FINAL REPORT

TRANS MOUNTAIN PIPELINE EDMONTON TERMINAL

EDMONTON, ALBERTA

2025 ANNUAL AIR QUALITY AND METEOROLOGICAL MONITORING REPORT

RWDI #2602729

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1 SUMMARY

This report summarizes ambient air measurements made at the Trans Mountain Edmonton Terminal (ET) Air Quality Monitoring (AQM) station from January 1, 2025, to December 31, 2025. This monitoring program addresses the requirements of the Canada Energy Regulator (CER) Condition 79 for the Trans Mountain Expansion Project (Project).

The objective of the ET AQM program during this operational period was to monitor the ambient air quality in the vicinity of the ET and compare the results to the applicable Alberta Ambient Air Quality Objectives (AAQOs). The monitoring methods follow the approved Air Emissions Management Plan (AEMP) for the Edmonton Terminal (Trans Mountain 2017, CER Condition 79, Filing ID A84102, Approval 85838) and the Ambient Air Quality Monitoring Plan (AQMP) for the Edmonton Terminal (Trans Mountain 2020).

The ET AQM station continuously monitors the following air quality parameters: particulate matter less than 2.5 microns ($PM_{2.5}$), nitrogen oxides (NO_X, NO, NO_2), sulphur dioxide (SO_2), total reduced sulphurs (TRS), ozone (O_3), visibility, and benzene, toluene, ethylbenzene and xylene (BTEX). The AQM station also continuously monitors the following meteorological parameters: wind speed, wind direction, temperature, relative humidity, barometric pressure, and precipitation. Data validity for most parameters meets the minimum data completeness criteria acceptable range of >75% over the year, with the exception of visibility. Visibility data validity was 72.7%, for the monitoring period.

Throughout the period from January 1, 2025, to December 31, 2025, there were 15 exceedances of the 24-hour Alberta AAQO for $PM_{2.5}$. Forest fire smoke experienced across the region was determined to be the main cause of the $PM_{2.5}$ exceedances and not ET operations. The annual average for 2025 was 9.6 µg/m^3, above the 8 µg/m^3 annual AAQO. The annual AAQO is based on the Metro Vancouver annual AAQO of 8 µg/m^3, in the absence of an annual Alberta AAQO.

No other exceedances of the applicable AAQO were measured during the monitoring period for all other parameters.

Overall, monitoring indicates ET operations are not having an adverse impact on local or regional ambient air quality.

2 BACKGROUND

2.1 Geographical Area

The location of the ET AQM station is shown in **Figure 1**. The ET AQM station is located in the northeast corner of the intersection of Baseline Road/101 Avenue NW and 17 Street NW. The surrounding land use around ET is heavy industrial and the geographical area features flat terrain with the North Saskatchewan River valley located approximately 1 km northwest of the facility.

2.2 Air Emission Sources

The ET is the starting point of the Trans Mountain Pipeline System. The facility is made up of 39 tanks holding heavy crude, light sweet or light sour crude, and refined products.

The ET is surrounded by industrial emitters such as the Imperial Oil refinery, Enbridge storage and distribution terminal, Suncor Energy refinery and terminal, Celanese Polymers and Keyera Envirofuels. Many of these facilities emit VOCs that contain benzene, xylenes and hydrogen sulphide which are continuously measured at the ET ambient station.

Air Quality Monitoring Station Location
Edmonton Terminal

Map Projection: NAD 1983 UTM Zone 12N
Trans Mountain Pipeline - Edmonton, AB

True North

Project #: 2105728

Drawn by: PIP	Figure: 1
Approx. Scale:	1:26,000
Date Revised: Feb 26, 2025	

Map Document: C:\Working Folder\Jobs_America\P2105728\P2105728_TMEP.aprx

3 MONITORING INSTRUMENTS

The ET AQM station is equipped with air quality and meteorological monitoring instruments shown in Table 1. The ambient air quality and meteorological parameters being monitored are recorded at 1-minute and 60-minute intervals, on a Campbell Scientific CR1000x datalogger. The raw data is stored on the datalogger and is also pushed to a central database for processing and backup. Data is automatically checked using an automated diagnostic observation tool called HORNET and by a technician daily to ensure maximum uptime and data quality of the monitoring parameters. As required by Condition 79, the raw data is also publicly available on the Envision data platform and accessible through the Trans Mountain website.

Table 1. Air Quality and Meteorological Monitoring Instrumentation

Instrument	Parameters measured	Units
Thermo Sharp 5030i	Particulate Matter$_{2.5}$ ($PM_{2.5}$)	$\mu g/m^3$
Thermo 42iQ	Nitric Oxide/Nitrogen Dioxide/Total Nitrogen Oxides ($NO/NO_2/NO_x$)	ppb
Thermo 43iQ	Sulphur Dioxide (SO_2)	ppb
Thermo 49iQ	Ozone (O_3)	ppb
Thermo 43iQTL with CDN101	Total Reduced Sulphur (TRS)	ppb
AMA GC 5000	Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	ppb
Vaisala HC2-S3-L	Relative humidity and air temperature	% and ^oC
CS 106	Barometric pressure	mb
Ott Pluvio	Precipitation	mm
Nikira OEA	Visibility	km
Campbell CFCC Field Camera	Visibility	N/A

The gas analyzers (Thermo 42iQ, 43iQ**,** 43iQTL with CDN101 oxidizer, and 49iQ) are zero and span checked daily using the internal zero (charcoal and/or purafil cartridge) and span (permeation wafer in an internal permeation oven) system, referred to as the IZS system. Automatic IZS checks are performed daily, and the checks consist of a 10-minute zero check, a 10-minute span check and a 10-minute purge. These checks provide a way to monitor daily performance of the analyzer. The IZS checks are not for calibration purposes but are merely a diagnostic tool to identify instrument drift. Monthly calibration visits are undertaken to perform full range linear calibrations and maintenance for all the analyzers.

