7411	0.7406	0.7400	0.0011	0.7406	0.0029913

Where:

(a) D1, D2, D3 = three different nozzle diameters; each diameter must be measured to within (0.025mm) 0.001 in.

(b) Difference = maximum difference between any two diameters; must be less than or equal to (0.1mm) 0.004 in.

(c) Average = average of D1, D2 and D3

Appendix A – Stack Particulate Test

Pitot Tube Calibration

Date: 2-Jul-25
 Pbar (in.Hg): 29.94

Temp (R): 539
 Dn (in.): 0.25

Pitot ID: **5A-1**

Reference Pitot (in H ₂ O)	S-Type Pitot (in H ₂ O)	Air Velocity (ft/s)	Pitot Coeff. C _p	Deviation (absolute)
0.070	0.095	17.7	0.8498	0.0054
0.170	0.230	27.5	0.8511	0.0041
0.315	0.420	37.5	0.8574	0.0021
0.595	0.790	51.5	0.8592	0.0039
0.790	1.050	59.3	0.8587	0.0035
Average :			0.8552	0.0038

Pitot ID: **5A-3**

Reference Pitot (in H ₂ O)	S-Type Pitot (in H ₂ O)	Air Velocity (ft/s)	Pitot Coeff. C _p	Deviation (absolute)
0.045	0.060	14.2	0.8574	0.0025
0.170	0.230	27.5	0.8511	0.0037
0.300	0.400	36.6	0.8574	0.0025
0.490	0.650	46.7	0.8596	0.0047
0.750	1.020	57.8	0.8489	0.0059
Average :			0.8549	0.0039

Pitot ID: **5A-2**

Reference Pitot (in H ₂ O)	S-Type Pitot (in H ₂ O)	Air Velocity (ft/s)	Pitot Coeff. C _p	Deviation (absolute)
0.030	0.040	11.6	0.8574	0.0055
0.150	0.200	25.8	0.8574	0.0055
0.315	0.430	37.5	0.8473	0.0045
0.515	0.700	47.9	0.8492	0.0027
0.800	1.090	59.7	0.8481	0.0037
Average :			0.8519	0.0044

Pitot ID: **5A-4**

Reference Pitot (in H ₂ O)	S-Type Pitot (in H ₂ O)	Air Velocity (ft/s)	Pitot Coeff. C _p	Deviation (absolute)
0.030	0.040	11.6	0.8574	0.0078
0.200	0.270	29.8	0.8521	0.0025
0.390	0.540	41.7	0.8413	0.0082
0.610	0.830	52.1	0.8487	0.0009
0.830	1.130	60.8	0.8485	0.0011
Average :			0.8496	0.0041

Pitot ID: **ST 5A**

Reference Pitot (in H ₂ O)	S-Type Pitot (in H ₂ O)	Air Velocity (ft/s)	Pitot Coeff. C _p	Deviation (absolute)
0.210	0.290	30.6	0.8425	0.0003
0.375	0.520	40.9	0.8407	0.0020
0.480	0.660	46.2	0.8443	0.0015
0.545	0.750	49.3	0.8439	0.0012
0.630	0.870	53.0	0.8425	0.0003
Average :			0.8428	0.0011

Pitot ID: **5A-5**

Reference Pitot (in H ₂ O)	S-Type Pitot (in H ₂ O)	Air Velocity (ft/s)	Pitot Coeff. C _p	Deviation (absolute)
0.025	0.035	10.6	0.8367	0.0008
0.180	0.250	28.3	0.8400	0.0025
0.310	0.430	37.2	0.8406	0.0031
0.470	0.660	45.8	0.8354	0.0021
0.775	1.090	58.8	0.8348	0.0027
Average :			0.8375	0.0022

Pitot ID: **ST 5B**

Reference Pitot (in H ₂ O)	S-Type Pitot (in H ₂ O)	Air Velocity (ft/s)	Pitot Coeff. C _p	Deviation (absolute)
0.210	0.290	30.6	0.8425	0.0017
0.360	0.500	40.0	0.8400	0.0007
0.490	0.670	46.7	0.8466	0.0059
0.610	0.860	52.1	0.8338	0.0070
0.700	0.970	55.8	0.8410	0.0002
Average :			0.8408	0.0031

Pitot ID:

Reference Pitot (in H ₂ O)	S-Type Pitot (in H ₂ O)	Air Velocity (ft/s)	Pitot Coeff. C _p	Deviation (absolute)

* Average absolute deviation must not exceed 0.01.

Calibrated by: Jack Dennis

Signature: 

Date: July 2, 2025

Appendix A – Stack Particulate Test

BAROMETER CALIBRATION FORM						
Device	Cal Date	Pbar Env Canada		Device (inches of Hg)		Difference
		(kPa)	(inches of Hg)	Reading	Elevation Corrected	
LA	2-Jul-25	101.4	29.95	29.88	29.95	0.00
DS	2-Jul-25	101.4	29.95	29.86	29.93	0.02
CL	2-Jul-25	101.4	29.95	29.88	29.95	0.00
JC	2-Jul-25	101.4	29.95	29.88	29.95	0.00
LF	2-Jul-25	101.4	29.95	29.85	29.92	0.03
SV	2-Jul-25	101.4	29.95	29.85	29.92	0.03
CDO	2-Jul-25	101.4	29.95	29.85	29.92	0.03
JG	2-Jul-25	101.4	29.95	29.85	29.92	0.03
ML	2-Jul-25	101.4	29.95	29.85	29.92	0.03
JD	2-Jul-25	101.4	29.95	29.87	29.94	0.01

Calibrated by: Louis Agassiz

Signature: 

Date: 02-Jul-25

Performance Specification is

Device Corrected for Elevation must be +/- 0.1 " Hg of ENV CANADA SEA-LEVEL Pbar

Enter Environment Canada Pressure from their website for Vancouver (link below)
and the reading from your barometer on the ground floor of the office.

