



Alberta Environment and Parks (AEP)
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February 22, 2018

Subject: Monthly Report Submission for the LICA Cold Lake South station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Cold Lake South AQM Station in the month of February 2017.

The air monitoring program consists of continuous air monitoring, passive sampling and intermittent sampling, including both VOC, PAH and Partisol sampling programs. All the air monitoring activities were conducted by contractors.

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

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

All data collected in February 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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

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

Respectfully,



Lakeland Industry & Community Association
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A handwritten signature in blue ink that reads 'Michael Bisaga'.

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

JOB #: 2833-2017-02-1-C

February 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

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Attention: MIKE BISAGA

DATE: **April 11, 2017**

Prepared by:

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Reviewed by:

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

SUMMARY

In February 2017, 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 were 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}: Twenty four hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.

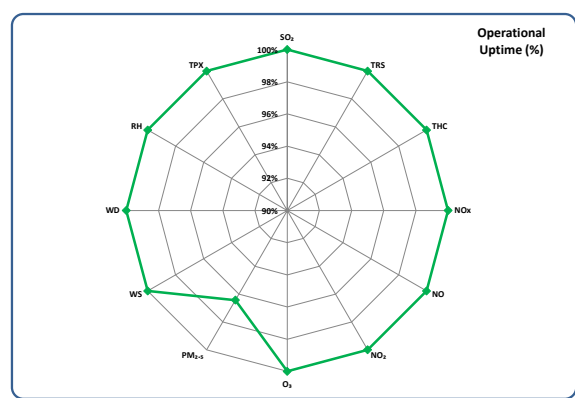
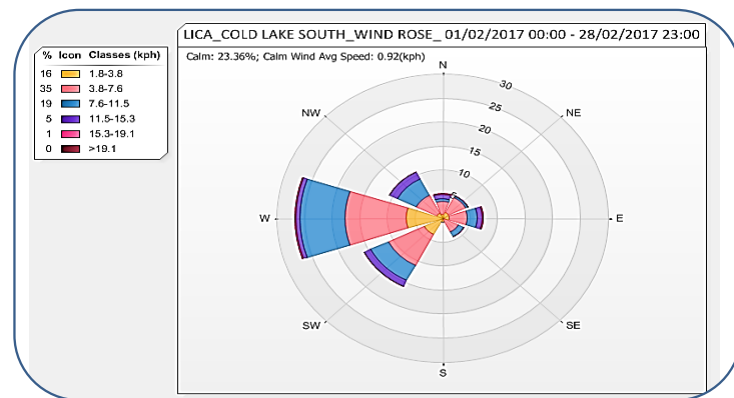
NO_x/NO/NO₂: The NO_x gas concentration 50.7 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.9 ppm. A sample of affected calculations has been rerun and the error has no significant effect on the calibration. The NO_x calibration still meets the AMD calibration criteria.

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			AAAQO Objective	Exceed. Hours	Maximum			Exceed. Days
				Conc.	Date	Hour			Conc.	Date	Exceed. Days	
SO ₂	ppb	0.3	100.0%	2.8	February 25	14	172	0	1.4	February 12	48	0
TRS	ppb	0.2	100.0%	0.7	February 14	8	-	-	0.4	February 16	-	-
THC	ppm	2.22	100.0%	3.35	February 15	7	-	-	2.78	February 15	-	-
NO _x	ppb	7.1	100.0%	144.5	February 14	8	-	-	19.7	February 15	-	-
NO	ppb	1.5	100.0%	104.0	February 14	8	-	-	7.8	February 14	-	-
NO ₂	ppb	5.5	100.0%	40.5	February 14	8	159	0	12.6	February 15	-	-
O ₃	ppb	28.4	100.0%	46.0	February 12	13	82	0	42.6	February 12	-	-
PM _{2.5}	µg/m ³	3.4	96.4%	18.0	February 9	10	80	0	9.7	February 9	30	0
WS	%	2.3	100.0%	19.0	February 26	5	-	-	9.9	February 12	-	-
WD	degree	276 (W)	100.0%	-	-	-	-	-	-	-	-	-
RH	mm	71	100.0%	100	February 20	6	-	-	94	February 19	-	-
AmbTPK	°C	-8.9	100.0%	11.3	February 14	15	-	-	3.2	February 17	-	-



Monthly Update

- * The sampling, collection and reporting of air monitoring data was performed by Maxxam Analytics and complies with the quality assurance practices outlined in the Alberta Air Monitoring Directive (Alberta Environment and Parks, 2016).
- * 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

- There were no operational issues that impacted hourly data.
- **PM_{2.5}**: Twenty four hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.
- **THC/CH₄/NMHC**: Instantaneous maximum data on February 27, at hour 15:00, was invalidated due to a brief power failure.
- **O₃**: Instantaneous maximum data on February 27, at hour 15:00, was invalidated due to a brief power failure.
- **WS**: Instantaneous maximum data on February 27, at hour 15:00, was invalidated due to a brief power failure.

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	0.3	2.8	25	14	8.2	WSW	1.4	12	100.0
TRS (ppb)	-	-	-	-	0.2	0.7	14	8	0.7	ESE	0.4	16	100.0
THC (ppm)	-	-	-	-	2.22	3.35	15	7	2.0	ENE	2.78	15	100.0
NO ₂ (ppb)	159	-	0	-	5.5	40.5	14	8	0.7	ESE	12.6	15	100.0
NO (ppb)	-	-	-	-	1.5	104.0	14	8	0.7	ESE	7.8	14	100.0
NO _x (ppb)	-	-	-	-	7.1	144.5	14	8	0.7	ESE	19.7	15	100.0
O ₃ (ppb)	82	-	0	-	28.4	46.0	12	13	14.1	SW	42.6	12	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	3.4	18.0	9	10	4.1	ESE	9.7	9	96.4
RELATIVE HUMIDITY (%)	-	-	-	-	71	100	20	6	6.5	W	94	19	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-8.9	11.3	14	15	3.3	S	3.2	17	100.0
VECTOR WS (kph)	-	-	-	-	2.3	19.0	26	5	-	NNW	9.9	12	100.0
VECTOR WD (sec)	-	-	-	-	276 (W)	-	-	-	-	-	-	-	100.0

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
February 6, 2017	1.1	Acetone
February 12, 2017	1.2	Acetone
February 18, 2017	1.3	Acetone
February 24, 2017	1.3	Acetone

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
February 6, 2017	1.08	Napthalene
February 12, 2017	0.43	Napthalene
February 18, 2017	0.30	Phenanthrene
February 24, 2017	0.20	Napthalene

Note: NA

Partisol Sampler Summary

Sample Collection Date	Concentration (mg)
February 6, 2017	0.127
February 12, 2017	0.018
February 18, 2017	0.044
February 24, 2017	0.051

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 non-continuous monitoring data results for Partisol, VOCs, and PAHs 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 (December, 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)
<ul style="list-style-type: none"> Operational time was 100%. The routine monthly calibration was performed on February 27.
TOTAL REDUCED SULPHUR (TRS)
<ul style="list-style-type: none"> Operational time was 100%. The routine monthly calibration was performed on February 27.
TOTAL HYDROCARBONS (THC)
<ul style="list-style-type: none"> Operational time was 100%. The routine monthly calibration was performed on February 23. There were no operational issues that impacted hourly data. Instantaneous maximum data on February 27, at hour 15:00, was invalidated due to a brief power failure.
OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)
<ul style="list-style-type: none"> Operational time was 100%. The routine monthly calibration was performed on February 27. The NO_x gas concentration 50.7 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.9 ppm. A sample of affected calculations has been rerun and the error has no significant effect on the calibration. The NO_x calibration still meets the AMD calibration criteria.
OZONE (O₃)
<ul style="list-style-type: none"> Operational time was 100%. The routine monthly calibration was performed on February 23. Instantaneous maximum data on February 27, at hour 15:00, was invalidated due to a brief power failure.
PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})
<ul style="list-style-type: none"> Operational time was 100%. Two routine TEOM audits were performed this month. The first was completed on February 10 and the second on February 21. Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, <i>Zero Adjustment Criteria</i>. Data recorded between 0 and -3 µg/m³ was corrected to 0 µg/m³. Data recorded below -3 µg/m³ was invalidated. Twenty four hours of data were invalidated as the data was below -3 µg/m³.
WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)
<ul style="list-style-type: none"> Operational time was 100%. There were no operational issues that impacted hourly data. Instantaneous maximum data on February 27, at hour 15:00, was invalidated due to a brief power failure. Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.
RELATIVE HUMIDITY (RH)
<ul style="list-style-type: none"> Operational time was 100%.
AMBIENT TEMPERATURE (AmbTPX)
<ul style="list-style-type: none"> Operational time was 100%.

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, as scheduled, on February 6, 12, 18 and 24. Analysis and results are provided by InnoTech Alberta.

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, as scheduled, on February 6, 12, 18 and 24. Analysis and results are provided by InnoTech Alberta.

PARTISOL SAMPLES

- The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).
- Samples were collected, as scheduled, on February 6, 12, 18 and 24. Analysis and results are provided by InnoTech Alberta.

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 were 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-00007: TISCH PUF Sampler Operating, Calibration and Maintenance
- 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
- Maxxam PTC SOP-00148: Monitoring NO₂ in the Atm. by using All-Season Passive Maxxam
- PTC SOP-00149: Monitoring SO₂ in the Atm. by using All-Season Passive Maxxam PTC
- SOP-00150: Monitoring H₂S in the Atm. by using All-Season Passive Maxxam PTC
- SOP-00197: Monitoring O₃ in the Atm. by Using Maxxam All-Season Passive Sample

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
- PAH - TISCH PUF Plus
- Partisol - R&P 2000H Unit
- VOC - XONTECH 910A Gaseous Air Sampler

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

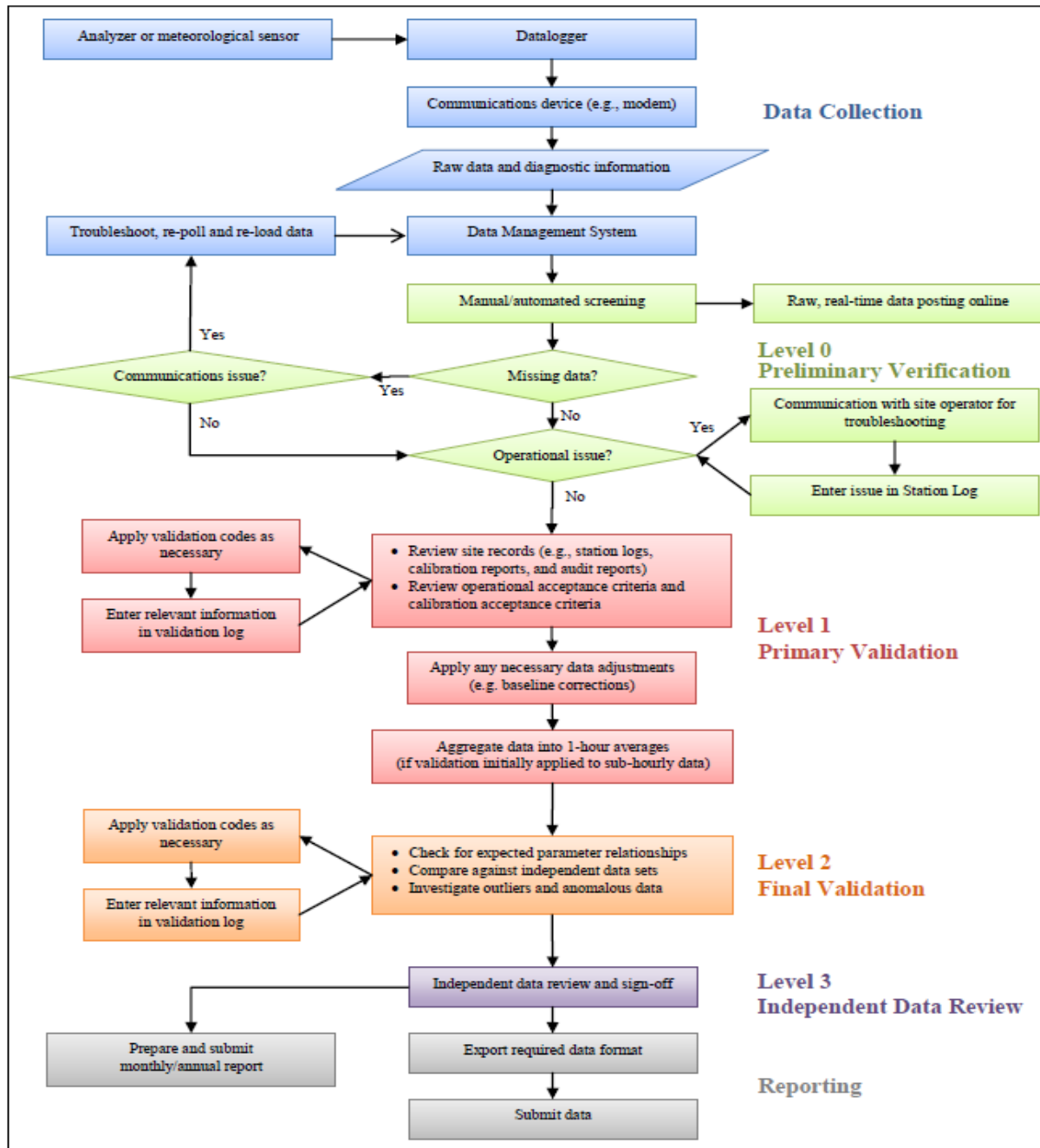
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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.

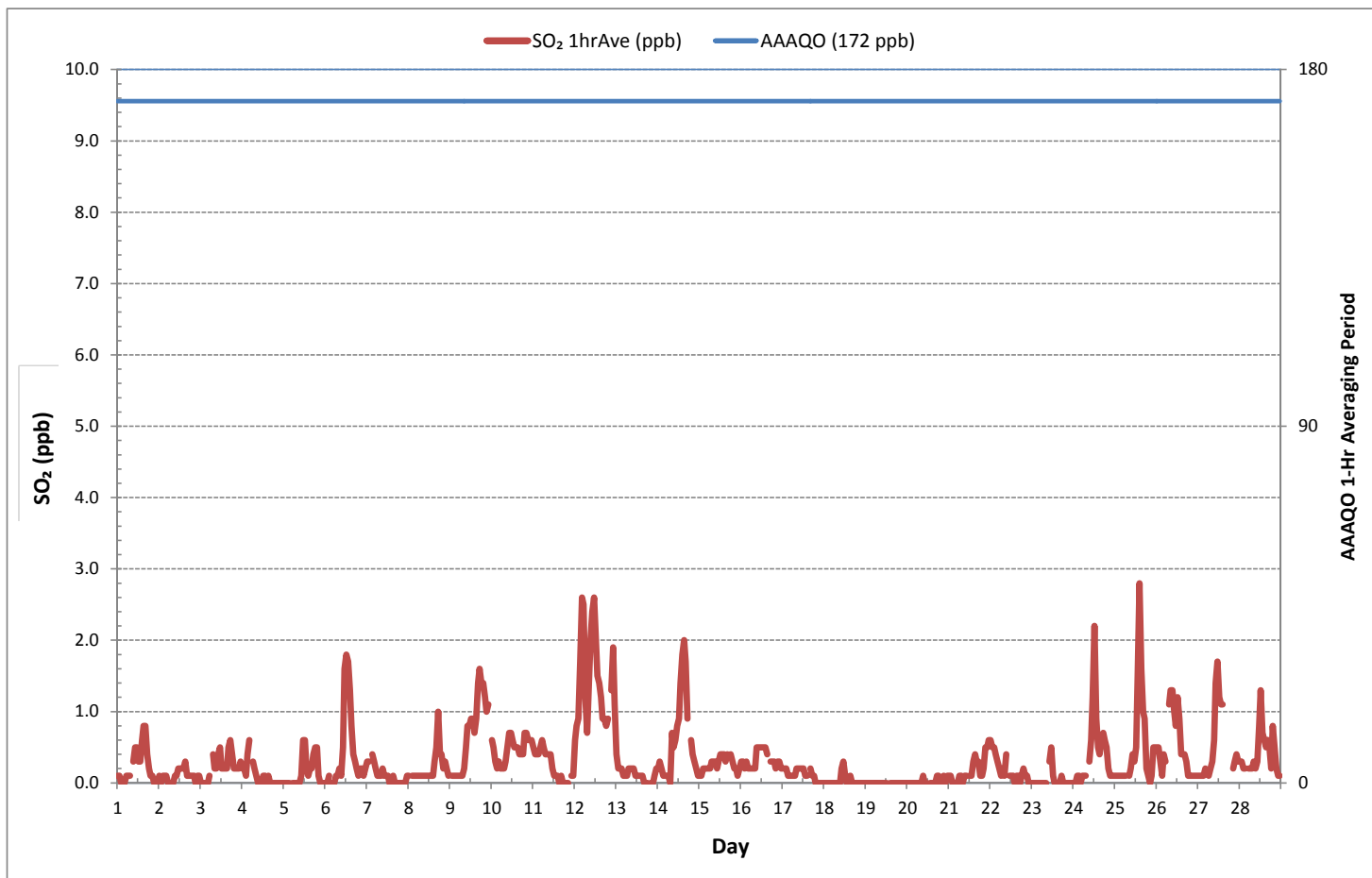


Source: Air Monitoring Directive (Dec, 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	0.5	0.3	0.3	0.5	0.3	0.6	0.3	0.5	S	0.9	0.9	0.9	0.6	0.6	1.4	1.4	1.2	0.8	0.6	0.3	0.5	0.5	0.3	0.5	0.3	0.3	1.4	0.6	24
2	0.3	0.5	0.3	0.5	0.3	0.5	0.3	S	0.3	0.4	0.3	0.6	0.5	0.5	0.5	0.7	0.5	0.5	0.3	0.5	0.5	0.3	0.5	0.5	0.3	0.3	0.7	0.4	24
3	0.5	0.3	0.5	0.3	0.3	0.3	S	0.9	0.6	0.6	0.9	0.9	0.6	0.6	0.5	0.6	0.9	0.9	1.2	0.6	0.5	0.5	0.5	0.7	0.3	1.2	0.6	24	
4	0.5	0.5	0.5	0.8	1.1	S	0.7	0.6	0.5	0.3	0.3	0.3	0.5	0.5	0.3	0.5	0.5	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.3	1.1	0.5	24
5	0.3	0.3	0.5	0.5	S	0.3	0.3	0.3	0.3	0.3	0.5	1.2	1.1	0.5	0.5	0.6	0.6	0.7	0.9	1.2	0.5	0.5	0.3	0.3	0.3	0.3	1.2	0.5	24
6	0.3	0.3	0.6	S	0.3	0.3	0.3	0.3	0.5	0.5	1.2	2.1	2.1	2.1	1.7	1.2	0.7	0.6	0.5	0.5	0.6	0.5	0.6	0.5	0.3	2.1	0.8	24	
7	0.6	0.6	S	0.7	0.6	0.5	0.5	0.3	0.5	0.6	0.4	0.6	0.5	0.3	0.4	0.5	0.3	0.5	0.3	0.5	0.3	0.4	0.3	0.5	0.3	0.7	0.5	24	
8	0.6	S	0.5	0.6	0.6	0.3	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.6	0.5	0.6	1.2	1.7	1.1	0.9	0.6	0.8	0.6	0.5	0.3	1.7	0.7	24	
9	S	0.5	0.5	0.5	0.4	0.3	0.5	0.3	0.5	0.8	1.1	1.1	1.1	1.1	0.9	1.1	1.7	1.9	1.7	1.4	1.2	1.4	S	0.3	1.9	1.0	24		
10	0.9	0.6	0.6	0.5	0.5	0.5	0.3	0.5	0.5	0.7	0.9	0.9	0.7	0.6	0.7	0.7	0.6	0.6	0.8	0.9	0.9	0.9	S	0.9	0.3	0.9	0.7	24	
11	0.8	0.7	0.7	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.3	0.5	0.3	S	0.5	0.5	0.3	0.9	0.6	24	
12	1.1	1.2	1.4	2.3	3.8	3.8	1.7	1.1	1.9	2.8	2.8	3.1	2.6	1.8	1.7	1.4	1.2	1.1	1.1	S	1.6	2.3	1.7	1.1	3.8	1.9	24		
13	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	S	0.5	0.5	0.5	0.9	0.5	0.9	0.5	24	
14	0.9	0.9	0.7	0.6	0.5	0.6	0.5	0.3	2.8	0.9	1.2	1.2	1.5	1.7	2.4	2.9	2.0	1.4	S	0.9	0.6	0.5	0.5	0.5	0.3	2.9	1.1	24	
15	0.5	0.3	0.5	0.5	0.5	0.5	0.6	0.8	0.5	0.5	0.5	0.6	0.6	0.7	0.6	0.6	0.8	S	0.6	0.6	0.3	0.5	0.3	0.5	0.3	0.8	0.5	24	
16	0.5	0.6	0.6	0.5	0.6	0.5	0.5	0.3	0.6	0.8	0.7	0.9	0.8	0.7	0.7	0.7	S	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.3	0.9	0.6	24	
17	0.3	0.5	0.5	0.5	0.3	0.5	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.5	S	0.6	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.6	0.5	24	
18	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.6	0.7	0.6	0.5	S	0.5	0.5	0.5	0.3	0.5	0.3	0.3	0.3	0.5	0.3	0.7	0.4	24	
19	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.5	0.3	0.5	S	0.3	0.3	0.5	0.3	0.6	0.5	0.5	0.3	0.5	0.3	0.3	0.6	0.4	24	
20	0.3	0.3	0.5	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.5	0.3	S	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.5	0.3	0.5	0.3	24
21	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.5	0.5	S	0.4	0.5	0.6	0.9	0.6	0.9	0.5	0.5	0.5	1.1	0.9	1.1	0.3	1.1	0.6	24	
22	0.9	0.9	0.7	0.8	0.6	0.4	0.3	0.5	0.5	0.7	S	0.5	0.5	0.3	0.3	0.5	0.3	0.3	0.5	0.6	0.3	0.6	0.3	0.3	0.3	0.9	0.5	24	
23	0.5	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.6	S	0.9	1.0	0.4	0.3	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	1.0	0.4	24	
24	0.3	0.3	0.5	0.3	0.5	0.5	0.4	0.5	S	0.7	1.1	1.8	2.9	1.7	0.8	0.9	1.1	1.1	0.9	0.9	0.6	0.3	0.5	0.3	0.3	2.9	0.8	24	
25	0.3	0.5	0.3	0.3	0.3	0.3	0.5	S	0.4	0.5	0.7	0.6	0.9	2.9	3.4	2.4	1.4	1.4	0.6	0.3	0.2	0.5	0.9	0.9	0.2	3.4	0.9	24	
26	1.1	0.9	0.7	0.5	0.9	0.6	S	1.9	2.0	1.7	1.4	1.2	1.9	1.5	0.9	0.9	0.7	0.8	0.5	0.5	0.3	0.3	0.5	0.3	0.3	2.0	1.0	24	
27	0.3	0.5	0.6	0.3	0.5	S	0.3	0.6	0.7	0.9	2.8	2.6	1.5	1.5	1.5	C	C	C	C	C	C	0.6	0.6	0.9	0.6	0.3	2.8	1.0	24
28	0.7	0.6	0.5	0.3	S	0.5	0.3	0.5	0.5	0.6	0.6	1.9	1.8	1.1	1.1	1.1	1.2	0.9	0.6	1.5	1.1	0.9	0.7	0.6	0.3	1.9	0.9	24	
HOURLY MAX	1.1	1.2	1.4	2.3	3.8	3.8	1.7	1.9	2.8	2.8	2.8	3.1	2.9	2.9	3.4	2.9	2.0	1.9	1.7	1.7	1.4	1.6	2.3	1.7					
HOURLY AVG	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.7	0.7	0.9	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.6	0.7	0.5	0.6	0.6	0.6					

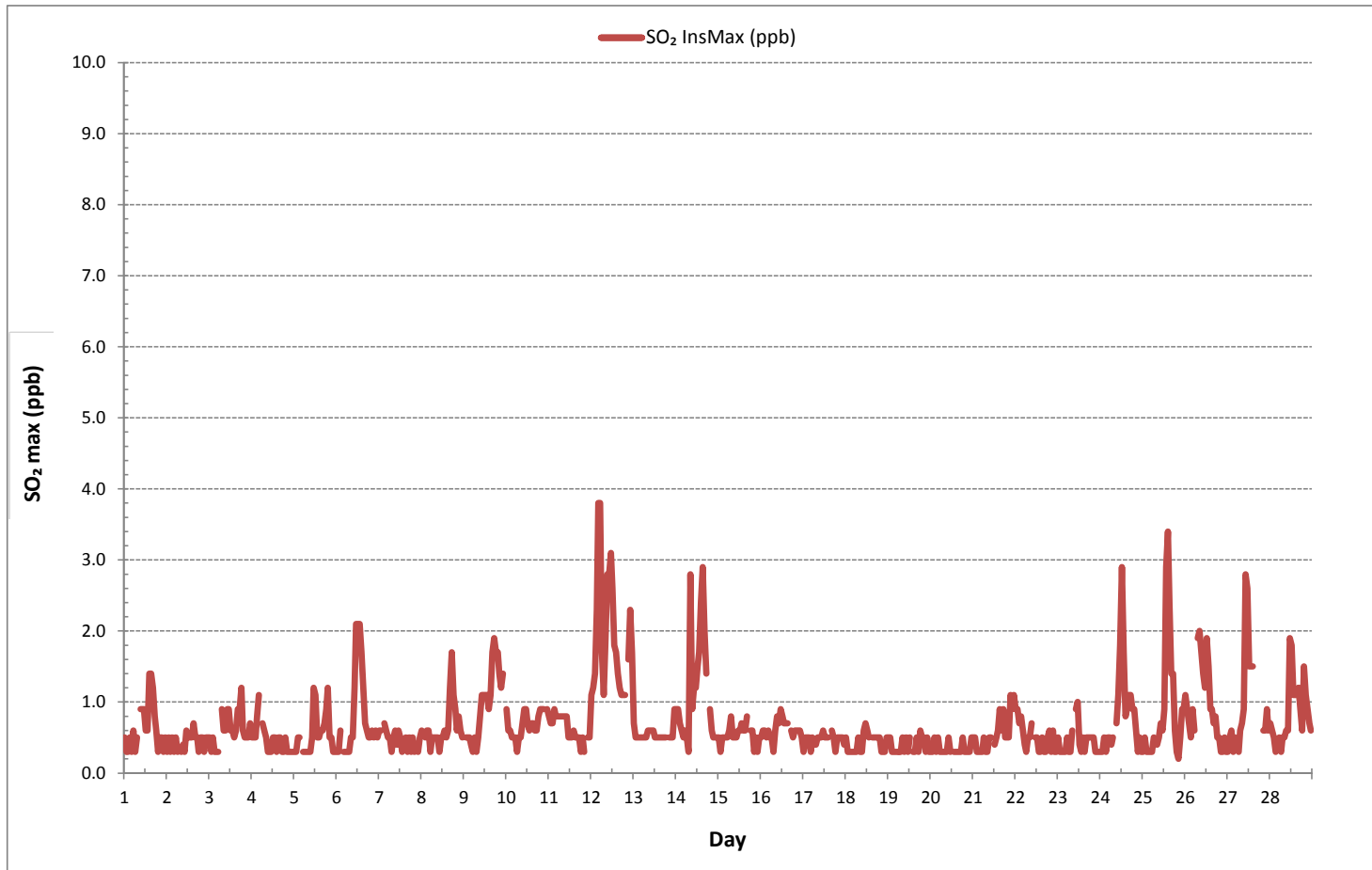
STATUS FLAG CODES

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:	638
MAXIMUM INSTANTANEOUS VALUE:	3.8 ppb @ HOUR(S) 4 ON DAY(S) 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	0.5

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO2 [ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

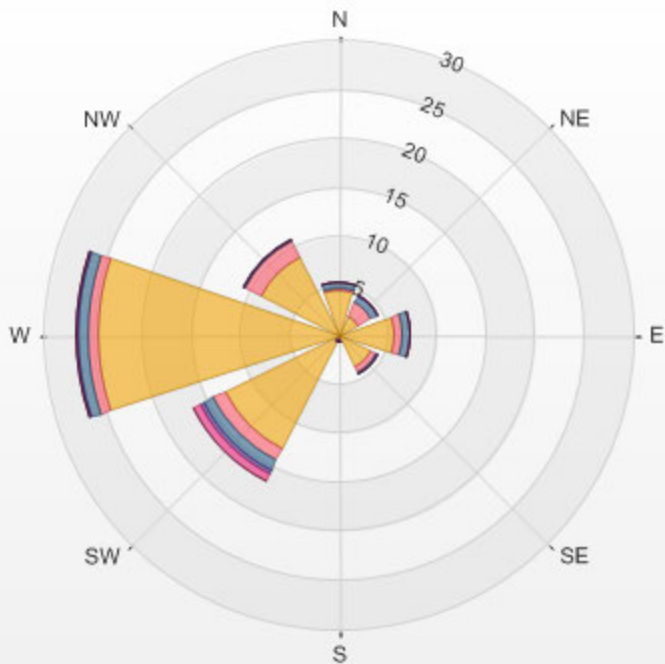
Calm: 23.35%

Calm Avg: 0.16 [ppb]

Direction	0.0-0.6	0.6-1.2	1.2-1.7	1.7-2.3	2.3-2.9	>2.9	Total
N	4.6	0.3	0.5	0.0	0.0	0.0	5.3
NE	2.2	1.6	0.6	0.2	0.0	0.0	4.6
E	5.6	0.9	0.8	0.0	0.0	0.0	7.4
SE	3.6	0.6	0.2	0.0	0.0	0.0	4.4
S	0.5	0.2	0.0	0.2	0.0	0.0	0.8
SW	13.0	1.3	1.1	0.5	0.8	0.0	16.6
W	24.5	1.1	0.9	0.2	0.0	0.0	26.7
NW	8.8	1.9	0.2	0.2	0.0	0.0	11.0
Summary	62.7	7.8	4.2	1.1	0.8	0.0	76.7

% Icon Classes (ppb)	63	0.0-0.6	8	0.6-1.2	4	1.2-1.7	1	1.7-2.3	1	2.3-2.9	0	>2.9
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 23.35% Calm Poll Avg: 0.16[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR

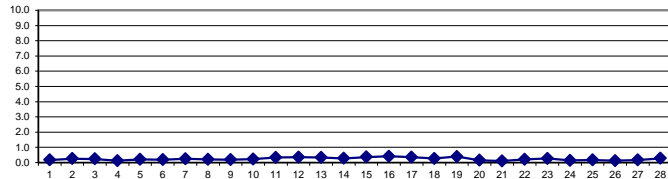
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	S	0.1	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	0.2	0.1	0.3	0.2	24																						
2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	S	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	24																					
3	0.3	0.3	0.2	0.3	0.3	0.3	S	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.3	0.2	24																						
4	0.1	0.1	0.1	0.1	0.1	S	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.0	0.2	0.1	24																						
5	0.2	0.2	0.3	0.3	S	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.3	0.2	24																						
6	0.2	0.1	0.1	S	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.2	24																						
7	0.2	0.3	S	0.4	0.3	0.3	0.3	0.2	0.3	0.3	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	0.3	0.2	0.4	24																						
8	0.3	S	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.3	0.2	24																					
9	S	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	S	0.1	0.3	0.2	24																						
10	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	S	0.3	0.2	0.3	0.2	24																					
11	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	S	0.4	0.4	0.3	0.4	0.3	24																					
12	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.4	S	0.4	0.3	0.3	0.3	0.4	0.4	24																					
13	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.3	S	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	24																					
14	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.7	0.5	0.3	0.2	0.3	0.2	0.3	0.2	0.3	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.3	24																					
15	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.4	S	0.5	0.4	0.4	0.4	0.4	0.5	0.2	0.5	0.4	24																						
16	0.5	0.5	0.5	0.5	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	S	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.5	0.4	24																					
17	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.4	0.4	S	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	24																					
18	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	S	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	24																					
19	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	S	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.4	24																					
20	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	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	0.1	0.1	0.1	0.1	0.4	0.2	24																					
21	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	S	0.1	0.0	0.1	0.2	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																					
22	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.2	0.2	24																					
23	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	S	0.5	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.3	24																					
24	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	24																					
25	0.2	0.2	0.2	0.2	0.2	0.1	0.1	S	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	24																					
26	0.2	0.2	0.2	0.1	0.1	0.2	S	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.1	24																						
27	0.1	0.0	0.0	0.0	0.0	S	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	C	C	C	C	0.3	0.3	0.3	0.3	0.3	0.0	0.3	0.2	24																						
28	0.3	0.3	0.3	0.2	S	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.3	24																					
HOURLY MAX	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.2	0.3	0.3	24																					
HOURLY AVG	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	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

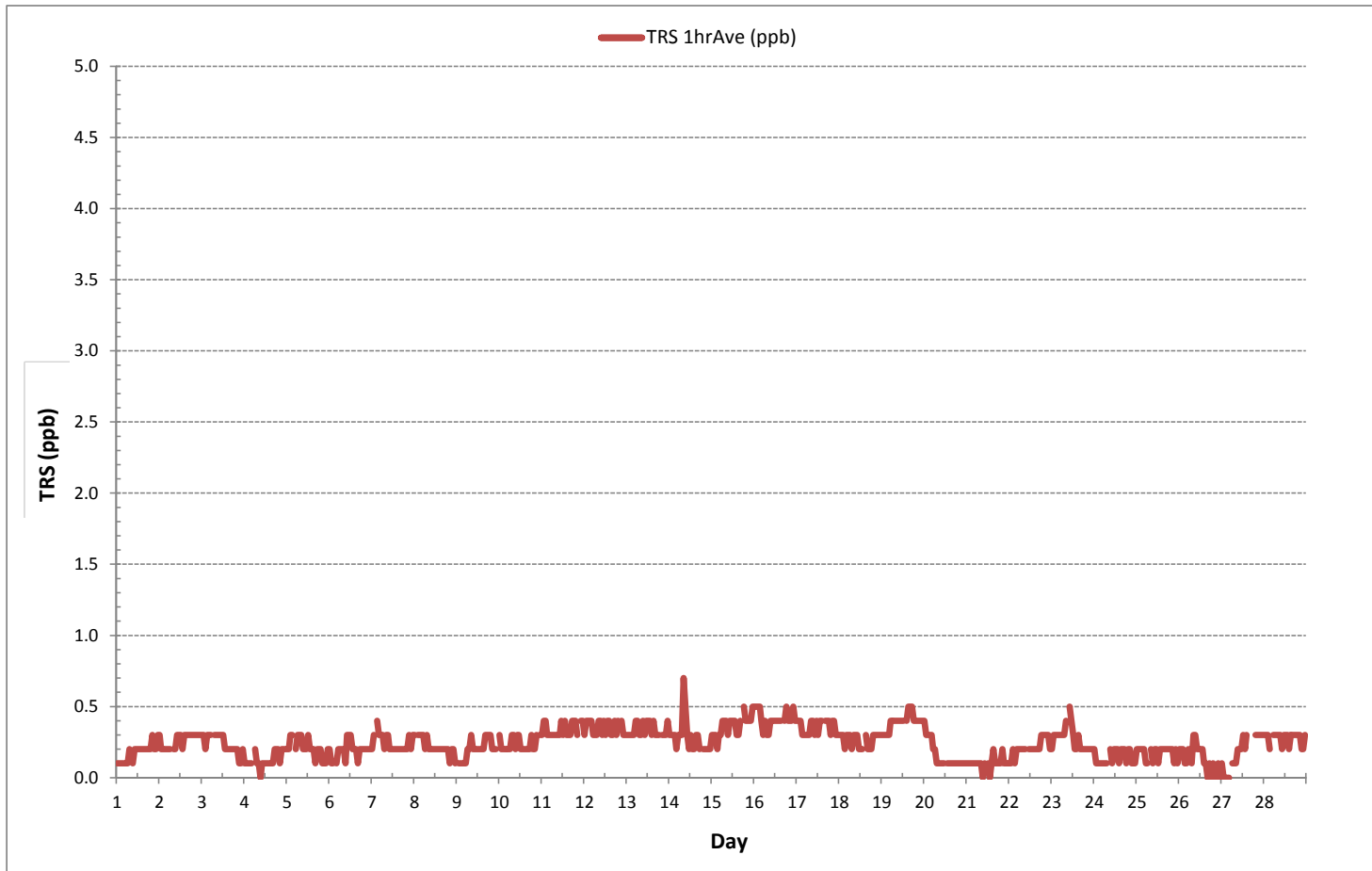
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	627				
MINIMUM 1-HR AVERAGE:	0.0	ppb @ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	0.7	ppb @ HOUR(S)	8	ON DAY(S)	14
MAXIMUM 24-HR AVERAGE:	0.4	ppb		ON DAY(S)	16
				VAR-VARIOUS	
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.1		MONTHLY AVERAGE:	0.2	ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	0.8	0.8	0.9	0.8	0.7	0.9	0.7	0.9	S	0.9	1.0	0.9	0.9	0.9	1.0	0.9	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.7	1.0	0.9	24	
2	1.0	0.8	0.9	0.9	0.9	1.0	1.0	S	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.8	1.0	0.9	24	
3	0.9	0.9	0.8	0.8	0.9	0.9	S	1.0	0.8	0.9	0.9	0.9	0.8	0.9	0.8	0.8	1.0	1.0	0.9	0.9	0.8	0.9	1.0	1.0	0.8	1.0	0.9	24	
4	0.9	0.8	0.9	1.1	0.9	S	0.8	0.8	0.9	0.9	0.8	0.9	0.9	0.9	0.7	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.7	1.1	0.9	24	
5	0.7	0.8	1.0	0.9	S	0.9	0.9	0.9	0.8	0.8	0.9	1.1	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.8	1.0	0.8	0.8	0.7	0.7	1.1	0.9	24	
6	0.9	0.9	0.9	S	0.7	1.0	0.9	0.9	1.0	0.8	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.8	0.9	0.8	0.7	1.0	0.9	24	
7	0.8	1.0	S	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.8	1.1	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.9	0.7	1.1	0.9	24
8	0.9	S	0.8	1.0	0.8	0.9	0.9	1.0	0.8	0.9	0.9	0.8	0.8	1.0	1.0	1.0	0.9	0.9	0.8	0.9	0.9	0.9	1.0	0.8	0.8	1.0	0.9	24	
9	S	0.8	0.7	0.9	0.8	0.8	1.1	0.8	1.0	0.9	0.9	0.8	1.0	1.0	0.9	0.9	0.9	0.9	1.0	0.8	0.9	0.9	S	0.7	1.1	0.9	24		
10	0.8	0.9	0.8	0.7	0.8	0.9	1.0	1.2	1.0	0.9	1.0	1.0	0.8	0.8	0.9	0.8	0.8	0.9	1.1	0.9	0.9	0.9	S	0.9	0.7	1.2	0.9	24	
11	0.9	1.0	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.8	1.0	0.9	0.9	0.9	1.0	0.9	0.9	1.0	1.0	0.9	0.9	S	0.9	0.9	0.8	1.0	0.9	24	
12	0.9	0.9	1.0	0.9	0.9	0.9	1.0	1.0	0.9	1.0	0.8	0.9	1.0	0.8	0.9	1.0	0.8	0.8	0.9	0.9	S	0.9	0.9	0.9	0.8	1.0	0.9	24	
13	0.8	0.9	0.8	0.9	0.7	0.9	0.9	0.9	0.8	1.1	0.8	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.8	S	1.0	0.8	1.0	1.0	0.7	1.1	0.9	24	
14	1.0	0.8	0.9	1.0	0.9	0.9	0.9	2.6	1.5	1.0	1.0	0.9	0.8	1.1	1.0	0.9	1.0	S	1.0	0.8	0.9	1.2	0.9	0.8	2.6	1.0	24		
15	0.9	0.9	1.0	0.7	0.9	0.9	1.0	1.0	1.1	0.8	0.9	1.0	0.8	0.9	0.8	1.2	0.9	S	1.0	0.9	0.9	0.9	0.9	0.7	1.2	0.9	24		
16	1.1	1.2	0.9	1.0	1.0	0.8	0.9	0.9	0.9	1.1	0.9	0.9	1.0	1.1	1.1	0.9	S	1.0	1.0	0.9	0.9	1.1	1.0	1.0	0.8	1.2	1.0	24	
17	0.9	1.0	0.8	0.8	0.7	0.9	0.7	0.8	0.8	1.0	0.8	1.0	0.8	1.0	0.9	S	0.9	0.9	0.9	1.1	0.9	1.0	0.8	0.9	0.7	1.1	0.9	24	
18	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.9	1.0	1.0	0.9	0.8	0.9	S	0.9	0.9	0.8	0.9	0.8	0.9	1.0	0.9	0.8	0.8	1.0	0.9	24	
19	1.0	0.9	0.8	0.8	0.9	1.0	0.9	0.8	0.9	1.0	0.9	0.9	1.0	S	1.0	1.2	0.9	1.2	0.9	1.1	1.1	0.9	1.0	1.1	0.8	1.2	1.0	24	
20	1.1	0.9	1.0	0.9	1.0	0.9	0.9	0.9	1.0	0.8	0.8	0.9	S	1.1	0.9	0.7	0.9	0.9	0.9	0.9	0.9	0.7	0.9	0.9	0.8	0.7	1.1	0.9	24
21	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.1	0.8	0.8	1.0	S	1.0	0.8	0.9	1.0	0.9	0.9	1.0	0.8	0.9	0.9	0.9	0.8	0.8	1.1	0.9	24	
22	0.7	0.9	0.9	1.1	0.9	0.9	0.9	0.9	0.7	0.9	S	0.9	0.9	0.8	0.8	0.7	0.9	0.8	0.9	0.9	0.9	1.0	0.9	0.9	0.7	1.1	0.9	24	
23	0.7	0.8	0.9	0.9	0.9	0.9	1.0	1.0	0.8	S	1.0	1.1	1.1	0.8	0.9	0.8	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.8	0.7	1.1	0.9	24	
24	1.1	0.9	0.9	0.9	0.8	0.9	1.0	1.0	S	0.9	0.9	0.9	1.0	0.9	1.0	0.9	1.1	1.0	0.9	0.9	1.0	0.8	0.9	0.9	0.8	1.1	0.9	24	
25	0.9	0.9	1.0	1.1	0.8	1.0	0.8	S	0.9	0.8	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	1.1	0.9	24	
26	0.9	1.0	0.9	0.9	0.8	0.9	S	0.9	1.1	1.1	0.9	0.9	1.0	1.0	0.9	0.9	1.0	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	1.1	0.9	24	
27	1.0	0.9	0.9	0.9	0.9	S	0.9	1.1	1.0	1.1	0.9	1.0	1.0	0.9	1.0	C	C	C	C	C	C	0.9	1.0	1.0	0.9	0.9	1.1	1.0	24
28	1.0	0.8	1.0	0.8	S	0.9	1.1	0.9	1.0	0.8	0.9	0.9	0.9	1.0	1.0	0.9	0.9	1.0	0.9	1.1	0.8	0.8	0.9	1.1	0.8	1.1	0.9	24	
HOURLY MAX	1.1	1.2	1.0	1.1	1.0	1.0	1.1	1.2	2.6	1.5	1.0	1.1	1.1	1.1	1.1	1.2	1.1	1.2	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.2	1.1	24	
HOURLY AVG	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	24	

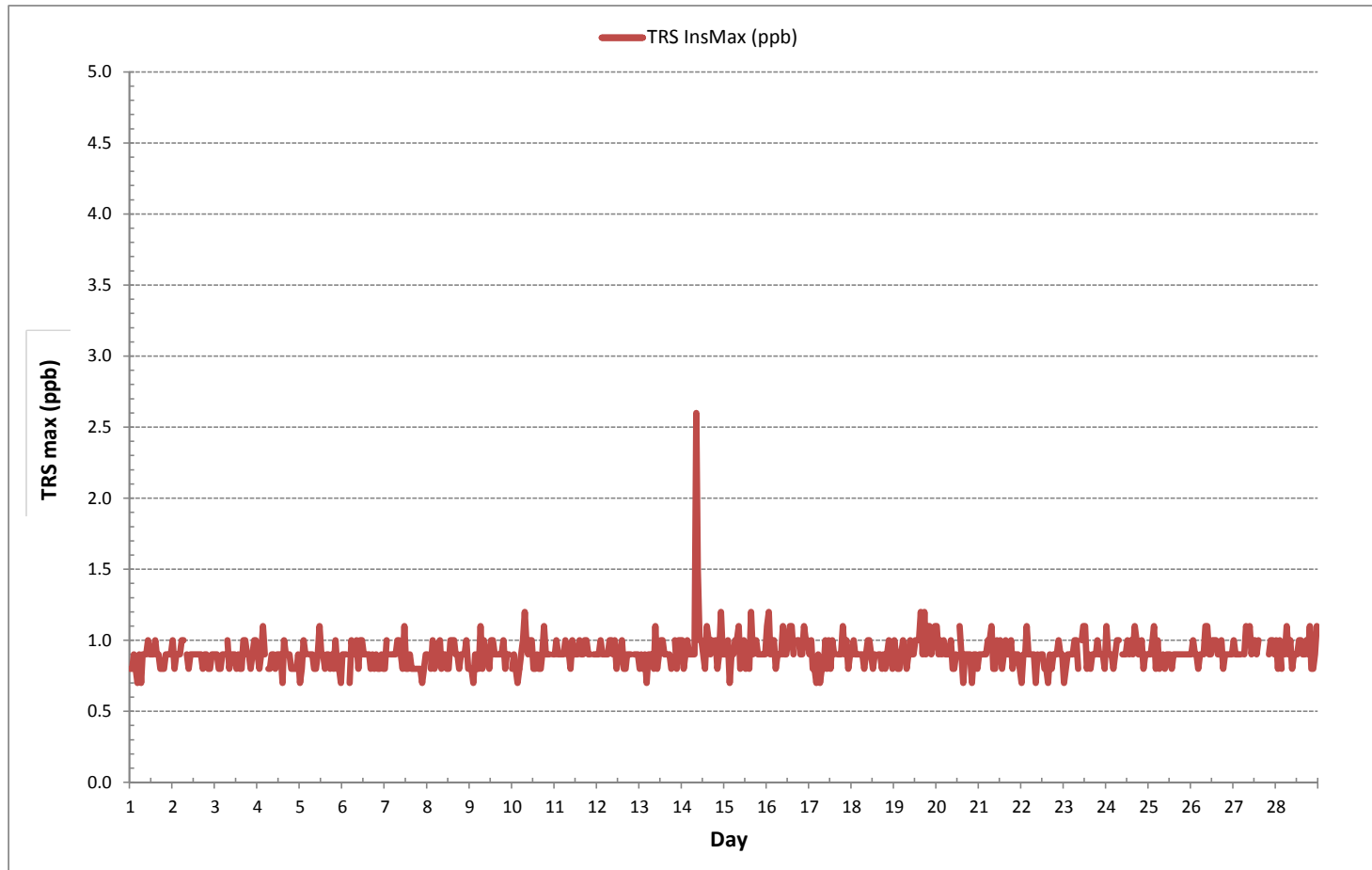
STATUS FLAG CODES

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:	638
MAXIMUM INSTANTANEOUS VALUE:	2.6 ppb @ HOUR(S) 8 ON DAY(S) 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	0.1

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-TRS [ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 23.32% Calm Avg: 0.24 [ppb]

Direction	0.0-0.6	0.6-1.3	1.3-1.9	>1.9	Total
N	5.3	0.0	0.0	0.0	5.3
NE	4.5	0.0	0.0	0.0	4.5
E	7.5	0.0	0.0	0.0	7.5
SE	4.4	0.0	0.0	0.0	4.4
S	0.8	0.0	0.0	0.0	0.8
SW	16.6	0.0	0.0	0.0	16.6
W	26.6	0.0	0.0	0.0	26.6
NW	11.0	0.0	0.0	0.0	11.0
Summary	76.7	0.0	0.0	0.0	76.7

% Icon Classes (ppb)

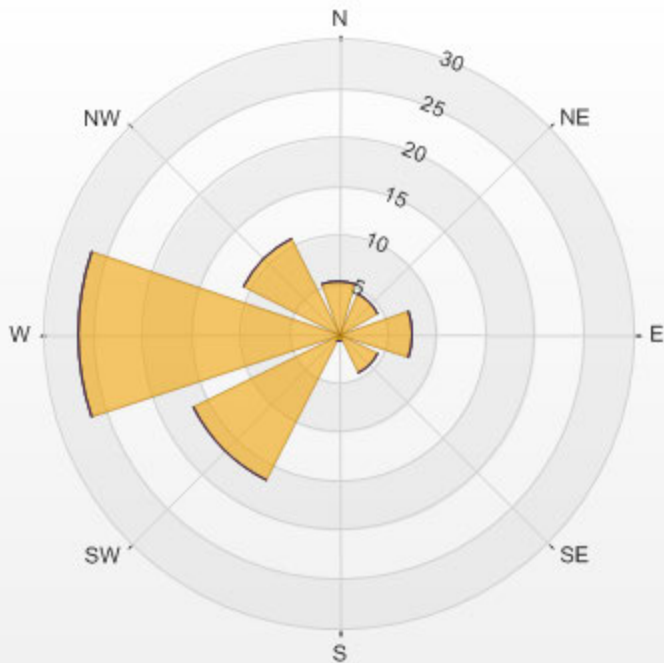
77 0.0-0.6

0 0.6-1.3

0 1.3-1.9

0 >1.9

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2017/02/01 00:00 - 2017/02/28 23:00
Calm: 23.32% Calm Poll Avg: 0.24[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

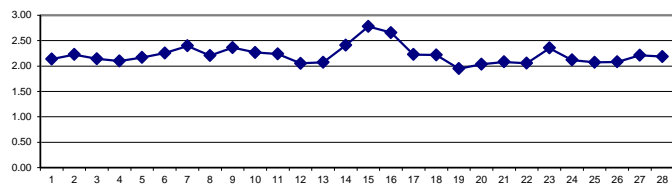
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.28	2.22	2.17	2.17	2.21	2.08	2.04	2.06	S	2.09	2.12	2.12	2.06	2.04	1.99	2.04	2.03	2.06	2.17	2.11	2.19	2.16	2.23	2.45	1.99	2.45	2.13	24	
2	2.42	2.43	2.41	2.31	2.37	2.28	2.22	S	2.37	2.26	2.15	2.12	2.12	2.11	2.03	2.06	2.14	2.12	2.15	2.23	2.30	2.18	2.23	2.20	2.03	2.43	2.23	24	
3	2.22	2.28	2.30	2.32	2.41	2.48	S	2.19	2.23	2.03	2.07	2.06	1.98	2.00	2.02	1.99	2.04	2.08	2.10	2.11	2.15	2.04	2.05	2.08	1.98	2.48	2.14	24	
4	2.04	2.04	2.10	2.10	2.10	S	2.14	2.07	2.17	2.24	2.13	2.07	2.04	2.01	2.01	2.05	2.02	2.02	2.04	2.10	2.12	2.21	2.26	2.22	2.01	2.26	2.10	24	
5	2.26	2.31	2.23	2.26	S	2.22	2.23	2.29	2.30	2.32	2.37	2.27	2.22	2.07	2.00	2.00	2.04	2.04	2.03	2.05	2.06	2.04	2.10	2.16	2.00	2.27	2.17	24	
6	2.15	2.18	2.23	S	2.24	2.37	2.55	2.82	2.81	2.64	2.39	2.18	2.16	2.05	2.04	2.06	2.03	2.03	2.09	2.09	2.08	2.23	2.27	2.17	2.03	2.82	2.25	24	
7	2.28	2.45	S	2.79	2.83	2.86	2.87	2.89	2.92	2.62	2.35	2.27	2.29	2.16	2.11	2.12	2.13	2.12	2.16	2.31	2.15	2.14	2.20	2.11	2.92	2.40	24		
8	2.19	S	2.26	2.29	2.19	2.28	2.34	2.36	2.39	2.24	2.18	2.18	2.18	2.13	2.14	2.16	2.17	2.14	2.18	2.19	2.12	2.11	2.14	2.13	2.11	2.39	2.20	24	
9	S	2.26	2.33	2.32	2.40	2.44	2.45	2.55	2.70	2.44	2.40	2.34	2.32	2.30	2.27	2.31	2.51	2.35	2.33	2.30	2.22	2.20	2.22	S	2.20	2.70	2.36	24	
10	2.16	2.21	2.22	2.25	2.37	2.47	2.43	2.44	2.39	2.29	2.25	2.25	2.28	2.12	2.10	2.12	2.19	2.17	2.25	2.30	2.31	2.29	S	2.29	2.10	2.47	2.27	24	
11	2.29	2.29	2.36	2.54	2.54	2.41	2.38	2.44	2.42	2.35	2.24	2.17	2.09	2.05	2.09	2.09	2.05	2.06	2.13	2.15	2.10	S	2.08	2.14	2.05	2.54	2.24	24	
12	2.10	2.10	2.08	2.09	2.13	2.13	2.07	2.06	2.06	2.10	2.07	2.03	2.01	2.02	1.99	1.98	1.98	2.03	2.05	2.08	S	2.02	2.01	2.02	1.98	2.13	2.05	24	
13	2.01	2.08	2.05	2.06	2.09	2.16	2.16	2.19	2.16	2.16	2.11	2.05	1.98	1.96	1.99	1.94	1.95	1.99	2.05	S	2.10	2.10	2.14	2.19	1.94	2.19	2.07	24	
14	2.22	2.22	2.22	2.30	2.32	2.52	2.59	2.45	2.77	2.92	2.54	2.50	2.37	2.25	2.18	2.24	2.50	2.36	S	2.24	2.29	2.36	2.50	2.56	2.18	2.92	2.41	24	
15	2.53	2.49	2.55	2.62	2.82	3.24	3.33	3.35	3.11	2.70	2.46	2.55	2.65	2.70	2.63	2.61	2.65	S	2.65	2.73	2.85	2.92	2.85	2.99	2.46	3.35	2.78	24	
16	3.08	3.00	3.02	3.07	3.06	3.00	2.91	2.85	2.68	2.62	2.64	2.45	2.37	2.33	2.27	2.32	S	2.39	2.44	2.49	2.50	2.51	2.55	2.60	2.27	3.08	2.66	24	
17	2.83	3.06	2.83	2.34	2.12	2.08	2.11	2.08	2.11	2.10	2.10	2.06	2.03	2.01	2.00	S	2.02	2.06	2.12	2.14	2.21	2.25	2.29	2.29	2.00	3.06	2.23	24	
18	2.34	2.35	2.34	2.40	2.39	2.39	2.48	2.51	2.49	2.43	2.28	2.19	2.07	2.00	S	2.05	2.03	2.06	2.11	2.06	2.04	2.02	2.01	2.00	2.00	2.51	2.22	24	
19	1.98	1.97	1.98	1.96	1.95	1.92	1.91	1.92	1.93	1.94	1.96	1.96	S	1.93	1.95	1.93	1.98	1.98	1.98	1.95	1.94	1.96	1.97	1.91	1.98	1.95	24		
20	2.00	2.00	1.98	1.98	1.99	2.08	2.12	2.11	2.09	2.07	2.03	2.03	S	2.02	2.01	2.02	2.04	2.04	2.06	2.03	2.03	2.07	2.04	2.00	1.98	2.12	2.04	24	
21	2.02	2.02	2.11	2.18	2.11	2.19	2.12	2.08	2.10	2.20	2.14	S	2.08	2.14	2.16	2.06	2.02	2.04	2.05	2.04	2.03	2.00	1.99	1.97	1.97	2.20	2.08	24	
22	1.98	1.99	1.99	1.98	1.98	1.99	1.98	2.02	2.05	2.12	S	1.94	1.96	2.02	2.04	2.03	2.05	2.10	2.09	2.11	2.18	2.21	2.24	2.26	1.94	2.26	2.06	24	
23	2.28	2.34	2.37	2.39	2.40	2.48	2.50	2.58	2.54	C	C	C	C	C	C	2.32	2.25	2.25	2.26	2.25	2.23	2.26	2.27	2.40	2.23	2.58	2.35	24	
24	2.30	2.20	2.19	2.20	2.22	2.18	2.02	2.03	S	2.04	2.06	2.16	2.07	2.05	2.05	2.05	2.05	2.07	2.10	2.13	2.07	2.18	2.14	2.17	2.02	2.30	2.12	24	
25	2.13	2.21	2.22	2.14	2.11	2.14	2.15	S	2.13	2.10	2.11	2.11	2.02	1.94	1.94	1.95	1.97	1.99	2.07	2.09	2.13	2.11	1.94	1.94	1.94	2.22	2.07	24	
26	2.00	2.00	2.06	2.08	1.99	2.01	S	2.06	2.10	2.13	2.11	2.10	2.10	2.11	2.09	2.08	2.07	2.08	2.07	2.08	2.11	2.12	2.13	2.19	1.99	2.19	2.08	24	
27	2.21	2.00	2.02	2.17	2.42	S	2.53	2.55	2.58	2.51	2.29	2.11	2.08	2.10	2.14	2.18	2.17	2.04	2.07	2.11	2.16	2.15	2.12	2.12	2.00	2.58	2.21	24	
28	2.12	2.16	2.21	2.17	S	2.31	2.47	2.37	2.43	2.32	2.56	2.37	2.12	2.06	2.04	2.05	2.06	2.08	2.08	2.07	2.05	2.05	2.04	2.04	2.04	2.56	2.18	24	
HOURLY MAX	3.08	3.06	3.02	3.07	3.06	3.24	3.33	3.35	3.11	2.92	2.64	2.55	2.65	2.70	2.63	2.61	2.65	2.39	2.65	2.73	2.85	2.92	2.85	2.99					
HOURLY AVG	2.24	2.25	2.25	2.28	2.30	2.34	2.35	2.36	2.39	2.30	2.23	2.18	2.14	2.11	2.09	2.10	2.11	2.10	2.14	2.16	2.18	2.18	2.18	2.21					