3.1 $PM_{2.5}$

The SHARP 5030i is a hybrid nephelometric/radiometric particulate mass monitor capable of providing precise, real-time measurements with a superior detection limit. The SHARP unit incorporates a high sensitivity light scattering photometer whose output signal is continuously referenced to the time-averaged measurement of an integral beta attenuating mass sensor. The SHARP monitor also incorporates a dynamic inlet heating system designed to maintain the relative humidity of the air passing through the filter tape.

The SHARP unit is calibrated once a month to ensure accuracy and validity of its data. The inlet and cyclone are cleaned routinely to ensure performance. The monthly calibration process consists of the following: zeroing the nephelometer if necessary, calibration of ambient temperature, calibration of barometric pressure, and flow calibration. Instrument mass foil checks are performed quarterly or if diagnostics indicate a requirement to do so.

3.2 NITROGEN OXIDES

The Thermo 42iQTL trace level Nitrogen Oxide (NO_X) analyzer uses chemiluminescence detection, coupled with microprocessor technology to provide sensitivity and stability for ambient air quality applications. The instrument determines real-time concentration of nitric oxide (NO), total nitrogen oxides (NO_X) (the sum of NO and NO_2), and nitrogen dioxide (NO_2). The amount of NO is measured by detecting the chemiluminescence reaction that occurs in the reaction cell when NO molecules are exposed to ozone (O_3). The NO and O_3 molecules collide in the reaction cell and enter a higher energy state.

When these excited molecules return to a stable energy state, they emit a photon of light which is proportional to the amount of NO in the sample stream of gas entering the analyzer.

To determine the total NO_X ($NO+NO_2$) measurement, sample gas is periodically bypassed through a heated molybdenum converter cartridge that converts any NO_2 molecules in the sample stream into NO (any existing NO molecules in the stream remain as is). The instrument will switch the sample stream through the converter periodically and then through the reaction cell where the same chemiluminescence reaction occurs with ozone.

The resultant response produced is now the sum of NO and converted NO_2, producing a NO_X measurement. The resultant NO_2 determination is the NO_X measurement subtracted from the NO measurement.

3.3 SUPLHUR DIOXIDE

The Thermo 43iQTL trace level Sulphur Dioxide (SO_2) Analyzer is a microprocessor-controlled analyzer that determines the concentration of SO_2 in a sample gas drawn through the instrument. In the sample chamber, sample gas is excited by ultraviolet light causing the SO_2 to absorb energy from the light and move to an active state (SO_2*). These active SO_2* molecules must decay into a stable state back to SO_2, and when this happens a photon of light is released which is recognized by the instrument as fluorescence. The instrument measures the amount of florescence to determine the amount of SO_2 present in the sample gas

3.4 TOTAL REDUCED SULPHUR

Total Reduced Sulphur (TRS) monitoring was conducted using a Thermo 43iQTL trace level SO_2 continuous analyzer in conjunction with an CDN-101 thermal oxidizer convertor (oxidizer). This instrument is a two-fold device. Sample air first passes through sulphur dioxide (SO_2) scrubber beads to eliminate any SO_2 molecules that might be in the sample air stream. Sample air is then passed through a glass tube surrounded by an oven inside of the oxidizer which is continuously heated to 800°C. It is here where any reduced sulphur compounds are converted into SO_2 molecules. The sample air is then directed to the SO_2 analyzer.

The 43iQTL is a microprocessor-controlled analyzer that determines the concentration of SO_2 in a sample gas drawn through the instrument. In the sample chamber, sample gas is exposed to pulsating ultraviolet light which causes the SO_2 molecules to become excited and enter into a higher energy state.

When the light is shut off during one of the pulse cycles, these excited SO_2 molecules decay into a lower energy state where fluoresced light is emitted proportionally to the SO_2 concentration in the gas stream. This fluorescence is read by a photo-multiplier tube, and the instrument reports the concentration of SO_2 in a ratio of 1:1 for TRS.

3.5 OZONE

Sampling for Ozone (O_3) was conducted using a Thermo 49iQ to provide sensitivity and stability for ambient air quality applications. The instrument determines real-time concentration of O_3 in a sample gas drawn through the instrument. The sample is split into two gas streams using solenoids, one stream is stripped of O_3 by a scrubber to become a reference gas. Each stream is then intermittently stored in two different cells within which the UV light intensities are measured, and the instrument calculates the O_3 concentrations.

3.6 VISIBILITY

Visibility sampling was conducted using a Nikira Optical Extinction Analyzer (Model NIK-OEA-52001-C01OP). The instrument combines open-path cavity ringdown measurements with a patented self-referencing system to rapidly measure the optical extinction coefficient of ambient aerosols. Ambient air is drawn into the cavity at ~1 m/s where direct optical extinction coefficient measurement is made. The cavity is closed off to ambient air and purged with filtered air to provide a background measurement to use in a comparison calculation for aerosol optical extinction. A Campbell Scientific CFCC field camera takes photographs of the horizon each hour of the day so the OEA visibility readings can be confirmed by visual records.

3.7 BTEX

Sampling of benzene, toluene, ethylbenzene, m, p-xylene and o-xylene (BTEX) is being completed using an AMA Gas Chromatograph (GC) 5000 BTX monitor fitted with a flame ionization detector (FID). An ambient air sample is drawn into the instrument every 15 min and the gaseous eluent is ignited to produce gas-phase ions of the analytes of interested. These ions are detected by an electrode and the integration of the electrical signal produced is calibrated and used to quantify the concentration of each analyte in the sample. An AMA HG 500 ultra-high purity generator uses deionized water and compressor to generate ultra-high purity Hydrogen (H_2) as a supply gas for the FID flame and act as a carrier gas for the GC.