https://weather.gc.ca/city/pages/bc-74_metric_e.html

Appendix A – Stack Particulate Test

<p>A. LANFRANCO and ASSOCIATES INC. ENVIRONMENTAL CONSULTANTS</p> <p>TEMPERATURE CALIBRATION FORM</p> <p>Calibrated by: Christian De La O Date: 2-Jul-25</p> <p>Signature: <u>Carsten Lanfranco</u></p>	<p style="text-align: center;">TEMPERATURE DEVICE CALIBRATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Reference Device</th> <th rowspan="2">Model Cl2DA Calibrator</th> <th colspan="3">32</th> <th colspan="3">100</th> <th colspan="3">200</th> <th colspan="3">300</th> <th colspan="3">Temperature Settings (degrees F)</th> <th colspan="3">500</th> <th colspan="3">600</th> <th colspan="3">700</th> <th colspan="3">800</th> <th colspan="3">900</th> <th colspan="3">1000</th> </tr> <tr> <th>ALI #</th> <th>Serial #</th> <th>Reading</th> <th>Variation</th> </tr> </thead> <tbody> <tr> <td>TPI 341K</td> <td>7</td> <td>20314590036</td> <td>-6.51%</td> <td>198.4</td> <td>-17.87%</td> <td>198.6</td> <td>-0.24%</td> <td>198.1</td> <td>-0.21%</td> <td>200.1</td> <td>-0.05%</td> <td>199.7</td> <td>-0.16%</td> <td>200.1</td> <td>-0.12%</td> <td>199.1</td> <td>-0.25%</td> <td>497.7</td> <td>-39.49%</td> <td>796.9</td> <td>-0.24%</td> <td>798.5</td> <td>-0.19%</td> <td>798.5</td> <td>-0.12%</td> <td>1695</td> <td>-0.25%</td> <td>1695</td> <td>-0.19%</td> </tr> <tr> <td>TPI 341K</td> <td>8</td> <td>20313490047</td> <td>-0.24%</td> <td>198.8</td> <td>-0.43%</td> <td>199.1</td> <td>-0.16%</td> <td>198.6</td> <td>-0.21%</td> <td>198.1</td> <td>-0.05%</td> <td>199.7</td> <td>-0.16%</td> <td>199.1</td> <td>-0.12%</td> <td>199.1</td> <td>-0.25%</td> <td>498.5</td> <td>-39.49%</td> <td>796.9</td> <td>-0.24%</td> <td>798.5</td> <td>-0.19%</td> <td>798.5</td> <td>-0.12%</td> <td>1695</td> <td>-0.25%</td> <td>1695</td> <td>-0.19%</td> </tr> <tr> <td>TPI 341K</td> <td>11</td> <td>20345510024</td> <td>31.6</td> <td>0.08%</td> <td>99.7</td> <td>-0.05%</td> <td>199.7</td> <td>-0.16%</td> <td>198.6</td> <td>-0.21%</td> <td>200.1</td> <td>-0.05%</td> <td>199.7</td> 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341K	11	20345510024	31.6	0.08%	99.7	-0.05%	199.7	-0.16%	198.6	-0.21%	200.1	-0.05%	199.7	-0.16%	200.1	-0.12%	199.1	-0.25%	497.7	-39.49%	796.9	-0.24%	798.5	-0.19%	798.5	-0.12%	1695	-0.25%	1695	-0.19%	TPI 341K	12	20345510031	-6.51%	198.4	-17.87%	198.6	-0.24%	198.1	-0.21%	200.1	-0.05%	199.7	-0.16%	200.1	-0.12%	199.1	-0.25%	498.5	-39.49%	796.9	-0.24%	798.5	-0.19%	798.5	-0.12%	1695	-0.25%	1695	-0.19%	TPI 341K	18	20329680036	-6.51%	198.4	-17.87%	198.6	-0.24%	198.1	-0.21%	200.1	-0.05%	199.7	-0.16%	200.1	-0.12%	199.1	-0.25%	497.7	-39.49%	796.9	-0.24%	798.5	-0.19%	798.5	-0.12%	1695	-0.25%	1695	-0.19%	TPI 341K	20	20330480013	30.4	-0.20%	99.5	0.09%	199.1	-0.14%	198.6	-0.30%	200.6	-0.14%	198.1	-0.30%	200.6	-0.18%	498.6	-39.49%	796.9	-0.15%	798.2	-0.09%	797.3	-0.11%	1698	-0.14%	1698	-0.09%	TPI 341K	22	20330480041	30.4	-0.33%	98.4	-0.29%	198.4	-0.30%	198.1	-0.30%	200.1	-0.29%	198.6	-0.30%	200.1	-0.29%	497.4	-39.49%	796.6	-0.27%	797.3	-0.21%	797.3	-0.21%	1696	-0.19%	1696	-0.19%	TPI 341K	24	20142536007	-6.51%	198.4	-17.87%	198.6	-0.24%	198.1	-0.21%	200.1	-0.05%	199.7	-0.16%	200.1	-0.12%	199.1	-0.25%	497.4	-39.49%	796.6	-0.27%	797.3	-0.21%	797.3	-0.21%	1696	-0.19%	1696	-0.19%	TPI 341K	26	20345510036	-6.51%	198.4	-17.87%	198.6	-0.24%	198.1	-0.21%	200.1	-0.05%	199.7	-0.16%	200.1	-0.12%	199.1	-0.25%	497.4	-39.49%	796.6	-0.27%	797.3	-0.21%	797.3	-0.21%	1696	-0.19%	1696	-0.19%	TPI 341K	28	20125300038	-6.51%	198.4	-17.87%	198.6	-0.24%	198.1	-0.21%	200.1	-0.05%	199.7	-0.16%	200.1	-0.12%	199.1	-0.25%	497.4	-39.49%	796.6	-0.27%	797.3	-0.21%	797.3	-0.21%	1696	-0.19%	1696	-0.19%	TPI 341K	30	20145510023	26.9	-6.51%	97.6	-0.43%	198.4	-0.24%	198.1	-0.21%	200.4	-0.21%	198.4	-0.24%	200.4	-0.21%	498.5	-39.49%	798.4	-0.16%	798.4	-0.13%	1697	-0.14%	1697	-0.14%	Reference device is a NIST certified digital thermocouple calibrator																													Variation expressed as a percentage of the absolute temperature must be within 1.5 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Sean Verby

has successfully completed

Stack Sampling

The Faculty of Continuing Education
Mount Royal University

30 hours | May 1, 2024

A handwritten signature in blue ink that appears to read 'Dimitra Fotopoulos'.

Dimitra Fotopoulos, Vice Dean
Professional and Continuing Education

Appendix A – Stack Particulate Test



Ministry of
Environment and
Climate Change Strategy

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals¹, under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional Sean Verby
2. Are you a registered member of a professional association in B.C.? Yes No
Name of Association: _____ Registration #: _____
3. Brief description of professional services:
Environmental consulting, specializing in air and atmospheric sciences

This declaration of competency is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature:

X _____

Print Name: Sean Verby

Witnessed by:

X _____

Print Name: Daryl Sampson

Date signed: Sept, 4, 2024

¹Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who

- a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and
- b) through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.