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

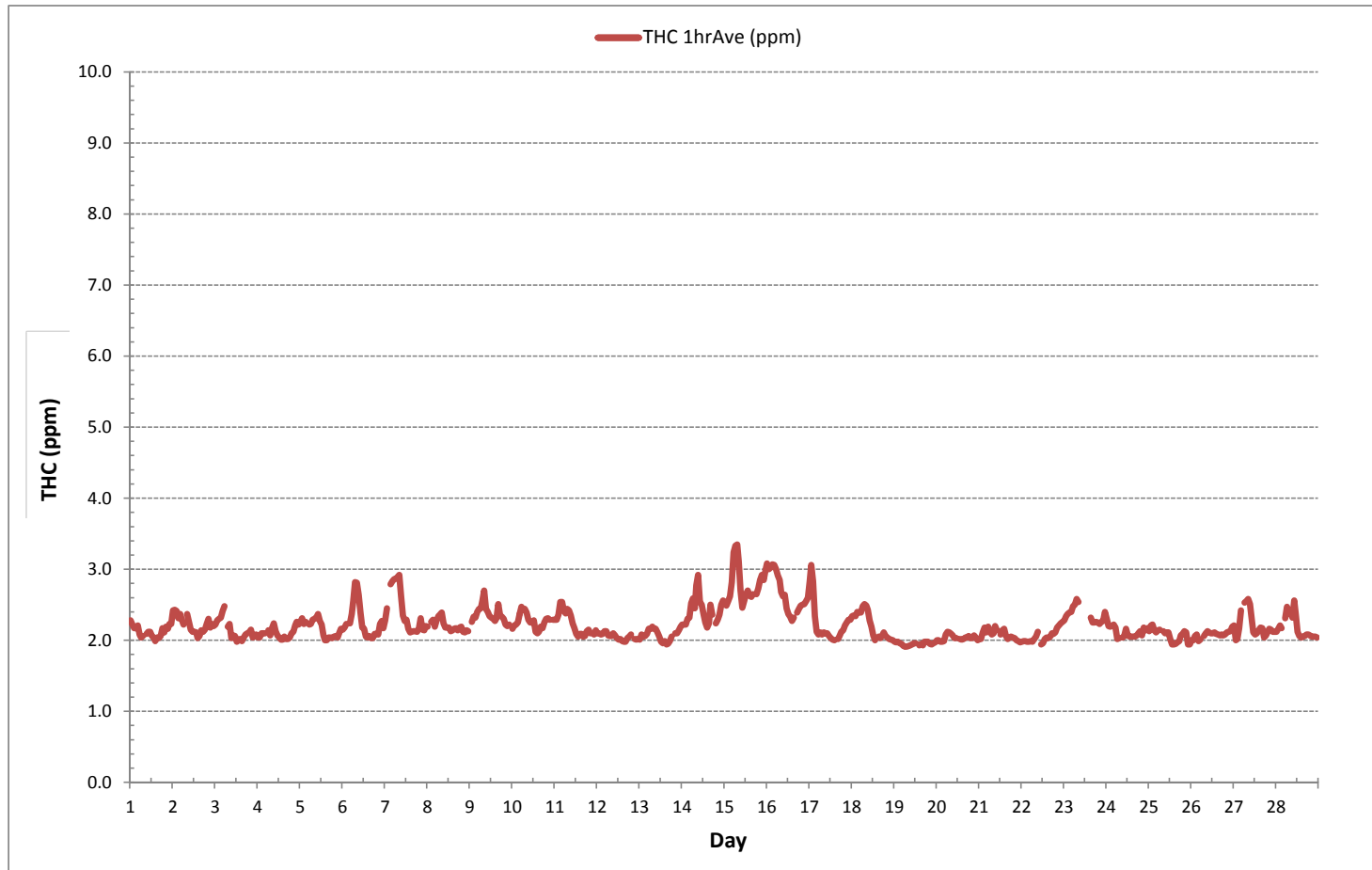
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	638			
MINIMUM 1-HR AVERAGE:	1.91 ppm	@ HOUR(S)	6	ON DAY(S) 19
MAXIMUM 1-HR AVERAGE:	3.35 ppm	@ HOUR(S)	7	ON DAY(S) 15
MAXIMUM 24-HR AVERAGE:	2.78 ppm			ON DAY(S) 15
				VAR-VARIOUS
IZS CALIBRATION TIME:	28 hrs	OPERATIONAL TIME:	672 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.24	MONTHLY AVERAGE:	2.22 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	2.58	2.56	2.48	2.49	2.52	2.42	2.34	2.37	S	2.41	2.43	2.43	2.58	2.37	2.34	2.39	2.37	2.43	2.55	2.46	2.55	2.52	2.68	2.83	2.34	2.83	2.48	24	
2	2.80	2.83	2.78	2.67	2.74	2.73	2.61	S	3.23	2.68	2.52	2.58	2.51	2.40	2.34	2.36	2.52	2.61	2.43	2.46	2.77	2.40	2.43	2.40	2.34	3.23	2.60	24	
3	2.42	2.49	2.49	2.51	2.61	2.61	S	2.54	2.81	2.41	2.52	2.23	2.13	2.17	2.18	2.17	2.21	2.43	2.73	2.36	2.37	2.21	2.22	2.25	2.13	2.81	2.39	24	
4	2.21	2.24	2.29	2.30	2.28	S	2.34	2.27	2.37	2.45	2.34	2.31	2.21	2.18	2.23	2.24	2.23	2.33	2.25	2.30	2.31	2.45	2.48	2.42	2.18	2.48	2.31	24	
5	2.46	2.52	2.46	2.45	S	2.40	2.42	2.46	2.48	2.52	2.73	2.48	2.43	2.34	2.21	2.21	2.24	2.27	2.24	2.24	2.27	2.24	2.34	2.37	2.21	2.73	2.38	24	
6	2.37	2.40	2.46	S	2.51	2.61	2.86	3.10	3.08	2.97	2.75	2.42	2.37	2.33	2.24	2.30	2.37	2.24	2.29	2.30	2.37	2.45	2.48	2.43	2.24	3.10	2.51	24	
7	2.53	2.77	S	2.98	3.04	3.07	3.10	3.11	3.92	3.04	2.61	2.48	2.48	2.39	2.36	2.49	2.34	2.43	2.30	2.31	2.85	2.34	2.40	2.33	2.30	3.92	2.68	24	
8	2.31	S	2.40	2.43	2.33	2.42	2.46	2.49	3.23	2.46	2.59	2.30	2.34	2.23	2.25	2.45	2.89	2.24	2.27	2.30	2.21	2.18	2.24	2.24	2.18	3.23	2.40	24	
9	S	2.42	2.43	2.43	2.46	2.51	2.48	2.74	2.91	2.50	2.46	2.37	2.92	2.34	2.43	2.54	2.81	2.43	2.24	2.25	2.13	2.09	2.09	S	2.09	2.92	2.45	24	
10	2.06	2.13	2.12	2.18	2.36	2.37	2.36	3.20	2.34	2.27	2.27	2.37	2.27	2.06	2.03	2.18	2.17	2.15	2.30	2.27	2.31	2.28	S	2.30	2.06	3.20	2.28	24	
11	2.31	2.31	2.49	2.64	2.61	2.49	2.46	2.55	2.58	2.48	2.37	2.40	2.27	2.27	2.24	2.27	2.21	2.24	2.33	2.36	2.30	S	2.27	2.36	2.21	2.64	2.38	24	
12	2.37	2.31	2.27	2.30	2.34	2.37	2.27	2.27	2.40	2.28	2.27	2.24	2.18	2.18	2.15	2.18	2.18	2.24	2.24	2.24	S	2.24	2.20	2.21	2.15	2.40	2.26	24	
13	2.23	2.28	2.27	2.29	2.34	2.40	2.48	2.43	2.40	2.49	2.40	2.46	2.43	2.19	2.25	2.31	2.45	2.27	2.33	S	2.36	2.36	2.39	2.45	2.19	2.49	2.36	24	
14	2.43	2.43	2.51	2.56	2.58	5.27	2.83	2.58	4.32	3.60	2.83	2.71	2.64	2.34	2.27	2.49	2.55	2.43	S	2.24	2.31	2.42	2.55	2.72	2.24	5.27	2.77	24	
15	2.94	2.56	2.76	2.65	3.04	4.70	3.48	3.48	3.26	2.92	2.59	2.49	2.64	2.91	2.58	2.64	3.07	S	2.58	2.70	2.83	2.93	2.96	2.98	2.49	4.70	2.94	24	
16	3.13	2.96	2.98	2.98	3.08	4.06	2.84	2.81	2.74	2.51	2.55	2.31	2.48	2.21	2.12	2.19	S	2.31	2.37	2.53	2.48	2.40	2.70	2.49	2.12	4.06	2.66	24	
17	2.76	3.04	2.86	2.39	2.03	1.97	1.97	1.97	2.09	2.03	2.37	1.97	2.06	2.03	1.97	S	1.93	3.17	2.05	2.09	2.18	2.21	2.27	2.27	1.93	3.17	2.25	24	
18	2.33	2.36	2.34	2.43	2.46	2.43	2.52	2.54	2.56	2.55	2.33	2.26	2.15	2.03	S	2.12	2.08	2.09	2.15	2.15	2.09	2.06	2.08	2.06	2.03	2.56	2.27	24	
19	2.03	2.03	2.03	2.01	2.00	1.97	1.97	1.97	1.97	2.00	2.00	2.02	2.03	S	1.97	5.15	2.00	2.05	2.05	2.09	2.09	2.02	2.03	2.05	1.97	5.15	2.15	24	
20	2.06	2.08	2.06	2.06	2.08	2.23	2.24	2.21	2.18	2.18	2.17	2.24	S	2.09	2.12	2.12	2.17	2.18	2.18	2.15	2.18	2.21	2.18	2.14	2.06	2.24	2.15	24	
21	2.15	2.15	2.30	2.36	2.29	2.36	2.31	2.24	2.27	2.43	2.36	S	2.31	2.64	2.73	2.24	2.21	2.22	2.24	2.24	2.21	2.20	2.22	2.15	2.15	2.73	2.30	24	
22	2.21	2.21	2.21	2.21	2.20	2.22	2.20	2.27	2.37	2.62	S	2.15	2.37	2.59	2.33	2.37	2.36	2.43	2.31	2.34	2.39	2.42	2.42	2.43	2.15	2.62	2.33	24	
23	2.45	2.53	2.51	2.64	2.61	4.15	2.84	2.80	2.76	C	C	C	C	C	C	C	2.45	2.84	2.52	2.45	2.46	2.74	2.49	2.59	2.80	2.45	4.15	2.70	24
24	2.61	2.48	2.49	2.54	2.58	2.57	2.39	2.64	S	2.43	2.48	2.77	2.42	2.42	2.77	2.40	2.40	2.41	2.43	2.64	2.41	2.71	2.49	2.51	2.39	2.77	2.52	24	
25	2.46	2.55	2.55	2.49	2.43	2.46	2.45	S	2.49	2.40	2.40	2.40	2.39	2.27	2.20	2.24	2.71	2.45	2.36	2.33	2.39	2.39	2.18	2.20	2.18	2.71	2.40	24	
26	2.25	2.24	2.29	2.31	2.21	2.21	S	2.27	2.31	2.34	2.32	2.31	2.31	2.31	2.30	2.29	2.27	2.29	2.30	2.31	2.33	2.34	2.39	2.39	2.21	2.39	2.30	24	
27	2.43	2.34	2.41	2.62	2.83	S	3.07	2.77	2.98	2.74	2.80	2.54	2.46	2.36	2.36	P	2.45	2.27	2.29	2.46	2.57	2.62	2.34	2.34	2.27	3.07	2.55	23	
28	2.34	2.39	2.45	2.40	S	2.64	4.46	2.64	3.02	2.68	3.36	2.77	2.43	2.32	2.32	2.31	2.34	2.36	2.36	2.37	2.34	2.34	2.39	2.34	2.31	4.46	2.58	24	
HOURLY MAX	3.13	3.04	2.98	2.98	3.08	5.27	4.46	3.48	4.32	3.60	3.36	2.77	2.92	2.91	2.77	5.15	3.07	3.17	2.73	2.70	2.85	2.93	2.96	2.98					
HOURLY AVG	2.42	2.43	2.43	2.46	2.48	2.76	2.61	2.57	2.73	2.53	2.49	2.39	2.38	2.31	2.28	2.43	2.38	2.35	2.32	2.33	2.38	2.35	2.37	2.39					

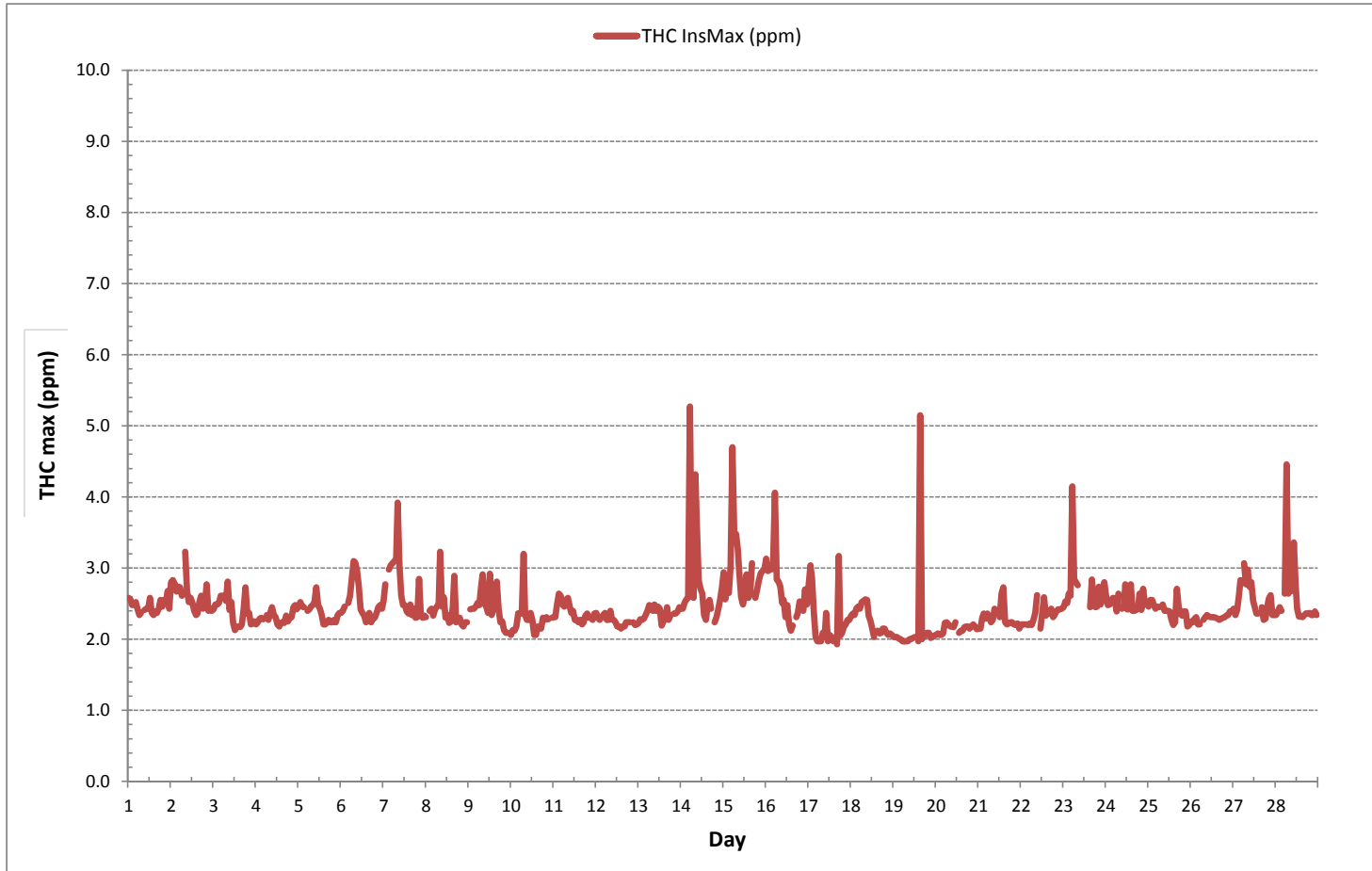
STATUS FLAG CODES

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:	637
MAXIMUM INSTANTANEOUS VALUE:	5.27 ppm @ HOUR(S) 5 ON DAY(S) 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	671 hrs
STANDARD DEVIATION:	0.35

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



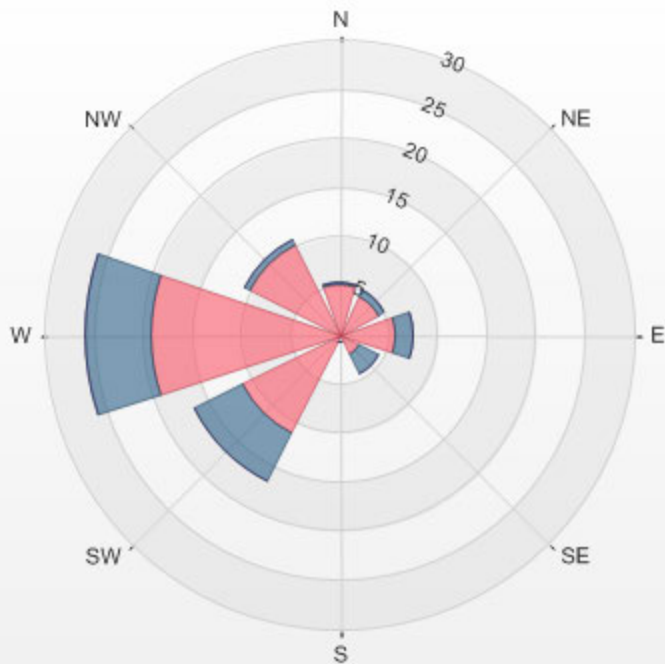
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-THC [ppm]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 23.35% Calm Avg: 2.39 [ppm]

Direction	0.0-1.1	1.1-2.2	2.2-3.4	>3.4	Total
N	0.0	5.2	0.2	0.0	5.3
NE	0.0	4.4	0.8	0.0	5.2
E	0.0	5.6	1.9	0.0	7.5
SE	0.0	2.2	2.2	0.0	4.4
S	0.0	0.2	0.6	0.0	0.8
SW	0.0	11.1	5.5	0.0	16.6
W	0.0	19.3	6.6	0.0	25.9
NW	0.0	10.3	0.6	0.0	11.0
Summary	0.0	58.3	18.3	0.0	76.6

% Icon	Classes (ppm)	0	0.0-1.1	58	1.1-2.2	18	2.2-3.4	0	>3.4
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 23.35%
 Calm Poll Avg: 2.39[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/02 Type: Span



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

OXIDES OF NITROGEN



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

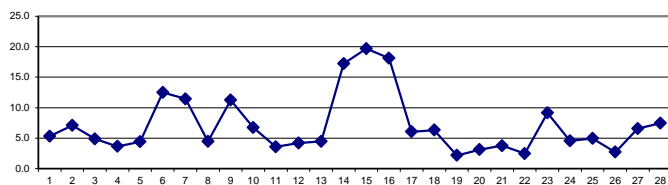
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	8.7	7.2	6.1	5.8	6.6	2.2	1.0	1.4	S	1.9	2.6	2.6	1.8	1.4	2.1	2.4	2.4	3.1	12.0	11.5	9.1	9.5	9.2	11.0	1.0	12.0	5.3	24	
2	11.0	10.0	10.7	9.7	8.5	7.0	7.3	S	8.6	9.5	7.0	12.5	6.6	4.1	4.2	4.3	3.8	4.6	5.2	6.2	6.7	6.2	5.0	4.9	3.8	12.5	7.1	24	
3	5.4	5.6	7.0	7.9	9.1	10.4	S	5.1	3.1	5.7	7.4	2.6	1.9	1.9	1.8	2.7	2.9	3.5	5.9	8.8	4.5	2.7	3.1	3.0	1.8	10.4	4.9	24	
4	2.6	2.5	2.9	4.0	6.0	S	7.5	4.0	5.0	6.7	4.3	2.6	0.7	1.1	1.3	1.2	1.0	2.8	2.8	3.8	5.7	5.0	5.3	5.2	0.7	7.5	3.7	24	
5	5.5	4.9	3.6	3.2	S	3.3	4.2	6.2	6.0	8.4	10.0	11.2	7.8	2.3	1.4	1.2	1.9	2.0	2.4	3.2	2.5	2.2	3.1	4.9	1.2	11.2	4.4	24	
6	7.4	9.2	9.4	S	10.8	16.4	25.3	31.6	36.1	27.3	22.2	12.2	12.3	5.7	5.5	4.9	3.6	3.7	7.4	5.6	7.4	8.8	8.5	6.1	3.6	36.1	12.5	24	
7	8.9	11.6	S	27.1	26.3	25.8	24.0	25.6	23.8	17.8	12.4	10.1	7.4	3.1	3.6	2.9	3.0	3.8	4.4	5.8	4.0	3.7	3.7	4.4	2.9	27.1	11.4	24	
8	4.4	S	5.7	6.9	4.8	6.0	6.7	7.9	5.9	5.1	4.1	3.6	3.4	2.5	2.6	3.0	4.3	5.2	5.8	4.4	2.3	2.3	2.8	2.9	2.3	7.9	4.5	24	
9	S	3.5	4.1	10.1	11.4	14.4	18.0	23.9	38.5	17.4	9.6	8.3	8.5	9.1	8.1	8.2	9.3	9.2	8.5	8.8	6.7	5.9	5.7	S	3.5	38.5	11.2	24	
10	6.4	5.9	4.9	8.2	15.0	10.1	10.1	18.0	23.4	10.3	5.3	4.7	4.0	2.9	2.8	3.0	2.8	2.4	2.8	2.7	2.9	2.9	S	3.0	2.4	23.4	6.7	24	
11	2.9	2.9	3.6	4.3	4.8	5.0	5.3	5.8	6.1	7.1	5.6	4.9	3.1	1.5	1.3	1.6	2.1	1.9	2.5	2.6	2.3	S	2.7	2.4	1.3	7.1	3.6	24	
12	2.5	3.4	4.0	5.1	5.2	4.5	3.1	2.7	3.8	4.7	5.1	5.2	4.3	3.6	3.7	4.0	3.9	3.7	4.0	5.7	S	4.8	5.0	4.4	2.5	5.7	4.2	24	
13	3.4	3.0	3.1	4.4	4.1	3.3	3.7	5.9	14.0	7.3	4.9	5.2	3.5	4.5	3.3	3.1	2.7	2.7	4.0	S	4.7	3.8	3.5	4.3	2.7	14.0	4.5	24	
14	4.8	4.8	4.7	5.8	5.6	18.2	18.5	8.6	144.5	77.7	12.5	8.6	7.9	6.9	6.4	7.2	9.9	7.4	S	5.5	4.6	5.0	8.8	12.5	4.6	144.5	17.2	24	
15	10.9	7.0	9.6	15.9	29.9	36.3	38.0	51.3	44.3	30.4	19.2	17.5	9.1	7.0	10.6	8.8	9.0	S	10.6	10.8	11.1	19.6	17.4	28.6	7.0	51.3	19.7	24	
16	39.1	39.9	37.0	37.9	27.7	31.0	30.9	21.0	16.6	8.3	7.2	5.4	6.2	5.4	4.6	7.9	S	13.4	19.0	17.6	11.5	9.5	9.2	10.7	4.6	39.9	18.1	24	
17	13.6	19.9	16.4	8.8	4.6	4.8	5.4	4.9	5.6	5.7	5.1	4.6	3.5	3.2	2.4	S	1.6	2.4	2.8	3.1	4.1	5.4	6.1	5.0	1.6	19.9	6.0	24	
18	4.5	5.6	6.3	6.6	6.0	9.1	20.0	21.4	14.5	11.8	4.2	3.4	2.1	1.5	S	5.0	2.6	4.2	5.2	3.8	2.0	1.8	1.9	1.7	1.5	21.4	6.3	24	
19	1.7	1.9	1.4	1.6	1.4	1.4	1.5	1.3	1.6	1.8	1.9	2.4	2.6	S	2.6	2.3	2.5	2.7	2.9	3.5	3.1	2.3	1.8	4.0	1.3	4.0	2.2	24	
20	4.2	3.8	1.7	1.7	3.6	4.5	5.5	5.4	5.7	4.7	3.5	3.1	S	1.4	1.2	1.3	1.9	2.2	3.1	2.7	2.2	3.4	3.0	1.6	1.2	5.7	3.1	24	
21	2.1	3.0	5.3	5.9	3.7	3.2	2.3	2.1	5.4	5.5	6.2	S	4.4	4.9	10.1	3.6	2.2	2.1	2.1	1.9	1.9	3.2	2.8	2.7	1.9	10.1	3.8	24	
22	2.5	2.5	2.5	2.1	1.4	1.7	1.3	1.5	2.4	2.2	S	1.2	1.0	1.8	1.8	0.9	1.7	2.4	2.6	3.5	4.2	5.3	4.9	5.0	0.9	5.3	2.5	24	
23	6.3	5.7	8.4	10.6	11.4	10.9	14.4	25.7	18.9	S	9.2	6.3	6.6	3.1	2.0	3.5	2.3	3.9	5.5	8.7	8.6	14.4	11.5	12.5	2.0	25.7	9.1	24	
24	14.7	9.1	6.4	5.3	7.4	12.7	2.8	3.3	S	1.7	2.2	2.3	4.0	2.7	1.8	2.4	2.8	2.9	3.2	3.6	1.9	3.7	4.0	3.9	1.7	14.7	4.6	24	
25	4.1	3.5	3.4	3.7	4.4	3.1	4.0	S	6.0	3.9	4.6	4.6	3.6	3.2	4.4	4.0	4.1	6.0	8.6	7.3	12.4	10.4	2.2	2.1	2.1	12.4	4.9	24	
26	4.1	4.3	4.7	4.1	2.0	1.3	S	2.6	2.6	2.5	2.7	2.1	2.9	2.4	1.7	1.1	1.4	1.4	1.8	3.4	2.9	4.4	2.8	2.8	1.1	4.7	2.7	24	
27	2.8	2.8	2.8	4.3	7.8	S	8.3	8.6	11.0	10.6	11.2	7.1	5.6	7.3	8.6	C	C	C	C	C	C	C	C	3.2	2.9	2.8	11.2	6.6	24
28	2.7	4.1	3.8	3.7	S	8.9	15.0	20.1	23.3	11.5	10.5	9.8	6.2	3.8	4.0	4.3	6.0	5.0	8.2	5.5	4.0	3.7	3.5	3.9	2.7	23.3	7.5	24	
HOURLY MAX	39.1	39.9	37.0	37.9	29.9	36.3	38.0	51.3	144.5	77.7	22.2	17.5	12.3	9.1	10.6	8.8	9.9	13.4	19.0	17.6	12.4	19.6	17.4	28.6					
HOURLY AVG	6.9	6.9	6.6	8.0	8.8	9.8	10.9	12.2	18.3	11.4	7.4	6.1	4.9	3.6	3.8	3.6	3.5	4.0	5.5	5.8	5.1	5.8	5.2	5.8					

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

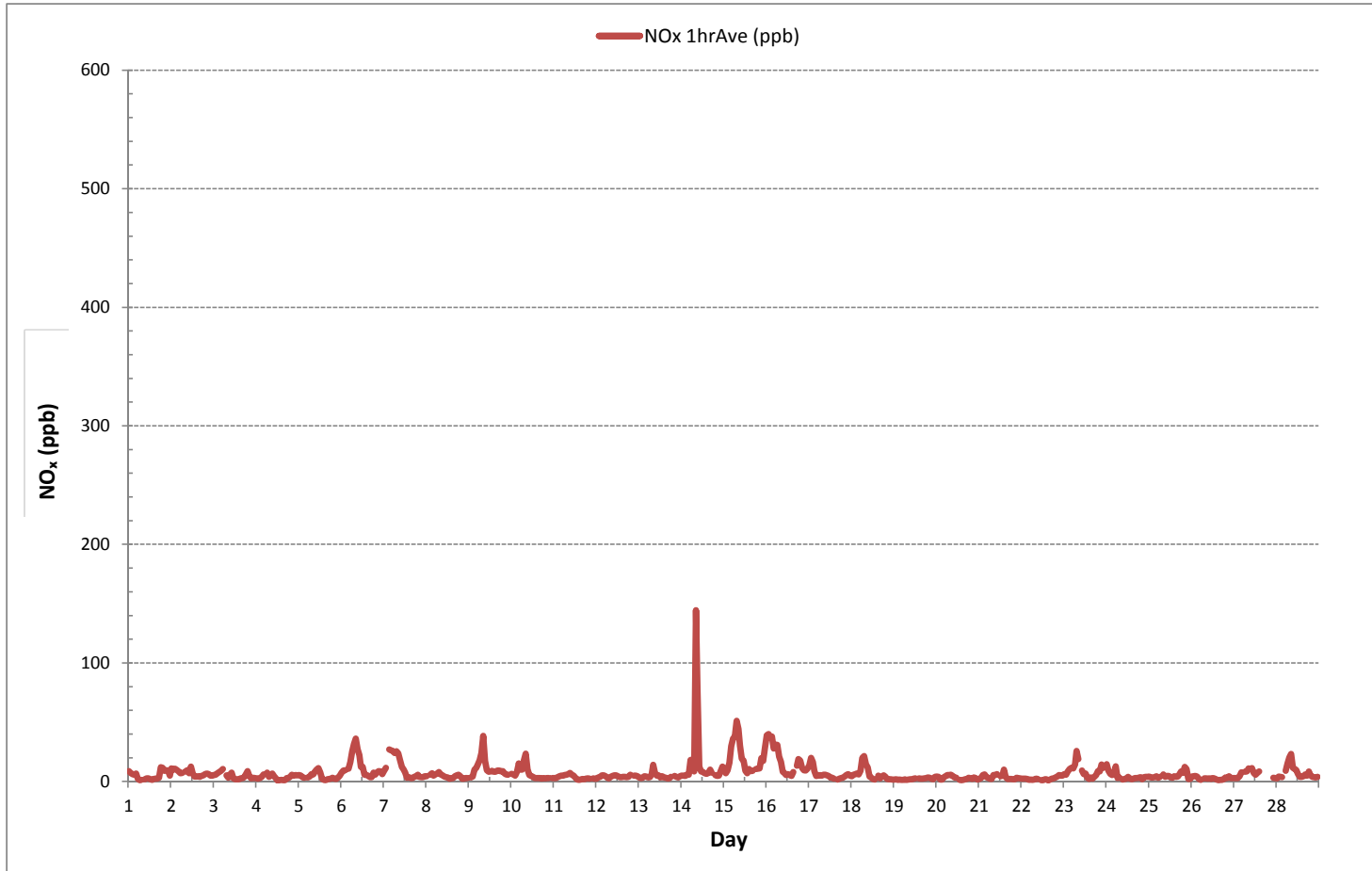
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	636		
MINIMUM 1-HR AVERAGE:	0.7 ppb	@ HOUR(S)	12 ON DAY(S) 4
MAXIMUM 1-HR AVERAGE:	144.5 ppb	@ HOUR(S)	8 ON DAY(S) 14
MAXIMUM 24-HR AVERAGE:	19.7 ppb		ON DAY(S) 15
			VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	9.2	MONTHLY AVERAGE:	7.1 ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	10.8	11.1	10.0	8.3	9.9	3.9	1.3	2.1	S	3.2	3.4	3.0	4.1	2.1	3.1	3.1	3.2	8.2	16.1	16.5	14.1	16.5	12.6	13.4	1.3	16.5	7.8	24	
2	13.7	11.6	12.4	10.8	9.4	9.1	9.6	S	11.8	11.7	7.8	57.4	27.8	5.5	7.3	6.7	5.5	8.7	7.1	8.2	7.5	7.0	6.3	6.6	5.5	57.4	11.7	24	
3	7.1	7.5	10.2	9.7	11.3	13.0	S	9.7	4.3	82.2	49.8	3.2	3.0	5.8	8.9	23.9	4.5	4.5	10.9	30.2	6.9	4.0	4.2	4.1	3.0	82.2	13.9	24	
4	4.0	4.2	3.7	8.1	9.5	S	10.8	6.9	7.1	8.6	5.5	7.5	1.3	2.4	2.6	2.6	3.0	5.5	5.0	6.6	9.1	6.7	7.0	6.6	1.3	10.8	5.8	24	
5	8.0	7.3	4.9	5.2	S	5.4	8.6	9.2	8.2	15.0	14.4	13.7	10.7	5.8	2.3	3.0	3.9	3.5	3.5	5.8	5.9	6.7	8.6	10.0	2.3	15.0	7.4	24	
6	11.0	14.5	10.8	S	13.0	26.9	30.2	38.2	44.2	31.2	26.4	15.8	15.2	12.3	6.8	6.6	6.4	9.0	10.4	7.0	12.9	10.0	9.6	8.6	6.4	44.2	16.4	24	
7	12.1	15.3	S	29.4	32.0	28.1	26.8	37.6	52.2	21.7	15.6	11.9	9.2	4.8	7.5	4.4	6.1	8.3	6.4	9.5	6.3	6.7	5.9	6.3	4.4	52.2	15.8	24	
8	6.6	S	7.3	9.0	5.9	8.4	10.2	11.0	12.2	6.6	5.8	5.9	5.0	4.9	6.1	5.2	16.7	6.8	6.8	6.2	3.1	3.4	3.9	5.3	3.1	16.7	7.1	24	
9	S	9.8	9.6	25.1	19.0	26.0	89.6	38.9	57.0	29.4	13.5	14.3	12.4	11.7	10.4	13.0	14.6	19.2	12.7	13.2	10.4	10.3	10.1	S	9.6	89.6	21.4	24	
10	12.6	10.8	9.1	18.1	21.3	15.1	15.9	38.3	43.5	28.6	9.7	11.1	6.1	6.8	4.4	8.6	7.2	3.3	4.0	4.5	4.0	6.4	S	4.6	3.3	43.5	12.8	24	
11	5.8	4.6	7.5	5.4	5.9	7.1	8.4	7.3	8.3	9.1	7.5	6.8	4.2	3.0	2.2	2.7	3.4	3.0	4.9	3.9	3.9	S	5.0	4.1	2.2	9.1	5.4	24	
12	3.9	4.5	5.0	6.4	6.9	5.9	4.5	7.6	8.4	6.0	6.0	6.4	5.4	4.6	4.5	4.4	5.0	5.4	6.2	7.6	S	6.9	6.3	7.3	3.9	8.4	5.9	24	
13	4.8	4.1	4.6	5.9	5.7	4.0	5.4	11.7	18.5	13.7	6.2	7.8	4.6	24.1	3.9	4.5	11.9	5.9	5.7	S	6.2	6.1	4.6	5.5	3.9	24.1	7.6	24	
14	6.7	8.7	10.7	12.9	11.0	45.4	36.5	13.5	510.6	134.7	46.9	12.3	22.2	7.8	9.2	12.2	12.0	9.9	S	7.6	5.8	7.5	15.9	22.1	5.8	510.6	42.7	24	
15	24.0	13.9	16.6	22.5	45.1	49.4	58.8	66.3	83.5	39.2	47.8	26.6	15.3	16.8	20.5	18.5	28.6	S	15.0	13.2	19.0	32.2	39.4	45.6	13.2	83.5	32.9	24	
16	53.7	59.1	46.5	43.3	41.0	58.7	47.8	32.7	30.6	13.2	14.9	7.9	17.8	20.4	8.2	18.0	S	28.1	49.7	47.7	18.0	11.2	13.8	16.1	7.9	59.1	30.4	24	
17	18.6	23.2	20.4	11.7	6.3	6.5	7.2	6.3	7.2	7.3	7.5	6.7	4.5	4.8	3.2	S	2.2	4.5	4.0	5.8	7.0	7.9	8.1	6.4	2.2	23.2	8.1	24	
18	7.1	7.1	7.8	9.2	9.9	15.4	29.4	27.6	19.7	25.8	5.3	5.1	6.6	6.2	S	14.2	5.7	10.4	8.3	9.5	3.5	3.4	3.9	2.7	2.7	29.4	10.6	24	
19	2.7	2.6	2.7	2.4	2.3	2.3	2.6	2.2	2.3	3.2	3.1	4.6	8.0	S	7.2	4.1	5.7	4.5	4.2	5.4	5.7	6.2	4.0	11.7	2.2	11.7	4.3	24	
20	15.4	5.8	3.3	4.4	5.2	6.6	6.8	6.8	6.9	6.7	4.6	5.2	S	2.6	2.2	2.9	3.0	7.6	4.5	4.6	4.0	6.5	5.0	2.3	2.2	15.4	5.3	24	
21	3.1	5.5	7.8	8.6	5.1	4.0	3.7	3.5	22.0	9.4	9.4	S	10.8	6.4	24.7	16.9	3.1	2.6	2.7	2.8	2.7	3.7	3.7	3.4	2.6	24.7	7.2	24	
22	3.8	3.2	3.3	3.3	2.8	7.2	2.2	3.7	4.1	3.5	S	3.5	1.7	3.1	3.0	1.1	3.2	5.5	4.4	7.1	7.8	8.6	18.4	13.5	1.1	18.4	5.1	24	
23	11.0	7.8	11.0	22.9	23.9	31.1	29.3	43.8	24.4	S	11.4	9.1	8.9	6.0	3.6	9.1	7.8	13.2	16.8	15.3	14.6	49.2	13.9	22.1	3.6	49.2	17.7	24	
24	21.2	13.3	8.7	7.5	13.5	62.6	5.8	5.8	S	3.1	8.1	4.1	5.5	4.2	3.5	5.0	3.6	3.9	4.4	5.4	3.1	4.8	5.5	5.1	3.1	62.6	9.0	24	
25	5.7	5.0	6.5	7.6	7.5	4.7	6.2	S	13.4	6.4	7.9	5.7	7.1	5.7	5.3	8.9	5.8	16.3	15.4	8.7	17.0	21.3	3.0	3.9	3.0	21.3	8.5	24	
26	6.6	6.2	6.8	5.9	3.5	2.0	S	4.3	3.5	2.8	7.1	3.1	3.6	3.7	2.4	1.9	2.7	3.2	5.5	5.8	4.5	14.1	4.1	4.6	1.9	14.1	4.7	24	
27	4.1	4.5	4.4	6.3	10.5	S	10.2	13.9	17.1	14.9	16.1	10.8	9.4	11.2	11.4	C	C	C	C	C	C	C	C	4.1	4.0	4.0	17.1	9.6	24
28	3.6	7.2	7.6	9.2	S	13.9	21.1	29.0	46.9	19.3	18.5	15.7	10.4	5.1	7.3	8.3	11.6	9.0	13.9	10.0	5.4	6.9	6.8	8.3	3.6	46.9	12.8	24	
HOURLY MAX	53.7	59.1	46.5	43.3	45.1	62.6	89.6	66.3	510.6	134.7	49.8	57.4	27.8	24.1	24.7	23.9	28.6	28.1	49.7	47.7	19.0	49.2	39.4	45.6					
HOURLY AVG	10.7	10.3	9.6	11.8	13.0	17.8	18.8	18.4	41.1	20.6	14.1	10.6	8.9	7.3	6.7	8.1	7.2	8.1	9.6	10.3	8.0	10.5	8.7	9.4					

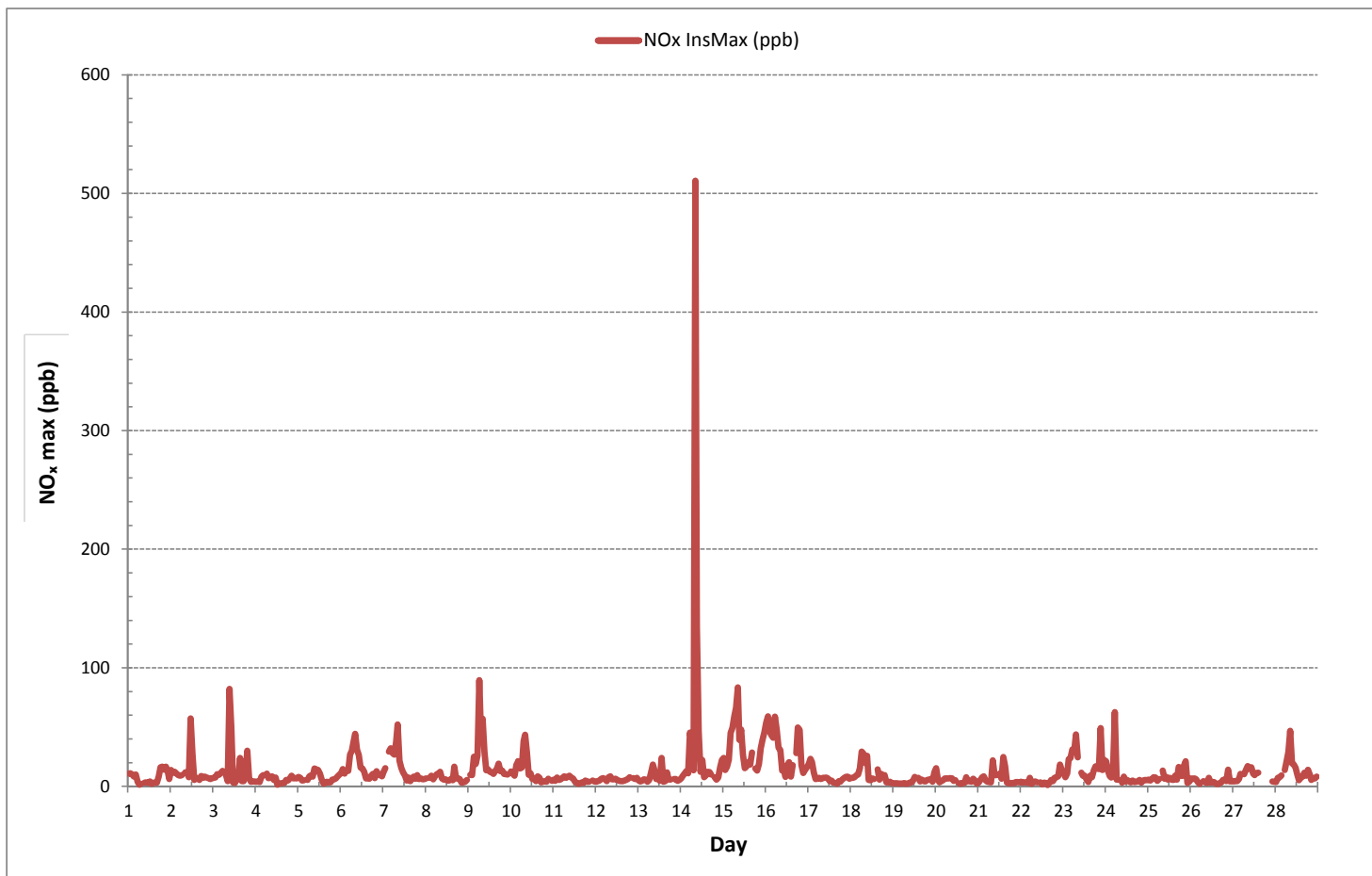
STATUS FLAG CODES

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:	636
MAXIMUM INSTANTANEOUS VALUE:	510.6 ppb @ HOUR(S) 8 ON DAY(S) 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	23.6


OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



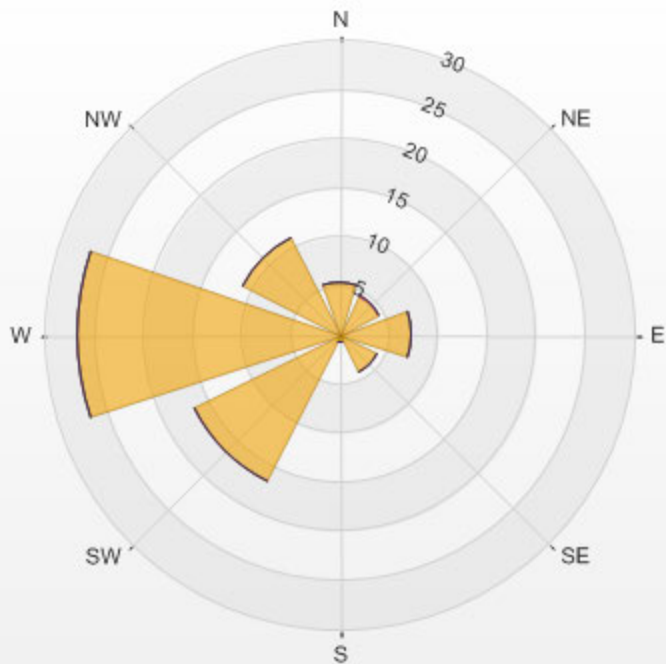
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NOX [ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 23.27% Calm Avg: 13.60 [ppb]

Direction	0.0-48.2	48.2-96.4	96.4-144.6	>144.6	Total
N	5.4	0.0	0.0	0.0	5.4
NE	4.4	0.2	0.0	0.0	4.6
E	7.4	0.0	0.0	0.0	7.4
SE	4.3	0.0	0.0	0.0	4.3
S	0.8	0.0	0.0	0.0	0.8
SW	16.7	0.0	0.0	0.0	16.7
W	26.7	0.0	0.0	0.0	26.7
NW	11.0	0.0	0.0	0.0	11.0
Summary	76.6	0.2	0.0	0.0	76.8

% Icon	Classes (ppb)	77		0.0-48.2	0		48.2-96.4	0		96.4-144.6	0		>144.6
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 23.27% Calm Poll Avg: 13.60[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES



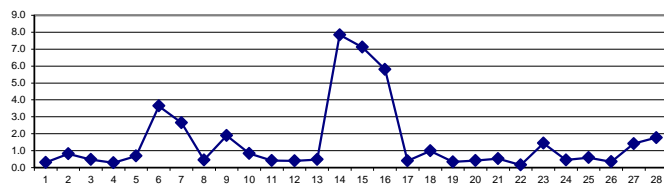
NITRIC OXIDE Hourly Averages (NO ppb)

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	0.5	0.5	0.5	0.5	0.4	0.1	0.0	0.0	S	0.2	0.6	0.7	0.5	0.3	0.4	0.4	0.1	0.1	0.1	0.1	0.0	0.4	0.2	0.4	0.0	0.7	0.3	24	
2	0.5	0.2	0.1	0.1	0.1	0.1	0.3	S	0.6	1.8	1.9	6.8	2.4	1.2	1.0	0.7	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.1	0.0	6.8	0.8	24	
3	0.2	0.2	0.2	0.1	0.2	0.1	S	0.0	0.1	4.0	2.8	0.3	0.2	0.3	0.3	0.6	0.2	0.0	0.0	0.7	0.1	0.1	0.1	0.1	0.0	4.0	0.5	24	
4	0.1	0.0	0.0	0.3	0.2	S	0.3	0.2	0.4	1.0	0.9	0.6	0.1	0.2	0.2	0.1	0.1	0.4	0.3	0.3	0.4	0.1	0.2	0.1	0.0	1.0	0.3	24	
5	0.2	0.2	0.0	0.1	S	0.0	0.1	0.0	0.5	2.4	3.3	4.2	2.3	0.6	0.3	0.3	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.0	4.2	0.7	24	
6	0.1	0.2	0.0	S	0.1	1.1	5.7	11.8	17.8	14.1	11.4	6.1	6.3	2.4	2.2	1.9	0.9	0.2	0.4	0.1	0.5	0.2	0.2	0.0	0.0	17.8	3.6	24	
7	0.5	0.1	S	5.1	4.7	5.0	4.4	6.6	8.6	7.1	5.6	4.6	3.1	1.0	1.1	0.7	0.5	0.5	0.3	0.4	0.2	0.3	0.3	0.4	0.1	8.6	2.7	24	
8	0.3	S	0.3	0.4	0.3	0.5	0.5	0.3	0.7	1.0	1.0	0.9	1.0	0.7	0.7	0.7	0.8	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	24	
9	S	0.1	0.1	0.4	0.3	0.9	3.3	2.8	13.3	3.5	1.9	2.3	2.4	2.2	1.6	1.5	1.4	1.2	0.8	0.6	0.3	0.3	0.4	S	0.1	13.3	1.9	24	
10	0.5	0.1	0.2	0.3	0.6	0.1	0.2	1.8	6.1	2.7	1.7	1.6	0.9	0.6	0.5	0.4	0.3	0.1	0.1	0.0	0.0	0.1	S	0.1	0.0	6.1	0.8	24	
11	0.0	0.1	0.3	0.0	0.1	0.2	0.4	0.3	0.6	1.6	1.5	1.4	0.8	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	S	0.3	0.4	0.0	1.6	0.4	24	
12	0.3	0.1	0.1	0.3	0.1	0.2	0.1	0.2	0.4	0.8	1.1	1.3	0.9	0.8	0.7	0.6	0.3	0.1	0.1	0.2	S	0.2	0.2	0.2	0.1	1.3	0.4	24	
13	0.2	0.1	0.2	0.2	0.2	0.0	0.2	0.5	1.4	1.2	1.1	1.2	0.9	1.5	0.7	0.5	0.5	0.2	0.1	S	0.1	0.1	0.0	0.0	0.0	1.5	0.5	24	
14	0.0	0.1	0.2	0.3	0.4	4.7	3.0	0.4	104.0	51.4	4.8	2.7	2.6	1.8	1.2	1.0	1.0	0.2	S	0.0	0.1	0.1	0.1	0.3	0.0	104.0	7.8	24	
15	0.5	0.2	0.5	1.4	9.7	16.7	20.3	32.5	26.6	14.4	7.3	5.8	2.3	1.8	3.3	2.1	1.5	S	0.3	0.3	0.3	0.3	2.6	3.3	10.0	0.2	32.5	7.1	24
16	18.2	17.7	15.3	16.9	10.5	11.9	11.7	6.3	5.4	2.0	2.2	1.5	2.1	1.7	1.1	1.7	S	1.2	2.8	1.2	0.5	0.3	0.5	0.7	0.3	18.2	5.8	24	
17	0.5	0.7	0.3	0.3	0.2	0.2	0.2	0.2	0.5	0.8	1.0	1.0	0.8	0.6	0.5	S	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	1.0	0.4	24
18	0.1	0.1	0.2	0.2	0.6	0.5	2.8	4.2	3.3	4.1	1.0	1.1	0.6	0.3	S	1.3	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	4.2	1.0	24
19	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.9	S	0.6	0.5	0.5	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.5	0.2	0.9	0.3	24	
20	0.6	0.2	0.2	0.1	0.2	0.3	0.3	0.5	1.2	1.3	1.2	1.3	S	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	1.3	0.4	24	
21	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.8	1.0	1.5	S	1.3	1.5	4.1	0.8	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	4.1	0.5	24	
22	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.3	S	0.2	0.2	0.3	0.3	0.1	0.2	0.2	0.1	0.1	0.1	0.3	0.1	0.2	0.1	0.0	0.3	0.2	24	
23	0.1	0.0	0.1	0.9	0.9	1.0	2.0	8.1	7.5	S	2.1	2.5	2.3	0.9	0.5	0.9	0.4	0.3	0.2	0.1	0.2	1.4	0.2	0.6	0.0	8.1	1.4	24	
24	0.6	0.2	0.1	0.1	0.3	2.6	0.5	0.4	S	0.4	0.8	0.7	1.1	0.7	0.3	0.4	0.4	0.2	0.0	0.0	0.2	0.1	0.1	0.1	0.0	2.6	0.4	24	
25	0.2	0.1	0.2	0.1	0.5	0.1	0.0	S	1.4	1.2	1.6	1.6	1.2	1.0	1.3	0.9	0.6	0.5	0.2	0.0	0.3	0.4	0.1	0.1	0.0	1.6	0.6	24	
26	0.1	0.3	0.3	0.2	0.0	0.0	S	0.2	0.5	0.8	1.0	0.8	1.3	1.0	0.6	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.0	0.0	0.0	1.3	0.3	24	
27	0.0	0.1	0.0	0.0	0.1	S	0.1	0.6	2.8	3.5	4.2	2.8	2.4	2.9	2.9	C	C	C	C	C	C	C	C	0.1	0.1	0.0	4.2	1.4	24
28	0.3	0.2	0.1	0.1	S	0.3	0.9	3.6	9.5	4.6	4.7	4.6	2.6	1.3	1.5	1.1	1.3	0.6	0.8	0.5	0.3	0.6	0.6	0.6	0.1	9.5	1.8	24	
HOURLY MAX	18.2	17.7	15.3	16.9	10.5	16.7	20.3	32.5	104.0	51.4	11.4	6.8	6.3	2.9	4.1	2.1	1.5	1.2	2.8	1.2	0.5	2.6	3.3	10.0					
HOURLY AVG	0.9	0.8	0.7	1.1	1.2	1.8	2.2	3.2	8.2	4.7	2.5	2.2	1.6	1.0	1.0	0.8	0.5	0.3	0.3	0.3	0.2	0.3	0.3	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

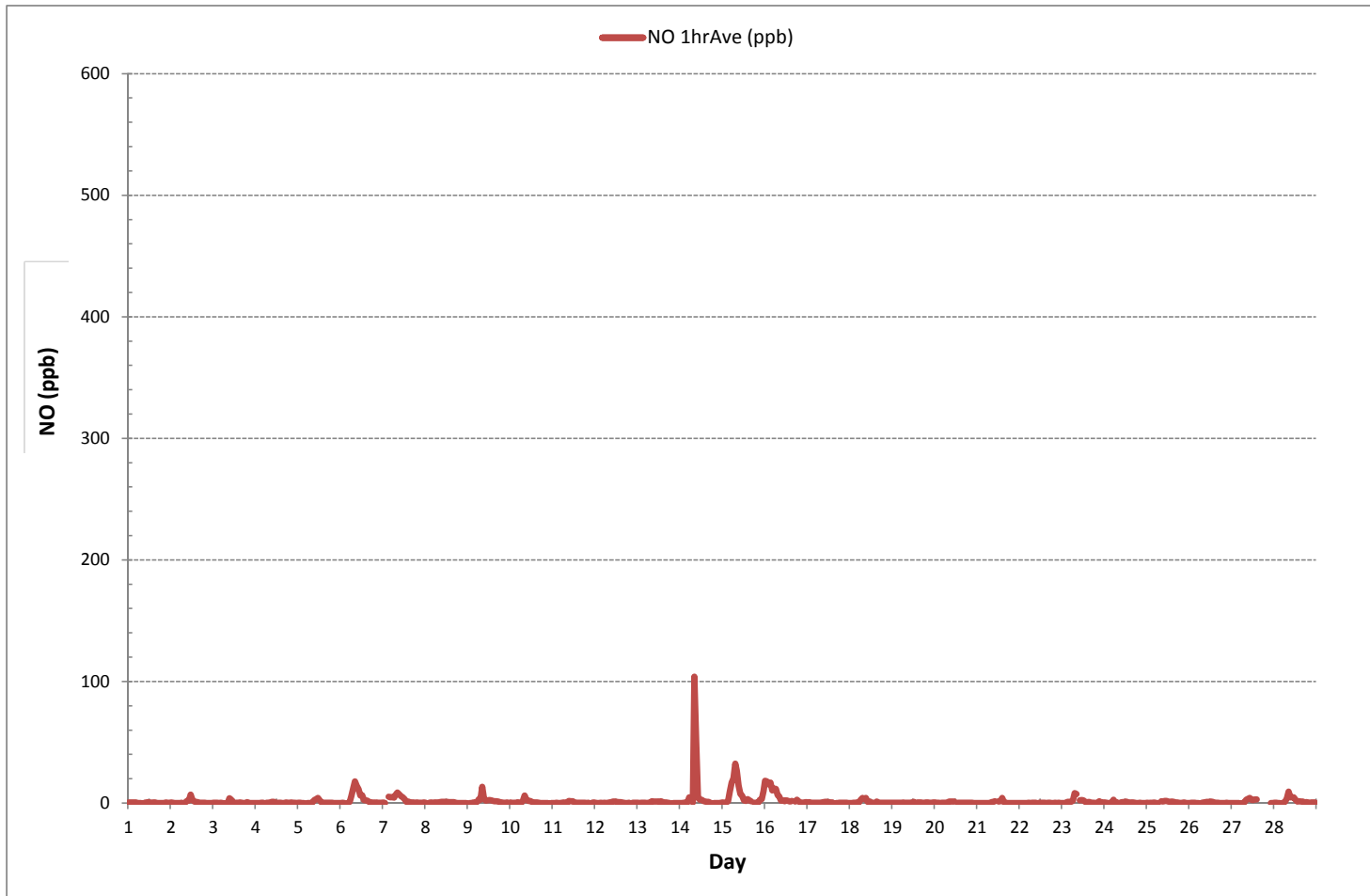
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	586			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	104.0 ppb	@ HOUR(S)	8	14
MAXIMUM 24-HR AVERAGE:	7.8 ppb			14
				VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	5.5	MONTHLY AVERAGE:	1.5 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	2.2	3.4	1.7	2.6	2.2	0.4	0.3	0.3	S	0.8	0.9	1.1	4.0	0.7	0.8	0.8	0.4	0.8	0.9	1.4	0.3	3.0	2.5	1.6	0.3	4.0	1.4	24		
2	2.5	1.3	1.8	1.1	1.6	0.8	1.3	S	2.1	2.7	2.6	38.5	14.4	2.5	3.5	2.6	1.3	6.7	2.2	1.7	0.4	0.8	0.8	1.6	0.4	38.5	4.1	24		
3	1.2	1.0	1.1	0.9	1.3	0.5	S	0.3	0.5	91.1	27.6	0.7	0.5	2.5	3.9	12.2	0.8	0.4	0.8	14.3	0.7	0.9	0.9	0.8	0.3	91.1	7.2	24		
4	1.0	0.4	0.2	2.9	2.0	S	2.2	1.3	1.3	2.0	1.4	3.3	0.4	0.8	0.8	0.8	1.0	2.1	2.1	2.1	1.8	1.0	2.1	1.1	0.2	3.3	1.5	24		
5	1.4	1.6	0.3	0.8	S	0.2	0.7	0.3	1.5	5.7	4.8	5.3	4.2	1.7	0.9	1.4	1.2	0.9	0.8	0.8	1.4	1.3	1.4	1.8	0.2	5.7	1.8	24		
6	1.6	2.0	0.4	S	0.7	6.7	9.4	17.6	26.7	16.4	13.6	11.1	8.5	5.6	3.3	5.1	3.6	0.9	1.6	0.7	2.1	1.2	1.7	0.6	0.4	26.7	6.1	24		
7	2.9	0.9	S	7.3	7.5	6.5	6.9	18.2	30.7	8.7	7.4	5.7	4.5	1.7	2.6	1.7	2.0	3.4	1.8	2.1	2.0	2.0	1.4	2.1	0.9	30.7	5.7	24		
8	2.3	S	1.8	1.4	1.7	2.1	1.7	1.2	3.7	2.3	1.6	2.1	2.4	1.7	2.0	2.9	10.3	1.7	0.5	0.5	0.4	0.6	0.3	0.2	0.2	10.3	2.0	24		
9	S	1.3	0.7	3.9	1.6	5.5	67.6	11.3	26.8	8.5	3.7	11.1	4.0	3.9	3.5	3.7	4.4	13.1	2.7	3.9	1.3	1.8	2.6	S	0.7	67.6	8.5	24		
10	3.5	0.7	3.5	1.8	2.7	1.1	0.7	10.9	16.1	10.3	4.7	8.5	1.8	1.8	1.2	2.3	1.8	0.4	0.4	0.8	0.4	1.4	S	0.9	0.4	16.1	3.4	24		
11	0.7	1.4	2.5	0.7	0.7	1.0	2.0	0.9	1.7	2.5	2.5	2.5	1.3	0.8	0.7	0.9	1.3	1.2	1.0	0.8	1.1	S	1.7	1.4	0.7	2.5	1.4	24		
12	1.2	0.5	0.7	0.8	0.8	1.4	1.4	2.0	3.3	1.3	1.8	2.1	1.6	1.6	0.9	1.0	1.3	1.8	1.2	0.8	S	0.9	0.8	0.8	0.5	3.3	1.3	24		
13	0.9	0.7	0.9	0.9	1.1	0.3	1.4	2.2	3.4	2.3	1.7	2.2	1.6	15.1	1.1	0.9	9.2	1.3	0.7	S	0.5	1.4	0.5	0.4	0.3	15.1	2.2	24		
14	0.4	1.6	1.3	2.7	3.5	20.9	14.0	2.2	436.4	95.6	25.5	8.0	15.9	2.2	2.6	2.5	2.9	S	0.5	0.7	0.7	1.4	3.3	0.4	436.4	28.1	24			
15	6.1	2.0	3.5	5.5	20.6	29.7	31.0	46.3	59.1	23.0	26.4	12.1	4.8	6.8	7.6	7.2	13.5	S	3.4	1.2	2.1	12.6	18.6	22.1	1.2	59.1	15.9	24		
16	28.6	33.0	22.9	21.0	18.7	35.2	28.8	15.9	14.8	3.7	6.2	4.4	7.6	11.4	2.2	6.7	S	12.3	20.4	12.9	4.7	1.6	2.1	2.4	1.6	35.2	13.8	24		
17	2.2	2.3	1.3	1.3	1.2	1.1	1.1	1.3	1.2	1.6	2.2	2.0	1.6	1.4	0.9	S	0.5	0.7	0.9	1.6	1.6	1.2	1.2	0.8	0.5	2.3	1.4	24		
18	1.0	0.9	0.8	1.7	5.1	1.7	8.5	7.7	6.5	12.0	2.0	2.0	3.4	2.1	S	13.4	4.3	1.6	1.4	1.6	1.1	1.2	0.9	0.8	0.8	13.4	3.6	24		
19	0.8	0.9	1.2	0.9	0.8	0.7	0.7	0.8	0.8	1.1	0.9	1.2	9.3	S	2.5	1.2	2.1	0.9	1.4	1.2	1.7	1.7	0.7	3.5	0.7	9.3	1.6	24		
20	3.9	1.6	0.9	1.2	1.6	1.3	1.3	1.4	2.1	2.1	2.0	2.4	S	0.8	0.8	0.7	0.5	3.4	1.6	1.2	1.8	1.7	0.9	0.4	0.4	3.9	1.5	24		
21	0.9	0.4	0.3	0.7	0.9	0.4	0.3	0.8	9.8	2.5	2.5	S	4.9	2.4	11.6	8.1	0.7	0.4	0.3	0.5	0.3	0.3	0.4	0.3	0.3	11.6	2.2	24		
22	0.5	0.3	0.3	0.4	0.7	2.4	0.4	0.8	0.7	S	1.3	0.7	1.1	0.8	0.3	1.2	1.7	0.8	0.8	0.8	1.6	0.8	4.0	3.0	0.3	4.0	1.1	24		
23	0.9	0.3	0.5	6.5	7.9	14.6	9.7	23.7	10.5	S	3.8	4.0	3.0	2.2	1.1	2.6	1.8	3.3	3.8	1.1	1.7	26.7	1.2	3.3	0.3	26.7	5.8	24		
24	2.2	1.8	0.5	0.7	2.5	42.3	2.5	1.8	S	1.1	4.5	1.6	2.1	1.5	0.9	2.5	0.9	0.7	0.3	0.7	0.7	1.2	1.1	0.9	0.3	42.3	3.3	24		
25	2.0	1.2	2.1	2.5	1.8	1.4	0.5	S	4.5	2.0	3.1	2.4	3.7	2.0	2.1	2.9	1.2	5.4	4.0	0.4	2.0	2.7	0.5	0.8	0.4	5.4	2.2	24		
26	1.2	1.8	1.7	1.3	0.3	0.3	S	0.8	0.9	1.2	2.9	1.4	1.7	1.7	1.0	0.9	0.4	0.4	1.6	1.6	0.6	2.5	0.6	0.5	0.3	2.9	1.2	24		
27	0.6	0.7	0.5	0.4	0.8	S	0.7	3.9	5.3	5.7	6.2	4.9	10.5	5.7	5.1	C	C	C	C	C	C	C	C	C	0.4	0.9	0.4	10.5	3.3	24
28	0.9	1.1	0.7	0.8	S	2.5	3.5	8.7	24.5	8.7	9.3	7.6	4.0	2.1	3.3	3.4	6.5	3.7	3.9	1.4	1.0	2.1	2.1	2.6	0.7	24.5	4.5	24		
HOURLY MAX	28.6	33.0	22.9	21.0	20.6	42.3	67.6	46.3	436.4	95.6	27.6	38.5	15.9	15.1	11.6	13.4	13.5	13.1	20.4	14.3	4.7	26.7	18.6	22.1						
HOURLY AVG	2.7	2.4	2.0	2.7	3.5	7.0	7.6	7.0	26.7	11.7	6.4	5.5	4.5	3.1	2.5	3.4	2.9	2.8	2.3	2.2	1.3	2.8	2.0	2.2						

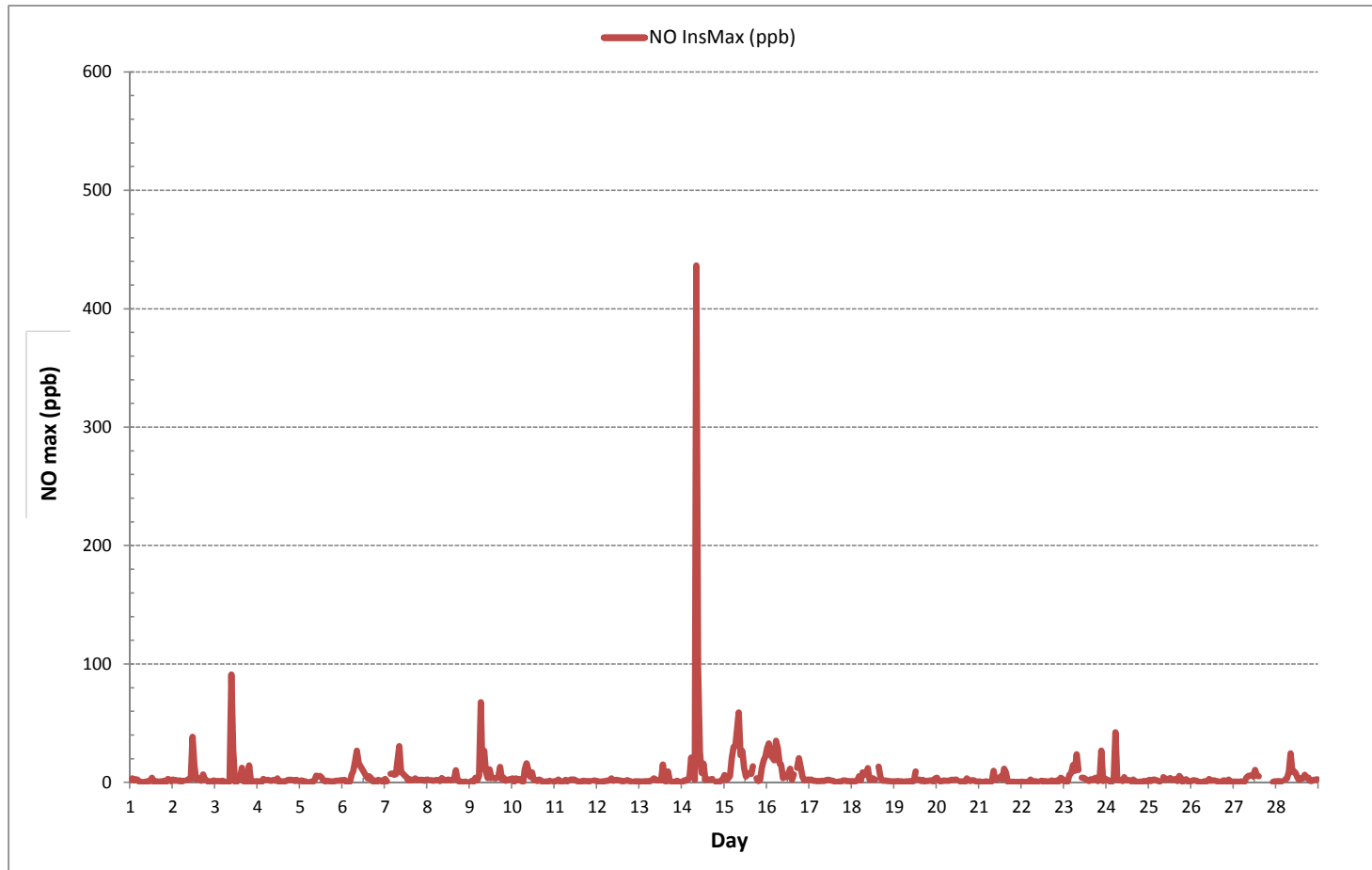
STATUS FLAG CODES

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

NUMBER OF NON-ZERO READINGS:	636
MAXIMUM INSTANTANEOUS VALUE:	436.4 ppb @ HOUR(S) 8 ON DAY(S) 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	19.1
OPERATIONAL TIME:	672 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



