Peace River Area Monitoring Program Committee
Suite 91, 305-4625 Varsity Dr NW
Calgary, AB, T3A 0Z9

Alberta Environment and Parks (AEP)
Air.Reporting@gov.ab.ca

April 2, 2019

Subject: Annual Report Submission for the PRAMP 986 AQM station

Peace Rive Area Monitoring Program Committee (PRAMP) is pleased to submit the ambient air monitoring annual report conducted at the PRAMP 986 AQM Station in the year of 2018.

The air monitoring program consists of continuous air monitoring and VOC canister sampling program. All the air monitoring activities were conducted by contractors.

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
VOC Canister	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable

In 2018, one contravention was reported to AEP in 2018: AEP reference # 343452 for the August 2018 event, and it was because the operational uptime for the hydrocarbon analyzer did not met the 90% uptime requirement. A detailed summary of this incident is included in the summary of monthly report discussions of the report.

In 2018, one NMHC canister was collected. A detailed summary of this event is included in the summary of monthly report discussions of the report.

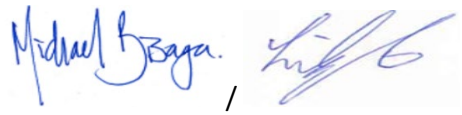
The air monitoring station was replaced, and the data acquisition system was upgraded between July 30 and August 2. The Envidas Ultimate datalogger was installed to replace the ESC 8832 datalogger.

As the PRAMP Technical Program Managers, we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also verify all air data that are required by the AMD to be electronically submitted to Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission.

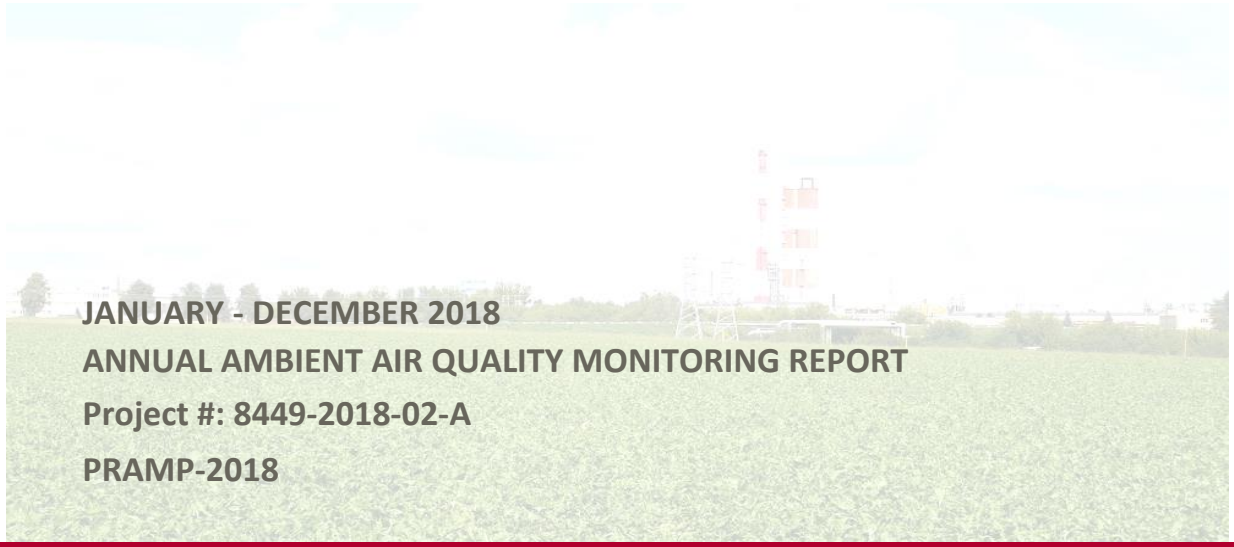
Should you have any questions, please don't hesitate to contact us.

Respectfully,

Peace River Area Monitoring Program Committee
Suite 91, 305-4625 Varsity Dr NW
Calgary, AB, T3A 0Z9



Michael Bisaga / Lily Lin
Technical Program Managers
Peace River Area Monitoring Program
780-266-7068 / 587-225-2248
prampatech@prampairshed.ca



JANUARY - DECEMBER 2018
ANNUAL AMBIENT AIR QUALITY MONITORING REPORT
Project #: 8449-2018-02-A
PRAMP-2018

Prepared for:

Peace River Area Monitoring Program Committee

Lily Lin

pramptech@prampairshed.ca

587-225-2248

Monitoring Station

Three Creeks 986b Station

Date of Report Issuance: March 28, 2019

Report Preparation By:

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Peace River Area Monitoring Program Committee

Peace River

Alberta

Attention: Lily Lin

Date: March 28, 2019

Subject: ANNUAL AMBIENT AIR QUALITY MONITORING REPORT for JANUARY - DECEMBER 2018

Between the months of January - December 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Three Creeks 986b Station near Peace River Oil Sands Area 2, Alberta, Alberta. The monitoring program provides measurements of ambient air pollutants and meteorological data to satisfy the reporting requirements of the Alberta airshed.

The annual report provides a summary of air monitoring activities and performance measures that were detailed in the monthly reports. The results of continuous monitoring are summarized and represented through annual statistics, plots and rose charts.

Annual Validation Synopsis

The station is equipped with analyzers to measure SO_2, TRS, THC, CH_4 and NMHC. The meteorological sensors and equipment capture data for WS, WD, RH, BP, AT and STNTPX. Data presented in this report has undergone the post-final validation procedures, as outlined in Chapter 6, 4.6, DQ 4-Q (AMD, 2016). If errors or omissions in the data are suspected or discovered after the initial submittal of data (monthly report), the post-validation step serves to re-evaluate the affected data. The evaluation of data collected in 2018 did not reveal any errors or omissions that would require resubmission of air data to Alberta Environment and Parks (AEP) airdata warehouse.

A summary of the annual statistics for the continuous monitoring program are presented below:

Annual Summary	SO_2	TRS	THC	CH4	NMHC	WS	RH	BP	AT	StnTPX
	ppb	ppb	ppm	ppm	ppm	kph	%RH	millibars	0C	0C
Minimum	0.0	0.0	1.87	1.87	0.00	0.0	13.0	914.0	-40.7	1.9
MinDate	2018/01/01 02:00	2018/05/01 06:00	2018/07/18 13:00	2018/07/18 13:00	2018/01/01 00:00	2018/01/10 03:00	2018/05/10 10:00	2018/12/11 17:00	2018/01/12 04:00	2018/11/16 08:00
Maximum	3	3.68	5.33	5.33	0.11	33	101	963	33.9	38.7
MaxDate	2018/02/05 14:00	2018/09/24 19:00	2018/01/05 02:00	2018/01/05 02:00	2018/01/13 05:00	2018/06/11 12:00	2018/08/23 21:00	2018/01/28 03:00	2018/06/20 16:00	2018/11/13 13:00
Avg	0	0.34	2.02	2.02	0	1.2	70	942	1.6	22.9
Num	8242	8206	8154	8154	8154	8696	8698	8698	8697	8698
Data[%]	99.0	98.7	98.0	98.0	98.0	99.3	99.3	99.3	99.3	99.3

A summary of NMHC canister events for 2018 is presented below:

Summary of NMHC Canister events for 2018				
Station	Date	Time	NMHC Conc. (ppm)	Notes
PRAMP 986b	December 9, 2018	20:25	0.63	Sample processed as per PRAMP Chain of Custody.

Exceedance & Performance Reporting:

All measured ambient air concentrations were below the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO, 2018, as amended). Comparisons of these concentrations to the corresponding AAAQOs were done in accordance with Chapter 9, 16.3.2, RC 16-R (AMD, 2016). Accordingly, the averaging specifications and data completeness criteria, as defined in Appendix A, were applied. (Chapter 9, Appendix A, AMD 2016).

The operational time of 88.3% for the THC/CH_4/NMHC analyzer did not meet the equipment uptime specifications as per Chapter 6, DQ 4-C (AMD, 2016) in August. A total of 87 hours of downtime was recorded. This contravention was reported to AEP under reference number 343452.

- A station upgrade event contributed forty hours of downtime between August 1 and August 2.
- A calibration attempt on August 29 did not meet Maxxam's internal stability requirement due to poor sample injections. A successful post-repair calibration was completed on August 30. Data was invalidated back to the point of failed performance, determined as August 28 at 14:00. Forty-seven hours of downtime were incurred due to this event.

Summary of AMD Contraventions for 2018		
AMD Contravention	Month Reported	AEP Reference #
Equipment uptime for THC/CH_4/NMHC < 90%	August	343452

For all the remaining parameters, the data capture rates for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

Monitoring Overview:

Station Upgrade: A station upgrade was implemented between July 30 and August 2. The trailer was replaced and the Envidas Ultimate data logger was installed to replace the resident ESC 8832.

During this monitoring period, there were no scheduled audits that Maxxam Analytics was privy to.

Should you have any questions concerning the results or if we can be of further assistance, please contact your Maxxam representative indicated below.

Reviewed by:

Cheri Sinclair, B.Sc.
Supervisor, Customer Service, Air Services
403-819-9139

I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. Certification of submitted information is specific to the contents of this report and is not intended to represent the onus of the Person Responsible, as outlined in Chapter 9, RC 2-E.

Equipment and Procedures				
Parameter	**Units**	**Instrument**	**Method**	**Serial #**
SULPHUR DIOXIDE (SO_2)	ppb	Thermo 43C UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	43C-62339-335
TOTAL REDUCED SULPHUR (TRS)	ppb	Thermo 43i - TLE UV Fluorescent Analyzer		1152940011
TOTAL HYDROCARBONS (THC)	ppm	Thermo 55i FID Analyzer	Maxxam AIR SOP-00001 - Methane, Non-Methane Hydrocarbon Analyzer Monitoring	1022143392
METHANE (CH_4)	ppm			
NON-METHANE HYDROCARBONS (NMHC)	ppm			
WIND SPEED (WS)	kph	RM Young 05305-VK Unit	Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration	129612
WIND DIRECTION (WD)	degree			
RELATIVE HUMIDITY (RH)	%	RM Young Unit	Operation Manual	61012322
BAROMETRIC PRESSURE (BP)	mbar	Met One Unit	Operation Manual	F3845
AMBIENT TEMPERATURE (AT)	°C	RM Young Unit	Operation Manual	61012322
DATALOGGER	-	ESC 8832 and Envidas Ultimate	-	-
NMHC CANISTER SAMPLES	-	Canister Sampler	Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canisters and Xontech	-

Continuous Monitoring Annual Results Summary

2018 SULPHUR DIOXIDE (SO_2) Monthly Averages & Frequency Distributions of 1-Hr Readings												
Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (ppb SO_2)						AAAQO** (ppb)		EXCEEDANCES		MONTHLY AVERAGE (ppb)
			≤ 20	20 < C ≤ 60	60 < C ≤ 110	110 < C ≤ 170	170 < C ≤ 340	> 340	1-HR	24-HR	1-HR	24-HR	
January	706	99.7	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
February	638	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
March	707	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
April	685	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
May	707	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
June	683	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
July	663	93.8	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
August	673	94.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
September	680	99.4	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
October	708	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
November	684	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
December	708	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	172	48.0	0	0	0
Annual	8242	99.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%			0	0	0

N/D - Valid Data Not Available

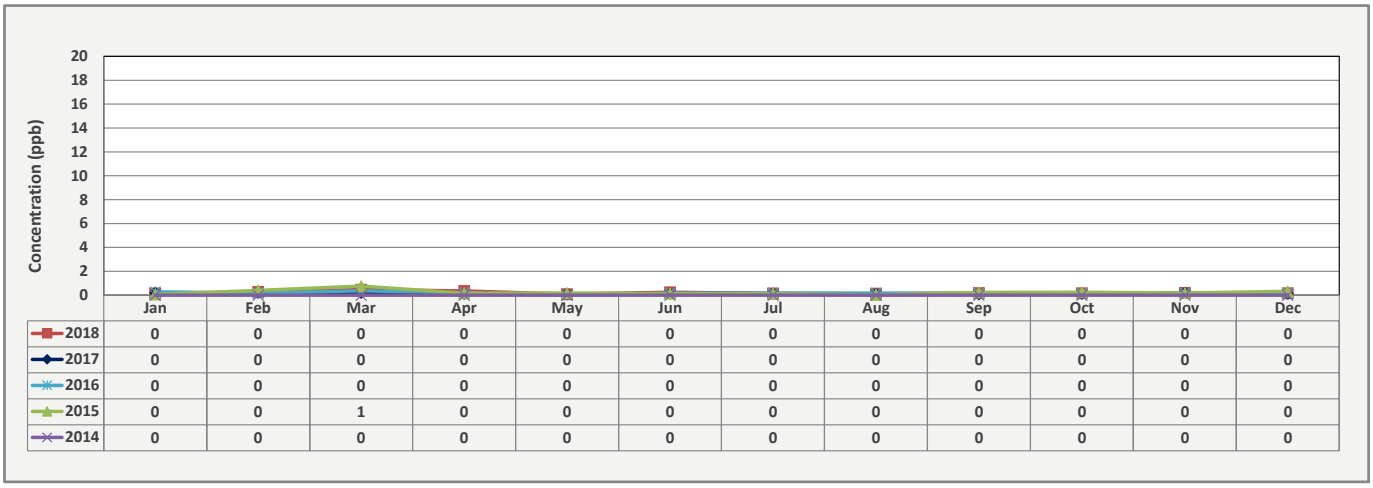
**# of valid readings excluding calibration hours*

***If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Alberta Ambient Air Quality Objectives Annual Average**	8.0	ppb
Annual Average for 2018	0	ppb

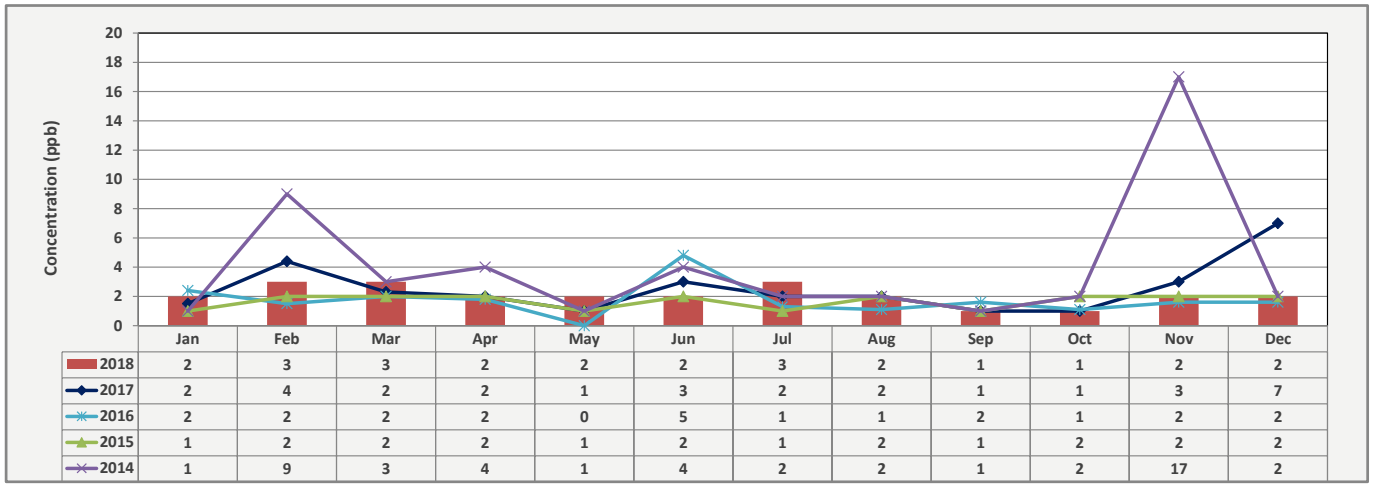
SO_2 Data Identifiers _ Total Hours Flagged = 518										
Continuous Flag	C	C1	G	P	Q	R	S	S1	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Daily Zero/Span	Additional Zero/Span	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y	Y	Y
Annual Total	50	7	0	7	0	0	375	0	2	77

2014 to 2018 SO_2 Monthly Averages



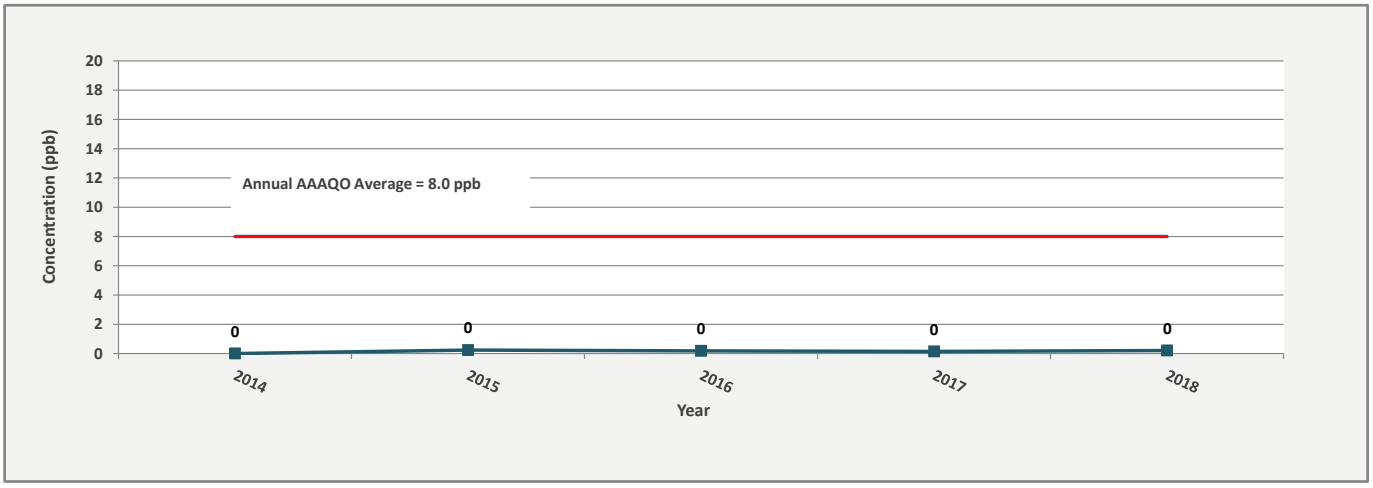
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	1	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0