3.8 METEOROLOGY

continuously monitors the wind speed (WS) and wind direction (WD) using a tower mounted R.M. Young 5305-10-L Wind Speed/Wind Direction sensor. Relative humidity and temperature are measured using a Vaisala HC2-S3-L. Air Pressure is measured using Campbell Scientific CS 106. Precipitation is measured using an Ott Pluvio, a highly sensitive weight-based measurement system that maximizes capture and quantification of snow and rain, with the attachment of a wind shield and antifreeze inside the collection bucket. Meteorological equipment is physically inspected between 3 months and annually, or if data QA/QC indicates the need more frequently. Calibrations are recertified following manufacturer recommendations (1 to 2 years).

4 SUMMARY OF AMBIENT MEASUREMENTS

Data validity is the percentage of hourly values available over the given period of time that remain after final data quality assurance and control checks (QA/QC). For measured values to be compared to hourly, 8-hour, 24-hour and annual average values there needs to be >75% of the data available for each relevant time period in accordance with the Alberta (AB), Metro Vancouver Regional District (MVRD) and BC AAQO as informed by the Canadian Council of Ministers of the Environment (CCME 2019). Similar requirements exist in Alberta and BC in their respective ambient air monitoring guideline documents.

4.1 $PM_{2.5}$

During the period from January 1, 2025, to December 31, 2025, the hourly $PM_{2.5}$ data validity was 99.4%. Summary statistics are presented in Appendix Tables A1, A2 and A6. There were 15 events that were over the 24-hour AAAQO (29 µg/m^3), between June and November. These elevated events were largely attributed to forest fire activity. Appendix Table A9 provides a summary of the elevated events. The highest maximum 1-hour mean $PM_{2.5}$ concentration during the monitoring period was in September 2025 with a value of 138.5 µg/m^3. The annual average was 9.6 µg/m^3, above the 8 µg/m^3 annual AAQO. The annual AAQO is based on the Metro Vancouver annual AAQO of 8 µg/m^3, in the absence of an annual Alberta AAQO.

4.2 NITROGEN OXIDES

During the period from January 1, 2025, to December 31, 2025, the hourly NO_x data validity was 98.6%. Summary statistics are presented in Appendix Tables A1, A2 and A6. There were no events over the NO_2 1-hour AAQO (159 ppb) during the monitoring period. The highest maximum 1-hour mean NO_X concentration during the monitoring period was in November 2025 with a value of 221.1 ppb. The highest maximum 1-hour mean NO_2 concentration occurred in October 2025 with a value of 62.3 ppb. Higher NO_x values were seen to be more prevalent during winter months, likely due to higher emissions from home heating and vehicular traffic, exacerbated by thermal inversions. The annual NO_2 level for 2025 was 10.2 ppb, below the annual AAQO of 24 ppb.

4.3 SULPHUR DIOXIDE

During the period from January 1, 2025, to December 31, 2025, the hourly SO_2 data validity was 99.3%. Summary statistics are presented in Appendix Tables A1, A2 and A6. There were no events that exceeded the 1-hour, 24-hour, or 30-day SO_2 AAQO during the monitoring period. The highest maximum 1-hour mean during the period was in January 2025, with a value of 41.3 ppb (AAQO limit of 172 ppb). The maximum 30-day average was 2.0 ppb (AAQO limit of 11 ppb). The annual SO_2 level for 2024 was 1.0 ppb, below the annual AAQO of 8 ppb.

4.4 TOTAL REDUCED SULPHUR

During the period from January 1, 2025, to December 31, 2025, the hourly TRS data validity was 99.1%. Summary statistics are presented in Appendix Tables A1, A2 and A6. The highest maximum 1-hour mean during the monitoring period was in June with a value of 5.5 ppb. There are no 1-hour, 24-hour or annual AAQO for TRS in Alberta. The 1-hour AAQO of 10 ppb was adopted from Metro Vancouver Regional District and the measured 1-hour TRS concentrations remained less than this AAQO.

4.5 OZONE

During the period from January 1, 2025, to December 31, 2025, the hourly O_3 data validity was 99.2%. Summary statistics are presented in Appendix Tables A1, A2 and A6. There were no events that were over the 1-hour daily max AAQO (76 ppb) during the monitoring period. The highest maximum 1-hour mean during the monitoring period was in May 2025 with a value of 61.3 ppb. There is no annual AAQO for O_3 in Alberta.

4.6 VISIBILITY

During the period from January 1, 2025, to December 31, 2025, the hourly visibility data validity was 72.7%. Summary statistics are presented in Appendix Table A5. The Nikira Optical Extinction Analyzer was fouled and needed to be sent for cleaning. The unit that was swapped in also developed a low laser issue and needed again to be removed for cleaning. This resulted in a lower data validity value between April to July, while the unit was out for repair. The minimum 1-hour mean value was measured in September (5.7 km).

Images are captured by a camera every hour onsite and can be made available for future reference. There was a disruption in the CFCC downloading to the database resulting in images from June 12 18:00 to June 16 19:00 not being saved. There are no AAQO or criteria in Alberta for reduced visibility. Based on a theoretical distance provided by the manufacturer, RWDI invalidates data over 15 000 km to eliminate extreme values.

4.7 BTEX

During the period from January 1, 2025, to December 31, 2025, the hourly BTEX data validity was 76.4%. Summary statistics are presented in Appendix Tables A3, A4 and A6. There were no BTEX events that were over the 1-hour or daily AAQOs during the monitoring period. The maximum 1-hour mean benzene concentration during the monitoring period was measured in August 2025 with a value of 4.8 ppb, below the AAQO of 9 ppb. The maximum 1-hour mean toluene, ethylbenzene and xylene concentrations were 17.0 ppb, 5.5 ppb, 10.1 ppb, respectively. These were all well below the AAQOs of 499 ppb, 460 ppb and 530 ppb, respectively. The annual mean benzene level was 0.2 ppb, below the annual AAQO of 0.9 ppb. There are no annual AAQOs for toluene, ethylbenzene, or xylenes.