July 2019

Appendix A – Stack Particulate Test



Ministry of
Environment and
Climate Change Strategy

Conflict of Interest Disclosure Statement

A qualified professional¹ providing services to either the Ministry of Environment and Climate Change Strategy ("ministry"), or to a regulated person for the purpose of obtaining an authorization from the ministry, or pursuant to a requirement imposed under the *Environmental Management Act*, the *Integrated Pest Management Act* or the *Park Act* has a real or perceived conflict of interest when the qualified professional, or their relatives, close associates or personal friends have a financial or other interest in the outcome of the work being performed.

A real or perceived conflict of interest occurs when a qualified professional has

- a) an ownership interest in the regulated person's business;
- b) an opportunity to influence a decision that leads to financial benefits from the regulated person or their business other than a standard fee for service (e.g. bonuses, stock options, other profit sharing arrangements);
- c) a personal or professional interest in a specific outcome;
- d) the promise of a long term or ongoing business relationship with the regulated person, that is contingent upon a specific outcome of work;
- e) a spouse or other family member who will benefit from a specific outcome; or
- f) any other interest that could be perceived as a threat to the independence or objectivity of the qualified professional in performing a duty or function.

Qualified professionals who work under ministry legislation must take care in the conduct of their work that potential conflicts of interest within their control are avoided or mitigated. Precise rules in conflict of interest are not possible and professionals must rely on guidance of their professional associations, their common sense, conscience and sense of personal integrity.

Declaration

I Sean Verby, as a member of Air and Waste Management Association declare

Select one of the following:

Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this project. I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to

Mr. Sajid Barlas, erring on the side of caution.

Appendix A – Stack Particulate Test



Ministry of
Environment and
Climate Change Strategy

Real or perceived conflict of interest

Description and nature of conflict(s):

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

Further, I acknowledge that this disclosure may be interpreted as a threat to my independence and will be considered by the statutory decision maker accordingly.

This conflict of interest disclosure statement is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Signature:

X A handwritten signature in black ink, appearing to read "Sean Verby".

Print name: Sean Verby

Date: Sept, 4, 2024

Witnessed by:

X A handwritten signature in black ink, appearing to read "Mark Lanfranco".

Print name: Mark Lanfranco

¹*Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*
a) *is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and*
b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*



Canadian Association
for Laboratory Accreditation Inc.
Certificate of Accreditation

A. Lanfranco and Associates Inc.
101 - 9488 - 189th Street
Surrey, British Columbia

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-IUAC-IAF Communiqué dated April 2017).



Accreditation No: 1004232
Issued On: 4/11/2023
Accreditation Date: 2/5/2021
Expiry Date: 10/11/2025



President and CEO


For the specific tests to which this accreditation applies, please refer to the laboratory's scope of accreditation on www.cal.ca.

Appendix B - Ash Analysis Report

Appendix B - Ash Analysis Report



Your C.O.C. #: 119322

Attention: Jacob Steyl

Atlantic Power (Williams Lake) Ltd.
4465 Mackenzie Avenue North
Williams Lake, BC
Canada V2G 5E8

Report Date: 2026/01/14
Report #: R3750304
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C597029

Received: 2025/12/08, 08:51

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Metals - TCLP	1	2025/12/10	2025/12/10	BBY7SOP-00001	EPA 1311, 6020bR2 m
Moisture	1	2025/12/10	2025/12/11	BBY8SOP-00017	BCMOE BCLM Dec2000 m
PAH in Soil by GC/MS (SIM)	1	2025/12/12	2025/12/13	BBY8SOP-00022	BCMOE BCLM Jul2017m
PAH TEQ Calculation, BC Reg. 132/92 (2)	1	N/A	2025/12/15	BBY WI-00033	Auto Calc
Total PAH and B(a)P Calculation (3)	1	N/A	2025/12/15	BBY WI-00033	Auto Calc
TCLP pH Measurements	1	N/A	2025/12/10	BBY7SOP-00005	EPA 1311
Dioxins/Furans in Soil (1613B) (1, 4)	1	2025/12/16	2026/01/10	BRL SOP-00410;BRL SOP-00407 & 405	EPA 1613B m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas Campbell, 6740 Campbell Road, Mississauga, ON, L5N 2L8

(2) PAH TEQ = 0.1*benzo(a)anthracene + 1.0*benzo(a)pyrene + 0.1*benzo(b)fluoranthene + 0.1*benzo(k)fluoranthene + 1.1*dibenzo(a,h)anthracene + 0.2*indeno(1,2,3-cd)pyrene

(3) Total PAHs in Soil include: Quinoline, Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Acridine, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b&j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene.

Appendix B - Ash Analysis Report



Your C.O.C. #: 119322

Attention: Jacob Steyl

Atlantic Power (Williams Lake) Ltd.
4465 Mackenzie Avenue North
Williams Lake, BC
Canada V2G 5E8

Report Date: 2026/01/14
Report #: R3750304
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C597029

Received: 2025/12/08, 08:51

Total PAHs in Sediment include (B.C. Reg. 116/2018, Schedule 3.4): Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(a)pyrene, and Dibenz(a,h)anthracene.
(4) Soils are reported on a dry weight basis unless otherwise specified.

Confirmatory runs for 2,3,7,8-TCDF are performed only if the primary result is greater than the RDL.

Encryption Key



Bureau Veritas
14 Jan 2026 09:40:35

Please direct all questions regarding this Certificate of Analysis to:
Augustina Isesele, Customer Solutions Representative
Email: Augustina.isesele@bureauveritas.com
Phone# (604) 734 7276

=====
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rob Gilbert, BBY General Manager responsible for British Columbia Environmental laboratory operations.