2014 to 2018 SO_2 Monthly Maximum Averages

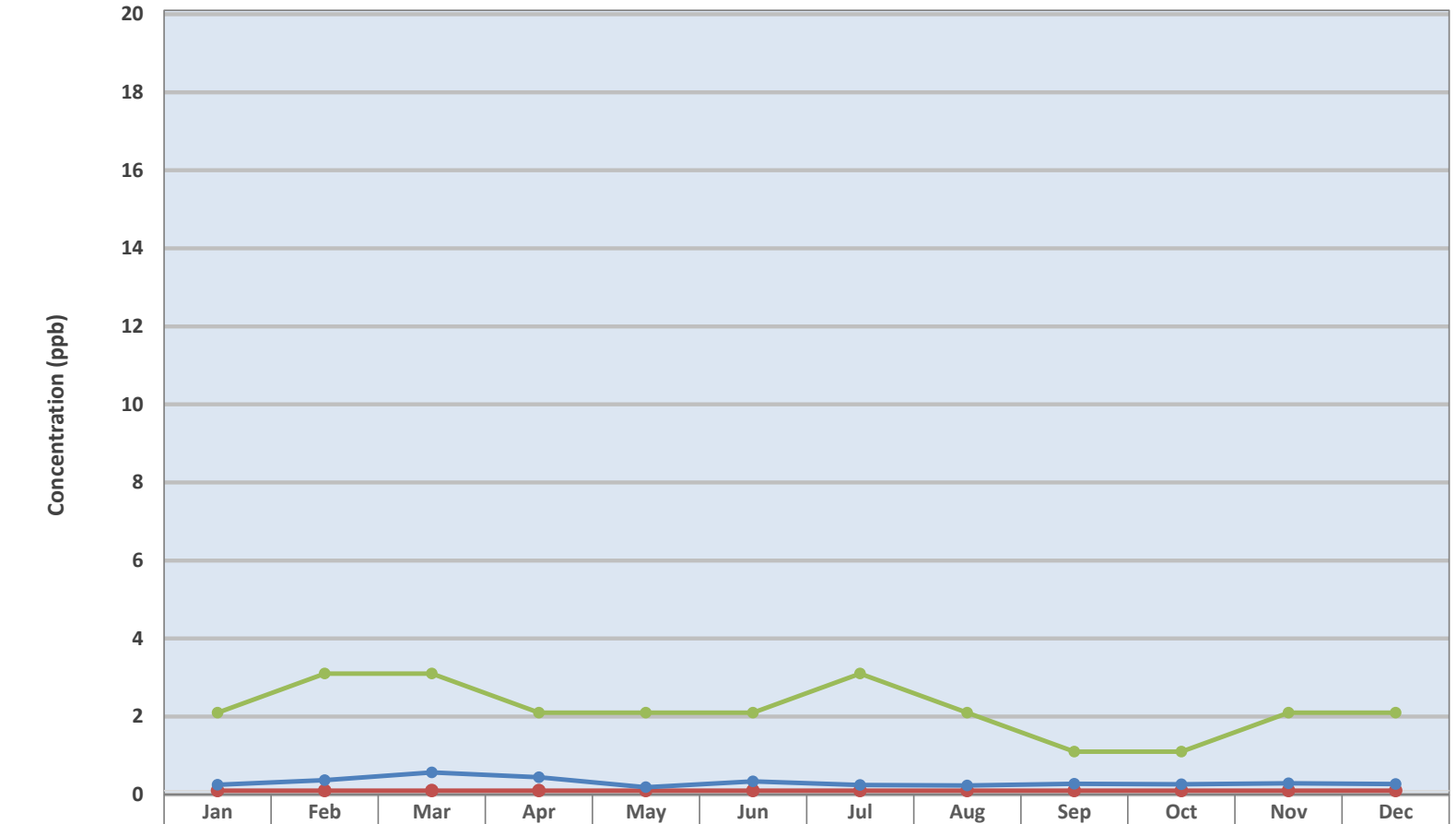


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	2	3	3	2	2	2	3	2	1	1	2	2
2017	2	4	2	2	1	3	2	2	1	1	3	7
2016	2	2	2	2	0	5	1	1	2	1	2	2
2015	1	2	2	2	1	2	1	2	1	2	2	2
2014	1	9	3	4	1	4	2	2	1	2	17	2

2014 to 2018 SO_2 Annual Averages

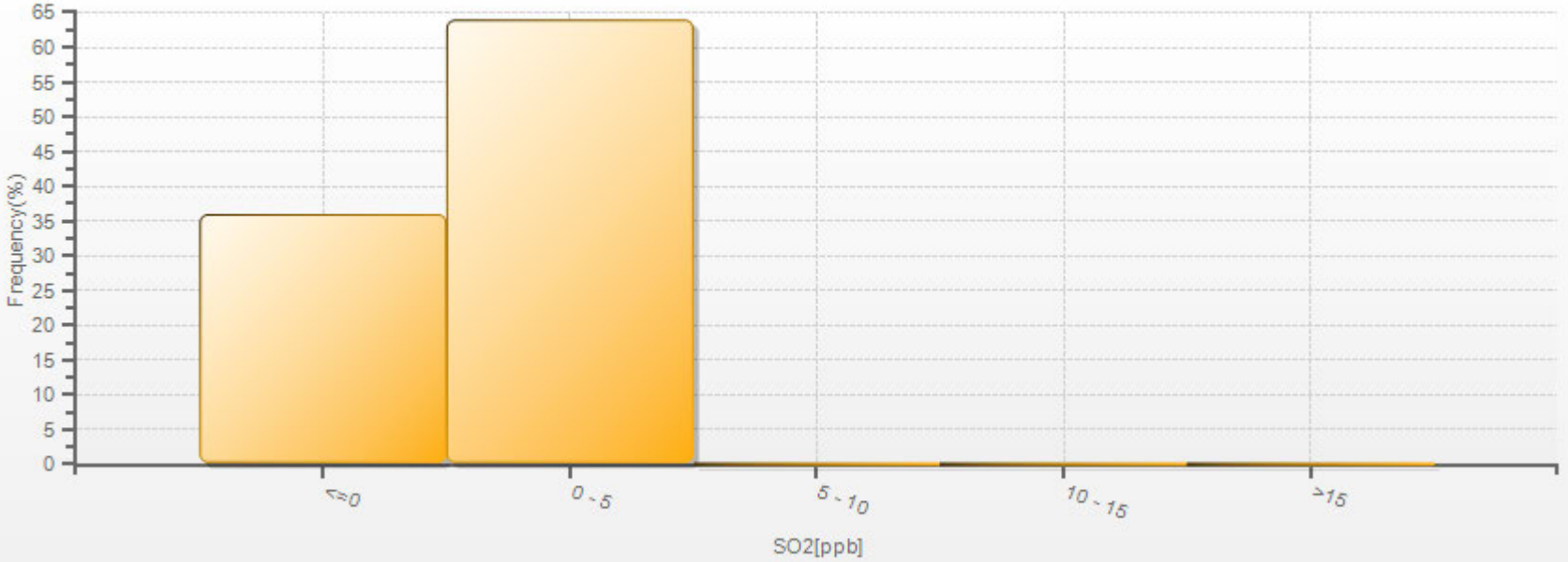


2018 SO_2 Monthly Statistics



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	0	0	0	0	0	0	0	0	0	0	0	0
AVERAGE	0	0	0	0	0	0	0	0	0	0	0	0
MAXIMUM	2	3	3	2	2	2	3	2	1	1	2	2

SO2[ppb] Histogram: PRAMP_986 Periodically: 2018/01/01 00:00-2018/12/31 23:00 1 Hr.



2018 TOTAL REDUCED SULPHUR (TRS) Monthly Averages & Frequency Distributions of 1-Hr Readings

Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (ppb TRS)				OBJECTIVES** (ppb)		EXCEEDANCES		MONTHLY AVERAGE (ppb)
			≤ 3	4 < C ≤ 10	11 < C ≤ 50	> 50	1-HR	24-HR	1-HR	24-HR	
January	704	99.7	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
February	638	100.0	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
March	698	99.2	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
April	682	99.7	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
May	707	99.9	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
June	683	100.0	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
July	661	93.5	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
August	669	94.5	100.0%	0.0%	0.0%	0.0%	-	-	-	-	1
September	679	99.4	99.9%	0.1%	0.0%	0.0%	-	-	-	-	0
October	707	100.0	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
November	673	98.8	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
December	705	100.0	100.0%	0.0%	0.0%	0.0%	-	-	-	-	0
Annual	**8206**	**98.7**	**100.0%**	**0.0%**	**0.0%**	**0.0%**			**0**	**0**	**0**

N/D - Valid Data Not Available

**# of valid readings excluding calibration hours*

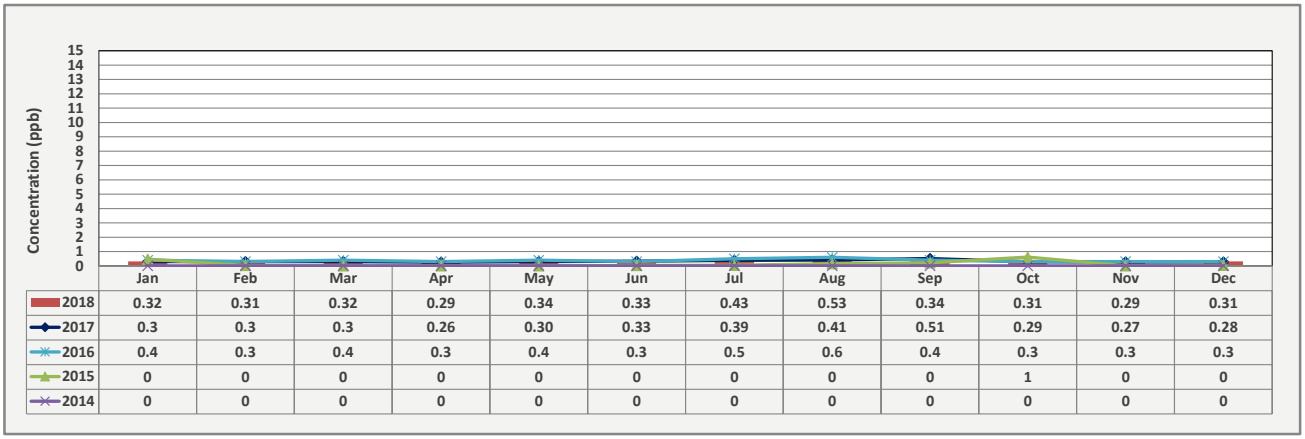
***If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Alberta Ambient Air Quality Objectives Annual Average**	-	ppb
Annual Average for 2018	0	ppb

TRS Data Identifiers _ Total Hours Flagged = 554

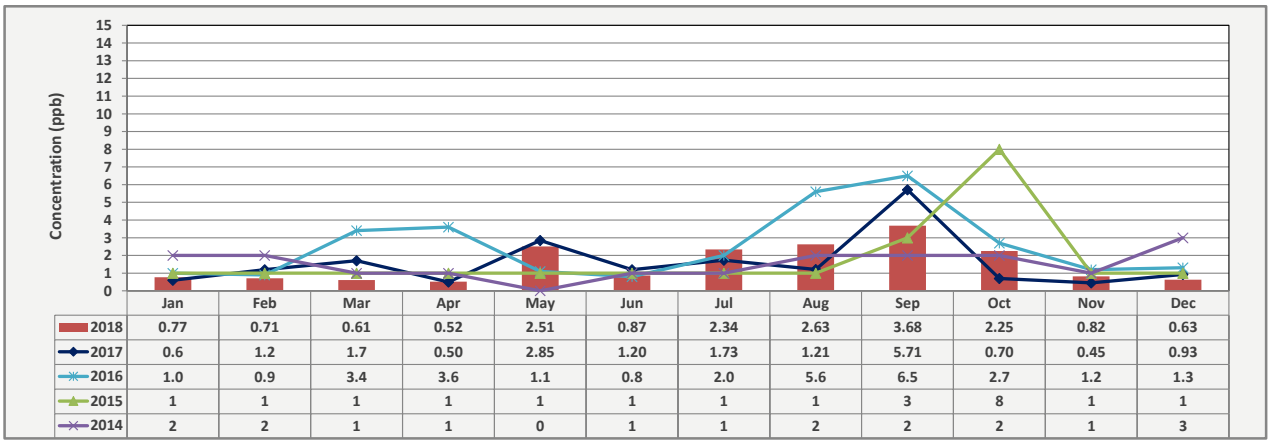
Continuous Flag	C	C1	G	P	Q	R	S	S1	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Daily Zero/Span	Additional Zero/Span	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y	Y	Y
Annual Total	66	6	0	7	0	0	375	5	11	84

2014 to 2018 TRS Monthly Averages



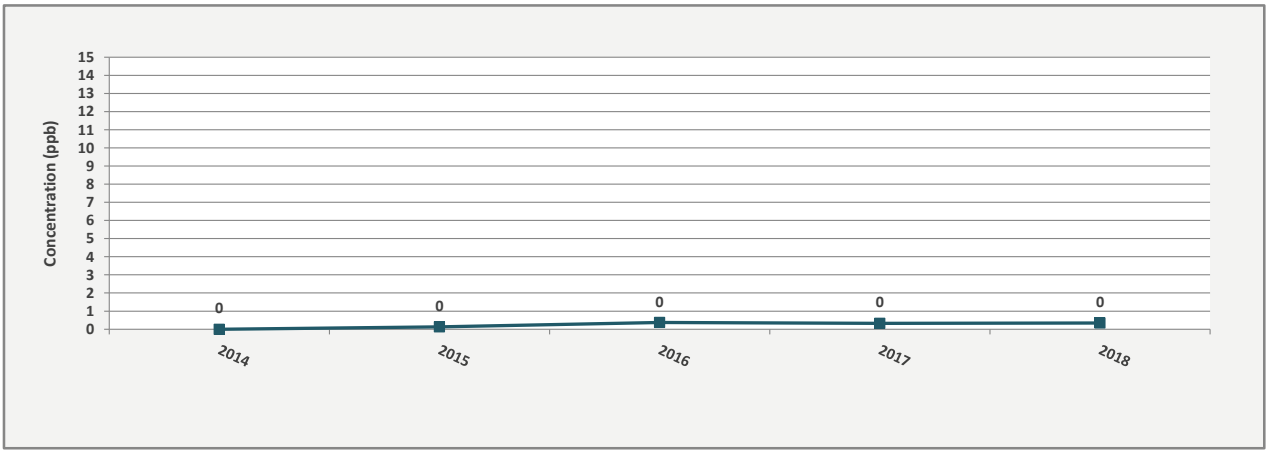
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	0.32	0.31	0.32	0.29	0.34	0.33	0.43	0.53	0.34	0.31	0.29	0.31
2017	0.3	0.3	0.3	0.26	0.30	0.33	0.39	0.41	0.51	0.29	0.27	0.28
2016	0.4	0.3	0.4	0.3	0.4	0.3	0.5	0.6	0.4	0.3	0.3	0.3
2015	0	0	0	0	0	0	0	0	0	1	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0

2014 to 2018 TRS Monthly Maximum Averages

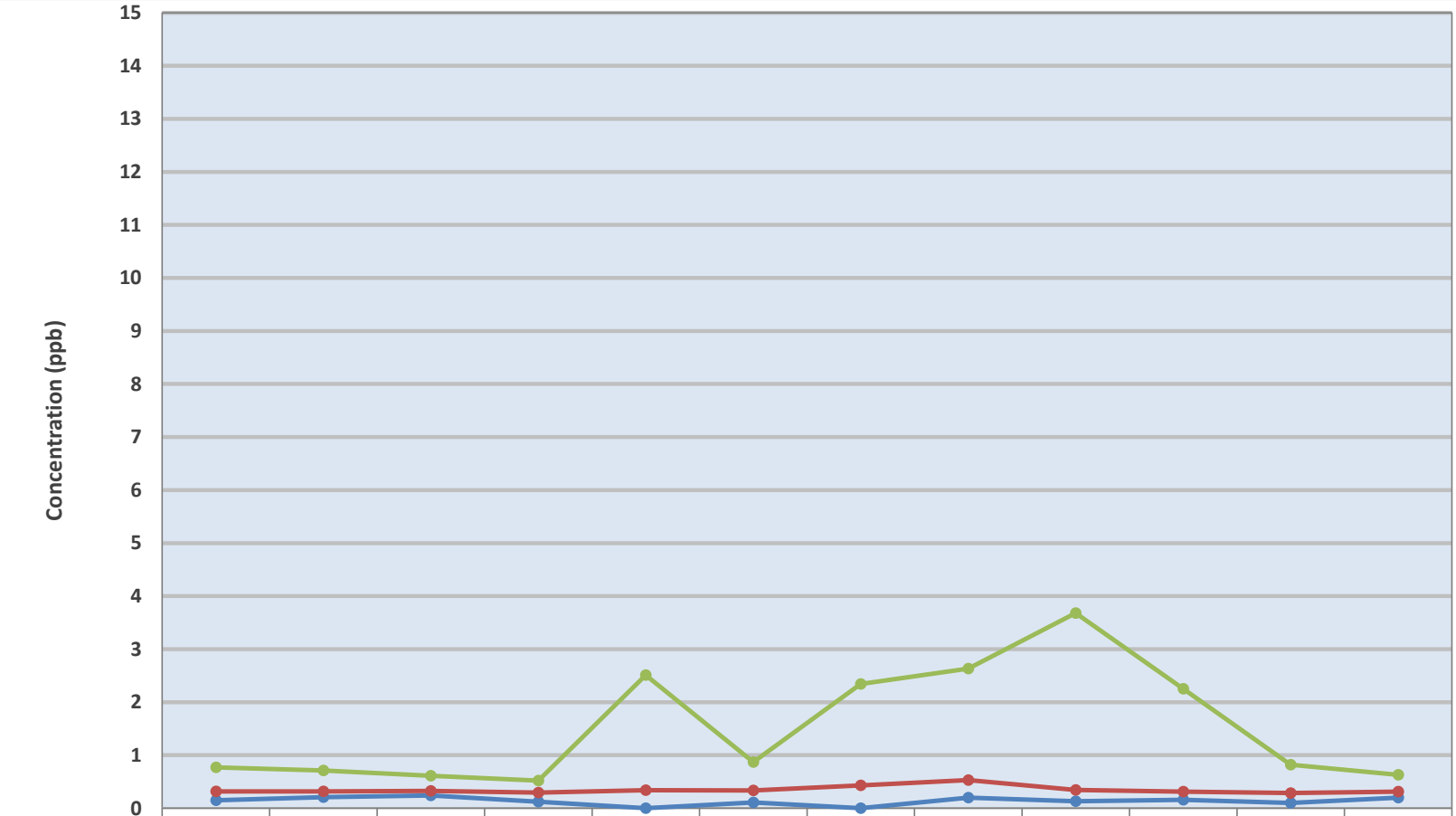


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	0.77	0.71	0.61	0.52	2.51	0.87	2.34	2.63	3.68	2.25	0.82	0.63
2017	0.6	1.2	1.7	0.50	2.85	1.20	1.73	1.21	5.71	0.70	0.45	0.93
2016	1.0	0.9	3.4	3.6	1.1	0.8	2.0	5.6	6.5	2.7	1.2	1.3
2015	1	1	1	1	1	1	1	1	3	8	1	1
2014	2	2	1	1	0	1	1	2	2	2	1	3

2014 to 2018 TRS Annual Averages



2018 TRS Monthly Statistics



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	0.15	0.21	0.24	0.12	0.00	0.11	0.00	0.20	0.13	0.16	0.10	0.20
AVERAGE	0.32	0.31	0.32	0.29	0.34	0.33	0.43	0.53	0.34	0.31	0.29	0.31
MAXIMUM	0.77	0.71	0.61	0.52	2.51	0.87	2.34	2.63	3.68	2.25	0.82	0.63

2018 TOTAL HYDROCARBONS (THC) Monthly Averages & Frequency Distributions of 1-Hr Readings

Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (ppm THC)				OBJECTIVES** (ppm)		EXCEEDANCES		MONTHLY AVERAGE (ppm)
			≤ 3.0	3.1 < C ≤ 10.0	10.1 < C ≤ 50.0	> 50.0	1-HR	24-HR	1-HR	24-HR	
January	707	99.9	96.0%	4.0%	0.0%	0.0%	-	-	-	-	2.17
February	627	98.2	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.00
March	705	99.9	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.02
April	680	99.3	100.0%	0.0%	0.0%	0.0%	-	-	-	-	1.98
May	708	99.9	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.00
June	682	100.0	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.00
July	663	93.7	100.0%	0.0%	0.0%	0.0%	-	-	-	-	1.98
August	624	88.3	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.02
September	684	100.0	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.04
October	707	99.9	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.00
November	666	97.2	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.02
December	701	99.3	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.04
Annual	8154	98.0	99.7%	0.3%	0.0%	0.0%			0	0	2.02

