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AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
COLD LAKE CONTINUOUS MONITORING STATION

JOB #: 2833-2016-10-1-C

October 2016

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
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Attention: MIKE BISAGA

DATE: **December 9, 2016**

Prepared by:

A handwritten signature in blue ink, appearing to read "Bim Adeniji", is written over a horizontal line.

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Cheri Sinclair, B.Sc.
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SUMMARY

In October 2016, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Cold Lake Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry & Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

PM_{2.5}: Thirty-one hours of data were recorded this month at concentrations less than $-3 \mu\text{g}/\text{m}^3$, rendering the data invalid.

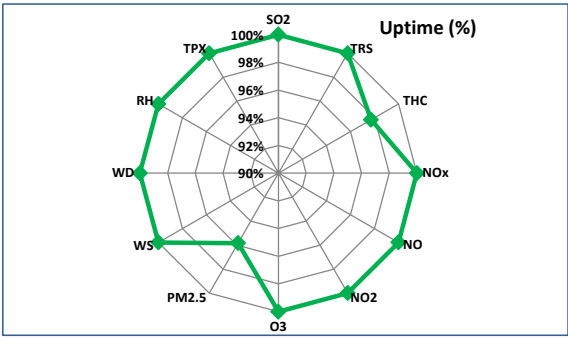
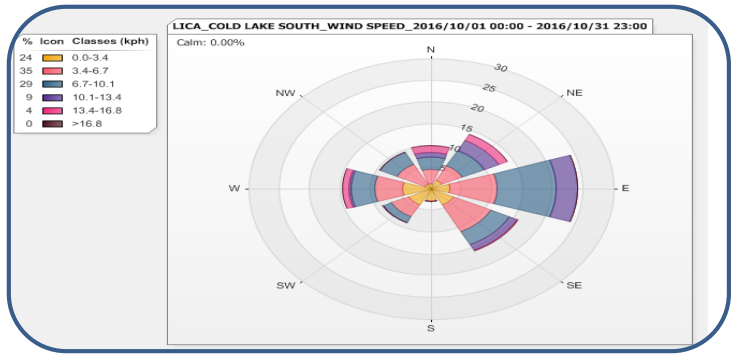
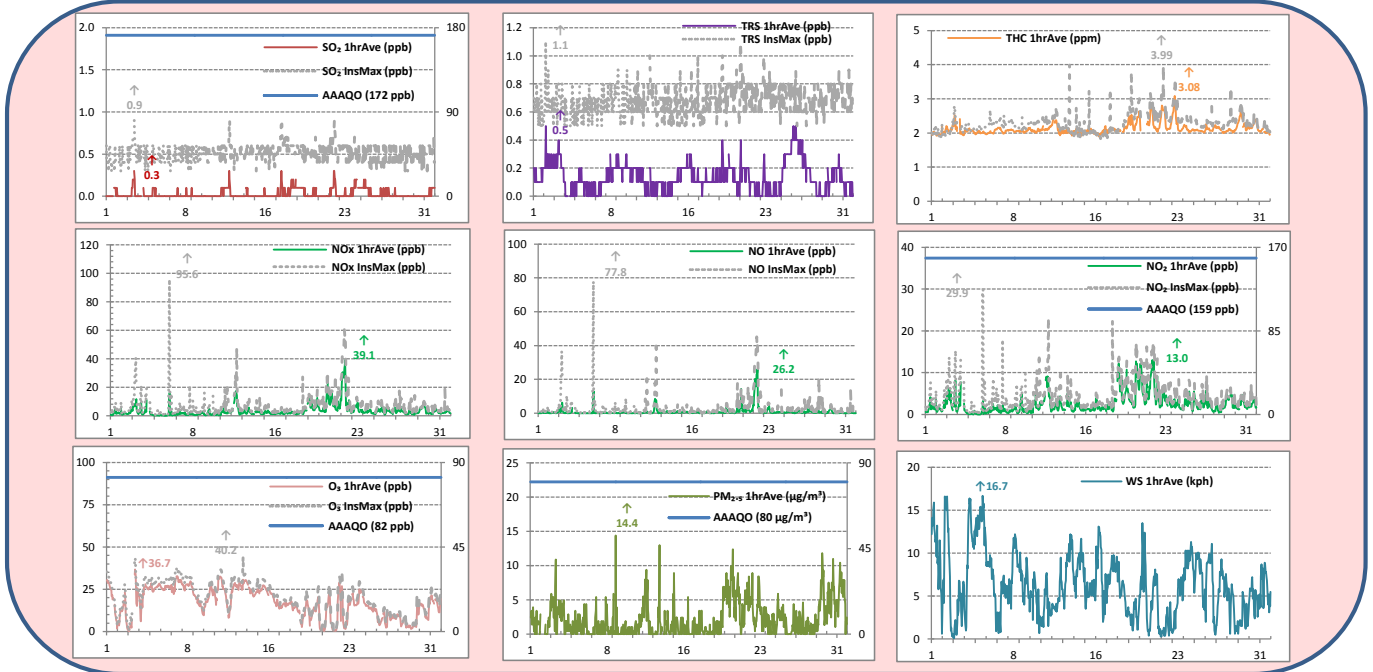
THC: Seventeen hours of downtime were attributed to a biased low zero drift and faulty sample pump. Additional calibrations were performed on October 18 and October 20 to address these occurrences.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, Cold Lake Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Pollutants		Monthly Records		1-Hour Records					24-Hour Records			
Name	Unit	Avg. Conc.	Uptime	Maximum			AAAOQ Objective	Exceed. Hours	Maximum		AAAOQ Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO	ppb	0.0	100.0%	0.3	ALL	VAR	172	0	0.1	VAR	48	0
TRS	ppb	0.1	100.0%	0.5	October 2, 26	4, VAR	-	-	0.4	October 26	-	-
THC	ppm	2.12	97.7%	3.08	October 23	6	-	-	2.39	October 23	-	-
NOx	ppb	3.4	100.0%	39.1	October 22	9	-	-	15.3	October 22	-	-
NO	ppb	0.9	100.0%	26.2	October 22	9	-	-	8.4	October 22	-	-
NO ₂	ppb	2.5	100.0%	13.0	October 22	5	159	0	6.9	October 22	-	-
O ₃	ppb	17.0	100.0%	36.7	October 3	15	82	0	28.4	October 7	-	-
PM _{2.5}	µg/m ³	2.2	95.8%	14.4	October 9	8	80	0	6.4	October 20	30	0
WS	%	1.8	100.0%	16.7	October 5	16	-	-	13.4	October 5	-	-
WD	degree	61 (ENE)	100.0%	-	-	-	-	-	-	-	-	-
RH	mm	85	100.0%	100	VAR	VAR	-	-	100	October 25	-	-
AmbTPX	°C	1.4	100.0%	13.7	October 3	15	-	-	8.4	October 1	-	-



Monthly Update

- * All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- * All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.

Operational Issues

- **PM_{2.5}**: Thirty-one hours of data were recorded this month at concentrations less than -3 µg/m³, rendering the data invalid.
- **THC**: Seventeen hours of downtime were attributed to a biased low zero drift and faulty sample pump. Additional calibrations were performed on October 18 and October 20 to address these occurrences.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Cold Lake Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.0	0.3	ALL	VAR	VAR	VAR	0.1	VAR	100.0
TRS (ppb)	-	-	-	-	0.1	0.5	2, 26	4, VAR	12.0 VAR	WSW VAR	0.4	26	100.0
THC (ppm)	-	-	-	-	2.12	3.08	23	6	1.2	W	2.39	23	97.7
NO ₂ (ppb)	159	-	0	-	2.5	13.0	22	5	1.3	E	6.9	22	100.0
NO (ppb)	-	-	-	-	0.9	26.2	22	9	0.9	E	8.4	22	100.0
NO _x (ppb)	-	-	-	-	3.4	39.1	22	9	0.9	E	15.3	22	100.0
O ₃ (ppb)	82	-	0	-	17.0	36.7	3	15	4.5	NNE	28.4	7	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	2.2	14.4	9	8	4.7	NE	6.4	20	95.8
RELATIVE HUMIDITY (%)	-	-	-	-	85	100	VAR	VAR	VAR	VAR	100	25	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	1.4	13.7	3	15	4.5	NNE	8.4	1	100.0
VECTOR WS (kph)	-	-	-	-	1.8	16.7	5	16	-	N	13.4	5	100.0
VECTOR WD (sec)	-	-	-	-	61 (ENE)	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

PM_{2.5} 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O₃ 1-Hour Exceedances

Measured concentrations of ozone were below the 1-hour AAAQO of 82 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
October 3, 2016	3.17	n-Butane
October 9, 2016	1.2	Acetone
October 15, 2016	1.4	Acetone
October 21, 2016	1.7	Acetone
October 27, 2016	1.7	Acetone

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
October 3, 2016	0.13	Phenanthrene
October 9, 2016	1.32	Anthracene
October 15, 2016	0.3	Phenanthrene
October 21, 2016	0.14	2-Methylnaphthalene
October 27, 2016	0.57	2-Methylnaphthalene

Note: NA

Partisol Sampler Summary

Sample Collection Date	Concentration (mg)
October 3, 2016	0.042
October 9, 2016	<0.004
October 15, 2016	0.022
October 21, 2016	0.076
October 27, 2016	0.035

Note: NA

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD). The results for the non-continuous Partisol, VOCs, PAHs and Passive monitoring program are also included in this report.

Sample filters for all continuous air monitors are changed before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: [Ambient Data Quality \(August 3, 2016\)](#). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 4. Two hours of maximum instantaneous data are missing on October 3, at hour 09:00 and October 18, at hour 08:00 due to a power failure.

TOTAL REDUCED SULPHUR (TRS)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 4. Two hours of maximum instantaneous data are missing on October 3, at hour 09:00 and October 18, at hour 08:00 due to a power failure.

TOTAL HYDROCARBONS (THC)

Seventeen hours of downtime were recorded this month. The analyzer exhibited a biased low zero drift on October 14. A successful repeat calibration was performed on October 18 to address the observed drift. Four hours of downtime were attributed to this event.

The analyzer began recording lower than historical concentrations on October 20 due to a damaged sample pump. A technician was dispatched to site immediately to conduct necessary maintenance. The sample pump was then rebuilt followed by a successful post-repair calibration. Thirteen hours of downtime were recorded due to this event.

NITROGEN DIOXIDE (NO₂)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 4. Two hours of maximum instantaneous data are missing on October 3, at hour 09:00 and October 18, at hour 08:00 due to a power failure.

OZONE (O₃)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 4. Two hours of maximum instantaneous data were discarded on October 3, at hour 09:00 and October 18, at hour 08:00 due to a power failure.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

Two routine TEOM audits were performed this month: one was completed on October 3 and the other audit was performed on October 26. Both the inlet filter and the FDMS filter were replaced during the audits. Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data recorded below -3 µg/m³ was invalidated. Thirty one hours of data were invalidated as the data was below -3 µg/m³ this month.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

There were no operational issues that impacted hourly data this month. Two hours of maximum instantaneous data were discarded on October 3, at hour 09:00 and October 18, at hour 08:00 due to a power failure.

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was blowing from.

RELATIVE HUMIDITY (RH)

There were no operational issues that impacted data this month.

AMBIENT TEMPERATURE (AmbTPX)

There were no operational issues that impacted data this month.

VOC SAMPLES

The sampler was programmed to collect a sample over a 24 hour period once every six days, as per NAPS (North American Pollution Surveillance) schedule.

Samples were collected on October 3, 9, 15, 21 and 27. Analytical results are included in this report.

PAH SAMPLES

The sampler was programmed to collect a sample over a 24 hour period once every six days, as per NAPS (North American Pollution Surveillance) schedule.

Samples were collected on October 3, 9, 15, 21 and 27. Analytical results are included in this report.

PARTISOL SAMPLES

The sampler was programmed to collect a sample over a 24 hour period once every six days, as per NAPS (North American Pollution Surveillance) schedule.

The quarterly audit was conducted on October 24. Samples were collected on October 3, 9, 15, 21 and 27. Analytical results are included in this report.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
- Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F TEOM Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Ambient Temperature - Met One Unit
- Datalogger - ESC 8832
- Partisol - R&P 2000H Unit
- VOC - XONTECH 910A Gaseous Air Sampler
- PAH - TISCH PUF Plus Unit

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

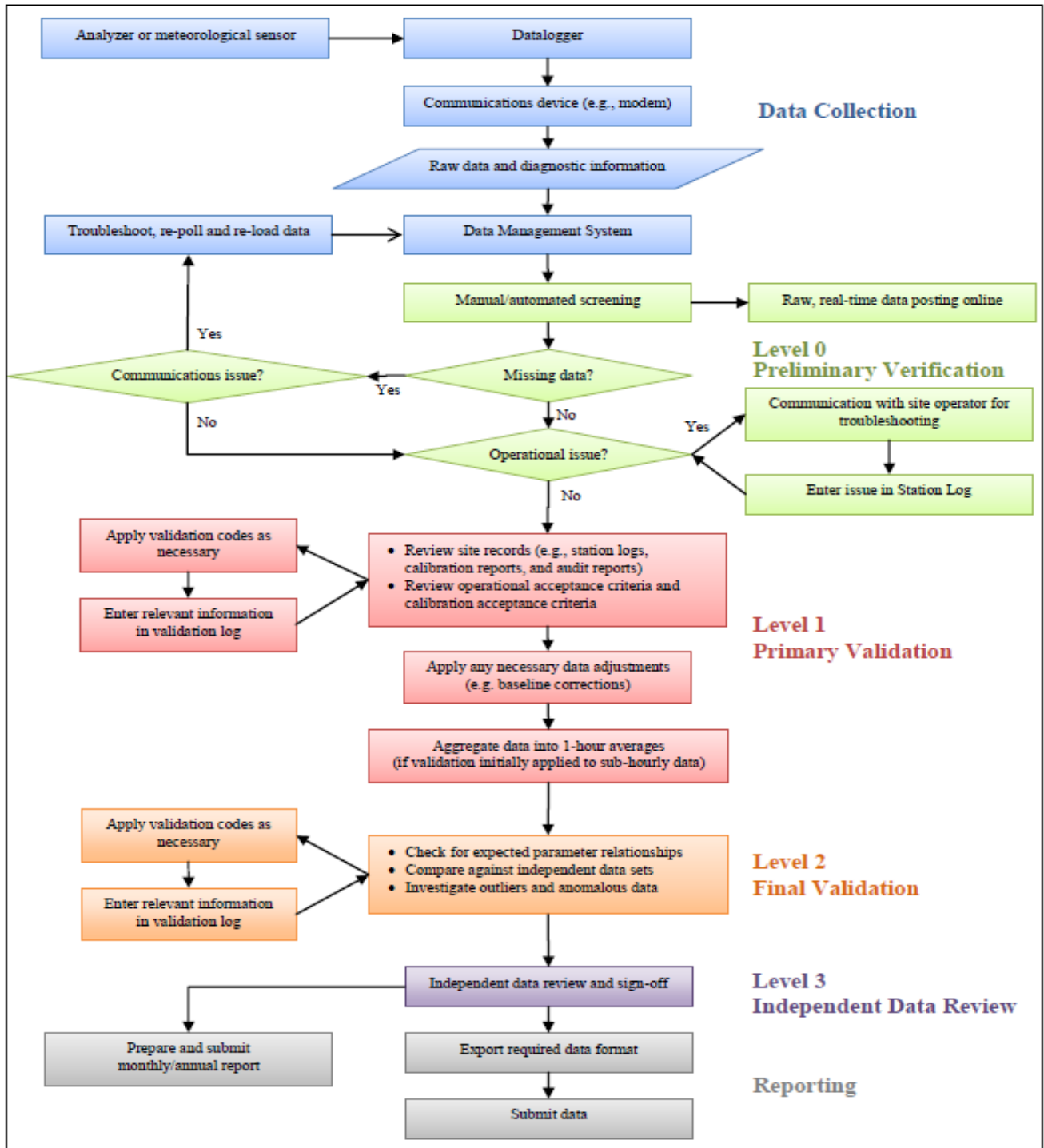
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (Aug 3, 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	S	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	S	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
9	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
11	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	24		
12	0.1	0.0	0.1	0.1	0.1	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24		
13	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
14	0.0	0.0	0.0	S	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
15	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	24		
16	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
17	S	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	S	0.0	0.3	0.1	24			
18	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	S	0.1	0.0	0.2	0.1	0.0	0.1	24		
19	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.1	0.1	0.0	24		
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
22	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.1	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24		
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
24	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	24	
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	S	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.1	24		
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	24		
27	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	S	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
28	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	24		
HOURLY MAX	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	24		
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

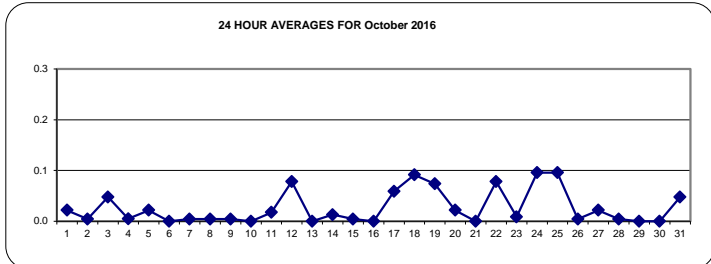
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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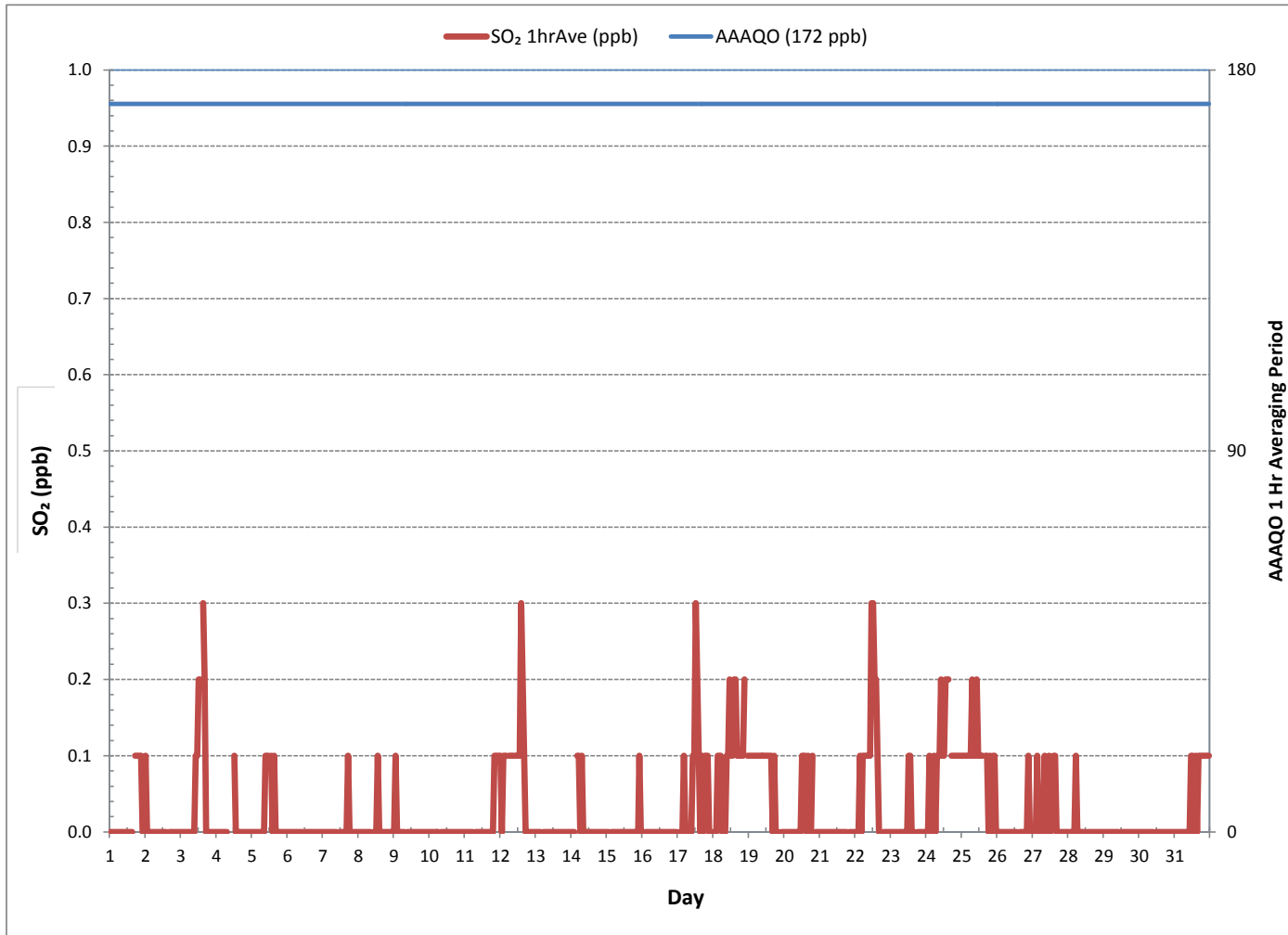
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	163					
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	0.3	ppb	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 24-HR AVERAGE:	0.1	ppb			ON DAY(S)	VAR
					VAR-VARIOUS	
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	744	hrs	
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	0.05		MONTHLY AVERAGE:	0.0	ppb	

24 HOUR AVERAGES FOR October 2016



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2016

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0.6	0.4	0.4	0.4	0.4	0.3	0.6	0.6	0.6	0.4	0.4	0.4	0.3	0.4	0.4	0.4	S	0.4	0.3	0.4	0.6	0.4	0.4	0.4	0.3	0.6	0.4	24	
2	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.4	0.4	0.3	0.4	0.4	0.6	0.4	0.4	S	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.6	0.4	24
3	0.4	0.6	0.3	0.4	0.6	0.4	0.4	0.6	0.6	P	0.6	0.6	0.7	0.7	S	0.9	0.7	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.9	0.5	23
4	0.6	0.4	0.6	0.5	0.4	0.4	0.6	0.4	C	C	C	C	C	0.6	0.4	0.4	0.3	0.6	0.4	0.4	0.6	0.4	0.3	0.4	0.3	0.6	0.5	24	
5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.4	0.6	S	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.4	0.6	0.4	24	
6	0.6	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.6	0.6	0.4	S	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.4	0.4	0.6	0.4	0.6	0.5	24	
7	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	S	0.6	0.4	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.5	0.3	0.6	0.4	24	
8	0.6	0.4	0.4	0.5	0.6	0.4	0.6	0.5	0.5	S	0.6	0.6	0.4	0.4	0.6	0.4	0.6	0.4	0.3	0.6	0.5	0.6	0.6	0.3	0.3	0.6	0.5	24	
9	0.4	0.5	0.6	0.5	0.5	0.6	0.4	0.5	S	0.4	0.4	0.4	0.6	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.4	0.5	0.5	0.5	0.4	0.6	0.5	24	
10	0.6	0.6	0.5	0.5	0.5	0.6	0.5	S	0.5	0.6	0.5	0.6	0.5	0.4	0.4	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.6	0.5	24	
11	0.5	0.5	0.6	0.6	0.5	0.5	S	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.6	0.4	0.6	0.4	0.5	0.4	0.6	0.4	0.6	0.5	24
12	0.5	0.4	0.6	0.6	0.4	S	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.9	0.9	0.6	0.6	0.4	0.6	0.5	0.5	0.5	0.5	0.4	0.9	0.6	24	
13	0.5	0.3	0.5	0.6	S	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.6	0.5	24	
14	0.5	0.4	0.5	S	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.6	0.5	24	
15	0.5	0.5	S	0.3	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.4	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.3	0.6	0.5	24	
16	0.4	S	0.5	0.6	0.5	0.6	0.5	0.6	0.3	0.5	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.4	0.5	0.3	0.5	0.5	0.3	0.6	0.5	24
17	S	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.7	0.7	0.9	0.9	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.7	0.6	S	0.5	0.9	0.6	24	
18	0.7	0.5	0.6	0.7	0.6	0.6	0.5	0.5	P	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	S	0.6	0.5	0.7	0.6	23	
19	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.4	0.6	0.4	0.6	0.4	0.5	0.5	S	0.5	0.5	0.4	0.6	0.5	24		
20	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.6	0.6	0.6	0.6	0.6	0.4	0.7	0.4	0.4	0.4	S	0.4	0.5	0.5	0.4	0.7	0.5	24		
21	0.5	0.5	0.4	0.6	0.5	0.6	0.5	0.5	0.5	0.4	0.6	0.4	0.6	0.4	0.6	0.6	0.6	0.4	S	0.4	0.5	0.6	0.6	0.4	0.6	0.5	24		
22	0.5	0.6	0.5	0.7	0.6	0.7	0.5	0.6	0.6	0.7	0.7	0.8	0.9	0.8	0.7	0.6	0.4	0.4	S	0.4	0.4	0.6	0.6	0.6	0.4	0.9	0.6	24	
23	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.4	S	0.6	0.4	0.4	0.4	0.6	0.4	0.4	0.6	0.5	24	
24	0.6	0.4	0.6	0.5	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.4	0.6	0.5	S	0.4	0.5	0.6	0.4	0.5	0.5	0.5	0.4	0.7	0.5	24	
25	0.5	0.5	0.4	0.4	0.4	0.6	0.4	0.6	0.4	0.6	0.4	0.6	0.4	0.4	0.4	S	0.6	0.4	0.4	0.4	0.4	0.3	0.6	0.4	0.3	0.6	0.5	24	
26	0.3	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.4	0.6	0.4	0.3	0.3	S	0.4	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.6	0.4	24
27	0.4	0.4	0.4	0.6	0.3	0.4	0.6	0.5	0.4	0.6	0.4	0.4	0.4	S	0.4	0.4	0.4	0.6	0.4	0.6	0.4	0.4	0.4	0.4	0.3	0.6	0.5	24	
28	0.4	0.4	0.6	0.6	0.4	0.4	0.5	0.6	0.4	0.4	0.5	0.6	S	0.4	0.5	0.4	0.4	0.6	0.4	0.4	0.6	0.6	0.6	0.4	0.4	0.6	0.5	24	
29	0.4	0.4	0.4	0.6	0.3	0.4	0.4	0.6	0.4	0.6	0.3	S	0.6	0.6	0.4	0.5	0.6	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.3	0.6	0.5	24	
30	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.3	S	0.5	0.5	0.4	0.6	0.5	0.4	0.5	0.3	0.6	0.5	0.6	0.3	0.6	0.3	0.6	0.5	24	
31	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.4	0.4	S	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.7	0.4	0.4	0.3	0.7	0.5	24	
HOURLY MAX	0.7	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
HOURLY AVG	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

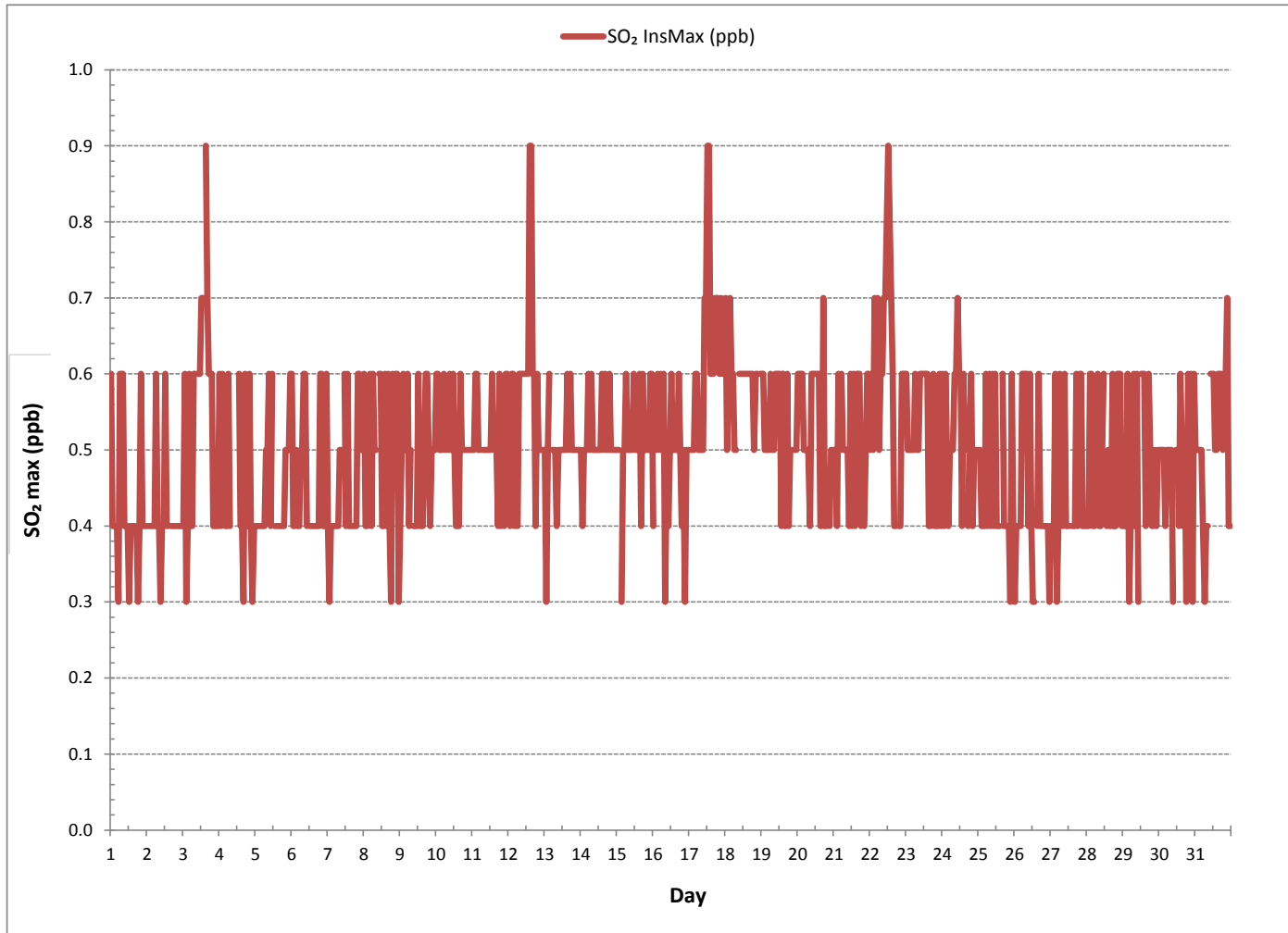
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706
MAXIMUM INSTANTANEOUS VALUE:	0.9 ppb @ HOUR(S) VAR ON DAY(S) VAR
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	742 hrs
STANDARD DEVIATION:	0.10

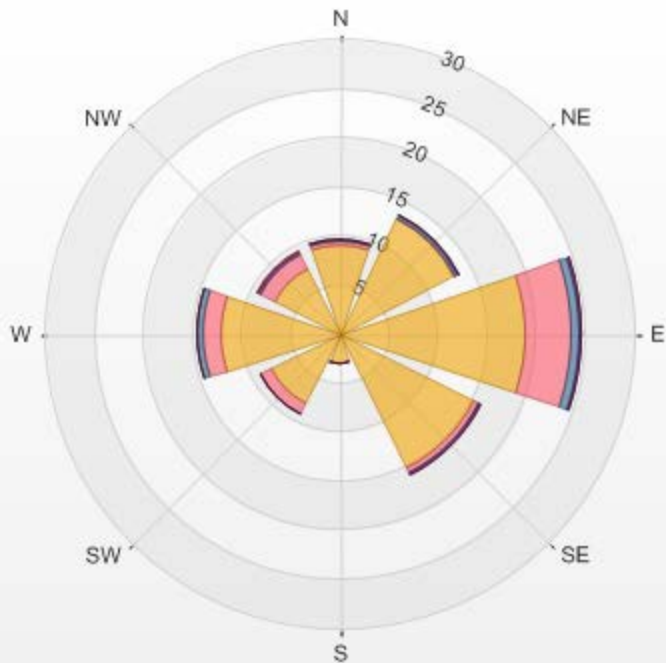
SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00 [ppb]

Direction	0-0.08	0.08-0.16	0.16-0.24	0.24-0.32	0.32-0.4	>0.4	Total
N	9.07	0.42	0.14	0	0	0	9.63
NE	13.03	0.14	0.28	0.14	0	0	13.59
E	18.84	4.82	0.71	0.28	0	0	24.65
SE	15.16	0.71	0	0.14	0	0	16.01
S	2.97	0.14	0	0	0	0	3.11
SW	7.93	1.13	0	0	0	0	9.06
W	12.18	1.7	0.57	0	0	0	14.45
NW	7.51	1.56	0.14	0.14	0.14	0	9.49
Summary	86.69	10.62	1.84	0.7	0.14	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO₂[ppb] 2016/10/01 00:00 - 2016/10/31 23:00 Calm: 0.00%



% Icon Classes (ppb)	87	11	2	1	0	0
0-0.08	87	11	2	1	0	0
0.08-0.16		11				
0.16-0.24			2			
0.24-0.32				1		
0.32-0.4					0	
>0.4						0

SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR

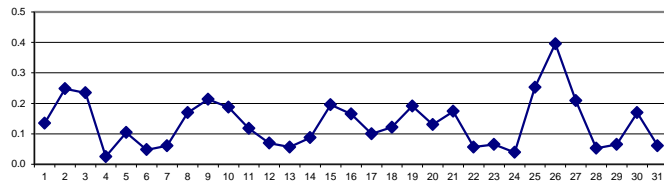
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	24
2	0.2	0.2	0.2	0.2	0.5	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	S	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.5	0.2	24	
3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	S	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.4	0.2	24	
4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	24	
5	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	S	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.2	0.1	24
6	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	S	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.0	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	S	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	24
8	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	S	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.2	24
9	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.2	S	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.3	0.2	24
10	0.3	0.2	0.2	0.2	0.2	0.2	0.2	S	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.2	24
11	0.1	0.1	0.2	0.2	0.1	0.2	S	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.1	24
12	0.1	0.1	0.1	0.1	0.0	S	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	24
13	0.1	0.1	0.1	0.1	S	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	24
14	0.0	0.1	0.0	S	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.1	24
15	0.2	0.1	S	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.3	0.2	24
16	0.2	S	0.3	0.3	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.2	24
17	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	S	0.0	0.2	0.1	24
18	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	S	0.2	0.1	0.2	0.1	24
19	0.2	0.1	0.1	0.1	0.2	0.1	0.3	0.4	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	S	0.3	0.2	0.1	0.4	0.2	24
20	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	S	0.1	0.0	0.0	0.0	0.2	0.1	24
21	0.1	0.3	0.4	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	S	0.2	0.1	0.1	0.0	0.0	0.4	0.2	24
22	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	S	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	24
23	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.0	0.1	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.1	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	S	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	24
25	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	S	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.3	0.3	24
26	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	S	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.5	0.4	24
27	0.3	0.4	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.1	0.2	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.2	24
28	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	S	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	S	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.2	0.1	24
30	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	S	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.2	24
31	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	24
HOURLY MAX	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.0	0.1	0.1	24
HOURLY AVG	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	24

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

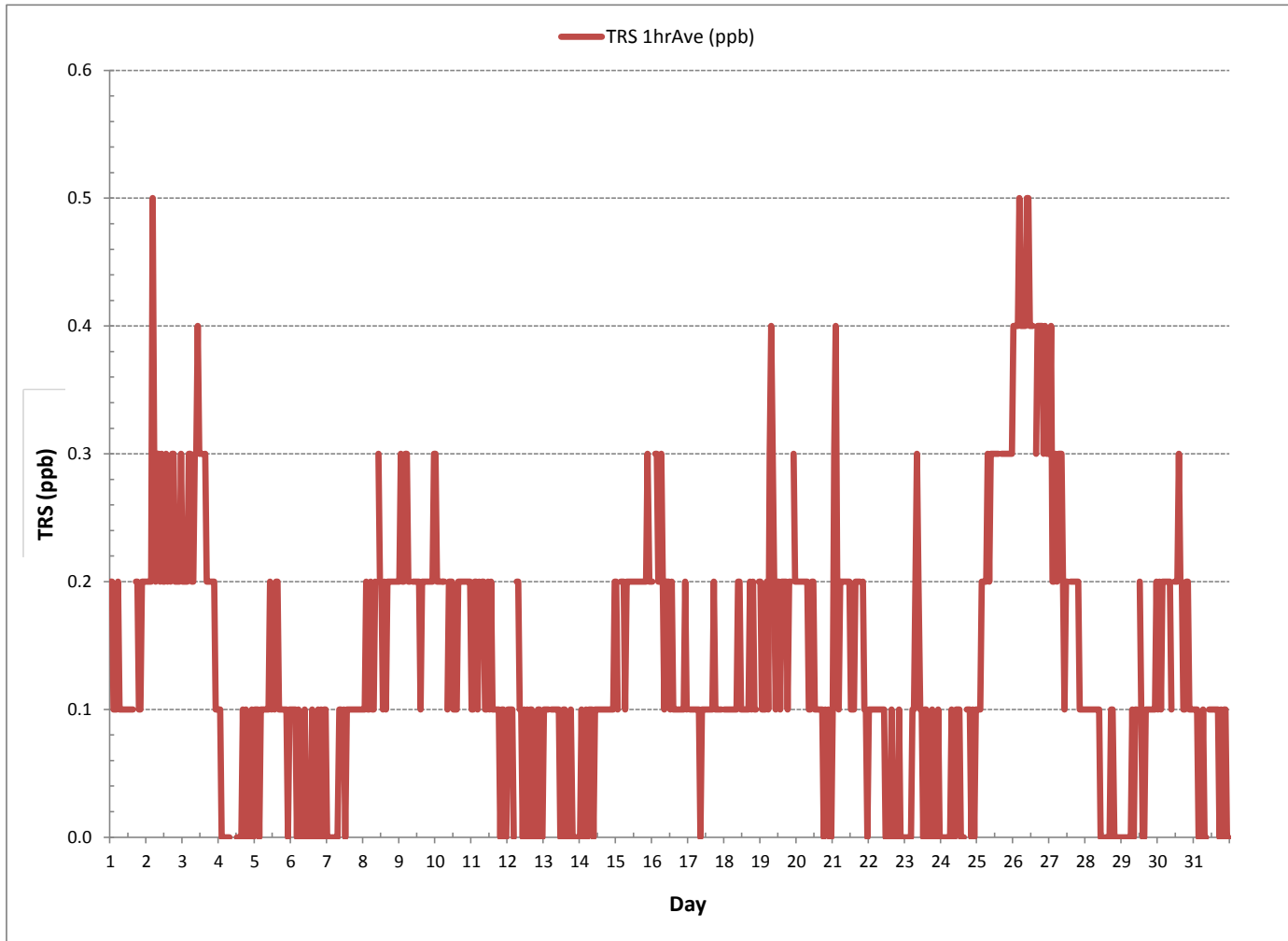
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	574			
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	0.5 ppb @ HOUR(S)	4 , VAR	ON DAY(S)	2 , 26
MAXIMUM 24-HR AVERAGE:	0.4 ppb		ON DAY(S)	26
			VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.10	MONTHLY AVERAGE:	0.1 ppb	

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2016

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.8	0.6	0.6	0.7	0.5	0.7	0.5	0.6	0.5	S	0.8	0.5	0.7	0.6	0.5	0.5	0.6	0.5	0.8	0.6	24	
2	0.6	0.6	0.6	0.8	1.1	0.7	0.7	0.6	0.8	0.8	0.9	0.6	0.7	0.7	0.6	S	0.6	0.6	0.7	0.6	0.6	0.7	0.5	0.7	0.5	1.1	0.7	24	
3	0.6	0.6	0.6	0.6	0.7	0.8	0.6	0.5	0.7	P	0.8	0.7	0.7	0.7	S	0.7	0.6	0.6	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.8	0.7	23	
4	0.5	0.7	0.6	0.7	0.6	0.5	0.6	0.6	C	C	C	C	C	0.5	0.6	0.6	0.7	0.6	0.8	0.5	0.7	0.7	0.6	0.5	0.5	0.8	0.6	24	
5	0.6	0.6	0.5	0.5	0.6	0.7	0.5	0.6	0.6	0.7	0.6	0.8	S	0.6	0.6	0.6	0.5	0.6	0.6	0.7	0.5	0.7	0.6	0.6	0.5	0.8	0.6	24	
6	0.7	0.6	0.6	0.6	0.7	0.6	0.7	0.5	0.6	0.8	0.5	S	0.7	0.6	0.7	0.7	0.5	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.5	0.8	0.6	24	
7	0.6	0.6	0.7	0.6	0.5	0.7	0.6	0.7	0.7	0.7	S	0.6	0.6	0.7	0.5	0.8	0.8	0.7	0.6	0.8	0.6	0.6	0.6	0.6	0.5	0.8	0.6	24	
8	0.7	0.7	0.6	0.6	0.6	0.8	0.6	0.6	0.7	S	0.8	0.7	0.7	0.8	0.6	0.6	0.7	0.6	0.6	0.7	0.8	0.7	0.8	0.7	0.7	0.6	0.8	0.7	24
9	0.7	0.7	0.8	0.8	0.9	0.8	0.7	0.6	S	0.6	0.5	0.6	0.6	0.6	0.6	0.8	0.8	0.5	0.8	0.6	0.6	0.5	0.6	0.7	0.7	0.5	0.9	0.7	24
10	0.7	0.9	0.6	0.6	0.6	0.7	0.6	S	0.8	0.6	0.7	0.7	0.5	0.5	0.7	0.6	0.6	0.6	0.7	0.8	0.6	0.8	0.7	0.6	0.5	0.9	0.7	24	
11	0.7	0.6	0.9	0.8	0.6	0.7	S	0.7	0.6	0.6	0.7	0.7	0.6	0.7	0.6	0.5	0.8	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.9	0.7	24	
12	0.6	0.6	0.8	0.8	0.7	S	1.0	0.9	0.7	0.7	0.7	0.8	0.7	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.6	0.5	0.5	1.0	0.7	24	
13	0.6	0.6	0.7	0.7	S	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.7	0.7	0.6	0.7	0.5	0.6	0.8	0.7	0.6	0.7	0.7	0.6	0.5	0.8	0.7	24	
14	0.6	0.8	0.5	S	0.7	0.5	0.6	0.7	0.7	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.7	0.8	0.7	0.6	0.8	0.7	0.5	0.6	0.5	0.8	0.6	24	
15	0.6	0.7	S	0.5	0.7	0.9	0.7	0.6	0.6	0.5	0.7	0.6	0.6	0.7	0.6	0.5	0.7	0.8	0.5	0.7	0.8	0.5	0.7	0.6	0.6	0.5	0.9	0.6	24
16	0.6	S	0.6	0.6	0.6	0.7	0.7	0.9	0.6	0.6	0.7	0.6	0.5	0.7	0.6	0.6	0.7	0.6	0.6	0.7	0.8	0.6	1.0	0.5	0.5	1.0	0.7	24	
17	S	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.7	0.7	0.5	0.6	0.6	0.6	0.7	0.8	0.6	0.7	0.8	0.7	0.6	S	0.5	0.8	0.6	24	
18	0.6	0.7	0.6	0.6	0.8	0.7	0.7	0.7	P	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.6	0.7	0.5	0.7	0.7	0.6	S	0.8	0.5	0.8	0.7	23	
19	0.8	0.6	0.8	0.6	0.7	0.7	0.9	1.0	0.9	0.7	0.7	0.6	0.6	0.7	0.7	0.8	0.5	0.7	0.6	0.8	0.7	S	0.8	0.8	0.5	1.0	0.7	24	
20	0.8	0.8	0.8	0.7	0.8	0.7	0.8	0.8	0.8	0.6	0.8	0.6	0.8	0.7	0.7	0.8	0.9	0.8	0.7	0.7	S	0.6	0.5	0.6	0.5	0.9	0.7	24	
21	0.8	1.1	1.0	0.9	0.7	0.8	0.9	0.9	0.8	0.6	0.8	0.6	0.7	0.7	0.6	0.8	0.7	0.8	0.8	S	0.8	0.8	0.7	0.6	0.6	1.1	0.8	24	
22	0.7	0.7	0.8	0.6	0.6	0.8	0.8	0.7	0.6	0.8	0.7	0.7	0.6	0.7	0.8	0.7	0.7	0.8	S	0.6	0.7	0.7	0.6	0.6	0.6	0.8	0.7	24	
23	0.7	0.6	0.6	0.8	0.8	0.8	0.8	1.0	1.0	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	S	0.8	0.7	0.7	0.9	0.7	0.8	0.6	1.0	0.8	24	
24	0.6	0.8	0.6	0.8	0.8	0.7	0.8	0.8	0.6	0.7	0.8	0.8	0.7	0.6	0.6	S	0.7	0.7	0.8	0.8	0.6	0.7	0.5	0.8	0.5	0.8	0.7	24	
25	0.7	0.7	0.7	0.8	0.6	0.8	0.6	0.7	0.7	0.7	0.8	0.8	0.6	0.7	S	0.8	0.8	0.7	0.8	0.7	0.8	0.7	0.6	0.8	0.8	0.6	0.8	0.7	24
26	0.7	0.7	0.7	0.8	0.7	0.7	0.6	0.8	0.6	0.8	0.9	0.6	0.6	0.5	S	0.6	0.8	0.6	0.7	0.7	0.7	0.6	0.8	0.7	0.6	0.5	0.9	0.7	24
27	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.7	0.7	0.7	0.5	0.6	0.6	S	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.6	0.5	0.8	0.6	24	
28	0.6	0.7	0.6	0.7	0.6	0.8	0.7	0.7	0.7	0.7	0.5	0.6	S	0.8	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.6	0.5	0.8	0.7	24
29	0.7	0.6	0.7	0.5	0.6	0.7	0.7	0.7	0.6	0.8	0.8	S	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.6	0.8	0.5	0.8	0.7	24
30	0.8	0.8	0.6	0.8	0.6	0.8	0.7	0.7	0.7	0.6	S	0.7	0.8	0.7	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.6	0.6	0.9	0.7	24	
31	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	S	0.8	0.6	0.7	0.9	0.7	0.8	0.8	0.6	0.8	0.6	0.7	0.7	0.6	0.6	0.6	0.9	0.7	24	
HOURLY MAX	0.8	1.1	1.0	0.9	1.1	0.9	1.0	1.0	1.0	0.8	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	1.0	0.8				
HOURLY AVG	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6				

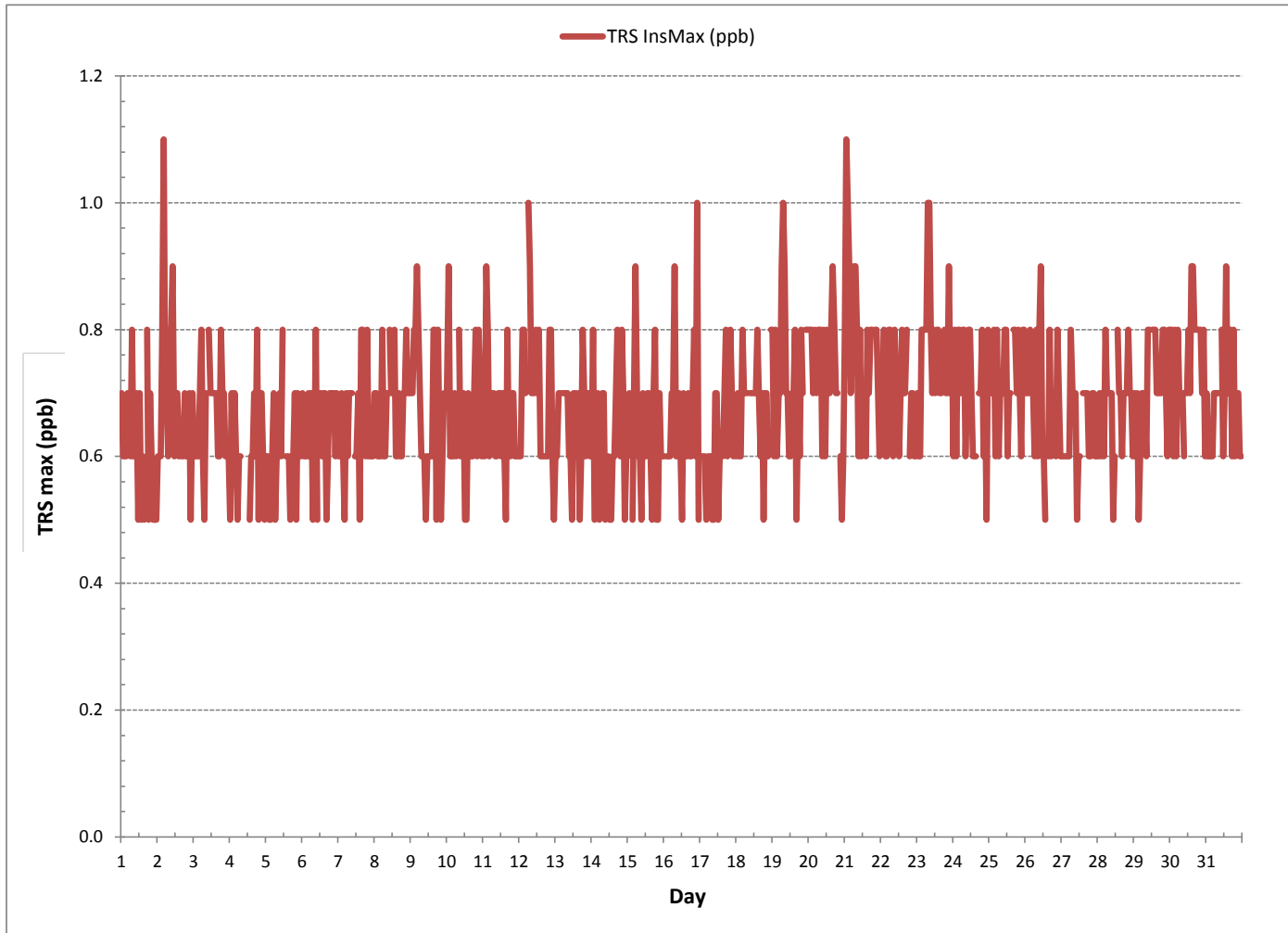
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

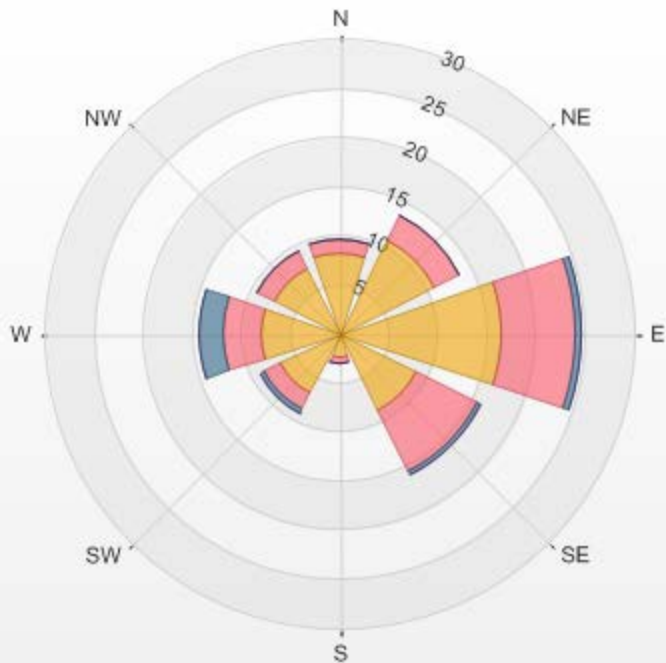
NUMBER OF NON-ZERO READINGS:	706
MAXIMUM INSTANTANEOUS VALUE:	1.1 ppb @ HOUR(S) 4, 1 ON DAY(S) 2, 21
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	742 hrs
STANDARD DEVIATION:	0.10

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



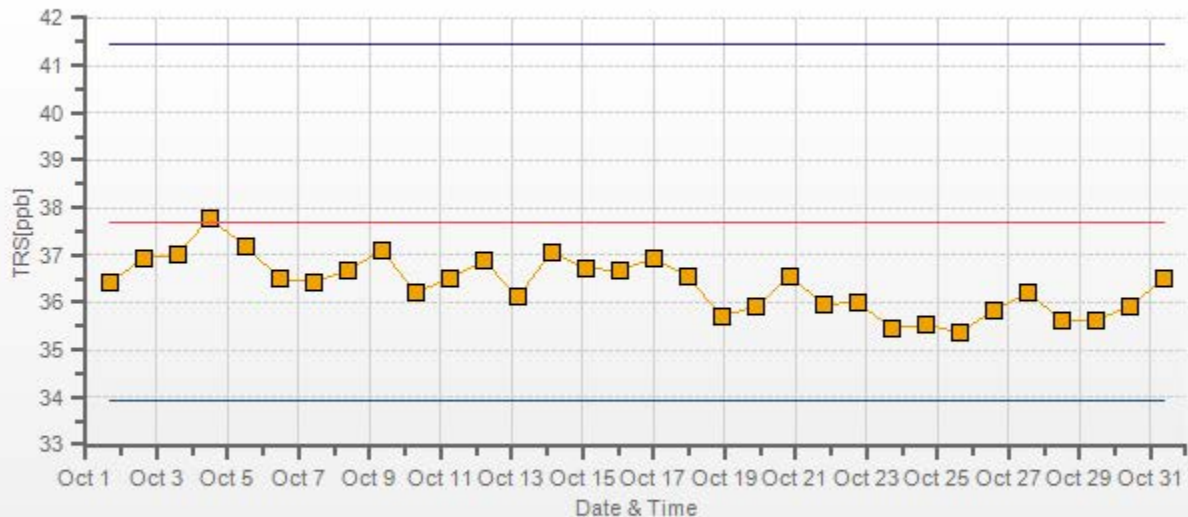
Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00 [ppb]

Direction	0-0.173	0.173-0.347	0.347-0.52	>0.5	Total
N	8.22	1.42	0	0	9.64
NE	10.76	2.83	0	0	13.59
E	16.57	7.51	0.57	0	24.65
SE	8.78	6.94	0.28	0	16
S	2.41	0.71	0	0	3.12
SW	6.8	1.84	0.42	0	9.06
W	8.07	3.82	2.55	0	14.44
NW	7.37	2.12	0	0	9.49
Summary	68.98	27.19	3.82	0	100



% Icon Classes (ppb)	69	27	4	0
0-0.173	69	27	4	0
0.173-0.347	27	4	0	0
0.347-0.52	4	0	0	0
>0.5	0	0	0	0

TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

TOTAL HYDROCARBON

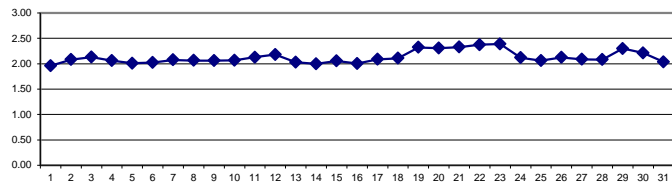
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.96	1.95	1.94	1.99	2.03	2.01	2.02	2.00	1.97	2.01	1.94	1.92	1.92	1.94	1.95	1.94	S	1.95	1.93	1.93	1.93	1.96	1.94	1.92	1.92	1.92	2.03	1.96	24
2	1.95	1.96	1.98	1.98	2.03	1.97	2.04	2.12	2.16	2.20	2.17	2.12	2.09	2.06	2.05	S	2.02	2.02	2.11	2.15	2.08	2.14	2.22	2.24	1.95	2.24	2.08	24	
3	2.23	2.20	2.46	2.52	2.47	2.11	2.11	2.18	2.05	C	C	C	C	C	2.41	1.98	1.98	1.99	2.02	2.00	1.95	1.94	1.93	1.94	1.93	2.52	2.13	24	
4	1.98	2.04	2.12	2.11	2.07	2.03	2.04	2.05	2.06	2.12	2.12	2.14	2.09	S	2.03	2.08	2.08	2.08	2.06	2.06	2.05	2.02	1.99	2.01	1.98	2.14	2.06	24	
5	1.98	1.96	1.97	1.99	2.00	2.03	2.05	2.05	2.03	2.05	2.05	1.99	S	2.00	2.00	2.00	2.01	2.03	2.04	2.01	2.00	1.99	1.98	1.97	1.96	2.05	2.01	24	
6	1.96	1.97	1.97	1.99	1.99	2.01	2.01	2.01	2.01	2.05	2.05	S	2.01	2.00	2.00	1.99	1.98	2.01	2.05	2.09	2.10	2.11	2.11	2.10	1.96	2.11	2.02	24	
7	2.12	2.14	2.16	2.15	2.15	2.16	2.12	2.16	2.10	2.07	S	2.04	2.02	1.99	1.98	1.99	2.00	2.01	2.03	2.07	2.07	2.07	2.08	2.09	1.98	2.16	2.08	24	
8	2.08	2.06	2.09	2.09	2.09	2.08	2.09	2.11	2.08	S	2.09	2.08	2.05	2.04	2.02	2.02	2.02	2.05	2.05	2.06	2.06	2.06	2.05	2.06	2.02	2.11	2.06	24	
9	2.05	2.07	2.02	2.04	2.05	2.07	2.04	2.09	S	2.06	2.01	2.01	2.01	2.03	2.04	2.05	2.04	2.05	2.06	2.08	2.08	2.15	2.13	2.14	2.01	2.15	2.06	24	
10	2.16	2.11	2.08	2.09	2.04	2.05	S	2.03	2.07	2.04	2.03	2.04	2.01	2.01	2.03	2.06	2.09	2.13	2.11	2.05	2.05	2.05	2.10	2.01	2.16	2.07	24		
11	2.09	2.07	2.10	2.09	2.17	2.20	S	2.10	2.07	2.09	2.12	2.10	2.12	2.12	2.08	2.09	2.13	2.15	2.12	2.18	2.17	2.20	2.18	2.21	2.07	2.21	2.13	24	
12	2.23	2.23	2.32	2.37	2.46	S	2.31	2.30	2.36	2.37	2.37	2.28	2.26	2.08	2.10	2.05	1.97	2.02	1.93	2.02	1.97	2.04	2.08	2.01	1.93	2.46	2.18	24	
13	2.09	1.99	2.09	2.00	S	2.04	2.01	2.06	2.01	2.13	2.01	2.06	2.11	2.01	2.12	2.04	2.00	2.01	1.98	2.04	1.92	2.04	1.98	1.97	1.92	2.13	2.03	24	
14	2.05	1.95	2.06	S	2.01	2.04	2.13	2.04	2.00	1.93	1.98	1.99	1.92	2.09	1.93	1.92	1.97	1.92	1.95	2.01	1.93	2.03	2.04	2.01	1.92	2.13	2.00	24	
15	2.06	2.06	S	2.08	1.99	2.03	2.06	2.00	2.11	2.06	2.06	2.11	2.03	2.09	2.13	2.04	2.08	2.08	2.02	2.09	2.04	1.97	2.04	2.04	1.97	2.13	2.06	24	
16	1.98	S	1.94	1.93	2.00	1.93	1.93	1.96	1.89	1.94	1.98	1.93	1.96	2.01	1.97	2.03	2.06	2.01	2.09	2.08	2.03	2.18	2.20	2.07	1.89	2.20	2.00	24	
17	S	2.09	2.00	2.06	2.07	2.03	2.11	2.06	2.09	2.16	2.06	2.09	2.13	2.08	2.13	2.14	2.10	2.08	2.13	2.06	2.04	2.09	2.09	S	2.00	2.16	2.09	24	
18	2.08	2.06	2.06	2.06	2.06	2.05	2.09	2.06	C1	C1	C1	C1	2.03	2.02	2.04	2.14	2.17	2.14	2.18	2.18	2.13	2.16	2.20	2.25	2.02	2.25	2.11	20	
19	2.37	2.42	2.49	2.47	2.31	2.23	2.41	2.53	2.32	2.43	2.27	2.11	2.10	2.08	2.08	2.20	2.25	2.24	2.31	2.37	2.47	S	2.46	2.47	2.08	2.53	2.32	24	
20	2.63	2.53	2.26	2.07	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	2.26	2.24	2.33	2.27	2.26	2.22	2.34	2.07	2.63	2.31	11	
21	2.52	2.81	2.71	2.86	2.85	2.67	2.46	2.24	2.19	2.15	2.15	2.17	2.13	2.10	2.07	2.13	2.03	2.05	2.12	S	2.15	2.22	2.33	2.42	2.03	2.86	2.33	24	
22	2.46	2.68	2.80	2.76	2.70	2.67	2.66	2.65	2.62	2.49	2.18	2.13	2.12	2.08	2.12	2.13	2.12	2.12	S	2.05	2.13	2.13	2.20	2.29	2.36	2.08	2.80	2.37	24
23	2.45	2.53	2.58	2.63	2.79	3.02	3.08	3.00	2.68	2.42	2.26	2.31	2.37	2.14	2.08	2.07	2.06	S	2.05	2.06	2.06	2.07	2.12	2.12	2.05	3.08	2.39	24	
24	2.14	2.17	2.22	2.24	2.22	2.19	2.18	2.21	2.15	2.11	2.08	2.10	2.07	2.03	2.06	2.02	S	2.04	2.05	2.07	2.09	2.11	2.11	2.08	2.02	2.24	2.12	24	
25	2.07	2.06	2.09	2.08	2.07	2.08	2.09	2.10	2.08	2.07	2.07	2.06	2.06	2.06	2.06	S	2.05	2.06	2.04	2.04	2.04	2.02	2.02	2.01	2.01	2.10	2.06	24	
26	2.05	2.06	2.11	2.26	2.18	2.11	2.14	2.12	2.11	2.14	2.10	2.06	2.06	2.06	2.07	S	2.07	2.06	2.05	2.12	2.15	2.17	2.21	2.21	2.23	2.05	2.26	2.12	24
27	2.16	2.15	2.18	2.16	2.15	2.15	2.18	2.17	2.13	2.12	2.11	2.08	2.08	S	2.02	2.02	2.00	2.02	2.03	2.01	2.02	2.03	2.03	2.03	2.00	2.18	2.09	24	
28	2.06	2.06	2.06	2.05	2.09	2.12	2.12	2.12	2.07	2.08	2.08	2.06	S	2.01	2.06	2.02	2.02	2.02	2.07	2.08	2.07	2.11	2.13	2.15	2.21	2.01	2.21	2.08	24
29	2.27	2.30	2.32	2.37	2.43	2.48	2.52	2.62	2.60	2.53	2.41	S	2.17	2.20	2.21	2.29	2.19	2.26	2.08	2.07	2.09	2.12	2.17	2.16	2.07	2.62	2.30	24	
30	2.20	2.17	2.12	2.15	2.15	2.15	2.15	2.14	2.16	2.21	S	2.24	2.35	2.37	2.36	2.37	2.39	2.31	2.30	2.22	2.14	2.08	2.07	2.05	2.05	2.39	2.21	24	
31	2.04	2.05	2.04	2.03	2.06	2.08	2.11	2.13	2.12	S	2.02	2.03	2.03	2.00	2.02	2.02	2.02	2.02	2.02	2.02	2.03	2.02	1.95	1.95	1.95	2.13	2.03	24	
HOURLY MAX	2.63	2.81	2.80	2.86	2.85	3.02	3.08	3.00	2.68	2.53	2.41	2.31	2.37	2.37	2.41	2.37	2.39	2.31	2.31	2.37	2.47	2.26	2.46	2.47					
HOURLY AVG	2.15	2.16	2.18	2.19	2.20	2.17	2.18	2.19	2.15	2.16	2.11	2.09	2.09	2.06	2.07	2.07	2.07	2.07	2.08	2.09	2.08	2.09	2.11	2.12					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

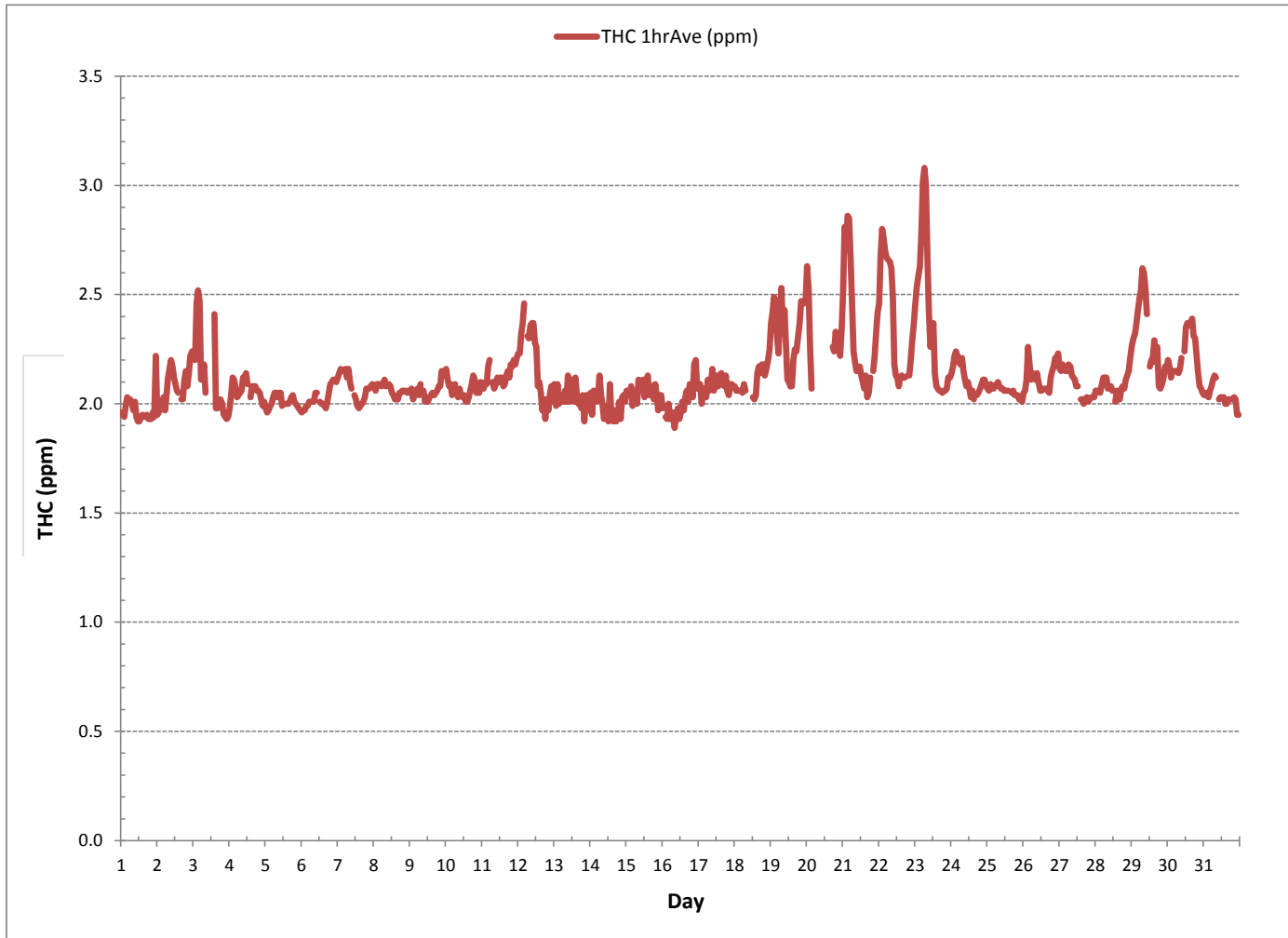
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	693			
MINIMUM 1-HR AVERAGE:	1.89 ppm	@ HOUR(S)	8	ON DAY(S) 16
MAXIMUM 1-HR AVERAGE:	3.08 ppm	@ HOUR(S)	6	ON DAY(S) 23
MAXIMUM 24-HR AVERAGE:	2.39 ppm			ON DAY(S) 23
				VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	727 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	97.7 %	
STANDARD DEVIATION:	0.17	MONTHLY AVERAGE:	2.12 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2016

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	2.01	1.91	1.91	1.96	1.99	1.98	2.14	1.98	1.98	2.24	1.92	1.89	2.05	1.98	2.14	1.98	S	1.92	1.83	1.83	1.82	1.92	1.91	1.83	1.82	2.24	1.96	24
2	1.91	1.93	1.92	1.93	1.98	1.86	1.93	2.02	2.08	2.07	2.05	1.99	1.96	1.99	2.02	S	1.98	1.93	2.14	2.11	2.11	2.17	2.26	2.38	1.86	2.38	2.03	24
3	2.24	2.42	2.79	2.67	2.56	2.27	2.21	2.39	2.18	P	C	C	C	C	C	2.11	2.11	2.14	2.24	2.14	2.11	2.04	1.99	2.01	1.99	2.79	2.26	23
4	2.05	2.11	2.26	2.25	2.16	2.11	2.08	2.13	2.14	2.22	2.30	2.30	2.19	S	2.07	2.11	2.14	2.16	2.14	2.14	2.14	2.10	2.10	2.08	2.05	2.30	2.15	24
5	2.05	2.04	2.05	2.08	2.10	2.11	2.14	2.19	2.16	2.19	2.17	2.13	S	2.11	2.14	2.16	2.16	2.17	2.20	2.19	2.19	2.17	2.17	2.17	2.04	2.20	2.14	24
6	2.17	2.17	2.19	2.20	2.22	2.26	2.26	2.26	2.45	2.67	2.29	S	2.26	2.23	2.23	2.20	2.20	2.33	2.29	2.31	2.32	2.33	2.33	2.31	2.17	2.67	2.28	24
7	2.35	2.36	2.39	2.35	2.37	2.38	2.34	2.45	2.32	2.26	S	2.23	2.20	2.25	2.17	2.51	2.20	2.23	2.23	2.26	2.26	2.28	2.28	2.30	2.17	2.51	2.30	24
8	2.30	2.28	2.33	2.33	2.34	2.34	2.34	2.41	2.35	S	2.30	2.28	2.23	2.22	2.18	2.21	2.17	2.20	2.19	2.19	2.17	2.17	2.16	2.16	2.16	2.41	2.25	24
9	2.14	2.16	2.13	2.11	2.10	2.11	2.08	2.45	S	2.13	2.18	2.24	2.07	2.08	2.11	2.11	2.14	2.14	2.17	2.21	2.23	2.29	2.32	2.32	2.07	2.45	2.17	24
10	2.34	2.32	2.28	2.35	2.32	2.29	2.34	S	2.26	2.29	2.26	2.26	2.26	2.33	2.22	2.25	2.28	2.34	2.35	2.33	2.31	2.29	2.30	2.34	2.22	2.35	2.30	24
11	2.35	2.32	2.36	2.35	2.45	2.45	S	2.38	2.33	2.32	2.42	2.32	2.48	2.32	2.25	2.39	2.31	2.40	2.30	2.39	2.37	2.34	2.34	2.36	2.25	2.48	2.36	24
12	2.38	2.36	2.45	2.56	2.66	S	2.44	2.50	2.68	2.73	2.60	2.72	2.41	2.32	2.29	2.20	2.08	2.13	2.06	2.13	2.14	2.19	2.21	2.13	2.06	2.73	2.36	24
13	2.20	2.11	2.20	2.14	S	2.42	2.11	2.16	2.26	2.26	2.11	2.14	2.14	2.04	3.12	3.99	2.04	2.02	1.99	2.04	1.94	1.99	1.99	1.94	1.94	3.99	2.23	24
14	1.99	1.91	1.99	S	1.97	1.99	2.75	2.06	1.94	1.88	1.91	1.95	1.86	2.35	1.88	1.86	1.89	1.88	2.11	1.94	1.89	1.97	1.99	2.34	1.86	2.75	2.01	24
15	1.99	2.01	S	1.99	1.95	1.97	2.01	1.95	2.06	2.08	3.25	2.06	1.99	2.06	2.09	2.00	2.08	2.06	2.01	2.09	2.06	1.95	2.06	2.03	1.95	3.25	2.08	24
16	1.97	S	1.95	1.94	1.97	1.92	1.89	1.91	1.83	1.88	1.91	1.83	1.86	1.91	1.86	1.97	1.94	1.91	2.03	1.94	1.93	2.07	2.13	1.93	1.83	2.13	1.93	24
17	S	1.94	1.86	1.92	1.94	1.92	1.99	1.97	3.28	2.34	1.97	2.00	2.03	2.14	2.06	2.07	2.08	2.03	2.07	2.01	1.99	2.06	2.06	S	1.86	3.28	2.08	24
18	2.06	2.05	2.11	2.09	2.10	2.10	2.14	2.20	P	C1	C1	C1	C1	2.25	2.19	2.41	2.34	2.32	2.34	2.32	2.31	2.37	2.43	2.45	2.05	2.45	2.24	19
19	2.68	2.68	2.79	2.78	2.55	2.52	2.75	3.77	2.71	2.76	2.78	2.44	2.45	2.40	2.64	2.55	2.60	2.62	2.71	2.76	2.96	S	2.88	2.88	2.40	3.77	2.72	24
20	3.00	2.97	2.81	2.41	X	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	2.59	2.57	2.51	2.42	2.41	2.48	2.41	3.00	2.62	10
21	3.19	3.11	2.93	3.00	3.04	2.97	2.71	2.47	2.81	2.51	2.33	2.64	2.39	2.29	2.28	2.32	2.61	2.33	2.37	S	2.48	2.48	2.57	2.63	2.28	3.19	2.63	24
22	2.79	3.11	3.13	3.06	3.00	3.99	3.03	3.03	2.88	2.82	2.55	2.73	2.32	2.26	2.32	2.33	2.39	2.36	S	2.36	2.33	2.42	2.52	2.59	2.26	3.99	2.71	24
23	2.68	2.79	2.82	2.88	3.16	3.28	3.34	3.62	3.19	2.69	2.56	3.07	2.82	2.45	2.35	2.33	2.32	S	2.31	2.31	2.33	2.33	2.42	2.37	2.31	3.62	2.71	24
24	2.42	2.42	2.48	2.48	2.47	2.45	2.48	2.45	2.50	2.37	2.37	2.35	2.37	2.29	2.37	2.37	S	2.48	2.28	2.31	2.31	2.32	2.32	2.28	2.28	2.50	2.39	24
25	2.26	2.26	2.28	2.26	2.25	2.39	2.26	2.26	2.26	2.23	2.20	2.20	2.20	2.23	2.20	S	2.17	2.20	2.17	2.17	2.17	2.16	2.19	2.19	2.16	2.39	2.22	24
26	2.30	2.30	2.30	2.44	2.44	2.28	2.30	2.34	2.32	2.33	2.35	2.47	2.40	2.28	S	2.78	2.25	2.20	2.33	2.37	2.36	2.40	2.38	2.42	2.20	2.78	2.36	24
27	2.31	2.33	2.33	2.30	2.28	2.28	2.32	2.31	2.25	2.26	2.20	2.20	2.17	S	2.14	2.14	2.11	2.14	2.28	2.14	2.16	2.17	2.17	2.21	2.11	2.33	2.23	24
28	2.21	2.22	2.23	2.23	2.31	2.31	2.33	2.35	2.26	3.37	2.31	2.29	S	2.34	2.43	2.23	2.23	2.32	2.31	2.26	2.41	2.35	2.37	2.44	2.21	3.37	2.35	24
29	2.47	2.48	2.50	2.58	2.62	2.66	2.72	2.81	2.79	2.73	2.60	S	2.35	2.57	2.41	2.45	2.40	2.44	2.33	2.20	2.26	2.38	2.33	2.28	2.20	2.81	2.49	24
30	2.44	2.33	2.21	2.26	2.25	2.21	2.21	2.20	2.31	2.40	S	2.28	2.57	2.51	2.48	2.48	2.56	2.41	2.42	2.28	2.22	2.13	2.11	2.06	2.06	2.57	2.32	24
31	2.06	2.07	2.07	2.06	2.06	2.07	2.11	2.13	2.11	S	2.17	2.34	2.17	2.17	2.20	2.03	2.21	2.06	2.09	2.10	2.09	2.26	2.03	2.03	2.03	2.34	2.12	24
HOURLY MAX	3.19	3.11	3.13	3.06	3.16	3.99	3.34	3.77	3.28	3.37	3.25	3.07	2.82	2.57	3.12	3.99	2.61	2.60	2.71	2.76	2.96	2.48	2.88	2.88				
HOURLY AVG	2.31	2.32	2.34	2.33	2.33	2.34	2.34	2.38	2.38	2.39	2.31	2.28	2.24	2.24	2.24	2.31	2.21	2.20	2.23	2.21	2.22	2.22	2.25	2.26				

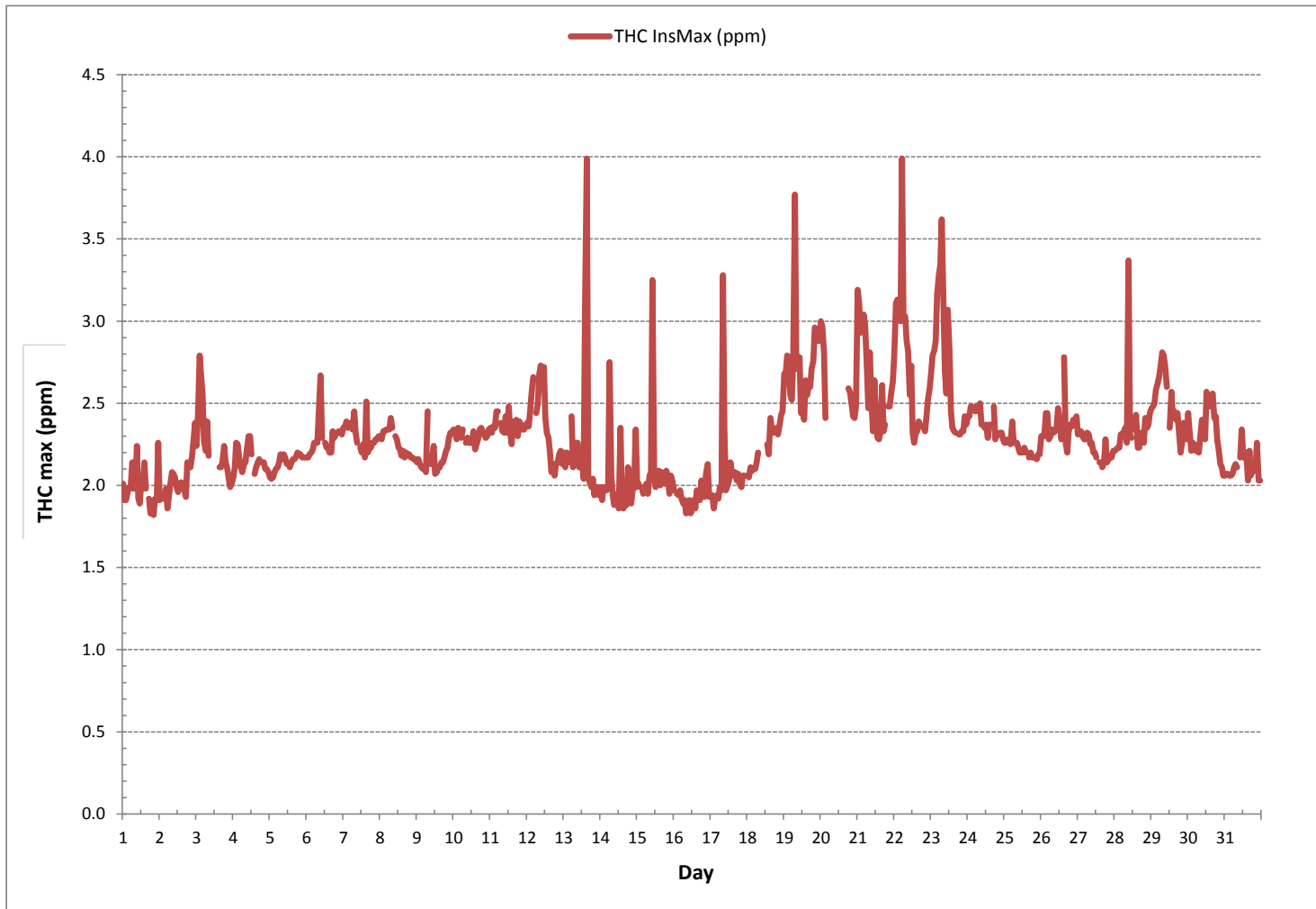
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	690
MAXIMUM INSTANTANEOUS VALUE:	3.99 ppm @ HOUR(S) 15, 5 ON DAY(S) 13, 22
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	724 hrs
STANDARD DEVIATION:	0.29

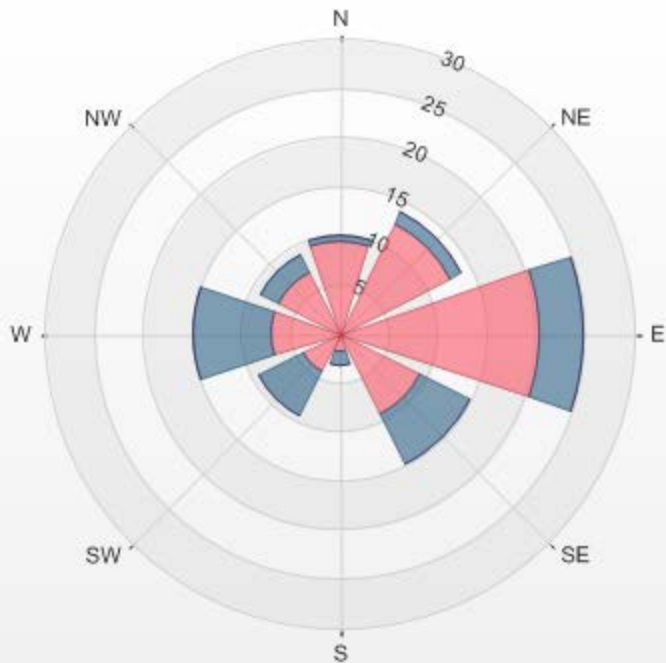
TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 92.88% Calm Avg: 0.00 [ppm]

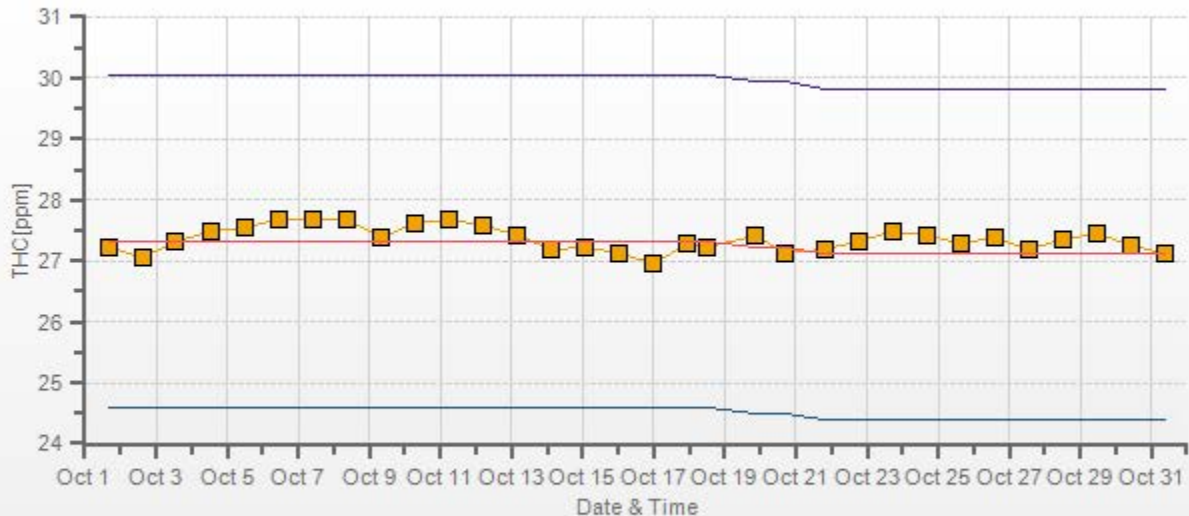
Direction	0.0-1.1	1.1-2.1	2.1-3.2	>3.2	Total
N	0	9.41	0.72	0	10.13
NE	0	12.59	1.3	0	13.89
E	0	20.41	4.34	0	24.75
SE	0	9.12	5.64	0	14.76
S	0	1.74	1.45	0	3.19
SW	0	4.2	5.07	0	9.27
W	0	6.95	7.96	0	14.91
NW	0	7.09	2.03	0	9.12
Summary	0	71.51	28.51	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2016/10/01 00:00 - 2016/10/31 23:00
 Calm: 0.00%



% Icon Classes (ppm)	
0	0.0-1.1
72	1.1-2.1
29	2.1-3.2
0	>3.2

THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

OXIDES OF NITROGEN



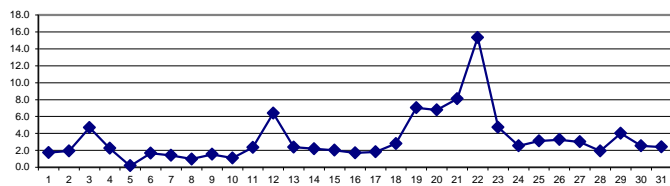
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.7	0.5	0.7	0.6	0.8	0.5	1.2	1.5	2.4	3.1	2.7	5.1	1.4	2.5	1.8	1.6	S	2.4	1.7	1.5	1.4	1.9	2.1	1.6	0.5	5.1	1.7	24	
2	1.1	0.8	0.6	1.1	1.6	1.5	1.3	1.6	1.7	1.8	1.5	1.4	1.1	1.3	1.2	S	2.1	1.5	3.5	1.8	2.4	3.5	4.9	4.9	0.6	4.9	1.9	24	
3	3.3	8.3	6.0	7.0	6.9	8.0	6.8	8.1	11.7	4.4	3.1	2.1	1.6	1.1	S	2.7	1.9	4.6	6.9	9.1	1.6	0.8	0.8	0.8	0.8	11.7	4.7	24	
4	1.3	1.6	2.1	2.2	6.1	4.2	2.6	11.0	C	C	C	C	C	S	3.1	1.2	1.1	1.1	0.8	0.6	0.4	0.4	0.5	0.2	0.2	11.0	2.3	24	
5	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.2	0.1	0.2	0.0	S	0.9	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.2	24
6	0.0	0.0	0.0	0.1	0.1	0.2	0.6	0.6	8.2	16.2	0.1	S	2.1	3.0	0.3	0.2	0.3	1.2	1.2	0.8	0.4	0.3	1.0	1.7	0.0	16.2	1.7	24	
7	1.0	0.6	0.6	1.1	0.8	1.5	1.2	3.0	2.4	1.3	S	1.5	1.9	1.6	1.7	1.9	1.7	1.1	2.4	1.8	0.8	0.5	0.6	1.1	0.5	3.0	1.4	24	
8	1.1	0.4	0.5	1.0	1.8	2.6	1.9	0.9	1.0	S	1.5	0.8	1.2	0.9	0.8	0.5	0.5	0.4	0.7	0.7	1.1	0.7	1.0	0.4	0.4	2.6	1.0	24	
9	1.1	1.4	1.0	1.0	1.5	1.3	1.6	2.1	S	2.9	1.8	2.3	0.9	1.2	0.4	0.5	0.3	0.6	0.6	0.7	1.6	2.5	3.6	4.2	0.3	4.2	1.5	24	
10	4.9	1.0	0.9	1.4	0.6	0.5	0.9	S	1.7	0.8	0.5	0.5	0.4	1.5	0.9	0.5	1.0	0.9	0.8	1.6	1.6	0.3	0.8	1.1	0.3	4.9	1.1	24	
11	0.9	0.4	2.4	3.0	2.4	3.5	S	5.3	2.0	1.9	2.6	2.3	1.8	1.6	2.3	2.1	1.6	3.3	2.5	2.6	2.2	2.4	2.3	2.6	0.4	5.3	2.3	24	
12	3.0	3.4	3.1	3.6	4.9	S	8.7	11.3	15.3	15.1	17.2	16.4	14.3	6.7	6.1	5.5	2.6	1.5	0.8	0.9	2.2	1.4	1.5	1.5	0.8	17.2	6.4	24	
13	1.5	1.5	1.9	3.2	S	4.0	1.9	2.1	1.6	1.3	1.4	2.2	4.2	4.3	5.8	3.3	3.4	2.3	2.0	1.7	1.2	1.3	1.3	1.3	1.2	5.8	2.4	24	
14	1.4	1.3	1.2	S	3.0	2.6	2.2	5.6	3.1	2.4	2.7	2.4	2.6	2.9	4.4	2.3	1.3	1.0	1.0	1.2	1.2	1.5	1.7	1.0	5.6	2.2	24		
15	1.4	3.3	S	3.4	2.3	2.4	2.1	2.3	3.8	3.0	2.8	2.1	2.2	1.6	1.2	1.3	1.4	1.0	1.0	1.7	1.0	1.6	1.7	1.6	1.0	3.8	2.0	24	
16	1.1	S	1.4	1.5	1.6	1.5	1.6	1.7	1.5	1.4	1.4	1.4	2.5	2.4	2.7	1.4	1.4	1.1	1.2	1.1	1.4	1.9	4.0	1.1	4.0	1.7	24		
17	S	3.6	1.9	1.3	2.1	1.8	1.7	2.1	1.5	1.5	1.5	2.2	2.7	2.8	2.3	1.5	1.5	1.6	1.5	1.5	1.2	0.9	S	0.9	3.6	1.8	24		
18	2.3	1.4	1.9	1.8	1.4	2.6	3.2	2.7	2.8	2.3	1.6	1.7	2.0	1.0	1.6	3.1	3.6	4.1	3.8	3.6	3.6	3.8	S	8.3	1.0	8.3	2.8	24	
19	10.0	9.6	12.6	9.5	8.6	5.7	5.7	7.4	12.1	5.1	5.1	4.2	3.8	3.9	4.1	5.5	5.5	5.5	5.9	6.7	12.6	S	6.7	6.0	3.8	12.6	7.0	24	
20	5.1	3.9	3.6	3.4	3.2	3.2	3.2	3.6	3.1	5.5	5.7	2.6	3.2	2.6	2.6	3.0	13.1	15.7	12.2	26.5	S	14.3	8.4	8.0	2.6	26.5	6.8	24	
21	7.6	9.3	13.7	16.0	15.3	11.6	8.8	6.7	7.7	6.6	6.1	7.2	4.7	4.1	4.0	4.1	3.4	10.1	7.7	S	7.6	5.0	7.4	11.7	3.4	16.0	8.1	24	
22	10.7	18.9	24.1	30.6	28.0	30.2	26.8	33.7	35.1	39.1	16.6	7.2	9.3	3.4	3.1	4.3	5.8	11.0	S	4.9	3.1	3.3	1.8	1.8	1.8	39.1	15.3	24	
23	3.5	3.4	2.6	2.4	3.5	6.5	6.2	7.1	7.1	6.4	7.4	5.6	9.2	7.0	3.6	2.8	2.5	S	4.3	4.0	3.6	2.5	4.2	3.0	2.4	9.2	4.7	24	
24	1.9	2.2	2.2	2.1	2.1	2.4	2.8	4.5	2.9	2.1	2.4	3.5	2.6	3.1	3.5	4.4	S	4.0	1.8	1.8	1.8	1.6	1.5	1.4	1.4	4.5	2.5	24	
25	1.9	1.5	1.3	1.1	1.7	2.5	2.7	4.6	3.9	4.9	3.3	4.0	3.0	2.6	4.9	S	6.9	6.1	2.9	3.5	2.9	2.4	1.9	0.9	0.9	6.9	3.1	24	
26	0.8	1.3	2.4	5.9	4.8	3.5	4.2	3.6	3.8	4.2	3.0	2.6	2.2	2.3	S	2.6	1.6	1.2	3.5	3.0	3.1	5.4	4.8	5.4	0.8	5.9	3.3	24	
27	1.7	2.0	2.8	2.8	3.5	4.3	4.0	8.2	3.1	3.3	2.6	4.4	6.0	S	3.4	3.1	2.5	2.9	2.7	1.6	1.3	1.0	0.9	1.0	0.9	8.2	3.0	24	
28	1.1	1.1	1.0	1.0	2.0	4.1	4.9	3.2	2.1	2.3	1.3	0.8	S	1.4	1.2	0.9	0.7	3.8	2.5	1.6	1.6	2.2	2.1	1.7	0.7	4.9	1.9	24	
29	1.8	2.0	2.4	3.3	4.4	5.6	4.4	4.8	4.9	5.6	5.4	S	7.3	7.4	6.5	6.1	5.4	3.9	1.6	1.6	1.5	2.2	2.7	1.6	1.5	7.4	4.0	24	
30	2.0	1.9	1.7	2.0	1.4	1.8	1.3	1.3	1.3	1.4	S	3.5	2.6	4.1	3.6	5.2	4.5	4.0	3.3	2.9	2.6	1.8	2.0	1.8	1.3	5.2	2.5	24	
31	1.8	1.8	1.4	1.7	1.8	2.0	1.9	2.0	1.8	S	2.8	3.0	2.1	3.0	2.9	3.0	3.3	3.6	3.9	3.1	2.9	2.1	1.7	1.7	1.4	3.9	2.4	24	
HOURLY MAX	10.7	18.9	24.1	30.6	28.0	30.2	26.8	33.7	35.1	39.1	17.2	16.4	14.3	7.4	6.5	6.1	13.1	15.7	12.2	26.5	12.6	14.3	8.4	11.7					
HOURLY AVG	2.5	3.0	3.3	3.8	3.9	4.1	3.9	5.1	5.2	5.2	3.7	3.3	3.5	2.8	2.8	2.6	2.8	3.4	2.8	3.1	2.3	2.3	2.4	2.8					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

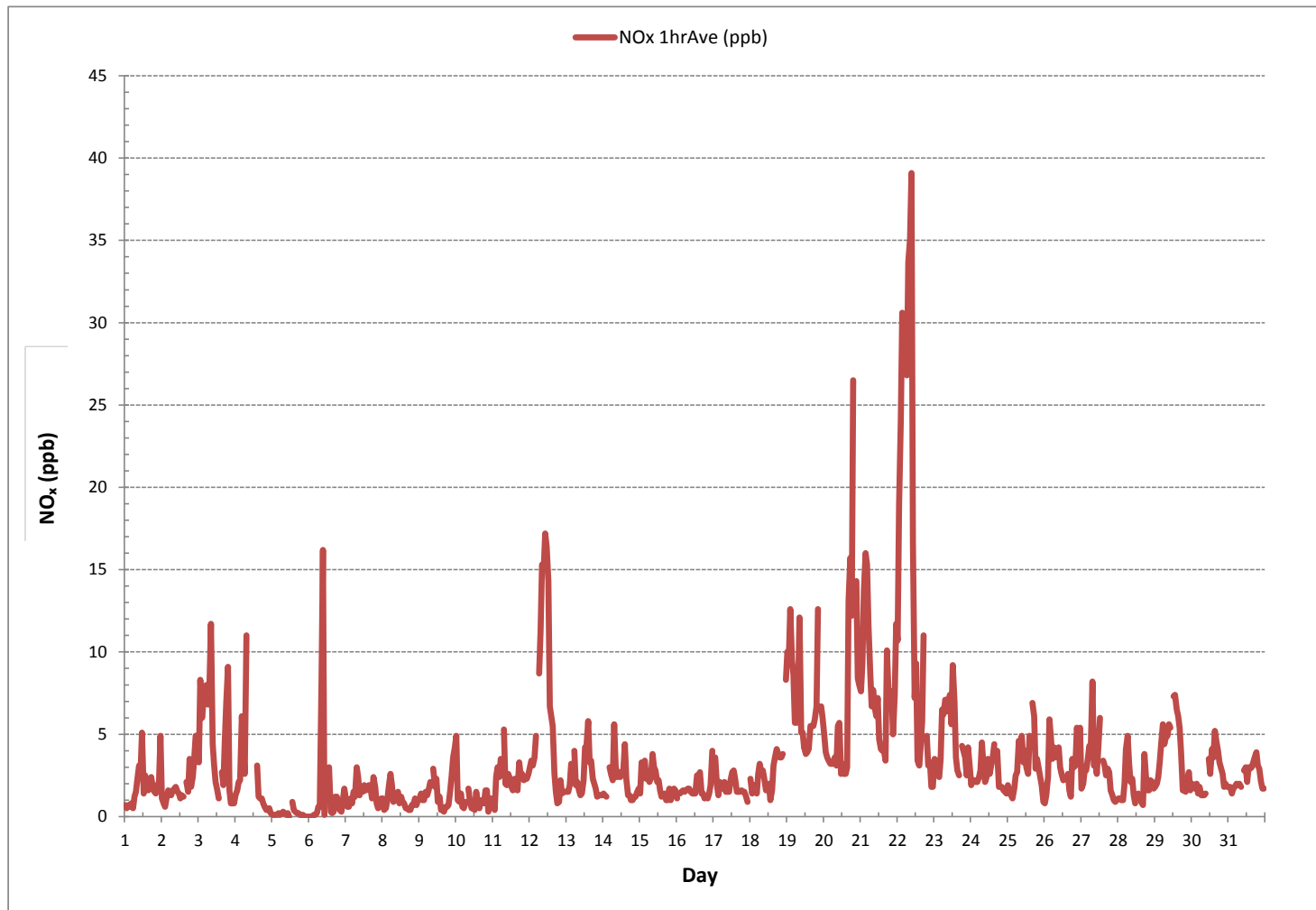
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	700			
MINIMUM 1-HR AVERAGE	0.0 ppb	@ HOUR(S)	VAR , VAR	ON DAY(S) 5 , 6
MAXIMUM 1-HR AVERAGE:	39.1 ppb	@ HOUR(S)	9	ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	15.3 ppb			ON DAY(S) 22
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	4.24	MONTHLY AVERAGE:	3.4 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2016

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	2.6	1.2	2.3	2.0	2.2	2.5	3.0	2.8	5.9	5.9	7.9	9.3	3.7	6.0	3.4	2.9	S	4.2	2.9	2.6	3.0	2.9	5.8	4.4	1.2	9.3	3.9	24
2	2.6	1.2	1.2	2.1	2.5	2.3	1.8	2.9	2.8	2.5	2.6	2.6	1.9	2.6	2.1	S	3.4	4.0	6.4	6.0	5.5	7.3	9.6	11.0	1.2	11.0	3.8	24
3	5.9	11.6	11.3	13.1	12.6	29.3	32.0	40.7	21.8	P	8.0	3.2	5.0	2.3	S	8.1	3.5	8.9	16.3	21.3	3.3	1.8	2.4	3.4	1.8	40.7	12.1	23
4	4.5	4.6	4.4	6.3	13.8	14.9	11.0	22.2	C	C	C	C	C	S	9.2	2.0	2.3	2.1	2.2	1.6	1.2	1.6	1.9	0.9	0.9	22.2	5.9	24
5	0.8	0.9	0.7	0.9	1.1	1.1	0.9	3.7	1.9	0.9	2.0	0.7	S	2.3	0.9	1.1	1.1	1.6	0.8	0.9	1.1	0.8	1.3	0.8	0.7	3.7	1.2	24
6	0.9	0.8	0.8	0.9	1.2	1.1	1.8	2.4	74.8	95.6	1.1	S	13.9	15.7	1.6	1.6	1.2	3.3	2.6	2.6	1.6	1.9	2.3	5.4	0.8	95.6	10.2	24
7	3.3	2.6	2.0	3.0	1.6	4.6	2.4	9.3	9.4	4.1	S	4.1	5.5	6.4	4.8	7.7	5.6	3.0	5.1	6.0	2.5	1.8	1.6	2.8	1.6	9.4	4.3	24
8	4.3	1.2	1.9	2.8	5.1	20.9	5.5	2.5	3.8	S	2.8	2.3	10.4	4.7	5.6	2.6	1.6	2.0	1.8	6.3	1.8	2.4	2.2	4.1	1.2	20.9	4.3	24
9	2.4	4.3	2.9	2.0	4.1	2.9	4.2	5.9	S	6.0	3.8	5.9	2.5	16.0	1.2	1.2	0.9	1.2	1.2	1.3	2.8	3.7	6.7	8.3	0.9	16.0	4.0	24
10	7.6	3.7	1.9	2.8	2.0	1.6	1.6	S	13.8	1.9	1.6	1.1	1.9	6.6	3.0	1.5	2.6	2.0	1.6	4.1	3.2	0.8	1.8	1.8	0.8	13.8	3.1	24
11	2.4	1.6	7.3	4.2	4.8	5.2	S	8.4	5.9	4.3	19.1	5.6	3.0	2.5	12.2	21.7	16.0	11.7	3.4	3.8	3.3	3.3	2.8	5.1	1.6	21.7	6.9	24
12	4.2	6.0	3.8	6.4	7.1	S	14.0	15.1	19.1	29.0	20.0	28.6	47.9	9.7	12.5	7.4	5.2	3.2	1.9	2.5	7.5	3.7	3.7	4.1	1.9	47.9	11.4	24
13	3.5	4.6	4.6	7.0	S	7.3	3.2	4.2	2.9	3.4	8.9	7.3	9.6	7.0	10.4	12.0	5.6	4.2	3.6	2.9	2.5	3.4	3.3	4.1	2.5	12.0	5.5	24
14	3.9	3.7	2.6	S	5.8	5.2	4.4	10.8	5.4	4.8	5.8	4.2	5.8	5.1	13.9	5.4	2.5	4.0	2.2	2.6	3.7	3.7	5.4	3.9	2.2	13.9	5.0	24
15	4.1	8.6	S	7.2	6.0	5.1	3.6	4.2	6.9	7.9	4.7	4.7	4.6	3.2	2.4	3.0	3.3	3.0	2.1	2.9	2.1	3.6	6.2	4.1	2.1	8.6	4.5	24
16	2.3	S	2.4	2.9	3.0	2.9	2.8	3.3	4.3	3.2	3.4	2.5	2.6	5.4	6.0	5.1	5.4	2.5	2.3	4.2	3.4	2.2	3.0	5.6	2.2	6.0	3.5	24
17	S	4.7	3.6	2.3	3.7	3.0	2.8	4.7	3.7	4.7	2.6	2.8	3.6	4.1	3.3	2.2	2.0	1.9	2.9	2.4	2.6	1.8	1.5	S	1.5	4.7	3.0	24
18	3.7	2.8	2.6	2.5	2.5	5.1	4.3	3.8	P	3.2	2.2	3.4	27.7	2.0	2.9	4.2	5.5	6.3	5.9	5.2	7.9	6.4	S	10.3	2.0	27.7	5.5	23
19	13.3	10.8	15.2	13.3	13.5	7.5	6.7	12.5	15.4	10.6	10.5	5.8	7.1	5.5	6.9	10.6	6.4	6.9	7.7	9.9	19.3	S	10.8	8.3	5.5	19.3	10.2	24
20	8.8	5.8	4.8	5.0	5.2	6.0	10.8	4.8	5.1	13.3	15.1	4.3	6.8	8.0	9.4	5.8	25.0	27.9	19.5	34.6	S	19.6	11.0	11.7	4.3	34.6	11.7	24
21	13.5	15.6	16.3	17.7	17.4	15.1	11.6	8.0	12.5	10.4	7.5	29.1	6.6	6.0	11.3	6.0	13.6	22.2	18.7	S	15.5	14.4	17.0	21.9	6.0	29.1	14.3	24
22	25.8	28.3	38.6	43.2	43.9	46.0	50.4	61.1	54.6	56.4	47.0	15.2	16.2	4.4	4.1	8.5	26.5	23.9	S	9.9	4.2	8.1	2.6	3.3	2.6	61.1	27.1	24
23	6.0	7.0	8.9	4.7	6.8	9.2	9.6	8.2	8.8	8.9	13.2	10.5	10.9	10.5	6.4	4.8	5.1	S	8.6	6.4	7.9	4.4	10.1	5.5	4.4	13.2	7.9	24
24	3.5	4.6	4.7	3.4	3.5	3.7	5.2	8.1	5.0	7.9	5.1	7.7	8.8	6.4	6.9	7.5	S	10.2	3.6	3.8	3.7	2.8	2.9	3.2	2.8	10.2	5.3	24
25	4.2	3.4	2.6	2.1	3.8	4.1	5.5	8.8	6.2	10.5	7.9	6.4	4.8	4.2	8.3	S	10.8	9.4	5.0	6.6	4.8	3.8	5.7	1.6	1.6	10.8	5.7	24
26	2.0	2.5	4.2	7.9	8.5	6.0	6.0	4.8	5.5	5.5	5.2	4.3	4.3	3.4	S	3.6	3.2	2.4	7.7	4.8	6.1	8.5	8.4	15.2	2.0	15.2	5.7	24
27	3.0	6.0	5.4	5.2	6.5	6.3	7.0	17.5	5.0	14.5	6.4	11.2	11.8	S	6.0	5.6	5.0	6.3	10.6	3.0	2.3	2.4	1.8	4.1	1.8	17.5	6.6	24
28	3.4	2.1	2.0	2.0	5.9	7.3	12.7	5.6	3.0	12.0	3.2	2.1	S	3.3	5.0	3.2	3.4	14.3	5.4	3.0	2.5	6.2	3.9	2.4	2.0	14.3	5.0	24
29	2.9	3.2	3.6	4.7	6.8	7.9	5.2	5.9	5.6	6.9	6.5	S	8.2	10.2	7.7	8.6	8.0	5.2	3.0	4.4	2.9	6.5	6.2	3.0	2.9	10.2	5.8	24
30	3.4	2.9	3.1	4.0	2.8	3.6	2.2	6.9	3.0	2.4	S	4.5	4.4	7.5	4.5	6.2	6.0	4.9	4.5	3.9	6.3	3.0	3.5	3.7	2.2	7.5	4.2	24
31	3.6	3.3	2.6	6.0	3.0	2.8	2.7	3.4	3.3	S	4.0	19.4	5.2	6.9	5.4	5.3	6.3	4.4	4.8	4.2	4.4	3.7	5.2	2.6	2.6	19.4	4.9	24
HOURLY MAX	25.8	28.3	38.6	43.2	43.9	46.0	50.4	61.1	74.8	95.6	47.0	29.1	47.9	16.0	13.9	21.7	26.5	27.9	19.5	34.6	19.3	19.6	17.0	21.9				
HOURLY AVG	5.1	5.3	5.6	6.3	6.9	8.0	7.8	10.1	11.3	12.5	8.1	7.5	8.7	6.1	6.1	5.7	6.4	6.9	5.5	5.8	4.6	4.6	5.0	5.6				

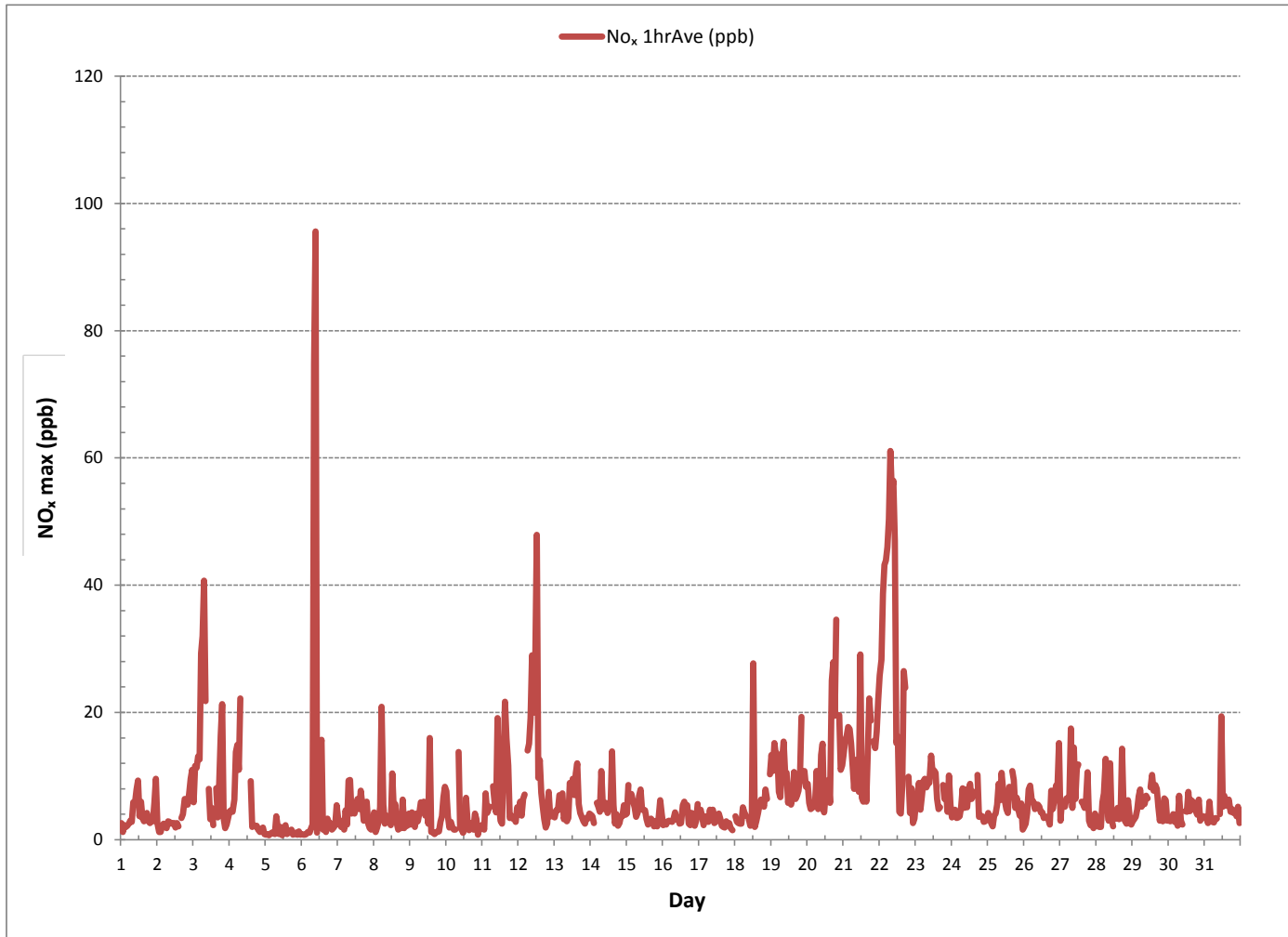
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	95.6 ppb @ HOUR(S) 9 ON DAY(S) 6
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	8.47
OPERATIONAL TIME:	742 hrs

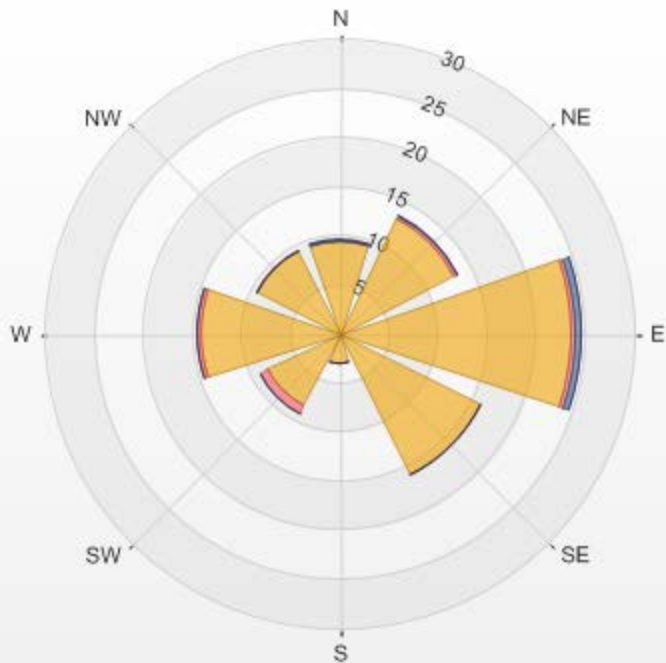
OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

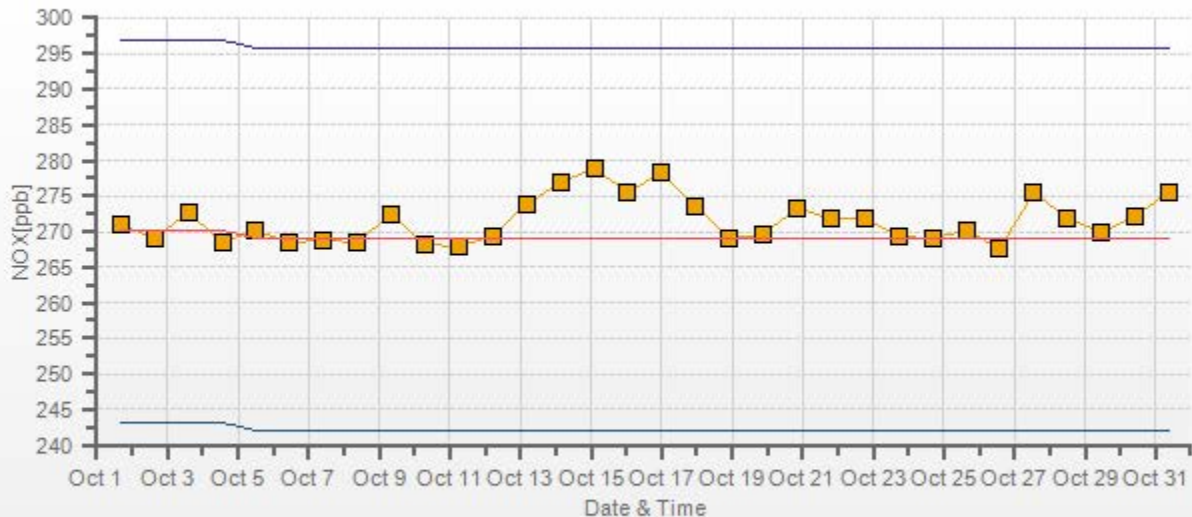
Direction	0.0-13.2	13.2-26.3	26.3-39.5	>39.5	Total
N	9.36	0.14	0.14	0	9.64
NE	13.05	0.28	0.14	0	13.47
E	23.69	0.28	0.71	0	24.68
SE	16.03	0	0	0	16.03
S	3.12	0	0	0	3.12
SW	8.23	0.85	0	0	9.08
W	14.04	0.43	0	0	14.47
NW	9.36	0	0.14	0	9.5
Summary	96.88	1.98	1.13	0	100

Calm: 0.00%



% Icon Classes (ppb)	97	2	1	0
0.0-13.2	97	2	1	0
13.2-26.3		2	1	0
26.3-39.5			1	0
>39.5				0

NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

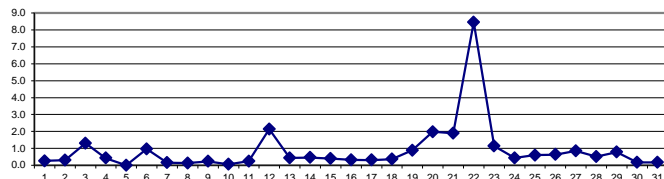
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.1	0.0	0.1	0.1	0.2	0.0	0.1	0.1	0.3	0.6	0.5	1.0	0.2	0.4	0.2	0.2	S	0.2	0.2	0.2	0.2	0.3	0.5	0.3	0.0	1.0	0.3	24	
2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.5	0.4	0.5	0.4	S	0.1	0.0	0.1	0.2	0.3	0.5	1.3	1.2	0.0	1.3	0.3	24	
3	0.9	3.6	2.4	1.4	0.6	1.9	2.6	4.7	6.2	1.7	0.7	0.4	0.3	0.1	S	0.3	0.1	0.4	0.5	0.9	0.1	0.0	0.1	0.1	0.0	6.2	1.3	24	
4	0.2	0.1	0.0	0.2	1.0	0.9	0.6	3.3	C	C	C	C	C	S	0.4	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	3.3	0.4	24	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	6.4	13.0	0.0	S	0.6	1.3	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.0	0.1	0.2	0.0	13.0	1.0	24	
7	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.5	0.2	0.2	S	0.1	0.3	0.4	0.3	0.3	0.3	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.5	0.2	24	
8	0.1	0.0	0.0	0.2	0.2	0.2	0.2	0.1	0.2	S	0.1	0.1	0.4	0.2	0.3	0.0	0.1	0.0	0.0	0.2	0.1	0.2	0.1	0.1	0.0	0.4	0.1	24	
9	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.7	S	0.6	0.5	0.7	0.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.7	0.2	24	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.2	0.1	0.1	0.1	0.1	0.5	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24	
11	0.0	0.0	0.2	0.1	0.0	0.0	S	0.3	0.2	0.4	0.8	0.7	0.4	0.3	1.2	0.5	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.2	24	
12	0.0	0.2	0.0	0.1	0.3	S	0.6	2.3	6.5	8.6	8.1	7.5	7.6	2.4	1.5	1.3	0.3	0.1	0.1	0.2	0.6	0.3	0.2	0.2	0.0	8.6	2.1	24	
13	0.3	0.3	0.3	0.3	S	0.3	0.1	0.3	0.3	0.4	0.5	0.7	1.2	1.1	1.3	0.5	0.7	0.3	0.2	0.3	0.1	0.2	0.1	0.2	0.1	1.3	0.4	24	
14	0.2	0.2	0.1	S	0.2	0.3	0.2	0.7	0.4	0.4	0.6	0.6	0.8	0.7	1.4	0.8	0.4	0.4	0.2	0.3	0.4	0.5	0.4	0.3	0.1	1.4	0.5	24	
15	0.3	0.7	S	0.4	0.3	0.4	0.3	0.3	0.7	0.8	0.8	0.7	0.9	0.5	0.3	0.3	0.2	0.1	0.1	0.2	0.1	0.3	0.3	0.3	0.1	0.9	0.4	24	
16	0.1	S	0.1	0.2	0.2	0.2	0.3	0.3	0.6	0.5	0.5	0.4	0.5	0.9	0.8	0.7	0.2	0.1	0.1	0.3	0.2	0.1	0.0	0.1	0.0	0.9	0.3	24	
17	S	0.1	0.1	0.1	0.1	0.0	0.1	0.4	0.4	0.6	0.5	0.9	1.3	0.9	0.6	0.3	0.2	0.1	0.1	0.0	0.1	0.0	0.0	S	0.0	1.3	0.3	24	
18	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.5	0.7	0.6	0.7	0.6	0.4	0.4	0.8	0.6	0.3	0.3	0.3	0.6	0.3	S	0.3	0.0	0.8	0.4	24	
19	0.5	0.3	0.4	0.1	0.3	0.2	0.2	1.1	3.3	1.8	1.9	1.5	1.3	1.1	1.0	1.2	0.7	0.2	0.2	0.2	1.9	S	0.5	0.4	0.1	3.3	0.9	24	
20	0.3	0.2	0.1	0.1	0.1	0.3	0.3	0.5	0.7	2.3	3.0	1.0	1.1	0.9	0.9	0.7	3.3	3.0	3.1	14.3	S	6.2	1.1	2.0	0.1	14.3	2.0	24	
21	1.6	0.8	1.7	3.8	3.2	1.0	0.6	1.1	2.6	2.1	1.8	2.8	2.0	1.7	1.4	1.0	0.6	1.2	1.2	S	2.2	1.4	2.9	5.0	0.6	5.0	1.9	24	
22	4.5	9.9	14.9	20.3	17.6	17.3	15.9	22.9	23.9	26.2	8.8	2.9	3.8	1.0	0.6	0.5	0.9	1.9	S	0.2	0.0	0.1	0.1	0.1	0.0	26.2	8.4	24	
23	0.7	0.9	0.4	0.3	0.2	0.2	0.4	1.0	2.3	2.4	3.2	2.5	4.7	3.0	1.1	0.5	0.3	S	0.2	0.4	0.6	0.1	0.6	0.3	0.1	4.7	1.1	24	
24	0.2	0.3	0.3	0.3	0.2	0.3	0.4	0.8	0.6	0.5	0.4	0.7	0.5	0.7	0.6	0.8	S	0.9	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.9	0.4	24	
25	0.5	0.3	0.2	0.2	0.3	0.4	0.4	0.9	0.8	1.3	0.9	1.1	0.7	0.6	1.4	S	1.4	0.9	0.4	0.5	0.2	0.2	0.2	0.0	0.0	1.4	0.6	24	
26	0.0	0.1	0.2	0.3	0.3	0.3	0.6	0.7	1.3	2.0	1.4	1.0	1.0	0.8	S	0.5	0.2	0.1	0.4	0.3	0.3	0.7	0.9	1.2	0.0	2.0	0.6	24	
27	0.1	0.3	0.3	0.3	0.6	0.7	0.8	2.4	0.9	1.3	1.0	2.1	2.8	S	0.9	1.0	0.8	0.9	0.9	0.4	0.3	0.2	0.2	0.4	0.1	2.8	0.9	24	
28	0.3	0.2	0.2	0.2	0.6	1.1	1.1	0.6	0.5	1.3	0.4	0.4	S	0.6	0.7	0.3	0.2	1.5	0.6	0.1	0.2	0.4	0.1	0.1	0.1	1.5	0.5	24	
29	0.2	0.1	0.1	0.1	0.3	0.7	0.2	0.4	1.4	1.8	1.9	S	2.7	2.9	2.2	1.4	0.9	0.3	0.0	0.1	0.0	0.3	0.1	0.0	0.0	2.9	0.8	24	
30	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	S	0.4	0.4	0.7	0.4	0.6	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.7	0.2	24	
31	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	S	0.3	0.8	0.3	0.5	0.3	0.2	0.3	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.8	0.2	24	
HOURLY MAX	4.5	9.9	14.9	20.3	17.6	17.3	15.9	22.9	23.9	26.2	8.8	7.5	7.6	3.0	2.2	1.4	3.3	3.0	3.1	14.3	2.2	6.2	2.9	5.0					
HOURLY AVG	0.4	0.6	0.8	1.0	0.9	0.9	0.9	1.6	2.1	2.6	1.4	1.2	1.3	0.9	0.7	0.5	0.5	0.5	0.3	0.7	0.3	0.4	0.4	0.5					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

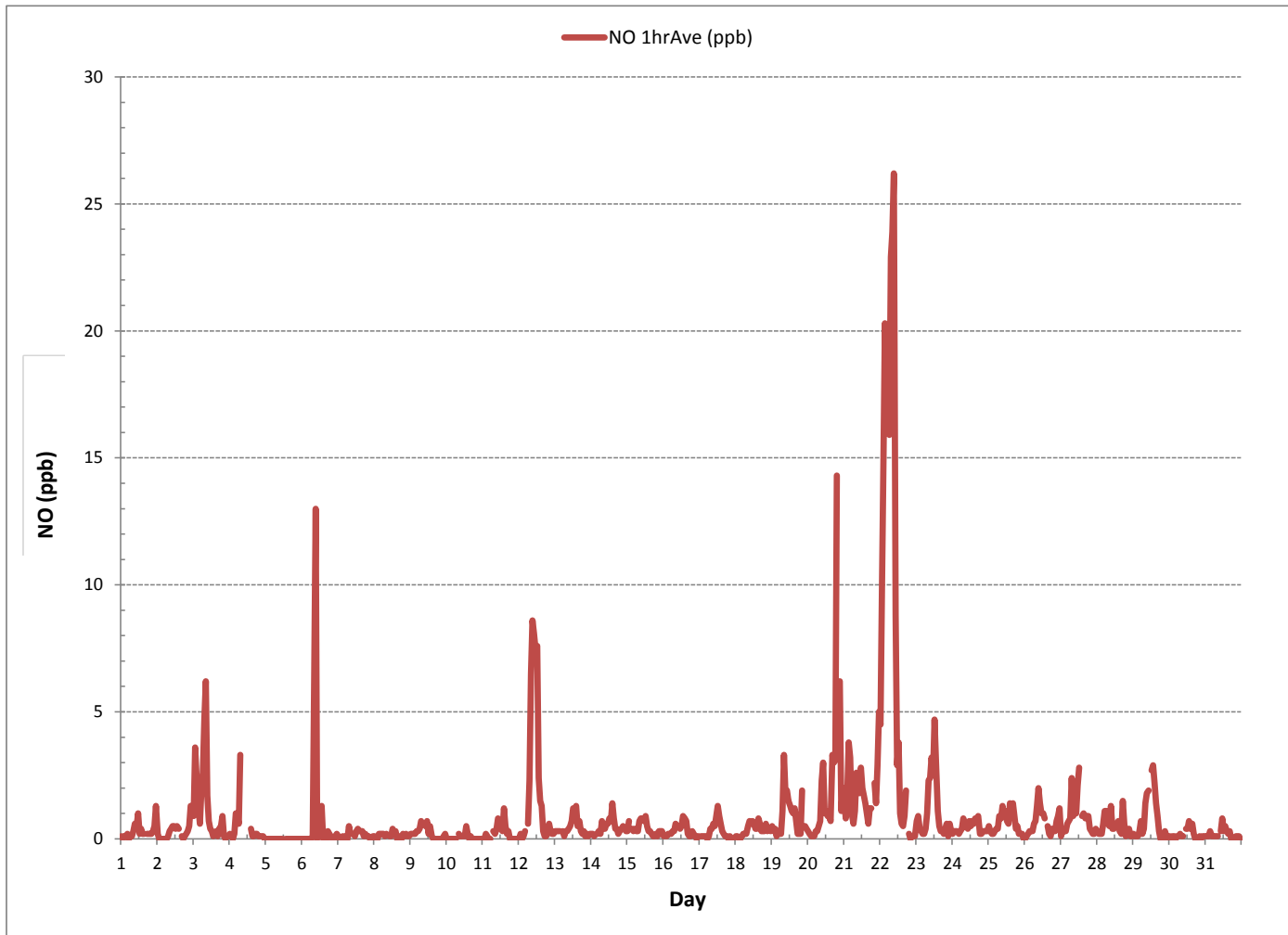
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	591				
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	26.2 ppb	@ HOUR(S)	9	ON DAY(S)	22
MAXIMUM 24-HR AVERAGE:	8.4 ppb			ON DAY(S)	22
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:		744 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:		100.0 %	
STANDARD DEVIATION:	2.45	MONTHLY AVERAGE:		0.9 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2016

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1.0	0.5	0.9	0.9	1.4	1.0	0.8	0.5	2.1	1.5	1.9	2.4	1.0	2.2	1.0	0.8	S	1.2	0.8	0.8	1.4	1.1	3.1	2.3	0.5	3.1	1.3	24
2	1.8	0.4	0.4	0.4	0.2	0.2	0.2	0.5	0.8	0.8	0.8	1.1	0.9	1.1	0.8	S	0.5	0.5	0.5	2.4	1.4	3.0	4.1	3.5	0.2	4.1	1.1	24
3	2.2	5.8	4.5	4.9	4.0	22.6	25.3	36.7	19.7	P	2.6	0.9	2.3	0.5	S	3.5	1.0	2.4	8.8	10.4	1.0	0.3	0.9	1.4	0.3	36.7	7.4	23
4	2.2	1.4	0.3	1.4	6.0	4.8	3.9	8.5	C	C	C	C	C	S	3.0	0.6	0.8	0.8	1.4	0.8	0.6	0.6	0.9	0.4	0.3	8.5	2.1	24
5	0.2	0.4	0.2	0.5	0.6	0.4	0.4	1.0	0.6	0.4	0.8	0.3	S	0.4	0.3	0.3	0.5	0.8	0.3	0.3	0.4	0.3	0.3	0.4	0.2	1.0	0.4	24
6	0.4	0.4	0.4	0.4	0.3	0.4	0.4	1.0	54.5	77.8	0.4	S	6.7	7.7	0.4	0.4	0.5	1.4	0.9	0.4	0.3	0.3	0.4	1.8	0.3	77.8	6.9	24
7	0.8	0.8	0.4	1.9	0.2	0.8	0.8	5.2	4.3	1.5	S	0.6	1.5	3.4	2.1	1.4	1.9	1.7	1.4	1.1	0.9	0.6	0.4	0.5	0.2	5.2	1.5	24
8	1.8	0.3	0.5	1.0	1.3	3.1	1.8	0.6	2.4	S	0.5	0.5	6.5	1.9	3.6	1.3	1.2	0.8	0.6	4.3	0.4	0.8	0.8	1.3	0.3	6.5	1.6	24
9	0.9	1.9	1.0	1.2	1.5	1.0	1.9	3.5	S	2.2	1.3	4.3	0.9	8.8	0.5	0.3	0.4	0.3	0.3	0.3	0.3	1.0	0.9	1.9	0.3	8.8	1.6	24
10	0.6	0.4	0.3	0.5	0.3	0.3	0.3	S	4.1	0.6	0.9	0.4	0.9	3.3	0.9	0.5	0.5	0.3	0.4	0.4	0.5	0.2	0.2	0.4	0.2	4.1	0.7	24
11	0.3	0.3	2.1	0.9	0.5	0.3	S	1.9	1.1	1.1	8.5	5.6	0.9	0.6	22.9	7.3	6.0	4.4	0.3	0.3	0.3	0.3	0.2	1.0	0.2	22.9	2.9	24
12	0.6	1.2	0.5	1.8	1.5	S	4.0	5.2	9.3	17.8	11.0	18.7	42.1	4.9	4.0	1.9	1.0	0.6	0.5	1.0	2.3	1.7	1.3	1.4	0.5	42.1	5.8	24
13	1.5	1.7	1.7	1.7	S	1.8	0.5	0.6	1.4	2.2	5.0	3.0	3.1	2.2	2.7	1.7	2.3	1.2	0.8	0.9	0.5	1.1	1.0	1.3	0.5	5.0	1.7	24
14	1.1	1.5	1.0	S	1.4	1.1	1.1	1.9	0.9	1.0	2.3	1.7	2.1	2.4	5.0	2.2	1.8	2.4	0.8	0.9	1.9	1.8	3.0	1.3	0.8	5.0	1.8	24
15	1.5	3.4	S	2.1	1.8	1.3	0.9	1.3	2.1	2.6	1.4	2.1	5.0	1.1	0.8	0.8	0.8	0.8	0.4	0.6	0.5	4.8	4.0	1.5	0.4	5.0	1.8	24
16	0.6	S	0.9	1.3	0.8	0.9	0.9	0.8	2.8	1.5	1.3	0.9	1.0	2.4	2.6	1.8	2.4	0.6	0.6	2.1	0.8	0.3	0.2	0.9	0.2	2.8	1.2	24
17	S	0.5	0.4	0.3	0.8	0.3	0.6	1.8	1.7	2.4	1.0	1.3	1.7	1.5	1.0	0.6	0.4	0.3	0.8	0.5	0.6	0.2	0.2	S	0.2	2.4	0.9	24
18	0.6	1.9	0.2	0.2	0.6	2.6	0.8	0.7	P	0.9	0.8	1.9	6.2	0.9	0.9	1.2	1.9	1.8	1.9	1.8	3.5	1.3	S	1.4	0.2	6.2	1.5	23
19	2.7	0.9	1.7	0.7	1.9	0.9	1.0	5.8	4.3	8.2	4.3	2.8	2.6	2.7	4.3	2.6	1.0	0.8	0.8	1.2	6.1	S	1.9	1.5	0.7	8.2	2.6	24
20	2.1	0.9	0.6	1.2	0.9	1.4	2.7	1.2	1.9	6.2	17.9	2.3	2.7	3.2	6.5	1.7	11.0	10.7	9.4	20.2	S	10.2	3.2	4.2	0.6	20.2	5.3	24
21	6.9	10.2	3.2	4.5	4.5	2.8	1.4	3.0	5.1	3.6	2.6	16.7	2.7	3.2	5.6	1.9	10.6	6.4	9.4	S	6.0	9.8	8.8	12.8	1.4	16.7	6.2	24
22	15.3	17.1	27.2	30.7	31.1	33.4	37.0	45.1	39.8	42.1	30.7	6.5	8.4	1.5	1.0	1.3	15.1	9.6	S	2.1	0.3	1.4	0.6	0.9	0.3	45.1	17.3	24
23	2.7	3.6	5.4	1.3	1.0	1.7	3.5	2.1	3.4	3.9	6.1	5.0	6.0	5.0	2.6	2.1	1.8	S	1.3	1.3	2.8	1.0	2.6	2.3	1.0	6.1	3.0	24
24	1.0	1.4	1.3	1.2	0.9	1.3	1.5	2.4	2.2	4.5	1.0	1.9	2.2	2.1	3.1	3.2	S	14.0	0.9	0.9	2.0	1.1	1.4	1.1	0.9	14.0	2.3	24
25	1.9	1.3	1.0	0.8	1.3	1.1	1.0	2.8	1.8	6.2	2.7	2.4	1.7	1.4	3.1	S	2.6	2.2	1.4	3.6	1.1	1.1	1.9	0.5	0.5	6.2	2.0	24
26	0.4	1.1	1.8	1.4	1.4	1.7	2.3	2.3	2.7	3.1	2.8	2.2	1.9	1.4	S	0.9	1.3	0.9	2.8	1.2	1.4	2.4	4.1	8.1	0.4	8.1	2.2	24
27	0.8	4.4	1.5	1.2	2.8	1.7	1.7	7.7	2.3	7.2	3.6	7.4	9.4	S	2.4	3.5	4.3	2.9	6.1	1.3	1.0	1.4	1.1	4.4	0.8	9.4	3.5	24
28	2.2	0.9	0.6	0.6	3.0	2.4	8.1	1.8	1.1	21.5	1.0	1.2	S	9.4	8.1	2.4	3.0	10.9	2.4	0.9	0.6	2.6	1.0	0.4	0.4	21.5	3.7	24
29	1.0	0.5	0.6	0.4	1.9	1.8	0.5	0.9	1.9	2.4	3.6	S	3.3	5.3	3.0	3.3	2.6	0.9	0.2	1.1	0.6	3.7	1.4	0.5	0.2	5.3	1.8	24
30	0.5	0.5	0.5	0.9	0.4	0.5	0.5	3.8	1.3	0.6	S	1.1	1.3	2.9	0.8	0.9	0.9	0.3	0.5	1.3	1.4	1.0	0.9	1.1	0.3	3.8	1.0	24
31	1.1	1.3	0.8	4.2	0.9	0.8	0.5	0.5	1.3	S	0.8	14.0	2.1	2.5	1.4	2.1	4.3	0.3	0.3	0.3	0.5	0.7	0.9	0.2	0.2	14.0	1.8	24
HOURLY MAX	15.3	17.1	27.2	30.7	31.1	33.4	37.0	45.1	54.5	77.8	30.7	18.7	42.1	9.4	22.9	7.3	15.1	14.0	9.4	20.2	6.1	10.2	8.8	12.8				
HOURLY AVG	1.9	2.2	2.1	2.4	2.5	3.1	3.5	5.0	6.3	8.3	4.2	3.9	4.5	3.0	3.3	1.8	2.8	2.7	1.9	2.2	1.4	1.9	1.7	2.0				

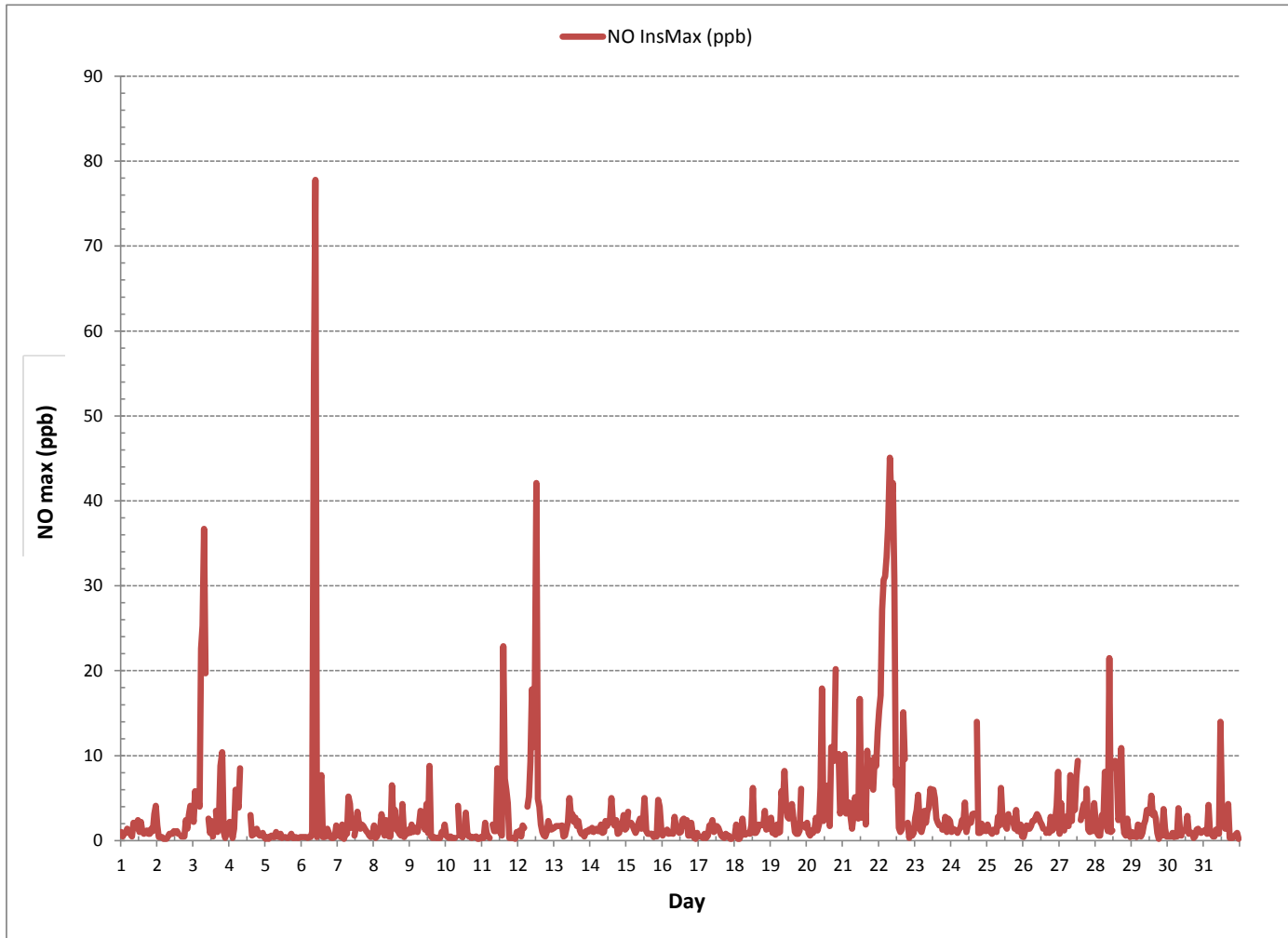
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	77.8 ppb @ HOUR(S) 9 ON DAY(S) 6
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	6.30
OPERATIONAL TIME:	742 hrs

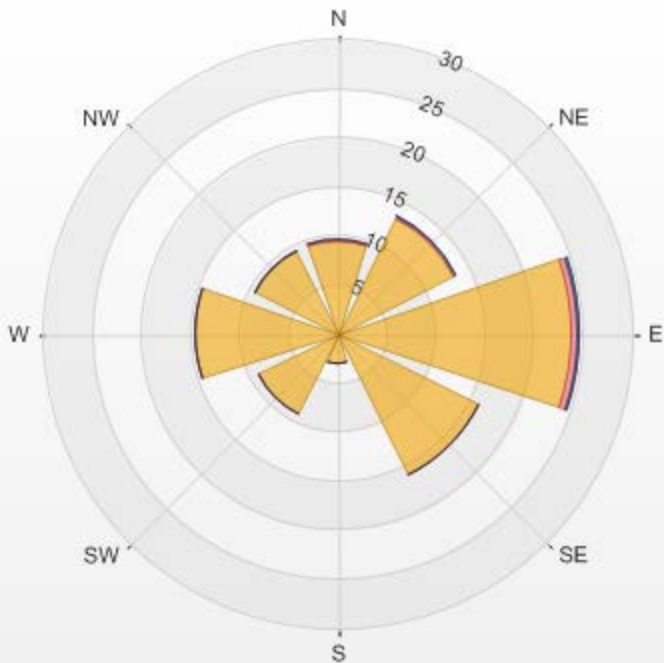
NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0.0-8.8	8.8-17.7	17.7-26.5	>26.5	Total
N	9.36	0.28	0	0	9.64
NE	13.19	0.14	0.14	0	13.47
E	23.83	0.57	0.28	0	24.68
SE	16.03	0	0	0	16.03
S	3.12	0	0	0	3.12
SW	9.08	0	0	0	9.08
W	14.47	0	0	0	14.47
NW	9.36	0	0.14	0	9.5
Summary	98.44	0.99	0.56	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2016/10/01 00:00 - 2016/10/31 23:00 Calm: 0.00%



%	Icon	Classes (ppb)	Count	Icon	Classes (ppb)	Count	Icon	Classes (ppb)	Count	Icon	Classes (ppb)
98		0.0-8.8	1		8.8-17.7	1		17.7-26.5	0		>26.5

NITROGEN DIOXIDE



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.6	0.5	0.6	0.6	0.6	0.5	1.0	1.3	2.0	2.5	2.2	4.1	1.2	2.1	1.6	1.4	S	2.2	1.5	1.3	1.2	1.5	1.6	1.3	0.5	4.1	1.5	24	
2	0.9	0.7	0.6	1.0	1.6	1.5	1.3	1.5	1.4	1.4	1.0	0.9	0.7	0.8	0.9	S	2.0	1.5	3.4	1.6	2.1	3.0	3.6	3.8	0.6	3.8	1.6	24	
3	2.5	4.7	3.7	5.6	6.3	6.1	4.2	3.4	5.5	2.8	2.3	1.7	1.4	1.0	S	2.4	1.8	4.3	6.3	8.1	1.5	0.8	0.7	0.7	0.7	8.1	3.4	24	
4	1.1	1.5	2.0	2.0	5.1	3.3	2.1	7.7	C	C	C	C	C	S	2.7	1.0	1.0	0.9	0.6	0.5	0.4	0.3	0.3	0.2	0.2	7.7	1.8	24	
5	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.0	S	0.9	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.2	24
6	0.0	0.0	0.0	0.1	0.1	0.2	0.6	0.5	1.8	3.2	0.1	S	1.5	1.7	0.3	0.2	0.2	1.0	1.0	0.7	0.4	0.3	1.0	1.6	0.0	3.2	0.7	24	
7	0.9	0.6	0.5	1.0	0.8	1.4	1.2	2.5	2.2	1.1	S	1.4	1.6	1.2	1.4	1.6	1.4	0.9	2.2	1.6	0.7	0.5	0.6	1.0	0.5	2.5	1.2	24	
8	1.0	0.4	0.4	0.9	1.6	2.3	1.7	0.8	0.9	S	1.4	0.7	0.8	0.7	0.6	0.4	0.4	0.4	0.3	0.5	0.7	1.0	0.6	0.8	0.3	2.3	0.8	24	
9	0.9	1.1	0.8	0.7	1.1	1.0	1.2	1.4	S	2.3	1.3	1.7	0.8	0.8	0.3	0.4	0.3	0.6	0.6	0.7	1.6	2.5	3.5	4.0	0.3	4.0	1.3	24	
10	4.9	1.0	0.9	1.4	0.6	0.5	0.9	S	1.4	0.7	0.5	0.4	0.3	1.0	0.7	0.4	0.9	0.9	0.8	1.6	1.6	0.3	0.8	1.1	0.3	4.9	1.0	24	
11	0.9	0.4	2.2	2.9	2.4	3.4	S	4.9	1.8	1.5	1.8	1.6	1.5	1.3	1.1	1.6	1.4	3.0	2.5	2.6	2.2	2.4	2.3	2.6	0.4	4.9	2.1	24	
12	3.0	3.2	3.1	3.5	4.6	S	8.2	9.0	8.9	6.5	9.1	8.9	6.8	4.3	4.5	4.2	2.3	1.3	0.7	0.7	1.6	1.1	1.3	1.4	0.7	9.1	4.3	24	
13	1.2	1.2	1.6	2.9	S	3.7	1.8	1.9	1.3	0.9	0.9	1.5	3.0	3.2	4.4	2.8	2.7	2.0	1.8	1.4	1.1	1.1	1.2	1.2	0.9	4.4	1.9	24	
14	1.2	1.1	1.1	S	2.8	2.3	2.0	5.0	2.7	2.0	2.0	1.8	1.8	2.3	3.0	1.5	0.9	0.9	0.7	0.7	0.8	0.7	1.1	1.3	0.7	5.0	1.7	24	
15	1.1	2.6	S	3.0	2.0	2.1	1.8	2.0	3.0	2.2	2.1	1.4	1.3	1.0	0.9	1.0	1.2	0.9	0.9	1.5	0.9	1.2	1.4	1.3	0.9	3.0	1.6	24	
16	0.9	S	1.3	1.2	1.3	1.3	1.3	1.4	1.1	1.0	0.8	1.0	0.9	1.6	1.7	1.9	1.1	1.4	1.0	0.9	1.0	1.3	1.9	3.9	0.8	3.9	1.4	24	
17	S	3.5	1.8	1.3	2.0	1.8	1.6	1.7	1.1	0.9	0.9	1.3	1.4	1.8	1.8	1.2	1.3	1.4	1.6	1.5	1.4	1.1	0.8	S	0.8	3.5	1.5	24	
18	2.3	1.2	1.8	1.8	1.3	2.4	3.0	2.6	2.3	1.7	1.0	1.0	1.4	0.7	1.1	2.3	3.0	3.8	3.6	3.3	3.1	3.6	S	8.0	0.7	8.0	2.4	24	
19	9.5	9.3	12.2	9.3	8.3	5.5	5.5	6.3	8.8	3.3	3.2	2.7	2.5	2.8	3.1	4.3	4.8	5.3	5.7	6.4	10.7	S	6.2	5.5	2.5	12.2	6.1	24	
20	4.8	3.7	3.4	3.2	3.1	2.9	2.9	3.0	2.4	3.2	2.7	1.6	2.1	1.7	1.7	2.3	9.7	12.7	9.0	12.2	S	8.1	7.4	6.0	1.6	12.7	4.8	24	
21	5.9	8.5	12.0	12.2	12.2	10.6	8.2	5.6	5.1	4.5	4.3	4.4	2.7	2.4	2.6	3.2	2.8	8.9	6.5	S	5.4	3.6	4.5	6.7	2.4	12.2	6.2	24	
22	6.2	9.0	9.1	10.3	10.4	13.0	10.8	10.8	11.2	12.9	7.8	4.3	5.5	2.4	2.5	3.7	5.0	9.1	S	4.7	3.1	3.2	1.7	1.7	1.7	13.0	6.9	24	
23	2.8	2.5	2.2	2.1	3.4	6.3	5.9	6.2	4.8	3.9	4.2	3.1	4.6	4.0	2.5	2.3	2.1	S	4.1	3.5	3.0	2.3	3.6	2.8	2.1	6.3	3.6	24	
24	1.7	1.9	1.9	1.8	1.9	2.1	2.4	3.7	2.3	1.6	2.0	2.8	2.1	2.4	2.9	3.6	S	3.1	1.7	1.6	1.5	1.3	1.2	1.2	1.2	3.7	2.1	24	
25	1.5	1.2	1.1	1.0	1.5	2.1	2.3	3.7	3.1	3.6	2.4	2.9	2.3	2.0	3.5	S	5.5	5.2	2.5	3.0	2.6	2.2	1.6	0.9	0.9	5.5	2.5	24	
26	0.8	1.2	2.2	5.5	4.5	3.2	3.6	2.9	2.6	2.1	1.6	1.6	1.2	1.5	S	2.2	1.4	1.2	3.1	2.7	2.8	4.6	3.9	4.2	0.8	5.5	2.6	24	
27	1.7	1.7	2.6	2.5	2.9	3.6	3.2	5.8	2.2	2.0	1.5	2.2	3.1	S	2.5	2.0	1.7	2.0	1.8	1.2	1.0	0.8	0.7	0.6	0.6	5.8	2.1	24	
28	0.8	0.9	0.8	0.8	1.4	3.0	3.8	2.6	1.6	0.9	0.8	0.4	S	0.8	0.5	0.6	0.5	2.4	1.9	1.5	1.4	1.8	1.9	1.6	0.4	3.8	1.4	24	
29	1.6	1.9	2.3	3.2	4.1	4.9	4.2	4.4	3.5	3.8	3.5	S	4.6	4.4	4.3	4.8	4.5	3.7	1.6	1.6	1.5	2.0	2.6	1.6	1.5	4.9	3.2	24	
30	1.9	1.8	1.6	1.9	1.4	1.7	1.3	1.2	1.2	1.3	S	3.0	2.2	3.3	3.2	4.7	4.3	3.9	3.3	2.9	2.5	1.8	1.9	1.7	1.2	4.7	2.3	24	
31	1.7	1.7	1.3	1.4	1.7	1.9	1.9	2.0	1.7	S	2.5	2.2	1.8	2.5	2.6	2.8	2.9	3.5	3.9	3.0	2.8	2.0	1.6	1.7	1.3	3.9	2.2	24	
HOURLY MAX	9.5	9.3	12.2	12.2	12.2	13.0	10.8	10.8	11.2	12.9	9.1	8.9	6.8	4.4	4.5	4.8	9.7	12.7	9.0	12.2	10.7	8.1	7.4	8.0					
HOURLY AVG	2.1	2.3	2.5	2.8	3.0	3.2	3.0	3.5	3.0	2.6	2.3	2.2	2.2	2.0	2.0	2.1	2.3	3.0	2.5	2.5	2.0	1.9	2.1	2.3					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

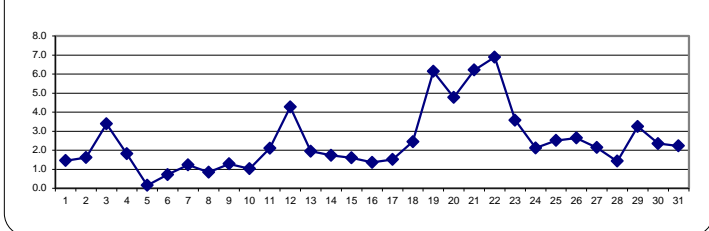
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

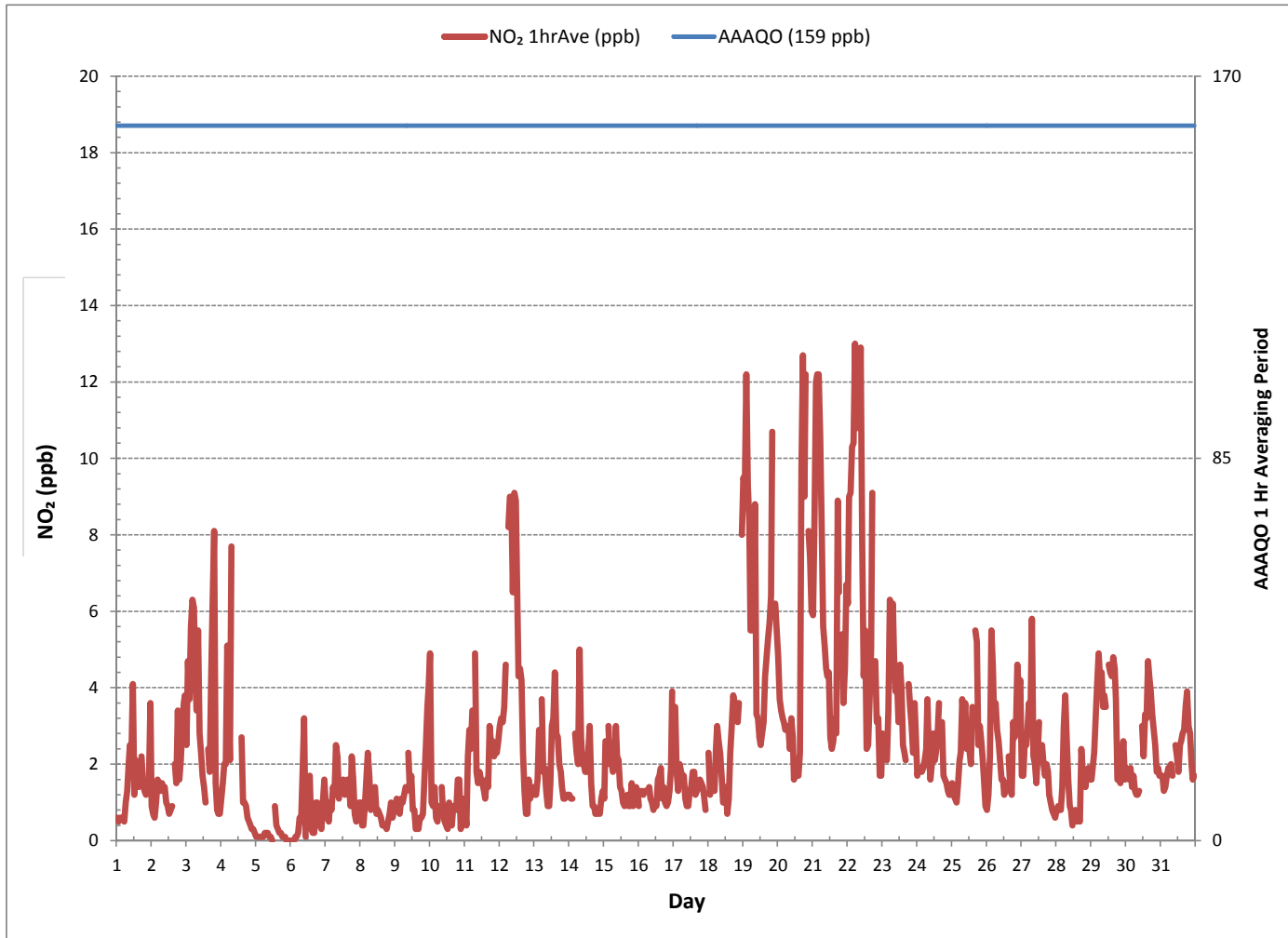
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	700			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR , VAR	ON DAY(S) 5 , 6
MAXIMUM 1-HR AVERAGE:	13.0 ppb	@ HOUR(S)	5	ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	6.9 ppb			ON DAY(S) 22
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	2.28	MONTHLY AVERAGE:	2.5 ppb	

24 HOUR AVERAGES FOR October 2016



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2016

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	1.8	0.7	1.4	1.1	1.2	1.4	2.2	2.3	3.9	4.5	6.0	7.6	2.7	3.8	2.4	2.0	S	3.8	2.2	1.9	1.7	1.9	2.8	2.3	0.7	7.6	2.7	24
2	1.4	0.9	0.9	1.8	2.3	2.0	1.5	2.3	2.0	1.8	1.8	1.8	1.1	1.5	1.2	S	2.8	3.7	5.9	4.5	4.1	4.5	5.7	8.5	0.9	8.5	2.8	24
3	3.7	6.5	7.1	8.5	8.9	13.7	6.5	5.5	7.8	P	5.3	2.2	2.8	1.8	S	6.6	2.8	7.8	12.5	15.3	2.5	1.4	1.4	1.9	1.4	15.3	6.0	23
4	2.3	3.5	4.1	5.7	9.8	10.2	7.4	13.6	C	C	C	C	C	S	7.7	1.8	1.6	1.6	1.2	1.0	0.8	1.0	1.1	0.6	0.6	13.6	4.2	24
5	0.6	0.5	0.3	0.5	0.7	0.7	0.6	3.2	1.1	0.6	1.1	0.4	S	2.0	0.8	0.7	0.6	1.0	0.6	0.7	0.6	0.5	1.0	0.4	0.3	3.2	0.8	24
6	0.5	0.4	0.5	0.6	0.9	0.7	1.5	1.6	29.7	29.9	0.6	S	7.3	8.2	1.1	1.2	0.8	2.3	2.0	2.2	1.2	1.5	2.0	3.5	0.4	29.9	4.4	24
7	2.4	1.9	1.6	2.2	1.4	4.0	2.2	6.2	8.5	3.2	S	3.3	4.3	3.1	3.1	6.3	3.6	2.4	3.9	4.8	1.6	1.3	1.2	2.5	1.2	8.5	3.3	24
8	2.5	1.0	1.2	2.2	4.0	17.9	3.6	1.8	1.9	S	2.5	1.8	3.9	2.8	3.6	1.2	1.0	1.1	1.2	2.0	1.5	1.6	1.4	2.7	1.0	17.9	2.8	24
9	1.8	2.4	1.9	1.5	2.5	2.2	2.4	2.7	S	3.9	2.4	3.9	1.6	7.2	0.8	0.9	0.7	1.0	1.0	1.1	2.5	3.5	6.0	6.3	0.7	7.2	2.6	24
10	7.0	3.2	1.6	2.2	1.9	1.2	1.4	S	9.7	1.1	0.7	0.7	1.1	3.5	2.0	1.0	2.2	1.8	1.4	3.6	2.5	0.7	1.4	1.5	0.7	9.7	2.3	24
11	2.3	1.2	5.3	3.8	4.4	5.2	S	6.9	4.8	3.3	10.6	3.5	2.2	1.9	3.8	14.4	9.8	7.2	3.3	3.6	2.9	2.9	2.7	4.0	1.2	14.4	4.8	24
12	3.9	4.8	3.5	5.2	6.0	S	11.1	10.6	10.5	11.0	11.0	15.0	23.0	5.7	8.6	5.6	4.1	2.4	1.2	1.8	5.7	2.2	2.4	2.8	1.2	23.0	6.9	24
13	2.2	2.8	3.1	5.5	S	6.3	2.5	3.5	2.2	1.8	4.9	4.9	6.5	5.1	7.7	10.7	4.3	3.6	2.7	2.2	1.9	2.2	2.4	2.8	1.8	10.7	4.0	24
14	2.7	2.7	1.9	S	4.4	4.0	3.7	9.7	4.5	4.0	4.7	3.1	3.6	3.9	9.0	3.3	1.8	1.5	1.5	1.7	1.8	2.0	3.1	2.8	1.5	9.7	3.5	24
15	3.1	5.2	S	5.3	4.6	3.9	2.9	3.3	5.2	5.3	3.5	2.7	2.8	2.0	1.6	2.3	2.4	2.3	1.8	2.3	1.6	2.5	2.8	2.5	1.6	5.3	3.1	24
16	1.6	S	2.0	2.2	2.5	2.0	2.0	2.4	2.2	2.0	2.0	1.6	1.5	3.5	3.3	3.3	3.1	2.2	2.2	2.3	3.1	1.9	2.9	5.3	1.5	5.3	2.5	24
17	S	4.6	3.2	2.0	3.3	2.7	2.3	3.1	2.3	2.3	1.5	1.6	1.9	2.7	2.3	1.5	1.6	1.8	2.0	1.9	2.2	1.5	1.4	S	1.4	4.6	2.3	24
18	3.6	1.9	2.4	2.3	2.2	3.5	3.9	3.1	P	2.3	1.4	1.9	22.4	1.1	1.8	3.1	4.0	5.5	4.7	4.1	5.2	5.6	S	9.0	1.1	22.4	4.3	23
19	11.5	10.6	14.6	13.0	11.7	6.6	6.4	8.4	11.0	5.2	6.8	3.5	4.5	3.7	4.1	8.1	5.6	6.3	7.1	8.8	13.4	S	8.9	7.0	3.5	14.6	8.1	24
20	6.8	4.9	4.1	4.0	4.4	4.6	8.0	3.8	3.2	7.0	10.6	2.2	4.5	4.8	5.9	4.1	15.0	17.5	13.1	15.3	S	10.1	9.0	7.7	2.2	17.5	7.4	24
21	9.3	11.7	13.4	13.0	13.1	12.5	10.2	6.6	7.3	6.6	5.1	12.3	4.0	3.5	5.6	4.1	5.3	16.2	11.0	S	9.4	9.2	8.2	9.2	3.5	16.2	9.0	24
22	10.5	11.9	11.4	13.0	15.2	14.9	13.6	16.7	14.4	16.6	16.2	8.7	8.2	2.9	3.1	7.2	11.5	14.5	S	7.7	3.9	7.1	2.2	2.4	2.2	16.7	10.2	24
23	4.0	3.6	3.5	3.3	6.1	7.4	7.0	7.8	5.7	5.2	7.2	5.3	5.7	3.3	5.8	2.8	S	7.4	5.2	5.7	3.5	7.6	4.0	2.8	7.8	5.3	24	
24	2.5	3.2	3.7	2.5	3.1	2.9	4.0	6.2	3.5	4.8	4.1	6.0	6.8	4.3	5.7	6.0	S	8.4	2.8	2.8	2.3	1.8	2.0	2.4	1.8	8.4	4.0	24
25	2.7	2.5	1.8	1.2	2.5	2.9	4.5	6.6	4.7	7.3	5.2	4.5	3.5	2.8	5.3	S	8.2	7.7	3.5	3.8	3.7	2.8	3.8	1.1	1.1	8.2	4.0	24
26	1.8	2.2	3.7	6.9	7.6	4.5	4.2	3.5	3.3	2.8	2.4	2.4	2.3	2.0	S	2.7	2.0	1.6	4.8	3.8	4.9	7.2	6.3	7.3	1.6	7.6	3.9	24
27	2.3	4.5	4.1	4.3	4.6	4.7	5.3	9.8	3.2	7.4	3.3	5.2	5.3	S	3.6	3.8	2.9	3.6	4.5	1.9	1.4	1.2	1.1	1.2	1.1	9.8	3.9	24
28	1.5	1.2	1.4	1.4	3.7	4.8	5.2	3.9	2.0	2.0	2.2	1.0	S	2.0	1.8	1.1	1.5	5.7	2.9	2.0	1.9	3.5	2.8	1.9	1.0	5.7	2.5	24
29	1.9	2.6	2.7	4.4	4.8	6.0	4.8	5.2	4.1	4.5	4.1	S	5.6	6.4	4.9	6.0	5.7	4.4	2.7	3.3	2.2	3.9	4.7	2.4	1.9	6.4	4.2	24
30	2.8	2.4	2.6	3.0	2.4	3.0	1.8	3.3	1.7	1.8	S	3.6	3.8	4.6	3.8	5.4	5.2	4.6	4.0	3.3	5.2	2.1	2.6	2.7	1.7	5.4	3.3	24
31	2.6	2.1	2.0	4.2	2.3	2.3	2.3	2.9	2.2	S	3.4	7.9	3.1	5.1	3.9	3.8	4.0	4.0	4.5	4.2	3.8	3.0	4.3	2.3	2.0	7.9	3.5	24
HOURLY MAX	11.5	11.9	14.6	13.0	15.2	17.9	13.6	16.7	29.7	29.9	16.2	15.0	23.0	8.2	9.0	14.4	15.0	17.5	13.1	15.3	13.4	10.1	9.0	9.2				
HOURLY AVG	3.5	3.6	3.7	4.2	4.8	5.3	4.5	5.6	5.8	5.5	4.7	4.2	5.2	3.7	3.9	4.2	4.1	4.9	4.0	4.0	3.4	3.1	3.5	3.7				

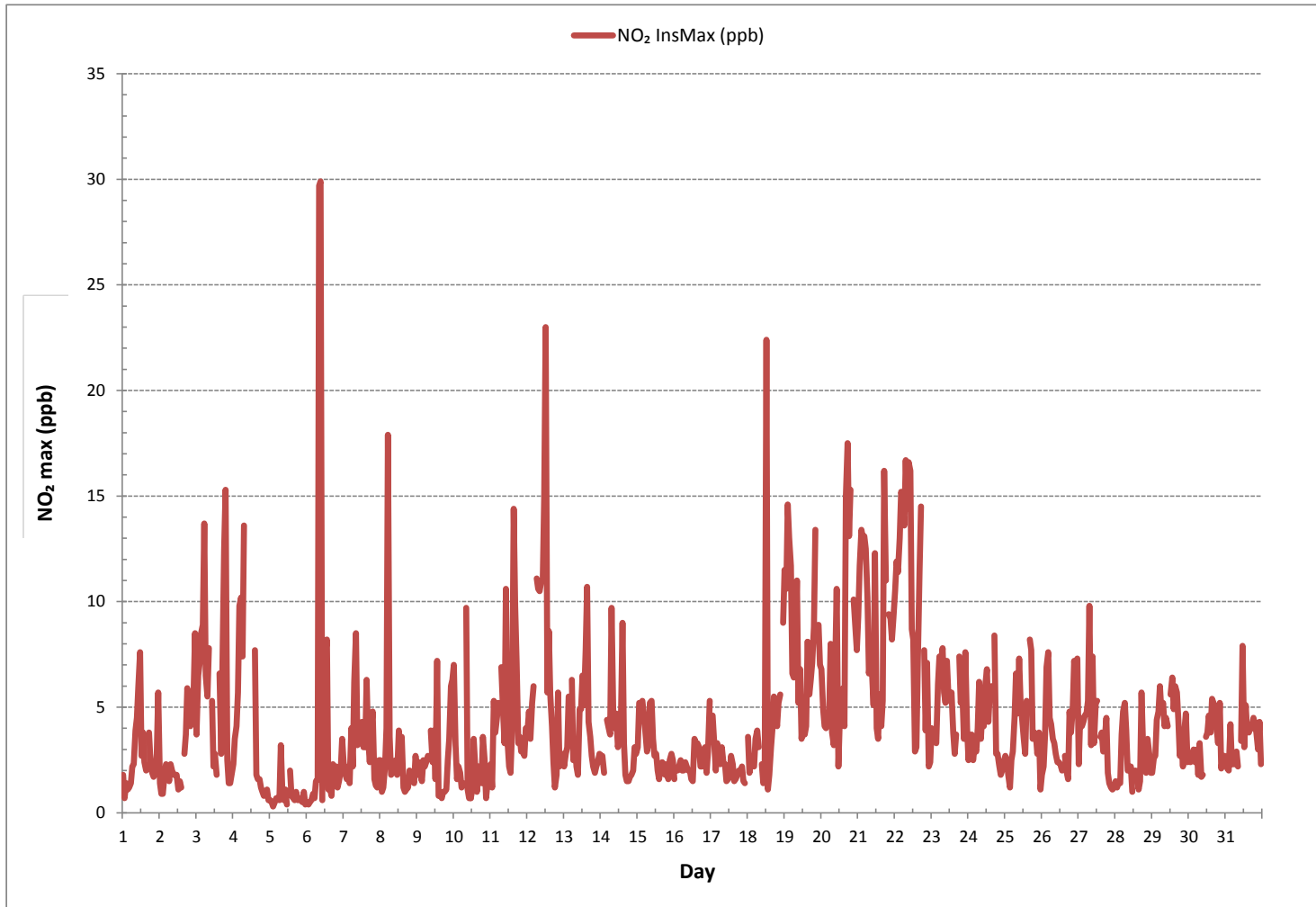
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	29.9 ppb @ HOUR(S) 9 ON DAY(S) 6
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	3.63
OPERATIONAL TIME:	742 hrs

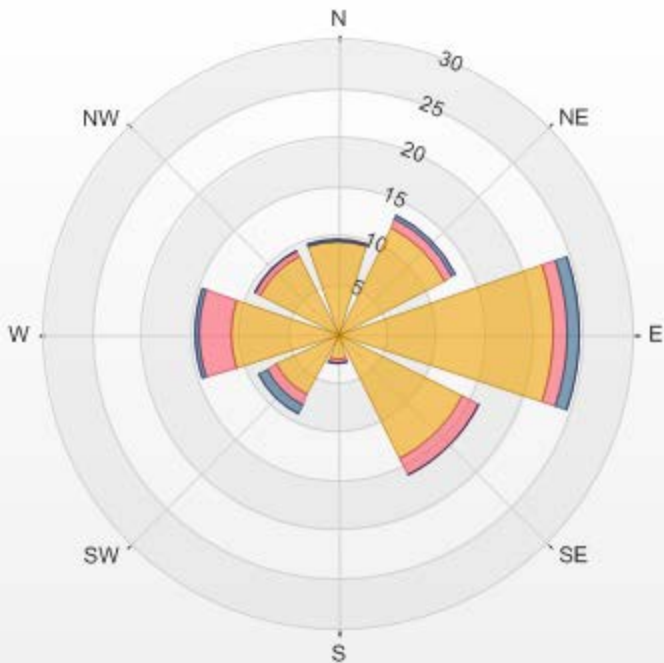
NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

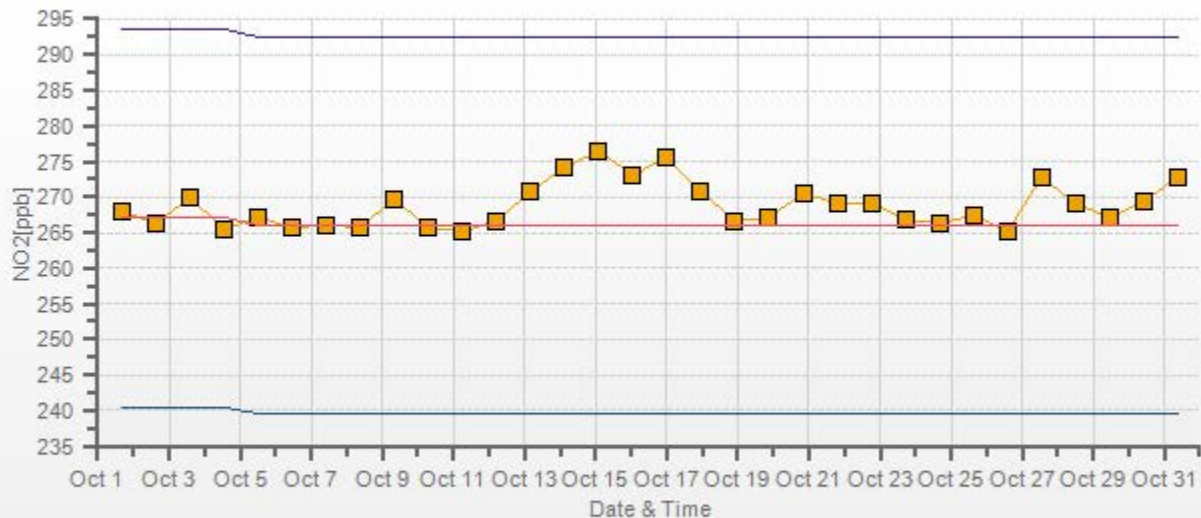
Direction	0.0-4.5	4.5-9.0	9.0-13.5	>13.5	Total
N	9.36	0.14	0.14	0	9.64
NE	12.2	0.85	0.43	0	13.48
E	21.99	1.42	1.28	0	24.69
SE	14.33	1.7	0	0	16.03
S	2.55	0.43	0.14	0	3.12
SW	6.95	1.13	0.99	0	9.07
W	10.92	3.12	0.43	0	14.47
NW	8.94	0.43	0.14	0	9.51
Summary	87.24	9.22	3.55	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2016/10/01 00:00 - 2016/10/31 23:00
 Calm: 0.00%



% Icon Classes (ppb)	87	9	4	0
0.0-4.5	87	9	4	0
4.5-9.0		9		
9.0-13.5			4	
>13.5				0

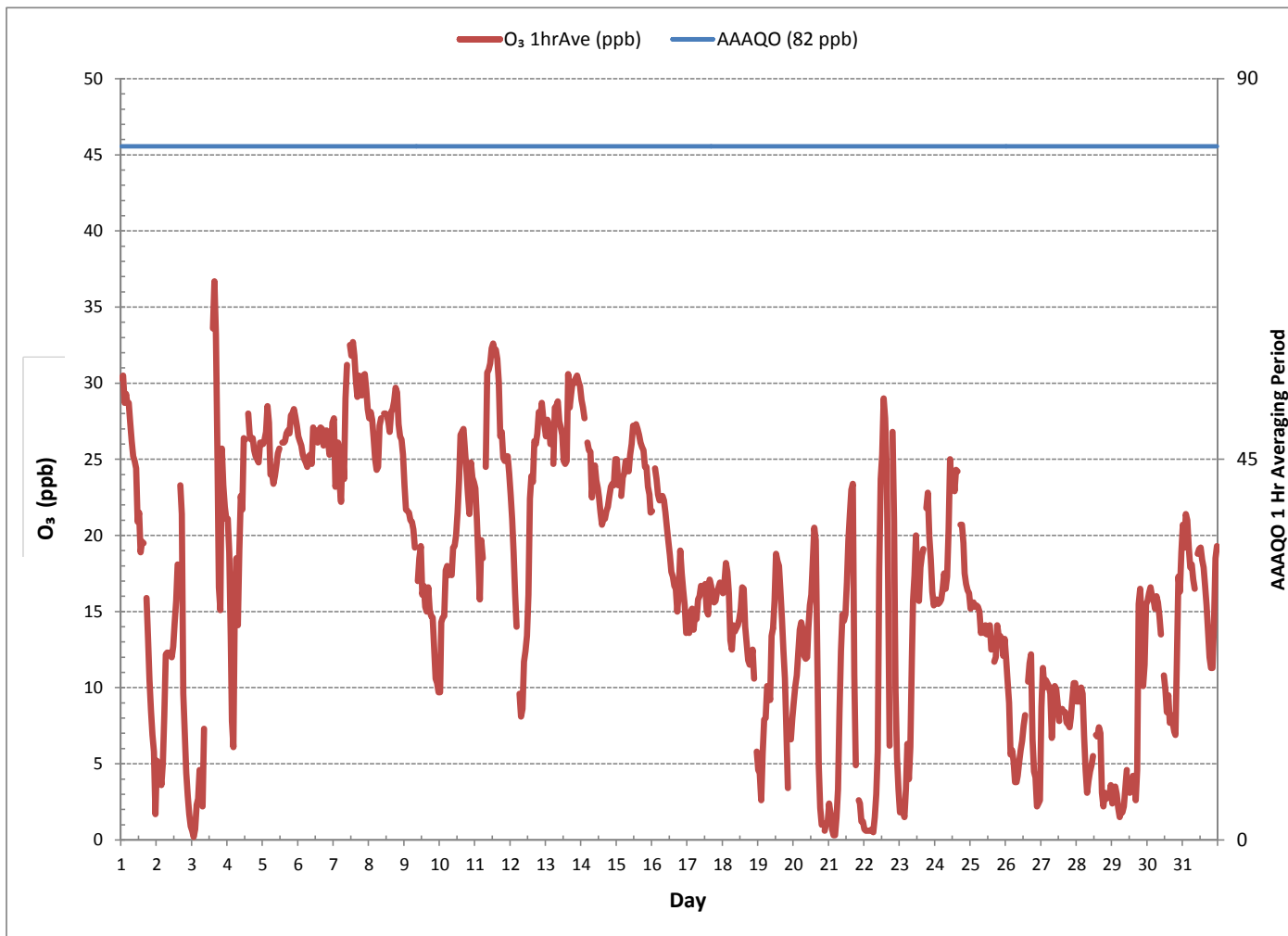
NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2016/10 Type: Span