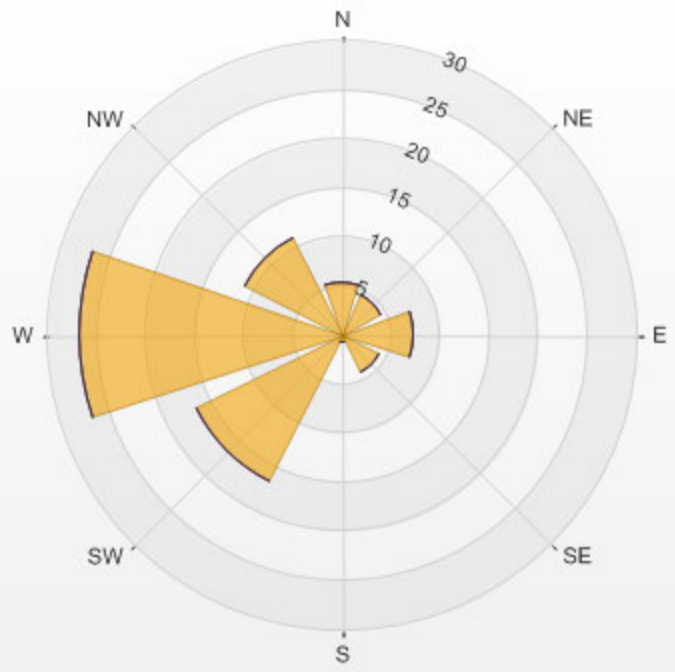
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO [ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 23.27% Calm Avg: 3.70 [ppb]

Direction	0.0-34.7	34.7-69.4	69.4-104.1	>104.1	Total
N	5.4	0.0	0.0	0.0	5.4
NE	4.6	0.0	0.0	0.0	4.6
E	7.4	0.0	0.0	0.0	7.4
SE	4.3	0.0	0.0	0.0	4.3
S	0.8	0.0	0.0	0.0	0.8
SW	16.7	0.0	0.0	0.0	16.7
W	26.7	0.0	0.0	0.0	26.7
NW	11.0	0.0	0.0	0.0	11.0
Summary	76.8	0.0	0.0	0.0	76.8

% Icon	Classes (ppb)	77	 0.0-34.7	0	 34.7-69.4	0	 69.4-104.1	0	 >104.1
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 23.27% Calm Poll Avg: 3.70[ppb]



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	8.1	6.8	5.6	5.3	6.2	2.1	0.9	1.3	S	1.7	2.0	1.9	1.3	1.1	1.6	2.0	2.3	3.0	11.8	11.4	9.1	9.1	9.1	10.6	0.9	11.8	5.0	24	
2	10.5	9.8	10.6	9.6	8.4	6.9	6.9	S	8.0	7.7	5.1	5.8	4.2	2.9	3.2	3.6	3.5	4.3	4.9	6.0	6.7	6.2	5.0	4.8	2.9	10.6	6.3	24	
3	5.1	5.4	6.8	7.8	8.9	10.3	S	5.1	3.0	1.7	4.7	2.3	1.7	1.6	1.5	2.1	2.7	3.4	5.8	8.1	4.4	2.6	3.0	2.8	1.5	10.3	4.4	24	
4	2.5	2.5	2.9	3.7	5.8	S	7.1	3.8	4.6	5.7	3.5	1.9	0.6	0.9	1.0	1.0	0.9	2.4	2.5	3.6	5.3	5.0	5.1	5.1	0.6	7.1	3.4	24	
5	5.4	4.8	3.6	3.2	S	3.3	4.2	6.2	5.5	6.0	6.7	7.0	5.4	1.7	1.0	1.0	1.6	1.8	2.1	2.9	2.3	2.1	2.9	4.8	1.0	7.0	3.7	24	
6	7.2	9.0	9.3	S	10.7	15.2	19.6	19.8	18.3	13.2	10.8	6.1	6.0	3.2	3.2	3.0	2.7	3.5	7.0	5.5	6.8	8.5	8.3	6.1	2.7	19.8	8.8	24	
7	8.3	11.5	S	22.0	21.6	20.8	19.6	19.0	15.2	10.7	6.8	5.5	4.3	2.2	2.5	2.2	2.5	3.3	4.1	5.5	3.8	3.4	3.4	4.0	2.2	22.0	8.8	24	
8	4.0	S	5.4	6.4	4.4	5.5	6.2	7.6	5.1	4.2	3.1	2.7	2.4	1.7	1.9	2.4	3.5	5.0	5.7	4.3	2.3	2.3	2.8	2.9	1.7	7.6	4.0	24	
9	S	3.4	4.0	9.6	11.0	13.5	14.8	21.1	25.1	13.9	7.7	6.0	6.1	6.9	6.5	6.7	7.9	8.0	7.7	8.1	6.5	5.6	5.3	S	3.4	25.1	9.3	24	
10	5.8	5.8	4.7	7.9	14.4	10.0	10.0	16.3	17.3	7.6	3.7	3.1	3.1	2.4	2.3	2.7	2.5	2.4	2.7	2.7	2.8	2.9	S	2.9	2.3	17.3	5.9	24	
11	2.9	2.8	3.4	4.2	4.7	4.8	4.9	5.6	5.5	4.1	3.4	2.3	1.3	1.1	1.4	1.8	1.7	2.3	2.4	2.1	S	2.4	1.9	1.1	5.6	3.2	24		
12	2.3	3.3	3.8	4.8	5.0	4.2	3.0	2.4	3.4	3.9	3.9	3.9	3.3	2.8	3.0	3.4	3.5	3.5	3.8	5.5	S	4.6	4.8	4.2	2.3	5.5	3.8	24	
13	3.3	2.9	3.0	4.2	3.9	3.3	3.4	5.4	12.6	6.0	3.8	4.0	2.6	3.0	2.6	2.6	2.2	2.6	3.9	S	4.6	3.7	3.5	4.3	2.2	12.6	4.0	24	
14	4.7	4.6	4.6	5.4	5.2	13.6	15.5	8.2	40.5	26.3	7.7	5.8	5.3	5.1	5.2	6.2	8.9	7.2	S	5.4	4.5	5.0	8.6	12.2	4.5	40.5	9.4	24	
15	10.3	6.8	9.1	14.5	20.2	19.7	17.7	18.9	17.7	15.9	11.9	11.6	6.8	5.2	7.2	6.7	7.4	S	10.4	10.5	10.7	17.0	14.1	18.6	5.2	20.2	12.6	24	
16	20.9	22.2	21.7	21.1	17.2	19.1	19.2	14.7	11.2	6.3	5.0	3.9	4.1	3.7	3.5	6.1	S	12.2	16.2	16.5	11.0	9.2	8.7	10.0	3.5	22.2	12.3	24	
17	13.1	19.1	16.1	8.5	4.4	4.6	5.2	4.7	5.1	4.9	4.1	3.5	2.8	2.6	1.9	S	1.5	2.2	2.6	2.8	3.8	5.1	5.9	4.9	1.5	19.1	5.6	24	
18	4.4	5.5	6.1	6.4	5.5	8.6	17.2	17.2	11.1	7.7	3.1	2.3	1.5	1.2	S	3.7	2.1	4.0	4.9	3.5	1.8	1.5	1.6	1.5	1.2	17.2	5.3	24	
19	1.4	1.6	1.2	1.3	1.2	1.3	1.1	1.3	1.5	1.6	2.0	1.7	S	1.9	1.9	2.0	2.5	2.6	3.2	2.7	2.0	1.6	3.5	1.1	3.5	1.8	24		
20	3.6	3.7	1.6	1.6	3.4	4.2	5.2	4.9	4.4	3.5	2.3	1.8	S	1.1	0.9	1.1	1.7	2.0	2.9	2.5	1.9	3.1	2.8	1.5	0.9	5.2	2.7	24	
21	2.0	2.9	5.2	5.8	3.6	3.1	2.2	2.1	4.6	4.5	4.7	S	3.2	3.4	6.0	2.8	2.0	2.0	2.1	1.9	1.8	3.1	2.8	2.6	1.8	6.0	3.2	24	
22	2.5	2.4	2.4	2.1	1.3	1.5	1.2	1.4	2.1	1.8	S	1.0	0.8	1.5	1.5	0.8	1.5	2.2	2.5	3.4	3.9	5.2	4.7	4.9	0.8	5.2	2.3	24	
23	6.2	5.7	8.3	9.7	10.5	9.9	12.4	17.5	11.4	S	7.1	3.8	4.3	2.2	1.5	2.6	2.0	3.7	5.3	8.6	8.4	13.1	11.4	11.9	1.5	17.5	7.7	24	
24	14.1	8.9	6.4	5.3	7.1	10.1	2.3	2.9	S	1.4	1.4	1.6	2.8	2.0	1.5	1.9	2.4	2.7	3.2	3.5	1.8	3.6	3.8	3.7	1.4	14.1	4.1	24	
25	3.9	3.4	3.3	3.6	3.9	3.0	4.0	S	4.6	2.7	3.0	3.0	2.4	2.2	3.0	3.1	3.5	5.4	8.4	7.2	12.2	9.9	2.1	2.0	2.0	12.2	4.3	24	
26	4.0	4.0	4.4	3.9	2.0	1.3	S	2.4	2.1	1.7	1.6	1.2	1.6	1.4	1.1	0.9	1.2	1.3	1.7	3.3	2.9	4.2	2.7	2.7	0.9	4.4	2.3	24	
27	2.8	2.7	2.8	4.2	7.7	S	8.2	7.9	8.3	7.2	7.0	4.3	3.2	4.4	5.7	C	C	C	C	C	C	C	C	3.1	2.7	2.7	8.3	5.1	24
28	2.4	4.0	3.7	3.6	S	8.6	14.1	16.5	13.8	6.9	5.8	5.2	3.6	2.5	2.6	3.1	4.7	4.3	7.4	5.0	3.6	3.1	3.0	3.3	2.4	16.5	5.7	24	
HOURLY MAX	20.9	22.2	21.7	22.0	21.6	20.8	19.6	21.1	40.5	26.3	11.9	11.6	6.8	6.9	7.2	6.7	8.9	12.2	16.2	16.5	12.2	17.0	14.1	18.6					
HOURLY AVG	6.0	6.1	5.9	6.9	7.6	8.0	8.7	9.0	10.1	6.7	4.9	3.9	3.2	2.6	2.8	2.9	3.0	3.7	5.2	5.5	4.9	5.4	4.9	5.2					

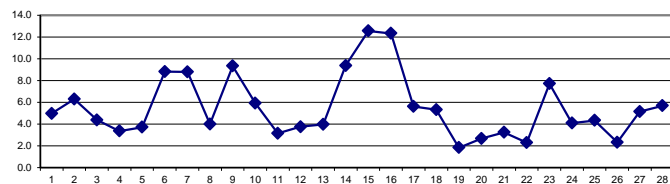
STATUS FLAG CODES

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 159 ppb

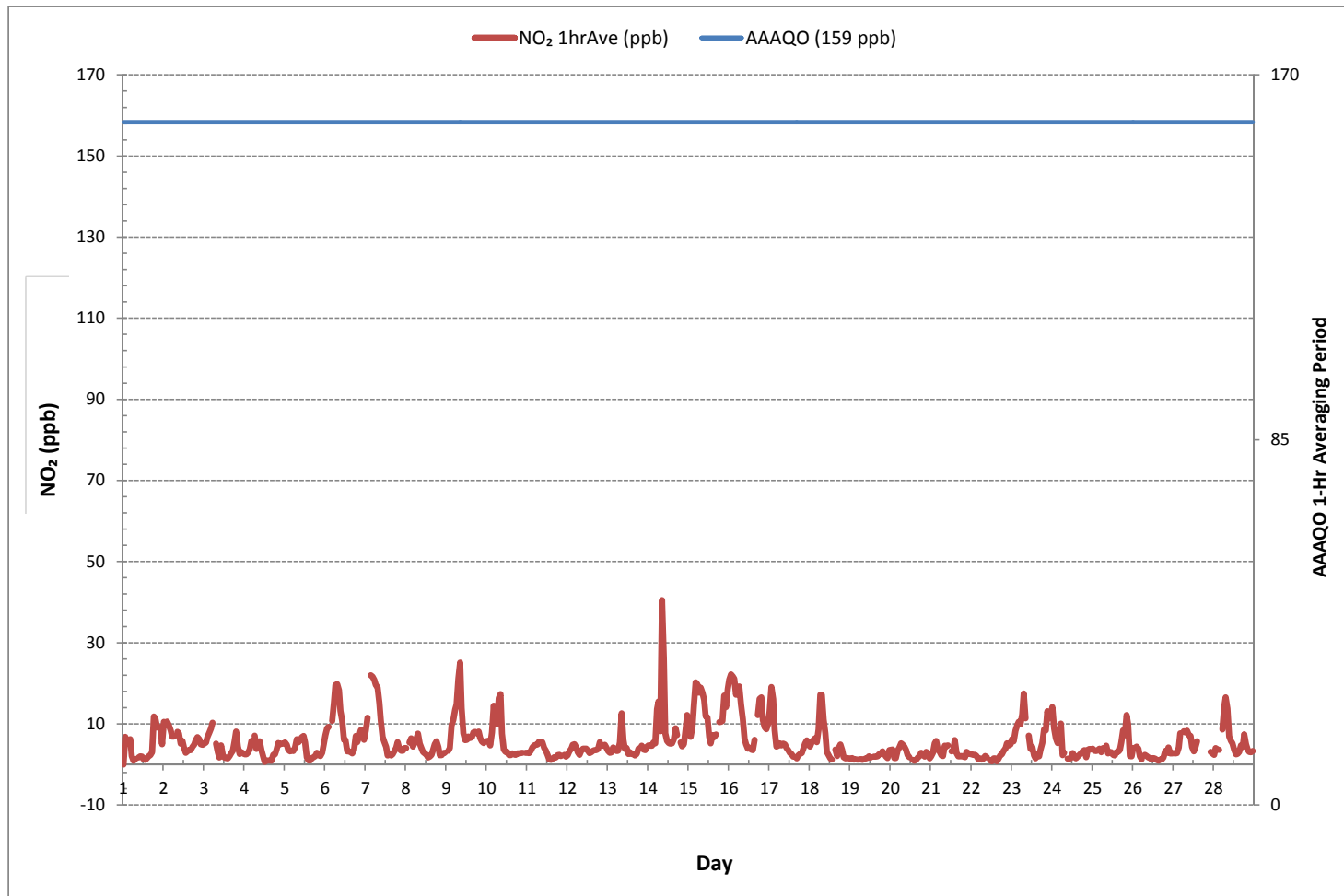
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	636				
MINIMUM 1-HR AVERAGE:	0.6 ppb	@ HOUR(S)	12	ON DAY(S)	4
MAXIMUM 1-HR AVERAGE:	40.5 ppb	@ HOUR(S)	8	ON DAY(S)	14
MAXIMUM 24-HR AVERAGE:	12.6 ppb			ON DAY(S)	15
				VAR-VARIOUS	
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs		
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %		
STANDARD DEVIATION:	4.7	MONTHLY AVERAGE:	5.5 ppb		

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	9.7	9.6	8.8	7.1	8.3	3.8	1.0	1.8	S	2.5	2.3	2.0	2.8	1.3	2.2	2.2	2.9	7.7	15.7	15.2	13.9	16.2	12.5	12.5	1.0	16.2	7.0	24		
2	12.0	10.9	11.5	10.1	8.9	8.5	8.7	S	10.0	9.3	5.7	29.1	17.6	3.4	5.5	4.6	4.4	5.2	6.3	6.6	7.2	6.7	6.0	5.5	3.4	29.1	8.9	24		
3	6.0	6.5	9.7	8.8	10.9	12.6	S	9.6	3.9	11.2	30.8	2.5	2.3	3.4	5.0	11.7	3.6	4.3	10.6	17.7	6.8	3.0	3.5	3.8	2.3	30.8	8.2	24		
4	3.1	3.8	3.5	6.5	8.4	S	9.3	5.6	6.1	6.8	4.0	4.3	0.9	1.7	1.8	1.7	2.0	3.5	3.8	6.0	8.0	6.4	6.5	6.3	0.9	9.3	4.8	24		
5	6.6	6.1	4.6	4.3	S	5.2	7.9	9.1	7.0	9.6	9.6	8.5	6.5	4.2	1.5	1.4	2.6	3.0	2.7	5.0	4.6	5.4	7.1	8.1	1.4	9.6	5.7	24		
6	10.1	12.7	10.5	S	12.7	20.2	21.1	21.3	20.9	16.0	12.6	7.4	7.0	6.6	3.8	3.9	3.6	8.0	8.9	6.8	11.5	9.2	9.1	8.1	3.6	21.3	11.0	24		
7	10.4	14.9	S	23.0	24.4	22.0	21.2	20.2	22.2	13.1	8.5	6.2	5.4	3.3	5.2	2.9	4.3	5.2	5.2	7.6	4.7	4.6	4.8	4.8	2.9	24.4	10.6	24		
8	4.9	S	6.6	7.9	5.4	7.5	8.8	10.1	9.6	5.1	4.3	4.3	3.3	3.3	4.2	3.6	7.0	5.8	6.6	5.9	2.9	3.0	3.8	5.1	2.9	10.1	5.6	24		
9	S	8.6	8.9	20.9	18.0	20.2	33.4	28.2	30.2	21.6	10.0	9.6	8.9	8.7	7.9	9.9	10.4	9.8	10.0	10.3	9.2	8.5	7.8	S	7.8	33.4	14.1	24		
10	10.0	10.3	6.6	16.2	19.7	14.0	15.3	27.4	27.4	18.3	5.9	5.9	4.3	5.1	3.3	6.3	5.5	3.0	3.5	3.8	3.5	5.0	S	4.0	3.0	27.4	9.8	24		
11	5.1	3.9	5.4	5.2	5.4	6.5	6.5	7.0	6.6	6.5	5.4	4.3	2.9	2.1	1.5	1.8	2.6	2.3	3.9	3.4	2.9	S	3.5	3.0	1.5	7.0	4.2	24		
12	3.1	4.0	4.6	5.6	6.1	5.5	3.6	5.8	6.5	4.7	4.4	4.4	4.0	3.2	3.4	3.6	4.3	4.2	5.2	7.2	S	6.3	5.6	6.8	3.1	7.2	4.9	24		
13	4.3	3.4	3.9	5.4	5.4	3.8	4.4	11.0	15.8	11.3	4.6	5.9	3.4	11.4	2.9	3.8	3.9	4.6	5.2	S	5.6	5.1	4.0	5.4	2.9	15.8	5.8	24		
14	6.4	7.6	9.5	10.7	9.3	27.7	22.7	13.0	119.2	39.4	22.4	8.3	9.5	5.6	6.5	10.0	9.9	8.1	S	7.2	5.4	7.1	14.6	18.9	5.4	119.2	17.3	24		
15	18.0	12.1	14.1	18.0	25.0	21.9	27.5	20.9	25.4	18.2	25.7	16.6	10.5	9.9	12.9	11.6	14.9	S	12.5	12.5	16.9	22.4	22.1	23.3	9.9	27.5	18.0	24		
16	25.3	26.5	24.1	23.9	23.3	27.1	21.8	18.6	17.5	9.6	8.8	5.4	10.3	10.3	6.1	12.6	S	20.5	29.1	34.7	14.2	10.1	12.2	14.6	5.4	34.7	17.7	24		
17	16.9	21.6	19.2	11.4	5.9	5.9	6.3	5.8	6.2	6.2	5.2	4.9	3.3	3.4	2.3	S	1.7	3.9	3.1	4.3	5.5	6.8	6.8	5.9	1.7	21.6	7.1	24		
18	6.0	6.3	7.1	8.4	7.6	13.7	21.2	20.1	13.5	14.0	3.5	3.1	3.4	3.9	S	7.0	4.4	8.8	7.1	7.9	2.7	2.5	2.9	2.2	2.2	21.2	7.7	24		
19	2.0	2.2	1.7	2.0	1.6	1.8	1.8	1.4	1.7	2.3	2.2	3.8	3.6	S	4.8	3.1	3.5	3.6	3.1	4.4	4.2	4.6	3.4	8.8	1.4	8.8	3.1	24		
20	11.5	5.2	2.7	3.3	4.6	5.8	5.6	5.8	5.2	4.6	2.9	3.0	S	1.8	1.4	2.3	2.3	4.2	3.8	3.5	3.0	5.0	4.3	2.1	1.4	11.5	4.1	24		
21	2.9	5.4	7.6	8.2	5.0	3.8	3.4	2.6	12.1	7.0	7.1	S	5.9	4.3	12.9	8.9	2.3	2.3	2.3	2.3	2.3	3.4	3.5	3.1	2.3	12.9	5.2	24		
22	3.3	3.0	3.1	3.0	2.1	5.0	1.6	3.1	3.3	2.7	S	2.2	1.0	2.1	2.1	0.8	2.6	3.9	3.9	6.3	7.4	8.3	14.4	10.6	0.8	14.4	4.2	24		
23	10.1	7.5	10.4	16.5	16.1	16.7	20.5	25.8	15.9	S	9.9	4.9	6.0	3.9	2.5	7.0	5.8	9.9	12.7	14.2	14.3	22.4	13.6	19.1	2.5	25.8	12.4	24		
24	19.5	11.4	8.3	7.1	11.3	21.7	3.3	4.7	S	2.0	3.5	2.5	3.4	2.7	2.6	2.6	2.9	3.4	4.0	5.0	2.7	4.5	4.9	4.6	2.0	21.7	6.0	24		
25	5.0	4.0	4.6	5.2	5.9	4.2	5.6	S	8.9	4.4	5.4	3.4	3.9	3.7	3.4	6.0	5.1	11.2	13.8	8.5	16.5	18.5	2.6	3.4	2.6	18.5	6.7	24		
26	6.1	4.7	5.8	5.0	3.1	1.7	S	3.4	2.9	1.8	4.4	1.7	1.8	2.1	1.3	1.2	2.2	2.7	4.0	4.4	3.9	11.6	3.6	4.2	1.2	11.6	3.6	24		
27	3.5	3.8	4.2	6.0	9.8	S	9.9	10.1	11.8	9.1	10.0	6.5	4.2	6.4	7.0	C	C	C	C	C	C	C	C	C	3.7	3.3	3.3	11.8	6.8	24
28	3.0	6.8	7.1	8.4	S	11.7	18.9	23.3	22.5	10.6	9.1	8.4	6.3	3.1	4.6	5.1	9.2	5.8	11.0	8.7	4.7	5.5	5.5	5.6	3.0	23.3	8.9	24		
HOURLY MAX	25.3	26.5	24.1	23.9	25.0	27.7	33.4	28.2	119.2	39.4	30.8	29.1	17.6	11.4	12.9	12.6	14.9	20.5	29.1	34.7	16.9	22.4	22.1	23.3						
HOURLY AVG	8.3	8.3	7.9	9.6	10.2	11.5	12.0	12.1	16.6	9.9	8.5	6.3	5.3	4.5	4.4	5.2	4.8	6.0	7.6	8.4	7.1	8.2	7.1	7.5						

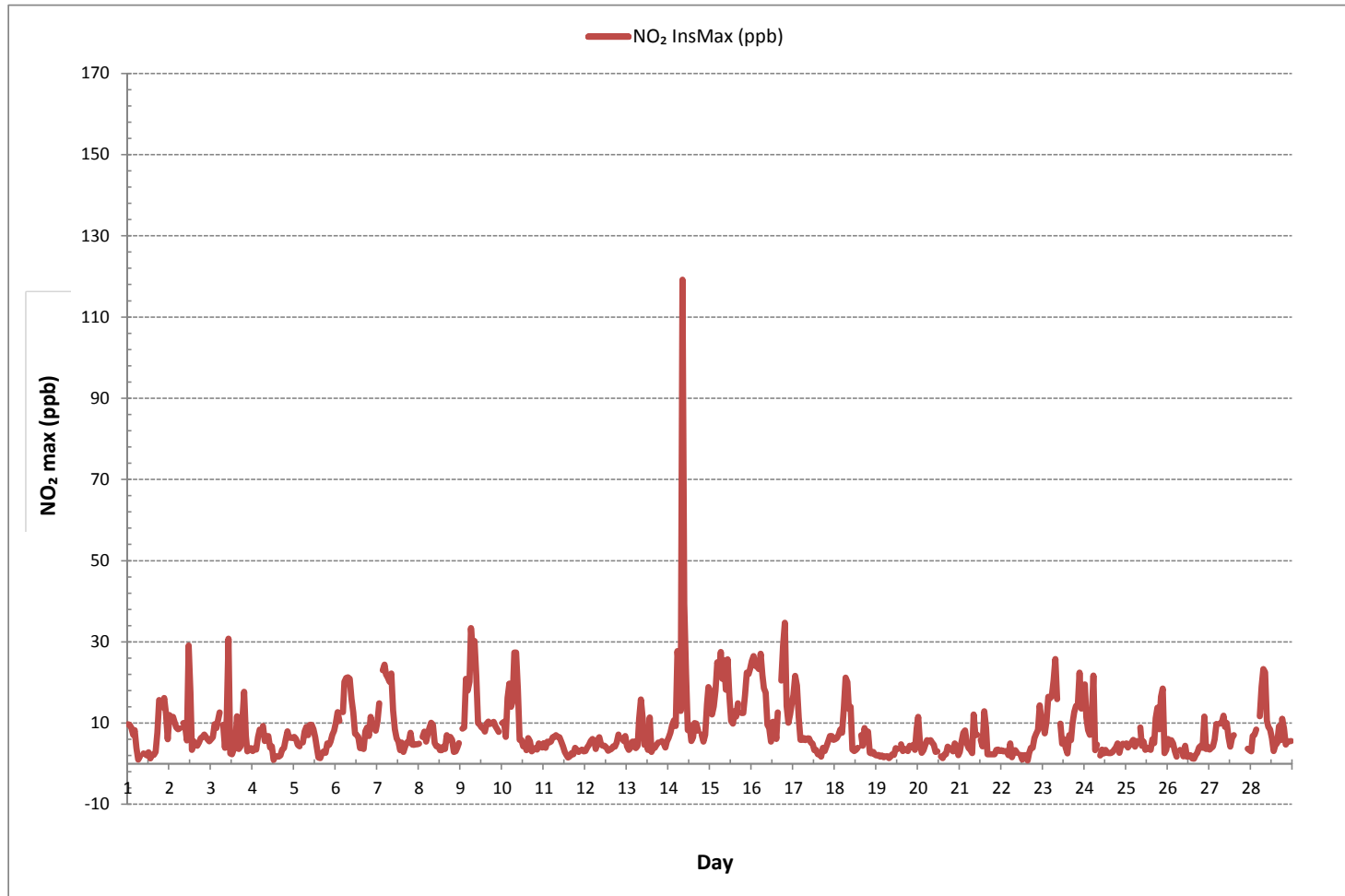
STATUS FLAG CODES

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:	636
MAXIMUM INSTANTANEOUS VALUE:	119.2 ppb @ HOUR(S) 8 ON DAY(S) 14
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	7.7

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



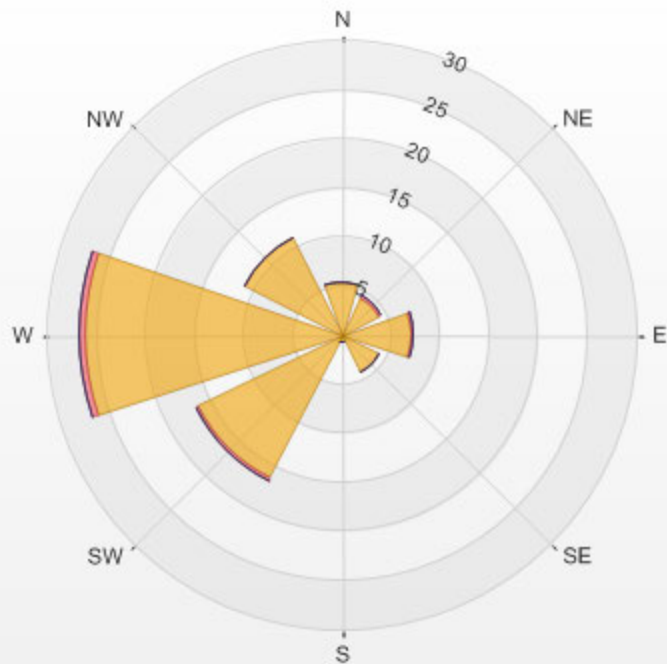
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO2 [ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 23.27% Calm Avg: 9.90 [ppb]

Direction	0.0-13.5	13.5-27.1	27.1-40.6	>40.6	Total
N	5.4	0.0	0.0	0.0	5.4
NE	4.3	0.3	0.0	0.0	4.6
E	7.1	0.3	0.0	0.0	7.4
SE	4.3	0.0	0.0	0.0	4.3
S	0.8	0.0	0.0	0.0	0.8
SW	16.4	0.3	0.0	0.0	16.7
W	26.1	0.6	0.0	0.0	26.7
NW	11.0	0.0	0.0	0.0	11.0
Summary	75.2	1.6	0.0	0.0	76.7

% Icon	Classes (ppb)	75	0.0-13.5	2	13.5-27.1	0	27.1-40.6	0	>40.6

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 23.27% Calm Poll Avg: 9.90[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/02 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	26.5	27.9	29.5	29.3	28.3	35.5	38.3	39.4	S	39.6	39.3	39.8	41.1	41.9	41.9	41.3	40.8	39.3	27.6	24.3	23.5	23.1	21.0	18.2	18.2	41.9	32.9	24
2	22.9	24.6	25.2	27.2	28.6	29.6	29.7	S	27.2	27.9	31.0	31.5	33.2	34.9	35.3	36.1	34.8	33.3	31.2	31.0	30.1	30.0	30.5	29.9	22.9	36.1	30.2	24
3	29.0	27.9	25.5	23.0	21.0	18.8	S	32.0	36.9	36.8	36.6	38.8	39.8	40.2	39.6	38.7	37.1	34.8	30.4	25.4	32.4	35.2	34.2	34.3	18.8	40.2	32.5	24
4	33.9	32.6	30.4	29.8	27.9	S	28.0	32.8	33.3	33.7	37.3	39.5	41.5	41.4	40.7	40.3	41.0	39.3	38.0	37.2	34.7	33.9	33.3	32.2	27.9	41.5	35.3	24
5	32.2	31.9	30.1	27.0	S	26.3	22.8	21.7	22.5	22.2	30.4	30.8	31.4	35.4	36.9	36.7	37.4	35.3	32.8	26.9	25.7	23.3	20.6	16.7	16.7	37.4	28.6	24
6	13.0	11.6	11.3	S	9.1	4.6	0.8	0.4	2.4	8.5	14.3	19.5	19.3	20.9	19.9	18.2	14.8	14.1	10.0	10.8	10.0	8.2	7.3	8.7	0.4	20.9	11.2	24
7	7.6	5.5	S	0.4	0.3	0.3	0.3	0.7	5.7	15.3	20.9	25.8	31.9	37.7	38.0	38.2	37.9	37.6	35.8	32.3	33.6	33.1	34.0	34.5	0.3	38.2	22.1	24
8	33.5	S	31.4	30.2	32.8	31.5	30.4	28.8	31.9	33.5	36.0	37.4	38.5	39.3	39.5	39.3	38.6	37.0	35.4	37.2	40.0	39.8	35.9	31.7	28.8	40.0	35.2	24
9	S	27.7	24.2	17.4	16.3	13.6	13.5	6.1	5.3	26.0	33.4	35.0	36.2	35.4	35.0	34.9	33.4	33.0	33.6	32.6	34.0	35.6	35.9	S	5.3	36.2	27.2	24
10	32.7	28.4	27.6	21.9	14.8	17.3	16.9	10.3	10.2	27.6	34.7	36.9	37.5	39.4	39.2	39.6	39.9	39.3	39.7	41.9	41.2	40.2	S	37.2	10.2	41.9	31.1	24
11	36.5	35.9	34.6	32.9	31.3	30.3	29.7	28.8	29.5	30.0	34.2	37.7	41.8	45.3	45.9	45.4	45.0	45.0	44.0	42.9	43.2	S	42.8	43.3	28.8	45.9	38.1	24
12	42.5	40.3	39.5	38.0	37.8	39.3	42.2	43.4	42.9	42.9	43.1	44.1	45.1	46.0	45.9	46.0	45.7	45.4	44.2	42.3	S	41.5	40.1	41.3	37.8	46.0	42.6	24
13	43.4	43.7	42.7	40.7	39.9	39.8	38.7	36.1	29.3	36.7	39.8	39.8	41.8	42.5	42.9	43.5	43.1	41.6	39.0	S	37.9	38.5	37.9	33.8	29.3	43.7	39.7	24
14	30.2	27.4	22.5	17.3	14.3	9.8	3.7	10.5	4.5	7.4	26.7	31.9	34.1	36.7	38.1	36.9	33.6	35.7	S	36.4	35.6	29.6	18.5	11.7	3.7	38.1	24.0	24
15	10.1	13.2	10.0	4.6	0.8	1.1	0.8	0.8	2.1	7.1	14.0	16.5	22.8	24.8	23.3	27.5	28.8	S	21.4	19.2	12.9	3.6	4.8	1.2	0.8	28.8	11.8	24
16	0.9	0.9	0.7	0.6	0.7	0.7	1.4	2.8	8.2	20.6	23.7	25.5	25.5	25.8	26.9	23.3	S	13.2	8.9	7.8	11.9	14.6	12.9	8.0	0.6	26.9	11.5	24
17	6.2	2.7	6.9	16.6	26.3	29.5	29.5	32.3	32.1	32.1	32.1	30.4	30.3	29.1	28.2	S	35.2	32.6	29.7	27.5	24.0	21.9	20.1	16.5	2.7	35.2	24.9	24
18	18.3	19.7	16.5	14.7	16.2	13.1	3.3	2.1	6.3	9.8	21.8	26.9	34.2	37.5	S	32.0	36.0	33.2	31.9	32.4	32.4	33.3	33.3	32.1	2.1	37.5	23.3	24
19	31.3	31.3	31.4	31.3	32.1	34.2	36.1	36.6	35.4	35.6	35.1	34.2	S	33.5	32.6	31.5	30.4	29.4	28.0	28.2	28.6	28.6	25.8	25.8	36.6	32.0	24	
20	25.0	22.8	20.9	20.6	19.3	16.0	12.9	12.4	14.4	19.1	24.7	26.5	S	29.7	29.7	28.5	27.4	28.2	26.4	30.5	34.5	32.2	30.9	32.4	12.4	34.5	24.6	24
21	30.8	27.5	22.1	21.0	27.0	25.0	25.7	27.8	23.2	25.3	26.5	S	28.3	27.8	25.2	29.5	30.0	28.6	27.9	29.1	29.2	30.8	31.8	33.8	21.0	33.8	27.6	24
22	36.5	37.6	37.7	37.9	39.0	38.8	38.7	38.2	36.8	38.0	S	39.9	40.7	40.9	40.9	40.8	40.3	38.8	37.4	33.8	30.9	27.6	23.7	21.5	21.5	40.9	36.4	24
23	19.2	16.4	11.6	9.6	7.2	9.3	5.3	2.3	8.5	C	C	C	C	C	C	35.0	36.1	33.2	28.8	22.2	24.0	17.5	12.9	11.0	2.3	36.1	17.2	24
24	14.2	21.2	18.9	16.5	13.2	15.2	31.4	29.5	S	32.8	33.5	33.8	34.6	38.2	39.3	40.1	39.6	39.1	37.8	36.3	37.9	33.6	31.7	33.6	13.2	40.1	30.5	24
25	33.8	33.9	33.6	33.5	33.2	29.7	26.2	S	26.4	31.9	32.7	34.3	38.0	39.4	37.6	36.8	35.4	32.3	24.4	22.5	15.9	19.6	38.0	38.5	15.9	39.4	31.6	24
26	34.9	34.4	34.0	33.9	36.3	37.3	S	33.0	32.2	32.3	32.8	33.7	33.3	33.6	34.6	36.7	37.0	36.7	35.8	33.0	30.8	26.9	26.1	29.5	26.1	37.3	33.4	24
27	30.2	30.9	29.8	27.1	24.2	S	21.9	23.5	23.5	27.0	30.0	35.1	35.9	35.3	32.8	32.5	33.5	35.7	32.4	26.4	19.4	31.4	31.4	31.2	19.4	35.9	29.6	24
28	31.7	29.0	23.6	21.1	S	13.5	8.3	7.5	14.0	23.7	27.5	29.6	32.6	34.4	34.6	34.1	32.7	33.0	29.3	30.5	32.4	33.2	33.6	32.4	7.5	34.6	27.1	24
HOURLY MAX	43.4	43.7	42.7	40.7	39.9	39.8	42.2	43.4	42.9	42.9	43.1	44.1	45.1	46.0	45.9	46.0	45.7	45.4	44.2	42.9	43.2	41.5	42.8	43.3				
HOURLY AVG	26.2	25.4	24.9	23.1	22.2	21.5	20.6	20.8	21.0	26.8	30.5	32.9	34.8	35.9	35.6	35.7	35.8	34.3	31.2	29.6	29.1	28.4	27.8	26.7				

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

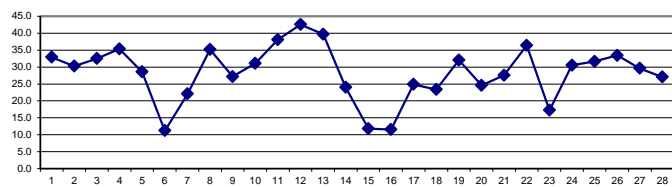
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

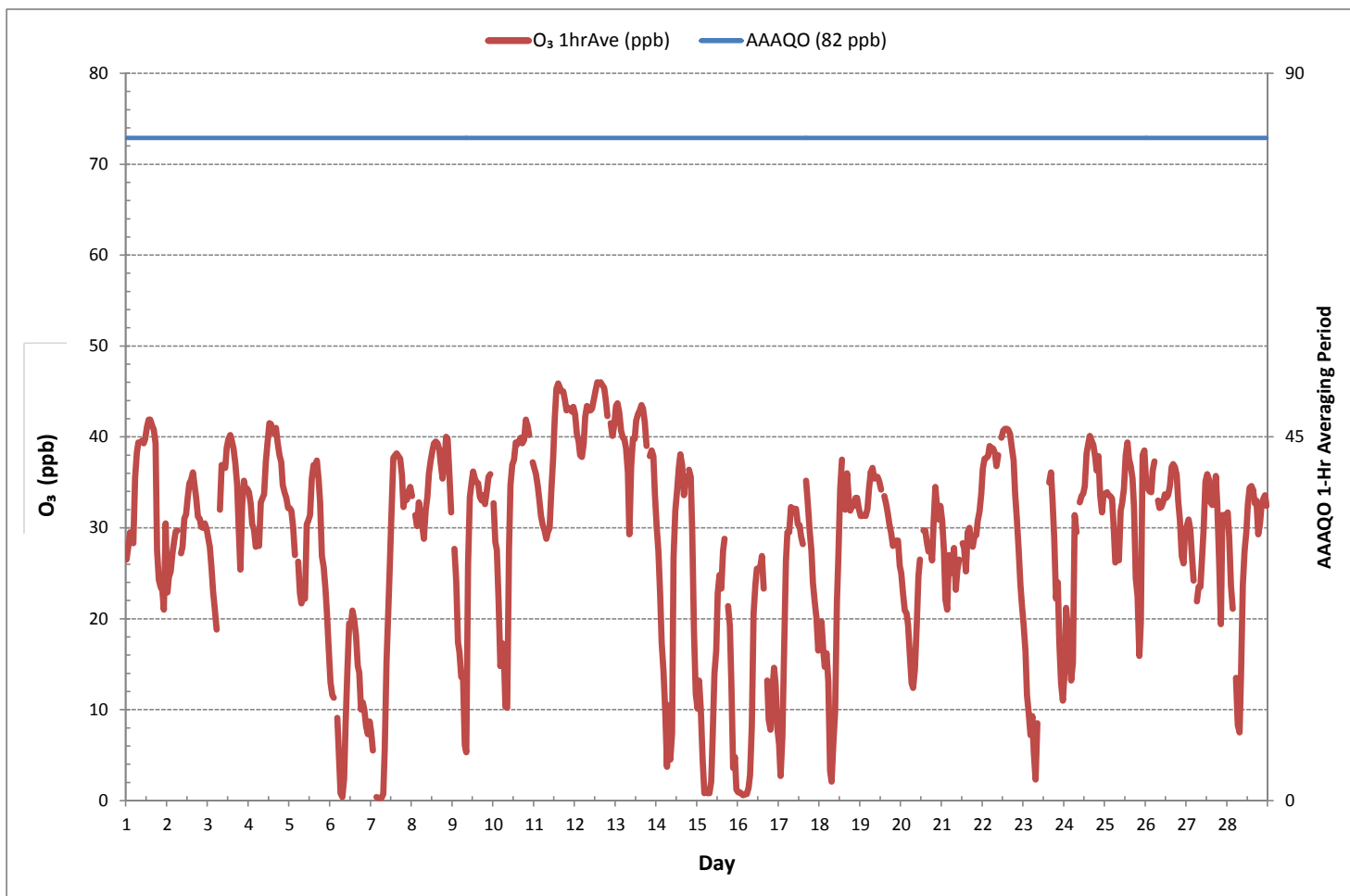
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	638					
MINIMUM 1-HR AVERAGE:	0.3	ppb	@ HOUR(S)	4	ON DAY(S)	7
MAXIMUM 1-HR AVERAGE:	46.0	ppb	@ HOUR(S)	13	ON DAY(S)	12
MAXIMUM 24-HR AVERAGE:	42.6	ppb			ON DAY(S)	12
					VAR-VARIOUS	
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	672	hrs	
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	11.0		MONTHLY AVERAGE:	28.4	ppb	

24 HR AVERAGES February 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	26.7	29.4	30.2	29.9	31.1	37.1	38.2	40.3	S	39.6	39.6	40.0	41.1	41.7	41.8	41.3	41.0	39.9	31.9	26.5	27.0	28.5	26.5	22.0	22.0	41.8	34.4	24	
2	23.5	26.5	26.5	27.7	28.6	30.1	29.9	S	27.3	29.3	31.3	32.0	33.6	35.1	35.7	36.5	35.3	33.9	32.4	31.0	30.1	29.7	30.2	30.1	23.5	36.5	30.7	24	
3	28.9	28.3	27.3	23.3	22.9	19.2	S	36.5	36.9	39.1	38.1	39.0	40.1	40.1	39.8	39.1	38.1	35.1	34.1	30.7	35.3	35.3	34.4	34.4	19.2	40.1	33.7	24	
4	34.4	33.3	31.5	31.3	28.5	S	31.0	34.7	33.3	36.2	37.4	40.8	41.4	41.1	40.8	43.9	40.8	39.9	38.5	37.7	35.0	34.7	33.9	32.3	28.5	43.9	36.2	24	
5	32.7	31.9	32.0	28.0	S	27.7	26.1	24.6	24.0	25.8	31.9	31.6	32.0	36.2	37.7	36.5	37.4	36.4	33.9	28.8	27.1	26.1	22.6	17.8	17.8	37.7	29.9	24	
6	14.4	13.5	12.9	S	10.3	7.6	2.0	0.1	4.8	10.8	18.3	19.8	19.5	21.2	21.2	18.9	14.8	14.4	11.5	11.5	11.3	8.5	7.9	9.3	0.1	21.2	12.4	24	
7	8.4	6.3	S	0.0	0.0	0.0	0.0	1.1	9.9	18.9	22.8	29.2	37.0	38.0	38.4	38.5	38.2	38.0	36.5	34.4	33.6	33.0	33.9	48.0	0.0	48.0	23.7	24	
8	34.1	S	31.6	31.3	32.9	31.8	30.7	29.8	32.2	34.8	36.0	37.7	38.4	39.3	39.4	39.4	39.1	36.8	36.2	38.4	39.9	39.8	38.4	33.0	29.8	39.9	35.7	24	
9	S	30.5	27.6	21.1	21.4	17.9	19.6	13.4	15.3	32.2	34.2	35.7	36.4	35.9	35.3	35.4	34.0	34.2	34.2	33.5	35.3	36.2	36.8	S	13.4	36.8	29.8	24	
10	34.1	34.7	28.9	28.3	18.0	19.6	19.0	14.4	15.2	32.6	36.7	38.0	38.7	39.6	39.0	39.8	39.9	39.6	40.9	41.6	41.3	40.5	S	37.6	14.4	41.6	33.0	24	
11	36.7	36.2	34.8	34.1	31.5	30.4	29.7	29.2	29.9	30.7	35.7	39.0	43.3	45.5	45.7	45.4	44.9	44.6	44.1	43.0	43.2	S	42.9	43.2	29.2	45.7	38.4	24	
12	43.0	40.8	39.8	37.9	37.7	40.9	42.5	43.3	42.7	42.8	43.2	44.3	45.5	46.0	45.8	45.8	45.8	45.7	44.3	44.3	S	41.4	41.1	43.0	37.7	46.0	42.9	24	
13	43.8	43.5	43.2	41.3	40.8	39.8	39.4	37.9	30.8	38.8	39.6	40.5	42.5	43.0	43.8	43.6	43.3	42.3	40.5	S	38.8	39.9	39.4	36.8	30.8	43.8	40.6	24	
14	33.3	29.7	24.7	24.1	17.7	20.9	4.7	17.2	14.0	21.4	30.7	32.4	35.9	36.8	38.8	39.2	34.5	36.2	S	37.8	37.8	35.1	23.5	14.7	4.7	39.2	27.9	24	
15	13.7	15.5	14.0	7.2	0.8	4.7	0.8	0.5	3.1	10.3	17.9	20.9	25.0	25.6	26.4	30.4	29.8	S	24.9	21.5	17.1	8.4	8.7	2.3	0.5	30.4	14.3	24	
16	0.5	1.1	0.2	0.2	0.6	1.4	1.9	7.8	16.9	22.3	24.6	25.6	25.6	25.6	27.3	26.4	S	17.6	15.5	11.3	15.2	15.9	14.9	12.3	0.2	27.3	13.5	24	
17	6.7	3.9	11.3	20.2	28.6	29.5	32.3	34.1	32.4	32.4	32.9	30.3	30.4	29.2	28.6	S	35.4	35.6	29.7	28.5	25.2	22.3	20.6	20.2	3.9	35.6	26.1	24	
18	21.5	20.6	17.2	15.9	18.8	17.4	7.6	7.2	7.5	15.6	25.3	28.5	36.4	38.2	S	36.1	37.0	34.8	32.9	33.6	32.3	33.2	33.6	32.4	7.2	38.2	25.4	24	
19	31.3	31.0	31.5	31.2	33.0	34.7	36.2	36.5	35.9	35.6	35.7	35.6	34.5	S	33.6	33.0	32.2	30.7	29.7	28.8	28.5	28.8	28.8	26.7	26.7	36.5	32.3	24	
20	26.1	25.3	21.4	20.9	19.9	18.9	13.2	12.9	15.3	22.0	25.5	25.5	29.5	S	30.1	29.7	28.6	28.7	28.8	27.6	33.9	34.7	33.2	31.8	32.3	12.9	34.7	25.6	24
21	31.7	30.7	25.3	24.8	30.1	25.5	26.6	28.9	26.5	26.2	27.4	S	29.5	29.2	26.0	30.4	29.8	28.9	27.9	29.4	29.8	32.2	32.6	35.1	24.8	35.1	28.9	24	
22	36.8	38.1	38.8	38.4	38.8	38.5	38.5	38.5	37.1	38.5	S	40.2	40.9	41.1	40.8	40.8	40.9	39.6	38.3	35.1	32.2	28.8	27.1	23.6	23.6	41.1	37.0	24	
23	23.0	18.9	13.4	12.9	10.3	13.7	7.9	4.9	12.4	C	C	C	C	C	C	C	36.1	36.7	35.1	34.2	26.0	29.8	22.9	16.7	13.8	4.9	36.7	20.5	24
24	23.8	25.2	21.1	19.5	16.2	30.2	32.2	30.8	S	33.5	34.4	34.8	36.2	39.8	40.7	40.8	40.6	39.7	39.3	37.6	38.7	36.4	33.5	34.2	16.2	40.8	33.0	24	
25	34.7	34.5	34.2	34.7	34.5	33.9	28.2	S	29.1	33.2	33.5	36.0	40.2	40.3	38.2	37.4	36.2	34.5	30.7	24.9	23.3	36.5	39.4	39.4	23.3	40.3	34.2	24	
26	36.8	35.1	35.0	34.8	38.0	38.0	S	34.7	32.6	32.6	33.5	34.1	33.9	34.1	35.6	37.6	37.6	37.6	36.8	34.4	32.9	29.4	28.6	31.9	28.6	38.0	34.6	24	
27	30.7	32.2	31.9	28.3	25.8	S	24.6	24.4	26.1	28.2	34.8	35.9	36.8	37.1	33.5	P	35.1	37.3	35.3	32.0	25.5	32.2	31.8	31.5	24.4	37.3	31.4	23	
28	32.0	31.9	26.4	22.7	S	16.7	11.6	12.8	21.8	27.9	30.1	32.6	33.6	36.2	35.4	34.8	33.8	33.9	33.2	31.7	33.8	34.1	34.4	33.8	11.6	36.2	29.4	24	
HOURLY MAX	43.8	43.5	43.2	41.3	40.8	40.9	42.5	43.3	42.7	42.8	43.2	44.3	45.5	46.0	45.8	45.8	45.8	45.7	44.3	44.3	44.3	43.2	41.4	42.9	48.0				
HOURLY AVG	27.5	27.0	26.4	24.8	23.7	24.1	22.1	22.9	23.6	29.3	32.0	34.0	35.7	36.4	36.1	36.8	36.3	35.2	33.1	31.4	30.9	30.5	29.4	28.6					

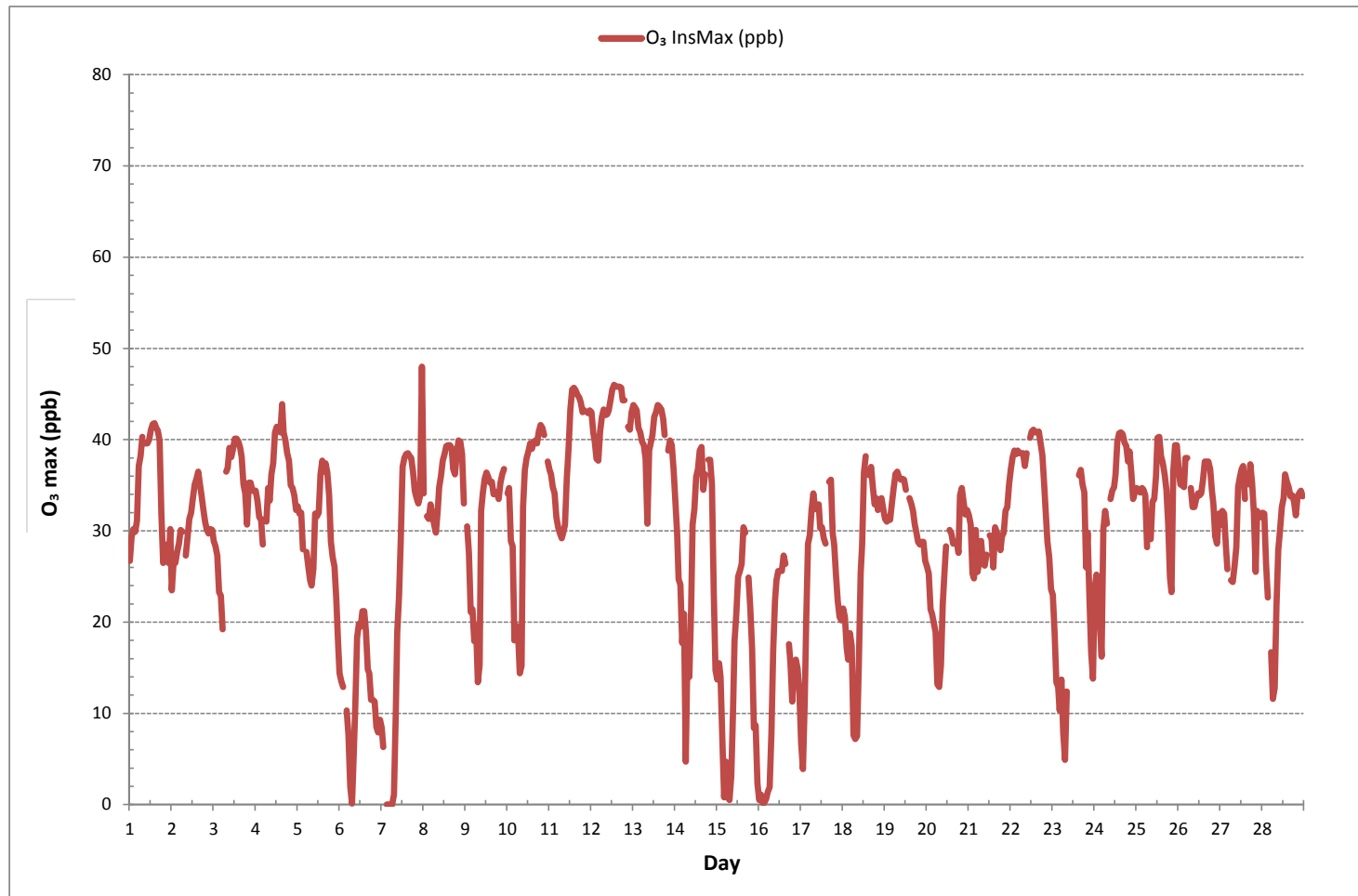
STATUS FLAG CODES

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:	633
MAXIMUM INSTANTANEOUS VALUE:	48.0 ppb @ HOUR(S) 23 ON DAY(S) 7
	VAR-VARIOUS
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	671 hrs
STANDARD DEVIATION:	10.3

OZONE Instantaneous Maximum (O₃ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-O3 [ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 23.35% Calm Avg: 16.47 [ppb]

Direction	0.0-15.4	15.4-30.7	30.7-46.1	>46.1	Total
N	0.3	0.5	4.6	0.0	5.3
NE	0.5	1.1	3.6	0.0	5.2
E	0.3	1.4	5.8	0.0	7.5
SE	0.2	1.6	2.7	0.0	4.4
S	0.0	0.3	0.5	0.0	0.8
SW	0.9	4.2	11.4	0.0	16.6
W	1.7	10.0	14.1	0.0	25.9
NW	0.2	2.4	8.5	0.0	11.0
Summary	4.1	21.5	51.1	0.0	76.6

% Icon Classes (ppb)

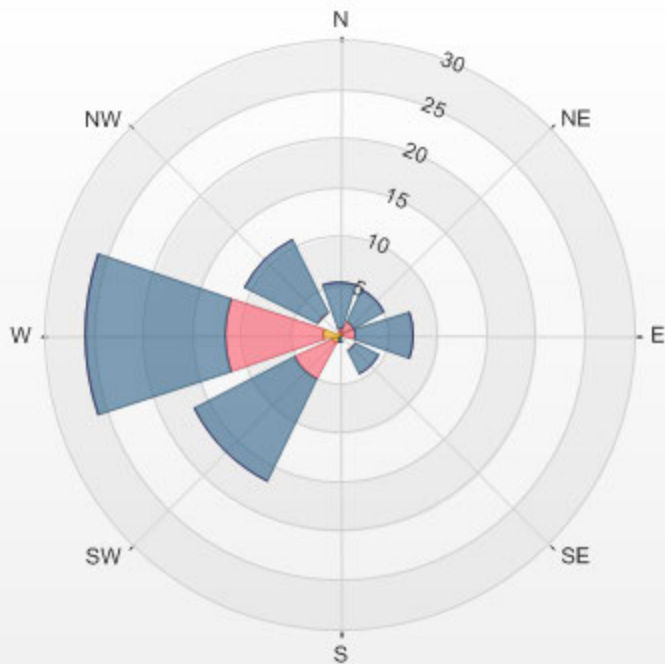
4 0.0-15.4

21 15.4-30.7

51 30.7-46.1

0 >46.1

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2017/02/01 00:00 - 2017/02/28 23:00
Calm: 23.35% Calm Poll Avg: 16.47[ppb]



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	1.9	0.5	2.5	1.4	0.0	2.9	1.4	0.0	1.4	1.4	2.5	1.0	0.4	0.0	0.0	0.0	1.0	0.5	7.0	5.0	4.0	6.5	1.9	4.0	0.0	7.0	2.0	24
2	4.4	2.5	6.0	5.9	2.9	3.4	1.4	6.0	1.0	3.4	1.9	0.0	2.5	1.0	4.0	7.0	7.0	9.9	5.0	6.0	9.9	9.0	5.5	6.0	0.0	9.9	4.7	24
3	7.0	7.5	9.4	6.0	7.5	7.0	9.4	4.0	3.4	7.0	0.5	0.0	0.4	0.0	5.0	2.5	0.0	1.4	2.5	1.9	0.0	2.5	1.9	2.5	0.0	9.4	3.7	24
4	0.0	2.5	3.4	2.9	5.0	5.0	0.0	2.5	3.4	3.4	1.9	0.0	0.5	0.0	0.0	5.5	3.4	5.0	0.0	1.0	1.4	1.9	1.4	0.0	0.0	5.5	2.1	24
5	0.5	0.5	3.4	0.0	4.4	0.5	3.4	2.9	2.5	2.9	1.4	4.4	6.0	0.0	5.0	5.5	7.5	6.0	4.4	1.9	2.5	5.0	2.9	5.0	0.0	7.5	3.3	24
6	2.5	4.0	5.0	5.0	0.0	4.4	1.0	4.4	4.4	3.9	4.0	0.4	7.0	6.0	7.0	2.9	3.4	4.4	7.5	5.0	7.5	5.5	5.0	7.9	0.0	7.9	4.5	24
7	6.5	4.0	9.4	7.9	8.4	5.5	7.0	5.0	5.9	8.9	5.9	2.9	7.0	1.0	5.5	5.5	1.0	1.4	4.0	4.4	3.4	8.4	1.4	7.0	1.0	9.4	5.3	24
8	6.0	7.0	5.5	8.4	1.0	5.0	0.0	5.0	4.9	1.9	2.5	2.9	1.0	3.4	2.5	2.9	5.5	5.0	1.0	4.0	1.4	2.9	4.0	6.5	0.0	8.4	3.8	24
9	5.0	5.5	5.0	1.4	6.5	8.4	7.5	12.5	13.0	16.0	18.0	11.5	13.5	13.0	15.0	12.4	9.4	9.4	10.9	7.5	6.5	9.9	4.0	10.5	1.4	18.0	9.7	24
10	6.5	5.5	6.5	7.9	7.9	7.5	6.5	7.0	7.9	7.0	C	C	6.5	4.4	5.0	0.0	1.9	4.4	5.5	1.4	1.4	5.5	9.9	5.5	0.0	9.9	5.5	24
11	7.5	6.5	9.0	9.4	9.4	7.0	10.9	9.9	10.9	9.9	2.5	0.0	0.0	0.5	0.0	0.0	X	0.0	0.0	X	1.0	0.0	1.4	X	0.0	10.9	4.6	21
12	1.9	0.0	0.0	1.0	1.9	1.9	1.9	0.0	0.0	0.4	X	X	0.0	X	X	X	X	0.0	1.4	0.0	1.9	2.9	2.5	1.9	0.0	2.9	1.1	18
13	1.9	0.5	2.9	X	2.9	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	X	X	X	1.0	2.5	0.5	0.0	X	1.0	0.0	2.9	0.7	18
14	2.9	1.9	5.0	1.9	2.5	8.4	9.9	3.4	9.0	15.4	4.0	7.0	0.0	1.0	0.0	0.0	X	0.0	X	0.0	X	0.0	1.9	4.4	0.0	15.4	3.8	22
15	2.5	1.0	1.9	1.4	0.5	6.0	1.9	7.9	4.4	6.5	2.9	5.0	9.0	5.5	2.5	7.5	4.0	X	0.0	1.9	2.5	1.9	3.4	5.0	0.0	9.0	3.7	23
16	8.4	9.0	7.5	4.4	5.0	6.5	7.5	4.4	3.4	5.5	2.9	0.5	X	X	0.0	X	0.0	X	0.4	1.9	3.4	0.0	0.0	1.9	0.0	9.0	3.6	20
17	0.0	7.0	6.5	1.0	1.4	1.0	1.4	0.5	1.4	3.4	1.9	2.9	1.4	1.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	3.4	4.0	0.0	7.0	1.7	24
18	1.9	1.9	1.0	2.5	1.4	2.5	1.4	4.4	4.4	7.0	5.0	2.5	3.4	X	0.0	7.0	0.5	1.9	1.4	1.9	0.0	0.0	0.5	0.0	0.0	7.0	2.3	23
19	1.9	2.9	1.9	2.5	0.0	1.9	1.9	1.9	1.4	2.9	1.9	1.4	0.0	2.5	0.0	0.0	0.0	0.5	1.9	0.5	1.0	0.0	0.0	0.0	0.0	2.9	1.2	24
20	0.0	1.4	1.4	0.0	2.9	0.0	0.0	0.0	0.0	2.9	0.5	1.0	0.5	2.5	0.5	0.0	1.4	1.4	0.5	1.0	3.4	1.0	4.0	0.0	4.0	1.1	24	
21	1.4	2.5	2.5	4.0	4.4	1.9	2.9	2.9	2.5	4.4	C	C	5.0	5.0	3.4	7.0	7.9	6.5	7.5	7.9	7.0	3.4	1.9	4.0	1.4	7.9	4.4	24
22	0.5	4.4	1.0	0.0	2.9	X	0.0	0.0	0.0	3.9	0.0	1.4	0.5	5.5	2.5	2.5	3.4	2.9	1.9	1.9	0.0	0.0	0.5	0.0	5.5	1.6	23	
23	0.0	5.0	1.9	7.0	4.0	4.4	1.9	2.5	5.0	8.4	3.9	0.0	3.9	1.4	0.0	0.0	6.0	6.0	1.9	4.0	1.9	4.4	5.0	1.0	8.4	3.1	24	
24	7.0	0.5	2.9	2.5	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	1.9	3.4	0.0	2.9	1.0	2.5	0.5	1.0	1.0	0.5	0.0	7.0	1.4	24	
25	2.5	2.5	0.5	0.0	3.4	2.9	1.4	2.9	1.9	1.9	1.0	1.0	6.0	5.5	4.0	1.9	9.4	7.5	10.5	9.9	10.5	1.4	1.0	0.0	10.5	4.0	24	
26	0.0	0.5	0.5	1.4	0.0	2.9	0.0	3.4	4.0	1.9	1.0	0.5	9.0	1.4	2.5	0.5	0.0	1.9	0.5	4.0	1.0	6.5	4.0	1.9	0.0	9.0	2.1	24
27	1.0	1.0	4.4	2.9	6.5	4.0	1.9	8.4	4.4	6.5	4.0	4.0	7.9	8.4	0.0	7.9	3.4	4.4	0.0	0.0	4.4	9.0	6.5	6.5	0.0	9.0	4.5	24
28	4.0	4.0	4.0	7.5	2.9	7.9	4.0	9.9	5.4	2.5	1.0	12.5	5.0	3.4	1.9	0.0	1.9	2.5	2.4	4.5	4.4	0.0	1.9	2.9	0.0	12.5	4.0	24
HOURLY MAX	8.4	9.0	9.4	9.4	9.4	8.4	10.9	12.5	13.0	16.0	18.0	12.5	13.5	13.0	15.0	12.4	9.4	9.9	10.9	10.5	9.9	10.5	9.9	10.5				
HOURLY AVG	3.1	3.3	4.0	3.6	3.6	4.2	3.1	4.0	3.8	5.0	2.8	2.5	3.7	3.0	2.6	3.1	3.1	3.4	2.9	3.0	3.0	3.6	2.8	3.4				