4.8 METEOROLOGY

A wind rose, which visually plots the joint frequencies of wind speed and wind direction, is shown in **Figure 2** for the 12-month period.

During the period from January 1, 2025, to December 31, 2025, the hourly meteorological data validity was above 99.9%. Summary statistics are presented in Appendix Tables A7 and A8.

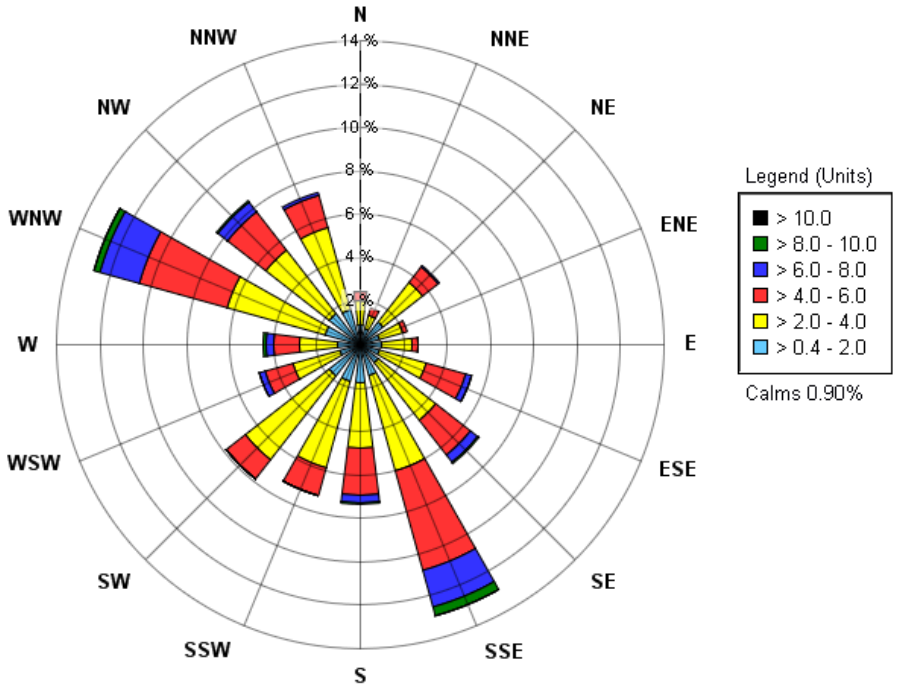

Figure 2 Edmonton Terminal Wind Rose – January 1, 2025, to December 31, 2025

5 DISCUSSION

Data validity for all parameters except visibility was in the statistically significant acceptable range of greater than 75% for the monitoring period. Wherever possible, ET AQM station data comparisons were made with the nearby Edmonton East AEPA station and Scotford South in the data QA/QC. All comparable data over this monitoring period showed a close agreement in measurement.

There were 15 exceedances of the 24-hour $PM_{2.5}$ Alberta AAQO during 2025. Forest fire smoke experienced across the region was determined to likely be the main cause of the $PM_{2.5}$ exceedances and not ET operations.

The annual $PM_{2.5}$ concentration was 9.5 µg/m^3 which exceeded the Metro Vancouver annual AAQO of 8 µg/m^3. Trans Mountain compares annual $PM_{2.5}$ to Metro Vancouver AAQO, as there is no Alberta annual AAQO for $PM_{2.5}$. No other exceedances were measured during monitoring period for all other parameters.

6 REFERENCES

Trans Mountain Pipeline, 2017. Air Emissions Management Plan for the Edmonton Terminal. Trans Mountain Expansion Project. CER Condition 79.

Trans Mountain Pipeline, 2020. Ambient Air Quality Monitoring Plan for the Edmonton Terminal. Trans Mountain Expansion Project.

7 GENERAL STATEMENT OF LIMITATIONS

This report entitled Edmonton Terminal 2025 Annual Air Quality and Meteorological Monitoring Report was prepared by RWDI AIR Inc. ("RWDI") for Trans Mountain ("Client"). The findings and conclusions presented in this report have been prepared for Trans Mountain and are specific to the project described herein ("Project"). This report was prepared using scientific principles, published methodologies and professional judgment in assessing available information and data. The findings presented within this document are based on available data within the limits of the existing information, budgeted scope of work, and schedule. The conclusions contained in this report are based on the information available to RWDI when this report was prepared; subsequent changes made by the Client after the date of this report have not been reflected in the conclusions.

This report was prepared for the exclusive use of Trans Mountain and the Canada Energy Regulator. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. RWDI accepts no responsibility for damages, if any, suffered by any third party as result of decisions made or actions based on this report.

APPENDIX A

Table A1. Trans Mountain Edmonton Maximum 1-hour and Maximum 24-hour Summary Statistics