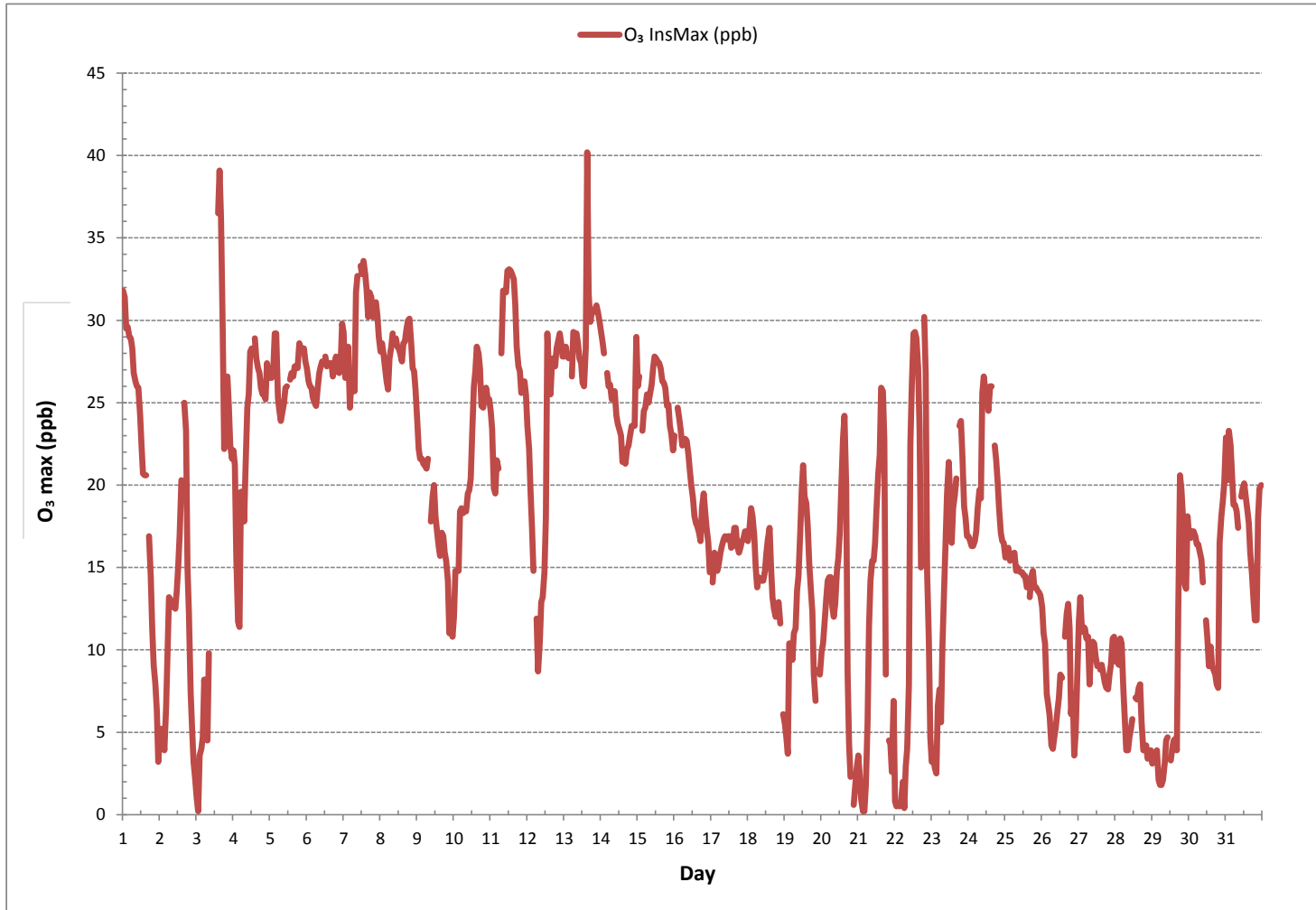
■ Span Meas
 — Span Ref
 — Span Low
 — Span High

OZONE

OZONE Hourly Averages (O₃ ppb)



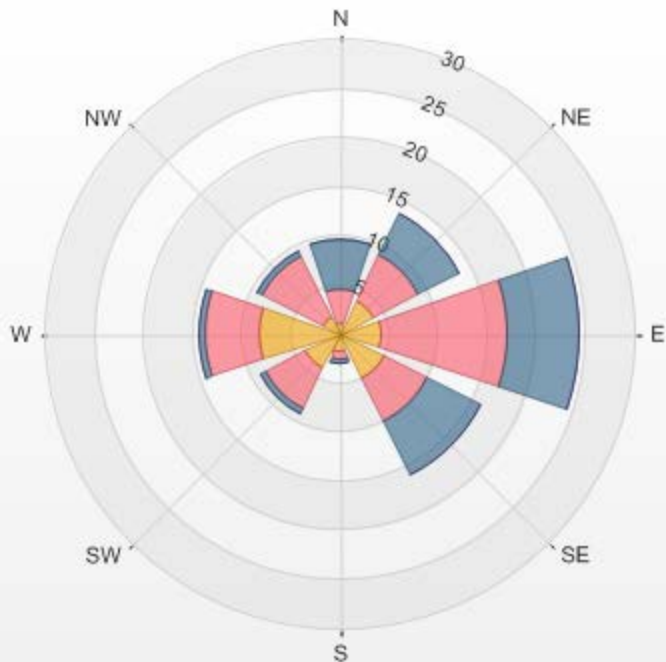
OZONE Instantaneous Maximum (O₃ ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppb]

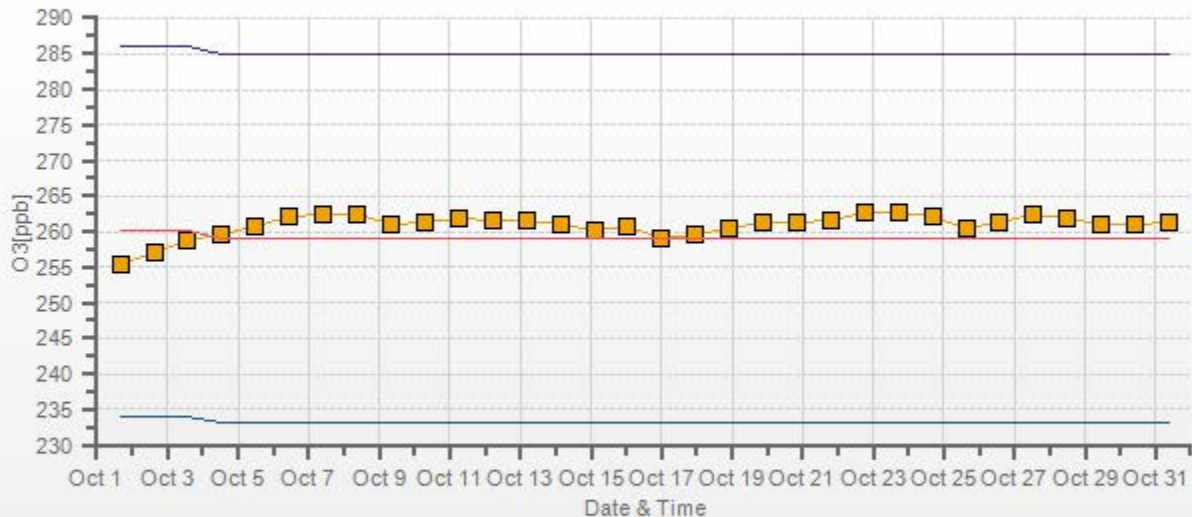
Direction	0.0-12.3	12.3-24.7	24.7-37.0	>37.0	Total
N	1.13	3.54	5.09	0	9.76
NE	3.82	5.23	4.67	0	13.72
E	4.24	12.87	7.36	0	24.47
SE	5.09	4.81	6.08	0	15.98
S	1.84	0.71	0.57	0	3.12
SW	3.96	4.53	0.57	0	9.06
W	8.2	5.52	0.71	0	14.43
NW	1.98	6.79	0.71	0	9.48
Summary	30.26	44	25.76	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-03[ppb] 2016/10/01 00:00 - 2016/10/31 23:00 Calm: 0.00%



% Icon Classes (ppb)	30	0.0-12.3	44	12.3-24.7	26	24.7-37.0	0	>37.0
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O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5

PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	X	2.4	3.4	1.4	2.9	1.4	3.9	2.4	0.4	X	0.0	2.4	1.9	0.0	3.4	0.0	X	X	1.9	1.4	X	0.0	0.0	X	0.0	3.9	1.6	18
2	X	X	X	X	X	X	1.4	X	0.0	X	0.0	1.4	X	0.0	0.0	X	0.0	1.9	1.4	2.4	1.0	1.9	2.9	4.9	0.0	4.9	1.4	14
3	3.4	5.9	4.4	5.4	3.9	5.4	2.4	2.4	2.4	0.4	6.9	10.9	0.0	C	0.0	2.9	3.9	2.9	3.9	4.9	3.4	2.4	4.9	4.9	0.0	10.9	3.8	24
4	1.9	4.4	1.9	3.4	3.4	4.4	4.9	2.9	0.0	0.0	0.0	1.9	1.9	1.4	0.4	1.9	1.0	2.9	0.4	1.0	0.4	1.4	0.4	1.0	0.0	4.9	1.8	24
5	0.0	0.4	0.0	1.9	1.0	0.0	0.4	0.4	1.4	3.4	1.4	0.0	1.9	0.0	0.0	2.9	2.9	1.0	0.4	2.9	2.4	1.9	1.0	0.0	0.0	3.4	1.2	24
6	0.0	1.4	0.4	2.4	0.0	0.0	4.4	2.4	1.9	1.9	1.0	4.4	1.4	0.0	0.4	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.9	24
7	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	2.4	3.4	5.4	1.4	1.0	0.0	1.4	1.9	1.4	0.0	1.0	1.4	0.0	0.0	0.0	1.9	0.0	5.4	1.0	24
8	1.0	1.0	0.0	1.9	1.0	0.0	1.0	0.0	0.4	5.4	1.4	4.4	3.4	0.4	1.0	0.0	0.0	0.0	0.4	0.0	1.0	1.0	0.4	0.4	0.0	5.4	1.1	24
9	0.0	2.4	0.0	5.9	X	0.0	0.4	0.0	14.4	0.0	3.9	0.0	0.0	1.0	0.0	0.0	0.0	X	X	0.0	0.0	0.4	1.0	0.0	0.0	14.4	1.4	21
10	X	1.4	0.0	0.0	0.0	0.0	1.0	1.9	0.4	0.0	0.0	0.0	0.4	1.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.9	0.4	23
11	0.0	0.0	0.0	0.4	0.0	1.0	1.4	1.9	0.0	0.0	1.0	1.4	1.0	1.4	0.4	0.0	2.9	1.9	2.4	1.0	1.4	2.9	1.9	3.9	0.0	3.9	1.2	24
12	2.9	5.5	3.9	2.4	3.4	8.0	5.4	6.4	9.4	1.9	5.9	7.9	3.4	2.9	0.0	1.0	1.9	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	9.4	3.1	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.9	2.4	6.4	13.0	1.9	1.4	0.0	1.0	0.4	1.0	X	1.9	0.0	13.0	1.5	23
14	X	0.0	0.0	3.4	1.4	1.9	X	0.0	1.9	1.0	3.4	1.4	0.4	0.4	0.0	0.0	X	0.0	1.4	1.0	0.4	1.9	0.4	5.9	0.0	5.9	1.2	21
15	0.0	8.9	1.9	0.0	X	0.0	2.4	1.4	2.4	1.9	1.4	0.4	0.0	0.0	0.0	0.0	1.0	1.9	2.4	0.0	0.0	2.4	0.4	X	0.0	8.9	1.3	22
16	0.0	0.0	1.4	0.0	1.0	0.4	0.0	0.0	1.9	0.0	5.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	X	X	0.0	1.9	0.0	0.0	0.0	5.4	0.6	22
17	0.0	2.4	0.4	1.4	1.4	0.0	0.0	1.4	0.0	0.4	0.4	0.0	3.4	2.4	0.0	1.4	1.4	3.4	3.4	0.4	0.4	0.4	0.0	0.0	0.0	3.4	1.0	24
18	0.0	0.0	1.0	0.4	1.0	X	0.0	0.0	0.4	0.0	0.0	0.0	0.0	1.4	0.4	0.0	0.0	X	0.0	0.4	0.0	0.0	2.4	0.0	0.0	2.4	0.3	22
19	0.0	0.0	1.0	1.0	1.4	1.9	0.4	0.0	1.9	0.0	0.0	0.0	0.0	0.0	1.9	0.0	3.4	1.4	1.4	1.0	4.4	6.9	4.9	6.4	0.0	6.9	1.6	24
20	6.4	6.9	5.9	5.4	8.9	4.4	4.9	7.9	4.9	5.4	3.9	6.9	2.5	5.4	6.4	9.9	8.9	8.9	7.9	12.4	5.4	8.4	3.9	2.4	2.4	12.4	6.4	24
21	3.9	3.9	1.9	6.4	5.4	6.4	7.5	8.9	5.9	6.9	4.4	5.9	1.4	1.4	0.0	0.0	1.4	4.4	4.4	3.9	1.0	1.9	1.4	3.9	0.0	8.9	3.9	24
22	6.4	4.4	4.4	6.4	4.4	7.5	6.9	6.9	3.4	8.4	5.4	3.9	5.4	4.4	4.4	5.4	5.4	8.9	3.9	1.9	1.9	1.4	2.4	0.4	0.4	8.9	4.8	24
23	1.9	1.0	1.9	1.9	2.9	4.4	3.9	8.4	8.4	7.9	6.9	3.4	3.9	2.9	3.9	3.4	0.4	1.9	2.4	0.4	3.9	1.4	3.9	2.4	0.4	8.4	3.5	24
24	1.0	3.9	2.9	2.9	2.9	1.4	0.0	2.8	1.9	0.0	0.0	1.9	X	0.0	0.3	0.0	2.9	2.4	1.8	3.0	0.0	1.9	0.0	0.4	0.0	3.9	1.5	23
25	1.3	0.0	1.0	1.4	3.9	5.9	4.5	2.4	3.5	3.3	2.0	2.3	2.9	2.0	3.9	3.0	2.1	4.3	2.9	1.0	2.4	2.4	2.9	0.0	0.0	5.9	2.6	24
26	2.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	0.0	0.0	0.0	0.3	0.4	1.3	1.1	1.0	4.4	0.4	0.4	0.6	0.0	1.9	0.0	4.4	0.7	24
27	3.4	0.8	0.2	2.4	2.4	0.0	0.2	2.2	3.3	2.2	0.0	0.2	2.2	0.0	2.4	3.2	4.6	2.6	0.0	0.9	0.0	0.0	0.0	0.0	0.0	4.6	1.4	24
28	1.9	0.0	0.7	2.4	1.6	1.9	0.4	1.2	0.0	0.0	1.6	1.3	0.0	0.0	0.0	1.1	1.4	0.0	0.0	0.0	0.6	2.9	0.4	1.9	0.0	2.9	0.9	24
29	0.4	2.1	0.4	1.6	1.3	4.0	4.4	4.9	3.4	5.5	7.9	5.1	7.9	11.8	10.8	8.3	9.3	6.4	1.3	1.9	2.3	4.1	2.9	2.8	0.4	11.8	4.6	24
30	1.5	3.3	6.1	5.4	7.5	4.4	3.0	6.5	6.0	3.4	2.4	4.4	7.5	7.5	6.4	11.0	6.4	6.9	4.4	4.4	1.0	3.3	3.4	5.0	1.0	11.0	5.0	24
31	3.5	5.0	4.4	2.5	5.5	6.9	7.5	10.4	7.5	7.0	9.0	6.0	7.9	5.9	5.4	7.9	5.9	7.9	5.5	4.4	0.0	1.9	1.4	2.4	0.0	10.4	5.5	24
HOURLY MAX	6.4	8.9	6.1	6.4	8.9	8.0	7.5	10.4	14.4	14.4	8.4	9.0	10.9	7.9	11.8	10.8	13.0	9.3	8.9	7.9	12.4	5.4	8.4	4.9	6.4			
HOURLY AVG	1.6	2.3	1.7	2.3	2.5	2.5	2.4	2.9	3.0	2.4	2.6	2.6	2.3	1.9	1.9	2.7	2.5	2.7	2.0	1.8	1.2	1.8	1.5	1.9				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

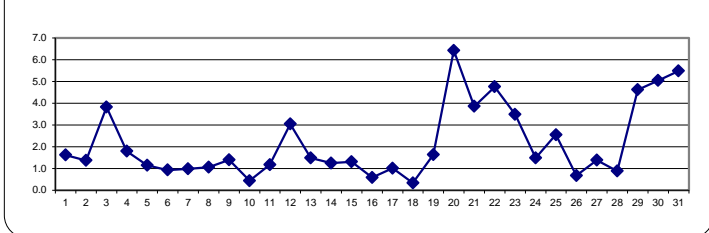
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m ³	24-HR	30 µg/m ³
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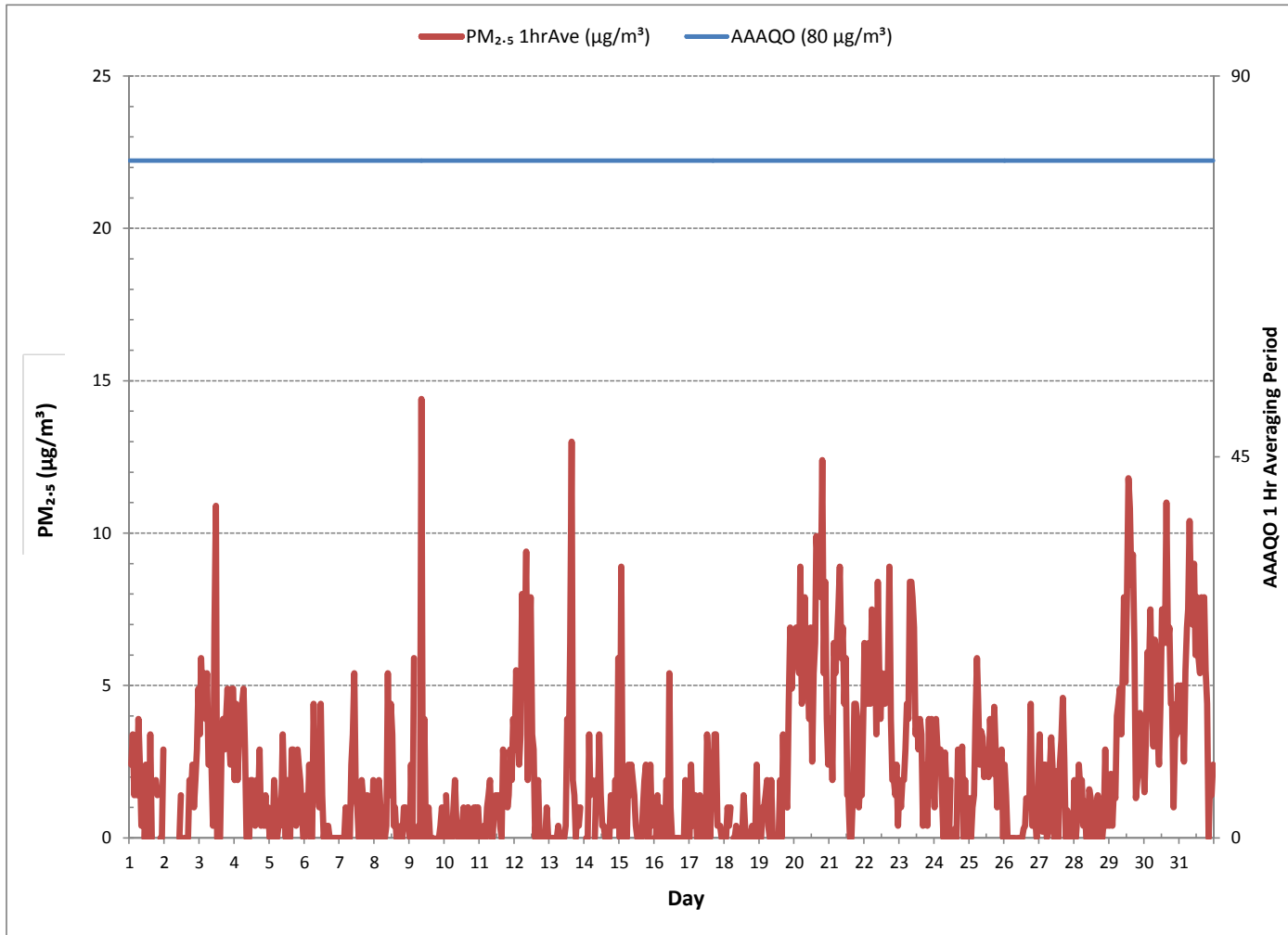
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	506			
MINIMUM 1-HR AVERAGE	0.0 µg/m ³	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	14.4 µg/m ³	@ HOUR(S)	8	ON DAY(S)
MAXIMUM 24-HR AVERAGE:	6.4 µg/m ³			ON DAY(S)
				VAR-VARIOUS
MONTHLY CALIBRATION TIME:	2 hrs	OPERATIONAL TIME:	713 hrs	
STANDARD DEVIATION:	2.52	AMD OPERATION UPTIME:	95.8 %	
		MONTHLY AVERAGE:	2.2 µg/m ³	

24 HOUR AVERAGES FOR October 2016



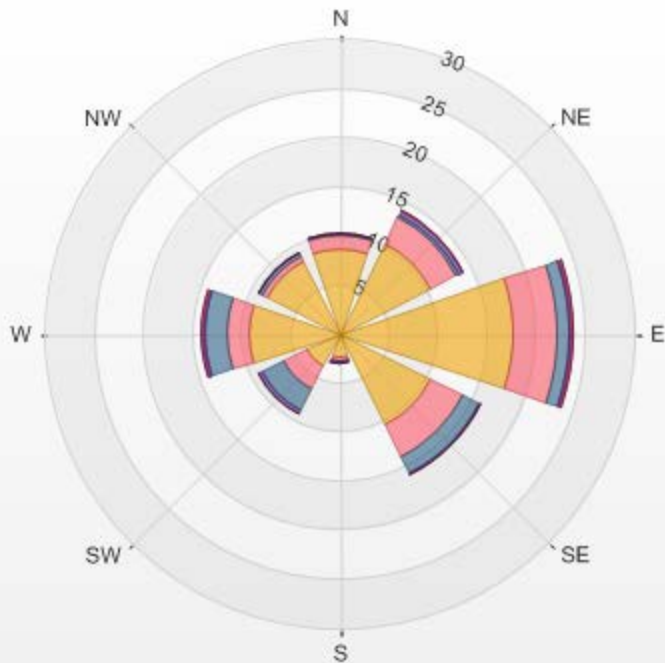
PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5[ug/m3(L)] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr
 Calm: 0.00% Valid Data: 95.30% Calm Avg: 0.00 [ug/m3(L)]

Direction	0.0-2.9	2.9-5.8	5.8-8.7	8.7-11.6	11.6-14.5	>14.5	Total
N	8.74	1.41	0.14	0	0	0	10.29
NE	10.3	2.96	0.28	0.42	0.14	0	14.1
E	17.77	4.37	1.27	0.14	0.28	0	23.83
SE	10.3	3.81	1.69	0.28	0	0	16.08
S	2.4	0.42	0	0.28	0	0	3.1
SW	3.67	2.68	2.4	0.42	0	0	9.17
W	9.31	2.12	2.26	0.28	0.14	0	14.11
NW	8.18	0.71	0.28	0.14	0	0	9.31
Summary	70.67	18.48	8.32	1.96	0.56	0	100

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5MAX[ug/m3(L)] 2016/10/01 00:00 - 2016/10/31 23:00 Calm: 0.00%



% Icon Classes (ug/m3(L))	71	18	8	2	1	0
0.0-2.9	71	18	8	2	1	0
2.9-5.8		18	8	2	1	0
5.8-8.7			8	2	1	0
8.7-11.6				2	1	0
11.6-14.5					1	0
>14.5						0

WIND SPEED

WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	12.2	14.1	13.2	13.6	15.1	15.9	12.9	12.3	11.3	11.6	11.5	9.6	13.2	8.8	9.5	5.8	7.9	9.6	11.5	9.2	6.0	5.3	3.9	4.5	3.9	15.9	10.0	24
2	4.5	5.9	6.9	4.2	12.0	16.6	15.8	16.0	15.4	15.0	16.6	14.1	12.5	12.9	9.9	9.4	7.3	3.8	1.0	1.3	0.9	0.3	0.6	0.2	0.2	16.6	6.8	24
3	0.2	0.1	1.1	1.6	2.2	2.1	0.5	0.5	1.9	4.6	2.8	3.3	6.8	6.7	5.5	4.5	5.3	3.1	1.5	2.9	5.1	6.5	6.7	6.3	0.1	6.8	3.0	24
4	3.5	2.3	1.7	1.0	1.4	4.4	8.6	8.2	13.0	14.5	15.5	16.4	15.7	16.3	14.6	12.4	12.2	11.4	11.4	10.7	11.6	10.5	12.6	11.0	1.0	16.4	9.8	24
5	12.8	13.4	14.1	14.1	12.0	14.4	14.1	12.9	12.8	13.0	15.3	15.4	15.3	14.8	13.7	14.0	16.7	15.3	15.8	13.5	10.9	13.0	12.0	11.3	10.9	16.7	13.4	24
6	8.5	9.0	8.5	8.6	8.5	8.9	9.0	8.4	9.8	9.0	8.6	9.4	7.0	7.8	8.1	7.5	7.4	5.0	5.3	4.9	4.8	0.9	1.1	2.6	0.9	9.8	6.8	24
7	3.1	1.6	1.3	0.7	3.1	1.2	2.0	0.8	4.4	6.7	6.2	5.3	5.9	6.9	7.4	6.3	5.2	6.4	4.8	6.1	5.9	6.2	5.1	4.6	0.7	7.4	3.7	24
8	4.1	6.2	7.0	5.6	4.2	5.2	3.5	6.8	6.5	7.8	9.9	11.0	11.8	10.7	10.6	12.2	11.8	11.7	10.0	10.3	8.4	8.5	8.6	8.4	3.5	12.2	8.1	24
9	8.7	7.8	10.1	8.3	6.8	8.0	7.0	7.5	4.7	4.3	5.4	4.0	5.1	7.1	6.4	7.9	9.5	8.5	7.8	6.6	4.8	4.8	4.7	3.2	3.2	10.1	3.8	24
10	4.7	5.6	5.3	4.9	5.1	4.9	2.2	7.0	5.9	7.8	7.1	6.7	5.6	5.4	4.3	3.8	1.8	4.4	5.8	2.8	0.7	2.7	1.8	2.0	0.7	7.8	3.7	24
11	2.1	1.5	2.5	2.2	2.6	1.4	3.0	4.0	5.8	5.2	5.7	7.3	7.7	7.0	3.5	4.7	1.5	3.7	4.3	3.5	2.9	2.7	3.2	2.8	1.4	7.7	2.7	24
12	3.7	4.1	3.7	3.6	3.8	3.5	3.5	3.6	3.3	4.1	3.2	3.6	4.1	4.2	4.8	4.5	4.4	6.7	7.8	9.5	6.9	6.6	5.8	5.8	3.2	9.5	0.9	24
13	5.0	5.1	4.4	3.5	5.4	6.4	6.8	8.9	8.4	9.9	9.8	9.8	9.2	11.1	9.0	9.7	12.2	10.4	12.1	11.5	11.5	9.7	8.1	7.6	3.5	12.2	8.3	24
14	6.4	7.2	5.6	6.3	4.8	7.3	8.0	7.3	8.8	9.4	9.6	9.8	10.0	8.1	9.0	11.4	11.7	9.8	9.0	9.9	10.0	7.9	6.7	8.3	4.8	11.7	8.0	24
15	6.5	3.8	3.5	4.7	6.1	6.6	4.9	5.4	5.3	4.9	5.6	6.5	6.5	5.7	5.1	5.1	6.8	6.8	6.5	5.0	6.9	5.1	4.7	4.5	3.5	6.9	5.3	24
16	6.4	10.8	8.6	9.3	8.2	10.9	13.1	13.0	12.3	12.4	12.0	10.7	10.4	6.8	6.2	3.7	2.0	2.5	5.6	5.0	2.9	7.6	6.1	5.1	2.0	13.1	5.7	24
17	4.2	5.7	6.1	7.5	7.5	6.7	6.4	6.8	7.8	8.2	8.4	9.7	9.3	8.2	7.9	9.8	8.0	8.8	8.7	7.8	8.1	9.2	9.6	8.2	4.2	9.8	7.8	24
18	6.7	6.9	9.0	7.2	6.0	4.8	5.1	5.3	5.1	6.0	6.7	6.8	6.5	6.3	5.9	5.4	4.6	4.3	2.7	2.7	3.2	2.6	3.2	3.7	2.6	9.0	5.1	24
19	3.1	3.1	2.8	2.7	2.2	1.6	2.9	2.1	1.1	1.0	1.8	3.3	4.3	3.5	4.0	4.7	3.8	2.5	2.6	1.1	1.1	2.4	3.4	4.1	1.0	4.7	1.8	24
20	5.1	4.9	6.4	7.3	5.8	8.8	13.5	11.6	9.7	5.5	8.0	12.4	9.3	8.6	6.3	4.5	2.4	1.2	0.9	0.9	0.4	1.1	0.9	1.1	0.4	13.5	5.3	24
21	3.0	3.2	4.4	3.4	3.6	5.7	6.5	7.3	6.2	7.1	8.1	6.3	6.5	7.6	7.5	5.2	4.2	1.2	1.5	0.6	1.2	1.1	0.3	0.3	0.3	8.1	3.9	24
22	0.3	0.9	0.7	0.8	1.1	1.3	0.4	0.5	0.4	0.9	2.6	2.9	2.7	3.7	1.6	1.2	0.4	1.0	2.2	4.3	3.1	1.0	1.2	0.8	0.3	4.3	0.8	24
23	0.7	1.0	1.0	1.2	3.1	3.3	1.2	2.9	3.5	3.6	3.8	4.2	5.8	7.0	6.2	6.4	6.4	5.1	5.7	7.2	6.6	6.0	4.5	4.6	0.7	7.2	2.0	24
24	7.5	6.8	8.3	6.9	8.7	10.3	8.3	8.7	10.3	9.2	8.2	8.8	10.3	10.1	9.1	9.9	10.7	11.3	10.3	10.7	9.3	8.2	7.9	7.1	6.8	11.3	9.0	24
25	5.4	6.7	7.2	8.9	10.0	9.7	9.3	9.6	10.1	9.8	10.0	8.4	7.6	9.3	8.9	7.9	7.7	7.7	5.5	3.7	4.2	3.6	3.4	5.8	3.4	10.1	7.4	24
26	3.3	2.0	6.3	8.8	8.8	9.0	8.9	9.4	9.7	9.9	9.7	8.8	9.7	9.8	11.1	9.4	6.8	6.2	1.9	2.6	1.0	0.6	0.5	0.7	0.5	11.1	6.1	24
27	1.6	1.6	2.9	3.8	4.6	5.8	5.8	5.5	7.8	7.9	7.4	9.3	8.0	8.1	7.9	7.0	7.1	7.2	4.9	5.8	6.8	7.6	6.8	6.1	1.6	9.3	5.5	24
28	4.5	4.6	5.7	5.9	5.3	3.3	0.6	1.8	4.0	5.6	6.4	5.6	5.3	5.1	4.2	3.5	1.5	0.6	1.4	1.5	0.9	1.2	1.0	2.1	0.6	6.4	2.4	24
29	0.6	1.6	1.9	1.7	2.2	2.0	1.5	2.1	1.5	2.6	5.5	5.1	4.7	4.3	3.1	1.4	1.2	1.2	4.1	2.7	1.5	1.5	2.7	3.3	0.6	5.5	1.8	24
30	4.2	5.2	5.9	5.7	5.6	5.7	7.0	7.2	4.7	5.8	4.4	2.8	2.4	3.5	5.7	5.2	5.2	4.9	4.4	2.6	4.2	5.1	3.5	5.2	2.4	7.2	1.5	24
31	5.2	3.7	7.3	8.7	7.0	8.1	8.2	3.6	4.0	7.7	8.9	8.8	7.7	7.8	7.1	6.8	6.0	4.4	4.0	5.2	3.1	4.9	3.8	5.5	3.1	8.9	5.1	24
HOURLY MAX	12.8	14.1	14.1	14.1	15.1	16.6	15.8	16.0	15.4	15.0	16.6	16.4	15.7	16.3	14.6	14.0	16.7	15.3	15.8	13.5	11.6	13.0	12.6	11.3				
HOURLY AVG	2.0	2.0	1.7	1.7	1.2	1.4	1.1	1.1	1.5	1.6	1.6	1.8	2.2	2.0	2.0	1.7	2.2	2.1	2.4	2.7	2.2	2.1	2.0	1.8				

STATUS FLAG CODES

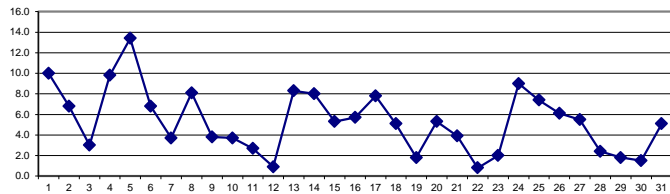
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: April 1, 2015
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

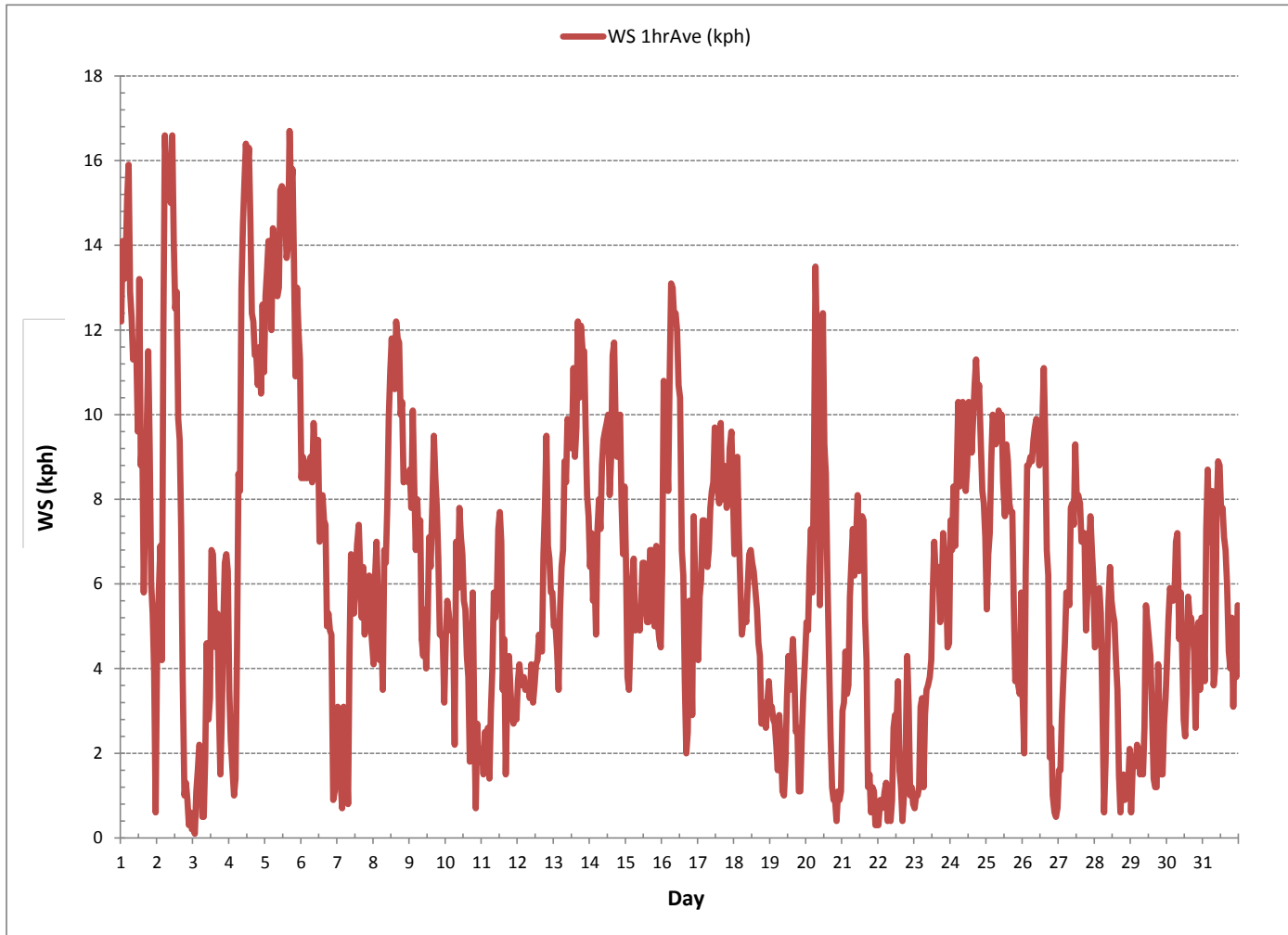
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR(S) 1 ON DAY(S) 3
MAXIMUM 1-HR AVERAGE:	16.7 kph @ HOUR(S) 16 ON DAY(S) 5
MAXIMUM 24-HR AVERAGE:	13.4 kph ON DAY(S) 5
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.64
MONTHLY AVERAGE:	1.8 kph

24 HOUR AVERAGES FOR October 2016



WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2016

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	18.6	19.6	20.2	17.9	21.5	22.0	20.2	17.7	16.7	17.2	20.0	16.8	19.7	17.8	18.6	11.7	17.5	16.3	18.7	16.7	11.0	8.8	7.2	7.5	7.2	22.0	16.7	24
2	7.2	11.7	9.8	7.6	20.2	27.2	25.9	23.8	23.6	22.8	22.8	24.3	24.4	19.1	14.6	16.9	13.0	8.5	2.0	3.0	2.4	2.2	2.1	3.2	2.0	27.2	14.1	24
3	2.5	3.3	6.0	5.8	5.7	5.0	5.9	3.7	5.7	P	7.8	7.5	11.0	12.0	11.4	8.5	8.4	5.0	3.4	5.6	8.8	10.8	11.2	10.1	2.5	12.0	7.2	23
4	8.6	5.9	3.5	2.4	3.2	8.0	13.0	13.5	20.7	20.9	25.5	27.0	23.3	26.6	21.8	19.2	19.9	18.0	16.5	15.6	16.9	17.3	22.6	18.6	2.4	27.0	16.2	24
5	20.0	23.5	20.4	22.9	22.7	23.5	20.9	19.8	20.1	22.1	21.6	22.2	24.6	23.9	21.6	21.8	24.6	24.2	26.9	21.5	17.6	20.7	20.8	18.9	17.6	26.9	22.0	24
6	14.6	13.0	13.0	14.3	12.2	13.9	12.7	12.2	14.1	13.8	13.1	14.4	11.5	12.1	13.7	11.7	11.6	9.9	9.4	9.4	10.0	5.3	5.3	5.3	5.3	14.6	11.5	24
7	6.5	5.3	5.3	7.0	5.7	3.5	5.1	3.4	10.4	12.4	13.0	10.5	12.9	14.3	13.8	9.7	11.3	12.3	8.8	10.7	11.6	10.9	10.9	9.5	3.4	14.3	9.4	24
8	7.0	12.1	12.1	10.5	11.2	8.7	9.6	11.3	12.2	13.7	16.4	19.5	18.9	17.2	15.7	17.1	17.9	17.4	15.3	18.8	13.6	13.9	13.4	16.2	7.0	19.5	14.2	24
9	14.2	11.9	19.7	13.9	10.7	13.7	12.1	13.3	9.5	7.0	8.8	8.4	12.5	12.8	9.9	10.5	12.9	12.0	12.7	9.2	7.9	7.0	7.6	6.3	6.3	19.7	11.0	24
10	7.3	7.4	7.2	7.5	8.9	7.0	4.7	11.5	9.6	11.5	10.8	10.2	10.3	13.3	9.5	7.7	4.3	6.8	10.0	7.0	4.6	7.6	3.9	4.1	3.9	13.3	8.0	24
11	4.0	3.5	4.5	4.1	5.8	4.6	6.3	7.9	9.9	10.2	10.9	11.8	10.7	12.6	8.0	10.7	4.0	6.9	5.5	5.4	6.0	6.2	5.9	5.6	3.5	12.6	7.1	24
12	6.2	7.7	6.2	5.3	6.1	6.0	5.5	6.5	5.0	7.8	6.1	7.0	7.3	10.5	8.3	8.2	8.7	11.6	12.5	15.9	11.7	10.7	10.5	9.9	5.0	15.9	8.4	24
13	8.6	8.0	7.8	5.3	8.4	11.0	11.7	15.0	12.4	18.6	16.5	15.2	15.7	18.8	14.4	16.2	19.4	16.7	19.5	19.0	18.3	15.7	14.8	12.0	5.3	19.5	14.1	24
14	10.8	12.3	9.1	10.8	7.7	13.7	13.6	14.9	16.3	14.8	16.4	15.8	15.6	14.8	13.9	18.8	19.0	16.6	14.5	15.0	14.3	12.8	14.5	13.0	7.7	19.0	14.1	24
15	11.2	7.3	6.3	7.6	10.0	11.3	10.9	8.9	11.8	9.3	11.7	12.8	11.6	9.3	9.9	8.0	12.7	10.6	10.5	8.5	12.9	9.0	9.3	9.0	6.3	12.9	10.0	24
16	15.0	17.9	13.0	14.3	14.7	21.1	20.0	21.2	19.2	19.5	18.5	16.3	16.9	10.3	11.7	9.1	3.8	6.4	9.4	10.1	7.5	11.0	9.1	7.1	3.8	21.2	13.5	24
17	6.7	9.5	10.1	11.4	12.6	12.9	14.1	11.5	11.9	12.8	12.9	16.0	15.1	11.4	13.2	17.8	14.2	17.4	16.1	12.8	11.4	13.3	15.7	11.7	6.7	17.8	13.0	24
18	11.2	11.9	14.5	10.0	9.6	7.2	6.9	9.4	P	12.1	12.7	10.5	10.8	10.4	10.0	8.2	7.7	6.1	4.6	4.5	5.3	3.9	7.1	6.2	3.9	14.5	8.7	23
19	4.9	4.5	4.5	4.8	4.8	4.1	4.9	5.3	2.7	3.0	4.6	5.6	6.9	5.7	6.4	7.7	6.3	4.8	5.0	4.0	3.2	5.9	7.0	6.1	2.7	7.7	5.1	24
20	7.6	7.0	10.6	10.0	10.4	12.3	20.7	17.1	17.0	12.6	13.8	18.3	17.9	15.1	14.5	8.9	5.8	2.9	2.3	2.9	2.2	3.3	3.3	5.3	2.2	20.7	10.1	24
21	9.0	6.0	7.6	6.6	6.4	9.3	10.3	10.8	9.9	12.7	12.5	10.0	10.7	11.4	13.5	8.9	7.4	4.6	3.7	1.9	3.1	3.0	4.8	4.4	1.9	13.5	7.9	24
22	2.3	2.1	3.2	2.1	3.2	2.7	3.5	5.0	2.4	2.8	5.5	4.8	6.5	6.0	4.6	4.2	2.9	4.3	5.2	8.8	10.4	4.2	3.8	3.2	2.1	10.4	4.3	24
23	1.9	2.3	3.8	4.0	5.5	5.6	3.9	5.5	5.7	6.3	6.9	8.3	9.8	12.7	10.8	12.8	9.6	10.7	9.4	11.3	10.7	10.0	9.6	12.6	1.9	12.8	7.9	24
24	14.0	10.3	13.5	12.2	13.3	16.9	13.2	15.1	16.0	14.4	13.8	14.3	17.1	19.4	14.6	17.6	16.5	18.5	19.0	19.9	14.6	13.3	12.0	13.1	10.3	19.9	15.1	24
25	9.2	9.6	11.0	13.3	15.3	16.0	18.1	17.1	15.5	14.4	14.7	13.3	12.6	16.4	15.1	12.0	14.6	13.1	10.8	6.8	7.1	6.1	6.8	7.5	6.1	18.1	12.4	24
26	6.7	4.8	10.4	12.0	14.1	13.2	14.4	13.2	14.6	13.4	15.1	14.2	16.7	14.6	16.4	15.1	12.1	11.8	4.6	4.4	2.5	2.6	2.6	3.3	2.5	16.7	10.5	24
27	3.8	4.5	6.2	8.7	8.4	10.4	8.8	10.4	13.0	12.5	12.6	14.8	13.9	12.0	11.9	11.6	12.3	11.1	8.9	10.1	9.5	11.4	10.6	9.9	3.8	14.8	10.3	24
28	7.8	7.7	10.0	9.6	9.1	6.0	5.4	4.7	6.8	7.9	10.4	9.5	8.2	7.9	8.1	6.7	3.5	2.8	3.4	2.9	2.3	2.9	3.2	5.0	2.3	10.4	6.3	24
29	1.9	3.8	3.5	3.0	4.7	4.8	4.0	4.2	3.8	7.0	9.1	8.6	9.3	6.5	4.9	3.7	2.7	3.7	8.9	5.3	6.0	3.2	4.8	6.2	1.9	9.3	5.2	24
30	6.6	8.7	9.4	10.0	10.0	9.8	10.9	10.0	9.4	7.7	6.6	5.6	4.6	6.7	10.1	9.0	9.7	7.5	7.2	5.7	7.6	10.3	7.1	9.3	4.6	10.9	8.3	24
31	9.2	7.7	14.4	14.6	12.9	13.1	16.4	7.5	8.5	11.6	14.7	14.6	12.2	11.2	11.7	11.5	9.9	8.2	7.3	10.5	5.1	8.1	7.2	7.9	5.1	16.4	10.7	24
HOURLY MAX	20.0	23.5	20.4	22.9	22.7	27.2	25.9	23.8	23.6	22.8	25.5	27.0	24.6	26.6	21.8	21.8	24.6	24.2	26.9	21.5	18.3	20.7	22.6	18.9				
HOURLY AVG	8.6	8.7	9.6	9.3	10.2	11.1	11.4	11.3	11.8	12.4	13.1	13.2	13.5	13.3	12.3	11.7	11.1	10.5	10.1	9.8	8.9	8.8	8.9	8.6				

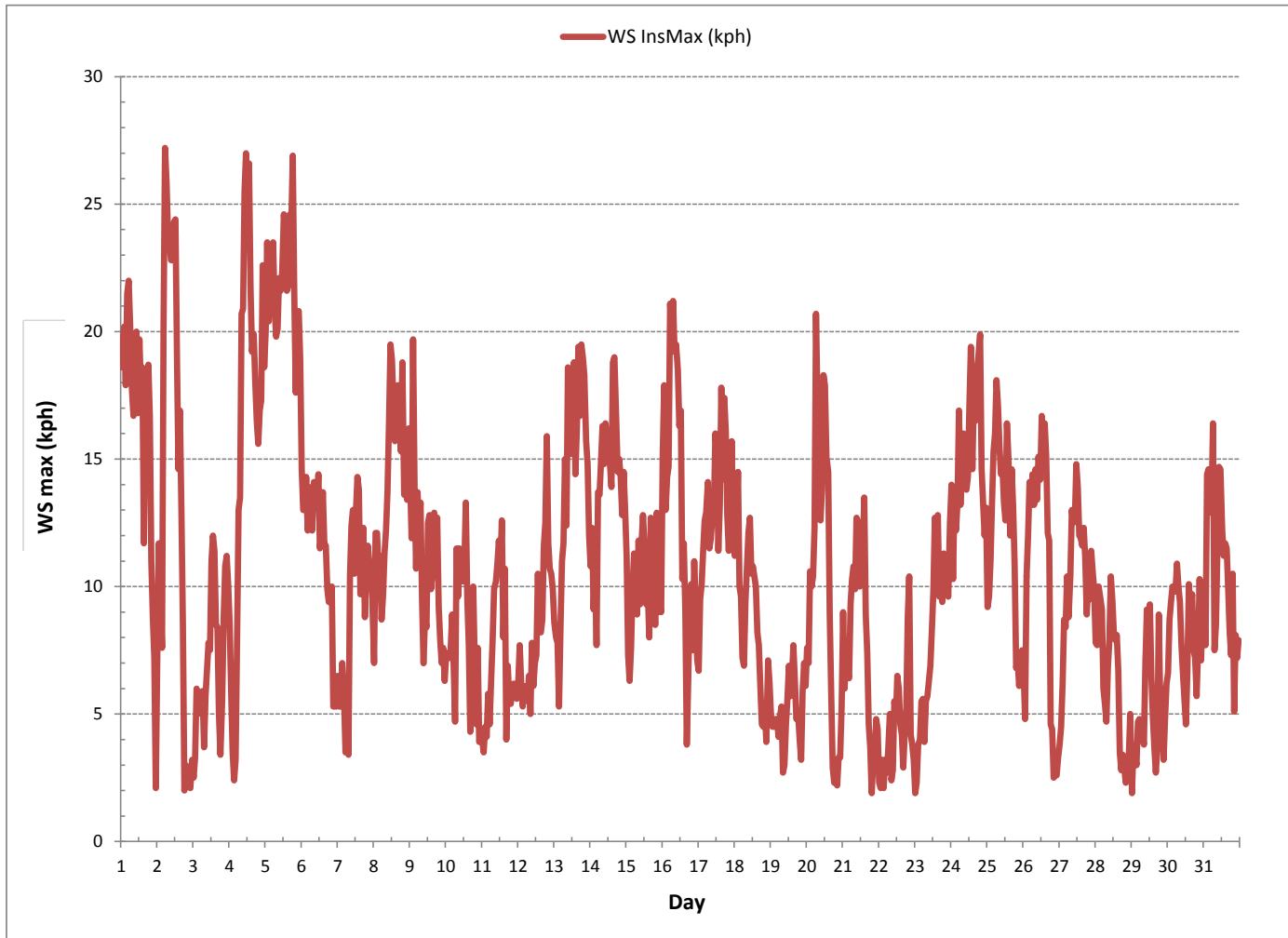
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

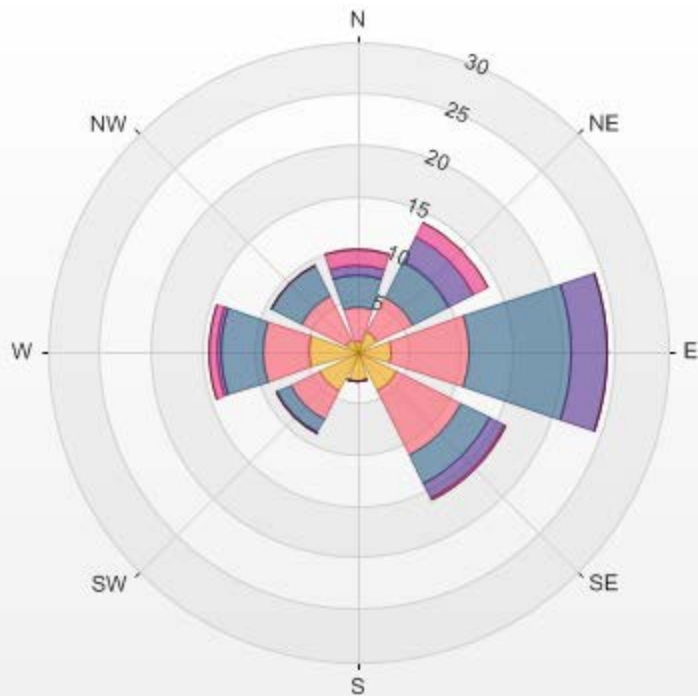
MAXIMUM INSTANTANEOUS VALUE:	27.2	kph	@ HOUR(S)	5	ON DAY(S)	2	
VAR-VARIOUS							
OPERATIONAL TIME:						742	hrs

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA COLD LAKE SOUTH Monitor: WSP [kph] Monthly: 2016/10 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-3.4	3.4-6.7	6.7-10.1	10.1-13.4	13.4-16.8	>16.8	Total
N	1.08	3.36	2.96	0.94	1.61	0	9.95
NE	2.15	3.76	3.9	2.69	1.61	0	14.11
E	3.23	7.66	9.81	3.49	0	0	24.19
SE	4.17	6.99	3.23	1.48	0.13	0	16
S	2.82	0.13	0	0	0	0	2.95
SW	4.17	3.09	1.48	0.13	0	0	8.87
W	4.7	4.57	3.9	0.4	0.94	0	14.51
NW	1.21	4.97	3.23	0	0	0	9.41
Summary	23.53	34.53	28.51	9.13	4.29	0	100



% Icon	Classes (kph)	24	35	29	9	4	0
	0.0-3.4		3.4-6.7		6.7-10.1		10.1-13.4
	13.4-16.8		>16.8				

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2016

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY 1	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	E	E	E	E	ESE	E	ENE	ESE	ENE	24	
2	ESE	SE	SE	SSE	WSW	WSW	W	W	W	WSW	W	W	W	W	W	WSW	SW	SE	SSE	S	ESE	E	ESE	WSW	24		
3	ENE	E	ESE	NNW	SE	SE	W	NW	NNE	ENE	E	NNE	NNE	NNE	NNE	NNE	NE	E	ENE	NE	NE	NE	NE	NE	24		
4	ENE	ENE	NE	NE	NE	NE	ENE	ENE	ENE	NE	ENE	ENE	ENE	ENE	NE	NE	NE	NNE	NE	NE	NE	NE	NE	NE	NE	24	
5	NE	NE	NE	NE	NNE	N	N	N	N	NNE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	NNE	24	
6	N	N	N	N	NNW	N	N	N	NNW	NNW	NNW	N	N	N	N	N	N	NNE	NE	NNE	N	NW	ENE	ENE	N	24	
7	SE	NW	SSE	S	NW	W	W	NE	SE	ESE	ESE	ESE	E	ESE	ESE	ESE	ESE	SE	E	ESE	SE	SE	SE	ESE	ESE	24	
8	ESE	SE	SE	ESE	ESE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	E	SE	24	
9	E	E	E	E	E	E	ENE	ENE	NE	NE	NE	N	N	NNW	NNW	NNW	NNW	NW	NW	NW	NW	WNW	WNW	W	NNE	24	
10	NW	NW	NW	NNW	NNW	NW	NW	NNW	NNW	N	N	NNW	N	NE	NNE	NNW	N	NW	NNW	NNW	S	SSE	SSW	SSW	NNW	24	
11	WSW	SW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	SW	SSE	SE	SSE	SSE	S	SW	SW	WSW	24	
12	SW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	NW	WSW	NW	N	NE	ENE	ENE	E	E	E	WNNW	24
13	E	E	E	E	E	E	SE	SE	SE	SE	ESE	ESE	E	E	E	ESE	E	E	E	E	E	ESE	E	E	E	ESE	24
14	E	E	E	E	E	E	E	E	E	E	E	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	24
15	ENE	ENE	ENE	E	E	ESE	ESE	E	ESE	ESE	E	ESE	ESE	ESE	ESE	SE	ESE	SE	SE	ESE	SE	ESE	ESE	ESE	ESE	24	
16	ESE	SE	ESE	E	E	E	E	E	E	E	E	E	E	E	ENE	E	E	SE	NW	N	NE	NNW	NW	NW	WNW	E	24
17	WNW	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	WNW	WNW	WNW	NW	NW	NW	NW	WNW	NW	NW	NW	WNW	WNW	24
18	WNW	WNW	NW	NW	WNW	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	W	W	W	WNW	W	W	W	W	WNW	24
19	W	WSW	WSW	WSW	WSW	WSW	WSW	W	SSW	SSE	SE	SE	SSE	SSE	SSE	SSE	SSE	SSE	SE	SE	E	SE	SE	SE	S	24	
20	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	SE	SE	SE	SE	SE	ENE	NE	E	E	NNW	SW	SW	W	SE	24	
21	WSW	SW	SW	SW	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	W	W	WSW	SW	WSW	S	SE	SE	SW	NE	ESE	WSW	24	
22	NNE	E	ENE	E	ENE	E	NNE	NW	ENE	E	ESE	E	E	ESE	E	NNW	SSE	S	SSW	SE	WSW	S	SSE	W	ESE	24	
23	S	SE	W	SW	WSW	W	W	WSW	W	WSW	W	NNW	NE	NE	NNE	NNE	NE	NE	ENE	ENE	ENE	ENE	ENE	ESE	NE	24	
24	E	E	E	E	E	E	E	ESE	E	ESE	ESE	ESE	ESE	E	E	E	E	E	E	E	E	E	E	E	E	E	24
25	E	E	E	ESE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE	ESE	ESE	ESE	SE	SE	E	24	
26	SSE	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	WNW	W	WSW	WSW	W	ESE	E	S	W	24	
27	S	ESE	ESE	ESE	E	E	ESE	E	E	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NNE	NNE	NE	NE	NE	NE	ENE	24	
28	NNE	NNE	NNE	NE	NE	NE	ENE	WNW	NNW	NNW	NNW	N	N	N	NNE	NNE	NNW	S	SSW	SSW	S	S	S	SW	N	24	
29	SE	SSE	SSE	SE	SSE	SSE	SW	SW	SSW	SW	WSW	W	W	W	WNW	W	SSW	SSW	SW	SW	SW	SE	SSE	SSW	SW	24	
30	SE	SE	SE	ESE	SE	SE	SE	SE	SE	SE	SE	SSE	SW	WSW	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	S	24	
31	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	W	NW	NW	NNW	NNE	N	WSW	24	

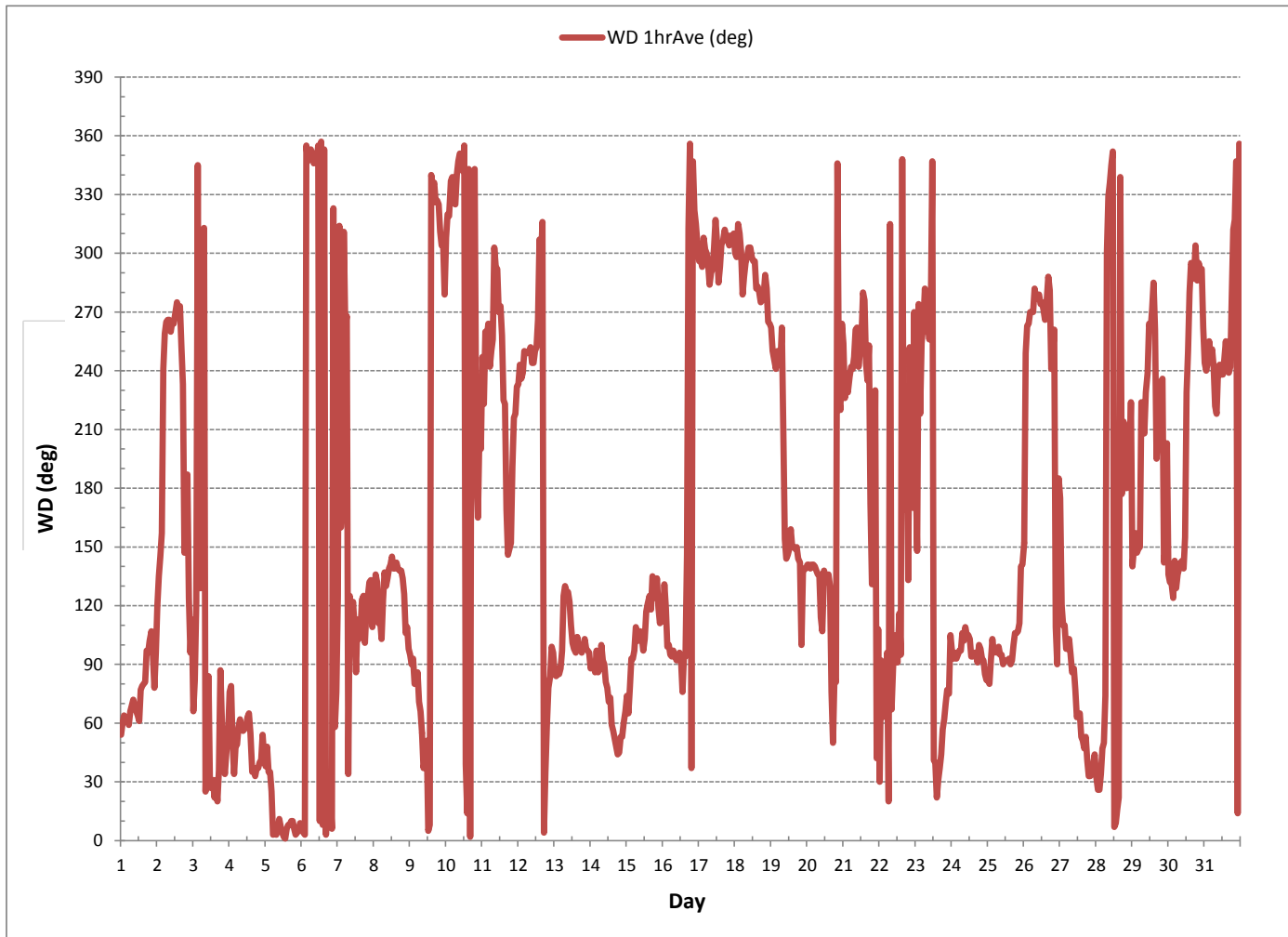
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	April 1, 2015
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	100.82		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	61 (ENE)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - October 2016

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.	
DAY																										
1	18	17	18	16	17	18	19	19	19	19	19	18	18	20	20	38	21	22	21	23	25	20	20	21	24	
2	24	17	15	32	25	19	20	19	19	19	20	20	22	21	26	26	22	21	28	32	44	62	58	64	24	
3	73	59	58	67	49	38	70	57	31	28	53	51	27	29	31	30	23	18	33	17	21	20	20	17	24	
4	26	38	30	34	26	22	16	16	18	19	20	19	21	20	19	22	22	21	22	21	21	22	19	21	24	
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7	22	46	57	52	16	44	52	57	29	25	27	31	30	29	28	27	26	18	21	22	22	21	20	20	24	
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11	24	35	18	24	27	31	21	21	22	23	23	24	23	25	33	26	38	14	14	22	40	36	25	24	24	
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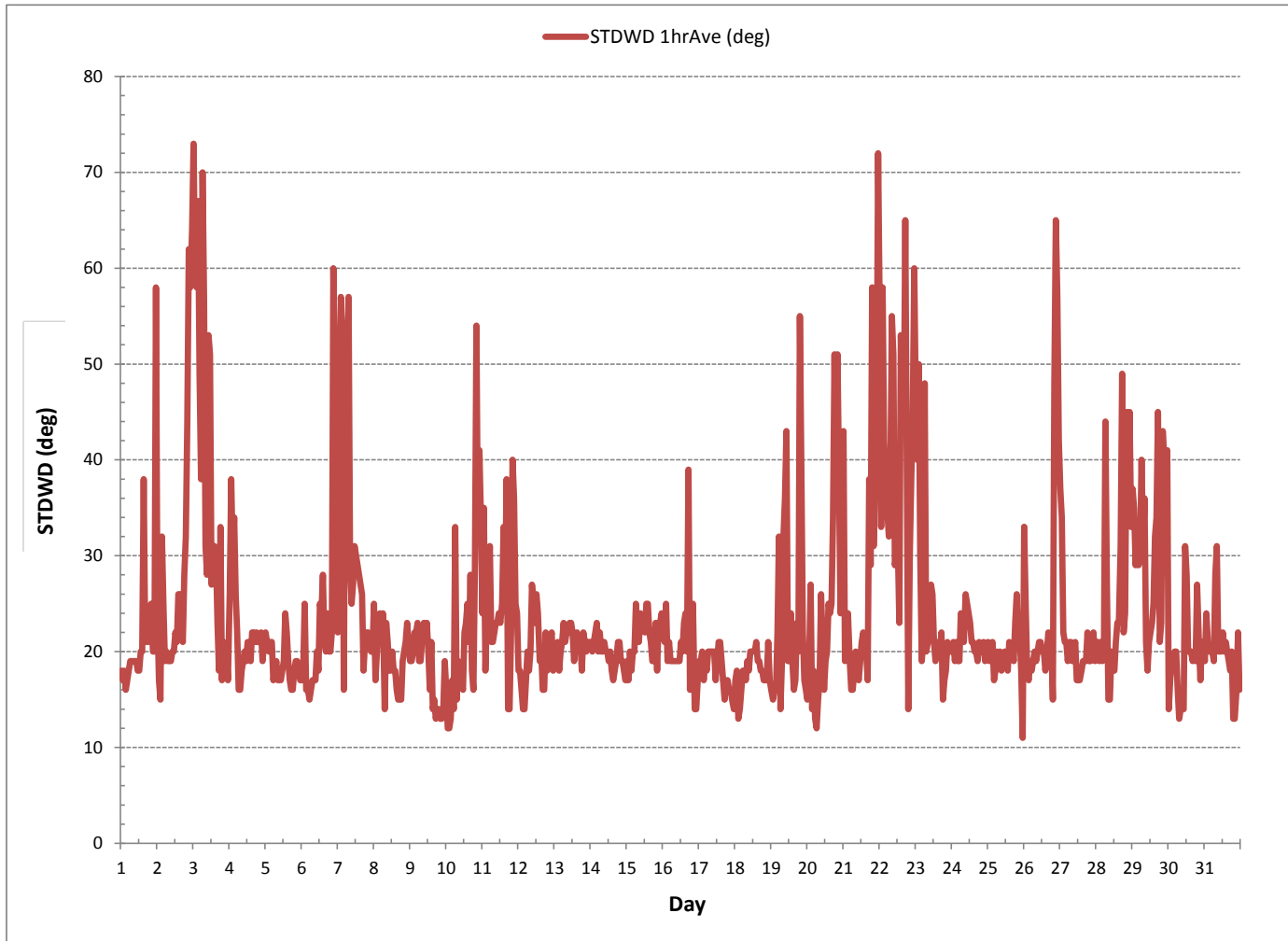
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: April 1, 2015

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



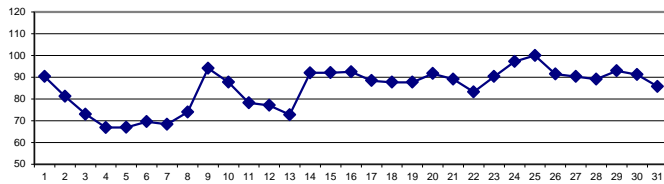
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
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2	100	100	100	100	99	92	87	85	83	80	75	73	68	65	57	51	51	57	77	84	88	92	92	93	51	100	81	24
3	93	94	94	95	95	95	95	96	85	70	59	55	51	51	49	48	52	60	73	72	65	71	68	67	48	96	73	24
4	63	67	77	84	87	77	74	75	69	62	55	53	53	50	52	58	66	64	68	71	72	74	67	67	50	87	67	24
5	66	65	65	62	66	74	75	76	83	83	73	68	64	62	60	59	61	62	63	63	64	64	64	65	59	83	67	24
6	67	68	69	70	72	74	75	75	74	74	73	70	67	66	66	64	63	65	68	68	69	71	72	70	63	75	70	24
7	70	74	75	74	85	83	76	76	68	65	63	61	61	58	59	62	63	62	63	66	66	68	70	72	58	85	68	24
8	72	72	72	74	76	77	78	76	74	72	71	67	64	64	64	63	64	65	67	73	90	94	93	93	63	94	74	24
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11	92	91	91	90	86	86	84	79	71	70	68	67	67	69	65	68	72	78	81	82	82	79	79	81	65	92	78	24
12	81	82	85	87	89	89	89	89	87	78	73	72	70	65	64	65	67	74	82	76	74	68	71	74	64	89	77	24
13	75	74	74	76	78	78	72	71	70	73	75	74	75	74	70	65	71	70	70	72	72	71	72	75	65	78	73	24
14	78	80	81	83	84	86	90	91	92	88	90	92	95	96	97	98	99	99	99	99	99	98	98	97	78	99	92	24
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18	87	87	85	86	88	90	90	91	93	86	83	82	82	81	83	87	88	92	92	91	89	89	90	92	81	93	88	24
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30	88	88	89	89	89	90	90	90	91	95	97	98	97	97	94	92	92	92	94	92	89	84	86	85	84	98	91	24
31	86	87	85	85	86	90	92	92	90	84	84	83	84	85	86	86	86	86	87	86	85	84	81	79	79	92	86	24
HOURLY MAX	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99	100	100	100	100	100	100	100	100	100	100	100	100	100
HOURLY AVG	87.6	87.9	88.3	88.5	89.1	89.2	88.6	88.4	86.9	84.5	81.9	80.4	79.2	78.7	78.3	78.3	80.2	82.5	85.1	86.0	86.7	87.4	87.3	87.4				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

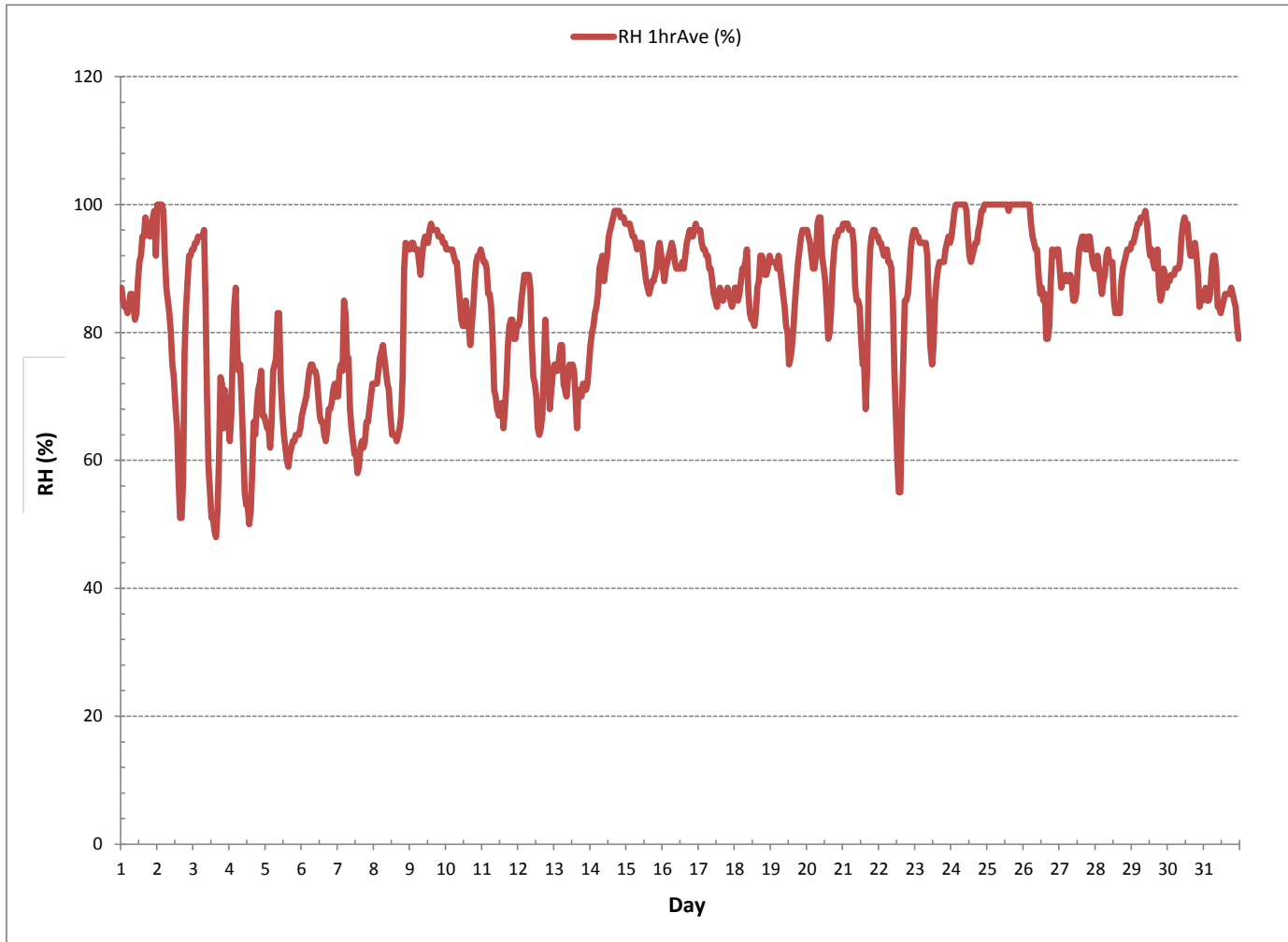
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

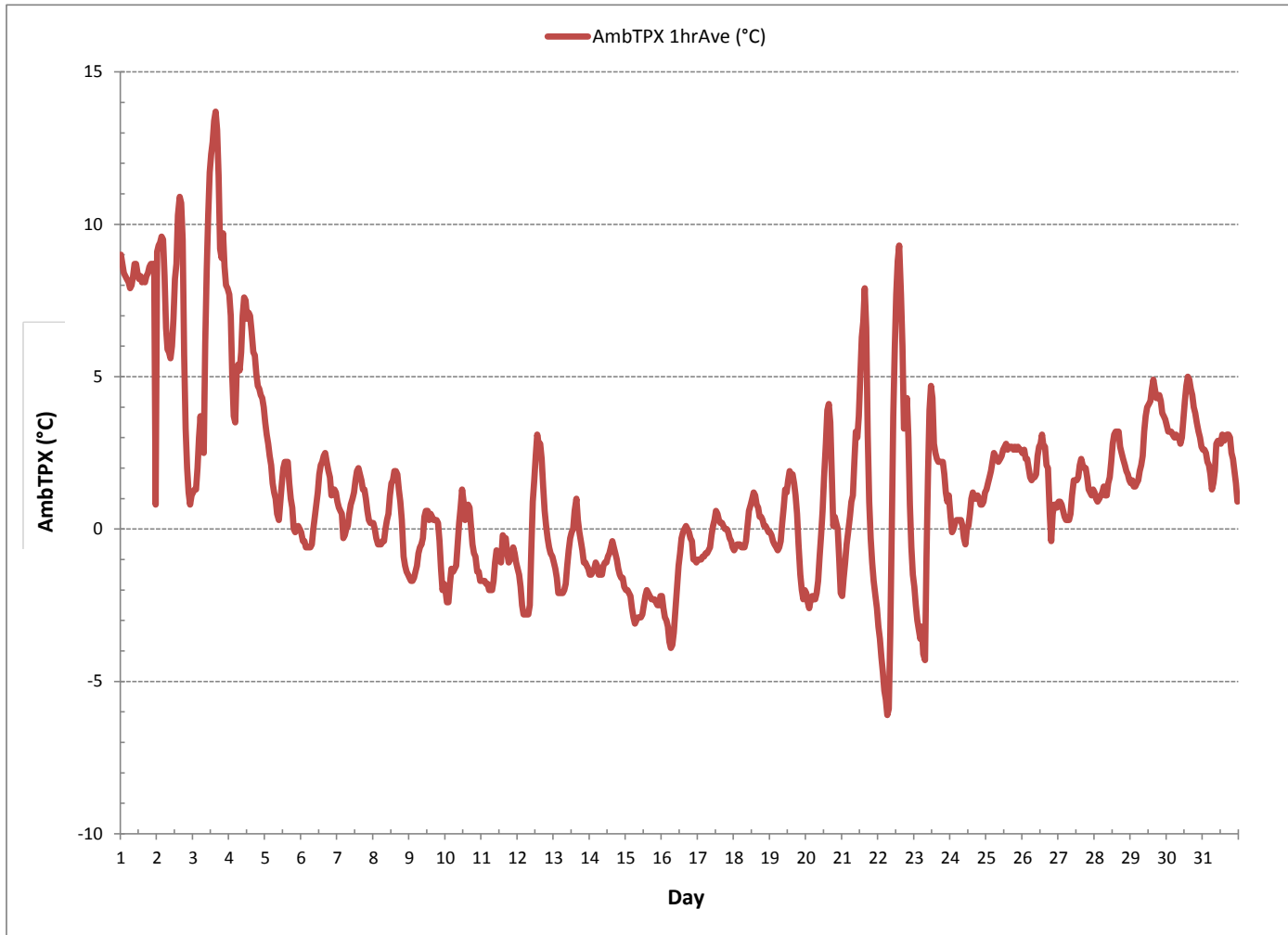
MINIMUM 1-HR AVERAGE:	48	%	@ HOUR(S)	15	ON DAY(S)	3
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 24-HR AVERAGE:	100	%			ON DAY(S)	25
					VAR-VARIOUS	
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	11.73				MONTHLY AVERAGE:	85 %

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: S 5684
 Station ID: LICA 01 Installation Date/Time (mst): Sep 28, 2016 @ 08:36
 Sample ID: LICA/VOC/CLS/Oct 03, 2016 Removal Date/Time (mst): Oct 04, 2016 @ 14:51

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 03, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Oct 04, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.3</u>	<u>+ 22.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Sep 02, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 03, 2016 (due every 6 months)

****Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required****

Comments: Date of last audit : Sep 02, 2016

Deployment Technician Signature: Alex Yakupov
 Collection Technician Signature: Alex Yakupov Date: Oct 04, 2016

Sample ID: 16100085-001
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Oct 03, 2016



Volatile Organics Data Results

Date: October 3, 2016
Canister ID: S5684

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.12
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.06
1-Hexene	< 0.02
1-Pentene	0.03
2,2,4-Trimethylpentane	0.04
2,2-Dimethylbutane	0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.04
2,4-Dimethylpentane	0.02
2-Methylheptane	< 0.01
2-Methylhexane	0.04
2-Methylpentane	0.1
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.05
Acetone	2.5
Acrolein	< 0.3
Benzene	0.08
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.65
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.04
Chloromethane	0.56
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	0.03
Cyclohexane	0.02
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	1.3
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.34
Freon-113	0.08

Volatile Organics Data Results

Date: October 3, 2016
Canister ID: S5684

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.67
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.83
Isopentane	0.73
Isoprene	0.03
Isopropyl alcohol	0.6
Isopropylbenzene	< 0.01
m,p-Xylene	0.04
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.03
Methylcyclopentane	0.06
Methylene chloride	< 0.3
n-Butane	3.17
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.08
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.3
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.13
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	0.06
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 14988
 Station ID: LICA 01 Installation Date/Time (mst): Oct 04, 2016 @ 11:51
 Sample ID: LICA/VOC/CLS/Oct 09, 2016 Removal Date/Time (mst): Oct 11, 2016 @ 16:47

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 09, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Oct 10, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.2</u>	<u>+23.3</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Sep 02, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 03, 2016 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last audit : Sep 02, 2016
The canister is not equipped with a pressure gauge
Data was taken from a pressure gauge on the sampler.

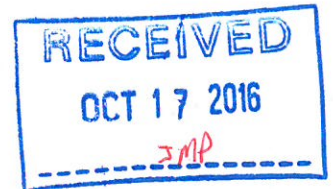
Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Oct 11, 2016

Sample ID: 16100130-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Oct 9, 2016

Priority: Normal



Volatile Organics Data Results

Date: October 9, 2016
Canister ID: 14988

PARAMETERS	CONCENTRATION (PPB)
n-Hexane	0.02
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.05
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.06
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.01
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.01
Acetone	1.2
Acrolein	< 0.3
Benzene	0.07
Benzyl chloride	< 0.4
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04

Volatile Organics Data Results

Date: October 9, 2016
Canister ID: 14988

PARAMETERS	CONCENTRATION (PPB)
1,2,3-Trimethylbenzene	< 0.05
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.06
Carbon tetrachloride	0.16
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.47
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	0.4
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.41
Freon-113	0.09
Freon-114	< 0.02
Freon-12	0.72
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.13
Isopentane	0.11
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	< 0.01
Methylcyclopentane	< 0.02
Methylene chloride	< 0.3
n-Butane	0.29
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	< 0.01

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 2489
 Station ID: LICA 01 Installation Date/Time (mst): Oct 11, 2016 @ 16:47
 Sample ID: LICA/VOC/CLS/Oct 15, 2016 Removal Date/Time (mst): Oct 18, 2016 @ 11:44

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 15, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Oct 16, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.2</u>	<u>+ 23.2</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = — @ — mst
 Final leak check deployment vacuum (in. Hg) = — @ — mst
 Total leak rate = — psi over — minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Sep 02, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 03, 2016 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last audit : Sep 02, 2016
The canister is not equipped with a pressure gauge
Data was taken from a pressure gauge on the sampler

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Oct 18, 2016

Sample ID: 16100230-002

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Oct 15, 2016



Volatile Organics Data Results

Date: October 15, 2016
Canister ID: 2489

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.05
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.02
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.01
Acetone	1.4
Acrolein	< 0.3
Benzene	0.17
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	0.3
Carbon tetrachloride	0.12
Chlorobenzene	< 0.02
Chloroethane	0.02
Chloroform	0.03
Chloromethane	0.51
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	0.6
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.32
Freon-113	0.07

Volatile Organics Data Results

Date: October 15, 2016
Canister ID: 2489

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.64
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.16
Isopentane	0.14
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	< 0.01
Methylcyclopentane	< 0.02
Methylene chloride	< 0.3
n-Butane	0.24
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	< 0.01
n-Hexane	< 0.01
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.05
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 14999
 Station ID: LICA 01 Installation Date/Time (mst): Oct 18, 2016 @ 11:44
 Sample ID: LICA/VOC/CLS/Oct 21, 2016 Removal Date/Time (mst): Oct 24, 2016 @ 09:23

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 21, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Oct 22, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 28.0</u>	<u>+ 21.9</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Sep 02, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 03, 2016 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last audit Sep 02, 2016
The canister is not equipped with a pressure gauge.
Data was taken from a pressure gauge on the sampler

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Oct 24, 2016

Sample ID: 16100270-004

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/ Oct 21, 2016



Volatile Organics Data Results

Date: October 21, 2016
Canister ID: 14999

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.07
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.04
2,4-Dimethylpentane	0.01
2-Methylheptane	0.02
2-Methylhexane	0.06
2-Methylpentane	0.1
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.06
Acetone	1.7
Acrolein	< 0.3
Benzene	0.14
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	0.03
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.53
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.1
Cyclopentane	0.04
Dibromochloromethane	< 0.01
Ethanol	0.6
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.3
Freon-113	0.06

Volatile Organics Data Results

Date: October 21, 2016
Canister ID: 14999

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.68
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.2
Isopentane	0.51
Isoprene	0.03
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.04
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.12
Methylcyclopentane	0.11
Methylene chloride	< 0.3
n-Butane	1.52
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.1
n-Nonane	0.01
n-Octane	0.02
n-Pentane	0.3
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.11
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Sample ID: LICA/VOC/CLS/Oct 27, 2016

Sampler S/N: 6167
 Canister ID: 1838
 Installation Date/Time (mst): Oct 24, 2016 @ 09:23
 Removal Date/Time (mst): Oct 28, 2016 @ 08:24

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 27, 2016</u>	<u>00:00</u>	<u>Oct 28, 2016 00:00</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.0</u>	<u>+25.3</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Sep 02, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: May 03, 2016 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last audit: Sep 02, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Oct 28, 2016

Sample ID: 16100306-001
Customer ID: LICA
Cust Samp ID: LICA/VOC/CLS/Oct 27, 2016



Volatile Organics Data Results

Date: October 27, 2016
Canister ID: 1838

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.14
1-Hexene	0.02
1-Pentene	0.02
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.01
2-Methylhexane	0.13
2-Methylpentane	0.08
3-Methylheptane	< 0.02
3-Methylhexane	0.11
3-Methylpentane	0.04
Acetone	1.7
Acrolein	< 0.3
Benzene	0.62
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.16
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	0.06
Chloroform	0.02
Chloromethane	0.51
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.04
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	1
Ethyl acetate	< 0.4
Ethylbenzene	0.08
Freon-11	0.3
Freon-113	0.07

Volatile Organics Data Results

Date: October 27, 2016
Canister ID: 1838

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.64
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.7
Isopentane	0.48
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.45
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.08
Methylcyclopentane	0.05
Methylene chloride	< 0.3
n-Butane	0.98
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.13
n-Hexane	0.16
n-Nonane	0.02
n-Octane	0.03
n-Pentane	0.4
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.01
o-Xylene	0.07
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	1.56
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

PAH RESULTS

Sample ID: 16100085-002

Customer ID: LICA
 Cust Samp ID: LICA/PUF/CLS/Oct 03, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>P13-01</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138/100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>Sep 22, 2016/08:53</u>
Field Sample ID:	<u>LICA/PUF/CLS/Oct 03, 2016</u>	Removal Date/Time:	<u>Oct 04, 2016/11:30</u>

Sample Data Collection Information

Sample Date:	<u>Oct 03, 2016</u>	Average Pressure (mmHg)	<u>711</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Oct 04, 2016</u>	Average Temperature (°C)	<u>9.0°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.17</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>Sep 02, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Oct 04, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: October 3 , 2016
PUF S/N: P13-01

PARAMETERS	CONCENTRATION (UG)
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.03
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.03
Fluorene	0.07
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.04
Perylene	< 0.01
Phenanthrene	0.13
Pyrene	0.03
Retene	0.02
1-Methylnaphthalene	0.03
2-Methylnaphthalene	0.07
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.01
Acenaphthylene	0.02
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01

Sample ID: 16100130-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Oct 9, 2016

Priority: Normal

RECEIVED
OCT 17 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-04</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138 / 100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>Oct 04, 2016 / 11:30</u>
Field Sample ID:	<u>LICA/PUF/CLS/Oct 09, 2016</u>	Removal Date/Time:	<u>Oct 11, 2016 / 16:39</u>

Sample Data Collection Information

Sample Date:	<u>Oct 09, 2016</u>	Average Pressure (mmHg)	<u>711</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Oct 10, 2016</u>	Average Temperature (°C)	<u>0.5°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.19</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	<input type="radio"/> YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Sep 02, 2016</u>	
Other observations?		

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Oct 11, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: October 9 , 2016
PUF S/N: TE-04

PARAMETERS	CONCENTRATION (UG)
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.07
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.06
Dibenzo(a,h)pyrene	0.33
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	0.04
Dibenzo(ah)anthracene	0.08
Fluoranthene	0.07
Fluorene	0.11
Indeno(1,2,3-cd)pyrene	0.03
Naphthalene	0.03
Perylene	< 0.01
Phenanthrene	0.07
Pyrene	< 0.01
Retene	< 0.01
1-Methylnaphthalene	< 0.01
2-Methylnaphthalene	< 0.01
3-Methylcholanthrene	0.51
7,12-Dimethylbenz(a)anthracene	0.34
Acenaphthene	0.06
Acenaphthylene	0.07
Acridine	< 0.01
Anthracene	1.32
Benzo(a)anthracene	0.51
Benzo(a)pyrene	0.03

Sample ID: 16100230-003

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Oct 15, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-09</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138/100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>Oct 11, 2016 / 16:39</u>
Field Sample ID:	<u>LICA/PUF/CLS/Oct 15, 2016</u>	Removal Date/Time:	<u>Oct 18, 2016 / 11:56</u>

Sample Data Collection Information

Sample Date:	<u>Oct 15, 2016</u>	Average Pressure (mmHg)	<u>704</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Oct 16, 2016</u>	Average Temperature (°C)	<u>-1.4°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.21</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>Sep 02, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	<u>Date: Oct 18, 2016</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: October 15 , 2016
PUF S/N: TE-09

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.05
2-Methylnaphthalene	0.1
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.02
Acenaphthylene	0.04
Acridine	< 0.01
Anthracene	0.03
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.09
Fluorene	0.1
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.08
Perylene	< 0.01
Phenanthrene	0.3
Pyrene	0.08
Retene	0.04

Sample ID: 16100270-005

AIR F

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/ Oct 21, 2016

HSCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE - 07</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138/100-1020</u>
Station ID:	<u>LICA 01</u>	Installation Date/Time:	<u>Oct 18, 2016/11:56</u>
Field Sample ID:	<u>LICA/PUF/CLS/ Oct 21, 2016</u>	Removal Date/Time:	<u>Oct 24, 2016/08:09:34</u>

Sample Data Collection Information

A.Y.

Sample Date:	<u>Oct 21, 2016</u>	Average Pressure (mmHg)	<u>708</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>22.9</u>
End Time (mst):	<u>00:00 Oct 22, 2016</u>	Average Temperature (°C)	<u>2.8°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.18</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<u>YES</u>	NO
Average temperature appears correct?	<u>YES</u>	NO
Average pressure appears correct?	<u>YES</u>	NO
Any error messages? (if yes list below)	YES	<u>NO</u>
Sample duration 24 hours?	<u>YES</u>	NO
Date of last calibration/audit:	<u>Sep 02, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date Oct 24, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

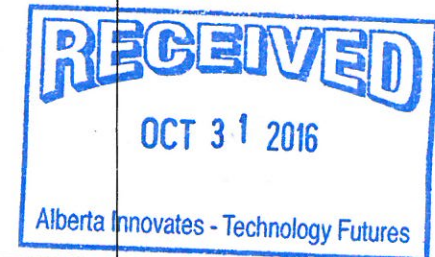
Date: October 21, 2016
PUF S/N: TE-07

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.09
2-Methylnaphthalene	0.14
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.01
Acenaphthylene	0.06
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.03
Fluorene	0.06
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.03
Perylene	< 0.01
Phenanthrene	0.11
Pyrene	0.03
Retene	0.02

Sample ID: 16100306-002

Customer ID: LICA
 Cust Samp ID: LICA/PUF/CLS/Oct 27, 2016

TISCH PUF PLUS Sample Collection Data Sheet			
Client:	<u>LICA</u>	Puf+ S/N:	<u>9801</u>
Location:	<u>Cold Lake South</u>	Motor S/N:	<u>1138/ 100-1020</u>
Station ID:	<u>LICA OP</u>	Installation Date/Time:	<u>Oct 24, 2016/09:34</u>
Field Sample ID:	<u>LICA/PUF/CLS/Oct 27, 2016</u>	Removal Date/Time:	<u>Oct 28, 2016/08:34</u>
Sample Data Collection Information			
Sample Date:	<u>Oct 27, 2016</u>	Average Pressure (mmHg)	<u>710</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Oct 28, 2016</u>	Average Temperature (°C)	<u>2.1°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.16</u>
Sample Recovery Checklist			
(circle one)			
Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO	
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO	
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO	
Any error messages? (if yes list below)	<input type="radio"/> YES	<input checked="" type="radio"/> NO	
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO	
Date of last calibration/audit:	<u>Sep 02, 2016</u>		
Other observations?			
Deployed By:	<u>Alex Yakupov</u>		
Collected By:	<u>Alex Yakupov</u>	Date:	<u>Oct 28, 2016</u>



Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: October 27, 2016
PUF S/N: 9801

PARAMETERS	CONCENTRATION (UG)
1-Methylnaphthalene	0.31
2-Methylnaphthalene	0.57
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.02
Acenaphthene	0.03
Acenaphthylene	0.1
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.06
Benzo(c)phenanthrene	0.01
Benzo(e)pyrene	0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.03
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.07
Fluorene	0.12
Indeno(1,2,3-cd)pyrene	0.02
Naphthalene	0.49
Perylene	< 0.01
Phenanthrene	0.24
Pyrene	0.08
Retene	0.17

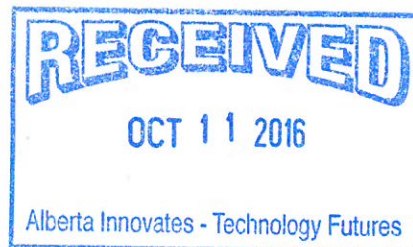
PARTISOL RESULTS

Partisol Sample Data Sheet

Date Sampled: Oct 03, 2016
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: P 602 96 39
 Start Time 00:00 Oct 03, 2016
 End Time 00:00 Oct 04, 2016
 Status OK
 Std Vol 23.955
 Valid Time 24:00
 Total Time 24.0

PM2.5

Sample ID: 16100083-001
 Customer ID: LICA
 Cust Samp ID: LICA Fit#P6029639
 Priority: Normal



Comments: Weather Conditions, etc.

Sample inlet head cleaned on July 08, 2016
Date of last calibration: July 08, 2016

Technician Signature: Alex Yakupov
 Date: Oct 04, 2016
 Time: 11:16

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End Date should be same date

Sample ID: 16100129-001

Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: LICA Fil # P6029640

Partisol Sample Data Sheet

Priority: Normal

Date Sampled: Oct 09, 2016

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P6029640

Start Time 00:00 Oct 09, 2016

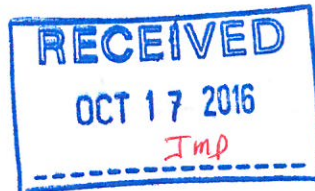
End Time 00:00 Oct 09/10, 2016
(A.Y.)

Status OK

Std Vol 24.670

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet head was cleaned on July 08, 2016
Date of last calibration : July 08, 2016

Technician Signature:

Alex Yakupov
Date: Oct 11, 2016
Time: 16:56

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End Date should be same date

Partisol Sample Data Sheet

Date Sampled: Oct 15, 2016
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: P603 1340
 Start Time 00:00 Oct 15, 2016
 End Time 00:00 Oct 16, 2016
 Status OK
 Std Vol 24.607
 Valid Time 24:00
 Total Time 24.0

PM2.5

Sample ID: 16100229-001

Customer ID: LICA

Cust Samp ID: LICA filter #P6031340

Priority: Normal



Comments: Weather Conditions, etc.

 Sample inlet head was cleaned on July 08, 2016
 Date of last calibration : July 08, 2016

Technician Signature:

Alex Yakupov
 Date: Oct 18, 2016
 Time: 12:21

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End
 Date should be same date

Partisol Sample Data Sheet

Date Sampled: Oct 21, 2016
Location: Cold Lake South
Parameter: TSP PM10
Filter #: P 603 13 38

PM2.5

Sample ID: 16100271-001

Customer ID: LICA
Cust Samp ID: LICA Fit# P6031338

Priority: Normal

Start Time 00:00 Oct 21, 2016
End Time 00:00 Oct 22, 2016
Status OK
Std Vol 24.422
Valid Time 24:00
Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet head was cleaned on July 08, 2016
Date of last calibration : July 08, 2016

Technician Signature: Alex Yakupov
Date Oct 24, 2016
Time: 09:53

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End Date should be same date

Partisol Sample Data Sheet

Sample ID: 16100307-001

Date Sampled: Oct 27, 2016

Customer ID: LICA

Cust Samp ID: LICA Fil# P6031339

Location: Cold Lake South

Priority: Normal

Parameter: TSP PM10

PM2.5

Filter #: P 603 13 39

Start Time 00:00 Oct 27, 2016

End Time 00:00 Oct 28, 2016

Status OK

Std Vol 24.489

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet head was cleaned on Oct 24, 2016
Date of last audit : Oct 24, 2016

Technician Signature: Alex Yakupov
Date: Oct 28, 2016
Time: 08:59

Programming

- 1) Make sure system is in "Stop Mode"
- 2) "ESC" to Time Screen then "Program"
- 3) Enter Beg 1 0:00
- 4) Enter Dur 24:00:00
- 5) Enter Beg D dd-Aug
- 6) Enter End D dd-Aug
- 7) "Stop/Run"

Note: Beginning & End Date should be same date

Partisol Sampler Results

Date	Filter NO.	Concentration (mg)
October 3	P6029639	0.042
October 9	P6029640	<0.004
October 15	P6031340	0.022
October 21	P6031338	0.076
October 27	P6031339	0.035

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date: <u>October 4, 2016</u>	Barometric Pressure: <u>0.935 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>23</u>
Location/Station Name: <u>Cold Lake South</u>	Weather Conditions: <u>Mix of sun and clouds</u>
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>routine monthly</u>
Start Time 24 hr. (mst): <u>8:22</u>	Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>12:06</u>	Cal Gas Expiry Date: <u>December 2, 2023</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer: ID# or Serial Number: <u>806528242</u>	Range ppb: <u>500</u> Station SO2 Analyzer Range? <u>500</u> ppb
Last Calibration Date: <u>September 13, 2016</u>	As Found C.F.: <u>1.004</u>
Previous C.F.: <u>0.997</u>	New C.F.: <u>0.999</u>

Calibrator: Flow Meter ID's: <u>n/a</u>	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)								
Make & Model: <u>API 700</u>	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90	Start/End Time 24 hr.: <u>3</u>
Point	ppb									
High	380									
Mid	180									
Low	90									
Serial #: <u>627</u>		Target Concentration (ppb): <u>380</u>								
Cal Gas Cylinder I.D. #: <u>LL119346</u>		Result (ppb): <u>3</u>								
Cal Gas Conc. (ppm): <u>50.0</u>		Zero Corrected Result (ppb): <u>3</u>								
		warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb								

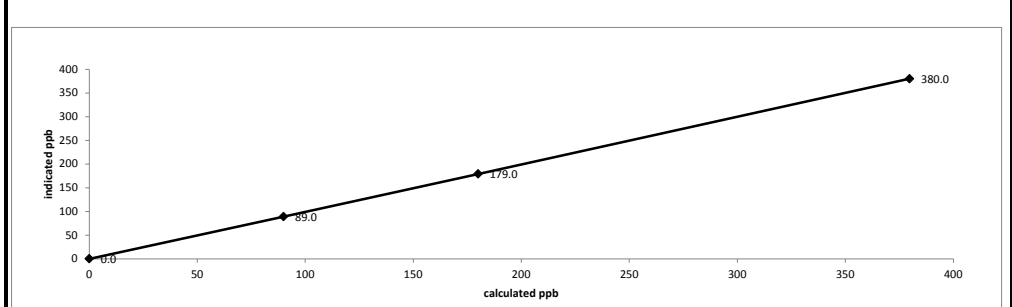
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	0.0	n/a
as found high	4966	38.00	5004	379.7	378.0	1.004
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4966	38.00	5004	379.7	380.0	0.999
mid	4982	18.00	5000	180.0	179.0	1.006
low	4992	9.00	5001	90.0	89.0	1.011
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F. =						1.005

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>0.998</u>	.95-1.05
b (Intercept as % of full scale) = <u>0.13%</u>	± 3% F.S.
% change in C.F. from last cal = <u>-0.75%</u>	± 10%

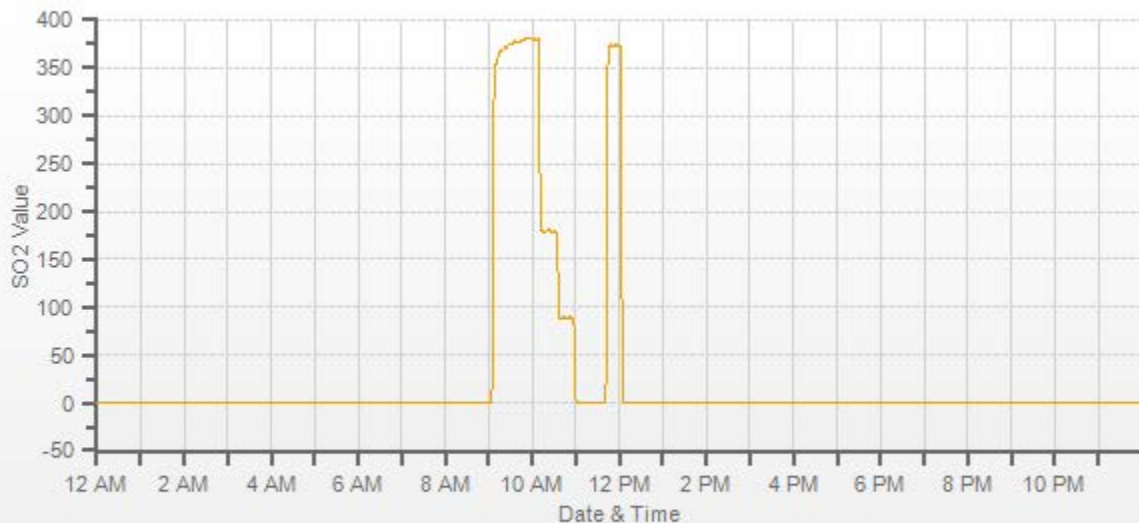
Thermo 43i Sulphur Dioxide Analyzer Calibration



BKG: <u>7.9</u>	BKG: <u>7.9</u>
COEF: <u>0.974</u>	COEF: <u>0.972</u>
PMT: <u>-623.8</u>	PMT: <u>-624.2</u>
FLASH: <u>771</u>	FLASH: <u>772</u>
INTERNAL: <u>28.6</u>	INTERNAL: <u>27.9</u>
CHAMBER: <u>45.0</u>	CHAMBER: <u>45.0</u>
PERM OVEN GAS: <u>45.00</u>	PERM OVEN GAS: <u>45.00</u>
PERM OVEN HEATER: <u>44.19</u>	PERM OVEN HEATER: <u>44.19</u>
PRESSURE: <u>680.4</u>	PRESSURE: <u>680.4</u>
SAMPLE FLOW: <u>0.475</u>	SAMPLE FLOW: <u>0.475</u>
LAMP INTENSITY: <u>96</u>	LAMP INTENSITY: <u>96</u>
CONVERTER: <u>n/a</u>	CONVERTER: <u>n/a</u>
CONVERTER SET: <u>n/a</u>	CONVERTER SET: <u>n/a</u>
Expected Value: <u>376.0</u>	Expected Value: <u>374.0</u>

Comments:
 The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.
 No zero adjustment was required/made. As found zero value copied to adjusted zero value for linearity calculation purposes.

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 2016/10/04 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	October 4, 2016	Barometric Pressure:	0.935 atm
Company/Airshed:	LICA	Station Temperature °C:	23
Location/Station Name:	Cold Lake South	Weather Conditions:	Mix of sun and clouds
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly
Start Time 24 hr. (mst):	8:22	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	12:06	Cal Gas Expiry Date:	July 15, 2017
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	CDNova CDN-101 #501

Analyzer:	ID# or Serial Number: 812728560	Range ppb:	100	Station SO2 Analyzer Range?	
	Last Calibration Date: September 13, 2016	As Found C.F.:	1.013		500 ppb
	Previous C.F.:	1.000	New C.F.:	1.000	

Calibrator:	Flow Meter ID's: n/a	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)
	Make & Model: SABIO 2010 D	Point	ppb
	Serial #: 11900613	High	78
	Cal Gas Cylinder I.D. #: LL36837	Mid	38
	Cal Gas Conc. (ppm): 10.0	Low	19
			Start/End Time 24 hr.: Target Concentration (ppb): 380
			Result (ppb): 0
			Zero Corrected Result (ppb): 0
			warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb

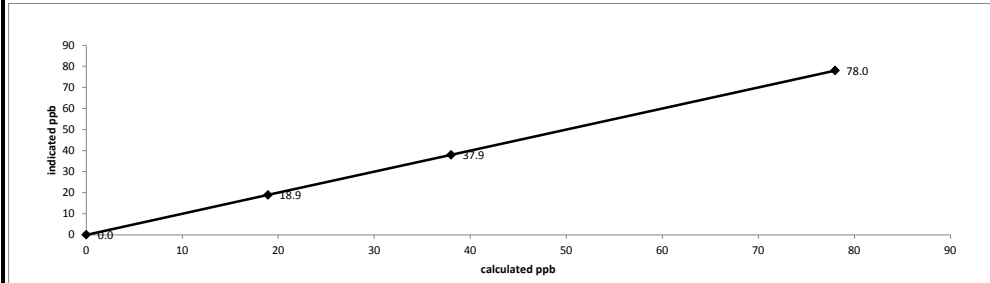
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	0.0	n/a
as found high	7443	58.50	7502	78.0	77.0	1.013
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	58.50	7502	78.0	78.0	1.000
mid	7472	28.50	7501	38.0	37.9	1.003
low	7486	14.20	7500	18.9	18.9	1.002
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F. =						1.001

Linear Regression/Calibration Results:

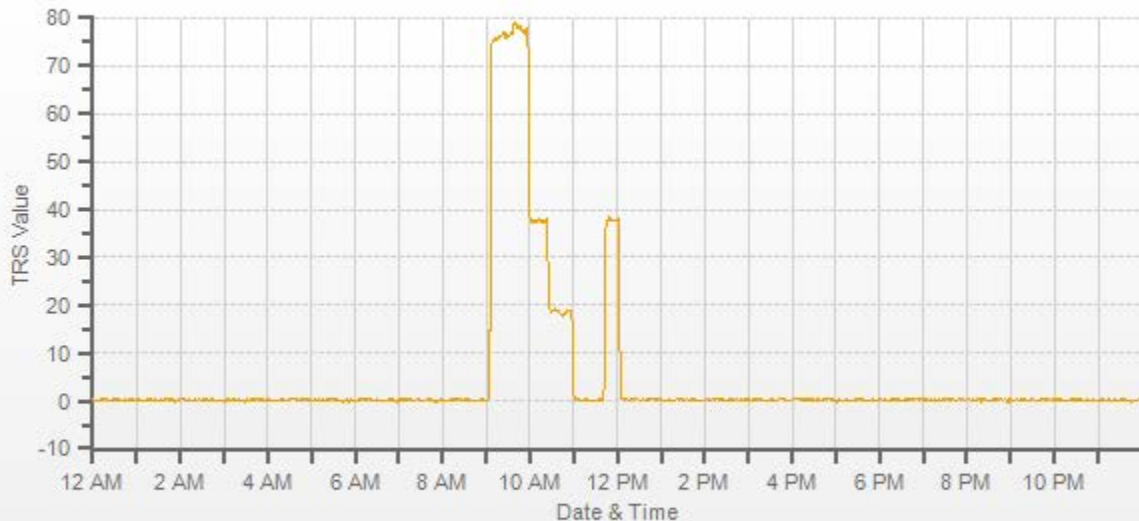
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		.95-1.05
b (Intercept as % of full scale) =	0.04%		± 3% F.S.
% change in C.F. from last cal =	-1.28%		± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration



BKG:	13.9	BKG:	13.9
COEF:	0.941	COEF:	0.944
PMT:	-650.8	PMT:	-650.5
FLASH:	737	FLASH:	740
INTERNAL:	31.2	INTERNAL:	31.2
CHAMBER:	44.9	CHAMBER:	45.0
CONVERTER TEMP:	825	CONVERTER TEMP:	825
CONVERTER SET:	825	CONVERTER SET:	825
PERM OVEN GAS:	45.0	PERM OVEN GAS:	45.0
PERM OVEN HTR:	44.37	PERM OVEN HTR:	44.38
PRESSURE:	658.4	PRESSURE:	658.4
SAMPLE FLOW:	0.510	SAMPLE FLOW:	0.510
LAMP INTENSITY:	92	LAMP INTENSITY:	92
Expected Value:	37.7	Expected Value:	37.7

Comments:
 The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.
 No zero adjustment was required/made. As found zero value copied to adjusted zero value for linearity calculation purposes.
 Expected Value has not changed after calibration.



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	October 3, 2016	Barometric Pressure:	0.936 atm
Company/Airshed:	LUCA	Station Temperature °C:	23
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly
Start/End Time 24 hr. (mst):	9:20 / 13:50	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:	ID# or Serial Number:	427408718	Range ppm:	50
	Last Calibration Date:	September 12, 2016	As Found C.F.:	0.990
	Previous Cal High Point C.F.:	1.000	New C.F.:	1.002

Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for a Range of:	50 ppm
	Make & Model:	API 700		
	Serial #:	627		
	Cal Gas Cylinder I.D. #:	LL165372		
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0 212.0		
	CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 1189.0		

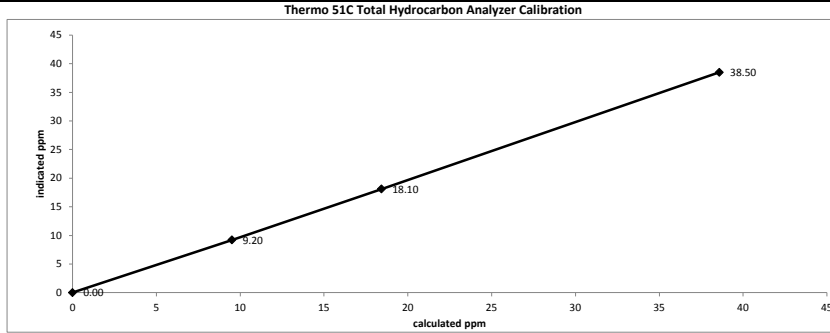
Point	Target ppm
High	38
Mid	18
Low	9

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	1999	0.00	1999	0.0	-0.20	n/a
as found high	1937	65.00	2002	38.60	38.80	0.990
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1938	65.00	2003	38.58	38.50	1.002
mid	1969	31.00	2000	18.43	18.10	1.018
low	1985	16.00	2001	9.51	9.20	1.033
calibrator zero	1999	0.00	1999	0.0	0.00	n/a
Average C.F. =						1.018

Linear Regression/Calibration Results:

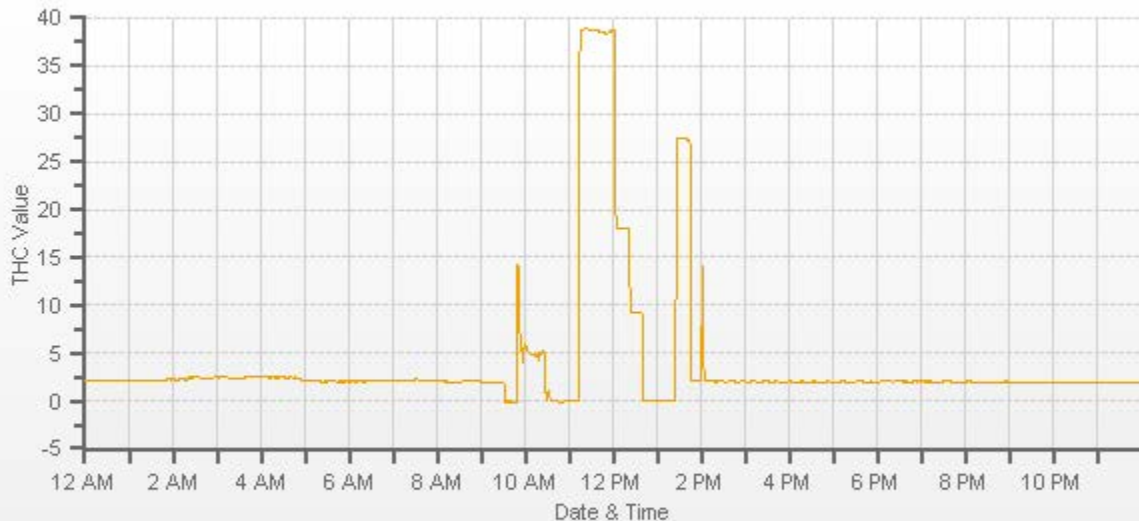
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		.95-1.05
b (Intercept as % of full scale) =	0.35%		± 3% F.S.
% change in C.F. from last cal =	1.02%		± 10%



As found:	As left:
H2 cylinder (psi): 500	H2 cylinder (psi): 500
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 1000	Span Cylinder (psi): 1000
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 34	Zero Air Gen Pressure: 34
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1649	cnt: 1560
rng: 1	rng: 1
try: 1	try: 1
flm: 180.8	flm: 179.3
det: 125.5	det: 125.8
Flame: 180	Flame: 179
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 06.52	Sample psi: 06.52
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 14	Internal Fuel Pressure: 14
Measured Flow: 0.9369	Measured Flow: 0.9370
Expected Value: 27.33	Expected Value: 27.31

Comments:
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.



— THC[ppm]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	October 18, 2016	Barometric Pressure:	0.931 atm
Company/Airshed:	LUCA	Station Temperature °C:	23
Location/Station Name:	Cold Lake South	Weather Conditions:	Light snow
Parameter:	Total Hydrocarbon	Calibration Purpose:	repeat
Start/End Time 24 hr. (mst):	8:41 / 12:01	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:	ID# or Serial Number:	427408718	Range ppm:	50
	Last Calibration Date:	October 3, 2016	As Found C.F.:	0.992
	Previous Cal High Point C.F.:	1.002	New C.F.:	1.000

Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for a Range of:	50 ppm
	Make & Model:	API 700		
	Serial #:	627		
	Cal Gas Cylinder I.D. #:	LL165372		
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0 / 212.0		
	CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 / 1189.0		

Point	Target ppm
High	38
Mid	18
Low	9

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

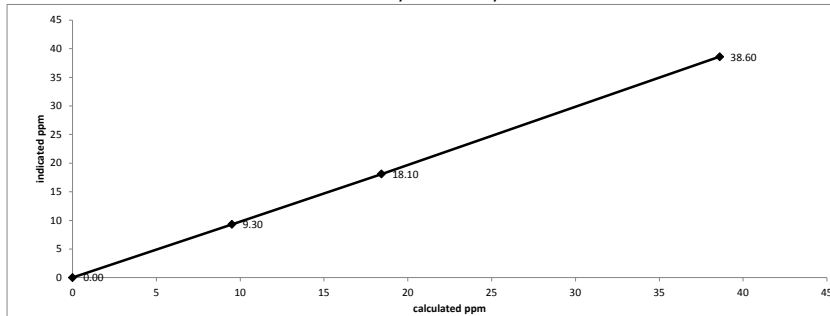
Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	1999	0.00	1999	0.0	0.00	n/a
as found high	1937	65.00	2002	38.60	38.90	0.992
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1937	65.00	2002	38.60	38.60	1.000
mid	1969	31.00	2000	18.43	18.10	1.018
low	1985	16.00	2001	9.51	9.30	1.022
calibrator zero	1999	0.00	1999	0.0	0.00	n/a

Average C.F. = 1.014

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale) =	0.31%		± 3% F.S.
% change in C.F. from last cal =	0.96%		± 10%

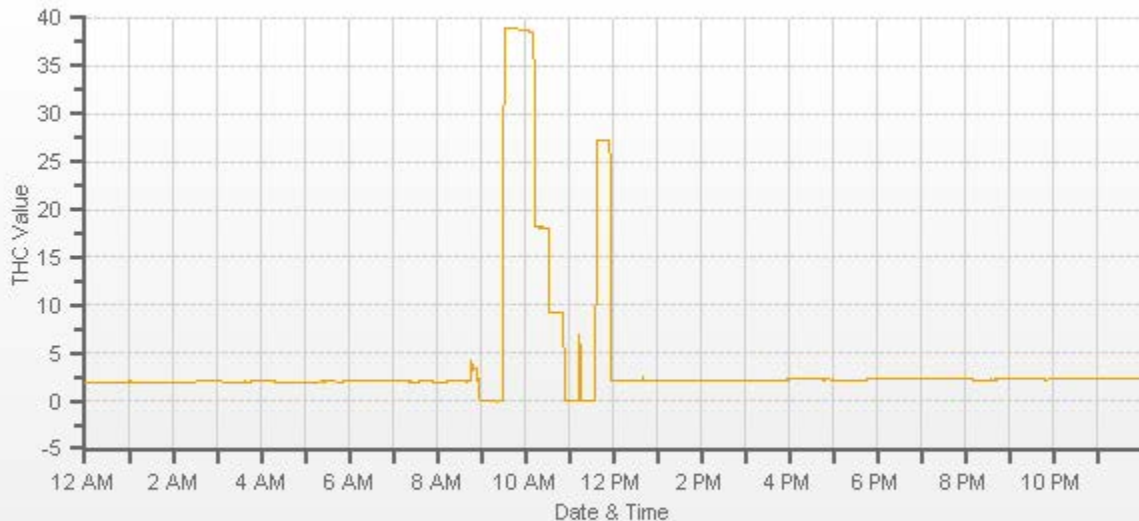
Thermo 51C Total Hydrocarbon Analyzer Calibration



As found:	As left:
H2 cylinder (psi): 700	H2 cylinder (psi): 700
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 1700	Span Cylinder (psi): 1700
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 34	Zero Air Gen Pressure: 34
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1550	cnt: 1480
rng: 1	rng: 1
try: 0	try: 0
flm: 179.3	flm: 178.3
det: 125.5	det: 125.1
Flame: 179	Flame: 178
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 06.51	Sample psi: 06.51
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 14	Internal Fuel Pressure: 14
Measured Flow: 0.9435	Measured Flow: 0.9441
Expected Value: 27.31	Expected Value: 27.23

Comments:

Repeat calibration completed to correct negative ZERO background (-0.1 ppm) for ZS checks.



— THC[ppm]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	October 20, 2016	Barometric Pressure:	0.927 atm
Company/Airshed:	LICA	Station Temperature °C:	23
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds
Parameter:	Total Hydrocarbon	Calibration Purpose:	post repair
Start/End Time 24 hr. (mst):	14:30 / 17:04	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:	ID# or Serial Number:	427408718	Range ppm:	50
	Last Calibration Date:	n/a	As Found C.F.:	n/a
	Previous Cal High Point C.F.:	n/a	New C.F.:	1.000

Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for a Range of: 50 ppm								
	Make & Model:	API 700									
	Serial #:	627									
	Cal Gas Cylinder I.D. #:	LL165372									
	CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	606.0 / 212.0	<table border="1"> <tr> <th>Point</th> <th>Target ppm</th> </tr> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </table>	Point	Target ppm	High	38	Mid	18	Low	9
Point	Target ppm										
High	38										
Mid	18										
Low	9										
	CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 / 1189.0									

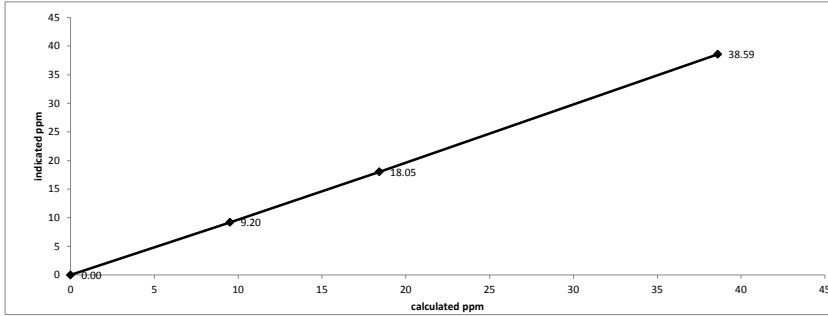
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
adjusted zero	1999	0.00	1999	0.0	0.00	n/a
adjusted high	1937	65.00	2002	38.60	38.59	1.000
mid	1970	31.00	2001	18.42	18.05	1.021
low	1985	16.00	2001	9.51	9.20	1.033
calibrator zero	1999	0.00	1999	0.00	0.00	n/a
Average C.F. =						1.018

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.998		.95-1.05
b (Intercept as % of full scale) =	0.40%		± 3% F.S.
% change in C.F. from last cal =	n/a		± 10%

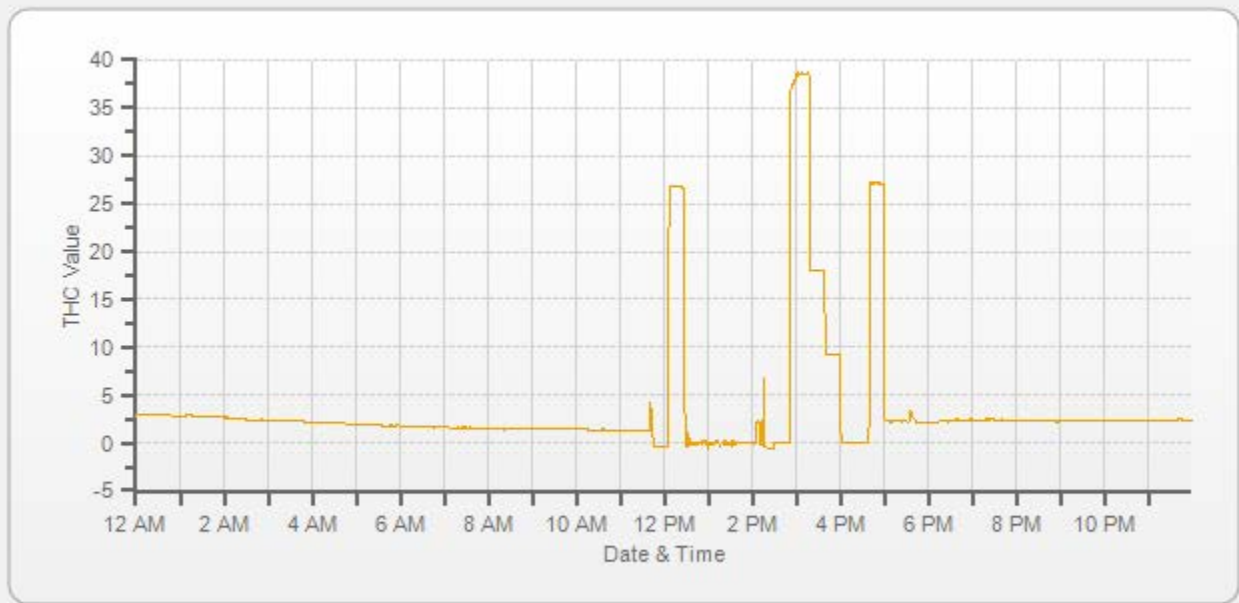
Thermo 51C Total Hydrocarbon Analyzer Calibration



As found:	As left:
H2 cylinder (psi): n/a	H2 cylinder (psi): 1700
H2 cylinder reg set (psi): n/a	H2 cylinder reg set (psi): 22
Span Cylinder (psi): n/a	Span Cylinder (psi): 600
Span Cylinder Reg Set (psi): n/a	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: n/a	Zero Air Gen Pressure: 36
measurement alarms: n/a	measurement alarms: None
service alarms: n/a	service alarms: None
cnt: n/a	cnt: 1211
rng: n/a	rng: 1
try: n/a	try: 2
flm: n/a	flm: 177.9
det: n/a	det: 125.9
Flame: n/a	Flame: 177
Filter: n/a	Filter: 125
Base: n/a	Base: 125
Sample psi: n/a	Sample psi: 06.51
Internal Air Pressure: n/a	Internal Air: 20
Internal Fuel Pressure: n/a	Internal Fuel: 14
Measured Flow: n/a	Measured Flow: 0.9415
Expected Value: n/a	Expected Value: 27.12

Comments:

Post-repair calibration completed after a sample pump had been repaired.



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: <u>October 4, 2016</u>	Barometric Pressure: <u>0.935 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>23</u>
Location/Station Name: <u>Cold Lake South</u>	Weather Conditions: <u>Mix of sun and clouds</u>
Start/End Time 24 hr. (mst): <u>8:22 / 13:53</u>	Calibration Purpose: <u>routine monthly</u>
G.P.T. to be used for Ozone? <u>No</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whatsitt</u>
Calibration Method: <u>Gas Dilution & Gas Phase Titration</u>	Cal Gas Expiry Date: <u>December 2, 2023</u>

Analyzer: ID# or Serial Number: <u>1505664393</u> Last Calibration Date: <u>September 13, 2016</u> Range ppb: <u>500</u>	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>0.994</td> <td>0.999</td> </tr> <tr> <td>NO₂ =</td> <td>1.008</td> <td>1.004</td> <td>1.004</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>0.994</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	0.994	0.999	NO ₂ =	1.008	1.004	1.004	NOx =	0.999	0.994	0.999
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	0.994	0.999														
NO ₂ =	1.008	1.004	1.004														
NOx =	0.999	0.994	0.999														

Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>API 700</u> Serial #: <u>627</u> Cal Gas Cylinder I.D. #: <u>LL119346</u> NO/NOx Gas Conc. (ppm): <u>50.0</u> <u>50.0</u>	Standard Calibration Points for a Range of: 500 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>250</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>145</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>50</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	380	250	n/a	Mid	180	145	n/a	Low	90	50	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	380	250	n/a																						
Mid	180	145	n/a																						
Low	90	50	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
as found high	4966	38.0	5004	379.7	379.7	382.0	382.0	0.994	0.994
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4966	38.00	5004	379.7	379.7	380.0	380.0	0.999	0.999
mid	4982	18.00	5000	180.0	180.0	180.0	180.0	1.000	1.000
low	4992	9.00	5001	90.0	90.0	90.0	90.0	1.000	1.000
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.000	1.000

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4966	38.00	5004	0.0	380.0	380.0	0.0	0.0	0.0	
as found high NO2	4839	38.00	4877	240.0	125.0	379.0	254.0	255.0	254.0	1.004
adjusted high NO2	4839	38.00	4877	240.0	125.0	379.0	254.0	255.0	254.0	1.004
gpt mid	4839	38.00	4877	140.0	234.0	380.0	146.0	146.0	146.0	1.000
gpt low	4839	38.00	4877	46.0	329.0	381.0	52.0	51.0	52.0	0.981
Average NO ₂ C.F.=									0.995	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.005	.95-1.05
b (Intercept as % of full scale)=	-0.01%	-0.01%	0.12%	± 3% F.S.
% change in C.F. from last cal=	0.50%	0.50%	0.40%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:	As left:
NO Bkg: <u>3.5</u>	NO Bkg: <u>3.5</u>
NOx Bkg: <u>3.6</u>	NOx Bkg: <u>3.6</u>
NO Coef: <u>1.018</u>	NO Coef: <u>1.014</u>
NO2 Coef: <u>1.000</u>	NO2 Coef: <u>1.000</u>
NOx Coef: <u>1.000</u>	NOx Coef: <u>1.000</u>
PMT: <u>-854.7</u>	PMT: <u>-854.7</u>
Internal: <u>25.9</u>	Internal: <u>25.5</u>
Chamber: <u>50.1</u>	Chamber: <u>50.1</u>
Cooler: <u>-3.0</u>	Cooler: <u>-3.1</u>
NO2 Converter: <u>325.0</u>	NO2 Converter: <u>325.0</u>
NO2 Converter Set: <u>325.0</u>	NO2 Converter Set: <u>325.0</u>
Pressure: <u>180.8</u>	Pressure: <u>181.4</u>
Flow: <u>0.778</u>	Flow: <u>0.780</u>
Ozonator Flow: <u>OK</u>	Ozonator Flow: <u>OK</u>
Expected Value NO: <u>3.00</u>	Expected Value NO: <u>2.60</u>
Expected Value NO2: <u>267.00</u>	Expected Value NO2: <u>266.00</u>
Expected Value NOx: <u>270.00</u>	Expected Value NOx: <u>269.00</u>

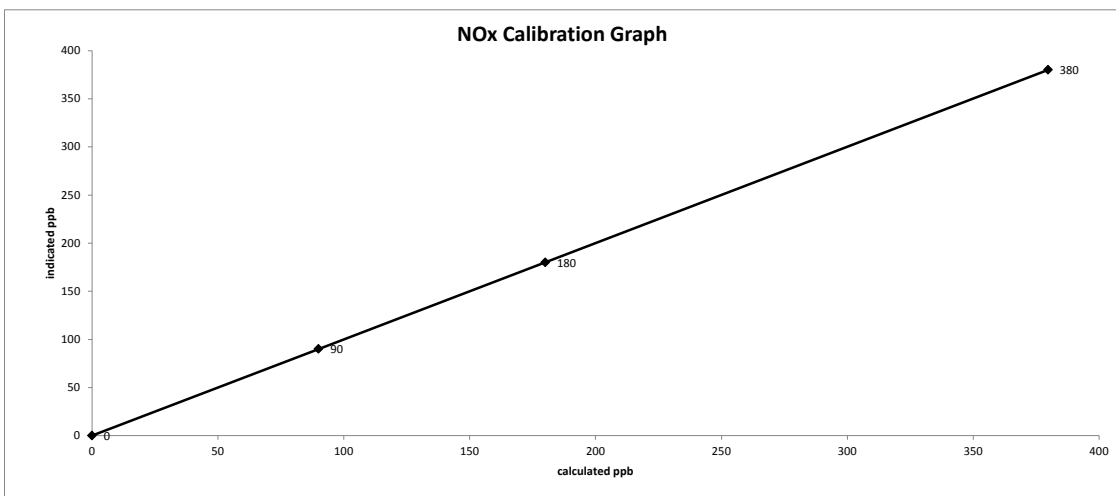
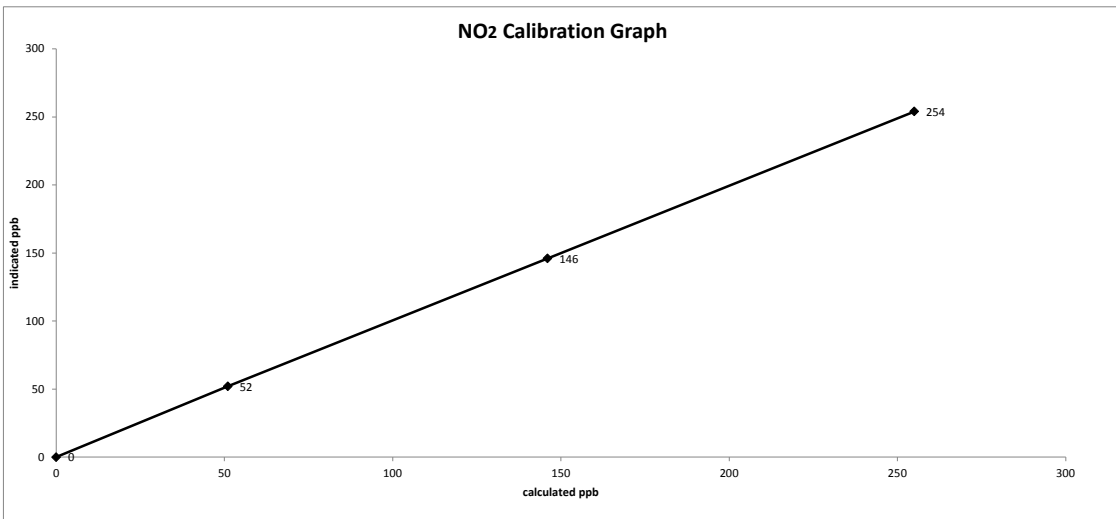
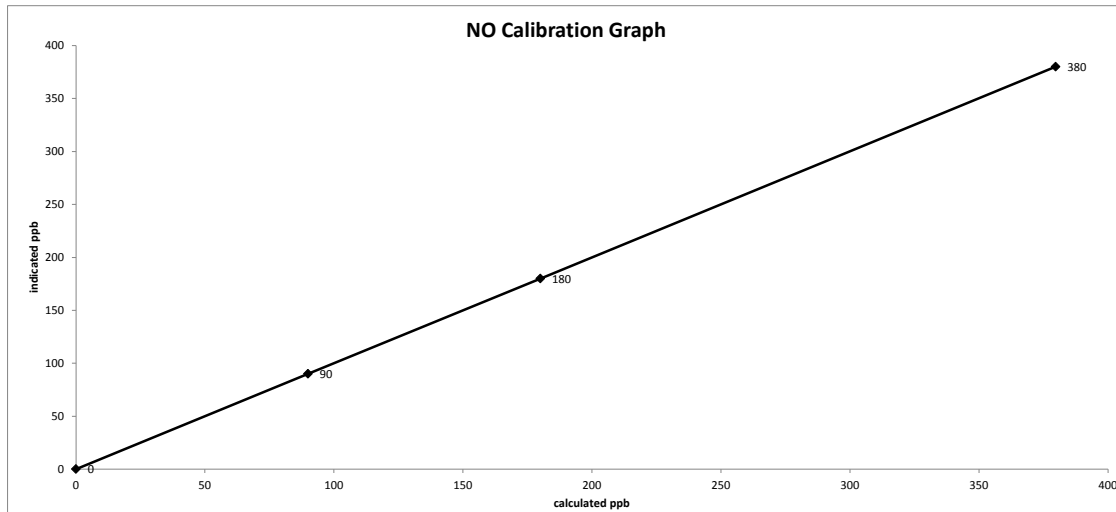
Comments:

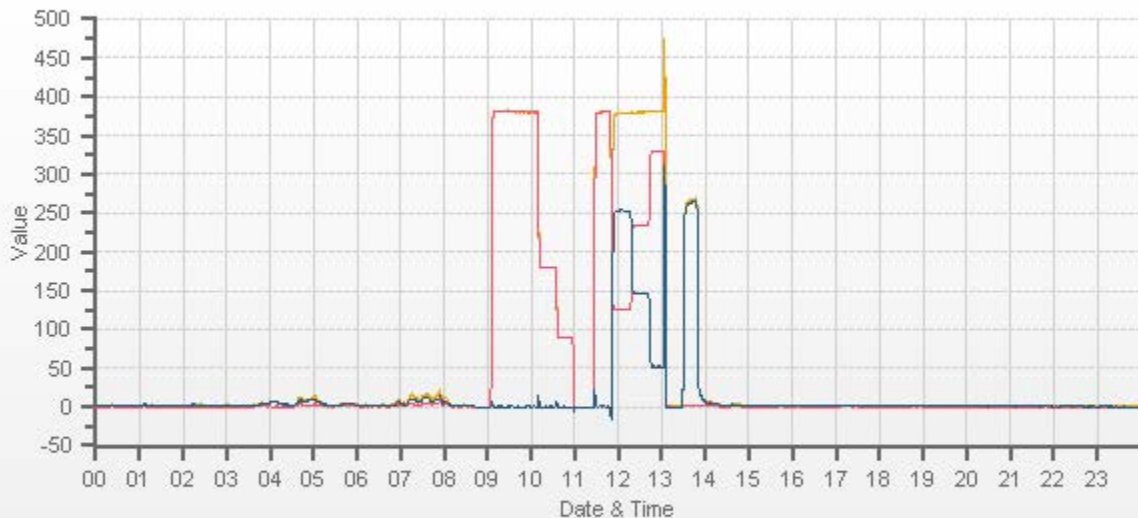
The analyzer sample inlet filter was changed. No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes. The analyzer cooling fan filter(s) were cleaned.

Date: October 4, 2016
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 8:22 / 13:53
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





NOX[ppb] NO[ppb] NO2[ppb]

OZONE

Maxxam Thermo 49i Ozone Analyzer Calibration

A Bureau Veritas Group Company

Date: October 3, 2016 Barometric Pressure: 0.936 atm
 Company/Airshed: LICA Station Temperature °C: 23
 Location/Station Name: Cold Lake South Weather Conditions: Mainly sunny
 Start/End Time 24 hr. (mst): 9:20 / 13:50 Calibration Purpose: routine monthly
 Ozone Calibration Method: Varying UV Lamp Power Performed By/Reviewer: Alex Yakupov Trina Whitsitt
 G.P.T. Date: n/a-done by Varying UV Lamp Power Cal Gas Expiry Date: n/a

Analyzer:
 ID# or Serial Number: 700419591 Ozone Range ppb: 500
 Last Calibration Date: September 12, 2016 As Found C.F.: 1.003
 Previous Cal High Point C.F.: 1.000 New C.F.: 1.000

Calibrator:
 Flow Meter ID's: n/a
 Make & Model: SABIO 2010 D
 Serial #: 11900613
 Cal Gas Cylinder I.D. #: n/a

Point	AMD Required Range of Ozone Calibration Points
High	300-400 ppb
Mid	150-200 ppb
Low	50-75 ppb

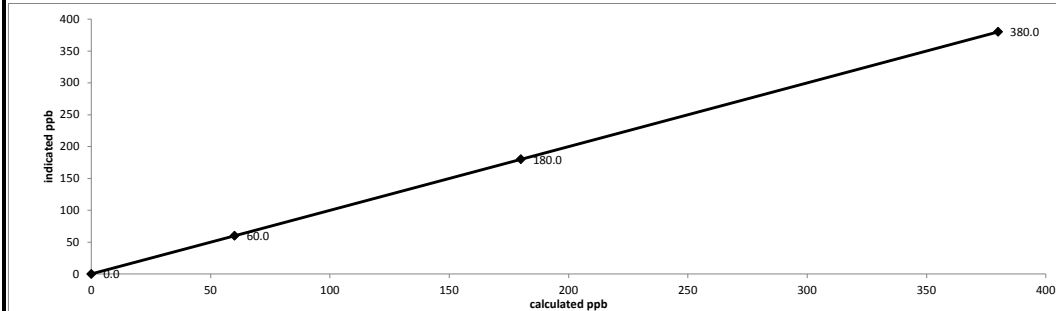
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.2	n/a
as found high	5000	5000	380.0	380.0	379.0	1.003
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F. =						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 > or = 0.995
 Slope = 1.000 .95-1.05
 b (Intercept as % of full scale) = 0.00% ± 3% F.S.
 % change in C.F. from last cal = -0.32% ± 10%

Thermo 49i Ozone Analyzer Calibration



As found:
 O3 Bkg: 0.2
 O3 Coef: 1.002
 Photo Lamp: 9.6
 O3 Lamp: 9.0
 Bench: 28.3
 Bench Lamp: 53.4
 O3 Lamp: 67.4
 Pressure: 707.1
 Cell A lpm: 0.717
 Cell B lpm: 0.757
 O3 ppb: 0.8
 Cell A ppb: 0.1
 Cell B ppb: 1.4
 Cell A int: 90713
 Expected Value: 260.0

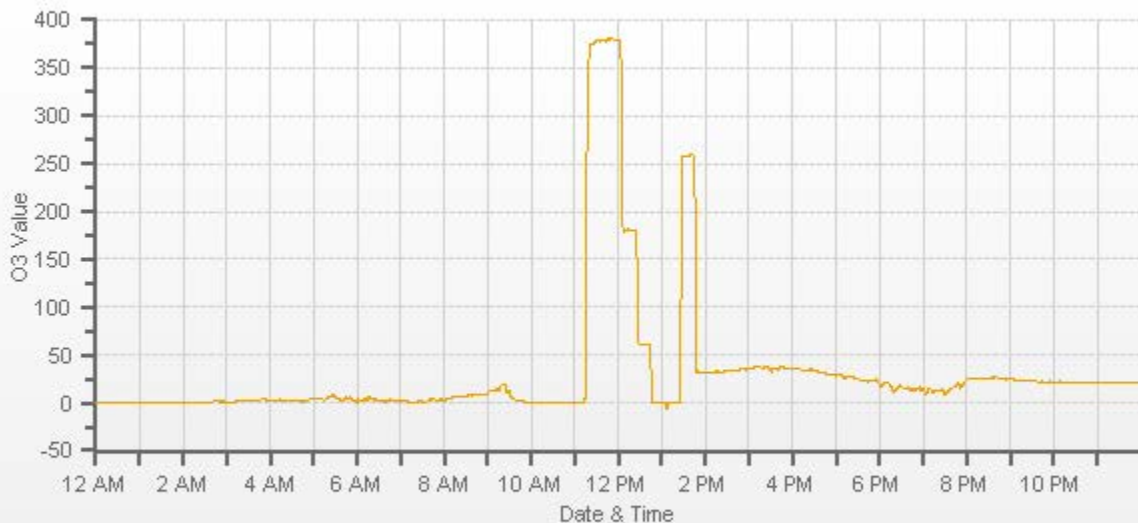
As left:
 O3 Bkg: 0.2
 O3 Coef: 1.000
 Photo Lamp: 9.6
 O3 Lamp: 9.0
 Bench: 27.6
 Bench Lamp: 53.4
 O3 Lamp: 67.3
 Pressure: 705.6
 Cell A lpm: 0.717
 Cell B lpm: 0.757
 O3 ppb: 0.3
 Cell A ppb: 6.7
 Cell B ppb: -6.0
 Cell A int: 90641
 Expected Value: 259.0

Comments:

The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

O3[ppb] Station: LICA COLD LAKE SOUTH Daily: 2016/10/03 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: October 3, 2016
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: September 20, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 13:11
 End Time (mst): 13:58
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number: 1405A201620804 As Found Filter Loading %: 25.53
 Ko Factor: 14578 As Left Filter Loading %: 25.73
 Ambient Temperature °C: 12.28 As Found Noise: 0.005
 Ambient Pressure atm: 0.936 As Left Noise: 0.002
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.31
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

Make:	Flow:	Pressure:	Temperature:
<u>Dwyer</u>	<u></u>	<u>Fisher</u>	<u>FLUKE</u>
<u>Model: 475 Mark III</u>	<u></u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
<u>Serial Number: #2</u>	<u></u>	<u>130168457</u>	<u>ID# 4295</u>
<u>Calibration Date: January 15, 2016</u>	<u></u>	<u>February 7, 2016</u>	<u>November 1, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.12	0.01	0.12
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.20	0.00	0.20
	limit	0.60	0.60	0.60	0.60

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.12	0.01	0.12
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.20	0.00	0.20
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>12.3</u>	1405F pressure atm: <u>0.936</u>
reference temperature °C: <u>12.5</u>	reference pressure: <u>0.936</u>
difference °C: <u>0.2</u>	difference: <u>0.000</u>

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>12.3</u>	1405F pressure atm: <u>0.936</u>
reference temperature °C: <u>12.5</u>	reference pressure: <u>0.936</u>
difference °C: <u>0.2</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>16.65</u>
difference lpm: <u>0.00</u>	difference lpm: <u>-0.02</u>

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>16.65</u>
difference lpm: <u>0.00</u>	difference lpm: <u>-0.02</u>

K_o Audit:

Last K_o audit date: August 8, 2016
 1405F K_o factor: 14578
 Measured K_o factor: 14731.5000
 % difference: 1.05

Comments:

The TEOM intake head and associated sharp cut components were cleaned.
 The bypass (auxillary) flow filter was changed.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: October 26, 2016
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: October 3, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 8:02
 End Time (mst): 9:10
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: A few clouds

1400A Information and Status:

ID# or Serial Number: 1405A201620804 As Found Filter Loading %: 31.87
 Ko Factor: 14578 As Left Filter Loading %: 18.46
 Ambient Temperature °C: 1.29 As Found Noise: 0.002
 Ambient Pressure atm: 0.937 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.33
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>BRUNTON</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>BIO</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>BPO 14</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>July 7, 2016</u>	<u>November 1, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.11	0.02	0.11
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.19	0.00	0.19
	limit	0.60	0.60	0.60	0.60

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.11	0.02	0.11
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.19	0.00	0.19
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>1.3</u>	1405F pressure atm: <u>0.937</u>
reference temperature °C: <u>1.6</u>	reference pressure: <u>0.937</u>
difference °C: <u>0.3</u>	difference: <u>0.000</u>

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>1.6</u>	1405F pressure atm: <u>0.937</u>
reference temperature °C: <u>1.6</u>	reference pressure: <u>0.937</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.98</u>	reference total/aux flow lpm: <u>16.58</u>
difference lpm: <u>-0.02</u>	difference lpm: <u>-0.09</u>

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.98</u>	reference total/aux flow lpm: <u>16.58</u>
difference lpm: <u>-0.02</u>	difference lpm: <u>-0.09</u>

K_o Audit:

Last K_o audit date: August 8, 2016
 1405F K_o factor: 14578
 Measured K_o factor: 14731.5000
 % difference: 1.05

Comments:

The TEOM sample filter was changed. The TEOM intake head and associated sharp cut components were cleaned.
 The bypass (auxillary) flow filter was changed.

PARTISOL SAMPLER



PARTISOL 2000 Audit

Date: October 24, 2016 **Weather Conditions:** A few clouds
Company: LICA **Start Time (mst):** 10:09
Station: Cold Lake South **End Time (mst):** 15:24
Parameter: PM 2.5 **Performed By/Reviewer:** Alex Yakupov Trina Whitsitt

Sampler

Instrument Data

Make/Model: R & P **Temperature (°C)** -0.5
Unit # # 2873 **Pressure (atm)** 0.949
ID# or Serial Number: 2000B206140102 **Set Flow (litres/min)** 16.67

Reference Standards

	Flow	Pressure	Temperature	Manometer
Make:	Dwyer	Fisher	FLUKE	Dwyer
Model:	475 Mark III	FB1291	1551A Ex STIK	475 Mark III
Serial Number:	#2	130168457	ID# 4295	#2
Calibration Date:	January 15, 2016	February 7, 2016	November 1, 2015	January 15, 2016

Temperature/Pressure/Flow Audit

Reference Temperature: (±2 °C)	-0.6	Δ °C	-0.1
Reference Pressure: (±0.02 ATM)	0.945	Δ atm	-0.004
Reference Flow (± 1.0 litres/min)	16.41	litres/min	0.26

Leak Check - Manual Mode

mmHg

Flow Controller Valve Closed (V1): 23.5
Pump Valve Closed after 10 Secs. (V2): 23.5
1/2*V1=(VL): 11.8
Pass/Fail? Pass

Other Checks:

Rubber Seal Condition: OK
Inlet Head Cleanliness: Sample inlet head cleaned on October 24, 2016
Inline Filter Condition: OK
Status Alarms: OK
Insulating Jacket Condition: OK
Side Hoods and Dust Filters: OK
Location v.s. AMD: OK
Flow Setting Actual or Standard ?: Actual

	As Found	As Left	% Change
Did the temperature require adjustment?	No	-0.5	
Did the ambient pressure require adjustment?	No	0.948	
Did the ambient flow require adjustment?	No	9.48	

Recommendations/Comments:

Loose connection of the MFC identified and fixed. Flow audited, no calibration needed.

Calculations for Total Flow:

Enter Barometric Pressure in. Hg 28.4
Barometric Pressure atm 0.949
Enter Ambient Temperature °C -0.5
Enter "m" variable 0.395
Enter "b" variable 0.0089
Enter Δp in. H₂O 6
Actual Flow lpm= 16.41

$$Q_a = m \sqrt{\frac{(\Delta P)(T_{amb})}{P_{amb}}} - b$$

WIND SYSTEM



Met One Instruments
1600 NW Washington Blvd.
Grants Pass, Oregon 97526
Telephone 541-471-7111
Facsimile 541-471-7116

Regional Service
3206 Main St. Suite 106
Rowlett, Texas 75088
Telephone 972-412-4715
Facsimile 972-412-4716

Sonic Wind Sensor Certificate of Calibration

Sensor Model No: 50.5H Sonic Sensor Serial No: F1644
 Customer: _____ P.O. No: _____ Sales Order: _____
 Final Calibration By: Kevin Ricks Calibration Date: 04-01-15
 Quality Control Inspected By: AJR Inspection Date: APR 03 2015
 New Unit Repair/Adjust Re-Calibration As Found
 Unit Within Tolerance as Found Unit Within Tolerance as Left

Calibration Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Digital Multimeter 1	Agilent/HP	34401A	MY41039534	4/11/2015
Digital Multimeter 2	Agilent/HP	34401A	US36094551	8/26/2015
Frequency Counter	Agilent/HP	53131A	MY40009285	5/22/2015
Standard Sensor	MOI	010C-1	P22383	7/11/2017
Temperature Probe	MOI	920005/PC8340	E3402	9/03/2015

Test 1: Average Wind Tunnel Speed: 3.08 Meters per Second FirmwareVersion: 3194-01 R2.62

WD Setting (Deg)	WD Output (Volts)	WD Indication (Deg)	WD Error (+/- 3 Deg)	WS Standard (m/s)	WS Output (Volts)	WS Indication (m/s)	WS Error (+/- .20 m/s)	Output Type:
30	.084	30.3	.3	3.06	.059	2.96	-.1	0 to 1 volt <input checked="" type="checkbox"/>
60	.165	59.3	-.7	3.07	.059	2.94	-.13	0 to 2.5 volt <input type="checkbox"/>
120	.334	120.2	.2	3.08	.059	2.94	-.14	0 to 5 volt <input type="checkbox"/>
150	.415	149.5	-.5	3.07	.059	2.94	-.13	RS-232 <input checked="" type="checkbox"/>
210	.583	210	0	3.08	.059	2.95	-.12	SDI-12 <input type="checkbox"/>
240	.668	240.3	.3	3.08	.06	2.98	-.1	RS-422 <input type="checkbox"/>
300	.834	300.4	.4	3.07	.06	3.02	-.04	RS-485 <input type="checkbox"/>
330	.916	329.8	-.2	3.09	.059	2.97	-.12	<input type="checkbox"/>

Test 2: Average Wind Tunnel Speed: 11.85 Meters per Second Output Range: 0-50 m/s

WD Setting (Deg)	WD Output (Volts)	WD Indication (Deg)	WD Error (+/- 3 Deg)	WS Standard (m/s)	WS Output (Volts)	WS Indication (m/s)	WS Error (+/- .24 m/s)	Test Items:
30	.081	29.3	-.7	11.79	.235	11.76	-.04	Array Alignment <input checked="" type="checkbox"/>
60	.165	59.5	-.5	11.85	.237	11.87	.01	Jumper Config <input checked="" type="checkbox"/>
120	.331	119.1	-.9	11.85	.236	11.81	-.03	Firmware Config <input checked="" type="checkbox"/>
150	.415	149.3	-.7	11.88	.236	11.8	-.08	Zero Calibration <input checked="" type="checkbox"/>
210	.582	209.5	-.5	11.81	.236	11.79	-.02	Low Speed Test OK <input checked="" type="checkbox"/>
240	.666	239.9	-.1	11.88	.235	11.73	-.16	High Speed Test OK <input checked="" type="checkbox"/>
300	.833	299.7	-.3	11.87	.235	11.73	-.13	Sensor Function <input checked="" type="checkbox"/>
330	.915	329.6	-.4	11.84	.238	11.9	.06	Physical Inspection <input checked="" type="checkbox"/>

The standards used for this calibration have accuracies equal to or greater than the instruments tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated hereon, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A. Calibration performed by direct comparison to the above standard following test procedure: 50.5-6100 Rev E

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO_x		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
	Make/Model <u>Thermo 42i</u>
	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>None</u>
Serial Number	<u>11900613</u>	Serial Number	<u>None</u>
Last Verification Date	<u>April 1, 2015</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>706 mmHg</u>
NO/NOx Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5001</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4999	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5001	77.5	0.779	0.779	0.775	0.000	0.775	-1%	-1%
5000	37.8	0.380	0.380	0.376	0.001	0.377	-1%	-1%
5000	18.9	0.190	0.190	0.188	0.001	0.189	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	0.9950	0.90-1.10		m (Slope)=	0.9946		
b (Intercept % of FS)=	-0.0773	± 3% F.S.		b (Intercept % of FS)=	-0.0167		

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
<u>NO₂</u>		<u>LIMITS</u>					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

COMMENTS: NO Cyl has 49.9ppb SO2 - Flows Not Manually Measured

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 31, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: Thermo146i
Serial Number: 1809
Last Verification Date: February 2, 2016
Gas Type: SO2 **Conc.** 98.07
Cylinder Number: CAL016625

Flow Measurement Device:

Make/Model: Bios DC-2
Serial Number: Bios D
Temp.°C: 24.5
B.P. 702mmHg

Reference Analyzer:

Make/Model: Thermo 43C **Serial/AMU Number:** 1623
Instrument Settings: **Zero:** 8.7 **Span:** 1.027 **Range:** 1.0
Last Calibration: **Date:** 1-Feb-16 **C.F.** 1.000 **Done By:** SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0

Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: February 2, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: LL36837 **Concentration PPM:** 10.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P.: 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson
Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
Serial Number AMU 1698
Last Verification Date January 18, 2016
Gas Type CH4 Conc. 999.2
Cylinder Number D751932
Gas Type C3H8 Conc. 246.5
Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
Serial Number Blos D
Temp. °C 24.5
B.P. 698mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
Instrument Settings Zero: NA Span: NA Range: 20.0
Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	0.02140	46.722	607	214
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						608	215

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016
Operator Signature: _____ Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:
Make/Model Thermo 42i **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.2 **Span:** 1.014 **Range:** 1.0
Last Calibration: **Date:** 02-Feb-16 **C.F.** 1.000 **Done By:** SB

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

NO	NOx
Previous Stated Concentration PPM: <u>50.0</u>	<u>50.0</u>
Percent variance from Stated: <u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO Blend 50.0PPM SO2
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton **Date:** February 2, 2016
Operator Signature: [Signature] **Location:** McIntyre Center Edmonton

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 03, 2016	S5684	Ambient Air	03-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Oct-16
16100085-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	15-Oct-16
16100085-001	1,2,4-Trimethylbenzene	I	0.12	ppbv	0.03	AC-058	15-Oct-16
16100085-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Oct-16
16100085-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	1,3-Butadiene	I	0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Oct-16
16100085-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-001	1-Butene	I	0.06	ppbv	0.02	AC-058	15-Oct-16
16100085-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	1-Pentene	I	0.03	ppbv	0.01	AC-058	15-Oct-16
16100085-001	2,2,4-Trimethylpentane	I	0.04	ppbv	0.01	AC-058	15-Oct-16
16100085-001	2,2-Dimethylbutane	I	0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	2,3-Dimethylbutane	I	0.03	ppbv	0.02	AC-058	15-Oct-16
16100085-001	2,3-Dimethylpentane	I	0.04	ppbv	0.02	AC-058	15-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 03, 2016	S5684	Ambient Air	03-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-001	2,4-Dimethylpentane	I	0.02	ppbv	0.01	AC-058	15-Oct-16
16100085-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	2-Methylhexane	I	0.04	ppbv	0.01	AC-058	15-Oct-16
16100085-001	2-Methylpentane	I	0.10	ppbv	0.01	AC-058	15-Oct-16
16100085-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	3-Methylhexane	I	0.03	ppbv	0.02	AC-058	15-Oct-16
16100085-001	3-Methylpentane	I	0.05	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Acetone		2.5	ppbv	0.4	AC-058	15-Oct-16
16100085-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Oct-16
16100085-001	Benzene	I	0.08	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Carbon disulfide		0.65	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Chloroform	I	0.04	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Chloromethane		0.56	ppbv	0.02	AC-058	15-Oct-16
16100085-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	cis-2-Pentene	I	0.03	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Cyclohexane	I	0.02	ppbv	0.02	AC-058	15-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Tuesday, November 15, 2016	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 03, 2016	S5684	Ambient Air	03-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-001	Cyclopentane	I	0.03	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Ethanol		1.3	ppbv	0.3	AC-058	15-Oct-16
16100085-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-001	Ethylbenzene	I	0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Freon-11		0.34	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Freon-113	I	0.08	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Freon-114	I	0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Freon-12		0.67	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	15-Oct-16
16100085-001	Isobutane		0.83	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Isopentane		0.73	ppbv	0.03	AC-058	15-Oct-16
16100085-001	Isoprene	I	0.03	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Isopropyl alcohol		0.6	ppbv	0.4	AC-058	15-Oct-16
16100085-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	m,p-Xylene	I	0.04	ppbv	0.03	AC-058	15-Oct-16
16100085-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	15-Oct-16
16100085-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	15-Oct-16
16100085-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Oct-16
16100085-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Oct-16
16100085-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Oct-16
16100085-001	Methylcyclohexane	I	0.03	ppbv	0.01	AC-058	15-Oct-16
16100085-001	Methylcyclopentane	I	0.06	ppbv	0.02	AC-058	15-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 03, 2016	S5684	Ambient Air	03-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Oct-16
16100085-001	n-Butane		3.17	ppbv	0.03	AC-058	15-Oct-16
16100085-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	15-Oct-16
16100085-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-001	n-Heptane	I	0.02	ppbv	0.01	AC-058	15-Oct-16
16100085-001	n-Hexane	I	0.08	ppbv	0.01	AC-058	15-Oct-16
16100085-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-001	n-Pentane		0.3	ppbv	0.1	AC-058	15-Oct-16
16100085-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Oct-16
16100085-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	15-Oct-16
16100085-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	15-Oct-16
16100085-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	o-Xylene	I	0.02	ppbv	0.01	AC-058	15-Oct-16
16100085-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Oct-16
16100085-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-001	Toluene	I	0.13	ppbv	0.01	AC-058	15-Oct-16
16100085-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-001	trans-2-Pentene	I	0.06	ppbv	0.02	AC-058	15-Oct-16
16100085-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Tuesday, November 15, 2016	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca



PO Bag 4000
 Vegreville, Alberta
 Canada T9C 1T4
 (780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 03, 2016	S5684	Ambient Air	03-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100085-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	15-Oct-16
16100085-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	15-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 9, 2016	14988	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Oct-16
16100130-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Oct-16
16100130-001	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Oct-16
16100130-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Oct-16
16100130-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Oct-16
16100130-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-001	1-Butene	I	0.06	ppbv	0.02	AC-058	25-Oct-16
16100130-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Tuesday, November 15, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 9, 2016	14988	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	2-Methylpentane	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	3-Methylpentane	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Acetone		1.2	ppbv	0.4	AC-058	25-Oct-16
16100130-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Oct-16
16100130-001	Benzene	I	0.07	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Carbon disulfide	I	0.06	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Carbon tetrachloride	I	0.16	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Chloroform	I	0.03	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Chloromethane		0.47	ppbv	0.02	AC-058	25-Oct-16
16100130-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-001	cis-2-Butene	I	0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
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		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 9, 2016	14988	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Ethanol		0.4	ppbv	0.3	AC-058	25-Oct-16
16100130-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Freon-11		0.41	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Freon-113	I	0.09	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Freon-12		0.72	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Oct-16
16100130-001	Isobutane	I	0.13	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Isopentane	I	0.11	ppbv	0.03	AC-058	25-Oct-16
16100130-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	m,p-Xylene	I	0.03	ppbv	0.03	AC-058	25-Oct-16
16100130-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Oct-16
16100130-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Oct-16
16100130-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Oct-16
16100130-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Oct-16
16100130-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Oct-16
16100130-001	Methylcyclohexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	Methylcyclopentane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 9, 2016	14988	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Oct-16
16100130-001	n-Butane	I	0.29	ppbv	0.03	AC-058	25-Oct-16
16100130-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Oct-16
16100130-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-001	n-Heptane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	n-Hexane	I	0.02	ppbv	0.01	AC-058	25-Oct-16
16100130-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	25-Oct-16
16100130-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Oct-16
16100130-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Oct-16
16100130-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Oct-16
16100130-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Oct-16
16100130-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-001	Toluene	I	0.05	ppbv	0.01	AC-058	25-Oct-16
16100130-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-001	trans-2-Butene	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16

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Date: Tuesday, November 15, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca



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 Vegreville, Alberta
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 9, 2016	14988	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100130-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	25-Oct-16
16100130-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 15, 2016	2489	Ambient Air	15-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-002	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-002	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100230-002	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Nov-16
16100230-002	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-002	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-002	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100230-002	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-002	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-002	1-Butene	I	0.05	ppbv	0.02	AC-058	03-Nov-16
16100230-002	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	2,2,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-002	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	2,3-Dimethylpentane	I	0.02	ppbv	0.02	AC-058	03-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 15, 2016	2489	Ambient Air	15-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-002	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	2-Methylpentane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-002	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	3-Methylhexane	I	0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	3-Methylpentane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Acetone		1.4	ppbv	0.4	AC-058	03-Nov-16
16100230-002	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100230-002	Benzene	I	0.17	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-002	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Bromomethane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Carbon disulfide		0.30	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Chloroethane	I	0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Chloroform	I	0.03	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Chloromethane		0.51	ppbv	0.02	AC-058	03-Nov-16
16100230-002	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-002	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 15, 2016	2489	Ambient Air	15-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-002	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Ethanol		0.6	ppbv	0.3	AC-058	03-Nov-16
16100230-002	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-002	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Freon-11		0.32	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Freon-113	I	0.07	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Freon-114	I	0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Freon-12		0.64	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Nov-16
16100230-002	Isobutane	I	0.16	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Isopentane	I	0.14	ppbv	0.03	AC-058	03-Nov-16
16100230-002	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-002	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-002	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-002	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Nov-16
16100230-002	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Nov-16
16100230-002	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100230-002	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-002	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100230-002	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-002	Methylcyclohexane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	Methylcyclopentane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 15, 2016	2489	Ambient Air	15-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-002	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100230-002	n-Butane	I	0.24	ppbv	0.03	AC-058	03-Nov-16
16100230-002	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100230-002	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-002	n-Heptane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	n-Hexane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	03-Nov-16
16100230-002	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100230-002	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100230-002	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100230-002	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-002	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100230-002	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-002	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-002	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-002	Toluene	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100230-002	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-002	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-002	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-002	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Oct 15, 2016	2489	Ambient Air	15-Oct-16 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100230-002	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Nov-16
16100230-002	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/ Oct 21, 2016	14999	Ambient Air	21-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-004	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-004	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-004	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Nov-16
16100270-004	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-004	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-004	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100270-004	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-004	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-004	1-Butene	I	0.07	ppbv	0.02	AC-058	03-Nov-16
16100270-004	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100270-004	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	2,3-Dimethylbutane	I	0.03	ppbv	0.02	AC-058	03-Nov-16
16100270-004	2,3-Dimethylpentane	I	0.04	ppbv	0.02	AC-058	03-Nov-16

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On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/ Oct 21, 2016	14999	Ambient Air	21-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-004	2,4-Dimethylpentane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	2-Methylheptane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100270-004	2-Methylhexane	I	0.06	ppbv	0.01	AC-058	03-Nov-16
16100270-004	2-Methylpentane	I	0.10	ppbv	0.01	AC-058	03-Nov-16
16100270-004	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	3-Methylhexane	I	0.04	ppbv	0.02	AC-058	03-Nov-16
16100270-004	3-Methylpentane	I	0.06	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Acetone		1.7	ppbv	0.4	AC-058	03-Nov-16
16100270-004	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100270-004	Benzene	I	0.14	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-004	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Bromomethane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Carbon disulfide	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Chloroform	I	0.03	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Chloromethane		0.53	ppbv	0.02	AC-058	03-Nov-16
16100270-004	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-004	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Cyclohexane	I	0.10	ppbv	0.02	AC-058	03-Nov-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Tuesday, November 15, 2016	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/ Oct 21, 2016	14999	Ambient Air	21-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-004	Cyclopentane	I	0.04	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Ethanol		0.6	ppbv	0.3	AC-058	03-Nov-16
16100270-004	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-004	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Freon-11	I	0.30	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Freon-113	I	0.06	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Freon-114	I	0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Freon-12		0.68	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Nov-16
16100270-004	Isobutane		1.20	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Isopentane		0.51	ppbv	0.03	AC-058	03-Nov-16
16100270-004	Isoprene	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-004	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	m,p-Xylene	I	0.04	ppbv	0.03	AC-058	03-Nov-16
16100270-004	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-004	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Nov-16
16100270-004	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Nov-16
16100270-004	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100270-004	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-004	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100270-004	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-004	Methylcyclohexane	I	0.12	ppbv	0.01	AC-058	03-Nov-16
16100270-004	Methylcyclopentane	I	0.11	ppbv	0.02	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

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Date: Tuesday, November 15, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/ Oct 21, 2016	14999	Ambient Air	21-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-004	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100270-004	n-Butane		1.52	ppbv	0.03	AC-058	03-Nov-16
16100270-004	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100270-004	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-004	n-Heptane	I	0.04	ppbv	0.01	AC-058	03-Nov-16
16100270-004	n-Hexane	I	0.10	ppbv	0.01	AC-058	03-Nov-16
16100270-004	n-Octane	I	0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	n-Pentane		0.3	ppbv	0.1	AC-058	03-Nov-16
16100270-004	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-004	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-004	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-004	n-Nonane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	o-Xylene	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100270-004	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-004	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100270-004	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-004	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-004	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-004	Toluene	I	0.11	ppbv	0.01	AC-058	03-Nov-16
16100270-004	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-004	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-004	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-004	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/ Oct 21, 2016	14999	Ambient Air	21-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100270-004	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Nov-16
16100270-004	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 27, 2016	1838	Ambient Air	27-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Nov-16
16100306-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	04-Nov-16
16100306-001	1,2,4-Trimethylbenzene	I	0.05	ppbv	0.03	AC-058	04-Nov-16
16100306-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Nov-16
16100306-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	04-Nov-16
16100306-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Nov-16
16100306-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-001	1-Butene	I	0.14	ppbv	0.02	AC-058	04-Nov-16
16100306-001	1-Hexene	I	0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	1-Pentene	I	0.02	ppbv	0.01	AC-058	04-Nov-16
16100306-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	2,3-Dimethylpentane	I	0.03	ppbv	0.02	AC-058	04-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 27, 2016	1838	Ambient Air	27-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	2-Methylheptane	I	0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	2-Methylhexane	I	0.13	ppbv	0.01	AC-058	04-Nov-16
16100306-001	2-Methylpentane	I	0.08	ppbv	0.01	AC-058	04-Nov-16
16100306-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	3-Methylhexane	I	0.11	ppbv	0.02	AC-058	04-Nov-16
16100306-001	3-Methylpentane	I	0.04	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Acetone		1.7	ppbv	0.4	AC-058	04-Nov-16
16100306-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Nov-16
16100306-001	Benzene		0.62	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Carbon disulfide	I	0.16	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Chloroethane	I	0.06	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Chloroform	I	0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Chloromethane		0.51	ppbv	0.02	AC-058	04-Nov-16
16100306-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-001	cis-2-Butene	I	0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Cyclohexane	I	0.04	ppbv	0.02	AC-058	04-Nov-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Tuesday, November 15, 2016	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 27, 2016	1838	Ambient Air	27-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-001	Cyclopentane	I	0.02	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Ethanol		1.0	ppbv	0.3	AC-058	04-Nov-16
16100306-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-001	Ethylbenzene	I	0.08	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Freon-11		0.30	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Freon-113	I	0.07	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Freon-114	I	0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Freon-12		0.64	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	04-Nov-16
16100306-001	Isobutane		0.70	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Isopentane		0.48	ppbv	0.03	AC-058	04-Nov-16
16100306-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	m,p-Xylene		0.45	ppbv	0.03	AC-058	04-Nov-16
16100306-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	04-Nov-16
16100306-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	04-Nov-16
16100306-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Nov-16
16100306-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Nov-16
16100306-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Nov-16
16100306-001	Methylcyclohexane	I	0.08	ppbv	0.01	AC-058	04-Nov-16
16100306-001	Methylcyclopentane	I	0.05	ppbv	0.02	AC-058	04-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 27, 2016	1838	Ambient Air	27-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Nov-16
16100306-001	n-Butane		0.98	ppbv	0.03	AC-058	04-Nov-16
16100306-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	04-Nov-16
16100306-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-001	n-Heptane	I	0.13	ppbv	0.01	AC-058	04-Nov-16
16100306-001	n-Hexane	I	0.16	ppbv	0.01	AC-058	04-Nov-16
16100306-001	n-Octane	I	0.03	ppbv	0.02	AC-058	04-Nov-16
16100306-001	n-Pentane		0.4	ppbv	0.1	AC-058	04-Nov-16
16100306-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Nov-16
16100306-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Nov-16
16100306-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Nov-16
16100306-001	n-Nonane	I	0.02	ppbv	0.01	AC-058	04-Nov-16
16100306-001	o-Ethyltoluene	I	0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	o-Xylene	I	0.07	ppbv	0.01	AC-058	04-Nov-16
16100306-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Nov-16
16100306-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-001	Toluene		1.56	ppbv	0.01	AC-058	04-Nov-16
16100306-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Oct 27, 2016	1838	Ambient Air	27-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100306-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	04-Nov-16
16100306-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	04-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Tuesday, November 15, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

PAHS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Oct 03, 2016	P13-01	Air Filter	03-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-002	1-Methylnaphthalene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	2-Methylnaphthalene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Acenaphthene		0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Acenaphthylene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Benzo(a)anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Benzo(b,j,k)fluoranthene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Benzo(c)phenanthrene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Chrysene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Fluoranthene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Fluorene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Naphthalene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Phenanthrene		0.13	ug/puf	0.01	NA-017	02-Nov-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Oct 03, 2016	P13-01	Air Filter	03-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-002	Pyrene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100085-002	Retene		0.02	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Oct 9, 2016	TE04	Air Filter	09-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-002	1-Methylnaphthalene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	2-Methylnaphthalene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Acenaphthene		0.06	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Acenaphthylene		0.33	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Anthracene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Benzo(a)anthracene		0.08	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Benzo(a)pyrene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Benzo(b,j,k)fluoranthene		0.11	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Benzo(c)phenanthrene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Benzo(e)pyrene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Chrysene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Fluoranthene		0.51	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Fluorene		0.34	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Indeno(1,2,3-cd)pyrene		0.06	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Naphthalene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Phenanthrene		1.32	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Oct 9, 2016	TE04	Air Filter	09-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100130-002	Pyrene		0.51 ug/puf	0.01	NA-017	02-Nov-16
16100130-002	Retene		0.03 ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Tuesday, November 15, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Oct 15, 2016	TE-09	Air Filter	15-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-003	1-Methylnaphthalene		0.05	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	2-Methylnaphthalene		0.10	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Acenaphthene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Acenaphthylene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Anthracene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Benzo(a)anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Benzo(b,j,k)fluoranthene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Benzo(c)phenanthrene		0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Chrysene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Fluoranthene		0.09	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Fluorene		0.10	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Naphthalene		0.08	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Phenanthrene		0.30	ug/puf	0.01	NA-017	02-Nov-16

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Oct 15, 2016	TE-09	Air Filter	15-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-003	Pyrene		0.08	ug/puf	0.01	NA-017	02-Nov-16
16100230-003	Retene		0.04	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/ Oct 21, 2016	TE07	Air Filter	21-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-005	1-Methylnaphthalene		0.09	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	2-Methylnaphthalene		0.14	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Acenaphthene		0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Acenaphthylene		0.06	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Anthracene		0.02	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Benzo(b,j,k)fluoranthene		0.04	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Benzo(c)phenanthrene		0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Chrysene		0.02	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Fluoranthene		0.03	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Fluorene		0.06	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Naphthalene		0.03	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Phenanthrene		0.11	ug/puf	0.01	NA-017	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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 Vegreville, Alberta
 Canada T9C 1T4
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/ Oct 21, 2016	TE07	Air Filter	21-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-005	Pyrene		0.03	ug/puf	0.01	NA-017	03-Nov-16
16100270-005	Retene		0.02	ug/puf	0.01	NA-017	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Oct 27, 2016	9801	Air Filter	27-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-002	1-Methylnaphthalene		0.31	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	2-Methylnaphthalene		0.57	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	7,12-Dimethylbenz(a)anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Acenaphthene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Acenaphthylene		0.10	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Benzo(a)anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Benzo(a)pyrene		0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Benzo(b,j,k)fluoranthene		0.06	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Benzo(c)phenanthrene		0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Benzo(e)pyrene		0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Chrysene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Fluoranthene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Fluorene		0.12	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Indeno(1,2,3-cd)pyrene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Naphthalene		0.49	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Phenanthrene		0.24	ug/puf	0.01	NA-017	02-Nov-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services	
Date:	Tuesday, November 15, 2016	Inquiries:	(780) 632 8455	E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Oct 27, 2016	9801	Air Filter	27-Oct-16	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-002	Pyrene		0.08	ug/puf	0.01	NA-017	02-Nov-16
16100306-002	Retene		0.17	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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PARTISOL SAMPLES



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Flt#P6029639</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 03-Oct-16 0:00</p> <p>REPORT CREATED: 09-Nov-16</p> <p>DATE RECEIVED: 11-Oct-16</p> <p>REPORT NUMBER: 16100083</p> <p>VERSION: Version 01</p>
---	--

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100083-001	Particulate Weight		0.042	mg	0.004	AC-029	13-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Wednesday, November 09, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Flt # P6029640</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 09-Oct-16 0:00</p> <p>REPORT CREATED: 09-Nov-16</p> <p>DATE RECEIVED: 17-Oct-16</p> <p>REPORT NUMBER: 16100129</p> <p>VERSION: Version 01</p>
---	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100129-001	Particulate Weight	K, T, U	< 0.004 mg	0.004	AC-029	19-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Wednesday, November 09, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA filter #P6031340</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION:</p> <p>DATE SAMPLED: 15-Oct-16 0:00 REPORT CREATED: 05-Dec-16</p> <p>DATE RECEIVED: 24-Oct-16 REPORT NUMBER: 16100229 VERSION: Version 01</p>
---	--

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100229-001	Particulate Weight		0.022 mg	0.004	AC-029	31-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: December-05-16 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Flt# P6031338</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION:</p> <p>DATE SAMPLED: 21-Oct-16 0:00 DATE RECEIVED: 27-Oct-16</p> <p>REPORT CREATED: 05-Dec-16 REPORT NUMBER: 16100271</p> <p>VERSION: Version 01</p>
---	---

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100271-001	Particulate Weight		0.076 mg	0.004	AC-029	31-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: December-05-16 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<p>RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE</p> <p>Calgary AB T2E 6P8</p> <p>INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Ftl# P6031339</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 27-Oct-16 0:00</p> <p>REPORT CREATED: 05-Dec-16</p> <p>DATE RECEIVED: 31-Oct-16</p> <p>REPORT NUMBER: 16100307</p> <p>VERSION: Version 01</p>
---	---

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100307-001	Particulate Weight		0.035	mg	0.004	AC-029	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: December-05-16 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	Cold Lake Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Bim Adeniji	Project Manager Assistant, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



Signature of the Representative of the Person Responsible / External Person Certifying the Report

06-12-2016





Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-10-1-C</u>
Site: <u>Cold Lake Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>11-Nov-2016</u>
Level 1 Primary Validation	<u></u>	Date <u>11-Nov-2016</u>
Level 2 Final Validation	<u></u>	Date <u>06-Dec-2016</u>
Level 3 Independent Data Review	<u></u>	Date <u>08-Dec-2016</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.



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Fax 403-219-3673

AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
MASKWA CONTINUOUS MONITORING STATION

JOB #: 2833-2016-10-30-C

October 2016

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
BONNYVILLE, ALBERTA
T9N 2J5

Attention: MIKE BISAGA

DATE: **December 6, 2016**

Prepared by: 

Bim Adeniji, M.Sc.
Project Manager Assistant, Customer Service, Air Services

Reviewed by: 

Cheri Sinclair, B.Sc.
Supervisor, Customer Service, Air Services

SUMMARY

In October 2016, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

SO₂/H₂S: Four hours of downtime were recorded due to additional quality checks.

NO_x/NO₂/NO: Sixty hours of downtime were attributed to an analyzer malfunction and additional quality checks.

- The API 200A (S/N: 2051) analyzer was replaced with model API 200A (S/N: 1899) on October 12. A successful installation calibration was completed on October 13.
- Additional quality checks were performed on October 19 and October 31 to address observed span drifts.