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

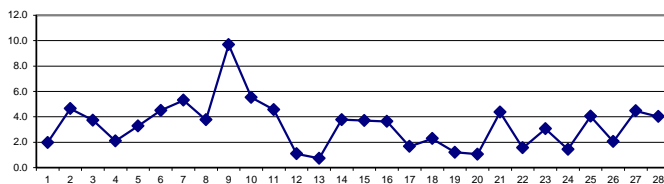
OBJECTIVE LIMIT:

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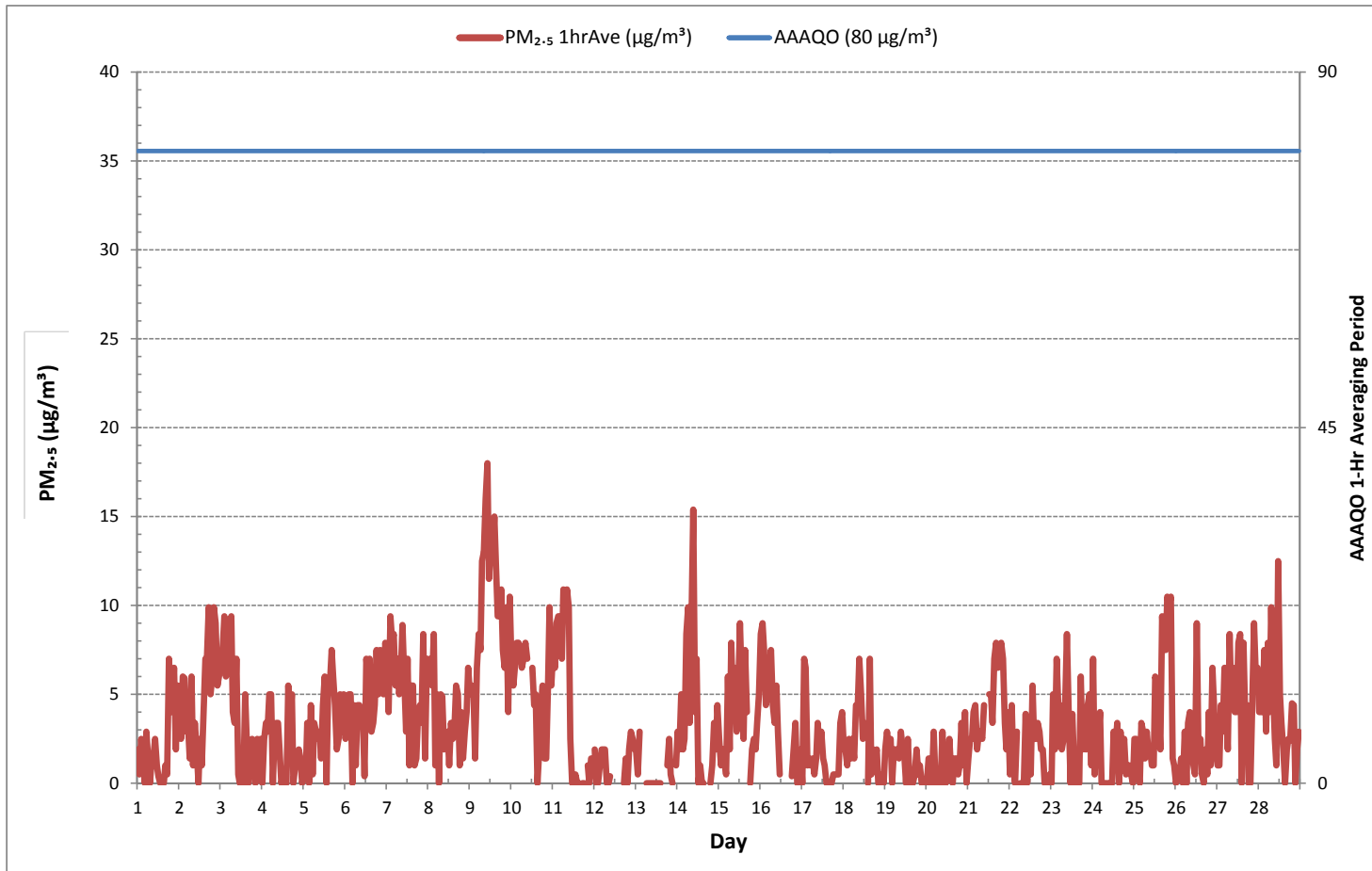
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	530				
MINIMUM 1-HR AVERAGE:	0.0 µg/m ³	@ HOUR(S)	4	ON DAY(S)	1
MAXIMUM 1-HR AVERAGE:	18.0 µg/m ³	@ HOUR(S)	10	ON DAY(S)	9
MAXIMUM 24-HR AVERAGE:	9.7 µg/m ³			ON DAY(S)	9
				VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	4 hrs	OPERATIONAL TIME:	648 hrs		
STANDARD DEVIATION:	3.1	AMD OPERATION UPTIME:	96.4 %		
		MONTHLY AVERAGE:	3.4 µg/m ³		

24 HR AVERAGES February 2017



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



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-PM25 [ug/m3(L)]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

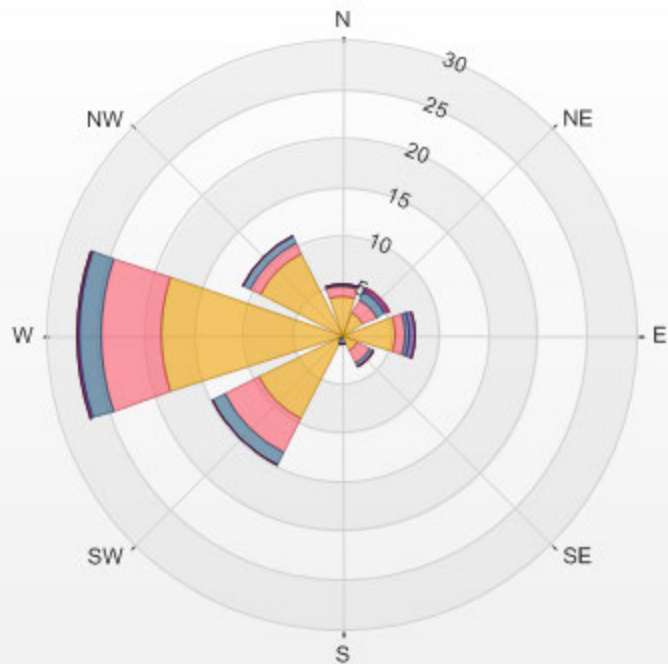
Calm: 24.07%

Calm Avg: 4.43 [ug/m3(L)]

Direction	0.0-3.6	3.6-7.2	7.2-10.9	10.9-14.5	14.5-18.1	>18.1	Total
N	4.0	0.9	0.3	0.0	0.0	0.0	5.3
NE	2.5	1.6	0.9	0.3	0.2	0.0	5.4
E	5.6	0.9	0.5	0.5	0.0	0.0	7.5
SE	1.9	1.4	0.3	0.0	0.2	0.0	3.7
S	0.2	0.3	0.5	0.0	0.0	0.0	0.9
SW	9.5	3.9	1.4	0.0	0.0	0.0	14.8
W	18.3	6.2	2.2	0.3	0.0	0.0	27.0
NW	9.2	1.4	0.8	0.0	0.0	0.0	11.3
Summary	51.1	16.6	6.8	1.1	0.3	0.0	75.9

% Icon	Classes (ug/m3(L))	51		0.0-3.6	17		3.6-7.2	7		7.2-10.9	1		10.9-14.5	0		14.5-18.1	0		>18.1
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM25[ug/m3(L)] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 24.07%
 Calm Poll Avg: 4.43[ug/m3(L)]



WIND SPEED



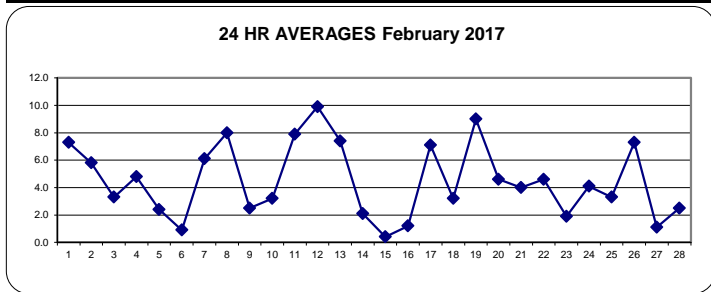
WIND SPEED Hourly Averages (WS kph)

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	5.8	6.0	6.2	5.4	4.8	11.5	12.8	13.5	11.9	11.0	15.1	14.0	12.7	12.8	11.7	11.4	8.8	4.6	2.2	1.2	1.5	3.7	2.1	3.2	1.2	15.1	7.3	24
2	3.6	3.4	3.5	4.7	5.2	4.9	5.7	5.6	7.2	6.6	6.4	9.1	8.3	8.5	8.7	9.6	6.8	5.6	3.5	5.1	5.0	4.7	4.0	4.1	3.4	9.6	5.8	24
3	4.4	3.2	1.4	1.9	2.0	1.4	1.2	3.6	4.5	4.4	5.9	3.5	4.3	4.3	5.2	5.9	4.8	3.7	1.2	1.6	5.5	6.9	7.3	6.6	1.2	7.3	3.3	24
4	1.8	0.5	0.9	2.9	3.8	3.7	3.5	3.6	3.9	6.2	8.5	10.1	11.5	9.7	10.0	10.4	7.6	5.4	4.4	4.6	3.7	3.4	3.4	2.7	0.5	11.5	4.8	24
5	3.6	2.7	1.0	0.4	0.2	1.1	0.4	0.3	0.4	0.8	3.0	3.8	6.5	9.3	8.3	9.7	8.0	7.5	7.0	3.9	1.9	1.2	1.5	0.2	0.2	9.7	2.4	24
6	0.4	0.7	0.7	0.5	0.6	0.8	0.3	0.4	1.6	1.8	1.5	1.9	2.5	4.2	5.6	4.7	2.0	1.4	1.8	1.1	2.1	1.3	1.5	2.6	0.3	5.6	0.9	24
7	2.8	3.0	4.4	4.3	3.9	2.3	1.1	1.1	3.1	5.1	5.8	6.1	9.4	11.1	10.3	10.4	9.5	9.5	7.9	6.0	7.6	7.3	8.5	8.6	1.1	11.1	6.1	24
8	8.4	8.1	7.3	6.1	7.7	6.6	7.2	5.0	6.9	8.0	9.9	9.6	11.0	14.5	15.0	12.7	11.9	10.7	8.5	8.5	8.9	7.3	1.5	0.2	0.2	15.0	8.0	24
9	0.8	1.1	0.3	0.5	0.5	0.4	0.6	0.5	1.2	1.7	4.1	4.7	4.0	4.7	6.5	3.8	5.1	4.9	4.4	4.8	3.6	3.8	3.4	3.1	0.3	6.5	2.5	24
10	1.7	0.2	1.3	0.5	1.0	0.1	0.7	0.6	1.2	4.0	5.6	5.5	5.4	7.1	7.7	7.9	7.8	5.0	5.1	5.8	4.4	3.3	2.1	1.3	0.1	7.9	3.2	24
11	2.0	2.3	3.0	5.0	6.5	6.8	5.0	5.7	6.1	6.7	10.3	10.8	12.8	15.8	15.9	12.2	11.6	11.1	9.1	7.4	9.3	8.1	6.0	7.5	2.0	15.9	7.9	24
12	10.4	7.5	9.6	8.0	7.8	7.4	7.2	9.1	9.0	11.0	10.6	12.8	14.3	14.1	13.3	13.0	10.6	9.8	9.2	10.1	7.7	8.8	8.9	8.7	7.2	14.3	9.9	24
13	10.0	9.9	10.1	10.6	7.7	8.3	6.9	7.3	6.8	7.9	9.8	8.5	9.3	9.1	9.6	9.1	8.5	6.9	4.6	4.2	4.9	4.3	4.1	4.4	4.1	10.6	7.4	24
14	3.0	3.3	2.7	1.9	0.9	0.5	0.6	1.6	0.7	0.6	2.1	6.2	6.2	6.1	5.8	3.3	6.9	3.9	3.7	3.0	4.5	1.7	0.8	0.4	0.4	6.9	2.1	24
15	1.0	0.2	1.0	0.3	1.0	1.2	0.9	2.0	1.5	1.4	1.5	3.3	3.5	1.8	2.0	2.2	5.4	5.0	3.4	4.0	0.8	0.3	0.9	0.7	0.2	5.4	0.4	24
16	1.3	0.8	1.6	2.0	0.4	2.1	2.9	1.5	0.7	5.2	3.5	4.7	4.5	4.2	3.0	1.4	1.5	0.5	1.4	0.8	5.2	5.4	2.3	1.4	0.4	5.4	1.2	24
17	5.3	5.3	4.8	6.5	7.6	8.6	6.8	7.8	6.2	7.7	7.4	9.1	12.2	11.3	9.8	9.8	11.6	7.1	8.1	5.8	5.4	5.5	4.9	3.3	3.3	12.2	7.1	24
18	4.5	4.2	4.3	3.8	4.6	1.0	1.4	1.0	0.8	1.1	2.1	3.9	5.7	4.5	5.6	4.9	6.3	7.8	5.7	7.0	8.8	10.4	10.5	10.2	0.8	10.5	3.2	24
19	10.5	12.3	12.4	13.6	14.1	16.2	14.9	14.7	11.3	9.7	9.3	8.3	8.0	7.8	7.0	7.0	6.9	5.7	6.0	5.4	4.8	4.3	4.0	3.8	3.8	16.2	9.0	24
20	2.3	0.9	2.1	1.7	2.5	5.1	6.5	6.2	6.4	6.5	6.7	7.6	8.4	8.3	7.6	4.4	4.3	4.7	3.4	7.3	6.2	3.6	3.4	6.1	0.9	8.4	4.6	24
21	2.9	1.4	0.9	1.2	2.2	2.9	2.6	2.1	1.9	3.3	5.4	5.5	5.5	5.9	5.9	8.7	6.8	5.6	5.8	8.0	9.4	7.0	5.4	9.4	0.9	9.4	4.0	24
22	6.4	6.9	4.8	5.4	6.4	6.6	6.9	5.7	1.6	5.5	4.6	8.8	8.7	7.0	7.0	8.4	5.8	4.6	7.2	4.0	2.9	2.4	1.3	2.2	1.3	8.8	4.6	24
23	0.9	0.3	0.2	0.1	0.7	0.9	0.2	0.7	0.8	2.8	4.5	4.3	6.8	7.3	7.7	7.4	6.0	2.2	0.5	1.0	1.3	0.9	0.7	0.5	0.1	7.7	1.9	24
24	1.8	1.1	0.6	0.2	0.6	2.7	7.1	6.3	7.7	7.3	6.7	4.7	8.2	10.0	9.3	12.3	10.6	8.5	6.2	4.4	5.9	2.6	2.6	3.1	0.2	12.3	4.1	24
25	3.8	4.1	3.7	4.8	4.5	1.7	0.3	0.5	0.4	2.6	4.2	6.4	7.8	8.4	8.2	7.6	5.6	3.1	0.4	0.5	2.0	3.1	7.9	3.9	0.3	8.4	3.3	24
26	3.5	4.4	6.4	8.1	15.3	19.0	16.8	11.7	14.5	13.7	12.9	13.5	11.3	8.7	9.0	8.8	7.2	4.3	3.7	1.8	0.7	0.8	1.5	1.7	0.7	19.0	7.3	24
27	1.1	0.6	0.7	1.1	1.5	0.5	1.6	1.8	0.9	3.1	4.8	6.5	6.1	1.8	1.8	7.1	5.8	6.5	4.7	2.1	1.7	7.8	9.9	9.1	0.5	9.9	1.1	24
28	8.1	1.5	0.4	0.7	0.6	0.2	0.3	0.6	1.0	1.1	5.4	1.7	5.0	6.4	5.9	3.4	3.5	3.8	2.9	4.8	6.1	6.1	4.7	7.1	0.2	8.1	2.5	24
HOURLY MAX	10.5	12.3	12.4	13.6	15.3	19.0	16.8	14.7	14.5	13.7	15.1	14.0	14.3	15.8	15.9	13.0	11.9	11.1	9.2	10.1	9.4	10.4	10.5	10.2				
HOURLY AVG	2.0	2.1	2.1	2.1	1.9	1.7	1.5	1.6	1.9	2.6	3.4	3.6	4.0	4.2	4.2	3.5	2.8	2.3	1.8	1.9	1.8	1.4	1.0	1.0				

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

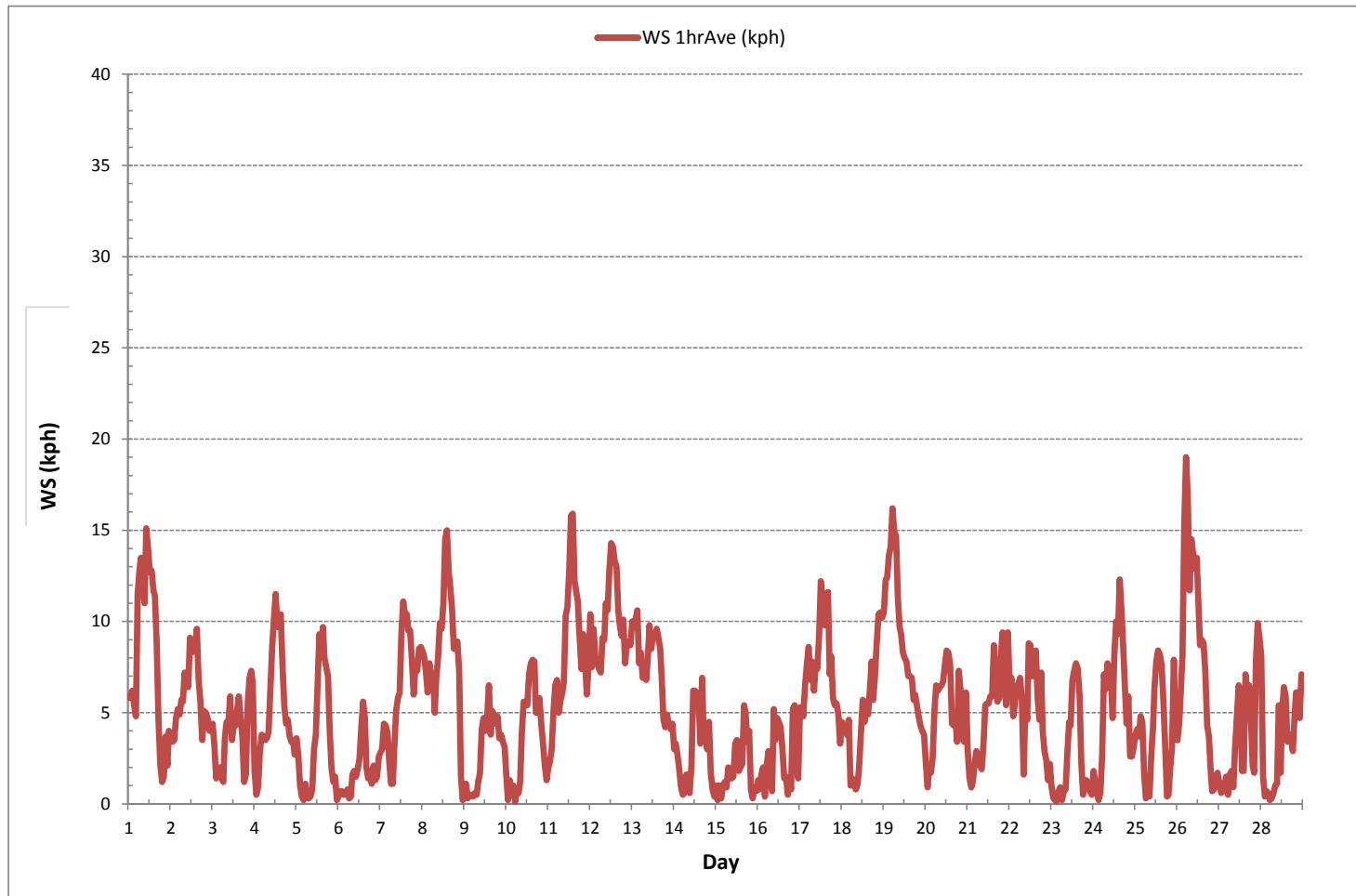
LAST CALIBRATION:	April 1, 2015
DECLINATION :	MAGNETIC DECLINATION 14 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	672
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR(S) 5 ON DAY(S) 10
MAXIMUM 1-HR AVERAGE:	19.0 kph @ HOUR(S) 5 ON DAY(S) 26
MAXIMUM 24-HR AVERAGE:	9.9 kph ON DAY(S) 12
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	672 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.7
MONTHLY AVERAGE:	2.3 kph

WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	8.6	8.7	8.5	7.5	10.4	18.0	19.3	22.4	18.2	19.5	21.2	20.4	19.9	17.6	18.3	17.2	14.2	8.3	3.6	3.4	3.2	6.0	3.9	5.9	3.2	22.4	12.7	24
2	6.7	5.4	5.4	8.1	8.2	7.5	8.0	8.3	10.6	10.8	12.0	13.3	12.9	13.7	13.7	14.3	9.9	9.6	5.7	8.1	8.5	7.2	6.3	6.1	5.4	14.3	9.2	24
3	7.0	6.0	5.1	5.3	3.7	4.6	3.1	6.2	8.1	7.1	8.6	7.3	11.2	8.6	10.0	10.0	9.9	4.7	4.1	5.4	9.6	10.3	10.5	9.2	3.1	11.2	7.3	24
4	6.0	1.6	1.9	7.1	5.8	5.5	5.9	6.3	6.9	9.5	15.2	17.7	19.3	15.9	16.8	15.4	13.8	7.7	6.9	7.4	6.5	4.6	7.3	5.5	1.6	19.3	9.0	24
5	6.8	5.4	3.2	1.8	2.1	2.8	3.1	2.2	4.7	3.7	9.3	9.2	12.5	14.8	13.0	15.7	18.5	12.7	11.3	7.3	5.2	3.0	3.6	3.7	1.8	18.5	7.3	24
6	6.9	4.9	2.6	9.0	4.2	2.6	6.9	5.0	3.7	4.4	4.8	5.5	6.6	7.7	9.0	10.0	4.9	3.5	4.2	2.4	5.2	2.7	3.1	5.1	2.4	10.0	5.2	24
7	5.2	4.8	7.1	6.3	7.0	4.5	27.6	23.4	6.2	8.9	9.2	9.8	18.2	17.4	15.5	16.6	14.9	13.8	11.8	9.5	10.5	10.9	12.9	12.0	4.5	27.6	11.8	24
8	12.3	12.3	10.9	8.7	12.7	8.7	10.0	8.1	9.9	13.0	17.3	17.8	17.1	21.0	20.7	20.3	16.5	16.8	14.3	12.4	13.9	12.8	6.6	3.0	3.0	21.0	13.2	24
9	6.4	3.7	3.2	3.7	3.3	3.9	5.4	2.2	4.1	3.7	7.3	7.7	7.3	9.8	9.9	8.4	8.3	8.1	7.2	10.8	6.6	8.9	6.0	5.3	2.2	10.8	6.3	24
10	4.6	3.1	4.7	2.6	2.3	2.4	2.9	2.5	4.8	9.0	10.3	8.6	8.4	11.5	14.2	12.8	12.0	11.0	9.1	8.6	12.7	7.4	4.9	3.1	2.3	14.2	7.2	24
11	4.4	5.3	6.7	7.4	11.1	11.1	9.2	10.3	10.0	9.1	14.6	14.8	25.5	22.6	22.3	20.2	17.5	15.0	13.5	11.7	14.8	12.7	8.7	15.3	4.4	25.5	13.1	24
12	14.8	10.7	13.2	13.4	11.3	11.9	11.3	12.3	12.4	17.0	15.2	18.8	18.9	24.8	19.7	21.6	14.3	14.0	14.5	14.8	11.2	13.0	13.1	15.9	10.7	24.8	14.9	24
13	12.9	14.4	13.4	13.2	13.9	12.0	9.6	9.2	8.7	14.0	15.0	13.0	13.5	13.6	14.1	13.8	12.9	11.0	8.6	7.6	6.7	7.1	5.6	7.2	5.6	15.0	11.3	24
14	5.5	6.4	5.0	4.3	3.1	3.1	4.9	4.1	2.3	2.2	6.6	10.2	11.0	10.1	8.5	8.0	10.1	6.9	6.8	6.4	8.6	5.0	3.6	2.6	2.2	11.0	6.1	24
15	4.4	3.3	4.1	3.7	3.5	3.7	4.3	5.2	4.9	4.4	6.0	6.7	7.7	6.4	6.4	6.0	9.3	8.5	7.8	5.7	2.8	5.4	5.3	3.5	2.8	9.3	5.4	24
16	4.2	2.6	3.5	4.8	2.6	4.9	5.5	3.8	5.9	8.4	6.6	7.6	9.6	8.2	9.2	5.0	6.7	3.3	3.5	5.7	14.6	14.8	7.9	5.9	2.6	14.8	6.5	24
17	8.4	9.2	6.7	10.2	10.3	12.0	10.2	12.5	9.9	11.6	12.2	15.5	19.2	15.7	16.9	15.4	18.5	11.1	11.7	9.6	7.7	8.5	6.5	5.6	5.6	19.2	11.5	24
18	6.7	6.3	5.7	5.7	8.4	6.2	5.8	4.0	2.5	4.4	6.7	7.6	10.4	12.6	9.2	8.3	9.4	12.0	8.2	11.6	12.3	15.3	16.5	15.8	2.5	16.5	8.8	24
19	15.5	18.7	21.2	20.8	19.6	24.6	22.0	24.2	19.7	14.2	15.5	13.3	12.0	13.0	13.6	10.8	12.3	10.0	8.9	8.7	8.3	6.9	7.9	7.0	6.9	24.6	14.5	24
20	5.4	2.8	3.1	3.5	5.9	8.0	10.1	9.4	8.7	10.2	12.2	14.0	16.0	15.1	11.9	7.8	8.3	9.0	6.2	10.9	10.2	5.3	6.0	11.0	2.8	16.0	8.8	24
21	8.2	4.2	3.4	5.0	7.3	4.5	5.0	4.5	6.2	6.0	9.4	8.8	9.5	9.7	9.5	16.2	10.7	10.8	8.7	14.0	16.4	11.5	9.8	15.1	3.4	16.4	8.9	24
22	11.9	11.6	8.5	9.8	11.3	9.7	11.4	10.0	5.5	12.2	10.9	15.0	14.5	12.1	16.4	13.8	10.9	8.8	16.9	7.3	5.2	3.8	3.3	3.5	3.3	16.9	10.2	24
23	2.4	2.2	1.6	3.1	3.0	3.0	1.7	3.6	3.6	6.6	7.2	8.0	12.0	12.7	12.8	11.2	12.5	6.1	4.1	2.4	2.5	2.6	2.0	3.7	1.6	12.8	5.4	24
24	5.5	5.5	2.3	1.5	3.0	8.9	11.2	11.5	11.3	12.3	13.4	11.1	12.8	14.1	16.8	19.0	18.3	12.0	10.3	9.0	10.8	7.2	4.6	5.4	1.5	19.0	9.9	24
25	7.4	6.9	6.2	7.2	6.3	5.4	1.9	2.3	1.7	5.3	7.5	10.0	13.3	13.3	12.7	11.1	9.0	6.6	1.9	1.3	3.8	11.8	13.5	7.0	1.3	13.5	7.2	24
26	4.9	7.1	10.6	15.5	23.9	30.9	25.7	20.4	19.4	20.4	20.9	20.5	17.9	15.9	16.4	14.9	11.0	8.4	6.2	3.9	3.8	2.7	3.5	4.2	2.7	30.9	13.7	24
27	2.5	2.6	2.7	2.9	4.3	2.6	5.3	4.7	4.0	6.0	9.9	10.3	9.5	11.1	14.1	P	9.9	10.4	6.5	4.4	7.2	11.4	14.8	12.5	2.5	14.8	7.4	23
28	10.5	6.0	1.9	2.3	2.4	3.8	3.3	7.1	4.1	10.5	11.6	7.9	8.6	10.3	9.6	8.4	6.7	6.6	6.3	9.1	8.7	9.0	6.6	13.6	1.9	13.6	7.3	24
HOURLY MAX	15.5	18.7	21.2	20.8	23.9	30.9	27.6	24.2	19.7	20.4	21.2	20.5	25.5	24.8	22.3	21.6	18.5	16.8	16.9	14.8	16.4	15.3	16.5	15.9				
HOURLY AVG	7.4	6.5	6.2	6.9	7.5	8.1	9.0	8.8	7.8	9.4	11.3	11.8	13.4	13.5	13.6	13.0	11.8	9.5	8.2	7.8	8.5	8.1	7.3	7.6				

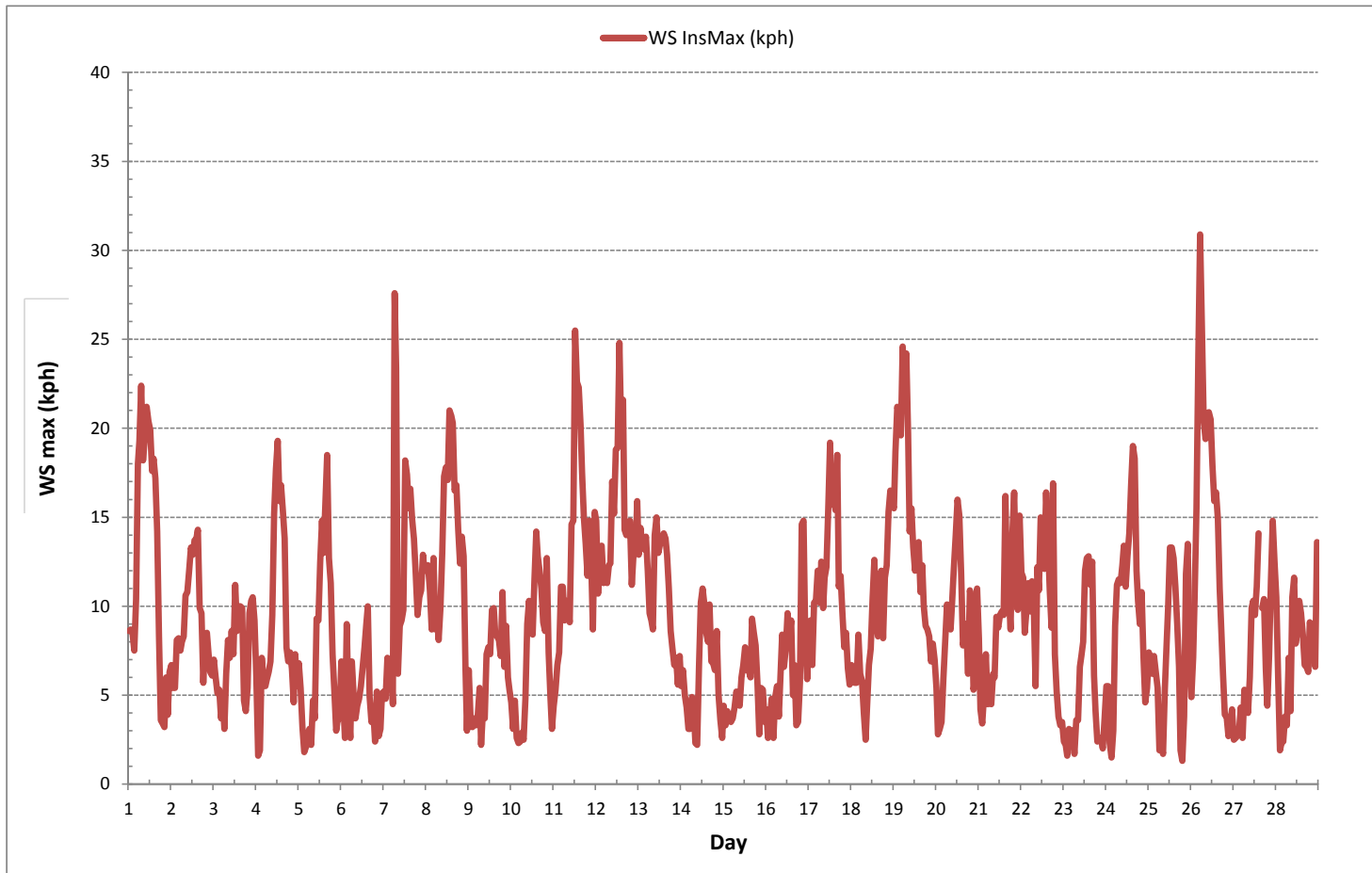
STATUS FLAG CODES

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:	30.9	kph	@ HOUR(S)	5	ON DAY(S)	26
					VAR-VARIOUS	
OPERATIONAL TIME:					671	hrs

WIND SPEED Instantaneous Maximum (WS kph)



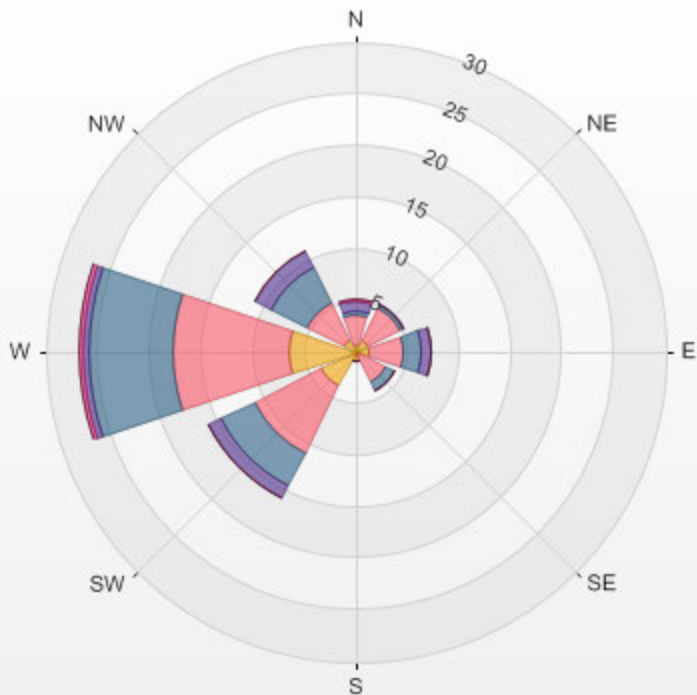
Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 2017/02
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 23.36%

Direction	1.8-3.8	3.8-7.6	7.6-11.5	11.5-15.3	15.3-19.1	>19.1	Total
N	0.7	2.8	0.5	0.9	0.3	0.0	5.2
NE	1.3	3.4	0.5	0.0	0.0	0.0	5.2
E	1.3	3.3	1.8	0.9	0.2	0.0	7.4
SE	0.5	2.8	1.0	0.0	0.0	0.0	4.3
S	0.9	0.0	0.0	0.0	0.0	0.0	0.9
SW	3.7	7.3	3.6	1.3	0.0	0.0	15.9
W	6.6	11.2	8.2	0.6	0.3	0.0	26.8
NW	1.2	4.2	3.9	1.6	0.0	0.0	10.9
Summary	16.2	35.0	19.4	5.4	0.8	0.0	76.7

%	Icon	Classes (kph)	16		1.8-3.8	35		3.8-7.6	19		7.6-11.5	5		11.5-15.3	1		15.3-19.1	0		>19.1
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LICA COLD LAKE SOUTH 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 23.36% Calm Wind Avg Speed: 0.92(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	W	W	W	W	WNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	W	W	WSW	W	W	WSW	NW	24			
2	W	WSW	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	SW	WSW	WSW	WSW	SW	SW	WSW	WSW	24			
3	WSW	WSW	WNW	WSW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	N	N	NNE	NNW	WNW	W	NNW	N	N	N	NNW	24			
4	NW	W	S	WSW	WNW	WNW	W	WSW	WSW	W	WNW	WNW	NW	WNW	WNW	NW	WNW	W	WSW	WSW	WSW	WSW	WSW	WSW	W	24		
5	WSW	WSW	S	SW	WSW	SW	NE	S	WNW	W	WSW	N	NNE	NNE	NNE	NNE	NNE	NNE	N	NNW	W	WNW	E	N	24			
6	SW	W	NW	W	W	N	N	NW	WSW	WNW	N	E	ENE	NNE	NE	NE	N	W	W	WNW	N	NW	W	WSW	N	24		
7	WSW	WSW	WSW	WSW	WSW	W	W	W	WSW	WSW	WSW	WSW	W	W	W	W	W	W	WSW	WSW	WSW	WSW	WSW	W	W	WSW	24	
8	W	W	W	W	W	W	W	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	S	SSE	WSW	24		
9	S	SSW	SSE	SE	SSE	ESE	SSE	E	E	ESE	ESE	ESE	E	NE	NE	ENE	ENE	ENE	ENE	E	NE	ENE	ENE	NE	ENE	24		
10	ENE	N	W	ENE	ENE	SSW	SW	SE	SE	SE	ESE	ESE	ESE	SE	SE	SE	SE	SE	SSE	SSE	SSE	SSE	S	SSE	SE	24		
11	SSE	SW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	W	W	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	24	
12	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24
13	W	W	W	W	WSW	SW	WSW	WSW	WSW	W	W	W	WSW	WSW	SW	SW	SW	WSW	WSW	WSW	SW	SW	SW	SW	WSW	24		
14	SW	SW	SW	SW	WSW	E	SSW	W	ESE	NNW	W	WSW	WSW	WSW	S	SE	SSE	SE	SSW	SW	SW	E	SSE	SW	24			
15	SW	W	NW	ENE	E	ENE	E	ENE	NE	NE	E	SE	SSW	WNW	WNW	WSW	WSW	WSW	WSW	NNW	WSW	ESE	WSW	ESE	WSW	24		
16	ESE	ENE	E	E	ENE	E	ENE	NE	SSW	SE	SE	SE	ESE	SE	WSW	ESE	NNE	NNE	NE	SSE	SE	NW	WSW	SW	ESE	24		
17	WSW	WSW	SW	WSW	W	W	W	W	W	W	W	W	W	W	W	WNW	NW	W	W	W	WSW	WSW	WSW	SW	W	24		
18	SW	WSW	WSW	WSW	WSW	WSW	ENE	SW	ESE	SE	S	SE	SE	SE	E	E	ESE	E	E	ESE	E	ESE	ESE	ESE	ESE	24		
19	ESE	E	E	E	E	E	ESE	ESE	ESE	E	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	ESE	24		
20	E	NNE	NNW	WSW	WSW	W	W	W	W	W	W	W	WNW	WNW	NW	WNW	WNW	WNW	WSW	W	W	W	WNW	NNW	W	24		
21	NW	W	SW	WNW	WSW	SW	SSW	W	SW	WSW	WSW	WSW	WSW	W	W	WNW	NW	NW	NW	NW	NW	NW	NW	NNW	WNW	24		
22	NNW	NW	NNW	N	N	N	N	N	NNW	NW	WNW	WNW	NW	W	WNW	NW	W	WSW	WNW	NW	WNW	NW	W	WSW	NW	24		
23	WSW	WSW	E	SSE	S	WSW	E	SSE	WSW	W	W	W	WSW	W	W	SW	SW	SSE	SE	E	E	ESE	NE	WSW	24			
24	NE	NE	W	N	ESE	NE	NE	NNE	NNE	NNE	NNE	NNE	NNW	NW	NW	NNW	NNW	NNW	NNW	WNW	WSW	WSW	WSW	WSW	NNW	24		
25	WSW	WSW	WSW	SW	WSW	SW	SW	SE	WNW	W	W	WSW	WSW	WSW	WSW	WSW	SW	WSW	SSE	WSW	WSW	NNW	N	NW	WSW	24		
26	WSW	W	W	WNW	NNW	NNW	NNW	N	NNW	NNW	NNW	NNW	NW	WNW	WNW	NW	NW	WNW	WNW	W	WSW	SSE	WSW	SSW	NW	24		
27	SSE	SSE	SSW	SSE	SE	S	S	SSE	SSE	W	WSW	WSW	WSW	NNE	NNE	NE	NE	ENE	ENE	E	SE	SE	SE	ESE	ESE	24		
28	SE	ESE	ESE	NW	SE	WNW	WSW	NW	NNW	S	NW	NNE	NE	ENE	ENE	ENE	NE	NE	ENE	NE	NE	NE	NE	ENE	ENE	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 14 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	672	hrs
STANDARD DEVIATION:	93		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	276	(W)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

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	17	17	17	17	19	15	14	16	13	14	16	16	18	20	19	15	13	13	25	41	33	25	34	28	24	
2	25	25	23	18	17	15	15	15	13	19	20	17	19	20	20	17	17	15	17	18	18	16	16	19	24	
3	18	17	46	37	36	31	51	17	14	26	17	28	26	32	22	20	25	11	25	44	16	15	18	15	24	
4	33	54	25	22	20	19	21	22	23	20	23	22	19	21	21	18	19	17	15	20	22	16	22	23	24	
5	23	30	33	48	37	35	51	60	63	62	48	37	21	17	20	17	19	17	17	21	33	34	44	64	24	
6	62	50	61	69	56	48	59	61	42	32	49	55	43	31	24	23	26	25	30	38	30	32	36	24	24	
7	28	23	23	25	27	37	45	46	38	26	24	23	23	21	22	19	19	17	18	21	20	19	18	19	24	
8	20	20	20	22	21	20	18	23	21	20	21	21	18	19	20	18	17	17	16	18	16	28	67	24	24	
9	45	61	65	57	66	73	64	62	42	39	24	22	24	25	20	40	21	22	21	18	22	22	23	19	24	
10	28	62	41	42	32	46	57	61	41	18	25	27	25	22	21	18	21	22	27	22	37	40	42	48	24	
11	36	41	23	18	17	18	19	15	15	17	17	19	21	20	20	22	18	18	17	19	17	18	18	15	24	
12	17	16	17	17	18	18	19	16	19	19	19	19	19	19	20	19	18	18	19	17	19	17	17	17	24	
13	17	19	16	15	17	14	14	13	13	17	18	18	18	19	17	17	18	16	17	17	14	16	16	17	24	
14	19	35	28	33	55	28	63	30	55	55	36	20	22	23	19	29	19	31	33	37	19	30	63	72	24	
15	45	63	54	74	48	41	40	23	38	55	40	26	31	56	53	46	23	16	21	25	61	45	54	43	24	
16	45	45	37	17	55	41	24	42	50	13	21	23	27	23	45	34	54	73	51	59	42	40	33	46	24	
17	18	18	13	16	19	17	17	19	20	19	21	21	19	21	20	19	16	21	19	17	15	15	12	14	24	
18	12	11	11	13	18	41	58	35	64	60	47	32	27	39	21	22	21	16	16	18	21	20	22	23	24	
19	22	20	20	18	19	18	20	20	22	20	19	20	19	21	22	21	21	23	20	22	20	22	25	20	24	
20	21	33	13	25	18	19	19	20	18	20	21	22	22	22	17	23	25	21	19	19	18	19	21	15	24	
21	33	52	45	56	34	27	31	39	32	23	19	21	21	22	24	18	15	16	13	14	14	15	17	14	24	
22	17	14	14	22	16	17	17	16	38	20	27	21	22	23	22	16	21	18	18	17	20	16	28	15	24	
23	38	48	71	45	52	40	49	42	66	24	20	32	23	25	23	20	21	25	54	42	26	28	56	57	24	
24	43	49	43	52	65	33	20	20	18	20	24	29	22	19	19	17	17	13	12	17	21	22	36	20	24	
25	21	19	16	15	13	25	67	65	60	28	31	21	23	21	20	18	19	46	50	51	18	33	16	15	24	
26	14	18	17	16	15	15	16	17	18	17	18	21	20	26	25	20	20	19	19	33	46	49	31	31	24	
27	49	74	66	53	50	61	49	48	40	37	28	24	27	35	19	17	18	18	13	22	26	14	12	11	24	
28	13	36	53	43	65	76	53	76	53	50	33	49	27	20	20	33	21	20	25	20	19	18	18	18	24	

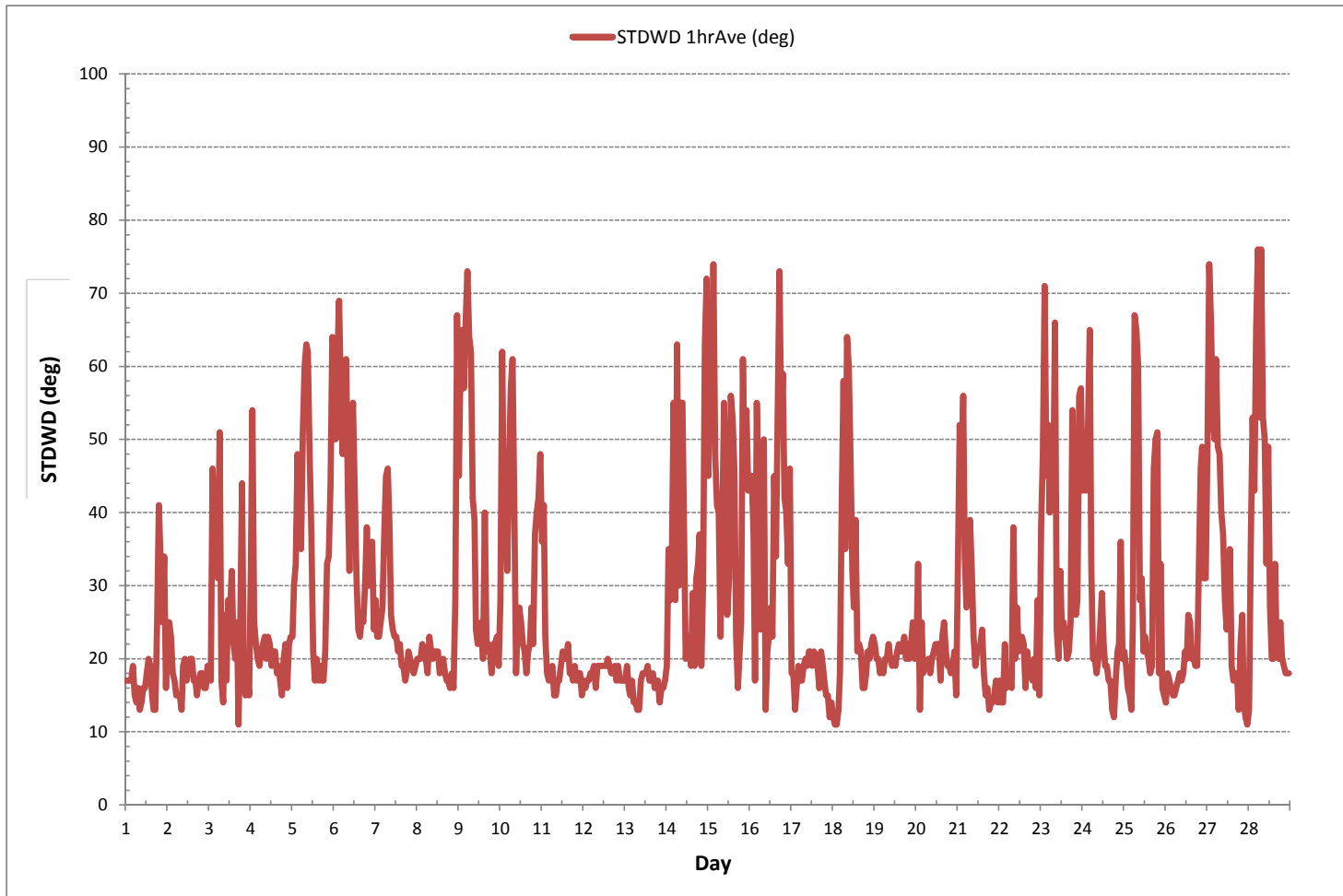
STATUS FLAG CODES

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

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 672 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - February 2017

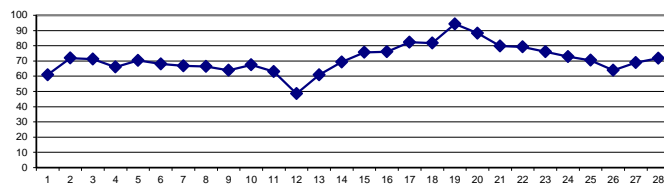
RELATIVE HUMIDITY Hourly Averages (RH %)

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	75	77	77	78	78	73	68	63	61	61	57	52	45	41	38	38	40	44	54	61	66	68	71	74	38	78	61	24	
2	75	76	76	76	77	79	82	82	82	78	72	68	63	61	60	62	65	68	71	70	70	70	71	72	60	82	72	24	
3	74	75	76	77	78	79	80	74	71	68	70	65	65	64	65	64	65	68	69	73	71	71	72	74	64	80	71	24	
4	74	74	76	76	75	76	76	73	71	72	71	60	55	52	56	55	53	57	60	61	62	64	66	68	52	76	66	24	
5	70	72	75	76	76	74	75	74	73	69	68	66	69	71	68	67	63	65	66	64	68	73	73	73	63	76	70	24	
6	72	71	70	69	69	69	70	70	70	69	69	66	63	62	63	63	61	63	66	69	72	72	73	73	61	73	68	24	
7	73	73	73	73	72	72	71	71	71	70	68	64	60	59	58	56	58	62	64	67	68	68	66	65	56	73	67	24	
8	65	67	69	70	70	73	75	76	75	71	67	63	61	58	58	56	58	62	64	65	65	64	69	74	56	76	66	24	
9	75	74	73	73	73	72	72	73	73	65	59	57	54	54	60	57	54	54	56	56	57	61	64	66	54	75	64	24	
10	64	70	73	77	77	77	78	79	77	65	55	51	52	54	55	54	60	67	76	74	71	70	71	72	51	79	67	24	
11	74	75	76	83	85	87	87	87	86	76	63	55	48	42	40	39	42	43	46	51	52	55	59	60	39	87	63	24	
12	57	58	56	56	55	55	53	54	52	48	45	41	39	38	38	38	41	45	49	49	51	51	49	47	38	58	49	24	
13	46	46	51	57	61	64	68	72	74	65	59	55	49	46	47	47	54	62	67	71	72	74	75	78	46	78	61	24	
14	81	82	84	85	86	88	88	89	89	77	65	55	57	52	47	44	43	45	50	55	59	62	71	81	84	43	89	69	24
15	86	88	88	89	89	90	89	89	87	82	77	73	62	56	53	47	47	56	63	70	79	83	86	86	47	90	76	24	
16	87	88	88	88	87	87	86	85	85	74	66	64	59	56	52	57	62	69	73	76	86	82	83	87	52	88	76	24	
17	88	86	83	81	79	83	85	83	85	82	79	78	75	77	80	77	73	76	80	83	89	91	91	92	73	92	82	24	
18	93	93	94	95	95	95	95	95	95	95	88	76	66	61	64	66	64	69	72	75	79	78	79	80	61	95	82	24	
19	82	82	84	91	94	94	93	96	97	96	92	94	98	97	97	97	95	95	97	98	99	99	99	99	82	99	94	24	
20	98	98	98	99	99	99	100	100	100	97	90	84	83	76	75	78	79	77	81	79	79	82	83	83	75	100	88	24	
21	83	83	85	86	80	84	84	82	84	80	79	76	73	72	73	73	76	79	80	82	81	79	80	81	72	86	80	24	
22	81	79	79	81	83	88	88	86	84	80	75	71	65	66	68	66	69	80	86	86	84	85	86	86	65	88	79	24	
23	85	84	83	82	81	79	79	80	79	80	79	71	68	60	59	62	63	68	76	79	79	80	83	85	59	85	76	24	
24	84	85	85	83	82	84	79	81	80	76	70	64	63	62	62	62	62	64	65	68	68	72	74	73	62	85	73	24	
25	73	75	77	78	80	79	79	77	75	69	68	67	58	50	52	56	60	65	75	80	81	79	70	68	50	81	70	24	
26	71	73	80	82	77	64	59	64	59	57	56	56	54	51	51	52	56	57	62	67	71	75	73	68	51	82	64	24	
27	68	69	71	73	73	75	75	74	70	65	60	54	51	52	62	66	66	67	70	73	79	79	80	81	51	81	69	24	
28	82	82	80	78	77	76	76	75	72	70	60	60	63	63	63	64	67	70	72	73	70	71	71	72	60	82	72	24	
HOURLY MAX	98	98	98	99	99	99	100	100	100	97	92	94	98	97	97	97	97	95	95	97	98	99	99	99					
HOURLY AVG	76	77	78	79	79	79	79	79	78	74	69	65	61	59	59	59	61	64	68	71	73	74	75	76					

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

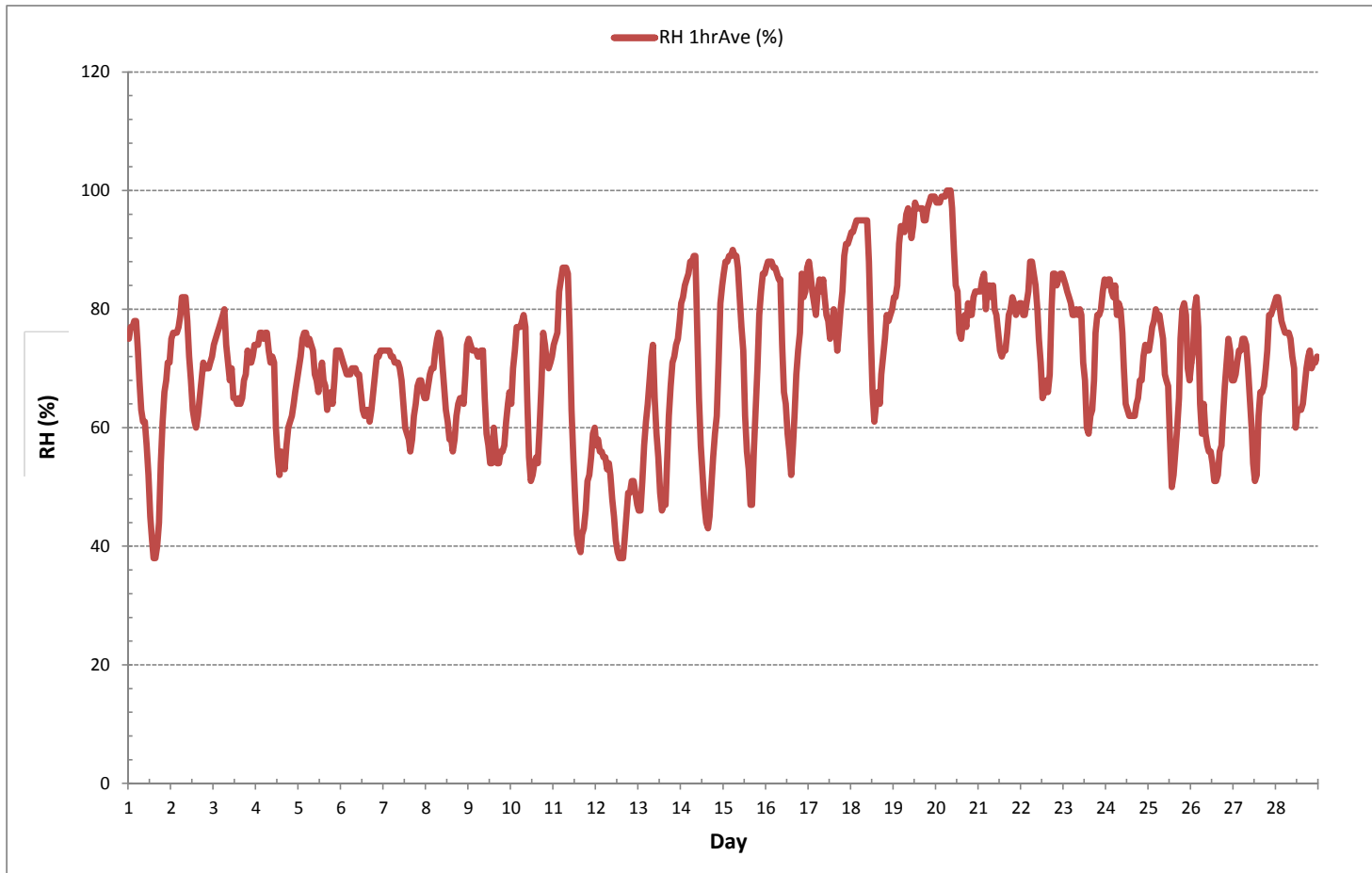
24 HR AVERAGES February 2017



MONTHLY SUMMARY

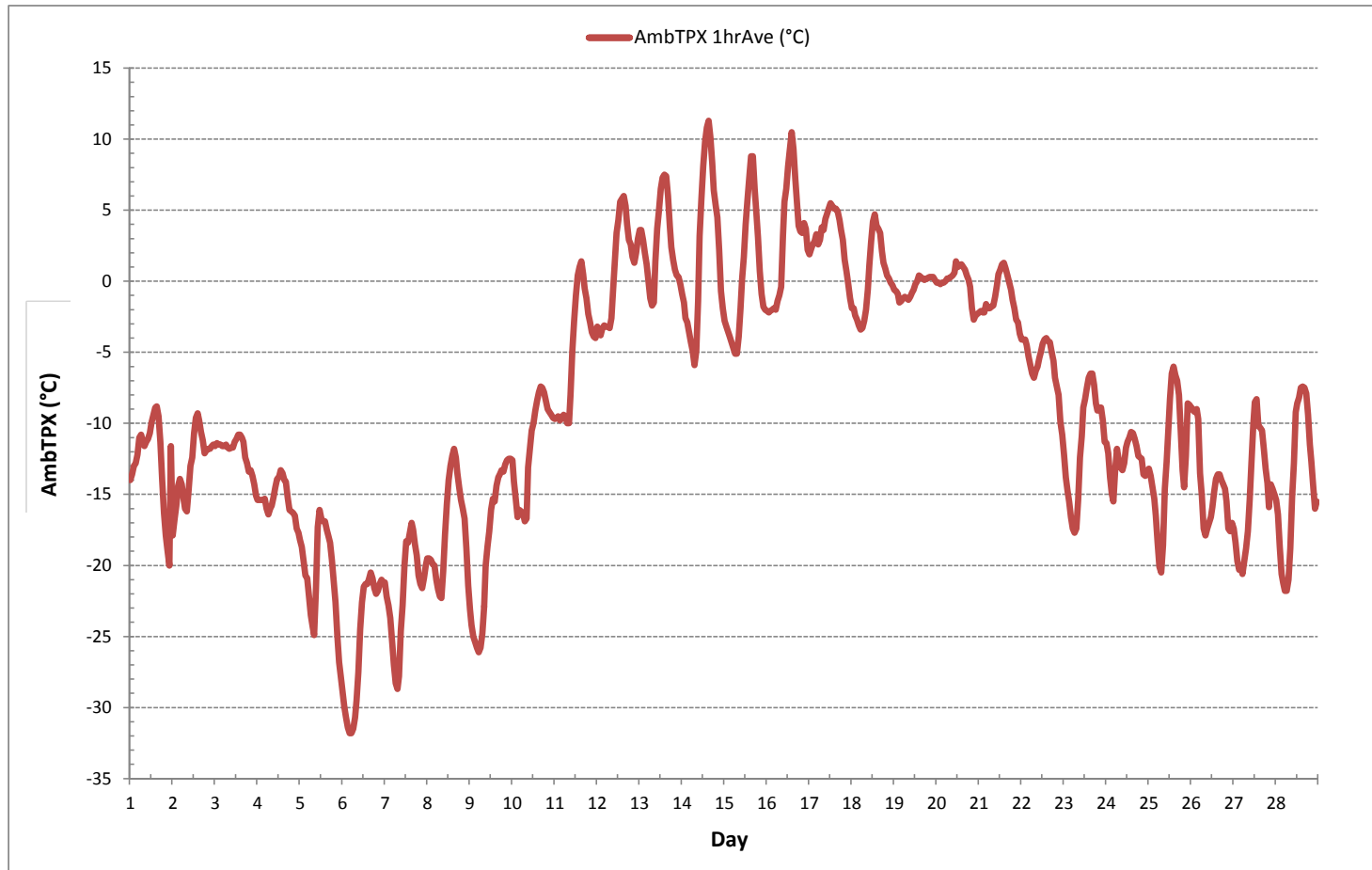
MINIMUM 1-HR AVERAGE:	38	%	@ HOUR(S)	14	ON DAY(S)	1
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR(S)	6	ON DAY(S)	20
MAXIMUM 24-HR AVERAGE:	94	%			ON DAY(S)	19
					VAR-VARIOUS	
OPERATIONAL TIME:						672 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	13					
MONTHLY AVERAGE:						71 %

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



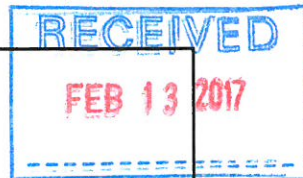
APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Sample ID: 17020108-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/Feb 06, 2017