Edmonton Station 2025 Statistics	Maximum 1-Hour Mean							Maximum 24-Hour Mean						
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	TRS	O_3	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	TRS	O_3
Units	$\mu g/m^3$	ppb						$\mu g/m^3$	ppb					
AAQO	—	—	—	**159**	**172**	**10[1]**	**76**	**29**	—	—	—	—	—	—
January	114.5	96.0	51.6	45.2	41.3	2.1	41.4	24.4	54.1	25.2	31.4	8.4	0.9	34.3
February	49.9	166.1	112.5	53.7	30.3	1.9	46.3	23.3	56.8	25.1	31.7	4.0	0.8	32.6
March	31.1	148.3	98.8	49.5	27.6	1.8	46.2	15.3	56.9	30.0	27.0	3.8	0.8	36.4
April	18.1	58.5	26.4	37.3	27.2	1.9	55.2	7.6	19.0	4.6	15.1	5.6	0.2	43.3
May	87.9	67.4	38.2	31.0	11.4	3.4	61.3	24.2	16.9	5.9	12.5	3.5	0.5	46.5
June	136.6	68.3	39.4	32.5	30.1	5.5	57.8	**77.2**	22.2	7.4	14.8	5.7	1.2	45.0
July	76.0	49.5	31.5	26.8	14.3	3.0	43.2	**46.3**	12.9	4.3	9.3	2.9	1.1	32.1
August	111.1	93.4	63.7	44.0	17.1	4.9	47.0	**63.1**	29.5	10.2	19.2	2.9	1.2	32.1
September	138.5	137.4	107.1	33.1	12.8	2.7	47.1	**97.7**	30.4	15.2	16.8	2.6	1.1	31.6
October	59.7	110.0	76.4	62.3	18.7	2.3	33.2	31.6	28.2	14.5	19.4	5.1	0.9	22.4
November	136.8	221.1	178.7	42.4	16.1	3.7	28.4	**51.8**	71.3	49.7	21.9	2.9	1.3	21.2
December	56.4	109.7	68.6	41.2	36.9	2.5	29.2	22.4	43.7	16.4	27.4	7.7	1.0	26.0
Annual	138.5	221.1	178.7	62.3	41.3	5.5	61.3	**97.7**	71.3	49.7	31.7	8.4	1.3	46.5

Notes:

— No AAQO available

Alberta AAQOs referenced unless noted otherwise.

Bold text indicates an exceedance of the AAQO.

[1] In the absence of an Alberta AAQO for TRS, the 1-hour AAQO (acceptable) of 10 ppb from Metro Vancouver Regional District was cited.

$PM_{2.5}$ (particulate matter less than 2.5 microns); NO_x, NO, NO_2 (nitrogen oxides); SO_2 (sulphur dioxide); TRS (total reduced sulphurs); O_3 (ozone)

Table A2. Trans Mountain Edmonton Monthly Mean and Valid Data Summary Statistics

Edmonton Station 2025 Statistics	Monthly Mean							Valid Data						
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	TRS	O_3	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	TRS	O_3
Units	$\mu g/m^3$	ppb						% (hourly)						
January	6.8	20.0	5.5	14.5	2.0	0.4	23.9	98.7	98.9	98.9	98.9	97.8	98.9	98.9
February	8.6	25.4	8.1	17.3	1.2	0.5	23.4	99.4	100.0	100.0	100.0	99.9	99.3	99.9
March	6.2	13.6	3.3	10.3	0.7	0.3	27.7	99.3	98.8	98.8	98.8	98.8	98.7	99.1
April	4.6	9.3	1.8	7.5	1.2	0.0	33.4	99.3	99.4	99.6	99.4	99.6	99.0	99.6
May	8.0	7.6	1.6	6.0	0.8	0.1	34.9	99.3	99.5	99.5	99.5	99.5	99.2	99.1
June	15.1	8.9	1.6	7.3	1.4	0.5	25.3	99.2	99.3	99.3	99.3	99.3	98.8	98.9
July	11.9	7.9	1.5	6.4	0.8	0.6	19.6	99.6	99.5	99.5	99.5	99.3	99.2	99.5
August	10.8	9.5	2.2	7.4	0.7	0.4	14.9	99.6	99.6	99.6	99.6	99.6	99.2	99.2
September	18.9	12.6	3.2	9.4	0.8	0.8	19.0	99.9	98.8	98.8	98.8	99.4	98.9	99.2
October	6.0	13.5	4.0	9.5	1.1	0.5	15.0	99.6	99.2	99.2	99.2	99.3	99.6	98.9
November	8.7	23.4	9.6	13.8	0.5	0.6	11.2	99.0	95.6	95.6	95.6	99.4	99.2	99.3
December	9.1	18.3	5.3	12.9	1.0	0.6	15.4	99.6	95.0	95.0	95.0	99.2	99.5	99.3
Annual	9.6	14.2	4.0	10.2	1.0	0.5	22.0	99.4	98.6	98.6	98.6	99.3	99.1	99.2

Notes:

$PM_{2.5}$ (particulate matter less than 2.5 microns); NO_X, NO, NO_2 (nitrogen oxides); SO_2 (sulphur dioxide); TRS (total reduced sulphurs); O_3 (ozone)

Table A3. Trans Mountain Edmonton Maximum 1-hour and Maximum 24-hour BTEX Summary Statistics

Edmonton Station 2025 Statistics	Maximum 1-Hour Mean				Maximum 24-Hour Mean			
Compound	Benzene	Toluene	Ethylbenzene	Xylenes	Benzene	Toluene	Ethylbenzene	Xylenes
Units	ppb				ppb			
AAQO	**9**	**499**	**460**	**530**	**—**	**106**	**—**	**161**
January	1.7	16.0	2.9	3.2	0.6	4.9	0.8	1.3
February	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
March	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
April	0.7	5.0	0.9	2.4	0.3	1.0	0.2	0.6
May	0.9	4.3	1.5	2.9	0.4	0.9	0.3	0.6
June	1.3	6.0	1.7	2.7	0.6	1.3	0.6	0.7
July	1.4	4.7	2.5	2.9	0.3	1.3	0.4	0.7
August	4.8	10.5	5.5	10.1	0.8	2.7	0.8	1.2
September	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
October	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
November	1.1	17.0	1.7	8.8	0.5	2.4	0.4	1.0
December	0.8	4.3	0.7	1.4	0.4	1.3	0.3	0.7
Annual	4.8	17.0	5.5	10.1	0.8	4.9	0.8	1.3

Notes:

— No AAQO available

N/A – Not available: Data validity is below 75%.