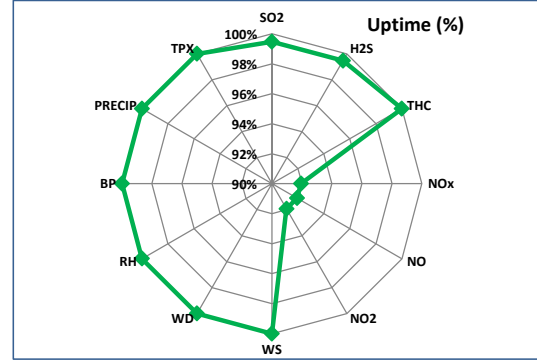
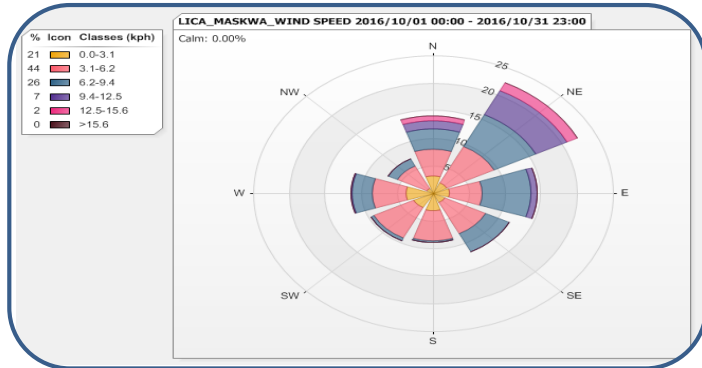
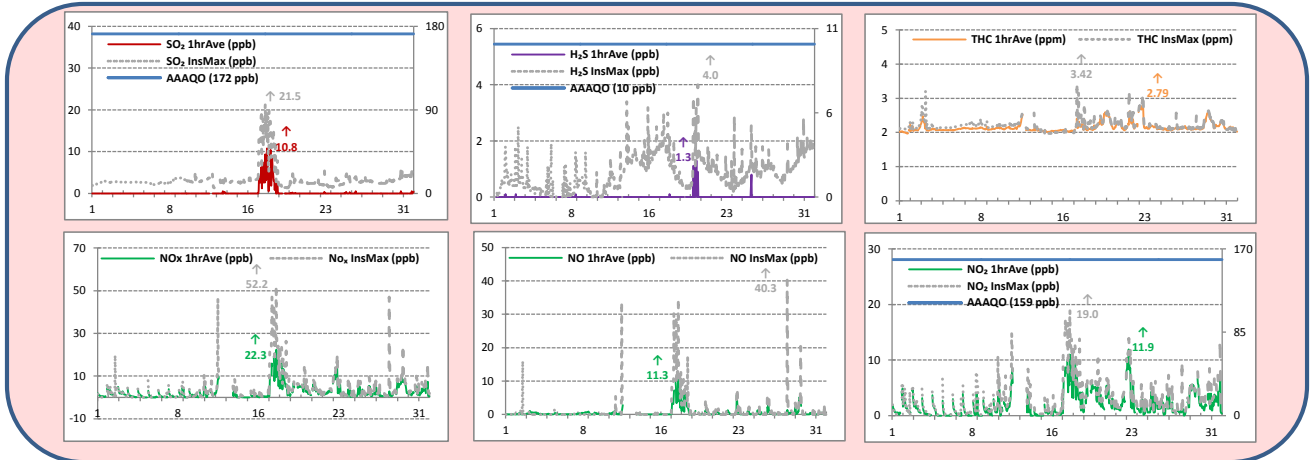
The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, Maskwa Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Lakeland Industry & Community Association - Maskwa Site October 2016 Monthly Report Summary

Pollutants		Monthly Records		1-Hour Records					24-Hour Records			
Name	Unit	Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO ₂	ppb	0.3	99.5%	10.8	October 17	20	172	0	4.4	October 17	48	0
H ₂ S	ppb	0.0	99.5%	1.3	October 20	13	10	0	0.3	October 20	3	0
THC	ppm	2.15	100.0%	2.79	October 23, 23	7, 8	-	-	2.37	October 23	-	-
NOx	ppb	2.4	91.9%	22.3	October 17	16	-	-	12.1	October 17	-	-
NO	ppb	0.5	91.9%	11.3	October 17	16	-	-	5.4	October 17	-	-
NO ₂	ppb	1.9	91.9%	11.9	October 23	5	159	0	6.7	October 17	-	-
WS	kph	2.0	100.0%	15.5	October 4	14	-	-	11.0	October 5	-	-
WD	degree	51 (NE)	100.0%	-	-	-	-	-	-	-	-	-
RH	%	83	100.0%	93	October 1, 2	23, VAR	-	-	92	October 25	-	-
BP	mbar	940	100.0%	953	October 6, 7	VAR	-	-	951	October 7	-	-
PRECIP	mm	0.1	100.0%	6.2	October 1	16	-	-	0.8	October 1	-	-
AmbTPX	°C	0.9	100.0%	14.6	October 3, 3	13, 15	-	-	7.7	October 1	-	-



Monthly Update

- * All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- * All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.

Operational Issues

- **SO₂/H₂S:** Four hours of downtime were recorded due to additional quality checks.
- **NOx/NO₂/NO:** Sixty hours of downtime were attributed to an analyzer malfunction and additional quality checks.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.3	10.8	17	20	6.0	NW	4.4	17	99.5
H ₂ S (ppb)	10	3	0	0	0.0	1.3	20	13	7.5	ESE	0.3	20	99.5
THC (ppm)	-	-	-	-	2.15	2.79	23, 23	7, 8	4.0 2.2	SW WSW	2.37	23	100.0
NO ₂ (ppb)	159	-	0	-	1.9	11.9	23	5	4.6	SW	6.7	17	91.9
NO (ppb)	-	-	-	-	0.5	11.3	17	16	7.2	NW	5.4	17	91.9
NO _x (ppb)	-	-	-	-	2.4	22.3	17	16	7.2	NW	12.1	17	91.9
RELATIVE HUMIDITY (%)	-	-	-	-	83	93	1, 2	23, VAR	5.5 VAR	E VAR	92	25	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	940	953	6, 7	VAR	VAR	VAR	951	7	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	0.9	14.6	3, 3	13, 15	2.2 3.9	NE NE	7.7	1	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	6.2	1	16	9.5	ENE	0.8	1	100.0
VECTOR WS (kph)	-	-	-	-	2.0	15.5	4	14	-	NNE	11.0	5	100.0
VECTOR WD (sec)	-	-	-	-	51 (NE)	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

H₂S 1-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

H₂S 24-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

Sample filters for all continuous air monitors are changed before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (August 3, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on October 12. The analyzer exhibited a biased high zero drift on October 17. A repeat calibration was performed on October 19 to assess analyzer performance and the result met the AMD, 2016 requirements. Four hours of downtime were recorded due to the additional quality check.

HYDROGEN SULPHIDE (H₂S)

The routine monthly calibration was performed on October 13. The analyzer exhibited a biased high zero drift on October 17. A repeat calibration was performed on October 19 to assess analyzer performance and the result met the AMD, 2016 requirements. Four hours of downtime were recorded due to the additional quality check.

TOTAL HYDROCARBONS (THC)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 12. One hour of maximum instantaneous data is missing on October 19, at hour 09:00, due to a brief power failure.

NITROGEN DIOXIDE (NO₂)

Sixty hours of downtime were recorded this month. The analyzer was observed to have elevated readings in the hour following the daily zero/span cycle. These elevated readings were caused by a delay of the reaction cell purging with ambient air and re-stabilizing at ambient baseline levels. Thirty three hours of data were invalidated as a result of this malfunction. Following a successful shut-down calibration on October 12, the API 200A (S/N: 2051) analyzer was replaced with model API 200A (S/N: 1899). The analyzer was allowed time to stabilize overnight and an installation calibration was completed on October 13. Seventeen hours of downtime were recorded due to the analyzer replacement.

Following the installation, the daily span values began to drift towards the upper limit, indicating the need for span value adjustment. A repeat calibration was performed on October 19 to update the expected span value, accounting for six hours of downtime.

The analyzer spanned towards the upper acceptance limit on October 30. A repeat span check was initiated on October 31, at hour 08:00, confirming the high span drift. An as-found response check was subsequently performed to assess analyzer functionality and the result was within acceptance limits. Three hours of downtime were attributed to these additional quality checks.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

There were no operational issues that impacted hourly data this month. One hour of maximum instantaneous data is missing on October 19, at hour 09:00, due to a brief power failure.

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was blowing from.

RELATIVE HUMIDITY (RH)

There were no operational issues that impacted data this month.

BAROMETRIC PRESSURE (BP)

There were no operational issues that impacted data this month.

PRECIPITATION

There were no operational issues that impacted data this month.

AMBIENT TEMPERATURE (AmbTPX)

There were no operational issues that impacted data this month.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technicians were Alexander Yakupov and Christopher Wesson.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring Maxxam
AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - API 100E UV Fluorescent Analyzer
Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
Total Hydrocarbons - Thermo 51C FID Analyzer
Oxides of Nitrogen - API 200A Chemiluminescent Analyzer
Wind System - Met One Unit
Relative Humidity - Met One Unit
Barometric Pressure - Met One Unit
Ambient Temperature - Met One Unit
Precipitation - Met One Unit
Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

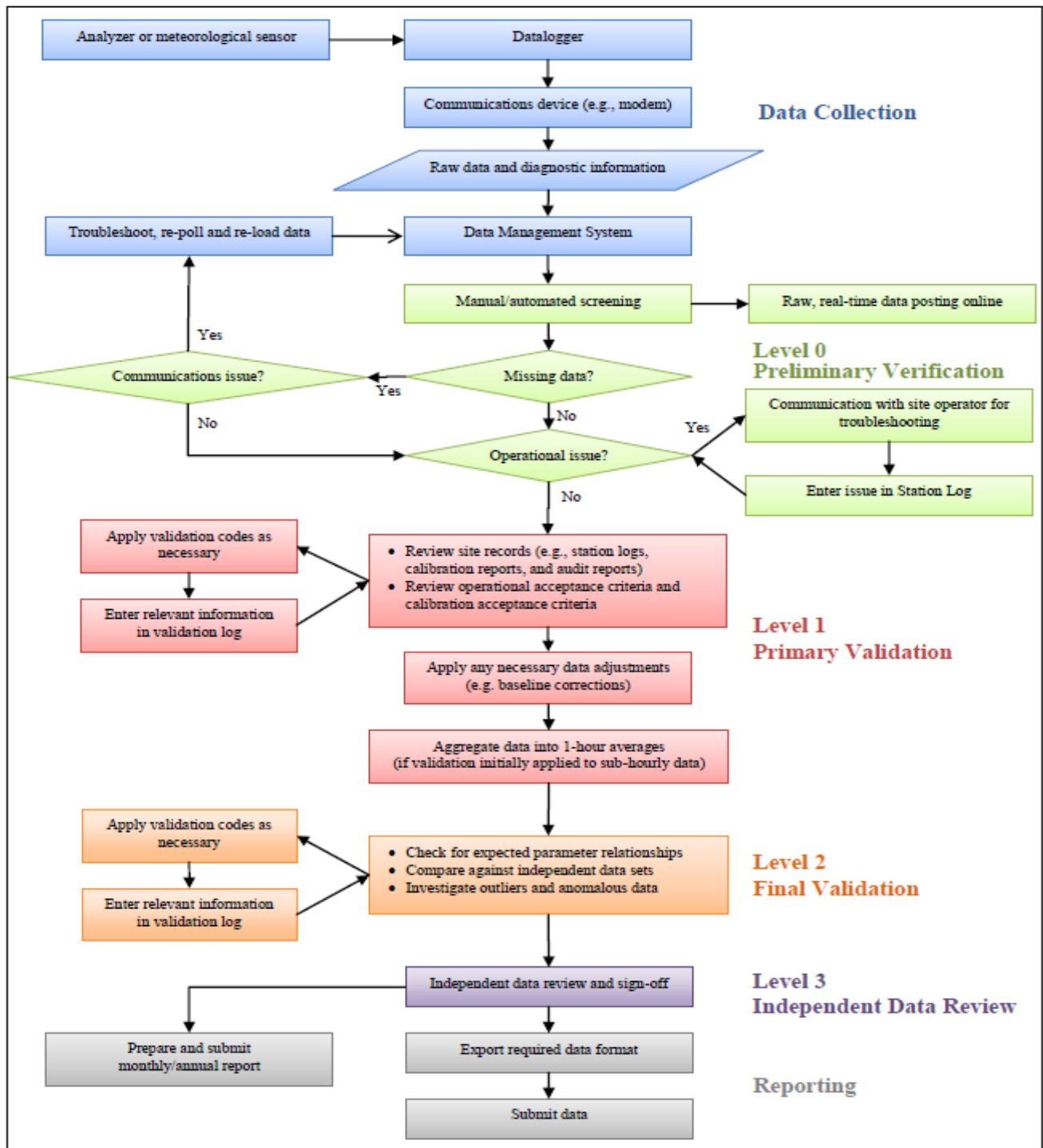
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (Aug 3, 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	2.4	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.1	24
13	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.2	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24
14	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.9	4.1	S	2.8	2.6	3.9	6.3	1.2	4.3	7.5	4.3	2.6	4.7	3.2	2.6	9.3	4.2	3.1	8.3	10.8	3.6	8.8	1.8	0.0	10.8	4.4	24	
18	0.5	5.6	S	7.8	10.4	6.0	1.8	6.1	8.6	6.7	4.7	3.8	3.0	2.9	0.8	3.1	2.2	0.0	0.0	0.0	2.3	0.3	0.0	0.0	0.0	10.4	3.3	24	
19	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C1	C1	C1	C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20	
20	S	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.2	0.0	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.4	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0	S	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	24
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.3	0.4	0.0	0.0	0.5	0.1	0.1	24
HOURLY MAX	0.5	5.6	4.1	7.8	10.4	6.0	3.9	6.3	8.6	6.7	7.5	4.3	3.0	4.7	3.2	3.1	9.3	4.2	3.1	8.3	10.8	3.6	8.8	1.8					
HOURLY AVG	0.0	0.2	0.1	0.3	0.4	0.3	0.2	0.4	0.3	0.5	0.4	0.3	0.2	0.3	0.2	0.2	0.4	0.2	0.1	0.3	0.4	0.1	0.3	0.1					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

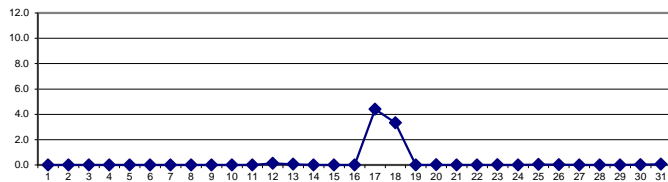
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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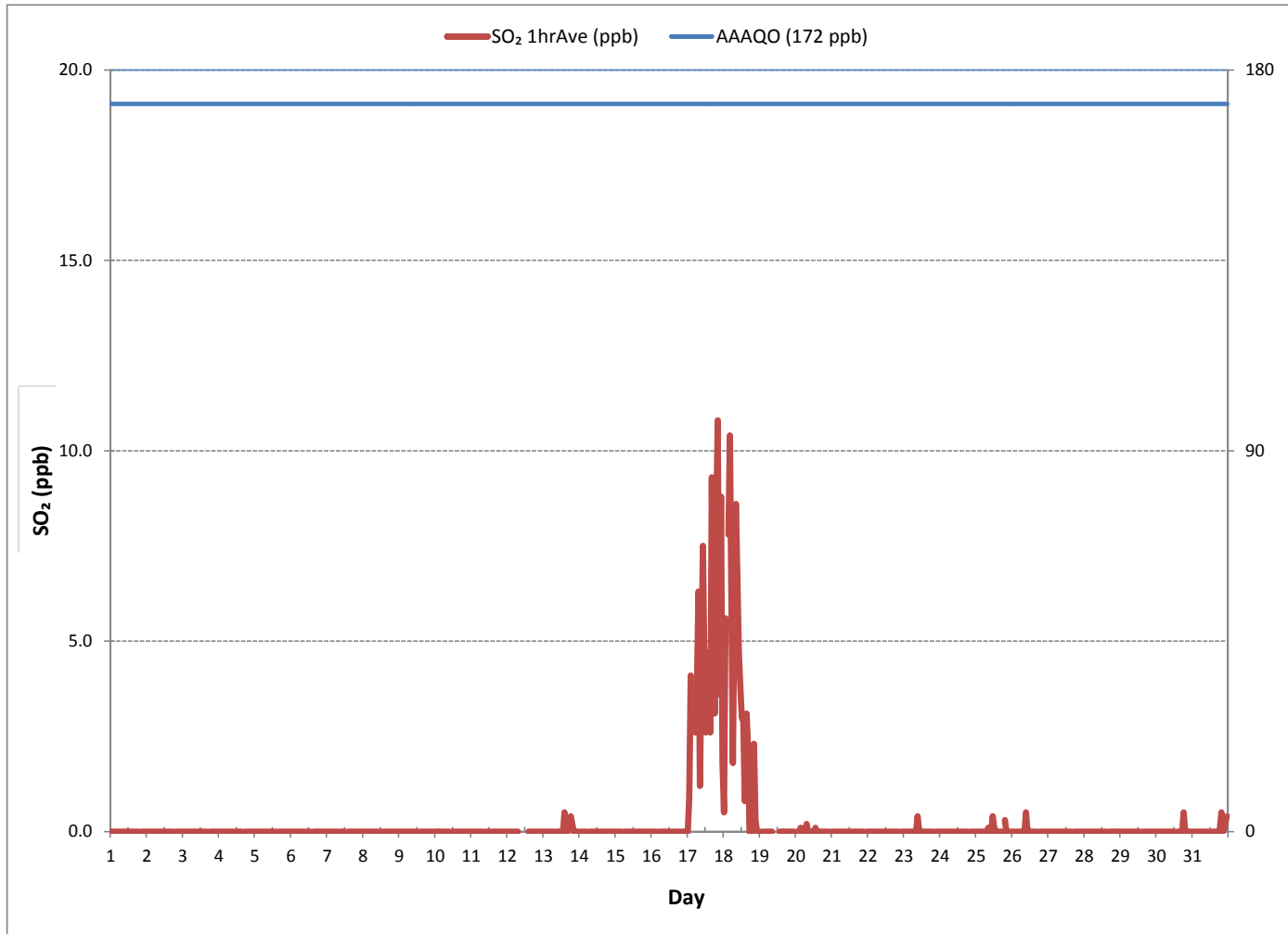
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	59			
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	10.8 ppb @ HOUR(S)	20	ON DAY(S)	17
MAXIMUM 24-HR AVERAGE:	4.4 ppb		ON DAY(S)	17
			VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	740 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.5 %	
STANDARD DEVIATION:	1.22	MONTHLY AVERAGE:	0.3 ppb	

24 HOUR AVERAGES FOR October 2016



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.9	1.8	1.8	1.8	1.8	1.8	1.8	2.2	2.2	2.2	2.2	2.4	2.3	2.3	2.4	2.4	2.6	2.6	2.7	S	2.6	2.7	2.8	2.6	1.8	2.8	2.3	24	
2	2.6	2.8	3.1	3.0	3.0	3.0	2.9	2.8	2.7	2.6	2.6	2.6	2.5	2.6	2.6	2.6	2.6	2.6	S	2.7	2.7	2.7	2.6	2.6	2.5	3.1	2.7	24	
3	2.6	2.6	2.7	2.6	2.7	2.6	2.6	2.7	2.9	3.1	3.2	3.2	3.1	3.1	3.1	3.3	3.3	S	2.7	2.7	2.9	2.8	2.7	2.6	2.6	3.3	2.9	24	
4	2.7	2.7	2.7	2.6	2.6	2.7	2.8	2.6	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.7	S	2.6	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.8	2.6	24	
5	2.6	2.7	2.7	2.6	2.7	2.8	2.7	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	S	2.6	2.7	2.7	2.6	2.6	2.6	2.7	2.6	2.6	2.8	2.7	24	
6	2.6	2.6	2.7	2.7	2.6	2.6	2.4	2.5	2.5	2.3	2.3	2.4	2.4	2.4	2.4	S	2.4	2.1	2.1	2.1	2.2	2.4	2.1	2.2	2.1	2.1	2.7	2.4	24
7	2.2	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.4	2.5	2.4	S	2.6	2.6	2.4	2.6	2.5	2.4	2.5	2.5	2.5	2.5	2.2	2.6	2.4	24	
8	2.4	2.6	2.4	2.6	2.4	2.4	2.4	2.4	2.6	2.4	2.4	2.6	S	2.6	2.7	2.6	3.0	2.9	2.8	2.8	3.2	3.9	3.9	3.9	2.4	3.9	2.8	24	
9	3.9	3.6	3.4	3.5	3.4	3.4	3.4	3.4	3.7	3.7	3.7	S	3.7	3.7	3.6	3.5	3.5	3.5	3.2	3.4	3.4	3.2	3.3	3.3	3.2	3.9	3.5	24	
10	3.2	3.2	3.1	3.1	2.9	2.9	2.9	3.0	3.0	2.9	S	2.8	2.9	2.8	2.8	2.7	2.6	2.6	2.8	2.6	2.7	2.6	5.0	3.2	2.6	5.0	3.0	24	
11	3.6	3.9	3.1	2.8	2.9	3.0	2.9	2.9	2.8	S	2.9	2.8	3.0	3.1	2.8	2.8	3.2	3.2	3.3	3.5	3.4	3.4	3.4	3.4	2.8	3.9	3.1	24	
12	3.4	3.5	3.5	3.4	3.6	3.7	3.7	3.7	S	C	C	C	C	C	4.6	3.1	1.5	1.4	1.3	1.4	1.3	1.3	1.3	1.2	1.2	4.6	2.6	24	
13	1.2	1.2	1.3	1.4	1.4	1.4	1.8	S	3.2	2.0	2.8	2.3	3.0	2.7	3.9	3.4	2.4	3.7	3.9	3.9	2.9	3.0	3.1	3.4	1.2	3.9	2.6	24	
14	2.6	2.6	2.6	2.6	2.7	2.7	S	2.6	2.8	2.7	2.8	2.9	3.0	2.8	3.0	2.9	2.9	2.9	2.9	2.9	3.0	2.8	2.7	2.7	2.6	3.0	2.8	24	
15	2.8	2.7	2.6	2.8	2.6	S	2.4	2.8	2.7	2.6	2.4	2.6	2.6	2.7	3.6	2.6	2.6	2.7	2.6	2.5	2.5	2.6	2.6	2.4	2.4	3.6	2.7	24	
16	2.5	2.7	2.6	3.7	S	3.7	2.9	3.0	3.0	3.1	3.1	3.1	3.4	3.1	3.3	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.5	4.4	2.5	4.4	3.2	24	
17	3.5	13.1	11.7	S	12.4	13.7	16.8	19.8	5.9	16.1	17.8	17.7	11.2	17.3	14.2	17.0	21.5	14.9	12.9	16.5	19.5	11.7	18.3	8.0	3.5	21.5	14.4	24	
18	5.0	20.9	S	17.3	17.3	15.9	8.6	14.1	14.9	15.1	13.1	14.9	11.0	10.2	4.4	12.6	9.2	2.7	2.8	3.6	7.8	5.6	3.1	2.1	2.1	20.9	10.1	24	
19	1.9	S	1.9	2.0	2.0	2.0	1.6	1.8	1.8	C1	C1	C1	C1	1.4	1.4	1.4	1.4	1.4	1.3	1.4	1.4	1.3	1.5	1.7	1.3	2.0	1.6	20	
20	S	2.0	2.9	2.8	2.0	2.1	2.3	4.7	4.7	2.4	2.9	2.4	3.5	3.3	2.9	2.5	2.8	2.9	2.6	2.6	2.7	2.7	S	2.0	4.7	2.8	24		
21	2.7	2.7	2.8	3.2	2.9	2.6	2.6	2.6	2.6	2.6	2.4	2.7	2.9	3.0	2.5	2.5	2.9	2.7	2.3	2.4	2.3	2.4	S	2.4	2.3	3.2	2.6	24	
22	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.6	3.6	3.1	2.8	2.7	2.5	2.4	2.4	3.2	2.2	S	2.1	2.2	2.1	3.6	2.5	24	
23	2.2	2.2	2.2	2.0	2.1	2.2	2.0	1.9	2.7	5.4	3.0	2.4	2.1	1.9	2.1	2.1	1.8	1.8	1.8	1.5	S	1.6	1.7	1.7	1.5	5.4	2.2	24	
24	1.6	1.6	1.5	1.6	1.6	1.5	1.6	1.6	1.6	3.2	2.7	3.0	3.7	3.0	2.4	1.9	2.0	1.8	3.1	S	1.9	2.2	2.1	2.1	1.5	3.7	2.1	24	
25	2.1	2.1	2.2	2.2	2.2	2.2	2.6	2.7	3.7	3.7	3.2	4.2	4.7	2.6	2.4	2.6	2.7	3.6	S	4.1	2.7	2.7	2.7	2.7	2.1	4.7	2.9	24	
26	2.9	2.7	2.7	3.0	2.7	2.7	3.7	3.7	4.0	4.0	4.0	3.2	2.6	2.4	2.6	2.3	2.4	S	2.7	2.7	2.8	2.7	2.6	3.0	2.3	4.0	2.9	24	
27	3.0	2.8	2.9	2.8	2.9	2.9	3.6	4.5	3.0	3.0	3.0	2.9	3.0	3.0	3.0	3.2	S	3.0	2.8	3.0	2.9	3.0	3.0	2.7	2.7	4.5	3.0	24	
28	3.0	2.6	2.6	2.6	2.7	2.7	2.8	2.6	2.6	2.7	2.4	2.4	2.6	2.6	2.5	S	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.4	3.0	2.6	24	
29	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.7	3.0	2.6	2.9	3.2	S	S	3.3	3.0	3.1	3.0	2.9	3.0	2.9	2.8	2.9	2.4	3.3	2.8	2.8	24	
30	2.9	3.2	3.0	3.7	3.5	3.4	3.3	3.2	3.2	3.4	3.4	3.4	3.4	S	3.5	3.5	3.5	4.5	6.6	4.3	3.8	5.8	4.0	3.8	2.9	6.6	3.8	24	
31	3.7	3.7	4.0	4.3	4.0	4.1	4.3	4.0	4.2	4.2	4.3	4.3	S	4.4	4.4	4.0	4.1	4.0	4.0	5.2	4.1	4.3	4.0	4.2	3.7	5.2	4.2	24	
HOURLY MAX	5.0	20.9	11.7	17.3	17.3	15.9	16.8	19.8	14.9	16.1	17.8	17.7	11.2	17.3	14.2	17.0	21.5	14.9	12.9	16.5	19.5	11.7	18.3	8.0					
HOURLY AVG	2.7	3.6	2.9	3.2	3.4	3.5	3.3	3.8	3.4	3.9	3.8	3.8	3.6	3.6	3.4	3.6	3.5	3.2	3.2	3.4	3.5	3.2	3.3	2.9					

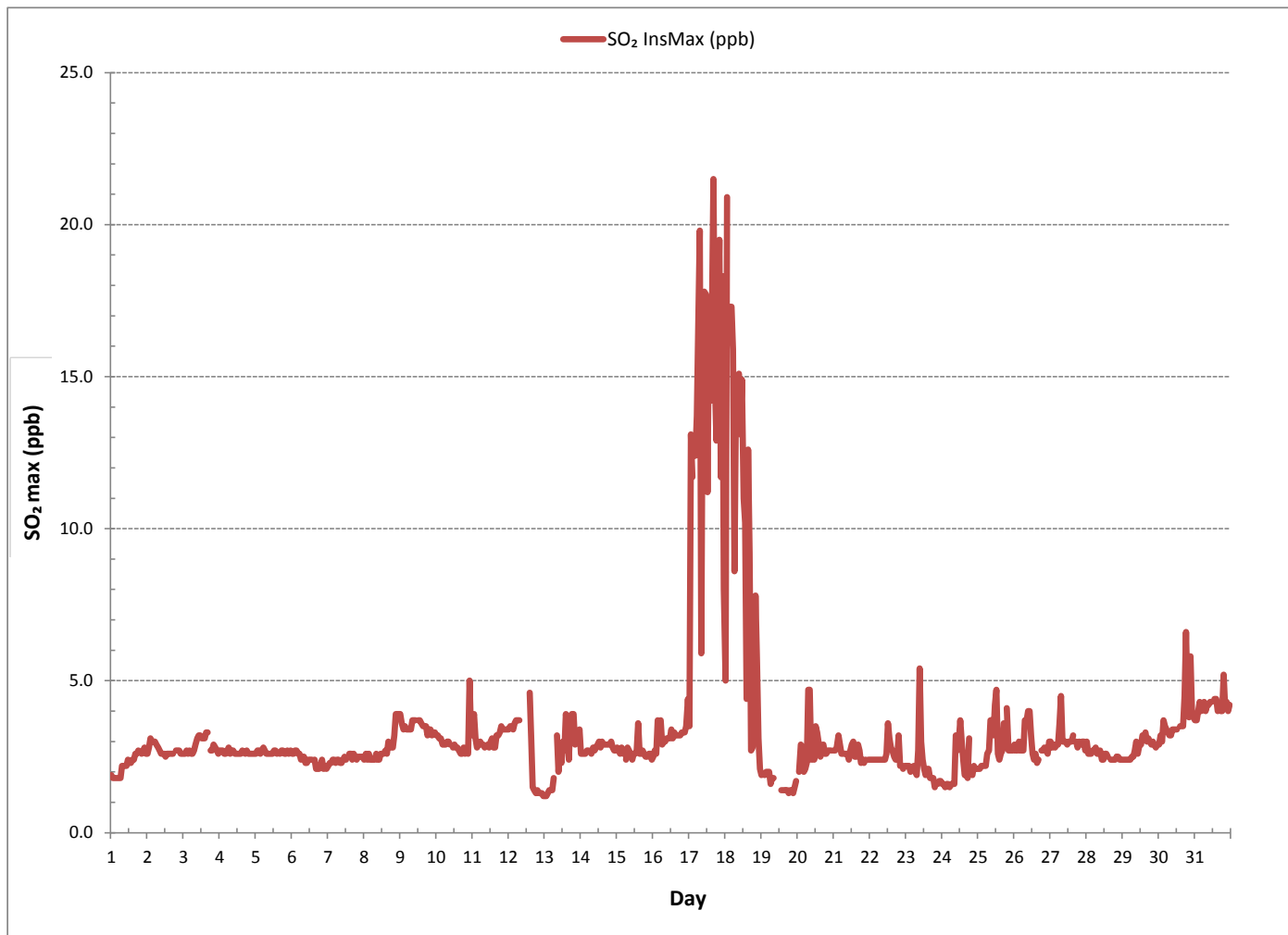
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

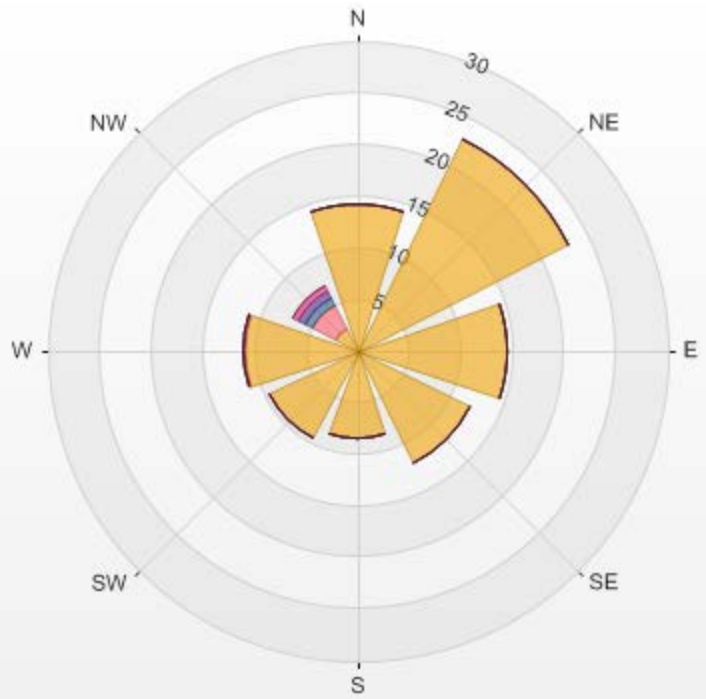
NUMBER OF NON-ZERO READINGS:	703
MAXIMUM INSTANTANEOUS VALUE:	21.5 ppb @ HOUR(S) 16 ON DAY(S) 17
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	2.80
OPERATIONAL TIME:	740 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



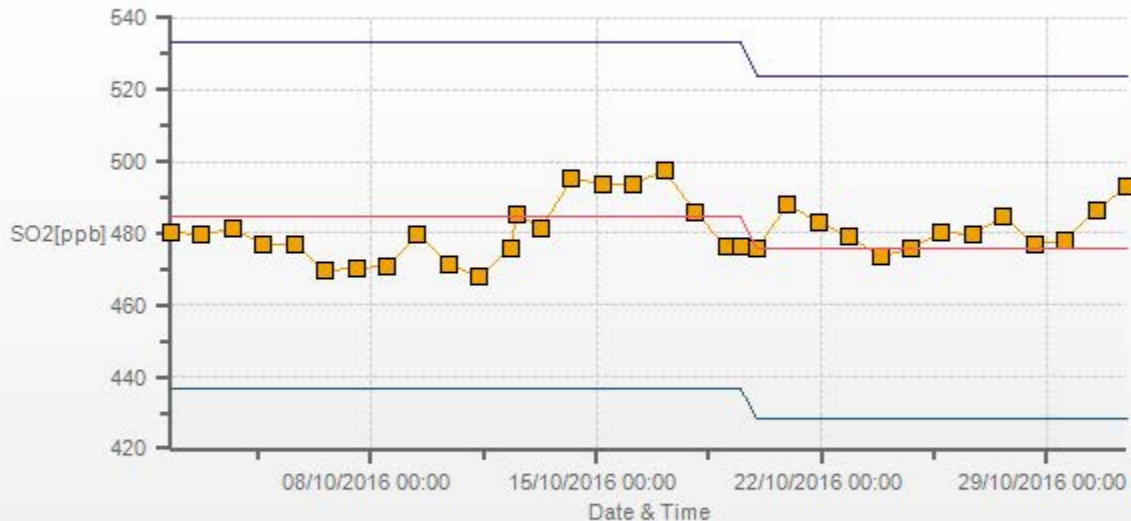
Wind: LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppb]

Direction	0.0-2.2	2.2-4.4	4.4-6.5	6.5-8.7	8.7-10.9	>10.9	Total
N	14.22	0	0	0	0	0	14.22
NE	22.9	0	0	0	0	0	22.9
E	14.51	0	0	0	0	0	14.51
SE	12.23	0	0	0	0	0	12.23
S	8.53	0	0	0	0	0	8.53
SW	9.53	0	0	0	0	0	9.53
W	10.95	0.14	0	0	0	0	11.09
NW	2.42	2.42	0.85	0.71	0.57	0	6.97
Summary	95.29	2.56	0.85	0.71	0.57	0	100



% Icon Classes (ppb)	95	3	1	1	1	0
0.0-2.2	2.2-4.4	4.4-6.5	6.5-8.7	8.7-10.9	>10.9	

SO2[ppb] Calibration: LICA MASKWA Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

HYDROGEN SULPHIDE



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	24
3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	24	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	S	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	24	
18	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	C1	C1	C1	C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20
20	S	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.7	1.0	0.0	0.2	1.3	0.1	0.0	0.9	0.7	0.0	0.0	0.0	0.0	S	0.0	1.3	0.3	0.0	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	24	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.3	0.8	0.0	0.0	0.0	0.8	24	
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
HOURLY MAX	0.0	0.0	0.1	0.0	0.0	1.1	1.1	0.0	0.7	1.0	0.0	0.2	1.3	0.1	0.0	0.9	0.7	0.0	0.0	0.0	0.3	0.8	0.0	0.1				
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

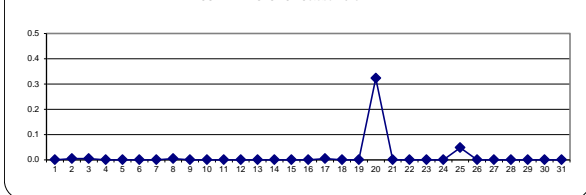
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 10 ppb 24-HR 3 ppb

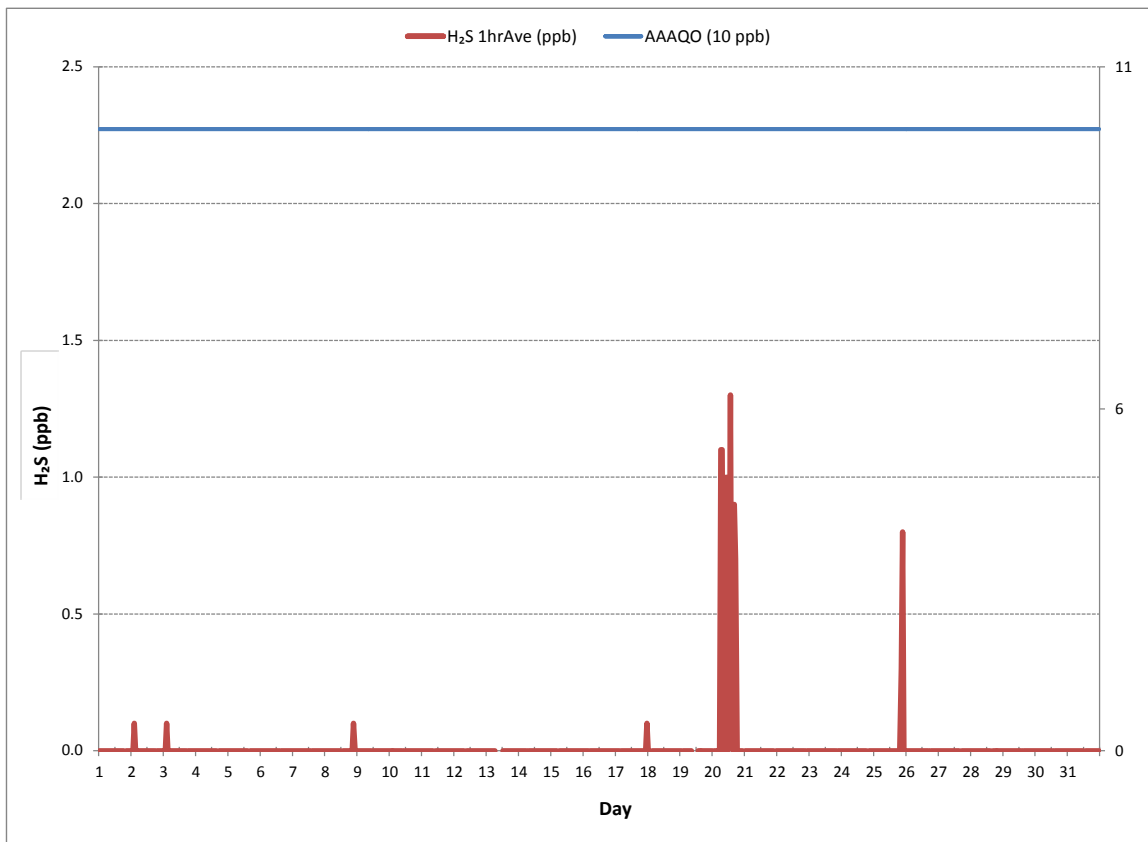
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	15
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S) VAR ON DAY(S) ALL
MAXIMUM 1-HR AVERAGE:	1.3 ppb @ HOUR(S) 13 ON DAY(S) 20
MAXIMUM 24-HR AVERAGE:	0.3 ppb ON DAY(S) 20
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs OPERATIONAL TIME: 740 hrs
MONTHLY CALIBRATION TIME:	4 hrs AMD OPERATION UPTIME: 99.5 %
STANDARD DEVIATION:	0.10 MONTHLY AVERAGE: 0.0 ppb

24 HOUR AVERAGES FOR October 2016



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.4	0.6	S	0.5	0.5	0.6	0.7	0.0	0.7	0.2	24	
2	0.5	1.6	1.8	1.5	1.0	0.8	0.7	0.9	0.6	0.4	0.6	0.4	0.5	0.6	0.5	0.8	0.7	0.4	S	0.4	0.4	0.4	0.4	0.6	0.4	0.4	1.8	0.7	24
3	0.4	1.8	1.5	1.2	0.4	0.5	0.6	1.5	2.5	0.5	0.6	0.7	0.5	0.6	0.7	0.6	1.5	S	0.7	0.4	0.3	0.4	0.4	0.3	0.3	2.5	0.8	24	
4	0.4	0.5	0.5	0.4	0.5	1.8	0.3	0.5	0.3	0.6	0.3	0.2	0.2	0.3	0.3	0.2	S	0.3	0.4	0.3	0.4	0.2	0.1	0.3	0.1	1.8	0.4	24	
5	0.4	0.4	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.0	0.3	0.2	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.4	0.2	24	
6	0.0	0.6	0.2	0.2	1.1	0.1	1.1	0.1	0.1	0.0	0.0	0.0	1.9	1.0	S	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.3	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.5	0.0	0.0	0.0	1.1	0.0	0.0	1.2	0.0	0.0	1.2	0.1	24	
8	0.0	0.6	0.0	0.0	0.0	0.4	0.0	0.0	0.5	0.0	0.0	0.1	S	0.1	0.0	0.1	0.2	0.1	0.2	0.7	0.7	1.6	0.9	1.3	0.0	1.6	0.3	24	
9	0.4	0.3	0.6	0.5	0.4	0.6	0.7	0.6	0.5	0.5	0.6	S	0.7	0.6	0.5	0.5	0.6	0.3	0.5	0.4	1.6	0.7	0.4	0.3	0.3	1.6	0.6	24	
10	0.2	0.2	0.2	0.3	0.3	0.1	0.2	0.2	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.9	0.0	0.0	0.9	0.1	24	
11	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	S	0.0	0.0	0.2	0.1	0.1	0.5	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.5	0.4	0.0	0.5	0.1	24
12	0.4	0.4	0.5	0.7	0.4	0.7	1.4	0.7	S	0.9	0.8	0.8	0.6	0.6	0.7	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.2	0.2	1.4	0.6	24
13	0.3	0.3	0.4	0.4	0.3	1.7	0.7	S	C	C	C	C	C	C	0.9	1.0	1.1	1.1	1.1	1.1	1.2	3.4	1.1	1.2	2.5	0.3	3.4	1.1	24
14	1.1	1.2	1.4	1.3	1.3	1.3	S	1.2	1.4	1.3	1.5	1.5	1.5	1.4	1.5	1.8	1.6	1.4	1.5	1.3	1.4	1.3	1.3	1.3	1.1	1.8	1.4	24	
15	1.3	1.3	1.3	1.2	1.1	S	1.3	1.2	1.5	1.1	1.1	1.5	1.8	2.1	1.4	1.0	1.6	0.9	1.0	1.1	1.2	3.2	1.0	2.3	0.9	3.2	1.4	24	
16	1.6	1.2	1.3	1.7	S	1.4	1.4	1.3	1.6	1.5	1.7	1.6	1.5	1.5	1.6	1.5	2.1	2.5	1.7	1.7	1.7	1.6	1.8	1.6	1.2	2.5	1.6	24	
17	1.7	1.9	1.8	S	1.8	1.9	2.3	2.3	1.7	3.0	2.5	2.2	2.0	1.9	1.8	1.5	1.9	1.9	1.5	3.0	1.4	1.3	1.8	2.2	1.3	3.0	2.0	24	
18	1.1	1.4	S	1.2	1.3	1.2	1.0	1.2	1.3	2.0	0.8	0.9	1.1	0.6	0.7	0.8	0.7	0.8	0.6	0.6	0.8	0.7	0.9	0.5	0.5	2.0	1.0	24	
19	0.7	S	0.5	0.7	0.5	0.4	0.4	0.3	0.4	C1	C1	C1	C1	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.2	0.4	0.3	0.4	0.2	0.7	0.4	20	
20	S	0.5	0.4	0.6	0.5	0.8	3.6	3.2	1.8	2.5	2.8	1.1	2.5	3.2	3.1	1.2	3.4	4.0	1.9	1.6	1.6	1.4	1.5	S	0.4	4.0	2.0	24	
21	1.4	1.3	1.3	1.4	1.5	1.3	1.4	1.2	1.2	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.8	0.9	1.6	0.9	0.9	S	1.1	0.9	1.8	1.2	24		
22	0.8	1.0	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.1	0.9	1.3	1.0	1.5	0.8	0.8	0.9	0.8	0.8	0.8	0.7	S	0.7	0.6	0.6	1.5	1.0	24	
23	0.8	0.8	0.7	0.7	0.6	0.7	0.7	0.7	0.7	1.5	0.4	0.4	0.5	0.9	0.6	0.6	0.4	0.5	0.4	0.3	S	0.5	0.3	1.3	0.3	1.5	0.7	24	
24	0.3	0.4	0.3	0.2	0.3	2.9	0.2	0.4	0.3	0.7	0.3	0.4	0.5	0.4	0.4	0.8	1.0	0.7	S	0.5	0.6	0.5	1.7	0.2	2.9	0.6	24		
25	0.5	0.6	0.5	0.6	0.5	0.7	0.7	0.8	0.8	1.0	0.7	1.0	0.9	0.9	0.9	0.9	1.0	1.2	S	1.1	2.2	2.6	1.1	1.2	0.5	2.6	1.0	24	
26	1.0	0.8	1.0	0.9	1.1	0.9	1.1	1.8	0.9	1.3	0.9	0.7	0.7	0.8	0.7	0.8	0.9	S	0.7	0.8	0.9	1.0	0.9	1.8	0.7	1.8	1.0	24	
27	1.0	1.1	1.1	1.0	0.9	1.0	1.1	1.2	1.3	1.3	1.0	1.2	1.0	1.7	1.1	1.1	S	1.0	1.1	1.2	1.2	1.2	1.0	0.9	0.9	1.7	1.1	24	
28	1.1	1.1	0.9	0.9	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.6	S	0.6	0.6	0.6	0.6	0.5	0.7	0.7	0.8	0.5	1.1	0.7	24	
29	0.8	1.0	0.6	0.9	0.7	0.7	0.7	0.8	0.8	1.9	1.0	0.9	0.9	0.9	S	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.0	0.6	1.9	0.9	24	
30	0.9	1.0	1.2	1.1	1.2	1.2	1.3	1.3	2.2	1.1	1.3	1.5	1.4	S	1.6	1.5	2.1	1.4	1.4	1.8	1.7	1.4	2.9	1.5	0.9	2.9	1.5	24	
31	1.4	1.8	1.6	1.6	1.7	1.7	2.2	1.8	1.7	1.7	1.8	1.7	S	1.7	2.0	1.7	1.7	1.8	1.7	1.9	1.7	1.7	1.5	1.6	1.4	2.2	1.7	24	
HOURLY MAX	1.7	1.9	1.8	1.7	1.8	2.9	3.6	3.2	2.5	3.0	2.8	2.2	2.5	3.2	3.1	1.8	3.4	4.0	1.9	3.0	3.4	3.2	2.9	2.5					
HOURLY AVG	0.7	0.8	0.8	0.8	0.7	0.9	0.9	0.9	0.9	1.0	0.8	0.8	0.9	0.9	0.8	0.8	1.0	0.9	0.8	0.9	0.9	0.9	0.9	0.9					

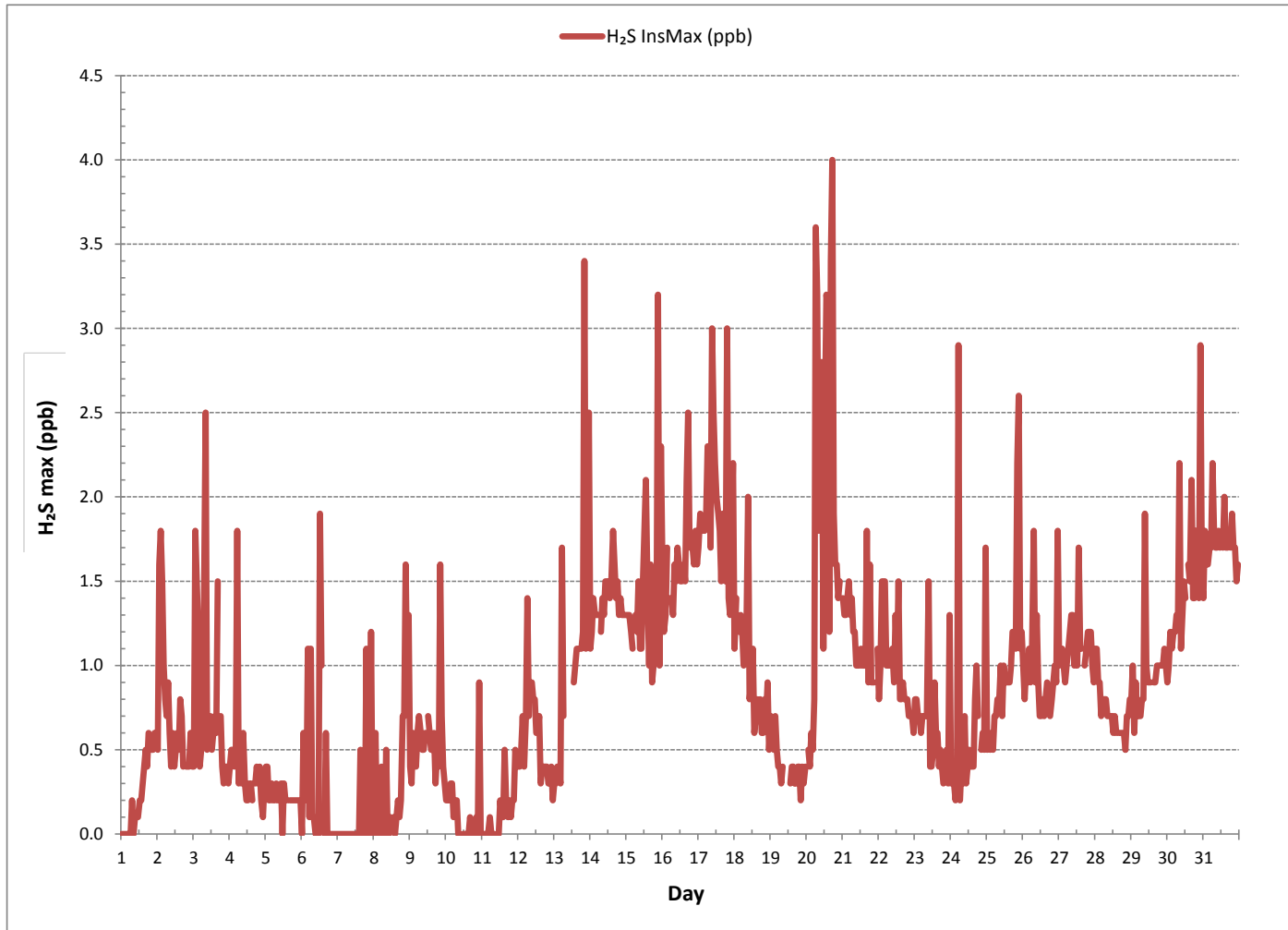
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

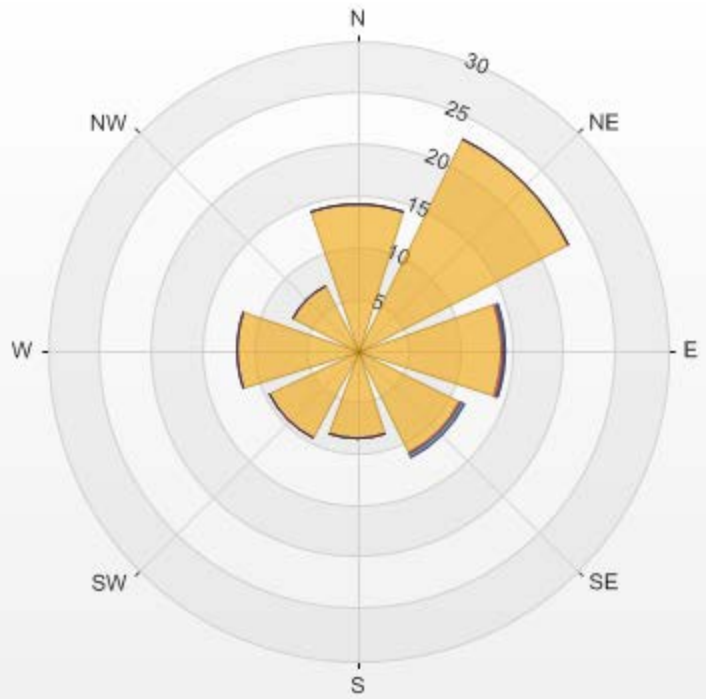
NUMBER OF NON-ZERO READINGS:	631
MAXIMUM INSTANTANEOUS VALUE:	4.0 ppb @ HOUR(S) 17 ON DAY(S) 20
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.67
OPERATIONAL TIME:	740 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



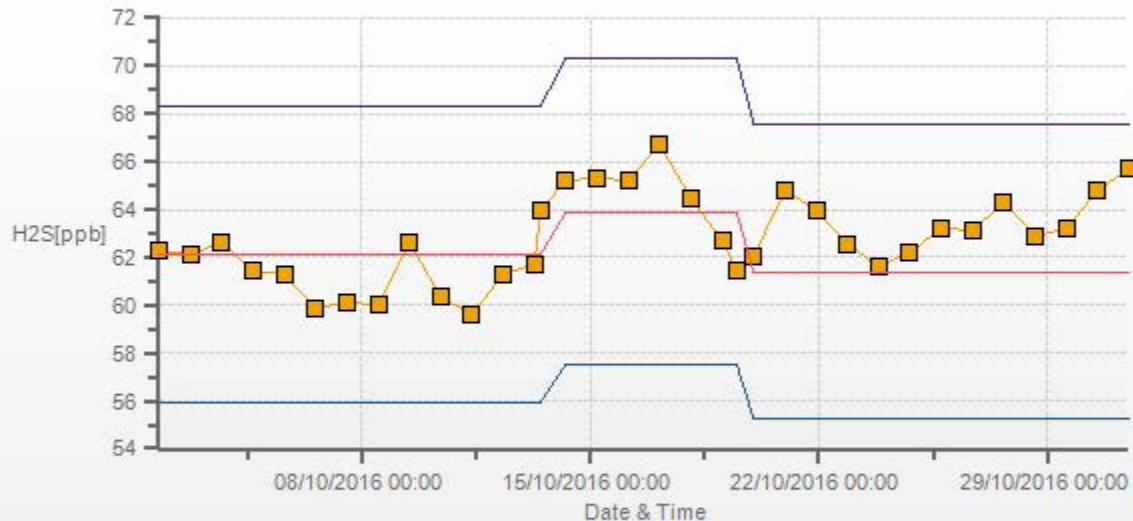
Wind: LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.49% Calm Avg: 0.00 [ppb]

Direction	0.0-0.5	0.5-0.9	0.9-1.4	>1.4	Total
N	14.22	0	0	0	14.22
NE	22.9	0	0	0	22.9
E	13.94	0.14	0.28	0	14.36
SE	10.95	0.28	0.43	0	11.66
S	8.53	0	0	0	8.53
SW	9.53	0	0	0	9.53
W	11.66	0	0	0	11.66
NW	7.11	0	0	0	7.11
Summary	98.84	0.42	0.71	0	100



% Icon Classes (ppb)		99	0	1	0
0.0-0.5	0.5-0.9	0.9-1.4	>1.4		

H2S[ppb] Calibration: LICA MASKWA Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

TOTAL HYDROCARBON

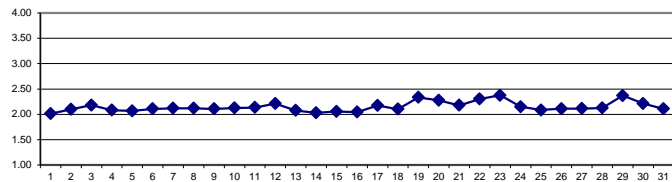
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.01	2.02	2.02	2.03	2.03	2.03	2.03	2.01	2.00	2.01	2.00	2.00	1.99	1.99	1.99	1.98	1.98	1.97	1.98	S	2.07	2.05	2.05	2.04	1.97	2.07	2.01	24	
2	2.04	2.08	2.06	2.10	2.18	2.09	2.04	2.06	2.07	2.07	2.08	2.08	2.07	2.07	2.07	2.06	2.06	2.07	S	2.11	2.15	2.16	2.23	2.26	2.04	2.26	2.10	24	
3	2.30	2.37	2.41	2.48	2.32	2.30	2.28	2.27	2.12	2.33	2.13	2.06	2.07	2.06	2.06	2.06	2.05	S	2.07	2.08	2.08	2.08	2.08	2.11	2.05	2.48	2.18	24	
4	2.12	2.09	2.09	2.11	2.11	2.10	2.08	2.09	2.08	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	S	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.12	2.08	24
5	2.08	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.06	2.07	2.07	2.07	2.07	S	2.06	2.07	2.07	2.07	2.06	2.07	2.06	2.07	2.06	2.06	2.08	2.07	24
6	2.07	2.07	2.08	2.08	2.09	2.09	2.09	2.10	2.10	2.11	2.11	2.11	2.11	2.11	S	2.11	2.12	2.13	2.12	2.13	2.13	2.13	2.13	2.14	2.13	2.07	2.14	2.11	24
7	2.13	2.12	2.13	2.13	2.13	2.13	2.13	2.13	2.12	2.11	2.11	2.12	2.11	S	2.11	2.13	2.11	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.11	2.13	2.12	24
8	2.11	2.12	2.12	2.12	2.12	2.13	2.13	2.13	2.13	2.14	2.15	2.14	S	2.14	2.13	2.12	2.11	2.11	2.11	2.11	2.10	2.09	2.09	2.11	2.11	2.09	2.15	2.12	24
9	2.17	2.11	2.08	2.08	2.08	2.08	2.09	2.09	2.09	2.09	S	2.11	2.11	2.11	2.11	2.11	2.10	2.11	2.11	2.12	2.13	2.14	2.14	2.13	2.08	2.17	2.11	24	
10	2.13	2.15	2.14	2.15	2.12	2.12	2.14	2.14	2.12	2.11	S	2.11	2.11	2.09	2.09	2.10	2.11	2.11	2.13	2.14	2.14	2.14	2.14	2.14	2.09	2.15	2.12	24	
11	2.15	2.17	2.13	2.11	2.12	2.12	2.11	2.11	2.10	S	2.11	2.11	2.11	2.12	2.12	2.15	2.14	2.10	2.12	2.14	2.17	2.18	2.21	2.18	2.10	2.21	2.13	24	
12	2.17	2.20	2.24	2.31	2.39	2.45	2.50	2.52	S	2.46	C	C	C	C	2.07	2.07	2.09	2.10	2.08	2.07	2.08	2.08	2.08	2.07	2.07	2.07	2.52	2.21	24
13	2.07	2.06	2.06	2.06	2.06	2.06	2.08	S	2.12	2.06	2.07	2.07	2.11	2.12	2.12	2.07	2.05	2.11	2.10	2.09	2.05	2.05	2.05	2.06	2.05	2.12	2.08	24	
14	2.05	2.03	2.03	2.04	2.04	2.04	S	2.03	2.06	2.03	2.03	2.03	2.01	2.01	2.01	2.01	2.02	2.01	2.02	2.02	2.02	2.03	2.05	2.04	2.01	2.06	2.03	24	
15	2.04	2.05	2.04	2.04	2.03	S	2.04	2.05	2.04	2.05	2.04	2.05	2.05	2.05	2.06	2.06	2.06	2.07	2.08	2.07	2.06	2.06	2.07	2.07	2.03	2.08	2.05	24	
16	2.08	2.07	2.05	2.05	S	2.07	2.05	2.04	2.04	2.04	2.03	2.02	2.02	2.03	2.02	2.03	2.04	2.04	2.06	2.05	2.04	2.05	2.05	2.05	2.02	2.08	2.04	24	
17	2.04	2.06	2.09	S	2.16	2.14	2.41	2.18	2.13	2.18	2.32	2.18	2.17	2.16	2.16	2.17	2.18	2.25	2.16	2.16	2.10	2.07	2.20	2.37	2.04	2.41	2.18	24	
18	2.11	2.11	S	2.07	2.09	2.10	2.06	2.13	2.10	2.11	2.10	2.11	2.12	2.09	2.09	2.09	2.08	2.07	2.08	2.09	2.21	2.11	2.11	2.11	2.06	2.21	2.10	24	
19	2.15	S	2.16	2.19	2.20	2.23	2.28	2.29	2.24	2.31	2.41	2.37	2.23	2.22	2.26	2.24	2.26	2.35	2.55	2.55	2.56	2.59	2.55	2.48	2.15	2.59	2.33	24	
20	S	2.58	2.55	2.47	2.46	2.48	2.46	2.38	2.28	2.27	2.22	2.19	2.17	2.13	2.10	2.10	2.10	2.13	2.15	2.15	2.20	2.23	2.25	S	2.10	2.58	2.28	24	
21	2.28	2.25	2.25	2.26	2.25	2.25	2.27	2.37	2.19	2.12	2.14	2.15	2.10	2.08	2.07	2.06	2.09	2.11	2.09	2.14	2.13	2.17	S	2.26	2.06	2.37	2.18	24	
22	2.22	2.35	2.62	2.33	2.35	2.31	2.27	2.26	2.42	2.34	2.36	2.17	2.11	2.12	2.16	2.18	2.20	2.24	2.25	2.17	2.25	S	2.59	2.67	2.11	2.67	2.30	24	
23	2.74	2.72	2.74	2.69	2.67	2.76	2.74	2.79	2.79	2.24	2.14	2.14	2.12	2.13	2.14	2.16	2.14	2.14	2.11	2.12	S	2.11	2.15	2.14	2.11	2.79	2.37	24	
24	2.16	2.19	2.19	2.20	2.19	2.18	2.17	2.16	2.14	2.18	2.18	2.16	2.15	2.15	2.11	2.09	2.11	2.11	2.12	S	2.10	2.12	2.11	2.11	2.09	2.20	2.15	24	
25	2.11	2.10	2.09	2.09	2.08	2.08	2.09	2.10	2.13	2.10	2.08	2.11	2.09	2.06	2.06	2.06	2.07	2.12	S	2.08	2.06	2.06	2.06	2.07	2.06	2.13	2.08	24	
26	2.09	2.10	2.09	2.09	2.12	2.12	2.12	2.12	2.12	2.15	2.13	2.09	2.09	2.10	2.11	2.09	2.11	S	2.12	2.11	2.11	2.11	2.11	2.12	2.09	2.15	2.11	24	
27	2.12	2.13	2.14	2.17	2.19	2.14	2.13	2.14	2.11	2.10	2.09	2.10	2.12	2.13	2.11	2.10	S	2.08	2.08	2.09	2.09	2.09	2.09	2.09	2.08	2.19	2.11	24	
28	2.11	2.11	2.11	2.12	2.09	2.11	2.12	2.12	2.13	2.11	2.11	2.10	2.09	2.09	2.09	S	2.09	2.11	2.11	2.12	2.12	2.13	2.22	2.35	2.09	2.35	2.12	24	
29	2.38	2.31	2.37	2.44	2.50	2.56	2.58	2.60	2.59	2.56	2.49	2.40	2.40	2.35	S	2.33	2.29	2.29	2.29	2.20	2.12	2.13	2.13	2.15	2.12	2.60	2.37	24	
30	2.23	2.19	2.19	2.19	2.18	2.18	2.18	2.18	2.21	2.23	2.28	2.32	2.35	S	2.34	2.31	2.28	2.24	2.18	2.14	2.11	2.12	2.12	2.10	2.10	2.35	2.21	24	
31	2.10	2.10	2.10	2.11	2.13	2.14	2.15	2.16	2.17	2.15	2.13	2.12	S	2.15	2.15	2.10	2.08	2.08	2.10	2.13	2.06	2.04	2.03	2.02	2.02	2.17	2.11	24	
HOURLY MAX	2.74	2.72	2.74	2.69	2.67	2.76	2.74	2.79	2.79	2.56	2.49	2.40	2.40	2.35	2.34	2.33	2.29	2.35	2.55	2.55	2.56	2.59	2.59	2.67					
HOURLY AVG	2.15	2.17	2.18	2.18	2.19	2.19	2.20	2.19	2.17	2.16	2.15	2.13	2.12	2.11	2.11	2.11	2.11	2.12	2.13	2.13	2.12	2.12	2.15	2.16					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

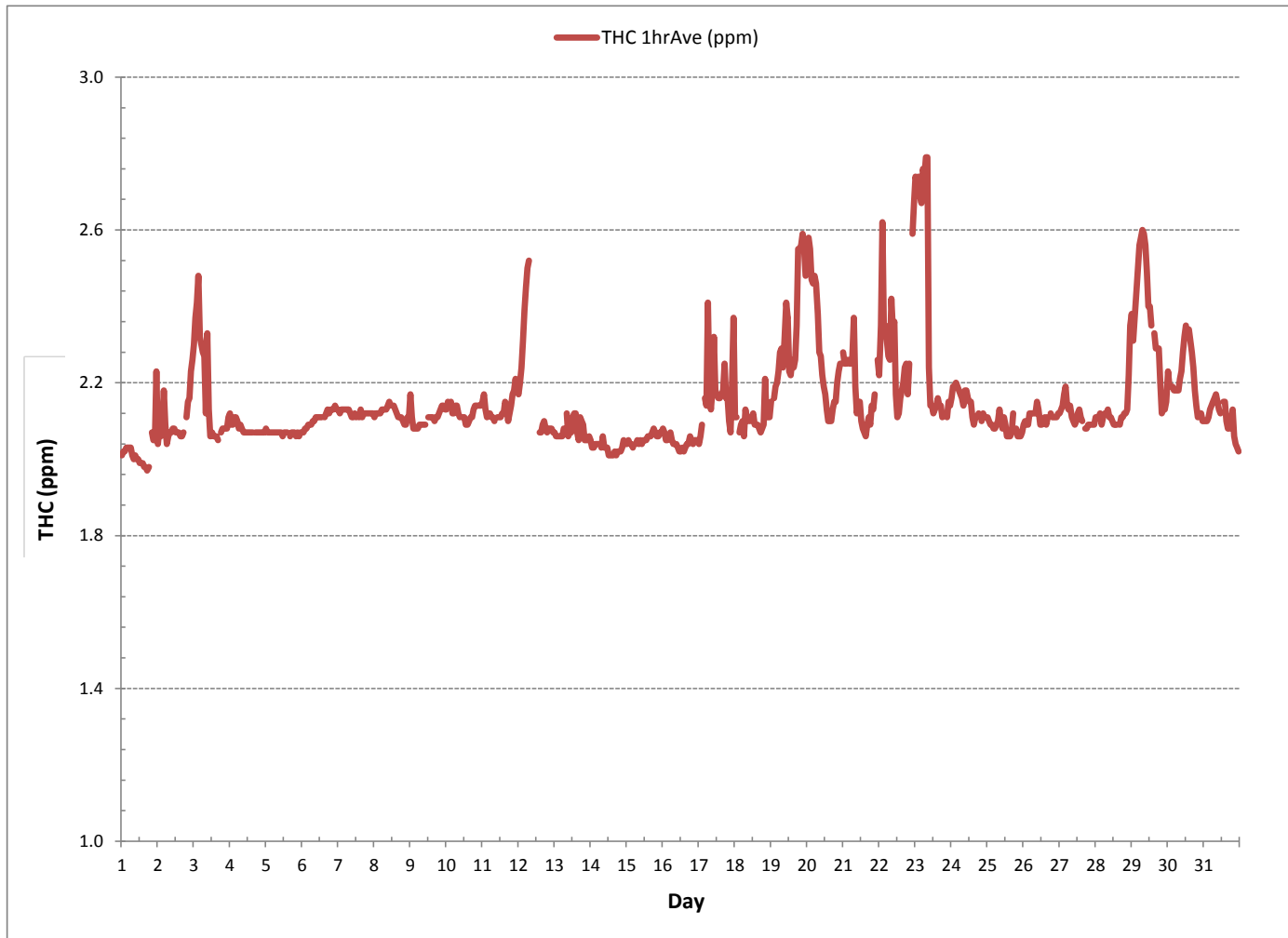
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708		
MINIMUM 1-HR AVERAGE:	1.97 ppm	@ HOUR(S)	17 ON DAY(S)
MAXIMUM 1-HR AVERAGE:	2.79 ppm	@ HOUR(S)	7 , 8 ON DAY(S)
MAXIMUM 24-HR AVERAGE:	2.37 ppm		ON DAY(S)
			23
			VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.13	MONTHLY AVERAGE:	2.15 ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.11	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.11	2.11	2.09	2.11	2.09	2.09	2.09	2.09	2.08	2.09	S	2.17	2.15	2.15	2.11	2.08	2.17	2.11	24		
2	2.09	2.17	2.14	2.17	2.32	2.26	2.09	2.12	2.12	2.14	2.14	2.17	2.14	2.12	2.15	2.17	2.12	2.14	S	2.20	2.24	2.26	2.29	2.52	2.09	2.52	2.19	24	
3	2.46	2.82	2.82	2.65	2.45	2.42	2.36	2.35	2.26	3.21	2.54	2.11	2.26	2.11	2.17	2.12	2.09	S	2.12	2.15	2.12	2.12	2.14	2.29	2.09	3.21	2.35	24	
4	2.21	2.17	2.17	2.17	2.17	2.17	2.14	2.15	2.15	2.12	2.12	2.12	2.12	2.12	2.14	2.12	S	2.14	2.14	2.14	2.14	2.14	2.14	2.12	2.21	2.15	2.14	24	
5	2.15	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.12	2.12	2.12	2.12	2.12	2.12	S	2.14	2.14	2.15	2.14	2.14	2.14	2.15	2.17	2.15	2.12	2.17	2.14	24	
6	2.15	2.15	2.17	2.17	2.17	2.17	2.18	2.20	2.20	2.21	2.21	2.21	2.21	S	2.21	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.15	2.24	2.20	24	
7	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.21	2.20	2.26	2.29	2.23	S	2.29	2.27	2.21	2.26	2.26	2.21	2.22	2.23	2.24	2.26	2.20	2.29	2.24	24	
8	2.20	2.23	2.23	2.21	2.22	2.26	2.23	2.24	2.23	2.26	2.41	2.24	S	2.24	2.23	2.20	2.20	2.20	2.20	2.17	2.18	2.26	2.29	2.26	2.17	2.41	2.23	24	
9	2.32	2.21	2.15	2.14	2.14	2.14	2.14	2.12	2.12	2.12	S	2.17	2.17	2.17	2.15	2.15	2.17	2.17	2.18	2.20	2.21	2.21	2.20	2.12	2.32	2.17	24		
10	2.23	2.23	2.23	2.23	2.20	2.23	2.23	2.23	2.23	2.21	S	2.20	2.20	2.20	2.20	2.21	2.23	2.23	2.24	2.26	2.26	2.26	2.26	2.26	2.20	2.26	2.23	24	
11	2.32	2.33	2.26	2.23	2.23	2.23	2.21	2.23	2.23	S	2.21	2.21	2.23	2.23	2.23	2.29	2.24	2.18	2.22	2.23	2.26	2.26	2.29	2.26	2.18	2.33	2.24	24	
12	2.24	2.27	2.30	2.41	2.49	2.51	2.57	2.57	S	C	C	C	C	C	2.14	2.12	2.12	2.12	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.57	2.24	24	
13	2.09	2.08	2.08	2.08	2.08	2.06	2.12	S	2.57	2.07	2.11	2.08	2.17	2.17	2.17	2.17	2.09	2.06	2.14	2.12	2.11	2.06	2.06	2.08	2.06	2.57	2.12	24	
14	2.05	1.99	1.99	1.99	1.99	1.98	S	1.98	2.09	1.97	1.97	1.97	1.97	1.96	1.96	1.97	1.97	1.97	1.97	1.97	1.97	1.97	2.03	2.02	1.96	2.09	1.99	24	
15	2.00	2.03	2.00	2.00	1.99	S	2.00	2.02	2.00	2.00	2.00	2.00	2.00	2.00	2.03	2.00	2.01	2.03	2.03	2.03	2.00	2.01	2.02	2.02	1.99	2.03	2.01	24	
16	2.03	2.02	2.00	2.02	S	2.09	2.00	1.99	1.99	1.98	1.98	1.98	1.97	1.97	1.97	1.98	1.99	1.99	2.00	1.99	2.00	1.99	2.00	1.99	1.97	2.09	2.00	24	
17	1.99	2.09	2.09	S	2.17	2.18	3.42	2.70	2.20	2.29	3.15	2.21	2.24	2.20	2.20	2.38	2.57	2.55	2.20	2.26	2.20	2.07	2.68	2.82	1.99	3.42	2.39	24	
18	2.20	2.23	S	2.17	2.14	2.15	2.06	2.29	2.30	2.20	2.15	2.17	2.35	2.15	2.18	2.12	2.15	2.09	2.09	2.26	2.55	2.20	2.14	2.14	2.06	2.55	2.19	24	
19	2.20	S	2.18	2.21	2.24	2.29	2.32	2.32	2.31	P	2.49	2.43	2.30	2.32	2.32	2.27	2.30	2.48	2.60	2.60	2.63	2.63	2.61	2.54	2.18	2.63	2.39	23	
20	S	2.63	2.61	2.51	2.51	2.64	2.54	2.46	2.33	2.32	2.26	2.20	2.20	2.15	2.11	2.09	2.09	2.17	2.43	2.20	2.22	2.27	2.29	S	2.09	2.64	2.33	24	
21	2.32	2.24	2.23	2.32	2.26	2.24	2.26	2.42	2.29	2.12	2.17	2.17	2.12	2.15	2.09	2.08	2.17	2.17	2.12	2.17	2.17	2.38	S	2.57	2.08	2.57	2.23	24	
22	2.46	3.24	2.83	2.64	2.49	2.61	2.48	2.35	2.71	2.51	2.59	2.27	2.15	2.15	2.17	2.21	2.21	2.30	2.30	2.23	2.32	S	2.64	2.73	2.15	3.24	2.46	24	
23	2.78	2.78	2.83	2.82	2.73	2.88	2.85	3.12	3.12	2.45	2.20	2.17	2.17	2.20	2.18	2.23	2.24	2.20	2.20	2.21	S	2.18	2.26	2.20	2.17	3.12	2.48	24	
24	2.21	2.23	2.23	2.23	2.23	2.23	2.21	2.20	2.18	2.29	2.29	2.26	2.23	2.23	2.20	2.12	2.18	2.14	2.20	S	2.14	2.18	2.12	2.12	2.12	2.29	2.20	24	
25	2.12	2.12	2.11	2.12	2.11	2.11	2.17	2.18	2.20	2.20	2.15	2.17	2.17	2.09	2.08	2.12	2.11	2.18	S	2.14	2.08	2.08	2.09	2.12	2.08	2.20	2.13	24	
26	2.12	2.12	2.11	2.12	2.12	2.12	2.14	2.17	2.20	2.57	2.43	2.11	2.11	2.20	2.14	2.11	2.12	S	2.15	2.14	2.12	2.12	2.17	2.14	2.11	2.57	2.17	24	
27	2.14	2.15	2.17	2.20	2.23	2.18	2.20	2.21	2.12	2.11	2.09	2.12	2.15	2.17	2.12	2.14	S	2.11	2.09	2.14	2.12	2.12	2.15	2.11	2.09	2.23	2.15	24	
28	2.15	2.12	2.14	2.14	2.12	2.49	2.14	2.15	2.17	2.15	2.14	2.12	2.12	2.12	2.17	S	2.12	2.15	2.15	2.15	2.15	2.20	2.29	2.45	2.12	2.49	2.18	24	
29	2.43	2.38	2.42	2.48	2.55	2.60	2.61	2.63	2.64	2.60	2.54	2.45	2.45	2.38	S	2.35	2.32	2.32	2.32	2.26	2.14	2.14	2.15	2.21	2.14	2.64	2.41	24	
30	2.26	2.20	2.20	2.20	2.20	2.18	2.17	2.18	2.21	2.23	2.29	2.32	2.36	S	2.35	2.30	2.26	2.33	2.20	2.26	2.09	2.15	2.15	2.08	2.08	2.36	2.22	24	
31	2.08	2.09	2.08	2.09	2.09	2.12	2.12	2.14	2.14	2.12	2.09	2.08	S	2.11	2.12	2.08	2.05	2.06	2.03	2.09	2.12	2.07	2.01	2.01	2.01	2.01	2.14	2.09	24
HOURLY MAX	2.78	3.24	2.83	2.82	2.73	2.88	3.42	3.12	3.12	3.21	3.15	2.45	2.45	2.38	2.35	2.38	2.57	2.55	2.60	2.60	2.63	2.63	2.68	2.82					
HOURLY AVG	2.21	2.26	2.24	2.24	2.24	2.27	2.28	2.27	2.26	2.25	2.25	2.17	2.18	2.15	2.15	2.16	2.16	2.18	2.18	2.18	2.18	2.17	2.21	2.24					

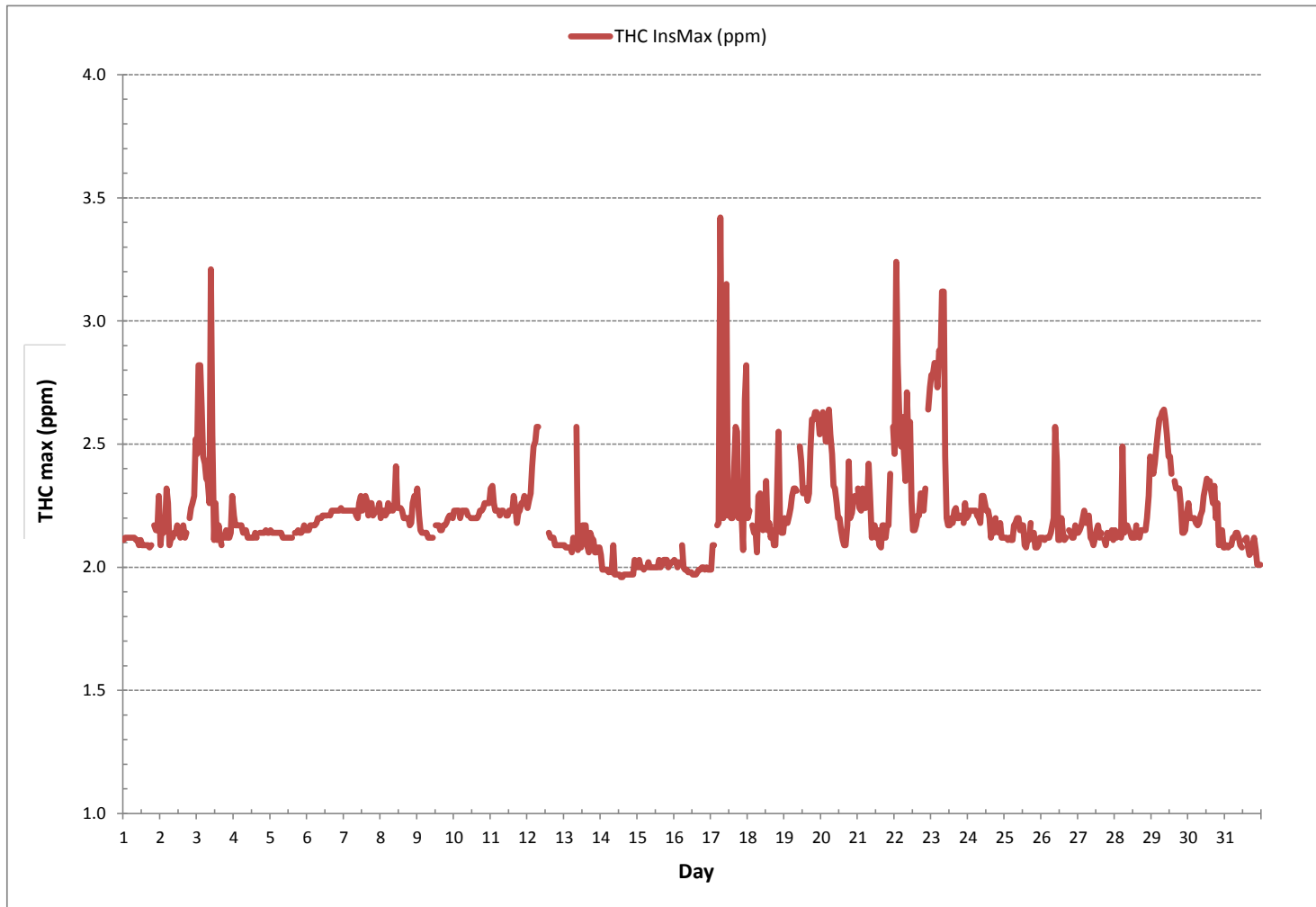
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

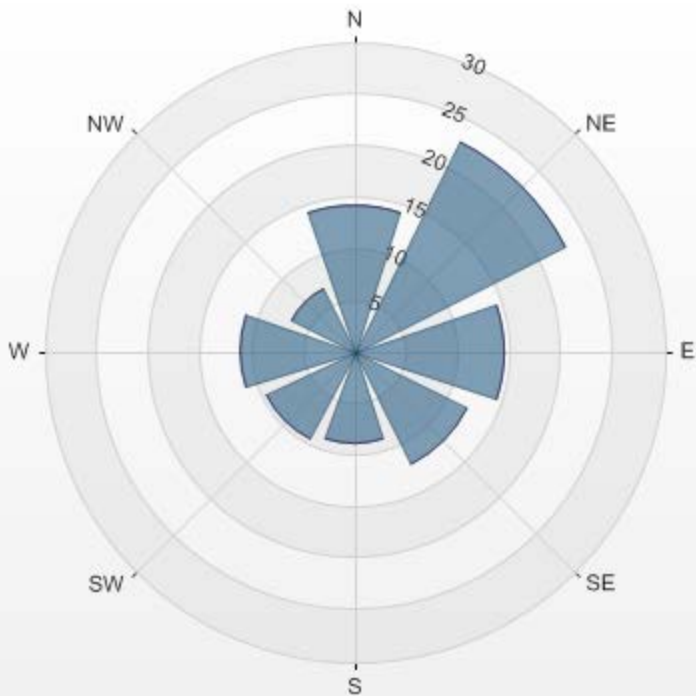
NUMBER OF NON-ZERO READINGS:	706		
MAXIMUM INSTANTANEOUS VALUE:	3.42 ppm @ HOUR(S) 6 ON DAY(S) 17		
	VAR-VARIOUS		
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	743 hrs
MONTHLY CALIBRATION TIME:	5 hrs		
STANDARD DEVIATION:	0.18		

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA MASKWA Poll.: LICA MASKWA-THC[ppm] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00 [ppm]

Direction	0.0-0.9	0.9-1.9	1.9-2.8	>2.8	Total
N	0	0	14.16	0	14.16
NE	0	0	22.8	0	22.8
E	0	0	14.45	0	14.45
SE	0	0	12.18	0	12.18
S	0	0	8.92	0	8.92
SW	0	0	9.49	0	9.49
W	0	0	11.05	0	11.05
NW	0	0	6.94	0	6.94
Summary	0	0	100	0	100



THC[ppm] Calibration: LICA MASKWA Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



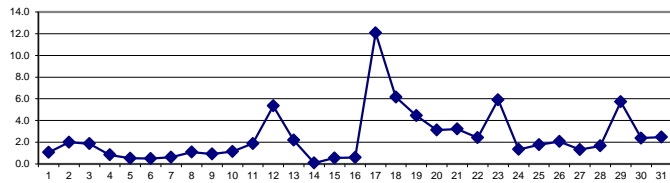
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	1.9	1.6	1.2	1.1	1.1	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.3	0.2	0.5	0.6	0.4	S	X		4.4	2.8	2.0	0.2	4.4	1.1	23	
2	1.6	2.1	1.9	2.1	3.4	2.4	1.4	2.1	1.5	1.2	1.5	0.9	0.7	0.6	0.6	1.2	0.6	0.6	S	X		4.6	4.8	5.0	3.1	0.6	5.0	2.0	23	
3	2.3	1.8	1.9	2.4	2.4	1.7	1.8	2.5	2.8	2.2	1.7	1.3	1.3	1.3	1.2	1.0	1.1	S	X		3.8	2.5	1.8	1.4	1.0	1.0	3.8	1.9	23	
4	0.9	0.8	0.7	0.6	0.6	0.5	0.2	0.3	0.5	0.5	0.2	0.1	0.1	0.0	0.2	0.1	S	X		3.8	2.4	1.8	1.6	1.5	1.2	0.0	3.8	0.8	23	
5	1.2	0.9	0.6	0.3	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X		3.1	1.9	1.1	0.6	0.6	0.5	0.2	0.0	3.1	0.5	23
6	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.5	0.1	0.1	S	X		3.0	2.0	1.3	1.1	0.9	0.7	0.6	0.5	0.0	3.0	0.5	23
7	0.5	0.1	0.3	0.2	0.1	0.4	0.4	0.0	0.3	0.0	0.0	0.5	0.0	S	X		3.9	1.7	1.6	1.1	0.8	0.5	0.5	0.5	0.5	0.0	3.9	0.6	23	
8	0.4	0.6	0.4	0.1	0.3	0.1	0.3	0.1	0.5	0.5	0.4	0.5	S	X		3.1	2.1	1.6	1.1	0.7	0.8	0.8	2.4	4.7	2.8	0.1	4.7	1.1	23	
9	4.1	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	X		3.2	2.4	1.6	1.2	1.2	0.6	0.7	1.4	1.0	0.9	0.6	0.0	4.1	0.9	23	
10	0.7	0.8	1.3	1.3	0.1	0.2	1.3	1.0	0.2	0.0	S	X		3.1	1.9	1.3	1.1	0.7	0.6	0.6	0.6	0.7	1.1	3.2	3.7	0.0	3.7	1.2	23	
11	3.3	5.0	2.1	0.2	0.1	0.2	1.9	1.6	1.5	S	X		3.1	2.7	3.5	2.3	2.5	1.8	1.3	0.8	1.0	1.2	1.6	2.1	1.6	0.1	5.0	1.9	23	
12	1.6	2.2	3.1	4.1	5.7	7.5	9.9	8.7	S	X	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	1.6	9.9	5.4	14	
13	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	C	2.1	0.6	4.9	4.7	3.8	0.6	0.8	0.9	1.4	0.6	4.9	2.2	16	
14	0.0	0.0	0.0	0.0	0.0	0.0	S	X		0.8	0.2	0.2	0.2	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	23	
15	0.0	0.0	0.0	0.0	0.0	S	X		2.0	0.7	0.7	0.5	0.8	0.7	0.6	1.0	0.3	0.7	1.1	0.7	0.6	0.4	0.6	0.6	0.2	0.0	2.0	0.6	23	
16	0.1	0.1	0.0	1.6	S	X		1.3	0.7	0.6	0.6	0.6	0.5	0.3	0.4	0.1	0.4	0.2	0.5	0.1	0.2	0.6	1.1	2.5	0.0	2.5	0.6	23		
17	0.4	3.6	9.7	S	X		10.2	15.9	14.9	S1	X		19.3	15.8	7.6	14.4	10.7	9.4	22.3	14.0	10.4	16.1	18.1	5.2	16.3	6.8	0.4	22.3	12.1	21
18	4.2	10.8	S	X		16.0	9.8	3.8	11.1	13.4	10.7	8.4	7.3	6.0	5.0	5.7	6.2	4.3	0.9	1.0	1.3	5.2	2.1	1.7	0.6	0.6	16.0	6.2	23	
19	1.4	S	X		2.7	2.2	2.7	5.5	6.7	4.6	C1	C1	C1	C1	C1	C1	5.0	4.5	4.5	5.7	5.6	4.8	5.3	5.2	5.0	1.4	6.7	4.5	17	
20	S	X		5.2	4.4	2.8	2.5	4.4	6.4	4.9	4.2	4.6	2.6	3.4	5.2	2.2	1.7	1.6	2.4	1.8	1.4	1.5	1.2	1.1	S	1.1	6.4	3.1	23	
21	X		3.6	3.1	6.3	3.9	3.4	5.0	6.5	4.0	2.7	3.0	3.8	3.2	2.9	1.8	1.4	3.3	2.9	2.1	2.2	1.6	1.1	S	X	1.1	6.5	3.2	22	
22	1.9	1.2	1.2	2.1	1.3	1.3	1.6	1.7	1.8	1.9	1.8	2.7	2.9	2.2	2.6	3.1	3.5	3.5	2.4	2.6	S	X		6.5	1.2	6.5	2.4	23		
23	8.0	8.5	10.4	9.1	8.4	12.0	10.7	9.8	14.4	8.2	2.0	4.4	3.3	1.8	4.4	6.8	2.0	1.1	0.6	0.6	S	X		2.0	1.6	0.6	14.4	5.9	23	
24	1.2	1.2	1.2	1.2	1.0	0.7	0.6	0.6	0.6	3.7	2.6	1.7	4.0	2.0	0.5	0.1	0.8	0.3	1.6	S	X		2.2	1.2	0.6	0.1	4.0	1.3	23	
25	0.6	0.6	0.6	0.6	0.6	0.6	1.6	2.7	5.6	2.4	1.4	4.9	3.5	0.6	0.6	0.6	0.6	0.8	3.7	S	X		2.6	1.8	1.2	1.2	0.6	5.6	1.8	23
26	1.8	1.4	1.2	1.5	1.4	1.3	2.2	5.4	3.8	5.4	3.3	1.2	0.6	0.7	0.6	0.7	1.6	S	X		3.5	1.5	1.3	1.3	3.8	0.6	5.4	2.1	23	
27	4.8	2.6	1.3	1.8	1.6	1.4	1.9	2.9	0.6	0.7	0.8	0.9	0.6	0.6	0.6	0.6	S	X		1.5	1.2	0.8	0.9	0.6	0.6	0.6	4.8	1.3	23	
28	0.6	0.6	0.8	0.7	0.6	2.8	2.0	1.2	1.1	0.6	0.6	0.6	0.8	1.4	1.3	S	X		2.4	2.5	2.4	1.5	1.5	3.8	6.9	0.6	6.9	1.7	23	
29	7.4	5.3	4.6	5.1	6.1	6.0	6.4	6.3	8.5	9.8	7.7	7.3	8.2	7.1	S	X		7.2	5.8	5.5	3.4	2.2	2.2	1.8	2.2	1.8	9.8	5.7	23	
30	2.4	1.8	1.4	1.6	1.7	1.6	1.1	0.9	1.3	1.9	2.6	2.0	2.3	S	X		4.1	2.8	3.6	5.2	3.7	1.2	3.1	4.0	2.1	0.9	5.2	2.4	23	
31	1.0	0.9	1.7	2.3	1.8	2.3	4.2	2.5	S1	X		4.0	3.0	S	X		4.9	1.9	C1	C1		4.5	7.3	0.8	0.4	0.4	0.4	7.3	2.5	19
HOURLY MAX	8.0	10.8	10.4	9.1	16.0	12.0	15.9	14.9	14.4	10.7	19.3	15.8	8.2	14.4	10.7	9.4	22.3	14.0	10.4	16.1	18.1	5.3	16.3	6.9						
HOURLY AVG	1.9	2.1	2.0	1.9	2.3	2.6	3.1	3.4	2.8	2.4	2.6	2.6	2.2	2.3	2.0	2.2	2.7	2.5	2.4	2.6	2.2	1.8	2.4	2.1						

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

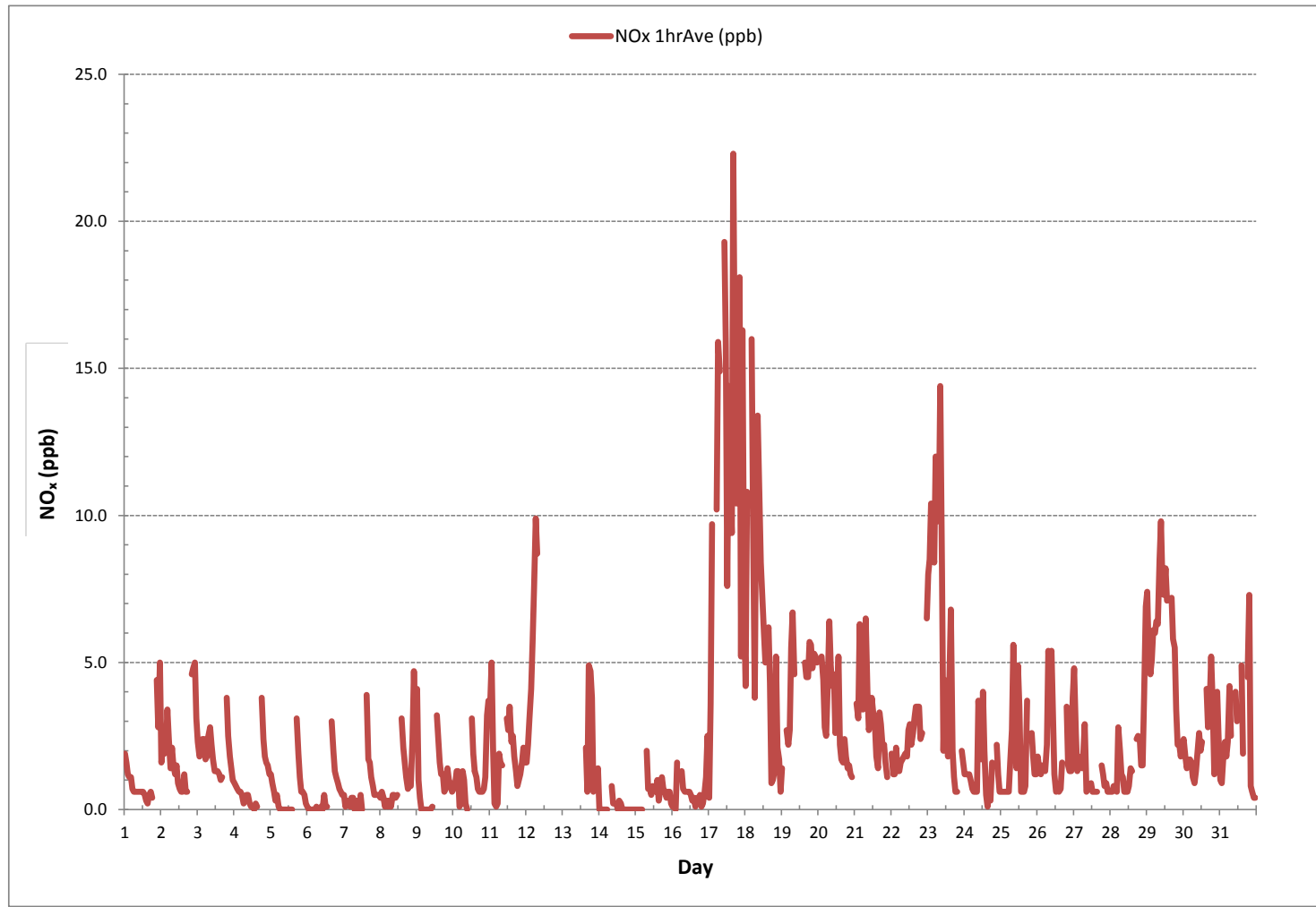
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	589				
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	22.3	ppb	@ HOUR(S)	16	17
MAXIMUM 24-HR AVERAGE:	12.1	ppb			17
					VAR-VARIOUS
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	684	hrs
MONTHLY CALIBRATION TIME:	12	hrs	AMD OPERATION UPTIME:	91.9	%
STANDARD DEVIATION:	3.03		MONTHLY AVERAGE:	2.4	ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	1.5	0.9	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	5.6	2.7	1.5	0.0	5.6	0.6	23	
2	0.9	2.1	2.7	2.1	5.0	3.8	0.9	2.1	1.5	0.9	1.5	0.9	0.4	0.4	0.0	19.7	0.4	0.0	S	X	4.4	4.4	5.0	3.8	0.0	19.7	2.9	23	
3	2.7	1.5	1.5	2.1	2.1	2.1	2.1	3.3	3.3	2.1	0.9	0.4	0.4	0.4	0.4	0.4	0.4	S	X	4.4	2.1	0.9	0.9	0.4	0.4	4.4	1.6	23	
4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	3.9	2.7	0.9	0.9	0.9	0.9	0.0	3.9	0.5	23	
5	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	7.9	1.5	0.9	0.4	0.4	0.4	0.0	0.0	7.9	0.6	23	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	3.3	2.1	1.5	0.4	0.4	0.4	0.4	0.0	0.0	3.3	0.4	23	
7	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	3.3	1.5	S	X	5.6	1.5	1.5	0.4	0.4	0.0	0.0	0.0	0.0	0.0	5.6	0.7	23	
8	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	3.3	1.5	1.5	0.9	0.4	0.4	0.4	0.4	7.4	7.4	6.2	0.0	7.4	1.4	23
9	6.2	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	3.8	2.1	0.9	0.4	0.4	0.4	0.4	0.9	0.9	0.9	0.0	0.0	6.2	0.8	23	
10	0.4	0.4	1.5	0.9	0.0	0.0	3.3	1.5	0.0	0.0	S	X	3.3	2.7	0.9	0.4	0.4	0.4	0.0	0.0	0.4	0.4	10.9	5.6	0.0	10.9	1.5	23	
11	3.9	7.4	2.7	0.0	0.0	0.0	2.7	2.7	2.1	S	X	3.3	3.3	3.8	2.7	9.7	1.5	1.5	0.9	1.5	1.5	2.1	2.1	2.1	0.0	9.7	2.6	23	
12	2.1	2.7	3.3	5.0	6.8	46.6	14.4	10.3	S	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	2.1	46.6	11.4	15	
13	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	5.3	1.8	8.2	8.8	8.2	2.4	2.4	4.1	5.9	1.8	8.8	5.2	16	
14	1.2	0.6	0.6	0.6	0.0	0.0	S	X	1.2	1.2	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	1.2	0.4	23	
15	0.0	0.0	0.1	0.0	0.0	S	X	3.0	1.8	1.2	0.6	1.3	1.2	0.6	4.1	0.6	1.2	1.8	1.2	0.6	0.6	0.6	0.6	0.6	0.0	4.1	1.0	23	
16	0.6	0.6	0.1	5.3	S	X	1.8	1.3	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.2	2.4	5.3	0.1	5.3	1.2	23	
17	0.6	21.8	21.2	S	X	24.1	47.0	29.9	S1	X	28.8	43.4	17.0	30.5	24.1	24.7	52.2	26.9	22.9	23.5	24.1	11.2	23.5	12.9	0.6	52.2	25.5	21	
18	7.6	22.9	S	X	23.5	17.0	6.5	17.0	18.8	15.2	14.7	15.2	11.2	7.7	26.4	10.6	8.8	1.3	1.2	2.4	8.8	4.7	3.0	1.2	1.2	26.4	11.2	23	
19	1.8	S	X	3.0	3.0	4.7	7.1	7.7	5.9	C1	C1	C1	C1	C1	C1	6.5	5.9	5.9	6.5	6.5	5.9	5.9	5.9	5.9	1.8	7.7	5.5	17	
20	S	X	5.9	5.3	4.1	4.1	5.9	15.2	15.2	5.3	7.1	3.5	8.8	7.1	4.1	2.4	1.8	3.5	2.4	1.8	1.8	1.3	1.3	S	1.3	15.2	5.1	23	
21	X	4.1	3.5	8.2	7.6	4.1	5.9	7.7	5.9	3.5	3.5	4.7	4.1	4.7	2.4	2.4	5.3	4.7	2.5	3.0	2.4	1.2	S	X	1.2	8.2	4.4	22	
22	2.4	1.2	1.3	2.4	1.8	1.8	1.8	1.8	2.4	2.4	2.4	3.0	3.0	2.4	3.5	3.5	4.1	4.1	4.1	3.5	3.0	S	X	7.1	1.2	7.1	2.9	23	
23	10.0	9.4	11.8	11.2	10.6	14.1	12.4	16.4	17.0	20.6	4.1	7.6	6.5	3.0	7.7	8.2	3.0	1.3	0.6	0.7	S	X	2.4	1.8	0.6	20.6	8.2	23	
24	1.8	1.3	1.3	1.3	1.3	1.3	0.6	0.6	0.6	7.7	4.7	4.1	6.5	3.0	2.4	0.6	1.8	0.6	5.3	S	X	3.0	1.3	1.2	0.6	7.7	2.4	23	
25	0.6	0.6	0.6	0.6	0.6	0.6	4.7	5.9	8.8	7.1	5.3	7.1	7.6	0.6	0.6	1.2	1.8	7.1	S	X	3.0	2.4	1.2	1.3	0.6	8.8	3.2	23	
26	2.4	1.8	1.3	3.0	1.8	1.8	2.4	8.8	10.0	7.6	8.8	2.4	0.6	1.8	0.6	1.3	3.0	S	X	5.9	1.8	1.8	1.8	7.7	0.6	10.0	3.6	23	
27	6.5	3.5	1.8	1.8	1.8	1.8	5.3	7.6	1.2	1.2	1.3	1.3	0.6	0.6	0.6	0.6	S	X	1.8	1.2	1.2	1.2	0.6	0.6	0.6	7.6	2.0	23	
28	0.6	0.6	1.3	1.3	1.2	47.0	11.8	1.3	1.3	0.6	0.6	1.2	1.2	1.8	2.4	S	X	3.0	3.5	3.0	1.8	2.4	4.7	8.8	0.6	47.0	4.6	23	
29	8.8	7.1	5.3	5.9	6.5	6.5	7.1	7.6	9.4	10.6	8.2	8.8	24.7	8.2	S	X	8.8	6.5	6.5	5.3	3.0	2.4	2.4	3.0	2.4	24.7	7.4	23	
30	3.0	2.4	1.8	3.0	3.0	3.0	1.8	2.4	3.0	3.5	3.5	3.5	S	X	5.9	3.5	7.6	10.0	8.2	1.8	7.7	7.1	5.9	1.8	10.0	4.2	23		
31	2.4	2.4	3.0	3.5	3.5	4.1	7.1	S1	S1	X	5.9	4.7	S	X	7.7	4.7	C1	C1	12.4	14.1	4.1	2.4	1.8	1.8	1.8	14.1	5.0	18	
HOURLY MAX	10.0	22.9	21.2	11.2	23.5	47.0	47.0	29.9	18.8	20.6	28.8	43.4	24.7	30.5	26.4	24.7	52.2	26.9	22.9	23.5	24.1	11.2	23.5	12.9					
HOURLY AVG	2.5	3.5	2.7	2.4	3.0	6.8	5.5	5.5	4.1	3.6	4.0	4.7	4.3	3.5	4.1	4.5	4.5	3.9	3.8	3.8	2.9	2.7	3.4	3.3					

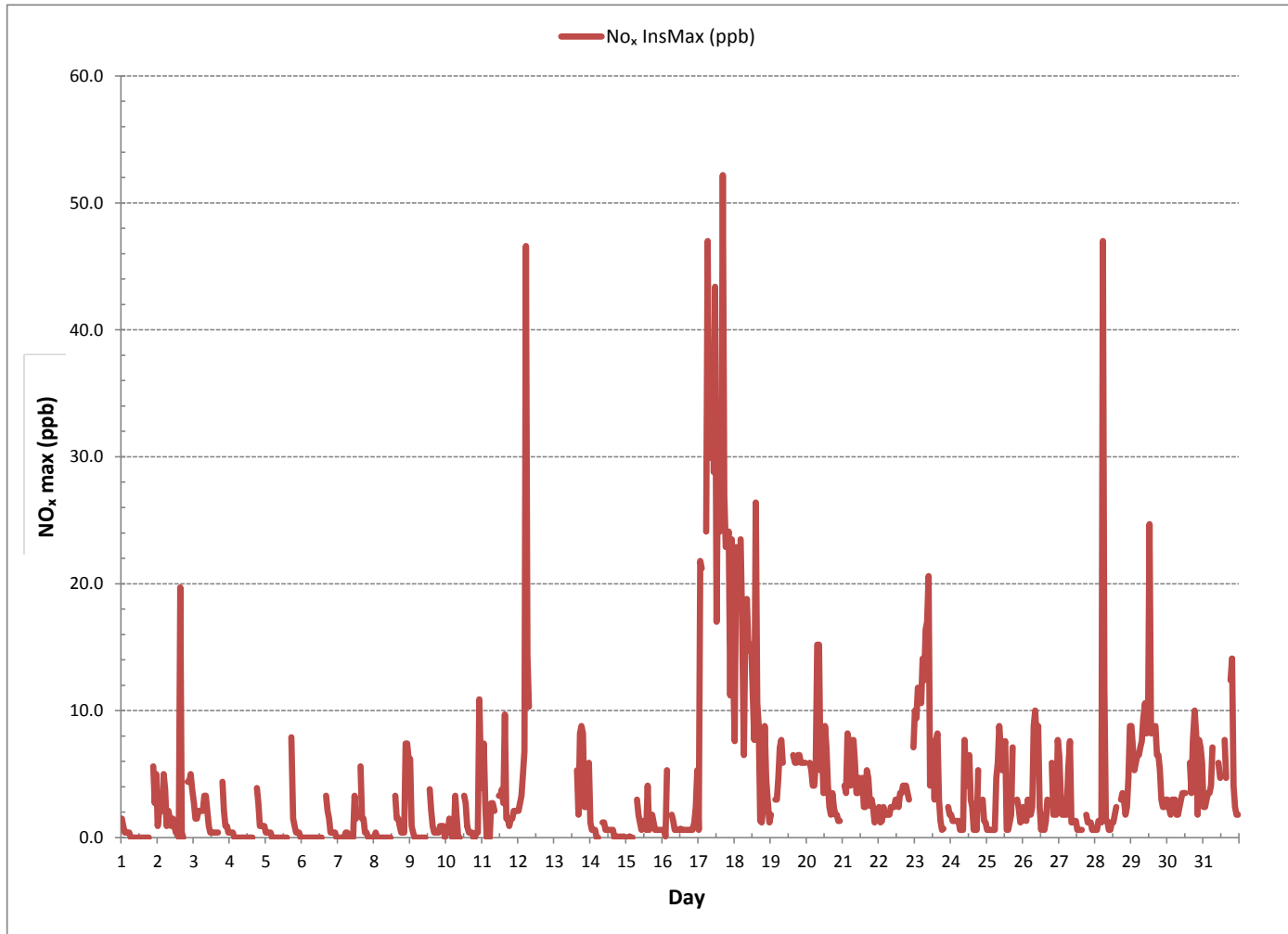
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

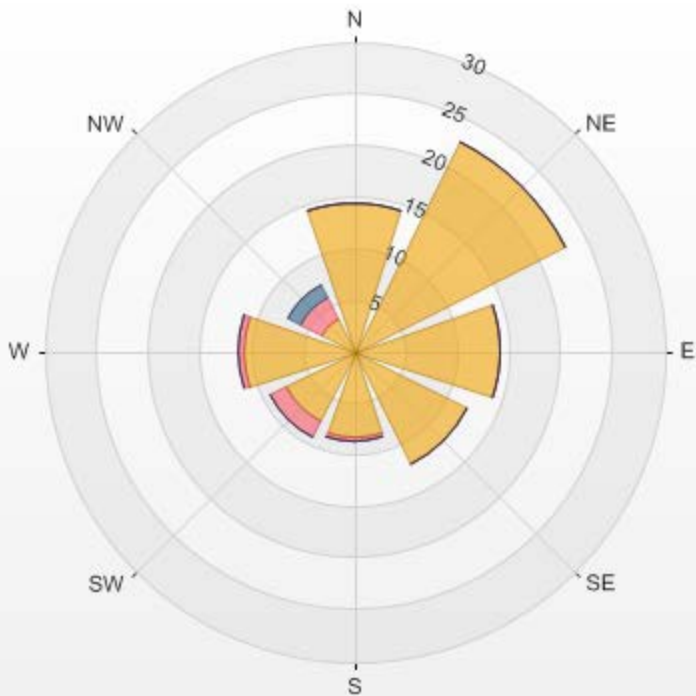
NUMBER OF NON-ZERO READINGS:	533
MAXIMUM INSTANTANEOUS VALUE:	52.2 ppb @ HOUR(S) 16 ON DAY(S) 17
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	13 hrs
OPERATIONAL TIME:	684 hrs
STANDARD DEVIATION:	6.30

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



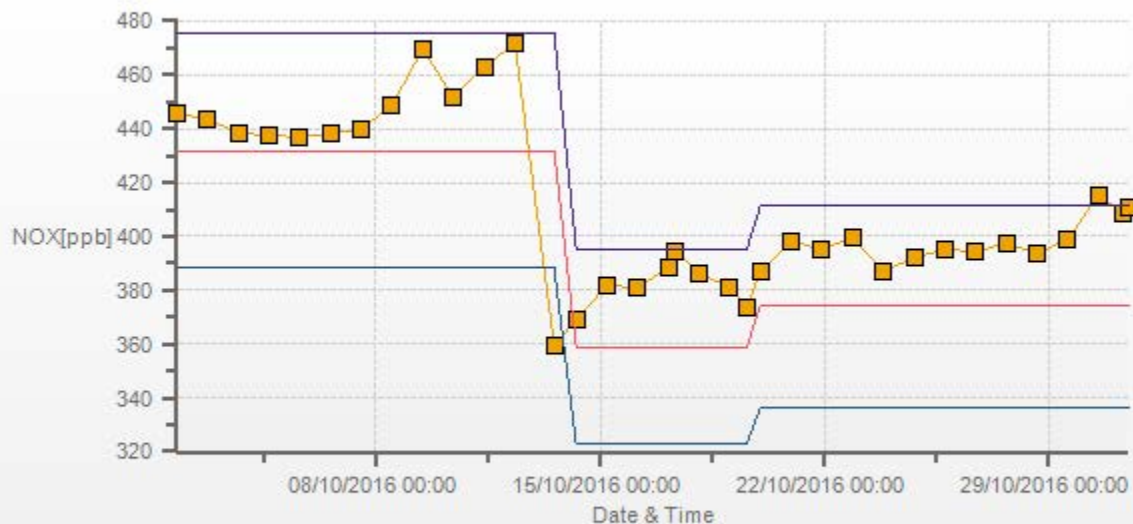
Wind: LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr
 Calm: 0.00% Valid Data: 86.02% Calm Avg: 0.00 [ppb]

Direction	0.0-7.5	7.5-14.9	14.9-22.4	>22.4	Total
N	14.38	0	0	0	14.38
NE	22.81	0	0	0	22.81
E	14.22	0	0	0	14.22
SE	12.19	0	0	0	12.19
S	8.28	0.47	0	0	8.75
SW	7.5	1.72	0	0	9.22
W	10.78	0.47	0	0	11.25
NW	3.59	2.34	1.25	0	7.18
Summary	93.75	5	1.25	0	100



% Icon Classes (ppb)	94	0.0-7.5	5	7.5-14.9	1	14.9-22.4	0	>22.4
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NOX[ppb] Calibration: LICA MASKWA Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

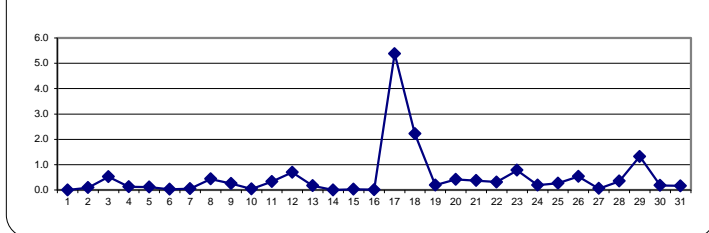
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23
2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.4	0.1	0.0	0.4	0.1	0.0	0.0	0.4	0.0	0.0	S	X	0.1	0.1	0.1	0.1	0.2	0.0	0.4	0.1	23	
3	0.2	0.2	0.3	0.3	0.3	0.4	0.5	1.0	1.1	0.8	0.7	0.5	0.5	0.6	0.6	0.5	0.6	S	X	0.6	0.5	0.6	0.5	0.2	0.2	1.1	0.5	23	
4	0.4	0.4	0.4	0.2	0.3	0.1	0.0	0.0	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	S	X	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.4	0.1	23	
5	0.1	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.4	0.4	0.2	0.3	0.3	0.3	0.1	0.0	0.4	0.1	23	
6	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	S	X	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	23	
7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.1	0.0	0.1	0.1	0.2	0.0	0.0	0.3	0.2	0.0	0.3	0.1	23	
8	0.0	0.2	0.4	0.1	0.1	0.1	0.3	0.1	0.5	0.5	0.4	0.5	S	X	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.8	0.7	0.0	0.8	0.4	23	
9	0.9	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	X	0.4	0.6	0.5	0.4	0.5	0.1	0.2	0.2	0.3	0.2	0.1	0.0	0.9	0.3	23	
10	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	S	X	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.2	0.0	23	
11	0.3	0.4	0.4	0.2	0.1	0.0	0.4	0.1	0.7	S	X	0.6	0.6	1.2	0.6	0.8	0.2	0.3	0.0	0.1	0.0	0.2	0.0	0.0	0.0	1.2	0.3	23	
12	0.0	0.0	0.1	0.0	0.1	1.1	1.5	2.8	S	X	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	0.0	2.8	0.7	14	
13	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	C	0.3	0.0	0.4	0.3	0.4	0.0	0.1	0.0	0.0	0.4	0.2	16	
14	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	
15	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	23	
16	0.0	0.0	0.0	0.1	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	23	
17	0.0	1.5	3.5	S	X	3.1	7.1	7.2	S1	X	9.5	8.4	3.4	7.5	4.6	3.9	11.3	6.2	4.1	6.9	8.0	1.9	7.4	2.0	0.0	11.3	5.4	21	
18	1.0	4.0	S	X	6.2	2.8	0.8	3.8	6.2	5.0	4.1	3.6	2.8	2.1	2.3	2.0	1.1	0.0	0.0	0.0	1.0	0.1	0.0	0.0	0.0	6.2	2.2	23	
19	0.0	S	X	0.0	0.0	0.0	0.1	0.8	1.1	C1	C1	C1	C1	C1	C1	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2	17	
20	S	X	0.0	0.0	0.0	0.0	0.0	1.2	0.9	1.2	1.9	0.6	1.0	1.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	1.9	0.4	23	
21	X	0.0	0.0	0.9	0.2	0.0	0.3	0.9	0.9	0.6	0.6	1.1	0.9	0.8	0.3	0.1	0.2	0.0	0.0	0.0	0.0	0.0	S	X	0.0	1.1	0.4	22	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	1.0	0.9	1.3	0.9	0.6	0.6	0.5	0.1	0.0	0.0	0.0	S	X	0.0	0.0	0.0	1.3	0.3	23	
23	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.6	5.8	2.9	0.5	1.6	1.1	0.5	1.2	1.4	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	5.8	0.8	23	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.8	0.5	1.1	0.5	0.0	0.0	0.1	0.0	0.2	S	X	0.1	0.0	0.0	0.0	1.1	0.2	23	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	1.3	0.5	0.3	1.3	0.9	0.0	0.0	0.0	0.1	0.7	S	X	0.0	0.0	0.0	0.0	0.0	1.3	0.3	23	
26	0.0	0.0	0.0	0.1	0.0	0.0	0.5	2.2	1.8	3.0	1.7	0.7	0.5	0.3	0.2	0.4	0.3	S	X	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.5	23	
27	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.0	0.0	0.2	0.3	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	23	
28	0.0	0.0	0.0	0.0	0.0	1.4	0.7	0.0	0.4	0.5	0.4	0.6	0.6	0.5	S	X	0.0	0.1	0.0	0.0	0.0	0.0	0.0	2.1	0.0	2.1	0.4	23	
29	1.9	0.7	0.1	0.2	0.4	0.4	1.0	0.9	3.3	5.2	4.1	3.9	4.0	2.5	S	X	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	1.3	23	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.2	0.5	S	X	0.3	0.0	0.6	1.2	0.1	0.0	0.4	0.0	0.0	0.0	1.2	0.2	23	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	S1	X	0.5	0.6	S	X	0.5	0.1	C1	C1	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2	19
HOURLY MAX	1.9	4.0	3.5	0.9	6.2	3.1	7.1	7.2	6.2	5.2	9.5	8.4	4.0	7.5	4.6	3.9	11.3	6.2	4.1	6.9	8.0	1.9	7.4	2.1					
HOURLY AVG	0.2	0.3	0.2	0.1	0.3	0.3	0.5	0.8	0.9	0.9	1.1	1.0	0.8	0.8	0.6	0.5	0.6	0.4	0.3	0.4	0.4	0.2	0.4	0.2					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

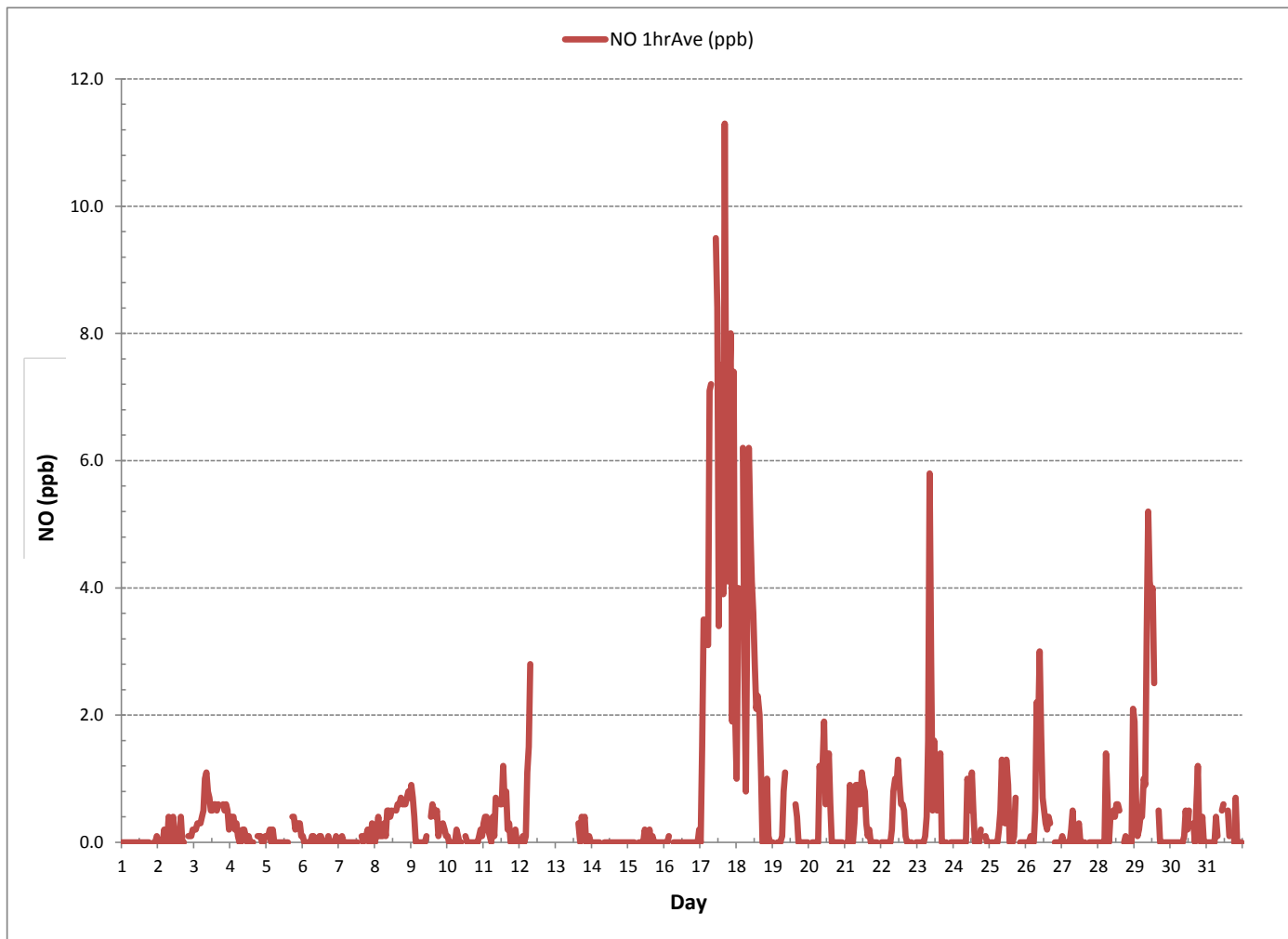
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	306				
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	11.3 ppb	@ HOUR(S)	16	ON DAY(S)	17
MAXIMUM 24-HR AVERAGE:	5.4 ppb			ON DAY(S)	17
				VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	684 hrs		
MONTHLY CALIBRATION TIME:	12 hrs	AMD OPERATION UPTIME:	91.9 %		
STANDARD DEVIATION:	1.27	MONTHLY AVERAGE:	0.5 ppb		

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.2	0.0	0.0	0.0	0.0	0.2	0.0	23
2	0.0	0.2	0.0	0.0	0.2	0.2	0.0	0.2	0.2	0.2	1.3	0.2	0.0	0.2	0.0	16.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	16.0	0.9	23
3	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	23
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	23
6	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	23
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	S	X	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	23
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.0	0.2	0.0	23
9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	23
10	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.2	0.0	0.0	S	X	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.8	0.1	23
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	S	X	0.0	0.2	0.8	0.2	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.3	23
12	0.0	0.0	0.0	0.0	0.0	33.6	3.1	3.7	S	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0.0	33.6	5.1	15
13	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	0.5	0.0	0.5	1.1	0.5	0.0	0.0	0.5	0.0	0.0	1.1	0.3	16	
14	0.0	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23
15	0.0	0.0	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.5	0.5	0.0	1.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.1	23
16	0.0	0.0	0.0	0.5	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	23
17	0.0	9.9	9.3	S	X	9.9	30.4	15.7	S1	X	16.3	29.2	9.3	18.7	12.3	12.8	34.5	14.0	9.9	11.1	11.1	4.6	12.8	3.9	0.0	34.5	13.8	21	
18	2.8	11.1	S	X	10.5	6.3	1.7	7.5	9.3	8.1	8.1	8.7	5.8	3.4	17.4	3.9	2.8	0.0	0.0	0.0	2.3	0.5	0.0	0.0	0.0	0.0	17.4	5.0	23
19	0.0	S	X	0.0	0.0	0.0	0.5	1.1	1.7	C1	C1	C1	C1	C1	C1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.3	17
20	S	X	0.0	0.0	0.0	0.0	0.0	4.5	4.6	1.7	2.8	1.1	2.3	2.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	4.6	1.0	23	
21	X	0.0	0.0	1.7	1.1	0.5	0.5	1.7	1.1	0.5	0.5	1.1	1.1	1.7	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	S	X	0.0	1.7	0.6	22	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.1	1.1	1.7	1.1	1.7	1.1	0.5	0.5	0.5	0.0	0.0	0.0	S	X	0.0	0.0	0.0	1.7	0.4	23	
23	0.0	0.0	0.0	0.0	0.0	0.5	0.5	5.2	6.9	8.1	1.1	2.8	2.3	1.1	2.3	2.3	0.5	0.0	0.0	0.0	S	X	0.0	0.0	0.0	8.1	1.5	23	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.1	1.1	2.3	0.5	0.5	0.0	0.5	0.0	0.5	S	X	0.5	0.0	0.0	0.0	2.3	0.4	23	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.1	2.3	1.7	1.7	1.7	2.3	0.0	0.0	0.5	1.1	S	X	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.6	23	
26	0.0	0.0	0.0	0.5	0.0	0.0	0.5	5.1	5.7	5.1	5.7	1.1	0.5	1.1	0.5	0.5	1.1	S	X	0.5	0.0	0.0	0.0	0.0	0.0	5.7	1.3	23	
27	0.5	0.0	0.0	0.0	0.0	0.0	1.1	1.7	0.0	0.0	0.5	0.5	0.0	0.0	0.0	S	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.2	23	
28	0.0	0.0	0.0	0.0	0.0	40.3	8.1	0.5	0.5	0.5	0.5	0.5	1.1	1.1	S	X	0.0	0.5	0.0	0.5	0.0	0.5	3.4	0.0	40.3	2.7	23		
29	3.4	1.7	0.5	0.5	0.5	1.1	1.7	4.6	5.7	4.5	5.1	20.4	2.8	S	X	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.4	2.5	23	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	1.1	0.5	S	X	0.5	0.0	2.3	2.8	0.5	0.0	1.7	0.0	0.0	0.0	0.0	2.8	0.5	23	
31	0.0	0.0	0.0	0.0	0.0	1.1	S1	S1	X	0.5	0.5	S	X	0.5	0.5	C1	C1	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.3	18
HOURLY MAX	3.4	11.1	9.3	1.7	10.5	40.3	30.4	15.7	9.3	8.1	16.3	29.2	20.4	18.7	17.4	16.0	34.5	14.0	9.9	11.1	11.1	4.6	12.8	3.9					
HOURLY AVG	0.2	0.8	0.4	0.1	0.4	3.3	1.8	1.8	1.4	1.4	1.8	2.2	2.0	1.4	1.6	1.7	1.7	0.8	0.6	0.6	0.5	0.3	0.5	0.3					

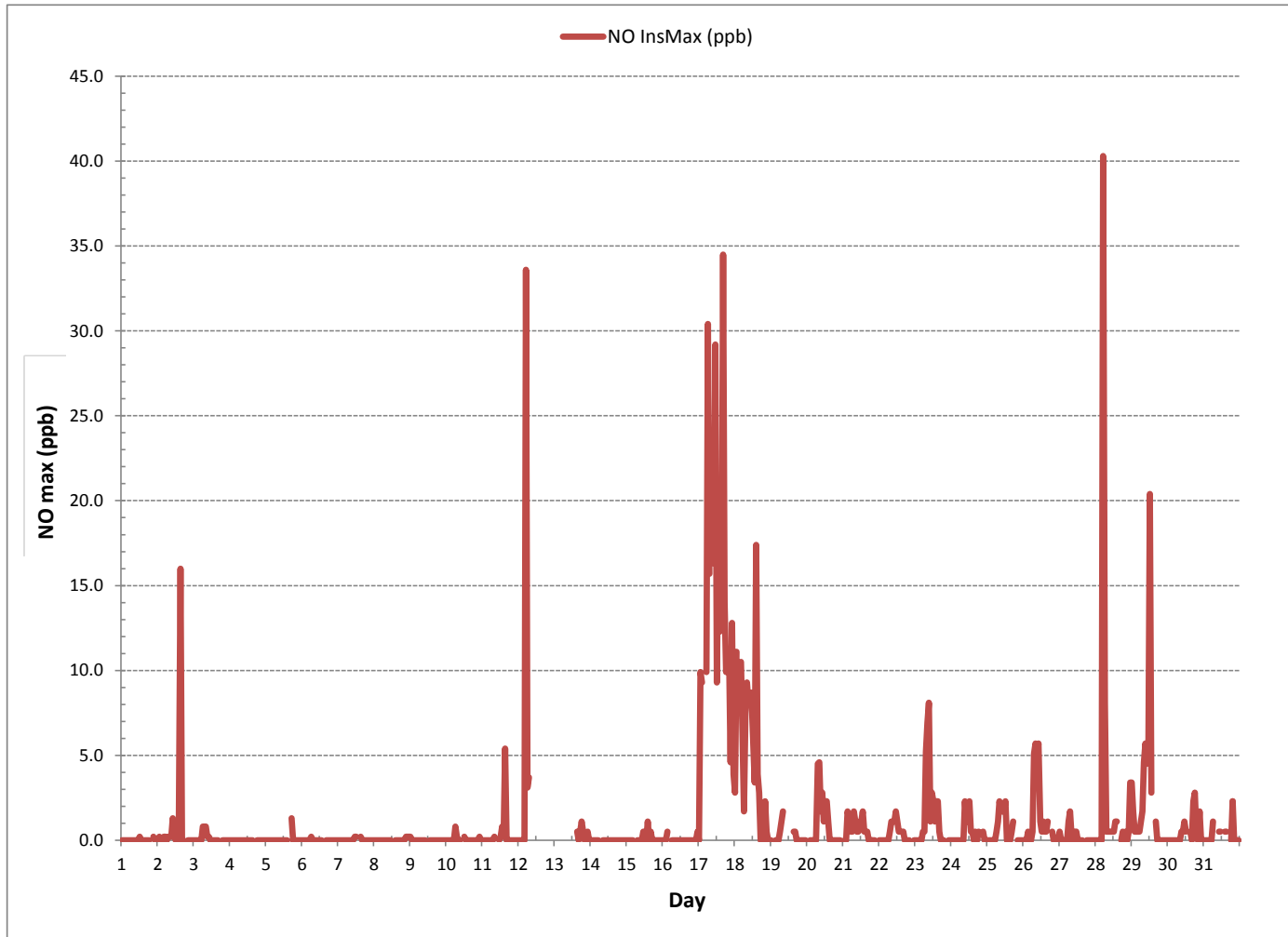
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

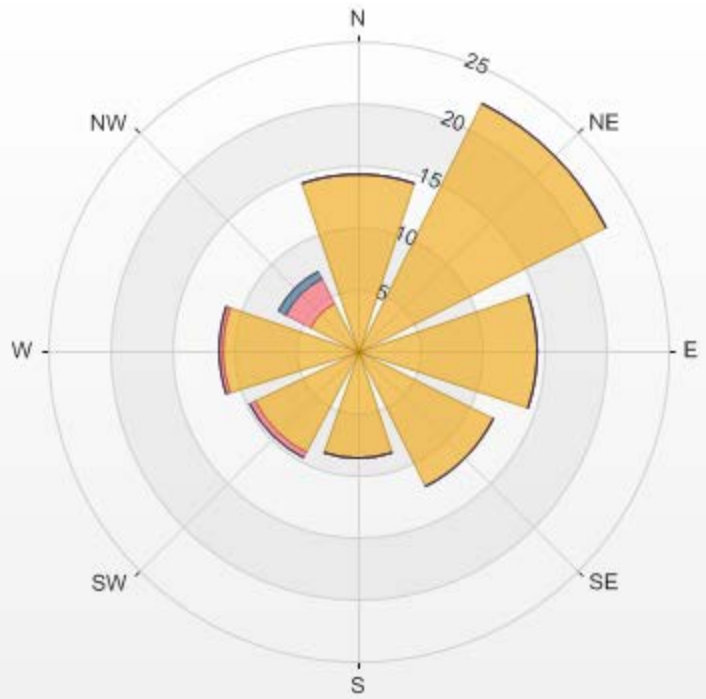
NUMBER OF NON-ZERO READINGS:	214
MAXIMUM INSTANTANEOUS VALUE:	40.3 ppb @ HOUR(S) 5 ON DAY(S) 28
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	13 hrs
STANDARD DEVIATION:	3.87
OPERATIONAL TIME:	684 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA MASKWA Poll.: LICA MASKWA-NO[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 90.19% Calm Avg: 0.00 [ppb]

Direction	0.0-3.8	3.8-7.6	7.6-11.4	>11.4	Total
N	14.31	0	0	0	14.31
NE	22.35	0	0	0	22.35
E	14.46	0	0	0	14.46
SE	12.22	0	0	0	12.22
S	8.64	0	0	0	8.64
SW	9.24	0.45	0	0	9.69
W	10.88	0.3	0	0	11.18
NW	4.32	2.24	0.6	0	7.16
Summary	96.42	2.99	0.6	0	100



% Icon Classes (ppb)	96	3	1	0
0.0-3.8	96	3	1	0
3.8-7.6		3		
7.6-11.4			1	
>11.4				0

NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	1.9	1.6	1.2	1.1	1.1	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.3	0.2	0.5	0.6	0.4	S	X		4.3	2.8	2.0	0.2	4.3	1.1	23	
2	1.6	2.0	1.9	2.1	3.1	2.4	1.4	1.7	1.4	1.2	1.1	0.8	0.7	0.6	0.6	0.8	0.6	0.6	S	X		4.5	4.7	4.9	2.9	0.6	4.9	1.9	23	
3	2.0	1.6	1.7	2.1	2.1	1.4	1.3	1.5	1.7	1.4	1.0	0.7	0.7	0.7	0.6	0.5	0.5	S	X		3.2	1.9	1.3	0.9	0.8	0.5	3.2	1.3	23	
4	0.5	0.4	0.3	0.4	0.3	0.4	0.2	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.2	0.1	S	X		3.7	2.4	1.7	1.6	1.5	1.2	0.0	3.7	0.7	23	
5	1.1	0.8	0.5	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X		2.7	1.5	0.9	0.3	0.2	0.2	0.1	0.0	2.7	0.4	23	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	S	X		3.0	1.9	1.3	1.1	0.9	0.7	0.5	0.5	0.0	3.0	0.5	23	
7	0.5	0.1	0.3	0.2	0.1	0.3	0.4	0.0	0.3	0.0	0.0	0.5	0.0	S	X		3.9	1.6	1.5	1.0	0.6	0.5	0.5	0.2	0.3	0.0	3.9	0.6	23	
8	0.3	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X		2.6	1.6	0.9	0.4	0.1	0.3	0.2	1.7	3.9	2.1	0.0	3.9	0.7	23
9	3.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	X		2.8	1.8	1.1	0.9	0.7	0.6	0.5	1.2	0.7	0.7	0.5	0.0	3.2	0.7	23	
10	0.6	0.8	1.3	1.3	0.1	0.2	1.1	0.9	0.2	0.0	S	X		3.0	1.9	1.3	1.1	0.7	0.6	0.6	0.6	0.6	1.0	3.0	3.6	0.0	3.6	1.1	23	
11	3.0	4.7	1.7	0.0	0.0	0.1	1.4	1.5	0.8	S	X		2.5	2.1	2.2	1.7	1.7	1.6	1.0	0.8	1.0	1.2	1.4	2.1	1.6	0.0	4.7	1.6	23	
12	1.6	2.2	3.0	4.1	5.6	6.4	8.4	5.9	S	X	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	1.6	8.4	4.7	14	
13	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	C	1.8	0.6	4.5	4.4	3.4	0.6	0.8	0.8	1.4	0.6	4.5	2.0	16	
14	0.0	0.0	0.0	0.0	0.0	0.0	S	X		0.8	0.2	0.2	0.2	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	23
15	0.0	0.0	0.0	0.0	0.0	S	X		2.0	0.7	0.7	0.5	0.6	0.6	0.6	0.8	0.3	0.6	1.1	0.7	0.6	0.4	0.6	0.6	0.2	0.0	2.0	0.5	23	
16	0.1	0.1	0.0	1.5	S	X		1.3	0.7	0.6	0.6	0.6	0.5	0.3	0.4	0.1	0.4	0.2	0.5	0.1	0.2	0.6	1.1	2.4	0.0	2.4	0.6	23		
17	0.4	2.1	6.2	S	X		7.1	8.7	7.7	S1	X		9.8	7.4	4.2	6.9	6.1	5.5	11.0	7.9	6.3	9.2	10.1	3.3	8.9	4.9	0.4	11.0	6.7	21
18	3.2	6.7	S	X		9.9	7.0	2.9	7.3	7.2	5.6	4.3	3.7	3.3	2.9	3.3	4.2	3.2	0.9	1.0	1.3	4.2	2.0	1.7	0.6	0.6	9.9	3.9	23	
19	1.4	S	X		2.7	2.2	2.7	5.4	5.8	3.5	C1	C1	C1	C1	C1	C1	4.5	4.1	4.5	5.7	5.6	4.8	5.2	5.2	5.0	1.4	5.8	4.3	17	
20	S	X		5.2	4.3	2.8	2.5	4.4	5.2	4.0	2.9	2.8	2.0	2.5	3.8	1.7	1.6	1.6	2.4	1.8	1.4	1.5	1.2	1.1	S	1.1	5.2	2.7	23	
21	X		3.6	3.1	5.4	3.7	3.4	4.8	5.6	3.2	2.2	2.4	2.7	2.3	2.1	1.5	1.3	3.1	2.9	2.1	2.2	1.6	1.1	S	X	1.1	5.6	2.9	22	
22	1.9	1.2	1.2	2.1	1.3	1.3	1.6	1.5	1.0	1.0	0.9	1.4	2.0	1.6	2.0	2.7	3.5	3.5	3.5	2.4	2.6	S	X		6.5	0.9	6.5	2.1	23	
23	8.0	8.5	10.4	9.1	8.4	11.9	10.4	8.2	8.6	5.3	1.5	2.9	2.2	1.3	3.2	5.4	2.0	1.1	0.6	0.6	S	X		2.0	1.6	0.6	11.9	5.1	23	
24	1.2	1.2	1.2	1.2	1.0	0.7	0.6	0.6	0.6	2.7	1.9	1.3	2.9	1.5	0.4	0.1	0.7	0.3	1.4	S	X		2.1	1.2	0.6	0.1	2.9	1.2	23	
25	0.6	0.6	0.6	0.6	0.6	0.6	1.4	2.2	4.3	1.9	1.1	3.6	2.6	0.6	0.6	0.6	0.7	3.0	S	X		2.6	1.8	1.2	1.2	0.6	4.3	1.5	23	
26	1.8	1.4	1.2	1.4	1.4	1.3	1.7	3.1	2.0	2.4	1.6	0.5	0.1	0.4	0.4	0.3	1.3	S	X		3.5	1.5	1.3	1.3	3.8	0.1	3.8	1.5	23	
27	4.7	2.6	1.3	1.8	1.6	1.4	1.7	2.4	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	S	X		1.5	1.2	0.8	0.9	0.6	0.6	0.6	4.7	1.3	23	
28	0.6	0.6	0.8	0.7	0.6	1.4	1.3	1.2	0.8	0.1	0.0	0.1	0.2	0.7	0.8	S	X		2.4	2.4	2.4	1.5	1.5	3.8	4.9	0.0	4.9	1.3	23	
29	5.5	4.7	4.5	4.9	5.6	5.6	5.4	5.1	4.7	3.6	3.4	4.2	4.6	S	X		6.7	5.8	5.5	3.4	2.2	2.2	1.8	2.2	1.8	6.7	4.4	23		
30	2.4	1.8	1.4	1.6	1.7	1.6	1.1	0.9	1.3	1.8	2.1	1.8	1.8	S	X		3.9	2.8	3.0	4.0	3.6	1.2	2.7	4.0	2.1	0.9	4.0	2.2	23	
31	1.0	0.9	1.7	2.3	1.8	2.3	3.8	2.4	S1	X		3.5	2.5	S	X		4.4	1.8	C1	C1		4.5	6.5	0.8	0.6	0.4	0.4	0.4	19	
HOURLY MAX	8.0	8.5	10.4	9.1	9.9	11.9	10.4	8.2	8.6	5.6	9.8	7.4	4.2	6.9	6.1	5.5	11.0	7.9	6.3	9.2	10.1	5.2	8.9	6.5						
HOURLY AVG	1.8	1.8	1.8	1.8	2.0	2.2	2.5	2.6	1.8	1.5	1.5	1.6	1.5	1.5	1.5	1.8	2.1	2.1	2.2	2.2	1.8	1.6	2.0	1.9						

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

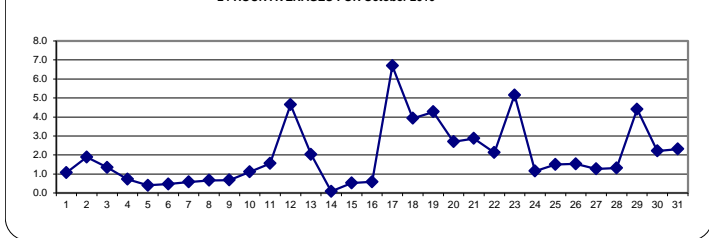
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

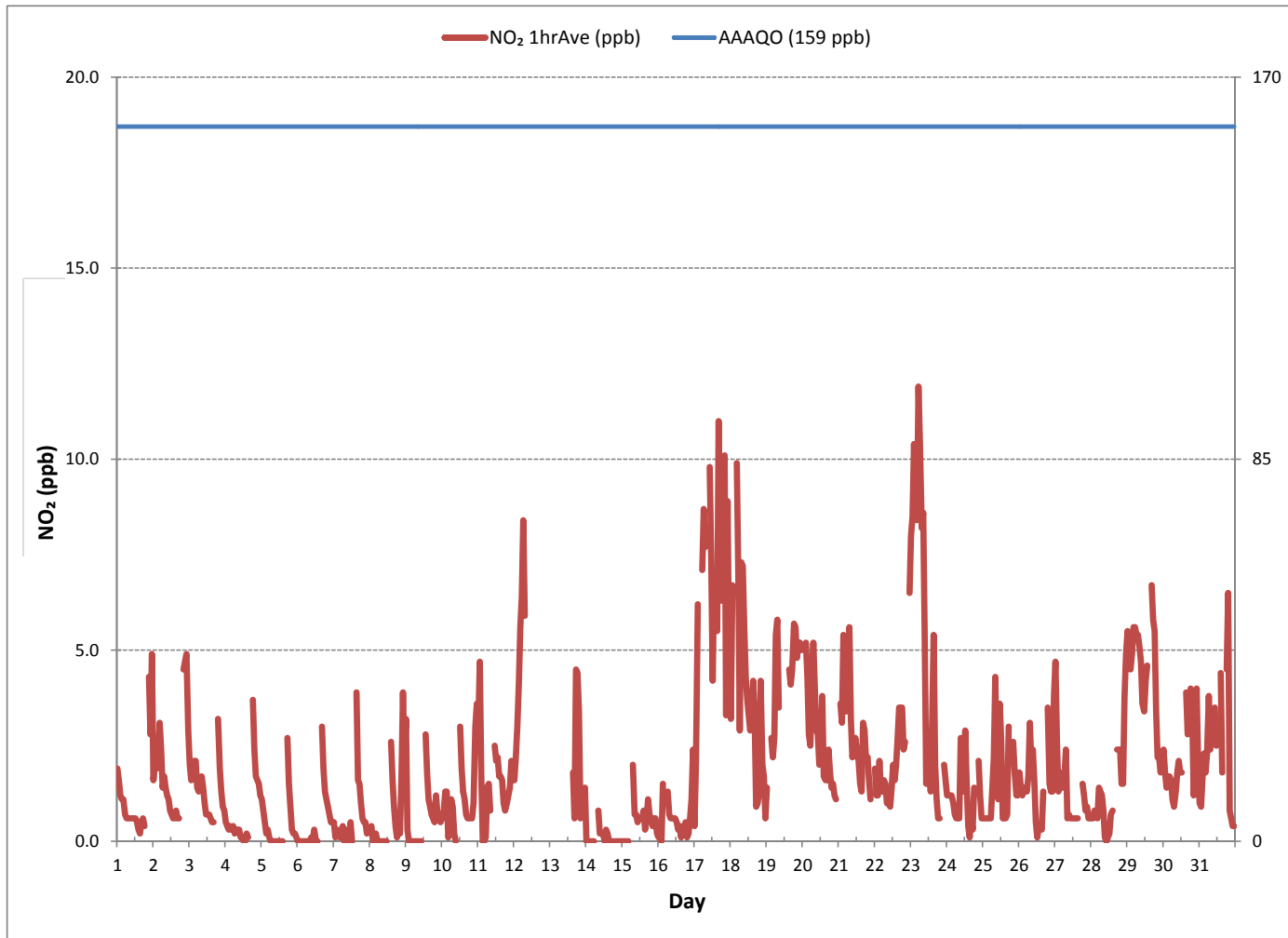
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	570				
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	11.9	ppb	@ HOUR(S)	5	23
MAXIMUM 24-HR AVERAGE:	6.7	ppb			17
				VAR-VARIOUS	
I2S CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	684	hrs
MONTHLY CALIBRATION TIME:	12	hrs	AMD OPERATION UPTIME:	91.9	%
STANDARD DEVIATION:	2.07		MONTHLY AVERAGE:	1.9	ppb

24 HOUR AVERAGES FOR October 2016



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.0	1.4	1.4	0.8	0.8	0.8	0.8	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	X	5.4	3.2	2.0	0.2	5.4	1.0	23	
2	1.9	2.6	3.2	2.6	4.9	4.3	1.4	1.9	1.4	0.8	1.3	0.8	0.8	0.2	0.2	4.3	0.2	0.8	S	X	4.8	4.8	5.4	3.8	0.2	5.4	2.4	23	
3	3.2	1.9	2.0	2.6	2.6	1.9	2.6	2.6	2.0	1.3	1.4	1.4	0.8	0.8	0.8	1.3	S	X	4.8	2.6	1.9	1.4	1.3	0.8	4.8	2.0	23		
4	0.8	0.8	0.8	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	X	4.3	3.1	1.9	1.4	1.4	1.9	0.2	4.3	0.9	23		
5	1.4	1.4	0.8	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	S	X	6.6	1.9	1.4	0.8	0.8	0.8	0.2	0.0	6.6	0.9	23		
6	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	X	3.8	2.6	1.9	0.8	0.8	0.8	0.8	0.2	3.8	0.7	23		
7	0.2	0.2	0.2	0.2	0.2	0.8	0.8	0.2	0.2	0.2	0.2	3.1	1.4	S	X	5.4	1.9	1.9	1.4	0.8	0.8	0.8	0.8	0.2	0.2	5.4	1.0	23	
8	0.2	0.8	0.2	0.2	0.2	0.2	0.2	0.8	0.2	0.8	0.2	0.2	S	X	3.8	2.6	1.9	1.4	0.8	1.4	0.8	7.8	7.8	6.0	0.2	7.8	1.8	23	
9	6.0	1.9	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	X	2.0	2.0	1.4	1.4	0.8	0.8	1.4	1.4	1.4	0.8	0.2	6.0	1.3	23		
10	0.8	0.8	1.9	1.9	0.2	0.8	2.5	1.4	0.2	0.2	S	X	3.7	3.2	1.4	1.4	0.8	0.8	0.8	0.8	0.8	0.8	10.8	6.1	0.2	10.8	1.9	23	
11	4.8	7.2	3.2	0.8	0.2	0.8	3.1	3.1	1.9	S	X	4.3	3.1	3.2	2.6	7.2	2.6	1.9	1.4	1.9	2.0	2.6	3.1	2.6	0.2	7.2	2.9	23	
12	2.6	3.7	3.8	6.0	7.3	14.9	11.3	7.8	S	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	2.6	14.9	7.2	15	
13	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	4.9	1.5	7.3	8.4	7.3	2.7	2.7	3.8	5.6	1.5	8.4	4.9	16	
14	0.9	0.3	0.3	0.3	0.3	0.3	S	X	1.5	0.9	0.9	0.9	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.5	0.5	23	
15	0.3	0.3	0.3	0.3	0.3	S	X	3.2	2.1	0.9	0.9	0.9	0.9	0.9	3.2	0.3	0.9	1.5	1.5	0.9	0.3	0.3	0.3	0.3	0.3	3.2	0.9	23	
16	0.9	0.3	0.3	4.4	S	X	2.1	0.9	0.9	0.9	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.9	0.9	0.3	0.9	1.5	2.1	4.4	0.3	4.4	1.1	23	
17	0.9	12.1	12.1	S	X	14.4	17.3	14.4	S1	X	12.7	16.7	7.3	13.9	12.1	12.1	19.0	12.7	12.7	12.1	13.8	6.7	11.5	8.5	0.9	19.0	12.2	21	
18	6.1	12.7	S	X	12.6	10.9	4.9	9.7	9.1	7.3	6.7	5.6	4.4	13.8	6.7	6.2	1.5	1.5	2.7	6.7	4.4	3.2	1.5	1.5	13.8	6.6	23		
19	1.5	S	X	3.2	3.2	4.9	6.7	6.7	4.9	C1	C1	C1	C1	C1	C1	6.2	5.0	5.6	6.7	6.7	6.1	6.2	6.2	6.2	1.5	6.7	5.4	17	
20	S	X	6.2	5.6	3.8	3.8	6.2	10.9	10.9	3.8	4.4	2.7	6.7	4.9	3.2	2.1	2.1	3.2	2.7	1.5	1.5	1.5	S	1.5	10.9	4.2	23		
21	X	4.4	3.3	6.7	6.7	4.4	5.6	6.7	4.4	3.2	3.2	3.8	3.2	2.1	2.1	4.9	4.4	2.7	2.7	1.5	S	X	1.5	1.5	6.7	3.9	22		
22	2.7	1.5	1.5	2.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.1	2.1	2.7	3.3	3.8	3.8	4.4	3.8	3.2	S	X	6.7	1.5	6.7	2.6	23	
23	10.3	9.7	11.5	11.5	10.9	13.9	12.1	10.9	10.9	12.1	2.7	4.4	4.4	2.1	6.1	6.2	2.7	0.9	0.9	0.9	S	X	2.7	2.1	0.9	13.9	6.8	23	
24	1.5	1.5	1.5	1.5	0.9	0.9	0.9	0.9	0.9	5.6	3.8	3.2	4.4	2.7	2.1	0.3	1.5	0.3	4.9	S	X	2.7	1.5	0.9	0.3	5.6	2.0	23	
25	0.9	0.9	0.9	0.9	0.9	0.9	4.4	4.4	6.2	5.6	3.8	5.6	5.6	0.9	0.9	0.9	1.5	6.2	S	X	3.2	2.7	1.5	1.5	0.9	6.2	2.7	23	
26	2.1	2.1	1.5	2.7	1.5	1.5	2.1	4.4	4.4	3.2	3.8	1.5	0.3	0.3	0.9	0.9	2.1	S	X	5.6	2.1	1.5	2.1	7.3	0.3	7.3	2.5	23	
27	6.2	3.2	2.1	2.1	2.1	1.5	4.4	5.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.3	S	X	2.1	1.5	0.9	1.5	0.9	0.9	0.3	6.2	1.9	23	
28	0.9	0.9	0.9	0.9	0.9	9.7	3.8	1.5	0.9	0.9	0.9	0.3	0.9	0.9	1.5	S	X	3.2	3.2	3.2	2.1	2.7	4.4	5.6	0.3	9.7	2.3	23	
29	6.2	6.1	4.9	5.6	6.2	6.2	6.2	5.6	5.6	5.0	4.4	4.4	5.6	5.6	S	X	7.9	6.7	6.2	5.0	2.7	2.1	2.7	2.1	2.7	2.1	7.9	5.2	23
30	3.3	2.7	2.1	3.2	3.3	2.7	2.1	1.5	2.1	2.7	3.8	3.2	3.2	S	X	5.6	3.8	5.6	7.3	8.5	2.1	6.2	6.7	5.6	1.5	8.5	4.0	23	
31	2.7	2.7	3.2	3.3	3.2	3.8	6.7	S1	S1	X	5.6	4.4	S	X	7.3	4.4	C1	C1	12.7	12.1	3.8	2.1	1.5	1.5	1.5	12.7	4.8	18	
HOURLY MAX	10.3	12.7	12.1	11.5	12.6	14.9	17.3	14.4	10.9	12.1	12.7	16.7	7.3	13.9	13.8	12.1	19.0	12.7	12.7	12.1	13.8	7.8	11.5	8.5					
HOURLY AVG	2.6	3.0	2.5	2.6	2.7	3.9	3.9	2.8	2.4	2.5	2.8	2.5	2.3	2.9	3.1	3.1	3.3	3.6	3.5	2.7	2.7	3.2	3.1						

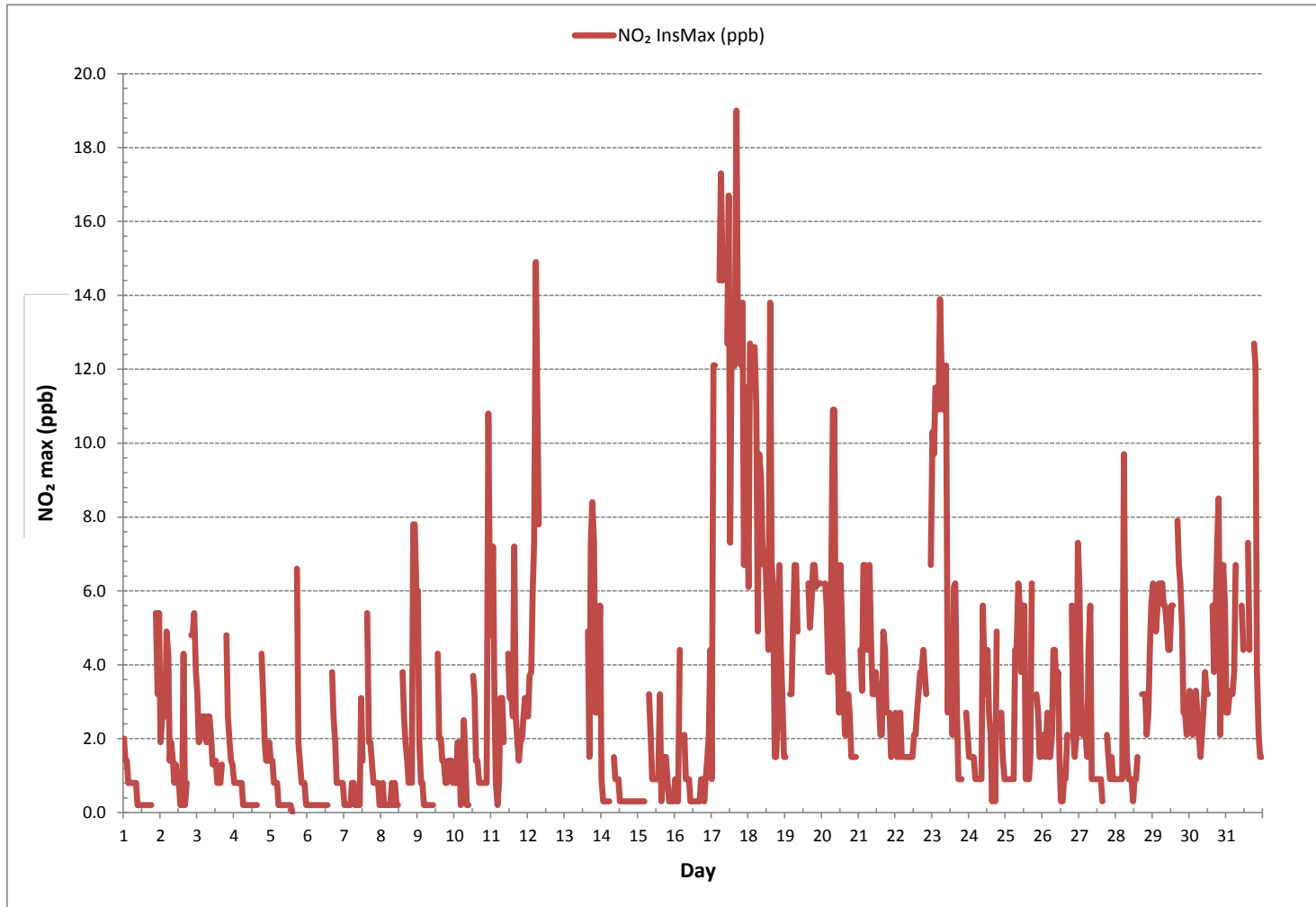
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

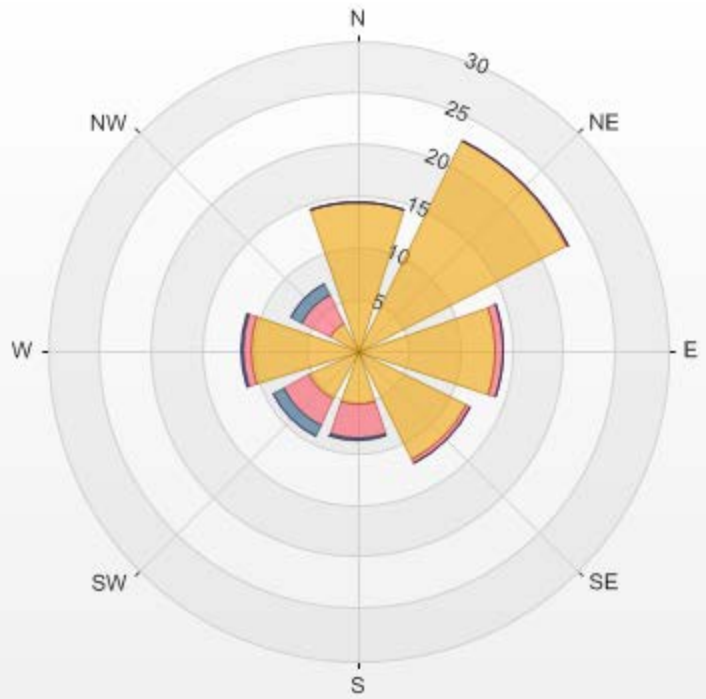
NUMBER OF NON-ZERO READINGS:	639
MAXIMUM INSTANTANEOUS VALUE:	19.0 ppb @ HOUR(S) 16 ON DAY(S) 17
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	13 hrs
STANDARD DEVIATION:	3.20
OPERATIONAL TIME:	684 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



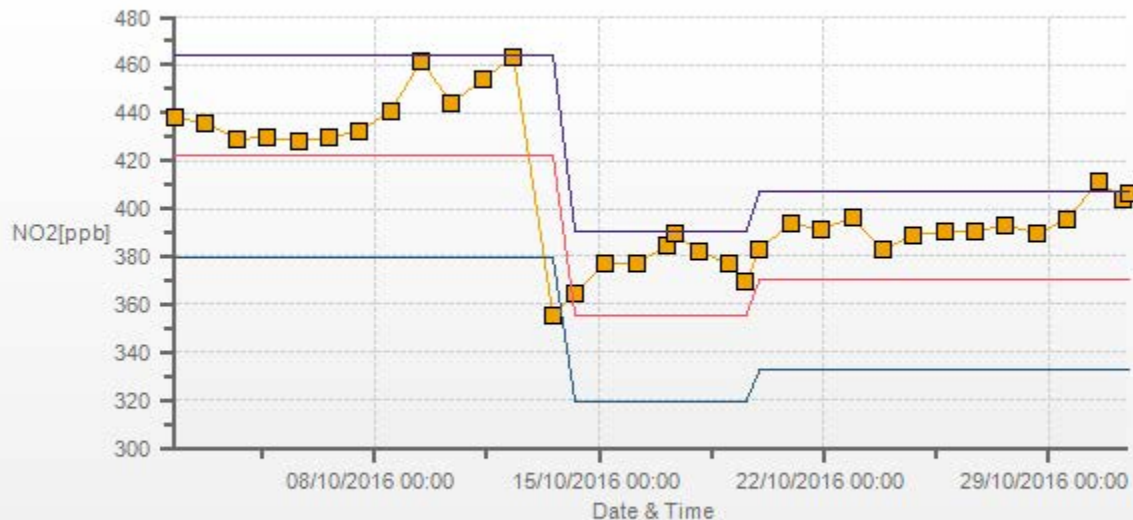
Wind: LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 86.02% Calm Avg: 0.00 [ppb]

Direction	0.0-4.0	4.0-8.0	8.0-12.0	>12.0	Total
N	14.38	0	0	0	14.38
NE	22.66	0.16	0	0	22.82
E	13.28	0.94	0	0	14.22
SE	11.88	0.31	0	0	12.19
S	5.16	3.28	0.31	0	8.75
SW	5.31	2.81	1.09	0	9.21
W	10.31	0.78	0.16	0	11.25
NW	2.97	3.13	1.09	0	7.19
Summary	85.95	11.41	2.65	0	100



% Icon Classes (ppb)	86	11	3	0
0.0-4.0	86	11	3	0
4.0-8.0		11		
8.0-12.0			3	
>12.0				0

NO2[ppb] Calibration: LICA MASKWA Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

WIND SPEED

WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	12.0	10.8	12.5	12.4	10.7	13.0	13.9	12.8	11.3	10.4	11.8	9.8	12.6	10.5	10.0	8.5	9.5	8.2	8.4	6.6	5.9	4.5	3.9	5.5	3.9	13.9	9.4	24
2	4.1	2.3	3.9	3.8	5.7	8.4	8.0	8.9	9.4	6.9	7.9	7.6	8.0	8.8	7.8	6.1	4.3	2.8	1.9	2.1	4.8	5.1	3.1	1.9	1.9	9.4	3.9	24
3	0.2	2.1	0.5	2.9	2.6	2.4	2.4	2.2	3.5	4.0	4.1	4.9	1.7	2.2	2.2	3.9	3.4	2.6	2.5	3.4	4.9	6.3	4.6	3.0	0.2	6.3	2.6	24
4	2.5	3.3	3.3	4.1	6.2	5.9	4.5	4.2	8.0	10.0	12.3	13.6	12.6	13.8	15.5	13.0	12.6	11.0	8.7	12.6	10.0	11.6	11.0	9.6	2.5	15.5	9.1	24
5	10.0	9.2	9.8	10.4	9.8	10.2	11.0	9.8	9.0	11.4	12.3	12.7	12.9	13.3	14.6	13.7	12.4	11.9	14.0	11.7	8.1	8.7	10.0	9.2	8.1	14.6	11.0	24
6	7.9	7.7	7.8	6.6	7.0	7.8	8.1	6.7	7.1	8.2	7.9	7.0	5.8	6.7	6.5	8.0	6.9	6.1	4.7	3.4	2.1	1.2	3.0	4.8	1.2	8.2	6.2	24
7	5.4	5.1	4.7	3.0	4.9	3.6	2.7	3.5	4.5	6.0	6.0	5.4	6.1	5.7	6.3	6.2	4.6	3.9	4.5	4.7	4.6	5.7	5.6	5.9	2.7	6.3	3.2	24
8	4.4	3.6	3.9	5.2	4.0	4.4	4.2	5.1	6.1	6.7	7.7	7.0	7.8	6.8	7.9	7.5	6.9	7.9	8.1	8.3	7.5	7.3	6.7	6.2	3.6	8.3	6.2	24
9	5.9	5.7	6.4	6.6	6.8	6.4	6.7	7.7	7.1	7.8	8.6	7.0	6.7	7.6	6.4	4.8	3.4	4.3	3.7	3.3	2.3	2.4	3.0	2.5	2.3	8.6	4.7	24
10	2.3	2.2	2.0	4.0	4.4	0.6	1.2	2.9	4.8	4.9	4.7	4.8	6.5	5.6	4.6	4.0	3.4	4.3	3.4	2.7	2.4	2.3	1.1	1.1	0.6	6.5	3.2	24
11	2.0	1.9	0.9	2.1	0.7	0.8	1.4	2.4	3.2	3.5	4.1	3.7	5.6	5.9	5.5	5.6	4.9	6.7	1.9	5.8	7.5	7.7	6.5	5.7	0.7	7.7	3.4	24
12	4.2	3.6	3.3	4.5	2.3	2.3	1.0	1.4	0.8	0.7	1.5	2.1	2.4	3.4	3.0	4.0	4.0	7.8	9.2	9.8	7.0	6.3	6.8	6.3	0.7	9.8	1.7	24
13	4.8	5.0	4.8	3.8	3.8	4.0	3.4	5.3	7.9	8.5	8.8	9.1	7.1	8.5	8.1	8.9	9.9	8.3	9.4	8.3	7.2	7.5	7.2	5.3	3.4	9.9	6.5	24
14	4.9	5.3	5.2	6.2	6.2	8.0	7.4	6.7	7.3	7.3	9.1	10.8	10.8	10.7	11.4	12.8	12.1	11.3	10.7	11.6	11.2	8.5	6.1	6.2	4.9	12.8	8.5	24
15	5.9	5.2	5.7	6.6	5.7	6.3	4.5	2.8	3.8	5.1	5.7	5.5	4.6	6.1	5.3	4.3	4.8	5.0	5.5	5.1	5.8	6.0	5.3	5.4	2.8	6.6	3.9	24
16	7.6	8.8	8.9	7.5	7.1	7.2	9.7	10.8	10.0	11.2	11.0	9.2	9.5	9.3	6.8	6.5	5.5	7.3	8.9	7.0	2.4	3.5	3.6	4.4	2.4	11.2	5.7	24
17	3.9	4.0	5.1	5.1	5.4	5.8	6.0	6.2	7.9	6.7	7.0	7.6	8.2	8.2	7.0	7.0	7.2	6.8	6.0	5.8	6.0	6.3	5.9	5.9	3.9	8.2	6.2	24
18	6.2	5.4	5.5	5.8	4.9	4.3	4.1	3.6	4.6	4.6	4.0	4.5	4.8	3.7	4.1	4.2	4.6	3.1	2.9	2.1	2.3	1.2	0.9	0.2	0.2	6.2	3.7	24
19	0.3	0.9	0.5	0.9	0.8	1.7	1.6	3.2	1.6	2.4	2.3	3.1	3.5	3.6	3.6	3.3	2.2	2.7	5.0	4.6	4.6	4.7	5.8	4.1	0.3	5.8	2.7	24
20	4.7	4.2	5.9	4.6	2.8	2.6	3.9	4.2	4.9	6.0	8.6	8.6	8.3	7.5	7.5	5.5	4.5	2.3	2.0	0.3	0.4	0.1	2.0	1.8	0.1	8.6	3.8	24
21	2.6	3.2	3.2	1.8	3.8	3.6	3.1	4.6	4.7	4.6	4.4	4.5	5.4	5.4	3.3	3.7	1.7	2.6	3.4	5.0	3.9	2.7	4.4	0.6	0.6	5.4	3.0	24
22	0.5	1.0	1.6	1.7	1.1	1.9	1.7	0.9	3.2	4.3	4.2	2.1	1.7	5.4	4.5	3.8	2.1	3.2	3.5	2.4	2.8	3.8	6.3	5.4	0.5	6.3	1.2	24
23	3.6	5.3	3.8	2.6	4.6	4.6	3.1	4.0	2.2	3.7	3.5	2.3	5.1	5.0	5.7	5.9	6.6	6.7	6.3	7.8	5.3	6.4	5.9	5.4	2.2	7.8	1.8	24
24	5.5	6.3	6.7	5.8	7.0	7.4	7.7	6.7	8.1	8.4	8.9	7.5	8.6	7.9	8.5	7.3	7.7	8.4	7.3	6.8	6.5	6.2	6.8	7.1	5.5	8.9	7.1	24
25	6.5	7.0	7.2	5.9	6.0	5.1	6.2	6.5	6.8	7.1	7.2	6.6	4.8	6.5	6.4	4.9	5.2	5.8	4.8	4.6	4.1	3.3	1.2	1.3	1.2	7.2	5.2	24
26	1.5	1.9	4.0	5.6	6.3	6.3	7.0	7.7	6.7	7.4	7.4	6.2	6.6	7.7	5.4	5.4	3.5	2.1	1.8	2.5	2.4	2.7	2.3	0.9	0.9	7.7	4.5	24
27	2.7	0.9	1.3	2.1	2.7	4.2	5.3	4.4	6.4	7.6	7.2	6.9	7.7	7.5	8.9	9.1	9.6	9.3	9.5	8.6	7.9	9.7	8.6	10.1	0.9	10.1	6.1	24
28	6.0	4.6	5.8	5.8	2.6	1.5	2.1	1.9	1.9	2.9	3.1	4.8	3.6	4.9	3.1	1.5	0.4	0.4	1.5	0.6	1.7	2.1	2.6	3.2	0.4	6.0	1.8	24
29	3.7	4.2	4.7	4.1	4.1	3.7	3.8	3.7	3.3	3.0	3.6	4.1	3.9	3.3	3.1	2.3	2.6	2.4	3.5	4.5	3.7	2.4	1.5	3.7	1.5	4.7	3.2	24
30	4.8	2.9	3.7	3.2	2.1	4.9	5.5	1.3	2.0	3.0	3.9	5.2	3.4	3.7	3.6	3.7	4.4	3.6	4.2	3.6	4.3	3.5	4.5	4.1	1.3	5.5	1.4	24
31	3.6	4.0	5.3	4.8	4.0	5.7	4.3	5.7	6.3	4.6	5.2	7.6	5.3	5.4	4.3	4.3	3.8	4.4	3.4	3.2	4.6	4.6	5.8	5.8	3.2	7.6	3.2	24
HOURLY MAX	12.0	10.8	12.5	12.4	10.7	13.0	13.9	12.8	11.3	11.4	12.3	13.6	12.9	13.8	15.5	13.7	12.6	11.9	14.0	12.6	11.2	11.6	11.0	10.1				
HOURLY AVG	1.6	1.6	1.7	2.1	1.8	1.7	1.9	1.5	1.8	2.3	2.5	2.0	2.1	2.5	2.6	2.5	2.6	2.4	2.4	2.2	1.5	1.7	1.3	1.6				

STATUS FLAG CODES

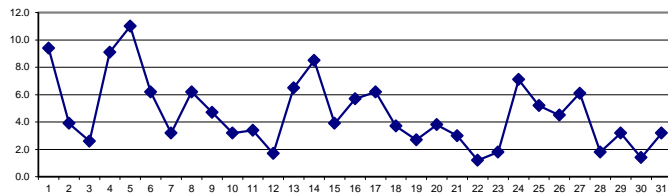
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: March 30, 2016
DECLINATION : MAGNETIC DECLINATION 19 DEGREE EAST

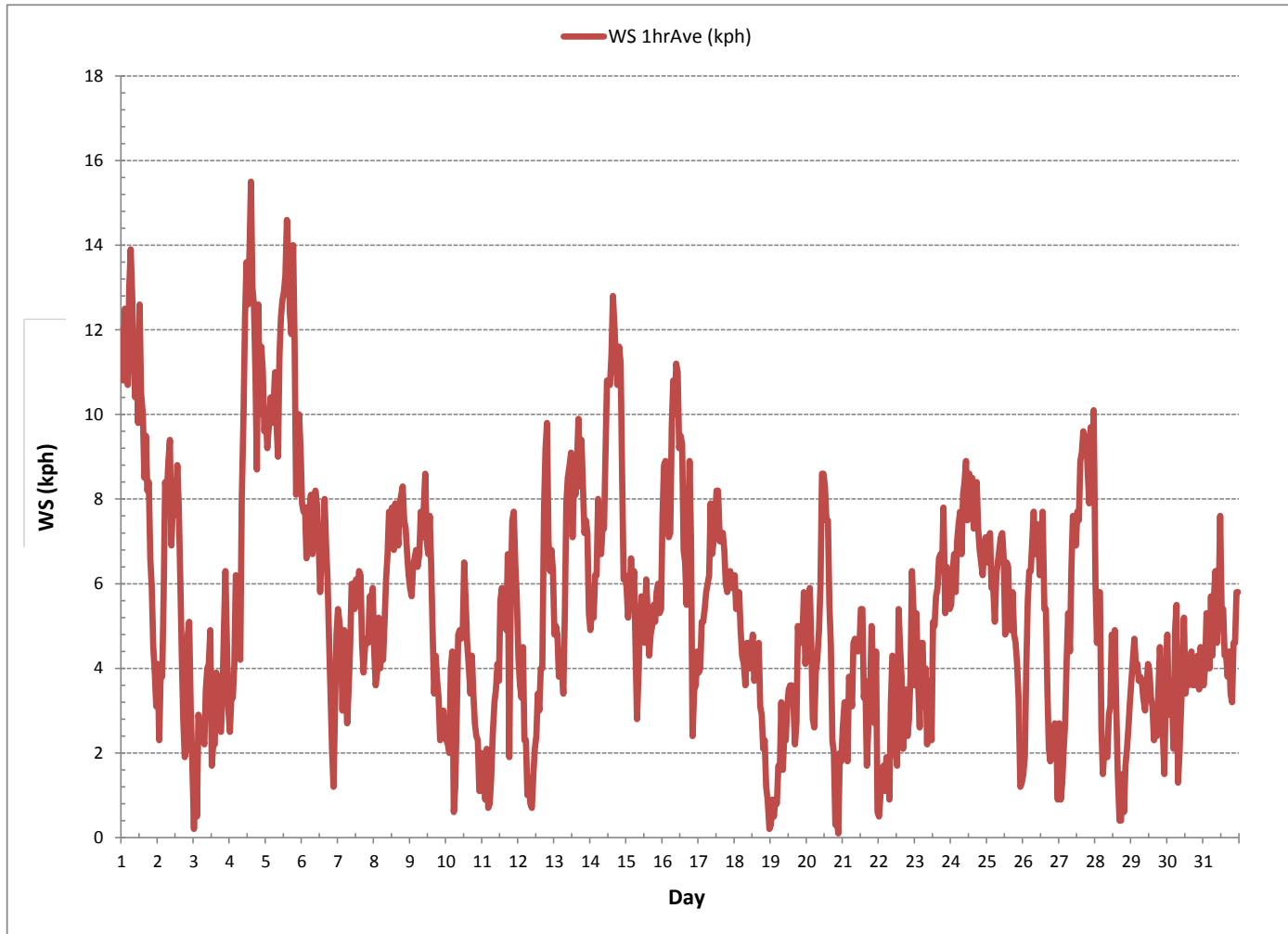
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744		
MINIMUM 1-HR AVERAGE:	0.1 kph	@ HOUR(S)	21 ON DAY(S) 20
MAXIMUM 1-HR AVERAGE:	15.5 kph	@ HOUR(S)	14 ON DAY(S) 4
MAXIMUM 24-HR AVERAGE:	11.0 kph		ON DAY(S) 5
			VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs	OPERATIONAL TIME:	744 hrs
		AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2.87	MONTHLY AVERAGE:	2.0 kph