Total Cover Pages : 2
Page 2 of 18

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		DXR846		
Sampling Date		2025/12/04		
COC Number		119322		
	UNITS	1	RDL	QC Batch
Physical Properties				
Moisture	%	0.40	0.30	C188152
RDL = Reportable Detection Limit				

Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		DXR846		
Sampling Date		2025/12/04		
COC Number		119322		
	UNITS	1	RDL	QC Batch
Calculated Parameters				
PAH Toxicity Equivalency	mg/kg	0.026	0.020	C186272
RDL = Reportable Detection Limit				

Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		DXR846	
Sampling Date		2025/12/04	
COC Number		119322	
	UNITS	1	QC Batch
TCLP Extraction Procedure			
Initial pH of Sample	pH	12.3	C187349
pH after HCl	pH	11.0	C187349
Final pH of Leachate	pH	7.01	C187349
pH of Leaching Fluid	pH	2.89	C187349

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Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

DIOXIN AND FURANS BY HRMS (SOIL)

Bureau Veritas ID		DXR846						
Sampling Date		2025/12/04						
COC Number		119322		TOXIC EQUIVALENCY		# of		
	UNITS	1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
DIOXINS								
2,3,7,8-Tetra CDD *	pg/g	6.34	0.581	4.73	1.00	6.34	N/A	C203204
1,2,3,7,8-Penta CDD *	pg/g	24.8	0.663	23.6	1.00	24.8	N/A	C203204
1,2,3,4,7,8-Hexa CDD *	pg/g	16.4	0.627	23.6	0.100	1.64	N/A	C203204
1,2,3,6,7,8-Hexa CDD *	pg/g	21.0	0.701	23.6	0.100	2.10	N/A	C203204
1,2,3,7,8,9-Hexa CDD *	pg/g	15.8	0.630	23.6	0.100	1.58	N/A	C203204
1,2,3,4,6,7,8-Hepta CDD *	pg/g	80.9	1.10	23.6	0.0100	0.809	N/A	C203204
Octa CDD *	pg/g	40.5	1.14	47.3	0.000300	0.0122	N/A	C203204
Total Tetra CDD *	pg/g	475	0.581	47.3	N/A	N/A	N/A	C203204
Total Penta CDD *	pg/g	567	0.663	23.6	N/A	N/A	N/A	C203204
Total Hexa CDD *	pg/g	423	0.650	23.6	N/A	N/A	N/A	C203204
Total Hepta CDD *	pg/g	151	1.10	23.6	N/A	N/A	N/A	C203204
2,3,7,8-Tetra CDF **	pg/g	56.8	0.604	4.73	0.100	5.68	N/A	C203204
1,2,3,7,8-Penta CDF **	pg/g	37.0	0.698	23.6	0.0300	1.11	N/A	C203204
2,3,4,7,8-Penta CDF **	pg/g	40.7	0.650	23.6	0.300	12.2	N/A	C203204
1,2,3,4,7,8-Hexa CDF **	pg/g	18.0	0.628	23.6	0.100	1.80	N/A	C203204
1,2,3,6,7,8-Hexa CDF **	pg/g	22.9	0.647	23.6	0.100	2.29	N/A	C203204
2,3,4,6,7,8-Hexa CDF **	pg/g	25.8	0.663	23.6	0.100	2.58	N/A	C203204
1,2,3,7,8,9-Hexa CDF **	pg/g	12.0	0.859	23.6	0.100	1.20	N/A	C203204
1,2,3,4,6,7,8-Hepta CDF **	pg/g	24.2	1.03	23.6	0.0100	0.242	N/A	C203204
1,2,3,4,7,8,9-Hepta CDF **	pg/g	6.32	1.42	23.6	0.0100	0.0632	N/A	C203204
Octa CDF **	pg/g	4.97	1.84	47.3	0.000300	0.00149	N/A	C203204
Total Tetra CDF **	pg/g	1070	0.604	47.3	N/A	N/A	N/A	C203204
Total Penta CDF **	pg/g	547	0.673	23.6	N/A	N/A	N/A	C203204
Total Hexa CDF **	pg/g	215	0.690	23.6	N/A	N/A	N/A	C203204
Total Hepta CDF **	pg/g	45.8	1.18	23.6	N/A	N/A	N/A	C203204
TOTAL TOXIC EQUIVALENCY	pg/g	N/A	N/A	N/A	N/A	64.4	N/A	N/A

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

DIOXIN AND FURANS BY HRMS (SOIL)

Bureau Veritas ID		DXR846						
Sampling Date		2025/12/04						
COC Number		119322		TOXIC EQUIVALENCY		# of		
	UNITS	1	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)								
37CL4 2378 Tetra CDD *	%	83	N/A	N/A	N/A	N/A	N/A	C203204
C13-1234678 HeptaCDD *	%	62	N/A	N/A	N/A	N/A	N/A	C203204
C13-1234678 HeptaCDF **	%	60	N/A	N/A	N/A	N/A	N/A	C203204
C13-123478 HexaCDD *	%	95	N/A	N/A	N/A	N/A	N/A	C203204
C13-123478 HexaCDF **	%	89	N/A	N/A	N/A	N/A	N/A	C203204
C13-1234789 HeptaCDF **	%	56	N/A	N/A	N/A	N/A	N/A	C203204
C13-123678 HexaCDD *	%	85	N/A	N/A	N/A	N/A	N/A	C203204
C13-123678 HexaCDF **	%	86	N/A	N/A	N/A	N/A	N/A	C203204
C13-12378 PentaCDD *	%	64	N/A	N/A	N/A	N/A	N/A	C203204
C13-12378 PentaCDF **	%	66	N/A	N/A	N/A	N/A	N/A	C203204
C13-123789 HexaCDF **	%	76	N/A	N/A	N/A	N/A	N/A	C203204
C13-234678 HexaCDF **	%	85	N/A	N/A	N/A	N/A	N/A	C203204
C13-23478 PentaCDF **	%	67	N/A	N/A	N/A	N/A	N/A	C203204
C13-2378 TetraCDD *	%	70	N/A	N/A	N/A	N/A	N/A	C203204
C13-2378 TetraCDF **	%	67	N/A	N/A	N/A	N/A	N/A	C203204
C13-OCDD *	%	46	N/A	N/A	N/A	N/A	N/A	C203204
EDL = Estimated Detection Limit								
RDL = Reportable Detection Limit								
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,								
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalency Quotients for the congeners tested.								
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds								
* CDD = Chloro Dibenzo-p-Dioxin								
N/A = Not Applicable								
** CDF = Chloro Dibenzo-p-Furan								

Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

TCLP METALS (SOIL)