N/D - Valid Data Not Available

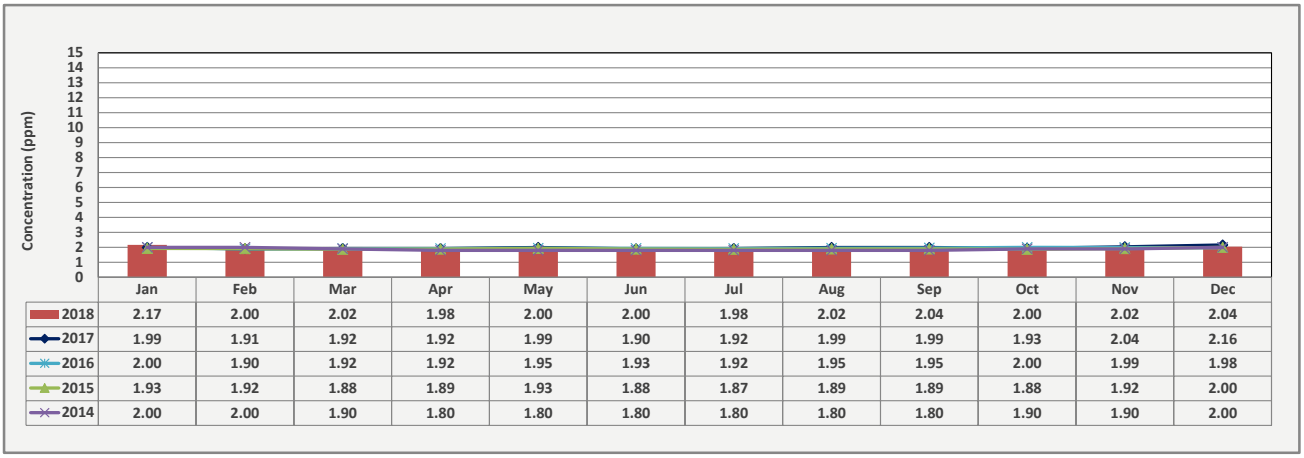
**# of valid readings excluding calibration hours*

***If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Alberta Ambient Air Quality Objectives Annual Average**	-	ppm
Annual Average for 2018	2.02	ppm

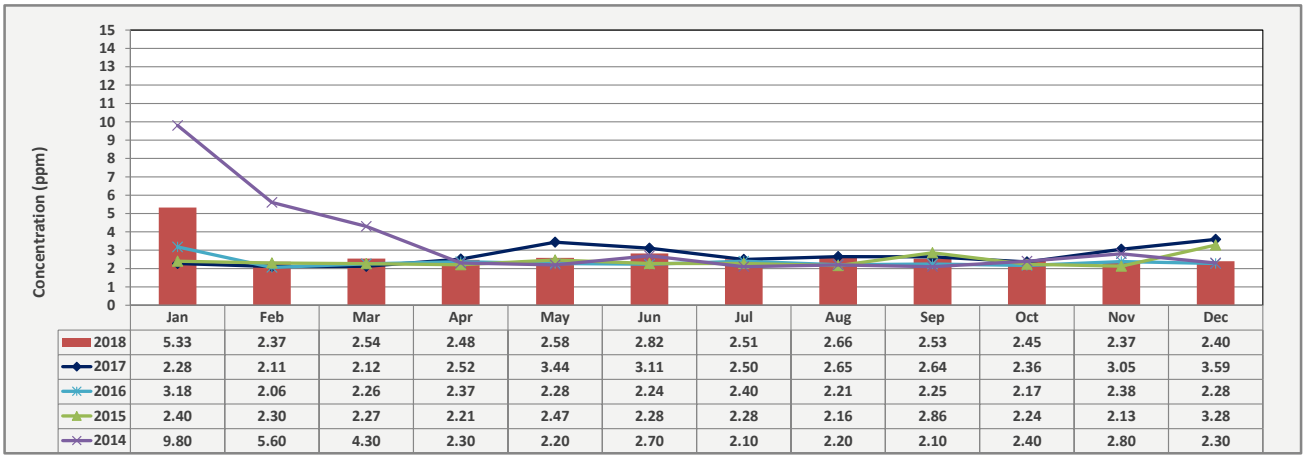
THC Data Identifiers _ Total Hours Flagged = 606										
Continuous Flag	C	C1	G	P	Q	R	S	S1	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Daily Zero/Span	Additional Zero/Span	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y	Y	Y
Annual Total	55	11	0	7	0	1	371	2	75	84

2014 to 2018 THC Monthly Averages



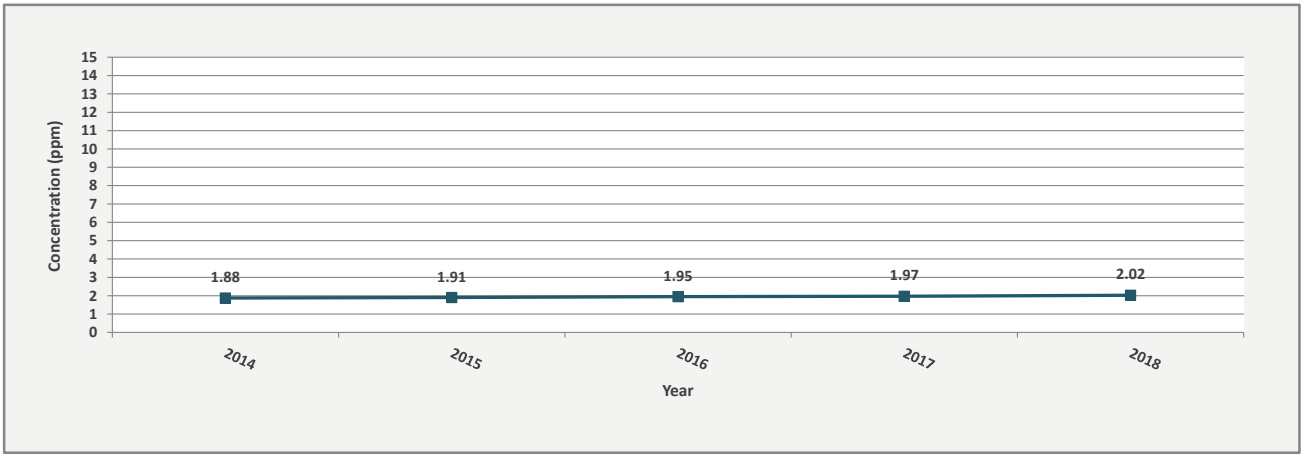
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	2.17	2.00	2.02	1.98	2.00	2.00	1.98	2.02	2.04	2.00	2.02	2.04
2017	1.99	1.91	1.92	1.92	1.99	1.90	1.92	1.99	1.99	1.93	2.04	2.16
2016	2.00	1.90	1.92	1.92	1.95	1.93	1.92	1.95	1.95	2.00	1.99	1.98
2015	1.93	1.92	1.88	1.89	1.93	1.88	1.87	1.89	1.89	1.88	1.92	2.00
2014	2.00	2.00	1.90	1.80	1.80	1.80	1.80	1.80	1.80	1.90	1.90	2.00

2014 to 2018 THC Monthly Maximum Averages

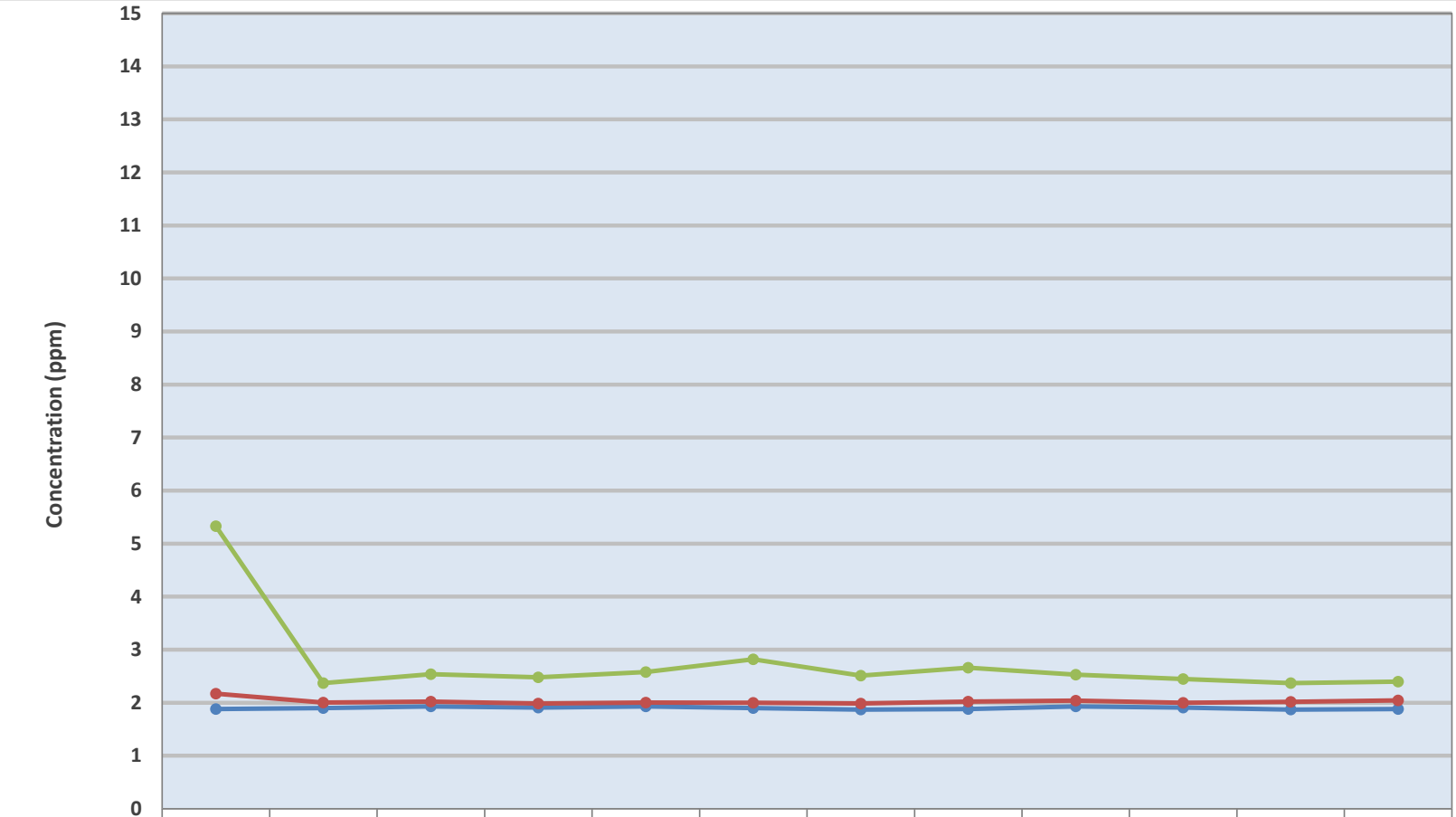


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	5.33	2.37	2.54	2.48	2.58	2.82	2.51	2.66	2.53	2.45	2.37	2.40
2017	2.28	2.11	2.12	2.52	3.44	3.11	2.50	2.65	2.64	2.36	3.05	3.59
2016	3.18	2.06	2.26	2.37	2.28	2.24	2.40	2.21	2.25	2.17	2.38	2.28
2015	2.40	2.30	2.27	2.21	2.47	2.28	2.28	2.16	2.86	2.24	2.13	3.28
2014	9.80	5.60	4.30	2.30	2.20	2.70	2.10	2.20	2.10	2.40	2.80	2.30

2014 to 2018 THC Annual Averages



2018 THC Monthly Statistics



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	1.88	1.90	1.93	1.91	1.93	1.90	1.87	1.88	1.93	1.91	1.87	1.88
AVERAGE	2.17	2.00	2.02	1.98	2.00	2.00	1.98	2.02	2.04	2.00	2.02	2.04
MAXIMUM	5.33	2.37	2.54	2.48	2.58	2.82	2.51	2.66	2.53	2.45	2.37	2.40

2018 METHANE (CH_4) Monthly Averages & Frequency Distributions of 1-Hr Readings

Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (ppm CH_4)				OBJECTIVES** (ppm)		EXCEEDANCES		MONTHLY AVERAGE (ppm)
			≤ 3.0	3.1 < C ≤ 10.0	10.1 < C ≤ 50.0	> 50.0	1-HR	24-HR	1-HR	24-HR	
January	707	99.9	96.0%	4.0%	0.0%	0.0%	-	-	-	-	2.17
February	627	98.2	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.00
March	705	99.9	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.02
April	680	99.3	100.0%	0.0%	0.0%	0.0%	-	-	-	-	1.98
May	708	99.9	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.00
June	682	100.0	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.00
July	663	93.7	100.0%	0.0%	0.0%	0.0%	-	-	-	-	1.98
August	624	88.3	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.02
September	684	100.0	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.04
October	707	99.9	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.00
November	666	97.2	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.02
December	701	99.3	100.0%	0.0%	0.0%	0.0%	-	-	-	-	2.04
Annual	**8154**	**98.0**	**99.7%**	**0.3%**	**0.0%**	**0.0%**			**0**	**0**	**2.02**

N/D - Valid Data Not Available

**# of valid readings excluding calibration hours*

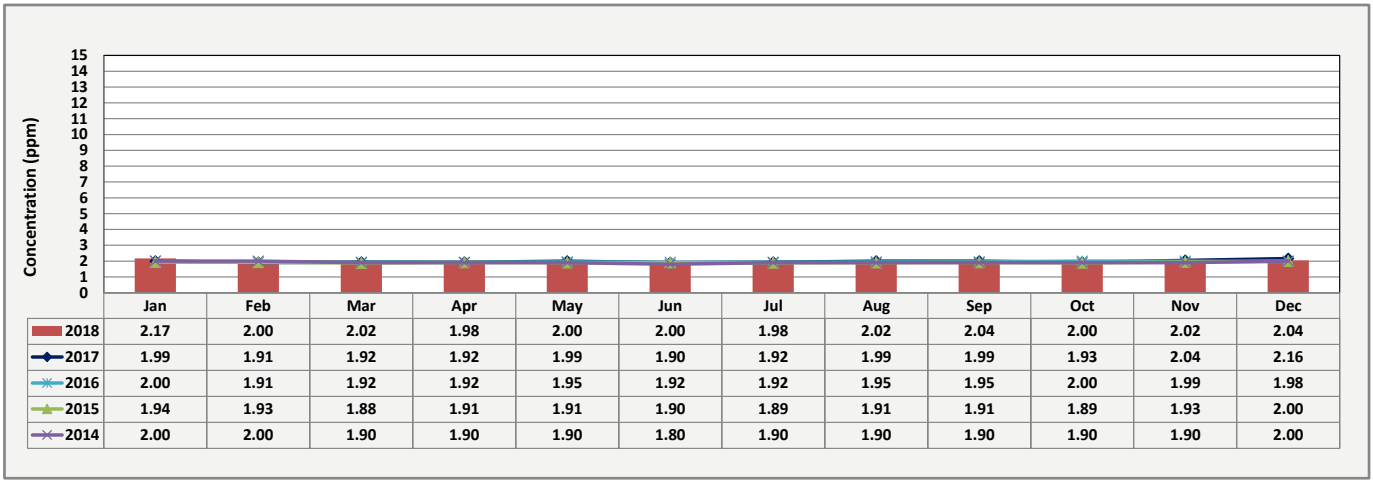
***If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Alberta Ambient Air Quality Objectives Annual Average**	**-**	**ppm**
Annual Average for 2018	**2.02**	**ppm**

CH_4 Data Identifiers _ Total Hours Flagged = 606

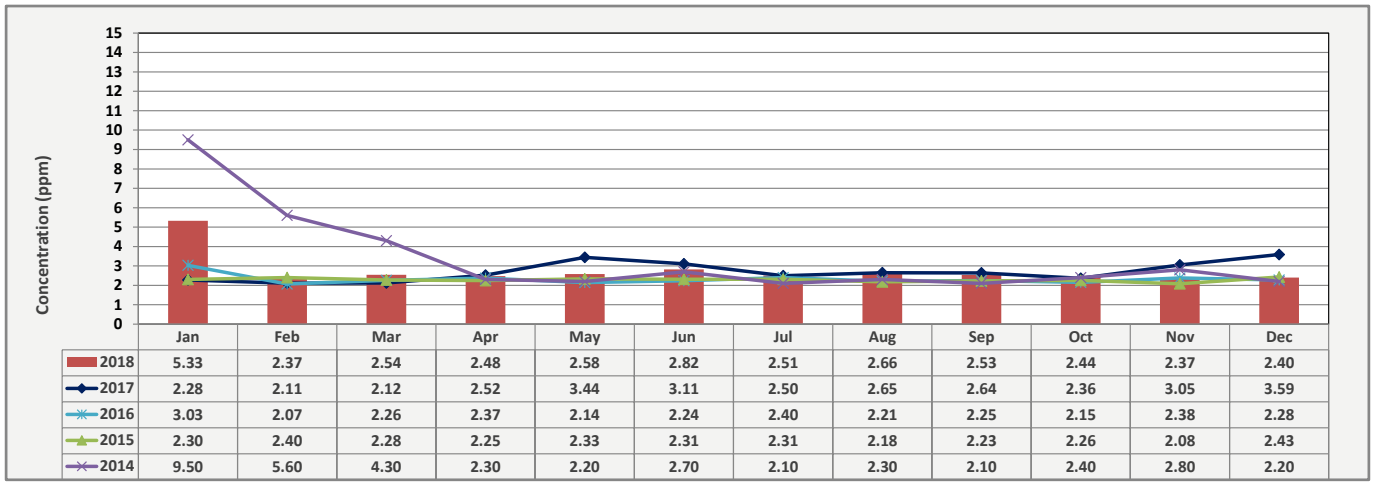
Continuous Flag	C	C1	G	P	Q	R	S	S1	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Daily Zero/Span	Additional Zero/Span	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y	Y	Y
Annual Total	55	11	0	7	0	1	371	2	75	84