24 HOUR AVERAGES FOR October 2016



WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	30.2	29.7	40.9	39.2	50.7	35.9	64.6	43.5	40.0	33.9	37.8	30.6	40.3	39.9	36.3	23.8	32.6	33.7	36.3	28.6	21.8	21.0	21.2	17.9	17.9	64.6	34.6	24
2	17.5	12.4	22.5	29.5	32.6	44.2	36.5	38.4	43.8	32.4	32.1	39.2	36.5	30.4	27.7	20.7	20.1	13.5	4.5	5.2	13.7	10.9	10.2	5.0	4.5	44.2	24.1	24
3	5.7	8.3	8.9	11.1	10.0	10.2	9.8	7.4	12.0	15.0	13.9	16.6	12.4	12.6	14.6	15.3	15.3	7.8	7.9	9.9	13.2	12.2	9.8	7.8	5.7	16.6	11.2	24
4	6.7	9.1	10.4	10.7	15.7	17.0	10.7	12.6	20.4	25.0	31.3	32.1	36.1	37.0	40.9	34.3	31.5	28.4	31.1	32.6	25.3	28.9	28.2	26.5	6.7	40.9	24.3	24
5	24.6	25.3	26.9	31.3	27.1	30.9	32.4	28.0	25.1	30.4	29.8	38.8	37.4	37.4	49.5	42.4	37.6	39.0	37.0	34.6	22.5	27.5	32.5	29.8	22.5	49.5	32.4	24
6	24.7	28.6	23.4	17.2	22.3	22.1	21.6	18.8	21.0	22.8	19.2	19.0	17.9	16.6	18.6	17.5	18.1	16.8	12.4	10.2	6.6	9.8	11.1	11.8	6.6	28.6	17.8	24
7	12.6	12.0	9.8	8.5	12.0	10.5	9.0	10.7	13.1	18.8	22.9	18.6	19.4	25.3	27.3	19.7	13.9	12.4	12.7	14.9	15.5	17.5	17.0	18.1	8.5	27.3	15.5	24
8	16.4	11.5	12.4	17.7	12.0	14.9	13.3	19.4	21.4	21.4	22.7	27.5	24.3	23.8	24.9	23.6	22.6	21.5	24.0	24.3	25.1	31.5	29.5	25.6	11.5	31.5	21.3	24
9	25.3	24.5	28.0	23.0	25.4	21.6	17.9	17.5	24.3	20.1	19.4	16.8	19.2	22.7	19.1	15.9	16.4	17.9	14.8	14.4	11.3	10.0	12.9	12.9	10.0	28.0	18.8	24
10	9.9	9.8	8.5	11.8	16.4	10.7	10.5	12.2	15.3	11.8	13.7	14.4	19.4	17.2	14.0	13.1	9.6	16.4	8.9	10.5	10.3	8.7	9.8	10.5	8.5	19.4	12.2	24
11	11.1	11.8	10.5	11.3	10.0	9.4	10.7	10.9	14.6	15.0	17.0	16.2	18.1	13.5	13.1	17.1	13.4	17.2	12.9	19.0	17.7	17.9	19.4	13.9	9.4	19.4	14.2	24
12	10.2	8.5	7.2	11.3	7.4	9.1	9.8	3.7	10.7	10.2	12.0	7.5	9.2	15.0	13.9	14.8	11.3	18.8	21.2	21.6	15.9	14.8	16.2	13.4	3.7	21.6	12.2	24
13	13.7	23.0	15.1	15.1	14.6	17.0	15.3	24.8	27.9	26.0	32.4	30.4	31.1	33.7	30.4	33.5	37.4	34.1	31.5	34.7	28.1	30.4	25.8	23.2	13.7	37.4	26.2	24
14	22.3	21.2	14.4	17.0	16.8	23.4	26.3	26.0	25.1	21.6	26.9	33.1	30.9	30.2	29.1	34.2	30.7	23.0	22.3	24.3	22.1	21.0	14.4	15.3	14.4	34.2	23.8	24
15	14.0	12.1	14.4	16.6	15.9	26.2	20.5	13.5	12.4	20.3	17.9	14.4	16.6	18.1	16.2	13.9	14.6	13.7	17.0	15.9	16.5	18.9	15.7	17.0	12.1	26.2	16.3	24
16	23.8	25.6	27.1	26.2	24.7	28.3	43.4	40.1	32.2	36.5	35.9	28.9	31.5	23.8	20.5	16.4	14.3	17.9	21.0	18.4	10.2	13.9	12.9	15.5	10.2	43.4	24.5	24
17	16.6	16.2	15.4	20.3	15.9	22.5	21.6	25.8	27.8	26.2	25.8	26.4	26.8	29.6	24.9	26.4	27.1	28.9	18.8	21.6	21.0	23.8	21.0	21.0	15.4	29.6	23.0	24
18	24.0	18.4	18.1	19.2	18.8	13.5	15.7	15.1	17.7	14.9	15.5	13.5	16.6	16.2	17.2	16.1	15.5	13.5	9.8	10.4	12.2	10.5	11.1	4.8	4.8	24.0	14.9	24
19	5.6	10.5	9.4	2.8	4.5	5.4	5.6	7.7	6.9	P	10.7	9.6	10.7	9.4	12.4	10.2	7.8	9.4	12.9	10.5	10.5	11.8	16.4	11.8	2.8	16.4	9.2	23
20	14.3	17.5	17.5	15.7	12.4	11.8	16.6	23.6	22.1	22.1	27.6	26.9	27.7	25.1	22.9	16.1	16.6	11.1	9.6	10.0	9.4	9.4	6.1	8.3	6.1	27.7	16.7	24
21	11.3	10.7	12.4	10.7	13.5	15.9	11.6	16.2	17.9	16.8	11.2	11.9	20.3	18.3	13.9	14.4	6.9	6.3	9.3	10.9	6.9	8.0	10.7	9.4	6.3	20.3	12.3	24
22	10.1	9.4	12.0	12.7	10.0	12.2	10.9	10.0	12.4	7.9	8.3	6.3	12.4	12.9	12.0	9.1	5.0	9.1	16.2	10.9	6.9	11.3	15.3	12.0	5.0	16.2	10.6	24
23	8.8	12.3	10.7	5.0	10.5	11.3	9.8	9.3	8.9	12.2	10.5	11.2	12.7	12.6	13.3	15.7	14.8	15.0	12.2	19.9	15.5	21.0	17.9	15.5	5.0	21.0	12.8	24
24	16.2	21.2	23.8	17.5	23.2	25.6	23.8	22.9	30.9	31.1	31.5	26.5	31.8	31.3	36.1	31.9	29.7	30.2	28.0	24.9	26.9	25.6	22.3	28.2	16.2	36.1	26.7	24
25	25.0	28.4	17.9	18.4	21.4	15.9	24.5	28.2	26.7	28.0	27.1	27.1	22.3	26.8	26.2	21.4	21.4	17.1	16.6	12.6	12.0	9.8	5.6	6.7	5.6	28.4	20.7	24
26	6.1	10.0	14.7	17.8	19.9	21.4	27.1	25.1	27.3	25.8	27.1	22.1	26.9	24.0	22.4	20.9	15.6	12.4	11.1	11.3	12.4	11.8	12.0	9.1	6.1	27.3	18.1	24
27	8.5	9.6	9.9	11.4	10.7	13.5	24.3	15.7	20.1	23.6	24.3	26.4	18.6	21.2	21.9	20.5	20.8	21.8	18.8	18.4	15.7	25.1	19.4	21.4	8.5	26.4	18.4	24
28	13.5	13.6	12.5	14.4	9.8	10.7	6.9	6.1	6.5	10.5	10.7	12.2	11.6	11.4	8.8	10.5	4.1	4.5	5.2	4.5	4.5	5.4	8.3	8.0	4.1	14.4	8.9	24
29	11.1	9.5	10.8	9.4	9.8	10.2	8.5	11.3	9.1	9.8	12.2	12.2	13.7	11.6	12.4	8.3	8.8	6.9	11.6	11.5	12.0	8.3	6.7	10.9	6.7	13.7	10.3	24
30	15.3	8.9	10.2	12.6	12.1	20.9	18.9	9.6	11.1	13.9	10.9	12.9	9.1	13.1	14.2	15.5	13.3	17.9	17.5	16.5	14.8	17.7	17.7	15.7	8.9	20.9	14.2	24
31	22.9	16.4	21.6	22.9	16.6	23.6	18.1	12.9	14.9	17.0	19.4	27.3	19.4	16.4	17.0	15.7	12.9	12.4	12.9	11.8	16.7	17.3	15.9	15.7	11.8	27.3	17.4	24
HOURLY MAX	30.2	29.7	40.9	39.2	50.7	44.2	64.6	43.5	43.8	36.5	37.8	39.2	40.3	39.9	49.5	42.4	37.6	39.0	37.0	34.7	28.1	31.5	32.5	29.8				
HOURLY AVG	15.0	15.6	15.9	16.3	16.8	18.2	19.1	18.2	19.9	20.6	21.1	21.1	21.9	21.7	21.6	19.6	17.9	17.9	16.9	16.8	15.2	16.4	15.8	14.8				

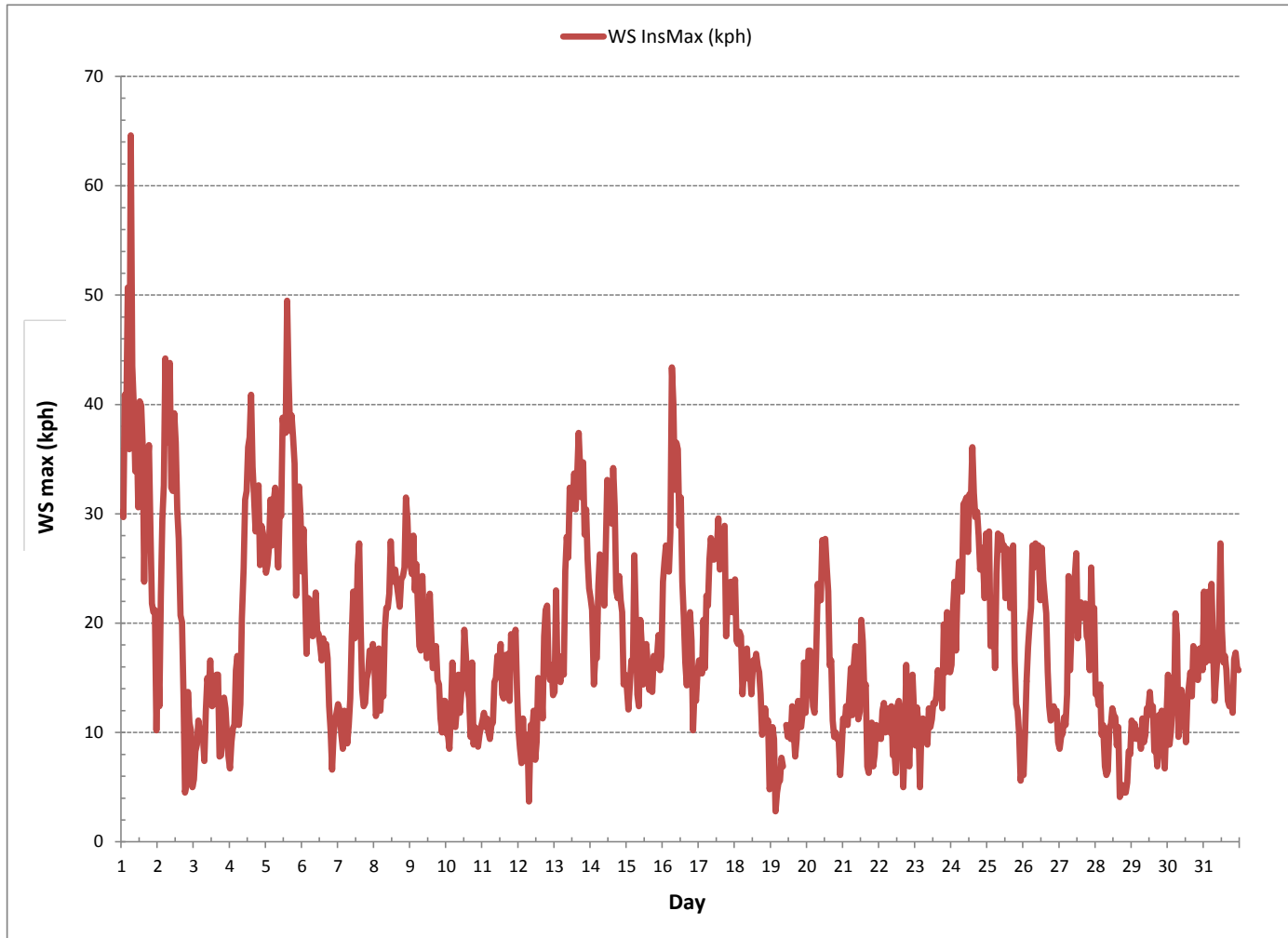
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

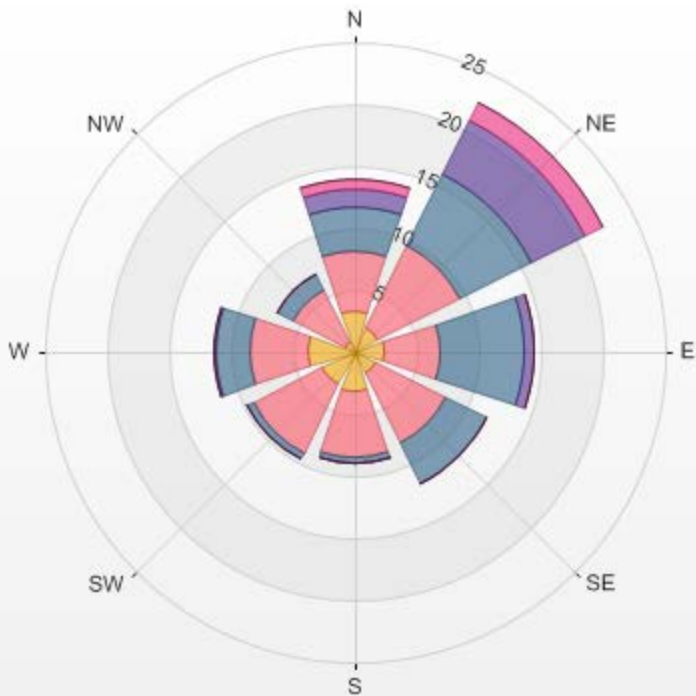
MAXIMUM INSTANTANEOUS VALUE:	64.6	kph	@ HOUR(S)	6	ON DAY(S)	1
					VAR-VARIOUS	
OPERATIONAL TIME:					743	hrs

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA MASKWA Monitor: WSP [kph] Monthly: 2016/10 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-3.1	3.1-6.2	6.2-9.4	9.4-12.5	12.5-15.6	>15.6	Total
N	3.23	4.84	3.63	1.48	0.81	0	13.99
NE	2.15	7.39	6.45	4.84	1.61	0	22.44
E	2.42	4.44	6.85	0.81	0	0	14.52
SE	1.88	6.32	3.76	0	0	0	11.96
S	3.23	5.38	0.4	0	0	0	9.01
SW	2.96	6.18	0.54	0	0	0	9.68
W	3.76	4.7	2.82	0.13	0	0	11.41
NW	0.94	4.57	1.48	0	0	0	6.99
Summary	20.57	43.82	25.93	7.26	2.42	0	100



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY 1	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	E	E	E	E	E	ENE	E	ENE	24	
2	ENE	E	SE	SSE	WSW	WSW	W	W	W	W	WSW	WSW	W	W	WNW	W	W	SW	SSE	S	SSW	SSW	SW	ESE	WSW	24	
3	W	SE	SSW	E	E	ENE	E	ESE	ESE	E	ENE	NE	NE	NE	NE	ENE	E	NE	NE	NE	NNE	NE	NE	ENE	ENE	24	
4	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	24
5	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	NNE	NNE	NNE	NNE	NNE	NNE	N	NNE	NNE	NNE	N	N	NNE	NNE	NNE	NNE	NNE	24
6	NNE	NNE	NNE	N	N	NNE	NNE	NNE	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	N	NNE	NNE	NNE	NNE	NNE	24
7	NNE	NNE	NNE	NNE	NNE	N	N	NNE	NE	NE	ENE	E	ENE	E	E	ESE	ENE	SE	SE	SE	SSE	SE	SSE	SSE	E	24	
8	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	ESE	SE	24
9	E	E	E	ENE	ENE	NE	NE	NE	NE	NE	NNE	NNE	NNE	NNE	NNE	N	N	N	N	N	N	NNW	NW	N	NE	24	
10	NNE	N	N	NNE	NNE	WSW	NW	N	N	NNE	NNE	NNE	NNE	NNE	N	N	N	NNE	NNE	N	N	NNW	WNW	WSW	N	24	
11	WSW	W	WSW	W	W	WSW	WSW	WSW	W	WSW	W	WSW	SW	SSW	S	SSW	S	S	S	S	S	SSW	SSW	SSW	SSW	SSW	24
12	SSW	SSW	SSW	SSW	SSW	SW	SW	S	WSW	WNW	W	W	NW	N	N	N	NNE	NNE	NNE	NNE	NNE	NE	NNE	NE	N	24	
13	NE	ENE	ENE	ENE	ENE	ENE	E	ESE	ESE	ESE	SE	SE	ESE	E	E	E	E	ESE	E	E	E	E	E	E	E	E	24
14	ENE	NE	NE	NE	NE	NE	NE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NNE	NNE	NE	NNE	NNE	NE	24	
15	NE	NNE	NE	NE	NE	NE	NE	ESE	SE	SSE	SE	SE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	24
16	SE	SE	SE	ESE	ESE	E	E	ENE	E	ENE	ENE	ENE	ENE	NE	NE	NE	NNE	NNE	NNE	NNE	NNW	N	NNW	NW	ENE	24	
17	NNW	NW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	WNW	WNW	NW	NW	NW	NW	WNW	WNW	WNW	24
18	WNW	NW	WNW	NW	NW	NW	WNW	NW	WNW	WNW	WNW	WNW	NW	NW	WNW	WNW	NW	NNW	NW	WNW	W	W	NNW	NW	NW	24	
19	W	SW	SE	SW	SE	SSW	SSW	SSW	S	S	SSE	S	S	S	SSE	S	SSE	S	S	S	S	S	S	S	SSE	S	24
20	SSE	SSE	SSE	SE	ESE	E	E	ESE	ESE	ESE	ESE	SE	ESE	ESE	ESE	ESE	ESE	E	NE	SSW	WNW	E	SSW	SW	SE	24	
21	SW	WSW	WSW	WSW	WSW	SW	SW	W	WSW	SW	SW	W	W	WSW	W	WNW	SSE	S	S	SSW	SSW	ESE	SW	SW	SW	24	
22	SSE	ENE	E	E	ENE	ENE	ENE	ENE	NE	NNE	NNE	N	SSW	S	SSW	S	S	S	SSE	SSW	S	SSW	SSW	SSW	SSE	24	
23	SW	SSW	SW	SSE	SSW	SW	SW	SW	WSW	NW	N	N	NNE	NNE	NNE	NNE	NE	NE	NNE	NE	NE	ENE	NE	ENE	NE	24	
24	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	ESE	ESE	E	ESE	E	E	ENE	E	E	E	E	E	E	ENE	ENE	E	24	
25	ENE	ENE	ENE	ENE	ENE	ENE	E	E	ESE	E	E	ESE	E	E	E	E	E	E	E	ESE	ESE	ESE	ESE	SE	SE	E	24
26	SSW	W	W	W	W	W	W	WNW	W	W	W	W	W	W	W	W	W	WSW	WNW	WSW	WSW	W	W	W	W	24	
27	S	ESE	E	E	ENE	ENE	E	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NNE	NNE	NNE	NNE	NE	24	
28	NNE	NNE	NNE	NNE	NNE	NNE	N	N	NNW	N	N	NNE	N	NNE	NE	NNE	SSW	SE	SW	SW	SE	S	SSW	SSW	NNE	24	
29	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SW	SW	WSW	WSW	WSW	SW	WSW	WSW	SW	S	SSW	SSW	SW	SSW	S	SSE	SSW	24	
30	S	SE	ESE	E	SSE	SE	SE	ENE	ESE	SE	S	SSW	SSW	W	W	W	W	NW	WNW	W	W	WNW	W	W	SW	24	
31	SW	SSW	WSW	WSW	WSW	SW	SW	SSW	SSW	WSW	SW	SW	SW	SW	WSW	W	W	W	W	W	WNW	N	N	NNE	N	WSW	24

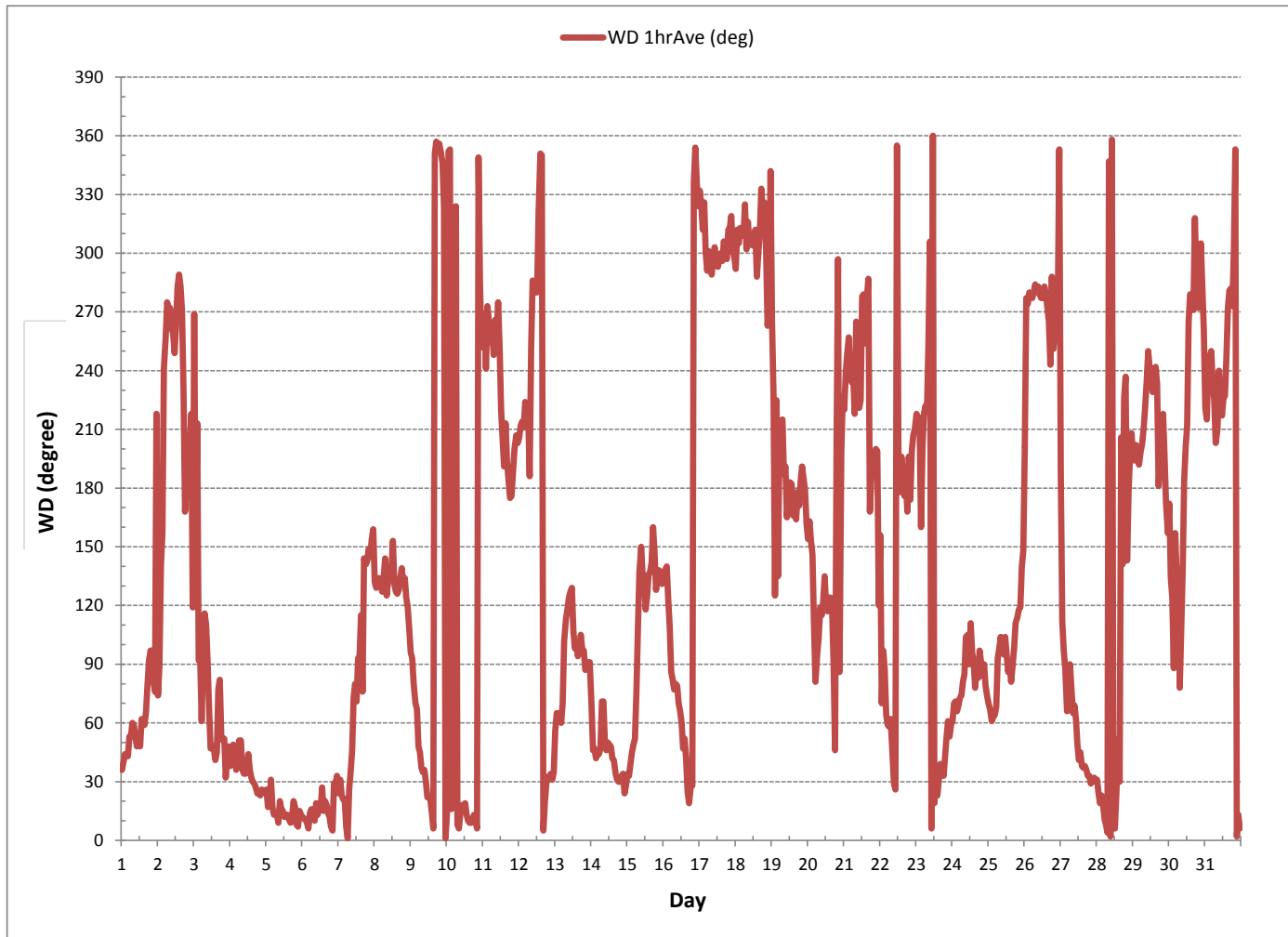
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	March 30, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0 hrs	OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	102.37	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	51 (NE)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - October 2016

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.	
DAY																										
1	18	20	23	22	24	24	24	25	26	26	24	23	23	27	26	24	28	29	31	31	31	28	28	24	24	
2	39	37	52	42	52	40	35	31	34	42	37	39	38	34	34	34	44	34	20	15	20	14	19	38	24	
3	54	43	74	30	41	31	23	24	31	46	47	45	67	65	62	43	36	24	23	20	19	11	17	18	24	
4	21	17	19	18	16	17	18	21	17	17	20	20	25	19	18	17	18	15	15	15	17	14	14	18	24	
5	16	20	19	17	20	21	21	21	23	18	20	25	24	23	22	23	23	23	17	19	23	23	26	21	24	
6	21	21	21	21	23	21	20	22	29	24	26	27	30	26	26	21	23	21	21	24	35	44	29	18	24	
7	19	16	18	25	20	28	35	26	23	27	34	36	36	37	38	34	29	28	23	24	24	25	25	25	24	
8	30	28	26	27	28	28	29	29	30	27	28	33	28	32	30	30	28	28	26	28	28	30	31	30	24	
9	28	27	28	27	25	23	21	17	17	18	16	16	19	20	22	25	38	34	31	32	40	40	42	40	24	
10	38	36	46	20	31	54	46	40	25	25	22	26	22	24	25	23	21	23	18	20	33	38	41	49	24	
11	37	50	59	33	61	57	44	31	36	37	35	39	28	20	23	25	22	20	65	22	20	17	17	19	24	
12	18	18	13	17	20	12	29	36	56	69	52	41	45	37	38	33	22	19	13	13	14	16	16	15	24	
13	23	25	24	27	26	26	31	33	30	29	30	30	36	29	32	28	28	31	29	29	30	27	28	28	24	
14	27	24	22	21	21	23	24	29	26	25	23	23	23	22	19	19	16	12	12	13	15	14	17	17	24	
15	15	15	19	20	21	26	29	30	28	29	32	27	28	30	30	26	26	26	26	27	27	23	27	26	24	
16	26	27	25	30	29	29	28	27	28	26	25	26	24	22	25	20	17	17	13	17	35	32	38	38	24	
17	35	37	37	39	31	33	31	34	27	31	33	29	31	31	31	30	34	31	32	37	37	38	33	32	24	
18	30	36	37	38	37	36	40	35	38	31	38	33	32	42	32	37	34	39	37	46	47	55	65	74	24	
19	75	47	47	46	57	48	53	17	34	18	30	26	26	26	27	24	29	22	21	18	16	19	21	24	24	
20	19	26	23	35	34	20	29	32	36	30	29	27	28	29	26	26	24	24	21	33	48	60	59	42	24	
21	40	22	30	47	23	25	25	18	29	28	23	23	28	30	33	33	47	18	35	10	8	26	12	48	24	
22	56	34	27	23	34	21	30	50	15	11	10	34	65	28	20	18	18	21	25	36	33	27	14	19	24	
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24	27	24	28	26	25	26	26	27	26	28	29	31	30	29	30	28	29	27	30	30	29	31	25	26	24	
25	27	24	23	26	22	26	30	28	29	29	27	27	35	28	29	29	28	26	27	25	23	25	50	49	24	
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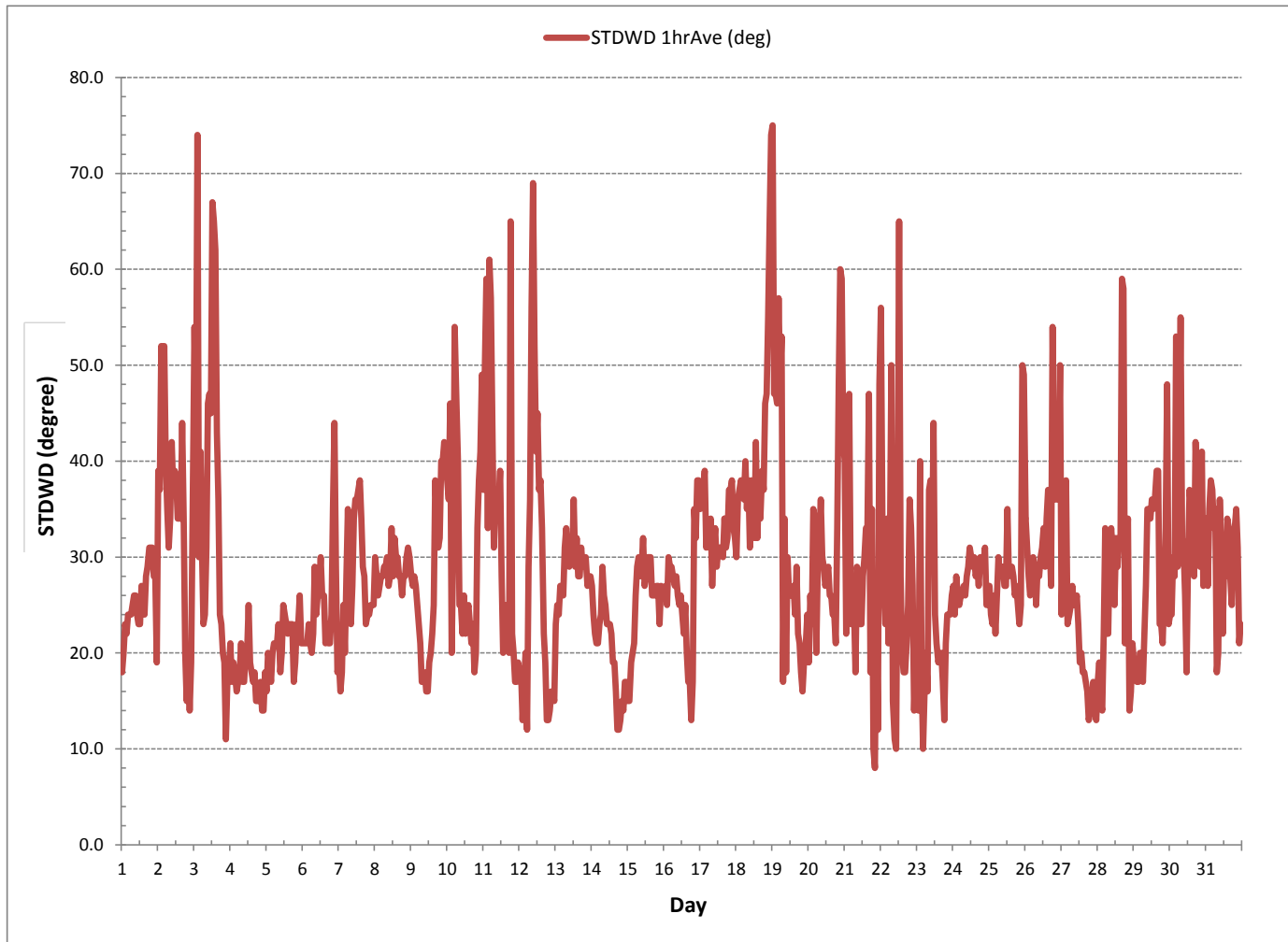
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: March 30, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



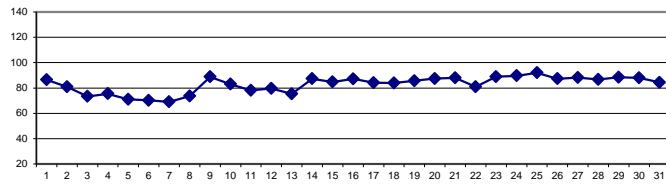
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	82	80	80	81	81	82	82	82	82	81	81	86	88	88	91	91	92	92	92	92	92	92	92	92	93	80	93	86	24
2	93	93	93	93	92	90	88	87	87	83	80	78	71	65	57	55	56	63	80	88	90	84	86	89	55	93	81	24	
3	90	90	90	90	90	90	91	91	81	61	55	53	52	51	52	49	52	63	76	80	76	76	79	83	49	91	73	24	
4	88	89	88	88	86	83	84	85	81	76	72	65	61	60	60	60	64	67	69	74	75	78	78	80	60	89	75	24	
5	79	79	82	82	77	77	76	77	80	76	72	68	63	61	60	62	64	66	67	67	68	68	67	68	60	82	71	24	
6	69	70	71	73	74	74	75	75	73	72	70	69	68	65	64	63	63	67	69	71	71	73	73	73	63	75	70	24	
7	73	74	75	75	74	74	74	74	71	67	65	64	63	62	62	63	64	67	69	68	68	68	70	72	62	75	69	24	
8	73	73	74	75	75	76	75	74	73	71	71	70	68	66	67	67	67	67	68	71	83	87	88	88	66	88	74	24	
9	89	89	89	89	89	89	89	89	89	89	88	88	88	87	87	88	89	89	89	89	89	89	90	90	89	87	90	24	
10	89	89	88	88	88	88	89	87	83	81	79	73	76	75	76	79	82	85	84	85	85	84	85	84	85	73	89	24	
11	86	85	84	84	83	84	84	82	75	71	71	69	69	70	70	72	75	78	79	80	81	81	81	82	69	86	78	24	
12	83	84	87	88	88	89	88	87	86	82	76	69	66	63	63	65	76	82	84	80	80	81	81	82	63	89	80	24	
13	80	77	76	77	78	81	81	76	75	72	66	69	72	74	74	73	75	75	73	75	78	77	77	78	66	81	75	24	
14	81	86	86	85	85	86	87	88	88	88	87	87	88	88	89	89	89	89	89	88	88	88	88	88	81	89	87	24	
15	88	88	88	87	87	87	87	87	87	85	83	81	81	77	78	78	80	84	85	86	86	87	88	88	77	88	85	24	
16	86	85	86	87	87	87	88	88	87	86	86	86	87	87	88	88	88	89	88	88	88	88	88	87	85	89	87	24	
17	87	87	87	87	87	87	86	86	84	83	83	80	79	80	81	83	83	84	85	85	84	84	84	85	79	87	84	24	
18	85	85	85	86	86	86	86	87	84	83	80	79	78	77	81	82	83	84	85	85	86	87	88	88	77	88	84	24	
19	87	88	89	89	89	89	89	89	89	87	82	80	78	76	79	79	80	83	86	87	89	90	90	91	90	76	91	24	
20	91	91	90	88	88	89	89	89	89	88	81	80	82	83	80	82	85	88	90	90	90	91	91	91	80	91	87	24	
21	91	91	91	91	91	91	91	91	90	87	86	85	82	78	81	78	81	89	91	91	90	91	91	91	78	91	88	24	
22	91	90	90	90	90	89	89	89	87	88	85	71	57	52	55	61	71	75	84	86	88	90	87	87	52	91	81	24	
23	89	89	89	90	90	90	90	90	89	88	88	86	86	87	88	89	89	89	89	89	89	90	90	90	86	90	89	24	
24	90	90	91	91	91	91	91	92	92	91	91	90	89	88	87	86	86	86	87	89	89	90	91	91	86	92	90	24	
25	91	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	91	92	92	24	
26	92	92	92	92	92	91	91	90	89	88	87	86	81	79	81	83	84	87	90	88	85	85	85	85	79	92	87	24	
27	86	86	86	87	87	88	89	87	87	87	86	88	89	90	90	90	90	90	90	90	90	89	88	88	86	90	88	24	
28	88	88	88	88	88	89	89	89	89	87	86	84	82	81	81	80	84	87	88	88	88	90	90	89	80	90	87	24	
29	89	89	89	90	91	91	91	91	92	92	91	89	87	85	85	86	86	88	89	87	85	85	86	86	85	92	88	24	
30	87	86	87	87	87	87	87	87	88	89	90	90	91	91	90	89	89	89	88	86	87	85	86	87	85	91	88	24	
31	87	86	85	85	86	87	89	90	88	85	85	84	84	84	84	82	82	83	84	84	83	80	79	78	78	90	84	24	
HOURLY MAX	93	93	93	93	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	93					
HOURLY AVG	85.8	85.8	86.1	86.3	86.1	86.3	86.4	86.1	84.7	82.3	80.4	78.6	77.2	76.3	76.5	76.8	78.7	81.2	83.3	83.9	84.3	84.6	84.8	85.3					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

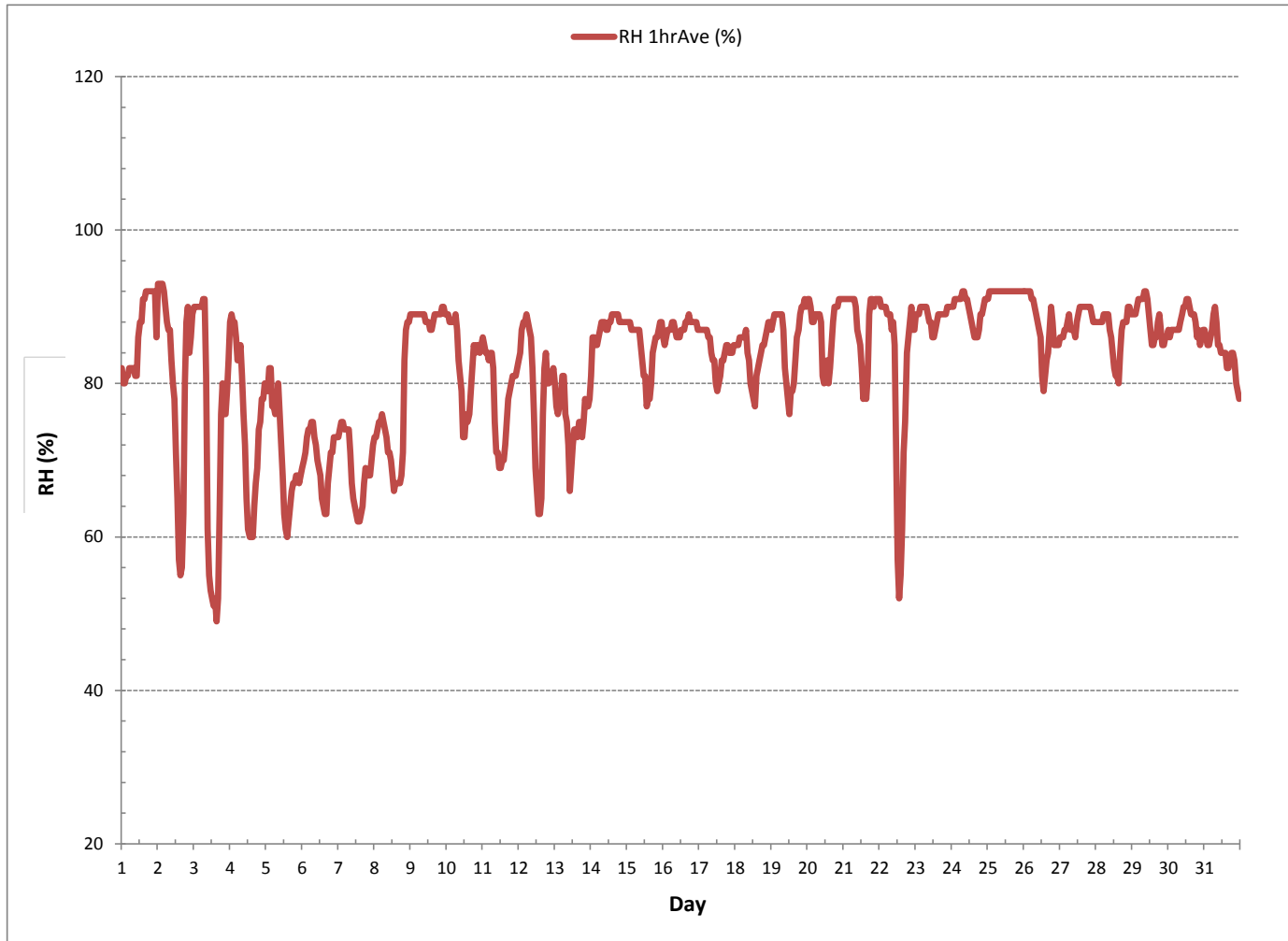
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	49	%	@ HOUR(S)	15	ON DAY(S)	3
MAXIMUM 1-HR AVERAGE:	93	%	@ HOUR(S)	23	VAR	1, 2
MAXIMUM 24-HR AVERAGE:	92	%			ON DAY(S)	25
					VAR-VARIOUS	
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	8.66					MONTHLY AVERAGE: 83 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE

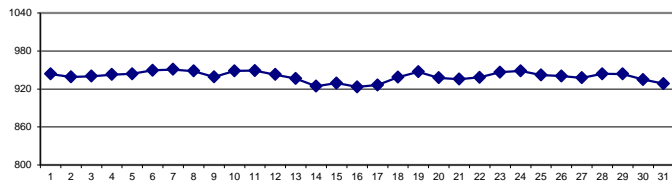
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	948	948	948	948	948	947	947	947	946	946	945	945	943	943	942	942	940	940	939	939	939	938	938	938	938	938	948	944	24
2	937	936	936	935	935	936	937	937	939	940	940	941	941	941	941	941	941	940	940	940	940	940	940	940	940	935	941	939	24
3	940	940	940	940	939	939	939	939	940	941	941	941	941	941	941	940	940	940	940	940	940	940	940	940	940	939	941	940	24
4	940	940	940	941	941	941	941	942	942	943	943	943	943	943	943	944	944	944	944	944	944	945	945	944	944	940	945	943	24
5	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	944	945	944	944	944	944	943	945	944	24
6	945	945	945	946	946	946	947	947	948	949	949	950	950	951	951	951	952	952	952	952	953	953	953	953	945	945	953	949	24
7	953	953	952	952	952	952	952	951	951	951	951	951	950	950	950	950	950	949	949	949	949	950	950	950	949	949	953	951	24
8	950	951	951	951	951	951	951	951	951	951	951	950	950	949	949	948	948	947	946	945	945	944	943	943	942	942	951	948	24
9	941	940	939	939	938	938	937	937	937	937	937	937	937	937	938	938	939	940	940	941	941	942	943	943	937	943	943	939	24
10	944	944	945	945	945	946	947	947	947	948	949	949	950	950	950	950	950	951	951	951	951	951	951	951	944	951	948	24	
11	951	951	951	951	951	951	951	951	951	951	951	950	950	949	948	948	947	947	947	946	945	945	944	944	944	944	951	949	24
12	944	943	943	942	942	941	941	941	941	942	942	942	942	943	942	943	943	943	943	943	944	944	944	944	944	941	944	943	24
13	944	943	943	943	942	941	941	940	940	939	939	938	937	936	934	933	932	932	931	930	929	929	928	928	928	928	944	936	24
14	928	927	927	927	927	926	925	925	925	924	924	923	922	921	921	921	922	923	923	923	924	924	924	925	925	921	928	924	24
15	925	926	927	927	927	927	928	929	929	930	930	930	931	931	931	931	931	931	931	931	930	930	930	929	925	931	929	24	
16	929	928	927	927	926	926	925	924	924	923	922	922	922	921	921	921	922	921	921	921	921	921	921	920	920	920	929	923	24
17	920	921	921	921	921	922	922	923	924	924	925	925	926	926	927	928	928	929	930	930	931	931	932	932	933	933	933	926	24
18	933	934	934	934	935	935	936	936	937	938	938	938	939	939	940	940	941	941	942	942	942	943	943	944	933	944	939	24	
19	944	944	945	945	946	946	946	947	947	948	948	949	949	949	949	949	948	948	948	948	948	947	947	944	949	949	947	24	
20	946	946	945	944	944	943	942	941	940	940	939	938	937	935	935	934	933	933	932	932	931	931	931	931	931	931	946	938	24
21	932	932	933	933	933	934	934	935	936	936	936	937	937	937	937	937	937	937	937	937	936	936	936	936	932	937	937	935	24
22	936	936	936	936	936	936	936	936	936	937	938	938	939	939	939	940	940	940	941	941	941	941	941	942	936	942	942	938	24
23	942	942	943	943	943	944	944	945	945	946	947	947	948	948	948	948	948	948	949	949	949	949	949	950	942	950	946	24	
24	950	950	950	950	950	950	949	950	950	950	950	949	949	948	948	948	947	947	947	947	947	947	946	945	945	950	949	24	
25	945	945	945	944	944	943	943	943	943	943	943	943	942	941	941	941	940	940	940	940	939	939	939	939	939	939	945	942	24
26	939	939	939	939	939	939	939	940	940	940	941	941	942	942	942	941	941	941	941	941	941	941	941	940	939	939	942	940	24
27	940	940	939	939	938	938	938	938	937	937	936	936	936	936	936	936	936	936	937	937	937	938	938	939	936	940	938	24	
28	939	940	940	940	941	941	942	943	943	944	944	944	945	945	945	946	946	946	946	946	946	946	946	946	939	946	944	24	
29	946	946	945	945	945	945	944	944	944	944	944	944	944	944	943	943	943	942	942	942	942	941	941	941	941	941	946	944	24
30	940	940	939	938	938	937	936	936	936	935	935	934	934	933	933	933	933	933	933	932	932	931	931	931	931	931	940	935	24
31	931	930	930	929	928	928	928	927	927	928	928	928	927	927	927	928	928	928	928	928	928	928	929	929	927	931	928	24	
HOURLY MAX	953	953	952	952	952	952	952	951	951	951	951	951	950	951	951	951	952	952	952	952	953	953	953	953					
HOURLY AVG	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940	940					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

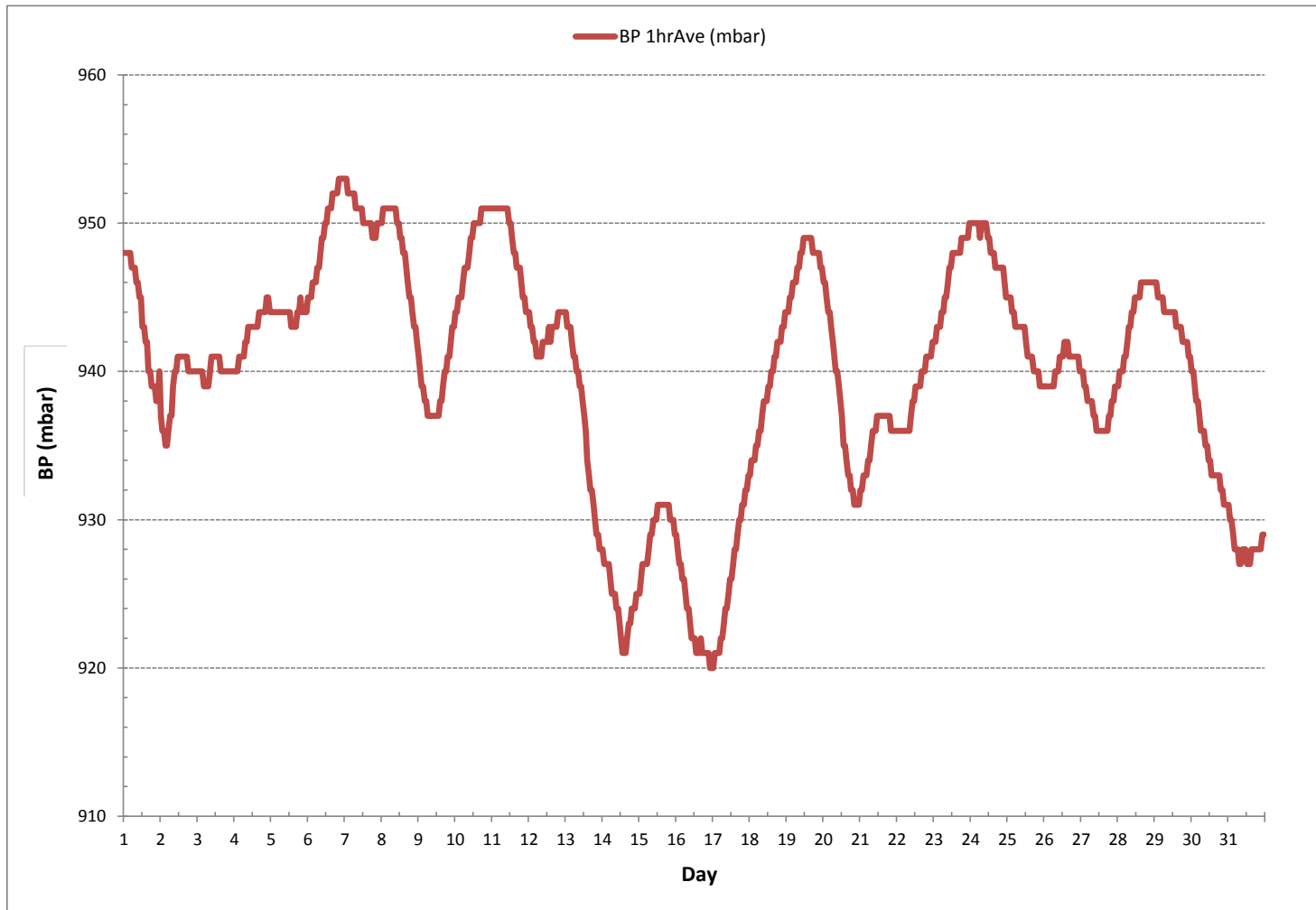
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	920 mbar	@ HOUR(S)	VAR , 0	ON DAY(S)	16 , 17
MAXIMUM 1-HR AVERAGE:	953 mbar	@ HOUR(S)	VAR	ON DAY(S)	6 , 7
MAXIMUM 24-HR AVERAGE:	951 mbar			ON DAY(S)	7
				VAR-VARIOUS	
		OPERATIONAL TIME:		744	hrs
		AMD OPERATION UPTIME:		100.0	%
STANDARD DEVIATION:	7.86	MONTHLY AVERAGE:		940	mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

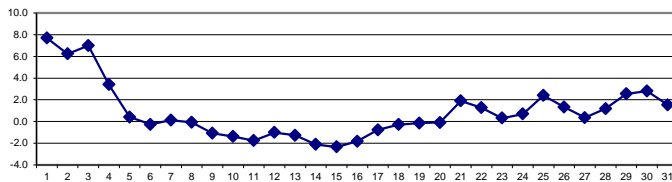
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	7.8	7.8	7.9	7.8	7.7	7.5	7.5	7.4	7.6	7.9	8.2	7.5	7.3	7.3	7.1	7.2	7.2	7.4	7.7	7.9	8.1	8.2	8.3	8.4	7.1	8.4	7.7	24
2	8.6	8.9	9.2	9.1	8.8	7.5	5.5	4.9	4.6	4.8	5.0	5.7	7.3	8.9	10.6	10.8	10.0	7.3	3.4	1.2	1.2	3.2	2.3	0.8	0.8	10.8	6.2	24
3	2.0	2.6	2.9	2.9	2.2	1.4	0.6	1.5	7.4	11.0	11.8	12.5	14.1	14.6	14.2	14.6	13.5	10.4	7.1	5.2	5.0	4.3	3.4	2.3	0.6	14.6	7.0	24
4	0.9	0.7	1.2	1.2	1.7	2.2	1.6	1.4	3.0	4.7	5.7	6.4	6.4	6.1	5.7	5.6	5.3	4.7	4.0	3.4	2.9	2.7	2.5	1.8	0.7	6.4	3.4	24
5	1.5	1.6	1.2	0.6	0.4	0.1	-0.1	-0.1	-0.2	0.1	0.5	1.1	1.6	1.9	2.0	1.6	1.0	0.4	-0.4	-0.8	-1.0	-1.0	-0.9	-1.2	-1.2	2.0	0.4	24
6	-1.5	-1.7	-1.9	-2.0	-2.0	-1.9	-1.9	-1.6	-0.9	-0.3	0.3	0.7	1.0	1.5	1.8	2.0	1.9	0.7	0.2	0.0	0.0	-0.2	-0.2	-0.4	-2.0	2.0	-0.3	24
7	-0.5	-0.7	-0.8	-0.7	-0.9	-1.0	-0.9	-0.8	-0.3	0.4	0.8	1.1	1.3	1.7	1.6	1.4	1.1	0.7	0.3	0.3	0.1	-0.1	-0.4	-0.5	-1.0	1.7	0.1	24
8	-0.5	-0.5	-0.5	-0.8	-0.9	-0.9	-0.9	-0.8	-0.4	0.0	0.3	0.7	1.2	1.6	1.3	1.3	1.2	0.9	0.5	0.1	-0.9	-1.3	-1.2	-1.4	-1.4	1.6	-0.1	24
9	-1.4	-1.3	-1.2	-1.3	-1.4	-1.5	-1.8	-1.8	-1.5	-1.0	-0.3	0.1	0.2	0.1	0.2	0.0	0.1	-0.2	-0.4	-0.6	-1.6	-2.7	-3.1	-3.3	-3.3	0.2	-1.1	24
10	-3.4	-3.4	-2.9	-2.8	-3.0	-3.0	-2.7	-2.0	-1.2	-0.5	0.5	1.6	1.7	0.8	1.0	0.5	-0.2	-0.9	-1.6	-1.8	-2.2	-2.3	-2.4	-2.6	-3.4	1.7	-1.4	24
11	-2.7	-2.7	-2.8	-2.9	-3.0	-3.0	-3.1	-2.9	-2.2	-1.6	-1.3	-0.5	-0.4	-0.5	-0.1	-0.4	-1.0	-1.7	-1.6	-1.7	-1.5	-1.3	-1.6	-1.6	-3.1	-0.1	-1.7	24
12	-1.9	-2.1	-3.2	-3.2	-3.9	-4.8	-5.7	-5.6	-2.8	0.1	1.7	3.8	4.4	4.2	3.1	2.7	1.0	0.0	-1.0	-1.6	-2.1	-2.2	-2.4	-2.6	-5.7	4.4	-1.0	24
13	-2.6	-2.9	-3.0	-3.2	-3.2	-3.3	-2.8	-2.3	-1.6	-0.8	1.1	0.7	0.5	0.2	0.1	0.1	-0.2	-0.6	-0.7	-0.9	-1.2	-1.3	-1.3	-1.2	-3.3	1.1	-1.3	24
14	-1.5	-2.1	-2.1	-2.2	-2.1	-2.3	-2.4	-2.2	-1.9	-1.8	-1.9	-1.9	-1.9	-1.3	-1.2	-1.2	-1.3	-1.6	-2.2	-2.5	-2.8	-2.9	-3.1	-3.1	-3.1	-1.2	-2.1	24
15	-3.2	-3.0	-2.9	-3.1	-3.3	-3.4	-3.3	-3.1	-2.6	-1.9	-0.9	-0.7	-0.8	-0.4	-1.1	-1.3	-1.8	-2.5	-2.8	-2.8	-2.8	-2.8	-2.8	-2.6	-3.4	-0.4	-2.3	24
16	-2.5	-2.9	-3.3	-3.3	-3.1	-3.0	-2.7	-2.8	-2.4	-1.8	-1.6	-1.3	-0.9	-0.8	-0.4	-0.3	-0.4	-1.1	-1.4	-1.6	-1.5	-1.5	-1.6	-1.6	-3.3	-0.3	-1.8	24
17	-1.6	-1.5	-1.5	-1.5	-1.5	-1.6	-1.5	-1.4	-1.0	-0.5	0.4	0.2	0.8	0.5	0.3	0.0	-0.3	-0.6	-0.7	-0.7	-0.9	-1.1	-1.2	-1.2	-1.6	0.8	-0.8	24
18	-1.2	-1.1	-1.1	-1.1	-1.1	-1.0	-1.0	-1.0	-0.5	0.0	0.6	1.0	1.2	1.6	1.2	0.7	0.2	-0.2	-0.4	-0.5	-0.6	-0.8	-0.9	-0.8	-1.2	1.6	-0.3	24
19	-0.9	-1.2	-1.4	-1.4	-1.3	-1.3	-1.3	-1.1	-0.2	0.8	1.6	2.0	2.0	1.4	1.7	1.6	1.0	0.3	0.0	-0.8	-1.1	-1.2	-1.1	-1.4	-1.4	2.0	-0.1	24
20	-1.7	-2.0	-1.9	-2.2	-3.2	-3.9	-3.6	-2.5	-1.1	0.4	2.8	3.2	2.5	2.7	3.6	3.2	2.6	1.2	0.2	0.4	0.2	-0.4	-0.9	-1.7	-3.9	3.6	-0.1	24
21	-0.7	-0.2	0.1	-0.1	0.2	0.8	0.7	0.2	2.4	3.3	3.8	4.3	5.5	6.7	5.9	6.7	5.4	2.6	1.9	1.8	-0.5	-1.6	-1.3	-2.2	-2.2	6.7	1.9	24
22	-3.1	-3.8	-4.3	-4.1	-5.2	-5.6	-5.8	-5.6	-2.8	0.0	3.3	8.9	11.1	10.8	9.1	7.8	5.6	4.2	3.5	2.9	1.4	0.1	1.3	0.9	-5.8	11.1	1.3	24
23	-0.2	-0.1	-0.4	-1.9	-1.8	-1.4	-2.4	-2.4	-0.5	0.2	0.6	1.4	1.6	1.5	1.5	1.6	1.4	1.3	1.4	1.6	1.5	1.3	1.0	0.8	-2.4	1.6	0.3	24
24	0.7	0.6	0.5	0.3	0.2	0.1	0.1	0.4	0.7	0.9	0.6	0.5	0.7	0.7	0.8	1.1	1.0	0.9	1.0	1.0	1.0	0.9	0.9	1.0	0.1	1.1	0.7	24
25	0.9	1.1	1.3	1.4	1.6	1.9	2.4	2.5	2.6	2.6	2.7	2.8	2.9	2.8	2.7	2.7	2.7	2.7	2.8	2.9	2.9	2.9	2.9	2.7	0.9	2.9	2.4	24
26	2.5	2.3	2.2	2.0	1.5	1.0	0.9	0.9	1.2	1.4	1.8	2.5	3.1	3.4	3.1	2.3	0.7	-0.9	-1.3	0.0	0.3	0.4	0.4	0.3	-1.3	3.4	1.3	24
27	0.0	0.4	0.1	0.1	-0.1	0.0	0.3	0.4	0.5	0.5	0.7	0.7	0.6	0.8	1.1	0.9	0.6	0.4	0.3	0.2	0.1	0.1	0.0	0.0	-0.1	1.1	0.4	24
28	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.1	0.0	0.5	0.8	1.4	2.1	2.5	2.7	2.9	2.9	2.4	2.0	1.8	1.7	1.4	1.1	1.2	1.3	-0.1	2.9	1.2	24
29	1.3	1.3	1.0	0.9	1.1	1.1	1.2	1.4	1.8	2.4	2.9	3.4	3.5	3.8	3.8	3.7	3.6	3.3	3.3	3.4	3.3	3.2	3.2	3.1	0.9	3.8	2.5	24
30	2.9	2.8	2.7	2.6	2.7	2.7	2.7	2.7	2.8	3.0	3.1	3.3	3.7	4.0	3.9	3.6	3.1	2.7	2.6	2.3	1.9	1.6	1.3	1.3	1.3	4.0	2.8	24
31	1.5	1.5	1.6	1.4	1.1	0.7	0.4	0.7	1.3	2.0	2.3	2.5	2.8	2.8	2.9	2.9	2.5	2.1	1.6	1.4	1.1	0.5	-0.2	-0.7	-0.7	2.9	1.5	24
HOURLY MAX	8.6	8.9	9.2	9.1	8.8	7.5	7.5	7.4	7.6	11.0	11.8	12.5	14.1	14.6	14.2	14.6	13.5	10.4	7.7	7.9	8.1	8.2	8.3	8.4				
HOURLY AVG	0.0	-0.1	-0.1	-0.2	-0.4	-0.5	-0.6	-0.5	0.4	1.2	1.9	2.5	2.8	3.0	2.9	2.8	2.3	1.5	0.9	0.7	0.4	0.2	0.1	-0.2				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

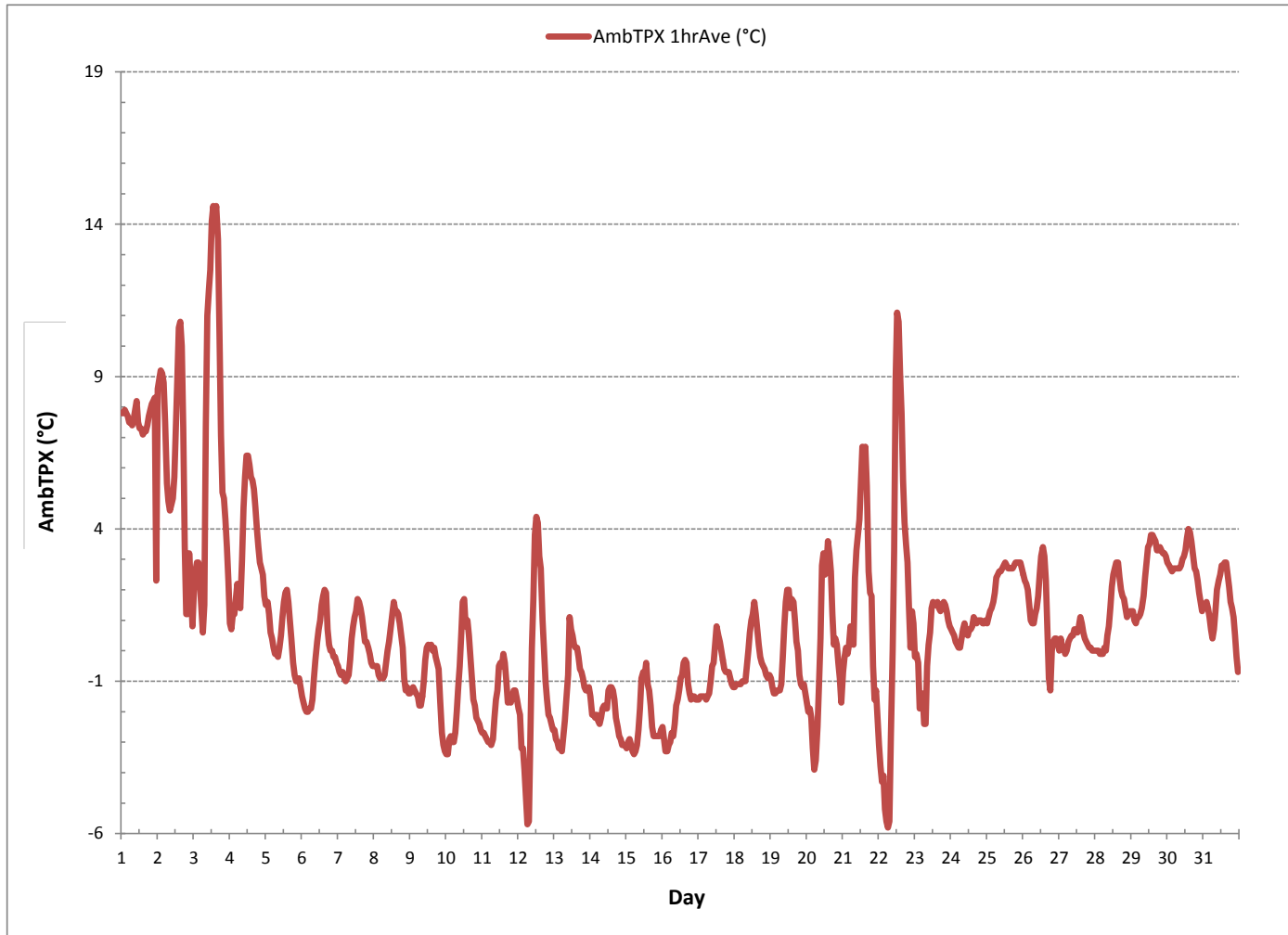
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-5.8 °C	@ HOUR(S)	6	ON DAY(S)	22
MAXIMUM 1-HR AVERAGE:	14.6 °C	@ HOUR(S)	13, 15	ON DAY(S)	3, 3
MAXIMUM 24-HR AVERAGE:	7.7 °C			ON DAY(S)	1
				VAR-VARIOUS	
OPERATIONAL TIME:				744	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	3.11			MONTHLY AVERAGE:	0.9 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



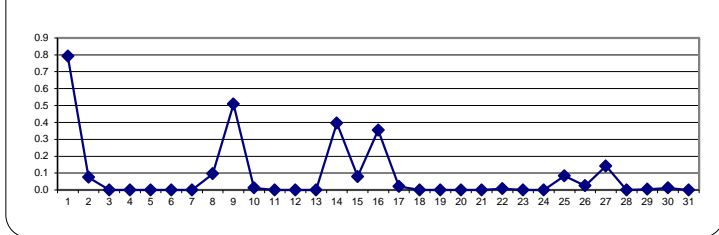
PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.6	4.5	5.3	6.2	0.8	0.1	0.0	0.3	0.5	0.1	0.1	0.0	6.2	0.8	24	
2	0.1	0.2	0.4	0.2	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	24	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.7	0.4	0.0	0.8	0.1	24
9	0.4	0.5	0.6	0.6	0.4	0.3	0.3	0.4	0.2	0.4	1.0	1.3	1.4	1.0	0.7	0.7	0.8	0.6	0.3	0.2	0.1	0.0	0.0	0.0	0.0	1.4	0.5	24	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
14	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.4	1.1	1.7	1.2	0.9	0.6	0.2	0.1	0.0	0.3	2.0	0.0	2.0	0.4	24	
15	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.5	1.1	0.5	0.5	0.5	0.3	0.9	0.7	0.7	0.4	0.0	0.3	0.6	0.5	0.2	0.2	0.0	1.1	0.4	24	
17	0.1	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	1.3	0.0	0.0	0.0	1.3	0.1	24	
26	0.2	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	1.1	0.5	0.1	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	1.1	0.1	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
HOURLY MAX	0.4	0.5	0.6	0.6	0.7	0.3	0.3	0.4	0.5	1.1	1.0	1.3	1.4	1.1	4.5	5.3	6.2	0.9	0.6	0.6	0.6	1.3	0.7	2.0	0.0	0.0	0.0	24	
HOURLY AVG	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	24	

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

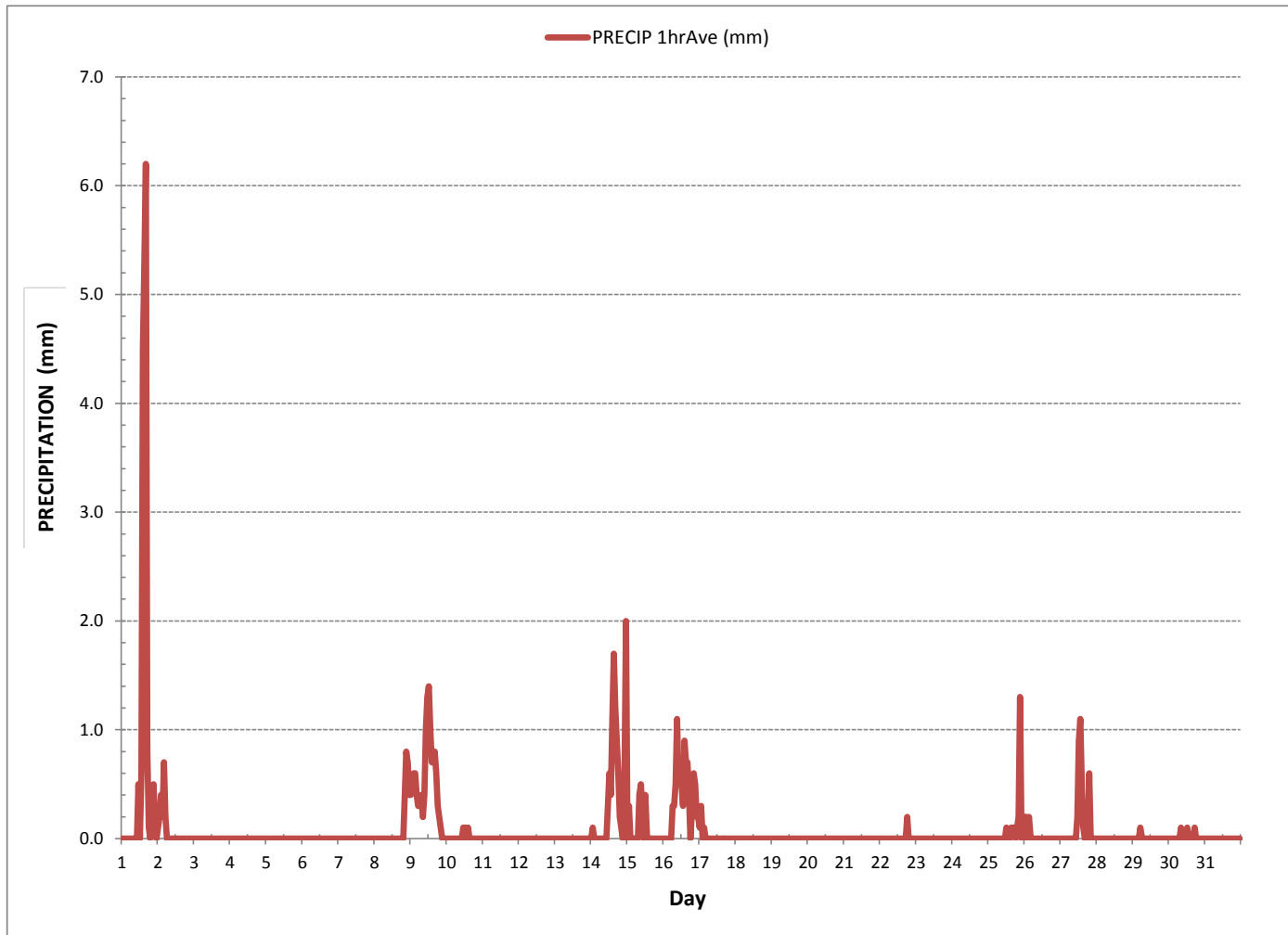
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0 mm	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	6.2 mm	@ HOUR(S)	16	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	0.8 mm			ON DAY(S)	1
MONTHLY TOTAL	62.6 mm			VAR-VARIOUS	
OPERATIONAL TIME:				744 hrs	
AMD OPERATION UPTIME:				100.0 %	
STANDARD DEVIATION:	0.40	MONTHLY AVERAGE:		0.1 mm	

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>October 12, 2016</u>	Barometric Pressure: <u>0.928 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>21</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>A few clouds</u>
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>routine monthly</u>
Start Time 24 hr. (mst): <u>9:45</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>13:47</u>	Cal Gas Expiry Date: <u>December 2, 2023</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>508</u>	Range ppb: <u>1000</u>	Station SO2 Analyzer Range? <u>500 ppb</u>
Last Calibration Date: <u>September 19, 2016</u>	As Found C.F.: <u>1.005</u>	
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>	

Calibrator:	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)								
Flow Meter ID's: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190	Start/End Time 24 hr.: <u> </u>
Point	ppb									
High	780									
Mid	380									
Low	190									
Make & Model: <u>API 700</u>		Target Concentration (ppb): <u>380</u>								
Serial #: <u>627</u>		Result (ppb): <u>3</u>								
Cal Gas Cylinder I.D. #: <u>LL119346</u>		Zero Corrected Result (ppb): <u>3</u>								
Cal Gas Conc. (ppm): <u>50.0</u>		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

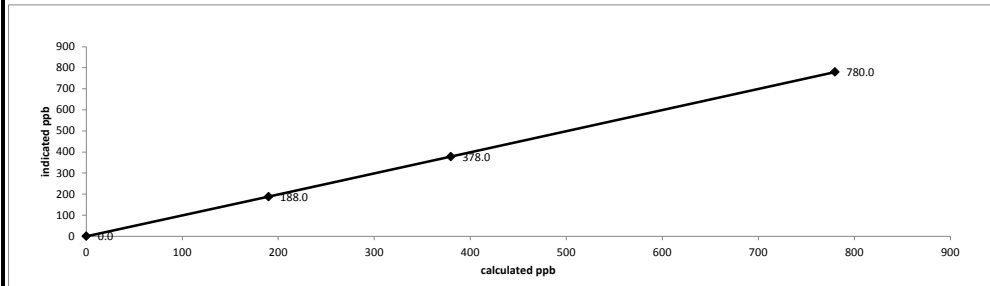
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	2.0	n/a
as found high	4924	78.00	5002	779.7	778.0	1.005
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	78.00	5002	779.7	780.0	1.000
mid	4966	38.00	5004	379.7	378.0	1.004
low	4981	19.00	5000	190.0	188.0	1.011
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.005

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.12%</u>	.95-1.05
% change in C.F. from last cal = <u>-0.48%</u>	± 3% F.S.
	± 10%

API 100E Sulphur Dioxide Analyzer Calibration



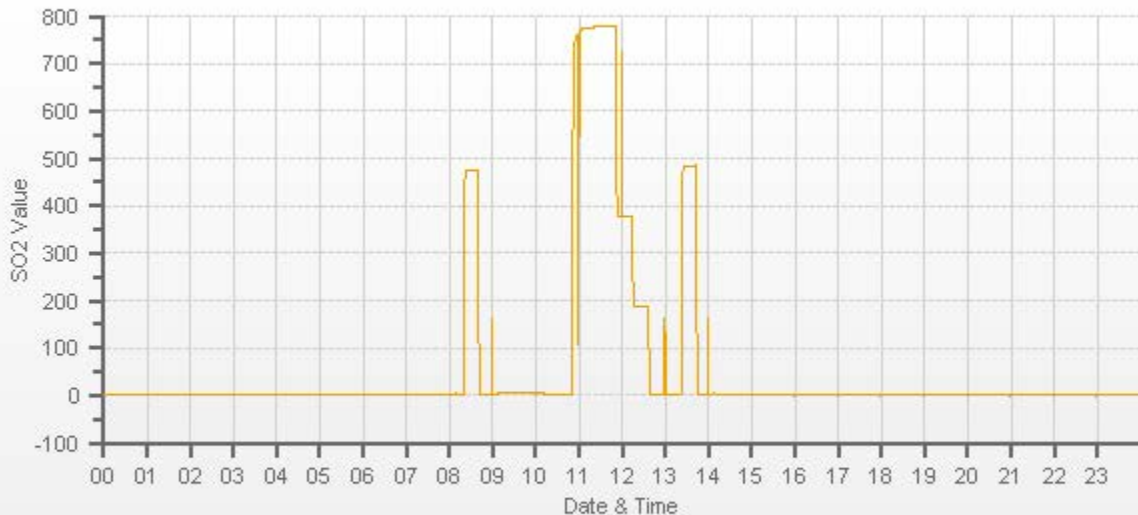
SLOPE: <u>1.007</u>	SLOPE: <u>1.012</u>
OFFSET: <u>105.3</u>	OFFSET: <u>109.8</u>
HVPS: <u>467</u>	HVPS: <u>467</u>
RCELL TEMP: <u>50.0</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>30.2</u>	BOX TEMP: <u>31.8</u>
PMT TEMP: <u>7.6</u>	PMT TEMP: <u>7.7</u>
IZS TEMP: <u>45.0</u>	IZS TEMP: <u>45.0</u>
PRES: <u>24.6</u>	PRES: <u>24.6</u>
SAMP FL: <u>621</u>	SAMP FL: <u>622</u>
NORM PMT: <u>114.1</u>	NORM PMT: <u>109.9</u>
UV LAMP: <u>3060.1</u>	UV LAMP: <u>3051.0</u>
LAMP RATIO: <u>84.1</u>	LAMP RATIO: <u>83.7</u>
STR. LGT: <u>53.0</u>	STR. LGT: <u>55.6</u>
DRK PMT: <u>9.8</u>	DRK PMT: <u>10.4</u>
DRK LMP: <u>-0.4</u>	DRK LMP: <u>-0.3</u>
Expected Value: <u>485.0</u>	Expected Value: <u>485.0</u>

Comments:

The analyzer sample inlet filter was changed.

Charcoal ZERO Air scrubber was renewed.
EV has not changed after calibration.

SO2[ppb] Station: LICA MASKWA Daily: 2016/10/12 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>October 19, 2016</u>	Barometric Pressure: <u>0.933 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Light snow</u>
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>repeat</u>
Start Time 24 hr. (mst): <u>9:07</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>12:41</u>	Cal Gas Expiry Date: <u>December 2, 2023</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>508</u>	Range ppb: <u>1000</u>	Station SO ₂ Analyzer Range? <u>500 ppb</u>
Last Calibration Date: <u>October 12, 2016</u>	As Found C.F.: <u>1.004</u>	
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>	

Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>API 700</u> Serial #: <u>627</u> Cal Gas Cylinder I.D. #: <u>LL119346</u> Cal Gas Conc. (ppm): <u>50.0</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190	SO₂ Scrubber Check (10 mins.) Start/End Time 24 hr.: _____ Target Concentration (ppb): <u>380</u> Result (ppb): <u>3</u> Zero Corrected Result (ppb): <u>3</u> **warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**
Point	ppb									
High	780									
Mid	380									
Low	190									

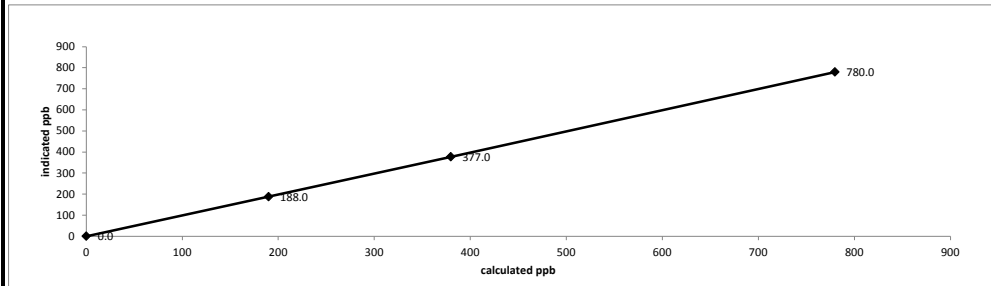
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	0.3	n/a
as found high	4924	78.00	5002	779.7	777.0	1.004
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	78.00	5002	779.7	780.0	1.000
mid	4966	38.00	5004	379.7	377.0	1.007
low	4981	19.00	5000	190.0	188.0	1.011
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.006

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>0.999</u>	.95-1.05
b (Intercept as % of full scale) = <u>0.14%</u>	± 3% F.S.
% change in C.F. from last cal = <u>-0.38%</u>	± 10%

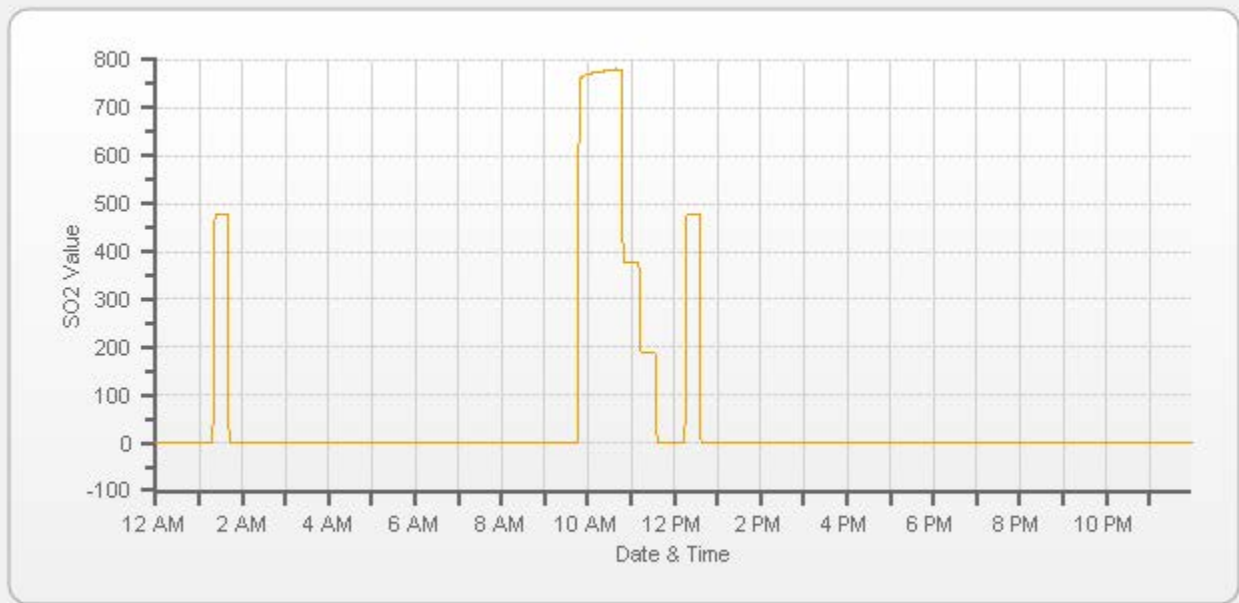
API 100E Sulphur Dioxide Analyzer Calibration



SLOPE: <u>1.012</u>	SLOPE: <u>1.017</u>
OFFSET: <u>109.8</u>	OFFSET: <u>110.5</u>
HVPS: <u>467</u>	HVPS: <u>467</u>
RCELL TEMP: <u>50.0</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>30.1</u>	BOX TEMP: <u>30.6</u>
PMT TEMP: <u>7.7</u>	PMT TEMP: <u>7.7</u>
IZS TEMP: <u>45.0</u>	IZS TEMP: <u>45.0</u>
PRES: <u>24.8</u>	PRES: <u>24.9</u>
SAMP FL: <u>626</u>	SAMP FL: <u>627</u>
NORM PMT: <u>110.2</u>	NORM PMT: <u>109.8</u>
UV LAMP: <u>3030.8</u>	UV LAMP: <u>3031.7</u>
LAMP RATIO: <u>83.2</u>	LAMP RATIO: <u>83.0</u>
STR. LGT: <u>55.6</u>	STR. LGT: <u>56.2</u>
DRK PMT: <u>9.8</u>	DRK PMT: <u>10.2</u>
DRK LMP: <u>-0.4</u>	DRK LMP: <u>-0.5</u>
Expected Value: <u>485.0</u>	Expected Value: <u>476.0</u>

Comments:

Repeat calibration performed to correct ZERO readings drift. According to a daily report, the ZERO readings drifted to about 3 ppb since the monthly calibration.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>October 13, 2016</u>	Barometric Pressure: <u>0.927 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>A few clouds</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>routine monthly</u>
Start Time 24 hr. (mst): <u>8:21</u>	Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>12:06</u>	Cal Gas Expiry Date: <u>July 15, 2017</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>722</u>	Range ppb: <u>100</u>	Station SO ₂ Analyzer Range? <u>500 ppb</u>
Last Calibration Date: <u>September 19, 2016</u>	As Found C.F.: <u>1.005</u>	
Previous C.F.: <u>0.994</u>	New C.F.: <u>0.999</u>	

Calibrator:	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)								
Flow Meter ID's: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: <u> </u>
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: <u>SABIO 2010 D</u>		Target Concentration (ppb): <u>380</u>								
Serial #: <u>11900613</u>		Result (ppb): <u> </u>								
Cal Gas Cylinder I.D. #: <u>LL36837</u>		Zero Corrected Result (ppb): <u>0</u>								
Cal Gas Conc. (ppm): <u>10.0</u>		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

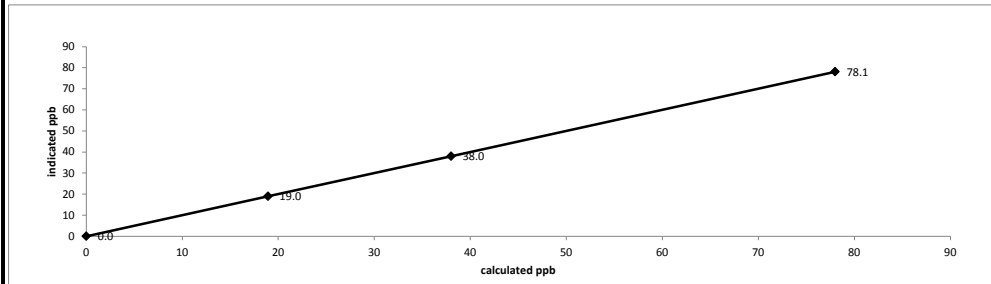
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	0.0	n/a
as found high	7442	58.50	7501	78.0	77.6	1.005
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	58.50	7501	78.0	78.1	0.999
mid	7471	28.50	7500	38.0	38.0	1.000
low	7486	14.20	7500	18.9	19.0	0.996
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						0.998

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>-0.01%</u>	.95-1.05
% change in C.F. from last cal = <u>-1.12%</u>	± 3% F.S.
	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



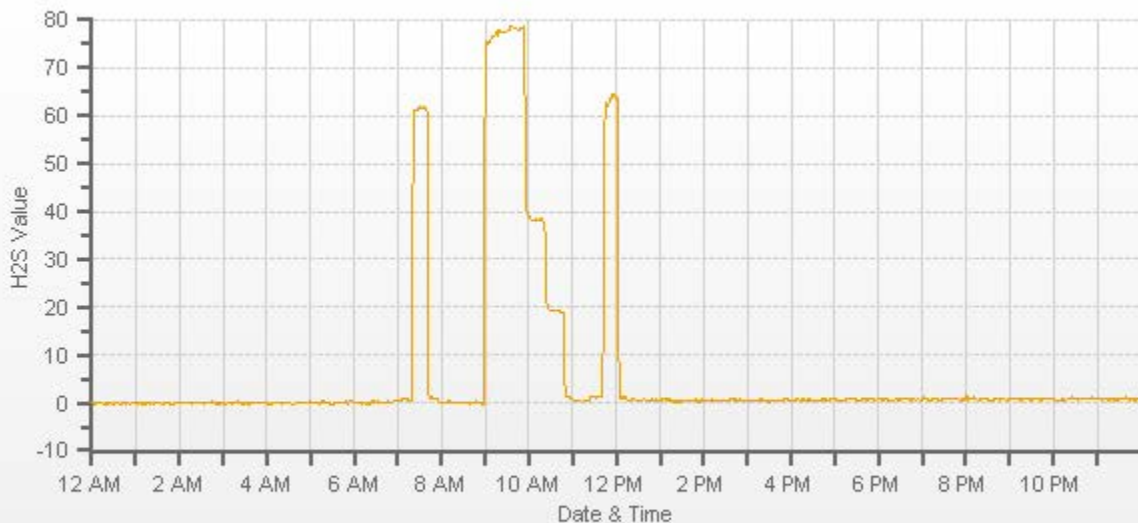
SLOPE: <u>0.849</u>	SLOPE: <u>0.863</u>
OFFSET: <u>91.7</u>	OFFSET: <u>91.7</u>
HVPS: <u>590</u>	HVPS: <u>590</u>
RCELL TEMP: <u>50.0</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>31.2</u>	BOX TEMP: <u>30.3</u>
PMT TEMP: <u>8.2</u>	PMT TEMP: <u>8.2</u>
IZS TEMP: <u>48.0</u>	IZS TEMP: <u>48.0</u>
Converter Temp: <u>314.8</u>	Converter Temp: <u>315.2</u>
PRES: <u>23.3</u>	PRES: <u>23.2</u>
SAMP FL: <u>619</u>	SAMP FL: <u>618</u>
UV LAMP: <u>3308.3</u>	UV LAMP: <u>3307.4</u>
LAMP RATIO: <u>104.2</u>	LAMP RATIO: <u>104.1</u>
STR. LGT: <u>38.9</u>	STR. LGT: <u>39.5</u>
DRK PMT: <u>27.3</u>	DRK PMT: <u>27.2</u>
DRK LMP: <u>3.5</u>	DRK LMP: <u>3.5</u>
Expected Value: <u>62.1</u>	Expected Value: <u>63.9</u>

Comments:

The analyzer sample inlet filter was changed.

No zero adjustment was required/made. As found zero value copied to adjusted zero value for linearity calculation purposes.

H2S[ppb] Station: LICA MASKWA Daily: 2016/10/13 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>October 19, 2016</u>	Barometric Pressure: <u>0.933 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Light snow</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>repeat</u>
Start Time 24 hr. (mst): <u>9:07</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>12:27</u>	Cal Gas Expiry Date: <u>July 15, 2017</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>722</u>	Range ppb: <u>100</u>	Station SO ₂ Analyzer Range? <u>500 ppb</u>
Last Calibration Date: <u>October 13, 2016</u>	As Found C.F.: <u>0.990</u>	
Previous C.F.: <u>0.999</u>	New C.F.: <u>1.000</u>	

Calibrator:	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)								
Flow Meter ID's: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: <u> </u>
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: <u>SABIO 2010 D</u>		Target Concentration (ppb): <u>380</u>								
Serial #: <u>11900613</u>		Result (ppb): <u> </u>								
Cal Gas Cylinder I.D. #: <u>LL36837</u>		Zero Corrected Result (ppb): <u>0</u>								
Cal Gas Conc. (ppm): <u>10.0</u>		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

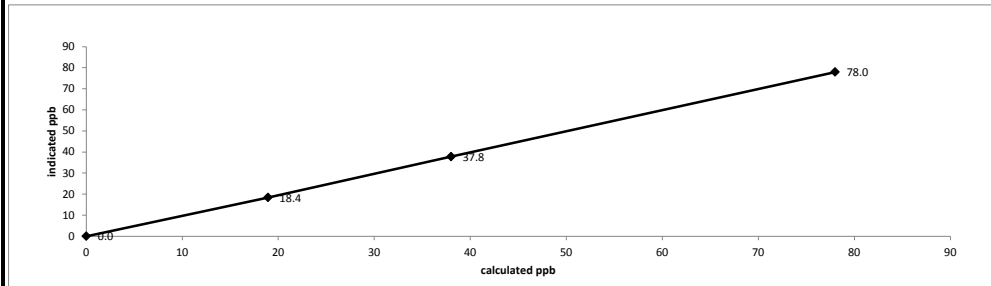
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	0.0	n/a
as found high	7442	58.50	7501	78.0	78.8	0.990
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	58.50	7501	78.0	78.0	1.000
mid	7471	28.50	7500	38.0	37.8	1.005
low	7486	14.20	7500	18.9	18.4	1.029
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.011

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.998</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.26%</u>	± 3% F.S.
% change in C.F. from last cal = <u>0.92%</u>	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



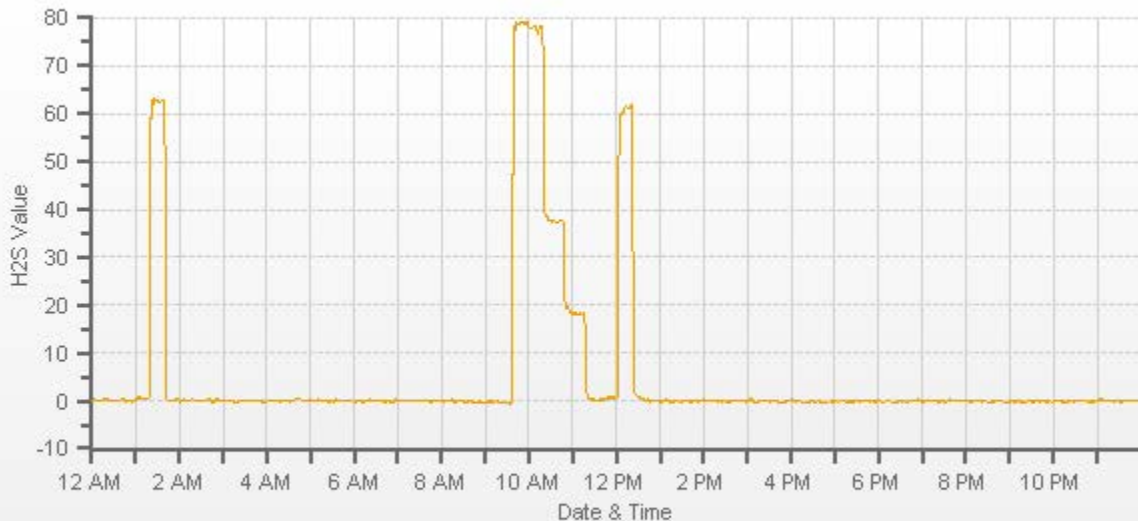
SLOPE: <u>0.863</u>	SLOPE: <u>0.852</u>
OFFSET: <u>91.7</u>	OFFSET: <u>91.7</u>
HVPS: <u>590</u>	HVPS: <u>590</u>
RCELL TEMP: <u>50</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>30.8</u>	BOX TEMP: <u>30.6</u>
PMT TEMP: <u>8.2</u>	PMT TEMP: <u>8.2</u>
IZS TEMP: <u>48</u>	IZS TEMP: <u>48.0</u>
Converter Temp: <u>315.1</u>	Converter Temp: <u>315.2</u>
PRES: <u>23.6</u>	PRES: <u>23.6</u>
SAMP FL: <u>626</u>	SAMP FL: <u>626</u>
UV LAMP: <u>3317.3</u>	UV LAMP: <u>3311.1</u>
LAMP RATIO: <u>104.4</u>	LAMP RATIO: <u>104.3</u>
STR. LGT: <u>39.5</u>	STR. LGT: <u>39.0</u>
DRK PMT: <u>26.9</u>	DRK PMT: <u>26.7</u>
DRK LMP: <u>3.4</u>	DRK LMP: <u>3.5</u>
Expected Value: <u>63.9</u>	Expected Value: <u>61.4</u>

Comments:

No zero adjustment was required/made. As found zero value copied to adjusted zero value for linearity calculation purposes.

Repeat calibration required to correct ZERO readings drift during ZS checks. According to a daily report, the ZERO readings drifted to 1.7 ppb since the monthly calibration.

H2S[ppb] Station: LICA MASKWA Daily: 2016/10/19 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: October 12, 2016	Barometric Pressure: 0.928 atm
Company/Airshed: UCA	Station Temperature °C: 21
Location/Station Name: Maskwa	Weather Conditions: A few clouds
Parameter: Total Hydrocarbon	Calibration Purpose: routine monthly
Start/End Time 24 hr. (mst): 9:45 / 13:36	Performed By/Reviewer: Alex Yakupov / Trina Whitsitt
Calibration Method: Gas Dilution	Cal Gas Expiry Date: November 25, 2023

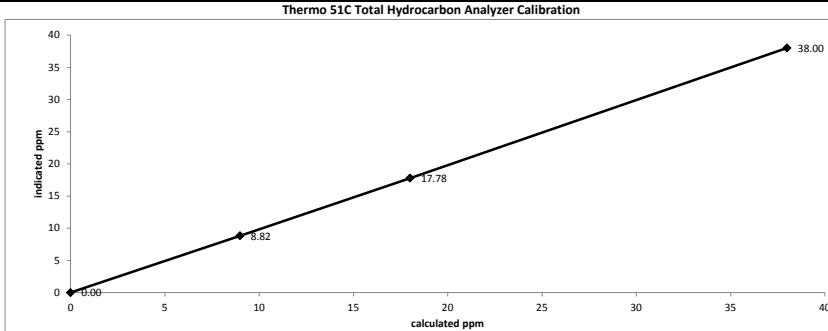
Analyzer: ID# or Serial Number: 436609738	Range ppm: 50
Last Calibration Date: September 1, 2016	As Found C.F.: 0.992
Previous Cal High Point C.F.: 1.001	New C.F.: 1.000

Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: LL165372 CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): 606.0 / 212.0 CH ₄ as propane/total CH ₄ equivalents (ppm): 583.0 / 1189.0	Standard Calibration Points for a Range of: 50 ppm <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>Target ppm</th></tr> <tr><td>High</td><td>38</td></tr> <tr><td>Mid</td><td>18</td></tr> <tr><td>Low</td><td>9</td></tr> </table>	Point	Target ppm	High	38	Mid	18	Low	9
Point	Target ppm								
High	38								
Mid	18								
Low	9								

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	1999	0.00	1999	0.0	0.06	n/a
as found high	1936	63.90	2000	37.99	38.36	0.992
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1936	63.90	2000	37.99	38.00	1.000
mid	1971	30.30	2001	18.00	17.78	1.012
low	1984	15.10	1999	8.98	8.82	1.018
calibrator zero	1999	0.00	1999	0.0	0.00	n/a
Average C.F. =						1.010

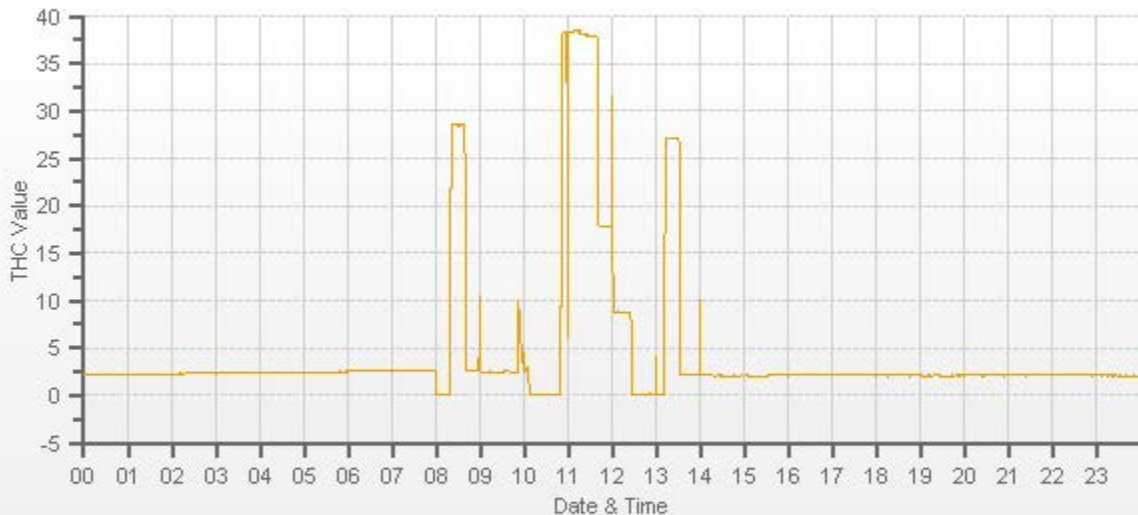
Linear Regression/Calibration Results:		LIMITS
Correlation Coefficient =	1.000	> or = 0.995
Slope =	0.999	.95-1.05
b (Intercept as % of full scale) =	0.23%	± 3% F.S.
% change in C.F. from last cal =	0.91%	± 10%



As found:	As left:
H2 cylinder (psi): 700	H2 cylinder (psi): 700
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 250	Span Cylinder (psi): 2100
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 37	Zero Air Gen Pressure: 37
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1108	cnt: 1084
rng: 1	rng: 1
try: 5	try: 5
flm: 187.2	flm: 186.6
det: 125.3	det: 125.9
Flame: 187	Flame: 186
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 07.52	Sample psi: 07.52
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 12	Internal Fuel Pressure: 12
Measured Flow: 0.9197	Measured Flow: 0.9272
Expected Value: 28.31	Expected Value: 27.07

Comments:
 The analyzer sample inlet filter was changed.

 A new span gas cylinder was installed.
 The analyzer cooling fan filter(s) were cleaned.



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: October 12, 2016	Barometric Pressure: 0.928 atm
Company/Airshed: LICA	Station Temperature °C: 21
Location/Station Name: Maskwa	Weather Conditions: A few clouds
Start/End Time 24 hr. (mst): 9:45 / 14:51	Calibration Purpose: shut down
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer:	Correction Factors:																
ID# or Serial Number: 2051	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> <tr> <td>NO =</td> <td>1.000</td> <td>0.997</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>0.998</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>0.996</td> <td>n/a</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	0.997	n/a	NO₂ =	1.000	0.998	n/a	NOx =	1.000	0.996	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	0.997	n/a														
NO₂ =	1.000	0.998	n/a														
NOx =	1.000	0.996	n/a														
Last Calibration Date: September 1, 2016																	
Range ppb: 1000																	

Calibrator:	Standard Calibration Points for a Range of: 1000 ppb																								
Flow Meter ID's: n/a																									
Make & Model: API 700																									
Serial #: 627																									
Cal Gas Cylinder I.D. #: LL119346																									
NO/NOx Gas Conc. (ppm): 50.0 50.0																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	-1.0	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	782.0	782.0	0.997	0.996
mid	4966	38.00	5004	379.7	379.7	375.0	375.0	1.013	1.010
low	4981	19.00	5000	190.0	190.0	186.0	187.0	1.022	1.011
Average C.F.=								1.010	1.005

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	784.0	782.0	-2.0	0.0	-2.0	
as found high NO2	4799	78.00	4877	490.0	278.0	278.0	783.0	506.0	507.0	0.998
gpt mid	4799	78.00	4877	270.0	505.0	783.0	278.0	279.0	280.0	0.996
gpt low	4799	78.00	4877	100.0	683.0	784.0	100.0	101.0	102.0	0.990
Average NO₂ C.F.=									0.995	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.996	0.995	0.995	0.90-1.10
b (Intercept as % of full scale)=	-0.30%	-0.32%	-0.07%	± 3% F.S.
% change in C.F. from last cal=	0.30%	0.20%	0.42%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

As found:	As left:
NOx SLOPE: 1.192	NOx SLOPE: n/a
NOx OFFS: -0.6	NOx OFFS: n/a
NO SLOPE: 1.194	NO SLOPE: n/a
NO OFFS: -2.1	NO OFFS: n/a
SAMP FLW: 501	SAMP FLW: n/a
OZONE FL: 81	OZONE FL: n/a
NORM PMT: -3.1	NORM PMT: n/a
AZERO: 47.9	AZERO: n/a
HVPS: 707	HVPS: n/a
DCPS: 2571	DCPS: n/a
RCELL: 50.2	RCELL: n/a
BOX TEMP: 27.8	BOX TEMP: n/a
IZS TEMP: 45.2	IZS TEMP: n/a
MOLY TEMP: 314.8	MOLY TEMP: n/a
RCEL: 5.0	RCEL: n/a
SAMP: 26.9	SAMP: n/a
Expected Value NO: 9.50	Expected Value NO: n/a
Expected Value NO ₂ : 422.00	Expected Value NO ₂ : n/a
Expected Value NOx: 432.00	Expected Value NOx: n/a

Comments:

No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

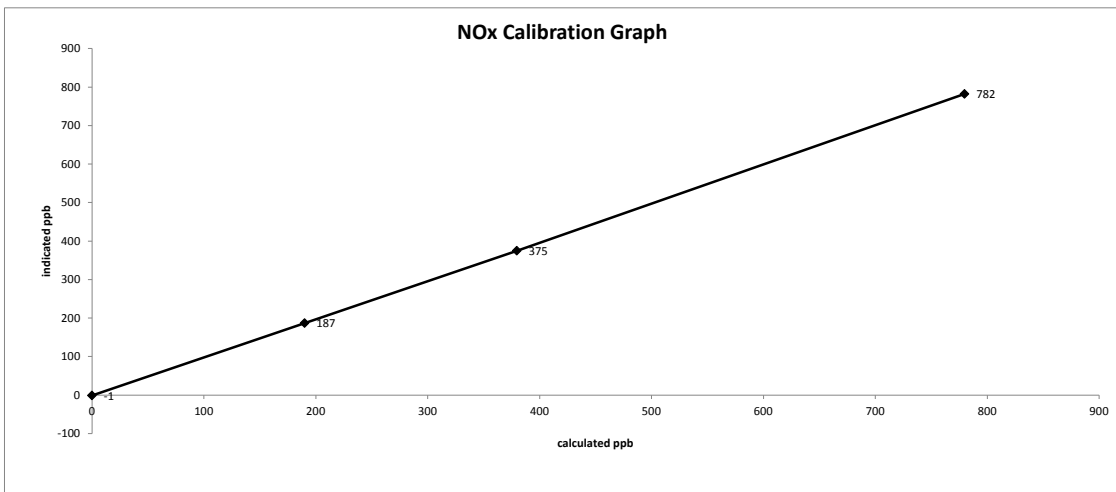
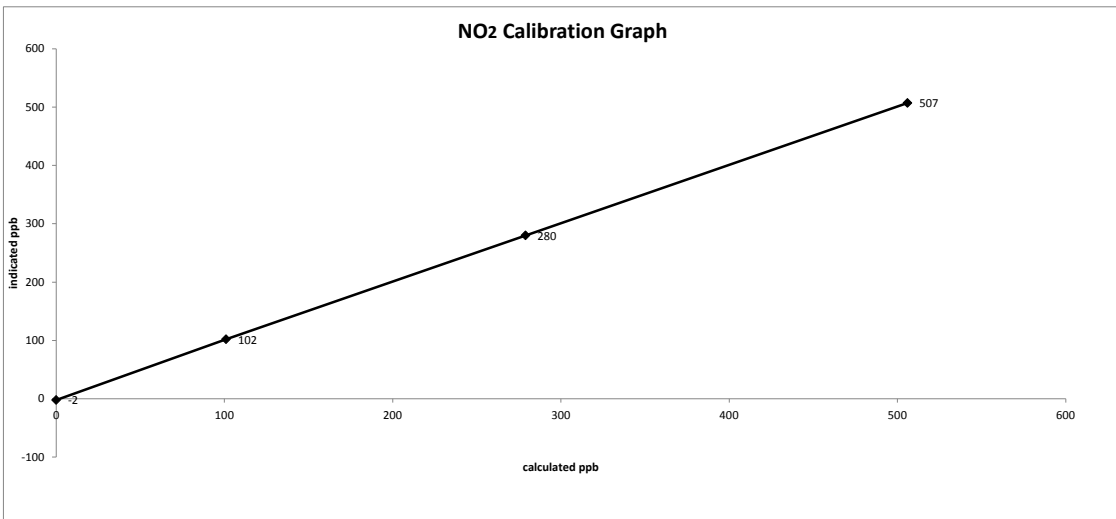
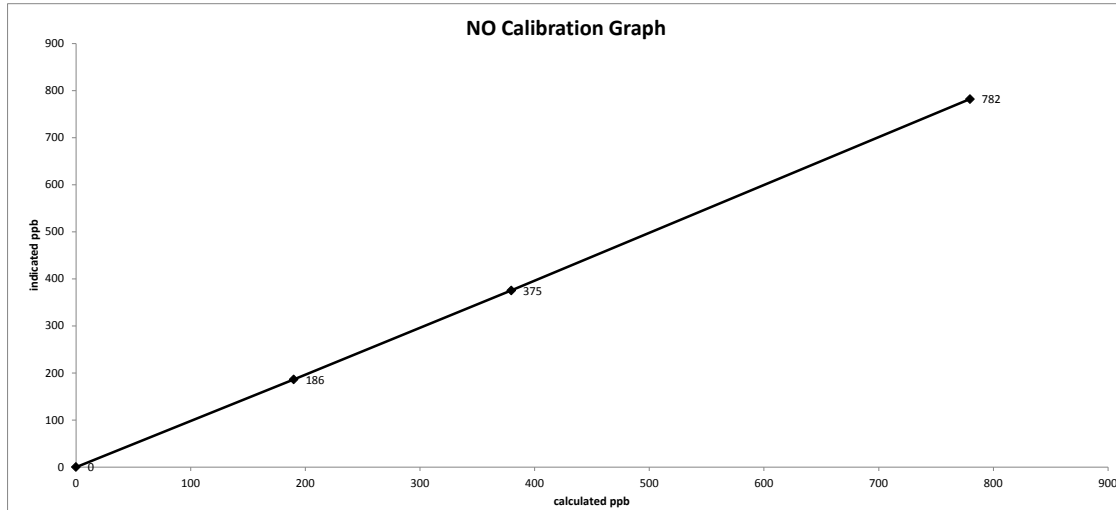
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

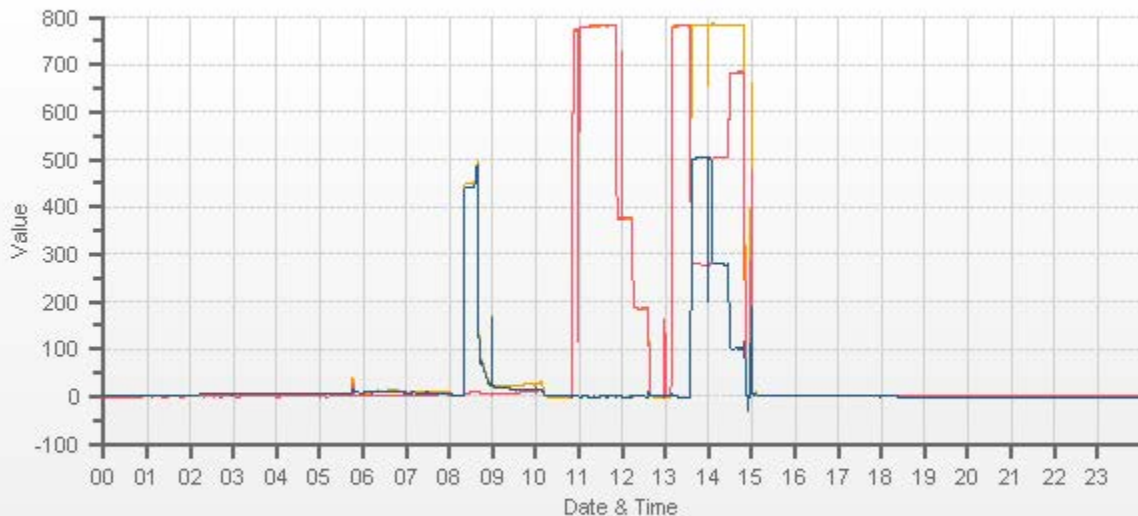
No High Point NOx adjustment made.

Reason for the shutdown calibration: according to a daily report, readings of the analyzer after ZERO/SPAN daily checks are higher during first two hours. The analyzer required replacement and maintenance.

Date: October 12, 2016
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 9:45 / 14:51
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration





NOx[ppb] NO[ppb] NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

Date: October 13, 2016	Barometric Pressure: 0.927 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: A few clouds
Start/End Time 24 hr. (mst): 8:21 / 14:15	Calibration Purpose: installation
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer:	Correction Factors:												
ID# or Serial Number: 1899	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">Previous C.F.:</th> <th style="width: 33%;">As Found C.F.:</th> <th style="width: 33%;">New C.F.:</th> </tr> <tr> <td>NO =</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>n/a</td> <td>1.000</td> </tr> </table>	Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	1.000	NO ₂ =	n/a	1.000	NOx =	n/a	1.000
Previous C.F.:	As Found C.F.:	New C.F.:											
NO =	n/a	1.000											
NO ₂ =	n/a	1.000											
NOx =	n/a	1.000											
Last Calibration Date: n/a													
Range ppb: 1000													

Calibrator:	Standard Calibration Points for a Range of: 1000 ppb																								
Flow Meter ID's: n/a																									
Make & Model: API 700																									
Serial #: 627																									
Cal Gas Cylinder I.D. #: LL119346																									
NO/NOx Gas Conc. (ppm): 50.0 50.0																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
adjusted zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
adjusted high	4924	78.0	5002	779.7	779.7	780.0	780.0	1.000	1.000
mid	4966	38.00	5004	379.7	379.7	373.0	373.0	1.018	1.018
low	4981	19.00	5000	190.0	190.0	184.0	183.0	1.033	1.038
calibrator zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F.=								1.017	1.019

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	777.0	777.0	0.0	0.0	0.0	
adjusted high NO2	4799	78.00	4877	490.0	262.0	777.0	515.0	515.0	515.0	1.000
gpt mid	4799	78.00	4877	265.0	491.0	777.0	286.0	286.0	286.0	1.000
gpt low	4799	78.00	4877	80.0	684.0	777.0	93.0	93.0	93.0	1.000
Average NO₂ C.F.=									1.000	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.997	1.000	.95-1.05
b (Intercept as % of full scale)=	-0.38%	-0.42%	0.00%	± 3% F.S.
% change in C.F. from last cal=	n/a	n/a	n/a	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

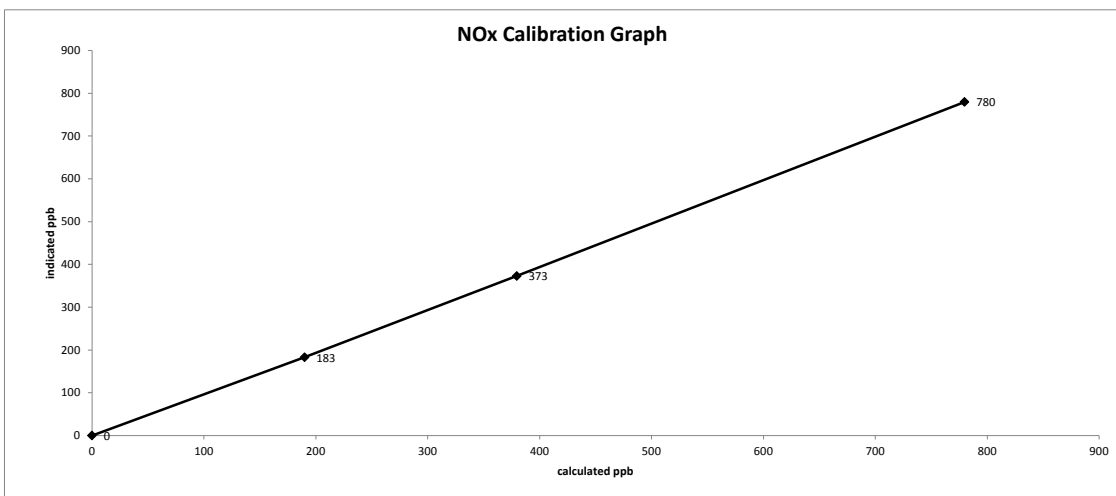
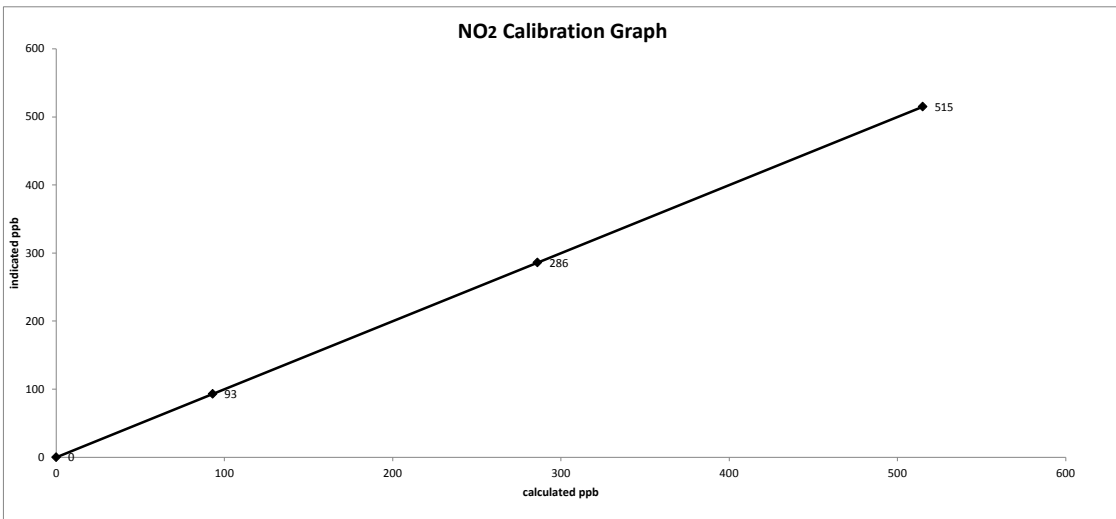
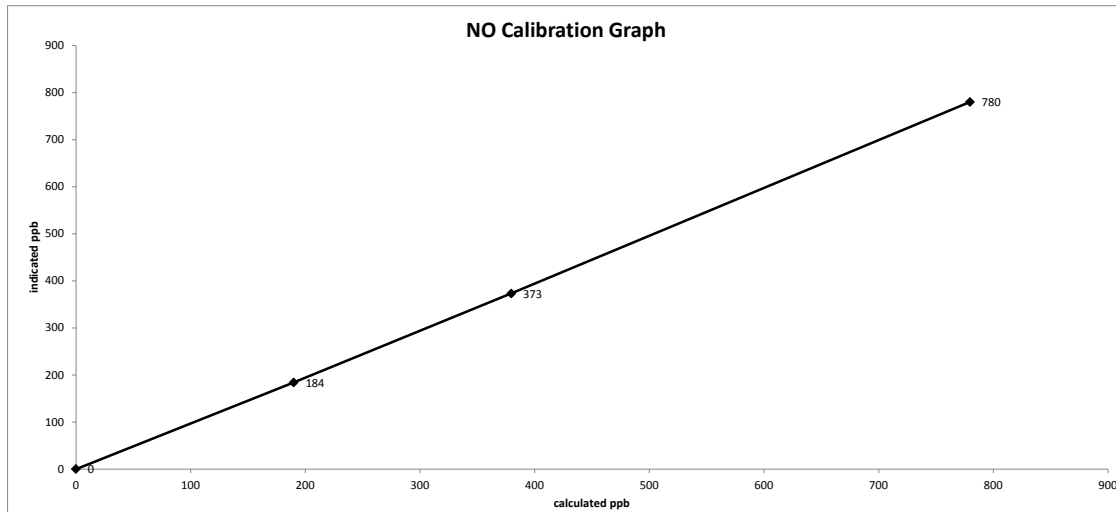
As found:	As left:
NOx SLOPE: n/a	NOx SLOPE: 1.270
NOx OFFS: n/a	NOx OFFS: 0.2
NO SLOPE: n/a	NO SLOPE: 1.284
NO OFFS: n/a	NO OFFS: -0.6
SAMP FLW: n/a	SAMP FLW: 550
OZONE FL: n/a	OZONE FL: 78
NORM PMT: n/a	NORM PMT: -0.4
AZERO: n/a	AZERO: 23.5
HVPS: n/a	HVPS: 662
DCPS: n/a	DCPS: 2571
RCELL: n/a	RCELL: 50.1
BOX TEMP: n/a	BOX TEMP: 31.0
IZS TEMP: n/a	IZS TEMP: 45.0
MOLY TEMP: n/a	MOLY TEMP: 315.1
RCEL: n/a	RCEL: 5.6
SAMP: n/a	SAMP: 25.8
Expected Value NO: n/a	Expected Value NO: 4.00
Expected Value NO ₂ : n/a	Expected Value NO ₂ : 355.00
Expected Value NOx: n/a	Expected Value NOx: 359.00

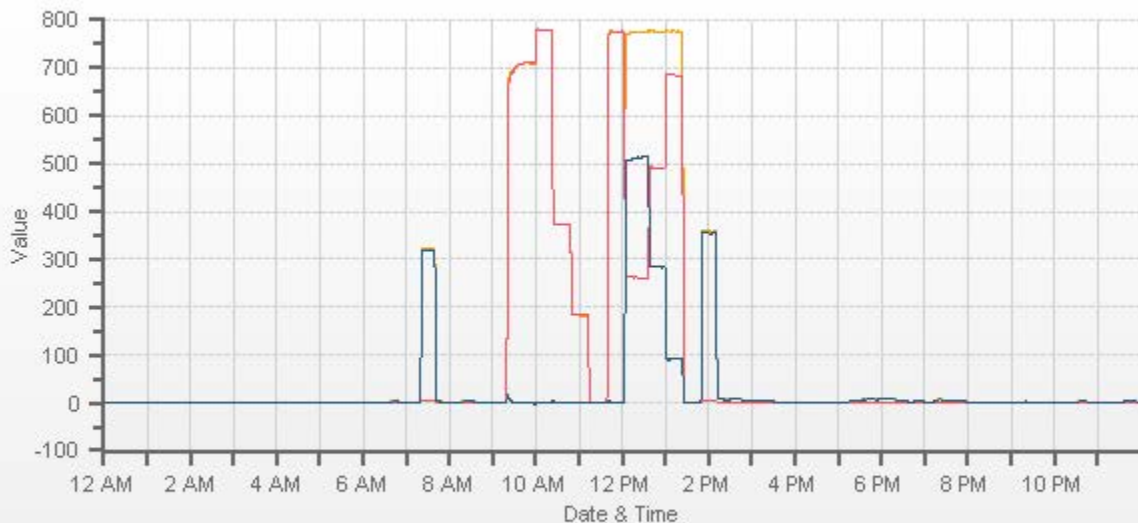
Comments:
 The analyzer sample inlet filter was changed. No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

Analyzer #1899 installed to replace the analyzer # 2051 because readings were high after the daily ZERO/SPAN checks. Analyzer #2051 required maintenance/repair.

Date: October 13, 2016
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 8:21 / 14:15
Calibration Purpose: installation
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

Date: October 19, 2016 Company/Airshed: LICA Location/Station Name: Maskwa Start/End Time 24 hr. (mst): 9:07 / 14:27 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Gas Phase Titration	Barometric Pressure: 0.933 atm Station Temperature °C: 22 Weather Conditions: Light snow Calibration Purpose: repeat Performed By/Reviewer: Alex Yakupov / Trina Whatsitt Cal Gas Expiry Date: December 2, 2023
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Analyzer: ID# or Serial Number: 1899 Last Calibration Date: October 13, 2016 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>Previous C.F.:</td> <td>As Found C.F.:</td> <td>New C.F.:</td> </tr> <tr> <td>NO =</td> <td>1.000</td> <td>1.006</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.006</td> <td>1.000</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.006	1.000	NO ₂ =	1.000	1.000	1.000	NOx =	1.000	1.006	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.006	1.000														
NO ₂ =	1.000	1.000	1.000														
NOx =	1.000	1.006	1.000														

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total Flow	Calculated NO (ppb)	Calculated NOx (ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	NO C.F.	NOx C.F.
as found zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	775.0	775.0	1.006	1.006
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	78.00	5002	779.7	779.7	780.0	780.0	1.000	1.000
mid	4966	38.00	5004	379.7	379.7	373.0	373.0	1.018	1.018
low	4981	19.00	5000	190.0	190.0	183.0	183.0	1.038	1.038
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
								Average C.F.=	1.019

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total Flow	Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	Indicated NO ₂ (ppb)	NO drop (ppb)	NO ₂ gain (ppb)	NO ₂ C.F. (ppb)	
NOx reference	4924	78.00	5002	0.0	777.0	777.0	0.0	0.0	0.0	n/a	
as found high NO2	4799	78.00	4877	480.0	270.0	778.0	507.0	507.0	507.0	1.000	
adjusted high NO2	4799	78.00	4877	480.0	270.0	778.0	507.0	507.0	507.0	1.000	
gpt mid	4799	78.00	4877	260.0	501.0	777.0	276.0	276.0	276.0	1.000	
gpt low	4799	78.00	4877	90.0	681.0	777.0	96.0	96.0	96.0	1.000	
										Average NO ₂ C.F.=	1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.997	0.997	1.000	.95-1.05
b (Intercept as % of full scale) =	-0.42%	-0.42%	0.00%	± 3% F.S.
% change in C.F. from last cal- NO ₂ converter efficiency	-0.60%	-0.60%	0.00%	± 10%
			1.00	0.96 to 1.04

As found: NOx SLOPE: 1.270 NOx OFFS: 0.2 NO SLOPE: 1.284 NO OFFS: -0.6 SAMP FLW: 556 OZONE FL: 78 NORM PMT: -0.4 AZERO: 22.5 HVPS: 662 DCPS: 2573 RCELL: 50.6 BOX TEMP: 29.3 IZS TEMP: 45.0 MOLY TEMP: 315.1 RCEL: 5.7 SAMP: 26.0 Expected Value NO: 4.00 Expected Value NO ₂ : 355.00 Expected Value NOx: 359.00	As left: NOx SLOPE: 1.278 NOx OFFS: 0.2 NO SLOPE: 1.293 NO OFFS: -0.6 SAMP FLW: 556 OZONE FL: 78 NORM PMT: -0.7 AZERO: 23.1 HVPS: 661 DCPS: 2568 RCELL: 50.5 BOX TEMP: 31.3 IZS TEMP: 45.5 MOLY TEMP: 315.1 RCEL: 5.7 SAMP: 26.0 Expected Value NO: 4.00 Expected Value NO ₂ : 370.00 Expected Value NOx: 374.00
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Comments:

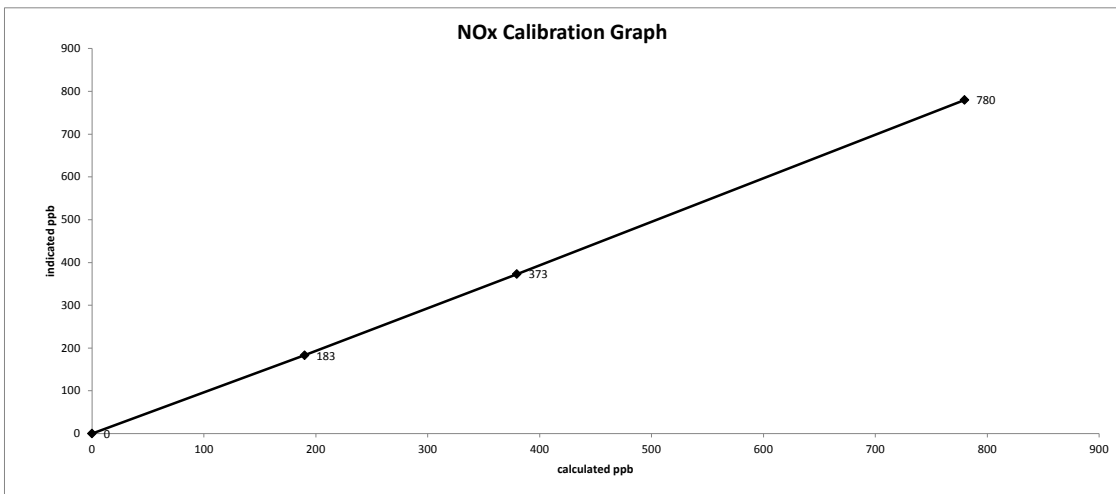
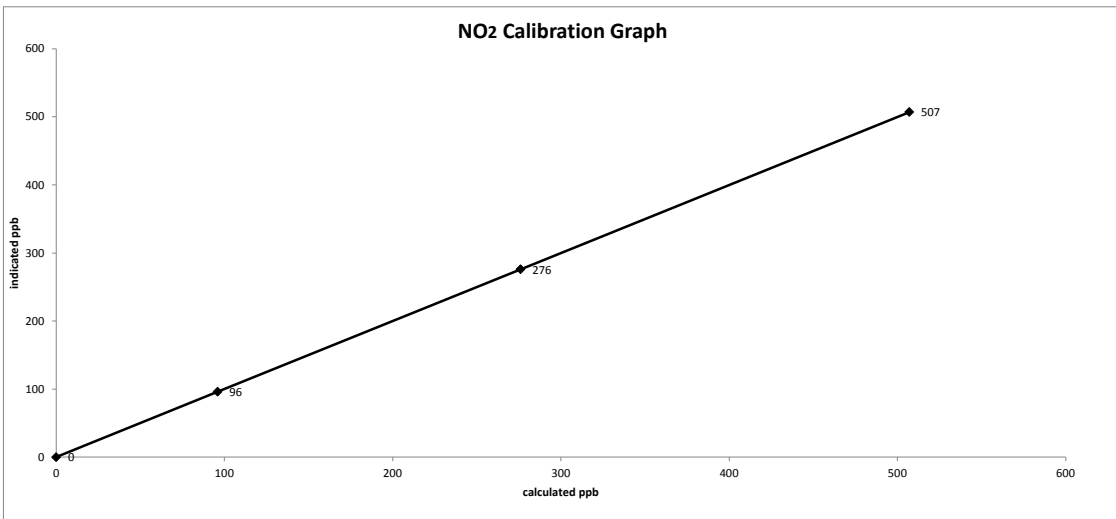
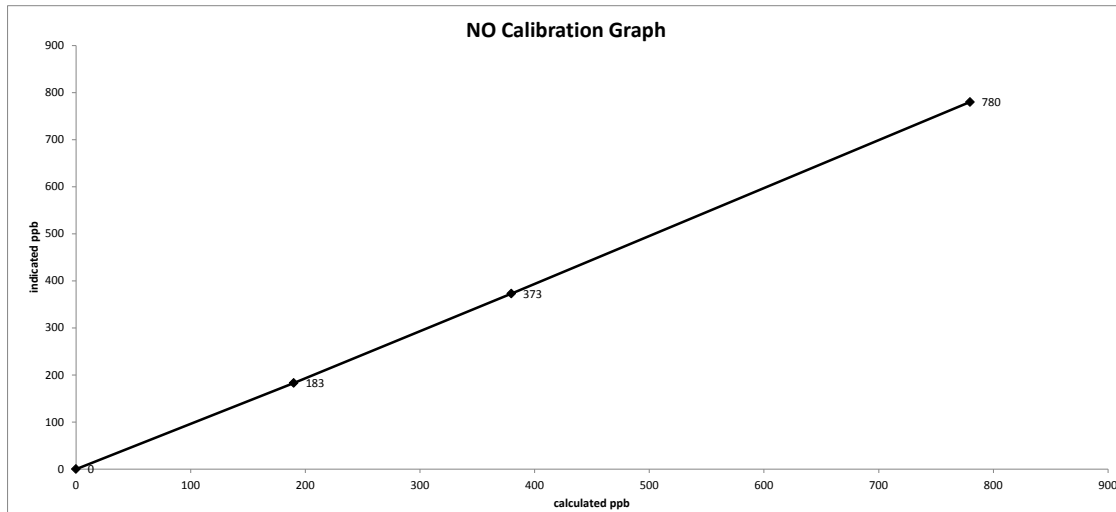
No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

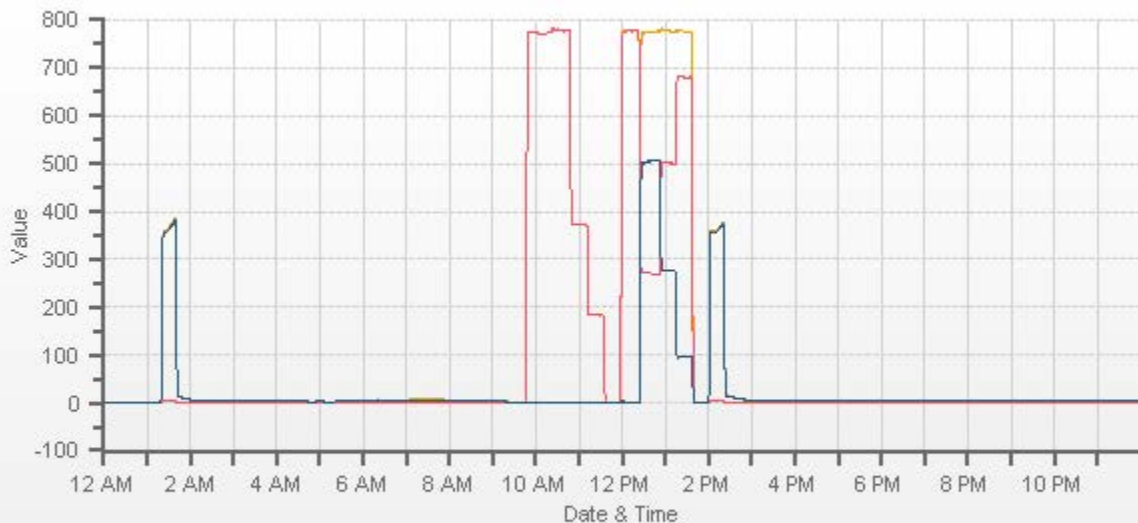
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

Repeat calibration required to correct the EV. According to a daily report, SPAN readings during daily ZERO/SPAN checks have drifted over 6% since the installation calibration. A full repeat calibration required to correct the EV.

Date: October 19, 2016
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 9:07 / 14:27
Calibration Purpose: repeat
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

Date: October 31, 2016
Company/Airshed: LICA
Location/Station Name: Maskwa
Start/End Time 24 hr. (mst): 16:22 / 17:23
G.P.T. to be used for Ozone? No
Calibration Method: Gas Dilution & Gas Phase Titration

Barometric Pressure: 27.4 inHg
Station Temperature °C: 21
Weather Conditions: Mainly cloudy with clear breaks
Calibration Purpose: as found
Performed By/Reviewer: Chris Wesson / Trina Whitsitt
Cal Gas Expiry Date: December 2, 2023

Analyzer:
ID# or Serial Number: 1899
Last Calibration Date: October 19, 2016
Range ppb: 1000

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	1.000	0.987	n/a
NO ₂ =	1.000	1.000	n/a
NOx =	1.000	0.982	n/a

Calibrator:
Flow Meter ID's: n/a
Make & Model: Sabio 2010
Serial #: 17100415
Cal Gas Cylinder I.D. #: LL119317
NO/NOx Gas Conc. (ppm): 50.3 | 50.3

Standard Calibration Points for a Range of: 1000 ppb

Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?
High	780	500	n/a
Mid	380	275	n/a
Low	190	100	n/a
Extra Point #1	n/a	n/a	n/a
Extra Point #2	n/a	n/a	n/a

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5001	0.0	5001	0	0	0.0	1.0	n/a	n/a
as found high	4922	77.8	5000	782.7	782.7	793.0	798.0	0.987	0.982
Average C.F.=								n/a	n/a

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4922	77.80	5000	0.0	793.0	798.0	5.0	0.0	5.0	
as found high NO2	4922	77.80	5000	500.0	288.0	798.0	510.0	505.0	505.0	1.000
Average NO₂ C.F.=										n/a

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	n/a	n/a	n/a	> or = 0.995
Slope =	n/a	n/a	n/a	.95-1.05
b (Intercept as % of full scale)=	n/a	n/a	n/a	± 3% F.S.
% change in C.F. from last cal=	1.30%	0.00%	1.79%	± 10%
NO ₂ converter efficiency				0.96 to 1.04

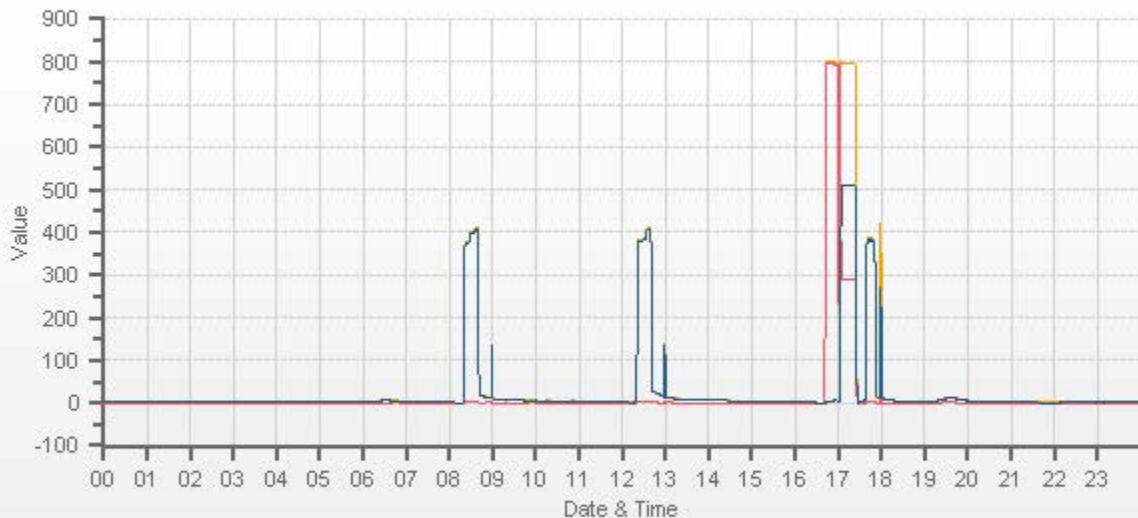
As found:

NOx SLOPE: 1.278
 NOx OFFS: 0.2
 NO SLOPE: 1.293
 NO OFFS: 0.6
 SAMP FLW: 543
 OZONE FL: 77
 NORM PMT: 1.0
 AZERO: 22.0
 HVPS: 662
 DCPS: 2580
 RCELL: 50.4
 BOX TEMP: 28.5
 IZS TEMP: 45.1
 MOLY TEMP: 316.6
 RCEL: 5.6
 SAMP: 25.5
 0 PMT Temp =7.0
 Expected Value NO: 4.00
 Expected Value NO2: 370.00
 Expected Value NOx: 374.00

As left:

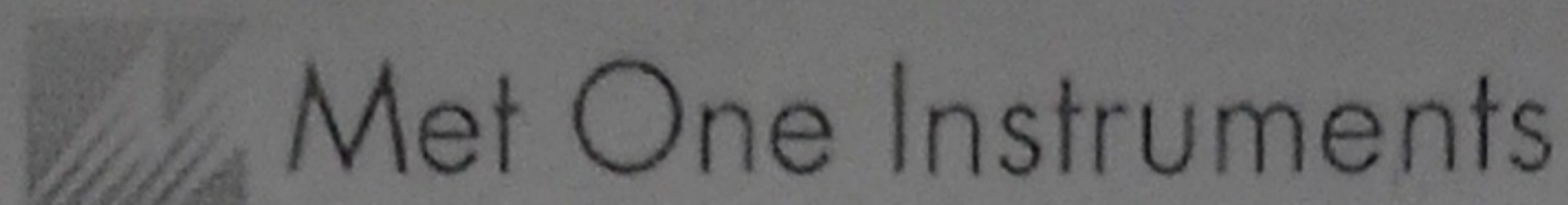
NOx SLOPE: 1.278
 NOx OFFS: 0.2
 NO SLOPE: 1.293
 NO OFFS: 0.6
 SAMP FLW: 544
 OZONE FL: 77
 NORM PMT: -0.5
 AZERO: 22.2
 HVPS: 662
 DCPS: 2573
 RCELL: 50.8
 BOX TEMP: 29.2
 IZS TEMP: 45.0
 MOLY TEMP: 315.0
 RCEL: 5.6
 SAMP: 25.4
 0 PMT Temp = 7.0
 Expected Value NO: 4.00
 Expected Value NO2: 370.00
 Expected Value NOx: 374.00

Comments:



NOX[ppb] NO[ppb] NO2[ppb]

WIND SYSTEM



Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H	Sensor Serial No.: H10703
Sensor Output Swing 0V - 1.0V	Sensor Output Range: 0 - 50.0 MPS
Customer: <u>Maxxam Analytics</u>	Sales Order No.: <u>115035</u>
Tested per PO: <u>35-62828</u>	Calibration Date: <u>03/30/2016</u>
Calibrated by: <u>David Frith</u> DF	QC Inspection: <u><i>Byron Dawson</i></u>

Instrument Condition Within Tolerance:	As Found	___	As Left	X
Corrective Action: No Adjustment	Adjust	X	Repair	___
	Preventative Maintenance	___		

As Found Test Date: N/A As Left Test Date: 03/30/2016

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.

All Work Performed per Customer Purchase Order Requirements.

Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	4/24/2012	4/24/2017	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none

Humidity 20 to 70% Radiation none

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO_x		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model <u>Thermo 146i</u>	Make/Model <u>Thermo 42i</u>
Serial/AMU Number <u>1809</u>	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>None</u>
Serial Number	<u>11900613</u>	Serial Number	<u>None</u>
Last Verification Date	<u>April 1, 2015</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>706 mmHg</u>
NO/NOx Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5001</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4999	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5001	77.5	0.779	0.779	0.775	0.000	0.775	-1%	-1%
5000	37.8	0.380	0.380	0.376	0.001	0.377	-1%	-1%
5000	18.9	0.190	0.190	0.188	0.001	0.189	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 0.9950	0.90-1.10	m (Slope)= 0.9946
b (Intercept % of FS)= -0.0773	± 3% F.S.	b (Intercept % of FS)= -0.0167

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO ₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9992	0.90-1.10
b (Intercept % of FS)= 0.0171	± 3% F.S.

AENV Standards Audit Calibrator	NO _x Analyzer
Make/Model <u>Thermo 146i</u>	Make/Model <u>Thermo 42i</u>
Serial/AMU Number <u>1809</u>	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>March 28, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: NO Cyl has 49.9ppb SO₂ - Flows Not Manually Measured

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 31, 2016
Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Christopher Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>17100415</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>May 2015</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOX Concentration	<u>48.5/48.5</u>		

Dilution Flow (sccm)		
Pt. #1 <u>5000</u>	Pt. #2 <u>5000</u>	Pt. #3 <u>5000</u>
Gas Flow (sccm)		
Pt. #1 <u>80</u>	Pt. #2 <u>40</u>	Pt. #3 <u>20</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5001	80.7	0.783	0.783	0.810	-0.004	0.806	3%	3%
5001	39.4	0.382	0.382	0.395	-0.001	0.393	3%	3%
5000	19.8	0.192	0.192	0.198	0.000	0.198	3%	3%
Absolute Average Percent Difference							3%	3%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0347	0.90-1.10	m (Slope)= 1.0292
b (Intercept % of FS)= -0.0283	± 3% F.S.	b (Intercept % of FS)= 0.0098

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5001	Lamp C.	0.000	0.808	-0.004	0.804	NO ₂	% Diff. Limit
5001	1.316	0.476	0.332	0.472	0.804	0%	± 10%
5001	0.696	0.234	0.574	0.231	0.805	0%	± 10%
5001	0.392	0.089	0.719	0.086	0.805	1%	± 10%
Absolute Average Percent Difference						1%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS	
Correlation= 1.0000	≥ 0.995	
m (Slope)= 0.9994	0.90-1.10	
b (Intercept % of FS)= -0.3382	± 3% F.S.	

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model <u>Teco 146i</u>	Make/Model <u>Teco 42i</u>
Serial/AMU Number <u>AMU 1809</u>	Serial/AMU Number <u>AMU 1868</u>
	Last Calibration Date <u>May 18, 2016</u>
	Full Scale (ppm) <u>1.0</u>

COMMENTS: Contains 50.3 ppm SO₂. Flows not measured as per Chapter 7, Section 5 of AMD.

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: May 18, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas: Make/Model: <u>Thermo146i</u> Serial Number: <u>1809</u> Last Verification Date: <u>February 2, 2016</u> Gas Type: <u>SO2</u> Conc. <u>98.07</u> Cylinder Number: <u>CAL016625</u>	Flow Measurement Device: Make/Model: <u>Bios DC-2</u> Serial Number: <u>Bios D</u> Temp. °C: <u>24.5</u> B.P. <u>702mmHg</u>
--	---

Reference Analyzer:
 Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0
 Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: *[Signature]*

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: LL36837 **Concentration PPM:** 10.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P.: 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson
Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:
Make/Model R&R MFC 201
Serial Number AMU 1698
Last Verification Date January 18, 2016
Gas Type CH4 Conc. 999.2
Cylinder Number D751932
Gas Type C3H8 Conc. 246.5
Cylinder Number XF0037998

Flow Measurement Device:
Make/Model Bios DC-2
Serial Number Blos D
Temp. °C 24.5
B.P. 698mmHg

Reference Analyzer:
Make/Model Thermo 55C Serial/AMU Number: 1643
Instrument Settings Zero: NA Span: NA Range: 20.0
Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	0.02140	46.722	607	214
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						608	215

CH4	C3H8
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
Operator Signature: _____

Date: January 19, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:
 Make/Model Thermo 42i Serial/AMU Number: 1868
 Instrument Settings Zero: 4.2 Span: 1.014 Range: 1.0
 Last Calibration: Date: 02-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

NO	NOx
Previous Stated Concentration PPM: <u>50.0</u>	<u>50.0</u>
Percent variance from Stated: <u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS: SO2/NO Blend 50.0PPM SO2**
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: February 2, 2016
 Operator Signature: [Signature] Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-113CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119317 **Conc (PPM)** 50.3/50.3 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:
 Make/Model Thermo 42i Serial/AMU Number: 1868
 Instrument Settings Zero: 4.2 Span: 1.014 Range: 1.0
 Last Calibration: Date: 02-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4945	0.0	0.000	0.000	0.01598	62.597	50.1	50.3
4937	78.87	0.801	0.803	0.01598	62.597	50.1	50.3
4956	39.38	0.399	0.399	0.00795	125.851	50.2	50.2
4940	19.50	0.198	0.198	0.00395	253.333	50.2	50.2
Average Cylinder Concentration:						50.2	50.2

	NO		NOx
Previous Stated Concentration PPM:	<u>50.3</u>		<u>50.3</u>
Percent variance from Stated:	<u>0.3</u>		<u>0.2</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO Blend 49.9PPM SO2
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: February 2, 2016
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

APPENDIX III
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	Maskwa Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Bim Adeniji	Project Manager Assistant, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



Signature of the Representative of the Person Responsible / External Person Certifying the Report

05-12-2016





Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-10-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification		Date <u>28-NOV-2016</u>
Level 1 Primary Validation		Date <u>29-NOV-2016</u>
Level 2 Final Validation		Date <u>05-DEC-2016</u>
Level 3 Independent Data Review		Date <u>05-DEC-2016</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.



MAXXAM ANALYTICS
#1 2080 39 Ave. NE, Calgary, AB
T2E 6P7

maxxam.ca
Toll Free 800-386-7247
Fax 403-219-3673

**AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
ST. LINA CONTINUOUS MONITORING STATION**

JOB #: 2833-2016-10-31-C

October 2016

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
BONNYVILLE, ALBERTA
T9N 2J5

Attention: MIKE BISAGA

DATE: **December 5, 2016**

Prepared by:

A handwritten signature in blue ink, appearing to read "Bim Adeniji".

Bim Adeniji, M.Sc.
Project Manager Assistant, Customer Service, Air Services

Reviewed by:

A handwritten signature in black ink, appearing to read "Cheri Sinclair".

Cheri Sinclair, B.Sc.
Supervisor, Customer Service, Air Services

SUMMARY

In October 2016, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry and Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

PM_{2.5}: Eighteen hours of data were recorded at concentrations less than $3 \mu\text{g}/\text{m}^3$, rendering the data invalid.

WS/WD/STDWD: The wind system was re-installed on October 27, following an annual calibration by the manufacturer. Two hours of downtime were recorded due to the installation event.

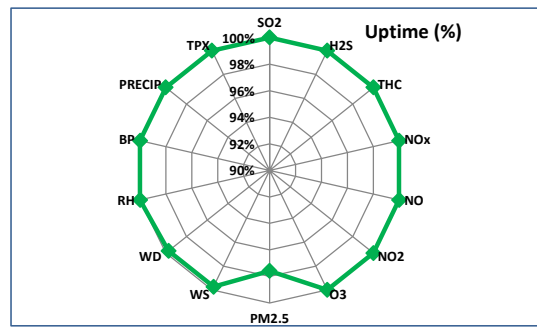
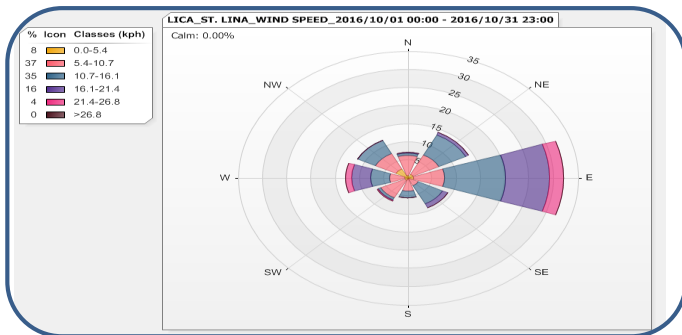
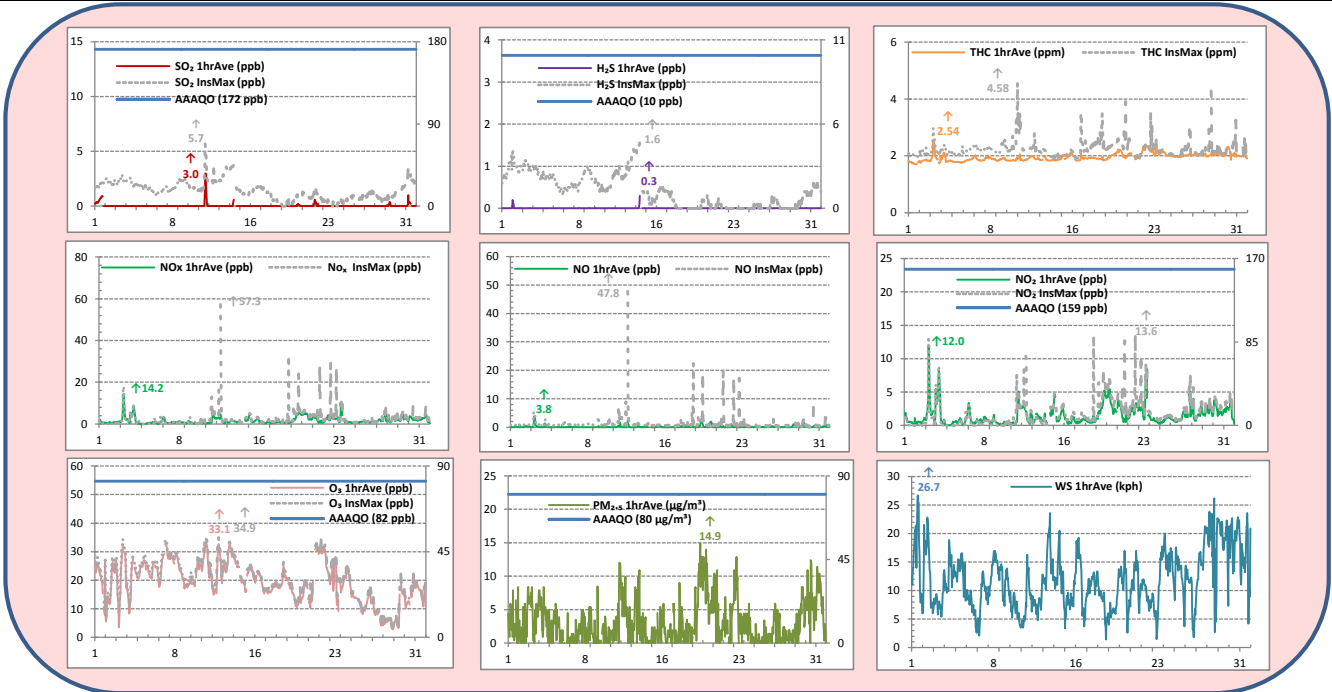
The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, St. Lina Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Lakeland Industry & Community Association - St. Lina Site October 2016 Monthly Report Summary

Pollutants	Monthly Records		1-Hour Records						24-Hour Records				
	Name ₂	Unit	Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
					Conc.	Date	Hour			Conc.	Date		
SO ₂	ppb	0.0	100.0%	3.0	October 11	16	172	0	0.4	October 1, 11	48	0	
H ₂ S	ppb	0.0	100.0%	0.3	October 14	9	10	0	0.0	ALL	3	0	
THC	ppm	1.95	100.0%	2.54	October 3	7	-	-	2.16	October 22	-	-	
NO _x	ppb	1.6	100.0%	14.2	October 3	7	-	-	3.7	October 3, 20	-	-	
NO ₂	ppb	0.1	100.0%	3.8	October 3	7	-	-	0.6	October 3, 19	-	-	
NO	ppb	1.5	100.0%	12.0	October 3	6	159	0	3.2	October 20	-	-	
O ₃	ppb	19.2	100.0%	33.1	October 11	10	82	0	27.9	October 22	-	-	
PM _{2.5}	µg/m ³	3.1	97.6%	14.9	October 19	17	80	0	7.9	October 20	30	0	
WS	kph	3.6	99.7%	26.7	October 1	13	-	-	17.3	October 29	-	-	
WD	degree	78 (ENE)	99.7%	-	-	-	-	-	-	-	-	-	
RH	%	80	100.0%	91	October 1, 2	VAR	-	-	90	October 24, 25	-	-	
BP	mbar	927	100.0%	939	October 6, 7	VAR	-	-	937	October 7	-	-	
PRECIP	mm	0.1	100.0%	5.1	October 1	14	-	-	0.9	October 14	-	-	
AmbTPX	°C	0.9	100.0%	14.3	October 3	15	-	-	7.8	October 3	-	-	



Monthly Update

- * All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- * All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.

Operational Issues

- **PM_{2.5}** : Eighteen hours of data were recorded at concentrations less than - 3 µg/m³, rendering the data invalid.
- **Wind System**: The wind system was re-installed on October 27, following an annual calibration by the manufacturer. Two hours of downtime were recorded due to the installation event.

Monthly Continuous Data Summary

Lakeland Industry & Community Association St. Lina Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.0	3.0	11	16	14.0	SW	0.4	1, 11	100.0
H ₂ S (ppb)	10	3	0	0	0.0	0.3	14	9	16.6	ENE	0.0	ALL	100.0
THC (ppm)	-	-	-	-	1.95	2.54	3	7	8.9	ENE	2.16	22	100.0
NO ₂ (ppb)	159	-	0	-	1.5	12.0	3	6	9.4	NE	3.2	20	100.0
NO (ppb)	-	-	-	-	0.1	3.8	3	7	8.9	ENE	0.6	3, 19	100.0
NO _x (ppb)	-	-	-	-	1.6	14.2	3	7	8.9	ENE	3.7	3, 20	100.0
O ₃ (ppb)	82	-	0	-	19.2	33.1	11	10	7.8	W	27.9	22	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	3.1	14.9	19	17	7.4	SSW	7.9	20	97.6
RELATIVE HUMIDITY (%)	-	-	-	-	80	91	1, 2	VAR	VAR	VAR	90	24, 25	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	927	939	6, 7	VAR	VAR	VAR	937	7	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	0.9	14.3	3	15	7.4	NE	7.8	3	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	5.1	1	14	25.4	E	0.9	14	100.0
VECTOR WS (kph)	-	-	-	-	3.6	26.7	1	13	-	E	17.3	29	99.7
VECTOR WD (sec)	-	-	-	-	78 (ENE)	-	-	-	-	-	-	-	99.7

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

H₂S 1-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

H₂S 24-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

PM_{2.5} 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O₃ 1-Hour Exceedances

Measured concentrations of ozone were below the 1-hour AAAQO of 82 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring data for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

Sample filters for all continuous air monitors are changed before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (August 3, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 14. The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the SO₂ channel, on October 21, during the post-calibration zero-span check on the Ozone analyzer. Three hours of maximum instantaneous data were discarded due to a brief power failure.

HYDROGEN SULPHIDE (H₂S)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 14. Three hours of maximum instantaneous data were discarded due to a brief power failure.

TOTAL HYDROCARBONS (THC)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 21. Two hours of maximum instantaneous data were discarded due to a brief power failure.

NITROGEN DIOXIDE (NO₂)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 14. Three hours of maximum instantaneous data were discarded due to a brief power failure.

OZONE (O₃)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 21. The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the O₃ channel, on October 14, during the post-calibration zero-span check on the SO₂ analyzer. Two hours of maximum instantaneous data were discarded due to a brief power failure.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

Two routine audits were performed this month: one was completed on October 7 and the other audit was performed on October 27.

Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data recorded below -3 µg/m³ was invalidated. Eighteen hours of data were invalidated as the data was below -3 µg/m³ this month.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

The wind system was sent to the manufacturer for routine annual calibration and it was re-installed on October 27. Two hours of downtime were recorded, at hours 13:00 and 14:00, due to the installation event. Three hours of maximum instantaneous data were discarded due to a brief power failure.

The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was coming from.

RELATIVE HUMIDITY (RH)

There were no operational issues that impacted data this month.

BAROMETRIC PRESSURE (BP)

There were no operational issues that impacted data this month.

PRECIPITATION

There were no operational issues that impacted data this month.