Table A4. Trans Mountain Edmonton Monthly Mean and Valid Data BTEX Summary Statistics

Edmonton Station 2025 Statistics	Monthly Mean				Valid Data			
Compound	Benzene	Toluene	Ethylbenzene	Xylenes	Benzene	Toluene	Ethylbenzene	Xylenes
Units	ppb				% (hourly)			
January	0.3	0.9	0.3	0.6	92.6	92.6	92.6	92.6
February	N/A	N/A	N/A	N/A	55.2	55.2	55.2	55.2
March	N/A	N/A	N/A	N/A	41.3	41.3	41.3	41.3
April	0.2	0.6	0.1	0.3	95.0	95.0	95.0	95.0
May	0.2	0.6	0.2	0.3	93.5	93.5	93.5	93.5
June	0.3	0.6	0.2	0.4	88.6	88.6	88.6	88.6
July	0.2	0.7	0.2	0.4	87.5	87.5	87.5	87.5
August	0.3	0.9	0.2	0.5	86.0	86.0	86.0	86.0
September	N/A	N/A	N/A	N/A	70.1	70.1	70.1	70.1
October	N/A	N/A	N/A	N/A	39.8	39.8	39.8	39.8
November	0.2	0.8	0.2	0.5	86.5	86.5	86.5	86.5
December	0.2	0.7	0.1	0.3	80.8	80.8	80.8	80.8
Annual	0.2	0.7	0.2	0.4	76.4	76.4	76.4	76.4

Notes:

N/A – Not available: Data validity is below 75%.

Table A5. Trans Mountain Edmonton Maximum 1-hour, Maximum 24-hour, Monthly Mean and Valid Data Visibility Summary Statistics

Edmonton Station 2025 Statistics	Minimum 1-Hour Mean	Monthly Mean	Valid Data
Compound	Visibility	Visibility	Visibility
Units	km	km	%
January	6284.4	302.7	100.0
February	6199.4	228.1	100.0
March	974.3	136.4	100.0
April	N/A	N/A	10.3
May	N/A	N/A	8.3
June	N/A	N/A	25.7
July	N/A	N/A	67.3
August	14581.2	317.6	99.9
September	10410.4	251.3	99.9
October	13301.4	1078.2	98.9
November	12632.1	569.0	99.9
December	N/A	N/A	62.8
Annual	974.3	411.9	72.7

Notes:

N/A: Not available-indicates <75% data availability.

Table A6. Trans Mountain Edmonton 1-hour, 24-hour and Annual Average AAQO Exceedances

2025 Event Statistics	1-Hour average > AAQO								24-Hour average > AAQO			Annual average > AAQO			
Compound	TRS	NO_2	SO_2	O_3	B	T	E	X	$PM_{2.5}$	T	X	NO_2	SO_2	B	$PM_{2.5}$
AAQO	10[1]	159	172	76[2]	9	499	460	530	29	106	161	24	8	0.9	8[3]
	ppb								µg/m³	ppb		ppb			µg/m³
Units	No. > AAQO								No. > AAQO			No. > AAQO			
January	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	**3**	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0	**2**	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0
September	0	0	0	0	0	0	0	0	**6**	0	0	0	0	0	0
October	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0
November	0	0	0	0	0	0	0	0	**2**	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual	0	0	0	0	0	0	0	0	**15**	0	0	0	0	0	0

Notes:

[1] 1-hour TRS AAQO (acceptable) adopted from Metro Vancouver Regional District.

[2] Averaging period: 1-hour daily maximum

[3] $PM_{2.5}$ annual AAQO adopted from Metro Vancouver Regional District.

Bold text indicates events that exceed the AAQO.

$PM_{2.5}$ (particulate matter less than 2.5 microns); NO_2 (nitrogen dioxide); SO_2 (sulphur dioxide); TRS (total reduced sulphurs); O_3 (ozone); B (benzene); T (toluene); E (ethylbenzene); X (xylenes)

Table A7. Trans Mountain Edmonton Maximum 1-hour and Maximum 24-hour Meteorological Summary Statistics

2025 Meteorological Statistics	Maximum 1-Hour Mean					Minimum 1-Hour Mean				
Parameter	Wind Speed	Temp	Relative Humidity	Pressure	Precip	Wind Speed	Temp	Relative Humidity	Pressure	Precip
Units	m/s	°C	%	mb	mm	m/s	°C	%	mb	mm
January	10.7	9.1	100.0	1038.0	1.3	0.0	-25.7	28.6	995.6	0.0
February	9.0	11.9	100.0	1036.0	1.1	0.0	-30.6	34.1	994.1	0.0
March	7.1	12.0	100.0	1021.8	1.2	0.0	-17.1	24.6	996.1	0.0
April	9.6	22.3	100.0	1026.0	0.0	0.1	-6.4	17.8	999.7	0.0
May	10.4	31.3	100.0	1025.0	3.8	0.0	2.4	16.3	1000.6	0.0
June	8.7	26.0	100.0	1020.0	32.1	0.4	7.0	15.2	1004.0	0.0
July	8.0	30.5	98.2	1027.0	7.3	0.4	9.1	24.8	1001.7	0.0
August	9.2	31.9	99.9	1028.0	9.3	0.5	8.7	21.5	1007.0	0.0
September	9.5	28.2	97.4	1026.0	1.0	0.2	6.9	22.4	1001.0	0.0
October	7.0	23.0	97.9	1024.0	4.0	0.5	-4.2	25.3	994.0	0.0
November	9.0	13.3	100.0	1031.0	1.3	0.2	-19.1	31.6	992.3	0.0
December	7.0	8.2	100.0	1032.3	1.6	0.5	-26.9	58.0	986.7	0.0
Annual	10.7	31.9	100.0	1038.0	32.1	0.0	-30.6	15.2	986.7	0.0