2014 to 2018 CH_4 Monthly Averages



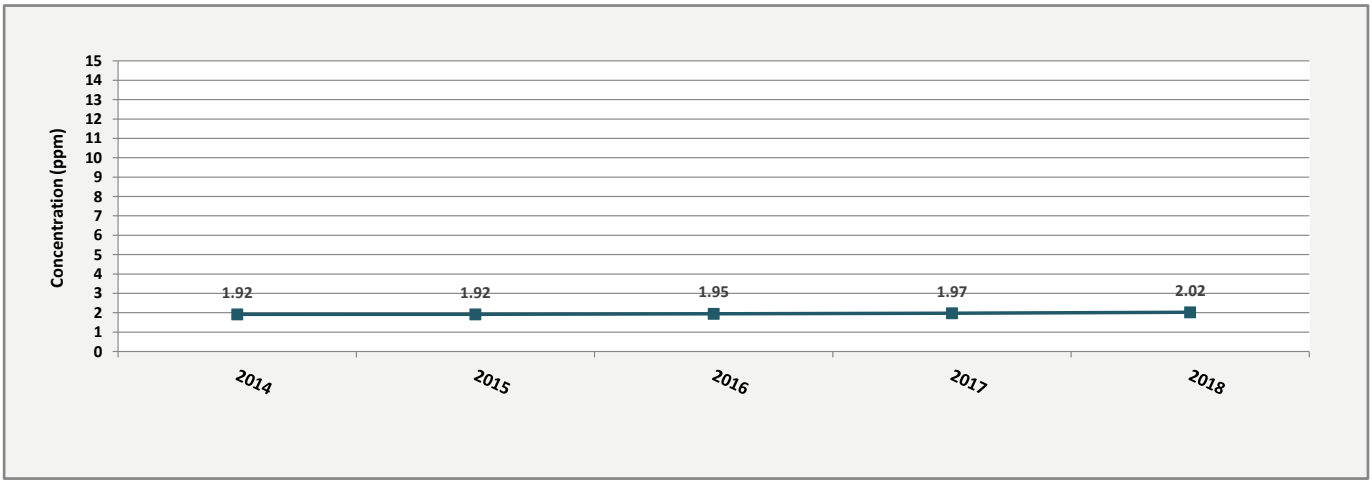
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	2.17	2.00	2.02	1.98	2.00	2.00	1.98	2.02	2.04	2.00	2.02	2.04
2017	1.99	1.91	1.92	1.92	1.99	1.90	1.92	1.99	1.99	1.93	2.04	2.16
2016	2.00	1.91	1.92	1.92	1.95	1.92	1.92	1.95	1.95	2.00	1.99	1.98
2015	1.94	1.93	1.88	1.91	1.91	1.90	1.89	1.91	1.91	1.89	1.93	2.00
2014	2.00	2.00	1.90	1.90	1.90	1.80	1.90	1.90	1.90	1.90	1.90	2.00

2014 to 2018 CH_4 Monthly Maximum Averages

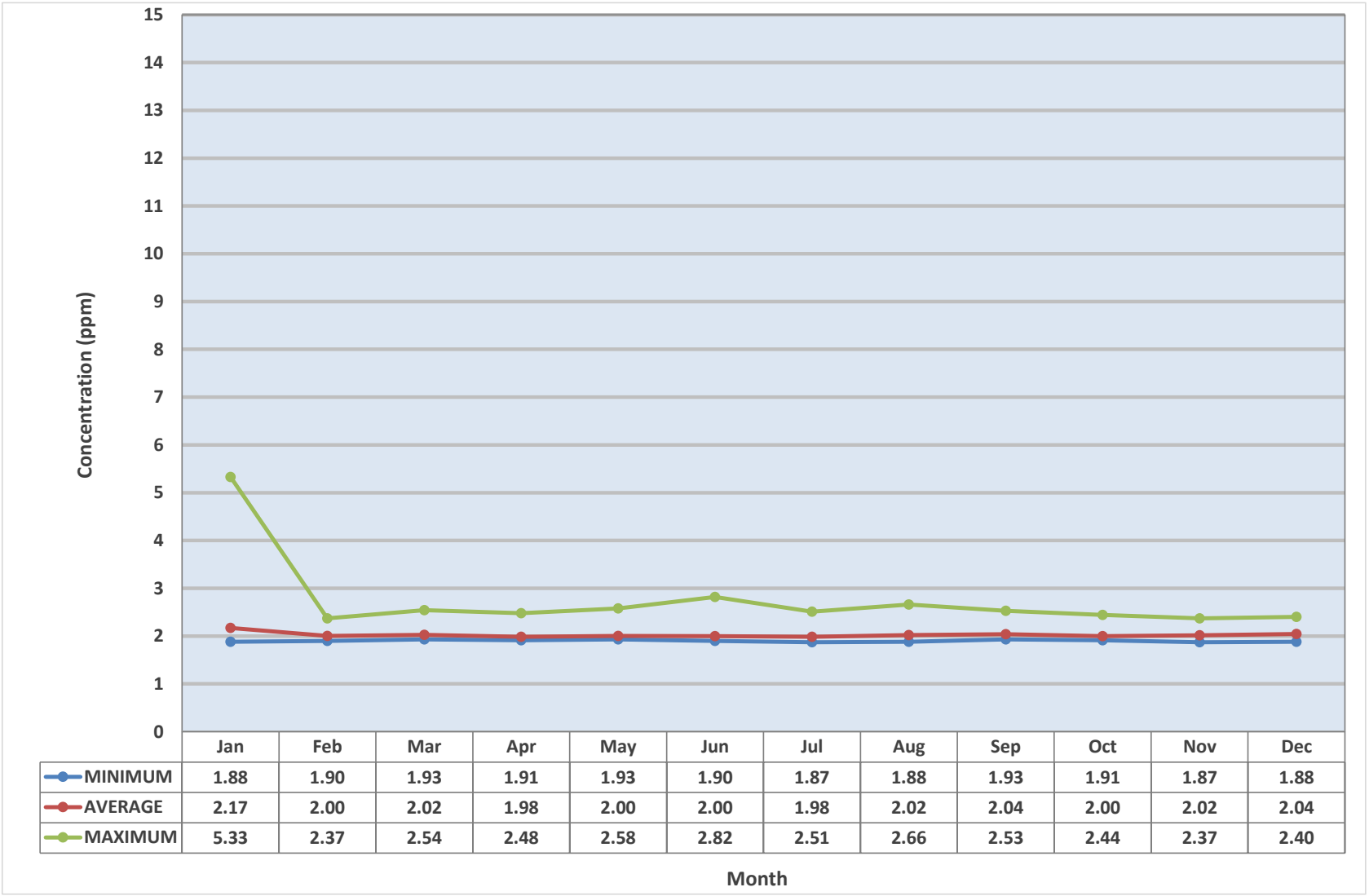


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	5.33	2.37	2.54	2.48	2.58	2.82	2.51	2.66	2.53	2.44	2.37	2.40
2017	2.28	2.11	2.12	2.52	3.44	3.11	2.50	2.65	2.64	2.36	3.05	3.59
2016	3.03	2.07	2.26	2.37	2.14	2.24	2.40	2.21	2.25	2.15	2.38	2.28
2015	2.30	2.40	2.28	2.25	2.33	2.31	2.31	2.18	2.23	2.26	2.08	2.43
2014	9.50	5.60	4.30	2.30	2.20	2.70	2.10	2.30	2.10	2.40	2.80	2.20

2014 to 2018 CH_4 Annual Averages



2018 CH_4 Monthly Statistics



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	1.88	1.90	1.93	1.91	1.93	1.90	1.87	1.88	1.93	1.91	1.87	1.88
AVERAGE	2.17	2.00	2.02	1.98	2.00	2.00	1.98	2.02	2.04	2.00	2.02	2.04
MAXIMUM	5.33	2.37	2.54	2.48	2.58	2.82	2.51	2.66	2.53	2.44	2.37	2.40

2018 NON-METHANE HYDROCARBONS (NMHC) Monthly Averages & Frequency Distributions of 1-Hr Readings												
Month	Number of Readings*	Operational Time (%)	% Readings in Concentration Range (ppm NMHC)						OBJECTIVES** (ppm)		EXCEEDANCES		MONTHLY AVERAGE (ppm)
			≤ 0.20	0.21 < C ≤ 0.50	0.51 < C ≤ 1.00	1.01 < C ≤ 2.00	2.01 < C ≤ 4.00	> 4.00	1-HR	24-HR	1-HR	24-HR	
January	707	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
February	627	98.2	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
March	705	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
April	680	99.3	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
May	708	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
June	682	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
July	663	93.7	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
August	624	88.3	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
September	684	100.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
October	707	99.9	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
November	666	97.2	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
December	701	99.3	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	0.00
Annual	8154	98.0	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%			0	0	0.00

N/D - Valid Data Not Available

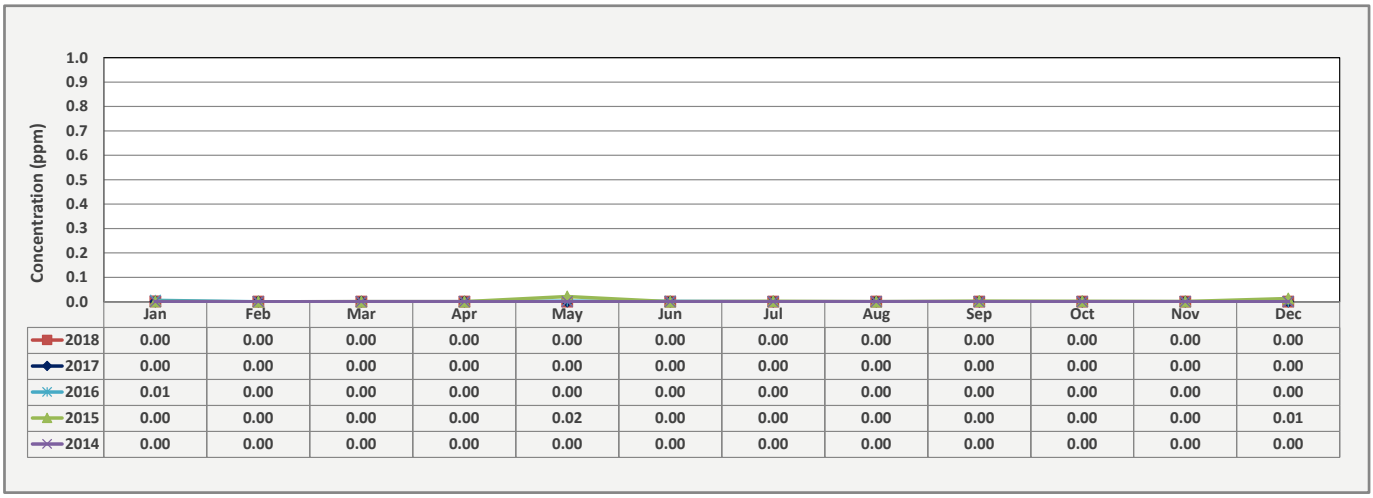
**# of valid readings excluding calibration hours*

***If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Alberta Ambient Air Quality Objectives Annual Average**	-	ppm
Annual Average for 2018	0.00	ppm

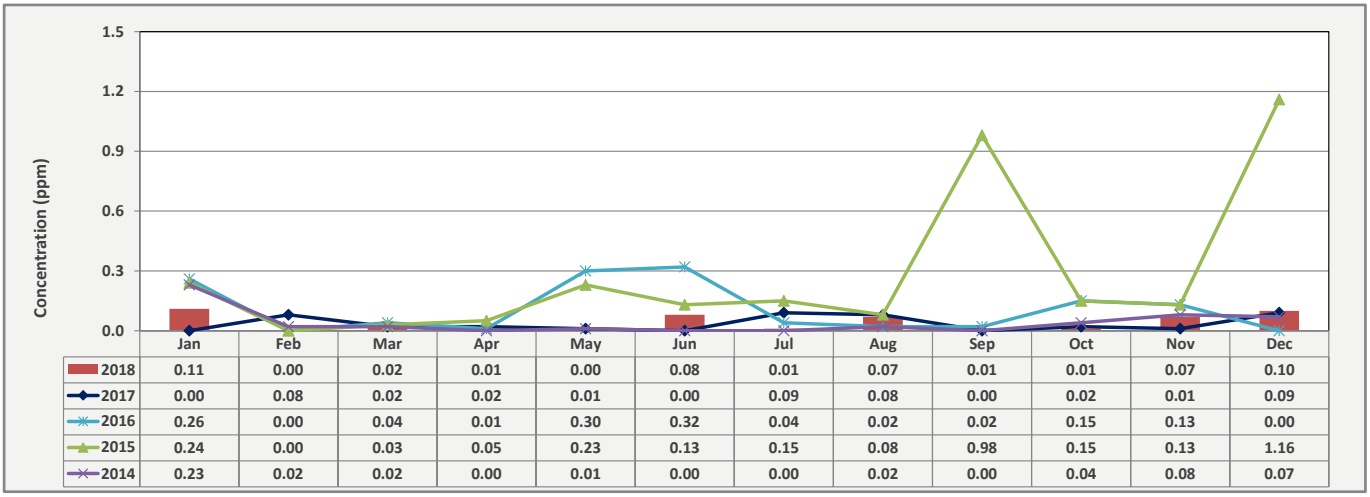
NMHC Data Identifiers _ Total Hours Flagged = 606										
Continuous Flag	C	C1	G	P	Q	R	S	S1	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Daily Zero/Span	Additional Zero/Span	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y	Y	Y
Annual Total	55	11	0	7	0	1	371	2	75	84

2014 to 2018 NMHC Monthly Averages



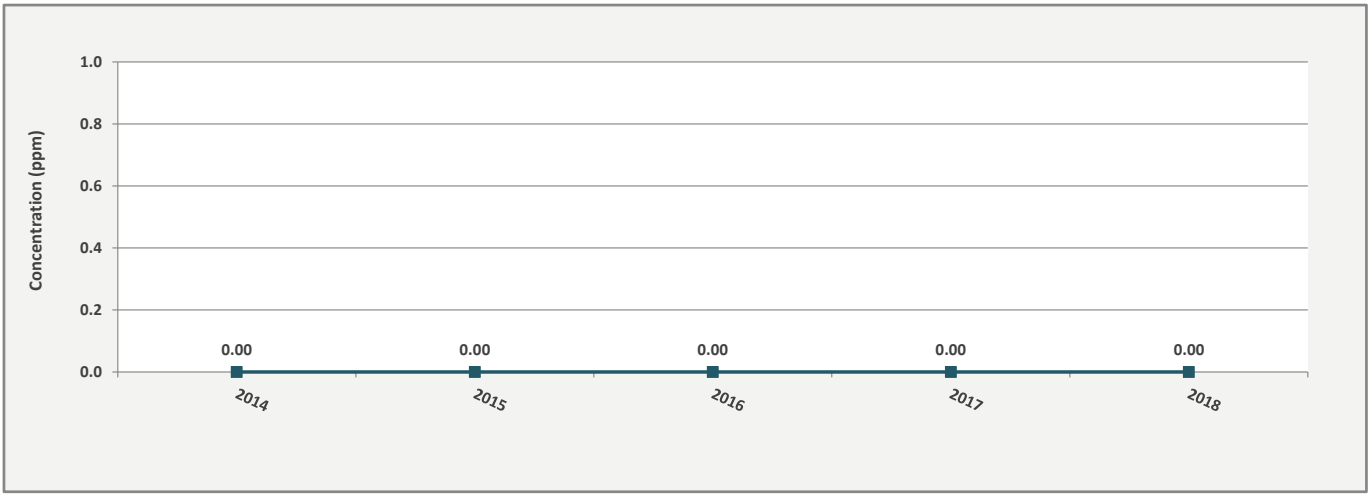
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2016	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2015	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01
2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2014 to 2018 NMHC Monthly Maximum Averages

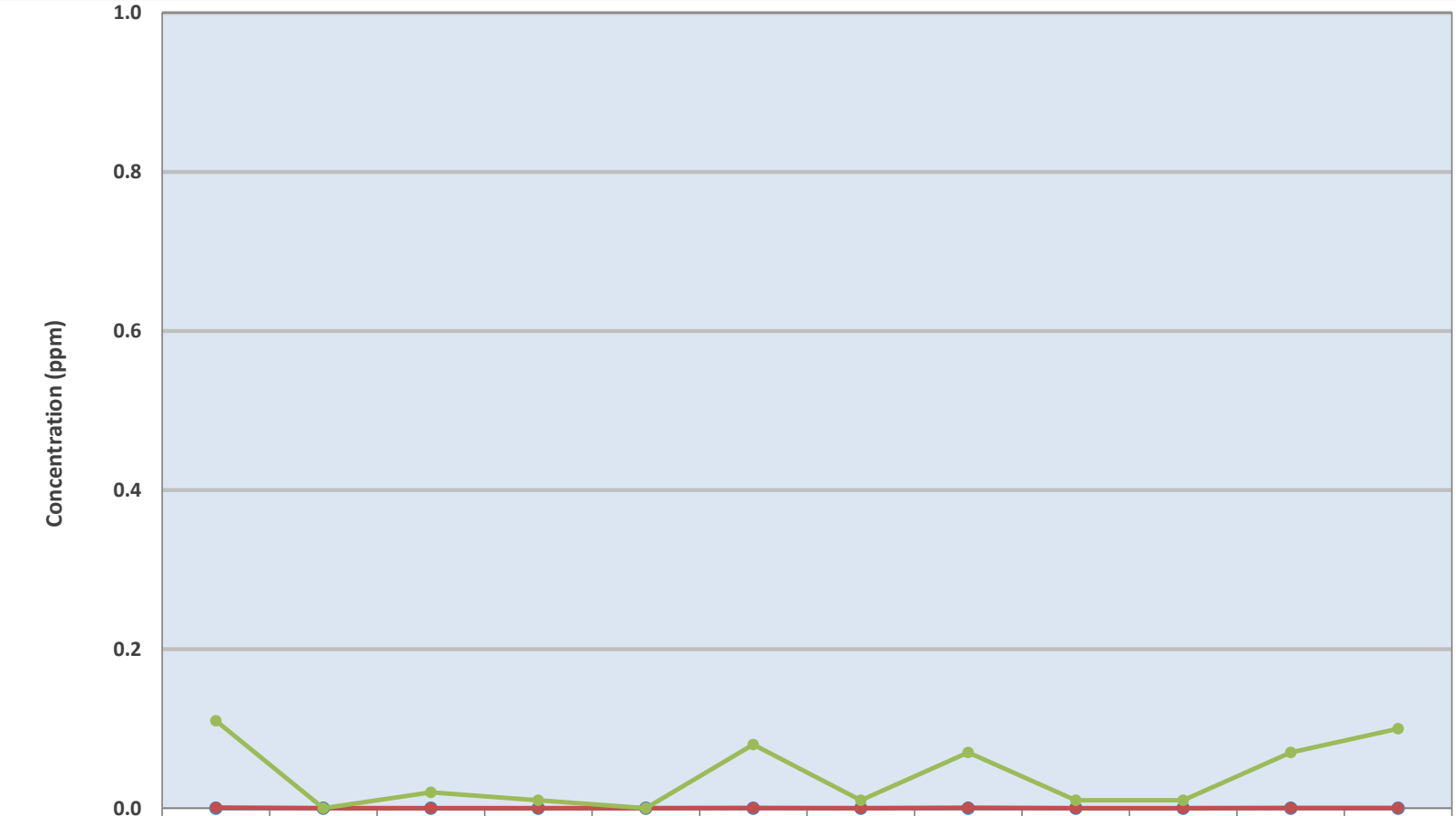


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	0.11	0.00	0.02	0.01	0.00	0.08	0.01	0.07	0.01	0.01	0.07	0.10
2017	0.00	0.08	0.02	0.02	0.01	0.00	0.09	0.08	0.00	0.02	0.01	0.09
2016	0.26	0.00	0.04	0.01	0.30	0.32	0.04	0.02	0.02	0.15	0.13	0.00
2015	0.24	0.00	0.03	0.05	0.23	0.13	0.15	0.08	0.98	0.15	0.13	1.16
2014	0.23	0.02	0.02	0.00	0.01	0.00	0.00	0.02	0.00	0.04	0.08	0.07

2014 to 2018 NMHC Annual Averages



2018 NMHC Monthly Statistics



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVERAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAXIMUM	0.11	0.00	0.02	0.01	0.00	0.08	0.01	0.07	0.01	0.01	0.07	0.10