AMBIENT TEMPERATURE (AmbTPX)

There were no operational issues that impacted data this month.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F TEOM Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

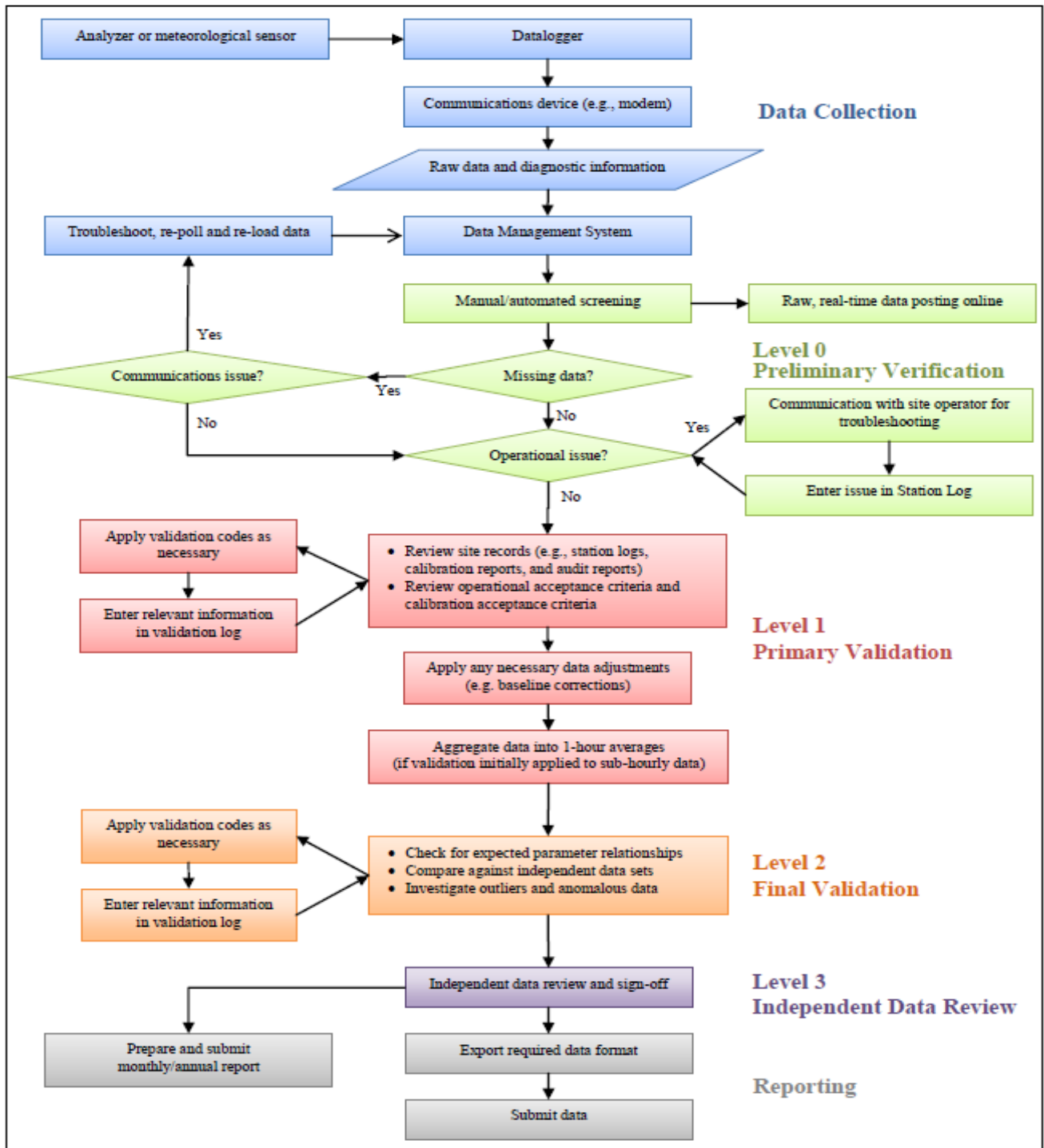
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (Aug 3, 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9	0.9	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.4	24	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.7	2.4	3.0	2.0	0.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.4	24	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
14	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.3	0.6	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	24	
15	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
16	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
17	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
18	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
19	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
20	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	S	0.0	0.0	0.2	0.0	24		
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Q	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	24	
22	0.0	0.0	0.0	0.2	0.4	0.6	0.4	0.4	0.3	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.6	0.1	24			
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
29	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	24		
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
31	0.0	0.0	0.0	0.0	0.2	1.0	0.2	0.3	0.4	0.3	0.2	0.2	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	24		
HOURLY MAX	0.2	0.2	0.3	0.3	0.4	1.0	0.4	0.4	0.4	0.6	0.5	0.6	0.7	0.7	0.8	2.4	3.0	2.0	0.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	24		
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

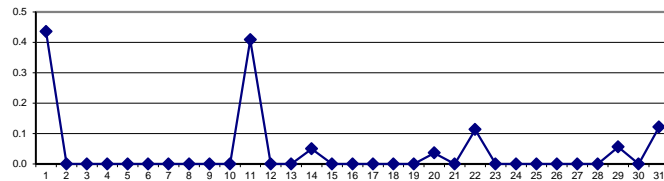
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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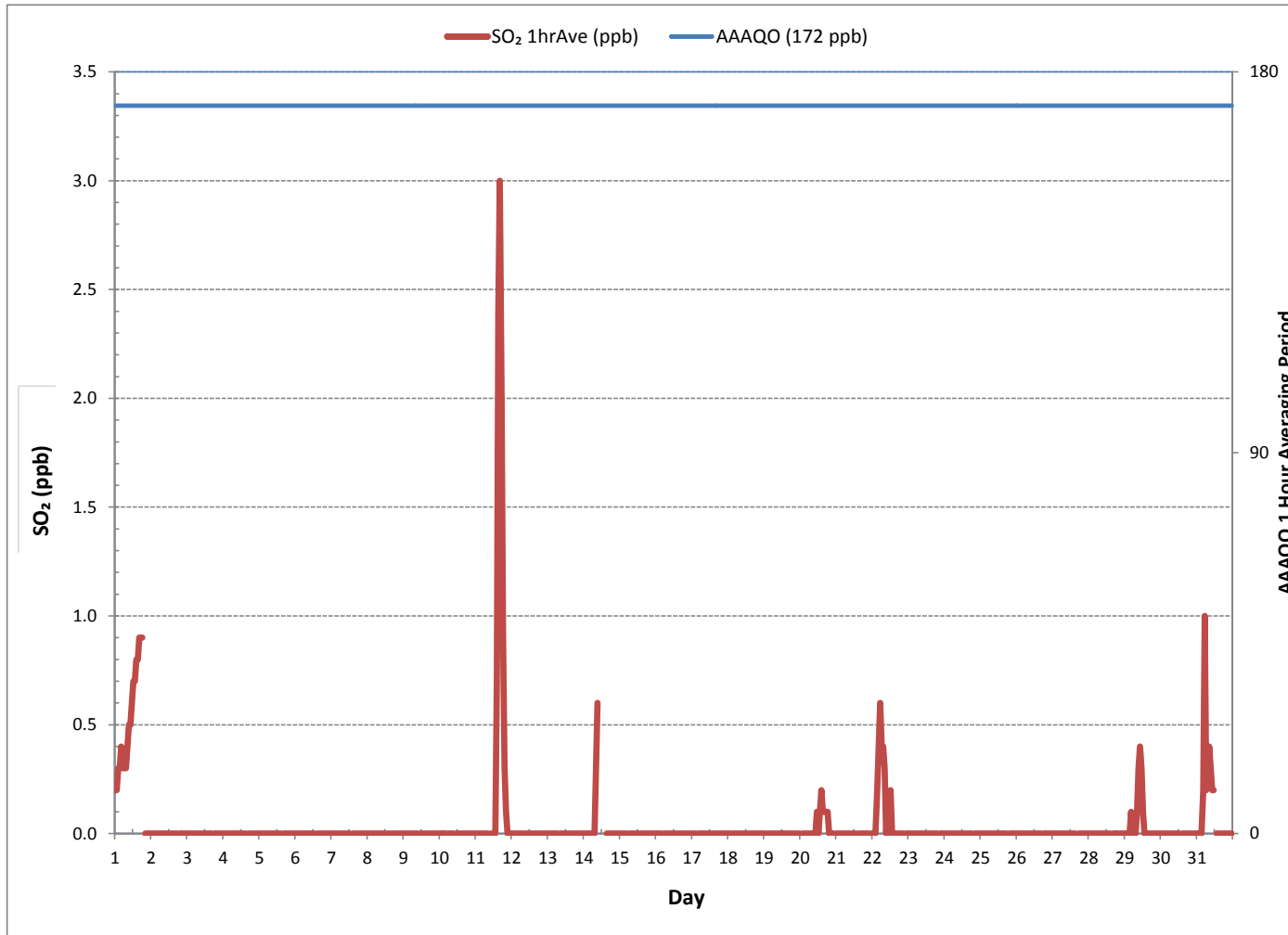
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	57			
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	3.0 ppb @ HOUR(S)	16	ON DAY(S)	11
MAXIMUM 24-HR AVERAGE:	0.4 ppb		ON DAY(S)	1, 11
			VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.20	MONTHLY AVERAGE:	0.0 ppb	

24 HOUR AVERAGES FOR October 2016



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.7	1.5	1.5	1.5	1.6	1.8	1.6	1.5	1.7	1.8	1.7	1.9	2.0	2.1	2.1	1.9	2.2	2.2	2.2	S	2.1	2.3	2.3	2.3	1.5	2.3	1.9	24	
2	2.4	2.4	2.5	2.4	2.3	2.3	2.4	2.1	2.0	2.0	2.0	2.2	2.0	2.1	1.9	2.0	2.0	2.0	S	2.0	1.9	2.3	2.4	2.3	1.9	2.5	2.2	24	
3	2.3	2.1	2.1	2.0	2.2	2.2	2.1	2.3	2.5	2.5	2.4	2.5	2.5	2.9	2.8	2.6	S	2.3	2.3	2.3	2.4	2.4	2.5	2.0	2.9	2.4	24		
4	2.4	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.6	2.6	2.5	2.2	2.1	2.2	1.9	2.0	S	1.8	2.0	1.8	2.0	1.8	2.0	1.7	1.7	2.6	2.2	24	
5	2.0	1.9	1.8	2.0	1.8	1.8	1.8	1.7	1.8	1.9	1.8	1.6	1.7	1.8	1.8	S	1.6	1.7	1.7	1.7	1.6	2.1	1.7	1.8	1.6	2.1	1.8	24	
6	1.7	1.7	1.7	1.5	1.7	1.6	1.5	1.7	1.5	1.5	1.6	1.5	1.3	1.3	S	1.3	1.2	1.2	1.1	1.2	1.1	1.0	1.0	1.0	1.0	1.7	1.4	24	
7	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.3	1.5	S	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.8	1.6	1.5	1.2	1.8	1.4	24	
8	1.3	1.3	1.5	1.5	1.5	1.6	1.3	1.5	1.5	1.5	1.6	1.5	S	1.6	1.8	1.7	1.7	1.6	1.8	1.9	1.9	1.9	2.0	2.1	1.3	2.1	1.6	24	
9	2.3	2.2	2.2	2.2	2.5	2.2	2.5	2.2	2.3	2.5	2.4	S	2.3	2.5	2.5	2.4	2.5	2.4	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.5	2.3	24
10	1.9	1.9	1.9	1.7	1.9	2.0	2.0	1.8	1.8	1.7	S	1.7	1.7	1.6	1.7	1.7	1.5	1.5	1.6	1.5	1.5	1.3	1.4	1.4	1.3	2.0	1.7	24	
11	1.5	1.3	1.4	1.4	1.3	1.7	1.4	1.3	1.6	S	1.5	1.6	1.8	2.2	3.5	5.7	5.4	4.6	3.9	2.6	2.4	2.3	2.3	2.2	1.3	5.7	2.4	24	
12	2.2	2.1	2.1	2.1	2.1	2.3	2.4	2.3	S	2.1	2.4	3.7	2.4	2.3	2.4	2.2	2.2	2.2	2.4	2.2	2.1	2.1	2.2	2.3	2.1	3.7	2.3	24	
13	2.3	2.4	2.3	2.3	2.5	2.4	2.5	S	2.7	2.9	2.8	2.9	2.9	3.1	3.2	3.4	3.6	3.4	3.4	3.4	3.4	3.4	3.3	3.5	3.5	2.3	3.6	3.0	24
14	3.4	3.3	3.5	3.5	3.7	3.7	S	3.6	3.7	3.7	C	C	C	C	C	1.7	1.5	1.5	1.6	1.5	1.6	1.5	1.3	1.5	1.3	3.7	2.5	24	
15	1.3	1.5	1.4	1.5	1.4	S	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.8	1.0	1.0	1.3	1.1	1.1	0.8	1.5	1.1	24	
16	1.3	1.3	1.3	1.3	S	1.3	1.5	1.5	1.7	1.5	1.6	1.7	1.8	1.8	1.7	1.7	1.7	1.8	1.7	1.6	1.9	1.7	1.7	1.7	1.3	1.9	1.6	24	
17	1.8	1.6	1.8	S	1.5	1.7	1.7	1.6	1.3	1.3	1.4	1.4	1.3	1.3	1.2	1.3	1.3	1.1	1.0	1.0	0.8	0.9	1.0	1.1	0.8	1.8	1.3	24	
18	0.7	0.8	S	0.5	0.6	0.6	0.5	0.6	0.7	0.7	0.6	0.6	0.4	0.6	0.4	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.8	0.4	24	
19	0.2	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.2	0.5	0.0	0.6	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.6	0.1	24	
20	S	0.2	0.4	0.3	0.6	0.4	0.6	0.6	0.6	0.9	0.8	1.0	0.8	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.2	1.4	S	0.2	1.4	0.9	24		
21	1.0	1.3	1.2	1.2	1.0	0.9	0.8	0.8	0.8	0.8	0.8	1.0	Q	P	0.8	0.8	0.7	0.8	0.8	0.7	0.7	S	0.8	0.7	1.3	0.9	23		
22	0.8	1.0	1.1	1.3	1.7	1.9	1.5	1.5	1.4	1.1	1.1	1.1	1.2	1.0	0.8	1.0	0.8	0.8	0.7	0.8	0.6	S	0.4	0.5	0.4	1.9	1.0	24	
23	0.5	0.6	0.5	0.5	0.3	0.4	0.6	0.6	0.3	0.5	0.3	0.6	0.5	0.4	0.5	0.4	0.4	0.3	0.2	0.4	S	0.0	0.0	0.4	0.0	0.6	0.4	24	
24	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.2	0.6	0.3	0.6	S	0.4	0.3	0.2	0.6	0.0	0.6	0.2	24	
25	0.6	0.4	0.5	0.5	0.7	0.4	0.5	0.7	0.5	0.7	0.4	0.6	0.8	0.8	0.8	0.8	0.8	0.9	S	0.7	1.0	0.9	1.0	0.9	0.4	1.0	0.7	24	
26	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.6	0.7	0.6	0.8	0.7	0.8	S	0.6	1.0	1.0	0.7	0.8	0.8	0.5	1.0	0.7	24	
27	0.9	0.8	1.1	1.0	0.8	0.8	0.8	1.2	1.2	1.1	1.3	1.0	1.3	1.1	1.2	1.1	S	1.4	1.2	1.3	1.3	1.1	1.2	0.9	0.8	1.4	1.1	24	
28	1.1	1.0	1.1	1.0	1.0	0.9	0.8	0.8	0.7	0.8	0.6	0.9	0.6	0.8	0.6	S	0.4	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.4	1.1	0.8	24	
29	0.6	0.6	0.6	0.6	P	0.8	1.0	0.6	1.1	1.0	1.1	1.2	0.8	0.8	S	0.8	0.9	0.8	0.8	0.9	1.0	1.0	1.0	1.2	0.6	1.2	0.9	23	
30	1.4	1.2	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.4	P	2.1	S	1.5	1.5	1.8	1.7	1.7	1.8	1.8	1.9	1.7	1.9	1.2	2.1	1.6	23	
31	1.9	1.9	1.8	2.5	2.9	3.5	2.9	2.8	3.0	2.8	2.7	2.9	S	2.4	2.3	2.3	2.4	2.3	2.2	2.1	2.1	2.3	1.9	1.9	1.8	3.5	2.4	24	
HOURLY MAX	3.4	3.3	3.5	3.5	3.7	3.7	2.9	3.6	3.7	3.7	2.8	3.7	2.9	3.1	3.5	5.7	5.4	4.6	3.9	3.4	3.4	3.3	3.5	3.5					
HOURLY AVG	1.5	1.4	1.4	1.4	1.5	1.5	1.4	1.4	1.4	1.5	1.4	1.5	1.4	1.5	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4	1.4					

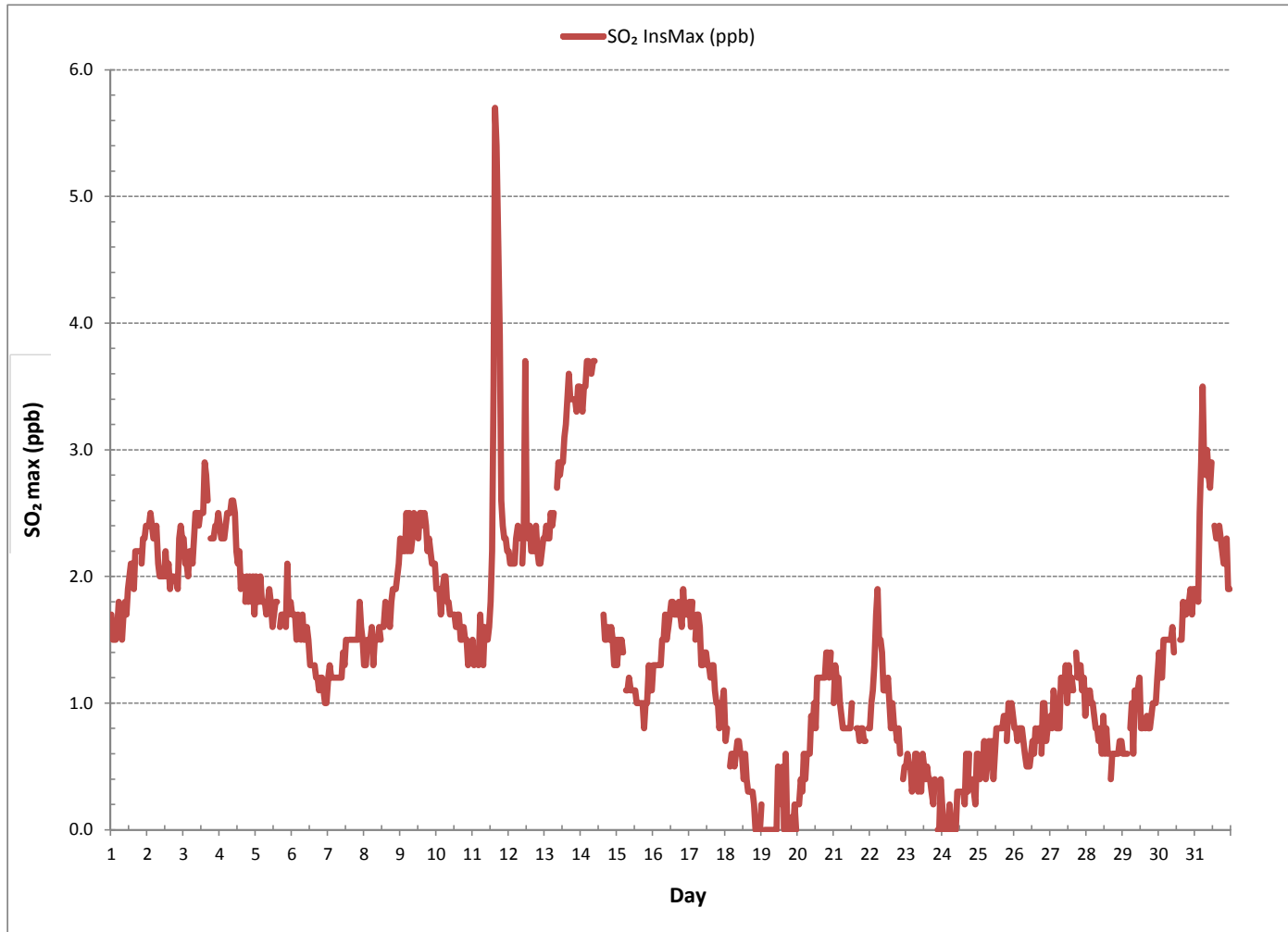
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

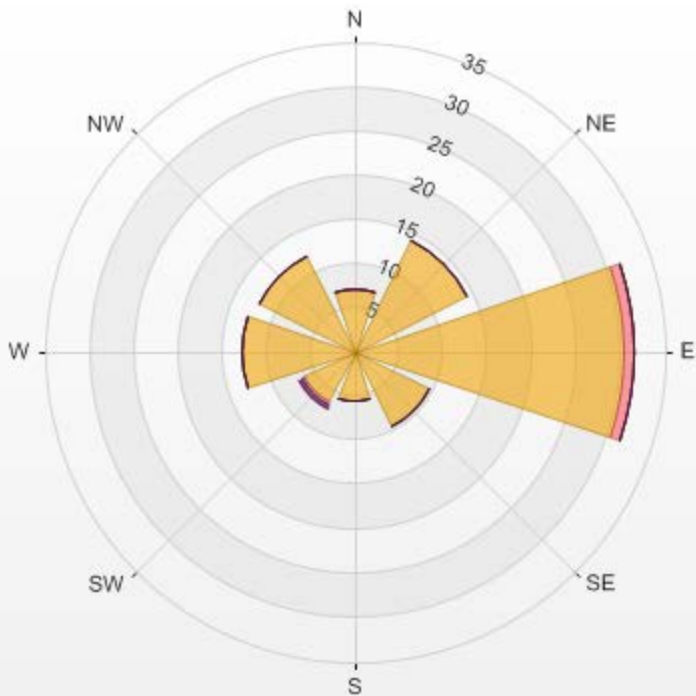
NUMBER OF NON-ZERO READINGS:	675
MAXIMUM INSTANTANEOUS VALUE:	5.7 ppb @ HOUR(S) 15 ON DAY(S) 11
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	741 hrs
STANDARD DEVIATION:	0.84

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppb]

Direction	0.0-0.6	0.6-1.2	1.2-1.9	1.9-2.5	2.5-3.1	>3.1	Total
N	7.13	0	0	0	0	0	7.13
NE	14.12	0	0	0	0	0	14.12
E	30.39	1.14	0	0	0	0	31.53
SE	9.56	0	0	0	0	0	9.56
S	5.71	0	0	0	0	0	5.71
SW	6.42	0.29	0	0.29	0.14	0	7.14
W	12.84	0	0	0	0	0	12.84
NW	11.98	0	0	0	0	0	11.98
Summary	98.15	1.43	0	0.29	0.14	0	100



% Icon Classes (ppb)	98	1	0	0	0	0
0.0-0.6	0.6-1.2	1.2-1.9	1.9-2.5	2.5-3.1	>3.1	

SO2[ppb] Calibration: LICA ST. LINA Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

HYDROGEN SULPHIDE



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	S	0.0	0.1	0.3	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	24
15	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

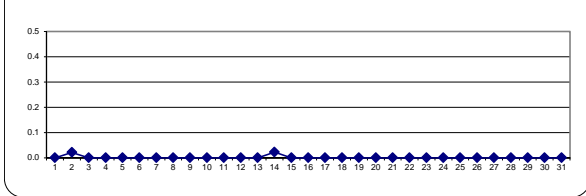
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 10 ppb 24-HR 3 ppb

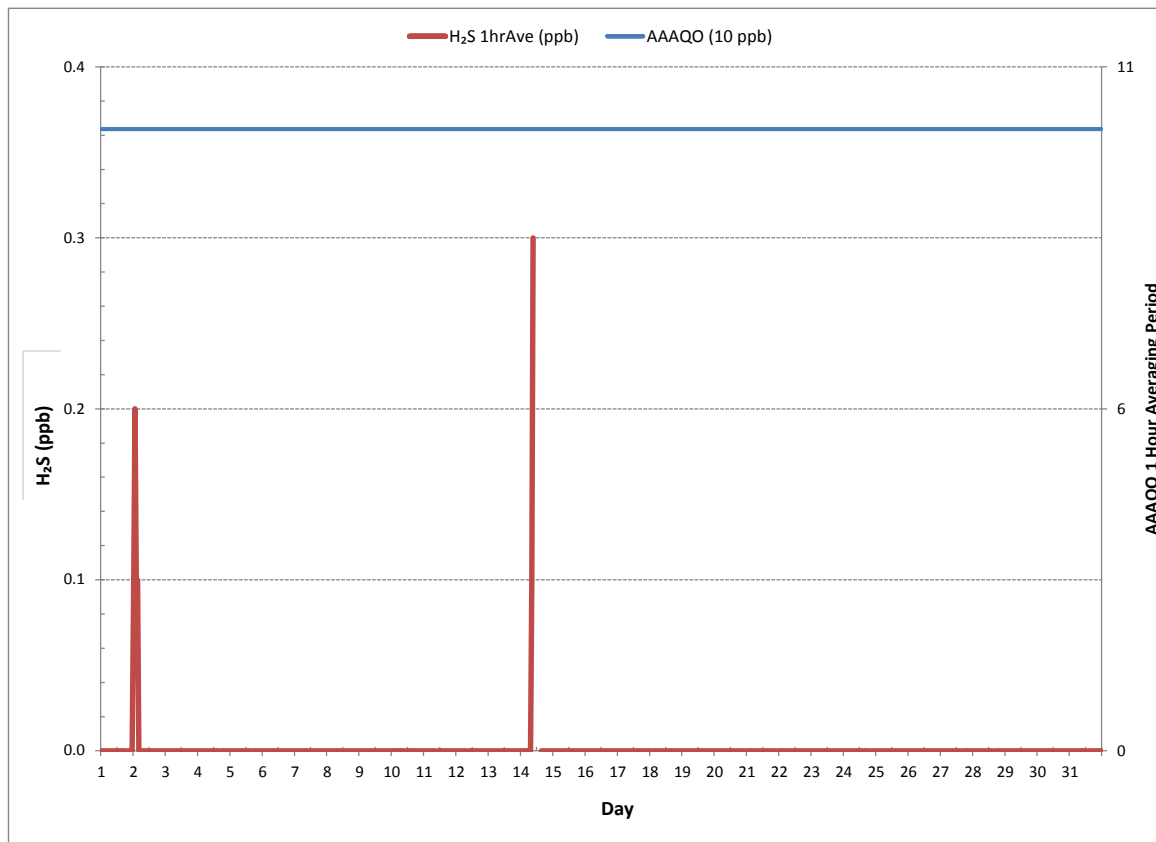
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	6		
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S) VAR ON DAY(S) ALL		
MAXIMUM 1-HR AVERAGE:	0.3 ppb @ HOUR(S) 9 ON DAY(S) 14		
MAXIMUM 24-HR AVERAGE:	0.0 ppb ON DAY(S) ALL		
	VAR-VARIOUS		
I2S CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.02	MONTHLY AVERAGE:	0.0 ppb

24 HOUR AVERAGES FOR October 2016



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0.6	0.6	0.8	0.8	0.7	0.8	0.7	0.7	0.7	0.8	0.7	0.8	0.9	0.9	0.9	0.9	1.1	1.0	1.0	S	1.1	1.1	1.3	1.1	0.6	1.3	0.9	24	
2	1.3	1.4	1.3	1.3	1.1	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.9	1.0	S	1.0	1.0	0.9	0.9	0.9	0.8	1.4	1.0	24	
3	0.9	1.0	1.0	1.1	1.1	1.0	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.0	0.9	1.0	0.9	S	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.2	1.0	24	
4	1.0	0.9	0.9	1.0	1.0	1.0	0.9	1.0	0.9	0.9	1.0	0.8	0.9	0.8	0.8	0.8	S	0.7	0.8	0.8	0.7	0.8	0.8	0.7	0.7	1.0	0.9	24	
5	0.9	0.8	0.8	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	S	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.7	0.8	0.7	0.9	0.8	24
6	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.4	S	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.7	0.5	24	
7	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	S	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.5	0.6	0.4	0.6	0.5	24	
8	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.6	0.6	S	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.4	0.9	0.6	24	
9	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.9	1.0	S	0.9	0.9	0.8	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1.0	0.8	24	
10	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.6	0.5	S	0.4	0.4	0.5	0.5	0.5	0.6	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.7	0.5	24	
11	0.5	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.4	S	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.9	0.9	0.4	0.9	0.6	24	
12	0.8	0.9	0.8	0.9	0.8	0.8	0.9	0.8	S	1.0	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.7	1.0	0.8	24	
13	0.8	0.8	1.0	0.9	0.9	1.0	1.1	S	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.3	1.3	1.3	0.8	1.4	1.1	24	
14	1.4	1.4	1.3	1.4	1.4	1.4	S	1.5	1.5	1.6	C	C	C	C	C	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	1.6	0.9	24	
15	0.3	0.3	0.3	0.4	0.3	S	0.2	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.4	0.2	24	
16	0.2	0.3	0.3	0.2	S	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.4	24	
17	0.4	0.4	0.4	S	0.4	0.3	0.3	0.4	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.4	0.2	24	
18	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
19	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
20	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	S	0.0	0.3	0.1	24	
21	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	P	0.0	0.0	0.0	0.0	0.1	0.0	0.0	S	0.1	0.0	0.2	0.1	23	
22	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	S	0.0	0.0	0.3	0.1	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	S	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	24	
26	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
27	0.0	0.1	0.0	0.1	0.1	0.3	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.3	S	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.3	0.1	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
29	0.0	0.0	0.0	0.0	P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	S	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.0	23	
30	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	P	0.4	S	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.1	0.4	0.3	23	
31	0.3	0.4	0.5	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.6	S	0.5	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.6	0.5	24	
HOURLY MAX	1.4	1.4	1.3	1.4	1.4	1.4	1.2	1.5	1.5	1.6	1.1	1.1	1.1	1.1	1.2	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.3					
HOURLY AVG	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4					

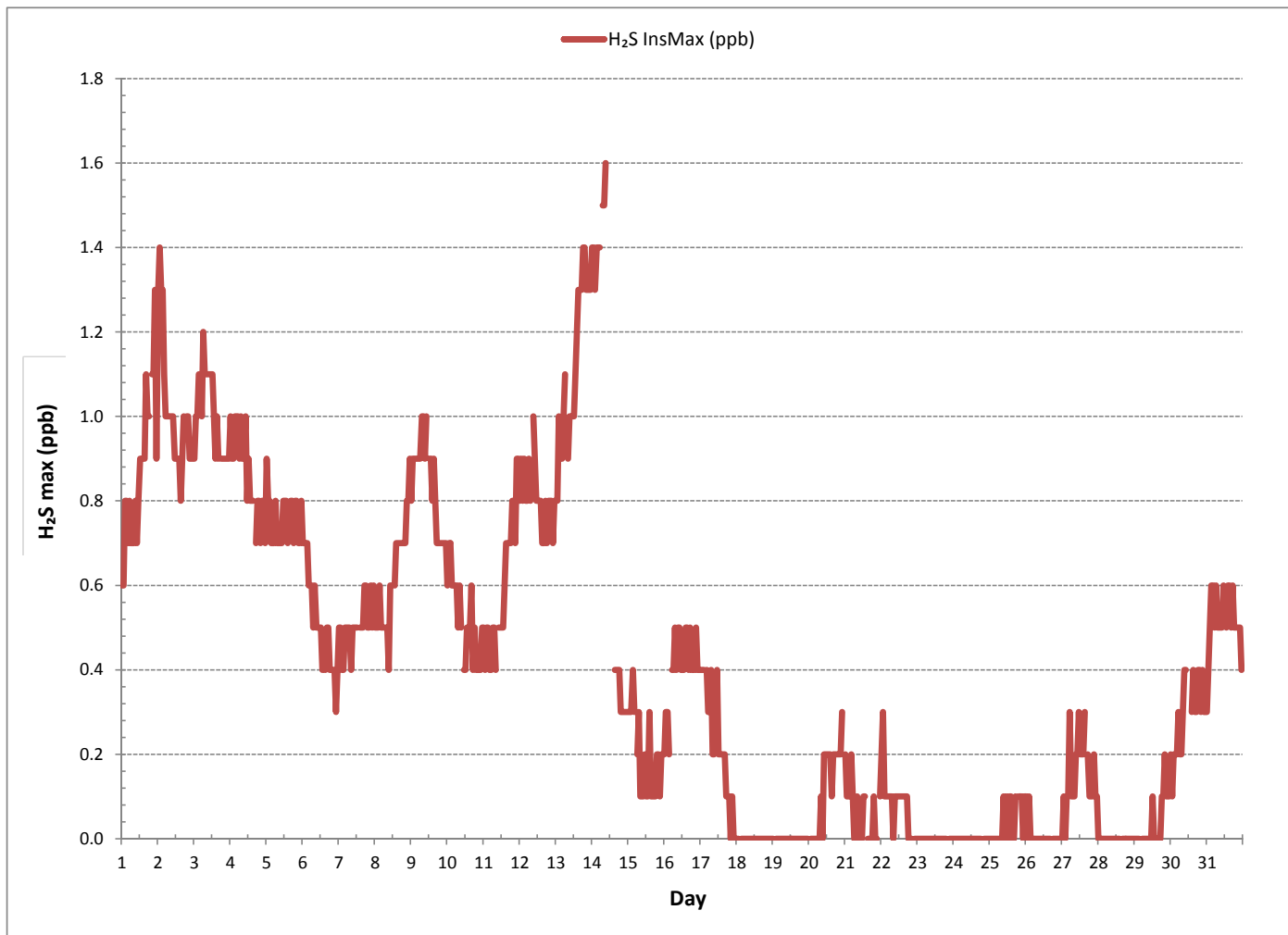
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

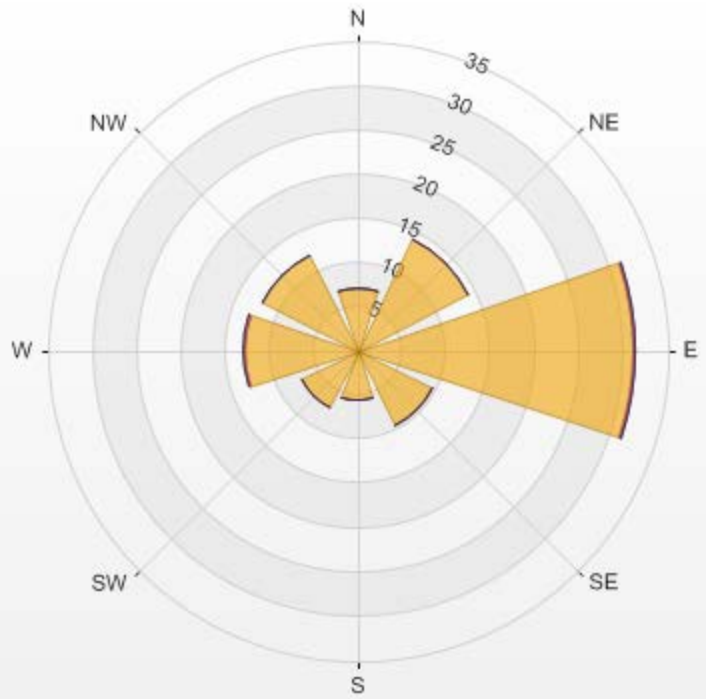
NUMBER OF NON-ZERO READINGS:	509
MAXIMUM INSTANTANEOUS VALUE:	1.6 ppb @ HOUR(S) 9 ON DAY(S) 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	741 hrs
STANDARD DEVIATION:	0.39

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



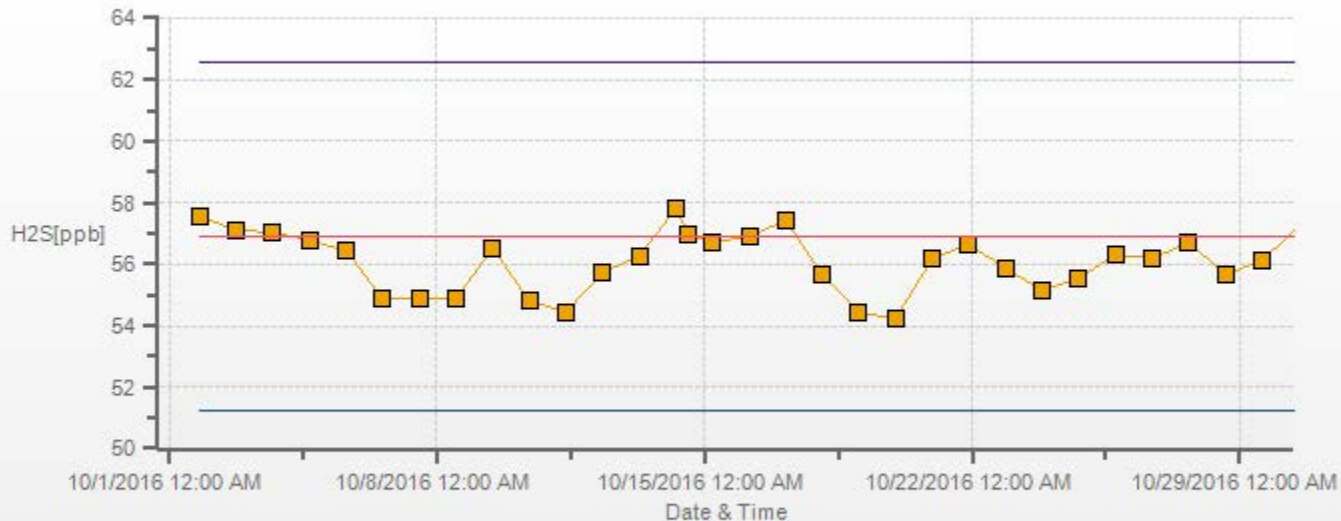
Wind: LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppb]

Direction	0-0.1	0.1-0.2	0.2-0.3	>0.3	Total
N	7.12	0	0	0	7.12
NE	14.1	0	0	0	14.1
E	31.2	0.14	0.14	0	31.48
SE	9.4	0.14	0	0	9.54
S	5.7	0	0	0	5.7
SW	7.12	0	0	0	7.12
W	12.82	0.14	0	0	12.96
NW	11.97	0	0	0	11.97
Summary	99.43	0.42	0.14	0	100



% Icon Classes (ppb)							
99	 0-0.1	0	 0.1-0.2	0	 0.2-0.3	0	 >0.3

H2S[ppb] Calibration: LICA ST. LINA Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON

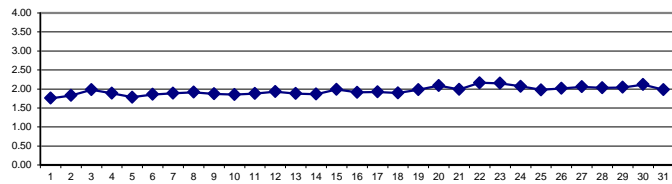
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.80	1.81	1.80	1.78	1.78	1.79	1.78	1.76	1.77	1.74	1.75	1.73	1.71	1.71	1.71	1.70	1.71	1.71	1.71	S	1.77	1.78	1.78	1.78	1.70	1.81	1.75	24	
2	1.80	1.82	1.79	1.76	1.79	1.81	1.82	1.83	1.83	1.85	1.85	1.85	1.84	1.87	1.88	1.86	1.82	S	1.83	1.85	1.82	1.81	1.81	1.76	1.88	1.83	24		
3	1.81	1.83	1.89	1.94	1.95	2.00	2.51	2.54	2.31	2.27	2.10	2.01	1.94	1.91	1.89	1.87	1.88	S	1.77	1.75	1.75	1.78	1.98	1.93	1.75	2.54	1.98	24	
4	1.87	1.90	1.91	2.01	2.06	2.12	2.10	1.98	1.98	1.94	1.78	1.79	1.80	1.81	1.81	1.80	S	1.83	1.83	1.83	1.82	1.83	1.82	1.82	1.78	2.12	1.89	24	
5	1.81	1.80	1.80	1.78	1.78	1.79	1.79	1.78	1.78	1.78	1.78	1.78	1.78	1.79	1.79	S	1.77	1.78	1.77	1.76	1.77	1.76	1.78	1.78	1.76	1.81	1.78	24	
6	1.77	1.78	1.79	1.79	1.82	1.83	1.84	1.83	1.85	1.86	1.86	1.85	1.86	1.87	S	1.87	1.87	1.87	1.88	1.91	1.91	1.90	1.93	1.96	1.77	1.96	1.86	24	
7	1.99	2.01	2.03	1.98	1.93	1.91	1.88	1.87	1.87	1.86	1.85	1.84	1.86	S	1.82	1.83	1.83	1.84	1.84	1.85	1.86	1.86	1.85	1.88	1.82	2.03	1.88	24	
8	1.93	1.95	1.94	1.96	1.93	1.92	1.95	1.97	1.90	1.95	1.95	1.95	S	1.90	1.90	1.90	1.88	1.89	1.89	1.89	1.89	1.87	1.89	1.86	1.86	1.97	1.92	24	
9	1.84	1.84	1.83	1.82	1.82	1.84	1.84	1.85	1.89	1.89	1.87	S	1.88	1.90	1.90	1.92	1.91	1.90	1.91	1.93	1.90	1.85	1.84	1.85	1.82	1.93	1.87	24	
10	1.85	1.84	1.84	1.84	1.83	1.83	1.83	1.82	1.84	1.84	S	1.84	1.86	1.86	1.85	1.85	1.84	1.84	1.83	1.82	1.87	1.92	1.88	1.95	1.82	1.95	1.85	24	
11	1.89	1.94	1.93	1.92	2.06	1.88	1.85	1.89	1.86	S	1.82	1.82	1.83	1.85	1.85	1.86	1.86	1.86	1.88	1.87	1.87	1.88	1.90	1.91	1.82	2.06	1.88	24	
12	1.92	1.94	1.95	1.97	1.99	1.98	1.97	1.98	S	2.00	1.98	1.92	1.92	1.89	1.88	1.88	1.89	1.88	1.88	1.88	1.88	1.94	1.93	1.88	1.87	1.87	2.00	1.93	24
13	1.88	1.86	1.85	1.85	1.85	1.85	1.87	S	1.97	1.96	1.96	1.97	1.94	1.92	1.88	1.87	1.84	1.85	1.85	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.97	1.88	24
14	1.83	1.83	1.85	1.86	1.88	1.86	S	1.85	1.84	1.88	1.84	1.84	1.84	1.86	1.88	1.89	1.88	1.86	1.86	1.89	1.88	1.88	1.88	1.88	1.91	1.83	1.91	1.86	24
15	1.93	1.98	2.03	2.04	2.00	S	1.89	1.88	1.90	1.91	1.92	1.92	1.94	1.94	1.97	2.01	2.00	2.05	2.09	2.10	2.10	2.08	2.05	2.05	1.88	2.10	1.99	24	
16	2.05	2.00	1.98	1.97	S	1.87	1.86	1.86	1.84	1.83	1.84	1.84	1.83	1.84	1.85	1.85	1.85	1.86	1.86	2.05	1.98	1.98	1.94	1.92	1.83	2.08	1.91	24	
17	1.88	1.92	1.91	S	1.91	1.92	1.91	1.91	1.89	1.90	1.91	1.93	1.93	1.92	1.92	1.92	1.92	1.92	1.93	1.95	1.93	1.94	1.93	1.93	1.88	1.95	1.92	24	
18	1.92	1.93	S	1.90	1.89	1.90	1.91	1.90	1.90	1.90	1.88	1.88	1.90	1.89	1.88	1.88	1.91	1.97	1.96	1.84	1.87	1.85	1.85	1.87	1.84	1.97	1.89	24	
19	1.87	S	1.88	1.88	1.87	1.91	1.96	1.96	1.93	1.95	1.95	1.98	2.00	2.01	2.03	2.03	2.03	2.03	2.06	2.05	2.02	2.02	2.10	2.07	1.87	2.10	1.98	24	
20	S	2.13	2.12	2.21	2.23	2.13	2.21	2.21	2.21	2.20	2.18	2.15	2.10	2.07	2.00	1.96	1.99	2.02	1.97	1.92	1.97	1.94	1.95	S	1.92	2.23	2.09	24	
21	1.98	2.01	2.07	2.02	2.09	2.05	2.07	2.09	2.09	2.07	C	C	C	C	C	C	1.88	1.89	1.88	1.89	1.90	1.92	S	1.92	1.88	2.09	1.99	24	
22	1.94	1.93	1.92	1.90	1.94	2.01	2.06	2.06	2.08	2.20	2.28	2.32	2.23	2.21	2.23	2.21	2.34	2.36	2.36	2.33	2.31	S	2.24	2.22	1.90	2.36	2.16	24	
23	2.23	2.22	2.16	2.15	2.17	2.15	2.14	2.27	2.27	2.20	2.26	2.03	2.03	2.02	2.07	2.37	2.40	2.18	2.10	2.10	S	2.04	2.06	2.06	2.02	2.40	2.15	24	
24	2.09	2.11	2.09	2.10	2.12	2.14	2.14	2.14	2.14	2.12	2.12	2.10	2.07	2.04	2.02	2.00	2.00	2.00	2.00	S	2.00	2.02	2.01	2.01	2.00	2.14	2.07	24	
25	2.01	2.03	2.00	1.98	1.97	1.98	1.98	1.98	1.96	1.97	1.97	1.97	1.97	1.97	1.97	1.95	1.97	1.95	1.90	S	1.96	1.96	1.96	1.97	2.00	1.95	2.03	1.98	24
26	1.98	1.98	2.00	1.98	1.99	2.00	2.01	2.02	2.03	2.03	2.01	2.01	2.01	2.02	2.03	2.06	2.04	S	2.04	1.99	2.02	2.02	2.02	2.04	1.98	2.06	2.01	24	
27	2.04	2.03	2.02	2.07	2.14	2.14	2.14	2.08	2.04	2.02	2.03	2.02	2.01	2.03	2.04	2.05	S	2.04	2.06	2.05	2.11	1.99	2.05	2.07	1.99	2.14	2.06	24	
28	2.07	2.02	2.04	2.09	2.00	1.98	1.98	1.99	1.98	1.99	1.98	2.02	2.03	2.03	2.04	S	2.10	2.01	2.05	2.03	2.07	2.08	2.06	2.05	1.98	2.10	2.03	24	
29	2.02	2.05	2.05	2.06	2.07	2.06	2.05	2.06	2.12	2.11	2.12	2.12	2.05	2.03	S	1.99	1.99	1.99	1.98	1.99	2.01	2.01	2.00	2.02	1.98	2.12	2.04	24	
30	2.01	2.12	2.29	2.31	2.28	2.32	2.31	2.26	2.21	2.13	2.05	1.86	2.04	S	2.04	2.03	2.06	2.07	2.07	2.10	1.98	2.05	2.06	1.97	1.86	2.32	2.11	24	
31	1.98	1.98	2.00	2.01	1.99	1.99	1.99	1.98	1.98	1.97	1.98	1.99	S	1.99	2.01	1.99	2.00	2.05	2.00	1.98	2.00	1.93	1.91	1.90	1.90	2.05	1.98	24	
HOURLY MAX	2.23	2.22	2.29	2.31	2.28	2.32	2.51	2.54	2.31	2.27	2.28	2.32	2.23	2.21	2.23	2.37	2.40	2.36	2.36	2.33	2.31	2.08	2.24	2.22					
HOURLY AVG	1.93	1.95	1.96	1.96	1.97	1.97	1.99	1.99	1.98	1.98	1.95	1.94	1.94	1.93	1.93	1.94	1.95	1.94	1.95	1.94	1.94	1.92	1.94	1.94					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

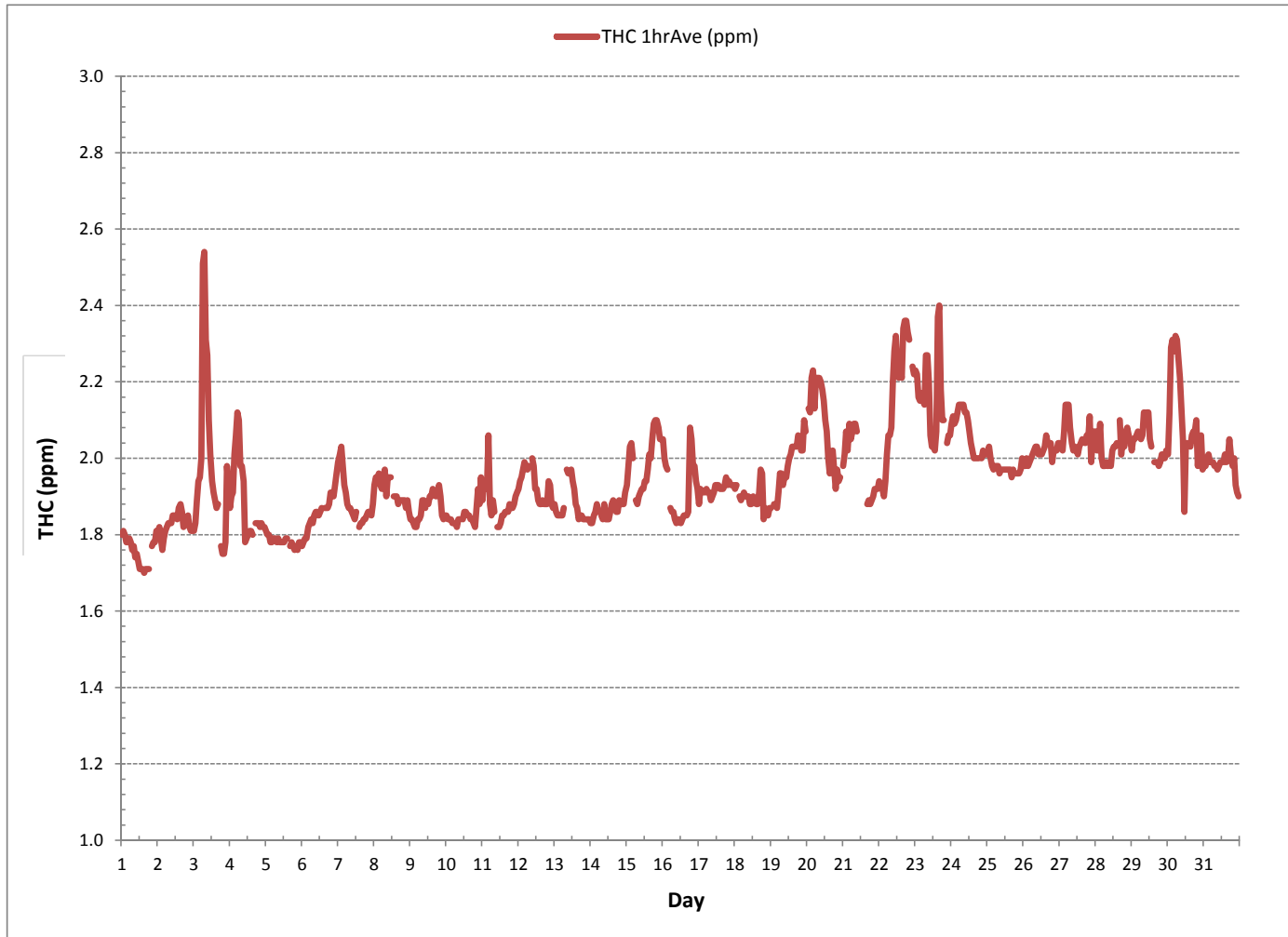
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706		
MINIMUM 1-HR AVERAGE:	1.70 ppm	@ HOUR(S)	15 ON DAY(S)
MAXIMUM 1-HR AVERAGE:	2.54 ppm	@ HOUR(S)	7 ON DAY(S)
MAXIMUM 24-HR AVERAGE:	2.16 ppm		22 ON DAY(S)
			VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.13	MONTHLY AVERAGE:	1.95 ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59						
DAY 1	2.08	2.08	2.08	2.05	2.09	2.09	2.05	2.04	2.04	2.05	2.04	2.01	1.98	1.98	1.98	1.98	1.98	1.98	1.99	S	1.98	1.98	1.98	1.99	1.98	2.09	2.02	24		
2	2.01	2.24	1.99	2.08	2.11	2.11	2.15	2.20	2.05	2.08	2.05	2.06	2.12	2.20	2.26	2.28	2.08	2.02	S	2.04	2.06	2.03	2.02	2.03	1.99	2.28	2.10	24		
3	2.04	2.09	2.17	2.17	2.20	2.38	2.97	2.92	2.58	2.57	2.39	2.29	2.20	2.17	2.14	2.12	2.14	S	2.09	2.01	2.01	2.18	2.27	2.20	2.01	2.97	2.27	24		
4	2.11	2.17	2.17	2.32	2.32	2.38	2.38	2.32	2.29	2.32	2.08	2.05	2.04	2.08	2.15	2.06	S	2.14	2.09	2.12	2.15	2.17	2.12	2.12	2.04	2.38	2.18	24		
5	2.09	2.14	2.08	2.08	2.06	2.06	2.06	2.02	2.04	2.04	2.02	2.03	2.04	2.04	2.05	S	2.03	2.04	2.04	2.04	2.04	2.04	2.04	2.35	2.23	2.02	2.35	2.07	24	
6	2.06	2.09	2.09	2.11	2.12	2.14	2.14	2.17	2.20	2.20	2.21	2.20	2.23	2.29	S	2.23	2.23	2.24	2.26	2.27	2.29	2.27	2.32	2.35	2.06	2.35	2.20	24		
7	2.38	2.38	2.41	2.39	2.32	2.39	2.35	2.25	2.25	2.23	2.21	2.26	2.23	S	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.23	2.25	2.20	2.29	2.20	2.41	2.27	24	
8	2.29	2.29	2.27	2.30	2.27	2.26	2.29	2.32	2.25	2.29	2.27	2.27	S	2.23	2.23	2.21	2.20	2.18	2.17	2.17	2.17	2.15	2.17	2.14	2.14	2.32	2.23	24		
9	2.11	2.09	2.08	2.06	2.08	2.08	2.08	2.13	2.13	2.08	S	2.41	2.32	2.50	2.53	2.36	2.40	2.54	2.64	2.51	2.25	2.21	2.21	2.06	2.64	2.64	2.26	24		
10	2.29	2.17	2.17	2.17	2.17	2.17	2.20	2.18	2.21	2.23	S	2.23	2.70	2.54	2.29	2.23	2.23	2.23	2.20	2.21	2.21	2.21	2.23	2.23	2.20	4.58	2.17	4.58	2.46	24
11	3.13	3.38	2.79	3.48	3.54	2.86	3.20	3.09	3.00	S	2.26	2.20	2.20	2.21	2.21	2.23	2.21	2.21	2.23	2.20	2.20	2.23	2.23	2.23	2.20	3.54	2.59	24		
12	2.23	2.25	2.25	2.27	2.29	2.26	2.25	2.25	S	2.29	2.29	2.41	2.82	2.60	2.15	2.44	2.15	2.17	2.15	2.15	2.25	2.25	2.17	2.14	2.14	2.82	2.28	24		
13	2.15	2.14	2.12	2.11	2.11	2.11	2.14	S	2.23	2.21	2.20	2.20	2.18	2.13	2.09	2.08	2.04	2.03	2.03	2.01	2.01	2.00	1.98	1.98	1.98	2.23	2.10	24		
14	1.98	1.97	1.98	1.98	1.98	1.95	S	1.94	1.93	2.08	1.94	1.94	1.98	1.96	2.01	2.04	2.17	1.98	1.97	2.00	1.98	1.98	1.98	2.01	1.93	2.17	1.99	24		
15	2.08	2.10	2.14	2.15	2.12	S	2.01	2.01	2.01	2.02	2.04	2.03	2.05	2.05	2.11	2.11	2.09	2.17	2.20	2.20	2.21	2.20	2.17	2.14	2.01	2.21	2.10	24		
16	2.14	2.14	2.04	2.07	S	1.95	1.94	1.94	1.93	1.92	1.92	1.92	1.94	1.93	1.94	1.92	1.95	3.43	3.51	2.63	2.45	2.42	2.23	1.92	3.51	2.18	24			
17	2.12	2.20	2.18	S	2.54	2.26	2.20	2.26	2.20	2.15	2.24	2.32	2.35	2.30	2.30	2.29	2.27	2.47	2.35	2.30	2.45	2.35	2.29	2.36	2.12	2.54	2.29	24		
18	2.35	2.50	S	2.48	2.41	2.44	2.53	2.41	2.64	2.48	2.41	2.39	2.82	2.50	2.50	2.59	3.34	3.51	2.98	2.14	2.59	2.18	2.18	2.21	2.14	3.51	2.55	24		
19	2.23	S	2.23	2.23	2.22	2.27	2.32	2.32	2.29	2.29	2.30	2.33	2.35	2.38	2.38	2.38	2.39	2.42	2.39	2.42	2.39	2.41	2.38	2.45	2.42	2.22	2.45	2.34	24	
20	S	2.48	2.50	2.56	2.60	2.48	2.57	2.54	2.54	2.51	2.48	2.45	2.41	2.36	2.32	2.23	2.26	2.85	2.61	2.48	3.91	2.51	2.54	S	2.23	3.91	2.55	24		
21	2.23	2.45	2.69	2.50	2.60	2.26	2.23	2.26	2.25	2.23	C	C	C	C	C	C	1.98	1.96	1.95	1.95	2.01	1.98	S	2.01	1.95	2.69	2.21	24		
22	1.99	1.98	1.98	1.95	2.02	2.09	2.12	2.14	2.20	2.32	2.38	2.39	2.35	2.27	2.29	2.33	2.41	2.42	2.44	2.41	2.41	S	2.32	2.30	1.95	2.44	2.24	24		
23	2.30	2.32	2.23	3.54	2.41	2.26	3.09	2.48	2.38	2.36	2.15	2.11	2.11	2.11	2.26	2.51	2.57	2.29	2.23	2.18	S	2.14	2.14	2.14	2.11	3.54	2.36	24		
24	2.17	2.20	2.17	2.17	2.20	2.22	2.23	2.21	2.21	2.18	2.20	2.17	2.15	2.11	2.09	2.08	2.05	2.06	2.06	S	2.05	2.08	2.06	2.08	2.05	2.23	2.14	24		
25	2.08	2.08	2.06	2.02	2.02	2.02	2.04	2.02	2.02	2.01	2.04	2.03	2.01	2.01	2.01	2.01	2.01	2.01	2.01	S	1.99	2.01	2.01	2.01	2.39	1.99	2.39	2.04	24	
26	2.04	2.11	2.11	2.02	2.26	2.20	2.20	2.32	2.54	2.35	2.20	2.39	2.20	2.37	2.42	2.35	2.92	S	2.85	2.03	2.05	2.06	2.05	2.08	2.02	2.92	2.27	24		
27	2.06	2.06	2.04	2.11	2.17	2.15	2.17	2.11	2.04	2.03	2.02	2.01	2.02	2.02	2.08	2.04	S	2.04	2.07	2.06	2.18	2.01	2.08	2.11	2.01	2.18	2.07	24		
28	2.11	2.08	2.08	2.30	2.04	2.08	2.05	2.06	2.06	2.08	2.08	2.94	2.89	2.23	2.41	S	4.28	2.12	2.17	2.14	2.17	2.17	2.17	2.17	2.04	4.28	2.30	24		
29	2.12	2.14	2.14	2.17	P	2.33	2.15	2.17	2.54	2.20	2.21	2.23	2.15	2.14	S	2.08	2.09	2.09	2.08	2.08	2.09	2.08	2.08	2.09	2.08	2.54	2.16	23		
30	2.09	2.23	2.39	2.38	2.39	2.38	2.38	2.30	2.27	2.20	2.11	P	2.42	S	2.35	2.27	2.42	2.52	2.63	2.57	2.35	2.74	3.26	1.96	1.96	3.26	2.39	23		
31	1.96	1.95	1.98	1.98	1.96	1.95	1.95	1.92	1.92	1.91	1.9	S	2.29	2.26	1.95	1.96	2.60	2.01	2.63	2.01	1.96	1.91	1.89	1.89	1.89	2.63	2.04	24		
HOURLY MAX	3.13	3.38	2.79	3.54	3.54	2.86	3.20	3.09	3.00	2.57	2.48	2.94	2.89	2.60	2.50	2.59	4.28	3.51	3.43	3.51	3.91	2.83	3.26	4.58						
HOURLY AVG	2.17	2.22	2.19	2.27	2.26	2.22	2.28	2.24	2.24	2.20	2.16	2.21	2.26	2.21	2.21	2.21	2.31	2.25	2.29	2.25	2.29	2.20	2.25	2.24						

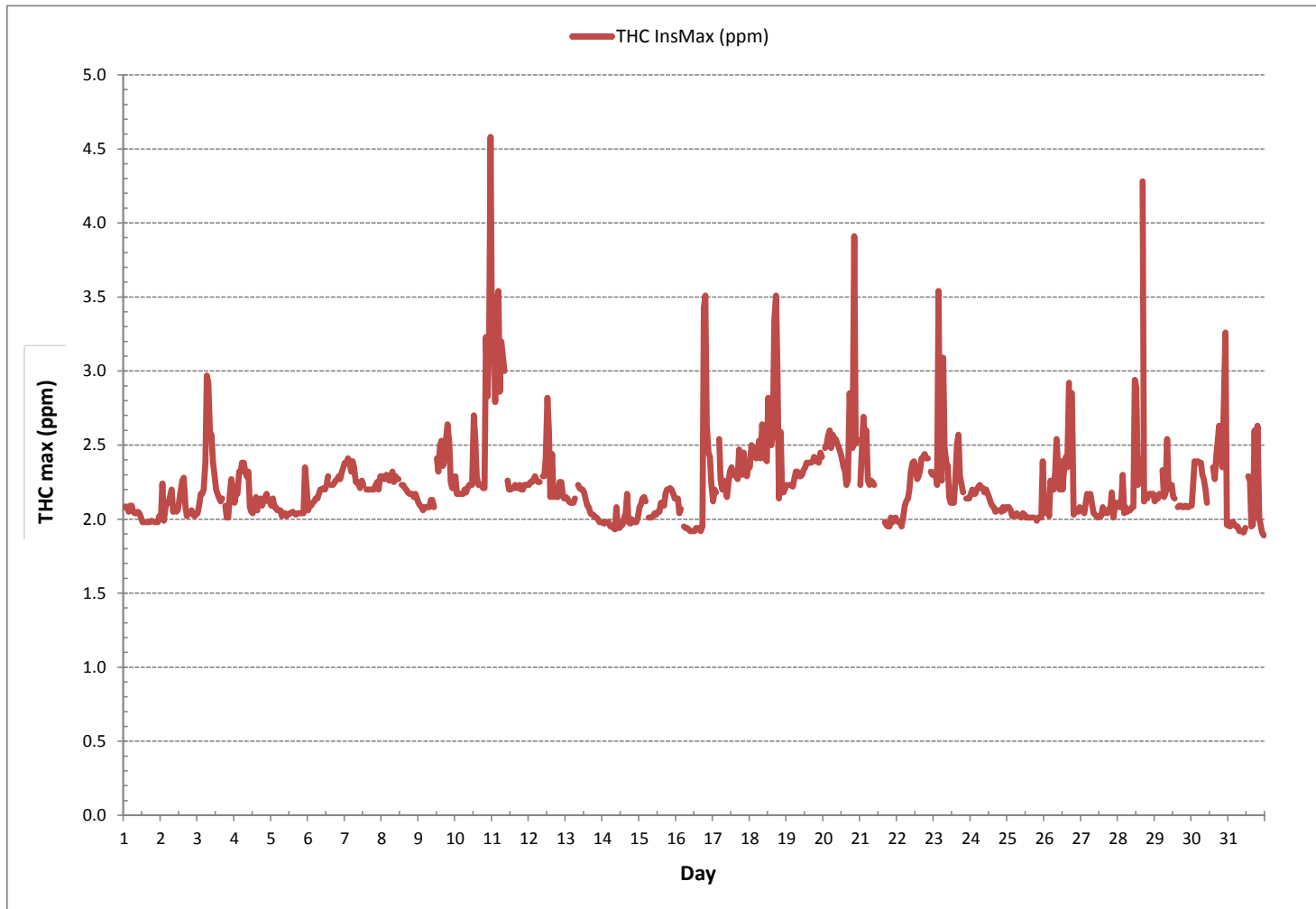
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

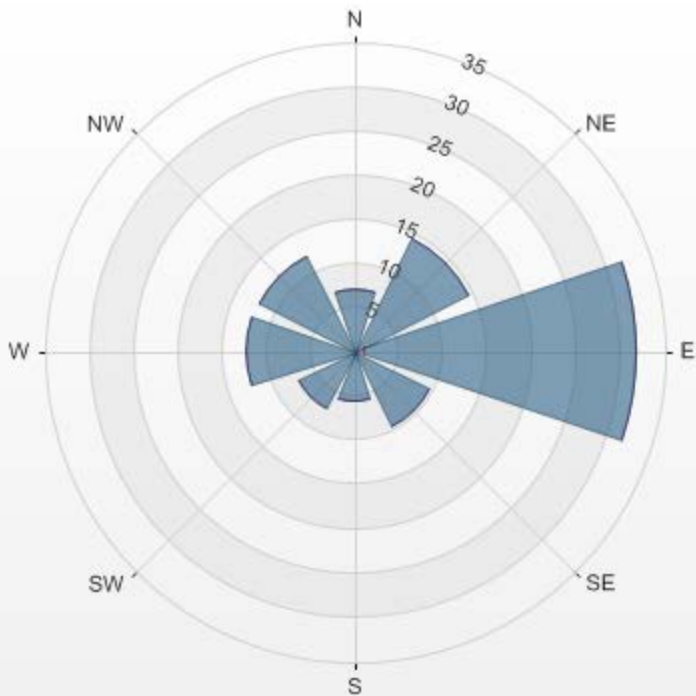
NUMBER OF NON-ZERO READINGS:	704
MAXIMUM INSTANTANEOUS VALUE:	4.58 ppm @ HOUR(S) 23 ON DAY(S) 10
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	742 hrs
STANDARD DEVIATION:	0.28

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.35% Calm Avg: 0.00 [ppm]

Direction	0.0-0.9	0.9-1.7	1.7-2.6	>2.6	Total
N	0	0	7.12	0	7.12
NE	0	0	14.39	0	14.39
E	0	1.14	30.77	0	31.91
SE	0	0	9.54	0	9.54
S	0	0	5.7	0	5.7
SW	0	0	7.12	0	7.12
W	0	0	12.25	0	12.25
NW	0	0	11.97	0	11.97
Summary	0	1.14	98.86	0	100



THC[ppm] Calibration: LICA ST. LINA Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

OXIDES OF NITROGEN



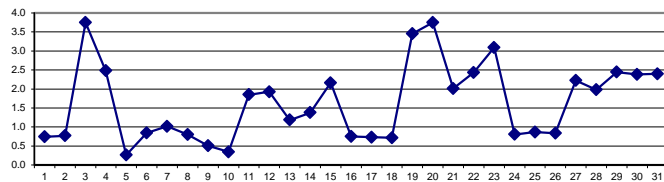
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1.8	1.8	1.9	1.4	1.2	1.1	0.5	0.6	0.6	0.5	0.8	0.7	0.6	0.5	0.5	0.5	0.4	0.5	0.5	S	0.2	0.1	0.1	0.2	0.1	1.9	0.7	24
2	0.4	0.6	0.5	0.4	0.2	0.5	0.6	0.7	0.6	0.7	1.0	0.9	0.9	0.8	0.7	0.6	0.7	1.0	S	1.1	1.4	1.1	1.1	1.2	0.2	1.4	0.8	24
3	0.8	1.0	1.7	2.0	2.7	4.5	13.6	14.2	9.2	7.4	3.6	2.6	1.9	2.0	1.9	2.0	2.4	S	0.9	0.5	0.5	1.1	5.5	4.1	0.5	14.2	3.7	24
4	3.2	3.5	3.6	4.9	6.1	8.5	7.8	5.9	5.5	3.4	0.7	0.4	0.7	0.5	0.4	0.0	S	0.9	0.7	0.1	0.0	0.1	0.0	0.1	0.0	8.5	2.5	24
5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4	0.6	0.4	S	0.6	0.5	0.6	0.5	0.7	0.6	0.4	0.3	0.0	0.7	0.3	24
6	0.6	0.5	0.5	0.9	1.0	1.1	0.9	0.8	1.0	0.4	0.2	0.2	0.0	0.0	S	0.4	0.8	0.8	1.2	1.4	1.2	1.2	1.8	2.5	0.0	2.5	0.8	24
7	3.4	3.4	3.1	2.5	1.3	0.8	0.4	0.5	0.4	0.6	0.4	0.3	0.3	S	0.5	0.4	0.3	0.5	0.7	1.0	0.7	0.6	0.6	0.7	0.3	3.4	1.0	24
8	0.8	0.6	0.7	1.0	0.7	0.6	0.4	0.7	0.4	0.8	0.8	1.3	S	1.3	1.1	1.1	0.8	0.8	0.8	0.8	0.8	0.6	0.8	0.7	0.4	1.3	0.8	24
9	0.2	0.3	0.5	0.0	0.2	0.7	0.5	0.6	1.1	1.6	1.0	S	0.8	1.1	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.0	1.6	0.5	24
10	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.6	S	0.6	0.5	0.4	0.5	0.1	0.2	0.3	0.7	0.5	0.5	0.7	0.1	0.3	0.1	0.7	0.3	24
11	0.3	0.2	0.3	0.4	0.4	0.5	0.5	0.3	0.3	S	0.7	0.5	0.9	0.7	2.4	5.2	6.3	5.2	3.4	3.1	3.0	2.5	2.8	2.6	0.2	6.3	1.8	24
12	2.8	2.6	2.8	2.9	2.8	3.0	2.9	2.4	S	4.6	3.4	2.4	1.4	0.7	0.6	0.8	0.5	0.4	0.2	0.2	1.7	2.2	1.8	1.2	0.2	4.6	1.9	24
13	1.4	0.9	0.4	0.5	0.5	0.7	0.9	S	2.1	2.3	2.2	1.9	1.7	1.5	1.3	1.3	1.0	1.2	1.2	1.2	1.0	0.7	0.6	0.7	0.4	2.3	1.2	24
14	0.8	0.8	0.7	1.1	1.8	1.2	S	0.8	0.3	0.4	C	C	C	C	C	C	2.0	1.5	1.4	2.5	2.3	1.6	1.7	2.5	0.3	2.5	1.4	24
15	2.6	3.8	4.7	4.6	4.6	S	1.6	0.8	0.8	1.0	1.1	0.8	1.1	1.3	1.4	1.6	1.9	1.9	2.1	2.8	2.9	2.4	2.3	1.6	0.8	4.7	2.2	24
16	1.4	1.5	0.9	1.0	S	0.8	0.7	0.4	0.3	0.2	0.6	0.4	0.3	0.3	0.4	0.3	0.4	0.8	1.2	1.3	1.1	1.3	0.9	0.7	0.2	1.5	0.7	24
17	0.6	0.6	0.3	S	0.6	0.5	0.4	0.3	0.4	0.6	0.5	0.6	0.6	0.8	0.8	1.2	0.8	1.1	1.0	1.1	1.0	1.1	0.9	1.0	0.3	1.2	0.7	24
18	0.9	0.9	S	0.9	0.8	0.9	0.8	0.6	0.7	0.5	0.4	0.4	0.5	0.5	0.9	0.6	0.4	0.6	1.9	0.5	0.8	0.5	0.6	0.9	0.4	1.9	0.7	24
19	1.0	S	1.1	1.1	1.0	2.6	1.9	2.3	2.0	2.3	2.9	4.2	4.7	4.3	4.8	4.5	5.0	5.2	5.3	5.2	4.8	4.5	4.5	4.2	1.0	5.3	3.5	24
20	S	4.4	4.3	4.7	5.3	4.8	5.5	4.9	4.7	4.9	5.0	5.0	4.7	3.9	2.6	2.1	2.0	2.4	2.5	2.4	2.2	2.0	2.1	S	2.0	5.5	3.7	24
21	2.7	3.6	3.8	3.5	3.1	2.9	3.3	3.0	3.2	2.5	2.0	1.6	1.1	0.6	0.5	1.1	1.4	1.0	0.5	1.7	1.0	0.6	S	1.5	0.5	3.8	2.0	24
22	1.0	1.3	1.1	1.1	1.6	2.3	2.6	2.6	2.3	3.1	3.9	4.3	2.6	1.7	1.9	1.8	3.3	3.2	3.4	3.2	2.7	S	2.4	2.5	1.0	4.3	2.4	24
23	2.8	2.9	2.5	2.3	2.2	2.6	2.6	2.6	2.9	3.2	1.5	0.9	0.9	0.9	1.7	7.8	8.8	4.6	4.1	8.4	S	1.7	1.7	1.5	0.9	8.8	3.1	24
24	1.3	1.4	1.2	1.0	0.8	0.8	0.9	0.8	0.8	0.9	1.1	1.0	0.9	0.6	0.6	0.7	0.6	0.7	0.5	S	0.7	0.4	0.4	0.4	0.4	1.4	0.8	24
25	0.2	0.6	0.4	0.4	0.5	0.4	0.6	0.8	0.5	0.9	0.8	1.0	1.1	1.0	1.2	1.1	1.1	1.2	S	1.2	1.3	1.1	1.3	1.2	0.2	1.3	0.9	24
26	1.0	1.0	0.9	0.9	1.0	0.9	0.8	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.5	0.7	0.6	S	1.1	0.9	0.8	0.9	0.7	0.8	0.5	1.1	0.8	24
27	0.9	0.9	1.4	1.6	2.0	2.1	2.3	2.2	1.8	1.2	1.4	1.7	1.8	1.3	1.4	1.8	S	4.6	4.9	3.2	5.1	1.3	2.6	3.7	0.9	5.1	2.2	24
28	3.0	1.8	1.9	4.0	1.1	0.9	0.8	0.7	0.8	1.1	1.8	2.2	2.4	2.5	2.5	S	2.1	1.5	1.4	2.4	3.0	2.7	2.9	2.0	0.7	4.0	2.0	24
29	1.8	1.6	1.9	1.8	1.6	1.4	1.5	2.2	3.5	3.8	4.5	4.6	2.8	2.1	S	2.3	3.0	3.7	2.9	2.4	2.2	1.8	1.4	1.4	1.4	4.6	2.4	24
30	1.7	2.4	3.8	3.5	3.3	3.5	3.2	2.8	2.4	2.1	1.8	2.1	3.1	S	1.8	1.9	2.1	2.1	1.9	2.0	1.5	1.7	1.8	2.3	1.5	3.8	2.4	24
31	2.4	2.1	2.1	2.5	2.0	2.7	2.4	2.9	2.9	2.8	2.8	2.7	S	3.2	4.5	4.5	3.8	3.5	1.3	1.0	0.9	1.0	0.8	0.3	0.3	4.5	2.4	24
HOURLY MAX	3.4	4.4	4.7	4.9	6.1	8.5	13.6	14.2	9.2	7.4	5.0	5.0	4.7	4.3	4.8	7.8	8.8	5.2	5.3	8.4	5.1	4.5	5.5	4.2				
HOURLY AVG	1.4	1.6	1.6	1.8	1.7	1.8	2.0	2.0	1.8	1.8	1.7	1.6	1.4	1.3	1.4	1.7	1.9	1.8	1.7	1.8	1.5	1.3	1.5	1.4				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

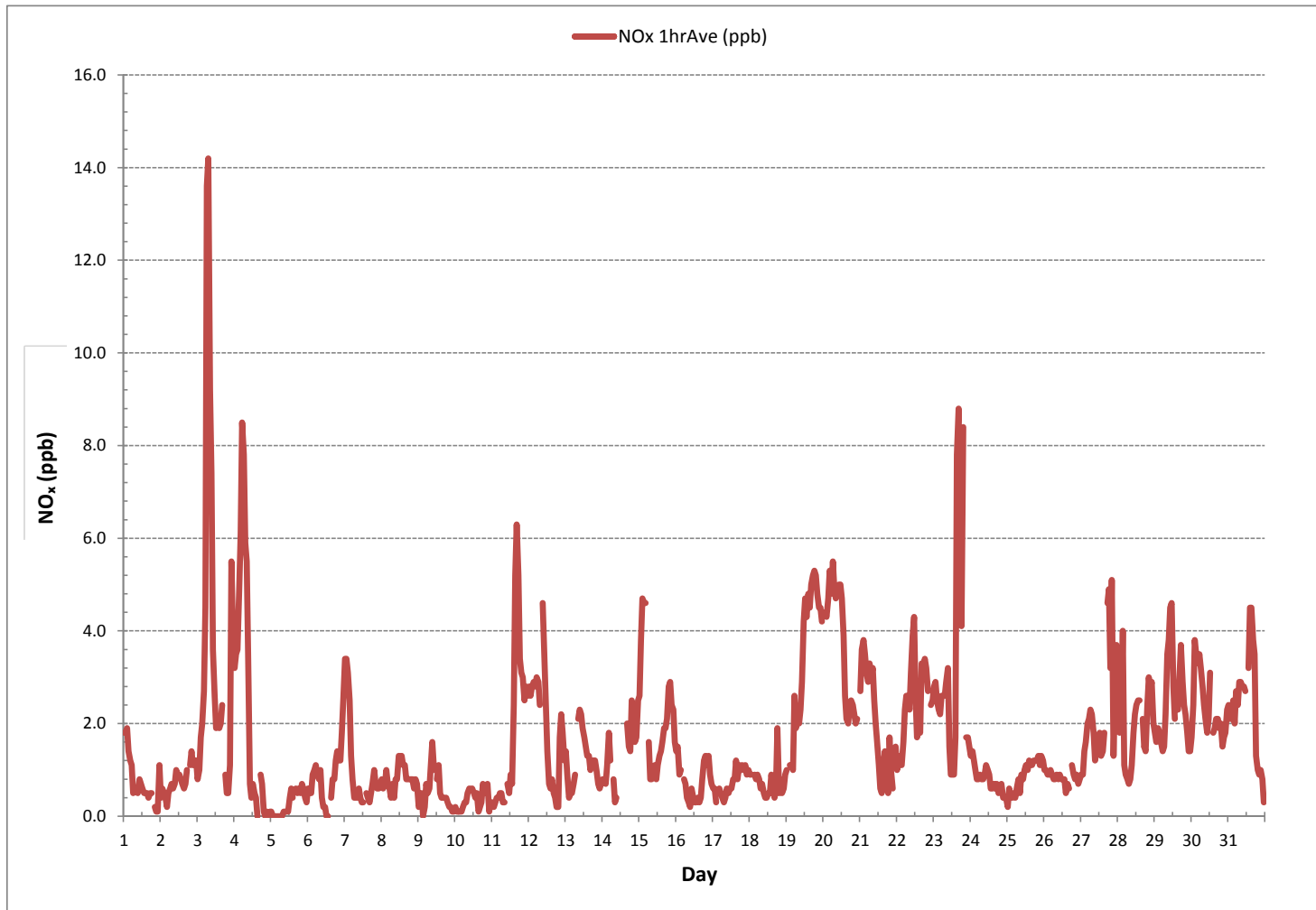
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	693			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	14.2 ppb	@ HOUR(S)	7	3
MAXIMUM 24-HR AVERAGE:	3.7 ppb			ON DAY(S) 3, 20
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	1.59	MONTHLY AVERAGE:	1.6 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1.5	1.5	1.8	1.0	1.0	1.0	0.2	0.2	0.2	0.4	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	0.1	0.0	0.0	0.1	0.0	1.8	0.5	24
2	0.1	0.4	0.2	0.2	0.0	0.1	0.4	0.5	0.4	0.4	1.0	0.5	0.4	0.4	0.5	0.2	0.2	0.8	S	0.5	0.9	0.7	0.7	0.7	0.0	1.0	0.4	24
3	0.4	0.7	1.4	1.7	2.5	7.1	17.8	17.5	10.3	8.2	4.2	2.7	1.9	1.9	1.8	1.9	2.4	S	1.6	0.5	0.5	4.3	5.6	4.1	0.4	17.8	4.4	24
4	3.4	4.5	3.6	5.4	6.3	9.4	8.2	7.1	5.8	4.9	1.3	0.5	0.8	0.7	0.5	0.3	S	1.3	1.0	0.3	0.0	0.0	0.0	0.0	0.0	9.4	2.8	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	S	0.2	0.2	0.5	0.1	0.2	0.2	0.2	0.0	0.0	0.5	0.1	24
6	0.2	0.1	0.1	0.7	2.7	1.5	2.4	0.7	0.9	0.2	0.0	0.0	0.0	0.0	S	0.8	1.4	1.2	3.3	1.3	1.1	1.1	1.7	2.7	0.0	3.3	1.0	24
7	3.5	3.6	2.9	2.8	1.7	0.6	0.3	0.3	0.0	0.4	0.3	0.2	0.2	S	0.2	0.3	0.2	0.3	0.6	0.8	0.6	0.3	0.3	0.8	0.0	3.6	0.9	24
8	0.9	0.4	0.5	0.8	0.6	0.4	0.3	0.6	0.4	0.6	0.8	1.1	S	1.1	1.0	0.9	0.8	0.7	0.7	0.7	0.6	0.6	0.7	0.8	0.3	1.1	0.7	24
9	0.0	0.2	0.5	0.0	0.2	0.7	0.7	0.8	1.0	1.9	1.7	S	3.1	2.8	0.8	0.8	0.6	0.6	0.4	0.0	0.1	0.1	0.0	0.0	0.0	3.1	0.7	24
10	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.1	0.5	0.3	S	0.8	1.4	4.0	4.1	0.0	0.3	0.2	0.6	1.0	1.7	2.5	0.3	0.2	0.0	4.1	0.8	24
11	0.3	0.4	0.3	0.3	0.9	2.0	1.7	2.0	1.9	S	1.6	1.4	12.1	12.9	3.5	7.4	6.7	5.9	6.0	6.4	3.8	2.9	3.0	3.0	0.3	12.9	3.8	24
12	3.0	2.9	3.2	3.3	3.3	16.3	4.4	3.1	S	57.3	15.9	4.7	2.6	1.4	0.9	1.6	0.6	0.4	0.4	0.1	2.4	2.2	1.9	1.3	0.1	57.3	5.8	24
13	1.1	0.8	0.2	0.2	0.0	0.3	0.5	S	1.8	2.0	1.9	1.6	1.6	1.1	0.9	0.8	0.6	0.9	0.9	0.8	0.6	0.6	0.3	0.6	0.0	2.0	0.9	24
14	0.5	0.6	0.3	1.1	1.7	1.4	S	0.9	0.2	1.5	C	C	C	C	C	C	C	2.9	2.7	3.2	2.9	2.1	2.5	2.8	0.2	3.2	1.7	24
15	3.0	4.1	5.1	4.9	4.7	S	2.7	1.0	0.9	1.1	1.2	1.1	1.3	1.4	1.5	2.1	2.1	2.2	2.2	3.2	3.2	2.7	3.2	2.1	0.9	5.1	2.5	24
16	1.7	2.1	1.3	1.3	S	1.3	1.1	0.8	0.8	0.6	1.1	0.8	0.8	0.8	0.9	0.7	1.1	1.4	2.0	2.0	1.6	2.4	1.5	1.3	0.6	2.4	1.3	24
17	1.2	1.1	0.7	S	1.3	1.1	1.2	0.9	1.0	1.0	1.3	1.6	1.2	3.5	1.3	2.7	1.0	1.8	1.5	2.4	1.1	1.4	1.3	1.1	0.7	3.5	1.4	24
18	1.1	0.9	S	0.9	0.9	2.2	1.1	1.3	1.6	0.5	0.7	0.9	1.1	0.7	2.6	5.2	0.6	2.4	32.7	0.8	1.2	0.8	0.9	1.1	0.5	32.7	2.7	24
19	1.2	S	1.4	1.7	1.2	8.8	8.5	4.4	2.6	3.1	3.7	5.3	5.2	5.0	6.9	7.8	23.9	8.9	6.0	6.2	6.9	5.4	5.4	5.2	1.2	23.9	5.9	24
20	S	5.4	5.1	5.7	6.4	6.0	6.8	6.5	5.8	5.8	5.8	6.1	5.7	4.9	3.9	3.1	3.1	3.3	4.7	3.6	3.6	2.8	3.1	S	2.8	6.8	4.9	24
21	3.8	4.6	4.6	4.4	4.1	3.7	5.4	3.8	4.6	3.3	4.0	8.5	2.4	1.7	P	15.8	27.9	4.4	1.1	5.0	1.8	1.3	S	2.0	1.1	27.9	5.4	23
22	1.4	2.0	1.7	1.7	2.3	3.2	3.2	3.4	3.2	3.9	4.6	4.8	4.9	2.5	2.4	2.5	29.2	5.7	4.1	4.5	3.2	S	2.8	3.4	1.4	29.2	4.4	24
23	5.0	3.5	3.0	2.9	2.8	27.1	3.4	3.4	3.4	5.3	2.4	1.5	1.4	1.5	3.8	9.8	10.5	5.5	5.5	9.6	S	2.3	2.3	2.3	1.4	27.1	5.1	24
24	1.7	2.0	1.7	1.4	1.3	1.1	1.3	1.1	1.1	1.2	1.5	1.5	1.2	1.1	0.9	1.0	0.7	0.9	0.7	S	1.0	0.6	0.6	0.8	0.6	2.0	1.1	24
25	0.4	0.9	0.9	0.6	0.7	0.6	0.9	1.2	0.9	1.2	1.2	1.1	1.5	1.4	1.5	1.5	1.2	1.4	S	1.7	1.5	1.4	1.5	1.4	0.4	1.7	1.2	24
26	1.3	1.1	1.0	1.0	0.9	1.5	1.4	0.9	1.5	1.4	1.7	1.2	1.1	3.3	0.3	0.8	0.6	S	1.4	0.8	0.7	0.9	0.9	0.9	0.3	3.3	1.2	24
27	1.3	0.9	2.0	1.8	2.4	2.3	2.6	2.3	2.2	1.8	1.7	2.0	3.5	1.9	2.0	2.6	S	5.1	6.1	3.9	8.1	2.6	3.7	4.5	0.9	8.1	2.9	24
28	3.9	2.4	2.7	5.4	2.2	1.5	1.3	1.2	1.3	1.8	2.7	3.4	3.0	3.2	3.4	S	3.7	2.2	1.9	3.4	3.7	3.6	4.9	2.6	1.2	5.4	2.8	24
29	3.0	2.4	2.4	2.4	P	2.1	2.1	3.7	4.5	4.8	5.7	4.5	3.0	S	3.1	3.9	4.4	4.1	3.3	3.1	2.8	2.0	2.2	2.0	5.7	3.4	23	
30	2.4	3.5	4.9	4.4	4.2	4.2	3.9	3.6	3.4	3.0	10.7	P	5.6	S	2.7	3.0	3.2	3.1	3.0	2.8	2.3	2.6	2.7	3.3	2.3	10.7	3.8	23
31	3.3	3.0	3.4	3.4	2.9	3.6	4.1	4.3	4.6	3.8	3.9	3.6	S	4.1	7.9	8.3	4.8	5.4	2.4	1.8	1.8	3.1	1.8	1.1	1.1	8.3	3.8	24
HOURLY MAX	5.0	5.4	5.1	5.7	6.4	27.1	17.8	17.5	10.3	57.3	15.9	8.5	12.1	12.9	7.9	15.8	29.2	8.9	32.7	9.6	8.1	5.4	5.6	5.2				
HOURLY AVG	1.7	1.9	1.9	2.0	2.0	3.7	2.9	2.6	2.2	4.1	2.9	2.2	2.5	2.4	2.1	3.0	4.7	2.5	3.4	2.4	2.0	1.8	1.9	1.7				

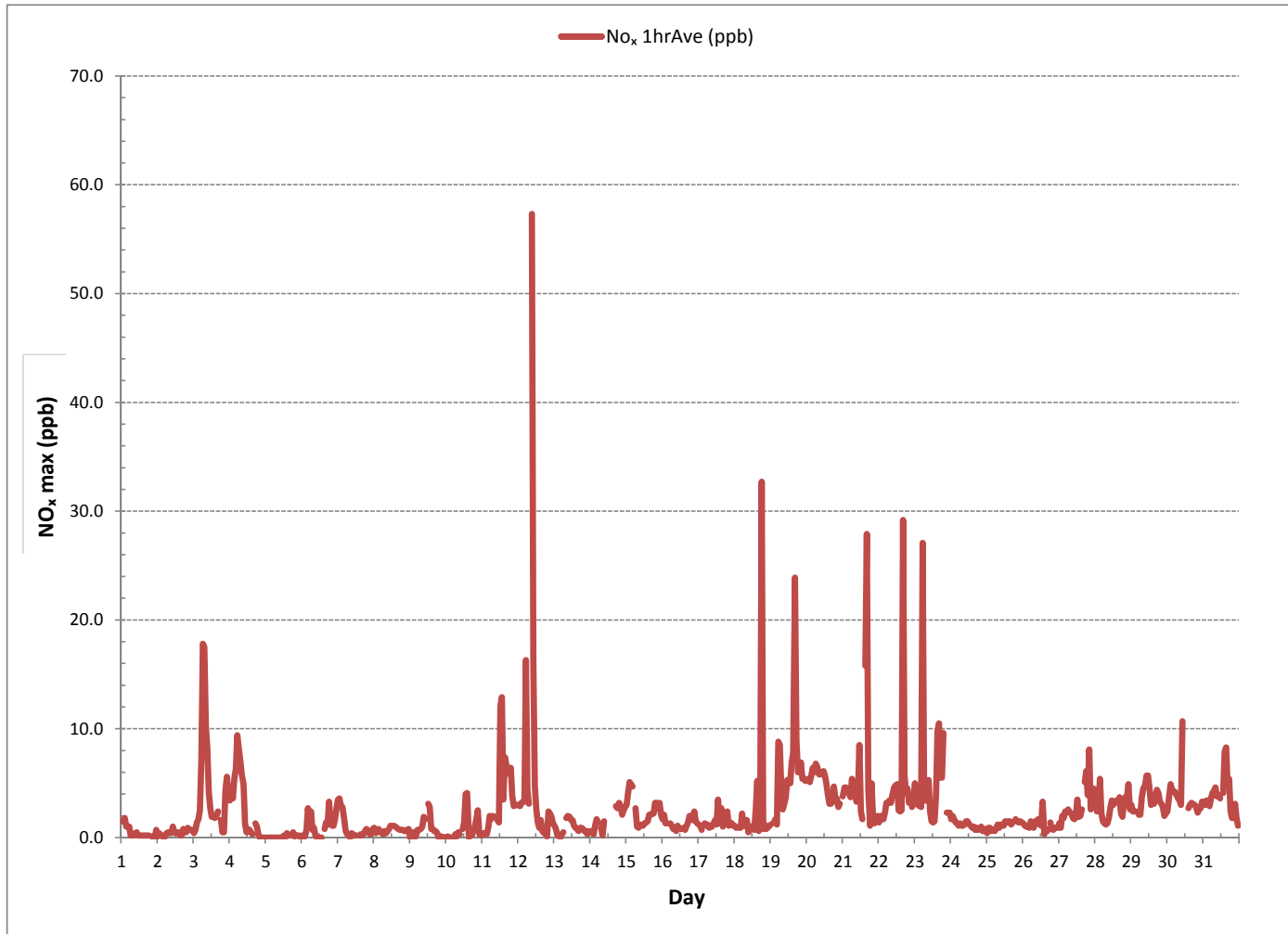
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

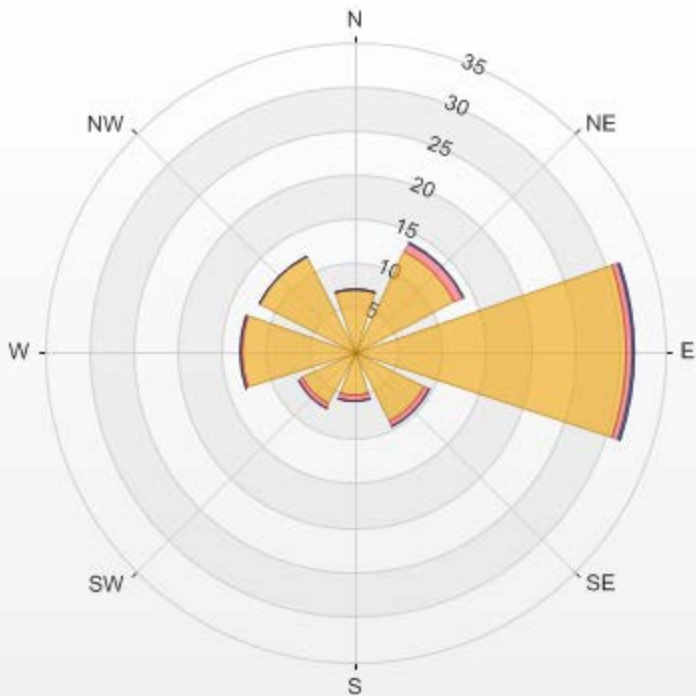
NUMBER OF NON-ZERO READINGS:	664
MAXIMUM INSTANTANEOUS VALUE:	57.3 ppb @ HOUR(S) 9 ON DAY(S) 12
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	741 hrs
STANDARD DEVIATION:	3.83

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.09% Calm Avg: 0.00 [ppb]

Direction	0.0-4.8	4.8-9.5	9.5-14.3	>14.3	Total
N	7.14	0	0	0	7.14
NE	12.71	1	0.14	0	13.85
E	30.71	0.71	0.14	0	31.56
SE	8.71	0.86	0	0	9.57
S	5	0.71	0	0	5.71
SW	6.57	0.57	0	0	7.14
W	12.71	0.29	0	0	13
NW	12	0	0	0	12
Summary	95.55	4.14	0.28	0	100



NOX[ppb] Calibration: LICA ST. LINA Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

NITRIC OXIDES

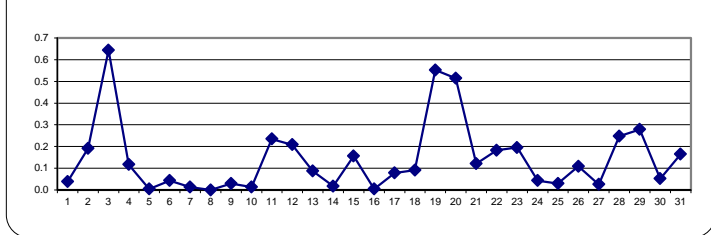
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.2	S	0.4	0.3	0.1	0.0	0.2	0.0	0.0	0.5	0.2	24	
3	0.0	0.0	0.0	0.0	0.0	0.0	1.6	3.8	3.3	3.1	0.9	0.7	0.4	0.4	0.2	0.2	0.2	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.6	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	24	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	S	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.2	0.0	24	
7	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	24	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	24	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	S	0.4	0.3	0.4	0.2	0.7	1.7	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.2	24	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	2.4	1.3	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.2	24	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.3	0.5	0.4	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24	
14	0.0	0.1	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	C	C	C	C	C	C	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
15	0.0	0.0	0.1	0.1	0.3	S	0.4	0.2	0.2	0.2	0.5	0.2	0.4	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2	24	
16	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
17	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.3	0.1	0.3	0.0	0.2	0.1	0.2	0.0	0.2	0.0	0.1	0.0	0.3	0.1	24		
18	0.0	0.1	S	0.3	0.2	0.3	0.2	0.0	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	24	
19	0.0	S	0.0	0.1	0.0	0.6	0.1	0.1	0.2	0.5	0.8	1.7	1.9	1.6	1.7	1.5	1.0	0.5	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	1.9	0.6	24	
20	S	0.1	0.0	0.0	0.1	0.0	0.0	0.2	1.1	1.6	1.8	2.0	1.7	1.5	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	2.0	0.5	24		
21	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	0.3	0.4	0.4	0.0	0.0	0.0	0.2	0.4	0.1	0.0	0.0	0.0	0.0	S	0.1	0.0	0.6	0.1	24		
22	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.0	1.1	0.3	0.1	0.1	0.0	0.3	0.0	0.0	0.0	0.0	S	0.2	0.1	0.0	1.1	0.2	24		
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.2	0.0	0.0	0.0	0.0	2.1	1.1	0.0	0.0	0.0	S	0.2	0.2	0.0	0.0	2.1	0.2	24		
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	S	0.4	0.1	0.0	0.1	0.0	0.4	0.0	24		
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
26	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.3	0.2	0.3	0.3	0.2	0.2	0.0	0.1	0.0	S	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.1	24	
27	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	24		
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.7	0.9	1.1	0.8	0.8	S	0.6	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	1.1	0.2	24	
29	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	1.5	1.8	0.7	0.2	S	0.4	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.8	0.3	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.5	S	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24	
31	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2	0.4	S	0.5	1.0	0.8	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.0	0.2	24	
HOURLY MAX	0.1	0.1	0.1	0.3	0.3	0.6	1.6	3.8	3.3	3.1	1.8	2.0	1.9	1.6	1.7	2.1	1.4	0.5	0.4	0.4	0.4	0.2	0.2	0.2	0.0	0.0	0.0	0.2	24	
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

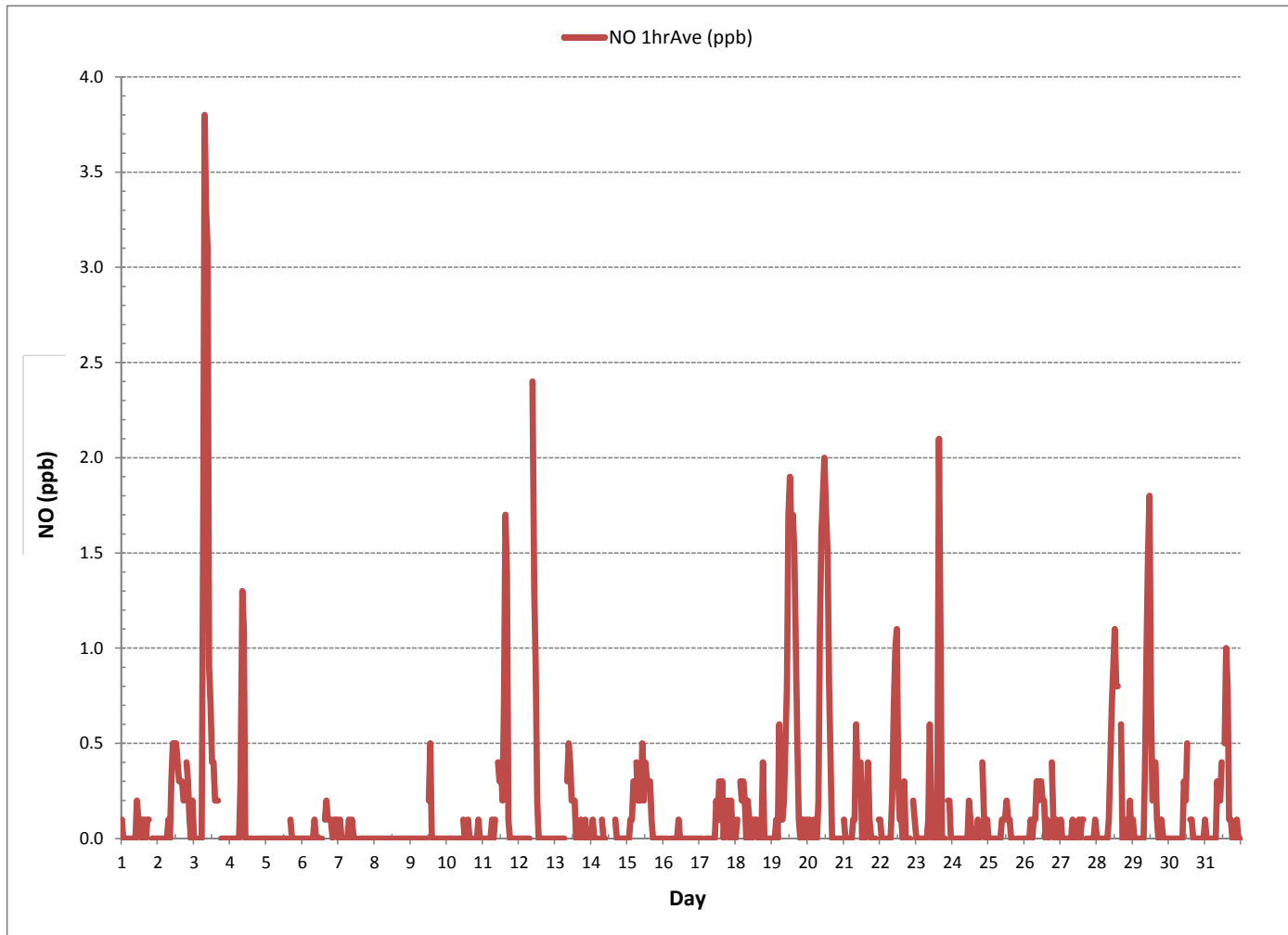
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	241			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) ALL
MAXIMUM 1-HR AVERAGE:	3.8 ppb	@ HOUR(S)	7	ON DAY(S) 3
MAXIMUM 24-HR AVERAGE:	0.6 ppb			ON DAY(S) 3, 19
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.39	MONTHLY AVERAGE:	0.1 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.8	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.7	0.9	0.7	0.7	0.7	0.7	0.7	0.9	0.7	0.7	S	0.9	0.7	0.6	0.6	0.6	0.6	0.9	0.7	24
2	0.8	0.8	0.6	0.6	0.6	0.6	0.6	0.9	0.9	0.9	1.2	1.0	1.0	1.0	1.2	1.0	0.9	0.8	S	0.9	0.9	0.7	0.6	0.9	0.6	1.2	0.8	24	
3	0.9	0.6	0.6	0.6	0.7	0.6	5.1	5.2	4.3	4.6	2.4	1.5	1.3	1.3	1.1	1.1	1.1	S	1.0	1.0	1.0	0.7	0.6	0.7	0.6	5.2	1.7	24	
4	0.8	0.9	0.9	0.7	0.9	0.9	0.9	1.7	2.5	2.8	1.2	0.8	0.8	0.6	1.0	0.9	S	1.1	0.9	0.7	0.9	0.7	0.7	0.9	0.6	2.8	1.1	24	
5	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.8	0.8	0.6	0.6	0.8	0.9	S	0.9	0.9	0.9	0.7	0.7	0.7	0.8	0.9	0.6	0.9	0.7	24	
6	0.7	0.6	0.6	1.1	2.0	1.3	1.7	0.8	1.0	0.8	0.8	0.8	1.0	0.9	S	1.0	1.6	1.1	1.4	1.0	0.9	0.9	1.0	1.1	0.6	2.0	1.0	24	
7	0.9	0.9	0.9	1.1	0.9	0.9	0.9	0.9	0.8	1.1	0.8	0.7	1.1	S	0.9	1.0	1.0	0.8	0.8	1.1	0.9	0.8	0.8	0.8	0.7	1.1	0.9	24	
8	1.0	0.9	0.9	0.9	0.9	0.7	0.9	0.9	1.0	1.1	1.1	1.1	S	1.2	1.1	0.9	0.9	0.8	0.7	0.8	0.8	0.8	0.7	1.0	0.7	1.2	0.9	24	
9	0.8	0.8	0.7	0.7	0.8	0.8	0.7	0.7	1.1	1.3	1.3	S	2.7	3.5	1.3	1.3	1.1	1.1	1.1	1.0	0.9	0.9	0.8	0.9	0.7	3.5	1.1	24	
10	1.0	0.8	0.9	0.7	1.0	0.8	0.8	1.0	1.0	S	1.3	1.3	3.9	3.9	0.8	0.8	0.8	0.8	1.0	1.3	1.9	0.8	0.9	0.7	3.9	1.2	24		
11	0.8	0.9	0.8	0.9	1.1	1.4	1.5	1.6	1.9	S	1.9	1.5	7.3	5.8	2.1	3.6	2.8	1.6	2.1	3.5	1.0	0.7	1.0	0.8	0.7	7.3	2.0	24	
12	1.0	1.0	0.9	1.0	1.1	9.0	1.6	1.0	S	47.8	7.1	3.5	1.7	1.1	1.1	1.0	0.9	1.1	0.9	0.9	0.9	1.0	0.8	0.7	0.7	47.8	3.8	24	
13	1.1	0.8	0.7	1.0	0.8	0.7	0.7	S	1.2	1.5	1.3	1.1	1.1	1.1	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.7	0.8	0.7	1.5	0.9	24	
14	0.7	1.0	0.8	0.8	0.8	0.8	S	1.0	1.0	1.4	C	C	C	C	C	C	C	C	C	0.7	0.7	0.7	0.5	0.5	0.7	0.5	1.4	0.8	24
15	0.6	0.8	0.6	0.6	0.7	S	0.8	0.6	0.7	0.7	0.9	0.8	0.9	0.8	0.9	0.8	0.9	0.5	0.7	0.5	0.7	0.5	0.5	0.5	0.5	0.9	0.7	24	
16	0.4	0.5	0.5	0.6	S	0.7	0.7	0.6	0.7	0.5	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	1.1	0.6	0.5	0.4	1.1	0.6	24		
17	0.4	0.5	0.4	S	0.8	0.8	0.9	0.8	0.5	0.7	0.8	1.3	1.0	2.6	1.0	1.5	0.6	1.1	0.8	1.4	0.6	0.6	0.6	0.6	0.4	2.6	0.9	24	
18	0.6	0.5	S	0.8	0.8	1.7	0.9	1.5	1.1	0.5	0.7	0.9	1.0	0.6	1.4	5.6	0.6	0.8	22.4	0.6	0.7	0.6	0.8	0.6	0.5	22.4	2.0	24	
19	0.6	S	0.6	0.9	0.6	3.8	2.7	1.2	0.9	1.2	1.7	2.5	2.7	2.4	3.8	3.7	19.0	3.4	0.6	0.5	1.0	0.6	0.6	0.6	0.5	19.0	2.4	24	
20	S	0.8	0.5	0.6	0.8	0.7	0.5	1.1	1.9	2.4	2.7	2.4	2.4	1.7	1.4	0.6	0.6	1.1	0.9	0.8	0.6	0.6	S	0.5	2.7	1.3	24		
21	1.0	0.6	0.5	0.5	0.5	0.7	1.8	1.3	1.9	1.2	2.0	3.1	0.8	1.3	P	11.5	19.9	3.0	0.4	1.5	0.3	0.3	S	0.8	0.3	19.9	2.5	23	
22	0.7	0.5	0.5	0.5	0.7	0.7	0.5	0.5	1.0	1.3	1.5	1.8	1.3	0.7	0.6	0.5	17.4	1.1	0.7	0.7	S	0.7	0.7	0.5	17.4	1.5	24		
23	1.4	0.5	0.4	0.5	0.4	17.3	0.6	0.6	0.8	1.8	0.7	0.6	0.4	0.6	1.1	3.4	2.6	0.4	0.6	0.6	S	0.7	0.9	0.7	0.4	17.3	1.6	24	
24	0.4	0.7	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.3	0.6	0.6	0.4	0.4	0.4	0.4	0.1	0.3	0.3	S	0.8	0.4	0.3	0.3	0.1	0.8	0.4	24	
25	0.2	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.5	0.4	0.7	0.4	0.7	0.6	0.4	0.4	0.4	0.4	S	0.7	0.6	0.4	0.4	0.3	0.2	0.7	0.4	24	
26	0.4	0.3	0.4	0.4	0.5	0.7	1.1	0.7	1.2	0.6	1.4	0.9	0.9	2.9	0.3	0.6	0.4	S	0.7	0.4	0.4	0.6	0.3	0.4	0.3	2.9	0.7	24	
27	0.5	0.2	0.3	0.3	0.6	0.3	0.3	0.6	0.6	0.6	0.6	0.6	1.0	0.4	0.7	0.8	S	0.7	0.6	0.4	0.7	0.4	0.4	0.7	0.2	1.0	0.5	24	
28	0.6	0.3	0.2	0.4	0.4	0.5	0.3	0.3	0.6	0.9	1.4	1.7	1.4	1.6	S	1.5	0.4	0.5	0.4	0.5	0.4	1.5	0.4	0.2	1.7	0.8	24		
29	0.7	0.4	0.4	0.4	P	0.3	0.2	0.6	1.1	1.6	2.6	2.6	1.9	0.9	S	0.9	0.7	0.4	1.0	0.7	0.4	0.4	0.3	0.3	0.2	2.6	0.9	23	
30	0.2	0.1	0.4	0.2	0.4	0.4	0.4	0.3	0.4	0.4	8.3	P	2.2	S	0.7	0.9	0.3	0.6	0.7	0.6	0.4	0.5	0.7	0.4	0.1	8.3	0.9	23	
31	0.5	0.4	0.5	0.5	0.5	0.5	1.2	1.1	1.7	0.8	0.8	0.9	S	1.0	3.6	3.3	0.9	1.9	0.5	0.5	0.4	0.9	0.4	0.4	0.4	3.6	1.0	24	
HOURLY MAX	1.4	1.0	0.9	1.1	2.0	17.3	5.1	5.2	4.3	47.8	8.3	3.5	7.3	5.8	3.9	11.5	19.9	3.4	22.4	3.5	1.3	1.9	1.5	1.1					
HOURLY AVG	0.7	0.6	0.6	0.6	0.7	1.7	1.0	1.0	1.1	2.7	1.7	1.3	1.4	1.5	1.3	1.8	2.9	1.0	1.6	0.9	0.7	0.7	0.7						

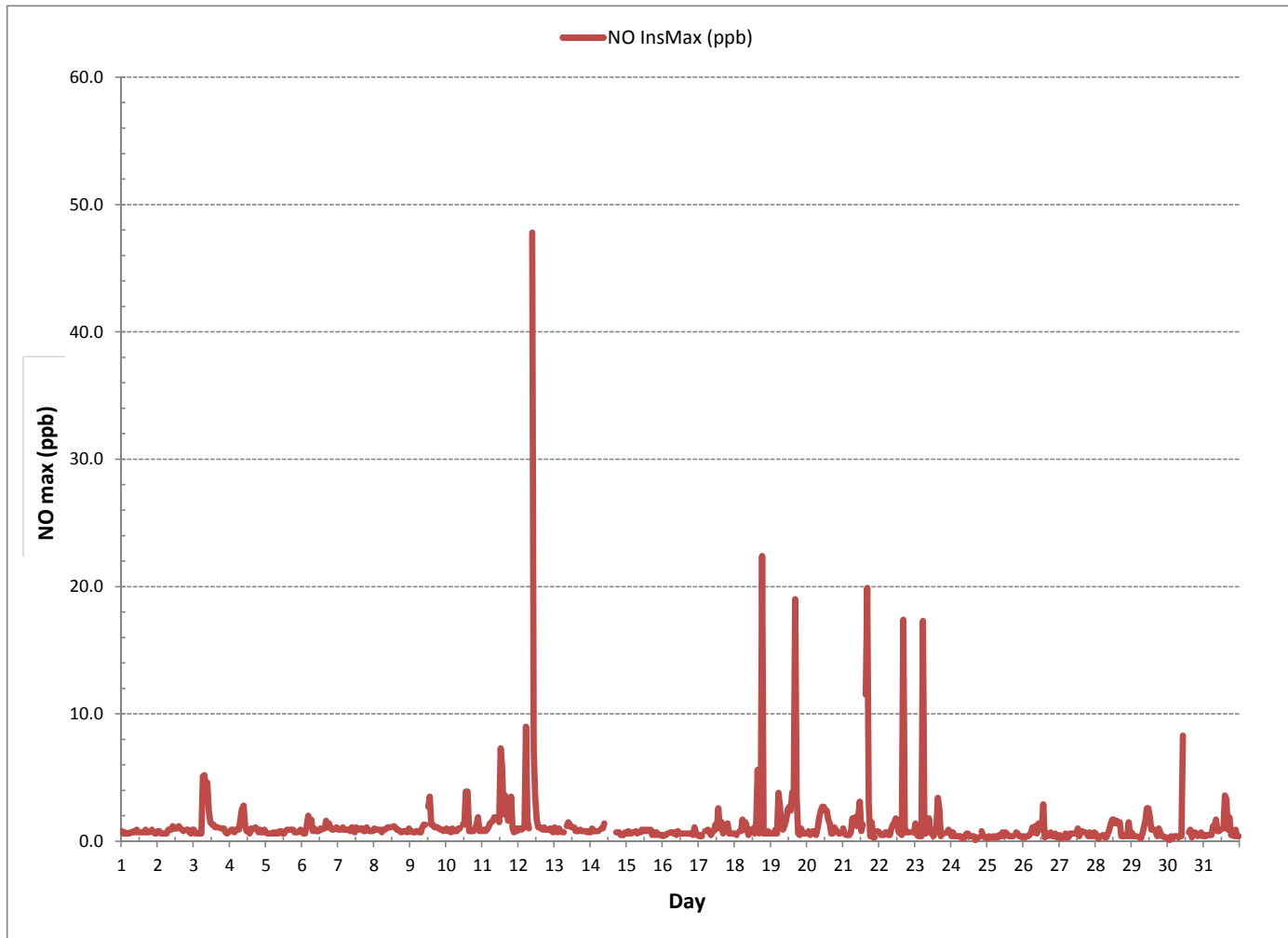
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

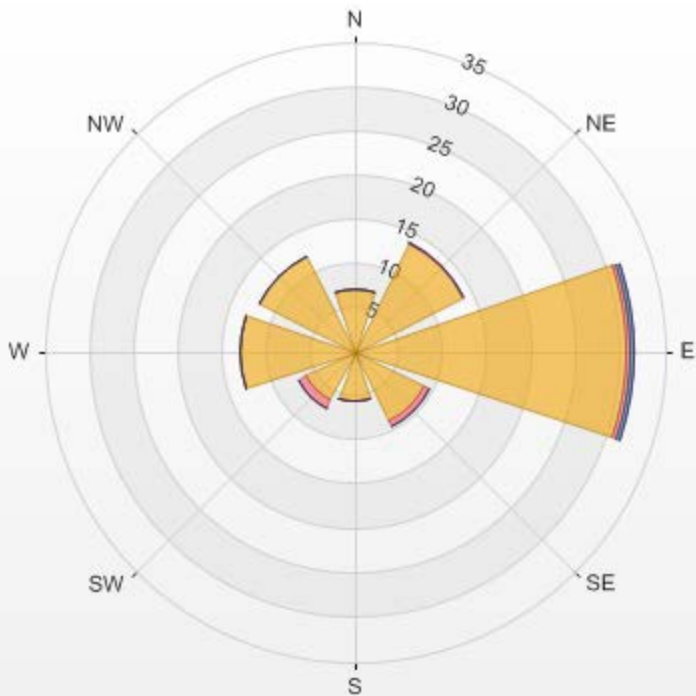
NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	47.8 ppb @ HOUR(S) 9 ON DAY(S) 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	2.53
OPERATIONAL TIME:	741 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.09% Calm Avg: 0.00 [ppb]

Direction	0.0-1.3	1.3-2.6	2.6-3.9	>3.9	Total
N	7.14	0	0	0	7.14
NE	13.71	0.14	0	0	13.85
E	30.71	0.43	0.43	0	31.57
SE	8.86	0.71	0	0	9.57
S	5.57	0.14	0	0	5.71
SW	6.14	1	0	0	7.14
W	13	0	0	0	13
NW	12	0	0	0	12
Summary	97.13	2.42	0.43	0	100



% Icon Classes (ppb)	97	2	0	0
0.0-1.3	97	2	0	0
1.3-2.6		2	0	0
2.6-3.9			0	0
>3.9				0

NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1.7	1.8	1.9	1.4	1.2	1.1	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.3	S	0.2	0.1	0.1	0.2	0.1	1.9	0.7	24
2	0.4	0.6	0.5	0.4	0.2	0.5	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.4	0.3	0.4	0.7	S	0.8	1.1	1.0	1.1	1.0	0.2	1.1	0.6	24
3	0.8	1.0	1.7	2.0	2.7	4.5	12.0	10.4	5.9	4.3	2.7	1.9	1.5	1.6	1.7	1.8	2.2	S	0.9	0.5	0.5	1.1	5.5	4.1	0.5	12.0	3.1	24
4	3.2	3.5	3.6	4.9	6.1	8.5	7.8	5.6	4.2	2.3	0.7	0.4	0.7	0.5	0.4	0.0	S	0.9	0.7	0.1	0.0	0.1	0.0	0.1	0.0	8.5	2.4	24
5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4	0.6	0.4	S	0.5	0.5	0.6	0.5	0.7	0.6	0.4	0.3	0.0	0.7	0.3	24
6	0.6	0.5	0.5	0.9	1.0	1.1	0.9	0.8	0.9	0.4	0.2	0.2	0.0	0.0	S	0.3	0.5	0.7	1.1	1.3	1.2	1.1	1.8	2.4	0.0	2.4	0.8	24
7	3.4	3.3	3.0	2.5	1.3	0.8	0.4	0.4	0.4	0.5	0.4	0.3	0.3	S	0.5	0.4	0.3	0.5	0.7	1.0	0.7	0.6	0.6	0.7	0.3	3.4	1.0	24
8	0.8	0.6	0.7	1.0	0.7	0.6	0.4	0.7	0.4	0.8	0.8	1.3	S	1.3	1.1	1.1	0.8	0.8	0.8	0.8	0.6	0.8	0.7	0.4	1.3	0.8	24	
9	0.2	0.3	0.5	0.0	0.2	0.7	0.5	0.6	1.1	1.6	1.0	S	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.0	1.6	0.5	24
10	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.6	S	0.5	0.5	0.4	0.4	0.1	0.2	0.3	0.7	0.5	0.5	0.5	0.1	0.3	0.1	0.7	0.3	24
11	0.3	0.2	0.3	0.4	0.4	0.5	0.4	0.3	0.1	S	0.4	0.2	0.5	0.5	1.7	3.5	4.9	5.1	3.4	3.1	3.0	2.5	2.8	2.6	0.1	5.1	1.6	24
12	2.8	2.6	2.8	2.9	2.8	3.0	2.9	2.4	S	2.2	2.1	1.6	1.2	0.7	0.6	0.8	0.5	0.4	0.2	0.2	1.7	2.2	1.8	1.2	0.2	3.0	1.7	24
13	1.4	0.9	0.4	0.5	0.5	0.7	0.9	S	1.7	1.7	1.8	1.7	1.5	1.3	1.3	1.3	1.0	1.1	1.2	1.2	0.9	0.7	0.6	0.7	0.4	1.8	1.1	24
14	0.8	0.7	0.7	1.1	1.8	1.2	S	0.7	0.3	0.4	C	C	C	C	C	C	1.9	1.5	1.4	2.5	2.3	1.6	1.7	2.5	0.3	2.5	1.4	24
15	2.6	3.8	4.7	4.6	4.3	S	1.3	0.6	0.6	0.7	0.7	0.6	0.7	0.9	1.0	1.4	1.8	1.9	2.1	2.8	2.9	2.4	2.3	1.6	0.6	4.7	2.0	24
16	1.4	1.5	0.9	1.0	S	0.8	0.7	0.4	0.3	0.2	0.6	0.4	0.3	0.3	0.4	0.3	0.4	0.8	1.2	1.3	1.1	1.3	0.9	0.7	0.2	1.5	0.7	24
17	0.6	0.6	0.3	S	0.6	0.5	0.4	0.3	0.4	0.6	0.5	0.4	0.5	0.5	0.8	0.9	0.7	1.0	0.9	0.9	0.9	1.0	0.9	0.9	0.3	1.0	0.7	24
18	0.8	0.8	S	0.6	0.6	0.6	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.8	0.5	0.4	0.6	1.5	0.5	0.8	0.5	0.6	0.9	0.4	1.5	0.6	24
19	1.0	S	1.1	1.0	1.0	2.0	1.8	2.2	1.8	1.8	2.2	2.5	2.7	2.6	3.0	3.0	4.0	4.7	5.2	5.2	4.8	4.4	4.5	4.1	1.0	5.2	2.9	24
20	S	4.3	4.2	4.7	5.3	4.8	5.5	4.7	3.6	3.3	3.2	3.0	3.0	2.4	1.8	1.7	2.0	2.4	2.5	2.4	2.2	2.0	2.1	S	1.7	5.5	3.2	24
21	2.6	3.6	3.8	3.5	3.1	2.9	3.2	2.9	2.6	2.2	1.6	1.1	1.1	0.6	0.5	1.0	1.0	0.8	0.5	1.7	1.0	0.6	S	1.4	0.5	3.8	1.9	24
22	1.0	1.3	1.1	1.1	1.6	2.3	2.6	2.6	2.1	2.4	2.9	3.2	2.3	1.6	1.8	1.8	3.0	3.2	3.4	3.2	2.7	S	2.2	2.4	1.0	3.4	2.3	24
23	2.8	2.9	2.5	2.3	2.2	2.6	2.6	2.6	2.8	2.6	1.4	0.9	0.9	0.9	1.7	5.7	7.8	4.6	4.1	8.4	S	1.5	1.6	1.5	0.9	8.4	2.9	24
24	1.3	1.4	1.2	1.0	0.8	0.8	0.9	0.8	0.8	0.9	1.1	0.9	0.8	0.6	0.6	0.7	0.6	0.6	0.5	S	0.3	0.3	0.4	0.3	0.3	1.4	0.8	24
25	0.2	0.6	0.4	0.4	0.4	0.4	0.6	0.8	0.5	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.1	1.2	S	1.2	1.2	1.1	1.3	1.2	0.2	1.3	0.8	24
26	1.0	1.0	0.9	0.9	0.8	0.9	0.8	0.7	0.6	0.7	0.6	0.6	0.5	0.6	0.5	0.6	0.6	S	0.8	0.8	0.8	0.8	0.7	0.8	0.5	1.0	0.7	24
27	0.8	0.9	1.4	1.6	2.0	2.1	2.3	2.2	1.7	1.2	1.4	1.6	1.7	1.3	1.2	1.7	S	4.6	4.9	3.2	5.1	1.3	2.6	3.6	0.8	5.1	2.2	24
28	3.0	1.8	1.9	4.0	1.1	0.9	0.8	0.7	0.7	0.7	1.1	1.3	1.2	1.6	1.7	S	1.5	1.5	1.4	2.4	2.9	2.7	2.7	2.0	0.7	4.0	1.7	24
29	1.7	1.6	1.8	1.8	1.6	1.4	1.5	2.2	3.2	2.8	3.0	2.8	2.1	1.8	S	1.9	2.9	3.7	2.8	2.4	2.2	1.8	1.4	1.4	1.4	3.7	2.2	24
30	1.7	2.4	3.8	3.5	3.3	3.5	3.2	2.8	2.4	2.1	1.4	1.8	2.5	S	1.7	1.9	2.1	2.1	1.9	2.0	1.5	1.7	1.8	2.3	1.4	3.8	2.3	24
31	2.3	2.1	2.1	2.5	2.0	2.6	2.4	2.8	2.7	2.5	2.6	2.3	S	2.7	3.5	3.7	3.7	3.4	1.3	1.0	0.9	0.9	0.8	0.3	0.3	3.7	2.2	24
HOURLY MAX	3.4	4.3	4.7	4.9	6.1	8.5	12.0	10.4	5.9	4.3	3.2	3.2	3.0	2.7	3.5	5.7	7.8	5.1	5.2	8.4	5.1	4.4	5.5	4.1				
HOURLY AVG	1.4	1.6	1.6	1.8	1.7	1.8	2.0	1.8	1.5	1.4	1.3	1.2	1.1	1.0	1.1	1.4	1.6	1.7	1.6	1.8	1.5	1.2	1.5	1.4				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

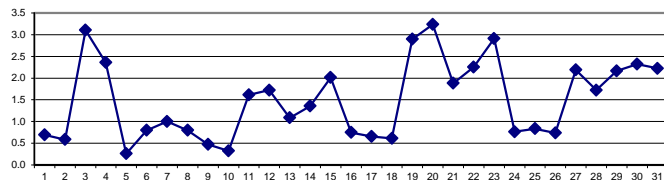
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

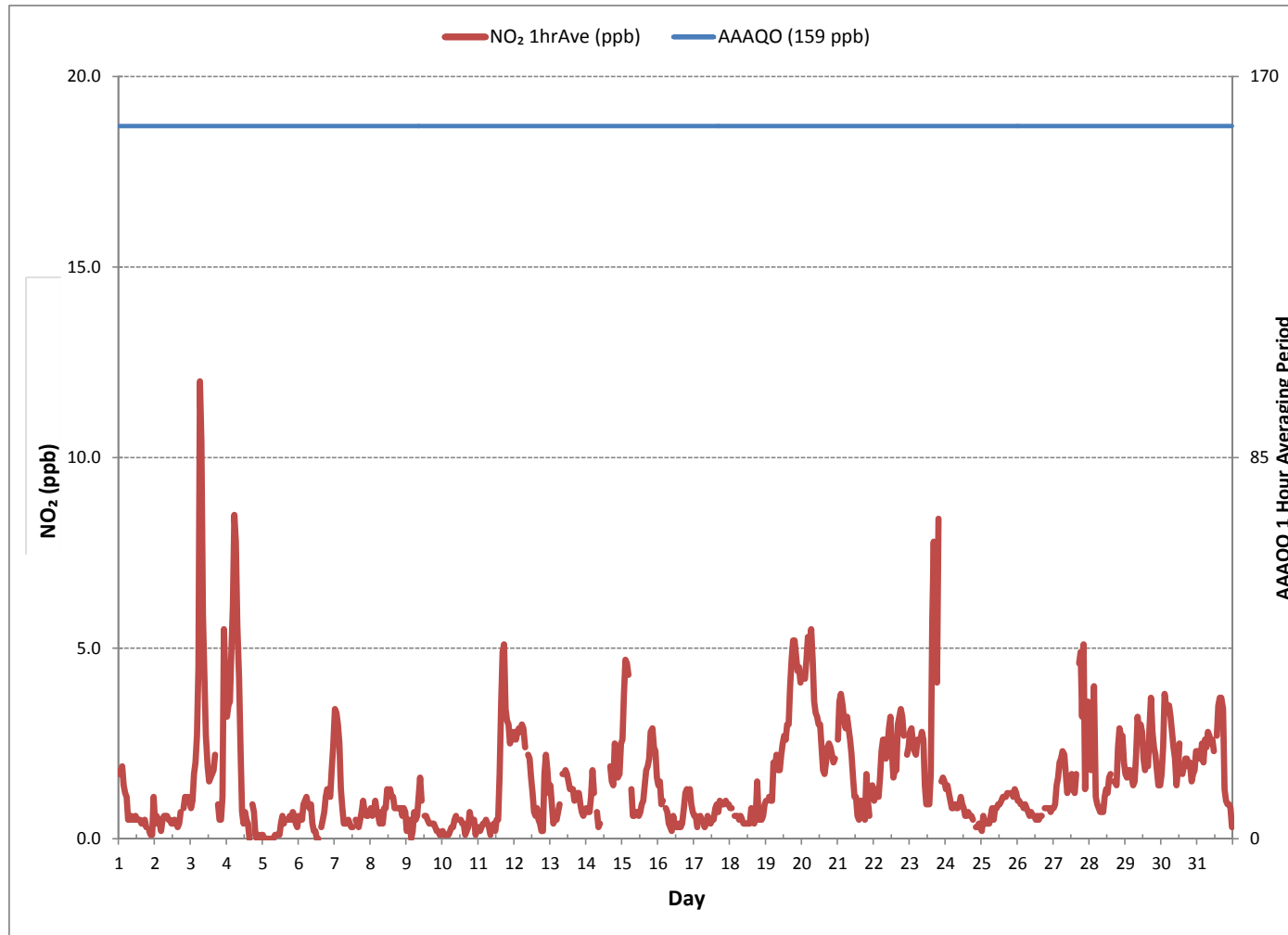
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	693				
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	12.0	ppb	@ HOUR(S)	6	3
MAXIMUM 24-HR AVERAGE:	3.2	ppb			20
					VAR-VARIOUS
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	1.40		MONTHLY AVERAGE:	1.5	ppb

24 HOUR AVERAGES FOR October 2016



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	1.1	1.2	1.6	1.1	0.6	0.8	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.3	24
2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.5	S	0.4	0.7	0.6	0.4	0.3	0.0	0.0	0.7	0.2	24	
3	0.3	0.5	1.3	1.3	2.2	6.8	13.3	12.4	6.6	4.1	2.1	1.6	1.2	1.1	1.3	1.3	1.8	S	1.2	0.1	0.0	3.8	6.1	4.1	0.0	13.3	3.2	24	
4	3.1	4.1	3.3	5.2	6.2	8.9	8.2	6.5	4.3	2.5	0.3	0.3	0.5	0.3	0.1	0.0	S	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	8.9	2.4	24	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	24	
6	0.1	0.2	0.0	0.0	1.0	0.6	1.1	0.3	0.6	0.1	0.0	0.0	0.0	0.0	S	0.1	0.6	0.9	2.4	1.1	1.0	0.7	1.6	2.6	0.0	2.6	0.7	24	
7	3.0	3.0	2.7	2.4	1.3	0.5	0.0	0.0	0.1	0.0	0.0	0.1	0.0	S	0.0	0.0	0.0	0.2	0.4	0.7	0.2	0.2	0.3	0.6	0.0	3.0	0.7	24	
8	0.4	0.2	0.2	0.7	0.5	0.5	0.2	0.2	0.0	0.2	0.4	0.7	S	0.7	0.6	0.7	0.5	0.5	0.7	0.7	0.6	0.4	0.4	0.7	0.0	0.7	0.5	24	
9	0.1	0.0	0.2	0.0	0.2	0.7	0.7	0.4	0.6	1.3	0.9	S	0.7	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.3	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.2	0.4	0.4	0.7	0.0	0.0	0.2	0.4	0.6	0.9	1.1	0.2	0.0	0.0	1.1	0.2	24	
11	0.2	0.2	0.1	0.3	0.2	1.2	0.5	0.8	0.6	S	0.2	0.8	6.8	7.7	2.0	4.4	5.1	5.3	4.2	4.3	3.6	2.7	2.7	2.6	0.1	7.7	2.5	24	
12	2.9	2.8	2.8	2.8	2.9	8.4	3.2	2.9	S	10.4	10.1	1.7	1.6	0.7	0.5	1.0	0.5	0.2	0.0	0.0	2.0	2.3	1.9	1.3	0.0	10.4	2.7	24	
13	0.9	0.7	0.0	0.0	0.0	0.1	0.3	S	1.2	1.1	1.2	1.1	0.9	0.6	0.8	0.7	0.5	0.6	0.7	0.7	0.5	0.2	0.3	0.4	0.0	1.2	0.6	24	
14	0.5	0.2	0.4	0.7	1.5	1.2	S	0.4	0.1	0.7	C	C	C	C	C	C	C	2.8	2.5	3.1	3.0	2.5	2.6	2.8	0.1	3.1	1.6	24	
15	3.2	4.4	5.1	5.0	4.7	S	2.6	1.0	1.0	1.0	1.0	1.1	1.3	1.5	1.5	1.9	2.0	2.4	2.4	3.4	3.4	3.1	3.4	2.3	1.0	5.1	2.6	24	
16	2.0	2.0	1.7	1.5	S	0.9	0.9	0.8	0.9	0.7	1.0	1.0	0.7	1.0	0.9	1.0	1.0	1.8	2.1	1.8	1.7	2.0	1.8	1.5	0.7	2.1	1.3	24	
17	1.5	1.3	1.2	S	0.9	0.9	0.9	0.9	0.9	0.9	1.1	0.9	0.9	1.1	1.2	1.9	1.0	1.3	1.3	1.5	1.5	1.3	1.2	1.3	0.9	1.9	1.2	24	
18	1.2	1.2	S	1.0	0.9	1.0	1.0	1.6	1.0	0.7	0.7	0.7	0.7	1.5	1.3	0.7	2.0	13.4	0.9	1.3	0.9	0.7	1.2	0.7	13.4	1.6	24		
19	1.4	S	1.3	1.4	1.3	6.3	6.4	3.7	2.2	2.6	2.7	3.5	3.4	3.3	4.0	4.7	8.5	6.3	6.1	6.3	6.6	5.4	5.6	5.1	1.3	8.5	4.3	24	
20	S	5.4	5.4	5.9	6.4	5.8	6.9	6.6	4.9	4.3	4.3	4.0	4.1	3.2	2.8	2.6	3.0	3.5	4.0	3.5	3.5	3.1	3.2	S	2.6	6.9	4.4	24	
21	3.9	4.7	4.8	4.4	4.1	3.7	3.9	3.6	3.5	2.8	2.6	6.1	2.2	1.2	P	4.6	12.7	2.2	1.3	3.9	2.1	1.5	S	2.1	1.2	12.7	3.7	23	
22	1.3	2.1	1.9	1.6	2.6	3.0	3.3	3.5	2.7	3.0	3.4	3.7	3.9	2.2	2.3	2.4	13.6	4.8	4.0	4.3	3.3	S	2.9	3.0	1.3	13.6	3.4	24	
23	4.0	3.5	3.3	3.0	3.0	10.6	3.4	3.0	3.2	3.7	1.8	1.3	1.4	1.5	2.8	7.8	9.2	5.5	5.7	9.4	S	2.1	2.1	2.2	1.3	10.6	4.1	24	
24	1.9	2.0	1.9	1.5	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	0.9	1.1	1.1	1.1	0.9	S	0.8	0.9	0.7	0.7	0.7	2.0	1.2	24	
25	0.8	1.1	1.0	0.7	0.7	0.7	1.0	1.3	0.9	1.3	1.3	1.2	1.2	1.3	1.4	1.3	1.6	1.6	S	1.5	1.5	1.5	1.6	1.5	0.7	1.6	1.2	24	
26	1.5	1.3	1.2	1.3	1.1	1.1	1.0	0.9	0.8	1.2	0.7	1.1	0.7	1.3	0.5	0.7	0.7	S	0.9	0.9	0.7	0.9	0.9	0.8	0.5	1.5	1.0	24	
27	1.1	1.4	1.9	1.9	2.4	2.5	2.7	2.4	2.4	1.5	1.8	2.0	2.8	1.8	1.7	2.3	S	4.9	5.9	3.7	7.8	2.7	3.6	4.2	1.1	7.8	2.8	24	
28	4.2	2.6	2.9	5.7	1.9	1.4	1.5	1.3	1.1	1.0	1.7	1.8	1.6	2.0	2.1	S	2.3	2.1	2.0	3.2	3.5	3.2	3.6	2.7	1.0	5.7	2.4	24	
29	2.4	2.1	2.4	2.3	P	2.1	2.1	3.5	3.7	3.6	3.7	3.9	2.8	2.6	S	2.7	3.8	4.4	3.9	3.3	3.0	2.5	2.2	2.1	2.1	4.4	3.0	23	
30	2.4	3.5	4.6	4.3	4.1	4.0	3.9	3.5	3.2	2.9	3.0	P	3.7	S	2.5	2.4	3.0	2.9	2.6	2.8	2.3	2.5	2.6	3.0	2.3	4.6	3.2	23	
31	3.1	3.0	3.0	3.5	3.0	3.6	3.2	3.5	3.2	3.2	3.2	3.0	S	3.5	4.8	5.4	4.3	4.1	2.3	1.8	1.7	2.2	1.8	1.5	1.5	5.4	3.1	24	
HOURLY MAX	4.2	5.4	5.4	5.9	6.4	10.6	13.3	12.4	6.6	10.4	10.1	6.1	6.8	7.7	4.8	7.8	13.6	6.3	13.4	9.4	7.8	5.4	6.1	5.1					
HOURLY AVG	1.6	1.8	1.9	2.0	1.9	2.6	2.5	2.2	1.7	1.9	1.8	1.5	1.6	1.5	1.4	1.9	2.8	2.2	2.5	2.2	1.9	1.7	1.8	1.7					

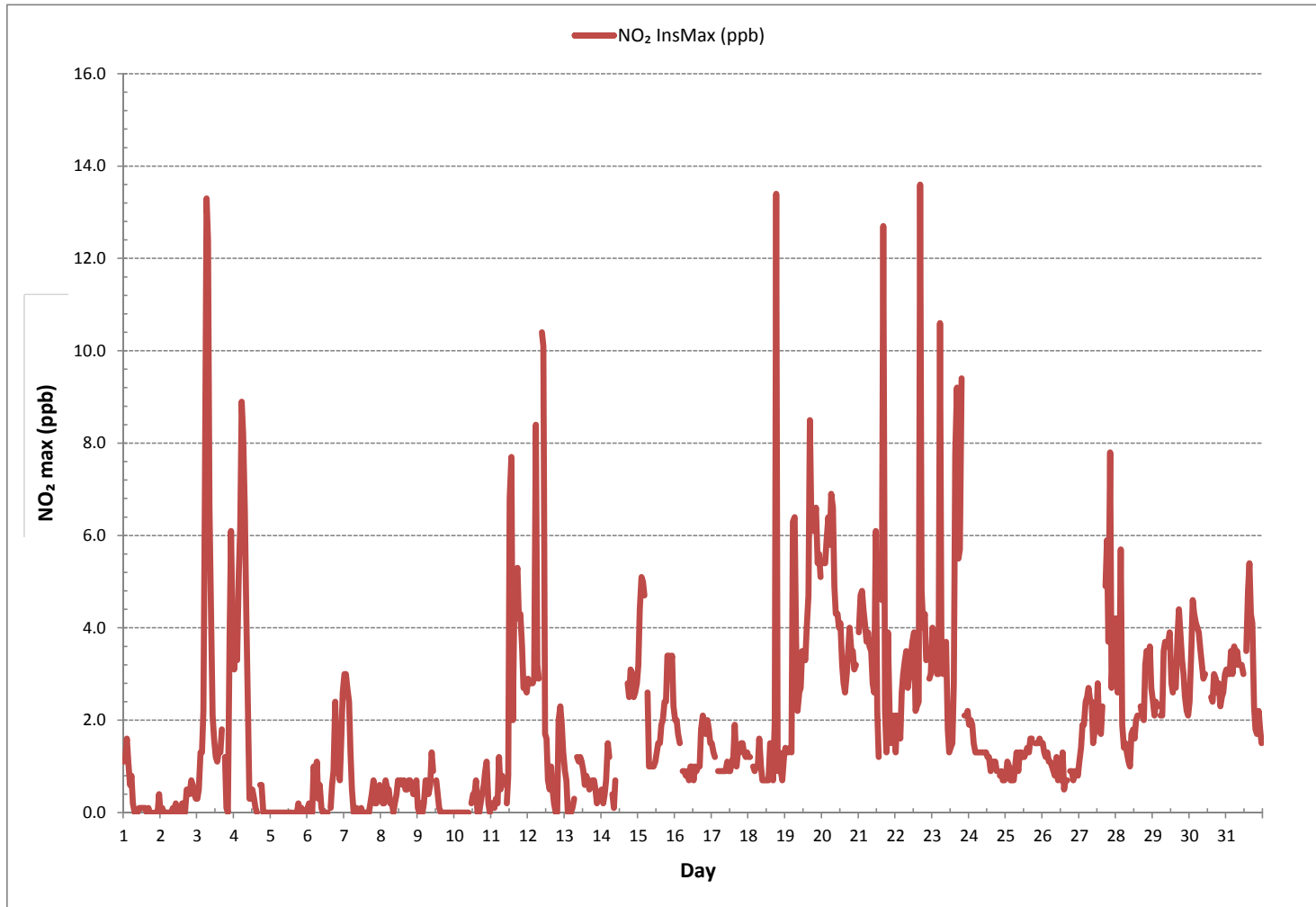
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

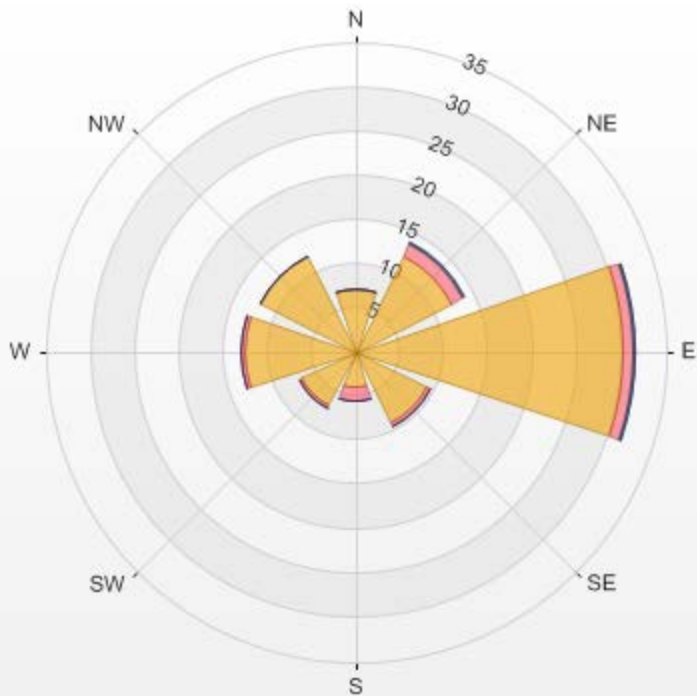
NUMBER OF NON-ZERO READINGS:	607
MAXIMUM INSTANTANEOUS VALUE:	13.6 ppb @ HOUR(S) 16 ON DAY(S) 22
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	2.06
OPERATIONAL TIME:	741 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



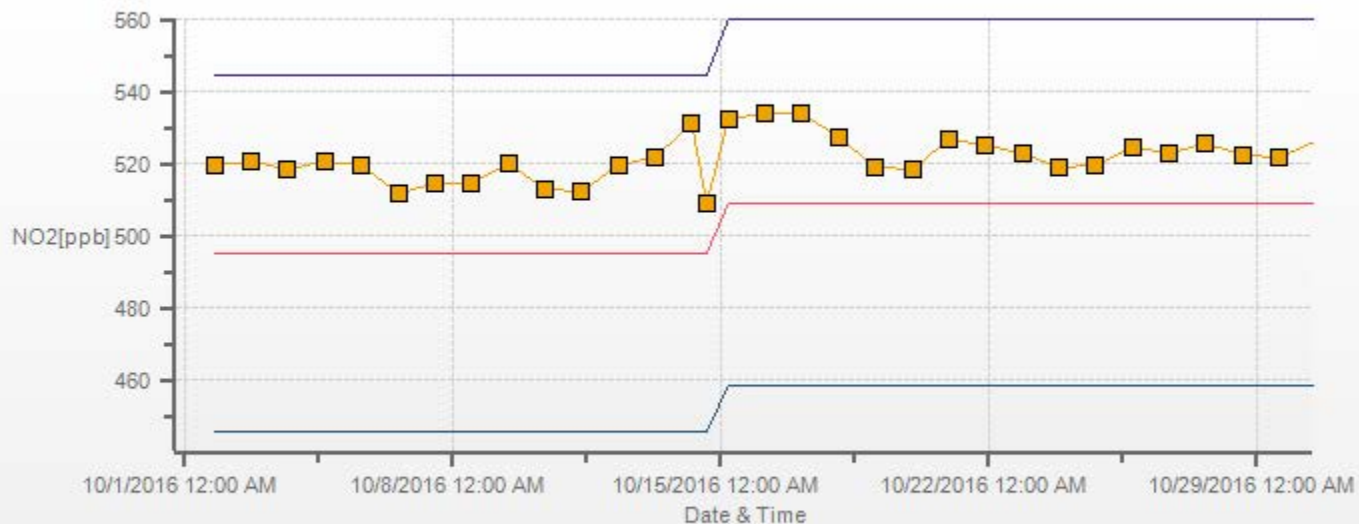
Wind: LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.09% Calm Avg: 0.00 [ppb]

Direction	0.0-4.1	4.1-8.1	8.1-12.2	>12.2	Total
N	7.14	0	0	0	7.14
NE	12.14	1.43	0.29	0	13.86
E	30.29	1	0.29	0	31.58
SE	9.14	0.43	0	0	9.57
S	4.14	1.57	0	0	5.71
SW	6.86	0.29	0	0	7.15
W	12.57	0.43	0	0	13
NW	12	0	0	0	12
Summary	94.28	5.15	0.58	0	100



% Icon Classes (ppb)	
94	0.0-4.1
5	4.1-8.1
1	8.1-12.2
0	>12.2

NO2[ppb] Calibration: LICA ST. LINA Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

OZONE

OZONE Hourly Averages (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	25.1	22.5	23.1	23.6	24.1	25.8	26.3	25.7	24.6	24.0	23.1	22.0	22.4	21.7	20.2	20.0	18.8	17.3	15.3	S	10.6	9.2	8.0	7.0	7.0	26.3	20.0	24	
2	6.3	5.5	7.1	10.6	13.2	14.5	13.7	13.0	12.0	11.6	11.9	13.8	16.2	19.7	23.7	26.0	26.2	23.7	S	23.4	22.6	24.5	26.8	26.7	5.5	26.8	17.1	24	
3	26.8	24.8	20.8	14.7	12.8	10.0	3.5	7.4	12.5	14.8	20.8	24.2	27.2	29.3	31.2	32.6	30.9	S	29.8	29.4	28.5	26.6	17.3	18.3	3.5	32.6	21.5	24	
4	17.8	15.8	15.4	13.2	11.7	8.3	8.6	11.8	12.9	16.5	21.5	25.4	25.8	26.9	28.3	28.1	S	24.3	23.7	23.3	22.4	22.4	21.8	21.0	8.3	28.3	19.4	24	
5	20.5	20.6	20.8	21.2	21.4	23.4	24.6	24.6	25.3	24.7	24.7	24.8	25.3	26.1	27.0	S	26.9	26.6	25.1	23.7	24.8	25.0	24.4	24.8	20.5	27.0	24.2	24	
6	23.0	22.6	22.4	21.8	20.9	20.9	20.8	20.7	20.7	23.1	25.2	25.6	25.8	26.1	S	25.2	24.6	24.5	24.4	24.6	24.7	23.0	21.3	19.0	19.0	26.1	23.1	24	
7	17.6	17.8	18.2	19.2	21.5	23.4	25.6	27.3	27.8	28.2	28.6	29.1	29.2	S	32.5	32.9	32.5	31.9	30.6	29.1	28.3	27.5	28.0	27.6	17.6	32.9	26.7	24	
8	28.7	27.4	28.1	27.8	28.8	28.3	28.1	27.4	27.4	26.2	25.9	25.8	S	28.1	29.5	29.2	28.6	28.3	27.1	26.6	25.6	24.5	23.8	23.2	23.2	23.2	29.5	27.1	24
9	23.1	23.2	22.6	22.3	21.2	20.0	20.2	20.1	19.5	17.1	18.0	S	18.4	18.6	18.1	18.2	17.4	17.9	18.5	18.6	18.5	18.5	19.8	19.6	17.1	23.2	19.5	24	
10	20.6	18.9	18.9	18.6	19.0	19.0	19.3	19.0	17.8	18.3	S	20.9	23.2	24.0	25.1	27.5	26.9	26.6	23.8	25.6	25.1	25.3	25.5	24.9	17.8	27.5	22.3	24	
11	23.2	23.2	25.2	27.3	27.6	28.9	29.5	30.2	32.1	S	33.1	32.7	31.5	30.8	27.1	24.5	22.3	20.8	23.5	24.5	23.3	22.4	20.6	19.1	19.1	33.1	26.2	24	
12	17.5	16.0	16.1	14.9	15.2	16.2	16.9	16.9	S	15.4	19.9	26.8	29.4	31.5	32.6	30.7	29.9	29.4	27.2	26.1	22.0	19.0	21.4	23.1	14.9	32.6	22.4	24	
13	22.8	23.7	25.8	25.3	24.7	23.8	22.7	S	23.0	24.8	25.7	28.0	30.3	31.4	32.2	32.4	31.9	31.3	30.9	28.9	28.2	29.4	29.6	28.9	22.7	32.4	27.6	24	
14	27.8	27.9	27.2	27.0	25.7	25.9	S	24.6	25.3	25.0	24.9	24.5	24.6	Q	20.5	20.2	19.2	19.1	19.1	19.1	19.6	20.1	19.7	19.2	19.1	27.9	23.2	24	
15	18.7	17.0	15.8	15.8	16.8	S	21.5	22.7	22.6	23.0	23.6	24.6	25.3	25.5	24.8	23.6	23.2	23.8	23.8	22.1	21.1	20.4	21.2	20.6	15.8	25.5	21.6	24	
16	19.1	19.4	21.0	21.5	S	22.2	22.3	22.1	21.9	22.5	22.5	21.9	21.3	20.6	19.6	19.1	18.4	17.5	16.3	16.0	15.3	16.2	17.2	16.9	15.3	22.5	19.6	24	
17	16.6	16.3	15.9	S	15.3	16.1	16.3	15.9	16.2	15.6	15.7	15.7	16.0	16.6	16.7	16.9	17.8	17.6	17.7	17.6	17.8	19.3	19.0	18.2	15.3	19.3	16.8	24	
18	18.0	17.6	S	17.5	17.4	17.2	17.2	17.2	17.6	17.6	17.9	18.2	18.6	19.1	21.7	24.1	24.6	24.1	21.1	21.8	21.8	20.9	20.5	20.5	17.2	24.6	19.7	24	
19	19.9	S	18.9	19.0	19.3	17.8	17.6	17.0	17.8	17.9	17.0	15.7	15.5	15.5	14.9	14.7	14.1	13.0	11.7	11.3	10.9	11.4	10.6	11.2	10.6	19.9	15.3	24	
20	S	11.6	12.7	12.4	12.8	14.9	12.0	12.1	13.3	13.7	13.6	14.1	14.4	16.3	19.4	19.9	19.3	18.6	18.3	17.7	17.9	17.5	17.2	S	11.6	19.9	15.4	24	
21	12.0	12.5	12.8	12.3	10.3	14.3	12.5	12.6	13.3	16.0	19.5	C	C	C	C	30.7	31.1	31.3	31.8	30.3	30.6	31.6	S	29.2	10.3	31.8	20.8	24	
22	30.0	29.7	30.4	32.9	31.0	29.4	29.3	29.8	31.0	30.0	29.7	30.2	30.8	30.9	29.3	28.1	24.5	24.3	23.6	23.4	22.6	S	21.2	20.1	20.1	32.9	27.9	24	
23	18.6	18.6	20.8	21.6	20.4	21.6	25.5	17.4	16.3	18.8	25.2	27.1	27.2	28.2	26.5	14.1	11.3	13.6	13.3	9.1	S	19.3	19.8	19.4	9.1	28.2	19.7	24	
24	17.6	15.7	16.4	17.3	17.5	18.3	18.8	19.6	21.4	21.1	20.7	21.0	20.6	22.8	24.6	25.0	24.8	22.9	22.1	S	20.4	19.1	17.8	17.0	15.7	25.0	20.1	24	
25	15.7	14.1	14.5	15.1	14.8	14.2	13.9	13.7	13.9	13.8	13.9	13.9	13.8	13.7	13.5	13.0	12.8	12.3	S	11.8	11.5	11.0	10.4	8.8	8.8	15.7	13.2	24	
26	9.7	8.9	8.1	9.0	9.3	9.3	9.3	9.7	9.9	10.3	11.2	12.0	12.8	13.6	14.0	15.2	14.7	S	15.2	16.2	12.7	11.8	12.2	12.3	8.1	16.2	11.6	24	
27	13.3	12.7	11.7	9.9	8.3	8.1	7.8	8.0	8.5	8.8	8.2	8.0	8.8	9.3	9.7	8.9	S	5.4	4.8	6.3	4.0	6.8	5.6	4.2	4.0	13.3	8.1	24	
28	5.5	7.3	7.1	4.6	6.3	5.8	5.5	5.3	5.4	5.6	5.6	5.7	6.3	6.6	6.9	S	5.9	5.3	4.4	3.4	2.9	2.7	2.9	3.7	2.7	7.3	5.2	24	
29	4.3	5.0	5.3	6.1	6.4	6.5	5.8	4.3	3.7	3.6	3.3	3.6	11.0	15.0	S	20.3	18.1	16.2	15.9	15.3	15.0	15.6	16.8	15.2	3.3	20.3	10.1	24	
30	14.0	13.0	10.1	10.7	11.4	11.7	11.9	12.5	12.7	12.3	12.5	11.7	11.5	S	15.9	14.0	14.9	17.8	16.1	16.6	22.0	19.9	19.2	17.3	10.1	22.0	14.3	24	
31	17.7	17.4	18.0	17.9	18.7	18.1	18.0	17.1	17.0	16.4	16.4	16.7	S	15.4	13.9	13.3	12.8	12.1	10.8	12.7	15.4	16.7	15.5	17.6	10.8	18.7	15.9	24	
HOURLY MAX	30.0	29.7	30.4	32.9	31.0	29.4	29.5	30.2	32.1	30.0	33.1	32.7	31.5	31.5	32.6	32.9	32.5	31.9	31.8	30.3	30.6	31.6	29.6	29.2					
HOURLY AVG	18.4	17.6	17.7	17.7	17.5	17.8	17.5	17.5	18.1	17.9	19.3	20.1	20.8	21.6	22.2	22.4	21.6	20.6	20.2	19.8	19.5	19.3	18.5	18.5					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

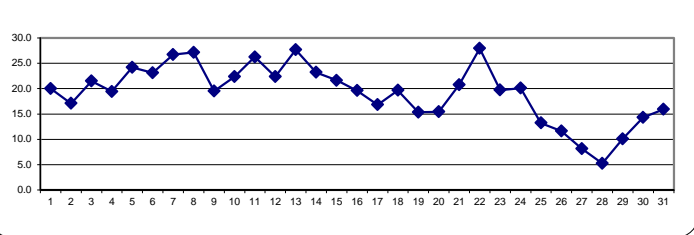
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

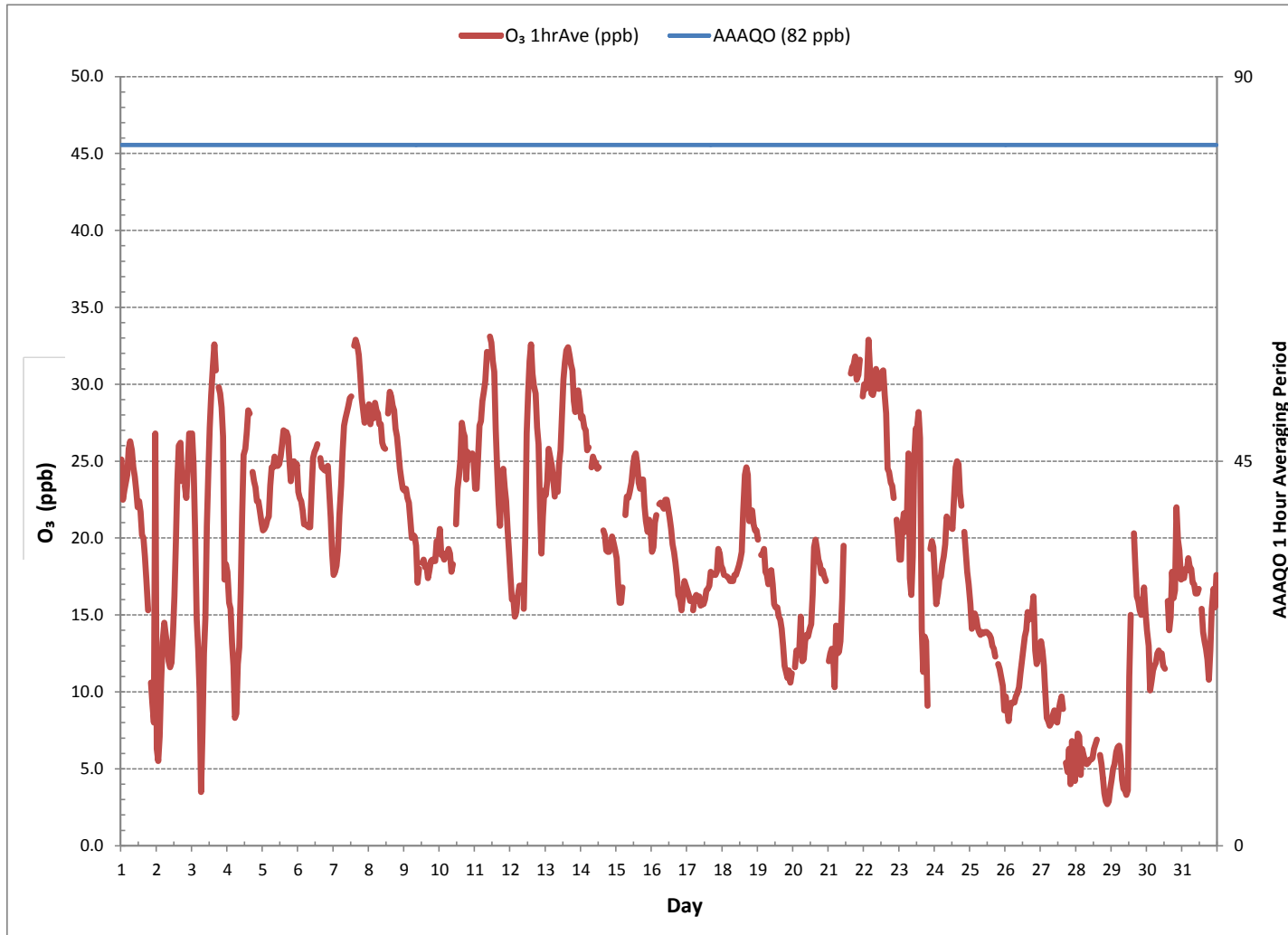
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	706				
MINIMUM 1-HR AVERAGE:	2.7 ppb	@ HOUR(S)	21	ON DAY(S)	28
MAXIMUM 1-HR AVERAGE:	33.1 ppb	@ HOUR(S)	10	ON DAY(S)	11
MAXIMUM 24-HR AVERAGE:	27.9 ppb			ON DAY(S)	22
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs		
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %		
STANDARD DEVIATION:	6.97	MONTHLY AVERAGE:	19.2 ppb		

24 HOUR AVERAGES FOR October 2016



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

OZONE Instantaneous Maximum (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	28.6	24.7	25.7	25.1	26.2	27.7	28.0	27.0	26.1	25.6	25.2	23.1	23.8	23.5	21.8	21.1	20.6	19.1	17.5	S	12.4	10.3	9.2	8.3	8.3	28.6	21.8	24
2	7.4	6.7	9.7	12.8	15.1	15.8	14.6	14.1	13.2	13.2	13.3	15.7	18.2	23.1	26.9	28.2	28.2	26.0	S	24.7	23.8	26.5	28.0	27.8	6.7	28.2	18.8	24
3	28.2	27.2	24.2	18.3	14.3	12.8	7.9	11.2	14.6	19.4	24.2	26.6	30.3	31.7	33.9	34.4	33.0	S	31.4	31.3	29.8	29.2	20.7	19.6	7.9	34.4	24.1	24
4	19.5	17.8	17.0	15.3	13.3	11.7	10.8	13.7	14.4	19.9	24.4	26.9	27.6	29.1	29.8	29.7	S	26.0	24.8	25.1	24.0	23.8	23.6	22.4	10.8	29.8	21.3	24
5	21.7	21.9	21.9	22.3	22.9	25.3	25.7	26.0	26.5	26.1	26.1	26.1	26.5	27.4	28.4	S	28.5	28.5	26.2	25.2	26.1	26.4	26.0	26.1	21.7	28.5	25.6	24
6	24.7	23.5	23.4	23.0	22.1	22.1	21.9	21.7	21.8	26.1	26.6	27.0	26.9	27.2	S	26.4	26.0	25.9	25.7	26.6	26.2	24.6	23.4	21.0	21.0	27.2	24.5	24
7	19.2	19.4	19.6	21.1	24.4	25.4	28.5	28.9	29.1	29.7	30.0	30.5	30.6	S	33.6	34.3	33.6	33.4	32.4	30.2	30.1	28.6	29.4	28.8	19.2	34.3	28.3	24
8	30.3	28.8	29.3	29.0	29.8	29.7	29.3	28.9	28.6	27.6	26.9	28.0	S	29.6	30.6	30.5	29.8	29.7	28.9	27.8	27.0	26.0	24.8	24.7	24.7	30.6	28.5	24
9	24.0	24.3	23.5	23.3	22.6	21.0	21.3	21.3	20.3	19.9	19.1	S	20.3	19.7	19.2	19.4	18.3	19.1	20.0	19.7	19.5	19.7	21.1	20.9	18.3	24.3	20.8	24
10	22.6	20.0	20.3	21.5	20.3	20.3	20.5	20.3	19.0	20.1	S	23.0	25.0	25.5	26.9	29.1	28.6	28.7	25.6	27.0	26.9	27.0	27.2	27.2	19.0	29.1	24.0	24
11	24.7	25.1	28.0	28.5	29.7	32.6	31.6	34.4	34.0	S	34.4	34.0	33.1	32.2	29.6	26.6	23.8	22.2	25.9	25.9	25.1	23.9	22.7	20.6	20.6	34.4	28.2	24
12	19.4	17.0	17.1	16.3	16.5	17.5	18.7	18.6	S	18.6	25.0	29.4	31.9	33.5	34.9	33.1	31.4	30.9	29.2	27.2	26.3	20.1	25.0	24.8	16.3	34.9	24.5	24
13	23.8	26.2	26.9	26.2	25.9	25.0	24.0	S	25.0	26.0	27.3	30.0	31.9	32.7	33.4	33.4	32.7	32.6	31.8	32.3	29.6	30.4	30.5	30.4	23.8	33.4	29.0	24
14	29.1	28.9	28.5	28.3	27.3	26.9	S	26.2	26.5	26.0	25.9	25.5	25.7	Q	Q	21.4	21.3	20.6	20.3	20.2	20.5	21.1	21.0	20.2	20.2	29.1	24.4	24
15	19.7	18.3	16.9	16.9	17.8	S	23.7	23.8	23.7	23.8	25.0	25.9	26.1	26.2	26.1	24.5	24.2	24.8	24.7	23.8	22.1	21.6	22.9	22.2	16.9	26.2	22.8	24
16	20.4	20.9	21.8	22.3	S	23.0	23.2	23.1	22.7	23.4	23.5	22.9	22.2	21.5	20.7	20.0	19.5	18.7	17.4	17.1	16.3	17.7	18.1	17.8	16.3	23.5	20.6	24
17	17.5	17.3	16.9	S	16.5	17.1	17.3	16.8	17.1	16.7	16.6	16.5	17.1	17.8	17.7	18.1	18.7	18.5	18.6	18.6	19.5	20.2	20.1	19.2	16.5	20.2	17.8	24
18	19.0	18.4	S	18.4	18.3	18.2	18.1	18.2	18.6	18.7	19.1	19.4	19.9	20.5	24.4	25.2	26.4	25.9	23.1	23.0	23.1	22.3	21.7	21.6	18.1	26.4	20.9	24
19	21.1	S	20.6	20.2	20.7	19.9	19.2	18.6	19.2	19.0	18.4	17.3	17.0	16.6	16.3	16.0	16.0	14.5	13.3	12.3	12.1	12.5	12.1	12.4	12.1	21.1	16.8	24
20	S	12.7	14.0	13.4	17.4	17.4	14.5	13.7	14.7	14.6	14.7	15.3	16.3	18.8	20.7	20.7	20.5	19.6	19.7	19.1	19.0	18.4	18.1	S	12.7	20.7	17.0	24
21	13.4	13.6	14.3	14.0	18.8	16.0	14.5	14.0	15.1	18.2	C	C	C	C	C	32.1	32.3	32.6	32.9	31.7	32.3	33.4	S	30.2	13.4	33.4	22.7	24
22	30.8	30.6	31.7	34.9	34.0	31.4	30.8	31.7	32.4	31.1	31.1	31.8	32.2	32.4	31.3	31.1	27.3	25.6	24.4	24.7	23.7	S	22.3	21.1	21.1	34.9	29.5	24
23	20.4	21.1	22.3	24.7	27.6	25.4	27.2	27.2	23.8	26.0	27.0	28.5	28.4	29.3	29.4	21.6	14.2	14.6	14.2	11.0	S	20.2	20.7	20.5	11.0	29.4	22.8	24
24	18.8	17.4	17.9	18.1	18.6	19.9	19.9	21.4	22.6	22.3	22.5	23.0	21.8	25.0	25.6	26.2	25.8	24.6	23.0	S	21.8	20.5	19.2	17.9	17.4	26.2	21.5	24
25	17.0	15.2	15.4	16.1	15.6	15.1	14.7	14.4	14.6	14.7	14.6	14.6	14.4	14.4	14.5	13.7	13.4	13.1	S	12.4	12.3	11.9	11.2	9.9	9.9	17.0	14.1	24
26	11.0	10.3	9.1	9.9	10.2	10.1	10.1	10.7	10.8	11.5	12.4	13.1	13.7	14.9	15.4	16.4	16.1	S	17.3	17.3	16.2	13.2	13.6	13.6	9.1	17.3	12.9	24
27	14.3	14.0	12.7	11.9	9.3	8.8	8.6	8.6	9.3	9.4	9.0	8.8	9.5	9.8	10.3	10.1	S	6.1	6.4	7.4	6.4	7.9	7.1	5.5	5.5	14.3	9.2	24
28	8.1	8.8	7.6	6.8	6.9	6.6	6.0	5.9	5.9	6.2	6.2	6.3	7.0	7.9	7.5	S	6.7	6.3	5.0	4.6	3.4	3.4	3.8	4.3	3.4	8.8	6.1	24
29	5.4	5.8	6.3	7.1	P	7.5	6.7	5.8	4.5	4.6	4.1	8.5	14.8	17.7	S	22.2	20.1	17.8	17.1	16.9	16.5	17.4	17.8	17.3	4.1	22.2	11.9	23
30	14.9	14.6	12.5	12.0	12.8	12.7	13.2	13.2	13.6	13.2	13.7	P	13.1	S	17.5	16.2	18.8	19.2	17.3	20.9	23.4	21.9	21.0	18.6	12.0	23.4	16.1	23
31	19.4	19.0	19.1	19.6	20.1	19.2	19.0	18.7	18.1	17.8	17.3	17.9	S	16.3	15.8	14.6	13.8	13.6	12.6	14.4	17.7	17.8	17.4	20.1	12.6	20.1	17.4	24
HOURLY MAX	30.8	30.6	31.7	34.9	34.0	32.6	31.6	34.4	34.0	31.1	34.4	34.0	33.1	33.5	34.9	34.4	33.6	33.4	32.9	32.3	32.3	33.4	30.5	30.4				
HOURLY AVG	19.8	19.0	19.1	19.2	19.8	19.4	19.0	19.3	19.5	19.6	20.8	22.0	22.3	23.1	23.8	24.0	23.1	22.0	21.6	21.3	21.1	20.6	20.0	19.8				

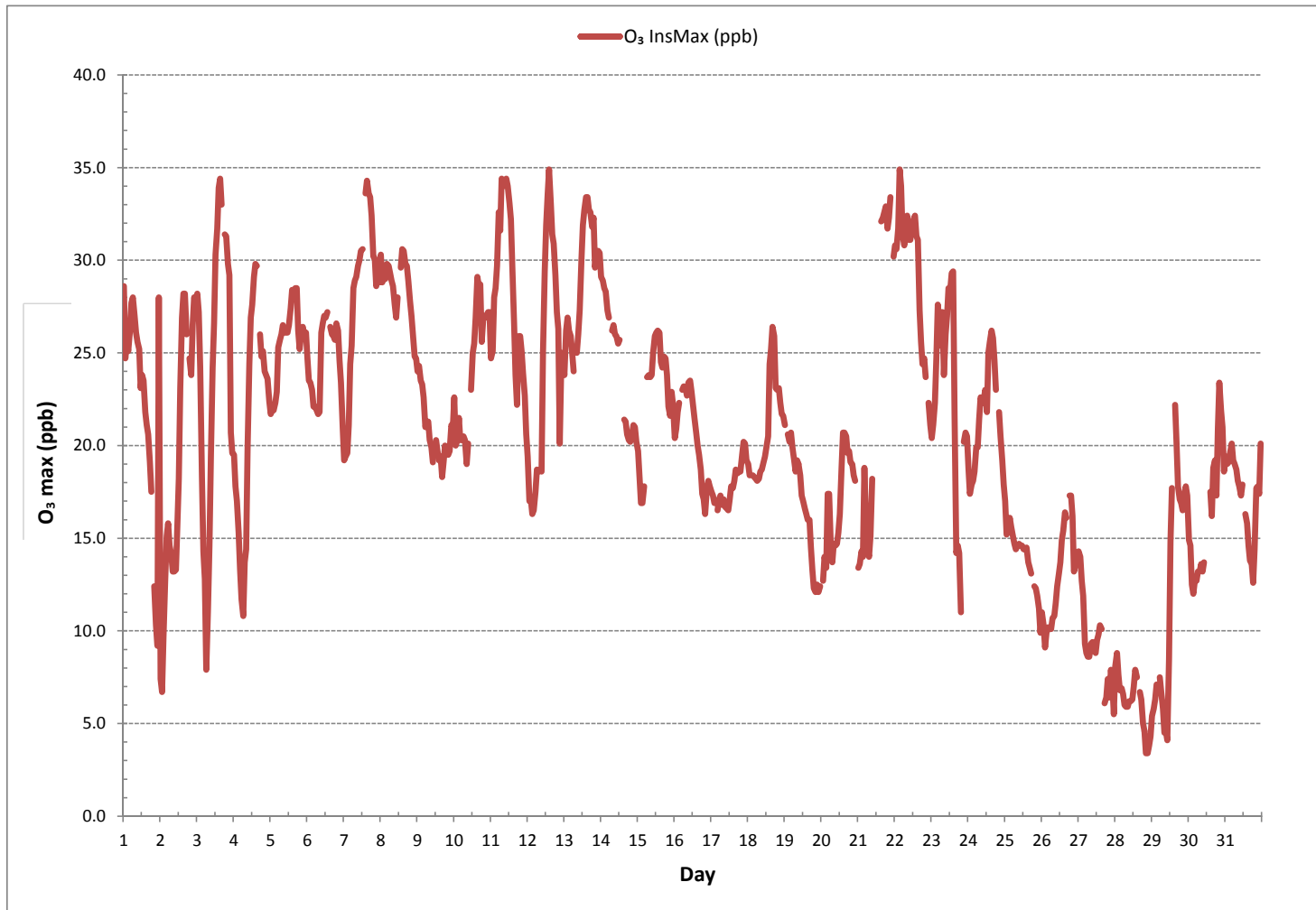
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

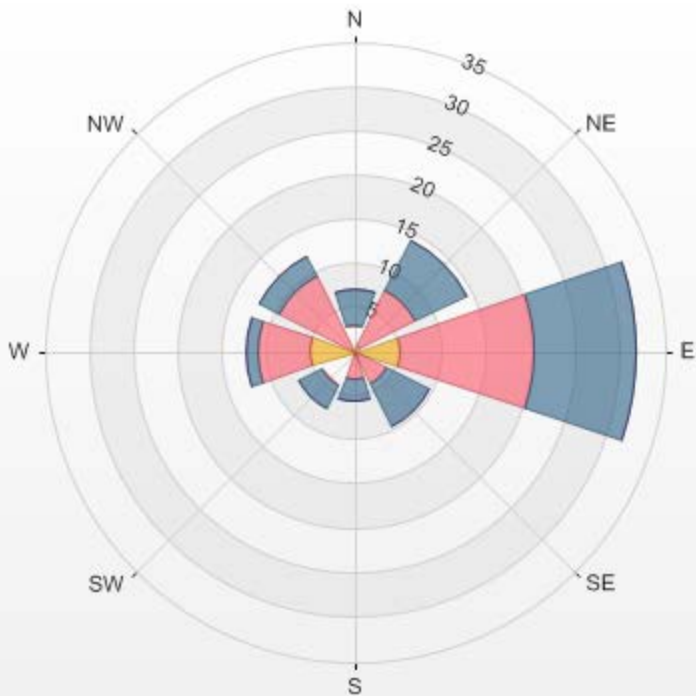
NUMBER OF NON-ZERO READINGS:	703
MAXIMUM INSTANTANEOUS VALUE:	34.9 ppb @ HOUR(S) 14, 3 ON DAY(S) 12, 22
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	7.09
OPERATIONAL TIME:	742 hrs

OZONE Instantaneous Maximum (O₃ ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppb]

Direction	0.0-11.1	11.1-22.1	22.1-33.2	>33.2	Total
N	0.14	2.85	4.14	0	7.13
NE	0.71	6.99	6.42	0	14.12
E	5.14	15.26	11.55	0	31.95
SE	0.29	3.85	5.42	0	9.56
S	0.43	2.71	2.57	0	5.71
SW	0.14	4.14	2.85	0	7.13
W	4.99	5.99	1.43	0	12.41
NW	0.43	9.27	2.28	0	11.98
Summary	12.27	51.06	36.66	0	100



% Icon Classes (ppb)	12	0.0-11.1	51	11.1-22.1	37	22.1-33.2	0	>33.2
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O3[ppb] Calibration: LICA ST. LINA Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5

PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	4.4	1.9	1.4	0.9	3.9	5.9	5.4	2.4	1.9	4.4	0.9	7.9	1.4	2.4	0.4	2.9	1.4	X	6.4	0.9	1.4	0.0	0.0	1.9	0.0	7.9	2.6	23	
2	0.0	2.4	3.4	0.9	1.4	2.4	0.0	1.4	0.0	0.0	1.9	5.4	1.4	0.0	1.9	5.9	2.4	0.0	4.4	0.9	4.4	5.4	8.4	8.4	0.0	8.4	2.6	24	
3	5.9	6.9	5.9	5.9	5.9	7.5	5.4	8.4	6.4	5.4	0.4	0.9	1.4	0.0	3.4	5.0	4.5	1.4	5.9	4.4	4.4	3.9	5.0	6.4	0.0	8.4	4.6	24	
4	7.9	7.9	6.4	5.9	5.0	6.9	6.4	1.9	1.9	0.9	2.4	8.4	5.4	4.4	4.4	5.4	3.4	4.4	2.4	4.9	0.9	2.4	0.0	1.9	0.0	8.4	4.2	24	
5	5.0	1.4	1.4	0.4	0.0	2.9	3.4	1.9	0.0	1.4	3.9	4.9	3.4	4.0	2.9	5.9	5.0	0.4	5.0	2.9	2.4	2.4	3.4	3.9	0.0	5.9	2.8	24	
6	2.4	0.0	1.4	1.4	1.9	1.4	0.0	1.9	0.9	0.4	0.0	0.0	0.0	0.0	0.0	X	0.0	X	0.0	4.5	0.0	0.0	X	0.0	0.0	4.5	0.8	21	
7	0.0	0.9	0.0	X	0.0	1.4	0.0	0.0	1.4	0.9	0.0	0.0	C	0.0	3.5	2.4	0.0	1.4	0.0	1.9	0.4	2.4	2.9	1.9	0.0	3.5	1.0	23	
8	1.4	1.4	2.9	2.9	5.0	5.0	0.0	5.0	2.4	4.5	2.9	4.0	0.0	2.4	0.9	1.9	0.4	0.0	0.0	3.0	0.0	2.4	5.4	0.4	0.0	5.4	2.3	24	
9	5.4	3.9	5.0	1.4	1.4	X	0.9	1.4	0.0	0.0	3.4	0.0	0.0	X	0.9	0.0	0.0	8.5	0.4	0.0	0.0	0.4	0.0	0.0	0.0	8.5	1.5	22	
10	0.0	0.4	X	1.4	1.9	2.4	2.9	0.0	0.0	1.9	0.0	4.0	2.4	2.4	0.9	0.0	0.4	0.0	0.0	2.4	1.9	0.0	0.4	1.9	0.0	4.0	1.2	23	
11	1.4	1.4	0.0	0.4	1.9	0.0	0.4	3.4	0.4	X	2.4	1.9	0.4	4.0	1.9	3.4	2.9	5.9	0.0	7.9	12.0	11.9	11.9	10.4	0.0	12.0	3.7	23	
12	8.4	6.4	9.0	4.0	5.0	8.4	6.4	4.0	5.9	6.9	9.9	5.9	4.0	5.4	2.4	4.5	1.9	0.0	0.9	0.0	5.4	0.9	0.9	0.0	0.0	9.9	4.4	24	
13	0.9	3.4	1.4	2.4	0.0	2.9	1.9	2.4	5.4	8.4	5.4	5.9	7.9	0.0	7.5	1.9	9.9	1.4	9.4	10.9	2.9	0.4	3.9	3.9	0.0	10.9	4.2	24	
14	2.4	0.0	2.9	4.5	0.0	2.4	1.4	0.9	2.9	3.9	0.0	0.0	0.9	0.0	0.0	0.0	0.4	0.0	0.0	0.0	X	0.0	0.4	0.0	0.0	4.5	1.0	23	
15	2.4	0.0	0.4	1.5	0.0	1.9	2.4	0.0	0.0	0.4	1.9	1.9	X	4.5	1.9	0.0	0.4	0.9	0.9	4.0	5.4	2.9	0.0	5.0	0.0	5.4	1.7	23	
16	2.4	4.5	2.9	5.9	4.5	2.4	1.4	2.4	0.9	0.0	0.0	0.0	0.0	0.9	1.9	1.4	0.9	0.9	0.9	2.4	2.9	0.0	0.0	0.0	0.0	5.9	1.6	24	
17	1.9	X	5.9	4.5	5.9	0.0	0.0	0.4	1.9	0.9	0.0	0.9	0.9	0.0	1.4	1.9	4.0	9.0	4.0	0.0	1.4	4.0	5.4	4.5	0.0	9.0	2.6	23	
18	3.5	0.9	1.4	0.0	0.4	0.9	1.9	0.0	2.9	1.9	3.5	1.4	0.0	2.9	2.9	2.4	2.9	2.4	0.0	0.0	2.4	0.0	0.9	0.0	0.0	3.5	1.5	24	
19	X	1.9	1.4	1.9	1.4	7.9	8.4	2.4	0.4	2.4	5.0	5.9	5.4	10.4	10.9	11.9	10.9	14.9	8.4	13.0	10.9	12.9	11.9	7.9	0.4	14.9	7.3	23	
20	11.4	12.9	10.4	11.4	9.5	10.4	5.9	14.0	10.4	11.9	9.4	6.4	7.5	2.9	2.9	5.0	4.5	5.9	5.4	6.4	4.5	8.4	5.4	6.9	2.9	14.0	7.9	24	
21	4.5	9.9	10.4	9.9	5.0	9.9	0.0	9.0	10.9	4.5	0.4	5.9	0.0	2.4	1.4	1.4	0.0	1.4	1.9	0.4	1.9	2.4	3.4	1.9	0.0	10.9	4.1	24	
22	3.4	4.4	2.9	0.9	6.9	1.9	1.4	1.9	3.4	3.4	1.4	0.0	0.0	0.9	0.9	0.0	5.9	3.4	0.0	3.9	4.9	4.9	5.9	5.9	0.0	6.9	2.9	24	
23	5.9	10.9	9.0	6.4	7.9	7.9	12.9	8.4	9.9	6.9	5.0	0.0	X	4.4	2.9	1.4	4.4	1.9	2.9	0.0	2.4	3.9	2.9	4.4	0.0	12.9	5.3	23	
24	2.9	1.4	1.9	4.4	4.4	1.4	2.4	4.4	1.4	0.4	2.4	5.9	1.4	3.9	3.4	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.9	0.0	0.0	5.9	1.8	24	
25	0.0	X	0.0	2.9	1.4	0.0	0.4	0.0	0.0	0.0	1.4	0.9	0.0	0.4	0.0	0.0	0.0	0.0	0.9	0.4	0.0	0.4	0.4	3.4	0.0	3.4	0.6	23	
26	0.0	0.0	2.4	0.0	0.0	0.9	0.0	X	1.4	0.0	1.4	1.4	1.4	X	1.4	0.0	0.0	0.0	1.9	2.4	1.4	2.9	5.0	3.4	0.0	5.0	1.2	22	
27	3.4	5.9	3.4	0.0	4.4	0.0	5.0	0.0	3.4	1.4	3.4	4.4	0.0	0.0	X	C	0.0	0.9	0.9	0.4	2.4	0.0	2.4	1.4	0.0	5.9	2.0	23	
28	0.0	1.9	0.9	0.4	0.4	0.9	0.4	0.4	1.9	0.0	1.9	0.4	0.4	1.4	0.9	0.4	0.0	1.4	1.9	0.0	1.9	0.9	1.9	1.4	0.0	1.9	0.9	24	
29	2.9	0.0	2.9	4.4	0.0	0.0	2.9	0.0	5.0	1.4	1.9	3.4	5.0	5.9	4.4	8.4	7.9	8.4	6.9	6.4	6.4	2.4	3.4	5.4	0.0	8.4	4.0	24	
30	6.9	6.4	5.4	4.9	10.9	7.9	5.0	7.5	2.9	5.4	0.0	0.0	12.4	11.9	6.4	7.5	5.0	5.9	6.4	1.9	2.4	6.9	4.4	6.4	0.0	12.4	5.9	24	
31	3.4	6.4	8.4	11.4	9.9	9.4	7.5	7.5	10.4	9.4	9.0	9.0	7.5	5.4	6.4	4.4	6.9	3.9	2.4	0.4	2.9	1.9	1.9	0.0	0.0	11.4	6.1	24	
HOURLY MAX	11.4	12.9	10.4	11.4	10.9	10.4	12.9	14.0	10.9	11.9	9.9	9.0	12.4	11.9	10.9	11.9	10.9	14.9	9.4	13.0	12.0	12.9	11.9	10.4					
HOURLY AVG	3.3	3.6	3.7	3.4	3.4	3.8	3.0	3.1	3.1	3.0	2.6	3.1	2.5	2.9	2.7	2.9	2.8	2.9	2.6	2.8	2.9	2.9	3.3	3.2					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

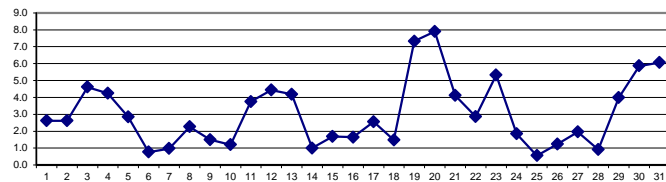
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80	µg/m ³	24-HR	30	µg/m ³
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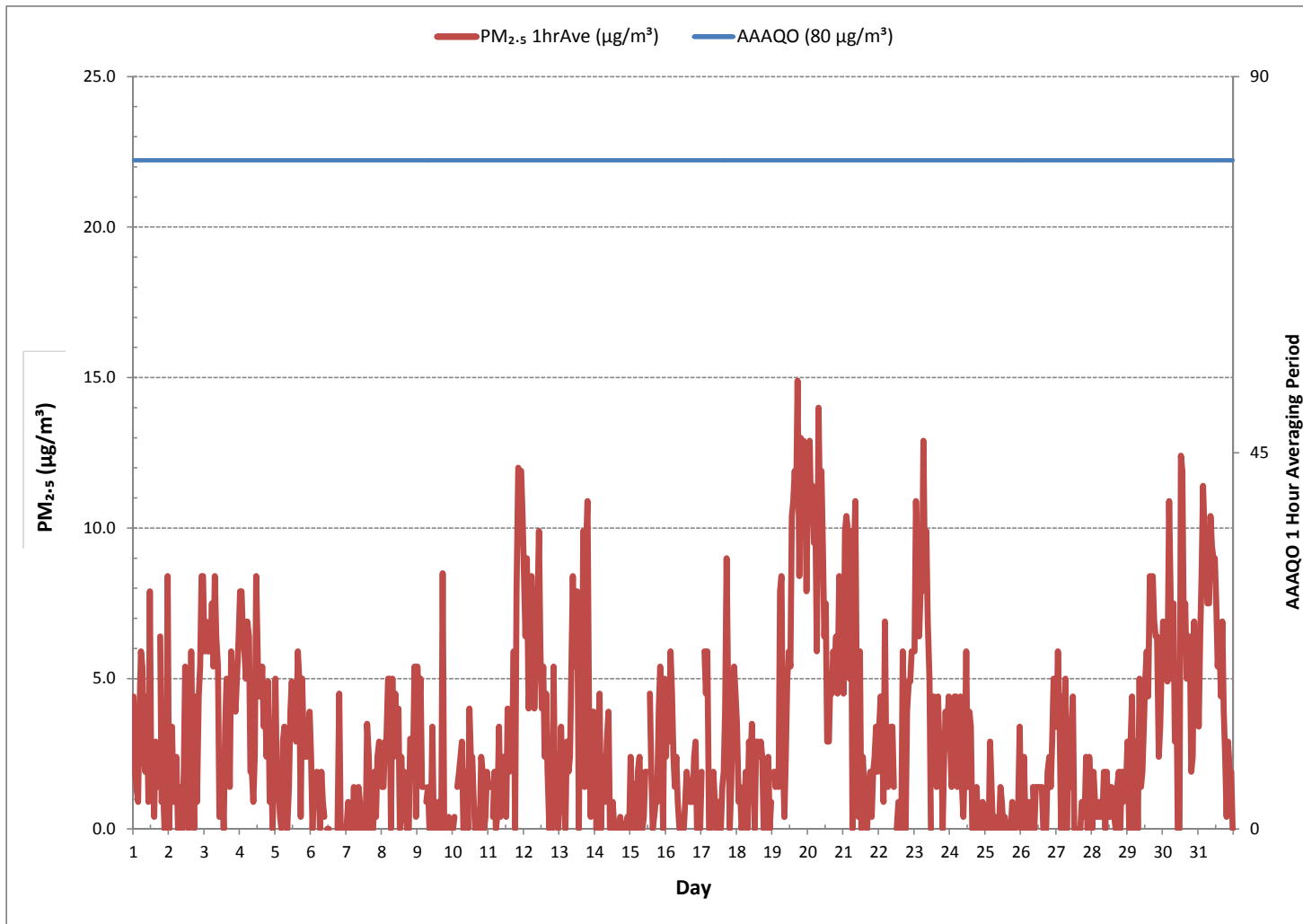
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	567					
MINIMUM 1-HR AVERAGE	0.0	µg/m ³	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	14.9	µg/m ³	@ HOUR(S)	17	ON DAY(S)	19
MAXIMUM 24-HR AVERAGE:	7.9	µg/m ³			ON DAY(S)	20
					VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	2	hrs	OPERATIONAL TIME:	726	hrs	
STANDARD DEVIATION:	3.12		AMD OPERATION UPTIME:	97.6	%	
			MONTHLY AVERAGE:	3.1	µg/m ³	

24 HOUR AVERAGES FOR October 2016

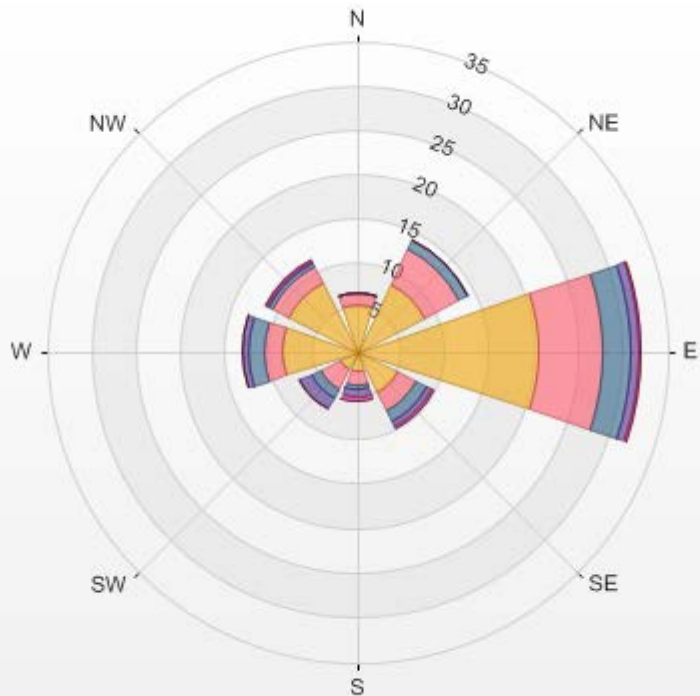


PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-PM2.5[ug/m3(L)] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.70% Calm Avg: 0.00 [ug/m3(L)]

Direction	0.0-3.0	3.0-6.0	6.0-9.0	9.0-12.0	12.0-15.0	>15.0	Total
N	5.34	1.4	0	0	0	0	6.74
NE	8.57	4.35	1.12	0	0	0	14.04
E	20.65	7.02	3.23	0.98	0.14	0	32.02
SE	5.2	2.25	1.26	0.84	0.14	0	9.69
S	2.25	1.54	0.56	0.84	0.56	0	5.75
SW	2.25	2.39	1.12	1.54	0	0	7.3
W	8.43	2.11	1.83	0.56	0	0	12.93
NW	8.71	1.97	0.42	0.28	0.14	0	11.52
Summary	61.4	23.03	9.54	5.04	0.98	0	100



% Icon	Classes (ug/m3(L))	Count	Color	Class Range (ug/m3(L))	Count	Color	Class Range (ug/m3(L))	Count	Color	Class Range (ug/m3(L))	Count	Color	Class Range (ug/m3(L))	Count	Color	Class Range (ug/m3(L))
61	0.0-3.0	23	Yellow	3.0-6.0	10	Pink	6.0-9.0	5	Blue	9.0-12.0	1	Purple	12.0-15.0	0	Dark Blue	>15.0

WIND SPEED

WIND SPEED Hourly Averages (WS kph)

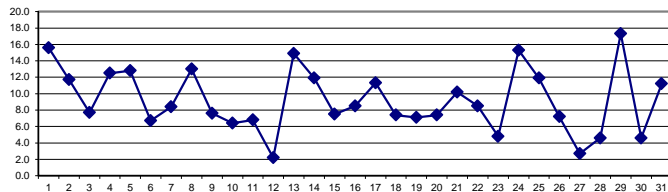
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	12.2	11.0	13.0	14.1	15.9	17.7	19.1	20.7	17.4	21.4	14.0	18.9	25.3	26.7	25.4	25.4	18.9	15.8	9.9	7.9	8.6	9.5	8.2	7.0	7.0	26.7	15.6	24
2	6.0	6.4	14.3	21.5	19.0	18.4	18.7	16.3	17.3	18.0	22.8	22.4	20.2	18.8	15.6	13.7	12.9	10.7	7.0	8.0	7.3	7.9	6.0	6.8	6.0	22.8	11.7	24
3	7.1	8.6	7.7	7.6	8.7	9.1	9.4	8.9	8.2	5.8	6.7	6.9	8.1	7.6	6.8	7.4	6.4	5.4	7.0	7.8	9.5	9.8	12.9	13.6	5.4	13.6	7.7	24
4	12.8	11.1	10.2	11.2	10.3	9.6	10.4	9.9	9.9	14.3	18.9	17.4	15.7	14.4	14.2	16.3	10.6	12.1	12.9	12.2	14.5	13.5	13.3	13.4	9.6	18.9	12.5	24
5	12.5	13.1	12.7	11.6	12.4	14.4	15.5	15.3	14.5	13.4	13.8	13.8	16.4	15.7	16.6	15.2	13.3	12.6	8.9	10.8	14.9	9.5	8.2	9.8	8.2	16.6	12.8	24
6	9.7	10.1	10.0	8.7	8.3	9.1	7.8	7.5	8.5	10.0	9.0	8.6	6.2	6.6	7.0	7.5	5.7	5.7	6.1	6.6	3.5	3.5	2.6	3.5	2.6	10.1	6.7	24
7	4.9	5.2	4.6	4.8	2.1	4.2	6.5	8.7	8.8	11.2	10.8	13.1	13.4	12.9	11.4	11.0	10.6	9.9	10.7	8.7	8.4	9.4	9.5	7.6	2.1	13.4	8.4	24
8	10.7	10.1	9.0	10.5	10.7	11.3	12.4	12.6	14.5	14.4	15.0	15.7	16.9	15.0	17.0	16.6	16.5	15.2	15.0	15.3	15.2	13.2	12.9	13.1	9.0	17.0	13.0	24
9	11.8	14.1	13.6	14.1	14.6	13.7	14.1	11.2	8.2	8.5	9.1	7.3	9.1	11.8	12.1	13.6	12.9	13.9	11.8	12.2	11.0	9.3	9.7	8.0	7.3	14.6	7.6	24
10	9.8	7.7	6.3	7.1	5.3	6.7	7.3	9.1	9.6	9.2	8.9	6.5	6.0	6.5	8.1	7.7	5.2	6.0	4.9	6.1	4.2	4.0	3.8	3.5	3.5	9.8	6.4	24
11	3.9	3.7	4.8	4.0	3.5	3.7	5.5	4.6	5.4	5.2	7.8	7.1	11.2	16.3	14.1	13.4	14.0	10.7	10.1	9.3	9.6	8.5	9.2	6.3	3.5	16.3	6.8	24
12	7.4	7.7	9.0	7.4	7.3	8.1	8.4	7.6	7.6	5.9	7.4	6.3	4.8	6.5	7.7	8.1	8.7	8.0	7.9	6.6	7.6	9.3	12.3	12.8	4.8	12.8	2.2	24
13	11.8	11.9	12.0	11.2	12.2	11.7	10.2	12.6	15.1	16.4	18.7	19.9	19.4	20.6	21.3	23.6	18.3	14.8	13.0	15.3	14.9	15.5	11.8	12.5	10.2	23.6	14.9	24
14	12.1	12.4	10.3	11.2	11.5	12.2	11.0	11.0	13.8	16.6	17.9	18.9	20.5	14.9	12.7	14.2	9.7	9.5	11.3	13.2	13.4	8.3	7.1	6.4	6.4	20.5	11.9	24
15	3.4	5.0	5.4	7.9	9.1	7.5	9.6	8.1	7.8	8.3	7.3	6.7	7.6	9.5	7.4	8.5	7.7	8.8	7.2	9.1	11.7	11.1	12.5	13.1	3.4	13.1	7.5	24
16	13.1	18.7	18.1	15.7	16.7	19.0	19.3	15.6	16.0	16.1	16.3	14.2	13.6	9.3	5.6	6.5	6.9	6.5	3.7	4.7	4.9	7.6	8.1	8.9	3.7	19.3	8.5	24
17	9.5	9.1	9.6	11.4	12.1	10.6	9.5	10.8	11.7	10.8	11.8	12.4	12.2	12.1	12.7	13.2	12.1	10.6	9.3	10.5	10.8	12.7	12.8	13.4	9.1	13.4	11.3	24
18	12.8	10.8	10.7	9.1	10.0	9.5	9.9	9.8	8.6	8.7	8.9	8.1	9.1	9.7	9.3	6.5	4.2	3.5	1.4	5.3	4.8	4.5	6.0	4.9	1.4	12.8	7.4	24
19	4.0	5.0	6.0	7.9	7.4	5.3	6.0	6.0	6.4	6.2	6.9	6.8	6.2	6.1	6.0	5.9	6.9	7.4	8.7	9.4	10.6	12.5	13.8	12.4	4.0	13.8	7.1	24
20	12.5	12.8	13.3	14.2	13.1	11.4	11.2	11.7	10.2	12.6	14.4	17.0	13.1	13.9	13.4	10.3	4.7	2.6	4.5	6.0	6.3	8.4	8.2	7.2	2.6	17.0	7.4	24
21	10.2	9.6	10.5	11.8	10.6	11.9	10.2	12.1	14.5	14.9	13.5	14.2	17.0	14.8	13.5	15.2	13.8	9.4	6.5	6.0	8.5	9.3	11.1	11.2	6.0	17.0	10.2	24
22	10.1	10.8	11.9	11.7	12.0	11.9	11.0	11.0	10.9	10.1	10.7	9.0	8.3	8.1	9.0	7.6	6.9	6.4	8.3	7.7	7.0	8.3	8.2	8.1	6.4	12.0	8.5	24
23	9.5	9.3	8.8	6.3	6.0	5.4	6.0	6.5	4.6	1.5	2.9	4.0	5.3	9.0	10.9	11.1	11.9	15.7	15.4	16.7	15.4	17.7	15.9	15.9	1.5	17.7	4.8	24
24	17.9	17.0	19.3	20.0	17.8	15.6	14.3	13.7	16.2	15.2	12.6	14.0	16.6	14.9	13.3	15.7	17.5	16.5	16.9	15.4	13.5	13.0	11.7	11.1	11.1	20.0	15.3	24
25	9.5	8.3	13.6	17.3	17.6	14.7	15.2	16.0	15.8	13.5	15.5	14.1	14.3	13.8	14.1	14.4	12.3	12.1	11.4	10.5	8.7	6.4	3.7	7.5	3.7	17.6	11.9	24
26	13.8	14.4	12.8	12.0	13.7	12.6	12.2	11.8	11.9	11.3	11.9	11.8	11.9	12.3	11.4	6.6	3.1	3.8	1.9	1.8	4.4	6.8	5.7	8.2	1.8	14.4	7.2	24
27	9.5	10.6	11.3	11.9	12.0	14.8	16.0	16.6	16.3	16.8	15.5	14.4	14.6	Y	Y	13.6	17.3	18.3	20.0	21.3	21.2	20.9	20.2	21.1	9.5	21.3	2.7	22
28	20.8	20.0	18.2	18.0	17.7	23.8	18.8	22.9	21.6	21.7	23.5	16.0	16.7	10.6	18.0	26.2	6.8	2.7	17.3	4.5	8.8	20.0	22.7	22.5	2.7	26.2	4.6	24
29	22.3	22.3	22.4	21.7	21.9	20.1	19.6	20.9	22.1	21.8	17.6	18.9	17.1	19.2	18.9	18.8	18.9	21.2	19.6	22.3	19.8	14.4	7.3	20.9	7.3	22.4	17.3	24
30	21.3	21.0	15.7	18.8	21.4	21.8	22.3	22.7	14.8	13.0	18.8	13.4	18.1	19.7	20.5	19.0	18.7	20.2	22.1	22.9	21.0	22.4	22.2	19.9	13.0	22.9	4.6	24
31	18.6	12.9	11.0	13.2	18.2	16.9	16.6	14.6	14.2	13.9	15.8	13.2	15.2	17.7	21.3	21.2	23.6	20.2	4.2	4.2	10.5	8.9	13.4	20.9	4.2	23.6	11.2	24
HOURLY MAX	22.3	22.3	22.4	21.7	21.9	23.8	22.3	22.9	22.1	21.8	23.5	22.4	25.3	26.7	25.4	26.2	23.6	21.2	22.1	22.9	21.2	22.4	22.7	22.5				
HOURLY AVG	2.3	2.1	2.3	2.5	2.8	2.8	3.4	3.1	3.4	4.4	4.3	5.3	4.4	4.2	5.2	5.4	4.1	4.1	4.0	3.8	4.0	4.4	2.9	1.7				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: July 7, 2016
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