Table A8. Trans Mountain Edmonton Monthly Mean and Valid Data Meteorological Summary Statistics

2025 Meteorological Statistics	Monthly Mean				Total	Valid Data					
Parameter	Wind Speed	Temp	Relative Humidity	Pressure	Precip	Wind Speed	Wind Direction	Temp	Relative Humidity	Pressure	Precip
Units	m/s	°C	%	mb	mm	(%)					
January	3.7	-5.6	81.1	1018.6	16.9	100.0	100.0	100.0	100.0	100.0	100.0
February	3.1	-12.6	72.1	1017.4	3.6	100.0	100.0	100.0	100.0	100.0	100.0
March	3.0	-0.9	78.5	1009.7	23.2	100.0	100.0	100.0	100.0	100.0	100.0
April	3.8	7.8	49.5	1013.7	6.3	100.0	100.0	100.0	100.0	100.0	100.0
May	4.0	14.5	57.2	1012.5	36.9	100.0	100.0	100.0	100.0	100.0	100.0
June	3.5	16.2	58.6	1013.6	152.9	100.0	100.0	100.0	100.0	100.0	100.0
July	3.5	18.3	60.0	1015.7	48.5	100.0	100.0	100.0	100.0	100.0	100.0
August	3.2	19.4	63.3	1015.7	42.8	100.0	100.0	100.0	100.0	100.0	100.0
September	3.3	16.9	53.2	1013.9	2.1	100.0	100.0	100.0	100.0	100.0	100.0
October	3.1	7.3	58.6	1011.3	15.4	100.0	100.0	100.0	100.0	100.0	100.0
November	3.1	-0.6	71.7	1013.1	14.9	99.9	99.9	100.0	100.0	100.0	100.0
December	3.1	-13.7	78.1	1010.8	33.8	100.0	100.0	100.0	100.0	100.0	100.0
Annual	3.4	5.6	65.2	1013.8	397.2	100.0	100.0	100.0	100.0	100.0	100.0

Table A9. Trans Mountain Edmonton 24-Hour $PM_{2.5}$ Exceedance Summary

Date	24-hour Average (µg/m³)	Wind Speed (m/s)	Wind Direction (deg)	Discussion
June 8, 2025	32.3	3.3	215..4	The $PM_{2.5}$ levels started to rise above the 29 µg/m³ limit at 03:00 on June 8, 2025, and maintained higher readings through June 9 04:00. The AQHI rose to 9 during that time. Elevated concentrations greater than 29 µg/m³ were detected from SE and SW. Environment Canada issued special air quality statements, because of wildfire smoke, in the region. It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
June 10, 2025	77.2	2.4	203.6	The $PM_{2.5}$ levels started to rise above the 29 µg/m³ limit at 03:00 on June 8, 2025. The $PM_{2.5}$ levels dipped below the 29 µg/m³ limit for part of the June 9, 2025. The $PM_{2.5}$ levels rose in the evening and remained high through June 10, 2025. The AQHI was 10 during that time. Elevated concentrations greater than 29 µg/m³ were detected from all directions. Environment Canada issued special air quality statements, because of wildfire smoke, in the region. It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
June 11, 2025	59.9	3.2	60.4	The $PM_{2.5}$levels started to rise above the 29 µg/m³ limit at 03:00 on June 8, 2025. The $PM_{2.5}$ levels dipped below the 29 µg/m³ limit for part of the June 9, 2025. The PM2.5 levels rose that evening and remained high through June 10, 2025. The AQHI was 10 during that time. Elevated concentrations greater than 29 µg/m³ were detected from NE and ENE. Environment Canada issued special air quality statements, because of wildfire smoke, in the region. It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
July 16, 2025	46.3	5.1	143.1	The $PM_{2.5}$ levels started to rise above the 29 µg/m³ limit at 08:00 on July 16, 2025. The $PM_{2.5}$ levels dipped below the 29 µg/m³ limit at 23:00 July 16, 2025. The AQHI had a maximum of 6, with a daily average of 4 during that time. Elevated concentrations greater than 29 µg/m³ were detected from SE to SSE. Environment Canada did not issue a special air quality statement. The Alberta government did have the following statement on their AQHI website, “Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. It is likely this exceedance is a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal

Date	24-hour Average (µg/m³)	Wind Speed (m/s)	Wind Direction (deg)	Discussion
July 17, 2025	30.3	2.9	99.7	The $PM_{2.5}$ levels started to rise above the 29 µg/m^3 limit at 08:00 on July 16, 2025. The $PM_{2.5}$ levels dipped below the 29 µg/m^3 limit at 23:00 July 16, 2025. The $PM_{2.5}$ levels rose again at 01:00 on July 17, 2025 and stayed above the limit till 13:00. Our tech was onsite during that time and a calibration was run on the unit. The wind shifted from north easterly to south westerly winds around 17:00 followed by a drop in the $PM_{2.5}$ levels. The AQHI had a maximum of 8, with a daily average of 6 during that time. Elevated concentrations greater than 29 µg/m^3 were detected from NE to NNE. Environment Canada did not issue a special air quality statement. The Alberta government did have the following statement on their AQHI website, "Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. It is likely this exceedance is a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
August 31, 2025	63.1	3.4	227.8	The $PM_{2.5}$ levels started to rise rapidly above the 29 µg/m^3 limit at 23:00 on August 30, 2025, reaching a maximum value 111.1 µg/m^3 at 20:00 on August 31st. The $PM_{2.5}$ levels stayed above the AAQO limit till September 1, 2025, at 21:00. The winds were predominantly out of the south southwest and the north northwest. The AQHI average was 8 with 13 hours being 10+. Alberta environment AQHI website had the following warning. "Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. Additional information can be found on the federal public alerts page." It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
September 01, 2025	97.7	2.8	91.6	The $PM_{2.5}$ levels started to rise rapidly above the 29 µg/m^3 limit at 23:00 on August 30, 2025, reaching a maximum value 138.5 µg/m^3 at 14:00 on September 1st. The $PM_{2.5}$ levels stayed above the AAQO limit through September 1, 2025, at 21:00. The winds were predominantly out of the northeast. The AQHI average was 9 with 21 hours being 10+. Alberta environment AQHI website had the following warning. "Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. Additional information can be found on the federal public alerts page." It is likely these exceedances