Bureau Veritas ID		DXR846		
Sampling Date		2025/12/04		
COC Number		119322		
	UNITS	1	RDL	QC Batch
TCLP Extraction Procedure				
Leachate Antimony (Sb)	mg/L	<0.10	0.10	C188129
Leachate Arsenic (As)	mg/L	0.50	0.10	C188129
Leachate Barium (Ba)	mg/L	2.07	0.10	C188129
Leachate Beryllium (Be)	mg/L	<0.10	0.10	C188129
Leachate Boron (B)	mg/L	2.47	0.10	C188129
Leachate Cadmium (Cd)	mg/L	<0.10	0.10	C188129
Leachate Chromium (Cr)	mg/L	<0.10	0.10	C188129
Leachate Cobalt (Co)	mg/L	<0.10	0.10	C188129
Leachate Copper (Cu)	mg/L	<0.10	0.10	C188129
Leachate Iron (Fe)	mg/L	<0.50	0.50	C188129
Leachate Lead (Pb)	mg/L	<0.10	0.10	C188129
Leachate Mercury (Hg)	mg/L	<0.0020	0.0020	C188129
Leachate Molybdenum (Mo)	mg/L	<0.10	0.10	C188129
Leachate Nickel (Ni)	mg/L	0.26	0.10	C188129
Leachate Selenium (Se)	mg/L	<0.10	0.10	C188129
Leachate Silver (Ag)	mg/L	<0.010	0.010	C188129
Leachate Thallium (Tl)	mg/L	<0.10	0.10	C188129
Leachate Uranium (U)	mg/L	<0.10	0.10	C188129
Leachate Vanadium (V)	mg/L	<0.10	0.10	C188129
Leachate Zinc (Zn)	mg/L	0.23	0.10	C188129
Leachate Zirconium (Zr)	mg/L	<0.10	0.10	C188129
RDL = Reportable Detection Limit				

Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

CSR PAH IN SOIL BY GC-MS (SOIL)

Bureau Veritas ID		DXR846		
Sampling Date		2025/12/04		
COC Number		119322		
	UNITS	1	RDL	QC Batch
Calculated Parameters				
Low Molecular Weight PAH's	mg/kg	<0.050	0.050	C176745
High Molecular Weight PAH's	mg/kg	<0.050	0.050	C176745
Total PAH	mg/kg	<0.050	0.050	C176745
B[a]P TPE Total Potency Equivalents	mg/kg	0.024	0.010	C176745
Polycyclic Aromatics				
Naphthalene	mg/kg	<0.010	0.010	C190277
2-Methylnaphthalene	mg/kg	<0.020	0.020	C190277
Acenaphthylene	mg/kg	<0.0050	0.0050	C190277
Acenaphthene	mg/kg	<0.0050	0.0050	C190277
Fluorene	mg/kg	<0.020	0.020	C190277
Phenanthrene	mg/kg	<0.010	0.010	C190277
Anthracene	mg/kg	<0.0040	0.0040	C190277
Fluoranthene	mg/kg	<0.020	0.020	C190277
Pyrene	mg/kg	<0.020	0.020	C190277
Benzo(a)anthracene	mg/kg	<0.020	0.020	C190277
Chrysene	mg/kg	<0.020	0.020	C190277
Benzo(b&j)fluoranthene	mg/kg	<0.020	0.020	C190277
Benzo(b)fluoranthene	mg/kg	<0.020	0.020	C190277
Benzo(k)fluoranthene	mg/kg	<0.020	0.020	C190277
Benzo(a)pyrene	mg/kg	<0.020	0.020	C190277
Indeno(1,2,3-cd)pyrene	mg/kg	<0.020	0.020	C190277
Dibenz(a,h)anthracene	mg/kg	<0.020	0.020	C190277
Benzo(g,h,i)perylene	mg/kg	<0.050	0.050	C190277
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	0 (1)	N/A	C190277
D8-ACENAPHTHYLENE (sur.)	%	0 (1)	N/A	C190277
D8-NAPHTHALENE (sur.)	%	0 (1)	N/A	C190277
TERPHENYL-D14 (sur.)	%	0 (1)	N/A	C190277
RDL = Reportable Detection Limit				
N/A = Not Applicable				
(1) Surrogate recovery below acceptance criteria due to matrix interference. Reanalysis yields similar results.				

Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

GENERAL COMMENTS

Sample DXR846 [1] : Sample analyzed past method specified hold time for PAH in Soil by GC/MS (SIM). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Results relate only to the items tested.

Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
C187349	S2L		Method Blank	Initial pH of Sample	2025/12/10	4.95		pH	
				Final pH of Leachate	2025/12/10	4.96		pH	
				pH of Leaching Fluid	2025/12/10	4.94		pH	
C188129	RLC		Matrix Spike	Leachate Antimony (Sb)	2025/12/10	93	%	75 - 125	
				Leachate Arsenic (As)	2025/12/10	105	%	75 - 125	
				Leachate Barium (Ba)	2025/12/10	102	%	75 - 125	
				Leachate Beryllium (Be)	2025/12/10	98	%	75 - 125	
				Leachate Boron (B)	2025/12/10	96	%	75 - 125	
				Leachate Cadmium (Cd)	2025/12/10	100	%	75 - 125	
				Leachate Chromium (Cr)	2025/12/10	100	%	75 - 125	
				Leachate Cobalt (Co)	2025/12/10	103	%	75 - 125	
				Leachate Copper (Cu)	2025/12/10	99	%	75 - 125	
				Leachate Iron (Fe)	2025/12/10	100	%	75 - 125	
				Leachate Lead (Pb)	2025/12/10	100	%	75 - 125	
				Leachate Mercury (Hg)	2025/12/10	112	%	75 - 125	
				Leachate Molybdenum (Mo)	2025/12/10	103	%	75 - 125	
				Leachate Nickel (Ni)	2025/12/10	98	%	75 - 125	
				Leachate Selenium (Se)	2025/12/10	99	%	75 - 125	
				Leachate Silver (Ag)	2025/12/10	86	%	75 - 125	
				Leachate Thallium (Tl)	2025/12/10	98	%	75 - 125	
				Leachate Uranium (U)	2025/12/10	103	%	75 - 125	
				Leachate Vanadium (V)	2025/12/10	102	%	75 - 125	
				Leachate Zinc (Zn)	2025/12/10	99	%	75 - 125	
				Leachate Zirconium (Zr)	2025/12/10	105	%	75 - 125	
C188129	RLC		Spiked Blank	Leachate Antimony (Sb)	2025/12/10	101	%	75 - 125	
				Leachate Arsenic (As)	2025/12/10	106	%	75 - 125	
				Leachate Barium (Ba)	2025/12/10	108	%	75 - 125	
				Leachate Beryllium (Be)	2025/12/10	106	%	75 - 125	
				Leachate Boron (B)	2025/12/10	101	%	75 - 125	
				Leachate Cadmium (Cd)	2025/12/10	104	%	75 - 125	
				Leachate Chromium (Cr)	2025/12/10	104	%	75 - 125	
				Leachate Cobalt (Co)	2025/12/10	107	%	75 - 125	
				Leachate Copper (Cu)	2025/12/10	103	%	75 - 125	
				Leachate Iron (Fe)	2025/12/10	103	%	75 - 125	
				Leachate Lead (Pb)	2025/12/10	106	%	75 - 125	
				Leachate Mercury (Hg)	2025/12/10	117	%	75 - 125	
				Leachate Molybdenum (Mo)	2025/12/10	104	%	75 - 125	
				Leachate Nickel (Ni)	2025/12/10	101	%	75 - 125	
				Leachate Selenium (Se)	2025/12/10	102	%	75 - 125	
				Leachate Silver (Ag)	2025/12/10	88	%	75 - 125	
				Leachate Thallium (Tl)	2025/12/10	103	%	75 - 125	
				Leachate Uranium (U)	2025/12/10	105	%	75 - 125	
				Leachate Vanadium (V)	2025/12/10	104	%	75 - 125	
				Leachate Zinc (Zn)	2025/12/10	101	%	75 - 125	
				Leachate Zirconium (Zr)	2025/12/10	109	%	75 - 125	
C188129	RLC		Method Blank	Leachate Antimony (Sb)	2025/12/10	<0.10		mg/L	
				Leachate Arsenic (As)	2025/12/10	<0.10		mg/L	
				Leachate Barium (Ba)	2025/12/10	<0.10		mg/L	
				Leachate Beryllium (Be)	2025/12/10	<0.10		mg/L	
				Leachate Boron (B)	2025/12/10	<0.10		mg/L	
				Leachate Cadmium (Cd)	2025/12/10	<0.10		mg/L	
				Leachate Chromium (Cr)	2025/12/10	<0.10		mg/L	
				Leachate Cobalt (Co)	2025/12/10	<0.10		mg/L	
				Leachate Copper (Cu)	2025/12/10	<0.10		mg/L	
				Leachate Iron (Fe)	2025/12/10	<0.50		mg/L	

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Appendix B - Ash Analysis Report



Bureau Veritas Job #: C597029
Report Date: 2026/01/14

Atlantic Power (Williams Lake) Ltd.

QUALITY ASSURANCE REPORT (CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Leachate Lead (Pb)	2025/12/10	<0.10		mg/L	
			Leachate Mercury (Hg)	2025/12/10	<0.0020		mg/L	
			Leachate Molybdenum (Mo)	2025/12/10	<0.10		mg/L	
			Leachate Nickel (Ni)	2025/12/10	<0.10		mg/L	
			Leachate Selenium (Se)	2025/12/10	<0.10		mg/L	
			Leachate Silver (Ag)	2025/12/10	<0.010		mg/L	
			Leachate Thallium (Tl)	2025/12/10	<0.10		mg/L	
			Leachate Uranium (U)	2025/12/10	<0.10		mg/L	
			Leachate Vanadium (V)	2025/12/10	<0.10		mg/L	
			Leachate Zinc (Zn)	2025/12/10	<0.10		mg/L	
			Leachate Zirconium (Zr)	2025/12/10	<0.10		mg/L	
C188152	IP1	Method Blank	Moisture	2025/12/11	<0.30		%	
C188152	IP1	RPD [DXR846-01]	Moisture	2025/12/11	0		%	20
C190277	JP1	Matrix Spike	D10-ANTHRACENE (sur.)	2025/12/13		89	%	50 - 140
			D8-ACENAPHTHYLENE (sur.)	2025/12/13		84	%	50 - 140
			D8-NAPHTHALENE (sur.)	2025/12/13		82	%	50 - 140
			TERPHENYL-D14 (sur.)	2025/12/13		86	%	50 - 140
			Naphthalene	2025/12/13		86	%	50 - 140
			2-Methylnaphthalene	2025/12/13		89	%	50 - 140
			Acenaphthylene	2025/12/13		91	%	50 - 140
			Acenaphthene	2025/12/13		92	%	50 - 140
			Fluorene	2025/12/13		93	%	50 - 140
			Phenanthrene	2025/12/13		92	%	50 - 140
			Anthracene	2025/12/13		96	%	50 - 140
			Fluoranthene	2025/12/13		90	%	50 - 140
			Pyrene	2025/12/13		88	%	50 - 140
			Benzo(a)anthracene	2025/12/13		88	%	50 - 140
			Chrysene	2025/12/13		91	%	50 - 140
			Benzo(b&j)fluoranthene	2025/12/13		94	%	50 - 140
			Benzo(b)fluoranthene	2025/12/13		92	%	50 - 140
			Benzo(k)fluoranthene	2025/12/13		95	%	50 - 140
			Benzo(a)pyrene	2025/12/13		91	%	50 - 140
			Indeno(1,2,3-cd)pyrene	2025/12/13		94	%	50 - 140
			Dibenz(a,h)anthracene	2025/12/13		94	%	50 - 140
			Benzo(g,h,i)perylene	2025/12/13		95	%	50 - 140
C190277	JP1	Spiked Blank	D10-ANTHRACENE (sur.)	2025/12/12		86	%	50 - 140
			D8-ACENAPHTHYLENE (sur.)	2025/12/12		84	%	50 - 140
			D8-NAPHTHALENE (sur.)	2025/12/12		75	%	50 - 140
			TERPHENYL-D14 (sur.)	2025/12/12		82	%	50 - 140
			Naphthalene	2025/12/12		87	%	50 - 140
			2-Methylnaphthalene	2025/12/12		90	%	50 - 140
			Acenaphthylene	2025/12/12		93	%	50 - 140
			Acenaphthene	2025/12/12		93	%	50 - 140
			Fluorene	2025/12/12		97	%	50 - 140
			Phenanthrene	2025/12/12		92	%	50 - 140
			Anthracene	2025/12/12		95	%	50 - 140
			Fluoranthene	2025/12/12		89	%	50 - 140
			Pyrene	2025/12/12		87	%	50 - 140
			Benzo(a)anthracene	2025/12/12		90	%	50 - 140
			Chrysene	2025/12/12		93	%	50 - 140
			Benzo(b&j)fluoranthene	2025/12/12		96	%	50 - 140
			Benzo(b)fluoranthene	2025/12/12		93	%	50 - 140
			Benzo(k)fluoranthene	2025/12/12		97	%	50 - 140
			Benzo(a)pyrene	2025/12/12		93	%	50 - 140
			Indeno(1,2,3-cd)pyrene	2025/12/12		95	%	50 - 140

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Appendix B - Ash Analysis Report



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Atlantic Power (Williams Lake) Ltd.