2018 AMBIENT TEMPERATURE (AT) Monthly Data Summary of 1-Hr & 24-Hr Readings					
Month	Number of Readings*	Operational Time (%)	Monthly Average (°C)	Maximum 1-Hr Average (°C)	Maximum 24-Hr Average (°C)
January	743	99.9	-13.4	3.1	-0.3
February	672	100.0	-15.5	2.3	-0.5
March	744	100.0	-6.8	12.9	4.1
April	720	100.0	0.7	23.1	13.9
May	743	99.9	15.0	31.6	23.1
June	720	100.0	14.9	33.9	25.6
July	720	96.8	16.6	28.9	21.9
August	707	95.0	15.2	28.5	21.4
September	720	100.0	4.3	18.0	12.3
October	744	100.0	3.1	19.3	14.2
November	720	100.0	-5.2	6.3	3.5
December	744	100.0	-9.3	3.6	0.8
Annual	8697	99.3	1.6	17.6	11.7

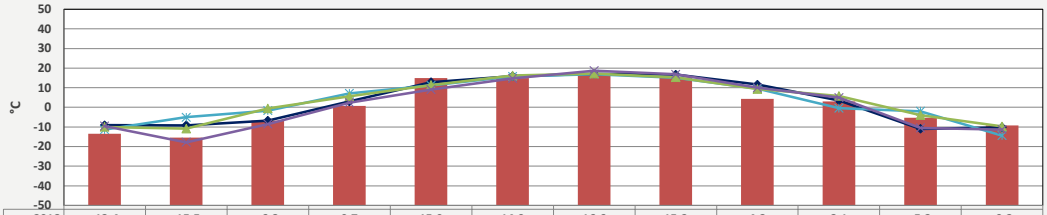
N/D - Valid Data Not Available *# of valid readings excluding calibration hours*

**If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Annual Average for 2018	1.6 °C

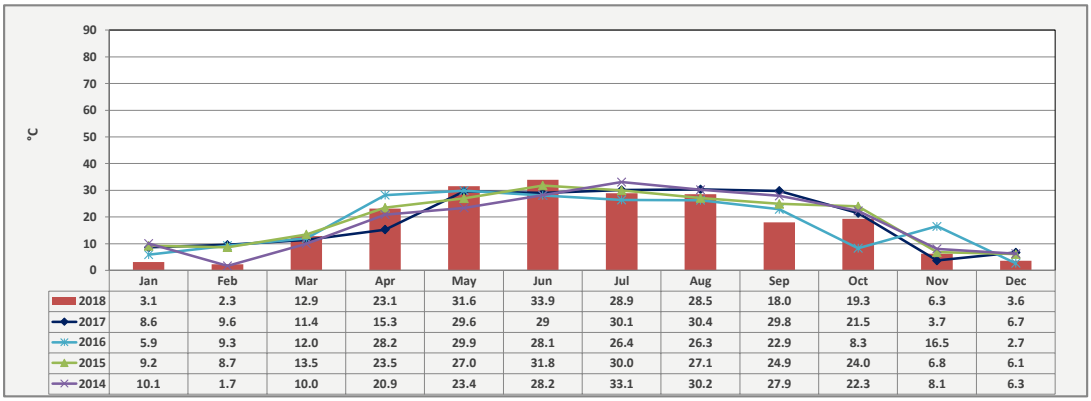
AT Data Identifiers _ Total Hours Flagged = 63								
Continuous Flag	C	C1	G	P	Q	R	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y
Annual Total	0	0	0	7	0	0	0	56

2014 to 2018 AT Monthly Averages



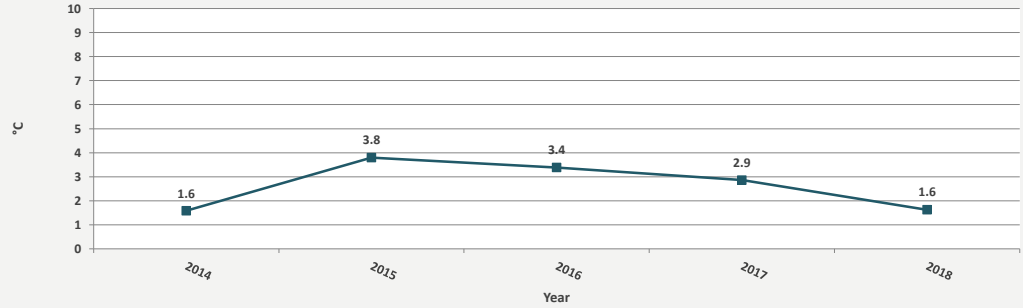
2018	-13.4	-15.5	-6.8	0.7	15.0	14.9	16.6	15.2	4.3	3.1	-5.2	-9.3
2017	-9.1	-9.2	-6.8	3.0	12.8	15.8	17.1	16.7	11.6	3.6	-11.0	-10.2
2016	-11.4	-5.1	-1.7	7.2	11.2	15.8	16.9	15.1	9.5	-0.4	-2.0	-14.4
2015	-10.0	-10.9	-0.6	5.6	11.4	16.2	17.2	15.3	9.3	5.8	-4.0	-9.7
2014	-9.5	-17.8	-8.5	2.4	9.0	14.7	18.7	16.8	10.0	5.0	-10.5	-11.3

2014 to 2018 AT Monthly Maximum Averages

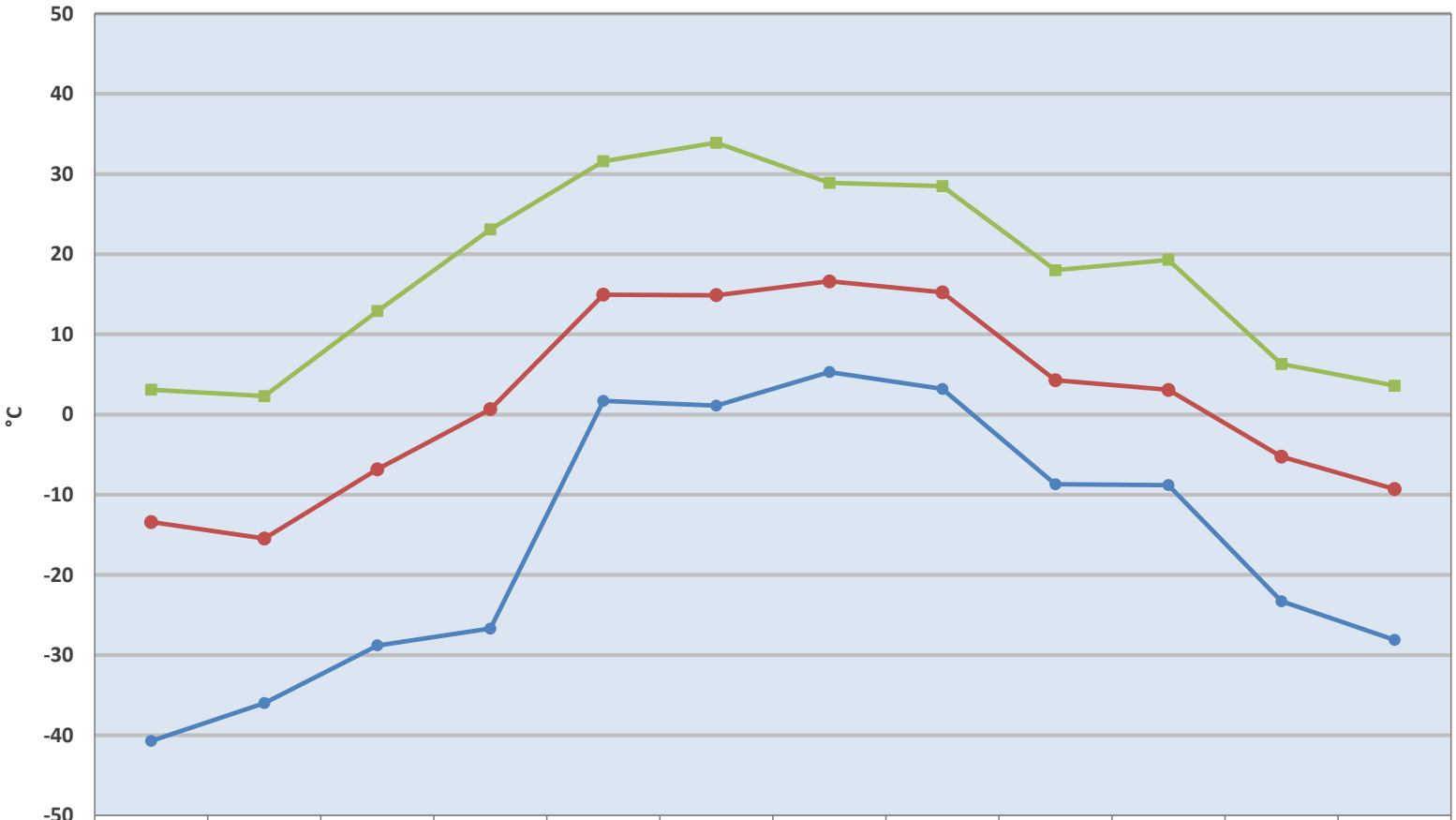


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	3.1	2.3	12.9	23.1	31.6	33.9	28.9	28.5	18.0	19.3	6.3	3.6
2017	8.6	9.6	11.4	15.3	29.6	29	30.1	30.4	29.8	21.5	3.7	6.7
2016	5.9	9.3	12.0	28.2	29.9	28.1	26.4	26.3	22.9	8.3	16.5	2.7
2015	9.2	8.7	13.5	23.5	27.0	31.8	30.0	27.1	24.9	24.0	6.8	6.1
2014	10.1	1.7	10.0	20.9	23.4	28.2	33.1	30.2	27.9	22.3	8.1	6.3

2014 to 2018 AT Annual Averages



2018 AT Monthly Statistics



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	-40.7	-36.0	-28.8	-26.7	1.7	1.1	5.3	3.2	-8.7	-8.8	-23.3	-28.1
AVERAGE	-13.4	-15.5	-6.8	0.7	15.0	14.9	16.6	15.2	4.3	3.1	-5.2	-9.3
MAXIMUM	3.1	2.3	12.9	23.1	31.6	33.9	28.9	28.5	18.0	19.3	6.3	3.6

2018 RELATIVE HUMIDITY (RH) Monthly Data Summary of 1-Hr & 24-Hr Readings					
Month	Number of Readings*	Operational Time (%)	Monthly Average (%)	Maximum 1-Hr Average (%)	Maximum 24-Hr Average (%)
January	743	99.9	78	97	91
February	672	100.0	71	100	85
March	744	100.0	66	95	82
April	720	100.0	59	99	93
May	744	100.0	46	100	65
June	720	100.0	69	100	98
July	720	96.8	73	100	96
August	707	95.0	72	101	96
September	720	100.0	77	100	99
October	744	100.0	67	100	91
November	720	100.0	85	100	100
December	744	100.0	79	100	95
Annual	8698	99.3	70	99	91

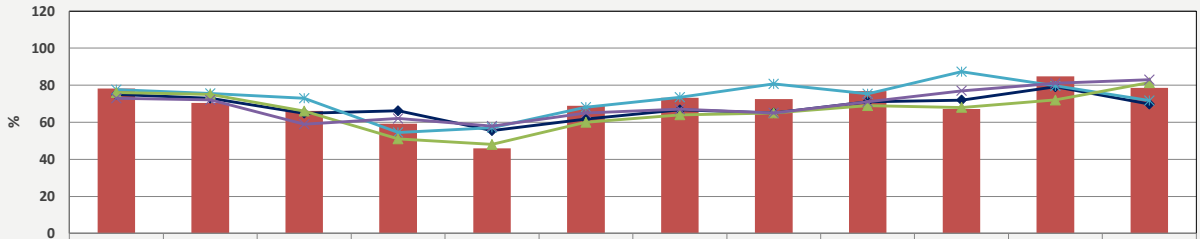
N/D - Valid Data Not Available *# of valid readings excluding calibration hours*

**If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Annual Average for 2018	70	%

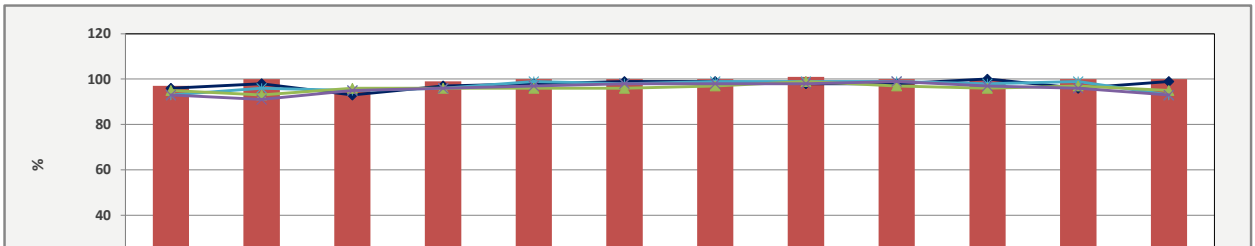
RH Data Identifiers _ Total Hours Flagged = 62								
Continuous Flag	C	C1	G	P	Q	R	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y
Annual Total	0	0	0	7	0	0	0	55

2014 to 2018 RH Monthly Averages



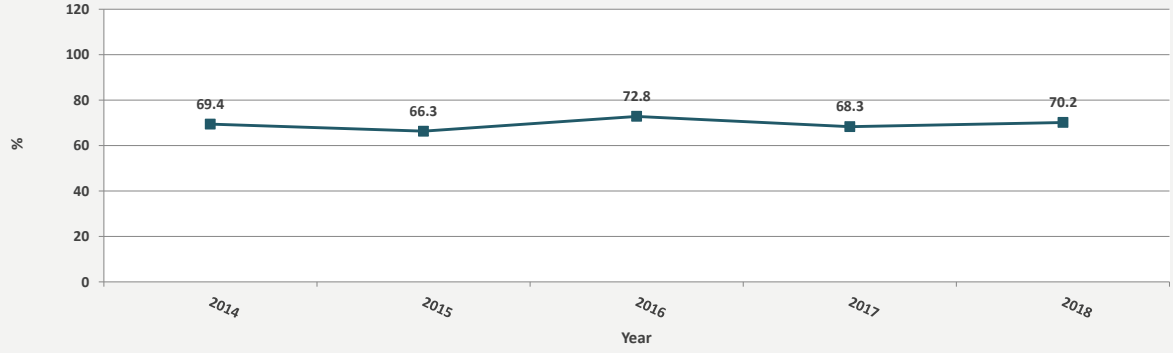
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	78	71	66	59	46	69	73	72	77	67	85	79
2017	75	73	65	66	55	62	67	65	71	72	79	70
2016	78	76	73	54	57	68	74	81	75	87	80	72
2015	76	75	66	51	48	60	64	65	69	68	72	81
2014	73	72	59	62	58	65	67	65	71	77	81	83

2014 to 2018 RH Monthly Maximum Averages

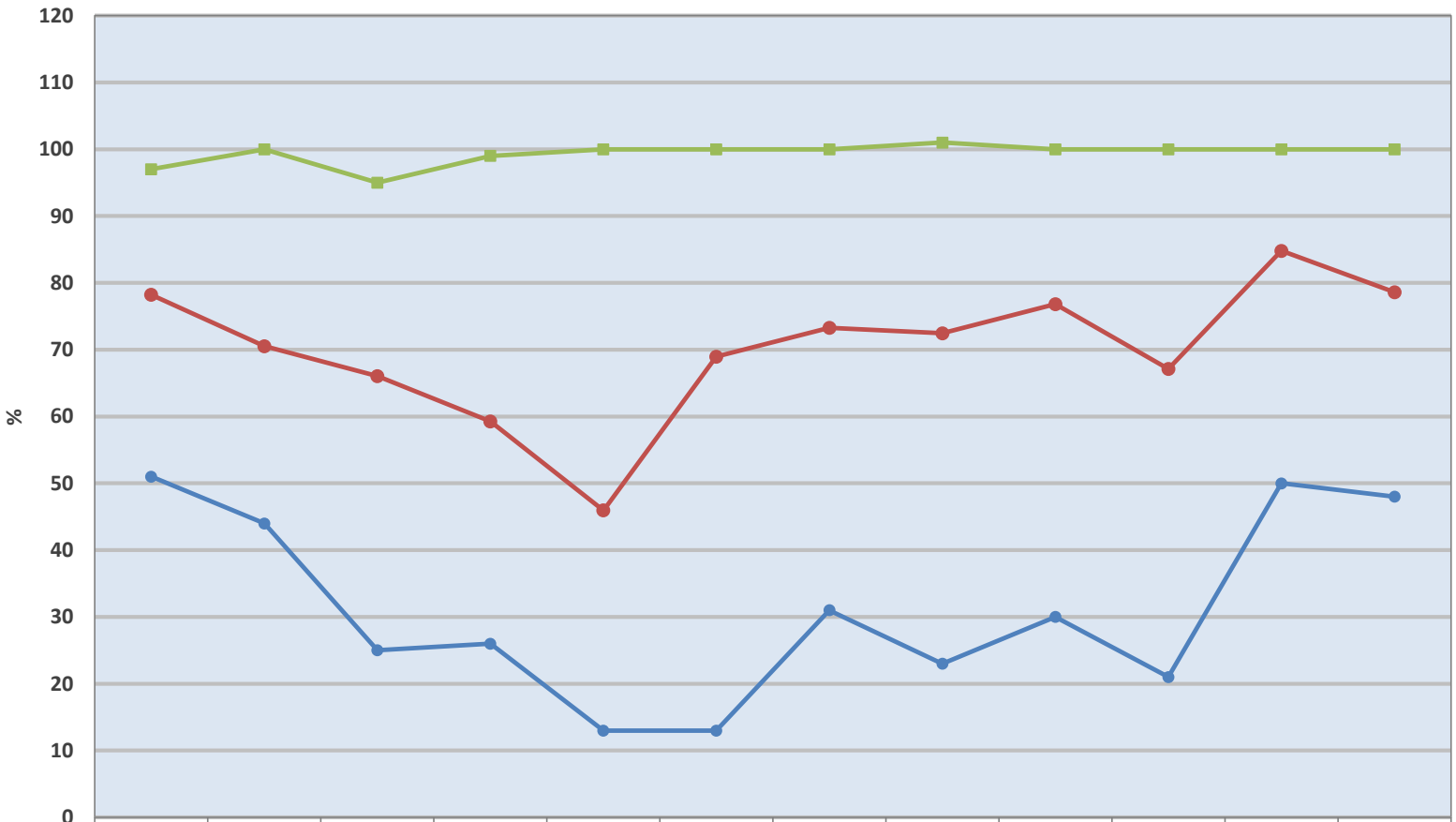


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	97	100	95	99	100	100	100	101	100	100	100	100
2017	96	98	93	97	98	99	99	98	98	100	96	99
2016	93	96	95	96	99	98	99	99	99	98	99	93
2015	95	93	96	96	96	96	97	99	97	96	97	95
2014	93	91	95	96	97	98	98	98	99	97	96	93

2014 to 2018 RH Annual Averages



2018 RH Monthly Statistics



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	51.0	44.0	25.0	26.0	13.0	13.0	31.0	23.0	30.0	21.0	50.0	48.0
AVERAGE	78.2	70.5	66.1	59.3	46.0	68.9	73.3	72.5	76.8	67.1	84.8	78.6
MAXIMUM	97.0	100.0	95.0	99.0	100.0	100.0	100.0	101.0	100.0	100.0	100.0	100.0

2018 BAROMETRIC PRESSURE (BP) Monthly Data Summary of 1-Hr & 24-Hr Readings					
Month	Number of Readings*	Operational Time (%)	Monthly Average (millibar)	Maximum 1-Hr Average (millibar)	Maximum 24-Hr Average (millibar)
January	743	99.9	942	963	960
February	672	100.0	943	962	960
March	744	100.0	943	962	958
April	720	100.0	942	960	959
May	744	100.0	941	952	951
June	720	100.0	937	948	946
July	720	96.8	945	956	956
August	707	95.0	940	954	952
September	720	100.0	947	958	956
October	744	100.0	943	957	955
November	720	100.0	941	962	959
December	744	100.0	938	955	951
Annual	8698	99.3	942	957	955