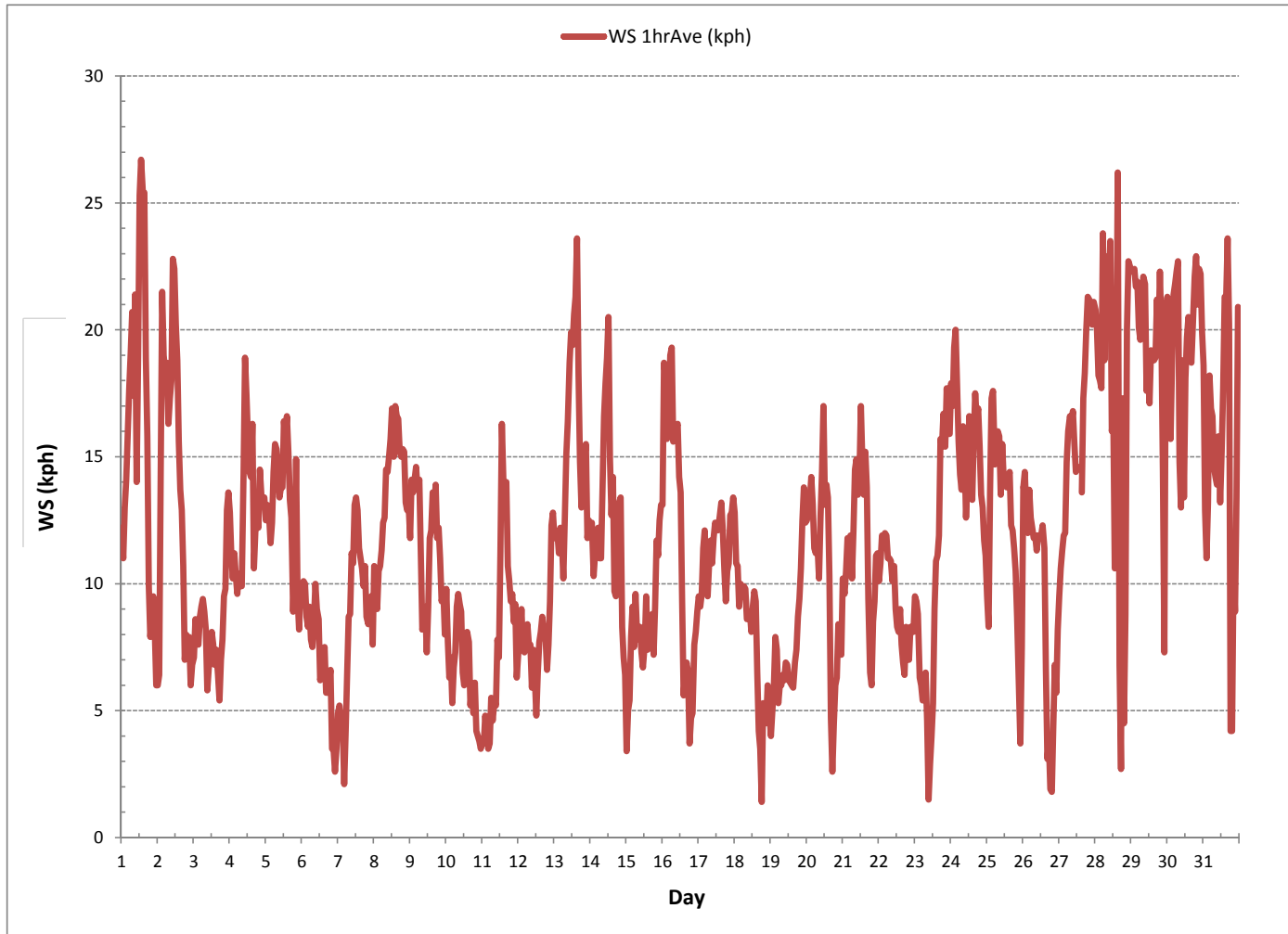
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	742				
MINIMUM 1-HR AVERAGE:	1.4 kph	@ HOUR(S)	18	ON DAY(S)	18
MAXIMUM 1-HR AVERAGE:	26.7 kph	@ HOUR(S)	13	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	17.3 kph			ON DAY(S)	29
				VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	0 hrs	OPERATIONAL TIME:	742 hrs		
		AMD OPERATION UPTIME:	99.7 %		
STANDARD DEVIATION:	5.00	MONTHLY AVERAGE:	3.6 kph		

WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	29.1	27.9	31.3	30.9	37.2	37.6	39.6	41.2	37.2	48.2	39.6	42.0	49.0	50.8	50.5	52.2	38.3	37.8	27.4	16.2	16.6	17.7	15.3	17.1	15.3	52.2	34.6	24	
2	14.7	15.4	34.4	45.4	44.0	43.5	44.8	38.3	35.9	34.9	39.9	39.4	37.6	31.8	31.5	25.9	22.5	19.3	12.2	13.5	10.5	10.9	9.2	11.0	9.2	45.4	27.8	24	
3	11.4	13.1	13.8	13.1	14.5	16.9	17.8	16.4	17.4	15.3	15.2	16.2	19.5	19.2	17.6	17.2	14.5	11.2	13.2	13.0	17.2	19.0	23.4	24.7	11.2	24.7	16.3	24	
4	28.3	18.1	17.1	18.0	17.9	17.6	19.1	18.5	21.0	39.6	40.1	44.3	35.3	30.5	31.1	34.9	29.4	28.6	27.8	28.2	36.9	31.5	32.0	29.0	17.1	44.3	28.1	24	
5	25.5	26.9	27.7	27.2	36.3	35.9	35.5	40.3	34.6	35.8	37.4	34.6	37.5	38.1	37.7	37.2	35.4	30.5	22.0	28.3	35.8	24.6	16.9	22.5	16.9	40.3	31.8	24	
6	21.2	20.4	18.7	20.6	16.6	17.9	16.6	17.7	18.7	21.5	21.2	20.6	18.7	17.6	16.4	15.8	16.4	12.5	13.4	14.8	11.0	10.4	7.2	9.2	7.2	21.5	16.5	24	
7	9.7	11.4	13.0	10.4	8.6	7.1	14.7	20.6	21.1	24.8	24.0	26.1	30.4	27.1	30.0	26.0	22.6	19.3	19.7	15.0	19.1	19.5	17.3	20.4	7.1	30.4	19.1	24	
8	23.3	22.1	24.5	22.4	21.2	21.9	24.3	28.4	28.9	28.9	30.5	30.4	33.8	31.7	35.8	33.5	34.0	30.4	30.0	33.9	34.2	24.6	26.1	28.0	21.2	35.8	28.5	24	
9	23.8	26.4	25.1	28.1	26.3	26.4	28.7	27.3	16.6	17.4	21.4	15.8	20.0	25.5	27.2	29.4	29.2	31.1	27.1	25.3	24.9	22.1	23.8	20.7	15.8	31.1	24.6	24	
10	22.4	16.1	18.0	18.7	10.3	12.8	15.4	18.4	19.3	20.8	19.7	16.4	14.0	13.0	19.1	16.9	11.5	14.0	11.2	12.3	11.3	8.2	10.7	7.5	7.5	22.4	14.9	24	
11	8.9	9.1	10.5	9.7	9.1	11.3	9.5	9.1	12.0	13.1	16.0	12.9	21.9	27.9	24.7	26.9	25.9	16.5	17.9	19.1	16.1	13.6	12.3	10.9	8.9	27.9	15.2	24	
12	12.4	10.0	11.9	8.8	8.8	10.2	13.1	9.5	10.3	8.7	12.6	14.8	12.4	15.6	17.0	24.4	22.2	18.7	19.6	12.6	16.0	19.8	27.0	25.1	8.7	27.0	15.1	24	
13	21.9	21.8	24.7	23.2	25.7	23.0	20.5	26.8	30.7	31.7	39.4	38.1	37.6	36.3	43.1	47.9	34.4	30.5	30.3	36.4	30.9	32.5	22.6	27.2	20.5	47.9	30.7	24	
14	24.2	26.5	24.3	25.8	25.0	25.5	25.7	24.5	33.6	36.3	36.1	42.5	41.0	34.7	25.3	29.8	21.1	22.4	27.3	27.7	26.2	16.1	16.8	16.2	16.1	42.5	27.3	24	
15	12.5	12.3	16.3	17.6	21.2	15.4	20.0	16.3	14.6	15.1	13.4	13.0	13.8	17.5	17.6	18.6	18.1	16.6	13.8	17.7	22.5	22.1	28.4	28.9	12.3	28.9	17.6	24	
16	32.9	42.0	40.4	30.4	30.2	43.5	39.8	30.4	33.7	31.6	32.7	32.3	30.3	22.9	13.4	12.9	14.1	14.0	8.5	9.9	12.0	15.9	16.4	19.2	8.5	43.5	25.4	24	
17	19.9	22.2	22.0	25.6	26.9	24.8	20.0	23.1	26.5	28.2	28.0	27.3	26.9	28.8	26.4	27.8	26.7	25.0	21.8	23.6	21.2	28.2	26.8	30.1	19.9	30.1	25.3	24	
18	29.3	22.6	25.6	21.4	26.9	20.5	21.2	21.0	18.9	18.3	18.2	17.6	18.6	23.7	22.4	13.8	13.2	10.3	4.8	10.3	10.4	7.7	8.8	7.9	4.8	29.3	17.2	24	
19	7.3	7.8	8.7	10.5	10.6	8.9	9.9	9.8	11.8	11.1	12.0	12.4	11.8	12.2	11.0	10.6	12.7	11.6	12.4	14.0	17.1	19.5	21.6	21.0	7.3	21.6	12.3	24	
20	20.0	20.6	22.9	23.4	25.1	21.7	19.6	25.1	22.4	25.8	32.3	34.5	33.9	30.2	26.4	23.2	13.4	6.0	9.2	12.8	10.7	13.4	13.7	12.7	6.0	34.5	20.8	24	
21	19.5	19.1	23.4	23.4	20.5	19.7	15.4	17.2	22.9	23.1	20.8	22.8	26.7	27.0	P	24.1	24.2	15.6	12.8	10.5	12.3	15.1	16.5	16.7	10.5	27.0	19.5	23	
22	14.5	14.5	15.9	16.7	21.3	20.6	19.8	20.8	21.1	21.0	23.7	23.2	16.5	17.2	19.7	23.2	13.7	9.3	12.1	10.4	10.9	10.7	11.0	11.3	9.3	23.7	16.6	24	
23	14.6	15.2	12.5	12.8	15.0	9.0	9.7	11.2	10.2	5.4	6.3	8.3	11.1	16.3	20.5	19.1	22.7	28.5	28.1	32.9	29.5	31.1	31.4	29.0	5.4	32.9	17.9	24	
24	33.9	34.9	35.9	41.7	32.0	27.3	30.3	27.1	30.2	27.4	24.3	27.6	31.6	32.3	29.1	31.0	34.3	35.2	31.5	31.0	24.6	23.7	22.6	21.3	21.3	41.7	30.0	24	
25	18.0	13.8	30.3	28.8	32.1	28.4	29.1	30.8	29.8	27.6	30.9	26.7	32.9	30.9	28.6	28.5	24.6	20.6	19.4	18.6	15.5	11.4	7.9	14.8	7.9	32.9	24.2	24	
26	27.2	30.0	28.0	24.4	30.6	27.3	24.8	26.9	30.0	26.7	26.3	24.3	25.8	24.4	24.3	20.0	8.4	9.4	7.9	6.2	8.0	9.2	9.6	13.5	6.2	30.6	20.6	24	
27	15.9	19.0	21.8	21.2	22.8	26.8	29.3	29.2	30.8	31.5	29.4	28.9	30.1	Y	Y	24.8	26.9	27.2	27.5	28.3	27.7	27.5	27.3	28.8	15.9	31.5	26.5	22	
28	27.5	27.1	28.2	28.9	29.5	29.4	29.3	29.2	29.8	29.2	29.7	30.6	30.5	30.8	30.6	29.9	30.4	29.5	29.5	28.0	28.4	28.1	27.8	27.3	27.1	30.8	29.1	24	
29	28.0	27.5	27.7	27.1	P	25.4	25.4	26.0	28.9	29.4	24.7	26.7	24.7	26.0	26.5	27.3	26.6	27.2	26.1	27.6	27.6	28.7	27.8	26.9	24.7	29.4	26.9	23	
30	28.4	27.4	29.3	27.4	27.8	26.5	27.1	27.8	27.3	28.5	27.2	P	27.2	29.3	28.5	27.6	28.0	29.1	28.2	28.8	29.1	28.7	29.4	26.8	26.5	29.4	28.1	23	
31	25.8	23.9	23.2	22.4	24.7	24.5	23.4	23.6	24.3	25.1	26.2	23.0	24.5	27.8	29.1	26.9	27.4	29.1	28.9	29.1	29.1	29.1	28.2	31.3	29.1	22.4	31.3	26.3	24
HOURLY MAX	33.9	42.0	40.4	45.4	44.0	43.5	44.8	41.2	37.2	48.2	40.1	44.3	49.0	50.8	50.5	52.2	38.3	37.8	31.5	36.4	36.9	32.5	32.0	30.1					
HOURLY AVG	21.0	20.8	22.8	22.8	23.3	22.8	23.2	23.6	24.2	25.2	25.8	25.8	26.6	26.6	26.2	26.0	23.3	21.5	20.1	20.5	20.8	20.0	20.0	20.5					

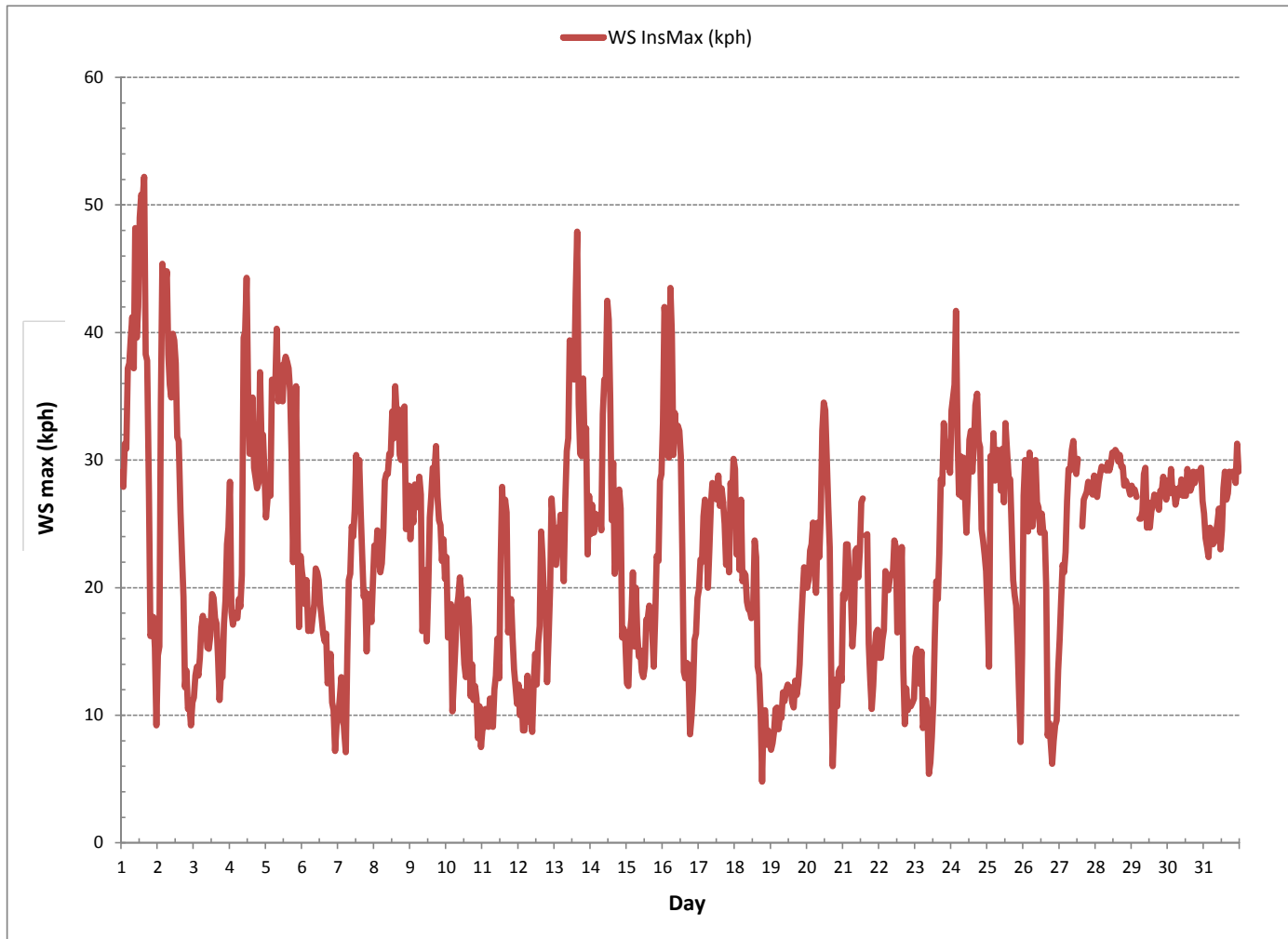
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

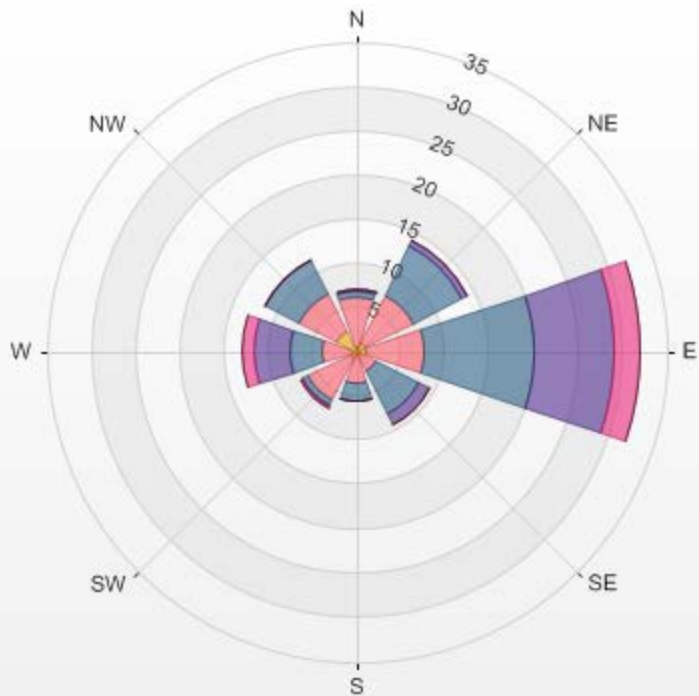
MAXIMUM INSTANTANEOUS VALUE:	52.2 kph	@ HOUR(S)	15	ON DAY(S)	1
				VAR-VARIOUS	
OPERATIONAL TIME:				739	hrs

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA ST. LINA Monitor: WSP [kph] Monthly: 2016/10 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 99.73% Calm Avg: 0.00

Direction	0.0-5.4	5.4-10.7	10.7-16.1	16.1-21.4	21.4-26.8	>26.8	Total
N	0.67	5.53	0.67	0.27	0	0	7.14
NE	1.21	5.93	6.2	0.67	0	0	14.01
E	1.21	6.47	12.4	9.16	2.83	0	32.07
SE	0.4	2.16	5.39	1.35	0	0	9.3
S	0.4	3.23	2.02	0	0	0	5.65
SW	0.81	5.39	0.67	0.13	0.13	0	7.13
W	0.67	3.23	3.77	3.91	1.35	0	12.93
NW	2.7	4.72	4.18	0.13	0	0	11.73
Summary	8.07	36.66	35.3	15.62	4.31	0	100



% Icon Classes (kph)	8	37	35	16	4	0
0.0-5.4	5.4-10.7	10.7-16.1	16.1-21.4	21.4-26.8	>26.8	

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - October 2016

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY 1	NE	ENE	ENE	ENE	ENE	ENE	E	E	ENE	ENE	ENE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	24
2	ESE	W	W	W	WNW	WNW	WNW	WNW	W	W	WSW	W	W	W	W	W	WSW	SW	SW	SSW	S	S	SSE	SE	SE	W	24
3	ESE	ESE	E	ENE	ENE	NE	NE	ENE	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	ENE	NE	NNE	NE	NE	ENE	ENE	ENE	24
4	ENE	ENE	NE	ENE	ENE	NE	ENE	ENE	NE	ENE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NNE	NNE	NE	NNE	NNE	NE	ENE	24
5	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	NNE	NNE	NNE	NNE	NNE	NE	NE	NNE	NNW	NNW	NNE	24
6	NNW	NNW	NNW	NNW	NNW	NNW	N	N	N	NNE	NE	N	N	N	NNE	N	N	NNE	NNE	NNE	NE	NE	NNE	NE	N	N	24
7	ENE	ENE	ENE	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	ESE	ESE	ESE	ESE	E	E	ESE	E	ESE	ESE	SE	ESE	24	
8	SSE	SE	SE	SSE	SSE	SE	SE	SE	SSE	SE	SE	SE	SE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	E	E	E	SE	SE	24
9	E	E	ENE	ENE	ENE	ENE	ENE	ENE	NE	N	NNW	NNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NNW	NNW	N	N	24
10	N	N	N	NNE	N	N	N	NNE	NNE	NNE	NNE	NNE	NNW	NNW	N	N	N	N	N	NNW	N	NNW	NNW	NW	N	N	24
11	NW	WNW	NW	NNW	NW	WNW	WNW	WNW	W	W	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SW	SW	SSW	WSW	WSW	24
12	SW	WSW	W	WSW	WSW	W	W	W	SW	SW	WSW	NNW	N	N	NNE	NNE	NNE	NE	NE	ENE	ENE	ENE	ENE	ENE	NNW	NNW	24
13	ENE	E	ESE	E	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	ESE	ESE	E	E	E	E	E	E	E	E	24
14	ENE	ENE	ENE	ENE	ENE	ENE	E	E	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	NNE	NNE	NNE	NE	NE	NE	NE	NE	ENE	ENE	24
15	ENE	NE	NE	ENE	E	E	E	E	E	E	ESE	ESE	E	ESE	ESE	E	ESE	SE	SSE	SE	ESE	SE	SE	SE	ESE	ESE	24
16	SE	SE	SE	ESE	E	E	E	E	E	E	ENE	E	E	E	ENE	ENE	NE	ENE	NNW	NW	NW	NW	NW	NW	E	E	24
17	WNW	NW	NW	NW	NW	NW	NW	NW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	24
18	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	W	W	WNW	W	W	WSW	NW	NW	24
19	SW	WSW	SW	SW	SW	SW	SSW	SSW	S	S	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	S	S	S	S	S	S	SSW	SSW	24
20	S	SSE	SSE	S	SSE	SE	ESE	SE	SE	SE	SE	SE	SSE	S	S	SSE	SSE	SW	W	NNW	NNW	NNW	NNW	WNW	SSE	24	
21	W	WNW	NW	WNW	W	W	WSW	WSW	WSW	W	W	WSW	WSW	W	W	WSW	WSW	WSW	SW	SW	SSW	S	S	S	WSW	WSW	24
22	S	S	S	SSE	SSE	SSE	SE	SSE	SE	SSE	SSE	S	SSW	S	SSE	SSE	SSW	SW	SW	SSW	SSW	SSW	SSW	SW	S	24	
23	SSW	SW	SW	W	W	NW	SSW	SW	SSW	ENE	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	E	E	E	24
24	E	E	E	E	E	E	ESE	ESE	ESE	ESE	ESE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	24
25	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	W	E	24
26	W	WNW	WNW	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	WNW	WNW	WNW	WNW	ESE	E	ESE	E	WNW	WNW	24
27	E	E	E	E	E	E	E	E	ENE	ENE	ENE	ENE	ENE	ENE	Y	Y	WNW	W	W	W	WNW	W	W	W	N	N	22
28	W	W	WNW	W	W	W	W	W	W	W	W	W	W	W	ENE	W	W	E	E	S	E	SSE	SW	E	E	W	24
29	ESE	ESE	ESE	ESE	E	E	E	E	E	E	E	E	E	E	ESE	ESE	E	E	E	E	E	ESE	SSW	WSW	E	E	24
30	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	ESE	E	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	24
31	ESE	ESE	ESE	E	E	ESE	ESE	ESE	ESE	ESE	ESE	E	E	E	E	E	E	E	ENE	NNW	NNE	NE	NE	WNW	WNW	E	24

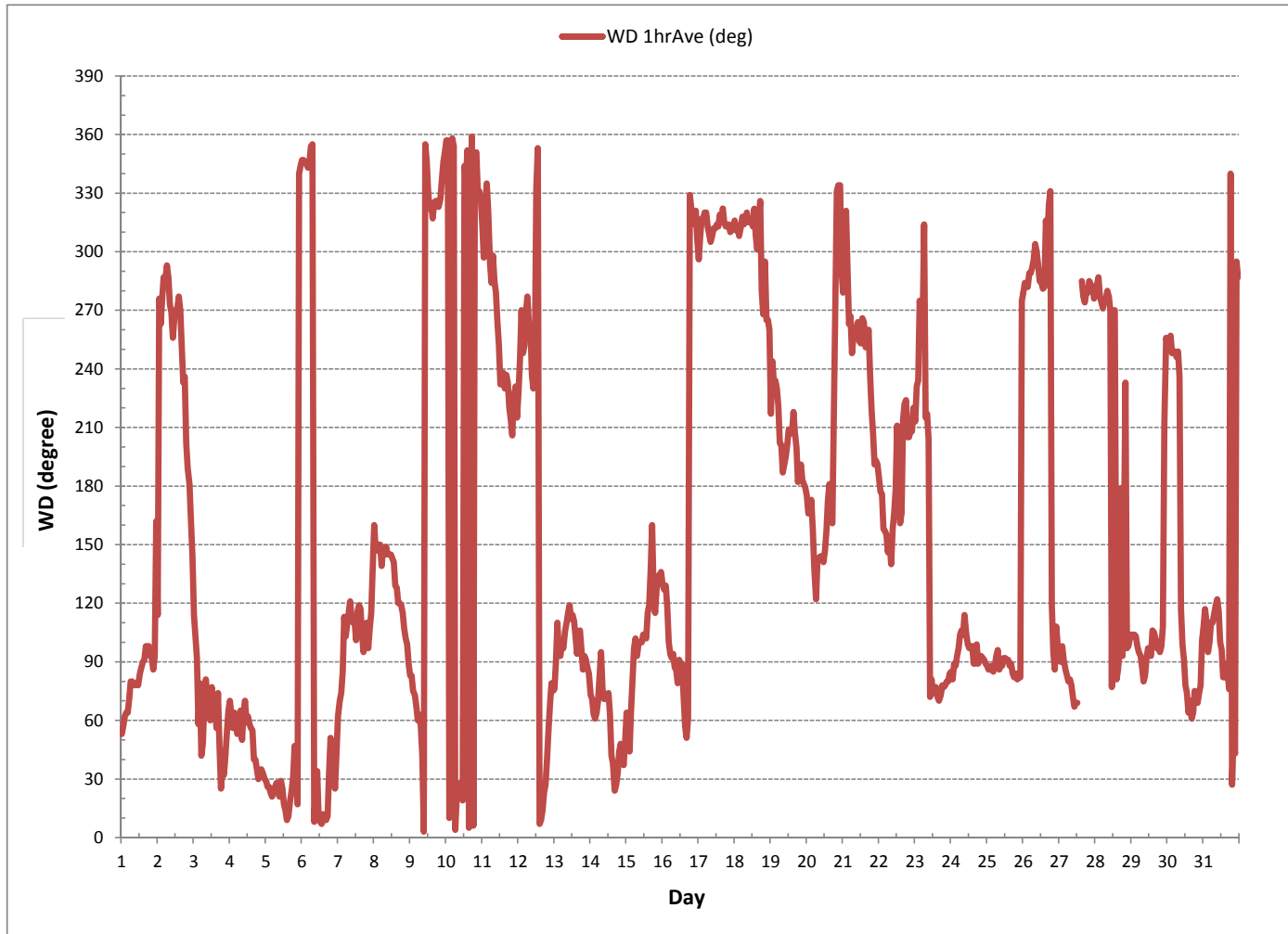
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	July 7, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	742	hrs
STANDARD DEVIATION:	102.06		AMD OPERATION UPTIME:	99.7	%
			MONTHLY AVERAGE	78 (ENE)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Continuous Monitoring Station - October 2016

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00			
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.		
DAY																											
1	15	15	15	15	15	15	14	14	15	14	17	14	13	13	13	13	13	14	15	13	13	12	12	12	24		
2	15	29	12	15	15	15	18	17	13	13	11	12	14	14	18	17	13	9	10	7	7	4	5	7	24		
3	10	13	14	13	13	9	13	13	16	24	22	24	22	25	29	23	17	15	11	9	10	11	12	12	24		
4	10	9	11	10	10	11	11	13	14	16	15	15	15	15	16	15	15	15	15	15	15	14	14	14	24		
5	14	15	15	15	16	16	14	15	17	18	17	17	19	20	20	19	18	16	14	13	15	17	16	16	24		
6	16	15	14	16	14	14	17	19	19	16	18	22	29	24	22	21	19	15	15	19	16	23	15	24	24		
7	11	12	12	15	24	12	15	15	18	15	15	17	15	17	17	19	14	12	11	11	12	11	12	15	24		
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10	17	17	18	15	16	14	16	15	14	15	15	19	18	20	19	18	18	17	17	15	16	12	16	17	24		
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12	8	5	4	4	2	3	6	3	5	9	9	27	34	20	20	20	18	15	12	11	12	13	12	12	24		
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15	50	14	12	13	14	14	12	12	12	11	13	15	17	13	17	16	12	12	13	14	14	14	15	24			
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17	17	18	17	18	17	16	17	18	18	18	18	19	18	19	16	16	17	17	17	17	17	17	16	16	24		
18	16	17	16	18	16	16	15	16	17	18	18	19	17	17	16	18	20	16	21	6	12	5	6	10	24		
19	8	8	7	5	7	9	17	12	13	14	13	15	14	15	15	13	13	8	7	8	9	8	10	11	24		
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24	13	13	12	11	12	12	13	12	13	12	13	12	12	14	13	12	12	14	11	12	11	11	11	10	24		
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26	11	15	15	15	15	15	16	17	16	18	17	16	17	17	16	21	20	17	39	25	12	8	15	9	24		
27	10	12	12	12	12	11	11	11	11	12	12	13	12	Y	Y	16	10	7	23	11	13	11	10	8	22		
28	7	9	12	42	50	19	42	16	12	8	6	59	46	76	56	8	70	56	53	65	52	37	6	12	24		
29	14	12	16	8	5	4	3	4	5	4	16	6	7	5	8	8	7	8	5	4	32	57	70	4	24		
30	5	5	46	35	8	4	7	9	56	60	8	10	8	11	13	9	11	12	6	8	17	12	16	6	24		
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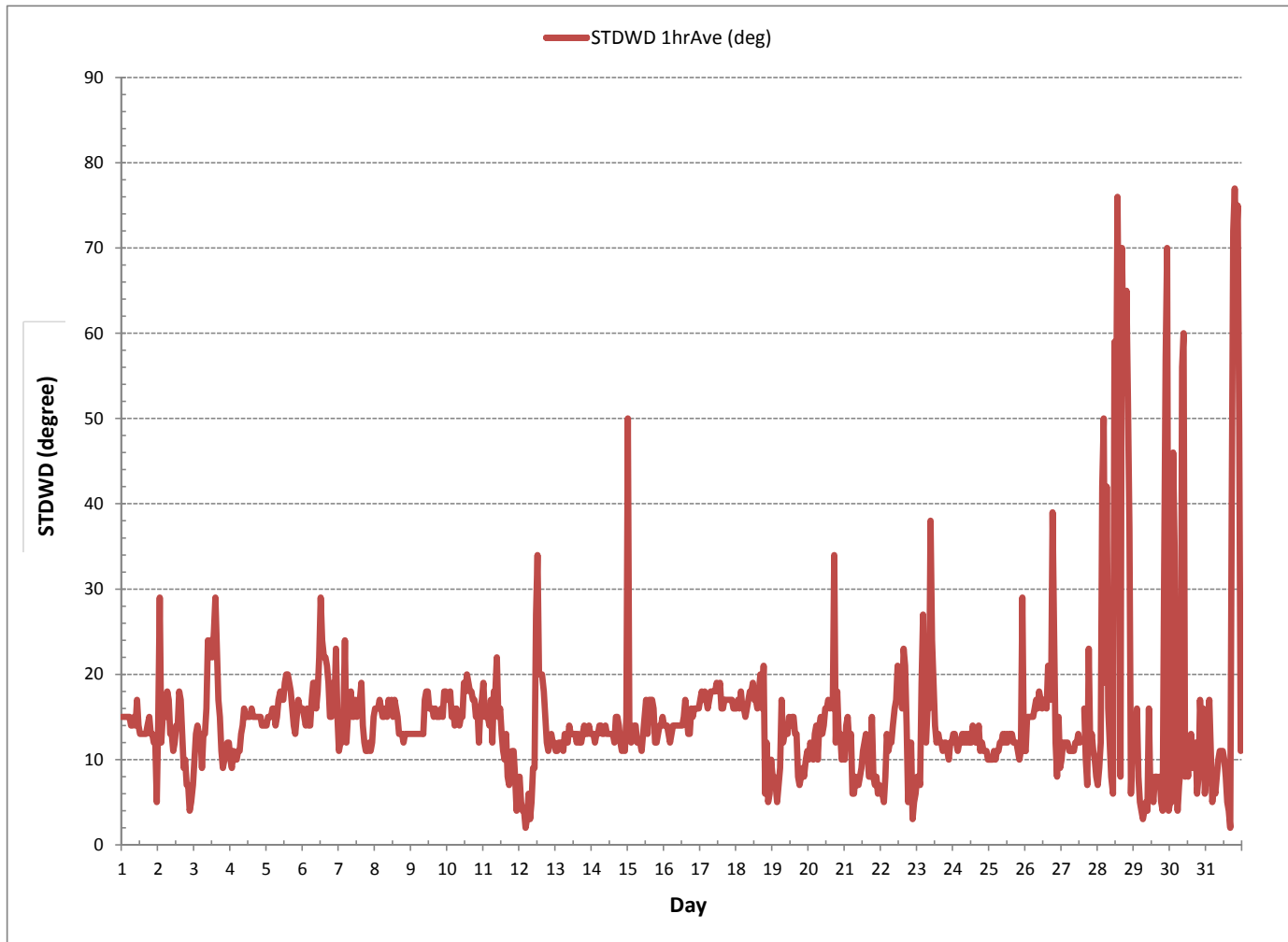
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: July 7, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 742 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



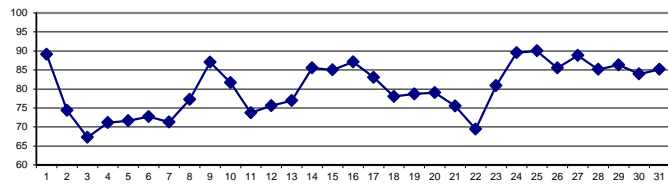
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	90	91	91	89	88	86	85	86	86	87	88	89	89	89	90	90	90	90	90	91	91	91	91	91	85	91	89	24	
2	91	91	91	91	90	88	86	84	83	81	79	75	67	61	54	50	51	60	67	70	72	69	67	66	50	91	74	24	
3	65	70	75	82	86	87	88	81	74	70	64	60	58	55	53	51	53	56	58	60	61	64	72	72	51	88	67	24	
4	75	78	79	81	81	82	83	82	77	66	58	57	58	57	57	63	67	70	73	76	75	77	78	57	83	71	24		
5	80	80	81	81	79	76	74	73	71	72	72	69	67	64	62	63	64	67	70	69	70	71	72	62	81	72	24		
6	75	77	78	79	80	81	81	80	79	75	71	67	64	64	63	65	66	68	70	70	71	73	74	75	63	81	73	24	
7	76	77	77	77	76	76	75	74	73	73	72	71	71	67	64	62	64	65	67	69	70	72	71	72	62	77	71	24	
8	71	73	74	75	75	75	76	76	75	75	74	74	71	68	64	66	81	86	87	87	87	88	88	88	64	88	77	24	
9	88	88	88	88	88	88	88	88	88	87	87	86	85	84	85	86	86	87	87	87	87	88	88	87	87	84	88	87	24
10	85	86	87	87	87	87	87	86	82	79	76	71	70	72	73	76	79	84	83	83	84	84	84	84	70	87	82	24	
11	85	86	84	81	80	79	79	77	73	69	63	61	60	66	62	63	68	73	75	78	81	83	83	83	60	86	74	24	
12	83	84	85	86	87	87	86	86	85	76	66	59	57	58	59	63	64	66	73	75	79	83	84	83	57	87	76	24	
13	83	82	81	81	82	83	84	84	81	76	77	73	69	67	66	68	70	72	73	77	80	79	79	79	66	84	77	24	
14	80	80	80	81	82	83	84	86	87	87	87	87	87	87	87	87	88	88	88	88	87	87	87	87	80	88	86	24	
15	87	87	87	87	87	87	87	87	87	86	84	82	79	82	82	81	82	83	84	85	87	88	87	86	79	88	85	24	
16	86	86	87	88	87	88	88	87	87	86	86	86	86	86	86	86	86	87	88	88	88	88	89	89	86	89	87	24	
17	89	89	89	88	87	86	86	86	86	85	82	79	78	78	79	80	81	81	81	81	82	80	80	80	78	89	83	24	
18	81	82	84	84	84	84	85	84	83	80	77	74	73	72	70	68	70	72	77	78	77	78	78	78	68	85	78	24	
19	78	79	80	80	79	79	80	80	78	76	75	73	69	69	70	69	72	80	85	87	88	88	87	87	69	88	79	24	
20	87	87	86	86	85	83	85	86	80	78	76	75	71	65	66	67	74	77	79	81	81	82	84	65	87	79	24		
21	88	84	82	82	86	86	87	87	85	85	80	69	65	60	57	61	62	67	69	73	75	73	76	74	57	88	76	24	
22	74	73	72	66	67	70	70	69	63	60	58	56	58	57	61	73	72	72	74	75	78	81	83	85	56	85	69	24	
23	84	84	83	84	84	85	84	84	79	75	69	66	66	63	68	74	83	88	89	89	90	90	90	90	63	90	81	24	
24	90	90	90	90	90	89	89	89	89	89	89	89	89	89	89	89	90	90	90	90	90	90	90	90	89	90	90	24	
25	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	24	
26	90	90	90	90	90	90	90	90	89	88	87	84	80	77	77	78	80	81	81	82	85	87	88	88	77	90	86	24	
27	87	86	87	87	88	89	89	89	89	89	88	89	89	89	89	89	89	89	90	90	90	90	90	90	86	90	89	24	
28	90	89	89	89	88	88	88	88	86	84	81	79	78	77	79	81	83	85	86	86	87	87	87	77	90	85	24		
29	89	89	89	89	90	90	90	90	90	90	90	88	83	81	80	82	83	84	83	83	83	83	82	84	80	90	86	24	
30	85	85	87	86	86	86	86	86	86	86	86	84	83	82	83	86	83	79	80	80	80	81	83	84	79	87	84	24	
31	84	86	87	88	86	86	86	86	87	88	88	86	86	85	84	84	84	84	85	83	82	82	84	83	82	88	85	24	
HOURLY MAX	91	91	91	91	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	91	91	91	91	91					
HOURLY AVG	83.4	83.8	84.2	84.3	84.4	84.3	84.4	83.9	82.4	80.5	78.3	76.2	74.5	73.1	72.6	73.4	75.2	77.4	79.5	80.5	81.4	82.0	82.6	82.8					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

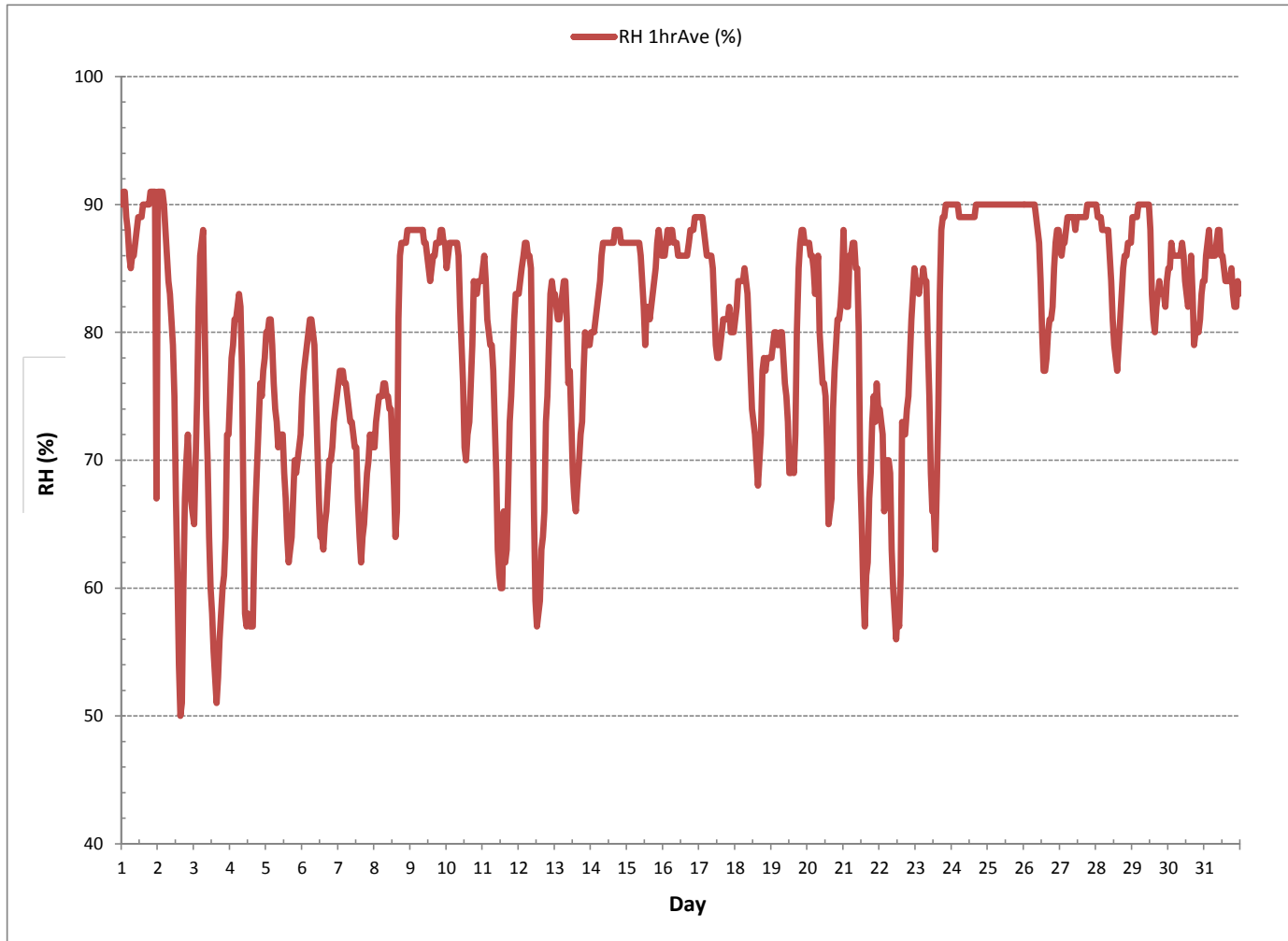
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	50	%	@ HOUR(S)	15	ON DAY(S)	2
MAXIMUM 1-HR AVERAGE:	91	%	@ HOUR(S)	VAR	ON DAY(S)	1, 2
MAXIMUM 24-HR AVERAGE:	90	%			ON DAY(S)	24, 25
					VAR-VARIOUS	
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	9.07					
MONTHLY AVERAGE:						80 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	935	936	935	935	934	934	934	933	933	932	933	931	929	929	928	927	927	926	927	926	926	926	925	925	925	925	936	930	24
2	925	924	924	924	925	926	926	927	928	929	929	930	930	930	930	930	930	929	928	928	928	928	928	928	924	930	928	24	
3	928	927	928	927	926	926	926	927	927	928	929	929	929	929	929	929	929	929	928	928	928	928	927	927	926	929	928	24	
4	928	928	928	928	928	928	928	928	929	930	931	931	931	931	931	931	931	932	932	932	932	932	932	932	928	932	930	24	
5	932	931	931	931	931	931	931	931	932	932	932	931	931	931	931	931	931	932	931	932	932	932	932	932	931	932	931	24	
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7	939	939	939	938	938	938	938	938	937	937	937	937	936	936	936	936	936	936	935	935	935	935	936	936	935	939	937	24	
8	936	936	936	937	937	936	936	936	936	936	936	936	935	934	934	933	932	931	931	930	929	928	927	927	937	934	24		
9	927	926	925	924	924	924	923	923	924	924	924	924	925	925	926	926	927	928	928	929	929	930	931	931	923	931	926	24	
10	931	932	932	932	933	933	934	934	935	936	937	937	937	937	937	937	938	938	938	938	938	938	938	938	931	938	936	24	
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12	930	930	930	929	929	928	928	928	928	928	929	930	930	930	930	930	930	930	930	930	930	930	930	930	928	930	929	24	
13	929	929	929	928	927	927	926	925	925	924	923	922	921	919	918	918	917	917	916	915	915	915	914	914	929	922	24		
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15	912	913	913	913	913	914	914	915	915	916	916	917	917	917	917	917	917	918	917	917	916	916	915	915	912	918	915	24	
16	914	913	913	912	911	910	909	909	908	908	907	908	908	909	909	909	908	909	909	909	909	909	908	908	907	914	909	24	
17	909	909	909	909	910	910	910	911	912	913	913	914	915	915	916	917	917	918	919	919	919	920	920	921	909	921	914	24	
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20	932	931	931	930	929	928	927	926	926	925	925	923	923	922	921	921	920	920	919	919	919	919	919	919	919	919	932	924	24
21	920	920	921	921	922	922	923	923	924	924	925	925	926	926	926	926	926	925	925	924	924	924	924	924	920	926	924	24	
22	924	924	924	924	923	923	923	923	924	924	925	926	926	926	926	927	927	928	928	928	929	929	930	923	930	926	24		
23	930	930	931	931	931	931	932	932	933	934	935	935	936	936	935	935	934	935	935	935	935	935	935	930	936	934	24		
24	935	935	935	935	935	935	935	935	935	935	935	935	934	934	934	933	932	933	932	932	932	932	931	931	935	934	24		
25	931	931	930	930	929	929	929	929	929	929	928	929	928	927	927	927	927	927	926	926	926	926	926	926	926	931	928	24	
26	927	927	927	927	927	928	928	928	928	929	929	929	930	930	930	929	929	929	928	928	928	927	927	927	927	930	928	24	
27	926	926	925	924	924	923	923	923	922	922	922	922	922	922	922	922	923	923	924	924	925	925	926	922	926	924	24		
28	927	927	927	928	928	929	929	930	930	931	932	932	932	932	933	933	933	933	933	933	933	933	933	927	933	931	24		
29	933	933	932	932	932	932	932	932	932	932	932	932	932	931	931	931	930	930	930	929	929	929	928	928	928	933	931	24	
30	927	926	926	925	924	924	923	923	923	923	922	922	922	922	922	921	921	921	920	920	919	919	919	919	919	927	922	24	
31	918	918	917	916	916	916	915	915	915	915	915	915	915	915	915	916	916	916	915	915	915	916	916	915	918	916	24		
HOURLY MAX	939	939	939	938	938	938	938	938	938	938	938	938	938	938	938	939	939	939	939	939	939	939	939	939	939	939	939	939	
HOURLY AVG	927	927	927	927	927	927	926	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	

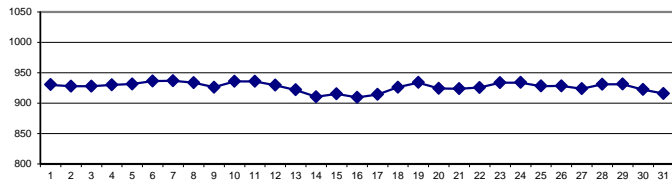
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

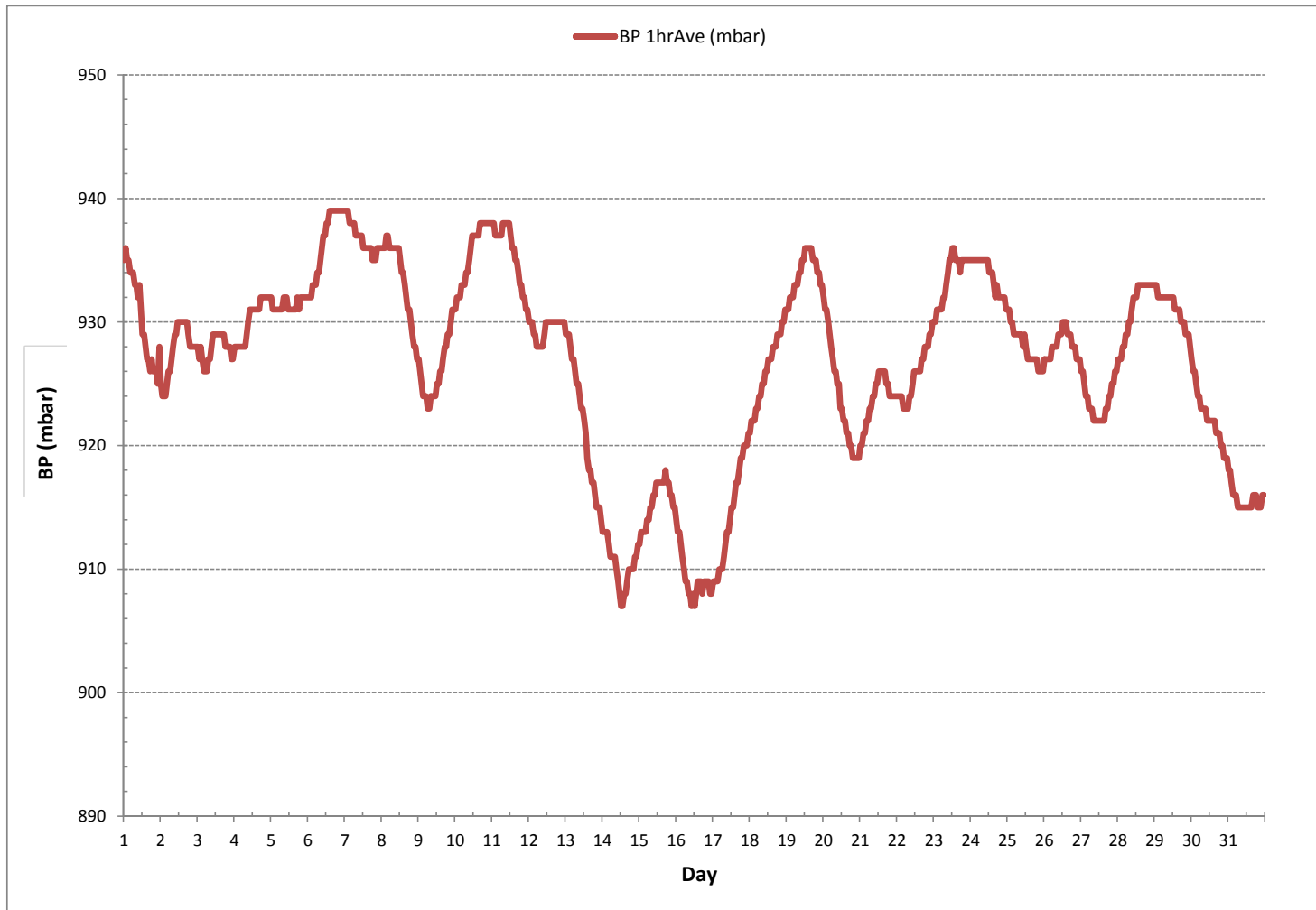
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	907	mbar	@ HOUR(S)	VAR	ON DAY(S)	14 , 16
MAXIMUM 1-HR AVERAGE:	939	mbar	@ HOUR(S)	VAR	ON DAY(S)	6 , 7
MAXIMUM 24-HR AVERAGE:	937	mbar			ON DAY(S)	7
					VAR-VARIOUS	
				OPERATIONAL TIME:		744 hrs
				AMD OPERATION UPTIME:		100.0 %
STANDARD DEVIATION:	7.75			MONTHLY AVERAGE:		927 mbar

24 HOUR AVERAGES FOR October 2016

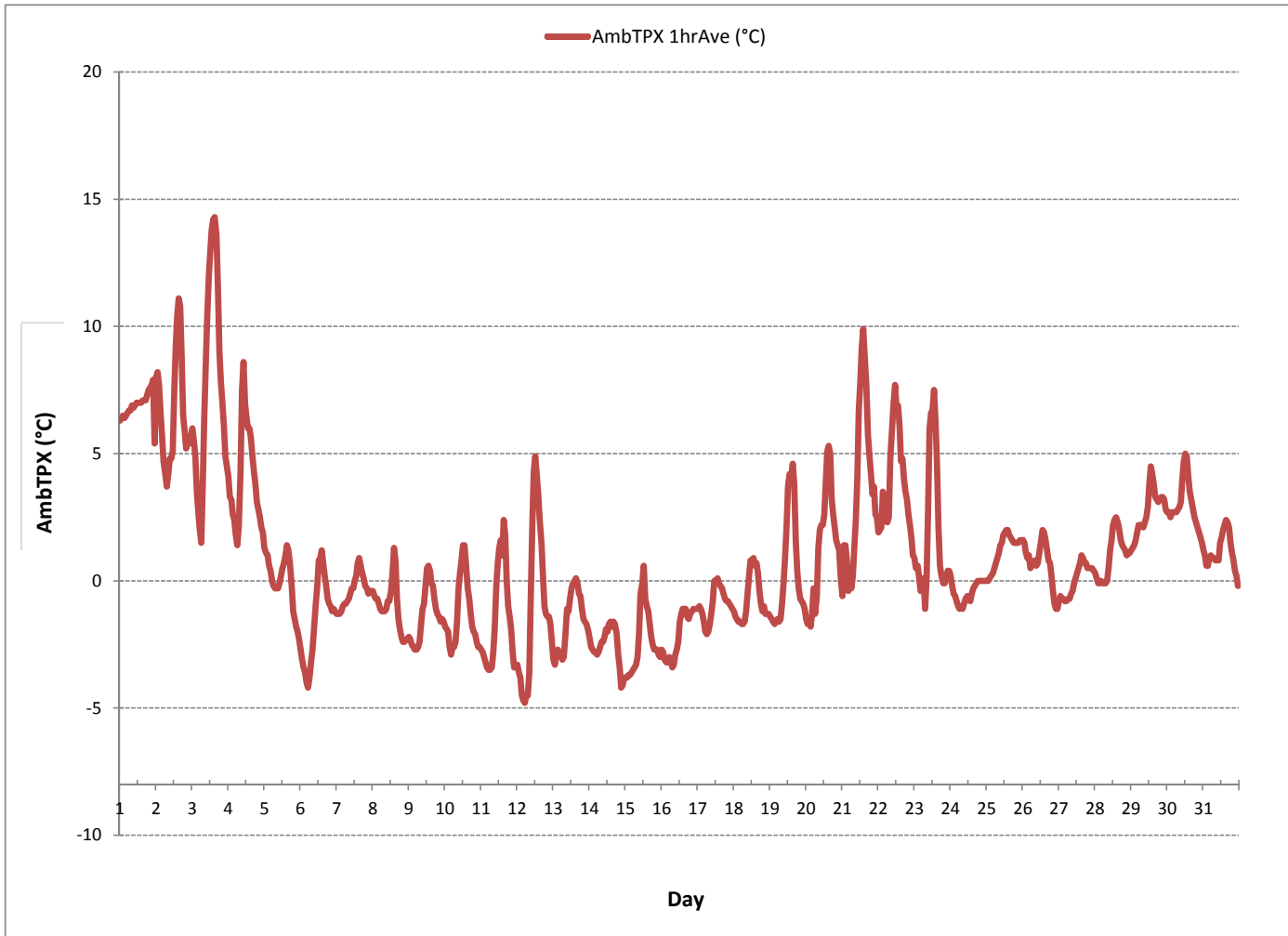


BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



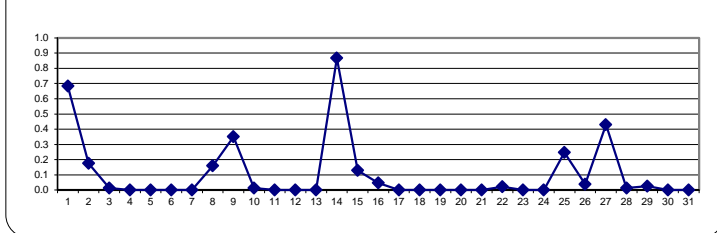
PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.6	0.4	3.1	5.1	3.2	0.2	0.2	0.0	0.5	0.5	0.2	0.3	0.1	0.0	0.0	5.1	0.7	24			
2	0.0	1.0	1.3	1.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.2	24			
3	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24			
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.8	0.6	0.5	0.5	0.3	0.0	0.0	0.8	0.2	24			
9	0.3	0.2	0.1	0.5	0.6	0.1	0.1	0.2	0.4	0.4	0.4	0.6	0.9	1.1	1.0	0.8	0.5	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.1	0.4	24			
10	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24			
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4	2.3	2.4	2.7	3.4	2.2	4.5	0.9	0.4	0.0	0.1	0.0	0.0	0.1	0.0	0.0	4.5	0.9	24			
15	1.5	0.0	0.0	0.0	0.0	0.1	0.0	0.9	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.1	24			
16	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.1	0.0	0.0	0.1	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24			
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	24			
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
25	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.3	0.8	2.9	0.5	0.2	0.2	0.2	0.0	0.0	0.0	2.9	0.2	24			
26	0.1	0.0	0.1	0.1	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24			
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	1.8	3.4	2.3	0.3	0.1	0.4	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.4	24			
28	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	24			
29	0.3	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
HOURLY MAX	1.5	1.0	1.3	1.6	0.6	0.4	0.1	0.9	0.5	0.4	1.8	2.3	2.4	3.4	5.1	3.2	4.5	0.9	0.8	2.9	0.6	0.5	0.5	0.3								
HOURLY AVG	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0							

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

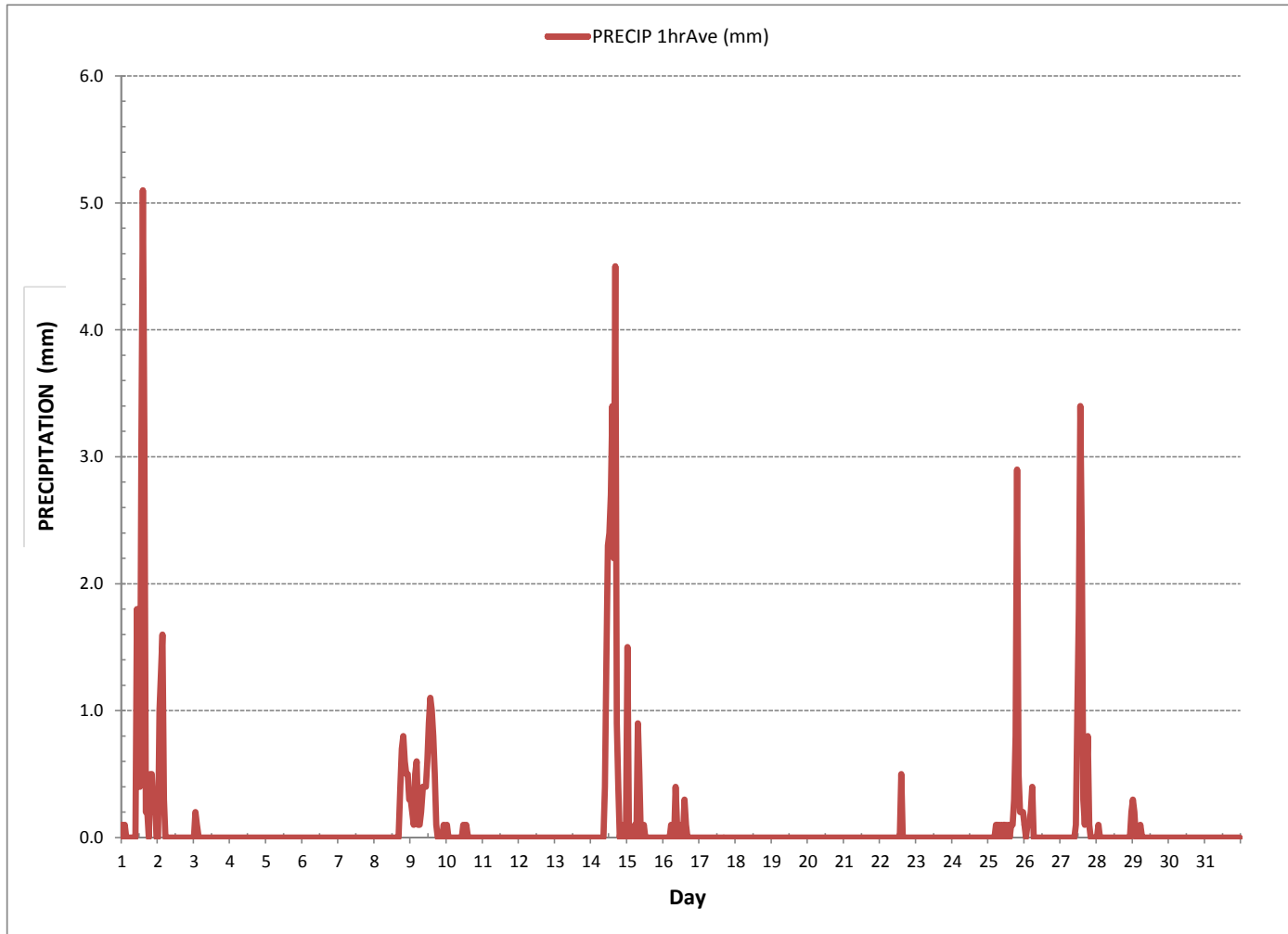
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	5.1	mm	@ HOUR(S)	14	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	0.9	mm			ON DAY(S)	14
MONTHLY TOTAL	76.9	mm			VAR-VARIOUS	
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	0.45					MONTHLY AVERAGE: 0.1 mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>October 14, 2016</u>	Barometric Pressure: <u>0.898 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>Mainly cloudy with snow</u>
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>routine monthly</u>
Start Time 24 hr. (mst): <u>10:26</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>14:26</u>	Cal Gas Expiry Date: <u>December 2, 2023</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>468</u>	Range ppb: <u>1000</u>	Station SO ₂ Analyzer Range? <u>500 ppb</u>
Last Calibration Date: <u>September 6, 2016</u>	As Found C.F.: <u>0.987</u>	
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>	

Calibrator:	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)								
Flow Meter ID's: <u>n/a</u>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190	Start/End Time 24 hr.: <u> </u>
Point	ppb									
High	780									
Mid	380									
Low	190									
Make & Model: <u>API 700</u>		Target Concentration (ppb): <u>380</u>								
Serial #: <u>627</u>		Result (ppb): <u>3</u>								
Cal Gas Cylinder I.D. #: <u>LL119346</u>		Zero Corrected Result (ppb): <u>3</u>								
Cal Gas Conc. (ppm): <u>50.0</u>		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

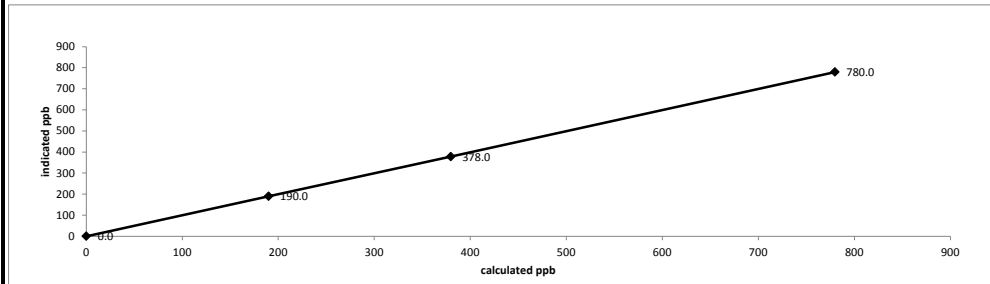
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	2.0	n/a
as found high	4924	78.00	5002	779.7	792.0	0.987
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	78.00	5002	779.7	780.0	1.000
mid	4966	38.00	5004	379.7	378.0	1.004
low	4981	19.00	5000	190.0	190.0	1.000
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.001

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>1.000</u>	.95-1.05
b (Intercept as % of full scale) = <u>0.04%</u>	± 3% F.S.
% change in C.F. from last cal = <u>1.31%</u>	± 10%

API 100E Sulphur Dioxide Analyzer Calibration



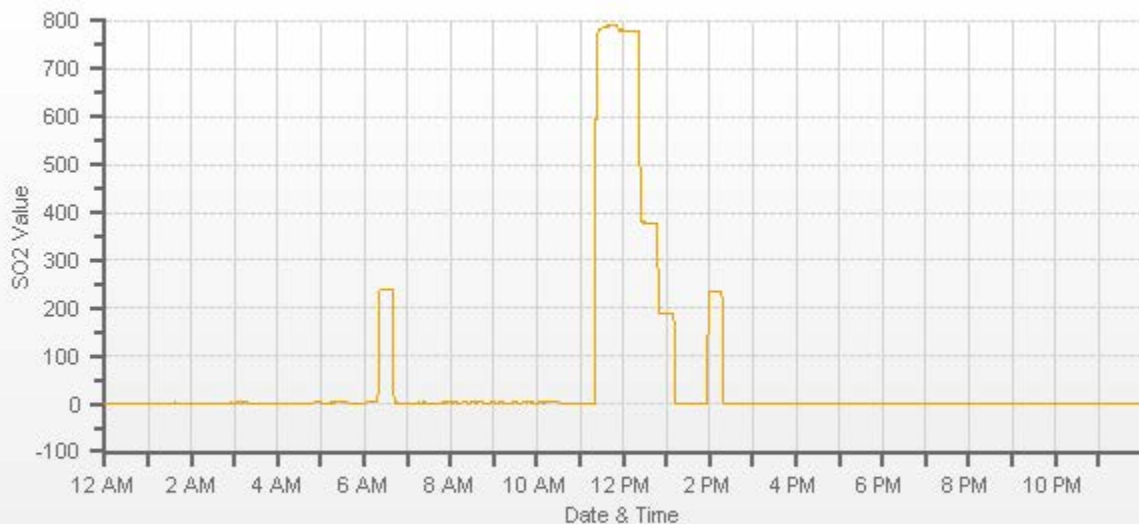
SLOPE: <u>1.017</u>	SLOPE: <u>1.002</u>
OFFSET: <u>110.7</u>	OFFSET: <u>115.3</u>
HVPS: <u>651</u>	HVPS: <u>651</u>
RCELL TEMP: <u>50.0</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>26.5</u>	BOX TEMP: <u>25.8</u>
PMT TEMP: <u>7.8</u>	PMT TEMP: <u>7.8</u>
IZS TEMP: <u>40.0</u>	IZS TEMP: <u>40.0</u>
PRES: <u>23.5</u>	PRES: <u>23.4</u>
SAMP FL: <u>613</u>	SAMP FL: <u>612</u>
NORM PMT: <u>114.3</u>	NORM PMT: <u>114.6</u>
UV LAMP: <u>3242.5</u>	UV LAMP: <u>3243.7</u>
LAMP RATIO: <u>99.5</u>	LAMP RATIO: <u>99.5</u>
STR. LGT: <u>56.3</u>	STR. LGT: <u>57.8</u>
DRK PMT: <u>4.7</u>	DRK PMT: <u>5.2</u>
DRK LMP: <u>6.9</u>	DRK LMP: <u>6.8</u>
Expected Value: <u>233.5</u>	Expected Value: <u>233.5</u>

Comments:

The analyzer sample inlet filter was changed.

The EV has not changed after the calibration.

SO2[ppb] Station: LICA ST. LINA Daily: 2016/10/14 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>October 14, 2016</u>	Barometric Pressure: <u>0.898 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>Mainly cloudy with snow</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>routine monthly</u>
Start Time 24 hr. (mst): <u>10:26</u>	Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>14:27</u>	Cal Gas Expiry Date: <u>July 15, 2017</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:	Station SO ₂ Analyzer Range?
ID# or Serial Number: <u>509</u>	Range ppb: <u>100</u>
Last Calibration Date: <u>September 6, 2016</u>	As Found C.F.: <u>0.997</u>
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>

Calibrator:	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)								
Flow Meter ID's: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: _____
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: <u>SABIO 2010 D</u>		Target Concentration (ppb): <u>380</u>								
Serial #: <u>11900613</u>		Result (ppb): _____								
Cal Gas Cylinder I.D. #: <u>LL36837</u>		Zero Corrected Result (ppb): <u>0</u>								
Cal Gas Conc. (ppm): <u>10.0</u>		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

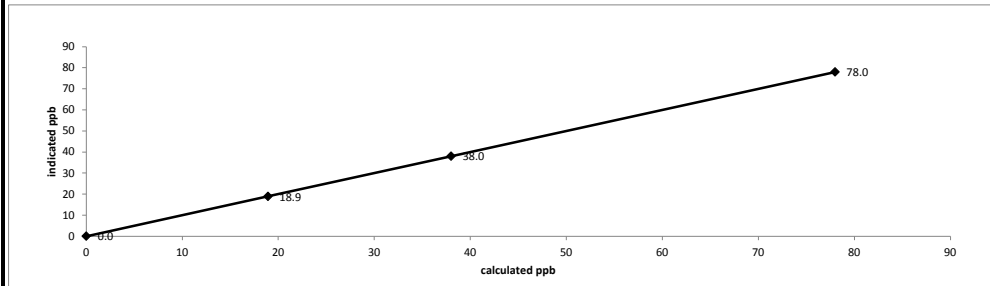
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	1.0	n/a
as found high	7443	58.50	7502	78.0	79.2	0.997
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	58.50	7502	78.0	78.0	1.000
mid	7472	28.50	7501	38.0	38.0	1.000
low	7487	14.20	7501	18.9	18.9	1.002
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.000</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.01%</u>	± 3% F.S.
% change in C.F. from last cal = <u>0.28%</u>	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



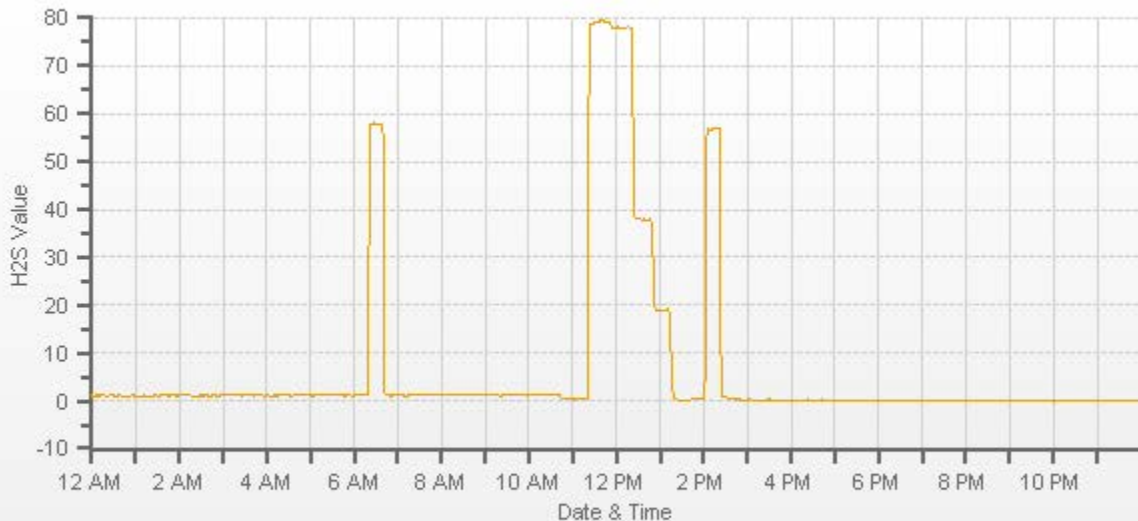
SLOPE: <u>0.941</u>	SLOPE: <u>0.939</u>
OFFSET: <u>50.7</u>	OFFSET: <u>53.0</u>
HVPS: <u>675</u>	HVPS: <u>675</u>
RCELL TEMP: <u>50.0</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>28.3</u>	BOX TEMP: <u>27.8</u>
PMT TEMP: <u>7.9</u>	PMT TEMP: <u>7.9</u>
IZS TEMP: <u>48.0</u>	IZS TEMP: <u>48.0</u>
Converter Temp: <u>314.4</u>	Converter Temp: <u>315.1</u>
PRES: <u>20.0</u>	PRES: <u>19.9</u>
SAMP FL: <u>549</u>	SAMP FL: <u>548</u>
UV LAMP: <u>3690.1</u>	UV LAMP: <u>3692.8</u>
LAMP RATIO: <u>98.8</u>	LAMP RATIO: <u>98.8</u>
STR. LGT: <u>23.8</u>	STR. LGT: <u>24.9</u>
DRK PMT: <u>0.2</u>	DRK PMT: <u>0.2</u>
DRK LMP: <u>0.6</u>	DRK LMP: <u>0.6</u>
Expected Value: <u>56.9</u>	Expected Value: <u>56.9</u>

Comments:

The analyzer sample inlet filter was changed.

The EV has not changed after the calibration.

H2S[ppb] Station: LICA ST. LINA Daily: 2016/10/14 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	October 21, 2016	Barometric Pressure:	0.912 atm
Company/Airshed:	LICA	Station Temperature °C:	20
Location/Station Name:	St. Lina	Weather Conditions:	A few clouds
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly
Start/End Time 24 hr. (mst):	10:51 / 15:39	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:	ID# or Serial Number:	51CLT-77021-384	Range ppm:	50
	Last Calibration Date:	September 7, 2016	As Found C.F.:	1.010
	Previous Cal High Point C.F.:	1.000	New C.F.:	1.000

Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for a Range of:	50 ppm
	Make & Model:	API 700		
	Serial #:	627		
	Cal Gas Cylinder I.D. #:	LL165372		
	CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	606.0 212.0		
	CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0 1189.0		

Point	Target ppm
High	38
Mid	18
Low	9

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

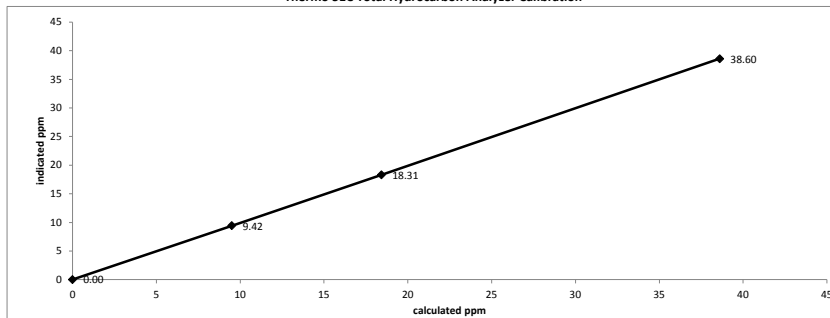
Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2000	0.00	2000	0.0	0.00	n/a
as found high	1938	65.00	2003	38.58	38.19	1.010
adjusted zero	2000	0.00	2000	0.00	0.00	n/a
adjusted high	1937	65.00	2002	38.60	38.60	1.000
mid	1969	31.00	2000	18.43	18.31	1.007
low	1986	16.00	2002	9.50	9.42	1.009
calibrator zero	2000	0.00	2000	0.0	0.00	n/a

Average C.F. = 1.005

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		.95-1.05
b (Intercept as % of full scale) =	0.12%		± 3% F.S.
% change in C.F. from last cal =	-1.03%		± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration



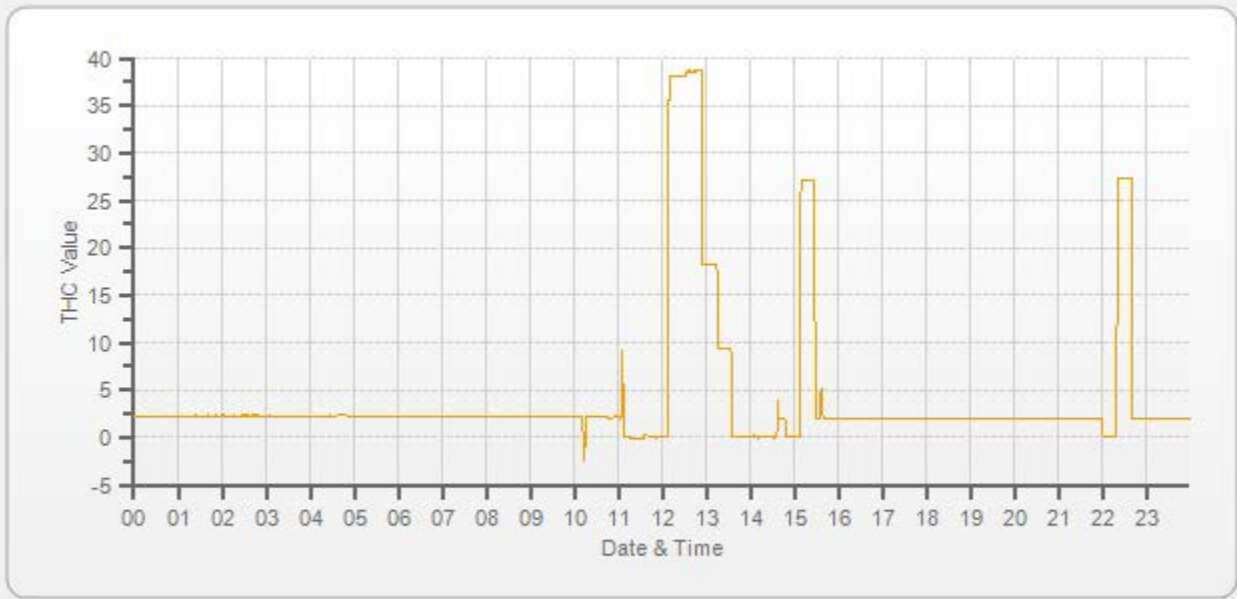
As found:

H2 cylinder (psi):	50
H2 cylinder reg set (psi):	22
Span Cylinder (psi):	200
Span Cylinder Reg Set (psi):	22
Zero Air Gen Pressure:	45
measurement alarms:	None
service alarms:	None
cnt:	1533
rng:	1
try:	5
flm:	183.5
det:	125.4
Flame:	183
Filter:	125
Base:	125
Sample psi:	06.90
Internal Air Pressure:	18
Internal Fuel Pressure:	13
Measured Flow:	1.082
Expected Value:	27.77

As left:

H2 cylinder (psi):	2000
H2 cylinder reg set (psi):	22
Span Cylinder (psi):	2000
Span Cylinder Reg Set (psi):	22
Zero Air Gen Pressure:	45
measurement alarms:	None
service alarms:	None
cnt:	1851
rng:	1
try:	5
flm:	189.8
det:	125.4
Flame:	189
Filter:	125
Base:	125
Sample psi:	06.90
Internal Air Pressure:	20
Internal Fuel Pressure:	13
Measured Flow:	1.064
Expected Value:	27.04

Comments:
 The analyzer sample inlet filter was changed. No zero adjustment was required/made. As found zero value copied to adjusted zero value for linearity calculation purposes.
 A new hydrogen cylinder was installed.
 A new span gas cylinder was installed.
 The analyzer cooling fan filter(s) were cleaned.



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: October 14, 2016
Company/Airshed: LICA
Location/Station Name: St. Lina
Start/End Time 24 hr. (mst): 10:26 / 16:04
G.P.T. to be used for Ozone? No
Calibration Method: Gas Dilution & Gas Phase Titration

Barometric Pressure: 0.898 atm
Station Temperature °C: 22
Weather Conditions: Mainly cloudy with snow
Calibration Purpose: routine monthly
Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
Cal Gas Expiry Date: December 2, 2023

Analyzer:

ID# or Serial Number: 594
Last Calibration Date: September 6, 2016
Range ppb: 1000

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	1.000	1.014	1.000
NO ₂ =	1.000	1.000	1.000
NOx =	1.000	1.007	1.000

Calibrator:

Flow Meter ID's: n/a
Make & Model: API 700
Serial #: 627
Cal Gas Cylinder I.D. #: LL119346
NO/NOx Gas Conc. (ppm): 50.0 | 50.0

Standard Calibration Points for a Range of: 1000 ppb

Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?
High	780	500	n/a
Mid	380	275	n/a
Low	190	100	n/a
Extra Point #1	n/a	n/a	n/a
Extra Point #2	n/a	n/a	n/a

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	0.0	1.0	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	769.0	775.0	1.014	1.007
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	78.00	5002	779.7	779.7	780.0	780.0	1.000	1.000
mid	4966	38.00	5004	379.7	379.7	378.0	378.0	1.004	1.004
low	4981	19.00	5000	190.0	190.0	189.0	189.0	1.005	1.005
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.003	1.003

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	780.0	775.0	-5.0	0.0	-5.0	
as found high NO ₂	7498	78.00	7576	485.0	277.0	775.0	498.0	503.0	503.0	1.000
adjusted high NO ₂	7498	78.00	7576	485.0	277.0	775.0	498.0	503.0	503.0	1.000
gpt mid	7498	78.00	7576	270.0	500.0	775.0	275.0	280.0	280.0	1.000
gpt low	7498	78.00	7576	100.0	679.0	775.0	96.0	101.0	101.0	1.000
Average NO₂ C.F.=									1.000	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	0.992	.95-1.05
b (Intercept as % of full scale)=	-0.08%	-0.08%	-0.29%	± 3% F.S.
% change in C.F. from last cal=	-1.39%	-0.73%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

As found:

NOx SLOPE: 0.974
 NOx OFFS: 2.0
 NO SLOPE: 0.977
 NO OFFS: -0.2
 SAMP FLW: 473
 OZONE FL: 77
 PMT: 22.4
 NORM PMT: 7.6
 AZERO: 15.5
 HVPS: 767
 RCELL TEMP: 50.0
 BOX TEMP: 27.9
 PMT TEMP: 6.6
 IZS TEMP: 45.3
 MOLY TEMP: 316.1
 RCEL: 5.0
 SAMP: 25.6
 Expected Value NO: 7.90
 Expected Value NO₂: 495.00
 Expected Value NOx: 502.00

As left:

NOx SLOPE: 0.980
 NOx OFFS: 0.8
 NO SLOPE: 0.992
 NO OFFS: 0.4
 SAMP FLW: 473
 OZONE FL: 77
 PMT: 19.5
 NORM PMT: -0.2
 AZERO: 16.0
 HVPS: 767
 RCELL TEMP: 50.0
 BOX TEMP: 27.5
 PMT TEMP: 6.6
 IZS TEMP: 45.1
 MOLY TEMP: 315.2
 RCEL: 5.0
 SAMP: 25.6
 Expected Value NO: 6.80
 Expected Value NO₂: 509.00
 Expected Value NOx: 515.00

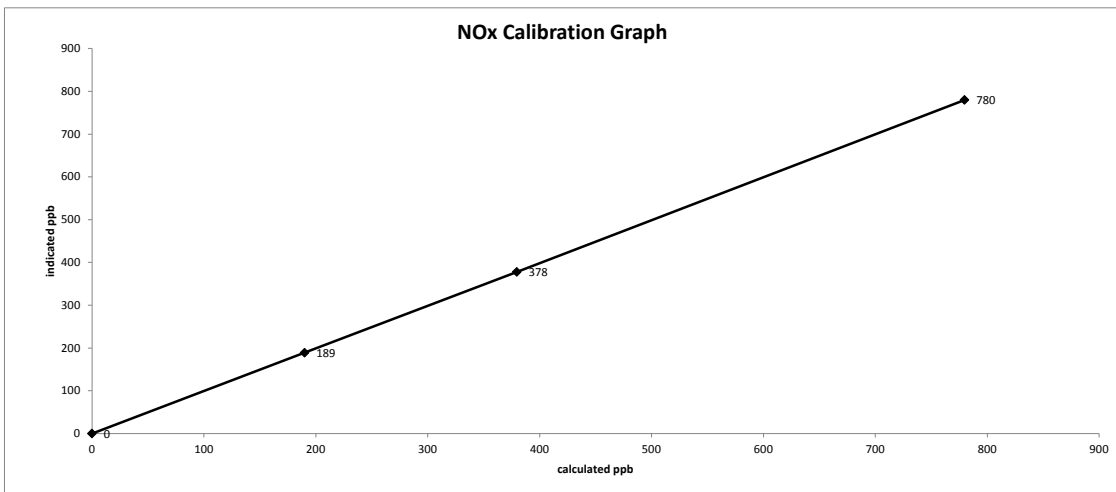
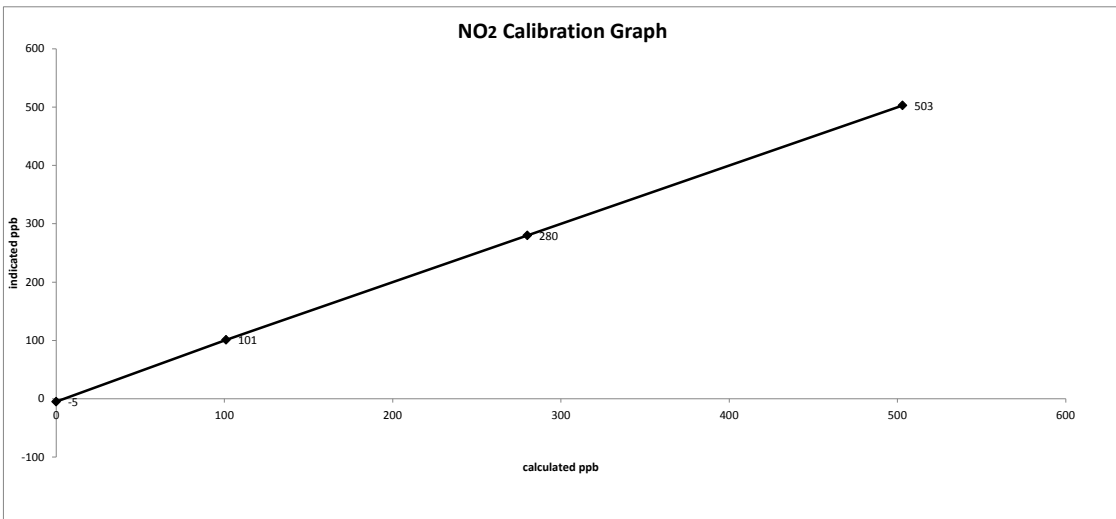
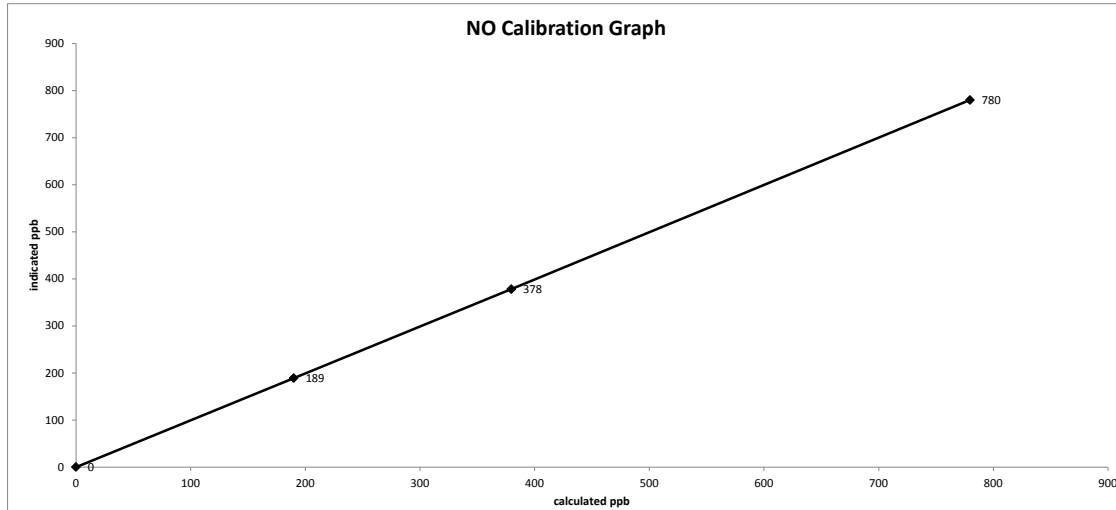
Comments:

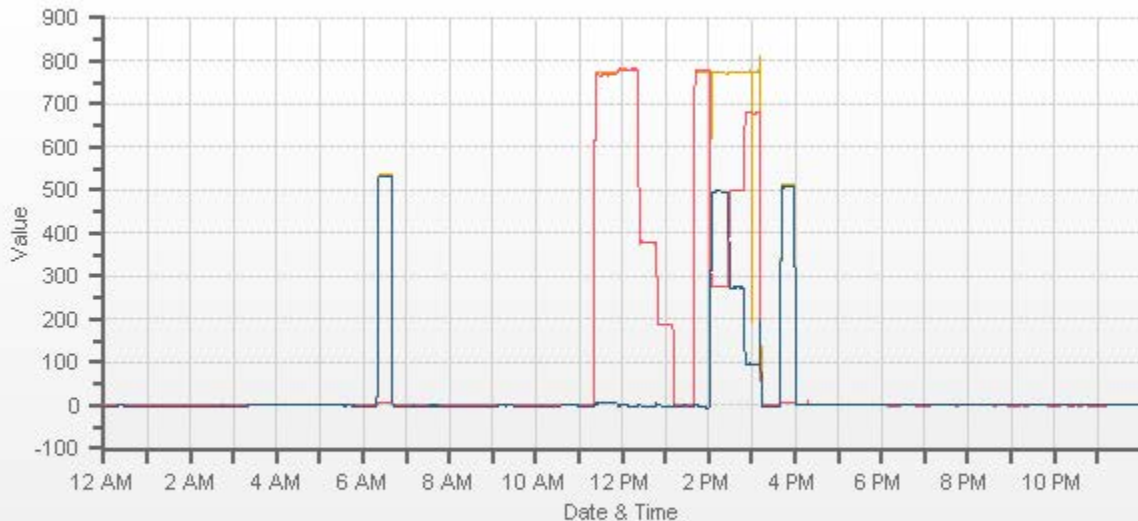
The analyzer sample inlet filter was changed.

No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

Date: October 14, 2016
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 10:26 / 16:04
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE

Maxxam Thermo 49i Ozone Analyzer Calibration

A Bureau Veritas Group Company

Date: October 21, 2016 Barometric Pressure: 0.912 atm
 Company/Airshed: LICA Station Temperature °C: 20
 Location/Station Name: St. Lina Weather Conditions: A few clouds
 Start/End Time 24 hr. (mst): 10:51 / 14:39 Calibration Purpose: routine monthly
 Ozone Calibration Method: Varying UV Lamp Power Performed By/Reviewer: Alex Yakupov Trina Whitsitt
 G.P.T. Date: n/a-done by Varying UV Lamp Power Cal Gas Expiry Date: n/a

Analyzer:
 ID# or Serial Number: 1002240371 Ozone Range ppb: 500
 Last Calibration Date: September 7, 2016 As Found C.F.: 1.000
 Previous Cal High Point C.F.: 1.000 New C.F.: 1.000

Calibrator:
 Flow Meter ID's: n/a
 Make & Model: SABIO 2010 D
 Serial #: 11900613
 Cal Gas Cylinder I.D. #: n/a

Point	AMD Required Range of Ozone Calibration Points
High	300-400 ppb
Mid	150-200 ppb
Low	50-75 ppb

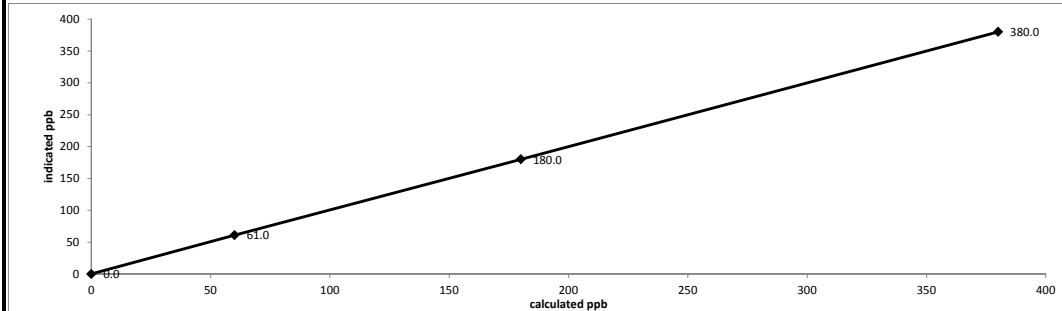
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	380.0	1.000
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	61.0	0.984
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F. =						0.995

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS
Slope =	<u>1.001</u>	> or = 0.995
b (Intercept as % of full scale) =	<u>-0.08%</u>	.95-1.05
% change in C.F. from last cal =	<u>0.00%</u>	± 3% F.S.
		± 10%

Thermo 49i Ozone Analyzer Calibration



As found:
 O3 Bkg: -0.5
 O3 Coef: 0.966
 Photo Lamp: 9.4
 O3 Lamp: 7.8
 Bench: 28.1
 Bench Lamp: 53.6
 O3 Lamp: 67.9
 Pressure: 676.4
 Cell A lpm: 0.725
 Cell B lpm: 0.718
 O3 ppb: 0.5
 Cell A ppb: 0.5
 Cell B ppb: -6.5
 Cell A int: 57066
 Expected Value: 343.0

As left:
 O3 Bkg: -0.1
 O3 Coef: 0.966
 Photo Lamp: 9.4
 O3 Lamp: 7.8
 Bench: 28.7
 Bench Lamp: 53.6
 O3 Lamp: 67.8
 Pressure: 676.1
 Cell A lpm: 0.725
 Cell B lpm: 0.719
 O3 ppb: -0.4
 Cell A ppb: -3.4
 Cell B ppb: 2.6
 Cell A int: 56977
 Expected Value: 365.0

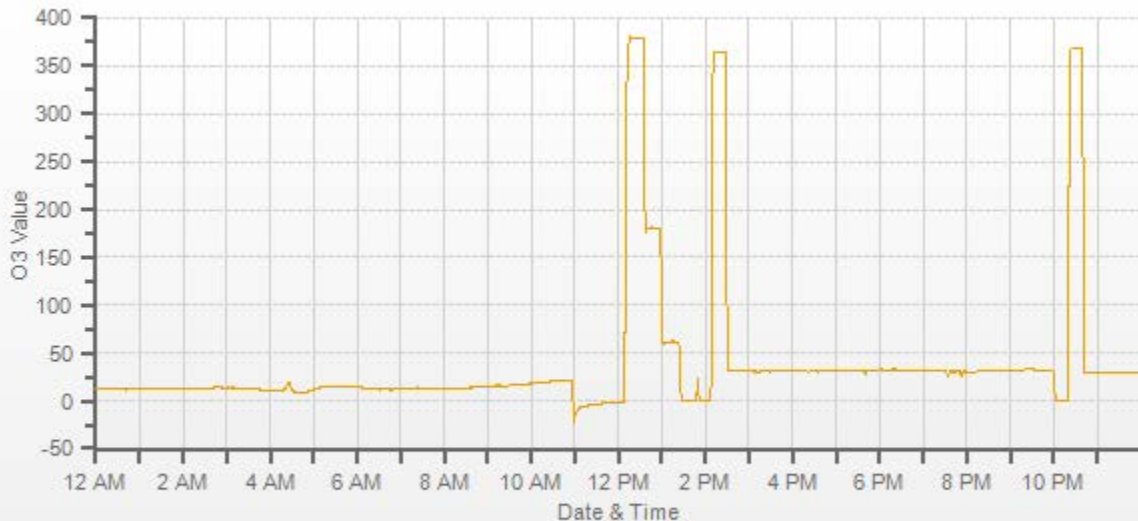
Comments:

The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

No high point adjustment made.

O3[ppb] Station: LICA ST. LINA Daily: 2016/10/21 Type: AVG 1 Min. [1 Min.]



O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: October 7, 2016
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: September 20, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 12:18
 End Time (mst): 13:01
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: A few clouds

1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 26.55
 Ko Factor: 13125 As Left Filter Loading %: 18.91
 Ambient Temperature °C: 0.58 As Found Noise: 0.003
 Ambient Pressure atm: 0.925 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.27
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>130168457</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>February 7, 2016</u>	<u>November 1, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	-0.05	0.00	-0.06
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.88	0.00	-0.88
	limit	0.60	0.60	0.60	0.60

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	-0.01	-0.05	0.00	-0.06
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.88	0.00	-0.88
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>0.6</u>	1405F pressure atm: <u>0.925</u>
reference temperature °C: <u>0.3</u>	reference pressure: <u>0.923</u>
difference °C: <u>-0.3</u>	difference: <u>0.002</u>

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>0.3</u>	1405F pressure atm: <u>0.923</u>
reference temperature °C: <u>0.3</u>	reference pressure: <u>0.923</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.98</u>	reference total/aux flow lpm: <u>16.80</u>
difference lpm: <u>-0.02</u>	difference lpm: <u>0.13</u>

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.98</u>	reference total/aux flow lpm: <u>16.80</u>
difference lpm: <u>-0.02</u>	difference lpm: <u>0.13</u>

K_o Audit:

Last K_o audit date: August 16, 2016
 1405F K_o factor: 13125
 Measured K_o factor: 13230.7000
 % difference: 0.81

Comments:

The TEOM sample filter was changed. The TEOM intake head and associated sharp cut components were cleaned.
 The bypass (auxillary) flow filter was changed.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: October 27, 2016
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: October 7, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 15:04
 End Time (mst): 16:00
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: Rain fall heavy at times

1400A Information and Status:

ID# or Serial Number: 1405A208301003 As Found Filter Loading %: 25.93
 Ko Factor: 13125 As Left Filter Loading %: 20.69
 Ambient Temperature °C: 1.35 As Found Noise: 0.002
 Ambient Pressure atm: 0.912 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.28
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>BRUNTON</u>	<u>BRUNTON</u>
Model:	<u>475 Mark III</u>	<u>BIO</u>	<u>BIO</u>
Serial Number:	<u>#2</u>	<u>BPO 14</u>	<u>BPO 14</u>
Calibration Date:	<u>January 15, 2016</u>	<u>July 7, 2016</u>	<u>July 7, 2016</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	-0.06	0.00	-0.06
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.89	0.00	-0.89
	limit	0.60	0.60	0.60	0.60

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	-0.06	0.00	-0.06
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.89	0.00	-0.89
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>1.4</u>	1405F pressure atm: <u>0.912</u>
reference temperature °C: <u>1.0</u>	reference pressure: <u>0.914</u>
difference °C: <u>-0.4</u>	difference: <u>-0.002</u>

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>1.0</u>	1405F pressure atm: <u>0.914</u>
reference temperature °C: <u>1.0</u>	reference pressure: <u>0.914</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.97</u>	reference total/aux flow lpm: <u>16.88</u>
difference lpm: <u>-0.03</u>	difference lpm: <u>0.21</u>

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.97</u>	reference total/aux flow lpm: <u>16.88</u>
difference lpm: <u>-0.03</u>	difference lpm: <u>0.21</u>

K_o Audit:

Last K_o audit date: August 16, 2016
 1405F K_o factor: 13125
 Measured K_o factor: 13230.7000
 % difference: 0.81

Comments:

The TEOM sample filter was changed. The TEOM intake head and associated sharp cut components were cleaned.
 The bypass (auxillary) flow filter was changed.

WIND SYSTEM



Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H	Sensor Serial No.: H12635
Sensor Output Swing 0V - 1.0V	Sensor Output Range: 0 - 50.0 MPS
Customer: <u>Maxxam Analytics</u>	Sales Order No.: <u>117998</u>
Tested per PO: <u>35-64914</u>	Calibration Date: <u>09/12/2016</u>
Calibrated by: <u>David Frith</u>	

QC Inspection Bryan J. [Signature]

Instrument Condition Within Tolerance:	As Found	<input type="checkbox"/>	As Left	<input checked="" type="checkbox"/>
Corrective Action:	No Adjustment	<input type="checkbox"/>	Adjust	<input checked="" type="checkbox"/>
	Preventative Maintenance	<input type="checkbox"/>	Repair	<input type="checkbox"/>

As Found Test Date: N/A As Left Test Date: 09/12/2016

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.

All Work Performed per Customer Purchase Order Requirements.

Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	4/24/2012	4/24/2017	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none

Humidity 20 to 70% Radiation none

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements



Met One Instruments

3206 Main St., Suite 106
Regional Service Center
Rowlett, TX. 75088

Wind Tunnel Calibration

Data Sheet

50.5-6100

NIST Cup Model No. 170.41
NIST Sensor Model No. 50.1B

Serial No. 3309
Serial No. 1263

Average wind speed this test in mps 11.17

WD Setting Degrees	WD Output Volts	WD Reading Degrees	WD Error +/- 3 Deg	WS Standard mps	WS Output Volts	WS Reading mps	WS Error +/- 0.24 MPS
30.0	0.081	29.3	-0.7	11.25	0.224	11.20	-0.05
60.0	0.163	58.8	-1.2	11.13	0.226	11.31	0.18
120.0	0.332	119.4	-0.6	11.17	0.224	11.18	0.01
150.0	0.419	150.7	0.7	11.18	0.219	10.97	-0.21
210.0	0.582	209.7	-0.3	11.15	0.222	11.09	-0.06
240.0	0.664	239.2	-0.8	11.15	0.226	11.27	0.12
300.0	0.836	300.9	0.9	11.16	0.225	11.23	0.07
330.0	0.915	329.5	-0.5	11.14	0.224	11.19	0.05

Average wind speed this test in mps 2.22

WD Setting Degrees	WD Output Volts	WD Reading Degrees	WD Error +/- 3 Deg	WS Standard mps	WS Output Volts	WS Reading mps	WS Error +/- 0.20 MPS
30.0	0.083	29.8	-0.2	2.22	0.043	2.14	-0.08
60.0	0.165	59.5	-0.5	2.19	0.044	2.18	-0.01
120.0	0.333	120.0	0.0	2.22	0.044	2.19	-0.03
150.0	0.419	150.7	0.7	2.21	0.044	2.19	-0.02
210.0	0.582	209.6	-0.4	2.24	0.044	2.20	-0.04
240.0	0.664	239.0	-1.0	2.22	0.044	2.22	0.00
300.0	0.834	300.3	0.3	2.23	0.044	2.20	-0.03
330.0	0.915	329.4	-0.6	2.21	0.043	2.16	-0.05

Instrument Test Condition As Found As Left

Sensor Model No.: 50.5H

Sensor Serial No.: H12635

Sensor Output Swing: 0V - 1.0V

Sensor Output Range: 0 - 50 MPS

Customer: Maxxam Analytics

Sales Order No.: 117998

Tested per PO: 35-64914

Calibration Date: 09/12/2016

Calibrated by: David Frith *DF*

QC Inspection *Byron Jones*

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

<u>NO</u>	<u>LIMITS</u>	<u>NOx</u>
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0106	0.90-1.10	m (Slope)= 1.0092
b (Intercept % of FS)= -0.0566	± 3% F.S.	b (Intercept % of FS)= -0.0368

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

<u>NO_x</u>	<u>LIMITS</u>
Correlation= 1.0000	≥ 0.995
m (Slope)= 1.0089	0.90-1.10
b (Intercept % of FS)= 0.1591	± 3% F.S.

AENV Standards Audit Calibrator	NO _x Analyzer
Make/Model <u>Thermo 146i</u>	Make/Model <u>Thermo 42i</u>
Serial/AMU Number <u>1809</u>	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: February 3, 2016
Location: McIntyre Center Edmonton



Calibrator Performance Audit

OZONE

File No. 2015-163

Company: Maxxam

Operator: Chris Wesson

Calibrator:
 Make/Model Sabio 2010D
 Serial Number 11900613
 Oven Temperature 49.8
 Last Verification Date May 21, 2015

Flow Measurement Device:
 Make/Model NA
 Serial Number NA
 Temperature (°C) 24
 Barometric Pressure 700 mmHg

Flow Measurements

Pt. No. 1 5000 Pt. No. 2 5000 Pt. No. 3 5000

Calibrator Flow (scm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
4999	0.000	-0.001		
5000	0.381	0.385	1%	± 10%
5000	0.180	0.182	2%	± 10%
5000	0.090	0.091	2%	± 10%
Absolute Average Percent Difference			2%	± 10%

LINEAR REGRESSION ANALYSIS
y=mx+b (where x=calculated concentration, y=indicated concentration)

O₃	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 1.0119	0.90-1.10
b (Intercept % of FS)= -0.0724	± 3% F.S.

AENV Standards	Ozone Analyzer
Audit Calibrator	Make/Model <u>Thermo 49i</u>
Make/Model <u>Thermo 49i PS</u>	Serial/AMU Number <u>1843</u>
Serial/AMU Number <u>1808</u>	Last Calibration Date <u>March 30, 2016</u>
Ozone Standard <u>Thermo 49i PS 1808</u>	Full Scale (ppm) <u>0.5</u>

COMMENTS: _____

Auditor: Shea Beaton
 Operator Signature:

Date: March 30, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>Thermo146i</u>	Make/Model: <u>Bios DC-2</u>
Serial Number: <u>1809</u>	Serial Number: <u>Bios D</u>
Last Verification Date: <u>February 2, 2016</u>	Temp. °C: <u>24.5</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>702mmHg</u>
Cylinder Number: <u>CAL016625</u>	

Reference Analyzer:
 Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.0000	0.000	0.0
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0
 Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: LL36837 Concentration PPM: 10.0 Tolerance(%): 2 Certified By: Air Liquide

Reference Calibrator and Gas:
 Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:
 Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P.: 702 mmhg

Reference Analyzer:
 Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F.: 1.000 Done By: Al Clark

Calibrator Flows (scem)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	100.000	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson
 Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:
 Make/Model R&R MFC 201
 Serial Number AMU 1698
 Last Verification Date January 18, 2016
 Gas Type CH4 Conc. 999.2
 Cylinder Number D751932
 Gas Type C3H8 Conc. 246.5
 Cylinder Number XF0037998

Flow Measurement Device:
 Make/Model Bios DC-2
 Serial Number Blos D
 Temp. °C 24.5
 B.P. 698mmHg

Reference Analyzer:
 Make/Model Thermo 55C Serial/AMU Number: 1643
 Instrument Settings Zero: NA Span: NA Range: 20.0
 Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	0.02140	46.722	607	214
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						608	215

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: January 19, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-115CGA

Company: Maxxam **Operators name:** Chris Wesson
Cylinder #: LL119346 **Conc (PPM)** 50.0/50.0 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:
Make/Model Thermo 42i **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.2 **Span:** 1.014 **Range:** 1.0
Last Calibration: **Date:** 02-Feb-16 **C.F.** 1.000 **Done By:** SB

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000				
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5
Average Cylinder Concentration:						50.5	50.4

	<u>NO</u>		<u>NOx</u>
Previous Stated Concentration PPM:	<u>50.0</u>		<u>50.0</u>
Percent variance from Stated:	<u>0.9</u>		<u>0.8</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO Blend 50.0PPM SO2

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton **Date:** February 2, 2016
Operator Signature: [Signature] **Location:** McIntyre Center Edmonton

***APPENDIX III
REPORT CERTIFICATION FORM***

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	St. Lina Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



Signature of the Representative of the Person Responsible / External Person Certifying the Report

05-12-2016





Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-10-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification		Date <u>16-Nov-22</u>
Level 1 Primary Validation		Date <u>16-Nov-30</u>
Level 2 Final Validation		Date <u>16-Nov-30</u>
Level 3 Independent Data Review		Date <u>16-Dec-01</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.



MAXXAM ANALYTICS
#1 2080 39 Ave. NE, Calgary, AB
T2E 6P7

maxxam.ca
Toll Free 800-386-7247
Fax 403-219-3673

**AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BONNYVILLE**

JOB #: 2833-2016-10-35-C

October 2016

Prepared for:

**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
BONNYVILLE, ALBERTA
T9N 2J5**

Attention: MIKE BISAGA

DATE: **December 14, 2016**

Prepared by:

Bim Adeniji, M.Sc.
Project Manager Assistant, Customer Service, Air Services

Reviewed by:

Cheri Sinclair, B.Sc.
Supervisor, Customer Service, Air Services

SUMMARY

In October 2016, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Bonnyville station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

PM_{2.5}: Nine hours of data were recorded this month at concentrations less than $-3 \mu\text{g}/\text{m}^3$, rendering the data invalid.

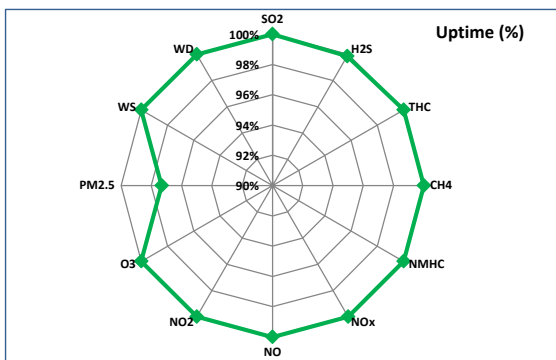
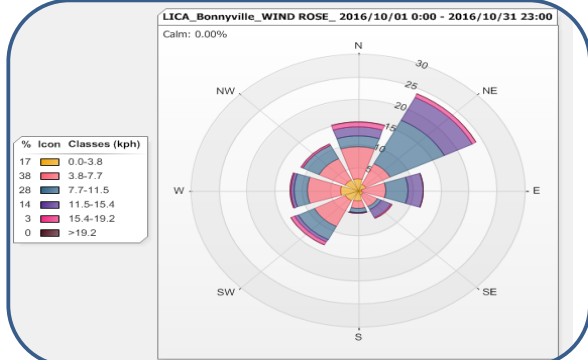
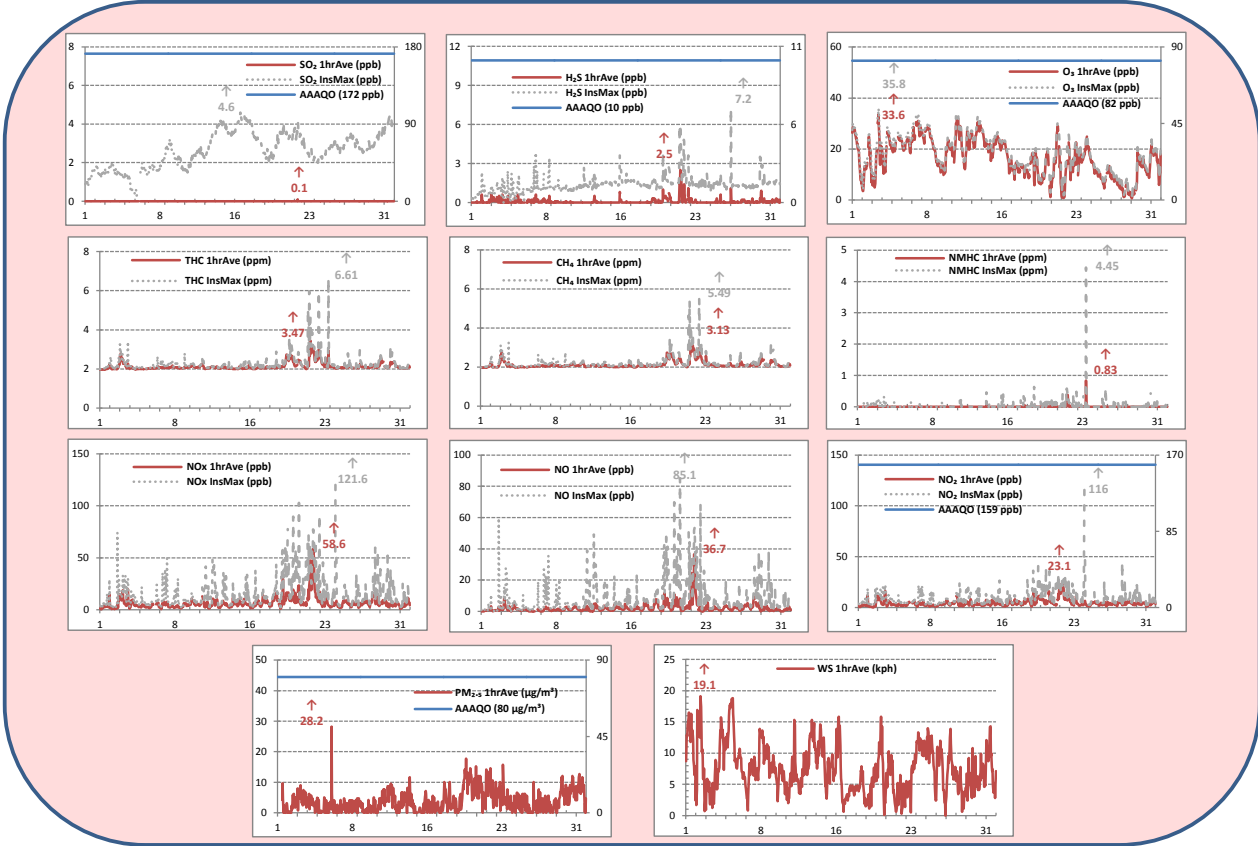
H₂S: One hour of downtime was recorded on October 5 due to an additional quality check.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, Bonnyville.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Pollutants	Monthly Records	1-Hour Records							24-Hour Records					
		Name #	Unit	Avg. Conc.	Uptime	Maximum			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
						Conc.	Date	Hour			Conc.	Date		
SO ₂	ppb	0.0	100.0%	0.1	October 22	7	172	0	0.0	ALL	48	0		
H ₂ S	ppb	0.1	99.9%	2.5	October 21	23	10	0	0.5	October 22	3	0		
THC	ppm	2.13	100.0%	3.47	October 22	0	-	-	2.78	October 22	-	-		
CH ₄	ppm	2.13	100.0%	3.13	October 22	1	-	-	2.74	October 22	-	-		
NMHC	ppm	0.00	100.0%	0.83	October 23	20	-	-	0.04	October 22, 23	-	-		
NO _x	ppb	6.5	100.0%	58.6	October 22	7	-	-	25.4	October 22	-	-		
NO ₂	ppb	2.1	100.0%	36.7	October 22	8	-	-	11.6	October 22	-	-		
NO	ppb	4.3	100.0%	23.1	October 22	5	159	0	13.7	October 22	-	-		
O ₃	ppb	16.4	100.0%	33.6	October 3	15	82	0	27.5	October 7	-	-		
PM _{2.5}	µg/m ³	3.9	97.3%	28.2	October 6	10	80	0	9.5	October 20	30	0		
WS	kph	2.2	100.0%	19.1	October 2	11	-	-	14.3	October 5	-	-		
WD	degree	30 (NNE)	100.0%	-	-	-	-	-	-	-	-	-		



Monthly Update

- * All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.
- * All data collected this month were within the objectives outlined in the AMD 2016 and AAAQO 2016.
- * The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above 90%.

Operational Issues

- **PM_{2.5}**: Nine hours of data were recorded this month at concentrations less than -3 µg/m³, rendering the data invalid.
- **H₂S**: One hour of downtime was recorded on October 5 due to an additional quality check.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Bonnyville						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.0	0.1	22	7	2.7	NNE	0.0	ALL	100.0
H ₂ S (ppb)	10	3	0	0	0.1	2.5	21	23	0.7	SSE	0.5	22	99.9
THC (ppm)	-	-	-	-	2.13	3.47	22	0	0.6	E	2.78	22	100.0
CH ₄ (ppm)	-	-	-	-	2.13	3.13	22	1	1.1	NNE	2.74	22	100.0
NMHC (ppm)	-	-	-	-	0.00	0.83	23	20	8.5	NE	0.04	22, 23	100.0
NO ₂ (ppb)	159	-	0	-	4.3	23.1	22	5	1.7	NNE	13.7	22	100.0
NO (ppb)	-	-	-	-	2.1	36.7	22	8	3.4	NNE	11.6	22	100.0
NO _x (ppb)	-	-	-	-	6.5	58.6	22	7	2.7	NNE	25.4	22	100.0
O ₃ (ppb)	82	-	0	-	16.4	33.6	3	15	1.2	NNW	27.5	7	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	3.9	28.2	6	10	9.7	NNW	9.5	20	97.3
VECTOR WS (kph)	-	-	-	-	2.2	19.1	2	11	-	SW	14.5	5	100.0
VECTOR WD (sec)	-	-	-	-	30 (NNE)	-	-	-	-	-	-	-	100.0

NA-NOT AVAILABLE VAR-VARIOUS

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

H₂S 1-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

H₂S 24-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

PM_{2.5} 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O₃ 1-Hour Exceedances

Measured concentrations of ozone were below the 1-hour AAAQO of 82 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
October 3, 2016	1.4	ACETONE
October 9, 2016	1.5	ACETONE
October 15, 2016	5.1	ETHANOL
October 21, 2016	2.1	ACETONE
October 27, 2016	0.98	n-BUTANE

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
October 3, 2016	0.21	PHENANTHRENE
October 9, 2016	0.15	ACENAPHTHENE, NAPHTHALENE
October 15, 2016	0.2	PHENANTHRENE
October 21, 2016	0.26	PHENANTHRENE
October 27, 2016	0.41	2-METHYLNAPHTHALENE

Note: NA

Volatile Organics (VOCs) Data Summary - NMHC Canister System

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
October 18, 2016	1.8	ACETONE
October 21, 2016	4.5	ETHANOL

Note: NA

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Methane (CH₄), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD). The results for non-continuous VOCs, PAHs and NMHC canister monitoring are also included in this report.

Sample filters for all continuous air monitors are changed before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (August 3, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 6. One hour of maximum instantaneous data was invalidated on October 21, at hour 15:00, due to a brief power outage.

HYDROGEN SULPHIDE (H₂S)

On October 5, the analyzer recorded anomalous data between hours 03:00 and 05:00. A repeat span check was initiated at hour 06:00 to assess analyzer performance and the result was within acceptance limits. One hour of downtime was recorded due to this event.

The routine monthly calibration was performed on October 6. One hour of maximum instantaneous data was invalidated on October 21, at hour 15:00, due to a brief power outage.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 5. One hour of maximum instantaneous data was invalidated on October 21, at hour 15:00, due to a brief power outage.

NITROGEN DIOXIDE (NO₂)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 6. One hour of maximum instantaneous data was invalidated on October 21, at hour 15:00, due to a brief power outage.

OZONE (O₃)

There were no operational issues that impacted hourly data this month. The routine monthly calibration was performed on October 5. One hour of maximum instantaneous data was invalidated on October 21, at hour 15:00, due to a brief power outage.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

Two routine TEOM audits were performed this month: one was completed on October 5 and the other audit was performed on October 26. Both the inlet filter and the FDMS filter were replaced during the audits. The TEOM unit malfunctioned on September 30. It was restarted on October 1 and after stabilization, the unit resumed normal operations. Eleven hours of data were discarded due to this malfunction. Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and $-3 \mu\text{g}/\text{m}^3$ was corrected to $0 \mu\text{g}/\text{m}^3$. Data recorded below $-3 \mu\text{g}/\text{m}^3$ was invalidated. Nine hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

There were no operational issues that impacted hourly data this month. One hour of maximum instantaneous data was invalidated on October 21, at hour 15:00, due to a brief power outage. The wind system is reported as vector wind speed and vector wind direction. The wind direction data included in this report represents where the wind was blowing from.

VOC SAMPLES

The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule). Samples were collected on October 3, 9, 15, 21, and 27. Analytical results are included in this report.

PAH SAMPLES

The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule). Samples were collected on October 3, 9, 15, 21, and 27. Analytical results are included in this report.

NMHC CANISTER SAMPLES

The canister sampler is programmed to draw in a whole air sample when the 5-minute average concentration of NMHC is above 0.30 ppm. A representative sample of ambient air is collected over a one-hour period when the canister event is triggered.

Two canister events were recorded this month on October 18 and October 21. The date, time and initial 5-min average concentration measurements are as follows:

- October 18 at hour 15:40 - 0.30 ppm
- October 21 at hour 22:15 - 0.31 ppm

There were two five-minute averages, recorded on October 22 and October 23, that were greater than 0.30 ppm. However, these measurements occurred prior to the scheduled replacement of the canister on October 24. Analytical results are included in this report.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

- Maxxam AIR SOP-00001 - Methane, Non-Methane Hydrocarbon Analyzer Monitoring
- Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 55i FID Analyzer
- Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F TEOM Unit
- Wind System - RM Young Unit
- Datalogger - ESC 8832
- VOC - XONTECH 910A Gaseous Air Sampler
- PAH - TISCH PUF Plus Unit

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

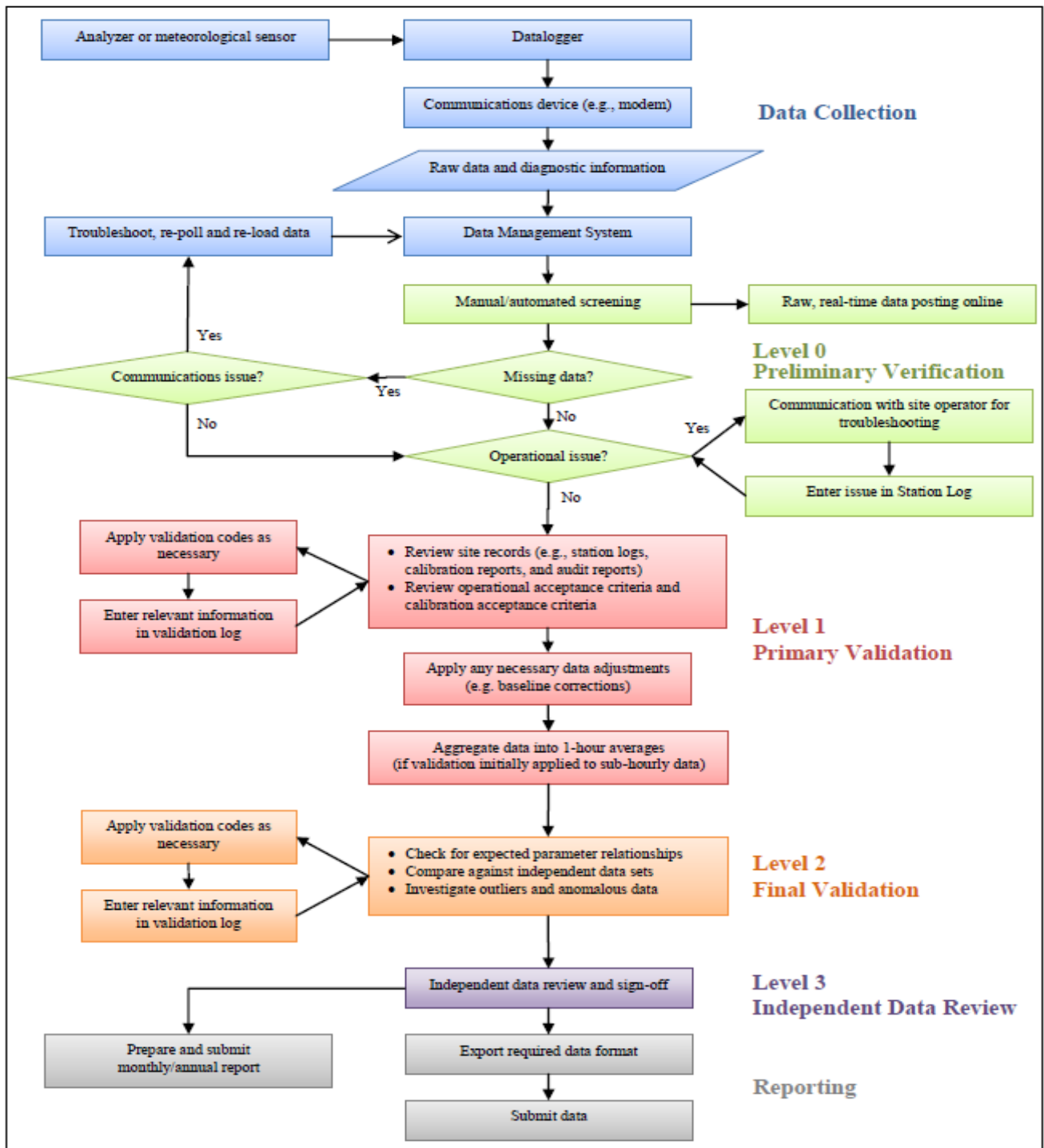
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (Aug 3, 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

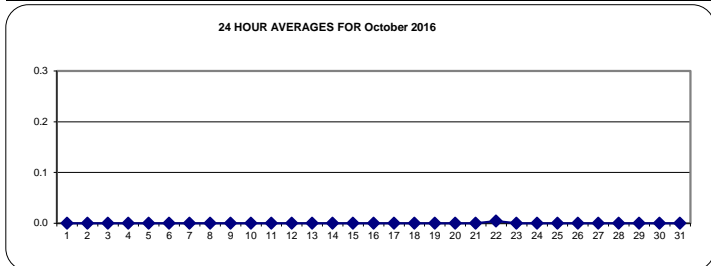
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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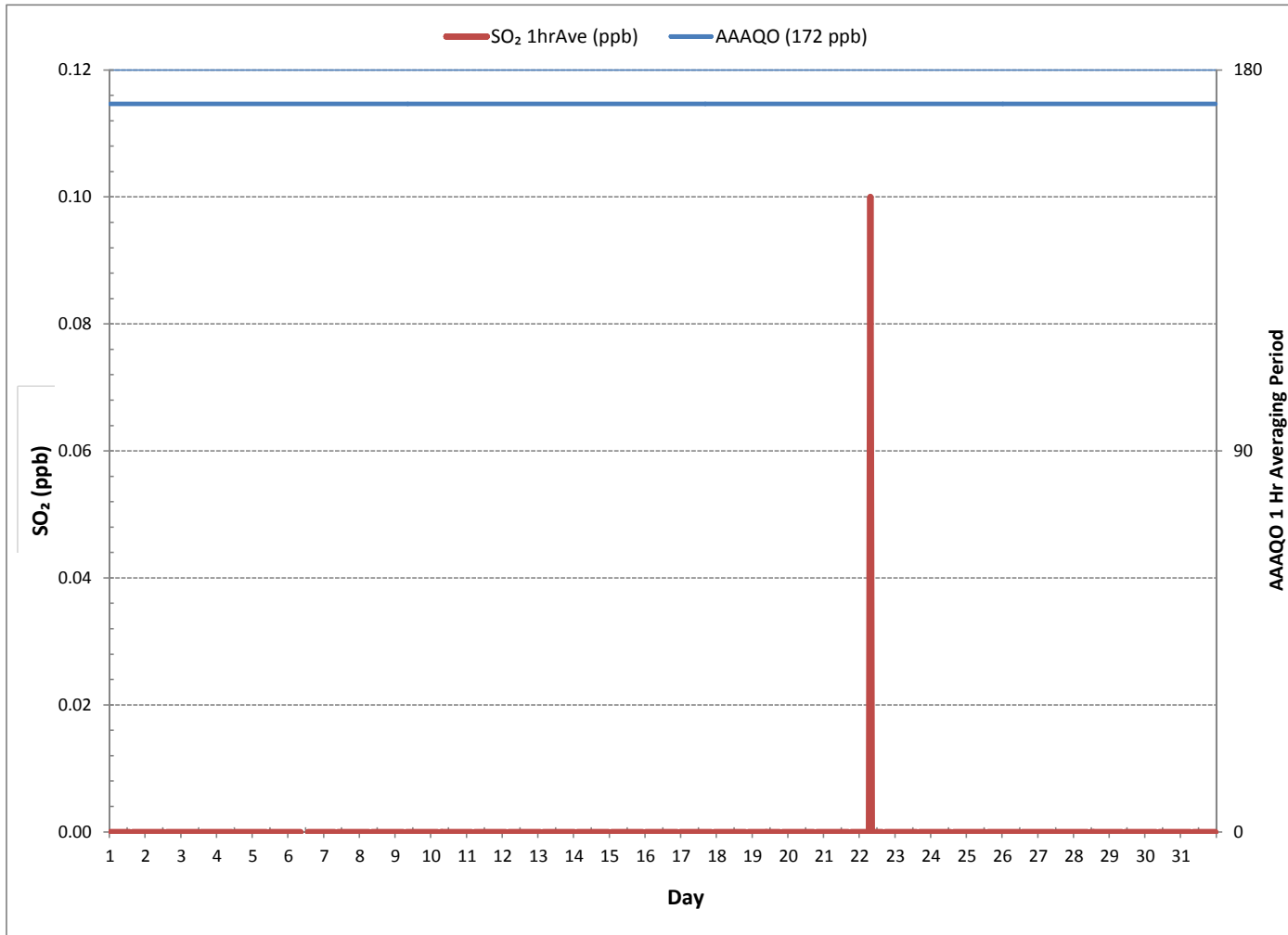
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	1				
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S) ALL
MAXIMUM 1-HR AVERAGE:	0.1	ppb	@ HOUR(S)	7	ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	0.0	ppb			ON DAY(S) ALL
					VAR-VARIOUS
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.00		MONTHLY AVERAGE:	0.0	ppb

24 HOUR AVERAGES FOR October 2016



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0.9	0.8	0.8	1.0	1.0	1.1	0.8	0.8	1.2	1.1	1.1	1.1	1.4	1.4	S	1.3	1.4	1.6	1.6	1.7	1.7	1.7	1.6	1.8	0.8	1.8	1.3	24	
2	1.8	1.8	1.8	1.8	1.9	1.8	1.7	1.5	1.4	1.4	1.3	1.4	1.3	S	1.3	1.5	1.5	1.3	1.6	1.5	1.5	1.5	1.6	1.4	1.3	1.9	1.5	24	
3	1.7	1.6	1.5	1.5	1.5	1.6	1.6	1.5	1.7	1.7	1.9	2.0	S	1.8	2.0	2.0	1.9	1.9	1.8	1.9	1.7	1.7	1.6	1.4	1.4	2.0	1.7	24	
4	1.6	1.7	1.6	1.4	1.4	1.6	1.5	1.5	1.4	1.5	1.4	S	1.4	1.4	1.3	1.4	1.4	1.2	1.2	1.2	1.3	1.4	1.2	1.2	1.2	1.7	1.4	24	
5	1.5	1.3	1.3	1.2	1.3	1.4	1.3	1.2	1.1	1.3	S	1.2	1.0	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.4	1.5	0.9	24	
6	0.5	0.5	0.6	0.5	0.3	0.3	0.3	0.5	C	C	C	C	C	1.5	1.7	1.7	2.0	1.6	1.6	1.7	1.7	1.8	1.7	1.8	1.7	0.3	2.0	1.2	24
7	1.7	1.6	1.6	1.4	1.4	1.4	1.5	1.6	S	1.5	1.7	1.8	1.9	1.7	1.7	1.7	1.8	1.8	1.9	1.7	1.6	1.8	1.8	1.7	1.4	1.9	1.7	24	
8	1.7	1.7	1.7	1.7	1.6	1.6	1.8	S	1.6	1.7	1.6	1.7	1.9	1.7	1.9	1.9	2.0	2.1	2.0	2.1	2.2	2.3	2.3	2.2	1.6	2.3	1.9	24	
9	2.3	2.4	2.7	2.9	2.9	2.7	S	2.7	2.8	2.8	3.0	3.2	3.0	3.0	2.8	3.1	2.7	2.6	2.6	2.5	2.5	2.3	2.3	2.2	1.6	3.2	2.7	24	
10	2.1	2.1	2.2	2.2	2.1	S	1.9	2.3	2.3	2.3	2.1	2.1	2.3	2.2	2.1	1.9	1.7	1.8	1.9	1.6	1.7	1.6	1.7	1.8	1.6	2.3	2.0	24	
11	1.7	1.6	1.6	1.7	S	1.6	1.5	1.6	1.9	1.9	1.6	1.6	1.7	1.8	2.0	1.9	2.4	2.5	2.3	2.1	2.2	2.3	2.4	2.4	1.5	2.5	1.9	24	
12	2.4	2.4	2.3	S	2.5	2.5	2.7	2.5	2.5	2.5	2.7	2.5	2.4	2.5	2.9	2.5	2.4	2.5	2.4	2.6	2.5	2.3	2.3	2.2	2.2	2.9	2.5	24	
13	2.3	2.3	S	2.4	2.5	2.6	2.5	2.5	2.6	2.8	2.9	3.0	3.0	2.9	3.3	3.4	3.4	3.3	3.5	3.6	3.6	3.6	3.6	3.7	2.3	3.7	3.0	24	
14	3.7	S	3.5	3.8	3.7	3.7	4.0	3.8	3.8	4.0	3.9	4.1	4.1	4.2	4.1	4.2	4.2	3.9	4.2	4.1	4.2	4.0	3.9	3.8	3.5	4.2	4.0	24	
15	S	3.8	4.0	3.7	3.9	3.8	3.6	3.6	3.5	3.7	3.7	3.7	3.6	3.5	3.5	3.3	3.6	3.4	3.6	3.5	3.6	3.5	3.5	S	3.3	4.0	3.6	24	
16	3.6	3.6	3.8	3.8	3.8	3.9	4.0	4.1	4.1	4.1	4.3	4.3	4.3	4.6	4.3	4.4	4.2	4.4	4.4	4.5	4.5	4.5	S	4.4	3.6	4.6	4.2	24	
17	4.2	4.4	4.4	4.3	4.2	4.1	4.3	4.3	4.1	4.1	4.1	3.9	4.2	4.0	3.9	4.0	4.0	4.0	3.8	3.5	3.6	S	3.4	3.3	3.3	4.4	4.0	24	
18	3.5	3.3	3.3	3.2	3.1	3.0	3.1	3.3	3.1	3.1	3.1	3.1	3.1	3.0	3.0	3.0	2.9	2.8	2.7	2.7	S	2.5	2.5	2.5	2.5	3.5	3.0	24	
19	2.5	2.4	2.5	2.2	2.2	2.4	2.7	2.5	2.3	2.3	2.1	2.3	2.3	2.4	2.5	2.7	2.4	2.2	2.5	S	2.2	2.4	2.3	2.5	2.1	2.7	2.4	24	
20	2.5	2.6	2.7	2.9	2.7	2.9	2.9	3.5	3.0	3.3	3.3	3.2	3.4	3.6	3.5	3.5	3.6	3.9	S	3.5	3.6	4.1	3.6	3.6	2.5	4.1	3.3	24	
21	3.5	3.4	3.6	3.5	3.6	3.4	3.3	3.4	3.2	3.3	3.4	3.4	3.1	3.2	P	3.2	S	3.2	3.3	3.5	3.3	3.4	3.7	3.1	3.7	3.4	23		
22	3.8	3.8	3.3	3.2	3.4	3.8	3.5	4.1	4.1	3.7	3.6	3.4	3.3	3.5	3.3	3.0	S	3.0	3.1	2.8	2.7	2.7	3.4	2.8	2.7	4.1	3.4	24	
23	2.7	2.7	2.5	2.5	2.5	2.4	2.5	2.5	2.5	2.4	2.3	2.5	2.5	2.5	S	2.7	2.4	2.3	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.7	2.4	24	
24	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.2	2.1	2.1	2.1	2.2	S	2.3	2.3	2.3	2.2	2.5	2.4	2.5	2.5	2.5	2.0	2.5	2.2	24	
25	2.5	2.5	2.4	2.6	2.8	2.8	2.7	2.7	2.7	2.8	2.8	2.7	2.7	S	2.8	2.9	2.9	2.9	2.8	3.1	3.1	3.1	2.9	3.0	2.4	3.1	2.8	24	
26	3.1	3.1	2.8	2.9	3.0	2.9	2.9	2.9	2.7	2.9	3.0	2.7	S	2.5	2.7	2.8	2.7	2.8	2.7	2.8	2.7	2.8	2.7	2.9	2.9	2.5	3.1	2.8	24
27	2.9	3.0	2.9	3.0	3.1	3.2	3.3	3.1	3.2	3.3	3.3	S	3.3	3.3	3.3	3.5	3.4	3.2	3.1	3.1	3.4	3.3	3.0	3.0	2.9	3.5	3.2	24	
28	3.1	3.0	2.8	3.1	3.0	3.2	3.1	3.0	3.1	2.9	S	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.5	2.6	2.4	2.5	2.4	3.2	2.8	24	
29	2.6	2.6	2.6	2.5	2.5	2.6	2.7	2.7	2.7	S	3.1	3.1	2.9	2.7	2.9	2.8	2.7	2.8	2.9	2.8	2.8	2.9	2.9	2.9	2.5	3.1	2.8	24	
30	3.0	3.1	3.1	3.2	3.1	3.4	3.3	3.4	S	3.2	3.4	3.5	3.6	3.6	3.6	3.4	3.5	3.3	3.5	3.6	3.9	3.7	3.8	3.5	3.0	3.9	3.4	24	
31	3.7	3.7	4.0	3.9	3.9	4.0	4.1	S	4.0	4.1	4.2	4.3	4.4	4.1	4.1	4.0	4.0	4.2	3.9	4.1	4.1	4.1	4.0	4.0	3.7	4.4	4.0	24	
HOURLY MAX	4.2	4.4	4.4	4.3	4.2	4.1	4.3	4.3	4.1	4.1	4.3	4.3	4.4	4.6	4.3	4.4	4.2	4.4	4.4	4.5	4.5	4.5	4.0	4.4					
HOURLY AVG	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.7	2.7	2.8	2.7	2.8	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.7	2.6	2.6					

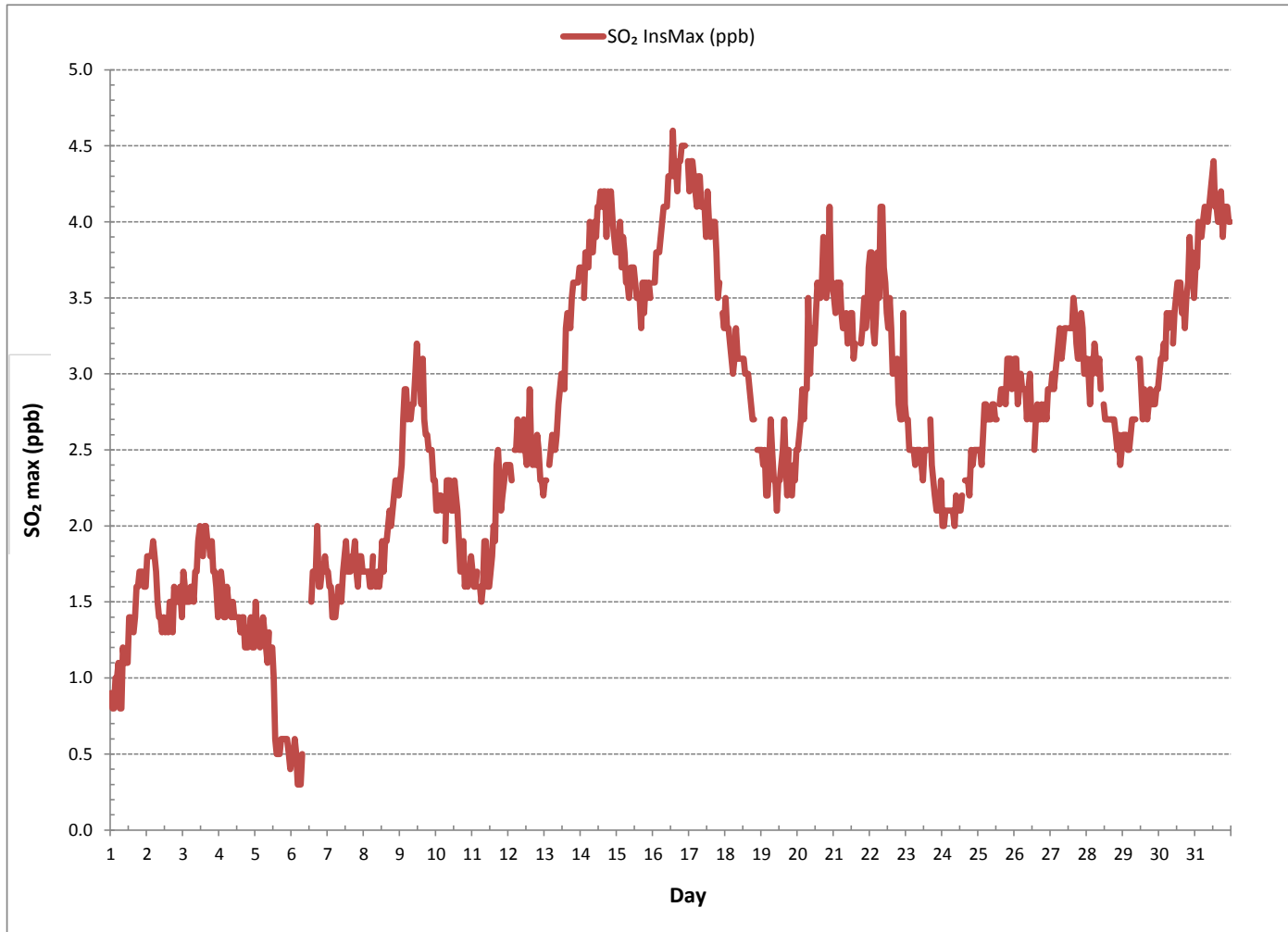
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	707
MAXIMUM INSTANTANEOUS VALUE:	4.6 ppb @ HOUR(S) 13 ON DAY(S) 16
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.93
OPERATIONAL TIME:	743 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



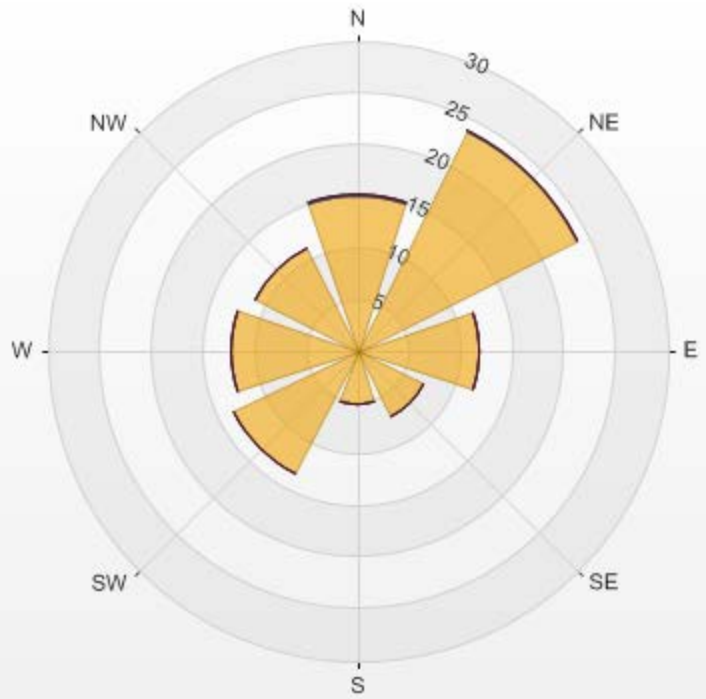
Wind: LICA Bonnyville Poll.: LICA Bonnyville-SO2[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppb]

Direction	0-0.02	0.02-0.04	0.04-0.06	0.06-0.08	0.08-0.1	>0.1	Total
N	14.99	0	0.14	0	0	0	15.13
NE	23.76	0	0.14	0	0	0	23.9
E	11.74	0	0	0	0	0	11.74
SE	7.07	0	0	0	0	0	7.07
S	5.23	0	0	0	0	0	5.23
SW	13.44	0	0	0	0	0	13.44
W	12.31	0	0	0	0	0	12.31
NW	11.17	0	0	0	0	0	11.17
Summary	100	0	0.28	0	0	0	100

SO2[ppb] Calibration: LICA Bonnyville Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High



% Icon Classes (ppb)	100	0	0	0	0	0
	0-0.02	0.02-0.04	0.04-0.06	0.06-0.08	0.08-0.1	>0.1

HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	24	
2	0.2	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.1	0.3	0.0	0.6	0.1	24
3	0.7	0.1	0.1	0.1	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.2	S	0.4	0.1	0.1	0.0	0.3	0.5	0.3	0.0	0.0	0.4	0.2	0.0	0.7	0.2	24	
4	0.0	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.2	0.0	S	0.0	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	24	
5	0.1	0.0	0.0	0.0	0.0	0.0	S1	0.3	0.0	0.0	S	0.0	0.0	0.3	0.4	0.1	0.6	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.6	0.1	23		
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.0	0.1	0.0	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.1	24	
7	0.2	0.0	0.0	0.0	0.0	0.3	0.0	S	0.1	0.2	0.6	0.1	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.1	24	
8	0.1	0.1	0.0	0.2	0.1	0.1	0.3	S	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24	
9	0.1	0.0	0.0	0.0	0.0	S	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
10	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	24	
11	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
12	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
13	0.0	0.0	S	0.0	0.0	0.0	0.3	0.5	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24	
14	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
15	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.7	S	0.0	0.8	0.1	24	
16	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.2	0.0	24	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
19	0.0	0.0	0.1	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	S	0.0	0.0	0.0	0.1	0.0	0.1	0.3	0.1	24	
20	0.0	0.0	0.0	0.0	0.1	1.0	0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.4	0.3	0.3	0.3	0.1	S	0.7	0.7	0.5	0.3	0.4	0.0	1.0	0.3	24	
21	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.1	1.7	1.4	2.5	0.0	2.5	0.3	24		
22	2.3	2.2	0.8	0.1	0.0	0.3	0.4	0.8	1.4	0.8	0.1	0.0	0.0	0.2	0.2	S	0.5	1.1	0.3	0.2	0.0	0.3	0.3	0.0	2.3	0.5	24		
23	0.2	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.3	0.0	24	
26	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	24		
27	0.0	1.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.1	24		
28	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.2	S	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	24		
29	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.0	S	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.1	24		
30	0.1	0.8	0.9	0.4	0.1	0.1	0.0	0.0	S	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.9	0.1	24	
31	0.1	0.1	0.1	0.0	0.2	0.0	0.2	S	0.1	0.1	0.0	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.0	0.0	0.3	0.1	24		
HOURLY MAX	2.3	2.2	0.9	0.4	0.3	1.0	0.4	0.8	1.4	0.8	0.4	0.6	0.3	0.4	0.4	0.3	0.6	0.5	1.1	0.7	0.7	1.7	1.4	2.5					
HOURLY AVG	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

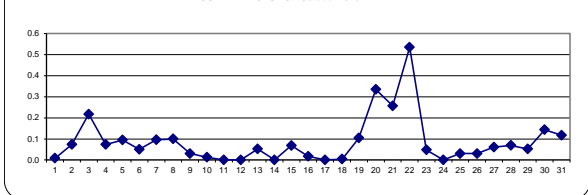
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 10 ppb 24-HR 3 ppb

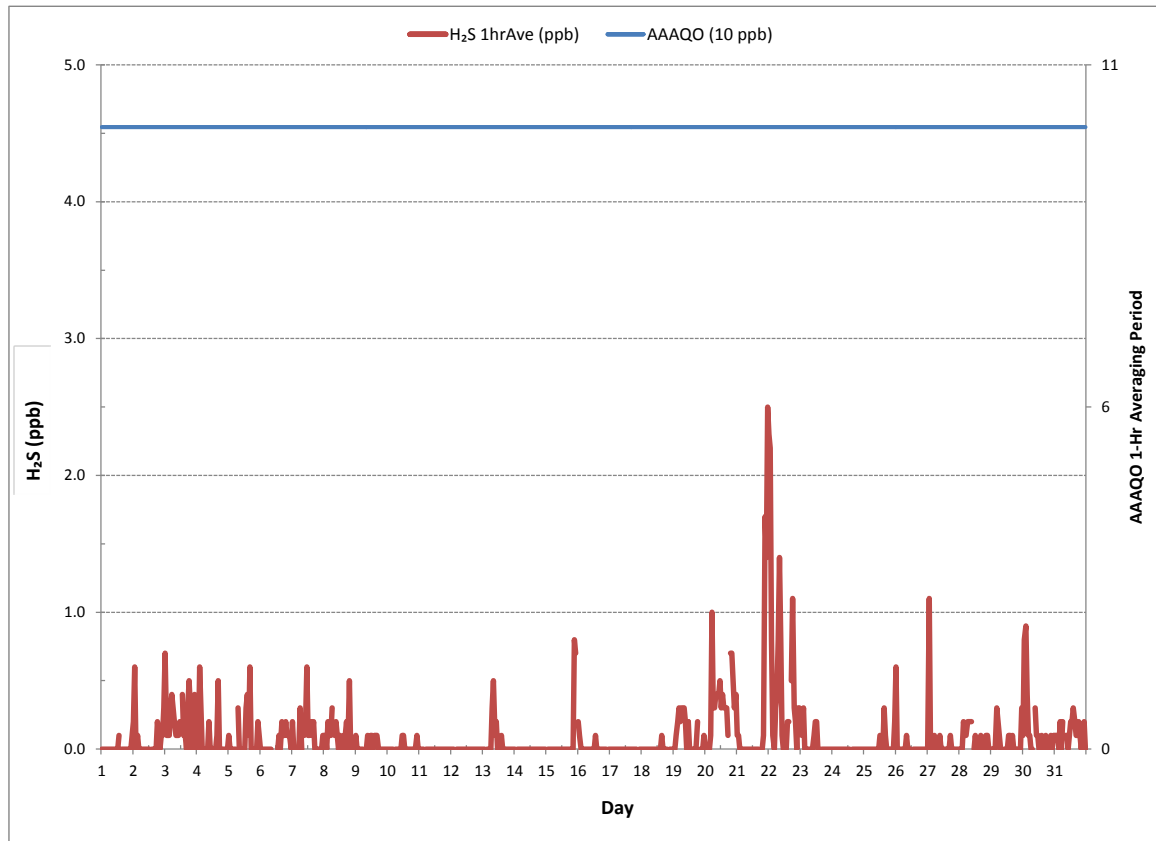
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	216			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) ALL
MAXIMUM 1-HR AVERAGE:	2.5 ppb	@ HOUR(S)	23	ON DAY(S) 21
MAXIMUM 24-HR AVERAGE:	0.5 ppb			ON DAY(S) 22
				VAR-VARIOUS
I2S CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	743 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	0.23	MONTHLY AVERAGE:	0.1 ppb	

24 HOUR AVERAGES FOR October 2016



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0.3	0.4	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.5	S	0.6	0.7	0.5	0.7	0.9	0.6	0.6	0.7	0.8	0.2	0.9	0.5	24	
2	1.1	2.3	1.8	0.9	0.7	0.7	0.7	1.3	0.5	0.5	0.5	0.5	S	0.5	0.4	0.4	0.5	0.9	0.9	0.9	0.9	0.7	0.9	1.1	0.4	2.3	0.8	24	
3	1.3	1.1	0.6	0.7	0.9	1.0	0.9	0.7	0.7	0.6	0.6	0.7	S	1.3	1.6	0.9	0.9	0.9	1.1	1.1	1.0	1.2	1.1	1.2	0.6	1.6	1.0	24	
4	0.5	0.6	1.8	1.9	0.8	0.0	1.0	1.6	1.0	0.8	0.7	S	0.8	0.4	0.5	2.4	1.4	1.2	0.7	0.3	0.6	0.5	0.1	1.1	0.0	2.4	0.9	24	
5	2.2	1.0	0.9	0.6	1.7	0.0	S1	S1	0.5	0.5	S	0.3	0.5	0.8	1.0	1.5	1.7	1.3	2.1	0.7	0.6	0.6	0.7	0.8	0.0	2.2	1.0	22	
6	0.6	0.8	0.8	0.5	1.1	1.0	0.0	0.2	C	C	C	C	C	1.0	1.1	1.2	0.9	0.8	0.9	1.0	0.9	0.8	0.9	0.8	0.0	1.2	0.8	24	
7	1.2	0.9	0.8	0.9	0.8	0.8	2.8	1.2	S	1.1	3.8	3.7	1.8	1.1	2.4	1.1	1.2	1.2	0.9	0.9	0.9	1.0	1.0	1.0	0.8	3.8	1.4	24	
8	0.9	0.9	1.0	1.0	1.1	1.0	2.4	S	1.1	1.2	1.3	1.0	1.1	1.0	1.1	1.3	1.4	2.1	2.1	3.4	1.0	1.1	1.2	1.2	0.9	3.4	1.3	24	
9	1.3	1.2	1.2	1.2	1.2	1.1	S	1.0	1.1	1.3	1.2	1.3	1.3	1.4	1.4	1.3	1.3	1.7	1.0	1.1	1.1	1.0	1.1	1.0	1.0	1.7	1.2	24	
10	0.8	1.0	1.0	1.2	1.2	S	1.1	1.2	1.1	1.0	1.0	1.1	1.3	1.4	1.3	1.0	1.0	0.9	0.9	1.0	1.0	1.0	1.3	1.0	0.8	1.4	1.1	24	
11	0.9	0.9	0.8	1.0	S	0.9	1.1	1.0	1.1	1.0	1.0	0.9	0.9	1.0	1.2	1.0	1.0	1.1	1.0	1.0	1.4	1.3	1.0	1.5	0.8	1.5	1.0	24	
12	1.1	1.2	1.2	S	1.2	1.2	1.3	2.7	1.4	1.2	1.4	1.4	1.3	1.2	1.0	1.2	1.3	1.2	1.2	1.3	1.2	1.6	1.2	1.0	1.0	2.7	1.3	24	
13	1.1	1.1	S	1.0	1.8	1.5	1.1	2.1	2.1	1.3	1.9	1.5	1.1	1.3	1.6	1.3	1.3	1.3	1.3	1.5	1.4	1.4	1.3	1.4	1.0	2.1	1.4	24	
14	1.4	S	1.5	1.5	1.4	1.5	1.7	1.7	1.6	1.6	1.5	1.6	1.6	1.6	1.4	1.5	1.5	1.4	1.4	1.4	1.5	1.4	1.6	1.7	1.4	1.7	1.5	24	
15	S	1.5	1.3	1.4	1.5	1.5	1.4	1.4	1.4	1.6	1.6	1.5	1.6	1.4	1.4	1.3	1.4	1.3	1.4	1.4	1.4	1.3	3.6	3.4	S	1.3	3.6	1.6	24
16	2.5	2.0	1.8	1.5	1.5	1.5	1.4	1.4	1.4	1.6	1.7	1.7	1.5	2.2	1.7	1.6	1.7	1.7	1.6	1.7	1.5	1.6	S	1.6	1.4	2.5	1.7	24	
17	1.7	1.6	1.4	1.6	1.6	1.6	1.7	1.7	1.5	1.5	1.6	1.6	1.6	1.5	1.4	1.5	1.6	1.4	1.4	1.4	S	1.4	1.3	1.3	1.7	1.5	24		
18	1.3	1.2	1.3	1.2	1.3	1.4	1.3	1.4	1.4	1.3	1.4	1.3	1.2	1.4	1.2	1.6	1.4	1.2	1.1	1.2	S	1.1	1.3	1.1	1.1	1.6	1.3	24	
19	1.1	1.3	1.4	1.5	1.6	1.9	1.6	1.6	2.0	1.7	1.7	1.6	1.3	1.0	1.2	1.4	1.2	1.4	1.5	S	1.2	1.1	1.2	1.2	1.0	2.0	1.4	24	
20	1.2	1.2	1.1	1.4	1.3	3.8	1.6	2.6	2.6	1.8	2.2	2.6	1.7	1.9	1.7	1.7	1.6	S	2.7	2.6	2.3	1.9	1.7	1.1	3.8	2.0	24		
21	1.6	1.4	1.4	1.5	1.5	1.3	1.4	1.4	1.3	1.3	1.4	1.4	1.4	1.3	1.4	P	1.4	S	1.5	1.5	1.8	5.9	4.2	6.0	1.3	6.0	2.0	23	
22	4.2	4.0	2.8	1.6	1.5	2.2	1.8	4.8	4.7	2.8	2.1	1.7	1.6	1.4	2.3	2.0	S	3.3	3.6	2.3	1.8	1.3	1.8	1.7	1.3	4.8	2.5	24	
23	1.7	1.6	2.0	1.3	1.6	1.1	1.1	1.1	1.0	1.0	1.4	1.4	1.3	1.4	1.1	S	1.3	1.3	1.4	1.2	0.9	1.6	1.6	1.2	0.9	2.0	1.3	24	
24	1.7	0.9	1.4	1.9	1.3	1.5	1.7	1.4	1.3	1.1	2.0	1.7	1.1	1.6	S	2.2	1.5	1.3	1.4	1.2	1.6	1.5	1.5	1.1	0.9	2.2	1.5	24	
25	0.9	1.4	1.3	1.1	1.1	1.2	1.0	1.4	1.5	1.5	1.1	1.4	1.5	S	1.5	1.6	1.6	1.4	1.4	1.1	1.4	1.4	1.3	1.7	0.9	1.7	1.3	24	
26	2.3	1.6	1.3	1.3	1.3	1.2	1.2	1.3	1.5	1.3	1.2	1.3	S	1.2	1.0	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.2	1.2	1.0	2.3	1.3	24	
27	1.2	7.2	1.3	1.1	1.3	1.4	1.3	1.3	1.4	1.5	1.3	S	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.1	1.2	1.2	1.2	1.1	7.2	1.5	24	
28	1.3	1.3	1.3	1.4	1.3	1.3	1.4	1.3	1.3	1.3	S	1.2	1.3	1.2	1.1	1.2	1.2	1.1	1.4	1.2	1.2	1.3	1.2	1.2	1.1	1.4	1.3	24	
29	1.1	1.1	1.2	1.2	1.8	1.4	1.3	1.1	1.2	S	1.2	1.2	1.3	1.3	1.2	1.3	1.2	1.4	1.2	1.4	1.2	1.3	1.4	3.5	1.1	3.5	1.4	24	
30	3.2	3.6	3.4	2.7	2.9	2.5	1.4	1.5	S	2.1	1.4	1.6	1.4	1.6	1.5	1.4	1.4	1.5	1.4	1.5	1.5	1.6	1.5	1.6	1.4	3.6	1.9	24	
31	1.5	1.6	1.6	1.6	1.6	1.5	1.6	S	1.6	1.5	1.4	1.6	1.6	1.6	1.7	1.6	1.6	1.6	1.7	1.6	1.4	1.6	1.6	1.4	1.4	1.7	1.6	24	
HOURLY MAX	4.2	7.2	3.4	2.7	2.9	3.8	2.8	4.8	4.7	2.8	3.8	3.7	1.8	2.2	2.4	2.4	1.7	3.3	3.6	3.4	2.6	5.9	4.2	6.0					
HOURLY AVG	1.4	1.6	1.4	1.3	1.3	1.3	1.3	1.5	1.4	1.3	1.4	1.4	1.3	1.3	1.3	1.4	1.3	1.3	1.4	1.3	1.2	1.5	1.4	1.5					

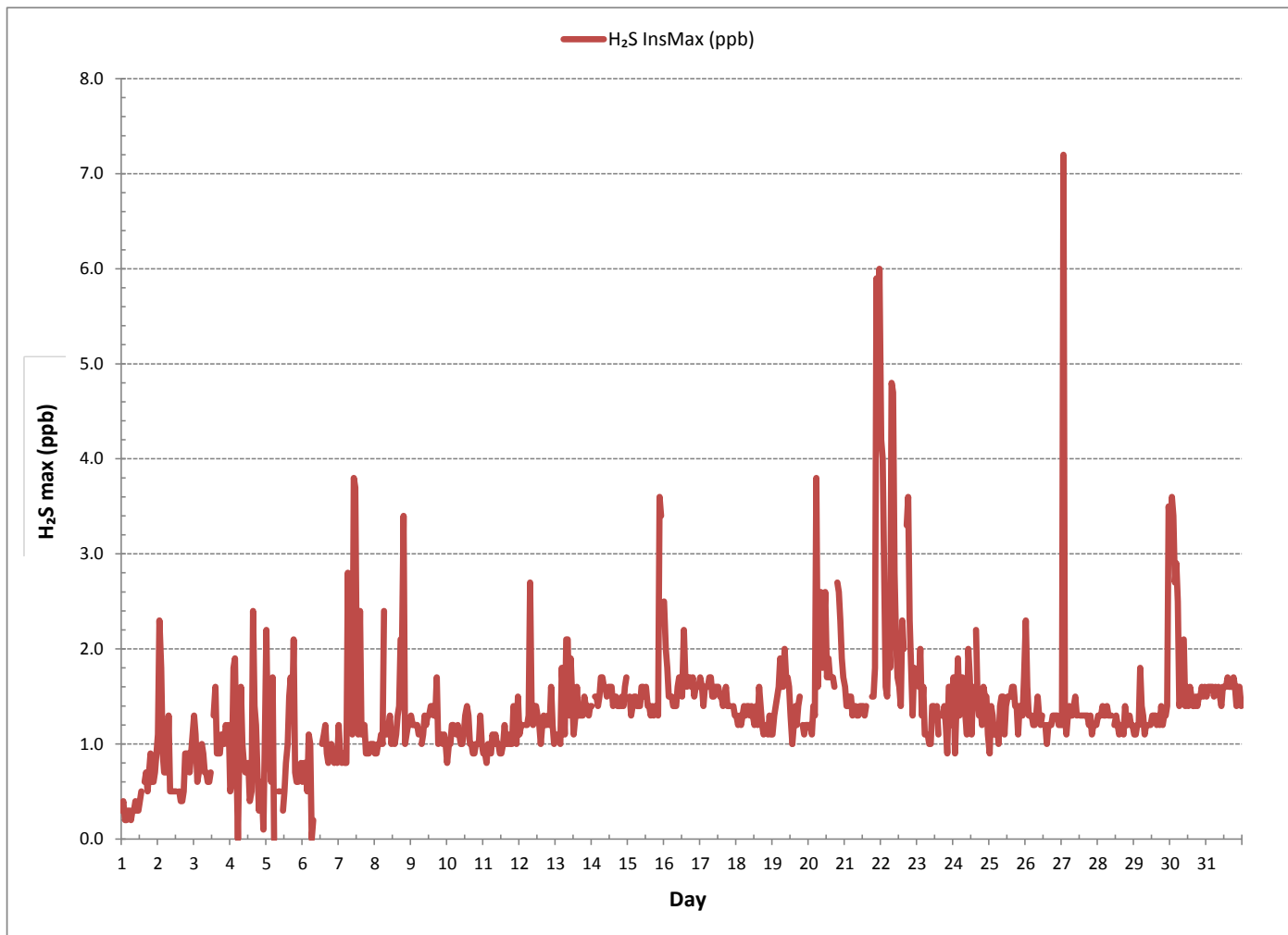
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

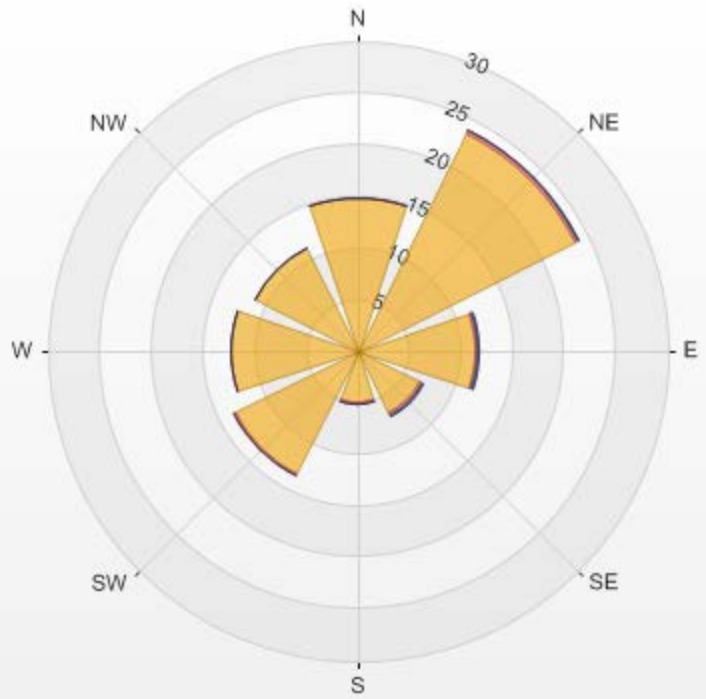
NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	7.2 ppb @ HOUR(S) 1 ON DAY(S) 27
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	741 hrs
STANDARD DEVIATION:	0.66

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-H2S[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0.0-0.9	0.9-1.7	1.7-2.6	>2.6	Total
N	14.89	0	0	0	14.89
NE	23.55	0.28	0.14	0	23.97
E	11.35	0.28	0.14	0	11.77
SE	6.81	0.14	0.14	0	7.09
S	5.11	0.14	0	0	5.25
SW	13.33	0.14	0	0	13.47
W	12.34	0	0	0	12.34
NW	11.21	0	0	0	11.21
Summary	98.59	0.98	0.42	0	100



% Icon	Classes (ppb)	99	1	0	0
	0.0-0.9				
			0.9-1.7	1.7-2.6	>2.6

H2S[ppb] Calibration: LICA Bonnyville Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



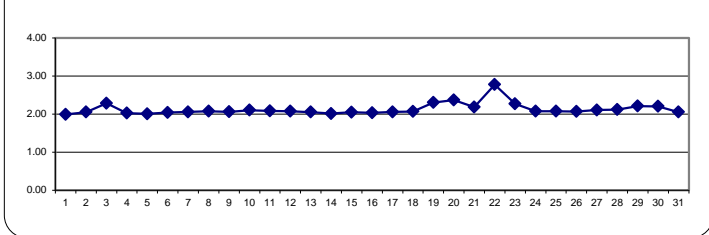
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1.97	1.96	1.96	1.97	1.97	1.97	1.97	1.97	1.98	1.98	1.98	1.99	1.97	1.98	S	1.99	2.00	2.00	2.01	2.02	2.02	2.04	2.05	2.06	1.96	2.06	1.99	24
2	2.07	2.16	2.17	2.14	2.00	1.98	1.99	1.99	2.00	2.00	2.00	2.00	2.00	S	1.99	1.99	1.98	1.99	2.03	2.08	2.06	2.15	2.22	2.23	1.98	2.23	2.05	24
3	2.64	2.55	2.79	2.65	2.40	2.51	2.54	2.35	2.25	2.29	2.28	2.27	S	2.14	2.12	2.07	2.03	2.04	2.11	2.27	2.10	2.08	2.03	2.00	2.00	2.79	2.28	24
4	2.02	2.05	2.09	2.13	2.10	2.11	2.04	2.03	2.04	2.01	1.99	S	1.98	1.99	1.98	1.98	1.99	2.00	1.99	2.00	2.00	2.00	2.00	2.03	1.98	2.13	2.02	24
5	2.00	2.02	2.04	2.00	2.00	2.03	2.01	2.00	2.00	1.98	C	C	C	C	1.99	1.99	1.99	2.00	2.01	2.02	2.02	2.02	2.02	2.02	1.98	2.04	2.01	24
6	2.03	2.04	2.03	2.03	2.04	2.04	2.04	2.03	2.03	S	2.03	2.03	2.03	2.04	2.03	2.04	2.04	2.05	2.08	2.09	2.12	2.05	2.04	2.05	2.03	2.12	2.04	24
7	2.07	2.06	2.08	2.06	2.06	2.05	2.08	2.06	S	2.06	2.04	2.07	2.04	2.05	2.05	2.04	2.06	2.06	2.08	2.06	2.05	2.06	2.05	2.06	2.04	2.08	2.06	24
8	2.07	2.11	2.08	2.07	2.10	2.11	2.17	S	2.10	2.09	2.08	2.09	2.08	2.08	2.07	2.07	2.07	2.06	2.05	2.09	2.06	2.04	2.03	2.04	2.03	2.17	2.08	24
9	2.03	2.05	2.04	2.04	2.03	2.03	S	2.02	2.03	2.04	2.09	2.07	2.07	2.05	2.09	2.07	2.06	2.06	2.07	2.07	2.07	2.12	2.10	2.09	2.02	2.12	2.06	24
10	2.10	2.11	2.13	2.15	2.13	S	2.17	2.19	2.20	2.11	2.09	2.10	2.07	2.06	2.06	2.07	2.07	2.06	2.07	2.10	2.10	2.12	2.09	2.08	2.06	2.20	2.11	24
11	2.11	2.16	2.17	2.23	S	2.27	2.21	2.16	2.15	2.08	2.02	2.01	2.00	2.00	2.01	2.01	2.02	2.04	2.05	2.06	2.02	2.03	2.04	2.05	2.00	2.27	2.08	24
12	2.07	2.08	2.09	S	2.12	2.11	2.12	2.11	2.11	2.09	2.09	2.08	2.04	2.03	2.07	2.11	2.12	2.12	2.08	2.04	2.01	2.02	2.04	2.01	2.01	2.12	2.08	24
13	2.01	2.03	S	2.06	2.05	2.07	2.08	2.09	2.08	2.08	2.11	2.10	2.08	2.07	2.08	2.06	2.03	2.03	2.03	2.02	2.02	2.04	2.01	2.01	2.01	2.11	2.05	24
14	2.01	S	2.01	2.01	2.02	2.03	2.00	2.01	2.00	2.00	2.00	2.01	2.00	2.00	2.00	2.01	2.01	2.00	2.00	2.00	2.00	2.02	2.12	2.07	2.00	2.12	2.01	24
15	S	2.06	2.08	2.07	2.05	2.02	2.00	2.03	2.03	2.04	2.03	2.03	2.02	2.04	2.01	2.01	2.02	2.03	2.06	2.05	2.10	2.19	2.18	S	2.00	2.19	2.05	24
16	2.11	2.06	2.05	2.05	2.03	2.01	2.00	1.99	1.99	1.99	1.99	1.99	2.00	2.01	2.02	2.03	2.05	2.08	2.10	2.07	2.14	S	2.04	1.99	2.14	2.03	24	
17	2.07	2.07	2.03	2.03	2.04	2.04	2.00	2.09	2.05	2.03	2.03	2.05	2.04	2.05	2.05	2.03	2.12	2.13	2.06	2.07	2.07	S	2.05	2.04	2.03	2.13	2.06	24
18	2.06	2.08	2.09	2.06	2.06	2.05	2.07	2.06	2.10	2.05	2.03	2.04	2.06	2.06	2.04	2.16	2.04	2.05	2.05	2.10	S	2.08	2.07	2.08	2.03	2.16	2.07	24
19	2.09	2.07	2.07	2.07	2.12	2.12	2.16	2.18	2.11	2.13	2.10	2.21	2.22	2.24	2.46	2.73	2.73	2.65	2.57	S	2.44	2.40	2.65	2.49	2.07	2.73	2.30	24
20	2.60	2.68	2.70	2.59	2.66	2.51	2.47	2.36	2.36	2.37	2.23	2.15	2.13	2.15	2.16	2.18	2.20	S	2.34	2.47	2.41	2.35	2.37	2.13	2.70	2.37	24	
21	2.42	2.33	2.24	2.20	2.18	2.15	2.12	2.12	2.12	2.13	2.12	2.08	2.04	2.01	2.00	2.00	2.00	S	2.06	2.14	2.34	2.14	2.67	2.67	2.00	2.67	2.19	24
22	3.47	3.32	2.84	2.80	2.96	3.15	2.97	2.98	2.92	2.89	2.72	2.46	2.36	2.38	2.36	2.51	S	2.44	2.45	2.54	2.84	3.00	2.83	2.70	2.36	3.47	2.78	24
23	2.57	2.54	2.48	2.38	2.30	2.23	2.23	2.25	2.27	2.16	2.11	2.09	2.13	2.57	2.31	S	2.10	2.09	2.08	2.08	2.95	2.12	2.10	2.10	2.08	2.95	2.27	24
24	2.09	2.09	2.13	2.14	2.13	2.12	2.12	2.10	2.10	2.08	2.05	2.05	2.02	2.02	S	2.03	2.05	2.04	2.05	2.06	2.07	2.06	2.07	2.07	2.02	2.14	2.08	24
25	2.08	2.06	2.05	2.05	2.07	2.06	2.05	2.07	2.06	2.05	2.05	2.06	2.06	S	2.05	2.05	2.06	2.06	2.08	2.10	2.08	2.11	2.14	2.22	2.05	2.22	2.07	24
26	2.18	2.12	2.08	2.06	2.06	2.05	2.05	2.05	2.06	2.05	2.04	2.05	S	2.04	2.04	2.06	2.05	2.06	2.06	2.06	2.05	2.06	2.14	2.17	2.04	2.18	2.07	24
27	2.26	2.25	2.27	2.18	2.10	2.13	2.10	2.10	2.09	2.07	2.09	S	2.06	2.07	2.05	2.08	2.06	2.07	2.07	2.06	2.10	2.09	2.06	2.05	2.05	2.27	2.11	24
28	2.07	2.16	2.16	2.12	2.08	2.12	2.16	2.19	2.20	2.20	S	2.10	2.06	2.06	2.04	2.05	2.07	2.08	2.09	2.11	2.18	2.16	2.13	2.20	2.04	2.20	2.12	24
29	2.23	2.52	2.57	2.45	2.38	2.31	2.34	2.36	2.37	S	2.12	2.13	2.12	2.11	2.11	2.04	2.04	2.04	2.06	2.06	2.10	2.09	2.09	2.18	2.04	2.57	2.21	24
30	2.25	2.36	2.29	2.24	2.26	2.32	2.30	2.33	S	2.37	2.35	2.32	2.17	2.11	2.13	2.15	2.15	2.12	2.10	2.11	2.10	2.08	2.08	2.04	2.04	2.37	2.21	24
31	2.03	2.02	2.04	2.04	2.04	2.05	2.05	S	2.04	2.02	2.01	2.01	2.01	2.01	2.02	2.02	2.02	2.03	2.10	2.14	2.18	2.15	2.14	2.08	2.01	2.18	2.05	24
HOURLY MAX	3.47	3.32	2.84	2.80	2.96	3.15	2.97	2.98	2.92	2.89	2.72	2.46	2.36	2.57	2.46	2.73	2.73	2.65	2.57	2.54	2.95	3.00	2.83	2.70				
HOURLY AVG	2.19	2.21	2.20	2.17	2.15	2.16	2.16	2.15	2.13	2.12	2.10	2.09	2.07	2.09	2.08	2.09	2.07	2.09	2.09	2.10	2.16	2.14	2.15	2.14				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