Maxxam Analytics

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

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 2407
 Station ID: LICA 01 Installation Date/Time (mst): Feb 01, 2017 @ 11:39
 Sample ID: LICA/VOC/CLS/Feb 06, 2017 Removal Date/Time (mst): Feb 10, 2017 @ 09:16

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Feb 06, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Feb 07, 2016</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.0</u>	<u>+23.8</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</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: Dec 19, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Nov 09, 2016 (due every 6 months)

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

Comments: The canister is not equipped with a pressure gauge

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Feb 10, 2017

Volatile Organics Data Results

Date: February 6, 2017
Canister ID: 2407

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	0.05
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.03
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	0.02
2-Methylheptane	0.02
2-Methylhexane	0.04
2-Methylpentane	0.07
3-Methylheptane	< 0.02
3-Methylhexane	0.05
3-Methylpentane	0.05
Acetone	1.1
Acrolein	< 0.3
Benzene	0.16
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.07
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.04
Chloromethane	0.5
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.03
cis-2-Pentene	< 0.02
Cyclohexane	0.03
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	0.5
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.39
Freon-113	0.11

Volatile Organics Data Results

Date: February 6, 2017
Canister ID: 2407

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.81
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.38
Isopentane	0.37
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.06
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	0.06
Methylene chloride	< 0.3
n-Butane	0.52
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.06
n-Hexane	0.07
n-Nonane	< 0.01
n-Octane	0.03
n-Pentane	0.2
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-01520 / 2

Client: LICA Sampler S/N: 6167
 Location: Cold Lake South Canister ID: 2442
 Station ID: LICA 01 Installation Date/Time (mst): Feb 10, 2017 @ 09:16
 Sample ID: LICA/VOC/CLS/Feb 12, 2017 Removal Date/Time (mst): Feb 13, 2017 @ 10:14

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Feb 12, 2017</u>	<u>00:00</u>	<u>00:00 Feb 13, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.0</u>	<u>+ 23.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</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: Dec 19, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Nov 09, 2016 (due every 6 months)

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

Comments: The canister is not equipped with a pressure gauge.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Feb 13, 2017

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Volatile Organics Data Results

Date: February 12, 2017
Canister ID: 2442

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	< 0.02
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	0.01
2-Methylpentane	0.03
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.03
Acetone	1.2
Acrolein	< 0.3
Benzene	0.09
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.08
Carbon tetrachloride	0.14
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.57
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	0.5
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.38
Freon-113	0.12

Volatile Organics Data Results

Date: February 12, 2017
Canister ID: 2442

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.8
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.5
Isopentane	0.25
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	0.03
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.8
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.05
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	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.03
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: 2458
 Station ID: LICA 01 Installation Date/Time (mst): Feb 13, 2017 @ 10:14
 Sample ID: LICA/VOC/CLS/Feb 18, 2017 Removal Date/Time (mst): Feb 23, 2017 @ 14:20

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Feb 18, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Feb 19, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.0</u>	<u>+23.4</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</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: Dec 19, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Nov 09, 2016 (due every 6 months)

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

Comments: The canister is not equipped with a pressure gauge

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Feb 23, 2017

Sample ID: 17020270-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Feb 18, 2017



Volatile Organics Data Results

Date: February 18, 2017
Canister ID: 2458

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	< 0.80
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	< 0.30
1,4-Dichlorobenzene	< 0.40
1,4-Dioxane	< 0.40
1-Butene	0.04
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.03
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	0.04
2-Methylpentane	0.05
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.04
Acetone	1.3
Acrolein	< 0.30
Benzene	0.12
Benzyl chloride	< 0.40
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.50
Carbon tetrachloride	0.15
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
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	0.05
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	1.10
Ethyl acetate	< 0.40
Ethylbenzene	0.01
Freon-11	0.39
Freon-113	0.11

Volatile Organics Data Results

Date: February 18, 2017
Canister ID: 2458

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.79
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.43
Isopentane	0.26
Isoprene	0.01
Isopropyl alcohol	< 0.40
Isopropylbenzene	< 0.01
m,p-Xylene	0.04
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.30
Methyl isobutyl ketone	< 0.40
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.09
Methylcyclopentane	0.08
Methylene chloride	< 0.30
n-Butane	0.51
n-Decane	< 0.06
n-Dodecane	< 0.40
n-Heptane	0.04
n-Hexane	0.05
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.20
n-Propylbenzene	< 0.05
n-Undecane	< 0.50
Naphthalene	< 0.50
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.40
Toluene	0.08
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	< 0.40
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: 2419
 Station ID: LICA OP Installation Date/Time (mst): Feb 23, 2017 @ 14:20
 Sample ID: LICA/VOC/CLS/Feb 24, 2017 Removal Date/Time (mst): Feb 27, 2017 @ 10:53

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Feb 24, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Feb 25, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 28.0</u>	<u>+ 23.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>6.52</u>	<u>24.0</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: Dec 19, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Nov 09, 2016 (due every 6 months)

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

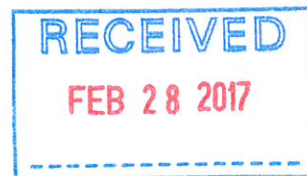
Comments: The canister is not equipped with a pressure gauge.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Feb 27, 2017

Sample ID: 17020270-003

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Feb 24, 2017



Volatile Organics Data Results

Date: February 24, 2017
Canister ID: 2419

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	0.1
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.03
2-Methylpentane	0.11
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.07
Acetone	1.3
Acrolein	< 0.3
Benzene	0.12
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.03
Carbon tetrachloride	0.15
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.68
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.04
cis-2-Pentene	< 0.02
Cyclohexane	0.03
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	0.7
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.52
Freon-113	0.15

Volatile Organics Data Results

Date: February 24, 2017
Canister ID: 2419

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.03
Freon-12	1.07
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.57
Isopentane	0.29
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	0.03
Methylcyclopentane	0.03
Methylene chloride	< 0.3
n-Butane	0.66
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	0.2
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	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.06
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.04
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

PAH RESULTS

Sample ID: 17020108-002

Customer ID: LICA
Cust Samp ID: LICA/PUF/CLS/Feb 06, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-05</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>Feb 01, 2017/11:30</u>
Field Sample ID:	<u>LICA/PUF/CLS/Feb 06, 2017</u>	Removal Date/Time:	<u>Feb 10, 2017/09:03</u>

Sample Data Collection Information

Sample Date:	<u>Feb 06, 2017</u>	Average Pressure (mmHg)	<u>718</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Feb 07, 2017</u>	Average Temperature (°C)	<u>-23.8</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)	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>Dec 28, 2016</u>	
Other observations?	<u>n/a</u>	

Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	Date: <u>Feb 10, 2017</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: February 6, 2017
PUF S/N: TE-05

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.61
2-Methylnaphthalene	0.96
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.08
Acenaphthylene	0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	0.01
Benzo(a)pyrene	0.02
Benzo(b,j,k)fluoranthene	0.05
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.02
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	0.05
Fluorene	0.09
Indeno(1,2,3-cd)pyrene	0.02
Naphthalene	1.08
Perylene	0.01
Phenanthrene	0.19
Pyrene	0.03
Retene	0.04

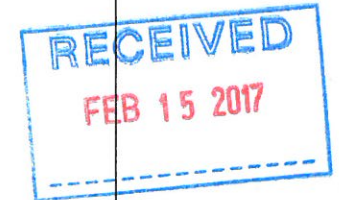
Sample ID: 17020146-002

AIR FCD-01321/2

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Feb 12, 2017

TISCH PUF PLUS Sample Collection Data Sheet			
Client:	<u>LICA</u>	Puf+ S/N:	<u>9102</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>Feb 10, 2017/09:03</u>
Field Sample ID:	<u>LICA/PUF/CLS/Feb 12, 2017</u>	Removal Date/Time:	<u>Feb 13, 2017/09:58</u>
Sample Data Collection Information			
Sample Date:	<u>Feb 12, 2017</u>	Average Pressure (mmHg)	<u>709</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Feb 13, 2017</u>	Average Temperature (°C)	<u>+ 1.3°</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 checked="" type="radio"/> NO	A.Y.
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>Dec 28, 2016</u>		
Other observations?	<u>n/a</u>		
Deployed By:	<u>Alex Yakupov</u>		
Collected By:	<u>Alex Yakupov</u> Date: <u>Feb 13, 2017</u>		



Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: February 12, 2017
PUF S/N: 9102

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.23
2-Methylnaphthalene	0.35
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
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	0.01
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	0.04
Indeno(1,2,3-cd)pyrene	0.01
Naphthalene	0.43
Perylene	< 0.01
Phenanthrene	0.09
Pyrene	0.02
Retene	0.02

Sample ID: 17020270-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Feb 18, 2017

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-11</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>Feb 13, 2017 / 09:58</u>
Field Sample ID:	<u>LICA/PUF/CLS/Feb 18, 2017</u>	Removal Date/Time:	<u>Feb 23, 2017 / 14:39</u>

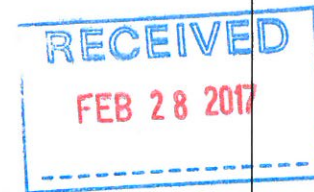
Sample Data Collection Information

Sample Date:	<u>Feb 18, 2017</u>	Average Pressure (mmHg)	<u>706</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Feb 19, 2017</u>	Average Temperature (°C)	<u>+1.0°</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	<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>Dec 28, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	<u>Date: Feb 23, 2017</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: February 18, 2017
PUF S/N: TE-11

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.13
2-Methylnaphthalene	0.11
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.04
Acenaphthylene	0.02
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	0.01
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.03
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	0.14
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.13
Perylene	< 0.01
Phenanthrene	0.30
Pyrene	0.04
Retene	0.02

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: February 24 , 2017
PUF S/N: TE-07

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.19
2-Methylnaphthalene	0.19
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.03
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	< 0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.02
Fluorene	0.04
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.20
Perylene	< 0.01
Phenanthrene	0.08
Pyrene	0.01
Retene	0.02

PARTISOL RESULTS

Sample ID: 17020109-001

Customer ID: LICA

Cust Samp ID: P6031621

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Feb 06, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P603 16 21

Start Time 00:00 Feb 06, 2017

End Time 00:00 Feb 07, 2017

Status OK

Std Vol 27.190

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

n/a

Sample inlet cleaned on ~~Oct 24, 2016~~ Jan 27, 2017 (A.Y.)
Date of last audit: Jan 27, 2017

Technician Signature: Alex Yakupov

Date: Feb 10, 2017
Time: 09:36

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"
- 8) Make Sure it is left in RUN mode

Note: Beginning & End Date should be same date

Sample ID: 17020147-001

Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: LICA Fit # P6031622

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Feb 12, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P603 16 2X2

Start Time 00:00 Feb 12, 2017

End Time 00:00 Feb 13, 2017

Status OK

Std Vol 24.497

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

n/a

Sample inlet cleaned on Jan 27, 2017

Date of last audit: Jan 27, 2017

Technician Signature:

Alex Yakupov

Date: Feb 13, 2017

Time: 10:27

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: 17020271-001

Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: LICA Fil # P6031620

Partisol Sample Data Sheet

Priority: Normal

Date Sampled: Feb 18, 2017
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: P6031620

PM2.5



Start Time 00:00 Feb 18, 2017
 End Time 00:00 Feb 19, 2017
 Status OK
 Std Vol 24.391
 Valid Time 24:00
 Total Time 24.0

Comments: Weather Conditions, etc.

n/a

Sample inlet cleaned on Jan 27, 2017
Date of last audit - Jan 27, 2017

Technician Signature: Alex Yakupov
Date: Feb 23, 2017
Time: 14:56

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

Priority: Normal

Date Sampled: Feb 24, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P607 22 95

Start Time 00:00 Feb 24, 2017

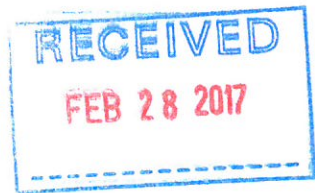
End Time 00:00 Feb 25, 2017

Status OK

Std Vol 25.984

Valid Time 24:00

Total Time 24.0



Comments: Weather Conditions, etc.

Sample inlet cleaned on Jan 27, 2017
Date of last audit - Jan 27, 2017

Technician Signature: Alex Yakupov

Date: Feb 27, 2017

Time: 11:09

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)
February 6	P6031621	0.127
February 12	P6031622	0.018
February 18	P6031620	0.044
February 24	P6072295	0.051

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date: February 27, 2017	Barometric Pressure: 0.927 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: A few clouds
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 14:59	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 19:37	Cal Gas Expiry Date: July 18, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer: ID# or Serial Number: 806528242	Range ppb: 500
Last Calibration Date: January 10, 2017	As Found C.F.: 1.011
Previous C.F.: 1.000	New C.F.: 1.001

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.6	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></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
Point	ppb								
High	380								
Mid	180								
Low	90								

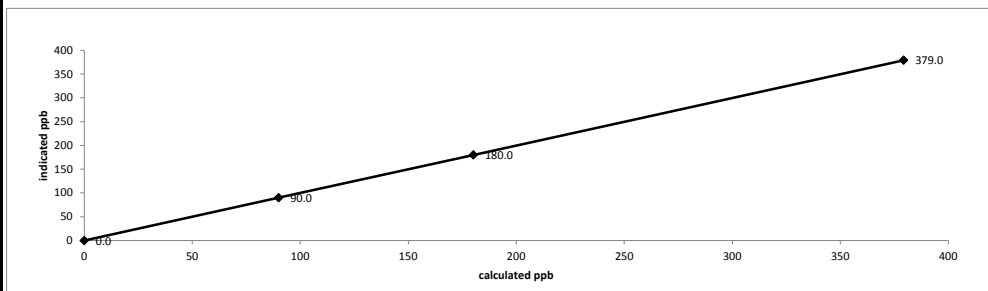
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	4965	37.50	5003	379.3	375.0	1.011
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4965	37.50	5003	379.3	379.0	1.001
mid	4981	17.80	4999	180.2	180.0	1.001
low	4992	8.90	5001	90.1	90.0	1.001
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.001

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 1.001	.95-1.05
b (Intercept as % of full scale) = 0.00%	± 3% F.S.
% change in C.F. from last cal = -1.15%	± 10%

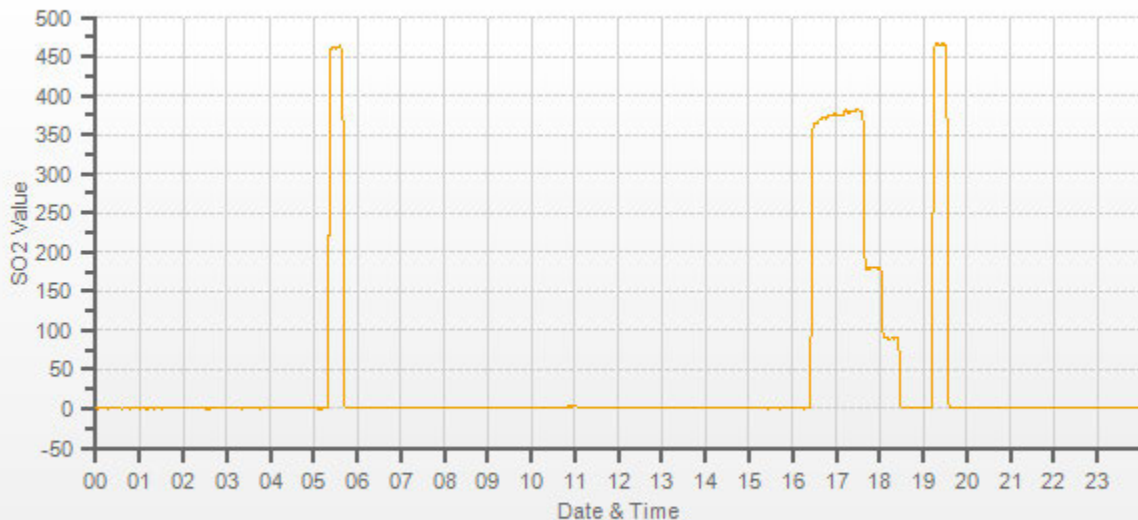
Thermo 43i Sulphur Dioxide Analyzer Calibration



As found: BKG: 8.0 COEF: 0.954 PMT: -623.8 FLASH: 775 INTERNAL: 29.2 CHAMBER: 45.1 PERM OVEN GAS: 44.99 PERM OVEN HEATER: 44.19 PRESSURE: 673.8 SAMPLE FLOW: 0.470 LAMP INTENSITY: 95 CONVERTER: n/a CONVERTER SET: n/a Expected Value: 465.0	As left: BKG: 8.0 COEF: 0.964 PMT: -623.8 FLASH: 774 INTERNAL: 30.1 CHAMBER: 45.0 PERM OVEN GAS: 45.00 PERM OVEN HEATER: 44.20 PRESSURE: 674.7 SAMPLE FLOW: 0.471 LAMP INTENSITY: 95 CONVERTER: n/a CONVERTER SET: n/a Expected Value: 465.0
--	---

Comments:
 The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.

The EV has not changed after the calibration.



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	February 27, 2017	Barometric Pressure:	0.927 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly
Start Time 24 hr. (mst):	14:59	Performed By/Reviewer:	Alex Yakupov / Trina Whitsitt
End Time 24 hr. (mst):	19:07	Cal Gas Expiry Date:	June 14, 2019
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	CDNova CDN-101 #501

Analyzer:	ID# or Serial Number:	812728560	Range ppb:	100
	Last Calibration Date:	January 10, 2017	As Found C.F.:	0.975
	Previous C.F.:	1.000	New C.F.:	1.000

Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 mins.)
	Make & Model:	SABIO 2010 D	Point	ppb
	Serial #:	11900613	High	78
	Cal Gas Cylinder I.D. #:	EY0000654	Mid	38
	Cal Gas Conc. (ppm):	10.2	Low	19
			Start/End Time 24 hr.:	16:07/16:18
			Target Concentration (ppb):	780
			Result (ppb):	0
			Zero Corrected Result (ppb):	0

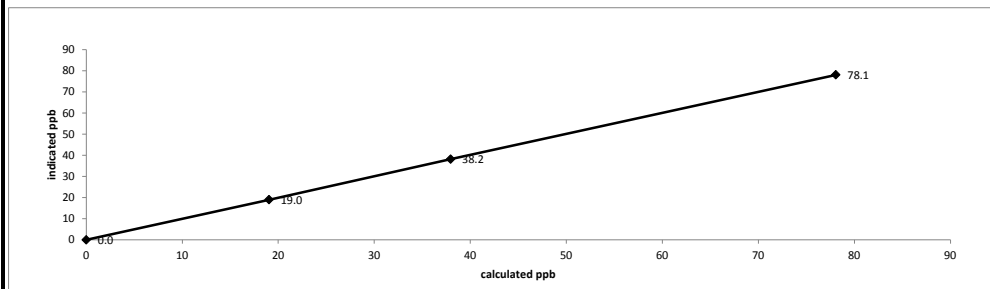
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	57.40	7499	78.1	80.1	0.975
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.40	7499	78.1	78.1	1.000
mid	7471	27.90	7499	37.9	38.2	0.993
low	7486	14.00	7500	19.0	19.0	1.002
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						0.998

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		.95-1.05
b (Intercept as % of full scale)=	-0.03%		± 3% F.S.
% change in C.F. from last cal=	2.53%		± 10%

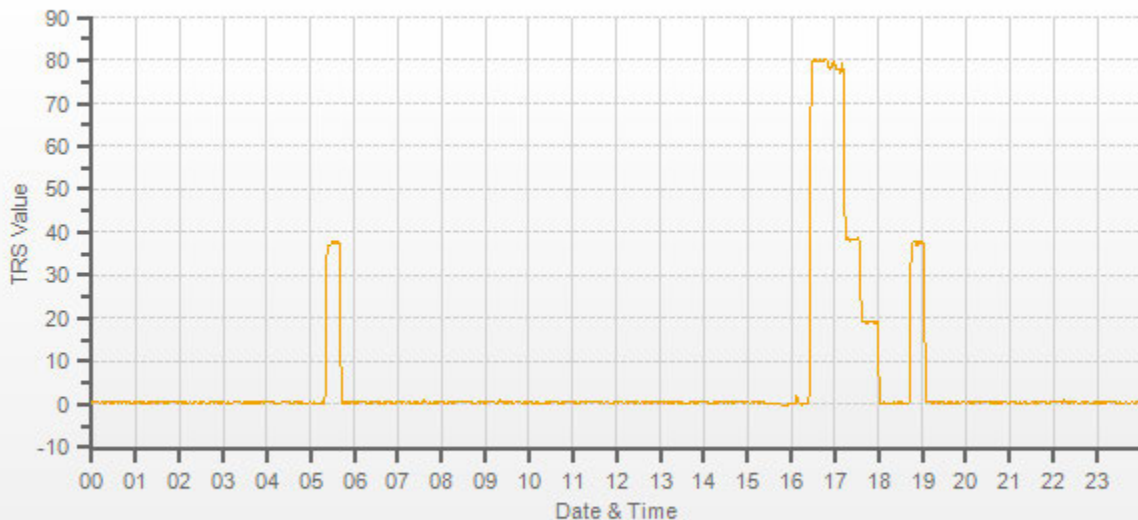
Thermo 450i Total Reduced Sulphur Analyzer Calibration



As found:	BKG:	14.1	As left:	BKG:	13.8
	COEF:	0.956		COEF:	0.937
	PMT:	-650.5		PMT:	-650.5
	FLASH:	741		FLASH:	739
	INTERNAL:	32.3		INTERNAL:	33.1
	CHAMBER:	44.9		CHAMBER:	45.0
	CONVERTER TEMP:	825		CONVERTER TEMP:	825
	CONVERTER SET:	825		CONVERTER SET:	825
	PERM OVEN GAS:	44.99		PERM OVEN GAS:	45.00
	PERM OVEN HTR:	44.36		PERM OVEN HTR:	44.38
	PRESSURE:	650.5		PRESSURE:	650.8
	SAMPLE FLOW:	0.506		SAMPLE FLOW:	0.507
	LAMP INTENSITY:	92		LAMP INTENSITY:	92
	Expected Value:	38.2		Expected Value:	37.6

Comments:

The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: February 23, 2017	Barometric Pressure: 0.943 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Cold Lake South	Weather Conditions: A few clouds
Parameter: Total Hydrocarbon	Calibration Purpose: routine monthly
Start/End Time 24 hr. (mst): 9:26 / 14:24	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: January 10, 2017	As Found C.F.: 0.987
Previous Cal High Point C.F.: 0.999	New C.F.: 1.000

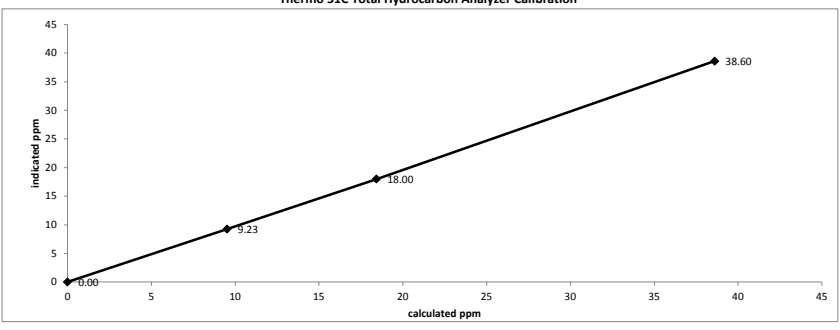
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: 165372 CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm): 606.0 / 212.0 CH ₄ as propane/total CH ₄ equivalents (ppm): 583.0 / 1189.0	Standard Calibration Points for a Range of: 50 ppm <table border="1" style="width: 100%; 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	2000	0.00	2000	0.0	0.00	n/a
as found high	1937	65.00	2002	38.60	39.10	0.987
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	18.00	1.024
low	1984	16.00	2000	9.51	9.23	1.031
calibrator zero	2000	0.00	2000	0.0	0.00	n/a
Average C.F. =						1.018

Linear Regression/Calibration Results:

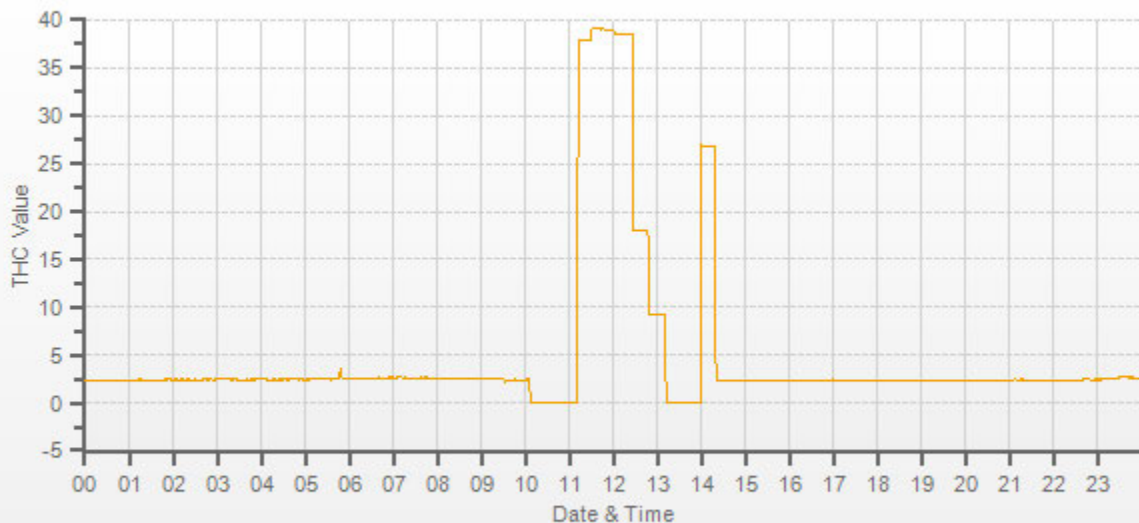
Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 0.998	.95-1.05
b (Intercept as % of full scale) = 0.41%	± 3% F.S.
% change in C.F. from last cal = 1.17%	± 10%



As found: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 23 Span Cylinder (psi): 150 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 37 measurement alarms: None service alarms: None cnt: 1390 rng: 1 try: 0 flm: 181.2 det: 125.7 Flame: 181 Filter: 125 Base: 125 Sample psi: 06.51 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Measured Flow: n/a Expected Value: 26.43	As left: H2 cylinder (psi): 1300 H2 cylinder reg set (psi): 23 Span Cylinder (psi): 2000 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 37 measurement alarms: None service alarms: None cnt: 1370 rng: 1 try: 0 flm: 181.5 det: 125.6 Flame: 181 Filter: 125 Base: 125 Sample psi: 06.51 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Measured Flow: n/a Expected Value: 26.81
--	--

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



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: February 27, 2017
Company/Airshed: LICA
Location/Station Name: Cold Lake South
Start/End Time 24 hr. (mst): 14:59 / 21:31
G.P.T. to be used for Ozone? No
Calibration Method: Gas Dilution & Gas Phase Titration

Barometric Pressure: 0.927 atm
Station Temperature °C: 22
Weather Conditions: A few clouds
Calibration Purpose: routine monthly
Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
Cal Gas Expiry Date: July 18, 2019

Analyzer:

ID# or Serial Number: 1505664393
Last Calibration Date: January 10, 2017
Range ppb: 500

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	1.000	1.008	1.000
NO ₂ =	1.000	1.000	1.000
NOx =	1.000	1.005	1.000

Calibrator:

Flow Meter ID's: n/a
Make & Model: API 700
Serial #: 627
Cal Gas Cylinder I.D. #: LL104222
NO/NOx Gas Conc. (ppm): 50.7 | 50.7

Standard Calibration Points for a Range of: 500 ppb

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	4965	37.5	5003	380.1	380.1	377.0	378.0	1.008	1.005
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4965	37.50	5003	380.1	380.1	380.0	380.0	1.000	1.000
mid	4981	17.80	4999	180.5	180.5	180.0	180.0	1.003	1.003
low	4992	8.90	5001	90.2	90.2	90.0	90.0	1.003	1.003
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.002	1.002

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	4965	37.50	5003	0.0	382.0	382.0	0.0	0.0	0.0	
as found high NO2	4840	37.50	4878	235.0	132.0	382.0	250.0	250.0	250.0	1.000
adjusted high NO2	4840	37.50	4878	235.0	132.0	382.0	250.0	250.0	250.0	1.000
gpt mid	4840	37.50	4878	137.0	238.0	382.0	144.0	144.0	144.0	1.000
gpt low	4840	37.50	4878	45.0	332.0	383.0	50.0	50.0	50.0	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 =	1.000	1.000	1.000	.95-1.05
b (Intercept as % of full scale)=	-0.04%	-0.04%	0.00%	± 3% F.S.
% change in C.F. from last cal=	-0.81%	-0.54%	0.00%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:

NO Bkg: 3.6
 NOx Bkg: 3.8
 NO Coef: 1.004
 NO2 Coef: 0.995
 NOx Coef: 0.999
 PMT: -854.7
 Internal: 26.5
 Chamber: 50.4
 Cooler: -2.9
 NO2 Converter: 326.0
 NO2 Converter Set: 325.0
 Pressure: 178.7
 Flow: 0.779
 Ozonator Flow: OK
 Expected Value NO: 2.4
 Expected Value NO2: 261.0
 Expected Value NOx: 264.0

As left:

NO Bkg: 3.7
 NOx Bkg: 3.8
 NO Coef: 1.009
 NO2 Coef: 0.995
 NOx Coef: 0.997
 PMT: -854.7
 Internal: 27.3
 Chamber: 50.0
 Cooler: -2.7
 NO2 Converter: 325.0
 NO2 Converter Set: 325.0
 Pressure: 178.7
 Flow: 0.779
 Ozonator Flow: OK
 Expected Value NO: 1.9
 Expected Value NO2: 268.0
 Expected Value NOx: 270.0

Comments:

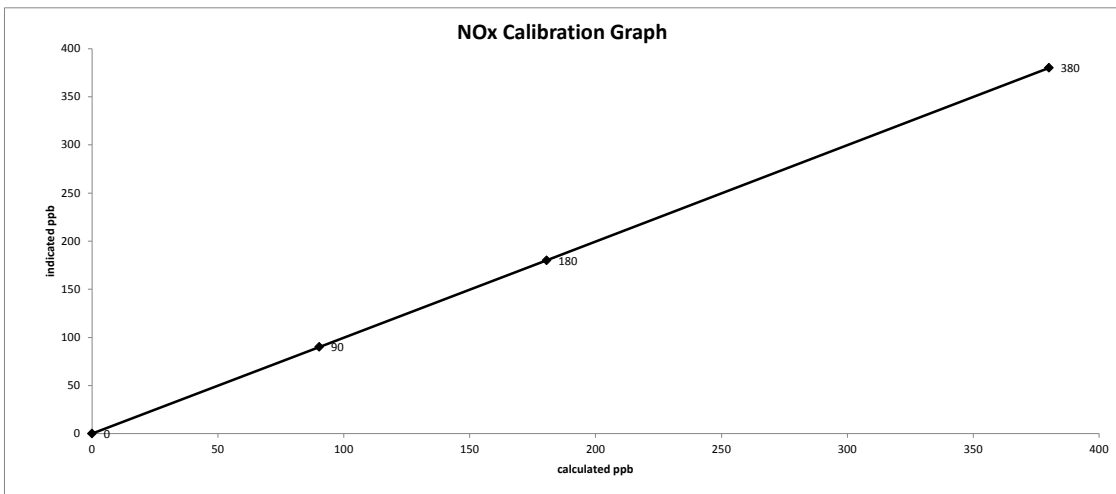
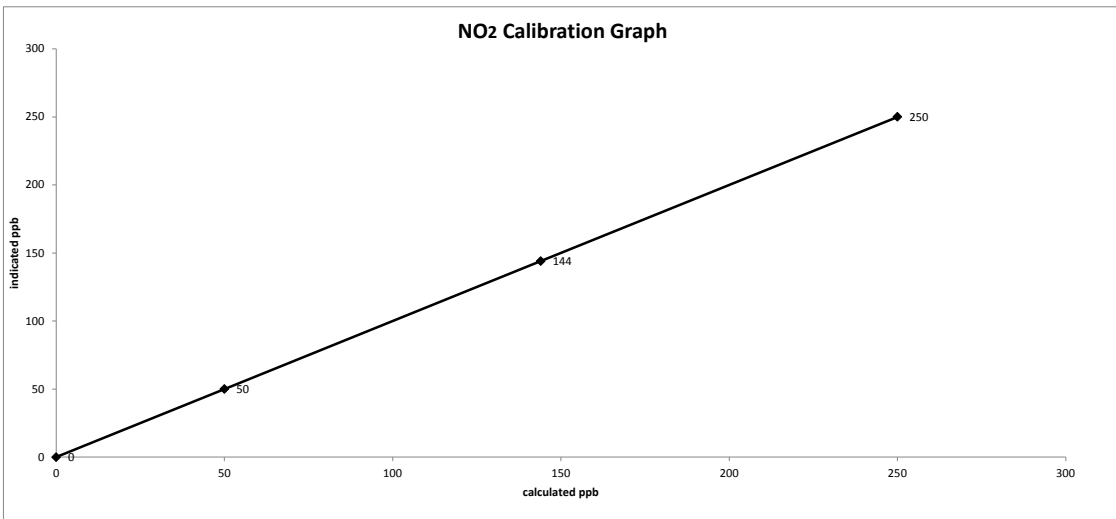
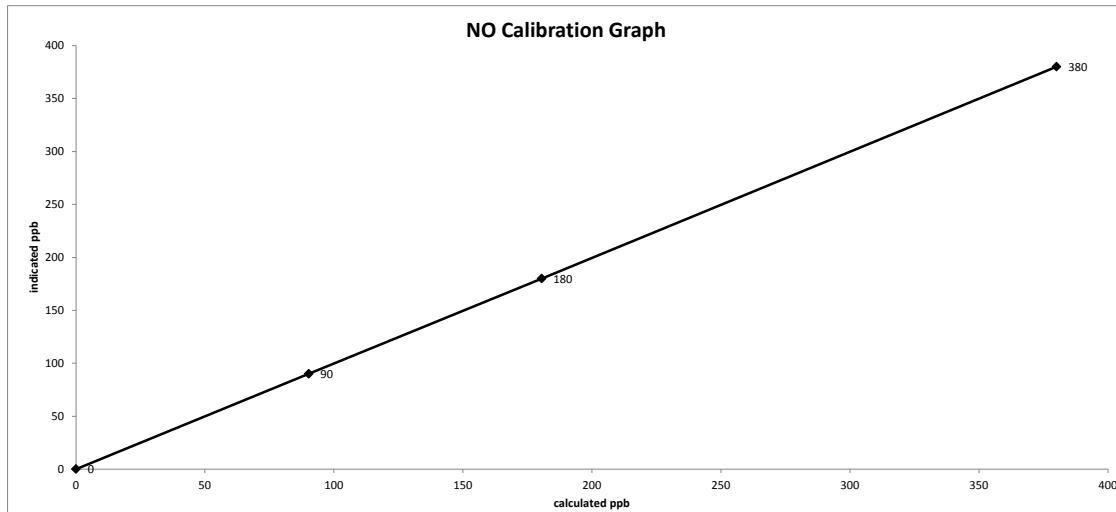
The analyzer sample inlet filter was changed.

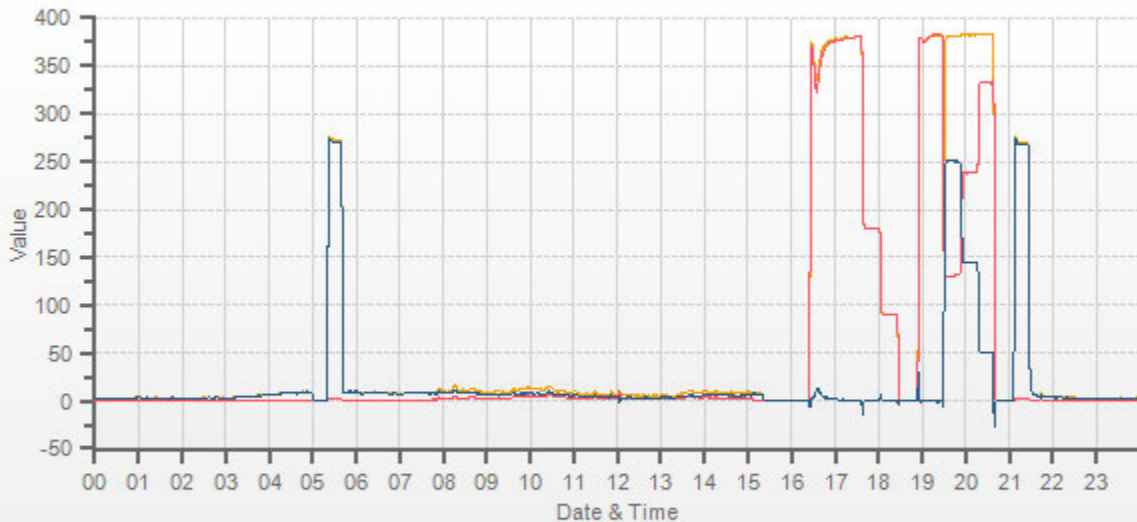
No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

The analyzer cooling fan filter(s) were cleaned.

Date: February 27, 2017
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 14:59 / 21:31
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: February 23, 2017
 Company/Airshed: LICA
 Location/Station Name: Cold Lake South
 Start/End Time 24 hr. (mst): 9:26 / 14:24
 Ozone Calibration Method: Varying UV Lamp Power
 G.P.T. Date: n/a-done by Varying UV Lamp Power

Barometric Pressure: 0.943 atm
 Station Temperature °C: 22
 Weather Conditions: A few clouds
 Calibration Purpose: routine monthly
 Performed By/Reviewer: Alex Yakupov / Trina Whitsitt
 Cal Gas Expiry Date: n/a

Analyzer:
 ID# or Serial Number: 700419951
 Last Calibration Date: January 10, 2017
 Previous Cal High Point C.F.: 1.000

Ozone Range ppb: 500
 As Found C.F.: 0.950
 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

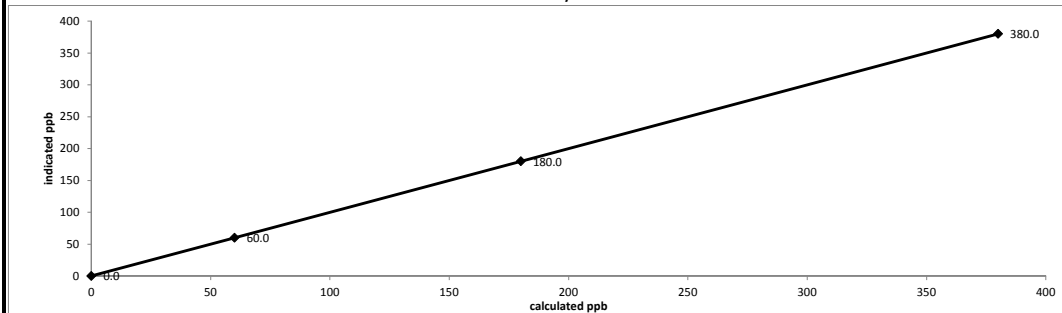
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	400.0	0.950
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
 Slope = 1.000
 b (Intercept as % of full scale) = 0.00%
 % change in C.F. from last cal = 5.00%

LIMITS
 > or = 0.995
 .95-1.05
 ± 3% F.S.
 ± 10%

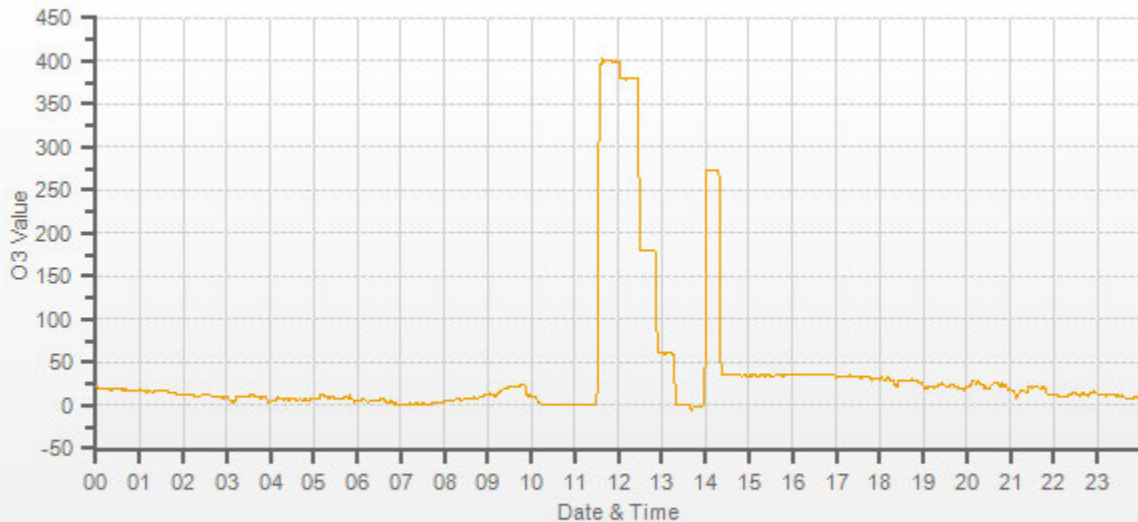
Thermo 49i Ozone Analyzer Calibration



As found:
 O3 Bkg: 0.7
 O3 Coef: 1.047
 Photo Lamp: 9.6
 O3 Lamp: 9.0
 Bench: 29.1
 Bench Lamp: 53.5
 O3 Lamp: 67.4
 Pressure: 710.1
 Cell A lpm: 0.718
 Cell B lpm: 0.759
 O3 ppb: 3.3
 Cell A ppb: 6.0
 Cell B ppb: 0.7
 Cell A int: 87598
 Expected Value: 283.1

As left:
 O3 Bkg: 0.1
 O3 Coef: 0.997
 Photo Lamp: 9.6
 O3 Lamp: 9.0
 Bench: 28.7
 Bench Lamp: 53.5
 O3 Lamp: 67.4
 Pressure: 709.5
 Cell A lpm: 0.717
 Cell B lpm: 0.757
 O3 ppb: -0.1
 Cell A ppb: -1.7
 Cell B ppb: 1.5
 Cell A int: 87630
 Expected Value: 273.0

Comments:
 The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: February 10, 2017
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: January 26, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 10:12
 End Time (mst): 11:30
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Sunny

1400A Information and Status:

ID# or Serial Number: 1405A201620804 As Found Filter Loading %: 30.84
 Ko Factor: 14578 As Left Filter Loading %: 19.81
 Ambient Temperature °C: 0.914 As Found Noise: 0.006
 Ambient Pressure atm: -9.88 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.38
 Aux Flow Reading lpm: 13.67 Warnings: none

Reference Standards:

	Flow:	Pressure:	Temperature:
Make:	<u>Dwyer</u>	<u>Fisher Scientific</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB 1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#3</u>	<u>ID# 05544</u>	<u>ID# 4295</u>
Calibration Date:	<u>January 1, 2017</u>	<u>December 5, 2016</u>	<u>November 15, 2016</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.02	0.12	0.01	0.12
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.11	-0.01	0.10	-0.01
	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	0.02	0.12	0.01	0.12
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.11	-0.01	0.10	-0.01
	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>-9.9</u>	1405F pressure atm:	<u>0.914</u>
reference temperature °C:	<u>-10.4</u>	reference pressure:	<u>0.916</u>
difference °C:	<u>-0.5</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>-10.4</u>	1405F pressure atm:	<u>0.916</u>
reference temperature °C:	<u>-10.4</u>	reference pressure:	<u>0.916</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>16.64</u>
difference lpm: <u>-0.02</u>	difference lpm: <u>-0.03</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>16.64</u>
difference lpm: <u>-0.02</u>	difference lpm: <u>-0.03</u>

K_o Audit:

Last K_o audit date: February 10, 2017
 1405F K_o factor: 14578
 Measured K_o factor: 14789.9000
 % difference: 1.44

Comments:

The TEOM intake head and associated sharp cut components were cleaned.

The 47 mm FDMS filter was changed.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: February 21, 2017
 Company: LICA
 Station Name/Location: Cold Lake South
 Previous Audit Date: February 10, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 10:37
 End Time (mst): 11:34
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: A few clouds

1400A Information and Status:

ID# or Serial Number: 1405A201620804 As Found Filter Loading %: 21.24
 Ko Factor: 14578 As Left Filter Loading %: 22.81
 Ambient Temperature °C: 0.94 As Found Noise: 0.002
 Ambient Pressure atm: 0.925 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.37
 Aux Flow Reading lpm: 13.67 Warnings: none

Reference Standards:

Make:	Flow:	Pressure:	Temperature:
Dwyer	Dwyer	Fisher Scientific	FLUKE
Model:	475 Mark III	FB 1291	1551A Ex STIK
Serial Number:	#3	ID# 05544	ID# 4295
Calibration Date:	January 1, 2017	December 5, 2016	November 15, 2016

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	-0.01	0.00	-0.01
	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	-0.01	0.00	-0.01
	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:	0.9	1405F pressure atm:	0.925
reference temperature °C:	0.9	reference pressure:	0.926
difference °C:	-0.1	difference:	-0.001

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

tolerance +/- 2.0°C		tolerance +/- 0.01 atm	
1405F temperature °C:	0.9	1405F pressure atm:	0.926
reference temperature °C:	0.9	reference pressure:	0.926
difference °C:	0.0	difference:	0.000

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: 3.00	1400A total/aux flow lpm: 16.67
reference main flow lpm: 3.02	reference total/aux flow lpm: 16.72
difference lpm: 0.02	difference lpm: 0.05

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: 3.00	1400A total/aux flow lpm: 16.67
reference main flow lpm: 3.02	reference total/aux flow lpm: 16.72
difference lpm: 0.02	difference lpm: 0.05

K_o Audit:

Last K_o audit date: February 10, 2017
 1405F K_o factor: 14578
 Measured K_o factor: 14789.9000
 % difference: 1.44

Comments:

The TEOM intake head and associated sharp cut components were cleaned.

The 47 mm FDMS filter was changed.

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

Company Maxxam/SIA **Operator:** Chris

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Definer 530</u>
Serial Number	<u>627</u>	Serial Number	<u>H-148944, L-152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>707.1 mmHg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1	<u>4892</u>	Pt. #3 <u>4951</u>
Pt. #2	<u>4975</u>	
Gas Flow (sccm)		
Pt. #1	<u>79.7</u>	Pt. #3 <u>19.4</u>
Pt. #2	<u>38.8</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

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)= 1.0041	0.90-1.10	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	0.90-1.10
b (Intercept % of FS)= 0.1755	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	Make/Model <u>Thermo 42i</u>
Make/Model <u>Thermo 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU1809</u>	Last Calibration Date <u>January 25, 2017</u>
SRM Gas Cylinder No. <u>CAL018140</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>48.79</u>	Cylinder Gas Expiry Date <u>March 25, 2019</u>

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: January 27, 2017
Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Mike</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>11900613</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 31, 2016</u>	Temperature (°C)	<u>23.9</u>
NO Cylinder S/N	<u>EY0000769</u>	Barometric Pressure	<u>698mmHg</u>
NO [PPM]	<u>51.1</u>	NOx [PPM]	<u>51.2</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4879</u>	Pt. #2 <u>4932</u>	Pt. #3 <u>4950</u>
Gas Flow (sccm)		
Pt. #1 <u>74.5</u>	Pt. #2 <u>36.4</u>	Pt. #3 <u>18.2</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4965	0.0	0.0000	0.0000	0.0001	0.0000	0.0001	Limit ± 10%	
4954	74.5	0.7685	0.7700	0.7915	0.0008	0.7923	3%	3%
4968	36.4	0.3744	0.3751	0.3832	0.0006	0.3838	2%	2%
4968	18.2	0.1872	0.1876	0.1916	0.0002	0.1918	2%	2%
Absolute Average Percent Difference							3%	2%

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)= 1.0301	0.90-1.10	m (Slope)= 1.0291
b (Intercept % of FS)= -0.0919	± 3% F.S.	b (Intercept % of FS)= -0.0881

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4954	0.000	0.0000	0.7949	0.0005	0.7954	NO ₂	% Diff. Limit
4954	0.510	0.5104	0.2845	0.5072	0.7917	-1%	± 10%
4954	0.250	0.2516	0.5433	0.2514	0.7944	0%	± 10%
4954	0.100	0.1085	0.6864	0.1087	0.7951	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9926	0.90-1.10
b (Intercept % of FS)= 0.0925	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	Make/Model <u>Thermo 42i</u>
Make/Model <u>Thermo 146i</u>	Serial/AMU Number <u>1868</u>
Serial/AMU Number <u>1809</u>	Last Calibration Date <u>March 15, 2017</u>
SRM Gas Cylinder No. <u>CAL018140</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>48.79</u>	Cylinder Gas Expiry Date <u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature:

Date: March 16, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

Company: Maxxam **Operator's Name:** Russell Kirchner

Cylinder #: LL104222 Concentration PPM: 50.6 Tolerance(%) 1 Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMY 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.5 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CA:016625</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623

Instrument Settings: Zero: 9.2 Span: 1.024 Range: 1.0

Last Calibration: Date: Oct 19/16 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	0.000	0.0000	0.0000	0.000
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					50.0

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 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: October 19, 2016

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. 688mmHg

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

DocNumber: 000096245

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

MAXXAM ANALYTICS INC *NA*
 9372 49TH ST
 EDMONTON AB T6B 2L7

Praxair Order Number: 26637434
 Customer PO Number: 35-36415
 Customer Reference Number:

Fill Date: 7/5/2016
 Part Number: NI NO50MS2E-AQ
 Lot Number: 109618704
 Cylinder Style and Outlet: AQ CGA 660
 Cylinder Pressure and Volume: 2000 psig 82 cu. ft.

Certified Concentration:

Expiration Date:	07/18/2019	NIST Traceable
Cylinder Number:	LL104222	Expanded Uncertainty:
50.7 ppm	NITRIC OXIDE	± 0.7 %
50.6 ppm	SULFUR DIOXIDE	± 1.0 %
Balance	NITROGEN	

NOx ppm = 50.9 ppm

NOX for Reference Only

Certification Information: Certification Date : 7/18/2016 Term : 36 Months Expiration Date : 07/18/2019

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
 Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1 . Component: NITRIC OXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 50.7 ppm
 Instrument Used: Thermo Electron 42i-LS S/N 1030645077
 Analytical Method: Chemiluminescence
 Last Multipoint Calibration: 06/23/2016

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC222724
 Ref. Std. Conc: 50.96 ppm
 Ref. Std. traceable to SRM #: vs. 1653b
 SRM Sample #: 45-V-42
 SRM Cylinder #: CAL017897

First Analysis Data:				Date: 07/11/2016	
Z:	0	R:	51	C:	50.6
				Conc:	50.6
R:	51	Z:	0	C:	50.8
				Conc:	50.8
Z:	0	C:	50.8	R:	51
				Conc:	50.9
UOM:	ppm		Mean Test Assay:	50.7 ppm	

Second Analysis Data:				Date: 07/18/2016	
Z:	0	R:	51	C:	50.7
				Conc:	50.7
R:	51	Z:	0	C:	50.8
				Conc:	50.8
Z:	0	C:	50.8	R:	51
				Conc:	50.7
UOM:	ppm		Mean Test Assay:	50.7 ppm	

2 . Component: SULFUR DIOXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 50.6 ppm
 Instrument Used: Ametek 921CE S/N AW-921-S321
 Analytical Method: Ultraviolet Absorption
 Last Multipoint Calibration: 06/27/2016

Reference Standard Type: NTRM
 Ref. Std. Cylinder #: CC
 Ref. Std. Conc: 48.58 ppm
 Ref. Std. traceable to SRM #: n/a
 SRM Sample #: 12070103
 SRM Cylinder #: N/A

First Analysis Data:				Date: 07/11/2016	
Z:	0	R:	482.8	C:	503.8
				Conc:	50.7
R:	482.6	Z:	0	C:	503.9
				Conc:	50.7
Z:	0	C:	503.9	R:	482.6
				Conc:	50.7
UOM:	ppm		Mean Test Assay:	50.7 ppm	

Second Analysis Data:				Date: 07/18/2016	
Z:	0	R:	482.1	C:	500.6
				Conc:	50.4
R:	482.7	Z:	0	C:	501.3
				Conc:	50.5
Z:	0	C:	501.3	R:	482.7
				Conc:	50.4
UOM:	ppm		Mean Test Assay:	50.4 ppm	

Analyzed by:

Matthew Angerer

Certified by:

Henry Koung

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Feb 06, 2017	2407	Ambient Air	06-Feb-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020108	REPORT CREATED:	24-Mar-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020108-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020108-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020108-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	16-Feb-17
17020108-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020108-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020108-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	16-Feb-17
17020108-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020108-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020108-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020108-001	1-Butene		0.05	ppbv	0.02	AC-058	16-Feb-17
17020108-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	2,2,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020108-001	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020108-001	2,3,4-Trimethylpentane		0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	16-Feb-17
17020108-001	2,3-Dimethylpentane		0.03	ppbv	0.02	AC-058	16-Feb-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 06, 2017	2407	Ambient Air	06-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020108	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020108-001	2,4-Dimethylpentane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020108-001	2-Methylheptane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020108-001	2-Methylhexane		0.04	ppbv	0.01	AC-058	16-Feb-17
17020108-001	2-Methylpentane		0.07	ppbv	0.01	AC-058	16-Feb-17
17020108-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	3-Methylhexane		0.05	ppbv	0.02	AC-058	16-Feb-17
17020108-001	3-Methylpentane		0.05	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Acetone		1.1	ppbv	0.4	AC-058	16-Feb-17
17020108-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020108-001	Benzene		0.16	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020108-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Carbon disulfide	I	0.07	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Chloroform	I	0.04	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Chloromethane		0.50	ppbv	0.02	AC-058	16-Feb-17
17020108-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020108-001	cis-2-Butene		0.03	ppbv	0.02	AC-058	16-Feb-17
17020108-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Cyclohexane		0.03	ppbv	0.02	AC-058	16-Feb-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 06, 2017	2407	Ambient Air	06-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020108	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020108-001	Cyclopentane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Ethanol		0.5	ppbv	0.3	AC-058	16-Feb-17
17020108-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020108-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Freon-11		0.39	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Freon-113	I	0.11	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Freon-114	I	0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Freon-12		0.81	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Feb-17
17020108-001	Isobutane		0.38	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Isopentane		0.37	ppbv	0.03	AC-058	16-Feb-17
17020108-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020108-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	m,p-Xylene		0.06	ppbv	0.03	AC-058	16-Feb-17
17020108-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020108-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	16-Feb-17
17020108-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Feb-17
17020108-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020108-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020108-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020108-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020108-001	Methylcyclohexane		0.05	ppbv	0.01	AC-058	16-Feb-17
17020108-001	Methylcyclopentane		0.06	ppbv	0.02	AC-058	16-Feb-17

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Date: Friday, March 24, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 06, 2017	2407	Ambient Air	06-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020108	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020108-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020108-001	n-Butane		0.52	ppbv	0.03	AC-058	16-Feb-17
17020108-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020108-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020108-001	n-Heptane		0.06	ppbv	0.01	AC-058	16-Feb-17
17020108-001	n-Hexane		0.07	ppbv	0.01	AC-058	16-Feb-17
17020108-001	n-Octane		0.03	ppbv	0.02	AC-058	16-Feb-17
17020108-001	n-Pentane		0.2	ppbv	0.1	AC-058	16-Feb-17
17020108-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020108-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020108-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020108-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	o-Xylene		0.02	ppbv	0.01	AC-058	16-Feb-17
17020108-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020108-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020108-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020108-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020108-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020108-001	Toluene		0.11	ppbv	0.01	AC-058	16-Feb-17
17020108-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020108-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020108-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020108-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17

Report certified by: Krista Gegoick, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

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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/Feb 06, 2017	2407	Ambient Air	06-Feb-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020108	REPORT CREATED:	24-Mar-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020108-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	16-Feb-17
17020108-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	16-Feb-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Friday, March 24, 2017

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E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Feb 12, 2017	2442	Ambient Air	12-Feb-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020146	REPORT CREATED:	24-Mar-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020146-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020146-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020146-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	16-Feb-17
17020146-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020146-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020146-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	16-Feb-17
17020146-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020146-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020146-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020146-001	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	2,2,4-Trimethylpentane		0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 12, 2017	2442	Ambient Air	12-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020146	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020146-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	2-Methylhexane		0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	2-Methylpentane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020146-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	3-Methylpentane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Acetone		1.2	ppbv	0.4	AC-058	16-Feb-17
17020146-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020146-001	Benzene		0.09	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020146-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Carbon disulfide	I	0.08	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Carbon tetrachloride	I	0.14	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Chloroform	I	0.03	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Chloromethane		0.57	ppbv	0.02	AC-058	16-Feb-17
17020146-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020146-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Feb 12, 2017	2442	Ambient Air	12-Feb-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020146	REPORT CREATED:	24-Mar-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020146-001	Cyclopentane		0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Ethanol		0.5	ppbv	0.3	AC-058	16-Feb-17
17020146-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020146-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Freon-11		0.38	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Freon-113	I	0.12	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Freon-114	I	0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Freon-12		0.80	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Feb-17
17020146-001	Isobutane		0.50	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Isopentane		0.25	ppbv	0.03	AC-058	16-Feb-17
17020146-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020146-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020146-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020146-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	16-Feb-17
17020146-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Feb-17
17020146-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020146-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020146-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020146-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020146-001	Methylcyclohexane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020146-001	Methylcyclopentane		0.03	ppbv	0.02	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 12, 2017	2442	Ambient Air	12-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020146	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020146-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020146-001	n-Butane		0.80	ppbv	0.03	AC-058	16-Feb-17
17020146-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020146-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020146-001	n-Heptane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020146-001	n-Hexane		0.05	ppbv	0.01	AC-058	16-Feb-17
17020146-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	n-Pentane		0.2	ppbv	0.1	AC-058	16-Feb-17
17020146-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020146-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020146-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020146-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020146-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020146-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020146-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020146-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020146-001	Toluene		0.03	ppbv	0.01	AC-058	16-Feb-17
17020146-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020146-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020146-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020146-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17

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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/VOC/CLS/Feb 12, 2017	2442	Ambient Air	12-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020146	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020146-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	16-Feb-17
17020146-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	16-Feb-17

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

Date: Friday, March 24, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 18, 2017	2458	Ambient Air	18-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Mar-17
17020270-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	01-Mar-17
17020270-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Mar-17
17020270-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020270-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	01-Mar-17
17020270-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020270-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-001	1-Butene		0.04	ppbv	0.02	AC-058	01-Mar-17
17020270-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	2,2,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	01-Mar-17
17020270-001	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	01-Mar-17
17020270-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	01-Mar-17
17020270-001	2,3-Dimethylpentane		0.04	ppbv	0.02	AC-058	01-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Feb 18, 2017	2458	Ambient Air	18-Feb-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	2-Methylheptane		0.02	ppbv	0.01	AC-058	01-Mar-17
17020270-001	2-Methylhexane		0.04	ppbv	0.01	AC-058	01-Mar-17
17020270-001	2-Methylpentane		0.05	ppbv	0.01	AC-058	01-Mar-17
17020270-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	3-Methylhexane		0.04	ppbv	0.02	AC-058	01-Mar-17
17020270-001	3-Methylpentane		0.04	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Acetone		1.3	ppbv	0.4	AC-058	01-Mar-17
17020270-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020270-001	Benzene		0.12	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Carbon disulfide		0.50	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Carbon tetrachloride	I	0.15	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Chloroform	I	0.03	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Chloromethane		0.42	ppbv	0.02	AC-058	01-Mar-17
17020270-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Cyclohexane		0.05	ppbv	0.02	AC-058	01-Mar-17

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Date: Monday, March 27, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 18, 2017	2458	Ambient Air	18-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Ethanol		1.1	ppbv	0.3	AC-058	01-Mar-17
17020270-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-001	Ethylbenzene		0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Freon-11		0.39	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Freon-113	I	0.11	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Freon-114	I	0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Freon-12		0.79	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	01-Mar-17
17020270-001	Isobutane		0.43	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Isopentane		0.26	ppbv	0.03	AC-058	01-Mar-17
17020270-001	Isoprene		0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	m,p-Xylene		0.04	ppbv	0.03	AC-058	01-Mar-17
17020270-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	01-Mar-17
17020270-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	01-Mar-17
17020270-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020270-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Mar-17
17020270-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020270-001	Methylcyclohexane		0.09	ppbv	0.01	AC-058	01-Mar-17
17020270-001	Methylcyclopentane		0.08	ppbv	0.02	AC-058	01-Mar-17

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Date: Monday, March 27, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 18, 2017	2458	Ambient Air	18-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020270-001	n-Butane		0.51	ppbv	0.03	AC-058	01-Mar-17
17020270-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020270-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-001	n-Heptane		0.04	ppbv	0.01	AC-058	01-Mar-17
17020270-001	n-Hexane		0.05	ppbv	0.01	AC-058	01-Mar-17
17020270-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	n-Pentane		0.2	ppbv	0.1	AC-058	01-Mar-17
17020270-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Mar-17
17020270-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	01-Mar-17
17020270-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	01-Mar-17
17020270-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	o-Xylene		0.02	ppbv	0.01	AC-058	01-Mar-17
17020270-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Mar-17
17020270-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-001	Toluene		0.08	ppbv	0.01	AC-058	01-Mar-17
17020270-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17

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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/VOC/CLS/Feb 18, 2017	2458	Ambient Air	18-Feb-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020270-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	01-Mar-17
17020270-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	01-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Monday, March 27, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 24, 2017	2419	Ambient Air	24-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Mar-17
17020270-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	01-Mar-17
17020270-003	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Mar-17
17020270-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020270-003	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	01-Mar-17
17020270-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020270-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-003	1-Butene		0.10	ppbv	0.02	AC-058	01-Mar-17
17020270-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	01-Mar-17
17020270-003	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	01-Mar-17
17020270-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	01-Mar-17
17020270-003	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 24, 2017	2419	Ambient Air	24-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	2-Methylhexane		0.03	ppbv	0.01	AC-058	01-Mar-17
17020270-003	2-Methylpentane		0.11	ppbv	0.01	AC-058	01-Mar-17
17020270-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	3-Methylhexane		0.03	ppbv	0.02	AC-058	01-Mar-17
17020270-003	3-Methylpentane		0.07	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Acetone		1.3	ppbv	0.4	AC-058	01-Mar-17
17020270-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020270-003	Benzene		0.12	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Carbon disulfide	I	0.03	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Carbon tetrachloride	I	0.15	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Chloroform	I	0.03	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Chloromethane		0.68	ppbv	0.02	AC-058	01-Mar-17
17020270-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-003	cis-2-Butene		0.04	ppbv	0.02	AC-058	01-Mar-17
17020270-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Cyclohexane		0.03	ppbv	0.02	AC-058	01-Mar-17

Report certified by:	Colleen McGerrigle, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Monday, March 27, 2017	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 24, 2017	2419	Ambient Air	24-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-003	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Ethanol		0.7	ppbv	0.3	AC-058	01-Mar-17
17020270-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-003	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Freon-11		0.52	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Freon-113	I	0.15	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Freon-114	I	0.03	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Freon-12		1.07	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	01-Mar-17
17020270-003	Isobutane		0.57	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Isopentane		0.29	ppbv	0.03	AC-058	01-Mar-17
17020270-003	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020270-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	01-Mar-17
17020270-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	01-Mar-17
17020270-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020270-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Mar-17
17020270-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020270-003	Methylcyclohexane		0.03	ppbv	0.01	AC-058	01-Mar-17
17020270-003	Methylcyclopentane		0.03	ppbv	0.02	AC-058	01-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Feb 24, 2017	2419	Ambient Air	24-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020270-003	n-Butane		0.66	ppbv	0.03	AC-058	01-Mar-17
17020270-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020270-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-003	n-Heptane		0.02	ppbv	0.01	AC-058	01-Mar-17
17020270-003	n-Hexane		0.08	ppbv	0.01	AC-058	01-Mar-17
17020270-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	n-Pentane		0.2	ppbv	0.1	AC-058	01-Mar-17
17020270-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Mar-17
17020270-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	01-Mar-17
17020270-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	01-Mar-17
17020270-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	o-Xylene		0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Mar-17
17020270-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020270-003	Toluene		0.06	ppbv	0.01	AC-058	01-Mar-17
17020270-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020270-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020270-003	trans-2-Butene		0.04	ppbv	0.01	AC-058	01-Mar-17
17020270-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020270-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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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/VOC/CLS/Feb 24, 2017	2419	Ambient Air	24-Feb-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020270-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	01-Mar-17
17020270-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	01-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

PAHS SAMPLES

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID LICA/PUF/CLS/Feb 06, 2017	CANISTER ID TE-05	Matrix Air Filter	Priority Normal
	DESCRIPTION: Cold Lake South			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 06-Feb-17	0:00	DATE RECEIVED: 13-Feb-17	
	780 812 2182	REPORT CREATED: 24-Mar-17	REPORT NUMBER: 17020108	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020108-002	1-Methylnaphthalene		0.61	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	2-Methylnaphthalene		0.96	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Acenaphthene		0.08	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Acenaphthylene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Benzo(a)anthracene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Benzo(a)pyrene		0.02	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Benzo(b,j,k)fluoranthene		0.05	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Benzo(e)pyrene		0.02	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Chrysene		0.02	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Graham Knox, Team Lead

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/Feb 06, 2017	TE-05	Air Filter	06-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020108	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020108-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Fluoranthene		0.05 ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Fluorene		0.09 ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Indeno(1,2,3-cd)pyrene		0.02 ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Naphthalene		1.08 ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Perylene		0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Phenanthrene		0.19 ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Pyrene		0.03 ug/Filter	0.01	NA-017	17-Mar-17
17020108-002	Retene		0.04 ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Graham Knox, Team Lead

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

RESULTS:	Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE		CLIENT SAMPLE ID	CANISTER ID	Matrix	Priority
	Calgary AB	T2E 6P8	LICA/PUF/CLS/Feb 12, 2017	9102	Air Filter	Normal
INVOICE:	Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB		780 812 2182		DESCRIPTION:	
		T9N 2J5			Cold Lake South	
			DATE SAMPLED:	12-Feb-17 0:00	DATE RECEIVED:	15-Feb-17
			REPORT CREATED:	24-Mar-17	REPORT NUMBER:	17020146
					VERSION:	Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020146-002	1-Methylnaphthalene		0.23	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	2-Methylnaphthalene		0.35	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Acenaphthene		0.03	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Benzo(a)pyrene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Benzo(b,j,k)fluoranthene		0.04	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Benzo(e)pyrene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Chrysene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/Feb 12, 2017	9102	Air Filter	12-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020146	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020146-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Fluoranthene		0.03	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Fluorene		0.04	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Indeno(1,2,3-cd)pyrene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Naphthalene		0.43	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Phenanthrene		0.09	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Pyrene		0.02	ug/Filter	0.01	NA-017	17-Mar-17
17020146-002	Retene		0.02	ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID LICA/PUF/CLS/Feb 18, 2017	CANISTER ID TE-11	Matrix Air Filter	Priority Normal
	DESCRIPTION: Cold Lake South			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 18-Feb-17	0:00	DATE RECEIVED: 28-Feb-17	
	REPORT CREATED: 27-Mar-17		REPORT NUMBER: 17020270	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-002	1-Methylnaphthalene		0.13	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	2-Methylnaphthalene		0.11	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Acenaphthene		0.04	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Acenaphthylene		0.02	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Anthracene		0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Benzo(a)anthracene		0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Benzo(a)pyrene		0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Benzo(b,j,k)fluoranthene		0.03	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Chrysene		0.02	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/Feb 18, 2017	TE-11	Air Filter	18-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020270-002	Dibenzo(ah)anthracene		0.01 ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Fluoranthene		0.06 ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Fluorene		0.14 ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Naphthalene		0.13 ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Phenanthrene		0.30 ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Pyrene		0.04 ug/Filter	0.01	NA-017	16-Mar-17
17020270-002	Retene		0.02 ug/Filter	0.01	NA-017	16-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Feb 24, 2017	TE-07	Air Filter	24-Feb-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020270-004	1-Methylnaphthalene		0.19	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	2-Methylnaphthalene		0.19	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Acenaphthene		0.03	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Benzo(a)pyrene		0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Benzo(b,j,k)fluoranthene		0.03	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Chrysene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Fluoranthene		0.02	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Fluorene		0.04	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Naphthalene		0.20	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Phenanthrene		0.08	ug/Filter	0.01	NA-017	16-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/Feb 24, 2017	TE-07	Air Filter	24-Feb-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17020270	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020270-004	Pyrene		0.01 ug/Filter	0.01	NA-017	16-Mar-17
17020270-004	Retene		0.02 ug/Filter	0.01	NA-017	16-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Monday, March 27, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

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: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID P6031621</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 06-Feb-17 0:00</p> <p>REPORT CREATED: 17-Feb-17</p> <p>DATE RECEIVED: 13-Feb-17</p> <p>REPORT NUMBER: 17020109</p> <p>VERSION: Version 01</p>
---	---

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020109-001	Particulate Weight		0.127	mg	0.004	AC-029	14-Feb-17

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

Date: Friday, February 17, 2017 **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: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Flter # P6031622</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 12-Feb-17 0:00</p> <p>REPORT CREATED: 03-Mar-17</p> <p>DATE RECEIVED: 15-Feb-17</p> <p>REPORT NUMBER: 17020147</p> <p>VERSION: Version 01</p>
---	--

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020147-001	Particulate Weight		0.018	mg	0.004	AC-029	21-Feb-17

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

Date: Friday, March 03, 2017 **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: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID LICA Flter # P6031620</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 18-Feb-17 0:00</p> <p>REPORT CREATED: 14-Mar-17</p> <p>DATE RECEIVED: 28-Feb-17</p> <p>REPORT NUMBER: 17020271</p> <p>VERSION: Version 01</p>
---	--

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020271-001	Particulate Weight		0.044	mg	0.004	AC-029	03-Mar-17

Report certified by: Graham Knox, Team Lead **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services

Date: Tuesday, March 14, 2017 **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 Flter # P6072295		Air Filter	24-Feb-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020271	REPORT CREATED:	14-Mar-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020271-002	Particulate Weight		0.051 mg	0.004	AC-029	03-Mar-17

Report certified by: Graham Knox, Team Lead	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Tuesday, March 14, 2017	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
Wunmi Adekanmbi	Project Manager, 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

07-04-2017




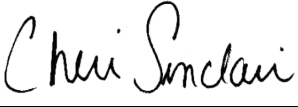
Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-02-1-C</u>
Site: <u>Cold Lake Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>14-Mar-17</u>
Level 1 Primary Validation	<u></u>	Date <u>24-Mar-17</u>
Level 2 Final Validation	<u></u>	Date <u>30-Mar-17</u>
Level 3 Independent Data Review	<u></u>	Date <u>04-Apr-17</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.