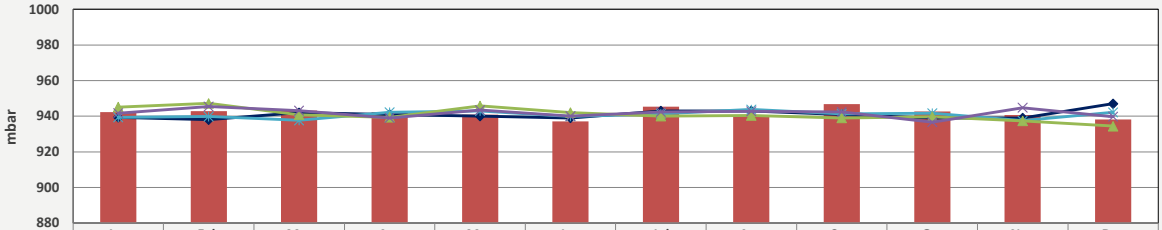
N/D - Valid Data Not Available *# of valid readings excluding calibration hours*

**If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Annual Average for 2018	942	mbar

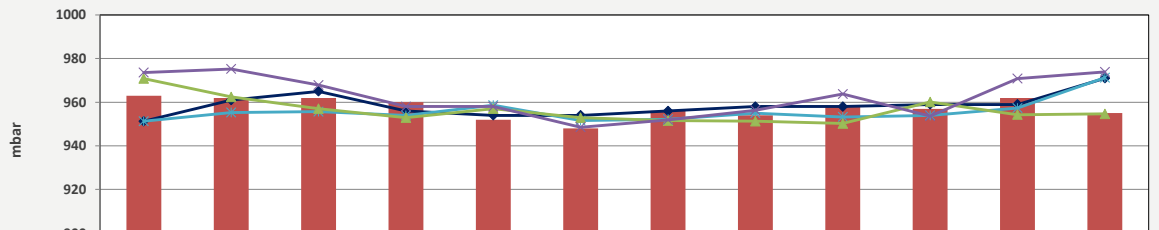
BP Data Identifiers _ Total Hours Flagged = 62								
Continuous Flag	C	C1	G	P	Q	R	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y
Annual Total	0	0	0	7	0	0	0	55

2014 to 2018 BP Monthly Averages



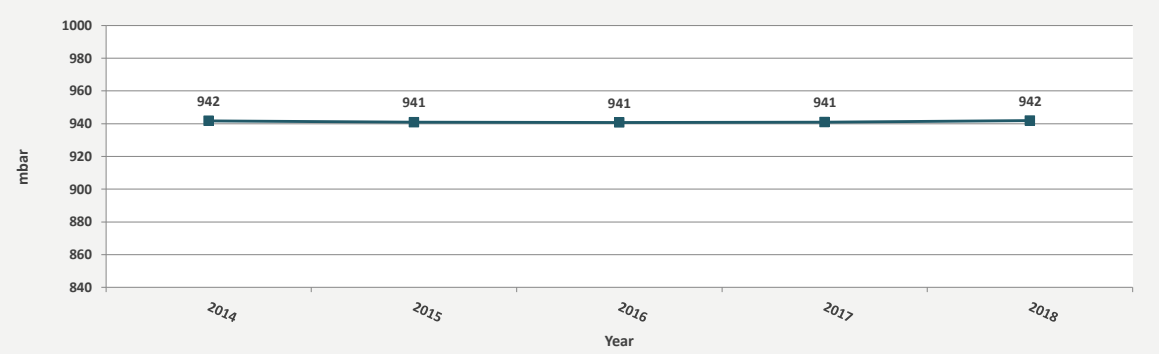
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	942	943	943	942	941	937	945	940	947	943	941	938
2017	939	938	942	941	940	939	943	943	941	939	939	947
2016	939	940	938	942	943	940	941	944	941	942	937	942
2015	945	947	941	939	946	942	940	940	939	940	937	934
2014	942	945	943	939	943	940	942	943	942	937	945	940

2014 to 2018 BP Monthly Maximum Averages

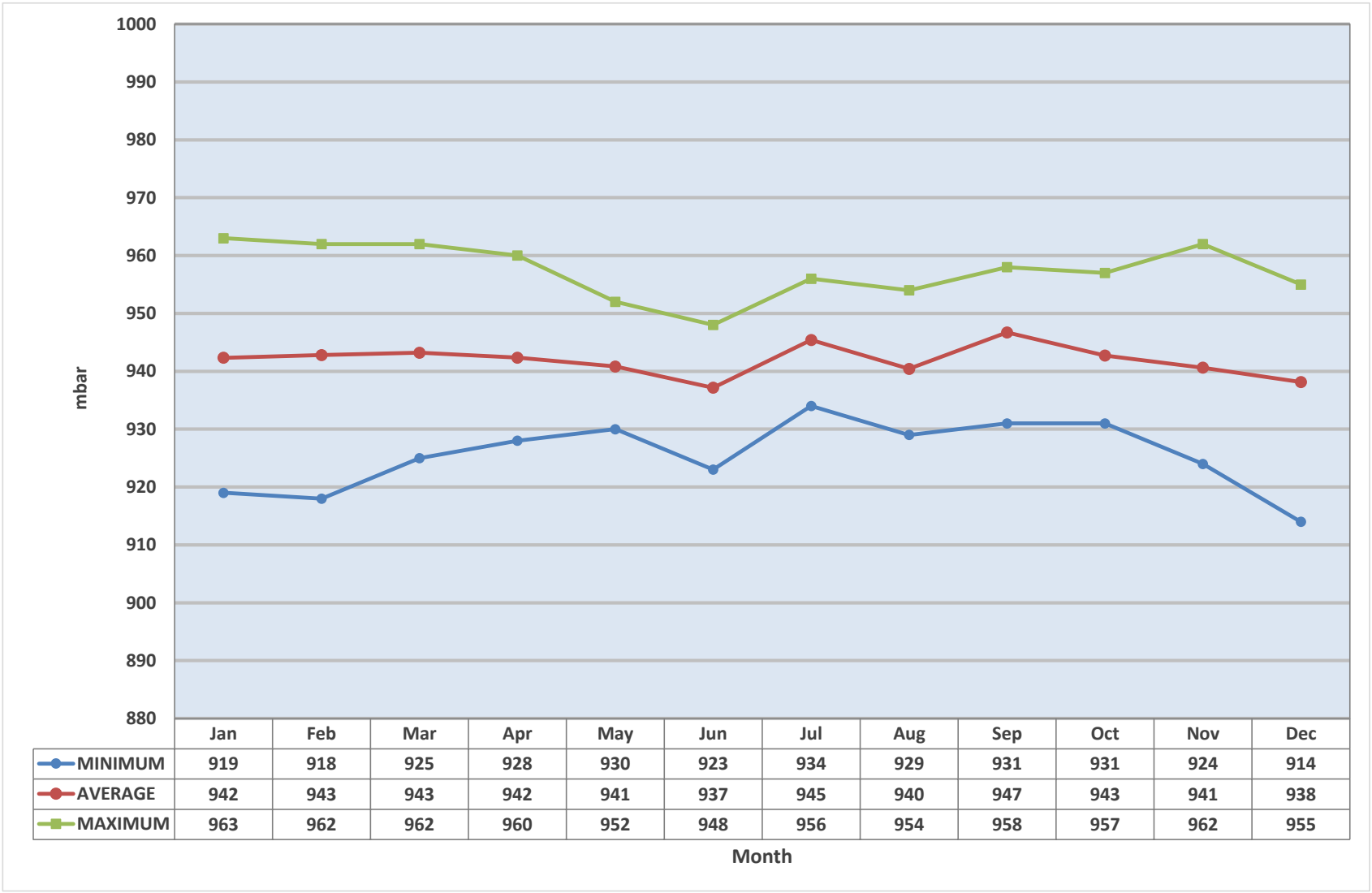


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	963	962	962	960	952	948	956	954	958	957	962	955
2017	951	961	965	956	954	954	956	958	958	959	959	971
2016	951	955	956	954	959	952	952	955	953	954	957	971
2015	971	962	957	953	957	953	952	951	950	960	954	955
2014	974	975	968	958	958	949	952	956	964	954	971	974

2014 to 2018 BP Annual Averages



2018 BP Monthly Statistics



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	919	918	925	928	930	923	934	929	931	931	924	914
AVERAGE	942	943	943	942	941	937	945	940	947	943	941	938
MAXIMUM	963	962	962	960	952	948	956	954	958	957	962	955

2018 STATION TEMPERATURE (STNTPX) Monthly Data Summary of 1-Hr & 24-Hr Readings					
Month	Number of Readings*	Operational Time (%)	Monthly Average (°C)	Maximum 1-Hr Average (°C)	Maximum 24-Hr Average (°C)
January	743	99.9	23.2	24.4	23.7
February	672	100.0	23.5	24.5	23.7
March	744	100.0	23.3	24.8	23.9
April	720	100.0	23.1	25.2	23.8
May	744	100.0	23.3	25.5	23.5
June	720	100.0	22.4	25.0	23.6
July	720	96.8	21.9	23.1	22.2
August	707	95.0	22.8	25.2	23.6
September	720	100.0	23.1	25.1	23.7
October	744	100.0	23.1	24.6	23.7
November	720	100.0	23.5	38.7	32.3
December	744	100.0	21.9	26.7	25.6
Annual	8698	99.3	22.9	26.1	24.4

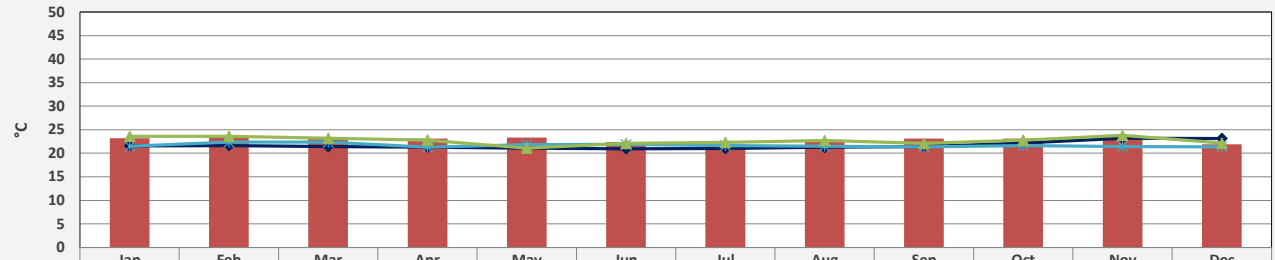
N/D - Valid Data Not Available *# of valid readings excluding calibration hours

***If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Annual Average for 2018	22.9 °C

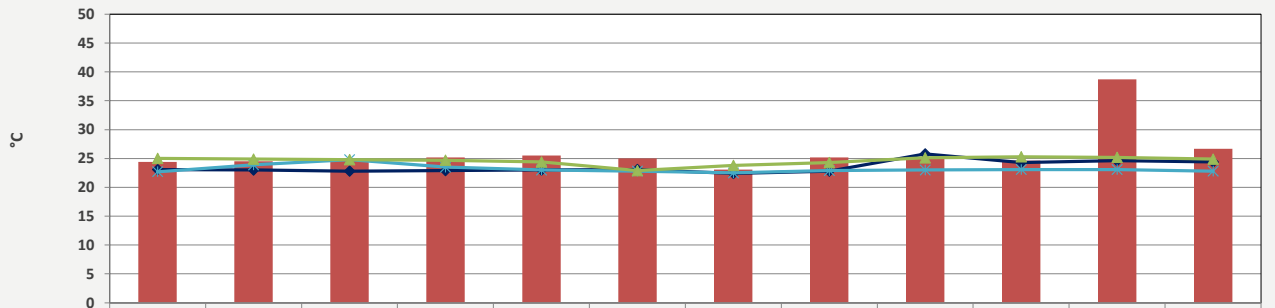
STX Data Identifiers _ Total Hours Flagged = 62								
Continuous Flag	C	C1	G	P	Q	R	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y
Annual Total	0	0	0	7	0	0	0	55

2014 to 2018 STNTPX Monthly Averages



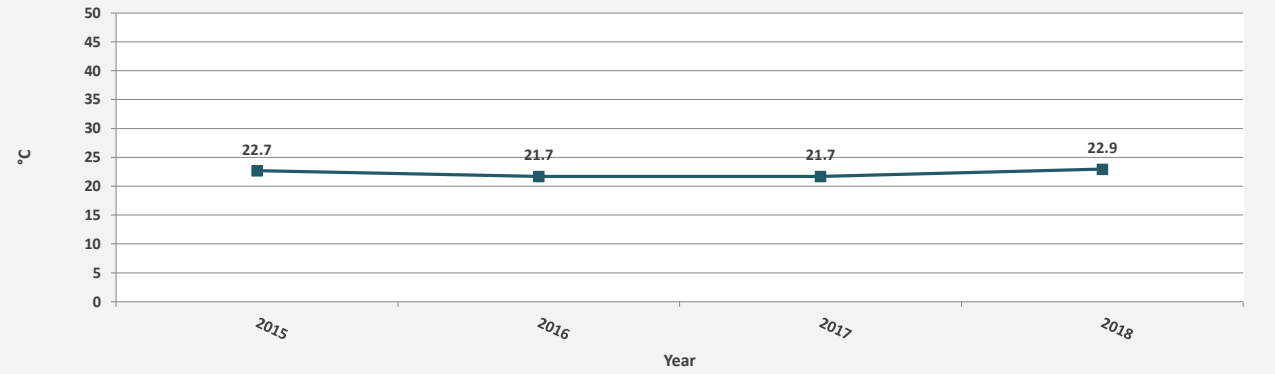
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	23.2	23.5	23.3	23.1	23.3	22.4	21.9	22.8	23.1	23.1	23.5	21.9
2017	21.6	21.7	21.4	21.3	21.1	21.0	21.0	21.3	21.4	22.1	23.2	23.1
2016	21.5	22.4	22.3	21.3	21.8	21.9	21.6	21.5	21.4	21.6	21.4	21.4
2015	23.6	23.6	23.2	22.8	21.1	22.1	22.3	22.7	22.1	22.8	23.8	22.1

2014 to 2018 STNTPX Monthly Maximum Averages



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	24.4	24.5	24.8	25.2	25.5	25.0	23.1	25.2	25.1	24.6	38.7	26.7
2017	23.1	23.0	22.8	22.9	23.0	23.1	22.4	22.8	25.8	24.3	24.6	24.4
2016	22.7	23.9	24.8	23.5	23.0	22.8	22.5	22.9	23.0	23.1	23.1	22.8
2015	25.0	24.9	24.8	24.7	24.4	22.9	23.8	24.3	25.1	25.3	25.2	24.9

2014 to 2018 STNTPX Annual Averages



2018 STNTPX Monthly Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	20.1	21.1	21.2	21.1	21.8	20.9	20.8	20.1	19.5	19.2	1.9	16.3
AVERAGE	23.2	23.5	23.3	23.1	23.3	22.4	21.9	22.8	23.1	23.1	23.5	21.9
MAXIMUM	24.4	24.5	24.8	25.2	25.5	25.0	23.1	25.2	25.1	24.6	38.7	26.7

2018 WIND SPEED (WS) Monthly Data Summary of 1-Hr & 24-Hr Readings					
Month	Number of Readings*	Operational Time (%)	Monthly Average (kph)	Maximum 1-Hr Average (kph)	Maximum 24-Hr Average (kph)
January	743	99.9	0.5	15.6	8.7
February	672	100.0	2.4	19.2	9.9
March	744	100.0	1.3	15.8	11.1
April	718	100.0	1.2	21.4	10.6
May	744	100.0	2.1	21.9	9.7
June	720	100.0	2.6	33.0	20.5
July	720	96.8	1.9	21.8	10.5
August	707	95.0	2.2	19.3	9.6
September	720	100.0	0.5	17.8	9.9
October	744	100.0	1.9	22.1	10.6
November	720	100.0	1.0	16.9	7.8
December	744	100.0	2.4	18.2	11.7
Annual	8696	99.3	1.2	20.3	10.9

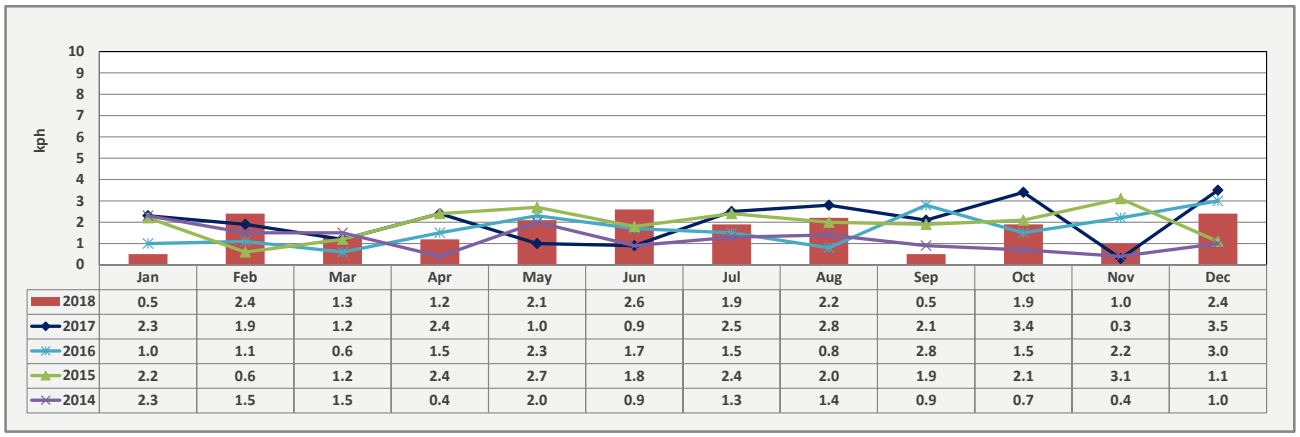
N/D - Valid Data Not Available *# of valid readings excluding calibration hours*

**If Alberta Ambient Air Quality Objectives and Guidelines are not available '-' is used*

Annual Average for 2018	1.2	kph

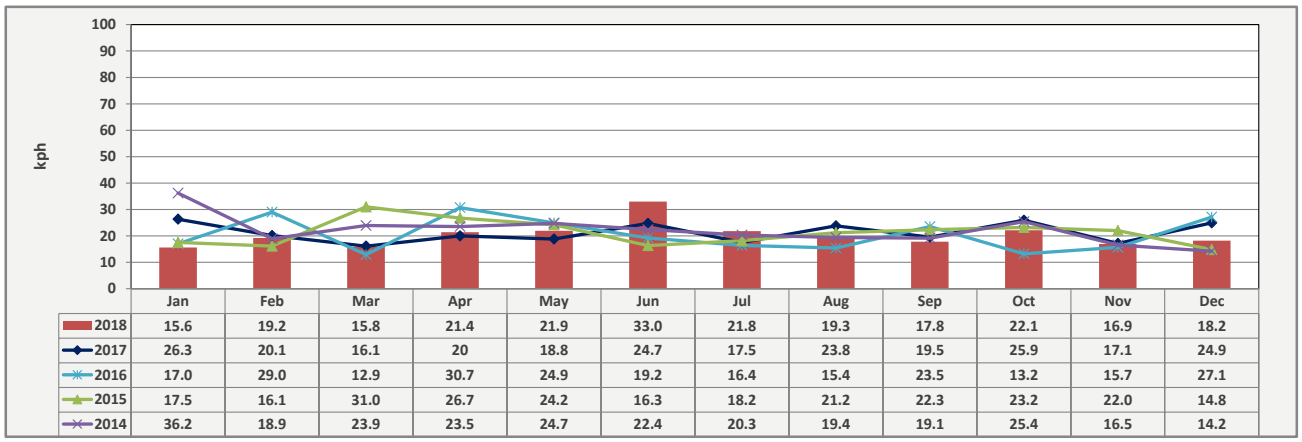
WS Data Identifiers _ Total Hours Flagged = 64								
Continuous Flag	C	C1	G	P	Q	R	X	Y
Name	Calibration	Additional Calibration	Out for Repair	Power Failure	Quality Assurance	Recovery	Machine Malfunction	Maintenance
Equipment in Operation	Y	Y	N	N	Y	Y	N	N
Downtime Accrued	N	Y	Y	Y	N	Y	Y	Y
Annual Total	2	0	0	7	0	0	0	55