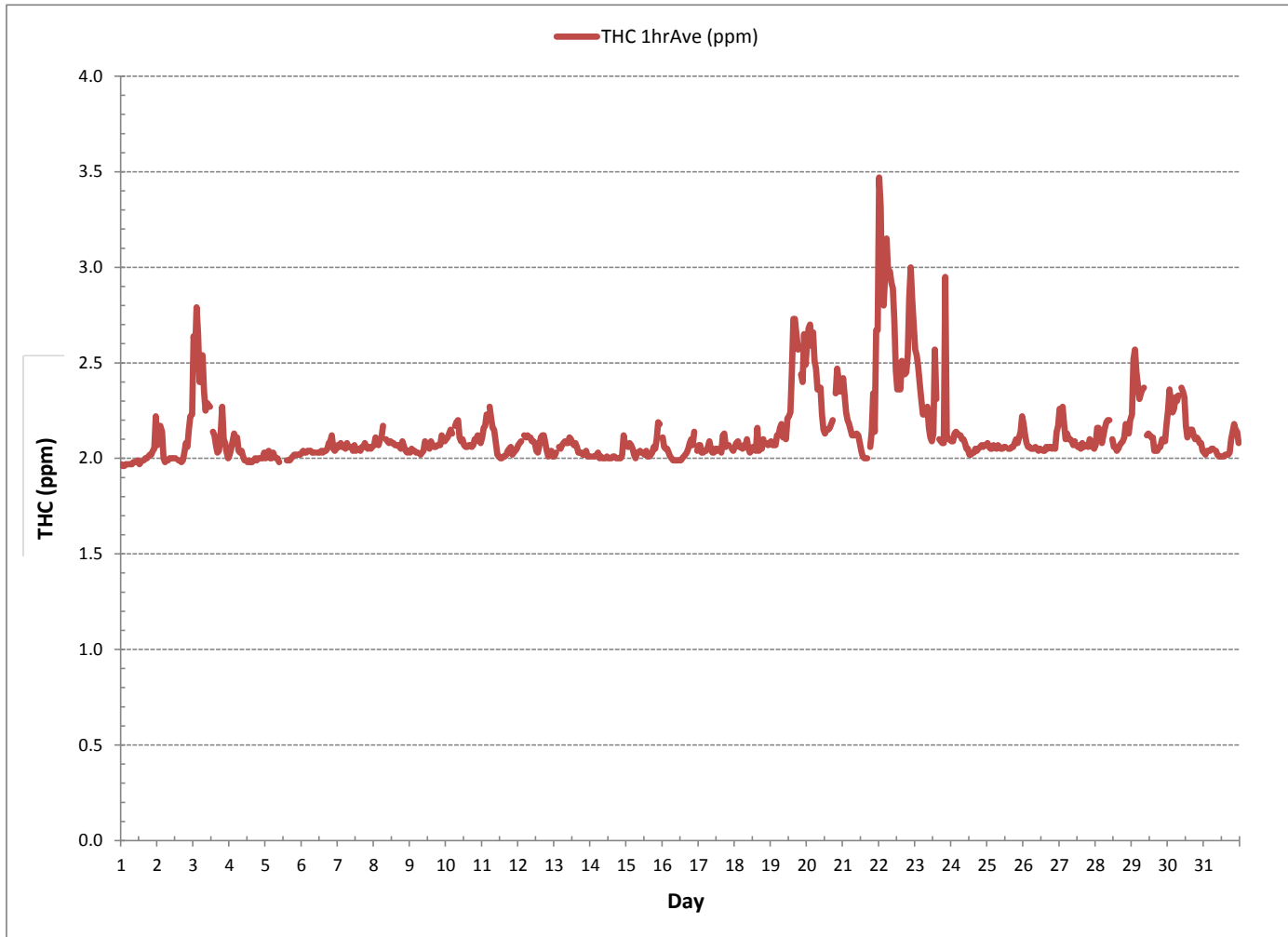
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	709		
MINIMUM 1-HR AVERAGE:	1.96 ppm	@ HOUR(S)	1, 2 ON DAY(S) 1, 1
MAXIMUM 1-HR AVERAGE:	3.47 ppm	@ HOUR(S)	0 ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	2.78 ppm		0 ON DAY(S) 22
			VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.19	MONTHLY AVERAGE:	2.13 ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	1.99	1.97	1.97	1.98	1.99	1.98	1.99	1.99	2.00	2.02	2.03	2.03	1.99	2.02	S	2.09	2.03	2.05	2.14	2.17	2.10	2.10	2.09	2.12	1.97	2.17	2.04	24
2	2.21	2.50	2.61	2.31	2.03	1.99	2.00	2.00	2.15	2.01	2.01	2.01	2.01	S	2.10	2.00	2.05	2.08	2.27	2.19	2.09	2.58	2.35	2.41	1.99	2.61	2.17	24
3	3.25	2.79	2.92	2.96	2.51	2.77	2.74	2.52	2.33	2.52	2.40	2.28	S	2.21	2.14	2.35	2.17	2.11	2.57	3.39	2.24	2.16	2.05	2.02	2.02	3.39	2.50	24
4	2.05	2.06	2.15	2.18	2.13	2.14	2.08	2.05	2.05	2.04	2.01	S	2.00	2.05	2.01	2.00	2.13	2.04	2.00	2.05	2.02	2.01	2.04	2.06	2.00	2.18	2.06	24
5	2.03	2.06	2.09	2.03	2.08	2.09	2.04	2.03	2.02	2.01	C	C	C	C	C	2.02	2.01	2.02	2.03	2.04	2.07	2.05	2.05	2.03	2.01	2.09	2.04	24
6	2.06	2.06	2.04	2.06	2.10	2.08	2.08	2.09	2.26	S	2.08	2.06	2.03	2.06	2.08	2.06	2.06	2.09	2.64	2.15	2.16	2.08	2.05	2.09	2.03	2.64	2.11	24
7	2.09	2.11	2.46	2.19	2.27	2.18	2.33	2.42	S	2.19	2.30	2.23	2.14	2.23	2.22	2.16	2.19	2.21	2.18	2.08	2.23	2.25	2.18	2.23	2.08	2.46	2.22	24
8	2.22	2.30	2.27	2.20	2.28	2.26	2.42	S	2.12	2.11	2.11	2.16	2.24	2.30	2.17	2.20	2.26	2.31	2.22	2.25	2.17	2.15	2.15	2.07	2.07	2.42	2.21	24
9	2.05	2.07	2.05	2.05	2.05	2.03	S	2.03	2.04	2.09	2.22	2.79	2.19	2.06	2.17	2.17	2.12	2.07	2.09	2.10	2.12	2.17	2.13	2.11	2.03	2.79	2.13	24
10	2.17	2.14	2.24	2.26	2.16	S	2.26	2.27	2.28	2.22	2.14	2.13	2.11	2.10	2.10	2.10	2.12	2.13	2.13	2.16	2.15	2.17	2.16	2.12	2.10	2.28	2.17	24
11	2.18	2.19	2.20	2.27	S	2.50	2.32	2.23	2.44	2.23	2.05	2.03	2.01	2.01	2.03	2.02	2.05	2.06	2.07	2.08	2.04	2.06	2.05	2.06	2.01	2.50	2.14	24
12	2.10	2.09	2.10	S	2.13	2.12	2.13	2.12	2.14	2.10	2.10	2.10	2.05	2.04	2.18	2.18	2.18	2.18	2.13	2.10	2.02	2.05	2.10	2.09	2.02	2.18	2.11	24
13	2.02	2.08	S	2.11	2.08	2.10	2.19	2.39	2.39	2.22	2.24	2.26	2.23	2.18	2.27	2.23	2.10	2.09	2.08	2.06	2.10	2.45	2.06	2.03	2.02	2.45	2.17	24
14	2.04	S	2.04	2.03	2.12	2.06	2.05	2.09	2.02	2.02	2.02	2.03	2.03	2.03	2.02	2.03	2.04	2.05	2.02	2.02	2.03	2.11	2.32	2.21	2.02	2.32	2.06	24
15	S	2.10	2.28	2.12	2.11	2.12	2.07	2.13	2.14	2.50	2.11	2.05	2.10	2.43	2.15	2.04	2.15	2.20	2.13	2.11	2.32	2.37	2.39	S	2.04	2.50	2.19	24
16	2.29	2.15	2.26	2.20	2.12	2.05	2.05	2.10	2.01	2.00	2.13	2.01	2.23	2.04	2.07	2.08	2.20	2.20	2.49	2.16	2.20	S	2.07	2.00	2.49	2.14	24	
17	2.09	2.38	2.17	2.06	2.06	2.05	2.09	2.29	2.08	2.04	2.04	2.07	2.06	2.07	2.39	2.19	2.54	2.33	2.08	2.10	2.10	S	2.07	2.15	2.04	2.54	2.15	24
18	2.07	2.21	2.11	2.07	2.16	2.15	2.13	2.09	2.12	2.27	2.05	2.13	2.15	2.22	2.06	2.88	2.08	2.16	2.14	2.20	S	2.09	2.08	2.12	2.05	2.88	2.16	24
19	2.17	2.09	2.09	2.09	2.16	2.16	2.46	2.35	2.15	2.28	2.25	2.33	2.29	2.35	2.58	2.80	2.79	2.69	2.72	S	2.54	2.48	3.65	2.58	2.09	3.65	2.44	24
20	2.63	3.02	3.16	3.32	3.05	2.93	2.81	2.55	2.54	2.63	2.54	2.23	2.22	2.29	2.17	2.30	2.44	2.34	S	2.73	2.87	2.70	2.49	2.42	2.17	3.32	2.63	24
21	2.48	2.38	2.28	2.22	2.20	2.16	2.12	2.14	2.18	2.22	2.13	2.15	2.47	2.02	2.17	P	2.01	S	2.09	5.07	4.28	2.61	5.97	3.28	2.01	5.97	2.67	23
22	4.00	4.61	3.14	3.14	3.25	3.87	3.21	3.21	3.16	3.12	3.12	2.58	2.40	2.87	2.62	3.02	S	2.89	2.61	2.62	4.63	5.96	2.96	2.85	2.40	5.96	3.30	24
23	2.60	2.83	3.41	2.61	2.40	2.31	2.34	2.36	2.36	2.26	2.14	2.15	2.19	2.91	2.84	S	2.14	2.11	2.09	2.31	6.61	2.15	2.11	2.16	2.09	6.61	2.58	24
24	2.13	2.11	2.22	2.26	2.20	2.23	2.18	2.21	2.20	2.18	2.22	2.16	2.11	2.09	S	2.06	2.09	2.08	2.15	2.08	2.08	2.09	2.09	2.09	2.06	2.26	2.14	24
25	2.11	2.07	2.09	2.08	2.11	2.15	2.11	2.14	2.08	2.07	2.07	2.30	2.07	S	2.16	2.06	2.07	2.07	2.10	2.79	2.20	2.15	2.27	2.61	2.06	2.79	2.17	24
26	2.44	2.18	2.10	2.07	2.07	2.06	2.06	2.07	2.07	2.06	2.05	2.09	S	2.05	2.04	2.31	2.09	2.16	2.17	2.06	2.19	2.07	2.56	2.96	2.04	2.96	2.17	24
27	2.92	2.36	2.36	2.32	2.20	2.18	2.13	2.11	2.10	2.09	2.11	S	2.07	2.21	2.06	2.09	2.16	2.19	2.16	2.19	2.15	2.11	2.10	2.18	2.06	2.92	2.20	24
28	2.13	2.26	2.23	2.20	2.17	2.19	2.25	2.27	2.25	2.26	S	2.14	2.10	2.25	2.14	2.08	2.15	2.13	2.12	2.18	2.27	2.44	2.15	2.26	2.08	2.44	2.20	24
29	2.25	2.70	2.67	2.49	2.44	2.37	2.37	2.38	2.40	S	2.13	2.13	2.13	2.14	2.17	2.08	2.05	2.05	2.08	2.08	2.20	2.12	2.13	2.56	2.05	2.70	2.27	24
30	2.59	3.25	3.02	2.75	2.65	2.81	2.91	2.91	S	2.39	2.39	2.38	2.26	2.11	2.16	2.16	2.30	2.14	2.17	2.13	2.12	2.12	2.24	2.09	2.09	3.25	2.44	24
31	2.05	2.03	2.05	2.04	2.05	2.08	S	2.08	2.03	2.02	2.02	2.02	2.02	2.02	2.03	2.03	2.03	2.07	2.17	2.22	2.30	2.23	2.24	2.14	2.02	2.30	2.09	24
HOURLY MAX	4.00	4.61	3.41	3.32	3.25	3.87	3.21	3.21	3.16	3.12	3.12	2.79	2.47	2.91	2.84	3.02	2.79	2.89	2.72	5.07	6.61	5.96	5.97	3.28				
HOURLY AVG	2.31	2.37	2.36	2.29	2.24	2.27	2.27	2.26	2.21	2.21	2.18	2.18	2.13	2.20	2.19	2.20	2.16	2.18	2.19	2.34	2.49	2.34	2.38	2.27				

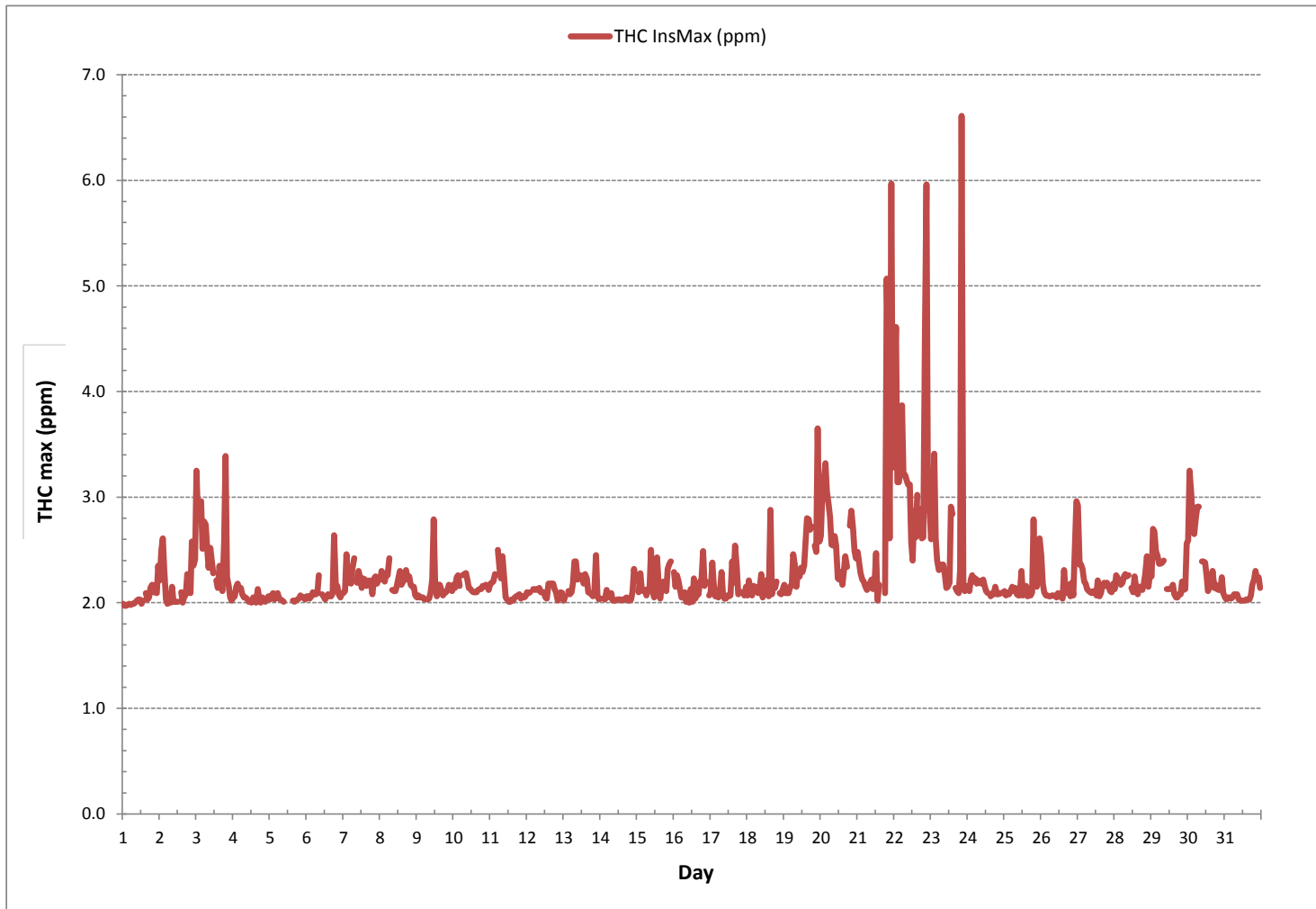
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

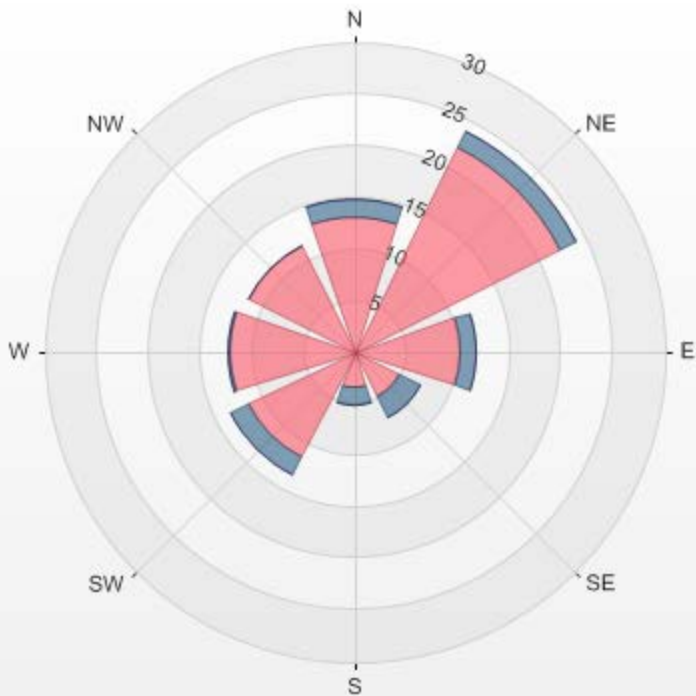
NUMBER OF NON-ZERO READINGS:	707
MAXIMUM INSTANTANEOUS VALUE:	6.61 ppm @ HOUR(S) 20 ON DAY(S) 23
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	743 hrs
STANDARD DEVIATION:	0.42

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

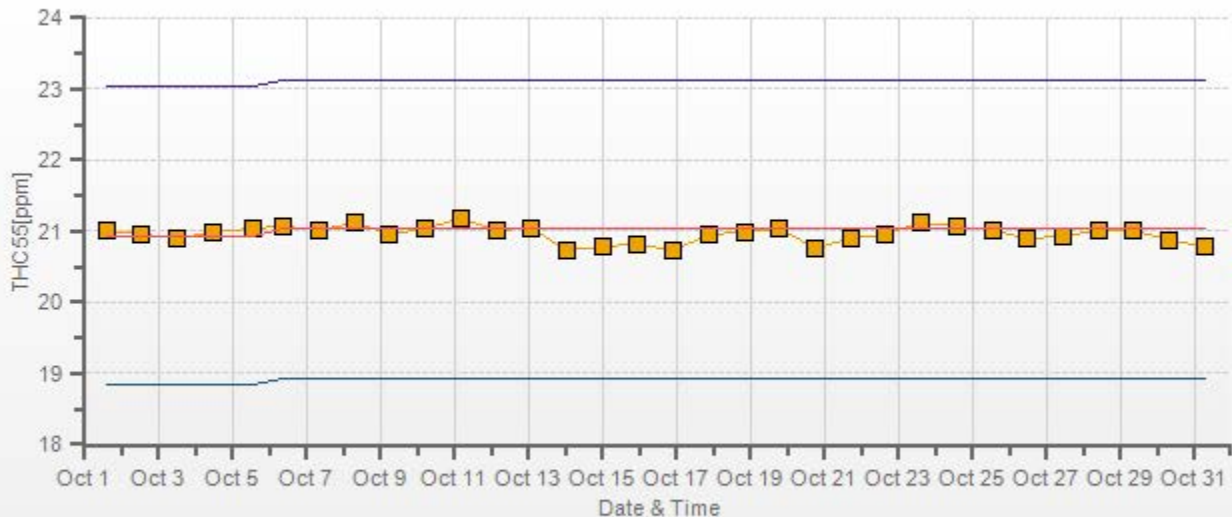


Wind: LICA Bonnyville Poll.: LICA Bonnyville-THC55[ppm] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppm]

Direction	0.0-1.2	1.2-2.3	2.3-3.5	>3.5	Total
N	0	13.01	1.7	0	14.71
NE	0	22.21	1.7	0	23.91
E	0	10.33	1.41	0	11.74
SE	0	4.81	2.26	0	7.07
S	0	3.54	1.7	0	5.24
SW	0	11.46	1.98	0	13.44
W	0	12.02	0.28	0	12.3
NW	0	11.6	0	0	11.6
Summary	0	88.98	11.03	0	100



THC55[ppm] Calibration: LICA Bonnyville Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

METHANE

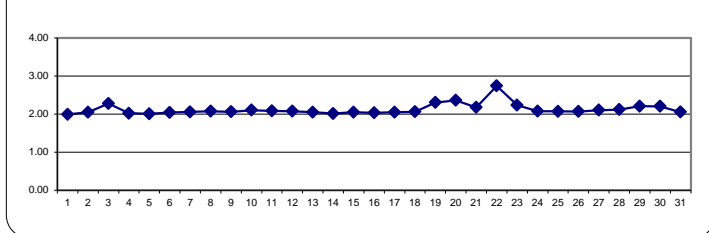
METHANE Hourly Averages (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.97	1.96	1.96	1.97	1.97	1.97	1.97	1.97	1.98	1.98	1.98	1.99	1.97	1.98	S	1.99	2.00	2.00	2.01	2.02	2.02	2.04	2.05	2.06	1.96	2.06	1.99	24	
2	2.07	2.16	2.17	2.14	2.00	1.98	1.99	1.99	2.00	2.00	2.00	2.00	2.00	S	1.99	1.99	1.98	1.99	2.03	2.08	2.06	2.14	2.20	2.23	1.98	2.23	2.05	24	
3	2.62	2.55	2.76	2.64	2.40	2.50	2.53	2.34	2.25	2.29	2.27	2.27	S	2.14	2.12	2.06	2.03	2.04	2.10	2.25	2.10	2.08	2.03	2.00	2.00	2.76	2.28	24	
4	2.02	2.05	2.09	2.13	2.10	2.11	2.04	2.03	2.04	2.01	1.99	S	1.98	1.99	1.98	1.98	1.98	2.00	1.99	2.00	2.00	2.00	2.00	2.03	1.98	2.13	2.02	24	
5	2.00	2.02	2.04	2.00	2.00	2.03	2.01	2.00	2.00	1.98	C	C	C	C	1.99	1.99	1.99	2.00	2.01	2.02	2.02	2.02	2.02	2.02	1.98	2.04	2.01	24	
6	2.03	2.04	2.03	2.03	2.04	2.04	2.04	2.03	2.02	S	2.03	2.03	2.03	2.04	2.03	2.04	2.04	2.05	2.08	2.09	2.12	2.05	2.04	2.05	2.02	2.12	2.04	24	
7	2.07	2.06	2.08	2.06	2.06	2.05	2.08	2.06	S	2.06	2.04	2.07	2.04	2.05	2.05	2.04	2.06	2.06	2.08	2.06	2.05	2.06	2.05	2.06	2.04	2.08	2.06	24	
8	2.07	2.11	2.08	2.07	2.10	2.11	2.17	S	2.10	2.09	2.08	2.09	2.08	2.08	2.07	2.07	2.07	2.06	2.05	2.09	2.06	2.04	2.03	2.04	2.03	2.17	2.08	24	
9	2.03	2.05	2.04	2.04	2.03	2.03	S	2.02	2.03	2.04	2.09	2.07	2.07	2.05	2.09	2.07	2.06	2.06	2.07	2.07	2.07	2.12	2.10	2.09	2.02	2.12	2.06	24	
10	2.10	2.11	2.13	2.15	2.13	S	2.17	2.19	2.20	2.11	2.09	2.10	2.07	2.06	2.06	2.07	2.07	2.06	2.07	2.10	2.10	2.12	2.09	2.08	2.06	2.20	2.11	24	
11	2.11	2.16	2.17	2.23	S	2.27	2.21	2.16	2.14	2.08	2.02	2.01	2.00	2.00	2.00	2.01	2.01	2.02	2.04	2.05	2.06	2.02	2.03	2.04	2.05	2.00	2.27	2.08	24
12	2.07	2.08	2.09	S	2.12	2.11	2.12	2.11	2.11	2.09	2.09	2.08	2.04	2.03	2.07	2.11	2.12	2.12	2.08	2.04	2.01	2.02	2.04	2.01	2.01	2.01	2.12	2.08	24
13	2.01	2.03	S	2.06	2.05	2.07	2.08	2.09	2.08	2.08	2.11	2.10	2.08	2.07	2.08	2.06	2.03	2.03	2.03	2.02	2.02	2.00	2.01	2.01	2.00	2.11	2.05	24	
14	2.01	S	2.01	2.01	2.02	2.03	2.00	2.01	2.00	2.00	2.00	2.01	2.00	2.00	2.00	2.01	2.01	2.00	2.00	2.00	2.00	2.02	2.02	2.07	2.00	2.12	2.01	24	
15	S	2.06	2.07	2.07	2.05	2.02	2.00	2.03	2.03	2.02	2.03	2.03	2.02	2.01	2.01	2.01	2.02	2.03	2.06	2.05	2.10	2.19	2.18	S	2.00	2.19	2.05	24	
16	2.11	2.06	2.05	2.05	2.03	2.01	2.00	1.99	1.99	1.99	1.99	1.99	1.99	2.00	2.01	2.02	2.03	2.05	2.08	2.10	2.07	2.14	S	2.04	1.99	2.14	2.03	24	
17	2.07	2.07	2.03	2.03	2.04	2.04	2.06	2.08	2.05	2.03	2.03	2.05	2.04	2.05	2.04	2.03	2.07	2.09	2.06	2.07	2.07	S	2.05	2.04	2.03	2.09	2.05	24	
18	2.06	2.08	2.09	2.06	2.05	2.05	2.07	2.06	2.10	2.04	2.03	2.04	2.06	2.05	2.04	2.10	2.04	2.05	2.05	2.10	S	2.08	2.07	2.08	2.03	2.10	2.06	24	
19	2.09	2.07	2.07	2.07	2.12	2.12	2.16	2.17	2.11	2.13	2.10	2.21	2.22	2.24	2.46	2.73	2.73	2.65	2.57	S	2.44	2.40	2.63	2.49	2.07	2.73	2.30	24	
20	2.60	2.68	2.69	2.58	2.65	2.51	2.46	2.34	2.35	2.29	2.22	2.15	2.13	2.15	2.15	2.16	2.18	2.20	S	2.34	2.45	2.41	2.34	2.37	2.13	2.69	2.37	24	
21	2.42	2.33	2.24	2.20	2.18	2.15	2.12	2.12	2.12	2.13	2.12	2.08	2.04	2.01	2.00	2.00	2.00	S	2.06	2.14	2.31	2.13	2.57	2.54	2.00	2.57	2.17	24	
22	3.11	3.13	2.83	2.79	2.95	3.12	2.96	2.96	2.90	2.87	2.71	2.46	2.36	2.36	2.36	2.50	S	2.44	2.45	2.54	2.82	2.97	2.82	2.69	2.36	3.13	2.74	24	
23	2.57	2.54	2.48	2.38	2.30	2.23	2.23	2.25	2.27	2.16	2.11	2.09	2.13	2.57	2.30	S	2.10	2.09	2.08	2.08	2.12	2.12	2.10	2.10	2.08	2.57	2.23	24	
24	2.09	2.09	2.13	2.14	2.13	2.12	2.12	2.10	2.10	2.08	2.05	2.05	2.02	2.02	S	2.03	2.05	2.04	2.05	2.06	2.07	2.06	2.07	2.07	2.02	2.14	2.08	24	
25	2.08	2.06	2.05	2.05	2.07	2.06	2.05	2.07	2.06	2.05	2.05	2.05	2.06	S	2.04	2.05	2.06	2.06	2.08	2.09	2.08	2.11	2.14	2.22	2.04	2.22	2.07	24	
26	2.18	2.12	2.08	2.06	2.06	2.05	2.05	2.05	2.06	2.05	2.04	2.05	S	2.04	2.04	2.05	2.05	2.06	2.06	2.06	2.05	2.06	2.14	2.17	2.04	2.18	2.07	24	
27	2.25	2.24	2.27	2.18	2.10	2.13	2.10	2.10	2.08	2.07	2.09	S	2.06	2.06	2.05	2.08	2.06	2.07	2.06	2.05	2.10	2.09	2.06	2.05	2.05	2.27	2.10	24	
28	2.07	2.16	2.16	2.12	2.08	2.12	2.16	2.19	2.20	2.20	S	2.10	2.06	2.06	2.04	2.05	2.07	2.08	2.09	2.11	2.18	2.16	2.13	2.20	2.04	2.20	2.12	24	
29	2.23	2.52	2.57	2.45	2.38	2.31	2.34	2.36	2.37	S	2.12	2.13	2.12	2.11	2.11	2.04	2.04	2.04	2.06	2.06	2.10	2.09	2.09	2.17	2.04	2.57	2.21	24	
30	2.25	2.36	2.29	2.24	2.26	2.32	2.29	2.32	S	2.37	2.35	2.32	2.17	2.11	2.13	2.15	2.14	2.12	2.10	2.11	2.10	2.08	2.07	2.04	2.04	2.37	2.20	24	
31	2.03	2.02	2.04	2.04	2.03	2.05	2.05	S	2.04	2.02	2.01	2.01	2.01	2.01	2.02	2.02	2.03	2.10	2.14	2.18	2.15	2.14	2.08	2.01	2.18	2.05	24		
HOURLY MAX	3.11	3.13	2.83	2.79	2.95	3.12	2.96	2.96	2.90	2.87	2.71	2.46	2.36	2.57	2.46	2.73	2.73	2.65	2.57	2.54	2.82	2.97	2.82	2.69					
HOURLY AVG	2.18	2.20	2.19	2.17	2.15	2.16	2.15	2.14	2.13	2.11	2.10	2.09	2.07	2.08	2.08	2.08	2.07	2.09	2.09	2.10	2.13	2.13	2.15	2.14					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

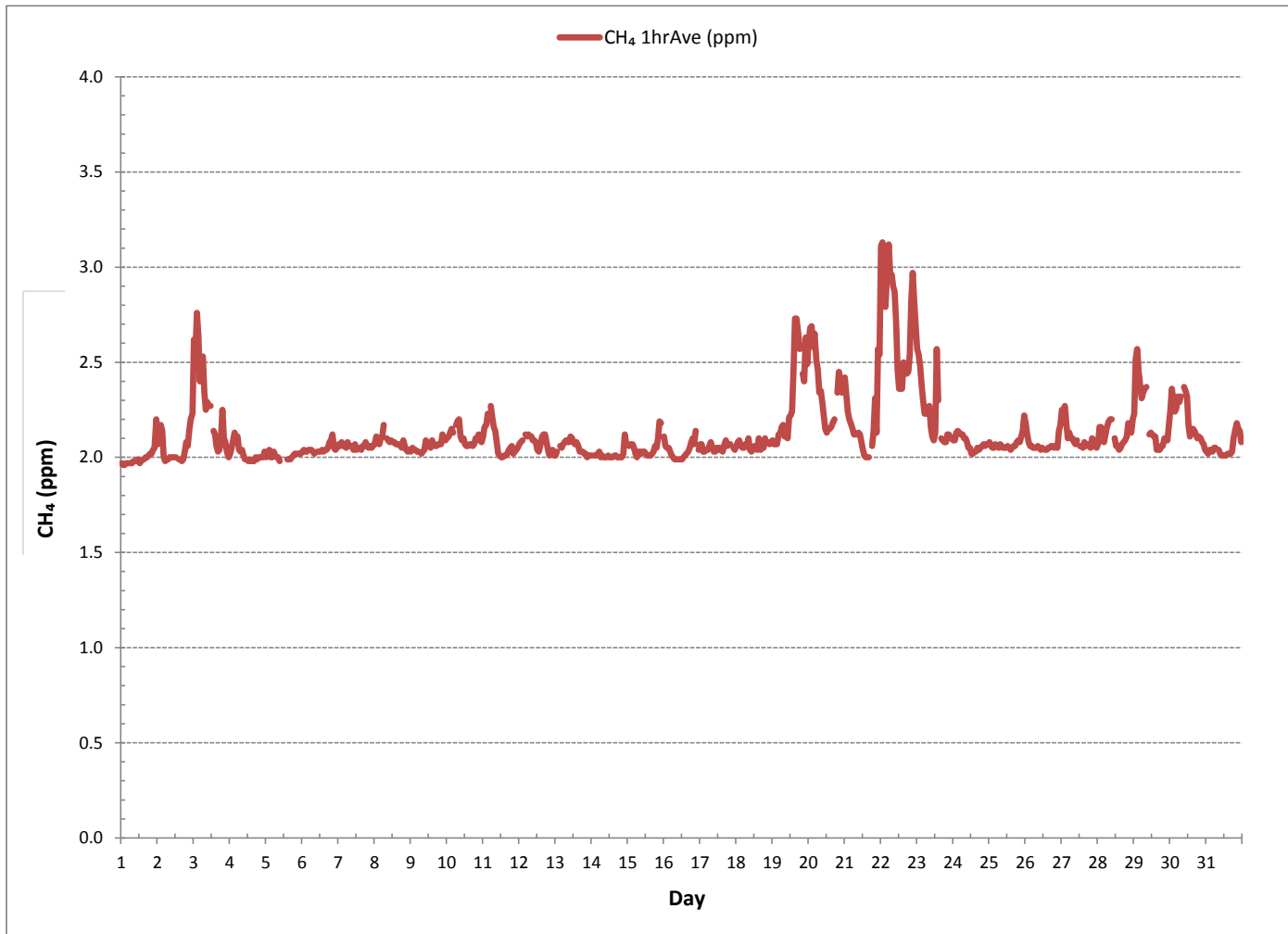
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	709
MINIMUM 1-HR AVERAGE:	1.96 ppm @ HOUR(S) 1, 2 ON DAY(S) 1, 1
MAXIMUM 1-HR AVERAGE:	3.13 ppm @ HOUR(S) 1 ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	2.74 ppm ON DAY(S) 22
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0.18
MONTHLY AVERAGE:	2.13 ppm

METHANE Hourly Averages (CH₄ ppm)





METHANE MAX Instantaneous Maximum (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	1.99	1.97	1.97	1.98	1.99	1.99	2.00	1.99	2.00	2.02	2.03	2.03	1.99	2.02	S	2.03	2.03	2.05	2.15	2.17	2.11	2.11	2.10	2.13	1.97	2.17	2.04	24
2	2.21	2.50	2.61	2.31	2.03	1.99	2.00	2.01	2.01	2.01	2.01	2.01	2.02	S	2.00	2.00	1.99	2.09	2.10	2.20	2.10	2.45	2.32	2.34	1.99	2.61	2.14	24
3	3.12	2.78	2.86	2.90	2.50	2.70	2.66	2.45	2.33	2.51	2.30	2.28	S	2.20	2.14	2.12	2.04	2.11	2.53	3.24	2.16	2.17	2.06	2.02	2.02	3.24	2.44	24
4	2.05	2.07	2.16	2.18	2.14	2.14	2.09	2.05	2.06	2.04	2.01	S	2.00	2.05	2.01	2.00	2.02	2.04	2.00	2.05	2.02	2.01	2.04	2.06	2.00	2.18	2.06	24
5	2.03	2.06	2.10	2.03	2.09	2.09	2.04	2.03	2.03	2.01	C	C	C	C	C	2.02	2.01	2.02	2.03	2.04	2.08	2.05	2.05	2.03	2.01	2.10	2.04	24
6	2.06	2.06	2.04	2.06	2.10	2.09	2.08	2.09	2.07	S	2.09	2.06	2.04	2.06	2.09	2.06	2.06	2.09	2.64	2.16	2.17	2.09	2.06	2.09	2.04	2.64	2.10	24
7	2.09	2.11	2.45	2.20	2.27	2.13	2.33	2.42	S	2.20	2.30	2.23	2.15	2.22	2.22	2.16	2.20	2.21	2.19	2.08	2.23	2.25	2.18	2.22	2.08	2.45	2.22	24
8	2.21	2.31	2.27	2.21	2.28	2.26	2.43	S	2.12	2.11	2.11	2.17	2.24	2.30	2.17	2.21	2.26	2.31	2.22	2.25	2.18	2.16	2.15	2.07	2.07	2.43	2.22	24
9	2.05	2.07	2.06	2.05	2.05	2.03	S	2.03	2.04	2.10	2.15	2.73	2.19	2.06	2.17	2.12	2.12	2.08	2.09	2.11	2.12	2.17	2.14	2.12	2.03	2.73	2.12	24
10	2.17	2.15	2.24	2.27	2.16	S	2.26	2.27	2.28	2.21	2.14	2.13	2.11	2.10	2.11	2.11	2.13	2.13	2.13	2.17	2.15	2.17	2.13	2.10	2.28	2.17	24	
11	2.19	2.20	2.20	2.27	S	2.32	2.32	2.21	2.23	2.22	2.05	2.03	2.01	2.01	2.03	2.02	2.05	2.06	2.07	2.08	2.04	2.06	2.05	2.06	2.01	2.32	2.12	24
12	2.11	2.09	2.10	S	2.14	2.13	2.13	2.23	2.15	2.11	2.10	2.10	2.06	2.04	2.19	2.19	2.19	2.19	2.14	2.11	2.02	2.05	2.10	2.09	2.02	2.19	2.12	24
13	2.03	2.06	S	2.12	2.08	2.11	2.19	2.39	2.39	2.22	2.25	2.26	2.22	2.19	2.28	2.24	2.11	2.10	2.08	2.06	2.11	2.02	2.06	2.03	2.02	2.39	2.16	24
14	2.04	S	2.04	2.03	2.06	2.06	2.06	2.09	2.02	2.02	2.03	2.04	2.03	2.02	2.03	2.04	2.05	2.02	2.02	2.02	2.03	2.12	2.32	2.22	2.02	2.32	2.06	24
15	S	2.11	2.20	2.13	2.11	2.12	2.07	2.14	2.15	2.16	2.09	2.05	2.11	2.05	2.03	2.04	2.07	2.20	2.14	2.12	2.32	2.38	2.39	S	2.03	2.39	2.14	24
16	2.29	2.16	2.26	2.20	2.13	2.05	2.05	2.10	2.01	2.01	2.00	2.03	2.01	2.03	2.04	2.08	2.08	2.21	2.21	2.49	2.17	2.21	S	2.07	2.00	2.49	2.13	24
17	2.10	2.38	2.18	2.06	2.06	2.06	2.09	2.10	2.09	2.04	2.04	2.08	2.07	2.07	2.08	2.04	2.26	2.16	2.08	2.10	2.10	S	2.07	2.15	2.04	2.38	2.11	24
18	2.08	2.22	2.11	2.08	2.07	2.09	2.10	2.10	2.13	2.08	2.05	2.10	2.11	2.12	2.07	2.26	2.09	2.10	2.15	2.21	S	2.10	2.09	2.13	2.05	2.26	2.11	24
19	2.18	2.09	2.09	2.09	2.17	2.16	2.45	2.35	2.15	2.28	2.25	2.33	2.29	2.35	2.58	2.79	2.79	2.67	2.60	S	2.54	2.44	3.48	2.58	2.09	3.48	2.42	24
20	2.63	2.99	3.09	3.20	2.98	2.85	2.72	2.55	2.49	2.45	2.47	2.23	2.21	2.29	2.18	2.22	2.36	2.34	S	2.74	2.76	2.65	2.42	2.42	2.18	3.20	2.58	24
21	2.48	2.38	2.28	2.22	2.20	2.16	2.13	2.14	2.14	2.13	2.14	2.10	2.06	2.02	2.02	P	2.01	S	2.10	4.64	3.85	2.40	5.40	2.91	2.01	5.40	2.54	23
22	3.55	4.12	3.11	3.14	3.15	3.72	3.11	3.13	3.03	2.95	2.94	2.58	2.40	2.53	2.62	2.96	S	2.89	2.62	2.63	4.34	5.49	2.88	2.81	2.40	5.49	3.16	24
23	2.60	2.82	3.29	2.61	2.40	2.28	2.34	2.36	2.29	2.26	2.15	2.15	2.19	2.82	2.55	S	2.14	2.11	2.09	2.12	2.23	2.16	2.12	2.17	2.09	3.29	2.36	24
24	2.14	2.11	2.23	2.26	2.21	2.14	2.19	2.22	2.21	2.18	2.22	2.17	2.12	2.10	S	2.06	2.10	2.08	2.16	2.09	2.09	2.10	2.10	2.10	2.06	2.26	2.15	24
25	2.11	2.08	2.09	2.09	2.12	2.16	2.12	2.15	2.08	2.08	2.07	2.08	2.08	S	2.06	2.06	2.08	2.08	2.11	2.19	2.10	2.16	2.28	2.61	2.06	2.61	2.13	24
26	2.44	2.18	2.10	2.08	2.08	2.06	2.07	2.08	2.06	2.05	2.10	S	2.05	2.04	2.11	2.09	2.17	2.12	2.06	2.19	2.08	2.50	2.90	2.04	2.90	2.16	24	
27	2.83	2.37	2.36	2.32	2.21	2.19	2.14	2.12	2.10	2.10	2.11	S	2.07	2.09	2.06	2.10	2.08	2.14	2.10	2.09	2.16	2.12	2.10	2.19	2.06	2.83	2.18	24
28	2.14	2.26	2.24	2.20	2.17	2.19	2.25	2.27	2.25	2.26	S	2.14	2.11	2.25	2.15	2.09	2.15	2.13	2.13	2.19	2.27	2.44	2.16	2.26	2.09	2.44	2.20	24
29	2.25	2.70	2.68	2.49	2.45	2.37	2.38	2.38	2.40	S	2.14	2.14	2.13	2.14	2.18	2.08	2.06	2.05	2.09	2.08	2.14	2.13	2.14	2.56	2.05	2.70	2.27	24
30	2.59	3.13	2.97	2.72	2.66	2.81	2.88	2.88	S	2.38	2.39	2.37	2.26	2.12	2.16	2.17	2.16	2.14	2.12	2.13	2.12	2.13	2.09	2.09	2.09	3.13	2.41	24
31	2.05	2.03	2.05	2.05	2.04	2.05	2.08	S	2.08	2.03	2.02	2.02	2.02	2.02	2.03	2.03	2.04	2.08	2.18	2.22	2.30	2.23	2.25	2.15	2.02	2.30	2.09	24
HOURLY MAX	3.55	4.12	3.29	3.20	3.15	3.72	3.11	3.13	3.03	2.95	2.94	2.73	2.40	2.82	2.62	2.96	2.79	2.89	2.64	4.64	4.34	5.49	5.40	2.91				
HOURLY AVG	2.29	2.35	2.35	2.29	2.24	2.25	2.26	2.25	2.19	2.18	2.16	2.17	2.12	2.15	2.15	2.15	2.13	2.17	2.18	2.29	2.31	2.30	2.34	2.26				

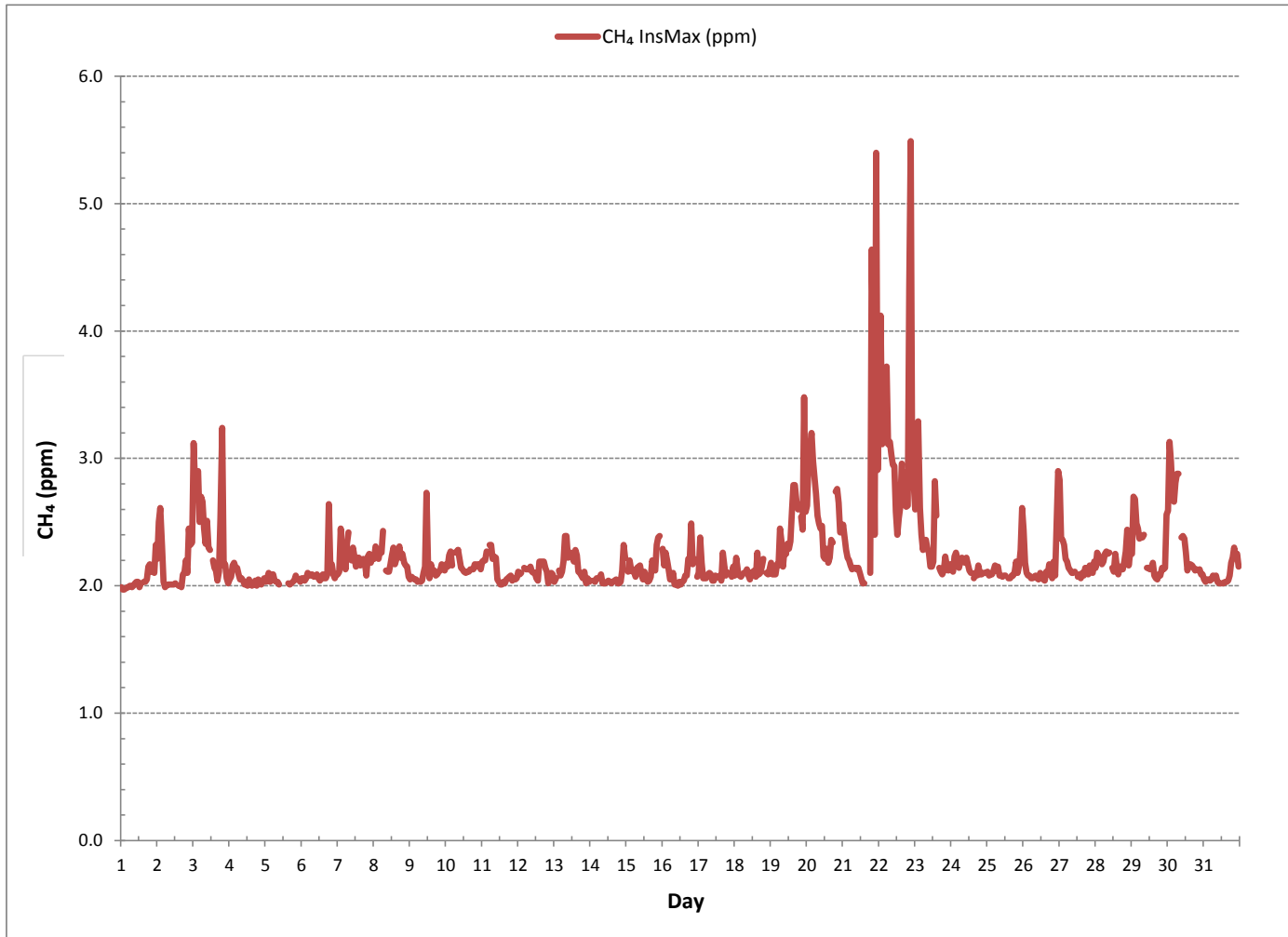
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

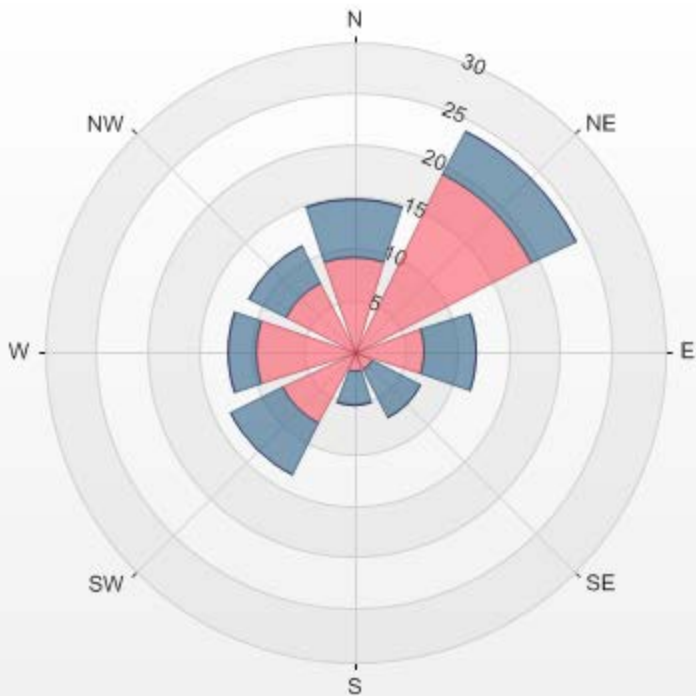
NUMBER OF NON-ZERO READINGS:	707
MAXIMUM INSTANTANEOUS VALUE:	5.49 ppm @ HOUR(S) 21 ON DAY(S) 22
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.34
OPERATIONAL TIME:	743 hrs

METHANE MAX Instantaneous Maximum (CH₄ ppm)

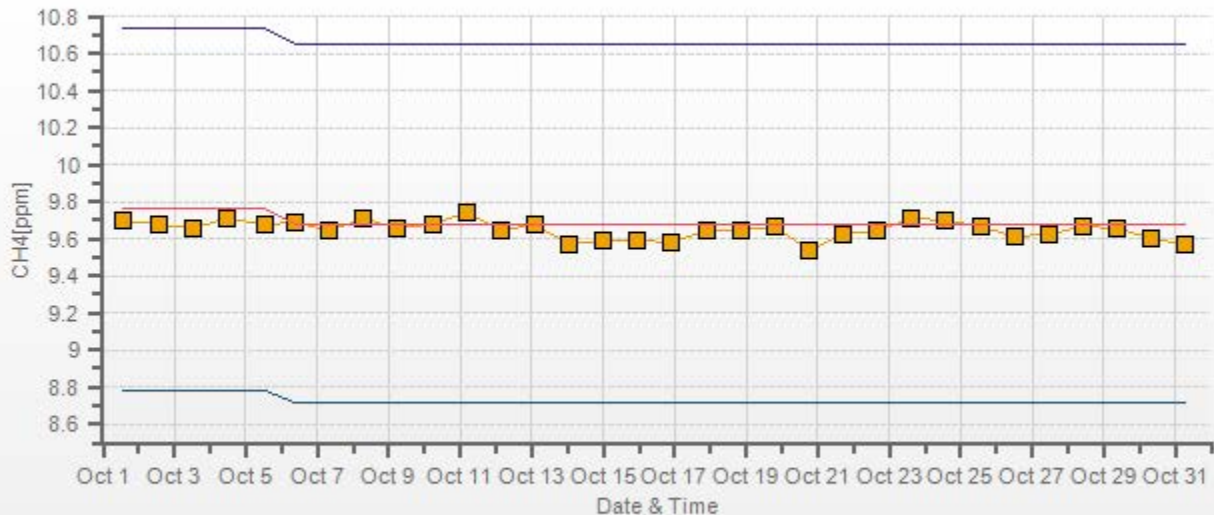


Wind: LICA Bonnyville Poll.: LICA Bonnyville-CH4[ppm] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppm]

Direction	0.0-1.0	1.0-2.1	2.1-3.1	>3.1	Total
N	0	9.19	5.52	0	14.71
NE	0	19.24	4.67	0	23.91
E	0	6.79	4.95	0	11.74
SE	0	1.98	5.09	0	7.07
S	0	1.84	3.39	0	5.23
SW	0	7.78	5.66	0	13.44
W	0	9.62	2.69	0	12.31
NW	0	7.36	4.24	0	11.6
Summary	0	63.8	36.21	0	100



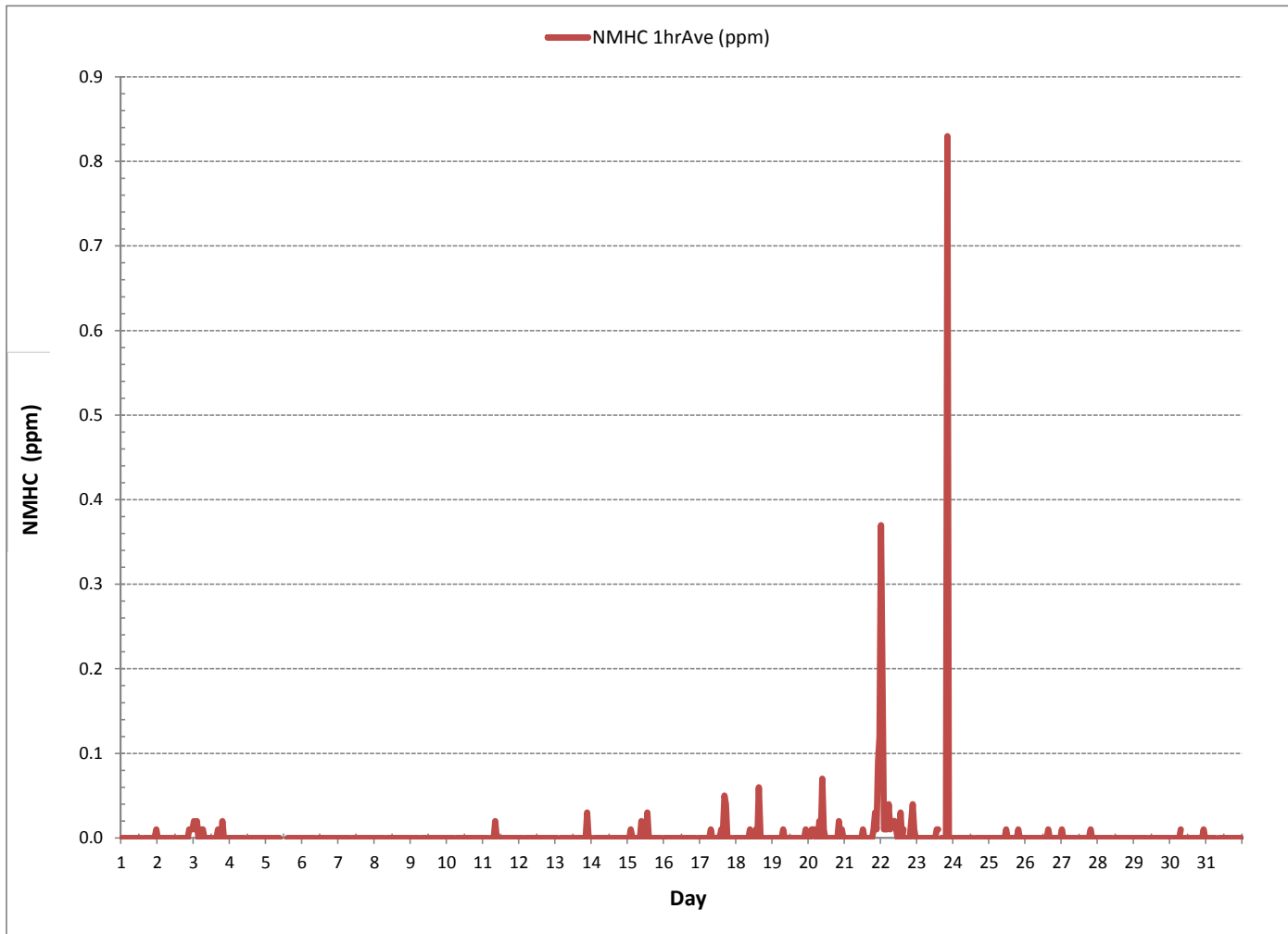
CH4[ppm] Calibration: LICA Bonnyville Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

NON-METHANE HYDROCARBON

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)





NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	24
2	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	S	0.11	0.00	0.07	0.00	0.17	0.00	0.00	0.20	0.13	0.13	0.00	0.20	0.04	24	
3	0.16	0.14	0.20	0.09	0.00	0.12	0.13	0.11	0.00	0.00	0.12	0.00	S	0.00	0.00	0.31	0.14	0.00	0.14	0.16	0.10	0.00	0.00	0.00	0.00	0.00	0.31	0.08	24
4	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.01	24	
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.01	24	
7	0.00	0.00	0.00	0.00	0.14	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.01	24	
8	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
9	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.13	0.05	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.01	24	
10	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00	24	
11	0.00	0.00	0.00	0.00	S	0.19	0.00	0.07	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.02	24	
12	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
13	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.46	0.02	24	
14	0.00	S	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.01	24	
15	S	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.37	0.07	0.00	0.00	0.44	0.13	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.44	0.06	24	
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.22	0.01	24	
17	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.16	0.29	0.18	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.35	0.05	24	
18	0.00	0.00	0.00	0.00	0.11	0.11	0.05	0.00	0.23	0.00	0.04	0.06	0.10	0.00	0.63	0.00	0.13	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.06	24	
19	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11	0.03	0.15	S	0.00	0.05	0.16	0.00	0.00	0.18	0.03	24		
20	0.00	0.14	0.15	0.12	0.09	0.08	0.10	0.18	0.08	0.23	0.12	0.00	0.10	0.06	0.00	0.14	0.14	0.00	S	0.15	0.13	0.06	0.12	0.00	0.00	0.23	0.10	24	
21	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.10	0.00	0.09	0.43	0.00	0.17	P	0.00	S	0.00	0.43	0.43	0.22	0.58	0.44	0.00	0.58	0.14	23		
22	0.49	0.48	0.14	0.15	0.11	0.21	0.15	0.18	0.17	0.19	0.19	0.11	0.00	0.35	0.00	0.17	S	0.00	0.00	0.00	0.29	0.48	0.15	0.11	0.00	0.49	0.18	24	
23	0.00	0.04	0.13	0.00	0.00	0.09	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.12	0.33	S	0.00	0.00	0.00	0.20	4.45	0.00	0.00	0.00	0.00	4.45	0.24	24	
24	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	24	
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	S	0.12	0.00	0.00	0.00	0.00	0.60	0.12	0.00	0.00	0.00	0.00	0.60	0.05	24	
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.25	0.00	0.00	0.12	0.00	0.00	0.00	0.06	0.07	0.00	0.25	0.02	24	
27	0.10	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.14	0.00	0.00	0.11	0.13	0.13	0.16	0.00	0.00	0.00	0.00	0.00	0.16	0.04	24	
28	0.00	0.00	0.00	0.00	0.00	0.07	0.09	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.01	24	
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.15	0.00	0.15	0.01	24	
30	0.00	0.13	0.07	0.04	0.05	0.09	0.10	0.42	S	0.03	0.00	0.01	0.00	0.00	0.00	0.17	0.00	0.08	0.00	0.00	0.00	0.17	0.00	0.00	0.42	0.06	24		
31	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.05	0.00	0.07	0.00	0.00	0.07	0.01	24	
HOURLY MAX	0.49	0.48	0.20	0.15	0.12	0.21	0.15	0.42	0.26	0.37	0.19	0.25	0.43	0.44	0.35	0.63	0.29	0.18	0.17	0.60	4.45	0.48	0.58	0.44					
HOURLY AVG	0.03	0.04	0.03	0.01	0.02	0.04	0.02	0.05	0.03	0.04	0.02	0.02	0.02	0.05	0.05	0.06	0.04	0.02	0.03	0.06	0.19	0.05	0.05	0.03					

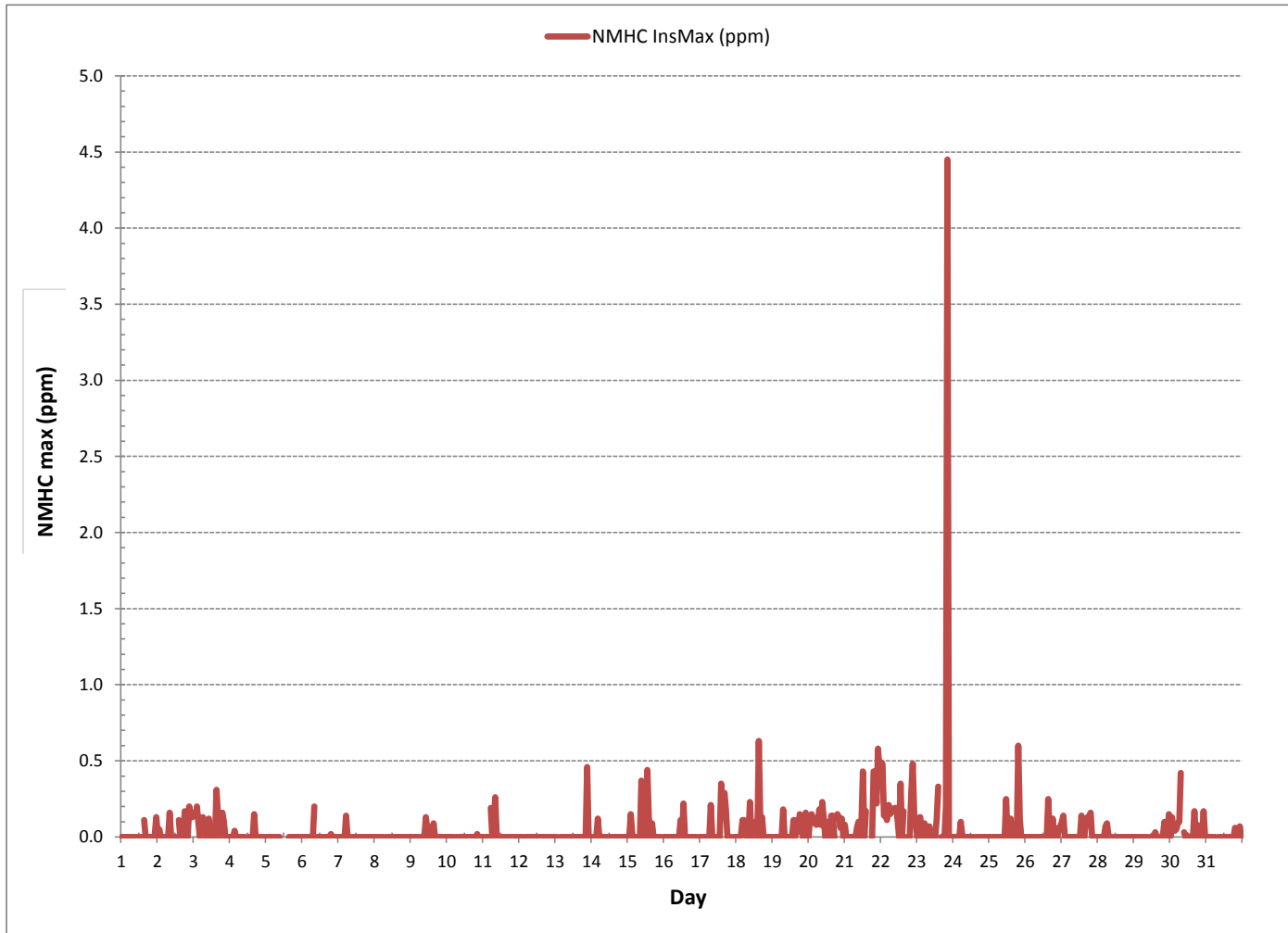
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

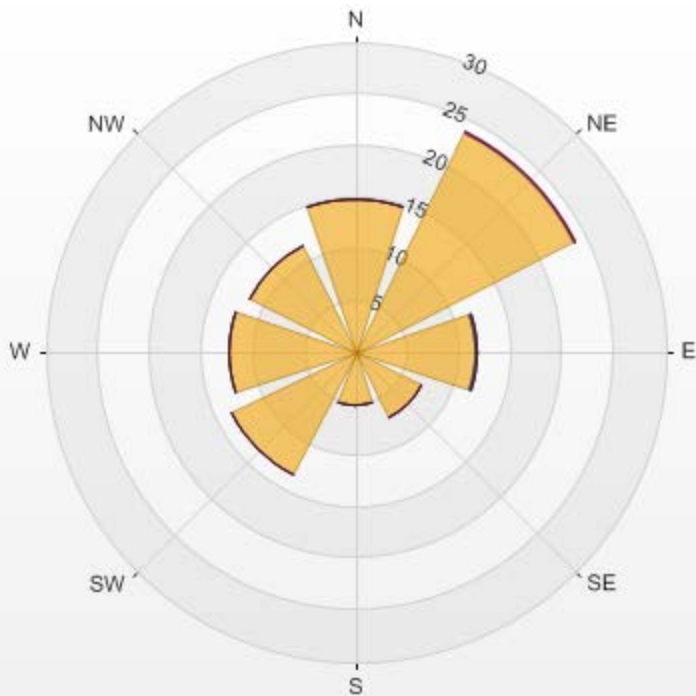
NUMBER OF NON-ZERO READINGS:	156
MAXIMUM INSTANTANEOUS VALUE:	4.45 ppm @ HOUR(S) 20 ON DAY(S) 23
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	743 hrs
STANDARD DEVIATION:	0.19

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



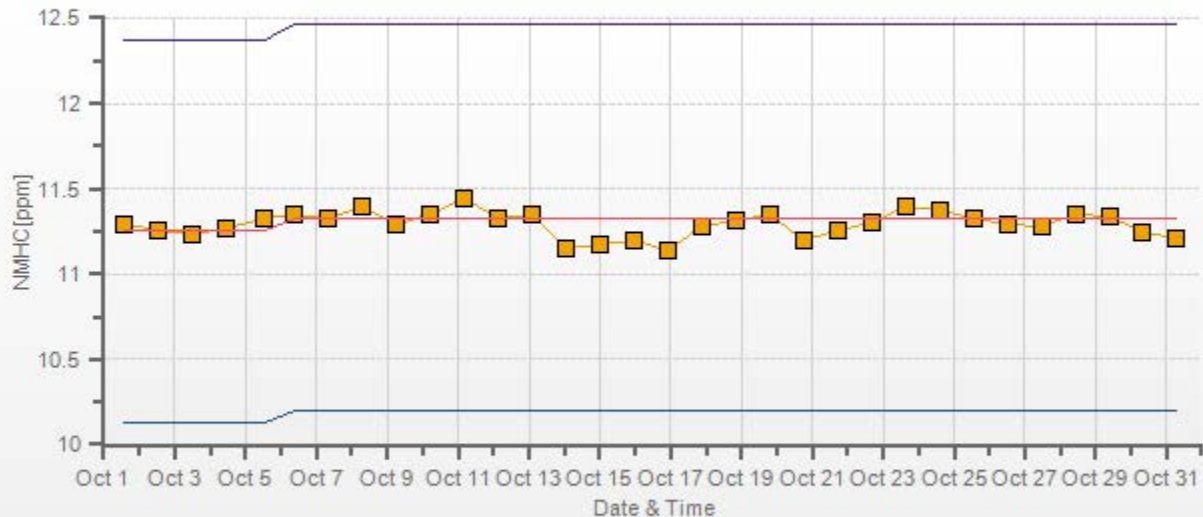
Wind: LICA Bonnyville Poll.: LICA Bonnyville-NMHC[ppm] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.03% Calm Avg: 0.00 [ppm]

Direction	0-0.168	0.168-0.336	0.336-0.504	0.504-0.672	0.672-0.84	>0.8	Total
N	14.71	0	0	0	0	0	14.71
NE	23.62	0.14	0	0	0.14	0	23.9
E	11.6	0	0.14	0	0	0	11.74
SE	7.07	0	0	0	0	0	7.07
S	5.23	0	0	0	0	0	5.23
SW	13.44	0	0	0	0	0	13.44
W	12.31	0	0	0	0	0	12.31
NW	11.6	0	0	0	0	0	11.6
Summary	100	0.14	0.14	0	0.14	0	100



% Icon Classes (ppm)	100	0-0.168	0	0.168-0.336	0	0.336-0.504	0	0.504-0.672	0	0.672-0.84	0	>0.8

NMHC[ppm] Calibration: LICA Bonnyville Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

OXIDES OF NITROGEN



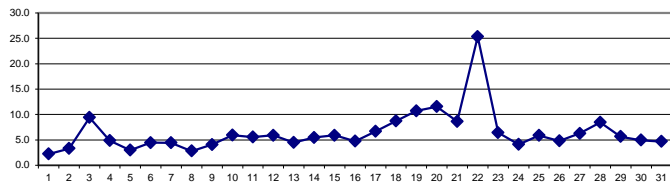
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.3	0.9	0.6	0.7	0.7	0.9	1.4	2.3	2.0	3.5	2.6	3.6	2.4	2.9	S	3.7	3.0	3.3	2.7	2.9	3.4	2.3	2.2	2.2	0.6	3.7	2.2	24	
2	2.3	2.6	2.2	1.8	0.6	1.0	1.5	1.4	1.4	1.5	0.7	0.7	0.9	S	1.9	0.9	1.1	1.2	7.2	2.1	8.6	8.3	15.2	10.6	0.6	15.2	3.3	24	
3	12.0	12.3	9.8	9.1	8.8	9.8	14.2	18.9	10.4	8.4	5.7	6.7	S	5.0	4.2	3.6	10.4	12.5	17.7	19.6	9.3	4.6	2.7	1.0	1.0	19.6	9.4	24	
4	1.7	2.4	4.6	9.0	6.3	6.9	7.9	9.7	8.8	5.3	4.3	S	5.7	3.6	3.7	4.3	4.6	4.3	3.9	3.7	3.1	2.4	2.6	3.2	1.7	9.7	4.9	24	
5	2.7	3.0	3.2	2.0	3.0	4.8	5.2	4.9	4.0	3.5	S	4.1	2.8	2.4	2.1	2.4	2.8	2.7	2.3	2.4	2.5	2.4	1.5	1.7	1.5	5.2	3.0	24	
6	2.2	2.5	2.1	3.1	4.8	4.5	5.1	5.9	4.8	C	C	C	C	C	C	C	5.2	6.3	6.5	5.4	6.8	6.9	3.5	2.5	2.2	2.1	6.9	4.5	24
7	2.2	2.0	2.2	0.6	1.7	3.9	6.9	6.1	S	5.0	6.4	7.7	5.3	4.4	4.2	5.7	5.7	7.8	7.2	5.3	2.6	2.5	3.4	2.7	0.6	7.8	4.4	24	
8	2.3	2.9	2.5	2.6	2.9	4.3	5.7	S	3.1	1.7	1.7	1.8	2.2	2.5	2.7	3.6	4.0	2.4	2.7	4.4	2.7	2.2	1.7	2.0	1.7	5.7	2.8	24	
9	1.7	1.6	1.7	1.4	1.9	2.1	S	2.8	4.3	6.2	5.7	6.0	6.1	6.0	6.2	5.9	3.8	3.6	4.1	4.4	5.1	4.0	4.2	5.3	1.4	6.2	4.1	24	
10	4.5	4.5	5.2	7.1	10.6	S	9.3	9.2	9.3	7.3	5.7	6.4	4.7	3.9	4.1	4.8	5.4	4.9	5.4	5.5	5.6	5.2	3.9	3.8	3.8	10.6	5.9	24	
11	4.3	4.9	5.3	6.1	S	12.8	12.3	10.8	11.4	9.4	3.1	4.2	2.1	4.7	5.9	3.1	7.2	3.8	7.3	2.9	1.5	2.2	1.2	1.5	1.2	12.8	5.6	24	
12	2.8	2.8	2.9	S	3.6	4.2	7.1	10.6	10.1	7.6	9.1	8.9	4.1	5.3	9.0	8.8	8.5	10.1	7.3	4.9	2.1	1.8	2.2	2.0	1.8	10.6	5.9	24	
13	1.8	2.5	S	3.8	4.0	5.6	5.8	8.6	6.3	5.8	6.1	5.1	5.5	4.2	6.5	6.1	5.7	4.1	3.9	3.5	2.3	2.0	2.2	2.3	1.8	8.6	4.5	24	
14	2.4	S	3.5	2.3	2.6	3.5	5.4	11.8	5.3	6.6	5.4	8.2	5.6	5.3	6.1	5.5	6.7	4.9	3.5	4.4	4.3	5.8	10.6	6.0	2.3	11.8	5.5	24	
15	S	7.8	7.5	6.5	4.6	4.5	3.4	4.3	4.4	10.2	10.4	7.0	6.8	6.6	5.7	5.5	4.9	4.8	5.6	4.3	5.6	5.3	4.2	S	3.4	10.4	5.9	24	
16	3.6	1.5	1.6	2.6	2.9	2.4	1.9	1.5	2.7	5.6	6.9	4.7	3.4	7.5	4.2	5.7	7.4	6.7	9.7	8.2	5.7	8.6	S	4.1	1.5	9.7	4.7	24	
17	3.4	3.4	2.8	3.8	4.6	5.7	9.3	13.8	7.4	8.9	7.3	8.2	9.8	6.3	8.5	7.3	9.6	9.1	6.3	6.6	5.4	S	3.3	2.9	2.8	13.8	6.7	24	
18	3.3	3.8	4.0	3.5	4.1	6.6	8.4	11.8	11.2	8.7	9.4	13.4	13.4	12.5	11.3	15.9	15.2	11.7	8.2	9.7	S	5.5	5.8	3.2	3.2	15.9	8.7	24	
19	3.5	1.0	1.1	5.0	3.5	8.8	19.1	29.6	10.0	5.2	6.6	11.6	9.4	8.5	15.5	16.3	16.5	15.0	13.5	S	16.7	10.5	10.4	8.6	1.0	29.6	10.7	24	
20	8.8	12.5	9.2	8.3	10.2	11.0	10.8	19.4	10.6	8.5	7.6	6.8	6.5	16.3	9.0	8.6	6.7	12.3	S	17.3	23.2	23.4	12.7	6.4	6.4	23.4	11.6	24	
21	9.6	6.0	4.3	5.6	4.9	5.5	4.7	7.4	5.9	4.3	5.9	6.1	4.9	4.2	7.3	4.1	5.7	S	11.5	8.8	19.8	10.4	22.7	28.8	4.1	28.8	8.6	24	
22	47.3	44.3	18.9	19.6	24.6	44.0	32.8	58.6	56.7	49.5	28.1	19.9	16.7	15.9	11.7	13.3	S	10.9	9.8	7.4	13.3	14.5	17.5	7.8	7.4	58.6	25.4	24	
23	7.5	7.3	5.8	8.0	4.9	2.7	3.3	7.8	7.1	4.7	4.2	3.1	6.0	15.0	11.4	S	15.7	8.6	5.5	4.5	4.3	4.0	3.5	2.9	2.7	15.7	6.4	24	
24	2.8	2.9	2.4	2.3	2.9	3.7	4.4	7.1	5.4	4.4	3.6	5.0	4.8	6.7	S	8.6	6.6	4.8	2.9	3.3	3.1	2.5	1.7	2.4	1.7	8.6	4.1	24	
25	2.2	1.8	2.0	2.1	2.4	3.7	6.1	8.0	8.9	6.9	8.0	8.9	7.5	S	8.5	8.1	8.9	6.1	7.8	6.5	5.4	4.6	5.7	5.4	1.8	8.9	5.9	24	
26	4.0	3.3	2.4	2.4	3.5	4.4	6.3	8.3	5.6	5.4	4.9	6.1	S	4.7	4.6	7.8	7.3	7.5	6.2	3.0	1.7	2.0	6.4	3.2	1.7	8.3	4.8	24	
27	4.9	6.5	5.3	5.0	4.3	4.7	6.8	7.7	6.7	6.9	6.1	S	6.6	7.7	9.2	10.1	6.9	8.0	6.6	4.9	7.1	6.3	3.9	2.3	2.3	10.1	6.3	24	
28	3.6	7.6	6.7	7.7	7.2	12.8	16.2	15.6	13.7	12.4	S	9.3	8.3	5.4	5.5	7.8	9.7	9.4	12.7	4.8	6.4	3.7	3.6	4.5	3.6	16.2	8.5	24	
29	5.0	7.2	6.9	6.0	5.9	5.6	9.1	6.5	8.1	S	6.5	6.7	6.5	6.8	8.3	3.6	5.3	3.6	6.3	3.2	2.5	3.3	3.2	3.8	2.5	9.1	5.6	24	
30	5.9	6.2	5.6	4.7	4.5	4.5	2.9	5.9	S	5.7	4.2	4.7	3.3	3.5	6.5	6.2	6.0	5.2	5.4	6.1	5.9	4.9	3.8	2.3	2.3	6.5	5.0	24	
31	1.0	1.1	1.4	1.8	1.5	2.4	3.5	S	5.6	3.5	3.0	3.6	3.4	4.3	8.1	4.6	5.1	6.4	9.6	11.3	9.3	6.4	6.6	4.3	1.0	11.3	4.7	24	
HOURLY MAX	47.3	44.3	18.9	19.6	24.6	44.0	32.8	58.6	56.7	49.5	28.1	19.9	16.7	16.3	15.5	16.3	16.5	15.0	17.7	19.6	23.2	23.4	22.7	28.8					
HOURLY AVG	5.4	5.6	4.5	4.8	4.9	6.6	7.9	10.9	8.7	7.7	6.4	6.7	5.9	6.5	6.9	6.6	7.1	6.7	6.9	6.1	6.5	5.5	5.7	4.6					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

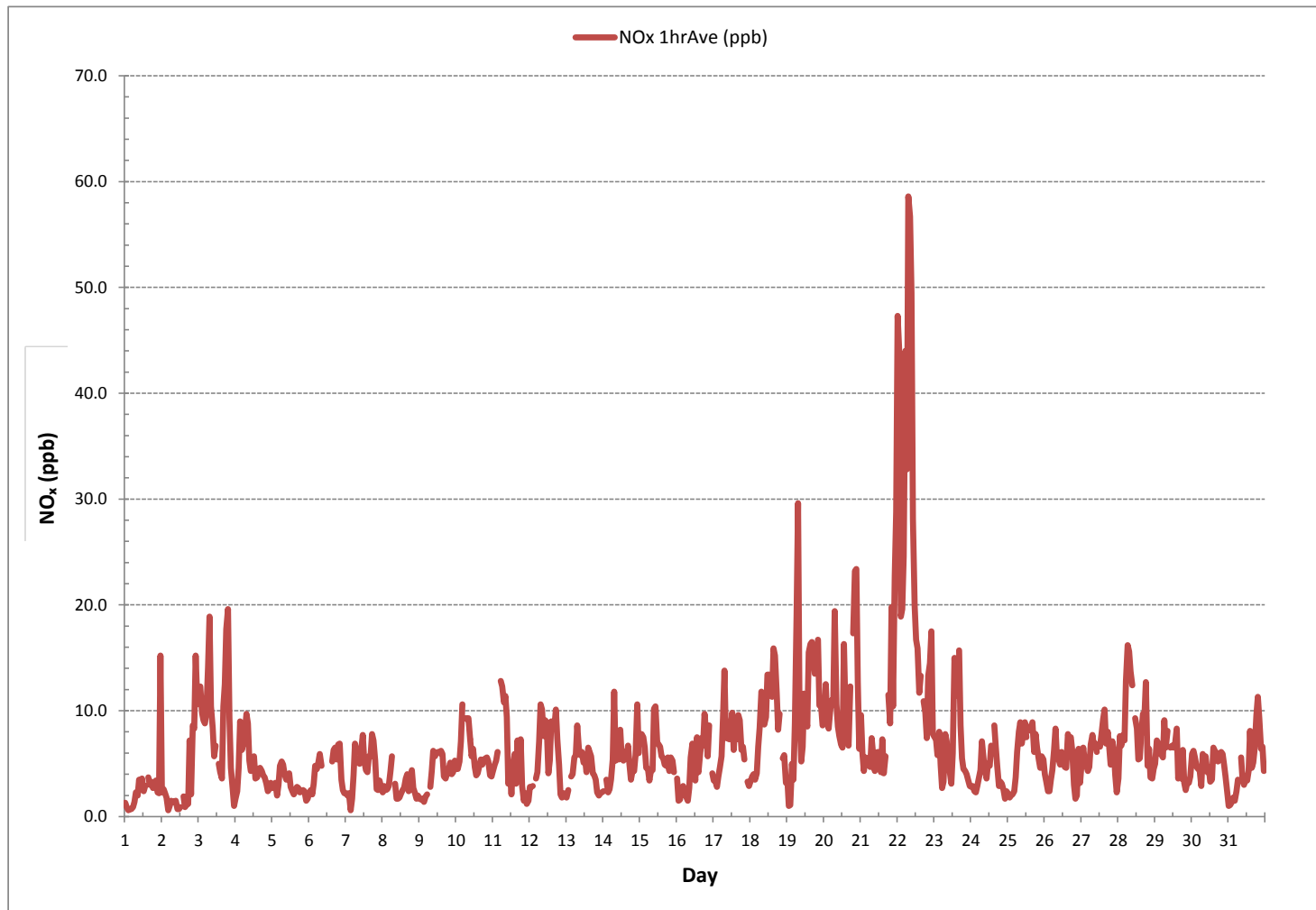
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	707			
MINIMUM 1-HR AVERAGE:	0.6 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	58.6 ppb	@ HOUR(S)	7	ON DAY(S) 22
MAXIMUM 24-HR AVERAGE:	25.4 ppb			ON DAY(S) 22
				VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	5.86	MONTHLY AVERAGE:	6.5 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	3.9	2.1	1.5	1.7	2.0	3.3	3.5	5.0	3.6	7.6	4.9	6.8	4.0	4.8	S	4.9	4.3	15.5	5.1	4.9	5.2	3.7	3.7	4.6	1.5	15.5	4.6	24
2	4.7	4.5	3.8	4.5	1.3	2.0	2.8	2.5	2.8	3.3	2.6	1.8	1.9	S	3.0	2.2	2.9	4.8	73.8	5.5	18.4	18.2	28.9	15.3	1.3	73.8	9.2	24
3	15.1	16.1	12.5	13.3	11.9	13.3	22.4	32.9	14.7	22.1	17.3	33.5	S	32.3	20.0	7.0	22.3	15.6	26.7	30.1	20.4	9.3	5.9	3.1	3.1	33.5	18.2	24
4	2.8	4.6	8.7	17.8	13.1	10.9	12.7	13.0	16.3	8.8	6.8	S	11.9	5.0	5.5	6.3	7.8	8.1	7.5	6.8	5.3	4.2	5.9	5.2	2.8	17.8	8.5	24
5	5.3	4.8	5.0	4.8	21.7	7.2	8.6	7.0	6.5	5.7	S	7.1	5.1	3.7	4.8	5.0	5.5	6.5	4.4	4.2	5.5	5.2	2.6	3.7	2.6	21.7	6.1	24
6	4.5	4.6	3.9	4.6	7.7	6.6	7.7	8.6	C	C	C	C	C	C	C	8.3	24.1	9.9	7.6	9.8	10.9	7.2	5.1	4.0	3.9	24.1	7.9	24
7	4.4	3.6	4.8	3.1	5.7	11.1	35.4	22.3	S	9.6	27.6	17.2	38.8	30.2	10.3	32.0	18.2	49.4	17.8	8.2	7.0	5.2	4.7	4.9	3.1	49.4	16.2	24
8	3.9	5.2	3.9	4.5	4.2	6.3	9.9	S	5.5	11.7	10.0	18.1	17.9	4.9	21.0	11.7	13.1	16.7	14.6	30.0	4.5	6.0	3.4	3.3	3.3	30.0	10.0	24
9	3.0	2.6	2.8	2.4	3.6	3.3	S	4.1	6.7	10.9	9.0	8.2	9.7	9.3	10.7	10.1	6.0	6.3	7.1	7.7	9.2	7.4	5.8	6.5	2.4	10.9	6.6	24
10	6.5	6.4	9.9	9.9	17.4	S	12.3	13.1	12.3	10.7	8.2	9.3	7.8	5.8	9.1	6.5	8.0	7.3	8.0	8.5	7.5	8.0	7.2	6.5	5.8	17.4	9.0	24
11	6.4	6.2	7.2	8.9	S	21.6	15.1	15.7	15.6	19.8	6.3	9.2	18.8	33.1	41.7	20.8	21.1	6.9	12.8	10.7	23.8	8.1	2.8	2.7	2.7	41.7	14.6	24
12	8.0	12.5	4.3	S	6.0	18.8	48.4	44.8	44.0	36.1	43.2	40.3	16.0	24.3	17.0	11.8	12.8	18.2	10.7	10.5	4.0	3.9	4.4	4.8	3.9	48.4	19.3	24
13	3.5	5.1	S	6.2	6.3	10.7	13.4	32.3	35.4	12.3	24.6	31.8	8.9	7.6	35.8	15.3	11.4	10.9	6.1	6.1	6.1	4.2	3.7	4.3	3.5	35.8	13.1	24
14	4.2	S	5.8	4.9	4.6	5.8	15.5	27.1	8.4	9.5	8.1	14.3	8.6	7.4	10.3	9.3	10.1	7.2	8.5	10.5	10.1	10.1	15.9	11.8	4.2	27.1	9.9	24
15	S	10.9	10.1	12.3	6.6	7.4	6.8	6.9	7.9	16.1	16.7	10.7	9.9	13.0	31.3	7.8	23.1	33.5	10.5	21.8	8.9	15.8	6.7	S	6.6	33.5	13.4	24
16	6.6	2.8	3.2	4.7	6.1	4.3	3.7	3.1	4.7	10.7	13.5	12.3	5.5	38.0	6.4	12.0	11.3	9.6	15.0	14.8	8.6	12.9	S	6.3	2.8	38.0	9.4	24
17	5.7	5.7	5.7	7.1	8.2	8.8	21.1	21.2	12.7	13.7	11.2	11.6	15.6	11.1	15.1	10.1	12.3	12.3	10.1	9.2	9.3	S	5.4	5.0	5.0	21.2	10.8	24
18	6.0	7.2	7.3	5.8	7.0	9.8	11.4	17.2	13.9	14.9	20.4	17.7	20.6	22.3	18.8	44.1	22.8	17.8	11.7	15.6	S	9.6	9.6	7.3	5.8	44.1	14.7	24
19	9.3	2.3	2.7	32.0	14.1	60.2	57.1	56.0	19.7	36.9	39.0	37.2	58.7	33.9	30.7	58.7	29.2	41.4	77.5	S	34.1	46.4	14.3	13.0	2.3	77.5	35.0	24
20	10.5	17.9	12.1	31.3	12.7	17.0	14.8	89.7	36.1	28.5	23.7	33.0	27.8	58.7	44.2	28.7	35.6	57.3	S	34.4	30.4	103.0	69.8	10.5	10.5	103.0	36.0	24
21	13.9	9.2	6.4	23.0	6.8	8.7	9.0	30.3	9.5	7.5	20.6	28.0	29.9	28.7	48.6	P	59.9	S	63.5	24.1	72.5	31.2	41.9	62.6	6.4	72.5	28.9	23
22	55.4	61.6	28.9	24.9	36.5	58.8	49.0	77.2	76.9	64.4	54.3	33.5	23.5	66.3	50.0	28.4	S	18.7	40.8	10.9	34.0	21.0	91.3	10.3	10.3	91.3	44.2	24
23	26.3	12.5	10.6	16.1	10.3	4.2	7.5	45.7	18.8	9.0	28.4	5.8	10.7	22.3	17.0	S	24.4	17.2	10.3	20.5	6.2	6.2	5.2	5.0	4.2	45.7	14.8	24
24	4.3	4.5	4.1	3.9	4.5	13.6	9.1	17.5	22.8	9.8	8.2	17.9	18.0	121.6	S	50.0	10.6	7.0	5.7	5.8	4.8	4.7	3.4	4.5	3.4	121.6	15.5	24
25	3.7	3.6	3.6	3.5	4.0	6.0	10.0	11.1	12.5	10.8	12.2	24.0	12.5	S	18.5	10.9	11.5	10.8	14.7	11.0	8.2	6.6	8.5	7.7	3.5	24.0	9.8	24
26	6.3	5.4	3.8	3.5	5.5	6.9	8.9	11.1	10.0	7.1	7.4	9.0	S	7.5	7.6	34.9	11.4	11.9	9.4	26.6	4.1	5.5	16.1	10.9	3.5	34.9	10.0	24
27	11.5	11.1	6.8	7.9	7.8	7.7	9.9	10.0	10.3	9.8	9.6	S	10.6	24.8	13.0	15.6	10.3	12.5	12.1	8.0	9.9	9.0	7.1	5.1	5.1	24.8	10.5	24
28	6.3	10.9	9.2	11.1	10.7	18.2	20.8	32.8	29.9	16.2	S	15.4	59.6	7.9	22.4	22.6	18.0	14.3	52.7	33.4	27.5	8.0	6.5	5.8	5.8	59.6	20.0	24
29	39.2	10.1	9.4	9.9	11.2	12.5	16.9	16.9	25.1	S	9.0	9.4	10.6	10.3	13.5	21.0	34.1	33.2	52.1	8.4	4.7	27.4	27.8	9.9	4.7	52.1	18.4	24
30	8.7	40.3	8.0	6.7	7.0	6.8	6.5	32.0	S	21.8	7.5	7.8	5.4	6.9	10.7	9.4	8.1	7.0	8.3	10.4	8.9	8.7	6.3	6.6	5.4	40.3	10.9	24
31	2.5	2.6	3.1	3.9	3.3	4.6	24.8	S	16.3	6.7	16.8	11.3	7.6	8.6	13.4	6.8	7.6	11.4	23.4	19.6	12.8	9.8	9.7	6.0	2.5	24.8	10.1	24
HOURLY MAX	55.4	61.6	28.9	32.0	36.5	60.2	57.1	89.7	76.9	64.4	54.3	40.3	59.6	121.6	50.0	58.7	59.9	57.3	77.5	34.4	72.5	103.0	91.3	62.6				
HOURLY AVG	9.7	9.9	7.0	9.8	8.9	12.5	16.5	24.4	17.8	15.6	16.7	17.2	17.0	23.2	19.7	17.7	16.6	16.6	21.0	14.3	14.1	14.2	14.3	8.6				

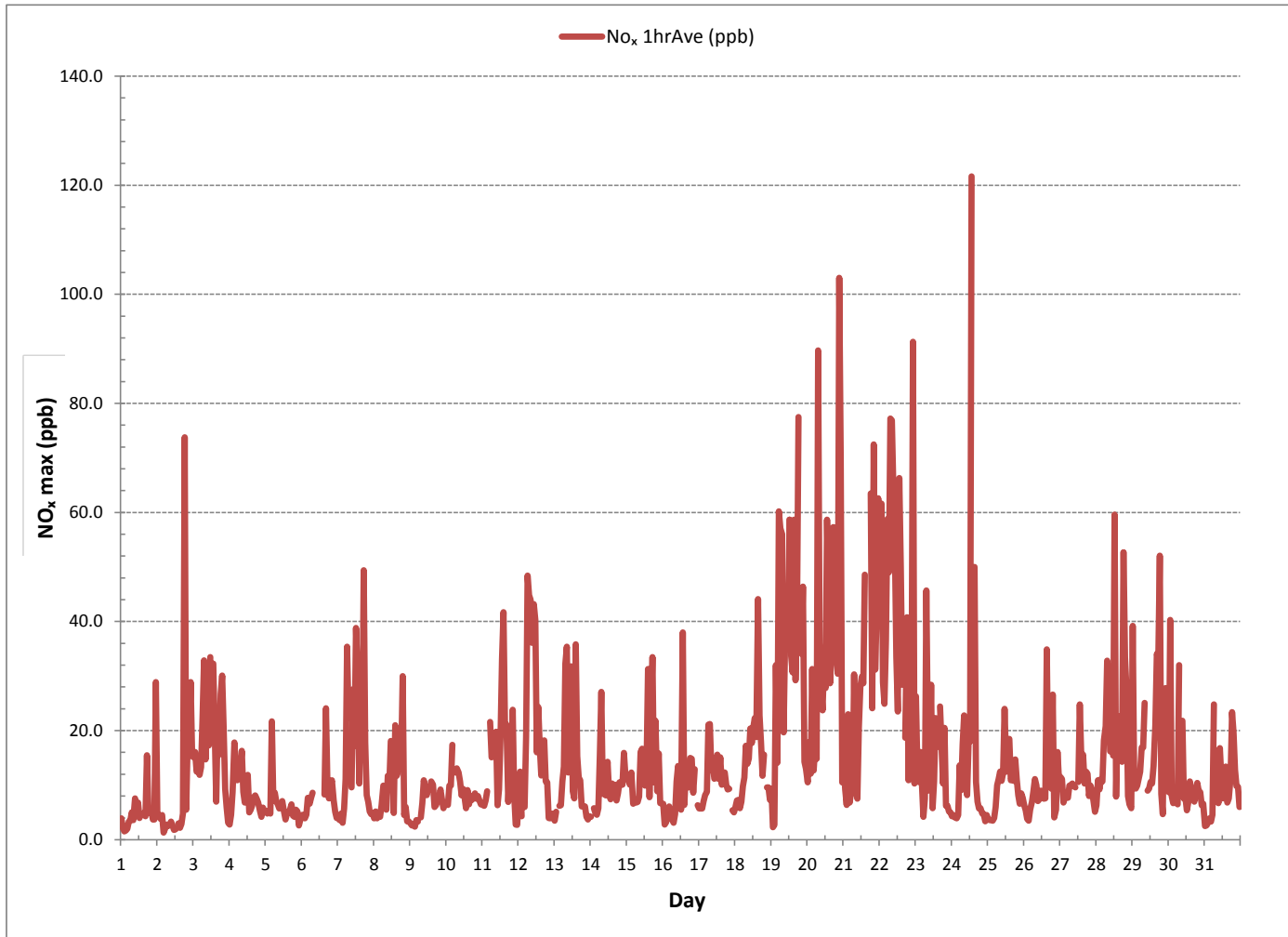
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

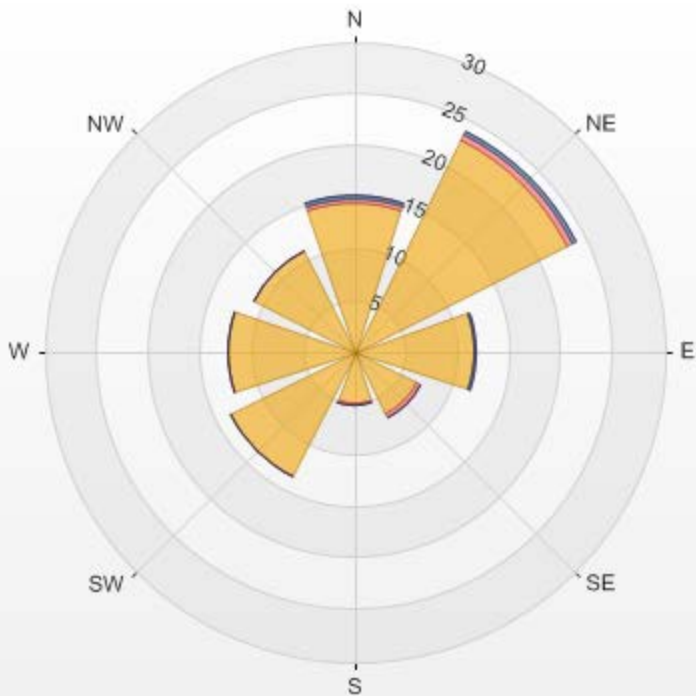
NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	121.6 ppb @ HOUR(S) 13 ON DAY(S) 24
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	15.02
OPERATIONAL TIME:	743 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-NOX[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0.0-19.6	19.6-39.1	39.1-58.7	>58.7	Total
N	14.33	0.57	0.28	0	15.18
NE	22.98	0.57	0.43	0	23.98
E	11.63	0	0.14	0	11.77
SE	6.81	0.28	0	0	7.09
S	4.96	0.28	0	0	5.24
SW	13.48	0	0	0	13.48
W	12.34	0	0	0	12.34
NW	10.92	0	0	0	10.92
Summary	97.45	1.7	0.85	0	100



% Icon Classes (ppb)	97	2	1	0
	0.0-19.6	19.6-39.1	39.1-58.7	>58.7

NOX[ppb] Calibration: LICA Bonnyville Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

NITRIC OXIDES

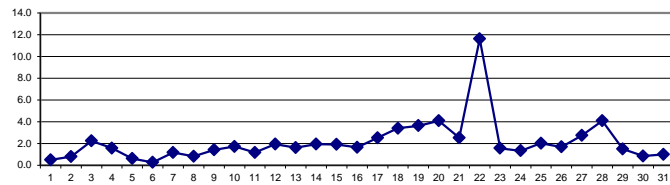
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.8	0.4	0.8	0.5	0.7	S	0.8	0.7	0.8	0.9	1.0	1.0	0.7	0.7	1.0	0.0	1.0	0.5	24
2	0.9	0.8	0.3	0.1	0.0	0.3	0.4	0.5	0.6	0.7	0.4	0.5	0.8	S	0.7	0.3	0.4	0.3	2.9	0.4	1.3	1.1	3.3	1.2	0.0	3.3	0.8	24
3	1.1	1.8	0.7	1.7	1.0	1.7	4.6	9.0	5.0	4.4	2.6	3.4	S	1.8	1.7	0.6	2.1	1.5	2.1	3.2	0.9	0.4	0.5	0.0	0.0	9.0	2.3	24
4	0.1	0.2	0.9	2.1	1.6	2.3	2.9	4.0	4.3	2.5	2.1	S	2.1	1.2	1.1	1.5	1.8	1.2	1.2	0.8	0.7	0.5	0.7	0.6	0.1	4.3	1.6	24
5	0.5	0.5	0.4	0.5	1.0	1.0	1.2	1.6	1.5	1.4	S	1.4	0.9	0.7	0.4	0.6	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.6	24
6	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	C	C	C	C	C	C	1.2	1.4	0.6	0.3	0.4	0.4	0.2	0.0	0.0	0.0	1.4	0.3	24
7	0.0	0.0	0.0	0.0	0.0	0.5	1.4	1.4	S	1.8	2.9	3.0	2.3	1.5	1.5	2.1	2.3	2.3	1.2	0.8	0.5	0.5	0.7	0.3	0.0	3.0	1.2	24
8	0.2	0.4	0.5	0.5	0.4	0.9	1.6	S	0.9	0.7	0.5	0.5	1.0	1.0	1.1	1.6	1.7	0.7	0.8	1.6	0.7	0.8	0.4	0.3	0.2	1.7	0.8	24
9	0.3	0.4	0.5	0.4	0.6	0.7	S	0.8	1.5	2.5	2.6	2.9	2.8	2.7	2.9	2.9	1.4	1.0	1.1	1.2	1.3	0.8	0.6	0.7	0.3	2.9	1.4	24
10	0.9	1.0	0.9	1.7	2.3	S	2.3	2.9	3.8	3.7	2.9	3.4	2.4	1.9	1.8	1.6	1.2	1.0	0.9	0.7	1.0	0.8	0.2	0.3	0.2	3.8	1.7	24
11	0.3	0.3	0.2	0.4	S	1.4	1.1	1.6	2.9	2.8	0.9	1.3	0.8	2.3	3.4	1.5	2.3	0.8	2.0	0.5	0.2	0.0	0.0	0.0	0.0	3.4	1.2	24
12	0.0	0.0	0.0	S	0.0	0.3	2.3	4.8	3.9	3.7	4.0	5.0	1.9	3.4	3.6	2.9	2.3	1.8	1.6	1.3	0.5	0.3	0.4	0.5	0.0	5.0	1.9	24
13	0.6	0.7	S	0.8	0.9	1.3	1.7	3.7	3.1	3.2	2.9	2.6	2.5	1.6	2.6	2.3	1.9	1.1	1.0	0.9	0.7	0.4	0.3	0.4	0.3	3.7	1.6	24
14	0.4	S	0.4	0.3	0.3	0.7	1.7	4.3	1.3	2.1	2.2	3.4	2.5	2.2	2.5	2.3	3.1	2.2	1.9	2.2	1.8	2.2	3.0	1.7	0.3	4.3	1.9	24
15	S	1.2	1.3	1.3	1.1	1.2	1.1	1.5	1.5	4.6	4.6	3.5	3.3	2.8	2.0	1.9	1.7	1.4	1.7	1.3	1.2	1.4	0.8	S	0.8	4.6	1.9	24
16	0.9	0.3	0.4	0.7	0.8	0.7	0.7	0.6	1.2	2.9	3.8	2.5	1.9	4.1	1.7	2.1	2.7	2.1	1.9	2.0	1.3	2.2	S	0.5	0.3	4.1	1.7	24
17	0.3	0.4	0.4	0.8	1.0	1.5	2.8	5.5	3.2	4.7	4.2	4.6	5.5	3.5	4.6	3.6	3.8	2.7	1.4	1.3	1.1	S	0.6	0.6	0.3	5.5	2.5	24
18	0.7	0.6	0.6	0.9	0.9	1.8	2.3	4.5	5.2	4.4	5.5	7.8	7.5	6.9	5.4	7.3	6.4	3.4	1.8	2.5	S	0.8	0.6	0.6	0.6	7.8	3.4	24
19	0.2	0.1	0.2	0.9	0.3	2.2	5.1	11.6	3.2	2.8	3.8	5.9	4.7	4.3	8.6	7.4	6.2	3.9	2.4	S	5.0	2.2	2.0	0.6	0.1	11.6	3.6	24
20	0.4	2.5	1.1	1.0	1.9	3.0	3.2	11.1	5.1	4.4	4.1	3.4	3.3	9.0	5.4	4.3	2.9	5.9	S	3.9	7.0	8.1	3.0	0.4	0.4	11.1	4.1	24
21	0.8	0.3	0.1	0.7	0.3	0.7	0.9	2.2	1.9	1.5	2.4	2.8	2.4	2.0	3.7	2.1	2.5	S	3.9	1.6	6.2	1.9	5.4	11.7	0.1	11.7	2.5	24
22	24.6	24.6	5.4	4.2	6.5	20.8	14.0	36.5	36.7	30.1	16.4	11.8	8.5	7.0	4.2	3.7	S	1.1	1.6	0.5	2.5	1.7	4.5	0.2	0.2	36.7	11.6	24
23	0.6	0.3	0.0	0.8	0.0	0.0	0.1	2.3	2.5	1.5	1.5	1.0	2.3	7.3	5.0	S	5.2	1.8	1.0	0.8	0.3	0.5	0.5	0.6	0.0	7.3	1.6	24
24	0.5	0.7	0.6	0.5	0.7	1.2	1.5	3.5	2.0	2.0	1.5	2.2	1.9	1.7	S	2.2	1.8	1.6	0.8	0.9	0.9	0.8	0.4	0.8	0.4	3.5	1.3	24
25	0.5	0.4	0.6	0.7	0.8	1.3	2.3	3.0	3.1	2.7	3.1	4.0	3.0	S	3.2	3.1	3.0	1.9	2.9	1.9	1.5	1.1	1.7	0.7	0.4	4.0	2.0	24
26	0.3	0.4	0.3	0.6	1.2	1.6	2.6	3.5	2.6	2.6	2.6	3.3	S	2.0	1.8	3.1	2.6	2.2	2.0	0.9	0.4	0.3	1.3	0.6	0.3	3.5	1.7	24
27	1.0	1.4	1.1	1.2	1.3	1.5	2.6	3.2	3.5	4.2	3.5	S	3.1	3.8	4.5	5.4	3.7	4.3	3.6	2.6	2.9	2.2	1.6	0.9	0.9	5.4	2.7	24
28	1.8	2.6	2.3	2.6	2.9	6.0	8.7	9.2	8.4	8.1	S	6.0	4.7	3.4	3.1	4.3	4.6	3.9	5.6	2.3	2.6	0.8	0.5	0.0	0.0	9.2	4.1	24
29	0.6	1.3	0.6	0.7	1.0	0.9	2.8	0.7	2.8	S	2.4	2.8	3.2	2.8	3.2	1.1	2.0	1.0	1.8	0.5	0.2	0.8	0.5	0.6	0.2	3.2	1.5	24
30	0.8	0.9	0.8	0.6	0.4	0.3	0.1	1.2	S	1.4	0.9	1.0	0.7	0.7	2.0	1.7	1.4	0.9	1.0	1.0	1.0	0.8	0.1	0.0	0.0	2.0	0.9	24
31	0.0	0.0	0.0	0.0	0.0	0.5	S	1.2	0.9	0.7	1.1	0.9	1.0	2.0	0.9	1.0	1.2	2.6	3.1	2.2	1.5	1.4	0.7	0.0	0.0	3.1	1.0	24
HOURLY MAX	24.6	24.6	5.4	4.2	6.5	20.8	14.0	36.5	36.7	30.1	16.4	11.8	8.5	9.0	8.6	7.4	6.4	5.9	5.6	3.9	7.0	8.1	5.4	11.7				
HOURLY AVG	1.3	1.5	0.7	0.9	1.0	1.9	2.4	4.7	3.9	3.8	3.1	3.3	2.8	3.0	3.0	2.5	2.5	1.8	1.8	1.4	1.6	1.2	1.2	0.9				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

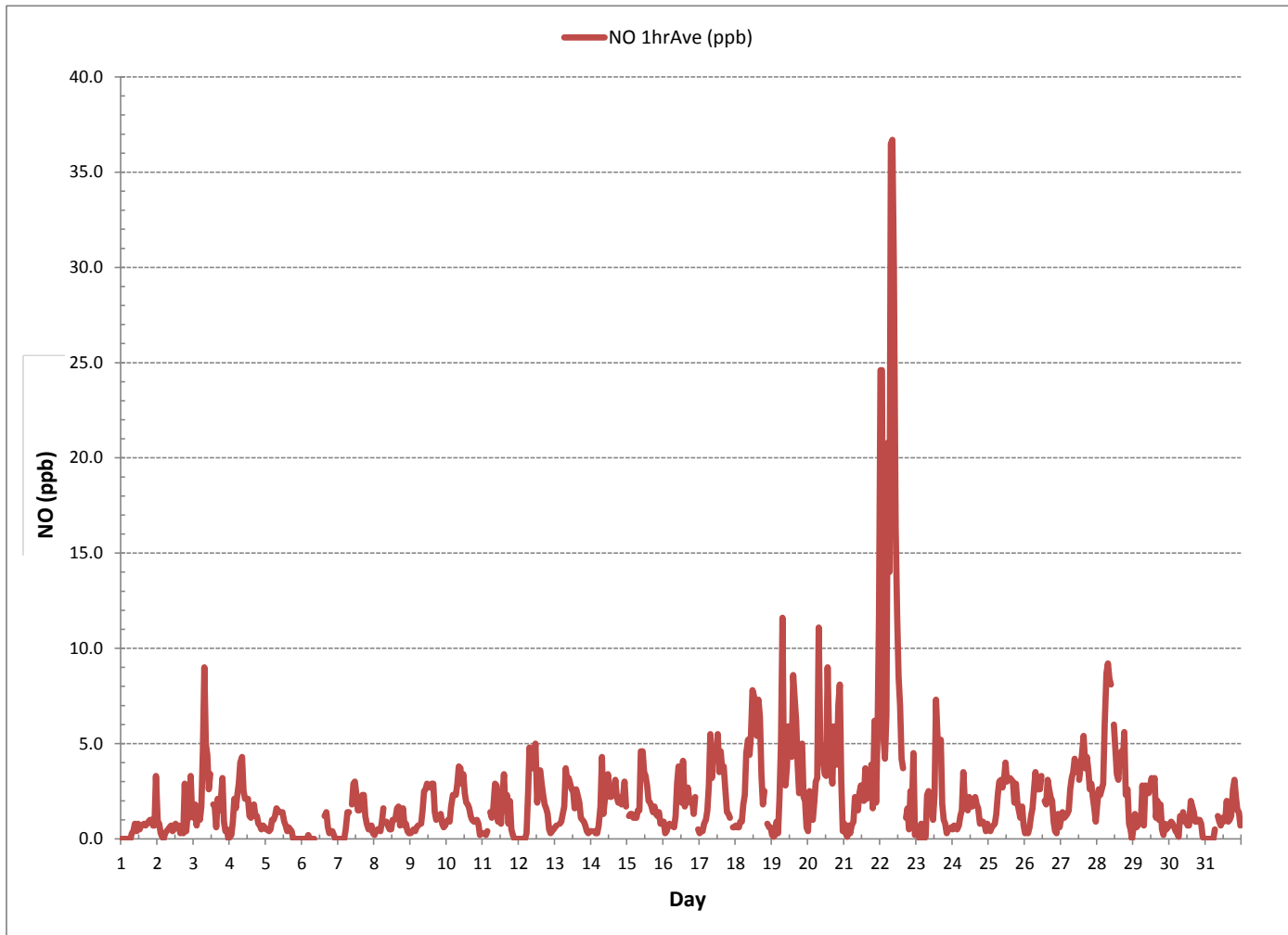
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	659			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	36.7 ppb	@ HOUR(S)	8	22
MAXIMUM 24-HR AVERAGE:	11.6 ppb			22
				VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	3.21	MONTHLY AVERAGE:	2.1 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0.9	0.0	0.0	0.0	0.0	0.4	0.5	0.9	1.0	1.4	1.1	1.8	1.1	1.2	S	0.8	1.0	5.0	1.9	1.8	1.0	0.7	1.2	2.3	0.0	5.0	1.1	24
2	1.7	1.3	0.6	0.0	0.0	0.0	0.3	0.2	0.6	0.5	0.4	0.2	0.5	S	0.6	0.2	0.4	0.5	59.6	2.4	3.5	3.3	10.6	2.2	0.0	59.6	3.9	24
3	2.1	2.7	1.1	3.2	1.9	2.9	8.8	15.5	6.8	14.2	11.3	29.5	S	24.4	10.4	1.3	5.7	2.3	7.5	8.8	4.0	0.6	1.4	0.2	0.2	29.5	7.2	24
4	0.3	0.4	2.3	6.0	4.0	4.7	4.9	5.2	7.6	4.9	2.7	S	4.3	1.2	1.3	2.1	2.8	2.3	1.7	1.5	1.2	0.6	1.8	1.4	0.3	7.6	2.8	24
5	0.9	0.8	0.3	0.9	10.5	1.3	1.7	2.2	1.9	1.8	S	2.7	1.5	1.5	1.5	1.6	1.1	2.5	1.0	0.4	0.7	0.8	0.3	0.3	0.3	10.5	1.7	24
6	0.4	0.6	0.2	0.3	2.2	1.5	1.8	4.4	C	C	C	C	C	C	C	4.0	18.9	2.7	2.5	2.4	2.4	3.1	1.3	1.5	0.2	18.9	3.0	24
7	1.3	1.1	1.3	1.1	1.7	2.2	26.9	11.1	S	4.7	22.0	9.2	22.6	20.5	4.6	17.1	11.4	35.4	5.7	2.7	2.0	1.9	2.1	1.5	1.1	35.4	9.1	24
8	1.5	1.7	1.8	2.0	1.7	2.4	3.5	S	2.5	7.8	4.4	3.3	17.1	3.6	6.4	3.8	10.6	8.1	10.7	20.3	2.0	2.8	1.7	1.2	1.2	20.3	5.3	24
9	1.1	1.2	1.4	1.2	1.7	1.7	S	1.6	3.1	4.9	5.0	4.5	4.5	5.1	6.0	6.0	3.1	2.4	3.5	3.9	3.6	2.7	1.7	1.5	1.1	6.0	3.1	24
10	2.4	2.5	3.2	3.6	6.2	S	4.5	5.7	5.7	5.8	4.8	5.4	4.6	3.3	4.7	2.9	2.8	2.4	2.0	2.8	2.5	2.2	1.9	1.3	1.3	6.2	3.6	24
11	1.4	1.5	1.4	1.7	S	9.3	2.4	3.3	5.2	7.2	2.5	3.7	15.1	26.8	38.8	13.6	13.4	2.9	4.6	4.4	21.1	1.9	1.0	0.8	0.8	38.8	8.0	24
12	1.0	6.5	1.0	S	1.8	7.5	49.1	29.5	26.1	23.7	25.5	29.8	13.3	18.4	7.2	4.6	4.5	4.3	3.3	3.8	1.8	1.8	1.6	2.0	1.0	49.1	11.7	24
13	1.6	2.0	S	2.1	2.2	3.3	8.2	18.8	19.8	10.4	11.5	13.3	4.7	3.3	16.9	6.6	4.4	4.4	2.1	2.8	3.5	1.6	1.6	1.8	1.6	19.8	6.4	24
14	1.5	S	1.8	1.9	1.6	1.8	6.2	22.8	2.7	3.5	4.0	6.3	4.3	3.6	4.6	4.6	5.1	3.7	5.2	6.2	4.9	4.5	6.4	3.1	1.5	22.8	4.8	24
15	S	2.8	3.0	3.2	2.2	2.3	2.3	3.2	3.8	7.4	7.7	5.8	5.2	6.7	13.5	2.9	14.3	7.3	5.7	14.6	3.0	10.9	2.4	S	2.2	14.6	5.9	24
16	2.7	1.3	1.7	2.1	3.0	1.8	2.1	1.9	2.5	6.2	7.6	7.0	3.6	24.0	3.3	6.4	5.0	4.0	3.8	4.5	3.7	5.3	S	2.1	1.3	24.0	4.6	24
17	2.2	1.9	2.3	3.0	2.9	3.5	9.7	9.8	6.2	7.5	6.7	7.4	9.0	6.8	9.9	5.7	5.6	4.8	3.4	3.0	2.6	S	2.3	2.2	1.9	9.9	5.1	24
18	2.7	2.4	2.3	2.8	2.3	3.5	4.3	8.2	6.8	7.8	12.7	10.4	12.1	13.1	9.6	15.8	10.7	5.9	4.0	5.4	S	2.4	1.7	3.5	1.7	15.8	6.5	24
19	1.2	0.8	1.1	15.6	2.3	26.3	38.4	42.5	11.8	22.2	35.7	29.4	47.6	19.1	24.4	41.4	23.6	23.9	29.9	S	13.9	18.0	4.4	3.2	0.8	47.6	20.7	24
20	2.5	5.0	2.6	7.6	3.6	5.2	5.1	69.9	19.8	19.1	18.1	23.1	15.4	35.8	25.3	15.9	20.7	49.8	S	18.7	12.3	41.2	3.1	2.5	2.5	85.1	22.0	24
21	2.8	1.4	1.3	9.6	1.5	3.2	3.6	12.8	4.3	4.1	9.8	19.5	19.1	13.8	26.5	P	41.2	S	50.5	7.8	44.2	20.5	16.2	35.1	1.3	50.5	15.9	23
22	31.7	36.3	12.5	7.0	14.6	34.3	29.5	51.7	53.8	41.2	29.4	21.7	13.2	41.2	34.5	18.6	S	4.1	20.5	1.7	12.5	4.8	68.5	1.6	1.6	68.5	25.4	24
23	18.1	1.9	1.3	3.4	1.1	1.0	2.4	25.9	11.9	4.3	14.4	2.8	4.7	12.4	9.0	S	10.3	5.6	3.8	9.1	1.7	1.8	1.6	2.0	1.0	25.9	6.5	24
24	1.7	1.7	1.8	1.9	2.0	6.2	3.7	8.6	10.3	5.8	4.9	8.1	7.9	6.2	S	4.5	3.8	2.7	2.5	2.4	2.0	2.2	1.4	2.1	1.4	10.3	4.1	24
25	1.7	1.4	1.7	2.1	1.9	2.7	4.8	6.2	5.3	4.6	6.1	20.0	6.0	S	11.1	5.0	5.1	4.7	6.8	4.0	3.3	2.7	3.6	2.1	1.4	20.0	4.9	24
26	1.8	1.8	1.4	1.5	2.4	3.2	4.5	5.4	4.8	4.3	4.3	5.4	S	3.7	3.5	9.7	4.9	4.4	4.5	18.1	2.6	1.6	6.7	3.6	1.4	18.1	4.5	24
27	4.2	4.0	2.7	3.5	3.4	3.2	4.8	5.2	5.9	6.5	5.9	S	10.3	13.6	7.0	9.0	6.4	7.2	7.1	5.4	5.5	4.3	4.3	2.7	2.7	13.6	5.7	24
28	3.3	4.8	4.3	5.1	4.7	9.3	12.0	20.5	28.7	11.1	S	10.3	15.9	5.3	14.5	22.8	9.8	7.7	36.5	26.7	23.3	4.4	2.5	0.8	0.8	36.5	12.4	24
29	32.1	3.3	2.5	3.3	4.2	5.1	8.4	8.5	13.2	S	4.1	5.8	6.8	4.9	6.5	14.7	21.4	23.6	38.5	3.5	1.9	11.7	18.5	5.0	1.9	38.5	10.8	24
30	2.4	20.0	2.2	2.3	2.2	1.8	2.1	14.5	S	13.8	4.2	3.1	2.6	2.3	4.2	3.9	3.5	2.4	2.7	3.0	2.9	3.3	1.1	1.0	1.0	20.0	4.4	24
31	0.9	1.2	1.2	1.0	1.3	1.3	11.8	S	5.0	3.1	12.8	5.6	4.0	2.9	4.6	2.8	3.2	3.9	7.9	8.7	4.4	3.9	3.7	2.4	0.9	12.8	4.2	24
HOURLY MAX	32.1	36.3	12.5	15.6	14.6	34.3	49.1	69.9	53.8	41.2	35.7	29.8	47.6	41.2	38.8	41.4	41.2	49.8	59.6	26.7	44.2	85.1	68.5	35.1				
HOURLY AVG	4.3	3.8	2.1	3.3	3.0	5.1	8.9	14.3	9.9	9.0	10.0	10.5	9.9	11.6	11.1	8.6	9.2	8.0	11.3	6.7	6.5	7.0	7.2	3.1				

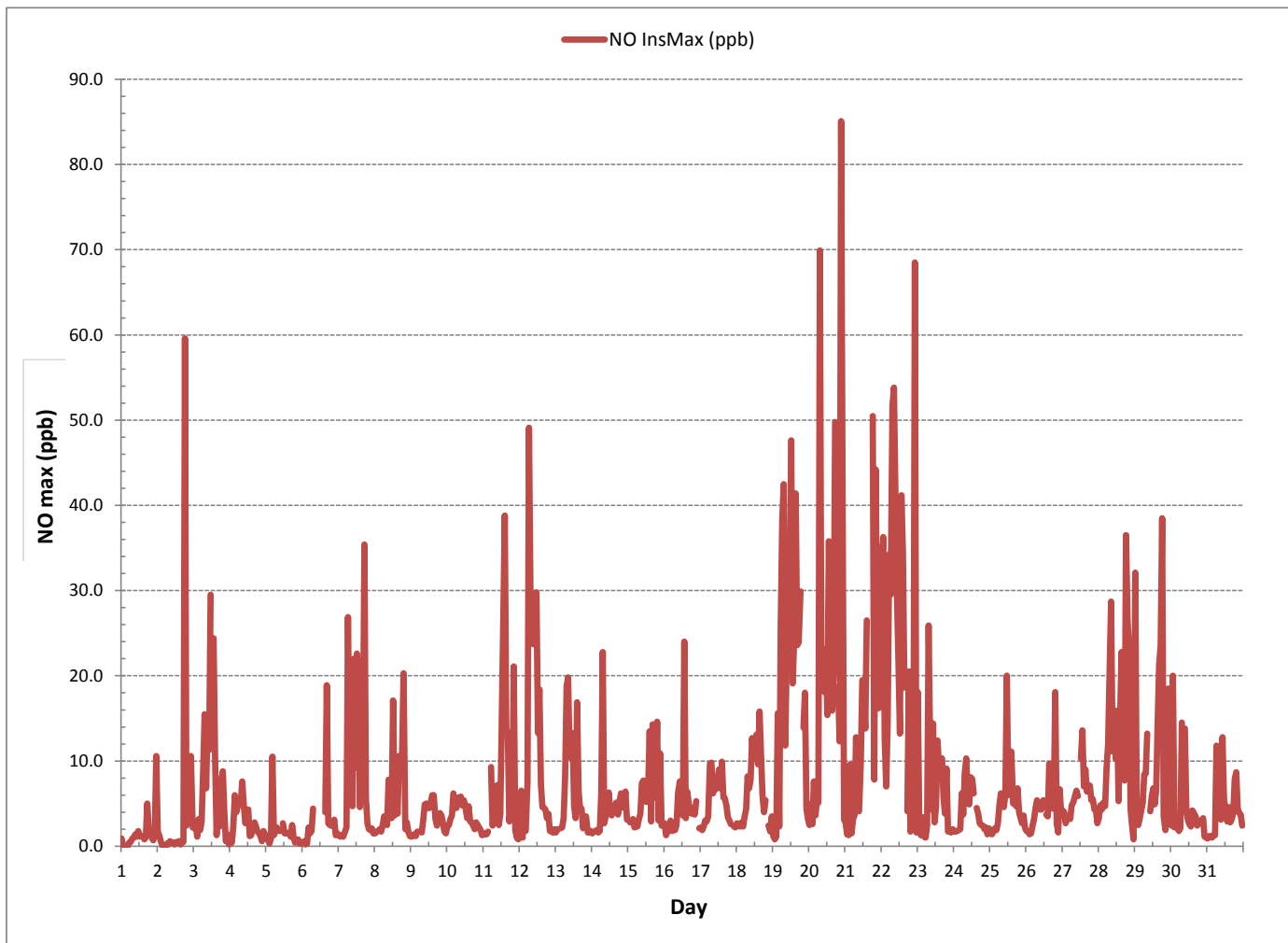
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

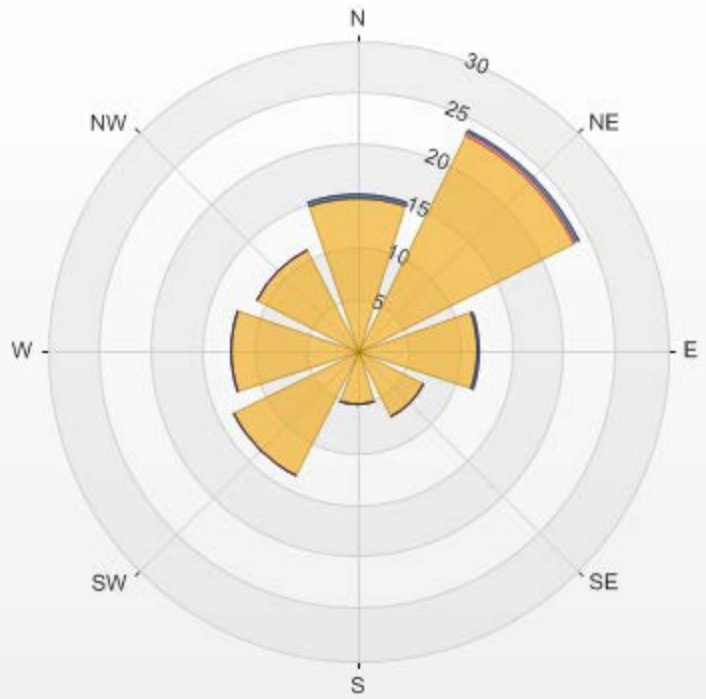
NUMBER OF NON-ZERO READINGS:	698
MAXIMUM INSTANTANEOUS VALUE:	85.1 ppb @ HOUR(S) 21 ON DAY(S) 20
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	10.29
OPERATIONAL TIME:	743 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-NO[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0.0-12.3	12.3-24.5	24.5-36.8	>36.8	Total
N	14.75	0.14	0.28	0	15.17
NE	23.4	0.28	0.28	0	23.96
E	11.63	0	0.14	0	11.77
SE	7.09	0	0	0	7.09
S	5.25	0	0	0	5.25
SW	13.48	0	0	0	13.48
W	12.34	0	0	0	12.34
NW	10.92	0	0	0	10.92
Summary	98.86	0.42	0.7	0	100



% Icon Classes (ppb)		99	0	1	0
0.0-12.3	12.3-24.5	24.5-36.8	>36.8		

NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1.3	0.9	0.6	0.7	0.7	0.9	1.4	2.0	1.6	2.8	2.1	2.8	1.8	2.3	S	2.8	2.3	2.5	1.8	1.8	2.4	1.6	1.6	1.3	0.6	2.8	1.7	24
2	1.4	1.7	1.9	1.7	0.6	0.7	1.0	1.0	0.8	0.8	0.3	0.2	0.1	S	1.2	0.6	0.7	0.9	4.3	1.7	7.3	7.2	12.0	9.3	0.1	12.0	2.5	24
3	10.9	10.6	9.2	7.4	7.7	8.1	9.6	9.9	5.4	4.0	3.2	3.3	S	3.2	2.5	3.0	8.3	11.0	15.7	16.4	8.4	4.2	2.2	1.0	1.0	16.4	7.2	24
4	1.6	2.2	3.7	6.9	4.7	4.6	5.0	5.7	4.4	2.8	2.1	S	3.6	2.4	2.6	2.8	2.8	3.1	2.7	2.8	2.3	2.0	1.9	2.6	1.6	6.9	3.3	24
5	2.3	2.5	2.8	1.5	2.1	3.8	4.0	3.4	2.6	2.0	S	2.7	2.0	1.7	1.7	1.8	2.4	2.3	2.3	2.4	2.5	2.4	1.5	1.7	1.5	4.0	2.4	24
6	2.2	2.5	2.1	3.1	4.6	4.5	5.1	5.8	4.8	C	C	C	C	C	C	4.0	4.9	5.9	5.1	6.4	6.4	3.3	2.5	2.2	2.1	6.4	4.2	24
7	2.2	2.0	2.2	0.6	1.7	3.4	5.4	4.7	S	3.1	3.5	4.6	3.0	2.9	2.7	3.5	3.4	5.5	6.1	4.5	2.1	1.9	2.7	2.4	0.6	6.1	3.2	24
8	2.1	2.5	2.0	2.0	2.5	3.4	4.1	S	2.2	1.0	1.1	1.3	1.2	1.5	1.6	2.0	2.3	1.7	1.9	2.8	2.0	1.4	1.4	1.7	1.0	4.1	2.0	24
9	1.4	1.2	1.2	1.0	1.4	1.4	S	2.0	2.8	3.7	3.1	3.1	3.3	3.2	3.3	3.0	2.3	2.6	3.0	3.2	3.8	3.2	3.7	4.7	1.0	4.7	2.7	24
10	3.5	3.5	4.3	5.4	8.3	S	7.0	6.3	5.5	3.6	2.8	2.9	2.2	2.0	2.2	3.2	4.2	3.8	4.5	4.6	4.6	4.5	3.6	3.5	2.0	8.3	4.2	24
11	4.0	4.5	5.0	5.8	S	11.4	11.2	9.2	8.6	6.6	2.2	2.8	1.3	2.5	2.6	1.7	4.9	3.0	5.4	2.4	1.2	2.2	1.2	1.5	1.2	11.4	4.4	24
12	2.8	2.8	2.9	S	3.6	3.9	4.8	5.7	6.1	4.0	5.1	3.9	2.2	1.9	5.5	5.9	6.2	8.2	5.6	3.6	1.6	1.5	1.8	1.5	1.5	8.2	4.0	24
13	1.2	1.8	S	3.0	3.1	4.3	4.2	4.9	3.2	2.6	3.2	2.5	3.0	2.7	3.9	3.8	3.9	3.0	2.9	2.6	1.6	1.6	1.9	1.9	1.2	4.9	2.9	24
14	2.1	S	3.1	2.0	2.3	2.9	3.7	7.5	4.0	4.5	3.2	4.8	3.1	3.1	3.6	3.1	3.6	2.7	1.7	2.2	2.4	3.5	7.7	4.3	1.7	7.7	3.5	24
15	S	6.6	6.2	5.2	3.5	3.3	2.3	2.9	2.9	5.6	5.8	3.5	3.5	3.7	3.7	3.7	3.3	3.3	4.0	3.0	4.4	3.9	3.4	S	2.3	6.6	4.0	24
16	2.7	1.3	1.2	1.9	2.1	1.7	1.2	0.9	1.5	2.7	3.1	2.2	1.6	3.4	2.6	3.6	4.7	4.6	7.8	6.3	4.4	6.4	S	3.6	0.9	7.8	3.1	24
17	3.0	3.1	2.4	3.0	3.6	4.1	6.4	8.3	4.1	4.2	3.1	3.7	4.4	2.8	3.9	3.8	5.8	6.4	4.9	5.3	4.3	S	2.7	2.2	2.2	8.3	4.2	24
18	2.5	3.2	3.4	2.6	3.2	4.8	6.1	7.3	6.0	4.4	3.9	5.6	5.9	5.6	5.9	8.6	8.8	8.3	6.4	7.2	S	4.7	5.1	2.6	2.5	8.8	5.3	24
19	3.3	0.9	0.9	4.1	3.2	6.6	14.0	18.0	6.8	2.5	2.8	5.7	4.7	4.2	6.9	8.9	10.3	11.1	11.1	S	11.7	8.3	8.5	7.9	0.9	18.0	7.1	24
20	8.4	10.1	8.1	7.3	8.3	8.0	7.6	8.3	5.5	4.2	3.5	3.4	3.2	7.3	3.6	4.3	3.9	6.4	S	13.4	16.2	15.4	9.7	5.9	3.2	16.2	7.5	24
21	8.8	5.7	4.3	4.9	4.6	4.8	3.7	5.2	4.0	2.8	3.5	3.3	2.5	2.2	3.6	2.1	3.2	S	7.6	7.2	13.6	8.5	17.2	17.1	2.1	17.2	6.1	24
22	22.7	19.8	13.5	15.4	18.1	23.1	18.8	22.0	20.0	19.4	11.7	8.1	8.2	8.9	7.5	9.6	S	9.8	8.3	6.8	10.8	12.8	13.0	7.7	6.8	23.1	13.7	24
23	6.9	7.0	5.8	7.3	4.8	2.7	3.2	5.5	4.7	3.2	2.8	2.0	3.8	7.7	6.4	S	10.6	6.8	4.5	3.7	4.0	3.4	3.1	2.4	2.0	10.6	4.9	24
24	2.3	2.3	1.8	1.8	2.1	2.6	2.9	3.7	3.3	2.4	2.1	2.8	2.9	4.9	S	6.5	4.8	3.3	2.2	2.4	2.3	1.7	1.4	1.6	1.4	6.5	2.8	24
25	1.7	1.4	1.3	1.4	1.7	2.4	3.8	5.1	5.8	4.2	4.9	4.9	4.4	S	5.3	5.0	5.9	4.2	4.9	4.6	3.9	3.4	4.0	4.7	1.3	5.9	3.9	24
26	3.7	2.9	2.0	1.8	2.4	2.8	3.7	4.8	3.0	2.7	2.3	2.8	S	2.8	2.9	4.7	4.7	5.3	4.2	2.1	1.3	1.7	5.1	2.6	1.3	5.3	3.1	24
27	3.9	5.1	4.2	3.7	3.0	3.2	4.2	4.4	3.1	2.7	2.6	S	3.6	3.9	4.8	4.7	3.1	3.8	3.0	2.4	4.1	4.1	2.3	1.4	1.4	5.1	3.5	24
28	1.8	5.0	4.4	5.0	4.3	6.8	7.6	6.4	5.3	4.3	S	3.3	3.6	2.1	2.5	3.5	5.1	5.5	7.0	2.5	3.7	2.9	3.1	4.5	1.8	7.6	4.4	24
29	4.4	5.9	6.3	5.3	4.9	4.6	6.3	5.8	5.4	S	4.0	3.9	3.4	4.0	5.1	2.6	3.3	2.6	4.4	2.7	2.3	2.5	2.7	3.2	2.3	6.3	4.2	24
30	5.1	5.3	4.8	4.1	4.1	4.2	2.8	4.6	S	4.3	3.3	3.7	2.5	2.8	4.5	4.6	4.5	4.2	4.5	5.1	4.9	4.1	3.7	2.3	2.3	5.3	4.1	24
31	1.0	1.1	1.4	1.8	1.5	2.4	3.0	S	4.3	2.6	2.3	2.5	2.5	3.3	6.1	3.7	4.1	5.2	7.0	8.2	7.0	5.0	5.2	3.5	1.0	8.2	3.7	24
HOURLY MAX	22.7	19.8	13.5	15.4	18.1	23.1	18.8	22.0	20.0	19.4	11.7	8.1	8.2	8.9	7.5	9.6	10.6	11.1	15.7	16.4	16.2	15.4	17.2	17.1				
HOURLY AVG	4.0	4.2	3.8	3.9	4.0	4.7	5.5	6.3	4.7	3.9	3.3	3.4	3.1	3.5	3.9	4.0	4.6	4.9	5.2	4.7	4.9	4.3	4.5	3.8				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

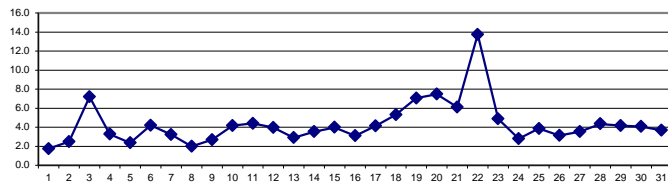
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

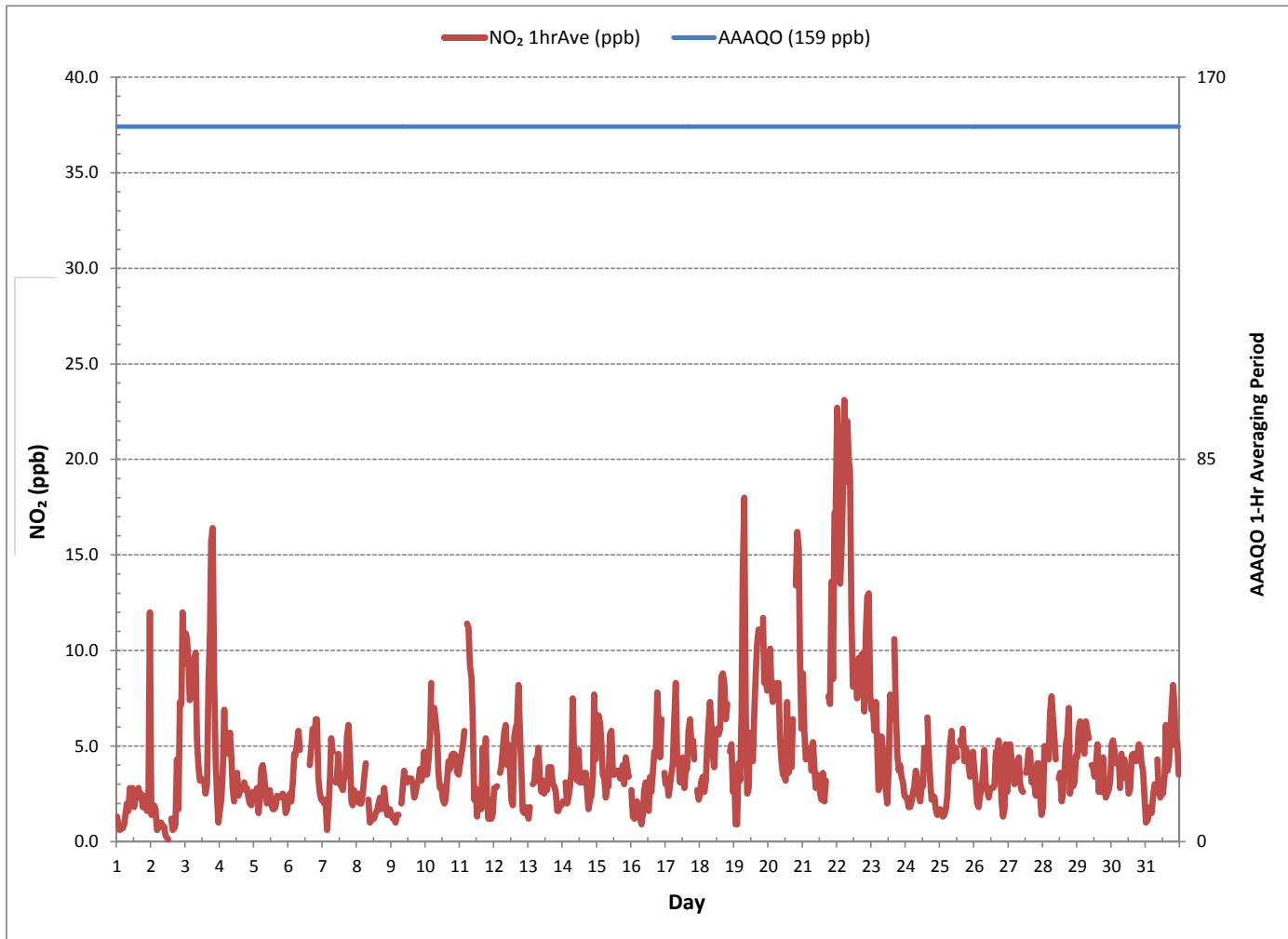
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	707				
MINIMUM 1-HR AVERAGE:	0.1 ppb	@ HOUR(S)	12	ON DAY(S)	2
MAXIMUM 1-HR AVERAGE:	23.1 ppb	@ HOUR(S)	5	ON DAY(S)	22
MAXIMUM 24-HR AVERAGE:	13.7 ppb			ON DAY(S)	22
				VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs		
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %		
STANDARD DEVIATION:	3.19	MONTHLY AVERAGE:	4.3 ppb		

24 HOUR AVERAGES FOR October 2016



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	3.8	3.3	2.8	2.7	2.7	3.4	3.5	5.2	4.1	6.8	5.4	6.0	4.1	4.7	S	5.0	4.2	11.1	4.7	4.2	5.0	3.7	3.6	3.6	2.7	11.1	4.5	24
2	4.0	3.9	4.1	5.2	2.6	2.9	3.3	3.2	3.0	3.3	2.6	2.3	2.4	S	3.5	2.6	3.3	4.9	19.1	4.1	15.9	15.9	18.6	14.3	2.3	19.1	6.3	24
3	14.0	14.2	11.9	11.2	11.3	12.0	14.3	17.8	8.5	11.7	6.2	20.4	S	20.0	10.1	6.4	17.4	14.3	20.6	22.2	16.9	9.4	5.0	3.5	3.5	22.2	13.0	24
4	3.6	4.9	6.9	12.4	10.7	8.6	8.8	8.6	9.3	5.3	4.8	S	8.3	4.8	5.0	5.2	5.8	7.3	7.0	6.2	5.0	4.1	4.9	5.2	3.6	12.4	6.6	24
5	5.2	5.2	5.6	4.8	11.9	6.6	8.1	5.9	5.4	4.7	S	5.2	4.3	3.6	4.1	4.3	5.1	5.1	4.3	4.6	5.1	5.2	3.5	4.2	3.5	11.9	5.3	24
6	4.9	4.7	4.3	5.4	6.6	6.5	7.6	7.9	C	C	C	C	C	C	C	5.4	6.8	8.1	6.2	8.5	9.7	5.2	4.5	3.5	3.5	9.7	6.2	24
7	4.0	3.3	4.3	2.9	4.9	9.6	21.7	14.0	S	6.3	17.1	10.5	18.8	11.7	7.0	21.1	11.0	15.0	12.7	6.2	5.6	4.0	4.1	4.4	2.9	21.7	9.6	24
8	3.2	4.3	3.1	3.2	3.5	5.1	7.4	S	3.7	8.8	8.2	15.5	7.2	3.0	15.6	10.4	11.5	9.1	8.6	15.5	4.1	3.6	3.0	3.1	3.0	15.6	7.0	24
9	2.5	2.3	2.1	2.1	2.7	2.4	S	3.2	4.7	6.7	5.0	4.5	6.0	5.2	5.6	5.4	4.1	4.7	5.5	4.9	6.2	5.3	5.4	5.8	2.1	6.7	4.4	24
10	5.0	5.1	7.5	7.9	11.9	S	8.6	8.4	8.5	5.8	4.2	4.5	3.8	3.3	5.2	4.9	6.7	5.6	6.9	6.5	6.4	6.6	6.2	5.8	3.3	11.9	6.3	24
11	6.1	5.8	6.7	8.0	S	14.2	13.8	13.0	11.8	13.6	4.7	6.4	7.4	24.5	18.0	12.5	12.9	5.7	8.7	7.2	8.4	7.5	2.6	2.9	2.6	24.5	9.7	24
12	8.1	6.8	4.3	S	4.8	14.3	19.8	21.4	21.0	14.8	20.5	16.6	9.5	11.1	10.5	8.3	9.0	14.5	8.3	8.1	3.1	3.2	3.4	3.7	3.1	21.4	10.7	24
13	2.7	3.9	S	4.8	4.8	7.8	9.4	14.1	16.5	7.2	13.4	20.1	5.6	5.1	19.9	9.1	8.0	7.0	4.7	5.1	3.5	3.2	3.1	3.2	2.7	20.1	7.9	24
14	3.6	S	5.1	3.7	4.0	4.8	9.9	13.3	6.4	6.7	5.2	8.8	5.3	4.8	6.4	5.3	5.9	4.5	4.0	5.3	5.9	6.6	11.9	9.4	3.6	13.3	6.4	24
15	S	9.1	9.0	9.9	5.0	5.9	5.5	4.6	5.1	9.3	9.6	6.1	5.6	6.9	17.8	5.6	9.2	26.5	6.0	7.7	6.6	9.7	5.1	S	4.6	26.5	8.4	24
16	4.8	2.5	2.6	3.8	3.9	3.3	2.6	1.9	2.9	5.3	9.2	6.2	3.3	16.0	4.3	6.4	7.0	7.5	11.9	11.7	6.1	9.3	S	5.0	1.9	16.0	6.0	24
17	4.6	5.1	4.1	5.0	6.2	6.0	11.9	12.1	7.1	6.8	5.0	5.3	7.2	5.0	5.7	5.3	7.5	8.6	7.2	7.4	7.4	S	4.4	3.6	3.6	12.1	6.5	24
18	4.2	5.5	5.6	4.3	5.5	7.2	8.2	9.6	8.1	7.5	8.0	7.9	9.0	9.8	28.8	12.5	12.8	9.1	12.1	S	8.8	8.9	5.3	4.2	28.8	9.1	24	
19	8.8	2.3	2.5	19.0	12.7	36.3	24.8	25.9	14.7	15.0	7.2	19.6	12.0	15.3	14.5	19.2	17.0	23.4	47.9	S	20.7	30.6	10.7	10.4	2.3	47.9	17.8	24
20	10.2	13.8	10.5	23.9	10.5	12.5	10.3	26.8	23.8	11.0	9.0	11.7	16.4	39.2	23.8	17.6	17.8	16.9	S	20.8	18.9	25.9	35.8	8.0	8.0	39.2	18.0	24
21	11.9	8.4	6.0	15.0	6.0	6.8	6.5	20.0	7.1	4.3	12.3	12.0	12.1	15.0	24.3	P	23.3	S	24.1	17.0	33.8	15.8	25.9	28.0	4.3	33.8	15.3	23
22	26.0	26.2	16.8	19.2	23.0	26.1	21.4	26.9	24.3	24.6	28.0	13.1	11.6	32.4	19.0	16.1	S	15.4	22.4	9.9	24.3	16.7	27.4	9.9	9.9	32.4	20.9	24
23	12.9	11.4	10.5	13.6	9.8	4.0	6.0	23.6	9.0	5.4	17.4	3.8	6.8	10.8	8.6	S	14.5	12.1	7.2	14.1	5.4	5.3	4.5	3.8	3.8	23.6	9.6	24
24	3.8	3.5	3.3	3.0	3.4	8.2	6.0	11.5	13.1	4.8	4.2	15.1	11.0	116.0	S	46.7	7.7	5.2	4.0	4.1	3.9	3.2	2.9	2.9	2.9	116.0	12.5	24
25	2.7	2.7	2.6	2.4	2.8	4.3	5.9	6.7	8.2	6.9	7.0	7.6	7.2	S	15.0	7.0	7.8	6.5	8.6	7.5	5.6	4.8	5.9	6.5	2.4	15.0	6.2	24
26	5.6	4.3	2.9	2.6	3.8	4.7	5.4	6.4	5.8	4.0	4.0	4.4	S	4.4	5.2	26.3	8.0	8.6	6.2	11.0	3.3	4.2	10.5	9.5	2.6	26.3	6.6	24
27	7.9	7.6	5.5	5.4	5.2	5.4	6.1	5.8	5.2	4.6	4.5	S	6.1	11.7	6.6	8.0	4.8	5.9	5.5	4.0	6.7	5.6	3.8	3.2	3.2	11.7	5.9	24
28	3.7	7.0	6.2	6.9	6.9	9.6	9.6	15.3	8.6	5.9	S	5.9	44.4	3.7	11.8	6.6	8.9	7.2	24.7	8.8	14.1	4.5	4.9	5.8	3.7	44.4	10.0	24
29	10.1	7.8	7.8	7.6	8.1	8.3	9.0	10.5	17.0	S	5.8	5.6	4.7	6.2	8.1	8.0	17.2	11.1	14.8	5.7	4.3	19.8	12.2	6.0	4.3	19.8	9.4	24
30	7.1	22.0	6.8	6.0	6.0	6.2	4.9	17.9	S	12.2	5.3	5.7	4.2	5.6	7.3	6.7	6.6	5.6	6.3	8.1	7.0	6.6	6.0	6.2	4.2	22.0	7.7	24
31	2.5	2.6	3.0	3.9	2.9	4.5	14.5	S	12.5	4.4	5.9	6.8	4.3	6.4	9.4	5.1	5.4	9.3	15.9	11.7	9.9	6.9	6.8	4.8	2.5	15.9	6.9	24
HOURLY MAX	26.0	26.2	16.8	23.9	23.0	36.3	24.8	26.9	24.3	24.6	28.0	20.4	44.4	116.0	24.3	46.7	23.3	26.5	47.9	22.2	33.8	30.6	35.8	28.0				
HOURLY AVG	6.6	7.0	5.8	7.5	6.8	8.6	9.8	12.5	9.8	8.1	8.6	9.2	8.9	14.5	10.8	11.0	9.6	10.0	11.4	9.0	9.3	8.7	8.5	6.4				

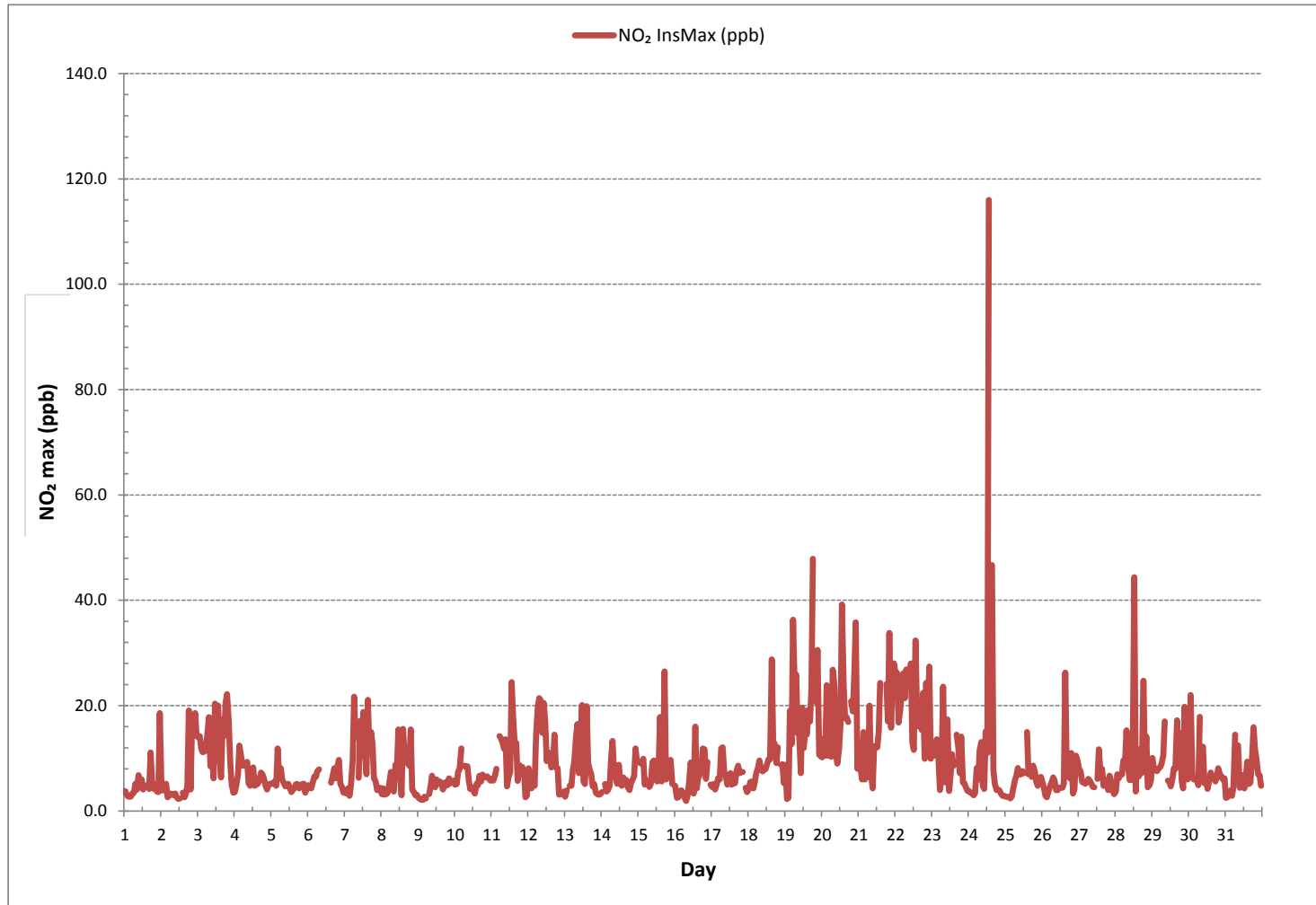
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

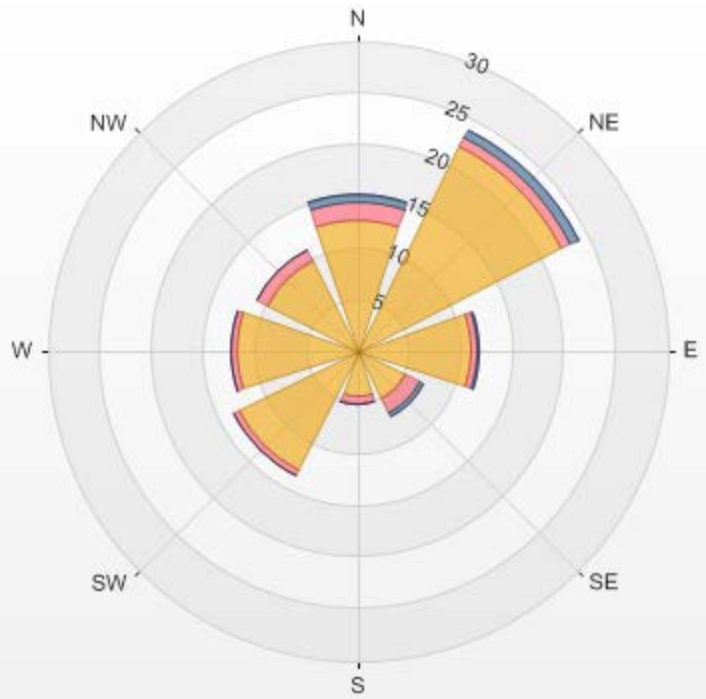
NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	116.0 ppb @ HOUR(S) 13 ON DAY(S) 24
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	7.70
OPERATIONAL TIME:	743 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-NO2[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0.0-7.7	7.7-15.5	15.5-23.2	>23.2	Total
N	12.62	1.84	0.71	0	15.17
NE	22.13	0.99	0.85	0	23.97
E	11.06	0.57	0.14	0	11.77
SE	5.25	1.56	0.28	0	7.09
S	4.4	0.85	0	0	5.25
SW	12.91	0.57	0	0	13.48
W	11.63	0.71	0	0	12.34
NW	9.79	1.13	0	0	10.92
Summary	89.79	8.22	1.98	0	100



% Icon Classes (ppb)					
90		0.0-7.7	8		7.7-15.5
2		15.5-23.2	0		>23.2

NO2[ppb] Calibration: LICA Bonnyville Monthly: 2016/10 Type: Span



■ Span Meas
 — Span Ref
 — Span Low
 — Span High

OZONE

OZONE Hourly Averages (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	26.4	28.5	28.6	27.6	28.0	27.3	27.5	25.9	24.9	24.0	24.4	21.8	22.1	20.0	S	19.5	18.3	15.0	11.8	9.7	7.8	7.4	6.5	5.6	5.6	28.6	19.9	24
2	4.7	3.6	3.6	5.0	9.7	13.1	13.2	13.0	13.3	12.1	13.4	13.3	14.6	S	20.8	23.5	24.9	23.7	17.3	19.3	12.9	12.0	6.9	9.5	3.6	24.9	13.2	24
3	6.2	5.7	8.3	7.9	9.1	7.5	4.9	6.5	10.5	13.8	17.8	19.8	S	30.2	31.3	33.6	28.9	23.6	16.3	13.8	19.7	21.3	20.7	20.8	4.9	33.6	16.4	24
4	18.6	17.7	13.8	10.3	12.2	11.7	12.8	10.9	12.7	16.7	21.2	S	26.8	25.9	26.7	25.1	25.5	23.9	23.2	21.7	21.4	21.4	20.7	20.0	10.3	26.8	19.2	24
5	21.0	20.1	18.8	21.2	21.1	19.7	19.1	20.4	21.7	22.5	C	C	C	C	24.8	24.5	23.9	23.8	24.1	23.3	24.1	24.2	23.4	23.3	18.8	24.8	22.3	24
6	22.1	21.0	20.6	19.4	19.5	19.5	20.4	20.4	21.9	S	22.7	23.2	23.6	23.9	24.5	24.1	23.3	21.9	20.9	18.9	18.4	22.6	22.6	23.3	18.4	24.5	21.7	24
7	22.9	23.7	25.8	28.7	27.1	25.0	23.7	25.3	S	30.5	30.6	29.2	30.3	30.2	30.9	31.0	29.4	26.9	25.0	25.4	28.7	28.4	26.6	27.0	22.9	31.0	27.5	24
8	26.9	25.9	25.0	24.3	24.2	22.2	25.3	S	26.8	27.2	28.1	27.9	28.4	28.6	28.1	27.6	27.5	28.1	28.1	25.3	24.5	24.9	24.3	24.0	22.2	28.6	26.2	24
9	23.3	22.9	21.8	20.8	20.0	19.9	S	19.7	18.2	16.8	15.7	14.7	15.1	13.7	13.3	13.9	14.7	14.9	13.4	13.0	12.6	10.8	11.1	11.7	10.8	23.3	16.2	24
10	13.8	14.4	12.2	11.2	9.8	S	10.4	10.6	11.0	15.1	19.5	19.0	19.2	21.2	22.3	23.7	22.6	22.2	21.5	20.3	19.7	20.0	20.8	21.8	9.8	23.7	17.5	24
11	19.7	17.3	18.1	17.3	S	14.7	16.5	19.4	21.4	24.0	30.1	30.5	32.6	31.4	32.1	31.5	26.8	25.9	23.7	25.4	29.0	27.5	26.6	24.4	14.7	32.6	24.6	24
12	20.6	19.1	17.1	S	14.9	14.6	12.9	12.1	13.1	16.4	18.2	20.3	24.7	27.1	23.6	25.0	22.2	19.7	20.0	21.6	24.7	24.2	25.7	26.3	12.1	27.1	20.2	24
13	26.2	25.2	S	22.9	21.8	20.5	21.3	20.8	23.1	25.1	25.5	26.7	26.8	28.7	30.5	29.1	29.2	28.2	26.9	29.2	29.6	28.6	28.3	28.3	20.5	30.5	26.2	24
14	27.4	S	26.4	26.0	25.0	24.2	23.3	20.9	22.6	22.1	22.4	21.4	22.0	21.8	21.1	21.1	18.7	19.8	21.7	22.0	21.7	20.5	15.4	19.2	15.4	27.4	22.0	24
15	S	17.1	16.6	18.8	21.5	22.3	24.1	23.7	24.0	21.8	22.5	23.7	23.9	24.6	25.2	24.4	24.3	23.7	22.4	22.6	20.6	20.1	19.5	S	16.6	25.2	22.2	24
16	20.5	22.8	23.4	22.6	22.2	22.3	22.3	22.9	22.4	21.0	19.9	19.8	19.3	17.9	17.3	16.4	15.2	14.8	10.5	11.9	14.1	11.4	S	15.7	10.5	23.4	18.5	24
17	13.7	12.2	12.4	12.0	11.6	12.2	9.4	8.0	11.9	12.9	14.5	14.8	14.2	13.0	13.1	12.9	10.8	11.7	12.3	10.8	11.7	S	13.2	13.4	8.0	14.8	12.3	24
18	13.2	12.6	12.8	13.6	13.2	12.1	11.1	8.7	9.1	11.2	12.0	11.2	11.6	11.8	11.8	10.2	9.3	8.6	10.1	9.1	S	14.2	14.8	16.2	8.6	16.2	11.7	24
19	15.6	18.4	18.4	15.4	15.6	14.0	7.4	5.8	13.9	17.9	18.7	16.3	16.8	16.3	12.7	10.6	8.9	7.1	6.6	S	7.0	7.5	6.2	6.9	5.8	18.7	12.3	24
20	7.1	6.7	8.9	10.5	8.2	8.5	8.3	9.3	10.7	13.2	15.3	17.2	18.0	17.2	19.1	18.2	17.0	13.7	S	5.6	3.2	1.2	4.9	7.5	1.2	19.1	10.8	24
21	5.0	7.4	9.4	8.7	9.0	10.0	14.9	14.7	14.7	14.3	14.7	18.0	23.6	26.2	27.6	29.0	27.3	S	21.2	19.7	12.7	15.0	6.7	5.5	5.0	29.0	15.4	24
22	2.1	1.1	5.6	5.0	3.9	0.8	1.0	1.3	4.2	8.0	11.7	12.7	14.2	14.7	15.5	14.4	S	22.6	20.9	18.8	14.2	11.0	7.8	12.5	0.8	22.6	9.7	24
23	12.7	12.0	13.2	11.0	13.0	16.4	16.1	13.6	15.4	19.9	21.4	22.6	20.9	13.9	14.3	S	9.7	12.9	14.3	18.4	20.2	20.4	18.1	16.6	9.7	22.6	16.0	24
24	14.8	14.8	15.6	15.8	16.1	16.7	17.4	17.8	18.0	19.9	19.7	22.0	23.8	24.9	S	21.2	20.2	21.0	20.3	18.8	17.4	17.1	16.3	15.2	14.8	24.9	18.5	24
25	14.8	15.3	15.3	14.8	14.6	14.0	12.6	11.3	10.4	11.7	11.0	10.8	11.3	S	11.2	10.4	9.2	10.5	10.3	9.8	10.4	10.3	9.0	8.3	8.3	15.3	11.6	24
26	8.2	8.2	8.6	7.6	6.6	6.7	5.6	4.6	6.8	7.2	7.8	8.1	S	10.6	10.6	10.6	11.2	10.6	11.4	13.3	12.8	12.3	9.1	8.9	4.6	13.3	9.0	24
27	9.5	8.2	8.7	9.4	10.0	9.4	8.1	7.2	7.6	7.7	8.3	S	8.5	7.8	6.6	5.8	6.6	6.0	6.6	7.5	5.1	4.6	6.8	7.6	4.6	10.0	7.5	24
28	7.7	4.1	4.9	4.0	4.1	1.7	1.2	1.4	1.4	2.6	S	5.2	6.3	6.7	6.2	4.9	3.3	2.5	2.1	3.3	2.6	3.2	2.4	1.4	1.2	7.7	3.6	24
29	1.5	0.7	0.9	2.0	2.7	3.8	2.6	2.2	2.7	S	4.3	3.8	4.3	6.3	6.5	18.8	17.1	18.1	15.4	15.6	14.8	13.9	15.8	16.4	0.7	18.8	8.3	24
30	13.2	13.1	13.3	12.8	13.4	13.9	16.0	13.8	S	12.9	12.5	11.3	11.9	11.1	9.8	10.2	10.3	10.0	9.7	8.7	10.1	13.4	16.2	19.2	8.7	19.2	12.5	24
31	20.0	21.6	19.5	18.5	19.5	19.1	17.4	S	17.8	19.5	19.8	19.4	19.4	18.0	15.3	16.1	14.6	12.5	8.7	5.9	7.1	10.2	10.8	18.0	5.9	21.6	16.0	24
HOURLY MAX	27.4	28.5	28.6	28.7	28.0	27.3	27.5	25.9	26.8	30.5	30.6	30.5	32.6	31.4	32.1	33.6	29.4	28.2	28.1	29.2	29.6	28.6	28.3	28.3				
HOURLY AVG	15.3	14.7	14.9	14.8	14.9	14.8	14.2	13.5	14.9	16.8	18.1	18.0	19.1	19.4	19.1	19.6	18.4	17.5	16.6	16.3	16.0	16.0	15.2	15.8				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

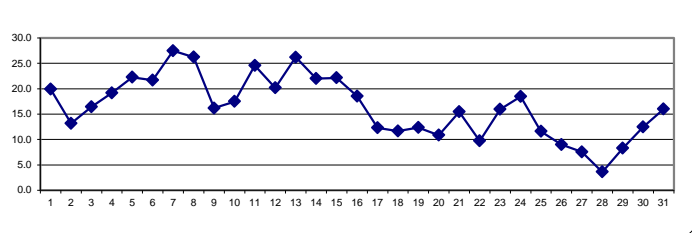
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

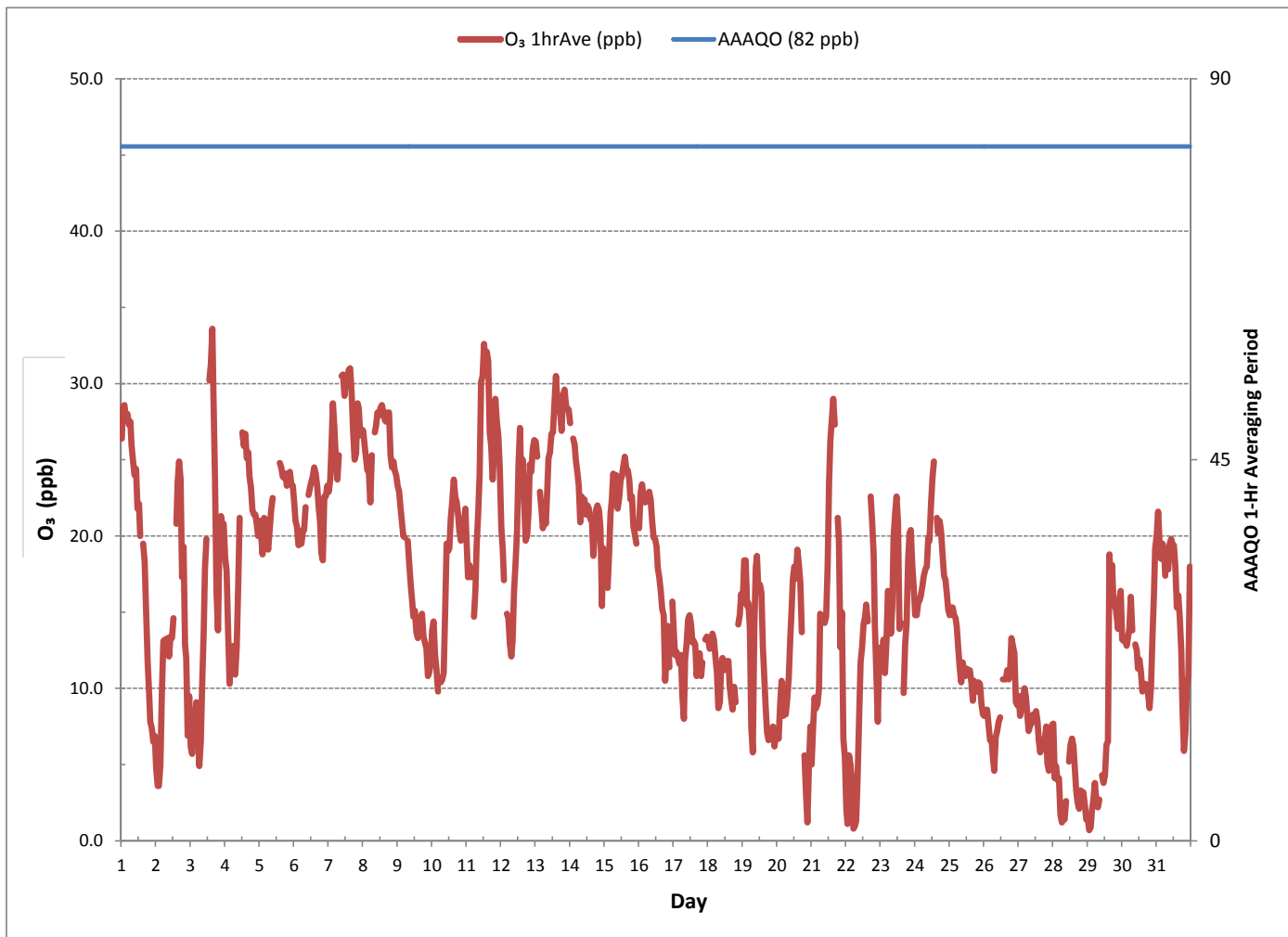
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	709			
MINIMUM 1-HR AVERAGE:	0.7 ppb	@ HOUR(S)	1	ON DAY(S) 29
MAXIMUM 1-HR AVERAGE:	33.6 ppb	@ HOUR(S)	15	ON DAY(S) 3
MAXIMUM 24-HR AVERAGE:	27.5 ppb			ON DAY(S) 7
				VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	7.41	MONTHLY AVERAGE:	16.4 ppb	

24 HOUR AVERAGES FOR October 2016



OZONE Hourly Averages (O₃ ppb)





OZONE Instantaneous Maximum (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	27.5	29.9	30.0	28.4	29.0	28.0	28.4	27.5	25.7	25.4	26.1	23.8	23.1	21.0	S	20.7	20.1	17.3	13.1	11.4	9.0	8.5	7.5	6.3	6.3	30.0	21.2	24
2	5.5	4.3	4.2	8.7	12.9	15.0	14.7	13.8	14.4	14.0	14.2	14.9	16.5	S	23.4	24.9	26.1	26.7	21.8	21.3	21.3	17.1	10.5	12.3	4.2	26.7	15.6	24
3	12.0	8.4	11.4	11.4	11.1	9.4	8.1	8.7	12.7	17.5	20.1	22.5	S	32.0	33.1	35.8	34.7	27.5	21.0	18.2	23.3	23.3	22.6	21.9	8.1	35.8	19.4	24
4	19.7	18.9	17.5	14.7	14.7	13.2	15.1	12.9	15.7	19.9	24.7	S	28.4	28.4	28.7	26.9	27.5	26.9	24.5	23.8	22.9	22.5	22.3	22.9	12.9	28.7	21.4	24
5	22.6	21.9	20.4	24.9	24.1	23.4	20.5	22.1	23.3	24.0	C	C	C	C	26.4	25.4	24.8	25.0	25.3	24.3	25.1	25.7	24.1	24.0	20.4	26.4	23.9	24
6	23.5	21.6	21.5	20.2	20.5	21.0	22.1	22.2	23.5	S	24.8	24.6	25.6	25.7	26.4	26.0	25.3	25.2	22.9	20.8	22.3	23.8	24.1	24.8	20.2	26.4	23.4	24
7	24.1	29.5	30.0	30.2	29.4	29.4	29.3	28.8	S	32.5	33.1	32.0	32.6	32.3	33.4	33.5	32.2	31.3	27.2	28.0	29.6	29.1	28.7	28.2	24.1	33.5	30.2	24
8	27.7	27.2	26.1	25.1	25.3	24.5	28.8	S	28.2	29.0	28.8	28.8	29.3	29.5	29.2	28.8	29.0	29.6	29.4	27.0	25.7	25.6	25.3	24.9	24.5	29.6	27.5	24
9	24.0	24.0	22.5	21.6	20.5	20.4	S	20.4	19.2	18.3	17.0	16.0	16.5	14.3	14.5	15.1	16.4	15.9	15.9	14.1	14.3	12.1	12.7	13.2	12.1	24.0	17.3	24
10	15.1	15.6	13.5	13.2	11.2	S	11.7	11.7	12.7	19.9	22.3	20.1	21.3	22.2	24.5	24.7	24.5	23.8	22.9	21.6	21.2	21.5	22.9	22.9	11.2	24.7	19.2	24
11	23.3	19.8	20.2	20.7	S	19.9	20.1	23.4	25.7	27.3	33.1	33.1	33.7	33.2	33.7	33.1	31.2	27.7	26.3	27.7	30.0	29.7	27.3	26.1	19.8	33.7	27.2	24
12	22.8	19.9	18.2	S	16.0	15.3	14.0	13.8	15.7	18.1	19.8	23.3	26.9	28.2	29.7	33.0	24.6	23.7	23.5	26.3	26.3	25.6	27.0	27.3	13.8	29.1	22.3	24
13	27.2	26.3	S	24.4	23.1	22.1	22.9	22.9	25.3	26.7	27.7	28.5	29.1	31.0	33.1	32.9	31.2	31.2	28.4	30.7	30.9	29.5	29.0	29.3	22.1	33.1	28.0	24
14	28.8	S	27.7	26.7	26.3	26.0	25.7	24.6	24.5	24.0	23.8	23.5	23.1	22.6	22.2	22.6	20.1	21.3	22.3	22.9	23.5	22.5	20.2	21.8	20.1	28.8	23.8	24
15	S	19.4	19.1	21.9	22.9	24.5	25.6	24.6	25.1	24.0	25.1	24.8	25.1	26.3	26.6	25.6	25.4	24.7	24.0	23.8	22.3	21.3	20.2	S	19.1	26.6	23.7	24
16	22.3	24.0	24.3	23.4	22.8	22.9	23.3	23.4	23.3	22.5	21.8	20.9	20.1	18.8	18.2	17.7	17.1	17.0	14.7	14.3	15.0	13.4	S	17.4	13.4	24.3	19.9	24
17	15.4	13.7	13.2	13.1	12.9	13.7	13.2	10.0	13.5	14.7	15.6	15.9	15.7	14.5	15.4	14.0	13.2	15.0	13.4	13.5	14.0	S	13.8	13.8	10.0	15.9	14.0	24
18	14.0	13.7	14.4	14.5	14.3	13.4	13.2	11.1	10.3	13.5	13.7	12.7	14.1	14.1	13.7	14.1	12.6	11.2	11.7	11.8	S	15.9	17.9	18.0	10.3	18.0	13.6	24
19	18.5	19.1	19.1	18.8	17.7	18.0	15.6	11.5	18.3	19.7	20.4	17.9	18.2	17.9	15.1	12.3	9.9	8.7	7.6	S	8.7	8.2	7.9	7.6	7.6	20.4	14.6	24
20	9.3	9.3	10.3	11.4	10.5	10.2	9.3	11.5	12.3	15.0	16.5	18.2	19.1	19.4	20.2	19.2	18.3	17.4	S	9.9	6.5	2.9	9.4	8.4	2.9	20.2	12.8	24
21	7.3	9.3	9.9	9.6	9.3	13.1	16.5	16.4	16.2	14.9	16.5	21.1	26.3	27.0	30.0	P	29.7	S	25.8	23.5	21.1	21.0	14.7	11.7	7.3	30.0	17.8	23
22	7.8	3.0	9.3	8.8	6.1	2.0	2.0	2.3	9.1	10.0	14.7	15.3	15.7	17.0	22.9	17.5	S	25.6	24.6	21.2	17.7	16.7	11.1	15.6	2.0	25.6	12.9	24
23	14.0	15.7	14.7	13.7	15.9	18.0	17.3	15.6	17.0	21.6	22.8	23.5	23.5	20.1	15.9	S	11.5	14.4	17.0	21.6	21.5	21.9	19.7	17.8	11.5	23.5	18.0	24
24	15.9	16.0	17.0	16.8	17.1	17.9	19.2	19.5	19.8	21.2	21.0	24.4	26.0	26.4	S	24.0	21.9	22.1	21.8	20.0	19.1	17.7	17.4	15.7	15.7	26.4	19.9	24
25	15.4	16.0	16.0	15.4	15.1	15.0	14.3	12.9	12.6	13.4	12.6	12.1	12.9	S	12.3	12.0	11.8	11.8	11.7	10.9	11.5	11.3	10.3	9.3	9.3	16.0	12.9	24
26	9.0	9.1	9.3	8.7	7.3	7.8	6.5	5.7	7.6	8.5	9.0	9.3	S	12.0	11.8	13.2	14.1	14.1	13.8	14.7	14.9	14.3	14.3	11.4	5.7	14.9	10.7	24
27	11.5	9.1	9.4	10.1	10.9	10.3	9.6	8.5	8.5	8.8	9.1	S	9.7	8.7	8.1	6.7	7.6	7.0	8.4	8.4	7.2	6.3	8.4	8.4	6.3	11.5	8.7	24
28	8.8	7.5	5.8	5.4	5.1	4.6	2.0	2.3	2.9	3.7	S	6.7	7.9	8.4	7.0	6.7	4.5	3.7	3.1	4.2	3.9	4.1	3.9	2.3	2.0	8.8	5.0	24
29	2.3	2.1	1.7	3.0	4.9	5.2	4.0	2.7	3.7	S	5.3	4.5	5.9	7.6	12.0	20.8	19.2	20.8	18.6	17.9	16.2	15.7	18.2	18.3	1.7	20.8	10.0	24
30	15.4	14.9	14.7	14.3	14.6	17.0	17.3	15.6	S	13.8	13.7	13.1	12.6	12.5	11.8	11.5	11.2	10.8	10.6	10.9	10.9	16.0	18.0	20.7	10.6	20.7	14.0	24
31	21.8	23.8	21.1	19.5	21.0	20.2	18.8	S	19.4	20.2	20.2	20.1	20.2	19.7	17.9	17.5	15.9	14.4	10.3	7.8	9.9	11.5	16.8	19.4	7.8	23.8	17.7	24
HOURLY MAX	28.8	29.9	30.0	30.2	29.4	29.4	29.3	28.8	28.2	32.5	33.1	33.1	33.7	33.2	33.7	35.8	34.7	31.3	29.4	30.7	30.9	29.7	29.0	29.3				
HOURLY AVG	17.1	16.4	16.4	16.6	16.4	16.7	16.3	15.4	16.8	18.7	19.8	19.7	20.7	21.1	21.3	21.1	20.4	19.7	18.7	18.4	18.2	17.8	17.5	17.4				