QUALITY ASSURANCE REPORT (CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
C190277	JP1	Method Blank	Dibenz(a,h)anthracene	2025/12/12	95	%	50 - 140	
			Benzo(g,h,i)perylene	2025/12/12	96	%	50 - 140	
			D10-ANTHRACENE (sur.)	2025/12/12	93	%	50 - 140	
			D8-ACENAPHTHYLENE (sur.)	2025/12/12	87	%	50 - 140	
			D8-NAPHTHALENE (sur.)	2025/12/12	78	%	50 - 140	
			TERPHENYL-D14 (sur.)	2025/12/12	87	%	50 - 140	
			Naphthalene	2025/12/12	<0.010		mg/kg	
			2-Methylnaphthalene	2025/12/12	<0.020		mg/kg	
			Acenaphthylene	2025/12/12	<0.0050		mg/kg	
			Acenaphthene	2025/12/12	<0.0050		mg/kg	
			Fluorene	2025/12/12	<0.020		mg/kg	
			Phenanthrene	2025/12/12	<0.010		mg/kg	
			Anthracene	2025/12/12	<0.0040		mg/kg	
			Fluoranthene	2025/12/12	<0.020		mg/kg	
			Pyrene	2025/12/12	<0.020		mg/kg	
			Benzo(a)anthracene	2025/12/12	<0.020		mg/kg	
			Chrysene	2025/12/12	<0.020		mg/kg	
			Benzo(b&j)fluoranthene	2025/12/12	<0.020		mg/kg	
			Benzo(b)fluoranthene	2025/12/12	<0.020		mg/kg	
			Benzo(k)fluoranthene	2025/12/12	<0.020		mg/kg	
			Benzo(a)pyrene	2025/12/12	<0.020		mg/kg	
			Indeno(1,2,3-cd)pyrene	2025/12/12	<0.020		mg/kg	
C190277	JP1	RPD	Dibenz(a,h)anthracene	2025/12/12	<0.020		mg/kg	
			Benzo(g,h,i)perylene	2025/12/12	<0.050		mg/kg	
			Naphthalene	2025/12/13	NC	%	50	
			2-Methylnaphthalene	2025/12/13	NC	%	50	
			Acenaphthylene	2025/12/13	NC	%	50	
			Acenaphthene	2025/12/13	NC	%	50	
			Fluorene	2025/12/13	NC	%	50	
			Phenanthrene	2025/12/13	NC	%	50	
			Anthracene	2025/12/13	NC	%	50	
			Fluoranthene	2025/12/13	NC	%	50	
			Pyrene	2025/12/13	NC	%	50	
			Benzo(a)anthracene	2025/12/13	NC	%	50	
			Chrysene	2025/12/13	NC	%	50	
			Benzo(b&j)fluoranthene	2025/12/13	NC	%	50	
			Benzo(b)fluoranthene	2025/12/13	NC	%	50	
			Benzo(k)fluoranthene	2025/12/13	NC	%	50	
			Benzo(a)pyrene	2025/12/13	NC	%	50	
			Indeno(1,2,3-cd)pyrene	2025/12/13	NC	%	50	
			Dibenz(a,h)anthracene	2025/12/13	NC	%	50	
			Benzo(g,h,i)perylene	2025/12/13	NC	%	50	
C203204	éGP	Spiked Blank	37CL4 2378 Tetra CDD	2026/01/10	67	%	35 - 197	
			C13-1234678 HeptaCDD	2026/01/10	62	%	23 - 140	
			C13-1234678 HeptaCDF	2026/01/10	58	%	28 - 143	
			C13-123478 HexaCDD	2026/01/10	80	%	32 - 141	
			C13-123478 HexaCDF	2026/01/10	79	%	26 - 152	
			C13-1234789 HeptaCDF	2026/01/10	58	%	26 - 138	
			C13-123678 HexaCDD	2026/01/10	81	%	28 - 130	
			C13-123678 HexaCDF	2026/01/10	75	%	26 - 123	
			C13-12378 PentaCDD	2026/01/10	62	%	25 - 181	
			C13-12378 PentaCDF	2026/01/10	63	%	24 - 185	
			C13-123789 HexaCDF	2026/01/10	66	%	29 - 147	
			C13-234678 HexaCDF	2026/01/10	76	%	28 - 136	
			C13-23478 PentaCDF	2026/01/10	64	%	21 - 178	

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Appendix B - Ash Analysis Report



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Atlantic Power (Williams Lake) Ltd.