Date	24-hour Average (µg/m³)	Wind Speed (m/s)	Wind Direction (deg)	Discussion
				are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
September 2, 2025	63.1	3.4	227.8	The $PM_{2.5}$ levels started to rise rapidly above the 29 µg/m^3 limit at 23:00 on August 30, 2025, reaching a maximum value 111.1 µg/m^3 at 20:00 on August 31st. The $PM_{2.5}$ levels stayed above the AAQO limit till September 1, 2025, at 21:00. The winds were predominantly out of the south southwest and the north northwest. The AQHI average was 8 with 13 hours being 10+. Alberta environment AQHI website had the following warning. "Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. Additional information can be found on the federal public alerts page." It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
September 3, 2025	38.2	4.9	221.8	The $PM_{2.5}$ levels started to rise above the 29 µg/m^3 limit at 03:00 on September 3, 2025, reaching a maximum value 72.3 µg/m^3 at 22:00 September 2, 2025. The $PM_{2.5}$ levels stayed above the AAQO limit till September 4, 2025, at 10:00. The winds were predominantly out of the south with the highest pollutants coming out of the north and southwest. The AQHI average was 6 with a maximum of 10. Alberta environment AQHI website had the following warning. "Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. Additional information can be found on the federal public alerts page." It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
September 8, 2025	29.2	2.2	167.9	The $PM_{2.5}$ levels started to rise above the 29 µg/m^3 limit at 05:00 on September 8, 2025, reaching a maximum value of 42.0 µg/m^3 at 07:00 September 8, 2025. The $PM_{2.5}$ levels stayed above the AAQO limit till September 8, 2025, at 11:00. The winds were predominantly out of the east southeast. The AQHI average was 5 with a maximum of 8. Alberta environment AQHI website had the following warning. "Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. Additional

Date	24-hour Average (µg/m³)	Wind Speed (m/s)	Wind Direction (deg)	Discussion
				information can be found on the federal public alerts page." It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
September 9, 2025	33.9	3.4	184.3	The $PM_{2.5}$ levels started to rise above the 29 µg/m³ limit at 04:00 on September 8, 2025, reaching a maximum value of 43.4 µg/m³ at 22:00 September 9, 2025. The $PM_{2.5}$ levels stayed above the AAQO limit till September 10, 2025, at 08:00. The winds were predominantly out of the south. The AQHI average was 6 with a maximum of 7. Alberta environment AQHI website had the following warning. "Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. Additional information can be found on the federal public alerts page." It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal
September 30, 2025	31.6	2.3	269.2	The $PM_{2.5}$ levels started to rise above the 29 µg/m³ limit at 13:00 on September 30, 2025, reaching a maximum value of 72.6 µg/m³ at 21:00 September 30, 2025. The $PM_{2.5}$ levels stayed above the AAQO limit till October 1, 2025, at 16:00. The winds were predominantly out of the northwest. The AQHI average was 5 with a maximum of 10+. Alberta environment AQHI website had the following warning. "Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. Additional information can be found on the federal public alerts page." It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
October 1, 2025	31.6	2.1	221.9	The $PM_{2.5}$ levels started to rise above the 29 µg/m³ limit at 13:00 on September 30, 2025, reaching a maximum value of 72.6 µg/m³ at 21:00 September 30, 2025. The $PM_{2.5}$ levels stayed above the AAQO limit till October 1, 2025, at 16:00. The winds were predominantly out of the west northwest. The AQHI average was 7 with a maximum of 10+. Alberta environment AQHI website had the following warning. "Smoke from wildfires can occur in very localized areas, fluctuate rapidly and may not be detected by AQHI stations. Take actions to protect your health based on your surroundings or symptoms. Additional

Date	24-hour Average (µg/m³)	Wind Speed (m/s)	Wind Direction (deg)	Discussion
				information can be found on the federal public alerts page." It is likely these exceedances are a result of regional wildfire smoke and not the result of activities at the Edmonton Terminal.
November 26, 2025	51.8	1.1	192.7	The $PM_{2.5}$ levels started to rise above the 29 µg/m³ limit at 08:00 on November 26, 2025, reaching a maximum value of 136.8 µg/m³ at 17:00 November 26, 2025. The $PM_{2.5}$ levels stayed above the AAQO limit till November 27, 2025, at 22:00. The winds were predominantly out of the northeast. The AQHI average was 7 with a maximum of 10+. Alberta environment AQHI website had the following warning. "When air pollution levels are high, everyone should limit time outdoors. Consider reducing or rescheduling outdoor sports, activities and events." It is likely these exceedances are a result of regional conditions and not the result of activities at the Edmonton Terminal
November 27, 2025	32.9	2.1	221.2	The $PM_{2.5}$ levels started to rise above the 29 µg/m³ limit at 08:00 on November 26, 2025, reaching a maximum value of 136.8 µg/m³ at 17:00 November 26, 2025. The $PM_{2.5}$ levels stayed above the AAQO limit till November 27, 2025, at 22:00. The winds were predominantly out of the north northwest. The AQHI average was 6 with a maximum of 8. Alberta environment AQHI website had the following warning. "When air pollution levels are high, everyone should limit time outdoors. Consider reducing or rescheduling outdoor sports, activities and events." It is likely these exceedances are a result of regional conditions and not the result of activities at the Edmonton Terminal