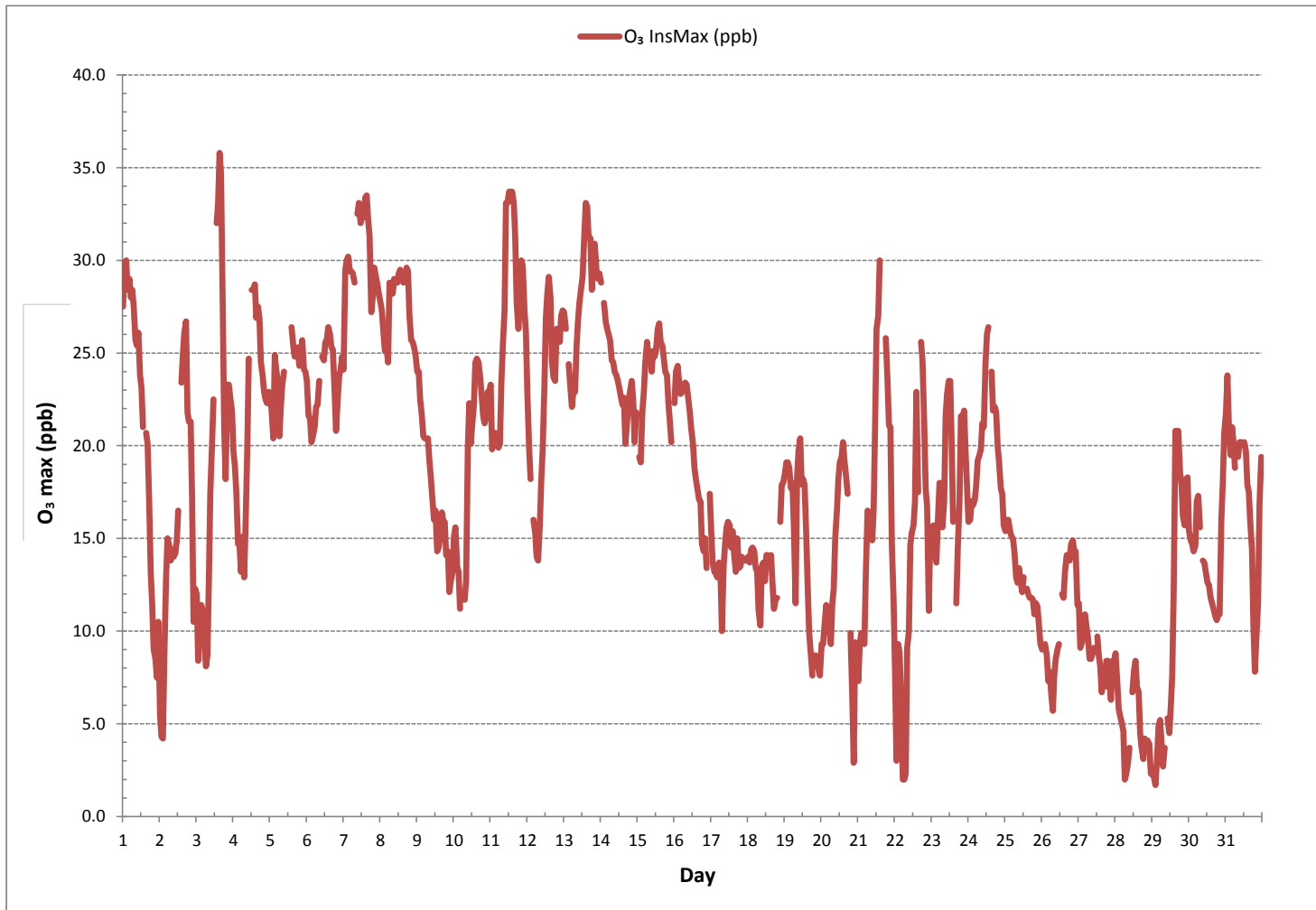
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

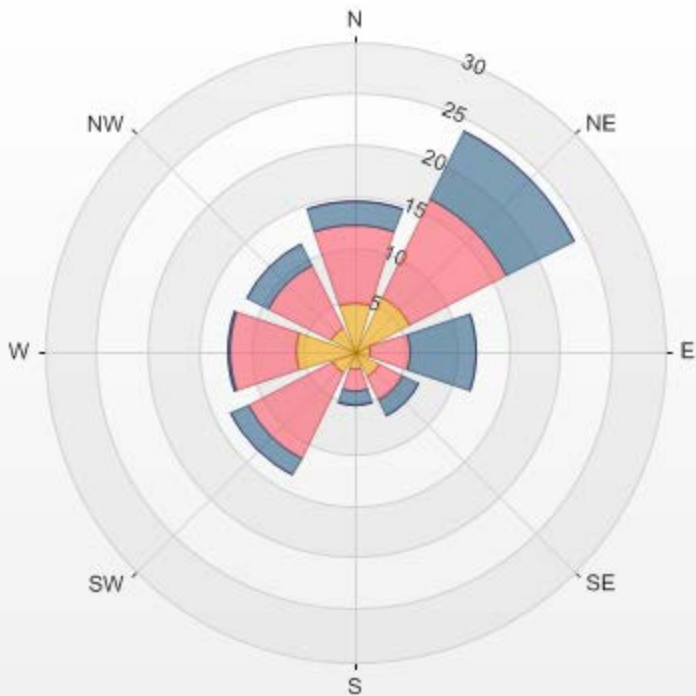
NUMBER OF NON-ZERO READINGS:	708
MAXIMUM INSTANTANEOUS VALUE:	35.8 ppb @ HOUR(S) 15 ON DAY(S) 3
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	7.45
OPERATIONAL TIME:	743 hrs

OZONE Instantaneous Maximum (O₃ ppb)



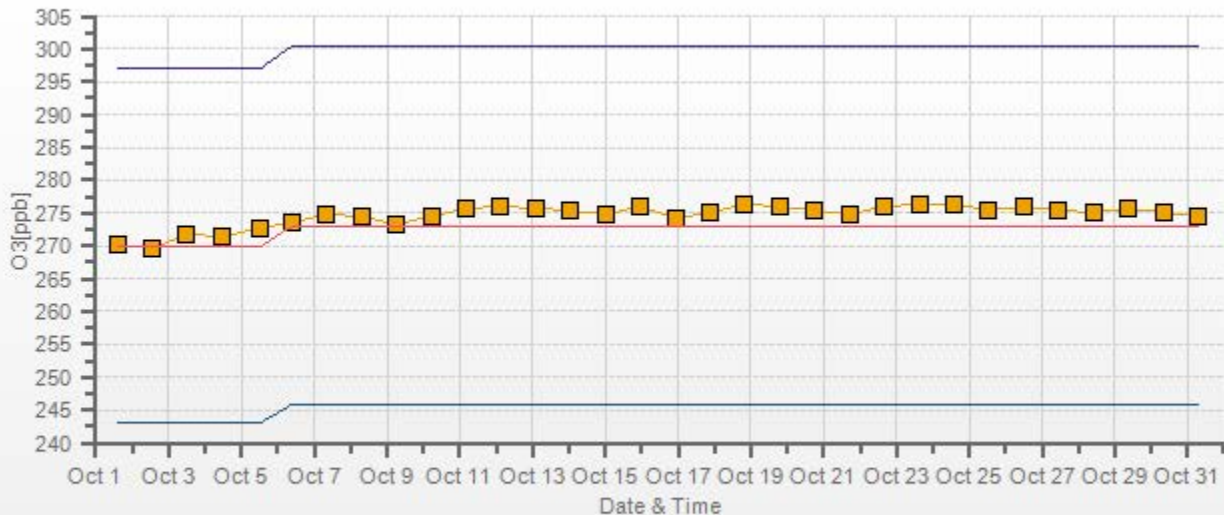
Wind: LICA Bonnyville Poll.: LICA Bonnyville-O3[ppb] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 95.16% Calm Avg: 0.00 [ppb]

Direction	0.0-11.2	11.2-22.5	22.5-33.7	>33.7	Total
N	4.8	7.49	2.4	0	14.69
NE	5.93	10.59	7.34	0	23.86
E	1.55	3.81	6.36	0	11.72
SE	2.68	2.54	1.84	0	7.06
S	1.69	2.12	1.41	0	5.22
SW	2.4	9.18	1.84	0	13.42
W	5.65	6.36	0.28	0	12.29
NW	2.68	6.78	2.26	0	11.72
Summary	27.38	48.87	23.73	0	100



% Icon Classes (ppb)	27	0.0-11.2	49	11.2-22.5	24	22.5-33.7	0	>33.7
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O3[ppb] Calibration: LICA Bonnyville Monthly: 2016/10 Type: Span



Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5

PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	X	X	X	X	X	X	X	X	X	X	X	4.2	9.7	4.5	0.0	2.5	0.0	2.0	0.0	0.0	0.0	0.8	3.2	0.5	0.0	9.7	2.1	13	
2	0.0	0.6	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	2.3	1.2	4.2	5.9	3.2	6.2	3.6	5.0	1.7	5.1	3.3	4.0	2.5	2.5	0.0	6.2	2.2	24	
3	8.0	0.8	4.8	7.3	4.7	4.7	7.8	9.0	6.0	5.1	3.2	3.8	6.6	2.4	7.5	6.7	6.7	2.8	7.0	5.6	6.3	1.7	5.1	4.2	0.8	9.0	5.3	24	
4	4.1	2.7	4.3	3.1	6.2	1.2	3.2	4.8	3.6	5.7	2.7	3.1	4.7	3.7	2.3	2.2	2.5	2.7	0.0	0.2	3.7	1.6	2.4	5.0	0.0	6.2	3.2	24	
5	0.7	4.7	0.0	4.1	0.0	X	0.2	0.7	0.0	0.7	0.1	C	C	C	C	0.2	5.1	4.1	0.0	1.6	1.6	4.1	0.0	1.1	0.0	5.1	1.5	23	
6	0.0	0.7	3.2	0.0	0.1	3.2	2.7	3.7	1.6	1.2	28.2	6.2	1.1	4.1	3.7	0.0	4.1	2.7	2.2	0.0	0.0	0.0	0.2	0.0	0.0	28.2	2.9	24	
7	2.7	0.0	1.1	X	0.0	1.1	1.2	2.7	4.2	0.0	0.0	2.2	1.1	1.1	2.7	2.7	4.7	1.1	3.7	3.2	0.0	0.7	0.2	2.7	0.0	4.7	1.7	23	
8	3.2	0.2	1.2	2.7	0.0	4.1	2.7	2.7	4.1	3.2	3.2	0.0	4.1	0.2	2.2	2.2	3.7	0.7	2.7	3.2	1.1	4.2	0.7	0.0	0.0	4.2	2.2	24	
9	4.7	0.0	0.1	X	4.7	3.2	2.2	2.7	3.7	1.7	3.2	1.6	3.2	0.2	0.7	0.2	0.7	0.0	X	0.2	1.2	1.1	0.0	0.7	0.0	4.7	1.6	22	
10	1.6	X	0.0	4.2	0.7	0.2	1.6	2.6	X	0.0	0.0	2.2	0.7	1.6	0.2	1.6	5.1	0.1	2.2	4.1	0.7	0.0	0.7	0.0	0.0	5.1	1.4	22	
11	0.1	0.0	1.6	2.6	1.6	4.7	3.1	1.1	2.6	4.7	3.2	3.7	7.2	3.2	4.7	7.7	5.1	7.7	2.2	4.7	3.6	4.2	4.7	3.7	0.0	7.7	3.7	24	
12	5.1	8.7	8.6	6.2	3.6	8.6	8.1	6.1	7.7	9.6	7.2	9.2	4.1	1.6	8.2	6.7	4.7	5.6	4.1	5.6	1.1	2.2	0.0	2.6	0.0	9.6	5.6	24	
13	1.6	0.0	0.2	0.0	3.7	0.0	2.6	1.6	2.2	1.6	5.1	6.7	1.6	6.6	4.7	2.2	4.7	5.1	6.7	5.1	3.7	3.7	5.1	0.0	0.0	6.7	3.1	24	
14	0.0	8.2	6.6	2.7	2.7	3.7	11.7	7.7	2.6	2.2	6.2	3.7	2.2	4.2	1.6	3.2	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	11.7	3.0	24	
15	0.0	X	0.0	X	0.2	0.7	1.7	1.6	1.6	0.2	0.0	0.2	X	0.0	0.0	0.7	3.2	0.0	3.2	5.6	5.6	7.2	6.2	1.1	0.0	7.2	1.9	21	
16	4.1	0.0	3.7	3.1	4.2	1.1	2.2	0.0	3.1	3.6	0.7	1.1	0.0	0.7	5.6	2.2	3.2	5.1	0.7	0.0	0.2	2.7	3.2	2.7	0.0	5.6	2.2	24	
17	0.7	1.1	3.7	1.7	1.1	0.7	0.0	1.6	1.6	0.0	0.0	2.2	3.7	2.7	0.7	2.2	4.1	6.7	10.1	8.2	5.1	7.7	4.7	3.2	0.0	10.1	3.1	24	
18	4.2	0.2	3.7	3.2	1.6	7.7	9.2	10.1	2.7	1.1	1.1	1.6	2.7	2.2	1.6	4.1	5.6	2.2	2.2	1.1	0.0	4.7	3.7	1.1	0.0	10.1	3.2	24	
19	1.1	0.7	0.0	0.0	0.7	0.7	1.6	5.1	5.6	6.2	1.1	2.7	3.7	4.7	6.6	9.2	7.7	10.6	11.2	14.2	12.7	12.7	17.7	11.7	0.0	17.7	6.2	24	
20	11.7	10.6	6.2	13.1	9.1	10.6	12.1	10.1	14.6	11.7	12.7	11.7	7.2	4.1	7.7	10.1	4.7	5.1	11.2	7.7	7.2	8.2	15.2	5.6	4.1	15.2	9.5	24	
21	6.2	5.1	4.7	9.2	12.1	4.7	9.6	6.7	12.1	10.6	8.7	6.7	9.6	8.7	0.0	4.7	6.7	2.7	2.7	5.6	3.7	1.2	9.6	14.2	0.0	14.2	6.9	24	
22	9.7	10.1	5.6	5.6	5.6	9.1	12.1	13.7	8.1	14.6	7.7	5.1	9.2	9.2	10.6	3.7	1.6	5.6	2.2	3.7	3.7	7.2	10.1	5.6	1.6	14.6	7.5	24	
23	2.2	5.1	5.1	7.7	6.7	8.2	5.1	9.2	10.1	0.7	7.7	6.7	8.7	6.2	2.6	15.7	9.2	7.2	3.7	4.7	5.1	2.7	3.2	2.7	0.7	15.7	6.1	24	
24	5.1	1.2	7.7	3.7	2.2	3.2	5.1	2.7	1.1	5.6	3.2	2.2	2.2	0.0	3.2	0.7	3.2	0.7	5.6	0.7	0.7	0.0	1.1	3.2	0.0	7.7	2.7	24	
25	5.1	6.6	1.6	2.6	6.2	3.2	1.1	3.2	5.6	3.7	0.2	3.2	4.7	0.0	6.2	2.2	2.7	6.2	4.7	6.2	0.7	2.6	4.7	0.0	0.0	6.6	3.6	24	
26	2.2	5.6	0.0	0.1	0.2	2.7	0.0	1.6	0.0	0.7	0.0	C	C	0.0	0.0	0.0	3.7	10.1	3.7	1.1	2.2	2.7	3.7	0.2	0.0	10.1	1.8	24	
27	0.0	4.1	2.7	0.0	1.2	7.7	0.2	0.7	6.7	0.2	0.7	1.1	4.7	2.2	2.7	4.7	0.0	2.2	3.7	3.7	0.7	5.6	3.2	0.0	0.0	7.7	2.4	24	
28	3.7	2.2	0.7	4.7	5.6	5.6	0.7	3.7	1.1	0.0	2.7	1.6	0.7	1.1	0.1	0.0	0.7	1.6	4.1	3.7	3.2	2.7	4.7	0.7	0.0	5.6	2.3	24	
29	0.0	0.0	2.7	2.7	3.2	4.2	1.6	4.7	5.1	6.7	6.6	8.2	11.7	10.6	12.1	6.2	5.6	7.2	7.7	2.7	5.6	4.7	9.2	9.2	0.0	12.1	5.8	24	
30	5.1	4.7	2.7	7.7	8.2	7.7	2.7	3.7	5.6	9.2	6.2	7.2	7.7	7.2	12.1	11.2	11.7	7.7	5.1	5.6	7.2	5.1	4.1	8.7	2.7	12.1	6.8	24	
31	8.2	4.1	8.7	6.7	9.2	8.7	11.7	12.7	8.7	8.7	6.2	7.2	6.7	8.2	11.7	9.2	8.7	8.2	9.2	6.2	0.2	3.2	0.0	4.7	0.0	12.7	7.4	24	
HOURLY MAX	11.7	10.6	8.7	13.1	12.1	10.6	12.1	13.7	14.6	14.6	28.2	11.7	11.7	10.6	12.1	15.7	11.7	10.6	11.2	14.2	12.7	12.7	17.7	14.2					
HOURLY AVG	3.4	3.1	3.0	3.9	3.5	4.2	4.1	4.6	4.5	4.0	4.3	4.0	4.8	3.6	4.2	4.2	4.3	4.0	4.2	3.9	3.1	3.5	4.1	3.3					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

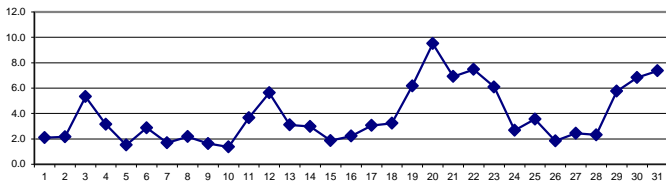
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m ³	24-HR	30 µg/m ³
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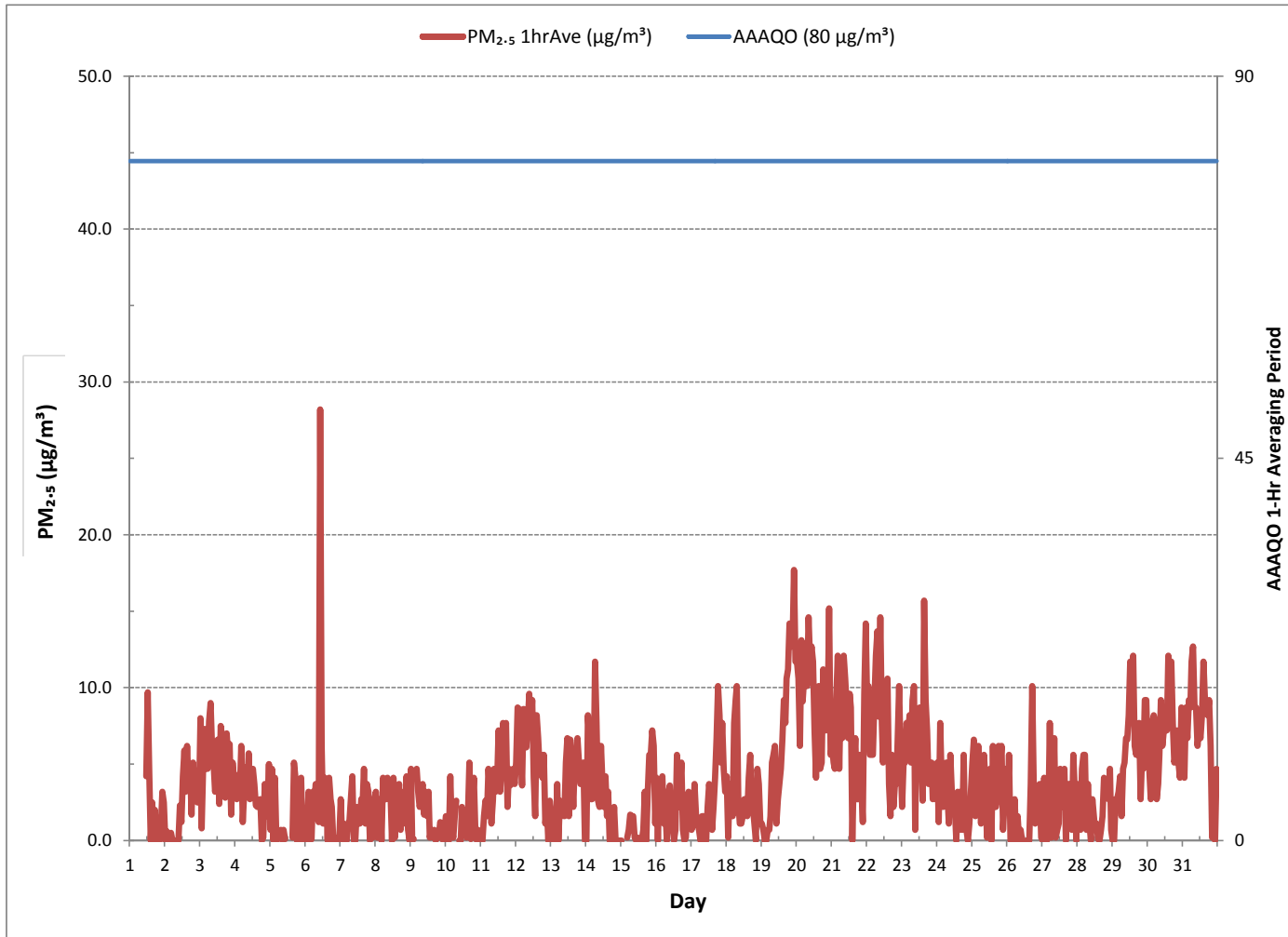
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	627			
MINIMUM 1-HR AVERAGE	0.0 µg/m ³	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	28.2 µg/m ³	@ HOUR(S)	10	ON DAY(S) 6
MAXIMUM 24-HR AVERAGE:	9.5 µg/m ³			ON DAY(S) 20
				VAR-VARIOUS
MONTHLY CALIBRATION TIME:	6 hrs	OPERATIONAL TIME:	724 hrs	
		AMD OPERATION UPTIME:	97.3 %	
STANDARD DEVIATION:	3.48	MONTHLY AVERAGE:	3.9 µg/m ³	

24 HOUR AVERAGES FOR October 2016

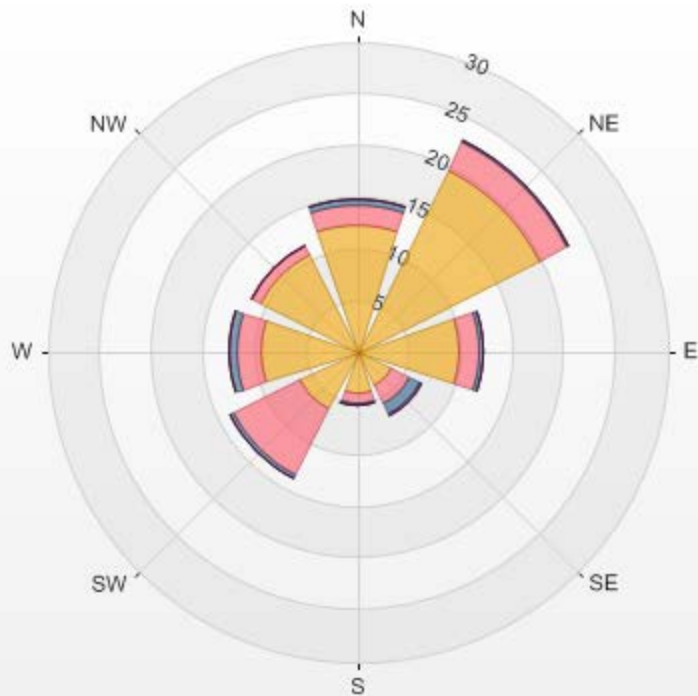


PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-PM25[ug/m3(L)] Monthly: 2016/10 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 96.37% Calm Avg: 0.00 [ug/m3(L)]

Direction	0.0-5.7	5.7-11.3	11.3-17.0	17.0-22.6	22.6-28.3	>28.3	Total
N	12.27	1.95	0.56	0	0	0	14.78
NE	19.67	3.07	0.14	0	0	0	22.88
E	9.9	1.95	0.42	0	0	0	12.27
SE	3.77	1.81	1.26	0.14	0	0	6.98
S	4.04	0.98	0.28	0	0	0	5.3
SW	6.28	7.11	0.42	0	0	0	13.81
W	9.34	2.37	0.7	0	0	0	12.41
NW	10.6	0.84	0	0	0.14	0	11.58
Summary	75.87	20.08	3.78	0.14	0.14	0	100



% Icon Classes (ug/m3(L))	76	20	4	0	0	0
0.0-5.7	0.0-5.7	5.7-11.3	11.3-17.0	17.0-22.6	22.6-28.3	>28.3

WIND SPEED

WIND SPEED Hourly Averages (WS kph)

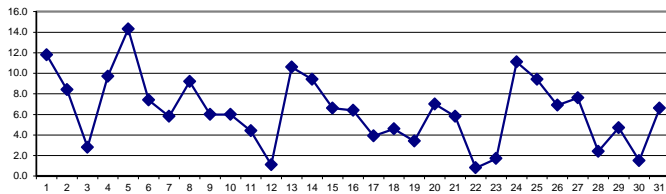
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	8.7	10.6	12.9	12.7	14.6	14.7	15.7	16.5	15.8	14.1	13.3	11.8	16.3	13.6	12.8	13.7	12.9	12.1	8.9	7.9	6.5	7.9	6.3	6.6	6.3	16.5	11.8	24
2	5.5	1.7	4.1	16.9	15.5	15.5	14.3	15.3	13.8	12.5	15.7	19.1	17.4	14.1	10.2	10.6	9.3	5.9	5.8	7.5	4.2	0.7	2.4	1.9	0.7	19.1	8.4	24
3	0.9	5.8	4.7	5.9	4.4	4.1	3.9	5.4	4.2	2.4	1.8	4.0	2.6	3.1	4.5	1.2	5.2	3.6	2.2	1.9	3.5	6.5	7.6	8.9	0.9	8.9	2.8	24
4	8.5	5.6	4.2	4.3	6.0	7.4	7.0	7.4	7.7	10.8	13.6	12.5	15.7	14.5	13.7	12.9	13.7	12.1	11.0	7.3	12.3	11.9	10.5	11.1	4.2	15.7	9.7	24
5	12.6	12.6	11.7	13.1	10.9	12.4	13.6	15.9	16.9	17.7	17.2	17.9	17.4	18.6	18.7	18.6	18.8	16.3	15.4	12.7	11.5	8.7	9.1	9.1	8.7	18.8	14.3	24
6	8.3	7.7	7.5	8.0	9.0	9.2	9.5	9.5	10.7	10.6	9.7	9.2	9.2	7.4	7.0	6.9	6.0	5.9	6.9	6.5	5.9	6.1	5.1	4.6	4.6	10.7	7.4	24
7	4.3	3.2	2.7	2.8	0.8	3.2	4.6	7.1	7.9	8.4	6.5	7.5	8.0	9.0	8.3	7.8	7.4	7.2	6.4	8.1	9.4	8.6	7.0	5.7	0.8	9.4	5.8	24
8	5.9	7.0	7.5	7.5	6.3	5.7	6.9	8.0	12.5	13.9	13.1	12.7	13.2	12.5	13.3	13.6	12.3	11.6	12.6	8.3	9.6	11.1	9.0	9.3	5.7	13.9	9.2	24
9	9.8	9.6	11.4	9.7	9.1	10.8	11.0	9.3	6.1	6.3	8.4	7.4	8.3	8.1	6.9	8.5	8.2	9.7	8.7	8.6	7.1	6.8	7.7	7.5	6.1	11.4	6.0	24
10	6.2	5.9	5.1	5.3	2.3	4.5	5.6	6.2	7.9	8.3	6.8	7.9	6.8	7.7	8.1	7.1	5.5	6.8	7.1	6.3	5.5	3.4	4.5	4.7	2.3	8.3	6.0	24
11	5.1	5.3	2.5	4.4	3.4	2.0	2.6	2.8	4.4	5.5	6.0	6.8	6.1	4.7	9.0	9.4	6.4	6.0	5.4	8.3	15.3	14.5	8.6	7.8	2.0	15.3	4.4	24
12	5.5	6.6	5.8	5.9	5.6	5.7	4.5	3.6	3.9	4.0	3.5	4.4	6.0	5.2	4.6	7.4	6.9	6.4	8.0	10.0	8.1	6.6	7.2	9.0	3.5	10.0	1.1	24
13	10.3	8.8	6.5	7.0	8.2	7.4	8.1	8.1	12.0	12.9	12.7	13.2	12.7	12.8	15.3	13.2	12.1	11.9	13.1	14.8	10.9	11.5	10.5	10.6	6.5	15.3	10.6	24
14	8.5	9.8	7.5	8.8	8.5	11.9	10.0	9.6	10.9	12.8	14.6	13.9	12.2	12.1	11.7	10.2	9.4	11.7	12.5	11.0	8.9	6.1	4.7	5.6	4.7	14.6	9.4	24
15	3.8	2.7	3.6	5.6	8.7	8.0	9.2	7.8	7.0	5.1	7.9	7.9	8.2	8.3	9.4	9.8	7.8	7.3	5.5	7.0	6.4	6.7	6.7	6.8	2.7	9.8	6.6	24
16	11.3	13.9	12.9	9.3	9.9	14.7	15.8	13.1	14.1	14.4	11.2	7.8	6.0	4.9	3.6	2.2	1.9	1.8	0.6	2.2	2.5	1.9	2.5	2.8	0.6	15.8	6.4	24
17	2.9	3.1	3.4	3.1	2.4	3.4	3.3	3.1	4.3	4.6	4.8	4.4	4.0	4.3	4.7	4.8	4.1	4.3	3.9	3.2	3.5	4.1	4.7	4.5	2.4	4.8	3.9	24
18	4.0	4.3	4.4	4.7	4.8	4.6	3.9	4.2	4.4	4.6	5.2	7.2	7.0	7.9	6.5	5.6	7.1	5.1	3.9	3.6	1.9	2.8	2.6	1.5	1.5	7.9	4.6	24
19	2.4	2.2	1.7	1.8	2.0	3.3	1.9	1.1	1.5	3.6	3.2	5.0	1.5	5.1	6.1	5.0	4.7	4.6	6.9	7.7	5.4	6.4	5.7	8.3	1.1	8.3	3.4	24
20	7.8	5.5	7.5	7.6	6.1	8.8	9.5	11.7	11.1	9.9	12.3	14.5	15.8	9.8	14.3	9.7	8.4	5.7	3.5	0.1	3.2	2.2	2.0	4.3	0.1	15.8	7.0	24
21	6.8	6.3	4.5	4.8	7.3	7.6	10.3	8.5	8.3	7.8	6.5	7.8	9.7	8.9	8.5	8.8	5.6	3.7	4.1	3.1	2.5	2.0	1.3	0.7	0.7	10.3	5.8	24
22	0.6	1.1	3.3	3.9	5.2	1.7	2.4	2.7	3.4	2.7	6.5	4.4	4.8	0.3	1.1	1.2	3.1	5.1	2.1	5.0	2.8	1.4	4.3	5.0	0.3	6.5	0.8	24
23	5.5	4.7	3.7	2.9	4.8	4.9	3.8	4.8	5.5	4.9	3.2	0.5	4.3	7.4	8.0	7.7	6.9	8.7	8.4	7.4	8.5	9.8	9.6	8.4	0.5	9.8	1.7	24
24	9.8	11.9	11.8	11.9	11.6	13.3	12.4	12.5	10.4	11.7	12.3	11.3	11.3	12.0	9.7	9.6	11.9	10.7	9.5	12.0	10.3	11.1	11.0	11.4	9.5	13.3	11.1	24
25	9.0	9.3	12.6	9.5	14.0	13.3	10.5	8.4	10.0	12.7	10.0	10.6	11.2	12.8	11.6	10.2	10.2	9.1	8.0	7.3	7.1	4.6	2.5	2.4	2.4	14.0	9.4	24
26	2.5	7.0	10.7	11.0	9.5	10.1	10.3	8.0	9.5	10.0	12.0	9.6	10.7	10.4	9.2	8.0	6.7	4.1	4.1	3.5	2.1	2.0	0.0	2.0	0.0	12.0	6.9	24
27	3.0	4.4	5.7	6.6	7.7	9.5	8.4	9.4	10.6	12.5	13.9	11.5	10.3	8.9	8.3	6.5	8.0	5.8	7.3	7.4	7.6	6.8	7.8	5.5	3.0	13.9	7.6	24
28	6.4	6.3	7.1	5.6	3.9	3.4	3.7	5.2	6.1	6.8	7.8	5.6	4.7	3.8	0.6	2.7	3.8	1.9	1.1	3.8	3.2	3.1	3.1	4.5	0.6	7.8	2.4	24
29	3.4	6.7	6.7	2.4	4.8	6.9	9.2	6.2	4.9	5.3	6.8	4.7	3.5	2.9	2.8	10.8	6.7	9.1	6.3	3.0	4.7	7.2	9.5	4.6	2.4	10.8	4.7	24
30	4.9	5.3	6.3	5.0	4.1	5.5	4.8	4.1	4.8	6.5	5.6	9.9	7.8	6.0	6.8	6.7	8.3	8.0	6.3	4.6	4.6	4.9	4.8	7.2	4.1	9.9	1.5	24
31	12.1	11.2	11.0	9.1	10.3	8.7	10.1	11.2	12.2	14.2	14.3	9.5	10.0	7.8	7.1	7.4	5.1	3.7	5.2	4.4	4.9	2.8	4.6	7.1	2.8	14.3	6.6	24
HOURLY MAX	12.6	13.9	12.9	16.9	15.5	15.5	15.8	16.5	16.9	17.7	17.2	19.1	17.4	18.6	18.7	18.6	18.8	16.3	15.4	14.8	15.3	14.5	11.0	11.4				
HOURLY AVG	2.2	2.1	2.2	1.9	2.3	2.6	2.4	2.3	2.3	2.2	2.0	1.8	2.3	2.3	2.1	2.0	2.4	2.6	2.6	2.4	2.4	2.4	2.3	2.3				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: January 26, 2016
DECLINATION : MAGNETIC DECLINATION 19 DEGREE EAST

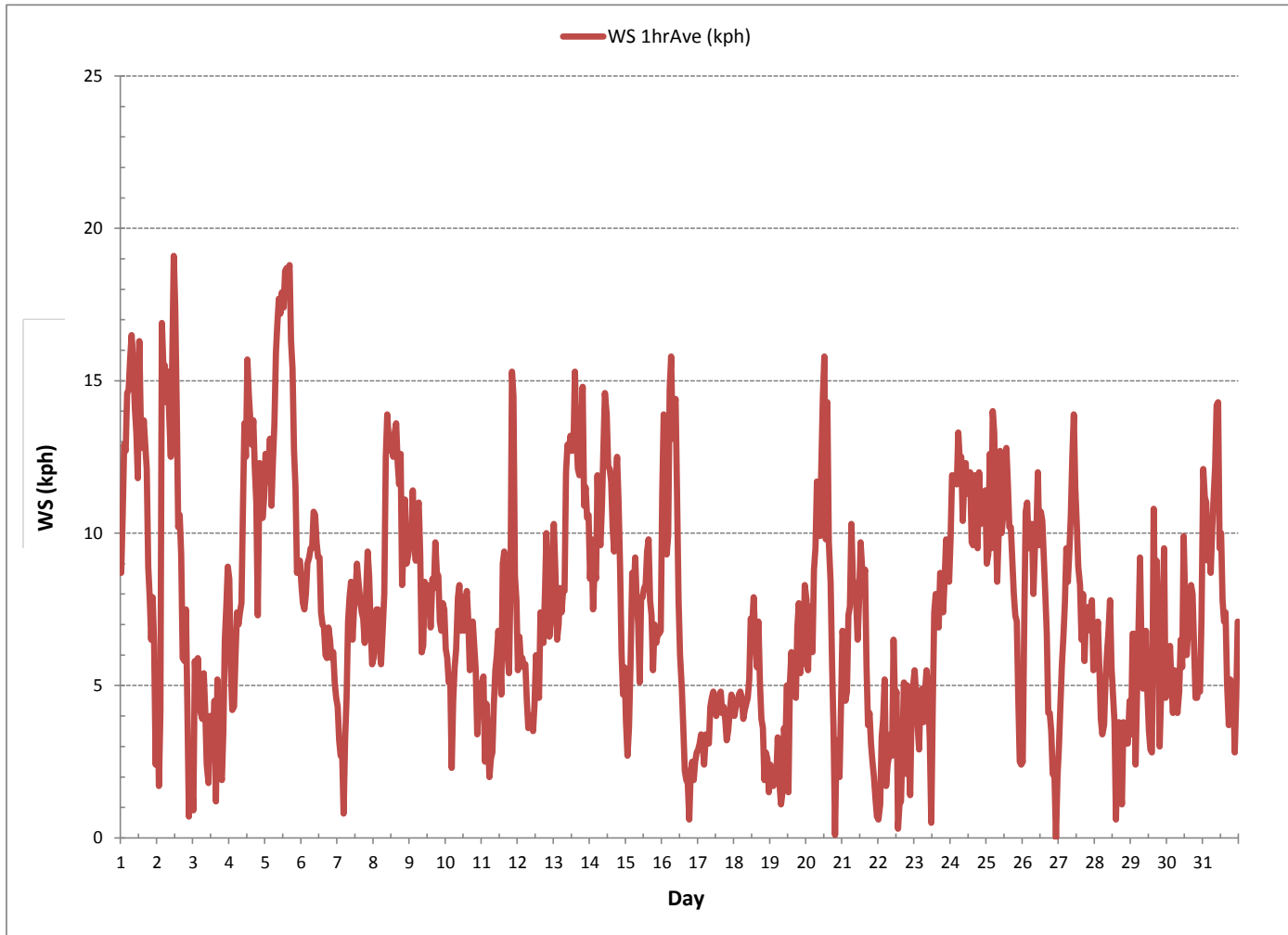
24 HOUR AVERAGES FOR October 2016



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	743
MINIMUM 1-HR AVERAGE:	0.0 kph @ HOUR(S) 22 ON DAY(S) 26
MAXIMUM 1-HR AVERAGE:	19.1 kph @ HOUR(S) 11 ON DAY(S) 2
MAXIMUM 24-HR AVERAGE:	14.3 kph ON DAY(S) 5
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs
	OPERATIONAL TIME: 744 hrs
	AMD OPERATION UPTIME: 100.0 %
STANDARD DEVIATION:	3.82
	MONTHLY AVERAGE: 2.2 kph

WIND SPEED Hourly Averages (WS kph)





WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	21.1	24.4	36.5	30.3	34.5	37.9	39.0	43.8	39.4	36.9	41.3	35.2	45.0	35.2	29.0	36.2	32.3	33.1	29.3	19.3	14.4	15.7	14.7	16.3	14.4	45.0	30.9	24
2	13.4	7.7	9.9	38.5	40.3	43.6	40.7	42.9	36.5	32.9	36.0	38.1	36.9	37.2	24.2	24.6	18.3	13.8	9.3	14.1	12.6	4.2	6.3	6.3	4.2	43.6	24.5	24
3	7.5	11.6	12.9	14.4	12.0	10.3	11.4	13.8	10.9	7.8	9.6	10.2	10.2	9.3	10.0	12.4	12.6	11.3	7.5	6.3	9.9	15.3	15.8	20.4	6.3	20.4	11.4	24
4	20.4	16.9	9.8	9.8	14.0	16.1	16.3	18.7	22.1	32.1	33.7	32.7	39.4	38.1	32.7	32.9	32.5	33.2	32.8	21.4	27.7	28.0	27.5	25.4	9.8	39.4	25.6	24
5	25.4	26.8	24.7	29.0	27.5	31.9	30.4	31.4	32.8	35.9	33.6	39.3	35.2	36.3	41.1	38.8	39.8	35.2	34.3	24.7	24.9	20.6	17.7	20.0	17.7	41.1	30.7	24
6	19.8	15.3	14.7	14.7	18.8	19.7	19.5	17.9	21.9	21.0	21.2	21.1	18.7	15.5	15.6	17.6	16.5	13.9	13.0	12.5	14.2	14.7	13.8	11.6	11.6	21.9	16.8	24
7	9.9	9.7	10.7	9.1	11.2	13.8	14.0	17.1	18.4	19.9	18.6	22.8	21.9	22.3	19.5	18.1	18.3	16.4	16.5	19.2	19.1	18.0	16.0	15.3	9.1	22.8	16.5	24
8	14.2	15.0	18.6	17.4	14.1	13.1	15.2	19.5	29.6	26.3	25.1	25.3	30.6	24.9	25.4	27.6	23.2	28.7	29.2	16.6	23.7	27.2	24.0	23.4	13.1	30.6	22.4	24
9	24.4	23.2	26.4	23.1	24.6	24.6	28.2	22.7	15.2	14.5	16.1	17.3	17.7	16.3	17.6	20.5	18.9	21.6	19.1	17.2	16.1	13.7	18.3	15.0	13.7	28.2	19.7	24
10	17.0	11.6	11.4	11.2	8.0	11.7	10.8	13.6	18.4	17.5	16.5	16.6	14.7	13.8	17.2	13.8	12.1	16.7	14.7	13.3	13.0	7.2	9.6	9.4	7.2	18.4	13.3	24
11	10.8	13.1	7.6	10.8	6.9	6.6	7.2	7.3	10.4	14.2	15.9	18.4	22.9	12.5	15.1	10.7	10.4	10.4	18.5	25.8	24.7	16.5	13.1	6.6	6.6	25.8	13.5	24
12	9.5	10.3	9.7	9.9	8.2	9.1	6.8	7.7	8.6	7.3	7.7	8.3	9.7	10.5	11.5	14.0	15.3	15.8	17.8	26.7	18.7	14.3	17.7	21.6	6.8	26.7	12.4	24
13	20.2	19.1	15.4	15.5	17.0	17.4	16.9	19.2	25.4	24.1	28.9	29.2	29.6	28.2	31.6	31.2	31.4	28.5	28.3	35.5	32.2	28.6	22.9	21.1	15.4	35.5	24.9	24
14	18.7	22.0	17.7	24.3	21.7	29.1	25.5	23.1	23.9	28.8	34.0	33.7	31.3	31.6	26.9	26.1	19.6	24.7	30.0	28.5	25.2	13.7	10.2	14.9	10.2	34.0	24.4	24
15	10.0	7.3	10.2	20.1	19.3	20.3	23.5	16.5	16.1	11.5	17.6	17.1	20.0	17.1	20.4	21.9	18.8	17.2	14.1	15.1	14.0	16.4	14.8	16.6	7.3	23.5	16.5	24
16	27.2	29.6	27.3	24.0	27.4	32.8	42.0	37.1	35.5	36.8	24.0	19.5	14.2	11.3	9.5	6.5	4.1	5.0	3.2	5.1	5.6	4.0	5.4	6.4	3.2	42.0	18.5	24
17	6.5	7.9	8.6	7.6	6.3	8.2	7.2	8.1	10.5	10.1	11.8	9.7	9.9	11.8	11.1	11.7	8.9	9.5	8.6	8.1	9.1	11.1	11.3	10.7	6.3	11.8	9.3	24
18	8.3	10.1	9.8	10.5	10.7	10.5	10.6	10.1	10.1	11.3	10.8	17.3	17.6	18.4	15.0	12.6	15.2	11.1	10.7	9.6	7.0	8.0	8.2	5.9	5.9	18.4	11.2	24
19	6.2	7.4	7.2	6.3	8.1	9.6	9.6	6.3	7.1	7.0	8.7	9.8	5.5	8.3	10.5	11.3	9.2	9.7	12.9	13.3	10.3	10.6	10.5	16.8	5.5	16.8	9.3	24
20	14.2	14.9	15.0	14.8	13.1	18.1	22.6	26.2	26.6	18.3	24.5	30.3	30.4	22.3	33.9	19.8	18.6	10.7	8.0	3.2	7.6	8.1	6.5	12.0	3.2	33.9	17.5	24
21	13.3	13.6	10.1	11.6	15.7	16.4	23.6	16.0	17.8	17.4	12.3	17.9	18.7	20.8	15.0	P	11.6	8.6	8.2	5.7	6.2	6.7	6.4	5.1	5.1	23.6	13.0	23
22	5.3	5.5	7.2	8.4	10.8	7.9	7.2	7.7	8.3	7.0	12.9	11.8	13.4	8.1	10.5	15.9	12.5	11.5	12.7	13.9	6.5	6.4	8.2	7.8	5.3	15.9	9.5	24
23	9.0	8.0	9.6	11.9	9.2	8.2	6.7	8.5	10.0	11.8	8.7	8.5	9.0	15.8	18.5	15.7	13.1	19.5	22.5	18.1	18.7	25.8	24.2	20.4	6.7	25.8	13.8	24
24	20.6	25.6	29.7	26.8	27.5	30.6	28.1	29.1	24.9	27.7	27.1	24.3	30.2	30.2	28.8	23.9	28.7	32.1	23.1	26.4	21.7	26.4	28.3	28.2	20.6	32.1	27.1	24
25	20.9	24.4	25.8	24.6	30.1	29.8	22.7	22.0	24.3	26.6	23.9	25.5	25.9	28.3	27.7	23.4	20.8	19.4	16.6	15.4	14.2	12.3	7.9	6.9	6.9	30.1	21.6	24
26	10.4	18.7	28.3	28.5	23.6	25.1	26.6	19.6	23.8	26.1	29.9	24.5	27.6	25.0	23.8	17.2	15.0	13.2	10.5	9.5	9.2	7.2	5.3	9.1	5.3	29.9	19.1	24
27	8.6	10.6	15.7	16.3	17.9	21.3	17.9	21.5	24.3	27.1	29.0	28.8	26.4	25.9	21.5	17.1	19.4	12.0	18.3	16.5	17.2	21.5	16.1	14.1	8.6	29.0	19.4	24
28	12.6	12.7	15.9	12.6	10.0	6.7	9.9	10.9	15.2	13.3	16.0	12.6	10.9	10.7	7.5	6.3	9.3	6.4	4.5	8.4	7.4	9.4	8.2	7.1	4.5	16.0	10.2	24
29	7.7	12.6	13.1	6.6	9.0	10.5	15.2	10.8	8.5	12.3	12.1	12.8	8.6	8.5	11.8	23.5	14.2	20.0	14.7	10.0	10.7	14.5	17.6	9.2	6.6	23.5	12.3	24
30	11.5	13.0	11.8	14.3	12.4	14.3	13.6	10.8	9.2	12.5	12.0	17.5	15.6	14.7	13.5	17.0	17.6	18.0	16.6	12.6	11.5	10.9	14.1	14.1	9.2	18.0	13.7	24
31	17.8	21.6	25.1	20.9	21.8	20.0	17.3	18.6	21.7	22.9	22.1	17.8	23.0	19.4	16.9	15.3	10.7	9.8	10.2	10.1	9.6	6.3	16.4	14.9	6.3	25.1	17.1	24
HOURLY MAX	27.2	29.6	36.5	38.5	40.3	43.6	42.0	43.8	39.4	36.9	41.3	39.3	45.0	38.1	41.1	38.8	39.8	35.2	34.3	35.5	32.2	28.6	28.3	28.2				
HOURLY AVG	14.3	15.2	16.0	16.9	17.2	18.6	18.9	18.7	19.6	20.0	20.7	21.1	21.6	20.3	19.8	19.6	17.7	17.3	16.4	15.3	15.0	14.6	14.2	14.2				

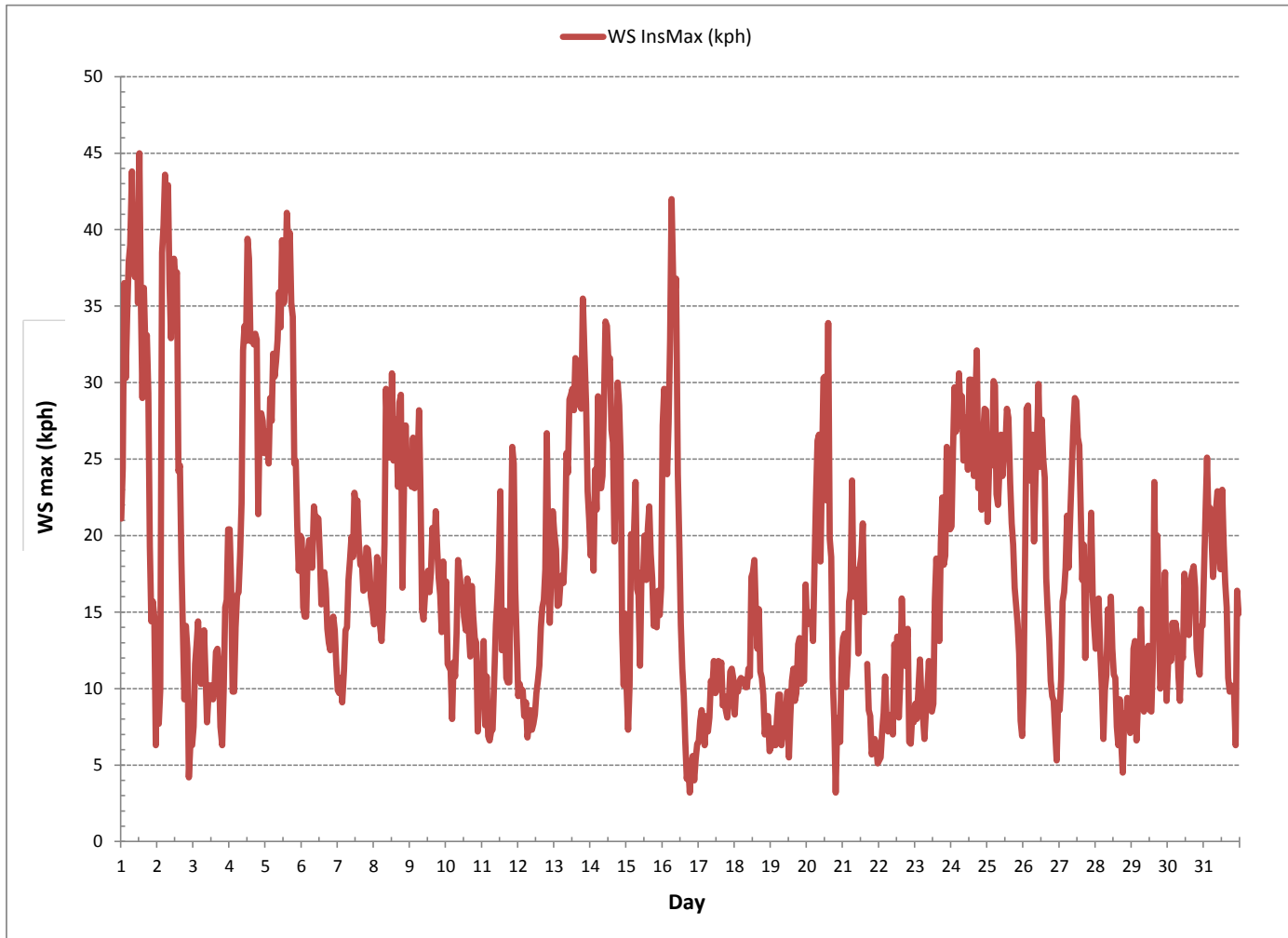
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

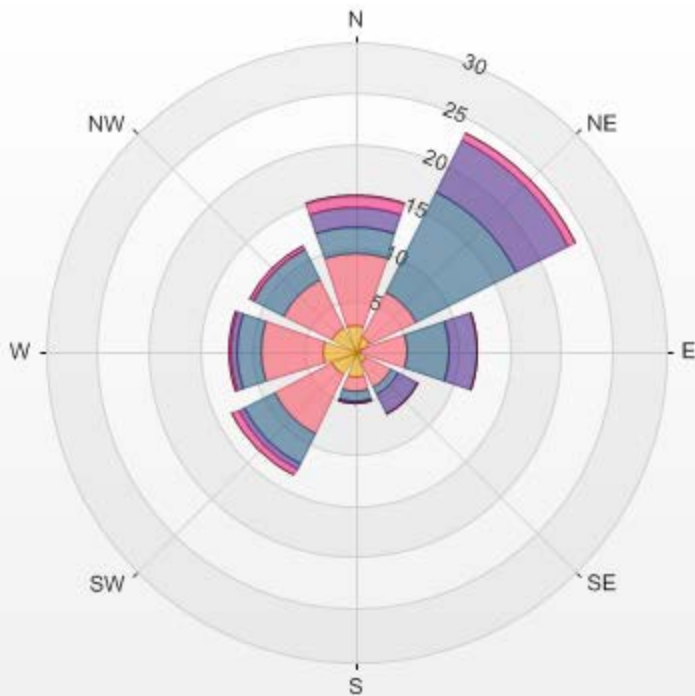
MAXIMUM INSTANTANEOUS VALUE:	45.0	kph	@ HOUR(S)	12	ON DAY(S)	1
					VAR-VARIOUS	
OPERATIONAL TIME:					743	hrs

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA Bonnyville Monitor: WSP [kph] Monthly: 2016/10 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 100.00% Calm Avg: 0.00

Direction	0.0-3.8	3.8-7.7	7.7-11.5	11.5-15.4	15.4-19.2	>19.2	Total
N	2.55	7.12	2.42	1.88	1.21	0	15.18
NE	1.61	4.97	10.75	5.65	0.81	0	23.79
E	0.67	4.44	4.03	2.69	0	0	11.83
SE	1.08	2.82	0.81	2.02	0.13	0	6.86
S	2.42	1.48	0.94	0.27	0	0	5.11
SW	2.55	6.32	3.23	0.67	0.67	0	13.44
W	3.23	5.91	2.28	0.67	0.13	0	12.22
NW	2.55	5.38	3.23	0	0.4	0	11.56
Summary	16.66	38.44	27.69	13.85	3.35	0	100



% Icon Classes (kph)	17	38	28	14	3	0
0.0-3.8	3.8-7.7	7.7-11.5	11.5-15.4	15.4-19.2	>19.2	

WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville - October 2016

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY 1	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	ENE	NE	24	
2	ENE	E	SE	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	WSW	WSW	WSW	WSW	SW	SW	SSW	S	SSW	NNW	NNW	N	WSW	24		
3	NE	NNE	NE	N	NE	NE	N	NNE	NNE	NNE	S	S	NNE	S	S	NNW	N	NNE	NNE	N	N	N	N	N	NNE	24	
4	NE	NE	N	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NNE	N	N	NNE	NNE	N	N	N	N	N	N	NNE	24
5	N	NNW	NNW	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24
6	NW	NW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24
7	NNE	NNE	NE	ESE	NNE	N	NE	NE	E	E	ESE	ENE	ENE	ENE	E	E	E	ENE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
8	ENE	E	ENE	ENE	ENE	ENE	E	ESE	SE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	E	E	ENE	NE	ESE	24
9	NE	NE	NE	NE	NE	NE	NE	NE	NNE	N	NNW	NNW	NW	NW	NW	NW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NNW	24
10	NW	NW	NW	NNW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	NW	NNW	NW	NW	NNW	NNW	NNW	NNW	NNW	NW	NW	NNW	24
11	WNW	WNW	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WSW	WSW	WSW	WSW	SSW	S	SSW	SSE	SSE	S	S	SSW	SW	SSW	SW	24	
12	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	NW	NNW	NNW	N	NNE	NNE	NNE	NE	NE	W	24	
13	NE	NE	ENE	NE	NE	ENE	E	E	ESE	ESE	E	E	ENE	E	E	ENE	ENE	ENE	ENE	NE	ENE	ENE	ENE	NE	ENE	ENE	24
14	NE	NE	NE	NE	NE	NE	ENE	ENE	NE	NE	NE	NE	NE	NE	NNE	NNE	N	N	N	N	NNE	N	NNW	N	NE	24	
15	NNE	NNE	NNE	NE	NE	ENE	ENE	E	ENE	NE	NE	NE	NE	NE	NE	ENE	ENE	E	ENE	ENE	E	E	E	ENE	ENE	ENE	24
16	E	ESE	E	E	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	ENE	ENE	NE	NE	NNE	N	NNW	NW	NW	NNW	NW	WNW	ENE	24	
17	WNW	W	W	WNW	WNW	WNW	W	W	W	W	WNW	WNW	W	W	W	W	WNW	WNW	WNW	W	W	W	W	WNW	W	24	
18	WNW	W	W	W	W	W	W	W	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	WSW	WNW	24
19	SW	WSW	SW	SSW	SSW	SSW	NNW	NE	SSE	SSE	SSE	ESE	SSE	SSE	SE	SE	SE	SE	SSE	SSE	SE	SE	ESE	SE	SSE	24	
20	SE	E	ESE	SE	ESE	E	E	SE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	SE	SE	ESE	NNW	N	S	SW	SW	ESE	24	
21	WSW	SW	SW	SW	WSW	SW	SSW	WSW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	SSW	SE	SSE	SW	24	
22	E	NNE	NNE	NNE	NE	NNE	N	NNE	NNE	NNE	NNE	NNE	NNE	W	SSW	SSE	SW	E	S	WSW	S	S	SSW	SW	NNE	24	
23	SSW	SSW	SW	WSW	SSW	SSW	SSW	SSW	SSW	SW	SW	NW	N	NNE	N	N	N	NE	NE	NE	NE	NE	NE	ENE	NNE	24	
24	NE	NE	ENE	ENE	ENE	ENE	ENE	E	E	E	ENE	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
25	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	E	NE	24	
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27	E	NE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NNE	NNE	NNE	N	N	NNE	N	NNE	NE	24
28	NNW	NNW	NNW	N	N	NW	NW	NNW	NNW	NNW	NNW	N	N	NNE	S	SW	WNW	NW	SSW	SSE	S	SE	S	SSE	NNW	24	
29	SSE	S	S	S	SSE	SSW	SSW	SSW	SSW	SW	WSW	WSW	WSW	W	W	SSW	SSW	SSW	SSW	SSW	SW	SE	SE	SSE	ESE	SSW	24
30	ENE	E	E	E	E	ESE	ESE	E	ESE	SE	S	SSW	SW	WSW	WNW	WNW	WNW	W	W	W	WNW	WNW	W	SW	SW	24	
31	SSW	SSW	SW	SW	SW	SW	S	S	SSW	SSW	SSW	SW	SW	WSW	W	WSW	WSW	WSW	NW	NW	NW	NW	NNW	NNW	SW	24	

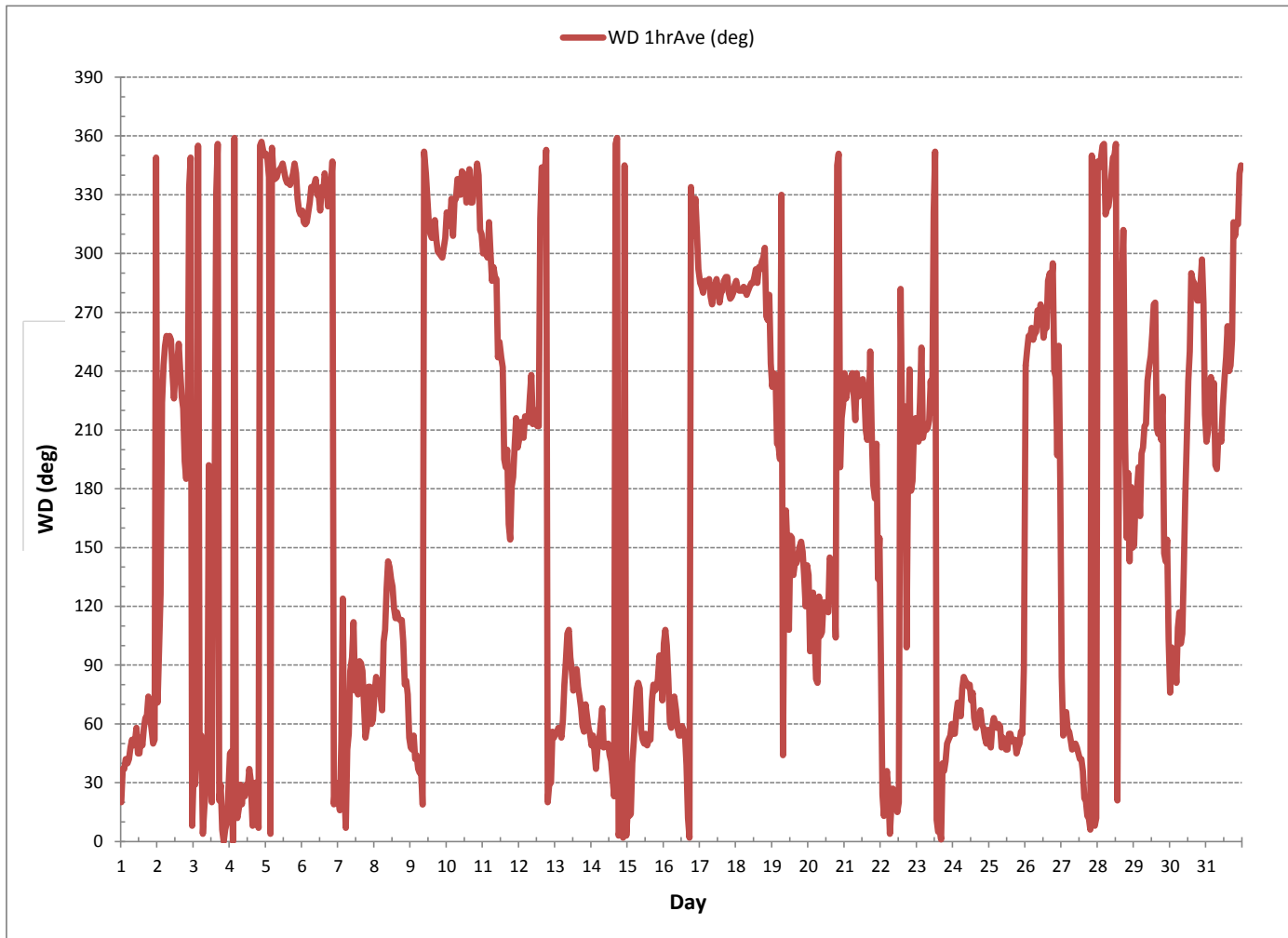
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	January 26, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0 hrs	OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	114.52	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	30 (NNE)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville - October 2016

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	RDGS.	
DAY																										
1	19	18	19	20	19	20	20	19	20	19	21	19	18	18	20	20	21	20	23	21	17	17	18	20	24	
2	19	33	18	16	17	18	19	18	20	19	17	15	18	19	21	18	14	11	11	10	17	14	10	20	24	
3	40	18	29	21	29	31	25	20	27	38	49	44	49	43	20	29	21	25	27	20	19	19	18	19	24	
4	21	23	16	16	20	19	20	20	21	22	22	20	22	21	20	21	21	20	20	19	17	18	16	15	24	
5	16	14	13	18	17	14	13	14	15	15	16	16	15	14	16	14	15	15	14	14	13	15	13	14	24	
6	13	13	13	12	13	13	14	13	14	15	16	19	16	19	21	17	20	14	13	13	13	17	19	18	24	
7	20	19	30	50	32	22	31	21	20	21	33	25	27	23	25	22	21	21	22	20	18	18	19	22	24	
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19	21	22	20	29	32	32	15	57	32	29	31	33	54	14	13	21	21	20	13	9	12	11	13	11	24	
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24	19	17	20	20	20	19	19	18	18	18	19	18	22	21	20	18	19	21	19	18	17	17	19	20	24	
25	19	19	16	21	17	17	19	20	18	16	19	18	18	17	17	16	17	17	17	17	15	19	21	26	24	
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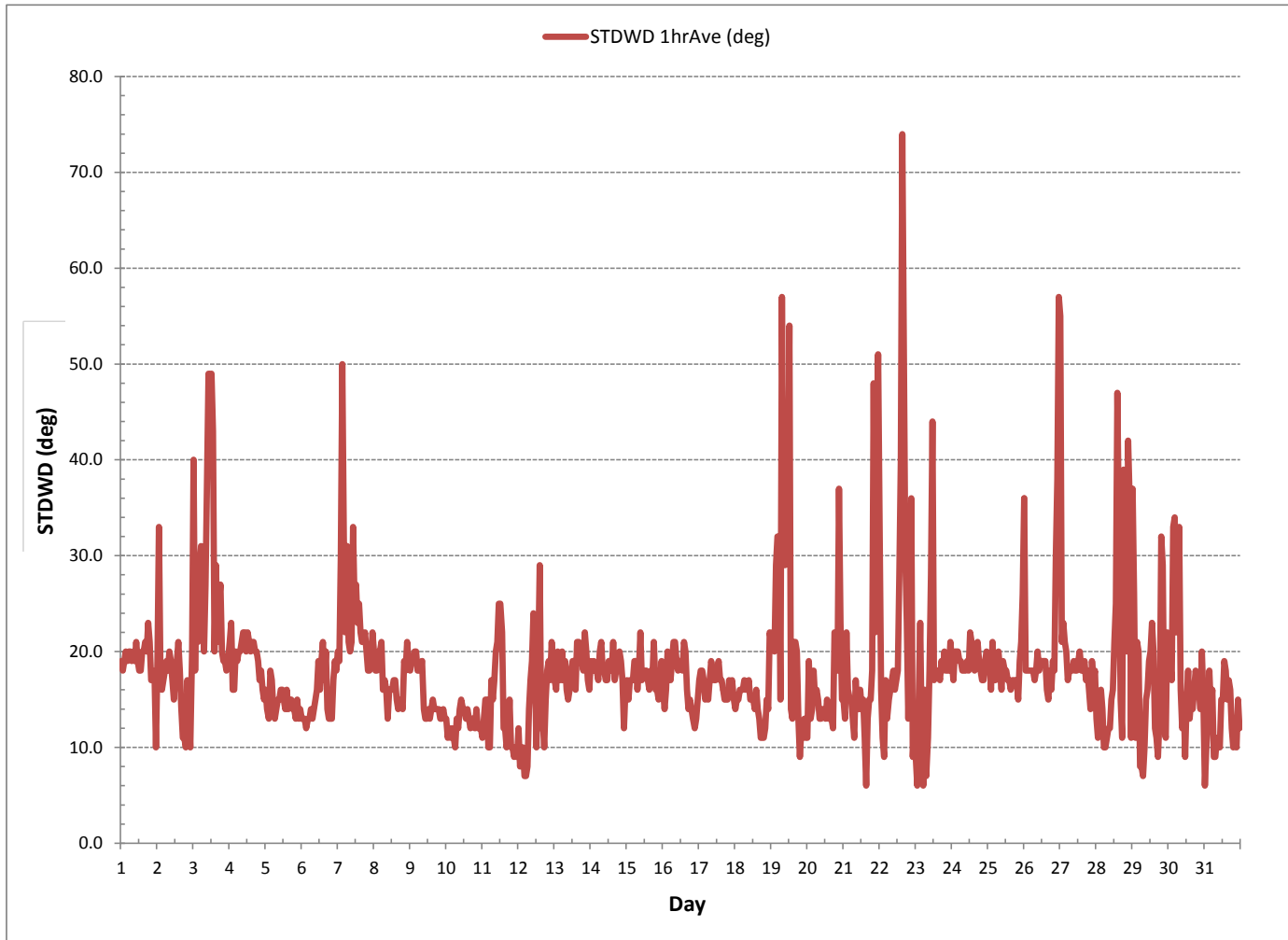
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: January 26, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 1499P
 Station ID: LICA-37 Installation Date/Time (mst): Sep 28, 2016 @ 12:22
 Sample ID: LICA/VOC/Bonnyville/Oct 03, 2016 Removal Date/Time (mst): Oct 06, 2016 @ 10:12

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 03, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Oct 04, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.3</u>	<u>+ 19.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - 27.3 @ 12:22 / Sep 28, 2016 mst
 Final leak check deployment vacuum (in. Hg) = - 27.3 @ 16:08 / Sep 29, 2016 mst
 Total leak rate = 0.0 psi over 27 hours minutes A.Y.
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Oct 07, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Sep 28, 2016 (due every 6 months)

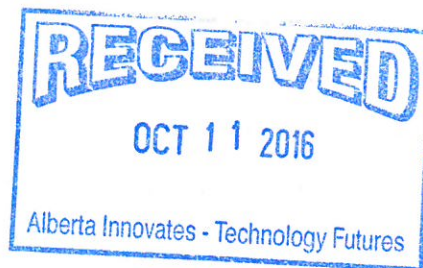
Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last calibration - Oct 07, 2016
The canister does not have a pressure gauge.
The data was taken from the pressure gauge of the sampler.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Oct 07, 2016

Sample ID: 16100085-003
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Oct 03, 2016



Volatile Organics Data Results

Date: October 3, 2016
Canister ID: 14998

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.02
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.02
2-Methylpentane	0.02
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.01
Acetone	1.4
Acrolein	< 0.3
Benzene	0.04
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.42
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	0.6
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.35

Volatile Organics Data Results

Date: October 3, 2016
Canister ID: 14998

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	0.02
Freon-12	0.69
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.17
Isopentane	0.13
Isoprene	0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.02
Methylcyclopentane	0.02
Methylene chloride	< 0.3
n-Butane	0.16
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.01
n-Hexane	0.02
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.04
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 8200
 Location: Bonnyville - AER Canister ID: 1136
 Station ID: LICA-37 Installation Date/Time (mst): Oct 06, 2016 @ 10:12
 Sample ID: LICA/voc/Bonnyville/Oct 09, 2016 Removal Date/Time (mst): Oct 11, 2016 @ 14:12

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 09, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Oct 10, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.2</u>	<u>+17.6</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Oct 07, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Sep 28, 2016 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last audit - Oct 07, 2016
On Oct 07, 2016 the sample canister was removed to complete an audit of the sampler. After the quarterly audit the canister was re-installed for sampling.

Deployment Technician Signature: Alex Yakupov
 Collection Technician Signature: Alex Yakupov Date: Oct 11, 2016

Sample ID: 16100130-003

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Oct 9, 2016



Volatile Organics Data Results

Date: October 9, 2016
Canister ID: 1136

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.07
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	< 0.01
2-Methylpentane	0.03
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.02
Acetone	1.5
Acrolein	< 0.3
Benzene	0.05
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	1.02
Carbon tetrachloride	0.15
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.46
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.03
cis-2-Pentene	< 0.02
Cyclohexane	0.02
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	0.6
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.41

Volatile Organics Data Results

Date: October 9, 2016
Canister ID: 1136

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.08
Freon-114	< 0.02
Freon-12	0.69
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.16
Isopentane	0.18
Isoprene	0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.04
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.03
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.44
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.01
n-Hexane	0.03
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.07
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.02
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6200
 Location: Bonnyville -AER Canister ID: 55645
 Station ID: LICA 37 Installation Date/Time (mst): Oct 14, 2016 @ 14:12
 Sample ID: LICA/VOC/Bonnyville/Oct 15, 2016 Removal Date/Time (mst): Oct 20, 2016 @ 18:18

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 15, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Oct 16, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.0</u>	<u>+19.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Oct 07, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Sep 28, 2016 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last audit - Oct 07, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Oct 20, 2016

Sample ID: 16100230-004

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/Oct 15, 2016



Volatile Organics Data Results

Date: October 15, 2016
Canister ID: S5645

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	0.04
1,1,2,2-Tetrachloroethane	0.03
1,1,2-Trichloroethane	0.03
1,1-Dichloroethane	0.03
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.05
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.05
1,2-Dichloropropane	0.04
1,3,5-Trimethylbenzene	0.03
1,3-Butadiene	0.04
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.09
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.05
2,4-Dimethylpentane	0.02
2-Methylheptane	0.01
2-Methylhexane	0.21
2-Methylpentane	0.1
3-Methylheptane	< 0.02
3-Methylhexane	0.11
3-Methylpentane	0.05
Acetone	4.1
Acrolein	< 0.3
Benzene	0.09
Benzyl chloride	< 0.4
Bromodichloromethane	0.04
Bromoform	0.02
Bromomethane	0.06
Carbon disulfide	0.14
Carbon tetrachloride	0.14
Chlorobenzene	0.02
Chloroethane	0.06
Chloroform	0.07
Chloromethane	4.76
cis-1,2-Dichloroethene	0.02
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.04
cis-2-Pentene	< 0.02
Cyclohexane	0.05
Cyclopentane	0.02
Dibromochloromethane	0.03
Ethanol	5.1
Ethyl acetate	< 0.4
Ethylbenzene	0.03
Freon-11	0.35

Volatile Organics Data Results

Date: October 15, 2016
Canister ID: S5645

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.1
Freon-114	0.06
Freon-12	0.68
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.69
Isopentane	0.53
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.11
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	0.6
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.1
Methylcyclopentane	0.06
Methylene chloride	< 0.3
n-Butane	0.91
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.15
n-Hexane	0.17
n-Nonane	0.02
n-Octane	< 0.02
n-Pentane	0.2
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.05
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.15
trans-1,2-Dichloroethylene	0.03
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.03
trans-2-Pentene	0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	0.04

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 1708
 Station ID: LICA-37 Installation Date/Time (mst): Oct 20, 2016 @ 18:18
 Sample ID: LICA/VOC/Bonnyville/Oct 21, 2016 Removal Date/Time (mst): Oct 24, 2016 @ 17:48

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 21, 2016</u>	<u>00:00</u>	<u>00:00</u> <u>Oct 22, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.0</u>	<u>+19.0</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Oct 07, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Sep 28, 2016 (due every 6 months)

Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required

Comments: Date of last audit - Oct 07, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Oct 24, 2016

Sample ID: 16100270-002

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/ Oct 21, 2016



Volatile Organics Data Results

Date: October 21, 2016
Canister ID: 1708

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.13
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.11
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.04
2,4-Dimethylpentane	0.01
2-Methylheptane	0.01
2-Methylhexane	0.07
2-Methylpentane	0.1
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.06
Acetone	2.1
Acrolein	< 0.3
Benzene	0.22
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.01
Carbon disulfide	0.07
Carbon tetrachloride	0.1
Chlorobenzene	< 0.02
Chloroethane	0.18
Chloroform	0.04
Chloromethane	1.23
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.04
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	1.7
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.3

Volatile Organics Data Results

Date: October 21, 2016
Canister ID: 1708

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.07
Freon-114	0.02
Freon-12	0.71
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.36
Isopentane	0.6
Isoprene	0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.05
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.05
Methylcyclopentane	0.07
Methylene chloride	< 0.3
n-Butane	1.62
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.1
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.3
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.11
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.03
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	0.03

Maxxam Analytics

VOC Sample Collection Data Sheet Alberta Air FCD AIR FCD-01320 / 2

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 14993
 Station ID: LICA 37 Installation Date/Time (mst): Oct 24, 2016 @ 17:48
 Sample ID: LICA/VOC/Bonnyville/Oct 27, 2016 Removal Date/Time (mst): Oct 28, 2016 @ 11:46

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Oct 27, 2016</u>	<u>00:00</u>	<u>Oct 28, 2016 00:00</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.7</u>	<u>+18.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Oct 07, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Sep 28, 2016 (due every 6 months)

****Leak rate must be 0.0 psi over a minimum of 5 minutes or repair is required****

Comments: Date of last audit - Oct 07, 2016

The canister is not equipped with a pressure gauge. Data was taken from the pressure gauge of the sampler.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Oct 28, 2016

Sample ID: 16100306-003

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Oct 27, 2016



Volatile Organics Data Results

Date: October 27, 2016
Canister ID: 14993

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.04
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.01
2-Methylpentane	0.12
3-Methylheptane	< 0.02
3-Methylhexane	0.02
3-Methylpentane	0.06
Acetone	0.9
Acrolein	< 0.3
Benzene	0.09
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	0.02
Carbon disulfide	0.01
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	< 0.02
Chloromethane	0.47
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.03
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	0.8
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.3

Volatile Organics Data Results

Date: October 27, 2016
Canister ID: 14993

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.06
Freon-114	0.02
Freon-12	0.64
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.65
Isopentane	0.33
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.05
Methylcyclopentane	0.05
Methylene chloride	< 0.3
n-Butane	0.98
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.06
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.2
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	0.07
Tetrahydrofuran	< 0.4
Toluene	0.09
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

PAH RESULTS

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-02</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA-37</u>	Installation Date/Time:	<u>Oct Sep 28, 2016/12:29 A.Y.</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Oct 03, 2016</u>	Removal Date/Time:	<u>Oct 6, 2016 / 10:04</u>

Sample Data Collection Information

Sample Date:	<u>Oct 03, 2016</u>	Average Pressure (mmHg)	<u>702</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Oct 04, 2016</u>	Average Temperature (°C)	<u>8.0°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (Vstd m ³)	<u>330.20</u>

Sample Recovery Checklist

(circle one)

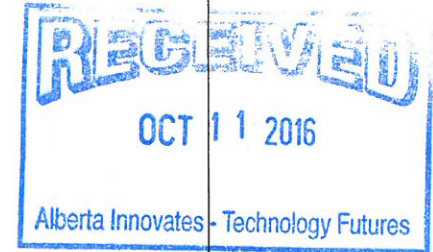
Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>Oct 07, 2016 (A.Y.)</u>	

Other observations? n/a

On Oct 07, 2016 a quarterly audit of the sampler was conducted.

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Oct. 07, 2016



Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: October 3 , 2016
PUF S/N: TE-02

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.04
2-Methylnaphthalene	0.10
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.02
Acenaphthylene	0.04
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.06
Fluorene	0.08
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.06
Perylene	< 0.01
Phenanthrene	0.21
Pyrene	0.06
Retene	0.03

Sample ID: 16100130-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Oct 9, 2016



TISCH PUF PLUS Sample Collection Data Sheet

Client:	LICA	Puf+ S/N:	TE-01
Location:	Bonnyville- AER	Motor S/N:	1139/100-1015
Station ID:	LICA-37	Installation Date/Time:	Oct 6, 2016 / 10:04
Field Sample ID:	LICA/PUF/Bonnyville/Oct 9, 2016	Removal Date/Time:	Oct 11, 2016 / 14:26

Sample Data Collection Information

Sample Date:	Oct 9, 2016	Average Pressure (mmHg)	702
Start Time (mst):	00:00	Average Flow (Q _{std})	229
End Time (mst):	00:00 Oct 10, 2016	Average Temperature (°C)	-0.8°
Elapsed Time (Hours):	24.0	Volume (V _{std} m ³)	330.22

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	Oct 07, 2016	
Other observations?	n/a	

On Oct 07, 2016, the sample filter (PUF) was removed for sampler calibration/audit and re-installed right after the audit.

Deployed By:	Alex Yakupov	
Collected By:	Alex Yakupov	Date: Oct 11, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: October 9, 2016
PUF S/N: TE-01

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.05
2-Methylnaphthalene	0.09
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.15
Acenaphthylene	0.06
Acridine	< 0.01
Anthracene	0.03
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.03
Fluorene	0.08
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.15
Perylene	< 0.01
Phenanthrene	0.1
Pyrene	0.03
Retene	0.06

Sample ID: 16100230-005

Customer ID: LICA
 Cust Samp ID: LICA/PUF/Bonnyville/Oct 15, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-06</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Oct 11, 2016 / 14:26</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Oct 15, 2016</u>	Removal Date/Time:	<u>Oct 20, 2016 / 18:24</u>

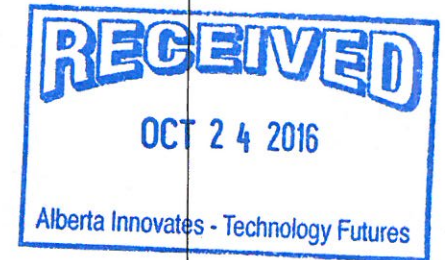
Sample Data Collection Information

Sample Date:	<u>Oct 15, 2016</u>	Average Pressure (mmHg)	<u>695</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Oct 16, 2016</u>	Average Temperature (°C)	<u>-2.0°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.21</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>Oct 07, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	Date: <u>Oct 20, 2016</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

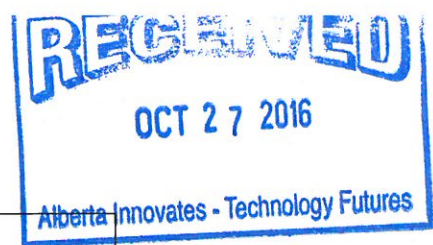
Date: October 15, 2016
PUF S/N: TE-06

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.09
2-Methylnaphthalene	0.17
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	0.06
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.07
Fluorene	0.07
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.09
Perylene	< 0.01
Phenanthrene	0.2
Pyrene	0.07
Retene	0.05

Sample ID: 16100270-003

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/ Oct 21, 2016



ISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>9102</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/ 100 - 1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Oct 20, 2016/18:24</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Oct 21, 2016</u>	Removal Date/Time:	<u>Oct 24, 2016/16:44</u>

Sample Data Collection Information

Sample Date:	<u>Oct 21, 2016</u>	Average Pressure (mmHg)	<u>699</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>Oct 22, 2016 100:00</u>	Average Temperature (°C)	<u>2.5°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (Vstd m ³)	<u>330.20</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Oct 07, 2016</u>	
Other observations?	<u>n/a</u>	

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Oct 24, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: October 21, 2016
PUF S/N: 9102

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.03
2-Methylnaphthalene	0.06
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.02
Acenaphthylene	0.10
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.05
Benzo(c)phenanthrene	0.12
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.10
Fluorene	0.08
Indeno(1,2,3-cd)pyrene	0.01
Naphthalene	0.05
Perylene	< 0.01
Phenanthrene	0.26
Pyrene	0.08
Retene	0.04

Sample ID: 16100306-004

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Oct 27, 2016

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-03</u>
Location:	<u>Bonnyville AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Oct 24, 2016/16:44</u>
Field Sample ID:	<u>LICA/Bonnyville/PUF/Oct 27, 2016</u>	Removal Date/Time:	<u>Oct 28, 2016/11:55</u>

Sample Data Collection Information

Sample Date:	<u>Oct 27, 2016</u>	Average Pressure (mmHg)	<u>700</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>Oct 28, 2016/00:00</u>	Average Temperature (°C)	<u>1.0</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (Vstd m ³)	<u>330.22</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	<input type="radio"/> YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Oct 07, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Oct 28, 2016

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: October 27, 2016
PUF S/N: TE-03

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.22
2-Methylnaphthalene	0.41
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	0.01
Acenaphthene	0.04
Acenaphthylene	0.13
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.07
Fluorene	0.15
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.31
Perylene	< 0.01
Phenanthrene	0.26
Pyrene	0.06
Retene	0.07

NMHC CANISTER RESULTS

Sample ID: 16100230-001

Customer ID: LICA
Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/Oct 18,
2016

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC - VOC/Bonnyville/
Oct 18, 2016

Sampler S/N: n/a
Canister ID: S12944
Canister Installation Date/Time: September 28, 2016 / 13:00 A.Y. 12:00
Canister Removal Date/Time: October 20, 2016 / 18:41

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Oct 18, 2016</u>	<u>15:45</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>-27.0</u>	<u>-2.2</u>



Canister valve open prior to sampling?: YES / NO
Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: Alex Yakupov Date: October 20, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: October 18, 2016
Canister ID: S12944

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.06
1,2,3-Trimethylbenzene	< 0.07
1,2,4-Trichlorobenzene	< 1.2
1,2,4-Trimethylbenzene	< 0.04
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	< 0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	< 0.03
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.6
1,4-Dioxane	< 0.6
1-Butene	0.16
1-Hexene	< 0.03
1-Pentene	0.02
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	< 0.03
2,3-Dimethylpentane	< 0.03
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.02
2-Methylhexane	0.04
2-Methylpentane	0.05
3-Methylheptane	< 0.03
3-Methylhexane	0.04
3-Methylpentane	0.03
Acetone	1.8
Acrolein	< 0.4
Benzene	0.11
Benzyl chloride	< 0.6
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	0.02
Carbon disulfide	0.27
Carbon tetrachloride	0.11
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.47
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	0.04
cis-2-Pentene	< 0.03
Cyclohexane	0.04
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	1.4
Ethyl acetate	< 0.6
Ethylbenzene	0.03
Freon-11	0.29

Volatile Organics Data Results (NMHC Canister System)

Date: October 18, 2016
Canister ID: S12944

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.05
Freon-114	< 0.03
Freon-12	0.63
Hexachloro-1,3-butadiene	< 0.74
Isobutane	0.37
Isopentane	0.34
Isoprene	< 0.01
Isopropyl alcohol	< 0.6
Isopropylbenzene	< 0.01
m,p-Xylene	0.08
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.12
Methyl butyl ketone	< 0.74
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.6
Methyl methacrylate	< 0.10
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.04
Methylcyclopentane	0.05
Methylene chloride	< 0.4
n-Butane	0.73
n-Decane	< 0.09
n-Dodecane	< 0.6
n-Heptane	0.03
n-Hexane	0.04
n-Nonane	0.03
n-Octane	< 0.03
n-Pentane	< 0.1
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.06
p-Ethyltoluene	< 0.10
Styrene	< 0.06
Tetrachloroethylene	0.1
Tetrahydrofuran	< 0.6
Toluene	0.13
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	0.02
trans-2-Pentene	< 0.03
Trichloroethylene	< 0.06
Vinyl acetate	< 0.6
Vinyl chloride	< 0.03

Sample ID: 16100270-001

Customer ID: LICA

Cust Samp ID: LICA/NMHC-
VOC/Bonnyville/ Oct 21,
2016

Maxxam

VOC Sample Collection Data Sheet



Client: LICA

Sampler S/N: n/a

Location: Bonnyville - AER

Canister ID: 14713

Station ID: LICA 37

Canister Installation Date/Time: October 20, 2016 / 18:41

Field Sample ID: LICA/NMHC-VOC/Bonnyville/
Oct 21, 2016

Canister Removal Date/Time: October 24, 2016 / 17:03

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Oct 21, 2016</u>	<u>22:20</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>-27.8</u>	<u>-5.3</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: Alex Varupov Date: Oct 24, 2016

Volatile Organics Data Results (NMHC Canister System)

Date: October 21, 2016
Canister ID: 14713

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2-Tetrachloroethane	< 0.03
1,1,2-Trichloroethane	< 0.03
1,1-Dichloroethane	< 0.03
1,1-Dichloroethylene	< 0.05
1,2,3-Trimethylbenzene	< 0.07
1,2,4-Trichlorobenzene	< 1.1
1,2,4-Trimethylbenzene	0.05
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	< 0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.03
1,3-Butadiene	0.04
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.23
1-Hexene	< 0.03
1-Pentene	0.03
2,2,4-Trimethylpentane	0.13
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.04
2,3-Dimethylbutane	0.06
2,3-Dimethylpentane	0.14
2,4-Dimethylpentane	0.05
2-Methylheptane	0.04
2-Methylhexane	0.13
2-Methylpentane	0.2
3-Methylheptane	0.03
3-Methylhexane	0.12
3-Methylpentane	0.13
Acetone	2.2
Acrolein	< 0.4
Benzene	0.25
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	0.02
Carbon disulfide	< 0.01
Carbon tetrachloride	0.08
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	0.03
Chloromethane	0.57
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.05
cis-2-Pentene	< 0.03
Cyclohexane	0.08
Cyclopentane	0.05
Dibromochloromethane	< 0.01
Ethanol	4.5
Ethyl acetate	< 0.5
Ethylbenzene	0.07
Freon-11	0.23

Volatile Organics Data Results (NMHC Canister System)

Date: October 21, 2016
Canister ID: 14713

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.05
Freon-114	< 0.03
Freon-12	0.5
Hexachloro-1,3-butadiene	< 0.68
Isobutane	1.46
Isopentane	0.93
Isoprene	0.03
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.24
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.11
Methyl butyl ketone	< 0.68
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.10
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.13
Methylcyclopentane	0.17
Methylene chloride	< 0.4
n-Butane	2.49
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.1
n-Hexane	0.18
n-Nonane	0.03
n-Octane	0.04
n-Pentane	0.5
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	0.01
o-Xylene	0.09
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.10
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	0.44
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.05
trans-2-Pentene	0.04
Trichloroethylene	0.23
Vinyl acetate	< 0.5
Vinyl chloride	< 0.03

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>October 6, 2016</u>	Barometric Pressure: <u>0.943 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>Bonnyville - AER</u>	Weather Conditions: <u>A few clouds</u>
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>routine monthly</u>
Start Time 24 hr. (mst): <u>8:54</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>12:59</u>	Cal Gas Expiry Date: <u>December 2, 2023</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>467</u>	Range ppb: <u>1000</u>	Station SO ₂ Analyzer Range? <u>500 ppb</u>
Last Calibration Date: <u>September 8, 2016</u>	As Found C.F.: <u>1.009</u>	
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>	

Calibrator:	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)								
Flow Meter ID's: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190	Start/End Time 24 hr.: <u> </u>
Point	ppb									
High	780									
Mid	380									
Low	190									
Make & Model: <u>API 700</u>		Target Concentration (ppb): <u>380</u>								
Serial #: <u>627</u>		Result (ppb): <u>3</u>								
Cal Gas Cylinder I.D. #: <u>LL119346</u>		Zero Corrected Result (ppb): <u>3</u>								
Cal Gas Conc. (ppm): <u>50.0</u>		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

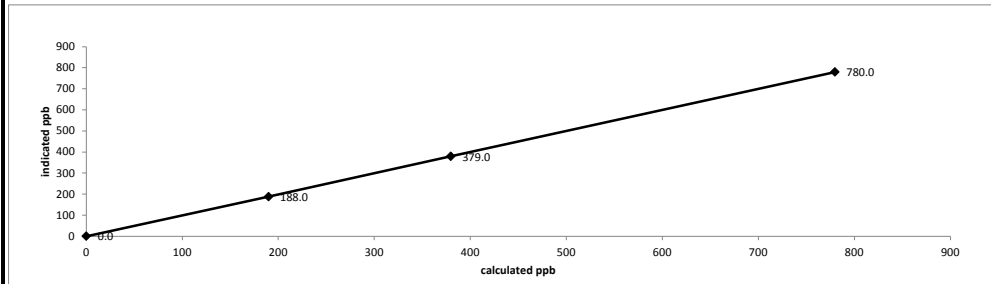
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	-1.0	n/a
as found high	4924	78.00	5002	779.7	772.0	1.009
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	78.00	5002	779.7	780.0	1.000
mid	4966	38.00	5004	379.7	379.0	1.002
low	4982	19.00	5001	190.0	188.0	1.010
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.004

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.10%</u>	.95-1.05
% change in C.F. from last cal = <u>-0.87%</u>	± 3% F.S.
	± 10%

API 100E Sulphur Dioxide Analyzer Calibration

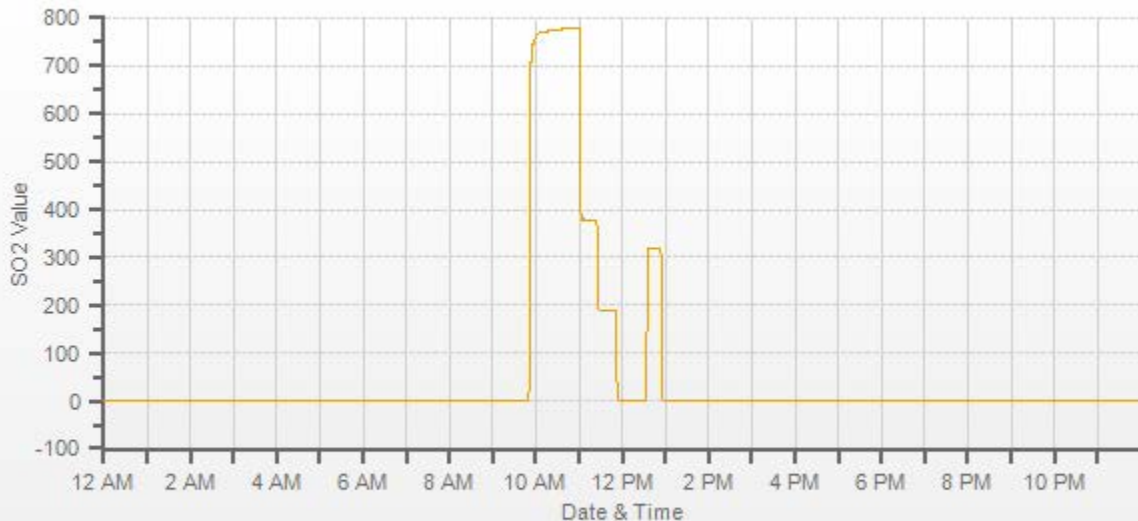


SLOPE: <u>0.983</u>	SLOPE: <u>0.986</u>
OFFSET: <u>124.7</u>	OFFSET: <u>121.5</u>
HVPS: <u>524</u>	HVPS: <u>524</u>
RCELL TEMP: <u>50.0</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>32.3</u>	BOX TEMP: <u>31.8</u>
PMT TEMP: <u>8.1</u>	PMT TEMP: <u>8.1</u>
IZS TEMP: <u>45.0</u>	IZS TEMP: <u>45.0</u>
PRES: <u>25.6</u>	PRES: <u>25.6</u>
SAMP FL: <u>583</u>	SAMP FL: <u>583</u>
NORM PMT: <u>121.6</u>	NORM PMT: <u>121.9</u>
UV LAMP: <u>2765.0</u>	UV LAMP: <u>2762.4</u>
LAMP RATIO: <u>99.5</u>	LAMP RATIO: <u>99.4</u>
STR. LGT: <u>61.3</u>	STR. LGT: <u>59.9</u>
DRK PMT: <u>15.0</u>	DRK PMT: <u>15.5</u>
DRK LMP: <u>2.6</u>	DRK LMP: <u>2.6</u>
Expected Value: <u>298.0</u>	Expected Value: <u>320.0</u>

Comments:

The analyzer sample inlet filter was changed.

ZERO Air charcoal scrubber was renewed.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>October 6, 2016</u>	Barometric Pressure: <u>0.943 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>Bonnyville - AER</u>	Weather Conditions: <u>A few clouds</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>routine monthly</u>
Start Time 24 hr. (mst): <u>8:54</u>	Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>12:59</u>	Cal Gas Expiry Date: <u>July 15, 2017</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>510</u>	Range ppb: <u>100</u>	Station SO ₂ Analyzer Range? <u>500 ppb</u>
Last Calibration Date: <u>September 8, 2016</u>	As Found C.F.: <u>0.993</u>	
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>	

Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>SABIO 2010 D</u> Serial #: <u>11900613</u> Cal Gas Cylinder I.D. #: <u>LL36837</u> Cal Gas Conc. (ppm): <u>10.0</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	SO ₂ Scrubber Check (10 mins.) Start/End Time 24 hr.: _____ Target Concentration (ppb): <u>380</u> Result (ppb): _____ Zero Corrected Result (ppb): <u>0</u> **warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**
Point	ppb									
High	78									
Mid	38									
Low	19									

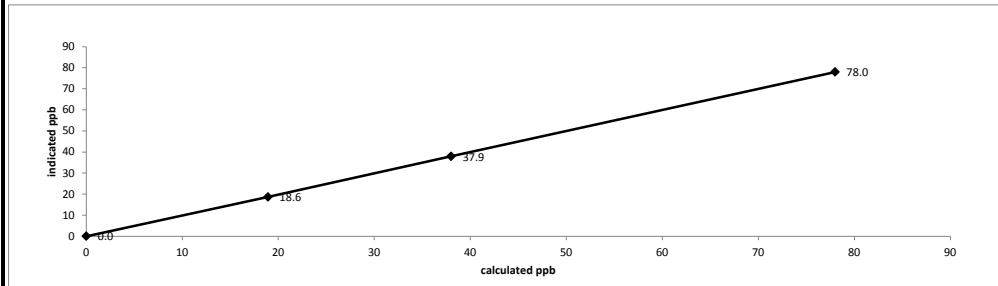
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	0.0	n/a
as found high	7443	58.50	7502	78.0	78.5	0.993
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	58.50	7502	78.0	78.0	1.000
mid	7472	28.50	7501	38.0	37.9	1.003
low	7486	14.20	7500	18.9	18.6	1.018
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.007

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>0.998</u>	.95-1.05
b (Intercept as % of full scale) = <u>0.16%</u>	± 3% F.S.
% change in C.F. from last cal = <u>0.66%</u>	± 10%

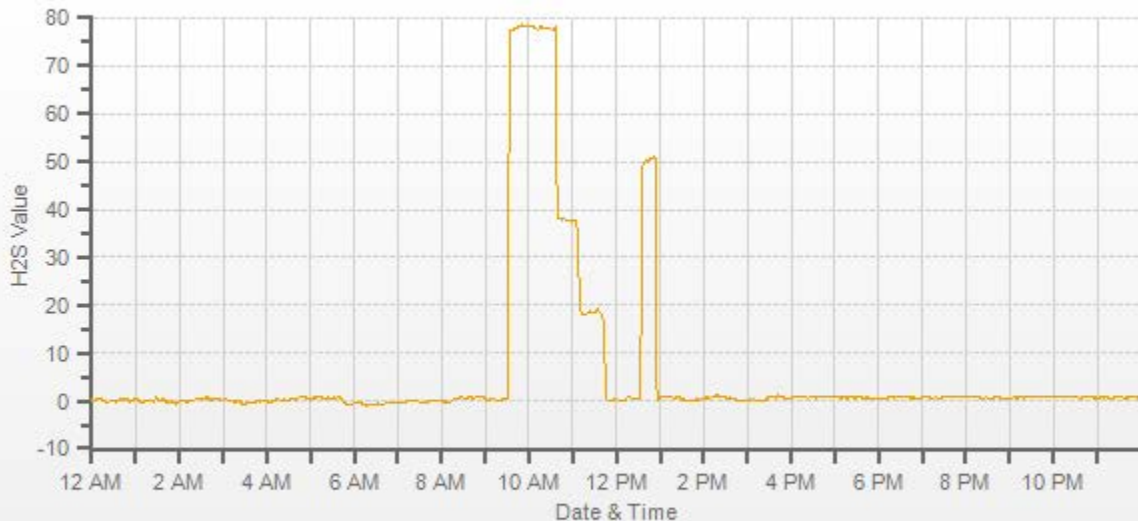
API 101E Hydrogen Sulphide Analyzer Calibration



SLOPE: <u>0.978</u>	SLOPE: <u>0.969</u>
OFFSET: <u>30.9</u>	OFFSET: <u>29.3</u>
HVPS: <u>530</u>	HVPS: <u>530</u>
RCELL TEMP: <u>50.0</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>33.6</u>	BOX TEMP: <u>33.3</u>
PMT TEMP: <u>8.4</u>	PMT TEMP: <u>8.4</u>
IZS TEMP: <u>45.0</u>	IZS TEMP: <u>45.0</u>
Converter Temp: <u>314.9</u>	Converter Temp: <u>314.8</u>
PRES: <u>21.5</u>	PRES: <u>21.5</u>
SAMP FL: <u>556</u>	SAMP FL: <u>557</u>
UV LAMP: <u>3657.2</u>	UV LAMP: <u>3659.2</u>
LAMP RATIO: <u>96.4</u>	LAMP RATIO: <u>96.4</u>
STR. LGT: <u>15.1</u>	STR. LGT: <u>14.2</u>
DRK PMT: <u>36.2</u>	DRK PMT: <u>36.6</u>
DRK LMP: <u>-1.8</u>	DRK LMP: <u>-1.8</u>
Expected Value: <u>52.6</u>	Expected Value: <u>50.9</u>

Comments:

The analyzer sample inlet filter was changed.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	October 5, 2016	Barometric Pressure:	0.939 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Bonnyville - AER	Weather Conditions:	A few clouds
Parameter:	CH ₄ / NMHC / THC	Calibration Purpose:	routine monthly
Start/End Time 24 hr. (mst):	10:01/14:28	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:		Correction Factors:			
ID# or Serial Number:	1236656107	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1.145	CH ₄ =	1.000	1.008	1.000
Last Calibration Date:	September 9, 2016	NMHC =	1.000	1.012	0.998
Range ppm:	20 CH ₄ /20 NMHC/40 THC	THC =	0.999	1.009	0.998

Calibrator:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
Flow Meter ID's:	n/a	Point	CH ₄	NMHC	THC
Make & Model:	API 700	High	13.00	13.00	26.00
Serial #:	627	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. #:	LL165372	Low	3.00	3.00	6.00
CH ₄ Cylinder Conc. =	606.0 212.0	=C ₂ H ₆ Cylinder Conc.			
CH ₄ as C ₂ H ₆ =	583.0 1189.0	=total CH ₄ equivalent			

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH ₄	NMHC	THC
as found zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2000	46.00	2046	13.62	13.11	26.73	13.51	12.95	26.49	1.008	1.012	1.009
adjusted zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2000	46.00	2046	13.62	13.11	26.73	13.62	13.14	26.78	1.000	0.998	0.998
mid	2000	24.00	2024	7.19	6.91	14.10	7.19	6.93	14.11	0.999	0.998	0.999
low	2000	11.00	2011	3.31	3.19	6.50	3.33	3.26	6.57	0.995	0.978	0.990
calibrator zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
										Average C.F. =		
										0.998	0.991	0.996

Linear Regression/Calibration Results:

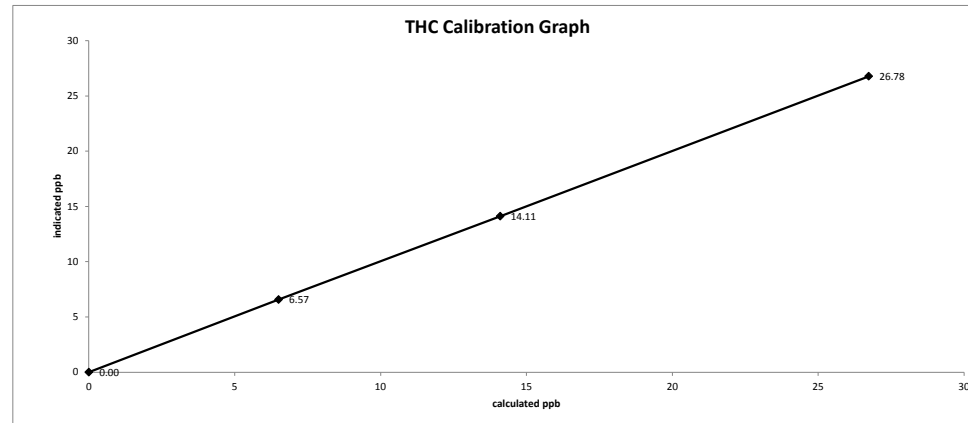
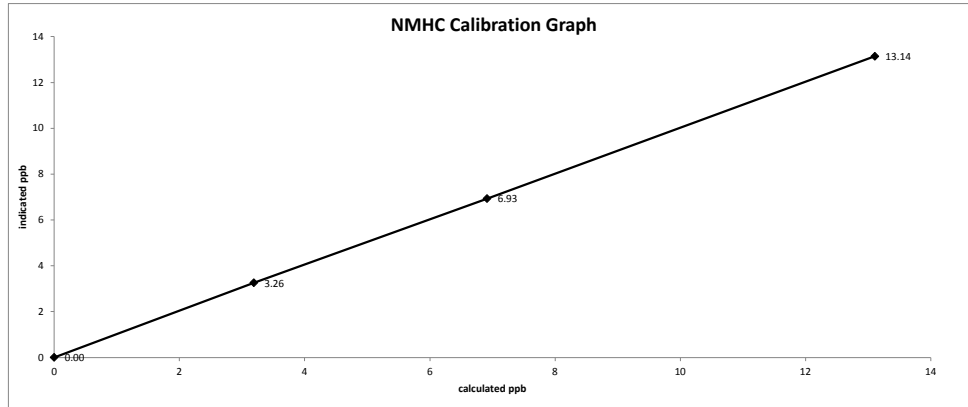
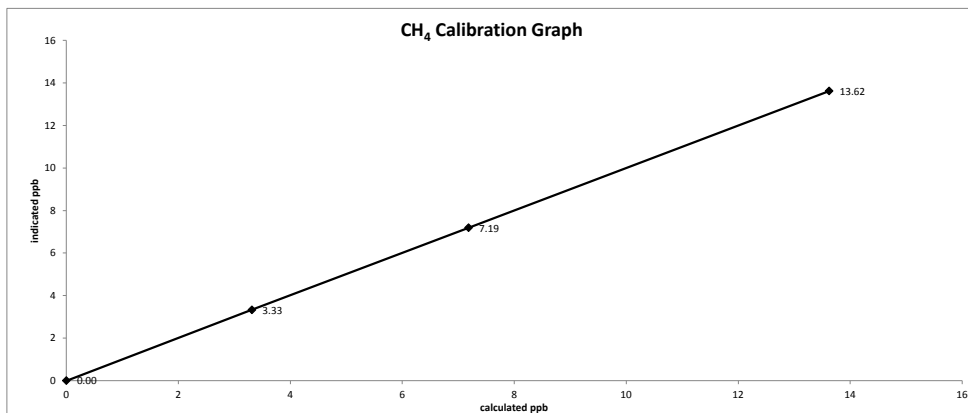
	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	1.001	1.001	.95-1.05
b (Intercept as % of full scale) =	0.04%	0.13%	0.05%	± 3% F.S.
% change in C.F. from last cal =	-0.85%	-1.22%	-1.02%	± 10%

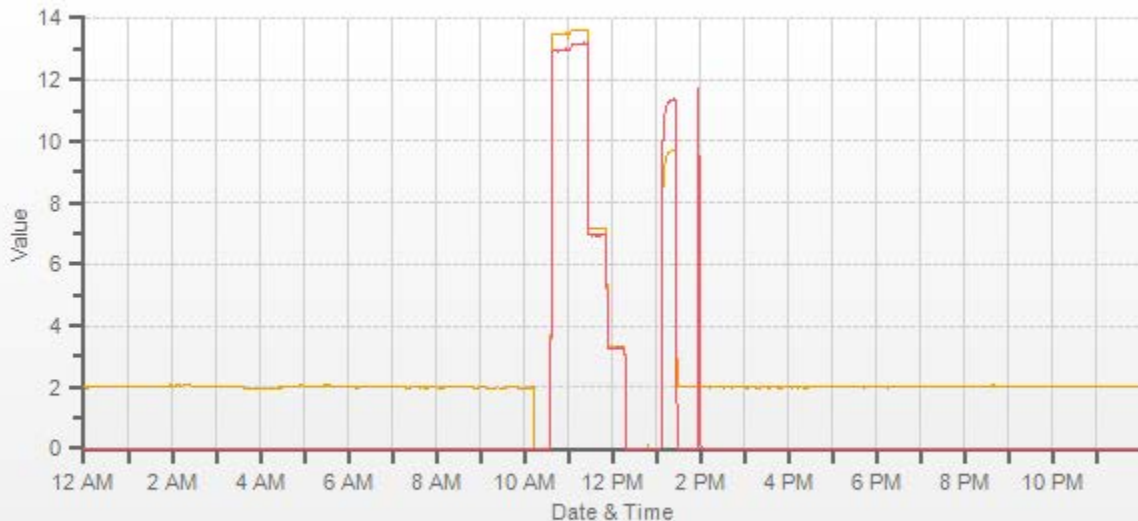
Interface Board Voltages:	Bias Supply:	-292.8	Calibration History cnt'd:	NM Peak Area:	87637
Temperatures:	Detector Oven:	175.0	Crucial Settings:	Methane Start:	n/a
	Filter:	175.0		Methane End:	n/a
	Column Oven:	75.1		Backflush:	n/a
	Internal:	32.0		NMHV Start:	n/a
Cylinder Pressures/reg.:	Carrier:	1600 50	Run History>1:	NMHC End:	n/a
	Fuel:	800 60		Date:	Oct 05, 2016
	Span Gas:	1500 22		Time:	10:13
	Zero Air Generator:	47		CH ₄ PK HT:	0
Internal Pressures:	Carrier:	31.1		CH ₄ RT:	12.4
	Fuel:	40.3		CH ₄ Baseline:	2267
	Air:	32.4		CH ₄ LOD:	66
FID Status:	Status:	LIT		CH ₄ SD:	22
	Counts:	26410		CH ₄ CONC:	0.00
	Flame:	378.4		NM PK HT:	0
	Det Base:	175.0		NM Peak Area:	0
Flame and Power Stats:	Last Power On:	August 3, 2016		NM CONC:	0.00
	Flameouts:	2		NM Base Start:	2249
	Det Oven at Start:	169.0		NM Base End:	2275
	Col Oven at Start:	74.5		NM LOD:	11
Calibration History:	Time:	Sep 09, 2016 / 09:46		NM Start IDX:	4
	Type:	SPAN		NM End IDX:	72
	Status:	GOOD		NM Max Slope:	9.8e-01
	Check/Adjust:	ADJUST		NM Min Slope:	-3.2e-01
	CH ₄ Span Conc:	13.62	Expected Values:	NM PT Count:	0
	CH ₄ SP Ratio:	0.00071		Previous CH ₄ :	9.76
	CH ₄ RT:	12.4		Previous NMHC:	11.15
	CH ₄ PK IDX:	22		Previous THC:	20.94
	CH ₄ PK HT:	19176		New CH ₄ :	9.68
	NM Span Conc:	13.11		New NMHC:	11.33
	NM SP Ratio:	0.00015		New THC:	21.03

Comments:
 The analyzer sample inlet filter was changed.
 No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.
 The analyzer cooling fan filter(s) were cleaned.

Date: October 5, 2016
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 10:01/14:28
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution





CH4[ppm] NMHC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: October 6, 2016	Barometric Pressure: 0.943 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: A few clouds
Start/End Time 24 hr. (mst): 8:54 / 14:58	Calibration Purpose: routine monthly
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 2, 2023

Analyzer: ID# or Serial Number: 593 Last Calibration Date: September 8, 2016 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.001</td> <td>1.019</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.002</td> <td>0.998</td> <td>0.998</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.013</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.001	1.019	1.000	NO ₂ =	1.002	0.998	0.998	NOx =	1.000	1.013	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.001	1.019	1.000														
NO ₂ =	1.002	0.998	0.998														
NOx =	1.000	1.013	1.000														

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL119346 NO/NOx Gas Conc. (ppm): 50.0 50.0	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5000	0.0	5000	0	0	-1.0	0.0	n/a	n/a
as found high	4924	78.0	5002	779.7	779.7	764.0	770.0	1.019	1.013
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	78.00	5002	779.7	779.7	780.0	780.0	1.000	1.000
mid	4966	38.00	5004	379.7	379.7	379.0	379.0	1.002	1.002
low	4982	19.00	5001	190.0	190.0	188.0	188.0	1.010	1.010
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.004	1.004

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4924	78.00	5002	0.0	777.0	778.0	1.0	0.0	1.0	
as found high NO ₂	4799	78.00	4877	500.0	270.0	779.0	509.0	507.0	508.0	0.998
adjusted high NO ₂	4799	78.00	4877	500.0	270.0	779.0	509.0	507.0	508.0	0.998
gpt mid	4799	78.00	4877	275.0	496.0	777.0	281.0	281.0	280.0	1.004
gpt low	4799	78.00	4877	97.0	683.0	778.0	95.0	94.0	94.0	1.000
Average NO ₂ C.F.=									1.001	

Linear Regression/Calibration Results:

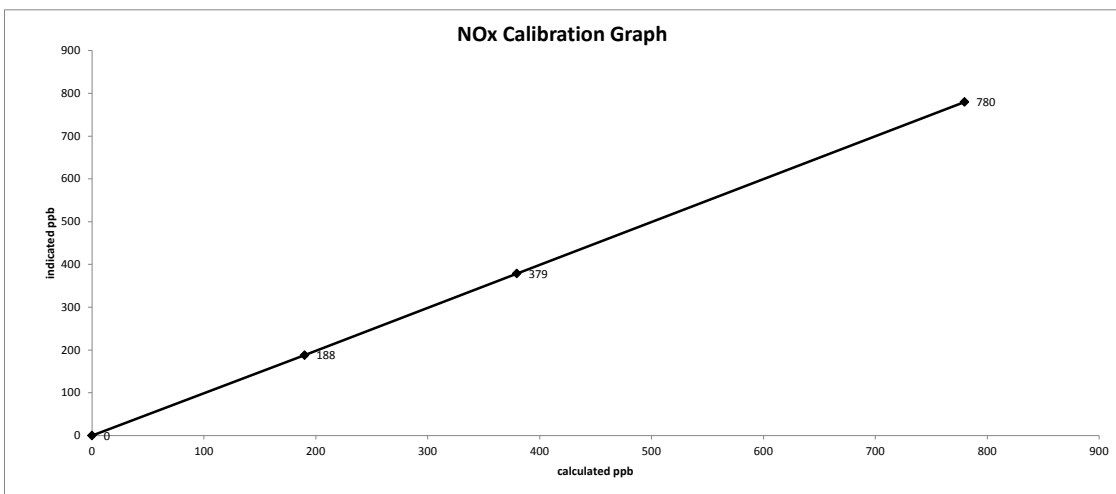
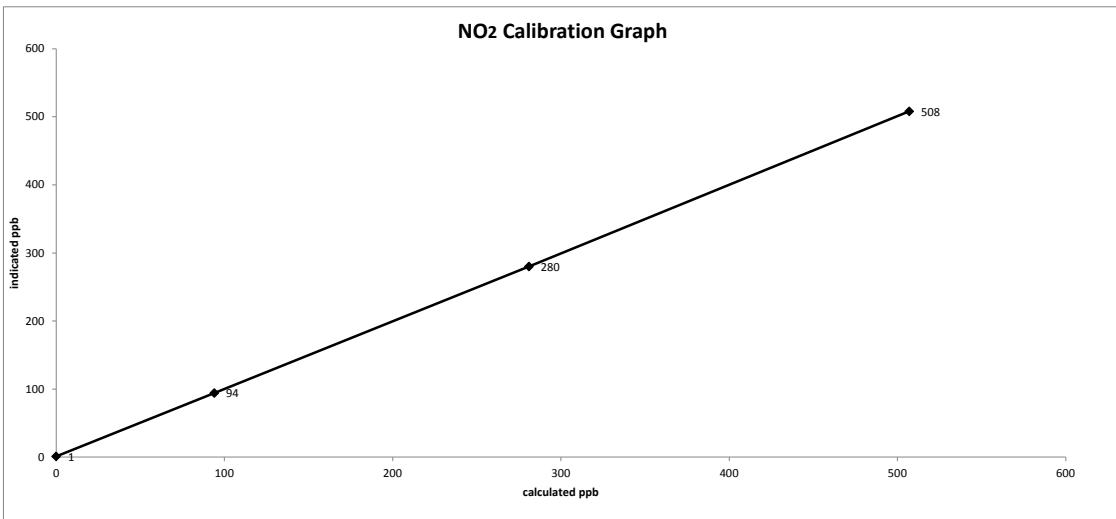
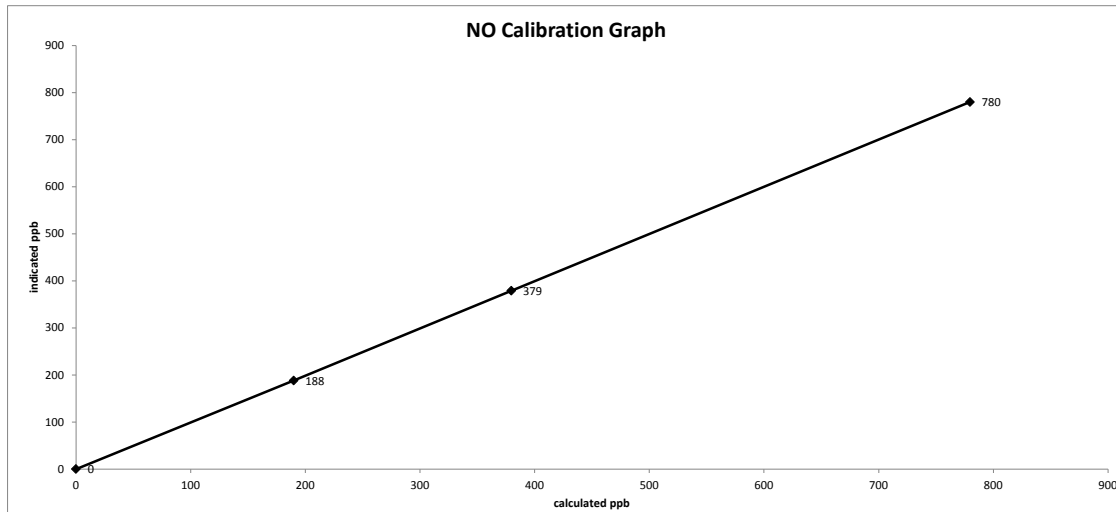
	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.000	.95-1.05
b (Intercept as % of full scale)=	-0.10%	-0.10%	0.02%	± 3% F.S.
% change in C.F. from last cal=	-1.82%	-1.26%	0.40%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

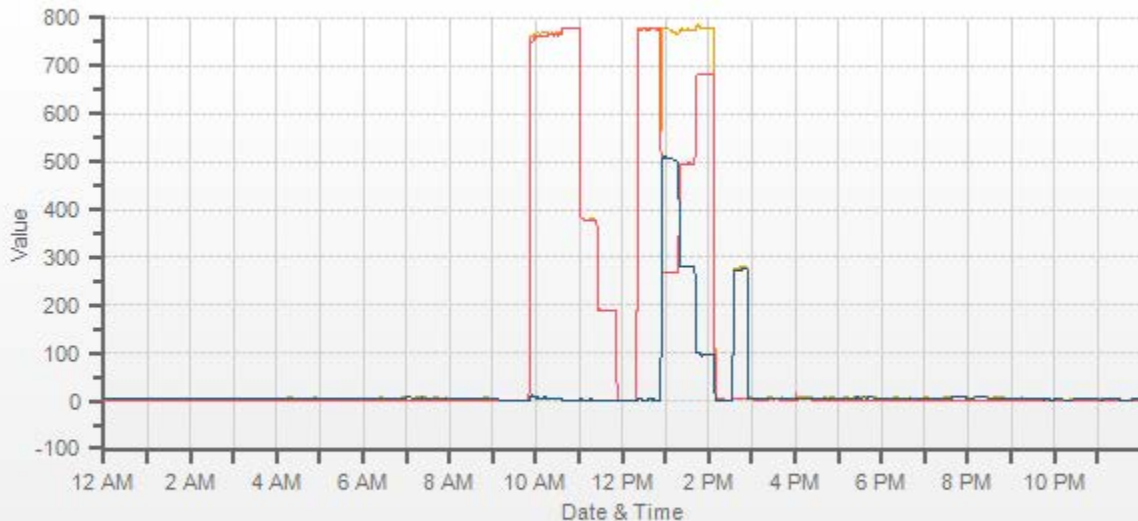
As found:	As left:
NOx SLOPE: 1.061	NOx SLOPE: 1.076
NOx OFFS: 0.7	NOx OFFS: 0.2
NO SLOPE: 1.060	NO SLOPE: 1.075
NO OFFS: 1.3	NO OFFS: -0.9
SAMP FLW: 482	SAMP FLW: 484
OZONE FL: 63	OZONE FL: 63
PMT: 8.7	PMT: 5.5
NORM PMT: 0.6	NORM PMT: 1.8
AZERO: 7.9	AZERO: 7.8
HVPS: 658	HVPS: 658
RCELL TEMP: 50.0	RCELL TEMP: 50.1
BOX TEMP: 31.4	BOX TEMP: 30.1
PMT TEMP: 6.7	PMT TEMP: 6.7
IZS TEMP: 40.0	IZS TEMP: 40.2
MOLY TEMP: 315.0	MOLY TEMP: 315.1
RCEL: 5.4	RCEL: 5.4
SAMP: 27.3	SAMP: 27.3
Expected Value NO: 6.10	Expected Value NO: 5.40
Expected Value NO ₂ : 284.00	Expected Value NO ₂ : 296.00
Expected Value NOx: 290.00	Expected Value NOx: 301.00

Comments:
 The analyzer sample inlet filter was changed. No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

Date: October 6, 2016
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

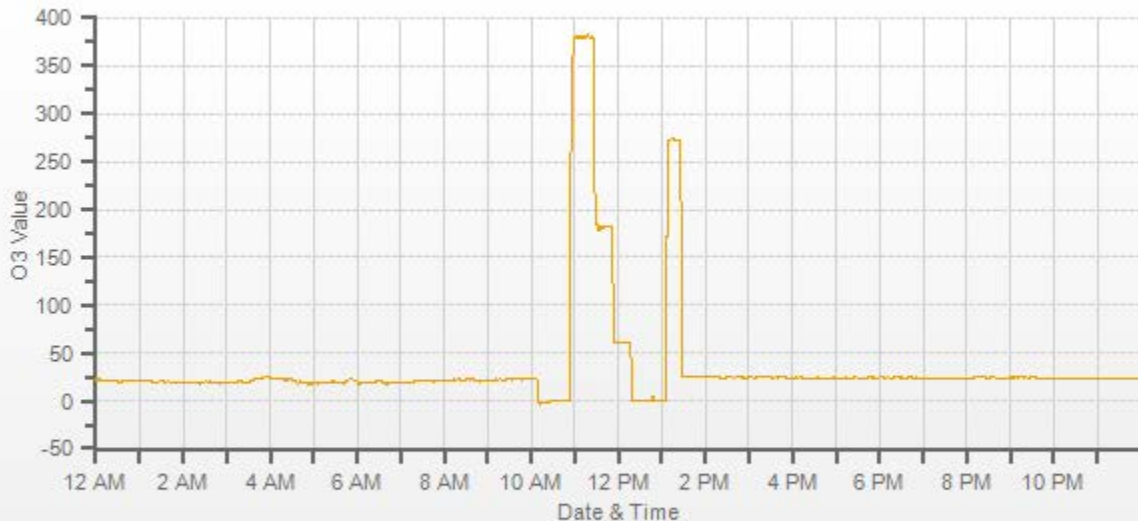
Start/End Time 24 hr. (mst): 8:54 / 14:58
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: October 5, 2016
 Company: LICA
 Station Name/Location: Bonnyville - AER
 Previous Audit Date: September 22, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 11:27
 End Time (mst): 14:46
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: A few clouds

1400A Information and Status:

ID# or Serial Number: 1405A207691003 As Found Filter Loading %: 27.57
 Ko Factor: 15635 As Left Filter Loading %: 18.40
 Ambient Temperature °C: 2.00 As Found Noise: 0.003
 Ambient Pressure atm: 0.938 As Left Noise: 0.002
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.40
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	Dwyer	Fisher	FLUKE
Model:	475 Mark III	FB1291	1551A Ex STIK
Serial Number:	#2	130168457	ID# 4295
Calibration Date:	January 15, 2016	February 7, 2016	November 2, 2015

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.09	0.00	0.09
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.42	0.00	-0.42
	limit	0.60	0.60	0.60	0.60

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.09	0.00	0.09
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.41	0.00	-0.41
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>2.0</u>	1405F pressure atm: <u>0.938</u>
reference temperature °C: <u>1.7</u>	reference pressure: <u>0.938</u>
difference °C: <u>-0.3</u>	difference: <u>0.000</u>

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>2.1</u>	1405F pressure atm: <u>0.938</u>
reference temperature °C: <u>2.1</u>	reference pressure: <u>0.938</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.98</u>	reference total/aux flow lpm: <u>16.51</u>
difference lpm: <u>-0.02</u>	difference lpm: <u>-0.16</u>

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>16.83</u>
difference lpm: <u>0.00</u>	difference lpm: <u>0.16</u>

K_o Audit:

Last K_o audit date: August 4, 2016
 1405F K_o factor: 15635
 Measured K_o factor: 15819.0000
 % difference: 1.18

Comments:

The TEOM sample filter was changed. The TEOM intake head and associated sharp cut components were cleaned.
 The bypass (auxiliary) flow filter was changed. The TEOM sample pump was replaced.
 The TEOM pump was rebuilt because vacuum readings were low (0.40 atm). After repair the pump vacuum readings are - 0.33 atm. Flows were audited and adjusted but not calibrated because of strong wind.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: October 26, 2016
 Company: LICA
 Station Name/Location: Bonnyville - AER
 Previous Audit Date: October 5, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whatsitt
 Start Time (mst): 11:14
 End Time (mst): 12:31
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: A few clouds

1400A Information and Status:

ID# or Serial Number: 1405A207691003 As Found Filter Loading %: 27.77
 Ko Factor: 15635 As Left Filter Loading %: 25.79
 Ambient Temperature °C: 1.86 As Found Noise: 0.004
 Ambient Pressure atm: 0.936 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.35
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>BRUNTON</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>BIO</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>BPO 14</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>July 7, 2016</u>	<u>November 2, 2015</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.09	0.00	0.09
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.41	0.00	-0.41
	limit	0.60	0.60	0.60	0.60

As left leak check (same as above if as found passes):

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.09	0.00	0.09
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.41	0.00	-0.41
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>1.9</u>	1405F pressure atm: <u>0.937</u>
reference temperature °C: <u>2.1</u>	reference pressure: <u>0.936</u>
difference °C: <u>0.2</u>	difference : <u>0.001</u>

As left temperature and pressure (same as above if as found adequate):

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>2.1</u>	1405F pressure atm: <u>0.937</u>
reference temperature °C: <u>2.1</u>	reference pressure: <u>0.937</u>
difference °C: <u>0.0</u>	difference : <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.99</u>	reference total/aux flow lpm: <u>16.87</u>
difference lpm: <u>-0.01</u>	difference lpm: <u>0.20</u>

As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>16.67</u>
reference main flow lpm: <u>2.99</u>	reference total/aux flow lpm: <u>16.87</u>
difference lpm: <u>-0.01</u>	difference lpm: <u>0.20</u>

K_o Audit:

Last K_o audit date: August 4, 2016
 1405F K_o factor: 15635
 Measured K_o factor: 15819.0000
 % difference: 1.18

Comments:

The TEOM intake head and associated sharp cut components were cleaned.
 The bypass (auxillary) flow filter was changed.

WIND SYSTEM



Meteorological Sensor Audit

Station Information

Company:	<u>LICA</u>	Performed By:	<u>Limin Li</u>
Location:	<u>Bonnyville (in Calgary shop)</u>	Reason:	<u>Annual maintenance</u>
Audit Date:	<u>26-Jan-16</u>	Start Time (mst):	<u>11:00</u>
Previous Audit Date:	<u>NA</u>	End Time (mst):	<u>15:00</u>

Wind Speed

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>200KPH</u>

Wind Speed Audit Data

RPM	Wind Speed Actual	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.032	0.032	-
1000	17.6	17.66	17.64	1.00
2000	35.28	35.3	35.29	1.00
3000	52.92	52.99	52.99	1.00
4000	70.56	70.66	70.65	1.00
5000	88.2	88.35	88.33	1.00
6000	105.84	106	106	1.00
7000	123.48	123.7	123.7	1.00
8000	141.12	141.4	141.3	1.00
9000	158.76	159.1	159.1	1.00
10000	176.4	176.7	176.7	1.00
Average Correction Factor:				1.00

Wind Direction

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>0-360DEG</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	0.5	NA
45	44.9	1.00
90	92.0	0.98
135	136.5	0.99
180	180.6	1.00
225	224.4	1.00
270	270.3	1.00
315	312.2	1.01
359	355.0	1.01
Average Correction Factor:		1.00

Remarks: Annual maintenance. Changed 05163PG, 05124VG bearings. 05131D, 05133B & 05135D

Audit Performed by: Limin Li

VOC SAMPLER

Maxxam Analytics

XONTECK FLOW RATE VERIFICATION/CALIBRATION

Client: <u>LICA</u>	Date: <u>October 7, 2016</u>
Location: <u>Bonnyville</u>	Last Cal. Date: <u>July 4, 2016</u>
Station ID: <u>LICA 37</u>	Start Time 24 hr. (mst): <u>8:56</u>
Sampler s/n: <u>6200</u>	End Time 24 hr. (mst): <u>9:31</u>
Purpose: <u>Routine Quarterly</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>

	Pressure Standard:		Flow Standard:
Make/Model: <u>Fisher Scientific/FB61291</u>		Dwyer/Series 475 Mark III	
S/N or ID#: <u>130168457</u>		#2	
Certification Date: <u>February 7, 2016</u>		January 15, 2016	

The desired flow rate can be calculated using the equation provided by USEPA Method T0-14 Section 9.1.3.1.

$$F = \frac{(P \times V)}{(T \times 60)} = \frac{1.63 \times 6000}{24 \times 60} = \boxed{6.78 \text{ cc/min}} = \text{target flow rate}$$

where;

F= flow rate in cc/min
P= final canister in atmosphere absolute
V= volume of canister in c.c.
T= sampling period in hours
bp= barometric pressure in atmospheres

enter:

bp 0.946 atm
P= 1.62646 (atm)+.68046
V= 6000 cubic centimetres
T= 24 hours

XONTECK QUARTERLY FLOW VERIFICATION/CALIBRATION

FLOW RATE VERIFICATION

<u>Volumetric Flow rate</u> =	10.00 (cc/min)	As found pot setting =	4.94
Target Flow Rate (cc/min) =	6.78		
% Difference =	n/a		#VALUE!

FLOW RATE CALIBRATION

<u>Volumetric Flow rate</u> =	10.00 (cc/min)	Adjusted pot setting =	4.94
Target Flow Rate (cc/min) =	6.78		
% Difference =	n/a		#VALUE!

XONTECK MAINTENANCE

Item:	Most Recent Date Completed:
1. Replace sample line and fittings from sampler to canister every 6 months.	<u>September 28, 2016</u>
2. Purge line from manifold--> sampler with zero air every 6 months.	<u>October 7, 2016</u>
3. Sample system cleaning every 2 years.	<u>March 21, 2015</u>
4. Perform 12 hour leak check procedure every 6 months.	<u>September 28, 2016</u>

COMMENTS:

The cleaning cannot be done in the field and requires laboratory settings. The current flow rate is adequate to fill up the sample canister to the pressure required for analysis.

PAH SAMPLER



TISCH PUF PLUS SAMPLER AUDIT

Check to remove

Date: October 7, 2016	PUF PLUS Serial #: 100-1015
Company/Airshed: LICA	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
Location/Station Name: Bonnyville/LICA 37	Weather Conditions: A few clouds
Reference Standards:	Flow: _____ Pressure: _____ Temperature: _____
Make: Dwyer	Fisher Scientific
Model: Series 475 Mark III	FB61291
Serial Number: #2	130168457
Calibration Date: January 15, 2016	February 7, 2016

TISCH PUF PLUS PRESSURE AND TEMPERATURE AUDIT

AS FOUND Reference Barometric Pressure (mmHg):	716.31	AS FOUND Reference Temperature (°C):	0.2
AS FOUND PUF PLUS Barometric Pressure (mmHg):	713	AS FOUND PUF PLUS Temperature (°C):	0.8
% Difference (+/- 2% max.):	0.46%	% Difference (+/- 2 °C max.):	-0.6
IF THE PRESSURE DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED		**IF THE TEMPERATURE DEVIATES BY MORE THAN +/- 2 °C A FLOW CALIBRATION IS REQUIRED**	

TISCH PUF PLUS FLOW AUDIT

Flow Audit Calculations:

Calibrated Orifice Certification Date: October 12, 2015

Enter Barometric Pressure from reference (inHg): 28.20

Barometric Pressure (mmHg): 716.3

Enter Ambient Temperature from reference °C: 0.2

Enter "m" variable from calibrated orifice: 6.07570

Enter "b" variable from calibrated orifice: -0.03578

Enter Δp in. H₂O: 1.81

Standardized Flow lpm=: 230.33

Flow Set Point lpm=: 230.00

% Difference (+/- 2% max.): -0.15%

****IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED****

TISCH PUF PLUS PRESSURE CALIBRATION

Reference Barometric Pressure AFTER CALIBRATION (mmHg): n/a

PUF Barometric Pressure AFTER CALIBRATION (mmHg): n/a

% Difference: n/a Max 2.0%

Calibration Point (mmHg):	Δp (in. H ₂ O) required for target barometric pressure:	As Found barometric pressure (mmHg):	As Left barometric pressure (mmHg):	% Difference vs. Calibration Target:
756.31	1.57	n/a	n/a	#VALUE!
736.31	0.79	n/a	n/a	#VALUE!
716.31	0.00	n/a	n/a	#VALUE!
696.31	-0.79	n/a	n/a	#VALUE!
676.31	-1.57	n/a	n/a	#VALUE!
% Difference (+/- 2% max.):				#VALUE!

TISCH PUF PLUS TEMPERATURE CALIBRATION

Temperature Calibrator Certification Date: n/a

Reference Temperature AFTER CALIBRATION (°C): n/a

TISCH PUF PLUS Temperature AFTER CALIBRATION (°C): n/a

Difference (°C): n/a Max 2.0 °C

Calibration Point (°C):	As Found (°C)	As Left (°C)	+/- Difference (°C)
20	n/a	n/a	#VALUE!
-20	n/a	n/a	#VALUE!
40	n/a	n/a	#VALUE!
0	n/a	n/a	#VALUE!
-30	n/a	n/a	#VALUE!
% Difference (+/- 2 °C max.):			#VALUE!

TISCH PUF PLUS FLOW CALIBRATION

Flow Calibration Calculations:

Calibrated Orifice Certification Date: n/a

Enter Barometric Pressure from reference (inHg): n/a

Barometric Pressure (mmHg): n/a

Enter Ambient Temperature from reference °C: n/a

Enter "m" variable from calibrated orifice: n/a

Enter "b" variable from calibrated orifice: n/a

Enter Δp in. H₂O: n/a

Standardized Flow lpm=: n/a

Flow Set Point lpm=: 230.00

% Difference (+/- 2% max.): n/a

****IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED****

R, A1 and A0 Factors:

	As Found/As Left Pressure:	As Found/As Left Temperature:	As Found/As Left Flow:
A0	15312.7500	-11845.5546	-0.2483
A1	22.5779	0.2990	17.6252
R	0.0000	0.0000	0.0000

Notes:

Audit started: 09:32 (SMT), audit finished: 10:12 (SMT)

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-119

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>627</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 1 2015</u>	Temperature (°C)	<u>NA</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>NA</u>
NO/NOx Concentration	<u>50.3/50.3</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5007	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5003	77.5	0.779	0.779	0.787	-0.001	0.786	1%	1%
5004	37.8	0.380	0.380	0.383	0.000	0.383	1%	1%
5001	18.9	0.190	0.190	0.191	0.000	0.191	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0106	0.90-1.10		m (Slope)=	1.0092		
b (Intercept % of FS)=	-0.0566	± 3% F.S.		b (Intercept % of FS)=	-0.0368		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5003	0	0.000	0.787	0.001	0.788	NO ₂	% Diff. Limit
5003	0.5	0.493	0.294	0.498	0.792	1%	± 10%
5003	0.25	0.256	0.531	0.262	0.792	2%	± 10%
5003	0.1	0.108	0.679	0.110	0.789	1%	± 10%
Absolute Average Percent Difference						1.2%	± 10%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO_x		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	1.0089	0.90-1.10					
b (Intercept % of FS)=	0.1591	± 3% F.S.					

AENV Standards	NO_x Analyzer
Audit Calibrator	
Make/Model	<u>Thermo 146i</u>
Serial/AMU Number	<u>1809</u>
	Make/Model <u>Thermo 42i</u>
	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>February 1, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: Flows not manually measured - calibration system audited as it is currently being operated.

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: February 3, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>None</u>
Serial Number	<u>11900613</u>	Serial Number	<u>None</u>
Last Verification Date	<u>April 1, 2015</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>706 mmHg</u>
NO/NOx Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5001</u>	Pt. #2	<u>5000</u>
		Pt. #3	<u>5000</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>37.8</u>
		Pt. #3	<u>18.9</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4999	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5001	77.5	0.779	0.779	0.775	0.000	0.775	-1%	-1%
5000	37.8	0.380	0.380	0.376	0.001	0.377	-1%	-1%
5000	18.9	0.190	0.190	0.188	0.001	0.189	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 0.9950	0.90-1.10	m (Slope)= 0.9946
b (Intercept % of FS)= -0.0773	± 3% F.S.	b (Intercept % of FS)= -0.0167

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5001	0	0.000	0.772	0.000	0.772	NO ₂	% Diff. Limit
5001	0.51	0.507	0.265	0.506	0.772	0%	± 10%
5001	0.25	0.252	0.520	0.254	0.773	1%	± 10%
5001	0.1	0.110	0.662	0.109	0.772	-1%	± 10%
Absolute Average Percent Difference						0.1%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO ₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9992	0.90-1.10
b (Intercept % of FS)= 0.0171	± 3% F.S.

AENV Standards Audit Calibrator	NO _x Analyzer
Make/Model <u>Thermo 146i</u>	Make/Model <u>Thermo 42i</u>
Serial/AMU Number <u>1809</u>	Serial/AMU Number <u>1868</u>
	Last Calibration Date <u>March 28, 2016</u>
	Full Scale (ppm) <u>1</u>

COMMENTS: NO Cyl has 49.9ppb SO2 - Flows Not Manually Measured

Auditor: Shea Beaton Date: March 31, 2016

Operator Signature: [Signature] Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-116CGA

Company: Maxxam **Operator's Name:** Chris Wesson
Cylinder #: LL119346 **Concentration PPM:** 50.0 **Tolerance(%):** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>Thermo146i</u>	Make/Model: <u>Bios DC-2</u>
Serial Number: <u>1809</u>	Serial Number: <u>Bios D</u>
Last Verification Date: <u>February 2, 2016</u>	Temp. °C: <u>24.5</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>702mmHg</u>
Cylinder Number: <u>CAL016625</u>	

Reference Analyzer:
 Make/Model: Thermo 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 8.7 Span: 1.027 Range: 1.0
 Last Calibration: Date: 1-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
4952	0.0	0.000	0.01608	62.183	49.3
4946	79.54	0.793	0.01608	62.183	49.3
4941	39.35	0.396	0.00796	125.565	49.7
4940	19.57	0.195	0.00396	252.427	49.2
Average Cylinder Concentration:					49.4

Previous Stated Concentration PPM: 50.0
 Percent variance from Stated: 1.2

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** SO2/NO blend 50.0ppm NO
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton
 Operator Signature: *[Signature]*

Date: February 2, 2016
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2014-251CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: LL36837 **Concentration PPM:** 10.0 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: December 15, 2014
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P.: 702 mmhg

Reference Analyzer:

Make/Model: Teco 45C Serial/AMU Number: 1624
 Instrument Settings: Zero: 6.4 Span: 1.160 Range: 0.1
 Last Calibration: Date: Dec15/14 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.00755	132.442	10.0
5099	38.5	0.0754	0.00755	132.442	10.0
5092	18.0	0.0349	0.00353	282.889	9.9
5066	9.2	0.0178	0.00182	550.652	9.8
Average Cylinder Concentration:					9.9

Previous Stated Concentration PPM: 10.0

Percent variance from Stated: 1.1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark
 Operator Signature: *Al Clark*

Date: December 16, 2014
 Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-092CGA

Company: Maxxam Operators name: Chris Wesson
Cylinder #: LL165372 Conc CH4 (PPM) 606/212 Tolerance (%) 0.5 Certified By: Praxair

Reference Calibrator and Gas:

Make/Model R&R MFC 201
Serial Number AMU 1698
Last Verification Date January 18, 2016
Gas Type CH4 Conc. 999.2
Cylinder Number D751932
Gas Type C3H8 Conc. 246.5
Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC-2
Serial Number Blos D
Temp. °C 24.5
B.P. 698mmHg

Reference Analyzer:

Make/Model Thermo 55C Serial/AMU Number: 1643
Instrument Settings Zero: NA Span: NA Range: 20.0
Last Calibration: Date: 18-Jan-16 C.F. 1.000 Done By: SB

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2568	0.00	0.00	0.00	0.02140	46.722	607	214
2630	56.29	12.99	12.62	0.02140	46.722	607	214
2588	19.73	4.62	4.50	0.00762	131.171	606	215
2580	9.69	2.29	2.24	0.00376	266.254	610	217
Average Cylinder Concentration:						608	215

CH4	C3H8
Previous Stated Concentration PPM: <u>606</u>	<u>212</u>
Percent variance from Stated: <u>0.3</u>	<u>1.6</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: _____
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration C3H8 manufacturers tolerance 1.1%
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: January 19, 2016
Operator Signature: _____ Location: McIntyre Center Edmonton



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-115CGA

Company: Maxxam Operators name: Chris Wesson
Cylinder #: LL119346 Conc (PPM) 50.0/50.0 Tolerance (%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Thermo 146i</u>			Make/Model	<u>Bios DC-2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>Bios D</u>
Last Verification Date	<u>February 2, 2016</u>			Temp. °C	<u>24.5</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>702mmHg</u>
Cylinder Number	<u>CAL018024</u>				

Reference Analyzer:
Make/Model Thermo 42i Serial/AMU Number: 1868
Instrument Settings Zero: 4.2 Span: 1.014 Range: 1.0
Last Calibration: Date: 02-Feb-16 C.F. 1.000 Done By: SB

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
4952	0.0	0.000	0.000	0.01608	62.183	50.3	50.3
4946	79.54	0.809	0.809	0.01608	62.183	50.3	50.3
4941	39.35	0.403	0.402	0.00796	125.565	50.6	50.5
4940	19.57	0.200	0.200	0.00396	252.427	50.5	50.5

Average Cylinder Concentration: **50.5** **50.4**

	NO	NOx
Previous Stated Concentration PPM:	<u>50.0</u>	<u>50.0</u>
Percent variance from Stated:	<u>0.9</u>	<u>0.8</u>

Cylinder gas tolerances based on NO only

- Meets Manufacturer Tolerance. Use manufacturers stated concentration COMMENTS: SO2/NO Blend 50.0PPM SO2
- < =5% Outside Manufacturer Tolerance. Use manufacturers concentration
- > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Shea Beaton Date: February 2, 2016
Operator Signature: [Signature] Location: McIntyre Center Edmonton

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 03, 2016	14998	Ambient Air	03-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Oct-16
16100085-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	15-Oct-16
16100085-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Oct-16
16100085-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Oct-16
16100085-003	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Oct-16
16100085-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-003	1-Butene	I	0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	1-Pentene	I	0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 03, 2016	14998	Ambient Air	03-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	2-Methylhexane	I	0.02	ppbv	0.01	AC-058	15-Oct-16
16100085-003	2-Methylpentane	I	0.02	ppbv	0.01	AC-058	15-Oct-16
16100085-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	3-Methylpentane	I	0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Acetone		1.4	ppbv	0.4	AC-058	15-Oct-16
16100085-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Oct-16
16100085-003	Benzene	I	0.04	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Chloroform	I	0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Chloromethane		0.42	ppbv	0.02	AC-058	15-Oct-16
16100085-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Oct 03, 2016	14998	Ambient Air	03-Oct-16	0:00
DESCRIPTION:	Bonnyville AER			
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-003	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Ethanol		0.6	ppbv	0.3	AC-058	15-Oct-16
16100085-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-003	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Freon-11		0.35	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Freon-113	I	0.08	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Freon-114	I	0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Freon-12		0.69	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	15-Oct-16
16100085-003	Isobutane	I	0.17	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Isopentane	I	0.13	ppbv	0.03	AC-058	15-Oct-16
16100085-003	Isoprene	I	0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Oct-16
16100085-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	15-Oct-16
16100085-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	15-Oct-16
16100085-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Oct-16
16100085-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Oct-16
16100085-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Oct-16
16100085-003	Methylcyclohexane	I	0.02	ppbv	0.01	AC-058	15-Oct-16
16100085-003	Methylcyclopentane	I	0.02	ppbv	0.02	AC-058	15-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 03, 2016	14998	Ambient Air	03-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Oct-16
16100085-003	n-Butane	I	0.16	ppbv	0.03	AC-058	15-Oct-16
16100085-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	15-Oct-16
16100085-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-003	n-Heptane	I	0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	n-Hexane	I	0.02	ppbv	0.01	AC-058	15-Oct-16
16100085-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	15-Oct-16
16100085-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Oct-16
16100085-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	15-Oct-16
16100085-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	15-Oct-16
16100085-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Oct-16
16100085-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Oct-16
16100085-003	Toluene	I	0.04	ppbv	0.01	AC-058	15-Oct-16
16100085-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16
16100085-003	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Oct-16
16100085-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Oct-16
16100085-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Oct-16

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Tuesday, November 15, 2016	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 03, 2016	14998	Ambient Air	03-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100085-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	15-Oct-16
16100085-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	15-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Tuesday, November 15, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Oct 9, 2016	1136	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Oct-16
16100130-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	25-Oct-16
16100130-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Oct-16
16100130-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Oct-16
16100130-003	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Oct-16
16100130-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-003	1-Butene	I	0.07	ppbv	0.02	AC-058	25-Oct-16
16100130-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	2,2,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	25-Oct-16
16100130-003	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	2,3-Dimethylpentane	I	0.03	ppbv	0.02	AC-058	25-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Tuesday, November 15, 2016	Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Oct 9, 2016	1136	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	2-Methylhexane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	2-Methylpentane	I	0.03	ppbv	0.01	AC-058	25-Oct-16
16100130-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	3-Methylhexane	I	0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Acetone		1.5	ppbv	0.4	AC-058	25-Oct-16
16100130-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Oct-16
16100130-003	Benzene	I	0.05	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Carbon disulfide		1.02	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Carbon tetrachloride	I	0.15	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Chloroform	I	0.03	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Chloromethane		0.46	ppbv	0.02	AC-058	25-Oct-16
16100130-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-003	cis-2-Butene	I	0.03	ppbv	0.02	AC-058	25-Oct-16
16100130-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Cyclohexane	I	0.02	ppbv	0.02	AC-058	25-Oct-16

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Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Oct 9, 2016	1136	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-003	Cyclopentane	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Ethanol		0.6	ppbv	0.3	AC-058	25-Oct-16
16100130-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-003	Ethylbenzene	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Freon-11		0.41	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Freon-113	I	0.08	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Freon-12		0.69	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Oct-16
16100130-003	Isobutane	I	0.16	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Isopentane	I	0.18	ppbv	0.03	AC-058	25-Oct-16
16100130-003	Isoprene	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	m,p-Xylene	I	0.04	ppbv	0.03	AC-058	25-Oct-16
16100130-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	25-Oct-16
16100130-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	25-Oct-16
16100130-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Oct-16
16100130-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Oct-16
16100130-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	25-Oct-16
16100130-003	Methylcyclohexane	I	0.03	ppbv	0.01	AC-058	25-Oct-16
16100130-003	Methylcyclopentane	I	0.03	ppbv	0.02	AC-058	25-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Oct 9, 2016	1136	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	25-Oct-16
16100130-003	n-Butane		0.44	ppbv	0.03	AC-058	25-Oct-16
16100130-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	25-Oct-16
16100130-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-003	n-Heptane	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	n-Hexane	I	0.03	ppbv	0.01	AC-058	25-Oct-16
16100130-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	25-Oct-16
16100130-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	25-Oct-16
16100130-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Oct-16
16100130-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	25-Oct-16
16100130-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	o-Xylene	I	0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	25-Oct-16
16100130-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	25-Oct-16
16100130-003	Toluene	I	0.07	ppbv	0.01	AC-058	25-Oct-16
16100130-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	25-Oct-16
16100130-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16
16100130-003	trans-2-Butene	I	0.02	ppbv	0.01	AC-058	25-Oct-16
16100130-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	25-Oct-16
16100130-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	25-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Oct 9, 2016	1136	Ambient Air	09-Oct-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100130-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	25-Oct-16
16100130-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	25-Oct-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 15, 2016	S5645	Ambient Air	15-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-004	1,1,1-Trichloroethane	I	0.04	ppbv	0.02	AC-058	03-Nov-16
16100230-004	1,1,2,2-Tetrachloroethane	I	0.03	ppbv	0.02	AC-058	03-Nov-16
16100230-004	1,1,2-Trichloroethane	I	0.03	ppbv	0.02	AC-058	03-Nov-16
16100230-004	1,1-Dichloroethane	I	0.03	ppbv	0.02	AC-058	03-Nov-16
16100230-004	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-004	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100230-004	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Nov-16
16100230-004	1,2,4-Trimethylbenzene	I	0.05	ppbv	0.03	AC-058	03-Nov-16
16100230-004	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-004	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-004	1,2-Dichloroethane	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100230-004	1,2-Dichloropropane	I	0.04	ppbv	0.01	AC-058	03-Nov-16
16100230-004	1,3,5-Trimethylbenzene	I	0.03	ppbv	0.02	AC-058	03-Nov-16
16100230-004	1,3-Butadiene	I	0.04	ppbv	0.02	AC-058	03-Nov-16
16100230-004	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100230-004	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-004	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-004	1-Butene	I	0.09	ppbv	0.02	AC-058	03-Nov-16
16100230-004	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-004	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-004	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-004	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-004	2,3,4-Trimethylpentane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-004	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-004	2,3-Dimethylpentane	I	0.05	ppbv	0.02	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 15, 2016	S5645	Ambient Air	15-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-004	2,4-Dimethylpentane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-004	2-Methylheptane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-004	2-Methylhexane	I	0.21	ppbv	0.01	AC-058	03-Nov-16
16100230-004	2-Methylpentane	I	0.10	ppbv	0.01	AC-058	03-Nov-16
16100230-004	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-004	3-Methylhexane	I	0.11	ppbv	0.02	AC-058	03-Nov-16
16100230-004	3-Methylpentane	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Acetone		4.1	ppbv	0.4	AC-058	03-Nov-16
16100230-004	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100230-004	Benzene	I	0.09	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-004	Bromodichloromethane		0.04	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Bromoform	I	0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Bromomethane	I	0.06	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Carbon disulfide	I	0.14	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Carbon tetrachloride	I	0.14	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Chlorobenzene	I	0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Chloroethane	I	0.06	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Chloroform	I	0.07	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Chloromethane		4.76	ppbv	0.02	AC-058	03-Nov-16
16100230-004	cis-1,2-Dichloroethene	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-004	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-004	cis-2-Butene	I	0.04	ppbv	0.02	AC-058	03-Nov-16
16100230-004	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Cyclohexane	I	0.05	ppbv	0.02	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 15, 2016	S5645	Ambient Air	15-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-004	Cyclopentane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Dibromochloromethane	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Ethanol		5.1	ppbv	0.3	AC-058	03-Nov-16
16100230-004	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-004	Ethylbenzene	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Freon-11		0.35	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Freon-113	I	0.10	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Freon-114	I	0.06	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Freon-12		0.68	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Nov-16
16100230-004	Isobutane		0.69	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Isopentane		0.53	ppbv	0.03	AC-058	03-Nov-16
16100230-004	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-004	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-004	m,p-Xylene	I	0.11	ppbv	0.03	AC-058	03-Nov-16
16100230-004	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-004	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Nov-16
16100230-004	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Nov-16
16100230-004	Methyl ethyl ketone		0.6	ppbv	0.3	AC-058	03-Nov-16
16100230-004	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-004	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100230-004	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-004	Methylcyclohexane	I	0.10	ppbv	0.01	AC-058	03-Nov-16
16100230-004	Methylcyclopentane	I	0.06	ppbv	0.02	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 15, 2016	S5645	Ambient Air	15-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-004	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100230-004	n-Butane		0.91	ppbv	0.03	AC-058	03-Nov-16
16100230-004	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100230-004	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-004	n-Heptane	I	0.15	ppbv	0.01	AC-058	03-Nov-16
16100230-004	n-Hexane	I	0.17	ppbv	0.01	AC-058	03-Nov-16
16100230-004	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-004	n-Pentane	I	0.2	ppbv	0.1	AC-058	03-Nov-16
16100230-004	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100230-004	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100230-004	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100230-004	n-Nonane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-004	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-004	o-Xylene	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100230-004	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-004	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100230-004	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-004	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-004	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-004	Toluene	I	0.15	ppbv	0.01	AC-058	03-Nov-16
16100230-004	trans-1,2-Dichloroethylene	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100230-004	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-004	trans-2-Butene	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100230-004	trans-2-Pentene	I	0.02	ppbv	0.02	AC-058	03-Nov-16
16100230-004	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 15, 2016	S5645	Ambient Air	15-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100230-004	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Nov-16
16100230-004	Vinyl chloride	I	0.04 ppbv	0.02	AC-058	03-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/ Oct 21, 2016	1708	Ambient Air	21-Oct-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-002	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-002	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-002	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Nov-16
16100270-002	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-002	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-002	1,2-Dichloroethane	I	0.13	ppbv	0.01	AC-058	03-Nov-16
16100270-002	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100270-002	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-002	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-002	1-Butene	I	0.11	ppbv	0.02	AC-058	03-Nov-16
16100270-002	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	2,2-Dimethylbutane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	2,3-Dimethylpentane	I	0.04	ppbv	0.02	AC-058	03-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/ Oct 21, 2016	1708	Ambient Air	21-Oct-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-002	2,4-Dimethylpentane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	2-Methylheptane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	2-Methylhexane	I	0.07	ppbv	0.01	AC-058	03-Nov-16
16100270-002	2-Methylpentane	I	0.10	ppbv	0.01	AC-058	03-Nov-16
16100270-002	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	3-Methylhexane	I	0.04	ppbv	0.02	AC-058	03-Nov-16
16100270-002	3-Methylpentane	I	0.06	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Acetone		2.1	ppbv	0.4	AC-058	03-Nov-16
16100270-002	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100270-002	Benzene	I	0.22	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-002	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Bromomethane	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Carbon disulfide	I	0.07	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Chloroethane	I	0.18	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Chloroform	I	0.04	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Chloromethane		1.23	ppbv	0.02	AC-058	03-Nov-16
16100270-002	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-002	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Cyclohexane	I	0.04	ppbv	0.02	AC-058	03-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/ Oct 21, 2016	1708	Ambient Air	21-Oct-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-002	Cyclopentane	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Ethanol		1.7	ppbv	0.3	AC-058	03-Nov-16
16100270-002	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-002	Ethylbenzene	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Freon-11		0.30	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Freon-113	I	0.07	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Freon-114	I	0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Freon-12		0.71	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Nov-16
16100270-002	Isobutane		1.36	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Isopentane		0.60	ppbv	0.03	AC-058	03-Nov-16
16100270-002	Isoprene	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-002	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	m,p-Xylene	I	0.05	ppbv	0.03	AC-058	03-Nov-16
16100270-002	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-002	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Nov-16
16100270-002	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Nov-16
16100270-002	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100270-002	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-002	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100270-002	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-002	Methylcyclohexane	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100270-002	Methylcyclopentane	I	0.07	ppbv	0.02	AC-058	03-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/ Oct 21, 2016	1708	Ambient Air	21-Oct-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-002	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Nov-16
16100270-002	n-Butane		1.62	ppbv	0.03	AC-058	03-Nov-16
16100270-002	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100270-002	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-002	n-Heptane	I	0.04	ppbv	0.01	AC-058	03-Nov-16
16100270-002	n-Hexane	I	0.10	ppbv	0.01	AC-058	03-Nov-16
16100270-002	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	n-Pentane		0.3	ppbv	0.1	AC-058	03-Nov-16
16100270-002	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-002	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-002	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-002	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	o-Xylene	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100270-002	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-002	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100270-002	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-002	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-002	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-002	Toluene	I	0.11	ppbv	0.01	AC-058	03-Nov-16
16100270-002	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-002	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-002	trans-2-Butene	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100270-002	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Nov-16
16100270-002	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/ Oct 21, 2016	1708	Ambient Air	21-Oct-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100270-002	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Nov-16
16100270-002	Vinyl chloride	I	0.03 ppbv	0.02	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Oct 27, 2016	14993	Ambient Air	27-Oct-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Nov-16
16100306-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	04-Nov-16
16100306-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Nov-16
16100306-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Nov-16
16100306-003	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	04-Nov-16
16100306-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Nov-16
16100306-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-003	1-Butene	I	0.04	ppbv	0.02	AC-058	04-Nov-16
16100306-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	1-Pentene	I	0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	2,2-Dimethylbutane	I	0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	2,3-Dimethylbutane	I	0.03	ppbv	0.02	AC-058	04-Nov-16
16100306-003	2,3-Dimethylpentane	I	0.03	ppbv	0.02	AC-058	04-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Oct 27, 2016	14993	Ambient Air	27-Oct-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	2-Methylhexane	I	0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	2-Methylpentane	I	0.12	ppbv	0.01	AC-058	04-Nov-16
16100306-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	3-Methylhexane	I	0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	3-Methylpentane	I	0.06	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Acetone		0.9	ppbv	0.4	AC-058	04-Nov-16
16100306-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Nov-16
16100306-003	Benzene	I	0.09	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Bromomethane	I	0.02	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Carbon disulfide	I	0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Chloroform	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Chloromethane		0.47	ppbv	0.02	AC-058	04-Nov-16
16100306-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Cyclohexane	I	0.03	ppbv	0.02	AC-058	04-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/Oct 27, 2016	14993	Ambient Air	27-Oct-16	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-003	Cyclopentane	I	0.02	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Ethanol		0.8	ppbv	0.3	AC-058	04-Nov-16
16100306-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-003	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Freon-11		0.30	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Freon-113	I	0.06	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Freon-114	I	0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Freon-12		0.64	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	04-Nov-16
16100306-003	Isobutane		0.65	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Isopentane		0.33	ppbv	0.03	AC-058	04-Nov-16
16100306-003	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Nov-16
16100306-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	04-Nov-16
16100306-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	04-Nov-16
16100306-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Nov-16
16100306-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Nov-16
16100306-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	04-Nov-16
16100306-003	Methylcyclohexane	I	0.05	ppbv	0.01	AC-058	04-Nov-16
16100306-003	Methylcyclopentane	I	0.05	ppbv	0.02	AC-058	04-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 27, 2016	14993	Ambient Air	27-Oct-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	04-Nov-16
16100306-003	n-Butane		0.98	ppbv	0.03	AC-058	04-Nov-16
16100306-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	04-Nov-16
16100306-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-003	n-Heptane	I	0.02	ppbv	0.01	AC-058	04-Nov-16
16100306-003	n-Hexane	I	0.06	ppbv	0.01	AC-058	04-Nov-16
16100306-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	n-Pentane	I	0.2	ppbv	0.1	AC-058	04-Nov-16
16100306-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	04-Nov-16
16100306-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Nov-16
16100306-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	04-Nov-16
16100306-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	04-Nov-16
16100306-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-003	Tetrachloroethylene	I	0.07	ppbv	0.04	AC-058	04-Nov-16
16100306-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	04-Nov-16
16100306-003	Toluene	I	0.09	ppbv	0.01	AC-058	04-Nov-16
16100306-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16
16100306-003	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	04-Nov-16
16100306-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	04-Nov-16
16100306-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	04-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Oct 27, 2016	14993	Ambient Air	27-Oct-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100306-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	04-Nov-16
16100306-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	04-Nov-16

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PAHS SAMPLES



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID CA/PUF/Bonnyville/Oct 03, 201	CANISTER ID TE02	Matrix Air Filter	Priority Normal
	DESCRIPTION: Bonnyville AER			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 03-Oct-16	0:00	DATE RECEIVED: 11-Oct-16	
	REPORT CREATED: 15-Nov-16		REPORT NUMBER: 16100085	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-004	1-Methylnaphthalene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	2-Methylnaphthalene		0.10	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Acenaphthene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Acenaphthylene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Benzo(a)anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Benzo(b,j,k)fluoranthene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Benzo(c)phenanthrene		0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Chrysene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Oct 03, 2016	TE02	Air Filter	03-Oct-16 0:00
DESCRIPTION:	Bonnyville AER		
REPORT NUMBER:	16100085	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100085-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Fluoranthene		0.06	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Fluorene		0.08	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Naphthalene		0.06	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Phenanthrene		0.21	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Pyrene		0.06	ug/puf	0.01	NA-017	02-Nov-16
16100085-004	Retene		0.03	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID ICA/PUF/Bonnyville/Oct 9, 201	CANISTER ID TE01	Matrix Air Filter	Priority Normal
	DESCRIPTION: Bonnyville- AER			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 09-Oct-16	0:00	DATE RECEIVED: 17-Oct-16	
	REPORT CREATED: 15-Nov-16		REPORT NUMBER: 16100130	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-004	1-Methylnaphthalene		0.05	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	2-Methylnaphthalene		0.09	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Acenaphthene		0.15	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Acenaphthylene		0.06	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Anthracene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Benzo(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Benzo(b,j,k)fluoranthene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Chrysene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Oct 9, 2016	TE01	Air Filter	09-Oct-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100130	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100130-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Fluoranthene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Fluorene		0.08	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Naphthalene		0.15	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Phenanthrene		0.10	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Pyrene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100130-004	Retene		0.06	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Oct 15, 2016	TE-06	Air Filter	15-Oct-16	0:00
DESCRIPTION:	Bonnyville AER			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-005	1-Methylnaphthalene		0.09	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	2-Methylnaphthalene		0.17	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Acenaphthene		0.03	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Acenaphthylene		0.06	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Benzo(a)anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Benzo(b,j,k)fluoranthene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Benzo(c)phenanthrene		0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Chrysene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Fluoranthene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Fluorene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Naphthalene		0.09	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Phenanthrene		0.20	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Oct 15, 2016	TE-06	Air Filter	15-Oct-16	0:00
DESCRIPTION:	Bonnyville AER			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100230-005	Pyrene		0.07 ug/puf	0.01	NA-017	02-Nov-16
16100230-005	Retene		0.05 ug/puf	0.01	NA-017	02-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/PUF/Bonnyville/ Oct 21, 2016	9102	Air Filter	21-Oct-16	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-003	1-Methylnaphthalene		0.03	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	2-Methylnaphthalene		0.06	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Acenaphthene		0.02	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Acenaphthylene		0.10	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Anthracene		0.02	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Benzo(a)anthracene		0.02	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Benzo(b,j,k)fluoranthene		0.05	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Benzo(c)phenanthrene		0.12	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Chrysene		0.02	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Fluoranthene		0.10	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Fluorene		0.08	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Indeno(1,2,3-cd)pyrene		0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Naphthalene		0.05	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Phenanthrene		0.26	ug/puf	0.01	NA-017	03-Nov-16

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/PUF/Bonnyville/ Oct 21, 2016	9102	Air Filter	21-Oct-16 0:00
DESCRIPTION:	Bonnyville- AER		
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
16100270-003	Pyrene		0.08 ug/puf	0.01	NA-017	03-Nov-16
16100270-003	Retene		0.04 ug/puf	0.01	NA-017	03-Nov-16

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RESULTS:	Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE		CLIENT SAMPLE ID	CANISTER ID	Matrix	Priority
	Calgary AB T2E 6P8		CA/PUF/Bonnyville/Oct 27, 201	TE03	Air Filter	Normal
INVOICE:	Charmaine Code	780 812-2182	DESCRIPTION:	Bonnyville - AER		
	PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5		DATE SAMPLED:	27-Oct-16 0:00	DATE RECEIVED:	31-Oct-16
			REPORT CREATED:	15-Nov-16	REPORT NUMBER:	16100306
					VERSION:	Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-004	1-Methylnaphthalene		0.22	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	2-Methylnaphthalene		0.41	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	7,12-Dimethylbenz(a)anthracene		0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Acenaphthene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Acenaphthylene		0.13	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Acridine	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Benzo(a)anthracene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Benzo(a)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Benzo(b,j,k)fluoranthene		0.04	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Benzo(c)phenanthrene		0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Chrysene		0.02	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Oct 27, 2016	TE03	Air Filter	27-Oct-16 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	16100306	REPORT CREATED:	15-Nov-16
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100306-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Fluoranthene		0.07	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Fluorene		0.15	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Naphthalene		0.31	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Perylene	K, T, U	< 0.01	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Phenanthrene		0.26	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Pyrene		0.06	ug/puf	0.01	NA-017	02-Nov-16
16100306-004	Retene		0.07	ug/puf	0.01	NA-017	02-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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NMHC CANISTER SAMPLES



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID NMHC-VOC/Bonnyville/Oct 18,	CANISTER ID S12944	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville AER			
INVOICE: Charmaine Code 780 812-2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 18-Oct-16 15:45	DATE RECEIVED: 24-Oct-16	REPORT NUMBER: 16100230	
	REPORT CREATED: 15-Nov-16	VERSION: Version 01		

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	1,1-Dichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100230-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100230-001	1,2,4-Trichlorobenzene	K, T, U	< 1.2	ppbv	1.2	AC-058	03-Nov-16
16100230-001	1,2,4-Trimethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-001	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-001	1,4-Dichlorobenzene	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Nov-16
16100230-001	1,4-Dioxane	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Nov-16
16100230-001	1-Butene	I	0.16	ppbv	0.03	AC-058	03-Nov-16

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On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Oct 18, 2	S12944	Ambient Air	18-Oct-16	15:45
DESCRIPTION:	Bonnville AER			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-001	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	1-Pentene	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	2,3,4-Trimethylpentane	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100230-001	2,3-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	2,3-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	2-Methylheptane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-001	2-Methylhexane	I	0.04	ppbv	0.01	AC-058	03-Nov-16
16100230-001	2-Methylpentane	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100230-001	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	3-Methylhexane	I	0.04	ppbv	0.03	AC-058	03-Nov-16
16100230-001	3-Methylpentane	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Acetone		1.8	ppbv	0.6	AC-058	03-Nov-16
16100230-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-001	Benzene	I	0.11	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Benzyl chloride	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Nov-16
16100230-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Bromomethane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Carbon disulfide	I	0.27	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Oct 18, 2	S12944	Ambient Air	18-Oct-16	15:45
DESCRIPTION:	Bonnville AER			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-001	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Chloromethane		0.47	ppbv	0.03	AC-058	03-Nov-16
16100230-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100230-001	cis-2-Butene	I	0.04	ppbv	0.03	AC-058	03-Nov-16
16100230-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Cyclohexane	I	0.04	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Cyclopentane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Ethanol		1.4	ppbv	0.4	AC-058	03-Nov-16
16100230-001	Ethyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Nov-16
16100230-001	Ethylbenzene	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Freon-11	I	0.29	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Freon-113	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Freon-12		0.63	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Hexachloro-1,3-butadiene	K, T, U	< 0.74	ppbv	0.74	AC-058	03-Nov-16
16100230-001	Isobutane	I	0.37	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Isopentane	I	0.34	ppbv	0.04	AC-058	03-Nov-16
16100230-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Isopropyl alcohol	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Nov-16
16100230-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	m,p-Xylene	I	0.08	ppbv	0.04	AC-058	03-Nov-16
16100230-001	m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100230-001	m-Ethyltoluene	K, T, U	< 0.12	ppbv	0.12	AC-058	03-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Oct 18, 2	S12944	Ambient Air	18-Oct-16	15:45
DESCRIPTION:	Bonnville AER			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-001	Methyl butyl ketone	K, T, U	< 0.74	ppbv	0.74	AC-058	03-Nov-16
16100230-001	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-001	Methyl isobutyl ketone	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Nov-16
16100230-001	Methyl methacrylate	K, T, U	< 0.10	ppbv	0.10	AC-058	03-Nov-16
16100230-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100230-001	Methylcyclohexane	I	0.04	ppbv	0.01	AC-058	03-Nov-16
16100230-001	Methylcyclopentane	I	0.05	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100230-001	n-Butane		0.73	ppbv	0.04	AC-058	03-Nov-16
16100230-001	n-Decane	K, T, U	< 0.09	ppbv	0.09	AC-058	03-Nov-16
16100230-001	n-Dodecane	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Nov-16
16100230-001	n-Heptane	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100230-001	n-Hexane	I	0.04	ppbv	0.01	AC-058	03-Nov-16
16100230-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	03-Nov-16
16100230-001	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100230-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Nov-16
16100230-001	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Nov-16
16100230-001	n-Nonane	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100230-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	o-Xylene	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-001	p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100230-001	p-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	03-Nov-16
16100230-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100230-001	Tetrachloroethylene	I	0.10	ppbv	0.06	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/Oct 18, 2	S12944	Ambient Air	18-Oct-16	15:45
DESCRIPTION:	Bonnville AER			
REPORT NUMBER:	16100230	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100230-001	Tetrahydrofuran	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Nov-16
16100230-001	Toluene	I	0.13	ppbv	0.01	AC-058	03-Nov-16
16100230-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100230-001	trans-1,3-Dichloropropylene	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100230-001	trans-2-Butene	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100230-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100230-001	Trichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Nov-16
16100230-001	Vinyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	03-Nov-16
16100230-001	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16

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RESULTS:	Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE		CLIENT SAMPLE ID	CANISTER ID	Matrix	Priority
	Calgary AB	T2E 6P8	VMHC-VOC/Bonnyville/ Oct 21,	14713	Ambient Air	Normal
INVOICE:	Charmaine Code	780 812-2182	DESCRIPTION: Bonnyville- AER		DATE SAMPLED:	DATE RECEIVED:
	PO Box 8237 5107W-50 St Bonnyville AB	T9N 2J5	21-Oct-16	22:20	27-Oct-16	REPORT NUMBER: 16100270
			REPORT CREATED: 15-Nov-16		VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100270-001	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	03-Nov-16
16100270-001	1,2,4-Trimethylbenzene	I	0.05	ppbv	0.04	AC-058	03-Nov-16
16100270-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-001	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	1,3-Butadiene	I	0.04	ppbv	0.03	AC-058	03-Nov-16
16100270-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-001	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-001	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-001	1-Butene	I	0.23	ppbv	0.03	AC-058	03-Nov-16

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/ Oct 21, 2	14713	Ambient Air	21-Oct-16	22:20
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-001	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	1-Pentene	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100270-001	2,2,4-Trimethylpentane	I	0.13	ppbv	0.01	AC-058	03-Nov-16
16100270-001	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100270-001	2,3,4-Trimethylpentane	I	0.04	ppbv	0.01	AC-058	03-Nov-16
16100270-001	2,3-Dimethylbutane	I	0.06	ppbv	0.03	AC-058	03-Nov-16
16100270-001	2,3-Dimethylpentane	I	0.14	ppbv	0.03	AC-058	03-Nov-16
16100270-001	2,4-Dimethylpentane	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100270-001	2-Methylheptane	I	0.04	ppbv	0.01	AC-058	03-Nov-16
16100270-001	2-Methylhexane	I	0.13	ppbv	0.01	AC-058	03-Nov-16
16100270-001	2-Methylpentane	I	0.20	ppbv	0.01	AC-058	03-Nov-16
16100270-001	3-Methylheptane	I	0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	3-Methylhexane	I	0.12	ppbv	0.03	AC-058	03-Nov-16
16100270-001	3-Methylpentane	I	0.13	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Acetone		2.2	ppbv	0.5	AC-058	03-Nov-16
16100270-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-001	Benzene	I	0.25	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Bromomethane	I	0.02	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Carbon tetrachloride	I	0.08	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16

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Date: Tuesday, November 15, 2016

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/ Oct 21, 2	14713	Ambient Air	21-Oct-16	22:20
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-001	Chloroform	I	0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Chloromethane		0.57	ppbv	0.03	AC-058	03-Nov-16
16100270-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-001	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-001	cis-2-Butene	I	0.05	ppbv	0.03	AC-058	03-Nov-16
16100270-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Cyclohexane	I	0.08	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Cyclopentane	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Ethanol		4.5	ppbv	0.4	AC-058	03-Nov-16
16100270-001	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-001	Ethylbenzene	I	0.07	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Freon-11	I	0.23	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Freon-113	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Freon-12		0.50	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Hexachloro-1,3-butadiene	K, T, U	< 0.68	ppbv	0.68	AC-058	03-Nov-16
16100270-001	Isobutane		1.46	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Isopentane		0.93	ppbv	0.04	AC-058	03-Nov-16
16100270-001	Isoprene	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-001	m,p-Xylene	I	0.24	ppbv	0.04	AC-058	03-Nov-16
16100270-001	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-001	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	03-Nov-16

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/ Oct 21, 2	14713	Ambient Air	21-Oct-16	22:20
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-001	Methyl butyl ketone	K, T, U	< 0.68	ppbv	0.68	AC-058	03-Nov-16
16100270-001	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-001	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-001	Methyl methacrylate	K, T, U	< 0.10	ppbv	0.10	AC-058	03-Nov-16
16100270-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Nov-16
16100270-001	Methylcyclohexane	I	0.13	ppbv	0.01	AC-058	03-Nov-16
16100270-001	Methylcyclopentane	I	0.17	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Nov-16
16100270-001	n-Butane		2.49	ppbv	0.04	AC-058	03-Nov-16
16100270-001	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Nov-16
16100270-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-001	n-Heptane	I	0.10	ppbv	0.01	AC-058	03-Nov-16
16100270-001	n-Hexane	I	0.18	ppbv	0.01	AC-058	03-Nov-16
16100270-001	n-Octane	I	0.04	ppbv	0.03	AC-058	03-Nov-16
16100270-001	n-Pentane		0.5	ppbv	0.1	AC-058	03-Nov-16
16100270-001	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Nov-16
16100270-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Nov-16
16100270-001	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Nov-16
16100270-001	n-Nonane	I	0.03	ppbv	0.01	AC-058	03-Nov-16
16100270-001	o-Ethyltoluene	I	0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-001	o-Xylene	I	0.09	ppbv	0.01	AC-058	03-Nov-16
16100270-001	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-001	p-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	03-Nov-16
16100270-001	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-001	Tetrachloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC-VOC/Bonnyville/ Oct 21, 2	14713	Ambient Air	21-Oct-16	22:20
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	16100270	REPORT CREATED:	15-Nov-16	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
16100270-001	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-001	Toluene		0.44	ppbv	0.01	AC-058	03-Nov-16
16100270-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Nov-16
16100270-001	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Nov-16
16100270-001	trans-2-Butene	I	0.05	ppbv	0.01	AC-058	03-Nov-16
16100270-001	trans-2-Pentene	I	0.04	ppbv	0.03	AC-058	03-Nov-16
16100270-001	Trichloroethylene	I	0.23	ppbv	0.05	AC-058	03-Nov-16
16100270-001	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Nov-16
16100270-001	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Nov-16

Report certified by: Rebecca Holgate, Account Coordinator

On behalf of: PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, November 15, 2016

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APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	Bonnyville
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Bim Adeniji	Project Manager Assistant, Customer Service, Air Services
Is an External Party Certifying the Report? (If 'Yes', fill in the fields below for the external person.)	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Name of External Person Certifying the Report (Last, First, Middle)	Position / Title of External Person Certifying the Report
NA	NA
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
NA	NA

I certify that I have reviewed and verified the submitted report. I also certify that the report presented with this certification form is complete, accurate and representative of the monitoring results and timeframe.



Signature of the Representative of the Person Responsible / External Person Certifying the Report

07-12-2016




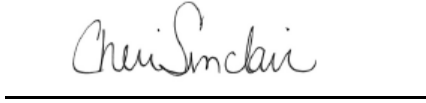
Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2016-10-35-C</u>
Site: <u>Bonnyville</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification		Date <u>21-Nov-2016</u>
Level 1 Primary Validation		Date <u>21-Nov-2016</u>
Level 2 Final Validation		Date <u>07-Dec-2016</u>
Level 3 Independent Data Review		Date <u>12-Dec-2016</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.