QUALITY ASSURANCE REPORT (CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
C203204	éGP	RPD		C13-2378 TetraCDD	2026/01/10	62	%	25 - 164	
				C13-2378 TetraCDF	2026/01/10	58	%	24 - 169	
				C13-OCDD	2026/01/10	49	%	17 - 157	
				2,3,7,8-Tetra CDD	2026/01/10	89	%	67 - 158	
				1,2,3,7,8-Penta CDD	2026/01/10	92	%	70 - 142	
				1,2,3,4,7,8-Hexa CDD	2026/01/10	91	%	70 - 164	
				1,2,3,6,7,8-Hexa CDD	2026/01/10	88	%	76 - 134	
				1,2,3,7,8,9-Hexa CDD	2026/01/10	85	%	64 - 162	
				1,2,3,4,6,7,8-Hepta CDD	2026/01/10	88	%	70 - 140	
				Octa CDD	2026/01/10	92	%	78 - 144	
				2,3,7,8-Tetra CDF	2026/01/10	92	%	75 - 158	
				1,2,3,7,8-Penta CDF	2026/01/10	90	%	80 - 134	
				2,3,4,7,8-Penta CDF	2026/01/10	90	%	68 - 160	
				1,2,3,4,7,8-Hexa CDF	2026/01/10	88	%	72 - 134	
				1,2,3,6,7,8-Hexa CDF	2026/01/10	89	%	84 - 130	
				2,3,4,6,7,8-Hexa CDF	2026/01/10	87	%	70 - 156	
				1,2,3,7,8,9-Hexa CDF	2026/01/10	91	%	78 - 130	
				1,2,3,4,6,7,8-Hepta CDF	2026/01/10	92	%	82 - 122	
				1,2,3,4,7,8,9-Hepta CDF	2026/01/10	93	%	78 - 138	
				Octa CDF	2026/01/10	92	%	63 - 170	
				2,3,7,8-Tetra CDD	2026/01/10	15	%	25	
				1,2,3,7,8-Penta CDD	2026/01/10	15	%	25	
				1,2,3,4,7,8-Hexa CDD	2026/01/10	16	%	25	
				1,2,3,6,7,8-Hexa CDD	2026/01/10	16	%	25	
				1,2,3,7,8,9-Hexa CDD	2026/01/10	12	%	25	
				1,2,3,4,6,7,8-Hepta CDD	2026/01/10	15	%	25	
				Octa CDD	2026/01/10	16	%	25	
				2,3,7,8-Tetra CDF	2026/01/10	15	%	25	
				1,2,3,7,8-Penta CDF	2026/01/10	16	%	25	
				2,3,4,7,8-Penta CDF	2026/01/10	13	%	25	
				1,2,3,4,7,8-Hexa CDF	2026/01/10	14	%	25	
				1,2,3,6,7,8-Hexa CDF	2026/01/10	16	%	25	
				2,3,4,6,7,8-Hexa CDF	2026/01/10	16	%	25	
				1,2,3,7,8,9-Hexa CDF	2026/01/10	15	%	25	
				1,2,3,4,6,7,8-Hepta CDF	2026/01/10	15	%	25	
				1,2,3,4,7,8,9-Hepta CDF	2026/01/10	15	%	25	
				Octa CDF	2026/01/10	18	%	25	
				37CL4 2378 Tetra CDD	2026/01/10	57	%	35 - 197	
				C13-1234678 HeptaCDD	2026/01/10	52	%	23 - 140	
				C13-1234678 HeptaCDF	2026/01/10	51	%	28 - 143	
				C13-123478 HexaCDD	2026/01/10	73	%	32 - 141	
				C13-123478 HexaCDF	2026/01/10	70	%	26 - 152	
				C13-1234789 HeptaCDF	2026/01/10	49	%	26 - 138	
				C13-123678 HexaCDD	2026/01/10	69	%	28 - 130	
				C13-123678 HexaCDF	2026/01/10	69	%	26 - 123	
				C13-12378 PentaCDD	2026/01/10	51	%	25 - 181	
				C13-12378 PentaCDF	2026/01/10	53	%	24 - 185	
				C13-123789 HexaCDF	2026/01/10	61	%	29 - 147	
				C13-234678 HexaCDF	2026/01/10	67	%	28 - 136	
				C13-23478 PentaCDF	2026/01/10	54	%	21 - 178	
				C13-2378 TetraCDD	2026/01/10	54	%	25 - 164	
				C13-2378 TetraCDF	2026/01/10	54	%	24 - 169	
				C13-OCDD	2026/01/10	38	%	17 - 157	
				2,3,7,8-Tetra CDD	2026/01/10	<0.917, EDL=0.917	pg/g		

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Atlantic Power (Williams Lake) Ltd.

QUALITY ASSURANCE REPORT (CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2,3,7,8-Penta CDD	2026/01/10	<0.744, EDL=0.744		pg/g	
			1,2,3,4,7,8-Hexa CDD	2026/01/10	<0.680, EDL=0.680		pg/g	
			1,2,3,6,7,8-Hexa CDD	2026/01/10	<0.733, EDL=0.733		pg/g	
			1,2,3,7,8,9-Hexa CDD	2026/01/10	<0.672, EDL=0.672		pg/g	
			1,2,3,4,6,7,8-Hepta CDD	2026/01/10	1.63, EDL=1.11		pg/g	
			Octa CDD	2026/01/10	4.48, EDL=1.16		pg/g	
			Total Tetra CDD	2026/01/10	<0.917, EDL=0.917		pg/g	
			Total Penta CDD	2026/01/10	<0.744, EDL=0.744		pg/g	
			Total Hexa CDD	2026/01/10	<0.694, EDL=0.694		pg/g	
			Total Hepta CDD	2026/01/10	1.63, EDL=1.11		pg/g	
			2,3,7,8-Tetra CDF	2026/01/10	<0.869, EDL=0.869		pg/g	
			1,2,3,7,8-Penta CDF	2026/01/10	<1.22, EDL=1.22		pg/g	
			2,3,4,7,8-Penta CDF	2026/01/10	<1.12, EDL=1.12		pg/g	
			1,2,3,4,7,8-Hexa CDF	2026/01/10	<0.683, EDL=0.683		pg/g	
			1,2,3,6,7,8-Hexa CDF	2026/01/10	<0.692, EDL=0.692		pg/g	
			2,3,4,6,7,8-Hexa CDF	2026/01/10	<0.713, EDL=0.713		pg/g	
			1,2,3,7,8,9-Hexa CDF	2026/01/10	<0.908, EDL=0.908		pg/g	
			1,2,3,4,6,7,8-Hepta CDF	2026/01/10	<1.05, EDL=1.05		pg/g	
			1,2,3,4,7,8,9-Hepta CDF	2026/01/10	<1.39, EDL=1.39		pg/g	
			Octa CDF	2026/01/10	<1.88, EDL=1.88 (1)		pg/g	
			Total Tetra CDF	2026/01/10	<0.869, EDL=0.869		pg/g	
			Total Penta CDF	2026/01/10	<1.17, EDL=1.17		pg/g	
			Total Hexa CDF	2026/01/10	<0.740, EDL=0.740		pg/g	

Appendix B - Ash Analysis Report



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Atlantic Power (Williams Lake) Ltd.

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Hepta CDF	2026/01/10	<1.18, EDL=1.18		pg/g	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference $\leq 2 \times$ RDL).

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Appendix B - Ash Analysis Report



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Atlantic Power (Williams Lake) Ltd.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature of Angel Guerrero.

Angel Guerrero, Supervisor, Ultra Trace Analysis, HRMS

A handwritten signature of Sandy Yuan.

Sandy Yuan, M.Sc., QP, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rob Gilbert, BBY General Manager responsible for British Columbia Environmental laboratory operations.

Appendix B - Ash Analysis Report