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

February 22, 2018

Subject: Monthly Report Submission for the LICA Maskwa station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Maskwa AQM Station in the month of February 2017.

The air monitoring program consists of continuous air monitoring results for 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).

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics

All data collected in February 2017 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 systems.

H₂S: The API 101E analyzer, s/n: 511, was removed on February 14 for maintenance. An API 101A analyzer, s/n: 324, was installed on February 14 and a successful installation calibration was completed on February 15.

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

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

Respectfully,



Lakeland Industry & Community Association
5107 50 St
Bonnyville, AB T9N 2J7

A handwritten signature in blue ink that reads 'Michael Bisaga'.

Michael Bisaga
Technical Program Manager
Lakeland Industry & Community Association
780-266-7068
mbisaga@otonabee.ca

A handwritten signature in blue ink that reads 'Lily Lin'.

Lily Lin
Data & Reporting Specialist
587-225-2248
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AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
MASKWA CONTINUOUS MONITORING STATION

JOB #: 2833-2017-02-30-C

February 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

402 - 19 ST NW
CALGARY, ALBERTA
T2N 2J1

Attention: MIKE BISAGA

DATE: **April 12, 2017**

Prepared by:

A handwritten signature in blue ink, appearing to read "Wunmi Adekanmbi".

Wunmi Adekanmbi, M.Sc., EPt.
Project Manager, 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 February 2017, 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).

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

SO₂: Two hours of downtime were incurred on February 14, due to a maintenance event.

H₂S: Twenty-three hours of downtime were recorded this month. Four hours were attributed to additional zero/span checks conducted on February 3 and February 12. Nineteen hours were incurred between February 14 and February 15 due to an analyzer replacement event.

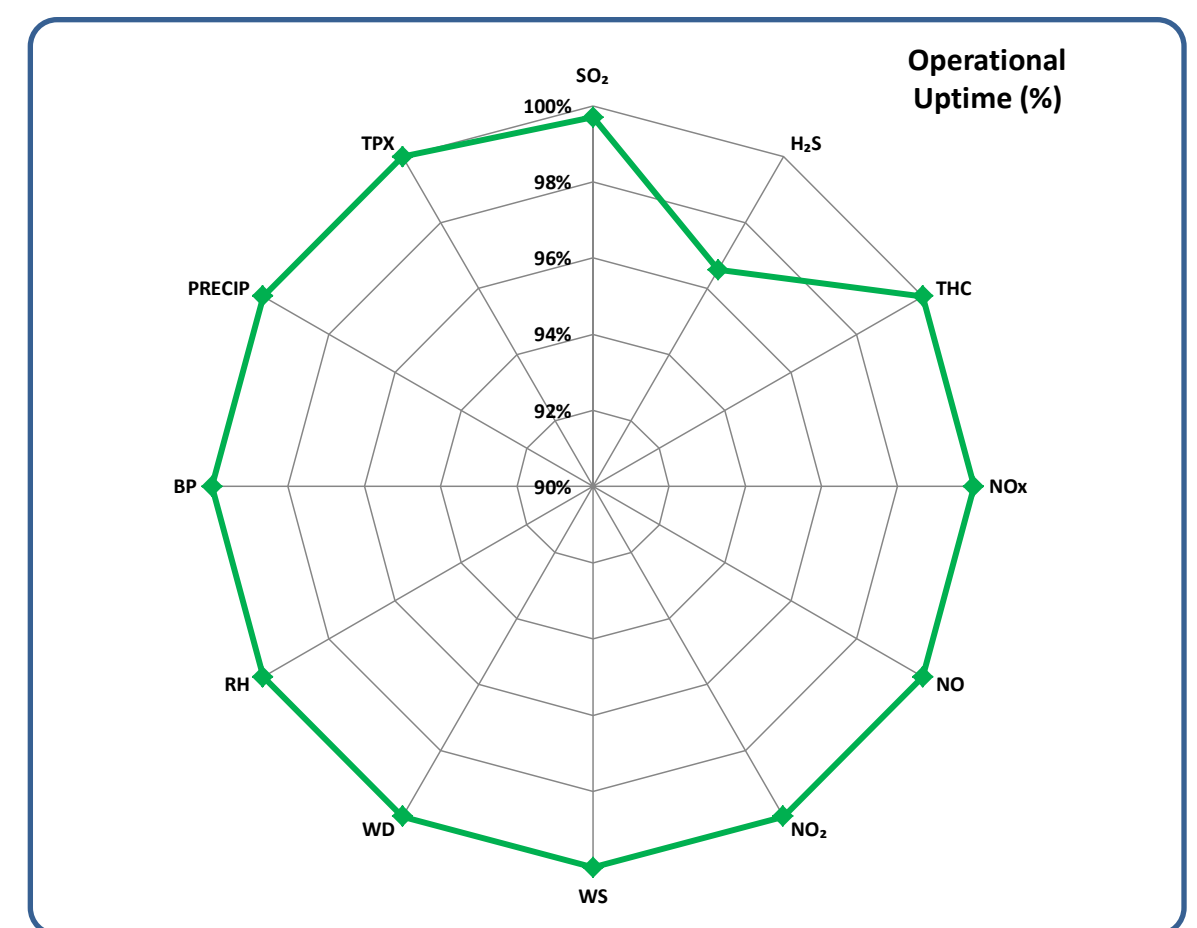
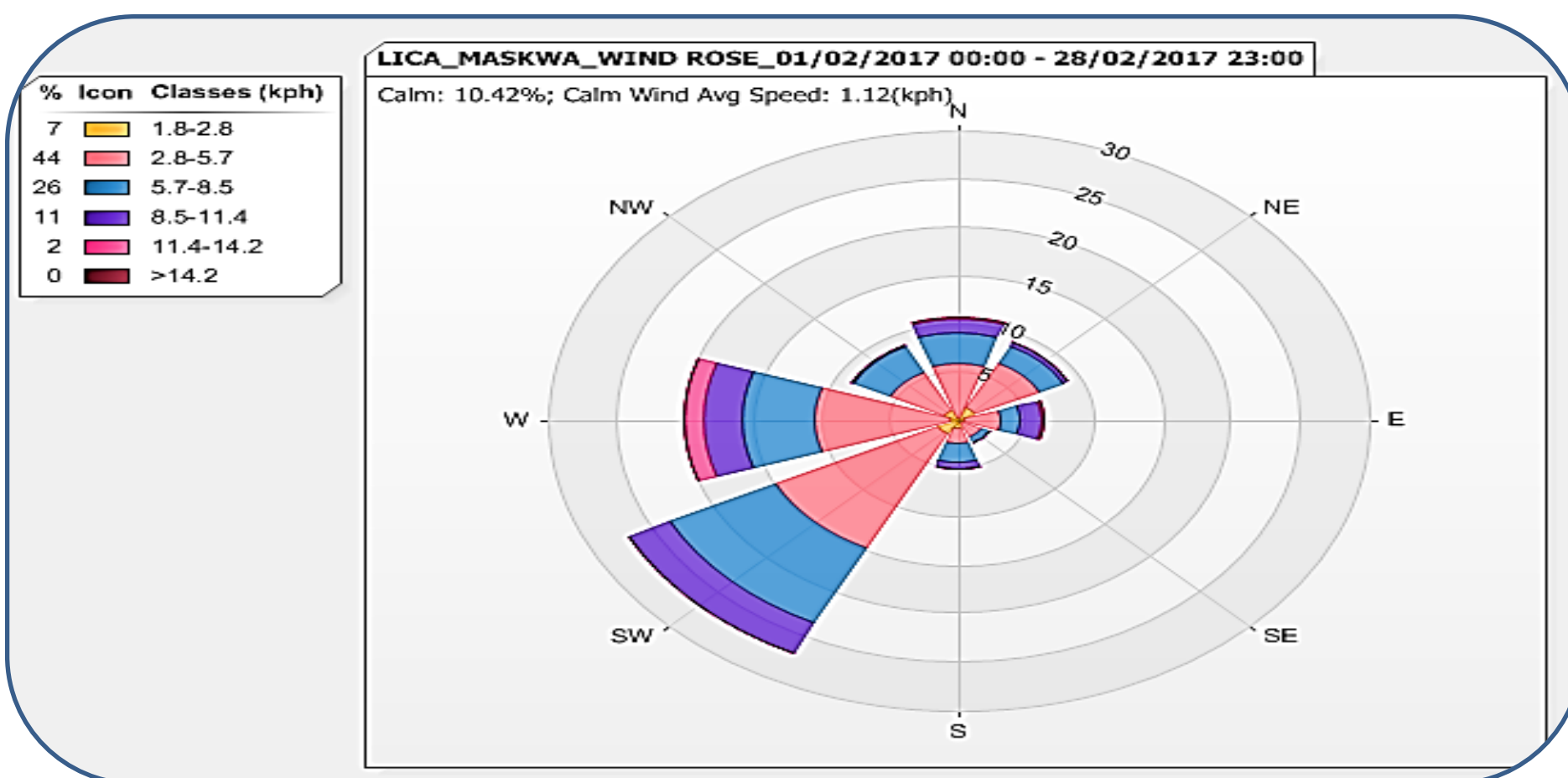
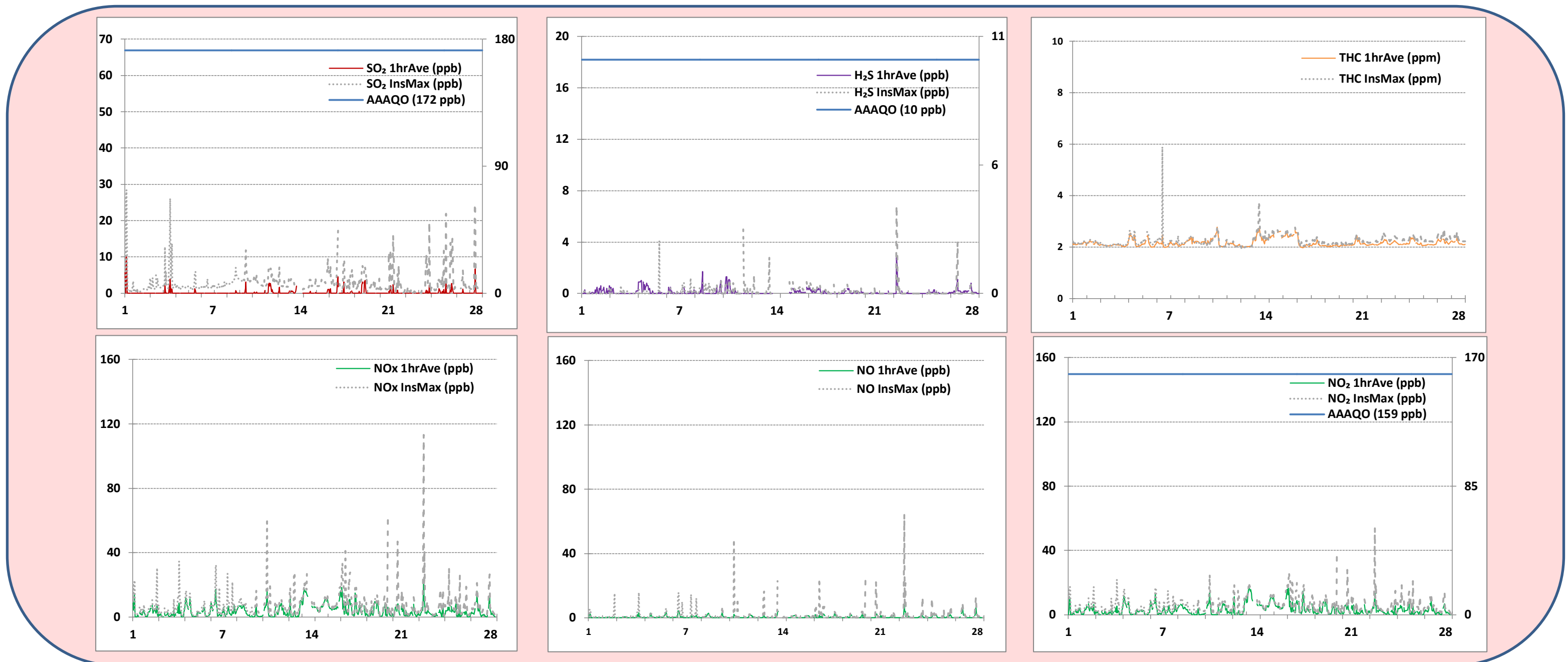
NO_x/NO/NO₂: NO_x calibration concentrations were calculated using a NO_x gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO_x that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO_x gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD complaint.

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.

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	0.2	99.7%	10.3	February 1	2	172	0	1.1	February 1	48	0
H ₂ S	ppb	0.1	96.6%	2.8	February 23	4	10	0	0.5	February 5	3	0
THC	ppm	2.17	100.0%	2.77	February 11	7	-	-	2.47	February 16	-	-
NO _x	ppb	3.6	100.0%	21.1	February 23	8	-	-	11.2	February 14	-	-
NO	ppb	0.5	100.0%	8.0	February 23	8	-	-	1.0	February 27	-	-
NO ₂	ppb	3.1	100.0%	17.0	February 14	4	159	0	10.5	February 14	-	-
WS	kph	1.8	100.0%	14.1	February 11, 13	VAR, 0	-	-	8.9	February 12	-	-
WD	degree	18.1 (NNE)	100.0%	-	-	-	-	-	-	-	-	-
RH	%	69	100.0%	90	VAR	VAR	-	-	88	February 19	-	-
BP	mbar	935	100.0%	956	February 1	VAR	-	-	954	February 1	-	-
PRECIP	mm	0.0	100.0%	3.0	February 19	13	-	-	0.7	February 19	-	-
AmbTPX	°C	-8.8	100.0%	9.8	February 13	14	-	-	3.8	February 13	-	-



Monthly Update

- * The sampling, correction and reporting of air monitoring data was performed by Maxxam Analytics and complies with the quality assurance practices outlined in the Alberta Air Monitoring Directive (Alberta Environment and Parks 2016).
- * 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: The operational time was 99.7%, equivalent to two hours of downtime. These were incurred on February 14, due to a maintenance event.

H₂S: The operational time was 96.6%, equivalent to twenty-three hours of downtime. Four hours were attributed to additional zero/span checks conducted on February 3 and February 12. Nineteen hours were incurred between February 14 and February 15 due to an analyzer replacement event.

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	0.2	10.3	1	2	7.4	NW	1.1	1	99.7
H ₂ S (ppb)	10	3	0	0	0.1	2.8	23	4	1.8	WSW	0.5	5	96.6
THC (ppm)	-	-	-	-	2.17	2.77	11	7	7.5	SW	2.47	16	100.0
NO ₂ (ppb)	159	-	0	-	3.1	17.0	14	4	5.9	SSW	10.5	14	100.0
NO (ppb)	-	-	-	-	0.5	8.0	23	8	1.1	SW	1.0	27	100.0
NO _x (ppb)	-	-	-	-	3.6	21.1	23	8	1.1	SW	11.2	14	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	69	90	VAR	VAR	VAR	VAR	88	19	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	935	956	1	VAR	VAR	VAR	954	1	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-8.8	9.8	13	14	8.9	W	3.8	13	100.0
PRECIPITATION (mm)	-	-	-	-	0.0	3.0	19	13	8.1	ESE	0.7	19	100.0
VECTOR WS (kph)	-	-	-	-	1.8	14.1	11, 13	VAR, 0	-	WNW	8.9	12	100.0
VECTOR WD (sec)	-	-	-	-	18.1 (NNE)	-	-	-	-	-	-	-	100.0

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 (December, 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%).

Trailer inspection was conducted on February 14. No issues were identified.

SULPHUR DIOXIDE (SO₂)

- The operational time was 99.7%, equivalent to two hours of downtime.
- A shut-down calibration was performed on February 14, prior to performing maintenance on the zero-span system to check for leaks. No leaks were found and a post-repair calibration was subsequently completed. Both calibrations met AMD requirements. Two hours of downtime were incurred due to this maintenance event.
- Maximum instantaneous data collected on February 9, at hours 11:00 and 12:00, were lost due to brief power outages.

HYDROGEN SULPHIDE (H₂S)

- The operational time was 96.6%, equivalent to twenty-three hours of downtime.
- The analyzer spanned towards the lower acceptance limit on February 2. A repeat zero/span check conducted on February 3 showed that this was not a trend. No further action was taken. Two hours of downtime were however incurred due to the additional span check.
- The analyzer started to exhibit instability in daily zero readings on February 11. An additional zero/span check performed on February 12 confirmed the unstable zero. This prompted a site visit on February 14, where the API 101E (s/n: 511) analyzer was removed for maintenance, following a successful shut-down calibration. An API 101A (s/n: 324) was installed and allowed time to stabilize overnight. A successful installation calibration was subsequently completed on February 15. Twenty-one hours of downtime were recorded due to the analyzer replacement activity and the additional quality check.
- Maximum instantaneous data collected on February 9 at hours 11:00 and 12:00 were lost due to brief power outages.

TOTAL HYDROCARBONS (THC)

- There were no issues that impacted operational time this month. The routine monthly calibration was performed on February 15.
- Maximum instantaneous data on February 9 at hours 11:00 and 12:00 were lost due to brief power outages.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- There were no issues that impacted operational time this month. The routine monthly calibration was performed on February 14.
- Maximum instantaneous data on February 9 at hours 11:00 and 12:00 were lost due to brief power outages.
- NO_x calibration concentrations were calculated using a NO_x gas concentration of 50.7 rather than 50.9 ppm. This yielded incorrect values for Calculated NO_x that were presented on the Analyzer Calibration Form. The calibration concentrations were recalculated using the correct NO_x gas value (50.9 ppm) and the outcome was insignificant. The calibration is still deemed AMD compliant.

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

- There were no issues that impacted operational time this month.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- There were no issues that impacted operational time this month.

BAROMETRIC PRESSURE (BP)

- There were no issues that impacted operational time this month.

PRECIPITATION (PRECIP)

- There were no issues that impacted operational time this month. The precipitation sensor was audited on February 14. The result was within acceptance limits.

AMBIENT TEMPERATURE (AmbTPX)

- There were no issues that impacted operational time this month. The temperature sensor was audited on February 14. The result was within acceptance limits.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technicians were Raja Ashraf and 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-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 and API 101A 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

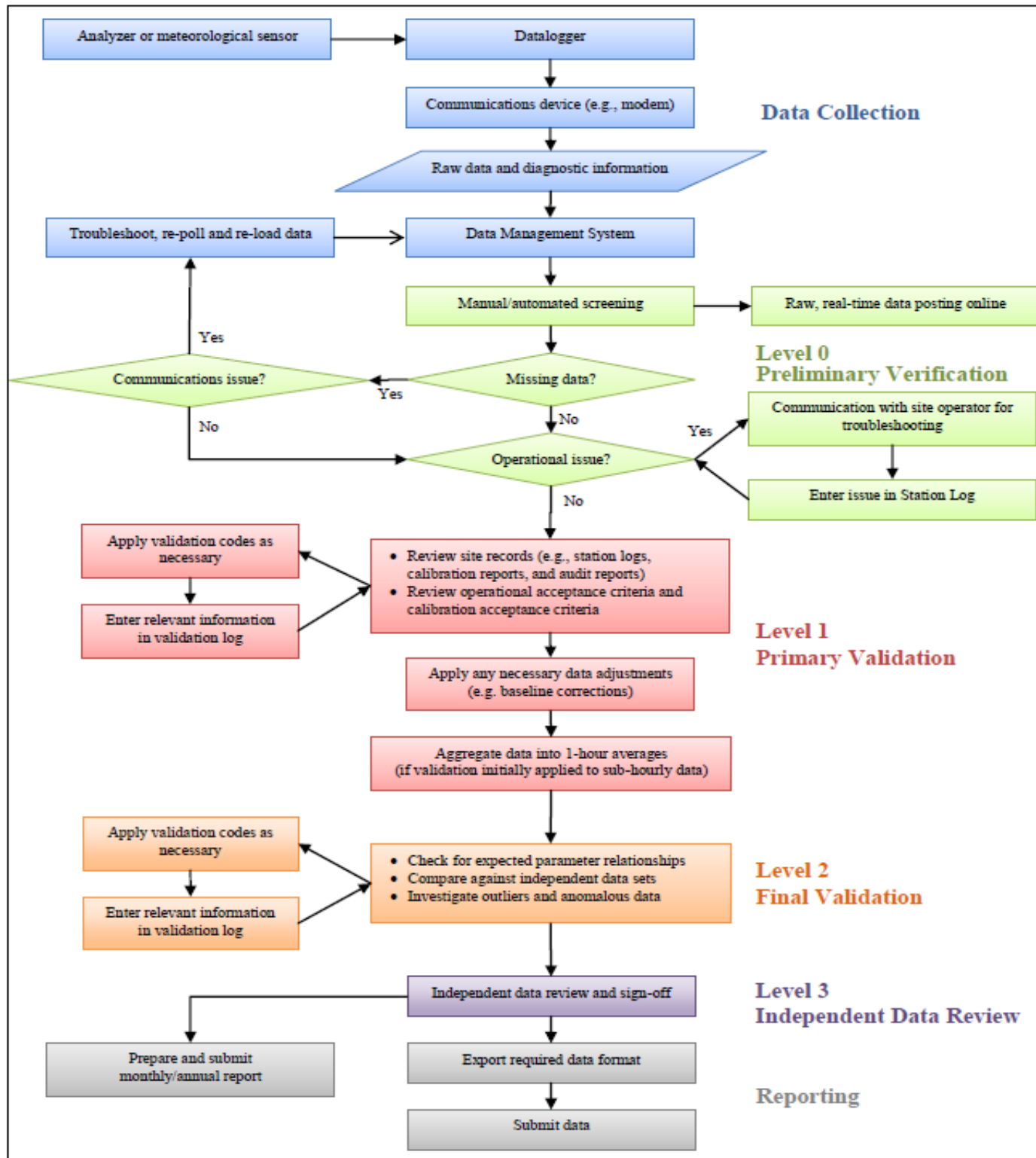
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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	5.7	0.0	10.3	10.2	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	10.3	1.1	24	
2	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	
3	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	0.0	24	
4	0.0	0.0	0.0	2.1	0.0	0.1	0.0	0.0	S	0.0	0.0	2.1	0.2	3.9	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.5	24	
5	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	
6	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	1.3	0.7	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	1.3	0.1	24		
7	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	
8	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	
9	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	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	24		
10	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	3.1	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	3.1	0.2	24		
11	0.0	S	0.0	0.0	0.3	0.0	0.0	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	0.7	0.7	0.1	24		
12	S	0.0	0.0	0.0	0.0	0.2	2.5	2.8	2.0	2.7	2.0	0.4	1.0	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	2.8	0.7	24			
13	0.0	0.7	1.7	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	0.2	0.6	S	0.3	0.0	1.7	0.2	24				
14	0.4	0.6	0.4	0.5	0.3	0.0	0.0	0.0	0.3	0.6	2.0	C	C	C	C	Y	Y	C	C	C	0.0	S	0.0	0.0	0.0	2.0	0.4	22				
15	0.0	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	S	0.0	0.2	0.0	0.0	0.5	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	S	0.2	1.0	1.0	1.0	0.0	1.0	0.1	24			
17	0.0	0.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.7	4.5	1.8	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.5	24			
18	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4	S	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.2	24			
19	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	2.3	3.1	2.8	S	0.2	3.1	3.5	1.7	0.0	0.0	0.0	0.0	0.0	3.5	0.7	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	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		
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	S	0.0	0.5	0.0	1.4	2.1	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.2	24			
22	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.8	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	2.4	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	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		
24	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	0.2	0.8	0.0	0.6	0.0	0.0	0.0	0.2	2.2	0.0	0.0	0.0	0.0	2.2	0.2	24			
25	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	0.3	1.3	1.0	0.6	0.0	0.0	0.0	0.5	0.0	0.0	1.0	0.0	1.3	0.2	24				
26	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	S	0.0	0.8	1.6	0.3	2.7	1.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.5	24			
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.2	1.2	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	1.2	0.1	24			
28	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	1.3	6.7	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	6.7	0.3	24			
HOURLY MAX	5.7	0.7	10.3	10.2	0.3	0.2	2.5	2.8	2.0	2.7	6.7	3.1	1.6	3.9	3.1	3.7	4.5	1.8	3.1	3.5	2.2	1.0	1.0	1.0								
HOURLY AVG	0.3	0.1	0.5	0.7	0.0	0.0	0.1	0.1	0.1	0.2	0.5	0.4	0.2	0.3	0.3	0.4	0.4	0.1	0.2	0.2	0.2	0.1	0.0	0.1								

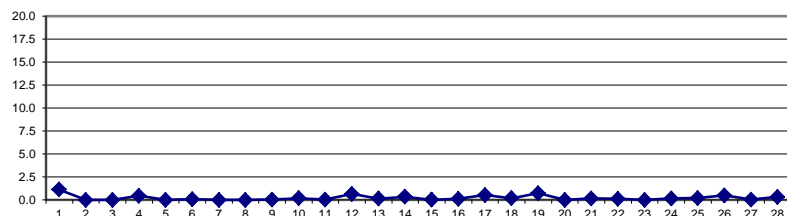
STATUS FLAG CODES

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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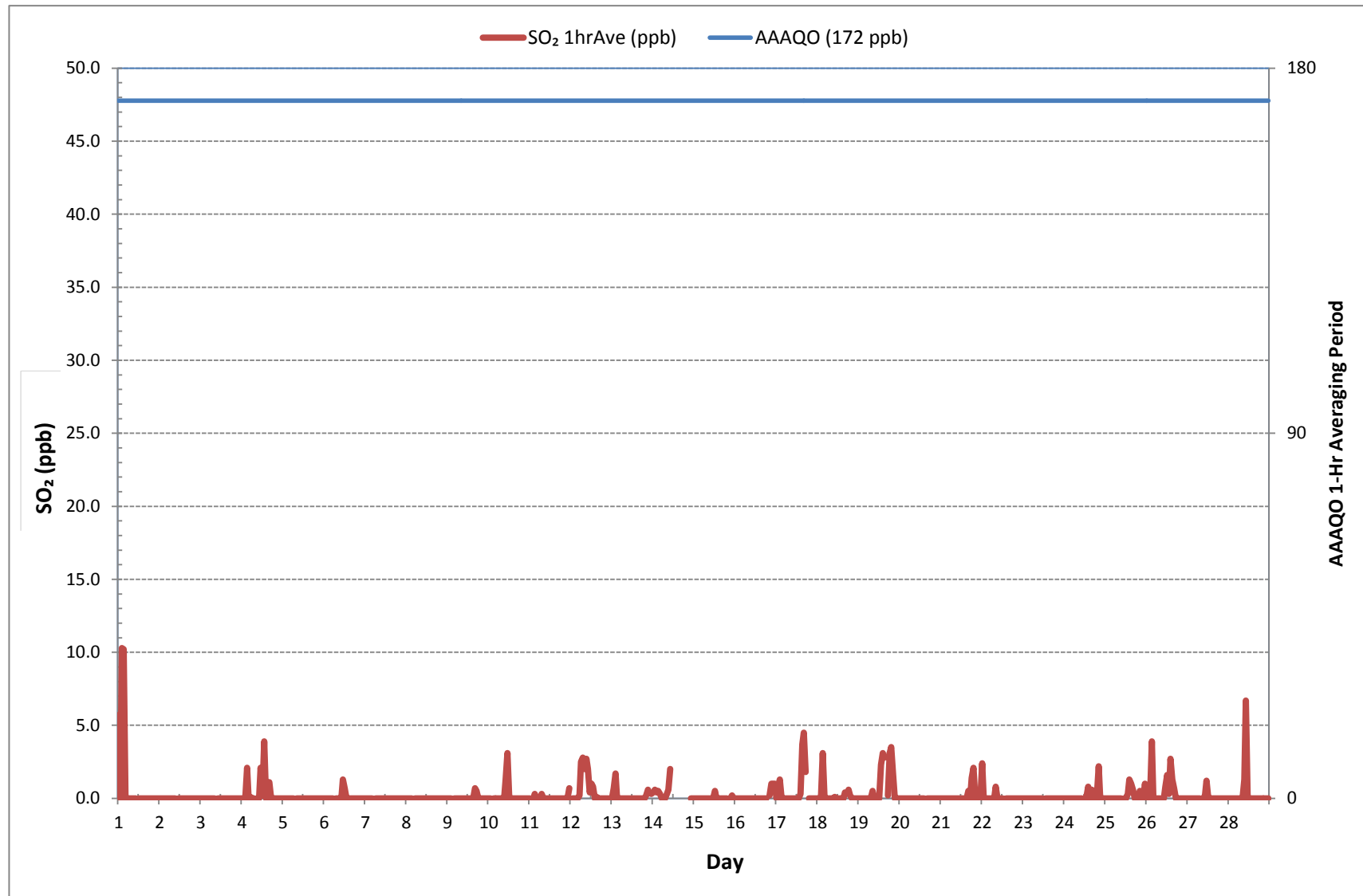
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	94		
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S) VAR ON DAY(S) ALL		
MAXIMUM 1-HR AVERAGE:	10.3 ppb @ HOUR(S) 2 ON DAY(S) 1		
MAXIMUM 24-HR AVERAGE:	1.1 ppb ON DAY(S) 1		
	VAR-VARIOUS		
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	670 hrs
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	99.7 %
STANDARD DEVIATION:	0.9	MONTHLY AVERAGE:	0.2 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

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	24.2	1.8	26.3	28.5	5.4	0.7	0.7	0.6	0.8	0.6	0.6	S	0.5	0.7	1.8	3.3	0.5	0.3	0.8	0.8	1.1	0.3	0.3	0.2	0.2	28.5	4.4	24
2	0.3	0.3	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.5	S	1.1	1.2	1.2	1.3	1.1	1.0	1.0	0.8	1.5	1.8	1.7	1.3	4.1	0.3	4.1	1.0	24
3	3.3	1.4	1.4	1.6	4.2	1.6	1.3	1.2	1.5	S	5.0	1.8	2.6	4.1	2.2	2.0	1.6	1.6	1.6	1.6	1.6	1.7	1.9	1.2	5.0	2.1	24	
4	2.1	1.9	1.9	12.8	2.3	5.8	1.6	1.6	S	1.4	3.8	13.0	14.6	26.1	3.9	9.7	13.7	1.5	1.6	1.6	1.6	2.1	2.4	1.6	1.4	26.1	5.6	24
5	1.8	2.4	1.8	1.4	1.5	1.6	1.4	S	1.3	1.6	1.9	1.8	1.9	1.7	1.8	1.9	1.7	1.5	1.6	1.5	1.6	1.9	2.0	1.3	2.4	1.7	24	
6	1.8	1.5	1.5	1.5	1.2	1.5	S	1.2	1.0	1.6	2.4	5.9	5.9	2.0	1.5	1.5	1.5	1.6	1.5	1.4	1.6	1.8	1.6	1.8	1.0	5.9	1.9	24
7	1.7	1.5	1.4	1.4	1.8	S	1.8	1.6	1.5	1.6	2.6	3.9	1.5	1.6	1.6	1.6	1.6	1.7	1.6	1.6	2.2	1.6	1.5	2.5	1.4	3.9	1.8	24
8	2.0	1.6	1.6	1.6	S	1.6	1.6	1.8	2.6	2.1	1.5	1.5	1.8	1.9	2.3	1.9	2.0	2.9	3.1	2.1	2.1	2.7	2.6	1.5	3.1	2.0	24	
9	2.7	2.7	2.7	S	2.6	2.6	2.6	2.6	2.8	2.8	3.1	P	P	3.8	4.0	5.2	7.0	5.1	4.8	4.5	4.2	4.0	3.9	3.7	2.6	7.0	3.7	22
10	3.7	3.7	S	3.4	3.5	3.6	3.5	3.7	3.5	4.8	8.4	11.8	7.0	5.0	4.7	3.3	3.1	3.2	3.7	3.2	3.4	3.7	3.6	3.5	3.1	11.8	4.4	24
11	3.4	S	3.8	5.0	4.2	4.0	3.2	4.8	4.0	3.1	2.8	2.6	2.8	2.6	2.4	2.4	2.2	2.2	2.2	2.0	2.1	2.0	4.0	5.1	2.0	5.1	3.2	24
12	S	2.1	2.4	2.6	3.0	4.8	6.8	6.8	6.2	6.8	6.8	4.0	5.3	4.7	3.4	4.5	4.4	2.7	2.7	2.8	3.5	3.4	2.5	S	2.1	6.8	4.2	24
13	2.5	6.1	7.2	2.3	2.1	2.0	2.0	2.0	1.9	2.0	3.1	3.4	2.0	2.0	1.8	1.8	1.9	1.8	1.8	2.7	4.5	4.2	S	3.5	1.8	7.2	2.8	24
14	3.9	3.8	3.6	3.6	3.1	3.1	2.4	2.5	3.0	3.3	C	C	C	C	C	Y	Y	C	C	C	C	S	1.0	1.3	1.0	3.9	2.9	22
15	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.6	1.5	1.6	2.1	3.7	3.7	3.6	2.0	2.1	2.0	2.6	2.8	2.3	S	2.6	4.2	3.1	1.2	4.2	2.2	24
16	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4	2.4	3.7	3.2	2.9	2.9	2.8	3.0	3.0	3.1	2.7	2.8	S	5.9	9.7	6.3	6.7	2.0	9.7	3.4	24
17	4.9	5.5	7.5	3.5	3.0	2.3	2.2	3.8	3.8	2.2	2.4	2.4	2.0	1.9	7.4	12.2	16.5	18.5	S	2.6	1.6	1.5	1.4	1.4	1.4	18.5	4.8	24
18	1.1	1.6	6.7	9.1	9.2	1.6	1.6	1.2	1.3	2.8	3.5	1.6	2.4	3.7	1.0	4.5	5.6	S	5.9	6.5	2.4	1.4	3.5	2.2	1.0	9.2	3.5	24
19	3.1	1.3	1.3	1.3	1.4	2.8	1.6	2.2	4.1	3.7	2.4	2.9	3.9	6.7	7.5	6.8	S	5.6	7.3	7.0	6.2	4.3	3.7	1.8	1.3	7.5	3.9	24
20	1.7	1.5	1.7	1.5	1.6	1.6	1.8	2.5	2.2	2.2	1.6	3.0	1.3	1.3	3.4	S	1.2	1.4	1.4	1.3	1.3	1.1	4.0	1.8	1.1	4.0	1.8	24
21	1.0	1.0	1.3	1.6	1.7	1.6	1.2	1.4	1.5	1.6	1.2	1.0	1.0	1.0	S	8.7	11.2	1.1	6.9	12.0	4.1	1.1	2.1	6.9	1.0	12.0	3.1	24
22	15.9	8.9	0.8	0.6	0.6	0.5	2.7	1.8	5.3	1.4	7.8	1.1	0.5	S	2.5	1.3	0.7	0.3	0.6	0.1	0.2	0.2	1.2	1.6	0.1	15.9	2.5	24
23	0.4	0.3	0.3	1.4	0.2	0.8	0.5	0.3	0.4	0.4	1.6	1.0	S	0.1	0.2	0.3	0.5	0.3	0.0	0.0	0.3	0.2	0.0	0.2	0.0	1.6	0.4	24
24	0.1	0.1	0.1	0.1	0.1	0.0	1.2	1.2	1.3	1.0	1.6	S	2.1	5.8	10.8	7.1	8.1	2.8	5.8	6.1	19.5	0.2	0.2	1.5	0.0	19.5	3.3	24
25	1.6	0.6	0.4	0.4	0.6	1.1	0.7	0.8	0.8	1.3	S	2.7	1.6	3.7	3.7	3.6	3.0	2.4	1.8	3.7	5.0	1.6	1.7	11.7	0.4	11.7	2.4	24
26	2.2	1.8	1.6	21.9	1.1	1.3	1.6	2.1	2.2	S	1.1	10.9	13.9	8.0	12.1	15.0	10.0	1.0	0.8	1.3	1.8	1.0	1.1	1.1	0.8	21.9	5.0	24
27	1.1	1.1	1.1	1.2	1.3	1.2	1.3	1.4	S	3.5	3.7	6.4	2.6	1.9	2.2	3.0	1.9	1.6	1.3	1.3	2.1	2.0	2.2	1.6	1.1	6.4	2.0	24
28	1.4	1.3	1.2	1.2	1.1	1.0	1.0	S	1.0	23.9	24.6	1.9	3.4	1.5	1.7	1.4	1.4	1.3	1.3	1.4	1.1	0.7	0.6	0.6	0.6	24.6	3.3	24
HOURLY MAX	24.2	8.9	26.3	28.5	9.2	5.8	6.8	6.8	6.2	23.9	24.6	13.0	14.6	26.1	12.1	15.0	16.5	18.5	7.3	12.0	19.5	9.7	6.3	11.7				
HOURLY AVG	3.4	2.2	3.1	4.2	2.2	1.9	1.9	2.1	2.2	3.1	4.0	3.8	3.5	3.8	3.5	4.2	4.2	2.6	2.5	2.8	3.2	2.1	2.2	2.8				

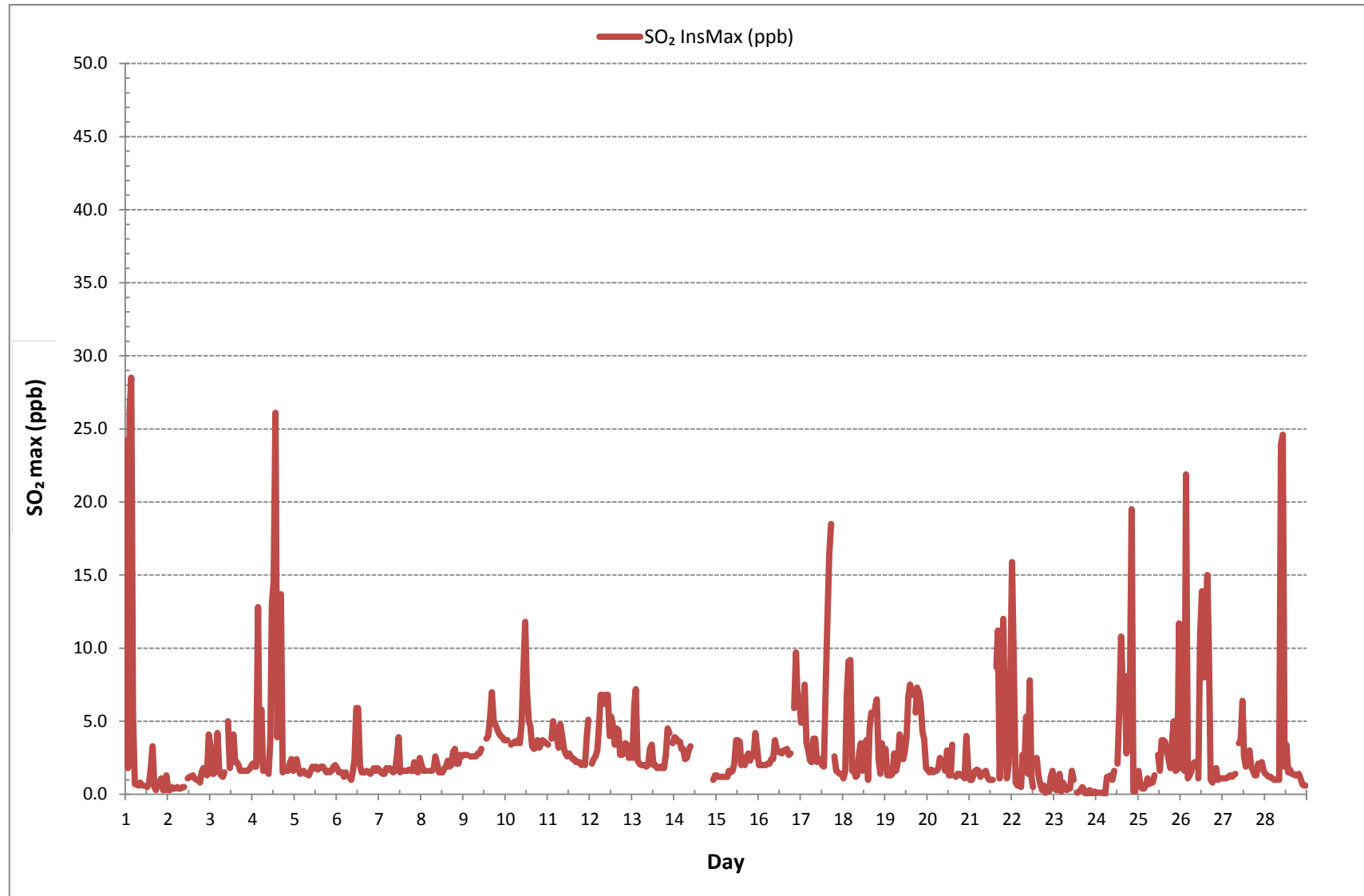
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	626
MAXIMUM INSTANTANEOUS VALUE:	28.5 ppb @ HOUR(S) 3 ON DAY(S) 1
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	668 hrs
STANDARD DEVIATION:	3.5

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-SO2[ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 10.57%

Calm Avg: 0.07 [ppb]

Direction	0.0-5.5	5.5-11.1	11.1-16.6	16.6-22.2	22.2-27.7	>27.7	Total
N	10.7	0.0	0.0	0.0	0.0	0.0	10.7
NE	9.6	0.0	0.0	0.0	0.0	0.0	9.6
E	6.6	0.0	0.0	0.0	0.0	0.0	6.6
SE	2.5	0.0	0.0	0.0	0.0	0.0	2.5
S	4.3	0.0	0.0	0.0	0.0	0.0	4.3
SW	26.7	0.0	0.0	0.0	0.0	0.0	26.7
W	19.6	0.2	0.0	0.0	0.0	0.0	19.7
NW	8.8	0.5	0.0	0.0	0.0	0.0	9.3
Summary	88.8	0.6	0.0	0.0	0.0	0.0	89.4

% Icon Classes (ppb)

1 5.5-11.1

0 11.1-16.6

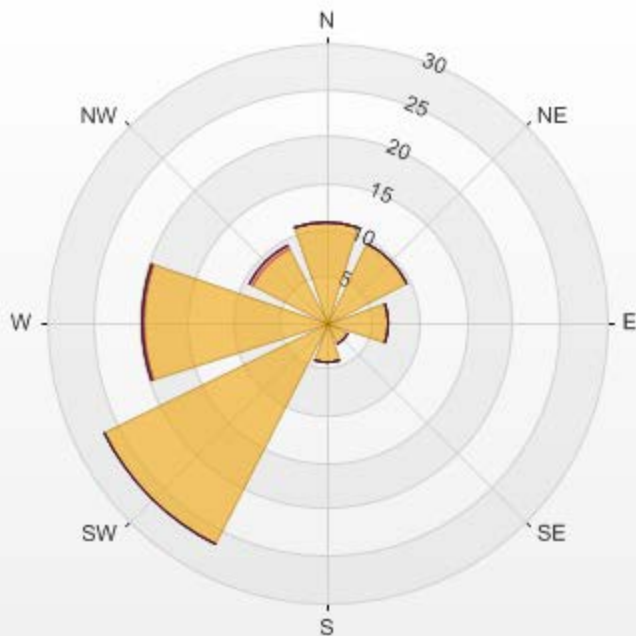
0 16.6-22.2

0 22.2-27.7

0 >27.7

89 0.0-5.5

LICA MASKWA Poll.: LICA MASKWA-SO₂[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.57%
Calm Poll Avg: 0.07[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

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	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	0.3	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	24				
2	0.0	0.4	0.5	0.1	0.0	0.0	0.4	0.3	0.6	0.1	S	0.2	0.3	0.5	0.2	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.3	0.6	0.0	0.6	0.2	24					
3	0.0	0.5	0.3	0.1	0.3	0.4	0.0	S1	S1	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	0.5	0.1	22					
4	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	0.2	0.2	0.2	0.2	0.0	0.2	0.0	24					
5	0.9	0.9	0.9	0.9	1.0	1.0	0.0	S	0.9	0.2	0.7	0.3	0.5	0.6	0.8	0.6	0.6	0.3	0.3	0.4	0.0	0.0	0.0	0.1	0.0	1.0	0.5	24					
6	0.2	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24					
7	0.0	0.0	0.0	0.5	0.2	S	0.5	0.0	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	0.5	0.1	24					
8	0.0	0.0	0.0	0.0	S	0.5	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	0.3	0.1	0.0	0.5	0.0	24					
9	0.2	0.1	0.0	S	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.6	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.1	24					
10	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.1	0.4	0.6	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	24					
11	0.0	S	0.0	0.7	1.3	1.3	0.0	0.3	1.0	1.1	1.0	0.4	0.2	0.2	0.0	0.2	0.3	0.3	0.0	0.4	0.2	0.0	0.1	0.0	0.0	1.3	0.4	24					
12	S	0.0	0.0	0.0	0.0	0.0	0.0	S1	S1	0.0	0.0	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	S	0.0	0.2	22					
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	S	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	0.0	0.0	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0.0	0.0	0.0	14				
15	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	0.1	0.1	0.0	0.1	0.1	S	0.4	0.3	0.2	0.0	0.4	0.2	15					
16	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.5	0.3	0.4	0.4	0.1	0.5	0.2	24				
17	0.3	0.5	0.4	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.4	0.3	S	0.4	0.0	0.0	0.0	0.0	0.0	0.5	0.2	24					
18	0.0	0.0	0.2	0.2	0.1	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	0.2	0.0	24					
19	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	0.2	0.2	0.2	S	0.4	0.3	0.4	0.3	0.1	0.1	0.0	0.4	0.1	24						
20	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.0	0.1	0.1	0.0	0.1	S	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.1	24					
21	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	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	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	S	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	24					
23	0.0	0.0	0.0	0.0	2.8	2.1	0.6	0.4	0.5	0.3	0.1	0.0	S	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	2.8	0.3	24					
24	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					
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	S	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.0	0.1	0.0	0.3	0.1	24					
26	0.1	0.0	0.0	0.1	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	0.0	0.1	0.1	0.0	0.0	0.1	0.0	24					
27	0.1	0.1	0.1	0.1	0.0	0.2	0.2	0.1	S	0.4	0.7	1.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	1.1	0.2	24					
28	0.2	0.2	0.2	0.1	0.2	0.2	0.2	S	0.6	0.5	0.8	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.8	0.2	24					
HOURLY MAX	0.9	0.9	0.9	0.9	2.8	2.1	0.6	0.4	1.0	1.1	1.0	1.1	1.7	0.6	0.8	0.6	0.6	0.4	0.6	1.0	0.5	0.4	0.4	0.6									
HOURLY AVG	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	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

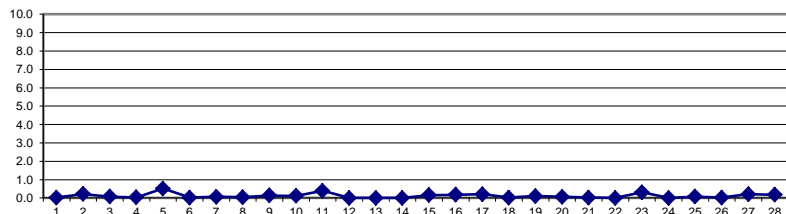
OBJECTIVE LIMIT:

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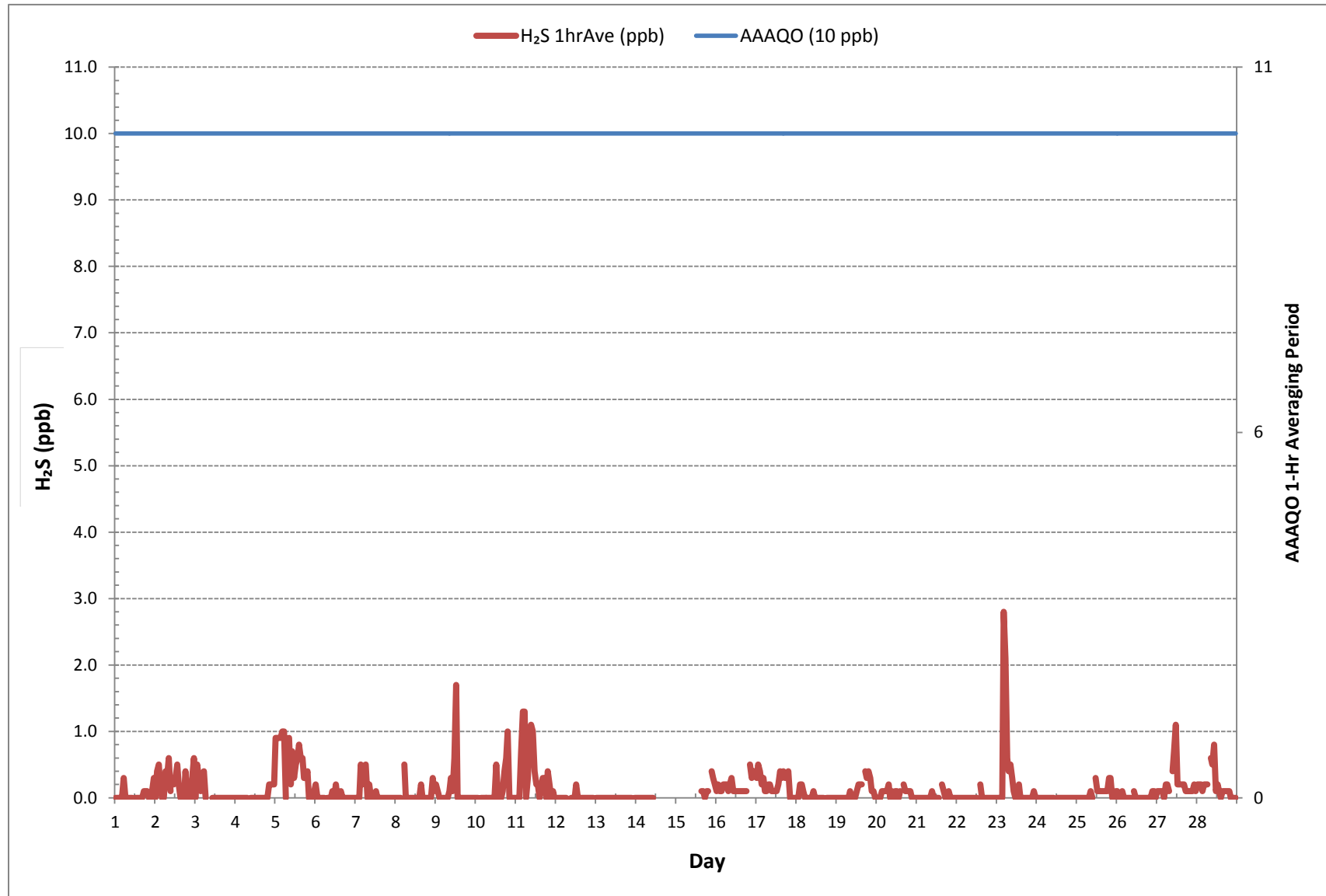
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	240					
MINIMUM 1-HR AVERAGE	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	2.8	ppb	@ HOUR(S)	4	ON DAY(S)	23
MAXIMUM 24-HR AVERAGE:	0.5	ppb			ON DAY(S)	5
					VAR-VARIOUS	
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	649	hrs	
MONTHLY CALIBRATION TIME:	9	hrs	AMD OPERATION UPTIME:	96.6	%	
STANDARD DEVIATION:	0.3		MONTHLY AVERAGE:	0.1	ppb	

24 HR AVERAGES February 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

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	0.2	0.3	0.0	0.0	0.0	0.0	0.0	S	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	0.3	0.0	24
2	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	0.5	0.0	0.5	0.0	24	
3	0.0	0.4	0.0	0.0	0.1	0.0	0.0	S1	S1	S	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.3	0.0	0.0	0.6	0.1	22	
4	0.0	0.0	0.0	0.0	0.0	0.2	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	0.1	0.0	0.0	0.0	0.0	0.2	0.0	24	
5	0.3	0.3	0.0	0.0	0.0	0.1	0.0	S	0.2	0.0	0.0	0.0	0.1	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	0.3	0.1	24
6	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.1	0.1	0.3	4.1	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	4.1	0.2	24	
7	0.0	0.0	0.0	0.3	0.0	S	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24	
8	0.0	0.0	0.7	0.0	S	0.8	0.4	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.2	1.2	0.0	0.1	0.0	0.0	0.2	0.6	0.1	0.0	1.2	0.2	24	
9	0.2	0.2	0.0	S	0.0	0.1	0.0	0.4	0.6	0.6	0.6	P	P	0.8	0.8	0.0	0.1	0.8	0.2	0.3	0.2	0.4	0.3	0.8	0.0	0.8	0.4	22	
10	0.1	0.6	S	0.0	0.4	0.3	0.0	0.3	0.5	0.2	0.3	0.5	0.7	0.5	0.0	0.0	0.2	0.1	0.2	0.7	1.0	0.0	0.0	0.0	0.0	1.0	0.3	24	
11	0.0	S	0.0	0.6	0.7	0.6	0.6	0.2	0.4	1.0	1.0	0.2	0.0	0.0	0.0	0.0	0.8	0.1	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.0	0.3	24	
12	S	0.0	0.0	0.0	0.0	0.0	0.1	S	S	5.0	0.2	0.2	0.7	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.1	0.4	0.2	S	0.0	5.0	0.4	24	
13	0.0	0.2	0.3	1.4	0.0	0.0	0.0	0.0	0.3	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	S	0.0	1.4	0.1	24	
14	0.1	0.3	0.2	0.2	0.6	2.8	0.3	0.0	0.0	0.0	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	0.0	2.8	0.5	14	
15	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	0.9	0.5	0.4	0.4	0.3	S	0.9	0.4	0.4	0.3	0.9	0.5	15	
16	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.3	S	0.9	0.7	0.6	0.7	0.3	0.9	0.4	24	
17	0.5	0.9	0.9	0.7	0.6	0.3	0.3	0.4	0.5	0.2	0.3	0.2	0.1	0.2	0.5	0.4	0.5	0.6	S	0.6	0.1	0.0	0.1	0.1	0.0	0.9	0.4	24	
18	0.1	0.1	0.3	0.3	0.3	0.0	0.1	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.1	S	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.7	0.1	24	
19	0.1	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.0	0.3	0.4	0.3	S	S	0.7	0.4	0.4	0.3	0.2	0.2	0.1	0.0	0.7	0.2	24	
20	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.3	0.1	0.2	0.0	0.2	0.0	0.0	0.3	S	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	S	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	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	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	
23	0.0	0.0	0.0	0.0	6.8	4.3	0.5	0.3	1.2	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	0.0	0.0	6.8	0.6	24	
24	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	
25	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	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
26	0.0	0.0	0.0	0.2	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	0.2	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.2	2.2	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	4.0	0.3	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.4	0.5	0.7	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	0.7	0.1	24	
HOURLY MAX	0.5	0.9	0.9	1.4	6.8	4.3	0.6	0.4	1.2	5.0	2.2	4.1	0.7	0.8	0.8	0.9	1.2	0.8	0.7	0.7	1.0	0.9	0.6	0.8					
HOURLY AVG	0.1	0.1	0.1	0.2	0.4	0.4	0.1	0.1	0.2	0.4	0.3	0.4	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1					