2014 to 2018 WS Monthly Averages



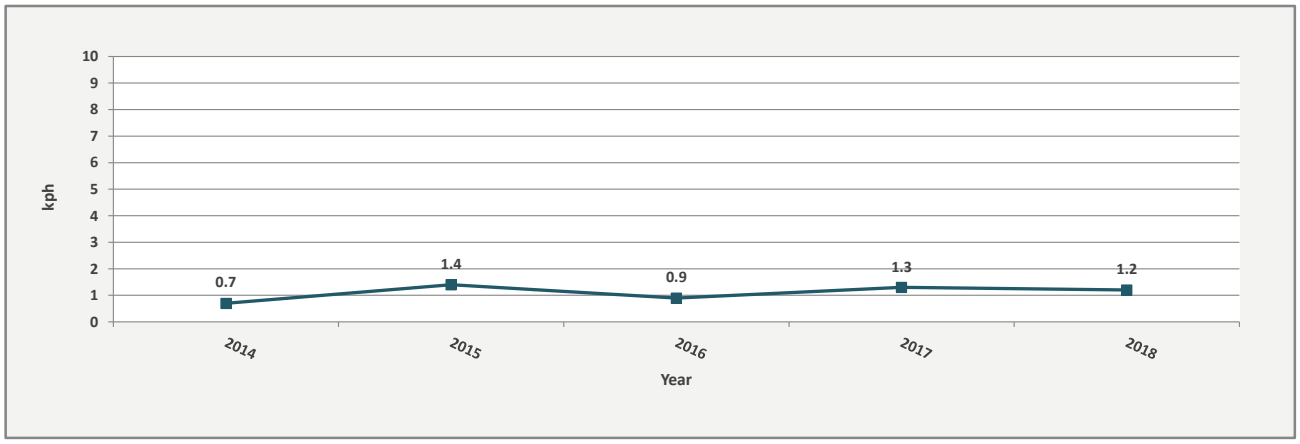
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	0.5	2.4	1.3	1.2	2.1	2.6	1.9	2.2	0.5	1.9	1.0	2.4
2017	2.3	1.9	1.2	2.4	1.0	0.9	2.5	2.8	2.1	3.4	0.3	3.5
2016	1.0	1.1	0.6	1.5	2.3	1.7	1.5	0.8	2.8	1.5	2.2	3.0
2015	2.2	0.6	1.2	2.4	2.7	1.8	2.4	2.0	1.9	2.1	3.1	1.1
2014	2.3	1.5	1.5	0.4	2.0	0.9	1.3	1.4	0.9	0.7	0.4	1.0

2014 to 2018 WS Monthly Maximum Averages

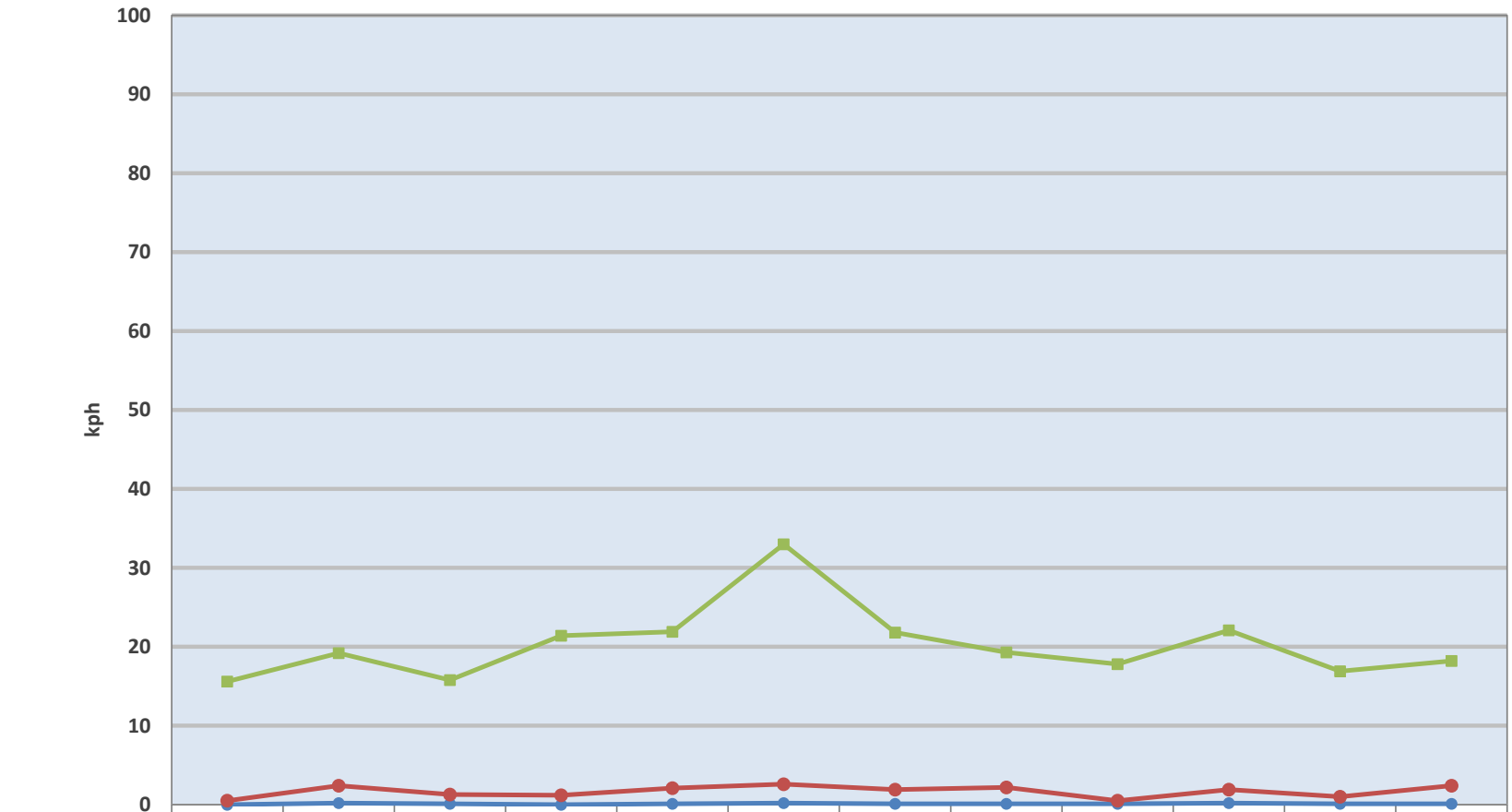


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	15.6	19.2	15.8	21.4	21.9	33.0	21.8	19.3	17.8	22.1	16.9	18.2
2017	26.3	20.1	16.1	20	18.8	24.7	17.5	23.8	19.5	25.9	17.1	24.9
2016	17.0	29.0	12.9	30.7	24.9	19.2	16.4	15.4	23.5	13.2	15.7	27.1
2015	17.5	16.1	31.0	26.7	24.2	16.3	18.2	21.2	22.3	23.2	22.0	14.8
2014	36.2	18.9	23.9	23.5	24.7	22.4	20.3	19.4	19.1	25.4	16.5	14.2

2014 to 2018 WS Annual Averages



2018 WS Monthly Statistics



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MINIMUM	0.0	0.2	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1
AVERAGE	0.5	2.4	1.3	1.2	2.1	2.6	1.9	2.2	0.5	1.9	1.0	2.4
MAXIMUM	15.6	19.2	15.8	21.4	21.9	33.0	21.8	19.3	17.8	22.1	16.9	18.2

Wind: PRAMP_986
Monitor: WSP [kph]
Periodically: 2018/01/01 00:00-2018/12/31 23:00
Type: WindRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

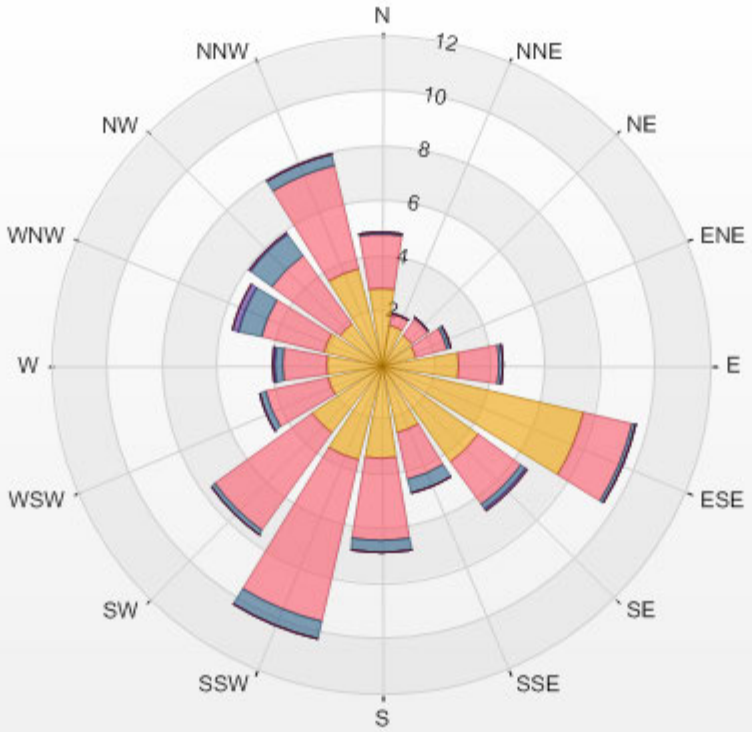
Calm: 10.34% Calm Avg: 1.11 (kph

Direction	1.8-6.0	6.0-12.0	12.0-20.0	20.0-29.0	29.0-39.0	>39.0	Total
N	2.8	1.9	0.1	0.0	0.0	0.0	4.8
NNE	1.5	0.5	0.0	0.0	0.0	0.0	1.9
NE	1.4	0.8	0.0	0.0	0.0	0.0	2.1
ENE	1.3	1.2	0.2	0.0	0.0	0.0	2.7
E	2.8	1.5	0.2	0.0	0.0	0.0	4.5
ESE	7.6	1.8	0.2	0.0	0.0	0.0	9.6
SE	4.4	1.9	0.3	0.0	0.0	0.0	6.5
SSE	2.6	1.8	0.5	0.0	0.0	0.0	4.8
S	3.4	3.0	0.4	0.0	0.0	0.0	6.9
SSW	3.6	6.0	0.7	0.0	0.0	0.0	10.3
SW	3.1	4.4	0.2	0.0	0.0	0.0	7.6
WSW	2.0	2.3	0.3	0.0	0.0	0.0	4.6
W	2.0	1.6	0.3	0.0	0.0	0.0	3.9
WNW	2.2	2.3	0.9	0.2	0.0	0.0	5.6
NW	1.9	3.1	0.9	0.1	0.0	0.0	6.0
NNW	3.6	3.9	0.5	0.0	0.0	0.0	7.9
Summary	46.1	37.7	5.4	0.4	0.0	0.0	89.7

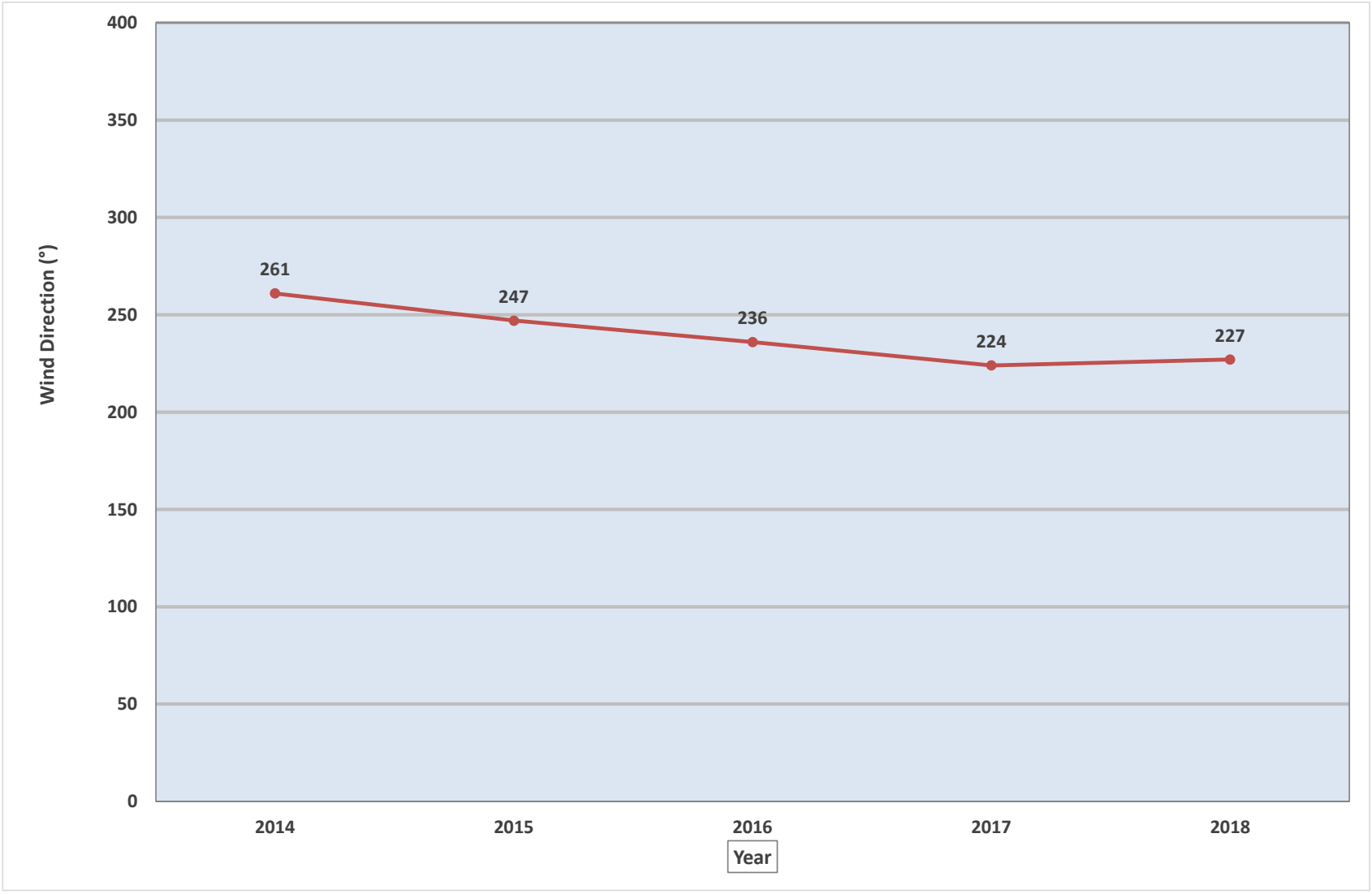
%	Icon	Classes (kph)	46	1.8-6.0	38	6.0-12.0	5	12.0-20.0	0	20.0-29.0	0	29.0-39.0	0	>39.0

PRAMP_986 2018/01/01 00:00 - 2018/12/31 23:00

Calm: 10.34% Calm Avg: 1.11 (kph)



2014 to 2018 WD Annual Averages



The summaries of the monthly maintenance report for the monitoring period are presented below:

SULPHUR DIOXIDE (SO_2)	
January	• Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime. • On January 16, an alternate datalogger (Ultimate) was installed and tested. Two hours of downtime were recorded at hours 16:00 and 19:00 as a result. The Ultimate data logger was installed to run in parallel with the resident (ESC) data logger for assessment, pending its transition to the primary data logger.
February	• Operational time for the monitoring period was 100%. No operational issues were identified.
March	• Operational time for the monitoring period was 100%. No operational issues were identified.
April	• Operational time for the monitoring period was 100%. No operational issues were identified.
May	• Operational time for the monitoring period was 99.9%, equivalent to one hour of downtime. • The automated daily zero-span check failed to execute on schedule on May 13. A valid zero-span check was manually triggered later in the day. One hour of downtime was incurred due to the failed execution.
June	• Operational time for the monitoring period was 100%. No operational issues were identified.
July	• Operational time for the monitoring period was 93.8%, equivalent to forty-six hours of downtime. • Seven hours of downtime were recorded on July 20, at hours 16:00-22:00, due to a power failure. • Following a successful shut-down calibration on July 30, a station upgrade was implemented. The trailer was replaced and the Ultimate data logger was installed to replace the resident ESC 8832. Thirty-nine hours of data were lost in the July monitoring period as a result of activities surrounding this upgrade.
August	• Operational time for the monitoring period was 94.9%, equivalent to thirty-eight hours of downtime. • Following the installation of the Ultimate data logger and an analyzer installation calibration, monitoring activity resumed on August 2. Thirty-eight hours of data were lost in the August monitoring period as a result of activities surrounding this data logger upgrade.
September	• Operational time for the monitoring period was 99.4%, equivalent to four hours of downtime. • The routine monthly calibration was performed on September 11 and the results met AMD requirements. Upon completion of the calibration, the sample filter holder was found damaged and was subsequently replaced. A post-repair calibration was then completed, after the analyzer had been restored to as-found settings. Four hours of downtime were incurred, at hours 11:00 - 14:00, due to the post-repair calibration.
October	• Operational time for the monitoring period was 99.9%, equivalent to one hour of downtime. This was incurred on October 10 at hour 18:00, as the analyzer was placed offline for sample manifold cleaning.

SULPHUR DIOXIDE (SO_2) contd.	
November	• Operational time for the monitoring period was 99.9%, equivalent to one hour of downtime. • A Windows update interrupted the automated daily zero-span check scheduled for hour 00:00 on November 14. A successful zero-span check was manually completed at hour 09:00 of the same day. One hour of downtime was recorded due to the unsuccessful attempt. • Unstable station temperature was exhibited during the month. Based on instrument diagnostic information, no impact on data quality was demonstrated.
December	• Operational time for the monitoring period was 100%. • Unstable station temperature was exhibited early in the month. Based on instrument diagnostic information, no impact on data quality was demonstrated.

TOTAL REDUCED SULPHUR (TRS)	
January	• Operational time, for the monitoring period was 99.7%, equivalent to two hours of downtime. • On January 16, an alternate data logger (Ultimate) was installed and tested on the channel. Two hours of downtime were recorded at hours 17:00 and 19:00 as a result. The Ultimate data logger is currently running in parallel with the resident (ESC) data logger for assessment, pending its transition to the primary data logger.
February	• Operational time for the monitoring period was 100%. No operational issues were identified.
March	• Operational time for the monitoring period was 99.2%, equivalent to six hours of downtime. • Following a successful shut-down calibration on March 6, maintenance activities were carried out on the sample pump and the converter. The internal sample pump was replaced with an external pump and the converter was re-peaked. A successful post-repair calibration was subsequently completed. Four hours of downtime were recorded due to this maintenance event. • On March 14, the daily zero-span check did not execute correctly due to a communication error with the Ultimate data-logger, incurring one hour of downtime. The communication program was reset on May 15 and a repeat zero-span check was successfully completed at hour 09:00. One hour of downtime was recorded due to the additional quality check.
April	• Operational time for the monitoring period was 99.7%, equivalent to two hours of downtime. • An as-found response check was completed on April 30 to assess analyzer performance after a slight, biased high drift in span response. Two hours of downtime were incurred due to the additional quality check.
May	• Operational time for the monitoring period was 99.9%, equivalent to one hour of downtime. • The automated daily zero-span check failed to execute on schedule on May 13. A valid zero-span check was manually triggered later in the day. One hour of downtime was incurred due to the failed execution.
June	• Operational time for the monitoring period was 100%. No operational issues were identified.

TOTAL REDUCED SULPHUR (TRS) contd.	
July	• Operational time for the monitoring period was 93.5%, equivalent to forty-eight hours of downtime. • Seven hours of downtime were recorded on July 20, at hours 16:00-22:00, due to a power failure. • The analyzer spanned outside the lower acceptance limit on July 29. Two subsequent repeat zero-span checks, at hour 19:00 on June 29 and hour 06:00 on June 30, yielded similar results. This prompted a site visit where a shut-down calibration was successfully completed. As the shut-down calibration met all AMD requirements, no data was discarded due to this event. Two hours of downtime were, however, incurred due to the additional quality checks. • Following a successful shut-down calibration on July 30, a station upgrade was implemented. The trailer was replaced and the Ultimate data logger was installed to replace the resident ESC 8832. Thirty-nine hours of data were lost in the July monitoring period as a result of activities surrounding this upgrade.
August	• Operational time for the monitoring period was 94.5%, equivalent to forty-one hours of downtime. • Following the installation of the Ultimate data logger and an analyzer installation calibration, monitoring activity resumed on August 2. Thirty-eight hours of data were lost in the August monitoring period as a result of activities surrounding this data logger upgrade. • The analyzer spanned outside the lower acceptance limit on August 3. An additional span response check conducted on August 4 and subsequent scheduled zero-span checks were within acceptance limits and progressively closer to the mean. An As-Found response check was performed on August 8 as a proactive measure. As the As-Found results met AMD requirements, data quality was not impacted by this event. Three hours of downtime were, however, incurred due to the additional quality checks.
September	• Operational time for the monitoring period was 99.4%, equivalent to four hours of downtime. • The routine monthly calibration was initiated at hour 07:00 on September 11. The calibration was, however, aborted as the AMD's calibration requirements were not met at Mid point, due to an operator/trainee error. The analyzer was restored to the as-found settings recorded before the calibration attempt and a successful monthly calibration was subsequently completed by a Senior Technician. Four hours of downtime were incurred, at hours 07:00 - 10:00, due to the unsuccessful calibration attempt.
October	• Operational time for the monitoring period was 100%. No operational issues were identified.

TOTAL REDUCED SULPHUR (TRS) contd.	
November	• Operational time for the monitoring period was 98.8%, equivalent to nine hours of downtime. • A Windows update interrupted the automated daily zero-span check scheduled for hour 00:00 on November 14. A successful zero-span check was manually completed at hour 09:00 of the same day. One hour of downtime was recorded due to the unsuccessful attempt. • Unstable station temperature compromised analyzer performance. Based on instrument diagnostic information, data recorded at hours 02:00 - 09:00 on November 16 were impacted and were therefore discarded. Eight hours of downtime were incurred as a result.
December	• Operational time for the monitoring period was 100%. • Unstable station temperature was exhibited early in the month. Based on instrument diagnostic information, no impact on data quality was demonstrated.

TOTAL HYDROCARBONS (THC), METHANE (CH_4) & NON-METHANE HYDROCARBONS (NMHC)	
January	• Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. • On January 16, an alternate datalogger (Ultimate) was installed and tested on the channel. One hour of downtime was recorded at hour 19:00 as a result. The Ultimate data logger is currently running in parallel with the resident (ESC) data logger for assessment, pending its transition to the primary data logger.
February	• Operational time, for the monitoring period was 98.2%, equivalent to twelve hours of downtime. • Due to low fuel gas (H_2) pressure, the analyzer recorded anomalously low hourly and span concentrations on February 7, prompting an immediate site visit. The fuel gas cylinder was replaced and as a quality check, a zero-span check was triggered after the replacement. The result was within limits. Ten hours of downtime were recorded due to this event. • After the routine monthly calibration on February 15, the canister trigger program was tested on the Ultimate data-logger, incurring two hours of downtime.
March	• Operational time for the monitoring period was 99.9%, equivalent to one hour of downtime. This was incurred on March 15, at hour 09:00, due to a data-logger communication reset that impacted data quality.
April	• Operational time for the monitoring period was 99.3%, equivalent to five hours of downtime. • The NMHC span response exhibited an abrupt biased high drift on April 22. A repeat zero-span check conducted on April 23 showed the same trend. This prompted a site visit on April 24 where a repeat calibration was successfully completed as a corrective action. Five hours of downtime were incurred due to this event.

TOTAL HYDROCARBONS (THC), METHANE (CH_4) & NON-METHANE HYDROCARBONS (NMHC) contd.	
May	• Operational time for the monitoring period was 99.9%, equivalent to one hour of downtime. • The automated daily zero-span check failed to execute on schedule on May 13. A valid zero-span check was manually triggered later in the day. One hour of downtime was incurred due to the failed execution.
June	• Operational time for the monitoring period was 100%. No operational issues were identified.
July	• Operational time for the monitoring period was 93.7%, equivalent to forty-seven hours of downtime. • Eight hours of downtime were recorded on July 20, at hours 16:00-23:00, due to a power failure and the subsequent analyzer recovery period. • Following a successful shut-down calibration on July 30, a station upgrade was implemented. The trailer was replaced and the Ultimate data logger was installed to replace the resident ESC 8832. Thirty-nine hours of data were lost in the July monitoring period as a result of activities surrounding this upgrade.
August	• Operational time for the monitoring period was 88.3%, equivalent to eighty-seven hours of downtime. The AMD's 90%operational time requirement was not met this month. This contravention was reported to AEP under reference number: 343452. • Following the installation of the Ultimate data logger and an analyzer installation calibration, monitoring activity resumed on August 2. Forty hours of data were lost in the August monitoring period as a result of activities surrounding this data logger upgrade. • Beginning on August 28, frequent poor sample injections were observed. This prompted a site visit on August 29 where a shut-down calibration was attempted prior to maintenance. However, the As-Found High point did not meet requirements as there were poor sample injections that impacted the stability criteria. The rotor and actuator were replaced, an orifice in the zero-span system was tightened and secured, gas pressures were adjusted and column conditioning was run overnight. A successful post-repair calibration was completed on August 30. Data was invalidated back to the point of failed performance, determined as August 28 at 14:00. Forty-seven hours of downtime were incurred due to this event. • Minute data for the month was reviewed. CH4 minute concentrations recorded lower than 1.80 ppm, along with the corresponding THC and NMHC values, were excluded and the corresponding hourly average recalculated, due to poor injections.
September	• Operational time for the monitoring period was 100%. No operational issues were identified.
October	• Operational time for the monitoring period was 99.9%, equivalent to one hour of downtime. This was incurred on October 1 at hour 09:00, as the analyzer was placed offline while the fuel (H_2) and carrier (N_2) gas cylinders were being replaced.

TOTAL HYDROCARBONS (THC), METHANE (CH_4) & NON-METHANE HYDROCARBONS (NMHC) contd.	
November	• Operational time for the monitoring period was 97.2%, equivalent to twenty hours of downtime. • A Windows update interrupted the automated daily zero-span check scheduled for hour 00:00 on November 14. A successful zero-span check was manually completed at hour 09:00 of the same day. One hour of downtime was recorded due to the unsuccessful attempt. • Minute data for the month was reviewed. CH_4 minute concentrations recorded lower than 1.80 ppm, due to suspected poor sample injections, along with the corresponding THC and NMHC values, were excluded and the corresponding hourly average recalculated. • Data recorded at hour 08:00 on November 14 was discarded as the AMD's 75% data completeness criteria was not met. One hour of downtime was incurred as a result. • Unstable station temperature compromised analyzer performance. Based on instrument diagnostic information, data recorded from hour 17:00 on November 15 to hour 10:00 on November 16 were impacted and were therefore discarded. Eighteen hours of downtime were incurred as a result.
December	• Operational time for the monitoring period was 99.3%, equivalent to five hours of downtime. • The span gas cylinder was replaced on December 4. A repeat zero-span check was subsequently completed as a quality check, incurring one hour of downtime. • An immediate site visit was scheduled on December 12 in response to a "low flow" alarm. Following a successful shut-down calibration, the sample pump was rebuilt. A successful post-repair calibration was subsequently completed. Four hours of downtime were incurred due to this maintenance activity. • Unstable station temperature was exhibited early in the month. Based on instrument diagnostic information, no impact on data quality was demonstrated. • One canister event was recorded on December 9 at 20:25, at an initial concentration of 0.63 ppm. The sample was processed for analysis as outlined in the PRAMP Chain of Custody.

WIND SPEED (WS) & WIND DIRECTION (WD)	
January	• Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. • On January 16, an alternate datalogger (Ultimate) was installed and tested on the channel. One hour of downtime was recorded at hour 19:00 as a result. The Ultimate data logger is currently running in parallel with the resident (ESC) data logger for assessment, pending its transition to the primary data logger.
February	• Operational time for the monitoring period was 100%. No operational issues were identified.
March	• Operational time for the monitoring period was 100%. No operational issues were identified.
April	• Operational time for the monitoring period was 100%. No operational issues were identified.
May	• Operational time for the monitoring period was 100%. No operational issues were identified.
June	• Operational time for the monitoring period was 100%. No operational issues were identified.
July	• Operational time for the monitoring period was 96.8%, equivalent to twenty-four hours of downtime. • Seven hours of downtime were recorded on July 20, at hours 16:00-22:00, due to a power failure. • A station upgrade was implemented this month. The trailer was replaced and the Ultimate data logger was installed to replace the resident ESC 8832. Seventeen hours of data were lost in the July monitoring period as a result of activities surrounding this upgrade.
August	• Operational time for the monitoring period was 95.0%, equivalent to thirty-seven hours of downtime. • Following the installation of the Ultimate data logger, monitoring activity resumed on August 2. Thirty-seven hours of data were lost in the August monitoring period as a result of activities surrounding this data logger upgrade.
September	• Operational time for the monitoring period was 100%. No operational issues were identified.
October	• Operational time for the monitoring period was 100%. No operational issues were identified.
November	• Operational time for the monitoring period was 100%. No operational issues were identified.
December	• Operational time for the monitoring period was 100%. No operational issues were identified.

RELATIVE HUMIDITY (RH)	
January	• Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. • On January 16, an alternate datalogger (Ultimate) was installed and tested on the channel. One hour of downtime was recorded at hour 19:00 as a result. The Ultimate data logger is currently running in parallel with the resident (ESC) data logger for assessment, pending its transition to the primary data logger.
February	• Operational time for the monitoring period was 100%. No operational issues were identified.
March	• Operational time for the monitoring period was 100%. No operational issues were identified.
April	• Operational time for the monitoring period was 100%. No operational issues were identified.
May	• Operational time for the monitoring period was 100%. No operational issues were identified.
June	• Operational time for the monitoring period was 100%. No operational issues were identified.
July	• Operational time for the monitoring period was 96.8%, equivalent to twenty-four hours of downtime. • Seven hours of downtime were recorded on July 20, at hours 16:00-22:00, due to a power failure. • A station upgrade was implemented this month. The trailer was replaced and the Ultimate data logger was installed to replace the resident ESC 8832. Seventeen hours of data were lost in the July monitoring period as a result of activities surrounding this upgrade.
August	• Operational time for the monitoring period was 95.0%, equivalent to thirty-seven hours of downtime. • Following the installation of the Ultimate data logger, monitoring activity resumed on August 2. Thirty-seven hours of data were lost in the August monitoring period as a result of activities surrounding this data logger upgrade.
September	• Operational time for the monitoring period was 100%. No operational issues were identified.
October	• Operational time for the monitoring period was 100%. No operational issues were identified.
November	• Operational time for the monitoring period was 100%. No operational issues were identified.
December	• Operational time for the monitoring period was 100%. No operational issues were identified.

BAROMETRIC PRESSURE (BP)	
January	• Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. • On January 16, an alternate datalogger (Ultimate) was installed and tested on the channel. One hour of downtime was recorded at hour 19:00 as a result. The Ultimate data logger is currently running in parallel with the resident (ESC) data logger for assessment, pending its transition to the primary data logger.
February	• Operational time for the monitoring period was 100%. No operational issues were identified.
March	• Operational time for the monitoring period was 100%. No operational issues were identified.
April	• Operational time for the monitoring period was 100%. No operational issues were identified.
May	• Operational time for the monitoring period was 100%. No operational issues were identified.
June	• Operational time for the monitoring period was 100%. No operational issues were identified.
July	• Operational time for the monitoring period was 96.8%, equivalent to twenty-four hours of downtime. • Seven hours of downtime were recorded on July 20, at hours 16:00-22:00, due to a power failure. • A station upgrade was implemented this month. The trailer was replaced and the Ultimate data logger was installed to replace the resident ESC 8832. Seventeen hours of data were lost in the July monitoring period as a result of activities surrounding this upgrade.
August	• Operational time for the monitoring period was 95.0%, equivalent to thirty-seven hours of downtime. • Following the installation of the Ultimate data logger, monitoring activity resumed on August 2. Thirty-seven hours of data were lost in the August monitoring period as a result of activities surrounding this data logger upgrade.
September	• Operational time for the monitoring period was 100%. No operational issues were identified.
October	• Operational time for the monitoring period was 100%. No operational issues were identified.
November	• Operational time for the monitoring period was 100%. No operational issues were identified.
December	• Operational time for the monitoring period was 100%. No operational issues were identified.

AMBIENT TEMPERATURE (AT)	
January	• Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. • On January 16, an alternate datalogger (Ultimate) was installed and tested on the channel. One hour of downtime was recorded at hour 19:00 as a result. The Ultimate data logger is currently running in parallel with the resident (ESC) data logger for assessment, pending its transition to the primary data logger.
February	• Operational time for the monitoring period was 100%. No operational issues were identified.
March	• Operational time for the monitoring period was 100%. No operational issues were identified.
April	• Operational time for the monitoring period was 100%. No operational issues were identified.
May	• Operational time for the monitoring period was 99.9%, equivalent to one hour of downtime. • A temperature sensor audit was conducted on May 1. The result barely met Maxxam's internal tolerance limits of +/-10C. It was determined that this resulted from the positioning of the sensor. On May 10, the sensor was repositioned higher than the trailer roof. The audit was subsequently repeated and the result was satisfactory. One hour of downtime was recorded due to this event.
June	• Operational time for the monitoring period was 100%. No operational issues were identified.
July	• Operational time for the monitoring period was 96.8%, equivalent to twenty-four hours of downtime. • Seven hours of downtime were recorded on July 20, at hours 16:00-22:00, due to a power failure. • A station upgrade was implemented this month. The trailer was replaced and the Ultimate data logger was installed to replace the resident ESC 8832. Seventeen hours of data were lost in the July monitoring period as a result of activities surrounding this upgrade.
August	• Operational time for the monitoring period was 95.0%, equivalent to thirty-seven hours of downtime. • Following the installation of the Ultimate data logger, monitoring activity resumed on August 2. Thirty-seven hours of data were lost in the August monitoring period as a result of activities surrounding this data logger upgrade.
September	• Operational time for the monitoring period was 100%. No operational issues were identified.
October	• Operational time for the monitoring period was 100%. No operational issues were identified.
November	• Operational time for the monitoring period was 100%. No operational issues were identified.
December	• Operational time for the monitoring period was 100%. No operational issues were identified.

STATION TEMPERATURE (STNTPX)	
January	• Operational time, for the monitoring period was 99.9%, equivalent to one hour of downtime. • On January 16, an alternate datalogger (Ultimate) was installed and tested on the channel. One hour of downtime was recorded at hour 19:00 as a result. The Ultimate data logger is currently running in parallel with the resident (ESC) data logger for assessment, pending its transition to the primary data logger.
February	• Operational time for the monitoring period was 100%. No operational issues were identified.
March	• Operational time for the monitoring period was 100%. No operational issues were identified.
April	• Operational time for the monitoring period was 100%. No operational issues were identified.
May	• Operational time for the monitoring period was 100%. No operational issues were identified.
June	• Operational time for the monitoring period was 100%. No operational issues were identified.
July	• Operational time for the monitoring period was 96.8%, equivalent to twenty-four hours of downtime. • Seven hours of downtime were recorded on July 20, at hours 16:00-22:00, due to a power failure. • A station upgrade was implemented this month. The trailer was replaced and the Ultimate data logger was installed to replace the resident ESC 8832. Seventeen hours of data were lost in the July monitoring period as a result of activities surrounding this upgrade.
August	• Operational time for the monitoring period was 95.0%, equivalent to thirty-seven hours of downtime. • Following the installation of the Ultimate data logger, monitoring activity resumed on August 2. Thirty-seven hours of data were lost in the August monitoring period as a result of activities surrounding this data logger upgrade.
September	• Operational time for the monitoring period was 100%. No operational issues were identified.
October	• Operational time for the monitoring period was 100%. No operational issues were identified.
November	• Operational time for the monitoring period was 100%. • The station temperature began to exhibit instability on November 9. This prompted a site visit on November 15 where a portable heater was installed. Station temperature was back to optimum conditions on November 16. However, fluctuations were again noted on November 18. A technician was onsite on November 20 and November 21 to troubleshoot the HVAC system and the problem was traced to the BARD and Heat Contactor components. An HVAC company was engaged and the faulty components were ordered. In the meantime, a second portable heater was installed to balance the temperature.
December	• Operational time for the monitoring period was 100%. • The station temperature exhibited instability beginning in the November monitoring period. An HVAC company was engaged and the faulty components were ordered. On December 11, the HVAC system was repaired and the temporary portable heaters were removed from site.

List of Acronyms

AAAQO	Alberta Ambient Air Quality Objectives and Guidelines Summary
A/C	Air Conditioning
AEP	Alberta Environment and Parks
AMD	Air Monitoring Directive
AT	Ambient Temperature
BP	Barometric Pressure
CH_4	Methane
hr	Hour
hrs	Hours
HVAC	Heating, Ventilation, and Air Conditioning
kph	Kilometers per hour
MaxDate	Date and time maximum value was recorded
mbar	Millibar
MinDate	Date and time minimum value was recorded
NMHC	Non-methane Hydrocarbon
Num	Number
ppb	Parts per billion
ppm	Parts per million
QA	Quality assurance
QC	Quality control
RH	Relative Humidity
s/n	Serial Number
SOP	Standard Operating Procedure
SO_2	Sulphur Dioxide
STNTPX	Station Temperature
THC	Total Hydrocarbons
TRS	Total Reduced Sulphur
UV	Ultraviolet
vs.	versus
WS	Wind Speed
WD	Wind Direction
°C	Degrees Celsius

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