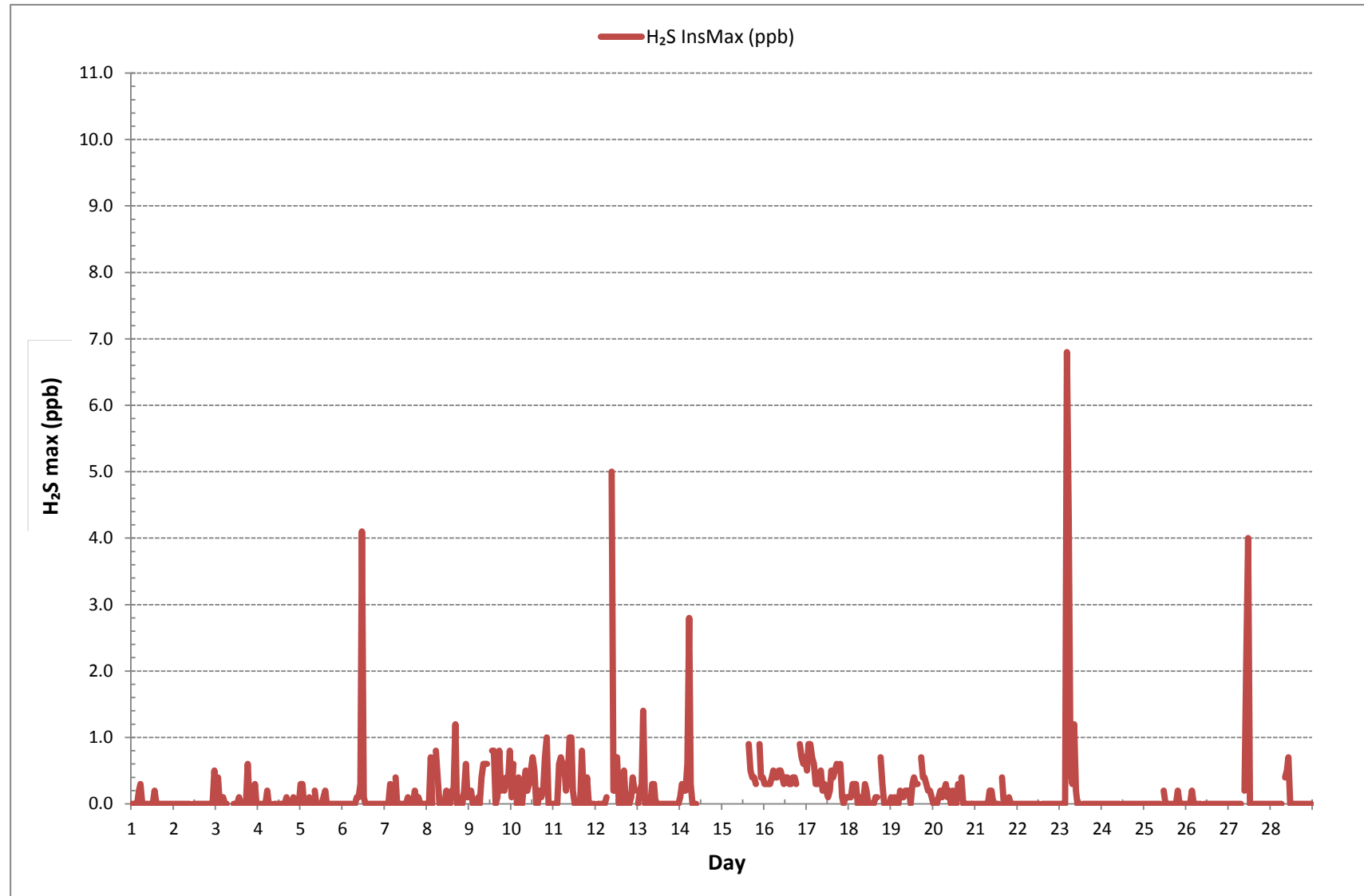
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	219
MAXIMUM INSTANTANEOUS VALUE:	6.8 ppb @ HOUR(S) 4 ON DAY(S) 23
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	10 hrs
STANDARD DEVIATION:	0.5
OPERATIONAL TIME:	649 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



% Icon Classes (ppb)

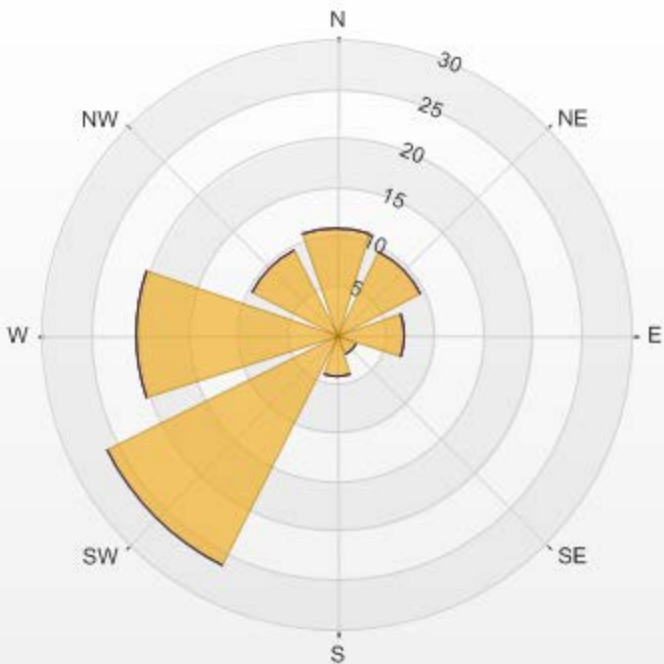
90 0.0-5.5

0 5.5-11.0

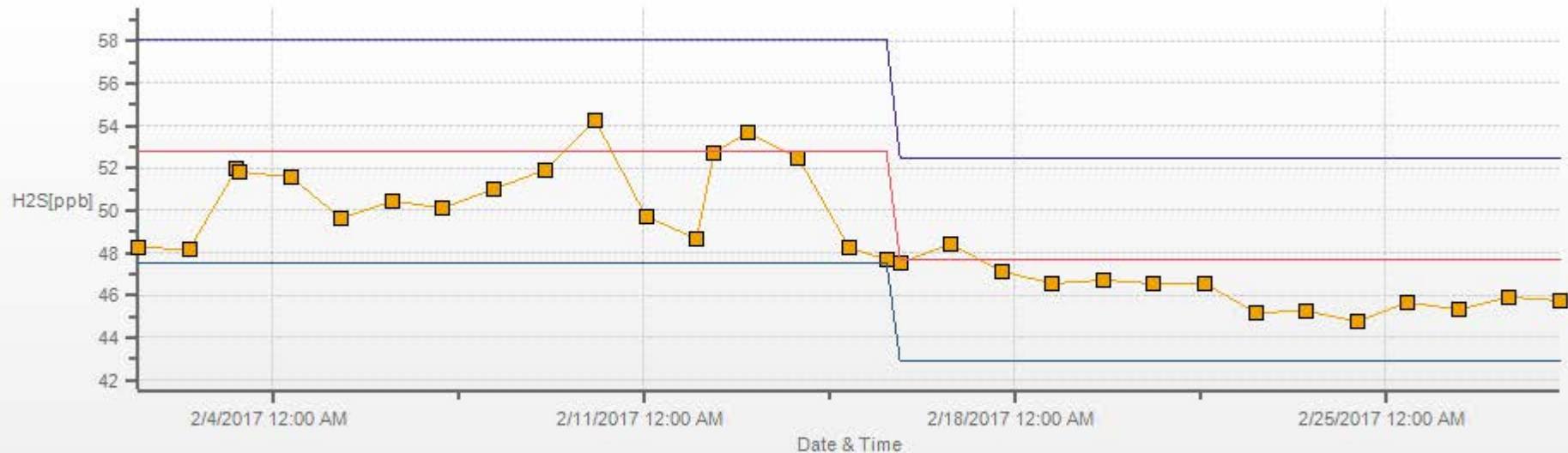
0 11.0-16.5

0 >16.5

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.13%
Calm Poll Avg: 0.18[ppb]



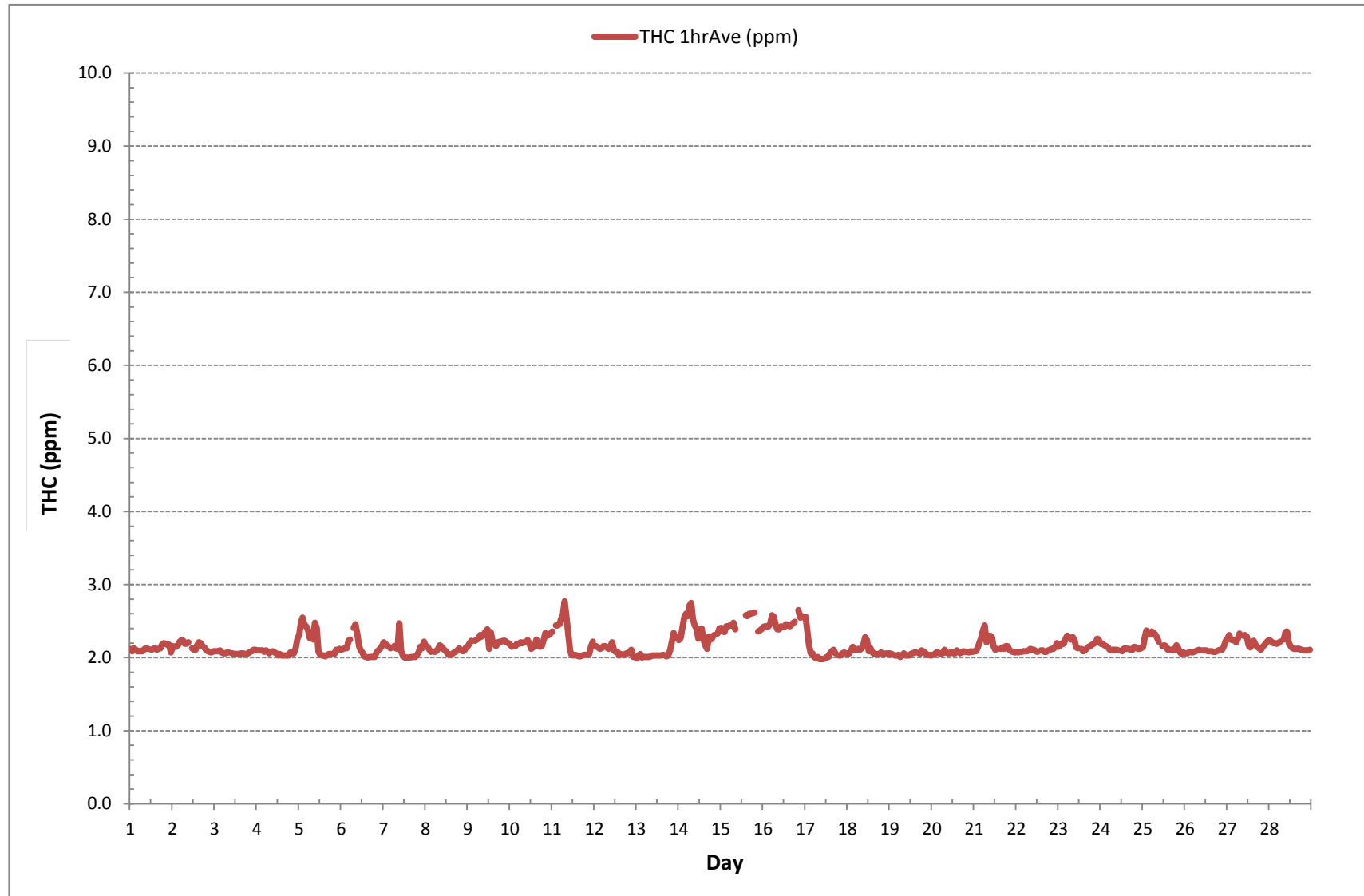
H2S[ppb] Calibration: LICA MASKWA Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

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	2.22	2.13	2.23	2.19	2.13	2.13	2.11	2.13	2.14	2.16	2.16	S	2.13	2.19	2.19	2.14	2.14	2.17	2.22	2.23	2.23	2.22	2.22	2.19	2.11	2.23	2.17	24
2	2.20	2.19	2.17	2.22	2.26	2.28	2.28	2.23	2.23	2.26	S	2.20	2.16	2.17	2.22	2.25	2.25	2.19	2.17	2.23	2.10	2.10	2.13	2.17	2.10	2.28	2.20	24
3	2.10	2.10	2.10	2.10	2.07	2.04	2.07	2.07	2.07	S	2.05	2.04	2.04	2.04	2.05	2.06	2.07	2.06	2.04	2.07	2.08	2.10	2.14	2.14	2.04	2.14	2.07	24
4	2.13	2.10	2.10	2.14	2.10	2.13	2.13	2.10	S	2.10	2.13	2.11	2.10	2.10	2.07	2.10	2.07	2.06	2.07	2.10	2.09	2.10	2.23	2.29	2.06	2.29	2.12	24
5	2.37	2.63	2.63	2.51	2.48	2.47	2.37	S	2.30	2.66	2.57	2.22	2.10	2.07	2.07	2.09	2.10	2.10	2.12	2.13	2.13	2.26	2.18	2.22	2.07	2.66	2.29	24
6	2.20	2.28	2.23	2.27	2.36	2.36	S	2.59	2.59	2.52	2.40	2.27	2.23	2.13	2.10	2.10	2.10	2.11	2.11	2.11	2.25	2.20	2.23	2.32	2.10	2.59	2.26	24
7	2.32	2.29	2.26	2.26	2.35	S	2.32	2.23	2.23	5.90	2.27	2.14	2.10	2.07	2.08	2.07	2.07	2.08	2.13	2.17	2.20	2.20	2.32	2.07	5.90	2.35	24	
8	2.29	2.22	2.19	2.13	S	2.13	2.14	2.20	2.22	2.22	2.17	2.14	2.44	2.20	2.08	2.10	2.13	2.13	2.14	2.17	2.16	2.13	2.13	2.17	2.08	2.44	2.18	24
9	2.20	2.23	2.26	S	2.25	2.29	2.29	2.35	2.34	2.32	2.47	P	P	2.37	2.23	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.16	2.13	2.13	2.47	2.24	22
10	2.17	2.07	S	2.13	2.11	2.13	2.13	2.13	2.13	2.17	2.35	2.19	2.07	2.07	2.13	2.20	2.13	2.10	2.10	2.29	2.31	2.23	2.25	2.28	2.07	2.35	2.17	24
11	2.31	S	2.41	2.40	2.44	2.50	2.57	2.78	2.72	2.37	2.20	2.01	2.04	2.07	2.02	1.98	2.01	2.01	2.02	2.01	2.02	2.04	2.26	2.29	1.98	2.78	2.24	24
12	S	2.14	2.13	2.10	2.13	2.14	2.14	2.13	2.11	2.16	2.23	2.13	2.07	2.07	2.01	2.02	2.04	2.02	2.04	2.04	2.08	2.11	2.02	S	2.01	2.23	2.09	24
13	1.96	2.07	2.08	1.98	1.98	1.99	1.99	2.01	2.01	2.02	2.02	2.04	2.04	2.04	2.04	2.05	2.04	2.02	2.04	2.20	2.28	2.38	S	2.31	1.96	2.38	2.07	24
14	2.37	2.42	2.48	2.72	2.62	2.60	3.73	3.60	2.61	2.44	2.45	2.34	2.35	2.41	2.32	2.31	2.26	2.63	2.32	2.36	2.29	S	2.29	2.53	2.26	3.73	2.54	24
15	2.42	2.41	2.44	2.45	2.49	2.54	2.72	2.66	2.51	C	C	C	C	C	2.66	2.60	2.63	2.63	2.65	2.66	S	2.44	2.41	2.45	2.41	2.72	2.54	24
16	2.45	2.51	2.51	2.48	2.54	2.72	2.69	2.57	2.45	2.42	2.45	2.44	2.47	2.50	2.47	2.45	2.47	2.50	2.51	S	2.76	2.67	2.63	2.57	2.42	2.76	2.53	24
17	2.61	2.54	2.32	2.13	2.20	2.04	2.01	2.19	2.02	2.01	2.05	2.04	2.07	2.07	2.26	2.22	2.26	2.20	S	2.10	2.10	2.13	2.13	2.13	2.01	2.61	2.17	24
18	2.11	2.13	2.29	2.26	2.29	2.17	2.28	2.20	2.20	2.38	2.38	2.38	2.17	2.21	2.19	2.17	2.13	S	2.14	2.23	2.13	2.10	2.19	2.13	2.10	2.38	2.21	24
19	2.16	2.10	2.10	2.08	2.10	2.13	2.07	2.10	2.13	2.13	2.10	2.11	2.13	2.17	2.16	2.17	S	2.13	2.17	2.16	2.16	2.11	2.10	2.07	2.07	2.17	2.12	24
20	2.07	2.16	2.21	2.20	2.13	2.10	2.10	2.23	2.14	2.11	2.10	2.18	2.10	2.11	2.22	S	2.13	2.13	2.13	2.13	2.13	2.13	2.16	2.13	2.07	2.23	2.14	24
21	2.13	2.18	2.20	2.31	2.35	2.48	2.53	2.32	2.32	2.35	2.35	2.26	2.23	2.23	2.23	2.21	S	2.23	2.26	2.20	2.20	2.22	2.23	2.25	2.31	2.35	2.22	24
22	2.20	2.17	2.17	2.17	2.17	2.18	2.23	2.25	2.23	2.23	2.23	2.23	2.21	S	2.23	2.26	2.20	2.20	2.22	2.23	2.23	2.25	2.31	2.35	2.17	2.35	2.22	24
23	2.29	2.34	2.45	2.34	2.53	2.47	2.44	2.41	2.45	2.41	2.35	2.26	S	2.28	2.23	2.26	2.28	2.29	2.31	2.35	2.41	2.38	2.44	2.41	2.23	2.53	2.36	24
24	2.37	2.35	2.35	2.32	2.34	2.28	2.26	2.26	2.26	2.26	2.26	S	2.25	2.32	2.31	2.26	2.28	2.26	2.26	2.31	2.32	2.26	2.25	2.28	2.25	2.37	2.29	24
25	2.35	2.47	2.48	2.45	2.43	2.48	2.47	2.41	2.38	2.32	S	2.28	2.32	2.31	2.22	2.20	2.20	2.20	2.23	2.41	2.28	2.19	2.17	2.23	2.17	2.48	2.33	24
26	2.19	2.19	2.25	2.29	2.20	2.20	2.22	2.23	2.25	S	2.23	2.23	2.23	2.22	2.23	2.23	2.20	2.19	2.20	2.20	2.22	2.23	2.32	2.35	2.19	2.35	2.23	24
27	2.41	2.50	2.35	2.35	2.37	2.32	2.38	2.44	S	2.43	2.60	2.73	2.31	2.23	2.32	2.34	2.32	2.25	2.23	2.21	2.28	2.43	2.32	2.32	2.21	2.73	2.37	24
28	2.37	2.35	2.31	2.32	2.32	2.45	2.38	S	2.40	2.60	2.60	2.34	2.28	2.25	2.25	2.25	2.23	2.26	2.26	2.23	2.23	2.23	2.23	2.23	2.23	2.60	2.32	24
HOURLY MAX	2.61	2.63	2.63	2.72	2.62	2.72	3.73	3.60	2.72	5.90	2.60	2.73	2.47	2.50	2.66	2.60	2.63	2.63	2.65	2.66	2.76	2.67	2.63	2.57				
HOURLY AVG	2.26	2.27	2.29	2.27	2.29	2.29	2.34	2.34	2.29	2.44	2.29	2.22	2.18	2.19	2.20	2.19	2.19	2.20	2.19	2.21	2.21	2.22	2.23	2.27				

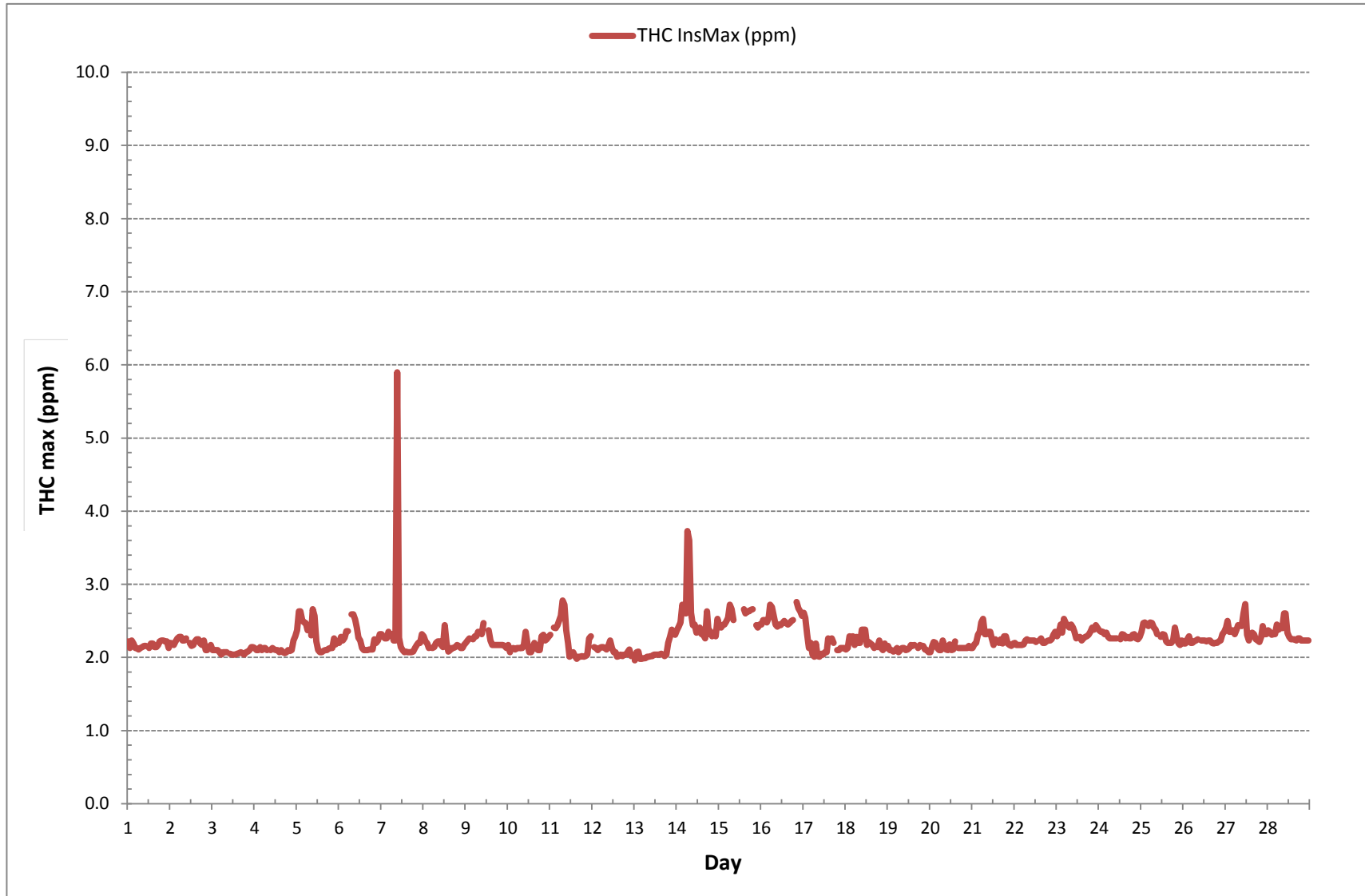
STATUS FLAG CODES

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:	636
MAXIMUM INSTANTANEOUS VALUE:	5.90 ppm @ HOUR(S) 9 ON DAY(S) 7
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	670 hrs
STANDARD DEVIATION:	0.23

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-THC[ppm]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 10.34% Calm Avg: 2.22 [ppb]

Direction	0.0-7.8	7.8-15.6	15.6-23.4	>23.4	Total
N	10.7	0.0	0.0	0.0	10.7
NE	9.4	0.0	0.0	0.0	9.4
E	6.6	0.0	0.0	0.0	6.6
SE	2.2	0.0	0.0	0.0	2.2
S	5.2	0.0	0.0	0.0	5.2
SW	26.8	0.0	0.0	0.0	26.8
W	19.6	0.0	0.0	0.0	19.6
NW	9.3	0.0	0.0	0.0	9.3
Summary	89.6	0.0	0.0	0.0	89.6

% Icon Classes (ppm)

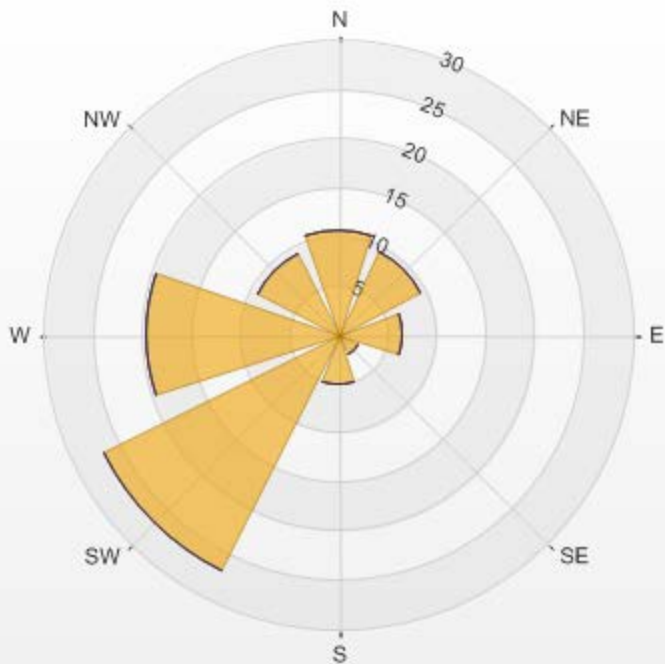
90 0.0-7.8

0 7.8-15.6

0 15.6-23.4

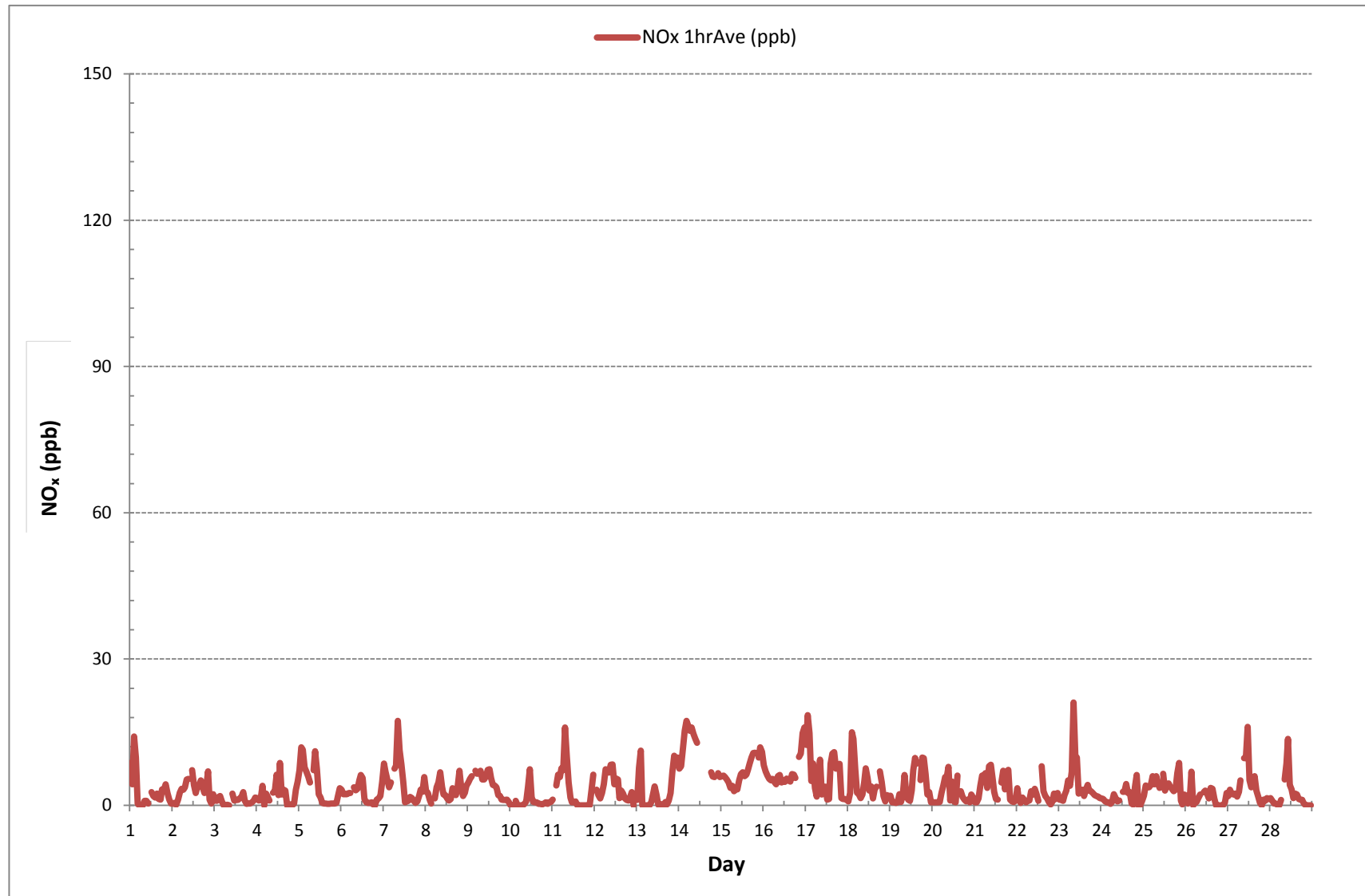
0 >23.4

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.34%
Calm Poll Avg: 2.22[ppm]



OXIDES OF NITROGEN

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

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	20.0	10.0	22.9	22.3	2.4	1.2	1.2	1.2	1.8	2.4	1.8	S	5.9	3.0	2.9	4.7	2.4	2.9	4.7	4.7	7.6	3.5	2.4	1.2	1.2	22.9	5.8	24	
2	1.2	1.2	1.2	2.4	4.1	5.3	5.3	5.9	6.5	7.1	S	10.6	6.5	4.1	4.7	5.3	7.1	4.7	4.1	14.1	30.5	8.2	1.2	7.6	1.2	30.5	6.5	24	
3	3.0	2.4	3.0	3.0	2.9	0.6	0.6	1.8	1.8	S	5.3	2.4	2.4	3.0	3.0	3.0	4.7	3.5	1.2	1.2	1.8	1.8	2.4	2.4	0.6	5.3	2.5	24	
4	2.4	2.4	2.4	11.2	1.2	6.4	4.1	3.6	S	4.7	9.4	13.0	12.4	34.6	12.3	7.6	10.0	1.2	0.6	1.2	0.6	2.4	4.7	5.9	0.6	34.6	6.7	24	
5	9.4	16.4	15.8	8.8	8.2	7.6	5.9	S	12.3	14.7	10.0	5.3	2.4	1.2	1.2	0.6	0.6	0.6	0.6	0.6	0.6	1.2	3.0	4.2	0.6	16.4	5.7	24	
6	4.2	3.0	2.4	2.4	3.0	3.0	S	5.9	4.2	4.2	7.1	8.8	10.0	2.4	0.6	0.6	0.6	0.6	0.6	0.0	3.6	3.0	2.4	8.8	0.0	10.0	3.5	24	
7	9.4	8.2	6.5	4.8	7.0	S	8.8	10.6	31.1	32.3	12.4	7.6	2.4	1.8	2.4	18.2	5.3	1.3	1.2	1.8	3.0	4.2	3.6	8.2	1.2	32.3	8.4	24	
8	7.0	3.6	2.4	1.3	S	3.0	27.0	8.8	9.4	8.8	4.2	4.2	5.3	4.7	3.0	21.7	8.8	4.2	7.6	8.3	6.4	3.0	4.2	5.3	1.3	27.0	7.1	24	
9	5.9	6.5	7.1	S	9.4	8.8	11.8	11.8	8.2	7.1	7.6	P	P	7.7	6.4	7.6	8.8	4.7	4.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5	11.8	6.7	22
10	3.0	2.4	S	5.9	2.4	2.4	1.8	1.8	1.8	5.3	9.4	16.4	9.4	4.7	3.5	3.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	1.8	16.4	4.0	24
11	3.0	S	7.6	8.8	8.8	11.8	11.8	61.0	16.4	7.1	5.3	1.8	8.8	20.6	0.6	1.2	0.6	0.6	0.6	0.6	0.6	1.2	7.6	10.6	0.6	61.0	8.6	24	
12	S	7.6	3.5	3.0	4.7	7.1	9.4	8.8	8.8	10.6	10.6	6.4	7.1	7.1	4.7	5.3	5.9	3.5	2.4	2.4	3.5	4.7	1.8	S	1.8	10.6	5.9	24	
13	4.7	15.8	18.2	1.8	0.6	0.6	0.6	1.2	3.0	27.5	27.0	4.7	1.2	1.2	1.8	1.2	2.9	1.2	4.1	5.9	10.6	11.8	S	11.8	0.6	27.5	6.9	24	
14	10.0	10.0	13.5	16.4	21.2	18.2	21.2	18.2	17.0	29.3	C	C	C	C	C	C	C	C	9.4	6.5	8.2	S	8.8	6.5	6.5	29.3	14.3	24	
15	7.1	7.1	6.5	5.9	5.9	4.7	5.3	3.0	5.3	4.1	7.1	7.6	7.7	7.1	7.6	7.6	10.0	11.2	12.4	11.8	S	10.6	14.1	13.0	3.0	14.1	7.9	24	
16	9.4	7.6	7.1	5.9	5.3	5.9	5.3	5.3	8.2	7.7	4.7	5.9	5.3	7.1	5.3	5.9	8.8	7.1	5.9	S	13.5	18.2	18.2	19.4	4.7	19.4	8.4	24	
17	15.8	26.3	33.5	23.5	21.7	8.8	4.1	20.0	42.8	8.2	7.1	11.8	1.8	3.0	21.7	19.4	27.5	27.6	S	12.4	4.6	1.8	1.8	1.2	1.2	42.8	15.1	24	
18	1.2	11.2	18.2	17.6	19.4	4.1	3.5	3.0	3.0	7.1	10.0	7.1	3.5	7.1	2.4	9.4	8.2	S	11.2	13.5	3.5	3.0	8.8	3.0	1.2	19.4	7.8	24	
19	5.3	1.2	1.2	0.6	1.3	4.7	1.8	3.0	10.0	6.5	2.4	3.5	5.3	11.2	11.2	S	8.8	13.5	11.8	10.0	6.5	4.7	1.2	0.6	13.5	6.0	24		
20	0.6	0.6	0.6	0.6	1.2	4.1	6.5	10.0	12.9	13.0	3.5	10.0	1.8	1.8	61.0	S	5.3	1.8	1.8	1.2	3.5	0.6	5.3	4.7	0.6	61.0	6.6	24	
21	0.6	0.6	1.8	6.5	7.1	7.1	7.6	5.3	47.0	25.9	7.1	4.1	1.8	1.8	S	10.6	16.4	5.9	12.4	11.2	7.6	1.2	1.2	4.7	0.6	47.0	8.5	24	
22	8.8	4.7	1.8	1.8	1.2	1.2	3.0	3.0	3.5	5.9	5.9	5.9	3.5	S	12.4	9.4	4.1	3.5	1.8	0.6	1.8	3.0	3.6	3.6	0.6	12.4	4.1	24	
23	2.4	1.2	1.8	4.1	4.1	6.4	4.7	16.4	113.1	19.4	41.1	3.6	S	6.4	7.0	10.0	7.1	4.1	4.1	3.6	3.0	2.4	2.4	1.8	1.2	113.1	11.7	24	
24	1.8	1.8	1.2	1.2	1.2	1.2	2.4	3.6	3.0	2.4	3.6	S	5.9	8.2	12.4	17.5	8.2	3.0	3.6	9.4	17.0	3.0	0.6	7.6	0.6	17.5	5.2	24	
25	7.6	5.9	5.9	5.3	7.6	10.0	7.6	30.5	7.6	7.1	S	10.6	5.9	5.9	6.5	5.9	4.7	4.7	4.7	11.8	14.1	4.1	1.2	10.0	1.2	30.5	8.1	24	
26	4.7	1.8	5.9	25.9	1.2	2.4	1.8	3.0	3.6	S	5.9	8.8	10.0	5.3	8.2	18.8	7.6	0.6	0.6	1.2	1.8	1.2	4.1	4.1	0.6	25.9	5.6	24	
27	4.1	5.9	4.7	4.7	5.3	4.1	6.5	8.8	S	13.5	15.2	21.2	11.8	5.9	6.5	8.8	7.1	3.6	3.0	1.8	3.6	3.6	4.7	4.1	1.8	21.2	6.9	24	
28	3.6	3.6	1.8	1.8	1.8	1.8	5.3	S	10.6	22.9	26.4	5.9	5.3	3.6	4.7	4.1	3.0	2.4	2.4	1.8	1.2	0.6	0.0	0.1	0.0	26.4	5.0	24	
HOURLY MAX	20.0	26.3	33.5	25.9	21.7	18.2	27.0	61.0	113.1	32.3	41.1	21.2	12.4	34.6	61.0	21.7	27.5	27.6	13.5	14.1	30.5	18.2	18.2	19.4					
HOURLY AVG	5.8	6.3	7.4	7.3	5.9	5.3	6.5	9.8	15.1	11.7	10.0	7.8	5.7	6.6	8.2	8.5	6.9	4.5	4.5	5.4	6.2	4.1	4.4	5.8					

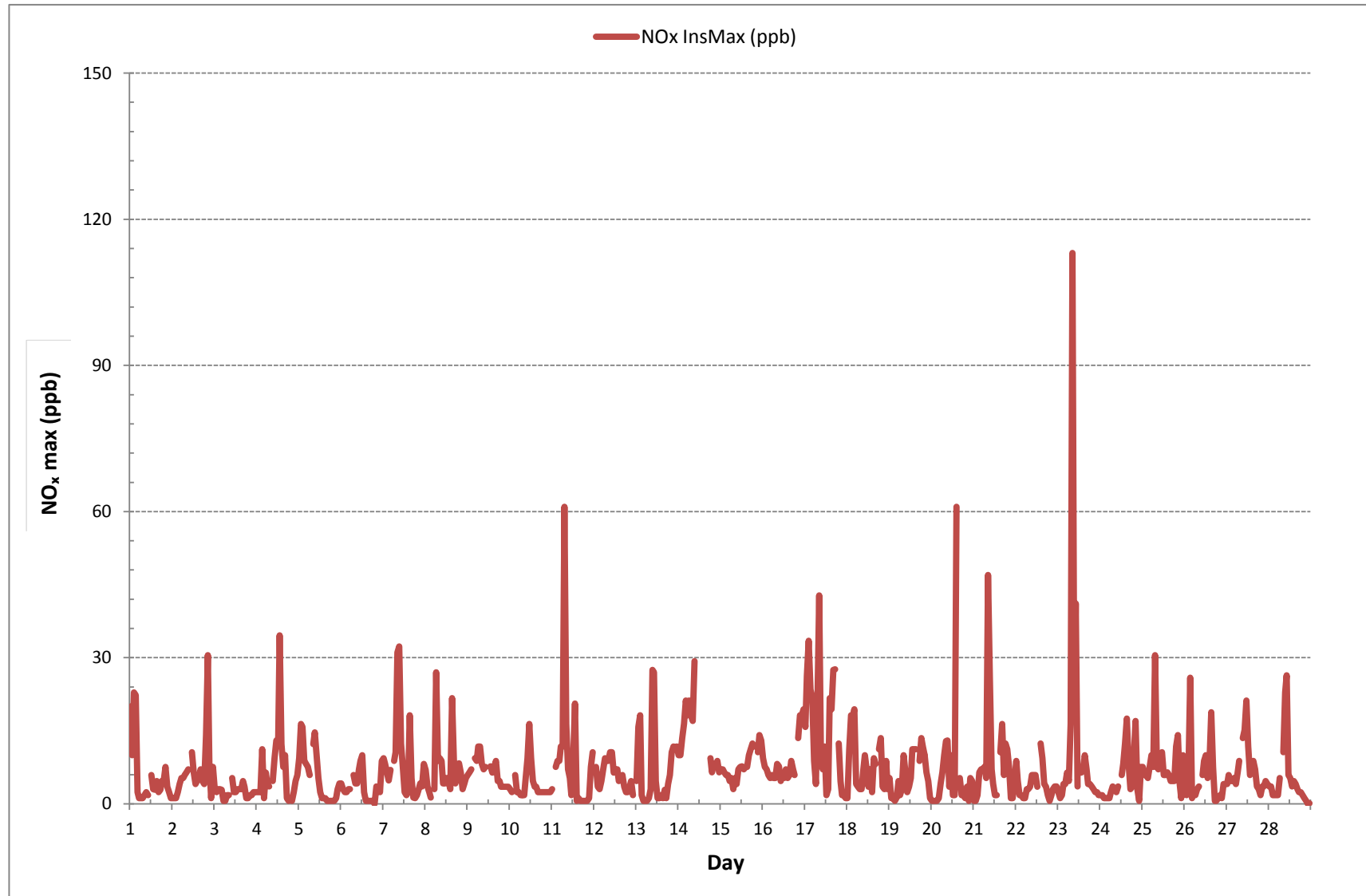
STATUS FLAG CODES

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:	631
MAXIMUM INSTANTANEOUS VALUE:	113.1 ppb @ HOUR(S) 8 ON DAY(S) 23
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	8.3
OPERATIONAL TIME:	670 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



% Icon Classes (ppb)

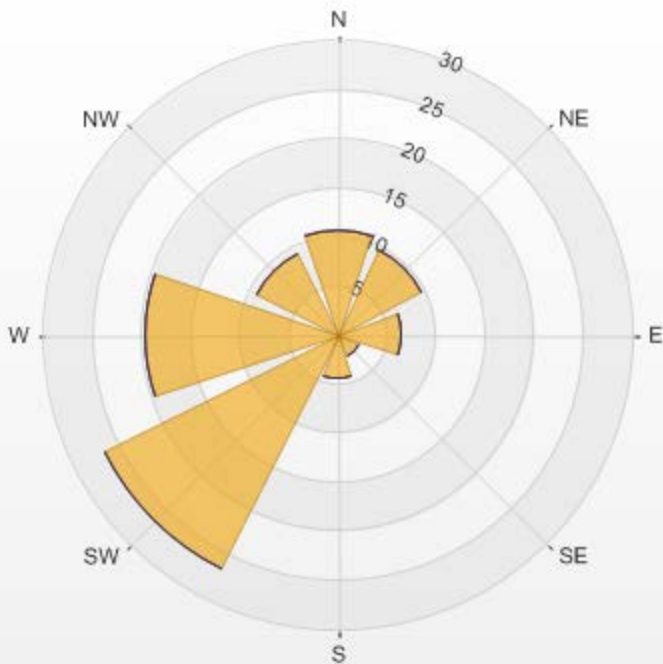
89 0.0-36.2

0 36.2-72.4

0 72.4-108.6

0 >108.6

LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.53%
Calm Poll Avg: 3.36[ppb]



NOX[ppb] Calibration: LICA MASKWA Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES



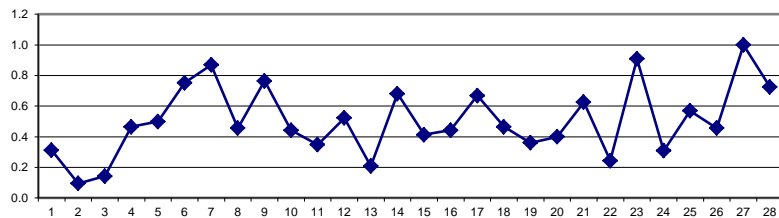
NITRIC OXIDE Hourly Averages (NO ppb)

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	1.3	0.2	2.8	2.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.3	24	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.6	S	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.6	0.1	24	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.3	0.4	0.5	0.6	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	24	
4	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	S	0.5	0.9	2.0	0.9	3.2	0.9	0.9	0.6	0.0	0.2	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	3.2	0.5	24	
5	0.1	0.2	0.2	0.2	0.0	0.0	0.2	S	0.8	2.8	2.7	1.0	0.6	0.5	0.4	0.4	0.0	0.1	0.0	0.1	0.2	0.3	0.3	0.4	0.0	0.0	0.0	0.0	2.8	0.5	24	
6	0.4	0.3	0.4	0.5	0.3	0.3	S	0.6	0.7	1.3	2.4	3.4	3.1	0.8	0.5	0.5	0.3	0.3	0.2	0.0	0.1	0.2	0.4	0.3	0.0	0.0	0.0	0.0	3.4	0.8	24	
7	0.3	0.3	0.4	0.4	0.3	S	0.5	0.6	4.3	4.3	3.6	1.8	0.4	0.5	0.5	0.8	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	4.3	0.9	24	
8	0.0	0.1	0.0	0.0	S	0.0	1.2	0.3	1.0	0.9	0.7	0.9	0.9	0.7	1.0	1.6	0.6	0.2	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.6	0.5	24	
9	0.0	0.4	0.1	S	0.5	0.5	0.8	0.7	0.8	1.5	2.1	2.6	3.0	1.6	1.1	0.9	0.4	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	3.0	0.8	24	
10	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.4	0.7	2.0	3.6	1.1	0.7	0.6	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	3.6	0.4	24	
11	0.0	S	0.0	0.0	0.1	0.4	0.2	2.2	1.2	1.2	0.7	0.6	0.6	0.8	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	2.2	0.3	24	
12	S	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.8	1.8	2.2	1.5	1.5	1.6	0.6	0.7	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	2.2	0.5	24	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	1.3	0.8	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.1	S	0.1	0.0	0.0	0.0	0.0	1.3	0.2	24	
14	0.0	0.0	0.0	0.0	0.2	0.1	0.8	0.5	1.5	3.6	4.1	C	C	C	C	C	C	C	0.0	0.0	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.7	24	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.6	1.0	1.1	1.2	1.2	1.4	1.3	1.0	0.1	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.4	24	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.2	1.2	1.2	1.2	1.3	1.3	0.5	0.6	0.0	0.0	S	0.0	0.5	0.4	0.2	0.0	0.0	0.0	0.0	1.3	0.4	24	
17	0.0	1.9	1.6	0.1	0.2	0.1	0.0	0.4	1.4	0.2	0.9	1.1	0.0	0.0	2.0	2.4	1.9	1.2	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.7	24	
18	0.0	0.0	0.3	0.5	0.2	0.0	0.1	0.0	0.3	1.5	2.8	2.1	0.8	0.9	0.0	0.4	0.4	S	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	2.8	0.5	24	
19	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.7	0.2	0.1	0.0	0.6	1.9	1.8	1.2	S	0.0	0.5	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.4	24	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.4	2.6	0.2	1.6	0.2	0.1	1.9	S	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	2.6	0.4	24	
21	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	2.0	2.4	1.7	0.9	0.3	0.5	S	0.6	1.4	0.4	0.9	1.3	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	2.4	0.6	24	
22	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.5	0.6	0.7	0.3	S	1.5	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.2	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	8.0	4.0	4.0	0.9	S	0.6	0.3	1.0	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.9	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.7	S	0.6	0.8	1.5	1.1	0.8	0.1	0.0	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.3	24	
25	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.8	1.1	1.7	S	2.1	1.3	1.8	1.7	1.3	0.6	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.6	24	
26	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.6	S	0.6	1.4	1.5	1.1	1.9	1.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.5	24	
27	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	S	2.7	4.0	7.5	2.3	1.4	1.6	1.9	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	1.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	1.2	3.2	6.7	1.8	1.2	0.6	0.9	0.7	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.7	24	
HOURLY MAX	1.3	1.9	2.8	2.2	0.5	0.5	1.2	2.2	8.0	4.3	6.7	7.5	3.1	3.2	2.0	2.4	1.9	1.2	0.9	1.3	0.6	0.5	0.4	0.4								
HOURLY AVG	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.3	1.2	1.6	1.8	1.7	0.9	0.9	0.9	0.8	0.5	0.2	0.1	0.1	0.1	0.1	0.1	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

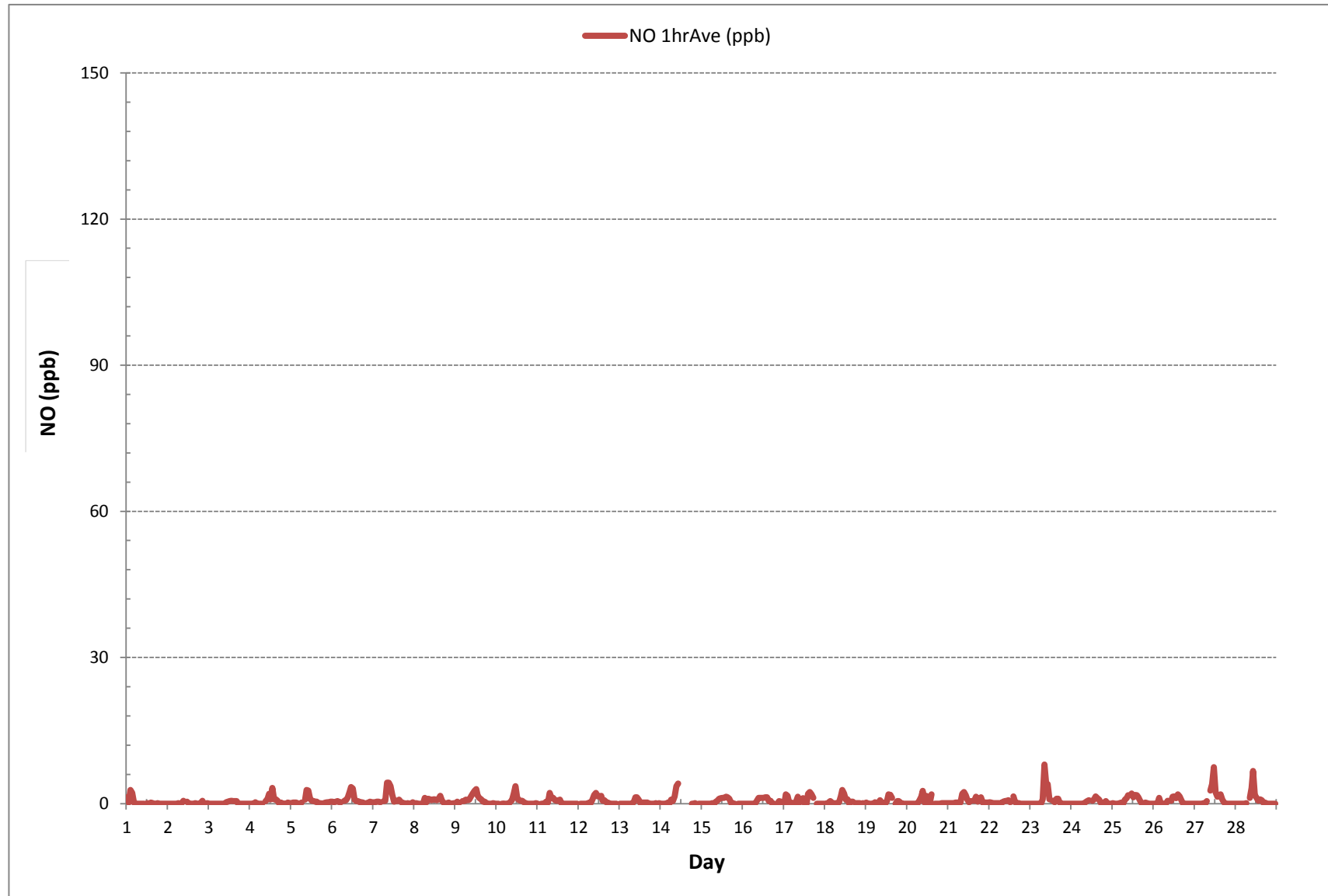
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	370					
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	8.0	ppb	@ HOUR(S)	8	ON DAY(S)	23
MAXIMUM 24-HR AVERAGE:	1.0	ppb			ON DAY(S)	27
					VAR-VARIOUS	
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs	
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	0.9		MONTHLY AVERAGE:	0.5	ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

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	3.4	0.5	5.1	5.1	0.5	0.5	0.5	0.0	0.0	0.5	0.5	S	0.5	0.5	0.5	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.8	24	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.5	S	0.5	0.5	0.0	0.0	0.0	0.5	0.5	0.0	4.6	15.1	0.0	0.0	0.5	0.0	0.0	0.0	15.1	1.0	24		
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2	24		
4	0.0	0.0	0.5	1.1	0.0	0.5	0.5	0.5	S	1.1	2.3	3.9	3.9	15.7	3.9	1.7	1.7	0.0	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.0	0.0	15.7	1.7	24		
5	0.5	0.5	0.5	0.5	0.5	0.0	0.5	S	2.3	3.4	3.4	1.7	1.1	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	0.0	3.4	0.9	24		
6	0.5	0.5	0.5	0.5	0.5	0.5	S	1.1	1.1	1.7	3.4	5.2	5.8	1.1	0.5	0.5	0.5	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.0	5.8	1.2	24		
7	0.5	0.5	0.5	0.5	0.5	S	1.1	1.7	14.6	15.7	5.8	2.8	1.1	1.1	1.1	9.9	2.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	15.7	2.7	24		
8	0.5	0.5	0.5	0.5	S	0.5	14.6	1.7	1.7	2.3	1.1	2.3	2.8	2.8	1.7	12.2	3.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	14.6	2.3	24		
9	0.5	0.5	0.5	S	0.5	0.5	2.3	1.7	1.7	1.7	2.3	P	P	1.7	1.1	1.1	1.1	0.5	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.0	2.3	0.9	22			
10	0.0	0.5	S	0.5	0.0	0.0	0.5	0.5	0.5	1.1	2.8	6.9	3.3	1.1	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	6.9	0.9	24			
11	0.5	S	0.0	0.0	0.5	1.7	1.7	48.5	1.7	1.1	1.1	0.5	0.5	11.7	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	48.5	3.1	24			
12	S	0.0	0.5	0.0	0.0	0.0	1.1	0.5	1.1	2.3	2.3	1.7	1.7	1.1	1.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	2.3	0.7	24			
13	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.1	12.8	16.3	1.1	0.5	0.5	1.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.5	S	0.5	0.0	16.3	1.6	24			
14	0.0	0.0	0.5	0.0	1.1	0.5	3.9	0.5	2.3	22.8	C	C	C	C	C	C	C	C	0.0	0.0	1.1	S	0.0	0.0	0.0	0.0	22.8	2.2	24			
15	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.1	0.5	1.7	1.7	1.1	1.1	1.7	1.7	1.7	0.5	0.5	0.0	S	0.0	0.0	0.0	0.0	0.0	1.7	0.6	24			
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	1.7	1.1	0.5	0.0	0.0	S	0.0	2.8	1.1	1.1	0.0	0.0	2.8	0.7	24			
17	0.5	5.7	7.5	2.8	1.1	0.5	0.0	2.3	24.0	1.6	2.3	3.9	0.0	0.5	6.9	4.6	6.9	6.9	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.0	3.4	24			
18	0.0	0.0	1.1	1.1	0.5	0.0	0.5	0.5	0.5	2.3	3.9	2.8	1.1	2.3	0.5	1.7	1.1	S	0.5	0.5	0.5	0.0	0.5	0.5	0.0	0.0	3.9	1.0	24			
19	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.5	1.1	1.1	0.5	0.5	1.7	3.3	2.3	1.7	S	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	3.3	0.7	24			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.7	3.9	3.9	1.7	3.4	1.1	0.5	26.2	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.2	1.9	24			
21	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	22.2	9.9	2.3	1.1	0.5	0.5	S	2.3	3.9	1.1	2.3	2.3	1.1	0.0	0.0	0.0	0.0	0.0	22.2	2.2	24			
22	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.1	1.1	1.7	1.1	S	2.8	2.3	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.5	24			
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	64.4	8.7	21.6	1.7	S	0.5	2.8	3.9	2.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.4	4.8	24			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	1.1	S	0.5	2.3	3.9	12.8	2.3	0.5	0.5	1.1	2.3	0.0	0.0	0.0	0.0	0.0	0.0	12.8	1.2	24			
25	0.5	0.0	0.0	0.0	0.5	1.1	0.0	12.2	1.7	2.3	S	2.8	1.7	1.7	2.3	1.7	1.1	0.5	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	12.2	1.4	24			
26	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	1.1	S	0.5	3.9	4.5	2.3	3.4	7.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	1.3	24			
27	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.1	S	3.9	6.3	9.3	4.6	1.7	1.7	2.3	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	1.4	24			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.5	S	2.8	9.9	12.8	2.3	1.7	1.1	1.1	1.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8	1.5	24			
HOURLY MAX	3.4	5.7	7.5	5.1	1.1	1.7	14.6	48.5	64.4	22.8	21.6	9.3	5.8	15.7	26.2	12.8	6.9	6.9	2.3	4.6	15.1	2.8	1.1	1.1								
HOURLY AVG	0.3	0.4	0.7	0.7	0.2	0.3	1.1	3.1	5.9	4.4	3.9	2.6	1.7	2.2	2.7	2.9	1.4	0.6	0.3	0.4	0.9	0.2	0.2	0.2								

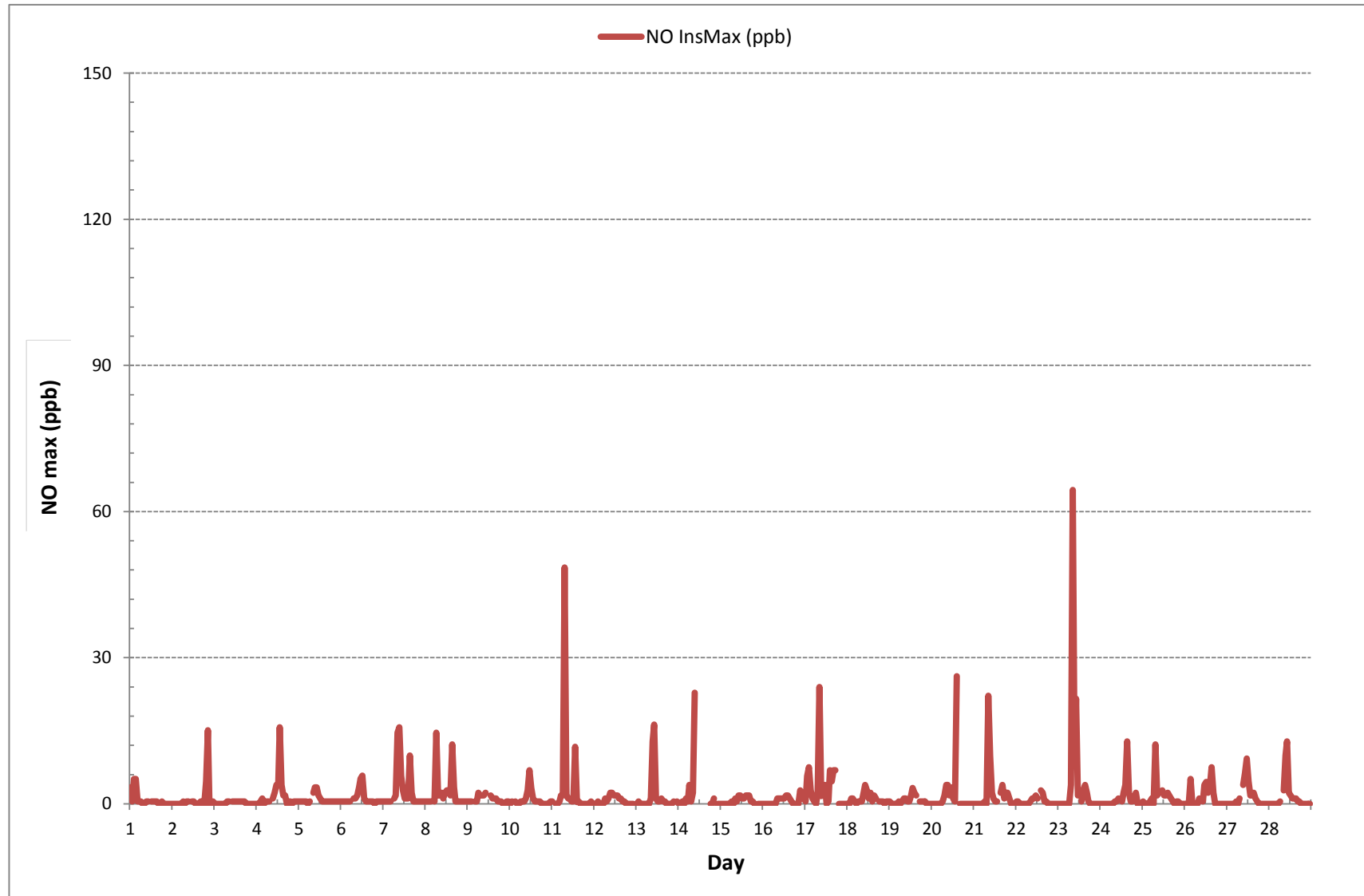
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	398
MAXIMUM INSTANTANEOUS VALUE:	64.4 ppb @ HOUR(S) 8 ON DAY(S) 23
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	4.4
OPERATIONAL TIME:	670 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



% Icon Classes (ppb)

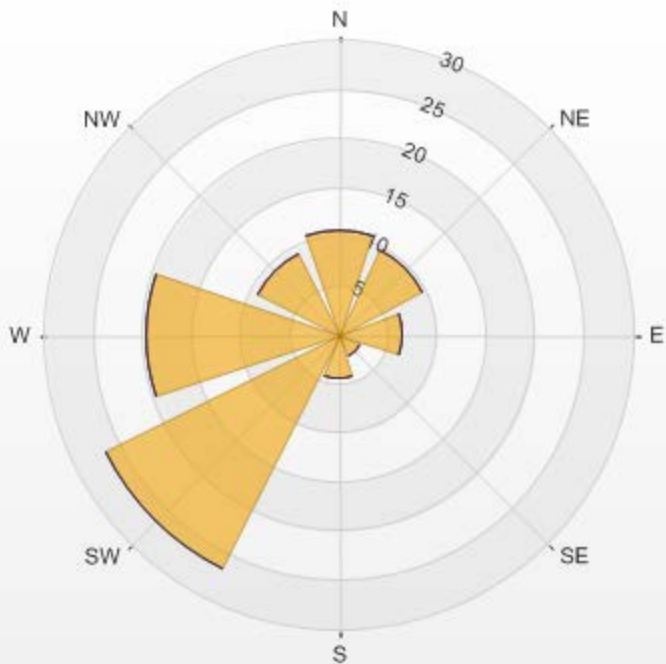
89 0.0-19.8

0 19.8-39.6

0 39.6-59.4

0 >59.4

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.53%
Calm Poll Avg: 0.37[ppb]



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	7.4	4.1	11.2	7.6	0.1	0.0	0.0	0.0	0.9	0.9	0.4	S	2.6	1.9	1.3	2.2	1.3	1.2	3.2	3.1	4.3	2.5	1.2	0.6	0.0	11.2	2.5	24	0.0	11.2	2.5	24	
2	0.3	0.5	0.1	1.1	2.6	3.4	3.1	3.7	5.2	4.8	S	6.8	4.0	2.5	3.7	4.1	5.0	3.6	2.5	3.6	6.4	1.2	0.4	2.2	0.1	6.8	3.1	24	0.1	6.8	3.1	24	
3	0.9	0.9	1.7	1.9	0.8	0.0	0.0	0.1	0.0	S	2.1	0.7	0.7	0.5	0.8	1.1	2.2	1.0	0.3	0.4	0.4	0.6	1.0	1.6	0.0	2.2	0.9	24	0.0	2.2	0.9	24	
4	1.5	1.0	1.3	3.6	0.0	2.4	1.8	1.0	S	2.1	2.0	4.3	1.2	5.5	1.3	2.3	2.4	0.0	0.0	0.2	0.0	0.3	3.0	4.8	0.0	5.5	1.8	24	0.0	5.5	1.8	24	
5	7.1	11.7	11.2	7.6	6.9	5.9	4.5	S	6.4	8.3	4.7	1.3	0.9	0.0	0.0	0.0	0.3	0.3	0.4	0.2	0.2	0.2	1.7	3.1	0.0	11.7	3.6	24	0.0	11.7	3.6	24	
6	2.8	2.0	1.9	1.8	2.1	2.2	S	3.1	2.4	2.0	2.7	2.7	2.4	0.5	0.1	0.1	0.2	0.2	0.0	0.0	1.1	1.2	1.5	4.4	0.0	4.4	1.6	24	0.0	4.4	1.6	24	
7	8.3	6.5	4.9	3.4	4.3	S	7.0	7.5	13.0	6.9	4.8	3.1	0.2	0.3	0.4	0.9	1.1	0.8	0.4	0.8	1.8	3.2	2.8	5.6	0.2	13.0	3.8	24	0.2	13.0	3.8	24	
8	2.9	2.4	1.2	0.4	S	1.4	2.5	4.3	5.8	2.9	1.5	1.2	0.5	0.3	0.3	1.9	2.0	1.9	3.8	6.9	3.3	1.9	2.6	3.9	0.3	6.9	2.4	24	0.3	6.9	2.4	24	
9	4.6	5.0	5.9	S	6.6	6.0	5.8	6.4	4.4	3.8	3.9	4.7	4.4	4.0	3.1	3.2	3.3	1.8	1.8	1.1	1.1	1.1	1.1	0.7	0.7	6.6	3.6	24	0.7	6.6	3.6	24	
10	0.0	0.0	S	0.9	0.0	0.0	0.0	0.0	0.0	0.1	1.9	3.8	0.6	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.6	0.3	0.6	0.7	0.0	3.8	0.4	24	0.0	3.8	0.4	24	
11	1.1	S	4.1	6.3	5.7	7.2	7.0	13.8	8.8	3.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	6.3	0.0	13.8	2.9	24	0.0	13.8	2.9	24		
12	S	3.2	2.0	1.4	2.4	4.3	7.2	6.8	5.9	6.5	6.2	2.8	3.9	3.7	0.8	2.2	2.0	1.2	1.1	1.0	1.8	2.7	0.0	S	0.0	7.2	3.1	24	0.0	7.2	3.1	24	
13	1.1	7.7	11.2	0.0	0.0	0.0	0.0	0.0	0.4	1.2	2.6	1.4	0.0	0.1	0.0	0.0	0.5	0.2	1.0	2.5	6.9	10.1	S	9.6	0.0	11.2	2.5	24	0.0	11.2	2.5	24	
14	7.5	8.0	11.6	15.3	17.0	16.2	14.6	15.6	13.2	10.1	8.7	C	C	C	C	C	C	C	C	6.8	5.9	5.7	S	6.6	5.7	5.7	17.0	10.5	24	5.7	17.0	10.5	24
15	5.9	6.0	5.8	5.3	4.7	3.6	3.9	2.8	3.1	2.7	4.1	5.3	5.7	4.8	5.0	5.9	7.5	9.7	10.6	10.8	S	9.8	11.9	11.0	2.7	11.9	6.3	24	2.7	11.9	6.3	24	
16	8.2	7.0	6.1	5.4	5.1	5.4	4.8	4.3	5.4	5.0	3.5	3.9	3.6	4.2	3.9	4.3	5.8	6.3	5.6	S	9.9	10.1	14.5	15.8	3.5	15.8	6.4	24	3.5	15.8	6.4	24	
17	12.4	16.6	13.2	4.9	8.4	3.5	1.8	5.5	7.9	2.0	2.8	2.8	1.2	1.3	6.5	8.3	9.0	6.3	S	8.5	1.5	1.3	1.3	1.2	1.2	16.6	5.6	24	1.2	16.6	5.6	24	
18	0.8	2.5	14.7	13.0	7.3	2.6	2.2	1.5	1.9	3.3	4.8	3.5	2.2	3.0	1.4	3.0	3.4	S	6.8	4.6	1.8	0.8	2.0	1.8	0.8	14.7	3.9	24	0.8	14.7	3.9	24	
19	1.8	0.6	0.7	0.5	0.6	2.1	0.7	1.9	5.5	2.0	1.2	0.9	2.5	5.3	7.9	7.3	S	5.2	9.3	9.2	6.3	2.2	2.7	0.6	0.5	9.3	3.3	24	0.5	9.3	3.3	24	
20	0.6	0.6	0.6	0.6	0.7	2.6	4.0	5.1	4.6	5.2	0.7	3.4	0.7	0.6	4.2	S	2.9	1.7	1.1	0.7	1.1	0.5	2.2	1.5	0.5	5.2	2.0	24	0.5	5.2	2.0	24	
21	0.5	0.5	1.2	3.8	5.9	5.8	6.4	3.4	5.9	5.9	3.7	1.9	0.9	0.7	S	4.1	5.7	2.9	5.5	6.0	0.9	0.7	0.5	0.8	0.5	6.4	3.2	24	0.5	6.4	3.2	24	
22	3.3	1.0	0.4	1.5	1.0	0.6	0.8	0.9	2.5	1.7	2.8	1.5	0.7	S	6.4	2.6	1.7	1.3	0.7	0.2	0.8	2.4	1.3	2.5	0.2	6.4	1.7	24	0.2	6.4	1.7	24	
23	1.2	1.1	0.9	2.1	3.0	5.1	4.0	6.0	13.2	6.0	5.8	1.5	S	2.7	1.6	2.3	3.2	2.9	2.9	2.5	2.1	1.9	1.8	1.5	0.9	13.2	3.3	24	0.9	13.2	3.3	24	
24	1.4	1.3	0.8	0.6	0.6	0.3	0.7	2.3	1.2	0.3	0.3	S	2.2	2.0	2.9	1.4	1.9	0.3	0.1	3.5	5.7	0.0	0.0	0.9	0.0	5.7	1.3	24	0.0	5.7	1.3	24	
25	2.0	4.1	3.8	3.7	4.0	5.8	4.2	5.2	3.6	1.9	S	4.4	1.8	2.5	2.7	2.7	2.7	2.9	3.1	6.4	8.5	1.0	0.2	2.2	0.2	8.5	3.5	24	0.2	8.5	3.5	24	
26	2.0	0.4	0.8	5.7	0.0	0.5	0.7	1.5	1.6	S	2.2	1.5	1.0	0.3	1.7	1.9	0.7	0.0	0.0	0.0	0.0	0.0	0.5	2.5	0.0	5.7	1.1	24	0.0	5.7	1.1	24	
27	1.9	3.2	2.4	2.2	2.4	1.7	2.8	4.5	S	7.0	5.7	8.6	2.9	2.3	2.3	4.1	2.2	1.6	0.5	0.0	1.2	0.9	1.5	1.3	0.0	8.6	2.7	24	0.0	8.6	2.7	24	
28	1.5	0.9	0.4	0.4	0.1	0.0	1.0	S	4.1	5.3	6.9	2.4	2.1	0.9	1.5	1.6	1.1	1.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0	6.9	1.4	24	0.0	6.9	1.4	24	
HOURLY MAX	12.4	16.6	14.7	15.3	17.0	16.2	14.6	15.6	13.2	10.1	8.7	8.6	5.7	5.5	7.9	8.3	9.0	9.7	10.6	10.8	9.9	10.1	14.5	15.8									
HOURLY AVG	3.3	3.7	4.4	3.7	3.4	3.3	3.4	4.1	4.9	3.9	3.3	3.0	1.9	1.9	2.3	2.6	2.6	2.1	2.5	2.9	2.7	2.1	2.4	3.4									

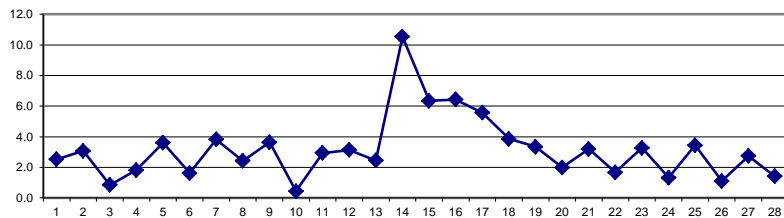
STATUS FLAG CODES

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

24 HR AVERAGES February 2017



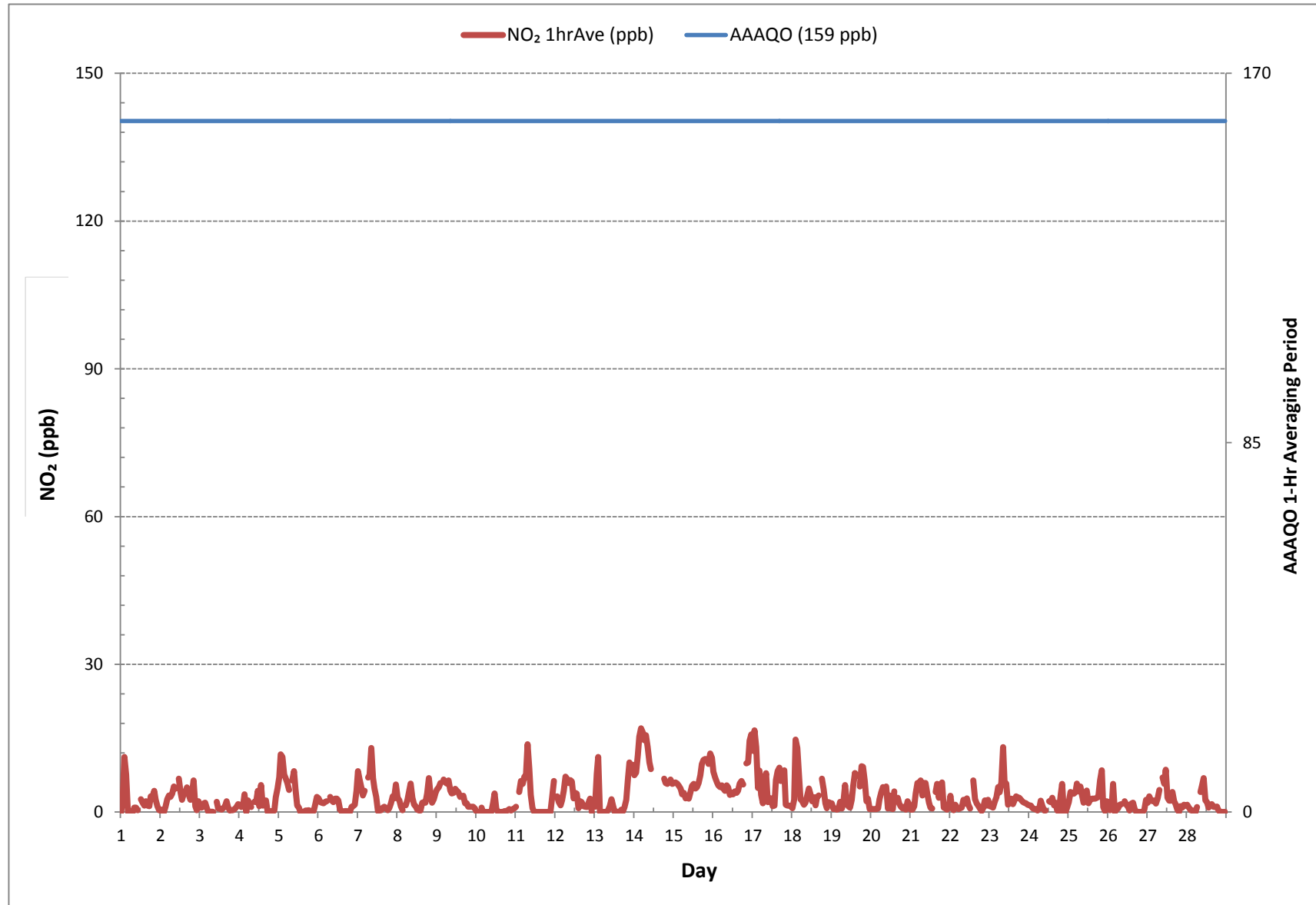
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	576					
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	17.0	ppb	@ HOUR(S)	4	ON DAY(S)	14
MAXIMUM 24-HR AVERAGE:	10.5	ppb			ON DAY(S)	14
					VAR-VARIOUS	
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs	
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	3.2		MONTHLY AVERAGE:	3.1	ppb	



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

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	16.1	9.7	17.3	17.3	2.1	0.9	0.9	0.9	2.1	2.1	1.5	S	5.6	3.2	3.2	3.8	2.1	3.2	4.4	4.9	7.3	3.8	2.1	1.5	0.9	17.3	5.0	24	
2	0.9	1.5	0.9	2.7	3.8	5.0	5.0	5.6	6.2	6.7	S	10.3	6.2	3.8	4.4	5.6	6.7	5.0	3.8	10.3	17.3	8.5	1.5	7.3	0.9	17.3	5.6	24	
3	2.7	2.1	2.7	3.2	2.7	0.3	0.9	1.5	1.5	S	4.9	2.1	2.1	2.7	2.7	4.4	3.2	1.5	1.5	1.5	1.5	2.1	2.7	0.3	4.9	2.3	24		
4	2.1	2.1	2.1	10.3	0.9	6.2	3.8	3.8	S	4.4	6.7	9.1	8.5	22.0	8.5	6.2	7.9	0.9	0.3	0.9	0.3	2.1	4.4	5.6	0.3	22.0	5.2	24	
5	9.1	16.2	15.6	9.1	8.0	8.0	5.6	S	10.4	11.5	7.4	3.9	2.1	0.9	0.9	0.9	0.9	0.9	0.4	0.4	0.4	0.9	2.7	3.9	0.4	16.2	5.2	24	
6	3.9	2.7	2.2	2.2	2.7	2.7	S	5.1	3.4	2.8	4.0	4.0	4.5	1.0	0.4	0.4	0.4	0.4	0.4	0.0	3.3	2.7	2.7	8.6	0.0	8.6	2.6	24	
7	9.2	8.0	6.2	4.5	6.8	S	8.6	9.8	16.3	16.8	6.2	4.5	1.5	0.9	1.5	8.6	3.3	0.9	0.9	1.5	2.7	3.9	3.3	8.6	0.9	16.8	5.8	24	
8	6.8	3.4	2.1	0.9	S	2.7	15.0	8.6	7.4	6.8	2.7	2.7	2.1	2.1	1.5	12.1	5.6	3.3	7.4	8.0	6.2	2.7	3.9	5.0	0.9	15.0	5.2	24	
9	5.6	6.8	7.4	S	9.2	8.0	9.8	10.4	6.8	5.6	6.2	P	P	6.2	5.0	6.7	7.9	4.4	4.4	3.8	3.2	3.2	3.2	3.2	3.2	3.2	10.4	6.0	22
10	2.7	2.1	S	5.6	2.7	2.1	2.1	1.5	1.5	4.4	6.1	9.7	6.1	3.8	2.7	2.7	2.7	2.1	2.1	2.7	2.7	2.1	2.1	2.7	1.5	9.7	3.3	24	
11	2.7	S	7.3	8.5	8.5	10.3	10.9	25.0	15.0	6.2	3.8	1.5	7.9	9.1	0.9	0.9	0.9	0.3	0.9	0.9	0.9	0.9	7.3	10.3	0.3	25.0	6.1	24	
12	S	7.3	3.8	2.7	4.4	6.7	9.7	8.5	7.9	8.5	8.5	4.4	5.6	5.6	3.8	3.8	5.6	3.2	2.7	2.1	3.2	5.0	2.1	S	2.1	9.7	5.2	24	
13	4.4	16.2	18.5	2.1	0.3	0.3	0.3	1.5	2.7	15.0	13.9	3.8	0.9	0.9	0.9	0.9	2.7	0.9	3.8	6.1	10.9	11.5	S	11.5	0.3	18.5	5.7	24	
14	9.7	9.7	13.9	16.7	19.7	17.9	16.7	17.3	16.2	15.5	C	C	C	C	C	C	C	C	9.1	6.7	7.3	S	8.5	6.7	6.7	19.7	12.8	24	
15	7.3	7.3	6.7	6.2	6.2	4.4	5.6	3.2	4.4	3.2	5.6	6.7	6.7	6.1	6.7	6.7	8.5	10.9	12.7	12.1	S	10.9	13.9	13.3	3.2	13.9	7.6	24	
16	9.7	7.9	7.3	6.2	5.6	6.2	5.6	5.6	7.3	6.8	3.8	4.4	3.8	5.0	4.4	5.0	8.5	6.8	6.2	S	13.9	15.6	17.3	18.5	3.8	18.5	7.9	24	
17	15.6	20.9	26.1	20.9	20.9	9.1	3.8	17.9	21.5	6.7	5.0	8.0	1.5	2.7	15.0	15.0	20.9	20.9	S	12.1	4.9	1.5	1.5	1.5	1.5	26.1	11.9	24	
18	1.5	11.5	17.3	17.3	19.1	3.8	3.3	2.7	2.7	5.0	6.2	5.0	2.7	5.6	2.1	7.9	7.3	S	10.9	13.3	3.8	2.7	7.9	2.7	1.5	19.1	7.1	24	
19	5.0	0.9	1.5	0.9	1.5	4.4	1.5	3.3	9.1	6.2	2.7	3.3	4.4	7.9	9.1	9.1	S	8.5	12.7	10.9	9.7	6.2	5.0	0.9	0.9	12.7	5.4	24	
20	0.9	0.9	0.9	0.9	1.5	4.4	6.2	8.5	9.1	9.1	2.1	6.8	0.9	0.9	36.7	S	5.6	2.1	1.5	1.5	3.8	0.9	5.6	4.4	0.9	36.7	5.0	24	
21	0.9	0.9	2.1	6.2	7.3	6.8	7.3	5.6	27.9	15.6	5.6	3.3	1.5	1.5	S	8.5	12.7	5.6	10.4	9.1	6.2	1.5	1.5	4.4	0.9	27.9	6.6	24	
22	8.5	4.4	1.5	2.1	1.5	1.5	3.3	3.2	3.8	4.4	5.0	4.4	2.7	S	9.7	7.3	3.8	3.3	1.5	0.9	2.1	2.7	3.3	3.3	0.9	9.7	3.7	24	
23	2.1	1.5	1.5	4.4	4.4	6.2	5.0	12.7	53.8	10.4	19.1	2.1	S	5.6	3.8	6.2	5.0	3.8	3.8	3.8	2.7	2.7	2.7	2.1	1.5	53.8	7.2	24	
24	2.1	1.5	1.5	1.5	0.9	1.5	2.7	3.8	2.1	2.1	2.1	S	5.0	6.2	8.5	5.6	5.6	2.7	3.3	8.5	15.0	2.7	0.9	7.3	0.9	15.0	4.0	24	
25	7.3	6.2	5.6	5.0	7.3	9.1	7.3	18.5	6.8	5.0	S	8.5	4.4	4.4	4.4	4.4	4.4	4.4	4.4	11.5	14.4	3.8	1.5	10.3	1.5	18.5	6.9	24	
26	5.0	2.1	5.6	20.9	1.5	2.7	2.1	2.7	3.3	S	5.0	5.0	5.0	2.7	5.0	11.5	5.0	0.9	0.3	0.9	2.1	0.9	3.8	4.4	0.3	20.9	4.3	24	
27	4.4	6.2	4.4	4.4	5.0	3.8	6.2	7.9	S	10.9	9.1	12.7	7.3	4.4	4.4	6.2	5.6	3.3	2.7	1.5	3.8	3.8	5.0	4.4	1.5	12.7	5.5	24	
28	3.8	3.3	2.1	2.1	1.5	1.5	4.4	S	7.9	12.7	13.9	4.4	3.8	2.7	3.8	3.3	2.7	2.7	2.7	2.1	1.5	0.3	0.3	0.3	0.3	13.9	3.6	24	
HOURLY MAX	16.1	20.9	26.1	20.9	20.9	17.9	16.7	25.0	53.8	16.8	19.1	12.7	8.5	22.0	36.7	15.0	20.9	20.9	12.7	13.3	17.3	15.6	17.3	18.5					
HOURLY AVG	5.6	6.0	6.8	6.8	5.8	5.1	5.7	7.5	9.9	7.9	6.3	5.4	4.1	4.5	5.8	5.8	5.6	4.0	4.3	5.1	5.6	3.9	4.3	5.8					

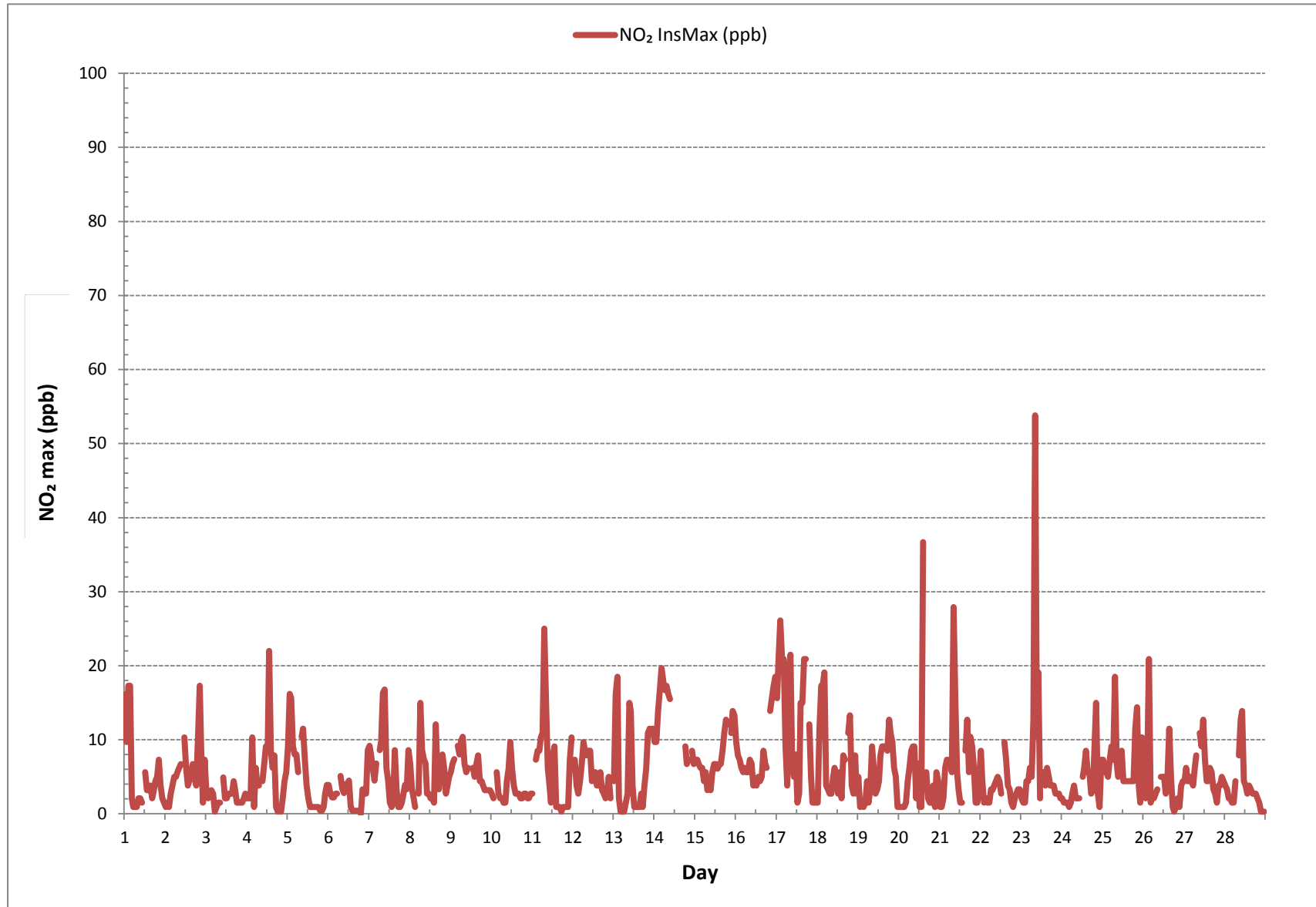
STATUS FLAG CODES

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:	632
MAXIMUM INSTANTANEOUS VALUE:	53.8 ppb @ HOUR(S) 8 ON DAY(S) 23
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	5.2
OPERATIONAL TIME:	670 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



% Icon Classes (ppb)

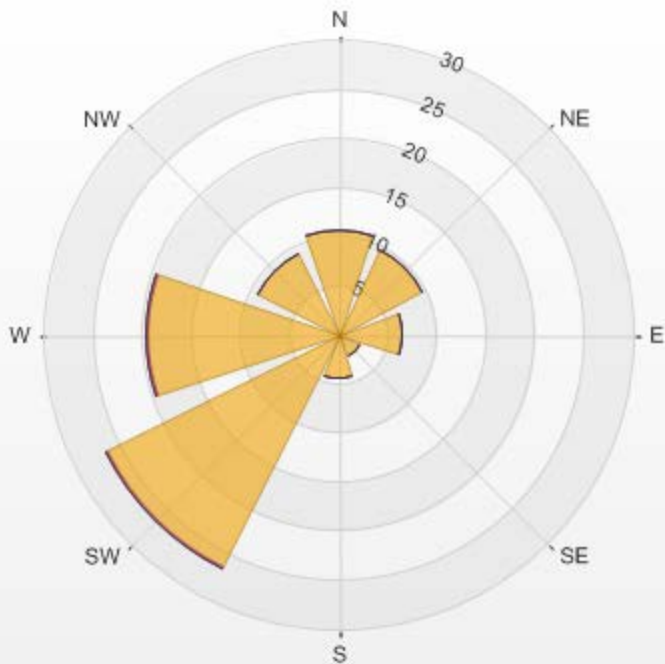
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0  16.4-32.8

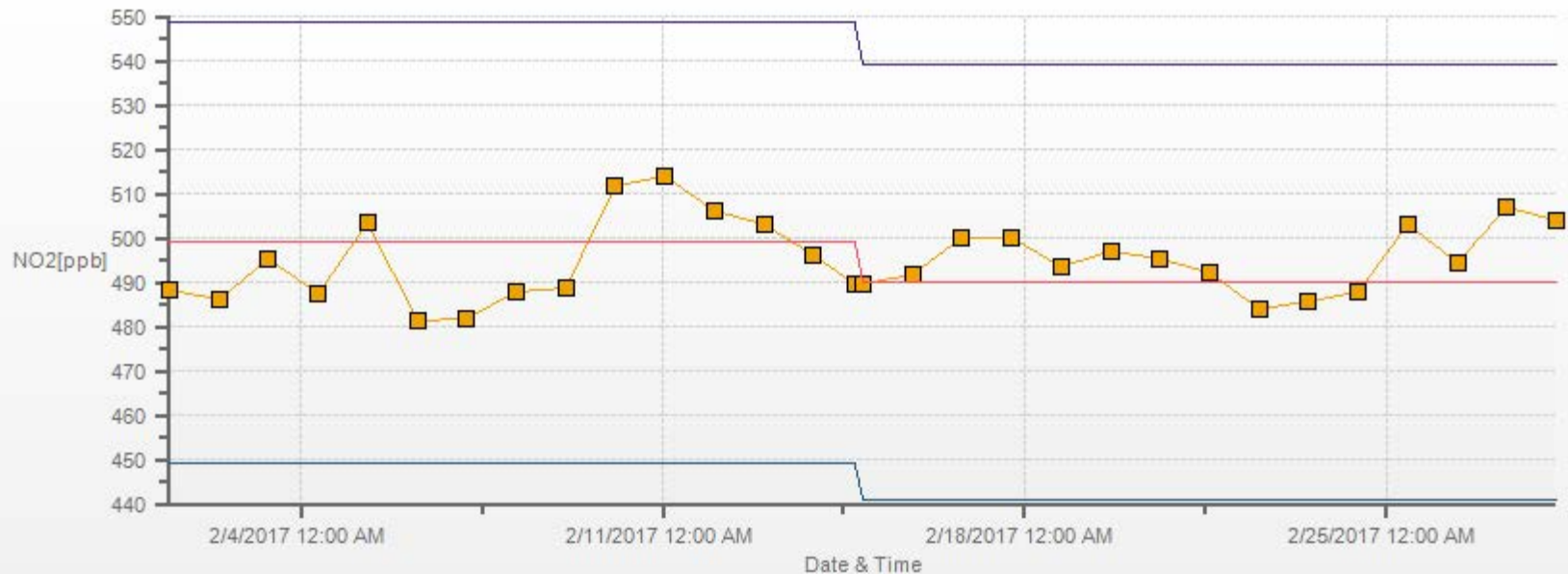
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0  >49.2

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.53%
Calm Poll Avg: 2.99[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

WIND SPEED



WIND SPEED Hourly Averages (WS kph)

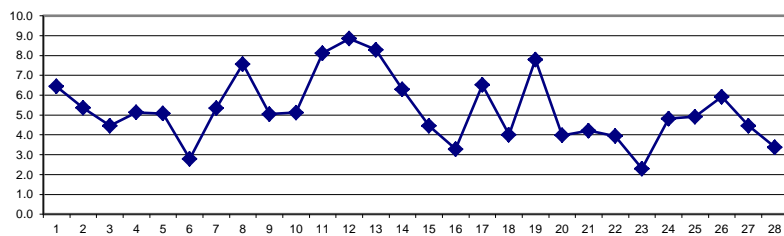
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	6.4	5.1	7.4	6.9	7.3	8.2	8.8	8.5	8.5	8.0	9.6	9.8	9.1	8.4	7.5	7.0	5.3	2.7	3.5	2.8	3.1	3.9	3.2	3.7	2.7	9.8	6.4	24				
2	4.4	4.4	5.0	5.3	5.1	4.1	4.3	4.1	4.5	4.3	5.0	6.2	6.3	7.8	10.2	8.0	5.1	4.3	4.2	5.6	5.4	5.4	5.2	4.4	4.1	10.2	5.4	24				
3	3.5	3.4	3.0	2.1	3.7	4.4	3.8	4.2	5.5	4.1	3.7	4.3	5.1	6.4	5.6	5.5	3.0	5.0	5.9	4.8	5.6	4.6	4.2	5.5	2.1	6.4	4.5	24				
4	4.0	0.6	2.8	4.7	2.7	3.5	3.5	4.3	4.0	4.9	7.7	9.0	9.7	8.5	8.5	6.9	5.4	5.5	4.4	4.8	3.4	4.1	5.4	4.8	0.6	9.7	5.1	24				
5	4.5	5.4	4.7	5.6	2.3	5.4	4.9	3.2	1.3	3.1	3.2	8.2	8.7	10.8	10.0	8.8	8.5	7.3	3.5	3.4	2.6	1.0	1.7	3.7	1.0	10.8	5.1	24				
6	1.4	0.6	2.5	0.7	1.4	0.6	0.5	2.1	1.1	3.1	6.5	4.2	1.0	7.2	5.9	5.8	4.0	3.7	2.7	1.1	3.2	3.6	0.7	3.3	0.5	7.2	2.8	24				
7	3.9	2.2	3.3	2.2	3.2	4.0	3.4	3.1	3.5	4.9	5.8	10.2	10.4	9.6	7.0	7.2	5.9	5.5	5.1	5.2	5.7	5.0	5.9	6.1	2.2	10.4	5.3	24				
8	5.5	4.9	5.3	6.8	7.2	5.6	5.5	5.3	7.4	7.2	6.4	7.3	7.7	9.1	9.0	8.5	10.1	10.7	10.4	9.9	9.5	8.9	7.1	6.3	4.9	10.7	7.6	24				
9	5.6	7.8	8.2	5.9	4.3	3.2	4.2	2.5	2.1	2.8	4.6	6.8	4.5	6.6	7.7	5.4	5.6	3.9	4.1	6.3	5.0	5.3	4.4	4.3	2.1	8.2	5.0	24				
10	4.5	4.1	0.6	2.7	4.0	4.2	4.6	5.0	5.2	4.0	5.4	4.7	6.2	6.5	6.8	6.0	5.3	5.0	4.4	6.2	8.0	8.1	5.9	5.5	0.6	8.1	5.1	24				
11	7.4	4.6	4.2	5.0	6.0	4.0	5.0	7.5	5.1	4.9	10.8	13.8	14.1	14.1	13.8	12.6	12.1	7.7	6.0	8.1	6.1	6.4	7.7	7.9	4.0	14.1	8.1	24				
12	7.9	7.7	8.6	9.2	8.9	7.7	8.3	9.7	10.4	10.6	10.9	10.7	9.2	8.9	9.6	8.1	8.0	7.4	8.5	8.3	6.4	6.9	9.7	10.9	6.4	10.9	8.9	24				
13	14.1	13.4	11.6	10.7	10.5	9.0	8.1	6.6	7.7	9.5	9.0	9.0	9.8	8.6	8.9	6.5	6.6	4.2	4.8	6.6	6.6	6.1	5.8	6.3	4.2	14.1	8.3	24				
14	4.4	5.0	5.3	5.0	5.9	2.2	1.4	7.3	6.8	7.5	6.2	8.5	7.3	9.4	10.2	9.4	6.3	6.5	6.7	9.2	9.9	3.6	2.3	4.7	1.4	10.2	6.3	24				
15	5.5	3.8	3.3	1.7	0.2	1.7	1.4	3.1	3.0	1.7	2.5	3.2	4.7	7.7	8.4	8.3	7.4	4.8	6.1	6.3	10.0	5.1	4.4	2.4	0.2	10.0	4.4	24				
16	1.4	1.0	2.4	2.2	3.1	3.3	5.0	4.3	2.5	4.8	7.7	6.7	4.9	4.5	6.1	3.3	2.4	0.5	1.4	2.6	2.0	3.8	2.2	0.8	0.5	7.7	3.3	24				
17	4.2	5.3	7.5	10.2	7.7	8.0	8.0	7.0	5.4	6.9	7.7	8.1	7.9	10.3	8.4	7.3	6.5	6.4	7.1	4.2	2.8	3.3	2.9	3.3	2.8	10.3	6.5	24				
18	2.9	3.3	2.8	1.0	2.5	0.9	1.6	0.9	3.3	4.3	4.8	2.0	2.2	4.2	6.0	4.9	4.7	4.7	5.9	4.8	6.0	6.2	7.5	8.6	0.9	8.6	4.0	24				
19	10.0	9.6	10.5	10.5	10.7	11.2	12.5	11.8	11.0	9.7	8.5	8.0	6.7	8.1	7.6	7.0	6.1	5.4	5.0	4.4	4.3	3.0	2.8	2.8	2.8	12.5	7.8	24				
20	3.4	1.6	0.6	1.3	2.4	4.8	4.8	5.6	4.5	3.8	5.3	5.4	5.7	6.0	5.1	4.3	3.5	2.6	3.6	5.7	4.7	5.0	4.0	1.7	0.6	6.0	4.0	24				
21	1.0	0.9	3.0	4.1	4.6	6.2	3.8	3.0	2.8	4.4	3.4	4.8	5.4	4.1	4.5	4.1	5.8	5.0	5.0	7.2	5.0	4.9	4.5	3.7	0.9	7.2	4.2	24				
22	4.1	3.7	4.6	5.3	4.2	4.3	4.1	1.7	3.5	3.3	4.3	5.3	5.5	7.5	6.7	3.2	3.1	3.6	4.3	3.9	3.9	1.6	1.5	1.2	1.2	7.5	3.9	24				
23	1.8	1.1	2.0	1.6	1.8	0.4	0.9	1.0	1.1	0.7	3.0	6.7	4.6	4.7	4.8	4.6	4.3	2.4	2.6	1.4	0.2	0.8	1.1	1.6	0.2	6.7	2.3	24				
24	1.4	1.1	1.2	2.5	4.2	7.6	8.5	8.0	7.5	6.5	6.3	6.2	5.6	6.2	7.0	6.7	7.1	4.5	4.2	4.6	3.3	0.9	1.3	3.3	0.9	8.5	4.8	24				
25	2.8	4.0	6.0	6.3	4.4	4.8	4.8	4.9	6.3	6.2	6.3	7.3	8.0	5.6	5.0	6.3	5.9	2.2	1.6	4.4	3.9	5.8	2.8	2.4	1.6	8.0	4.9	24				
26	2.4	3.0	4.3	8.0	12.0	10.9	8.8	9.0	9.3	8.3	7.8	7.1	6.8	6.6	5.7	6.4	4.7	3.0	1.5	0.8	1.9	3.1	4.7	5.9	0.8	12.0	5.9	24				
27	5.8	6.9	6.9	5.6	5.1	2.1	3.3	3.9	3.8	4.3	5.0	4.5	5.7	3.7	4.5	5.3	5.7	4.9	4.9	3.8	3.6	2.7	3.5	1.5	1.5	6.9	4.5	24				
28	1.7	1.9	1.3	0.7	1.3	1.4	0.3	0.5	1.2	2.9	2.1	2.1	2.9	6.2	3.4	6.3	5.6	3.2	5.0	6.1	7.5	5.4	6.0	6.0	0.3	7.5	3.4	24				
HOURLY MAX	14.1	13.4	11.6	10.7	12.0	11.2	12.5	11.8	11.0	10.6	10.9	13.8	14.1	14.1	13.8	12.6	12.1	10.7	10.4	9.9	10.0	8.9	9.7	10.9								
HOURLY AVG	2.0	2.0	2.4	2.2	1.7	1.4	1.3	1.0	1.2	1.8	2.8	3.1	3.3	3.1	2.7	2.0	1.8	1.4	1.3	1.7	1.6	1.4	1.6	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

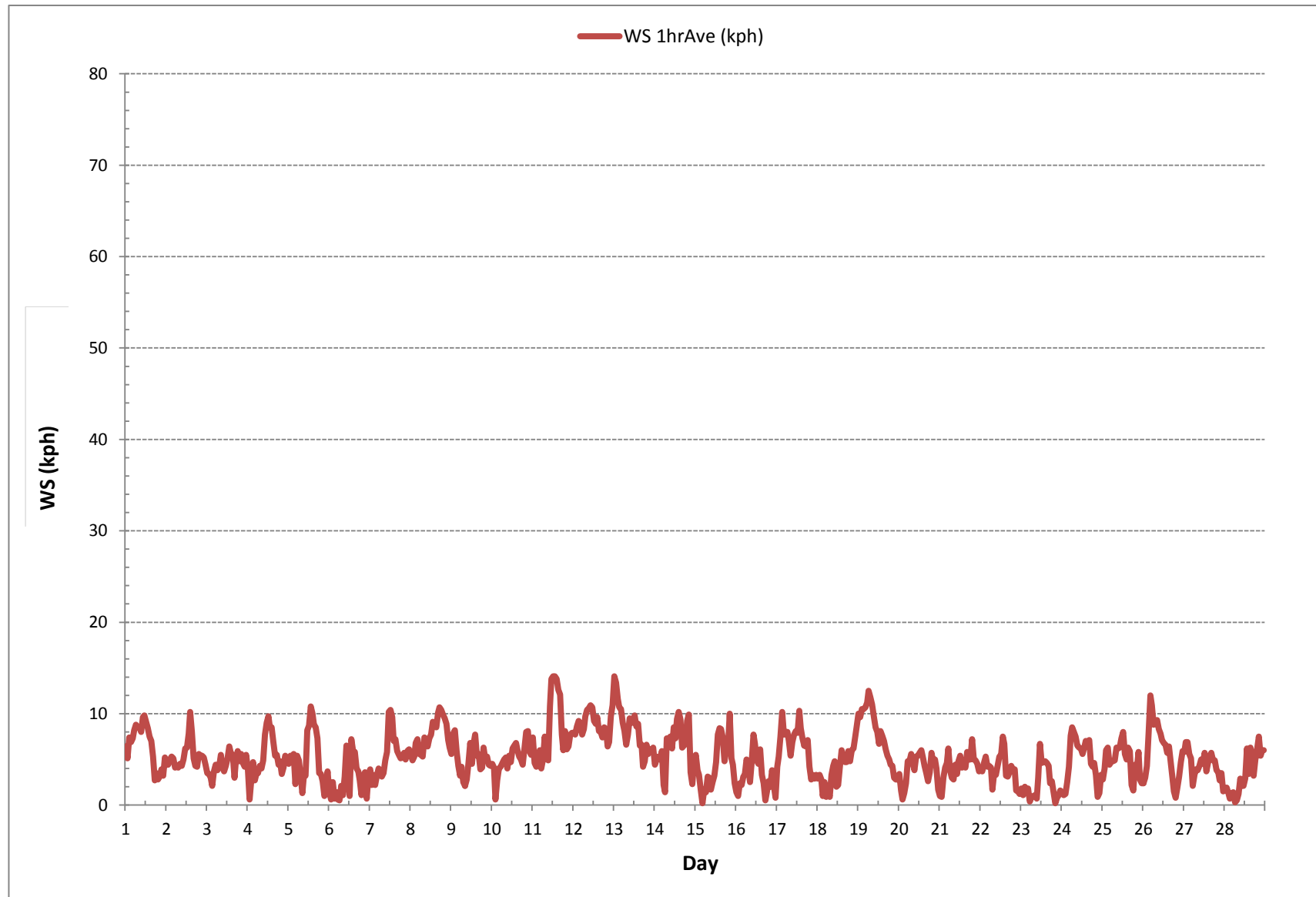
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	672
MINIMUM 1-HR AVERAGE	0.2 kph @ HOUR(S) 4 , 20 ON DAY(S) 15 , 23
MAXIMUM 1-HR AVERAGE:	14.1 kph @ HOUR(S) VAR , 0 ON DAY(S) 11 , 13
MAXIMUM 24-HR AVERAGE:	8.9 kph ON DAY(S) 12
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	672 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2.7
MONTHLY AVERAGE:	1.8 kph

WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

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	23.2	18.8	27.0	25.0	28.9	39.6	30.4	27.7	29.1	36.1	39.2	29.4	33.7	28.4	30.0	34.3	17.0	7.6	13.0	7.7	8.1	10.6	10.6	13.2	7.6	39.6	23.7	24				
2	12.8	13.0	11.1	11.4	11.6	10.4	10.9	9.8	10.3	9.8	18.0	17.0	21.5	19.8	22.0	20.6	14.6	11.7	13.7	16.6	15.9	15.7	14.0	15.4	9.8	22.0	14.5	24				
3	12.0	9.6	8.9	6.7	17.7	13.8	11.1	13.2	16.1	11.3	10.7	17.5	16.6	24.5	17.2	22.7	6.5	13.3	20.9	12.3	12.6	9.1	11.4	14.0	6.5	24.5	13.7	24				
4	11.8	5.3	7.4	17.7	13.3	8.0	12.6	11.7	13.6	16.3	29.3	31.9	32.2	25.8	26.6	29.7	17.7	14.3	14.8	14.1	10.4	10.6	13.5	15.5	5.3	32.2	16.8	24				
5	11.3	11.1	8.5	11.1	7.6	11.8	10.3	7.9	4.8	6.6	13.6	20.6	22.1	22.5	23.4	29.0	25.2	28.3	8.3	9.7	6.6	6.7	5.8	10.2	4.8	29.0	13.5	24				
6	3.8	4.7	5.4	9.7	9.8	10.6	6.6	5.3	4.3	7.9	12.7	10.1	12.8	17.1	13.3	11.9	10.1	8.3	7.8	5.2	9.1	7.9	5.3	7.3	3.8	17.1	8.6	24				
7	9.7	6.7	7.0	5.8	8.9	10.8	9.3	7.6	8.4	11.2	19.3	30.5	27.9	32.5	21.1	25.2	20.3	22.0	22.5	16.2	17.4	15.5	14.0	13.6	5.8	32.5	16.0	24				
8	13.7	14.0	18.2	21.8	21.2	21.4	14.8	12.4	17.0	22.9	22.8	23.7	28.7	35.7	31.4	30.9	28.3	26.5	38.9	32.0	33.7	22.9	17.0	20.3	12.4	38.9	23.8	24				
9	14.5	23.4	19.4	20.5	11.5	8.4	15.9	8.1	6.1	7.8	9.8	P	P	19.2	20.4	17.7	21.6	17.0	16.4	19.0	18.5	14.6	15.2	14.1	6.1	23.4	15.4	22				
10	14.0	14.8	12.8	20.1	15.6	14.1	13.2	17.8	18.7	15.0	18.2	16.4	17.2	17.6	19.9	17.3	17.9	12.2	11.9	14.7	24.0	18.2	15.2	16.7	11.9	24.0	16.4	24				
11	18.0	13.7	13.6	16.0	19.1	15.4	14.5	16.9	16.5	16.3	41.3	47.9	49.2	50.5	43.0	47.9	44.8	29.9	23.1	28.4	23.5	20.2	22.4	20.5	13.6	50.5	27.2	24				
12	18.2	21.3	21.5	24.4	23.0	22.4	24.2	29.5	28.1	31.7	33.9	33.0	29.9	30.3	32.3	27.1	22.6	18.0	21.7	19.8	16.9	31.9	46.1	44.0	16.9	46.1	27.2	24				
13	46.0	42.8	31.8	28.9	27.7	30.0	27.5	21.6	20.9	30.6	25.1	24.4	28.9	31.3	29.6	20.5	20.8	12.8	12.1	15.1	12.3	13.2	12.4	13.6	12.1	46.0	24.2	24				
14	9.4	9.9	13.8	11.0	12.1	9.5	5.3	15.9	16.7	15.6	14.2	21.4	16.3	18.6	25.3	25.1	16.4	16.5	22.2	25.7	23.5	10.8	7.5	13.6	5.3	25.7	15.7	24				
15	13.9	11.4	13.5	11.0	10.9	5.4	10.9	13.1	11.8	11.1	12.4	15.3	13.7	16.7	21.9	20.8	20.4	13.6	16.7	16.6	18.4	13.5	14.8	10.8	5.4	21.9	14.1	24				
16	8.1	7.0	11.8	11.3	12.3	11.4	9.0	12.0	11.4	18.9	18.9	14.5	14.8	11.3	15.4	8.6	13.0	7.7	11.2	20.2	22.2	14.5	15.1	6.3	6.3	22.2	12.8	24				
17	12.9	18.4	23.0	25.2	22.4	23.5	23.3	22.5	18.3	20.1	31.9	28.0	25.1	33.5	24.5	30.4	23.1	19.7	20.4	22.1	10.4	12.0	12.2	10.2	10.2	33.5	21.4	24				
18	10.4	14.4	12.9	6.5	6.4	9.8	9.6	4.3	11.6	11.5	9.8	10.2	14.6	16.6	16.6	14.0	14.2	18.8	25.8	18.4	24.3	34.1	31.9	4.3	34.1	14.9	24					
19	31.5	35.9	36.8	42.8	38.3	37.4	50.8	45.5	37.4	32.2	29.1	31.1	22.3	31.1	23.7	23.0	25.1	21.0	16.4	13.7	14.6	12.0	12.2	12.0	12.0	50.8	28.2	24				
20	7.6	4.6	2.1	9.6	11.8	15.7	18.8	19.0	14.6	14.6	19.4	16.8	18.2	25.3	20.3	20.8	13.5	13.5	15.7	21.0	19.7	18.1	18.2	11.0	2.1	25.3	15.4	24				
21	5.2	10.5	9.2	11.3	11.8	15.9	11.6	14.4	11.2	10.9	13.5	14.6	16.1	12.6	20.3	17.9	21.4	17.3	16.5	25.7	20.1	18.1	18.6	17.9	5.2	25.7	15.1	24				
22	16.2	15.7	15.3	19.6	13.3	14.6	13.5	11.1	12.4	13.3	17.8	19.0	21.2	23.2	23.2	16.8	14.2	34.2	19.6	17.8	14.4	10.9	10.7	14.4	10.7	34.2	16.8	24				
23	16.3	65.8	21.0	28.7	11.6	16.8	11.2	16.0	14.0	15.7	11.4	17.4	18.6	16.8	15.5	16.8	11.6	8.3	9.8	9.0	9.2	10.0	11.3	11.8	8.3	65.8	16.4	24				
24	12.2	10.3	18.2	11.4	12.2	16.4	17.3	20.7	20.6	19.7	19.5	22.8	23.9	23.9	26.7	25.6	22.3	19.5	19.7	23.9	18.2	31.5	21.4	30.9	10.3	31.5	20.4	24				
25	12.8	11.6	12.5	12.5	12.7	12.2	14.0	11.4	12.8	14.9	20.4	20.1	22.8	19.7	17.7	15.7	15.7	10.3	11.6	16.0	15.7	18.9	11.8	14.0	10.3	22.8	14.9	24				
26	15.3	14.0	26.9	49.8	37.1	36.4	29.1	28.3	36.7	26.7	27.4	27.4	25.6	23.9	21.9	25.6	24.3	16.6	21.0	16.2	16.9	11.6	11.1	14.2	11.1	49.8	24.3	24				
27	12.9	15.3	14.4	13.2	12.0	30.7	10.7	13.2	14.2	13.5	20.8	15.7	13.4	13.1	16.0	17.7	20.4	17.1	17.9	15.7	16.0	17.5	14.6	17.5	10.7	30.7	16.0	24				
28	19.5	17.7	34.6	19.7	51.7	34.4	19.5	18.2	18.0	12.7	12.9	12.2	11.8	15.3	14.1	17.7	15.3	11.3	18.8	21.2	21.7	15.8	20.2	21.4	11.3	51.7	19.8	24				
HOURLY MAX	46.0	65.8	36.8	49.8	51.7	39.6	50.8	45.5	37.4	36.1	41.3	47.9	49.2	50.5	43.0	47.9	44.8	34.2	38.9	32.0	33.7	31.9	46.1	44.0								
HOURLY AVG	14.8	16.5	16.4	18.0	17.6	18.1	16.3	16.3	17.0	20.5	21.8	22.0	23.4	22.6	22.6	19.2	16.5	17.2	17.9	16.7	15.6	15.6	16.3									

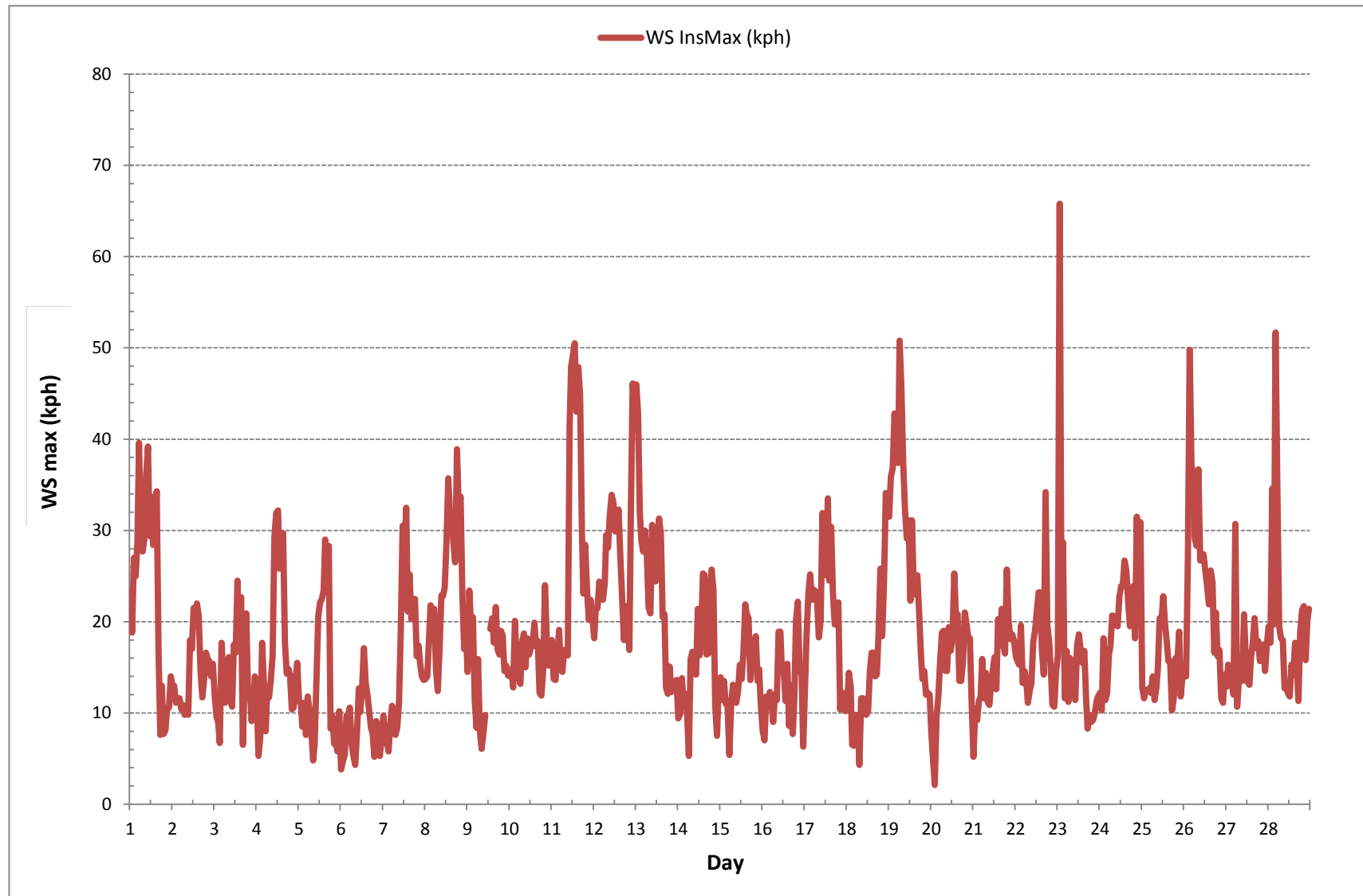
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	65.8	kph	@ HOUR(S)	1	ON DAY(S)	23
					VAR-VARIOUS	
OPERATIONAL TIME:	670	hrs				

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA MASKWA
 Monitor: WSP [kph]
 Monthly: 2017/02
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

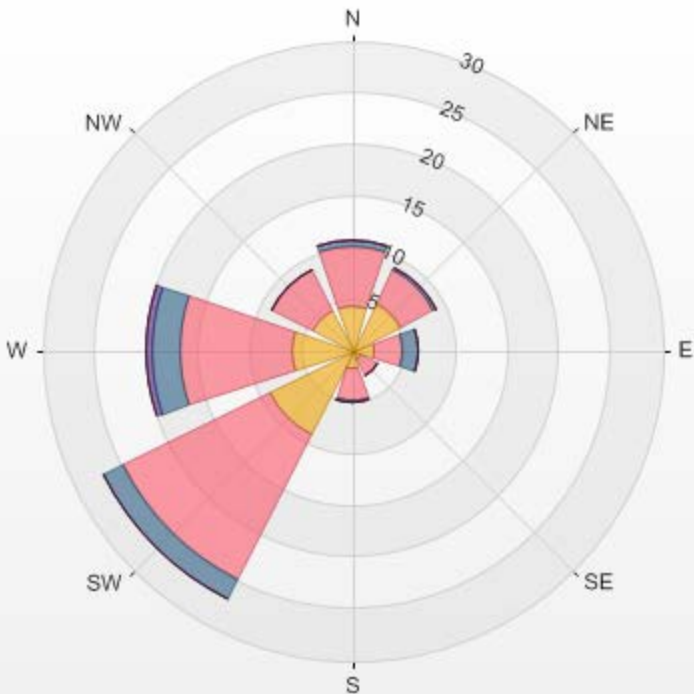
Calm: 10.42%

Calm Avg: 0.00 [ppb]

Direction	1.8-4.7	4.7-9.4	9.4-14.0	14.0-18.7	18.7-23.4	>23.4	Total
N	4.3	5.8	0.6	0.0	0.0	0.0	10.7
NE	5.2	3.6	0.3	0.0	0.0	0.0	9.1
E	2.1	2.8	1.5	0.0	0.0	0.0	6.4
SE	1.0	1.6	0.0	0.0	0.0	0.0	2.7
S	1.8	3.0	0.3	0.0	0.0	0.0	5.1
SW	9.1	15.8	2.1	0.0	0.0	0.0	26.9
W	6.0	10.7	2.8	0.5	0.0	0.0	19.9
NW	4.3	4.5	0.0	0.0	0.0	0.0	8.8
Summary	33.8	47.8	7.6	0.5	0.0	0.0	89.6

% Icon Classes (kph)	34	1.8-4.7	48	4.7-9.4	8	9.4-14.0	0	14.0-18.7	0	18.7-23.4	0	>23.4
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LICA MASKWA 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.42% Calm Wind Avg Speed: 1.12(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

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	WNW	W	NW	NW	NNW	N	N	N	N	NNW	NNW	NNW	NNW	NNW	NNW	N	NW	WNW	NW	WSW	W	WSW	WSW	WSW	NNW	24	
2	WSW	SW	SW	SW	SW	SW	WSW	SW	SW	SW	WSW	W	W	SW	SSW	SW	SW	SW	W	W	W	W	WNW	NNW	WSW	24	
3	NNW	NNW	N	NNW	NNW	N	NNW	NNW	N	N	NNW	NNW	NNW	N	NNW	N	N	N	N	N	NNE	N	N	N	N	N	24
4	NNE	NW	W	NW	NW	WSW	WSW	WSW	W	W	WNW	WNW	WNW	WNW	WNW	NW	WNW	W	W	W	WSW	SW	SW	WSW	W	24	
5	SW	SSW	SSW	SSW	S	SSW	SSW	SSW	SW	SW	NE	NNW	NNE	NE	NNE	NNE	N	N	NNE	NE	NNE	NW	SW	SSW	N	24	
6	ENE	SE	SSW	S	SSW	SSE	ESE	NE	SSW	NNE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ESE	WNW	N	NW	SW	NE	24	
7	SW	SW	SW	SW	W	W	WSW	SW	SW	SW	W	WNW	WNW	WNW	W	WSW	WSW	W	WSW	WSW	WSW	WSW	SW	SW	WSW	24	
8	SW	WSW	WSW	W	W	W	W	SW	SSW	SW	WSW	SW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	24
9	SW	SSW	SSW	SW	SW	SW	SSW	ENE	ENE	NNE	NNE	NE	NNE	NNE	NE	E	E	E	E	ENE	NE	NE	ENE	NE	ENE	24	
10	NE	NE	NNE	NNE	NE	ENE	NE	ENE	ENE	E	ESE	ESE	ESE	ESE	ESE	SE	SE	SE	SSE	S	S	S	SSW	S	ESE	24	
11	SSW	SW	SW	SW	SW	WSW	SW	SW	SW	SW	WSW	W	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	WSW	SW	SW	SW	W	24
12	SW	SW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	SW	SW	SSW	SW	SW	SW	SW	W	W	SW	24	
13	WNW	WNW	WNW	WNW	WNW	W	W	W	W	WNW	W	WNW	WNW	WNW	W	W	W	WSW	SW	SW	SW	SW	SW	SW	SW	W	24
14	SW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SW	SW	SSW	SSW	24	
15	SSW	SSW	SW	SSW	SSW	NE	E	ENE	NNE	NE	NE	SSE	SSE	SSW	SSW	SSW	SW	WSW	SW	SW	SSW	SW	SSW	S	SSW	24	
16	ESE	NNE	E	ENE	NE	NNE	NE	NE	NE	SSE	S	SSW	S	SSE	SSE	SSW	S	SSE	SE	NW	WNW	SSW	SSW	SSW	SSE	24	
17	WSW	W	WNW	WNW	WNW	W	W	WNW	W	WNW	WNW	W	WNW	WNW	WNW	WNW	WNW	WNW	W	W	WSW	WSW	WSW	WSW	W	24	
18	WSW	WSW	W	SSW	SW	SW	NNE	ESE	SE	SSW	SSW	S	SE	ENE	ENE	ESE	ESE	ESE	ESE	E	E	ENE	E	E	ESE	24	
19	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE	ESE	ESE	E	E	E	E	E	E	ENE	E	ENE	E	24
20	NE	NE	N	W	W	W	W	WNW	W	W	W	WNW	W	W	WNW	WNW	W	W	W	W	W	W	W	SW	W	24	
21	SSW	S	SW	SSW	SSW	SSW	SW	SW	SW	SW	WSW	WNW	WNW	WNW	WNW	WNW	WNW	W	WNW	NW	NNW	NNW	NNW	NNW	NNW	W	24
22	NW	NNW	N	N	N	N	N	NNW	WNW	NW	NW	WNW	WNW	WNW	WNW	NW	W	WNW	NNW	NNW	N	NNW	W	WSW	NW	24	
23	W	WNW	WNW	WSW	WSW	NW	SSE	S	SW	WNW	SW	SSW	W	WNW	W	SW	SSW	SSW	SSE	SSE	ESE	SE	NNE	ENE	SW	24	
24	ENE	NE	NE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	NNW	NNW	NW	NW	NNW	NW	NNW	NNW	WNW	WNW	WNW	WSW	W	N	24	
25	WSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SW	SW	SSW	SSW	WSW	WSW	WNW	WNW	N	N	WNW	SW	24	
26	W	WSW	W	NNW	N	N	N	N	N	N	NNW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	WSW	S	S	SSW	SSW	NNW	24	
27	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SW	SW	WNW	N	NNE	NNE	NE	ESE	E	ENE	ENE	ENE	E	ENE	E	E	SE	24	
28	NE	ENE	ENE	E	ENE	E	ESE	S	SSW	NNW	NW	NW	N	NNE	N	NNE	NNE	NE	NE	ENE	NE	NE	NE	NE	NE	24	

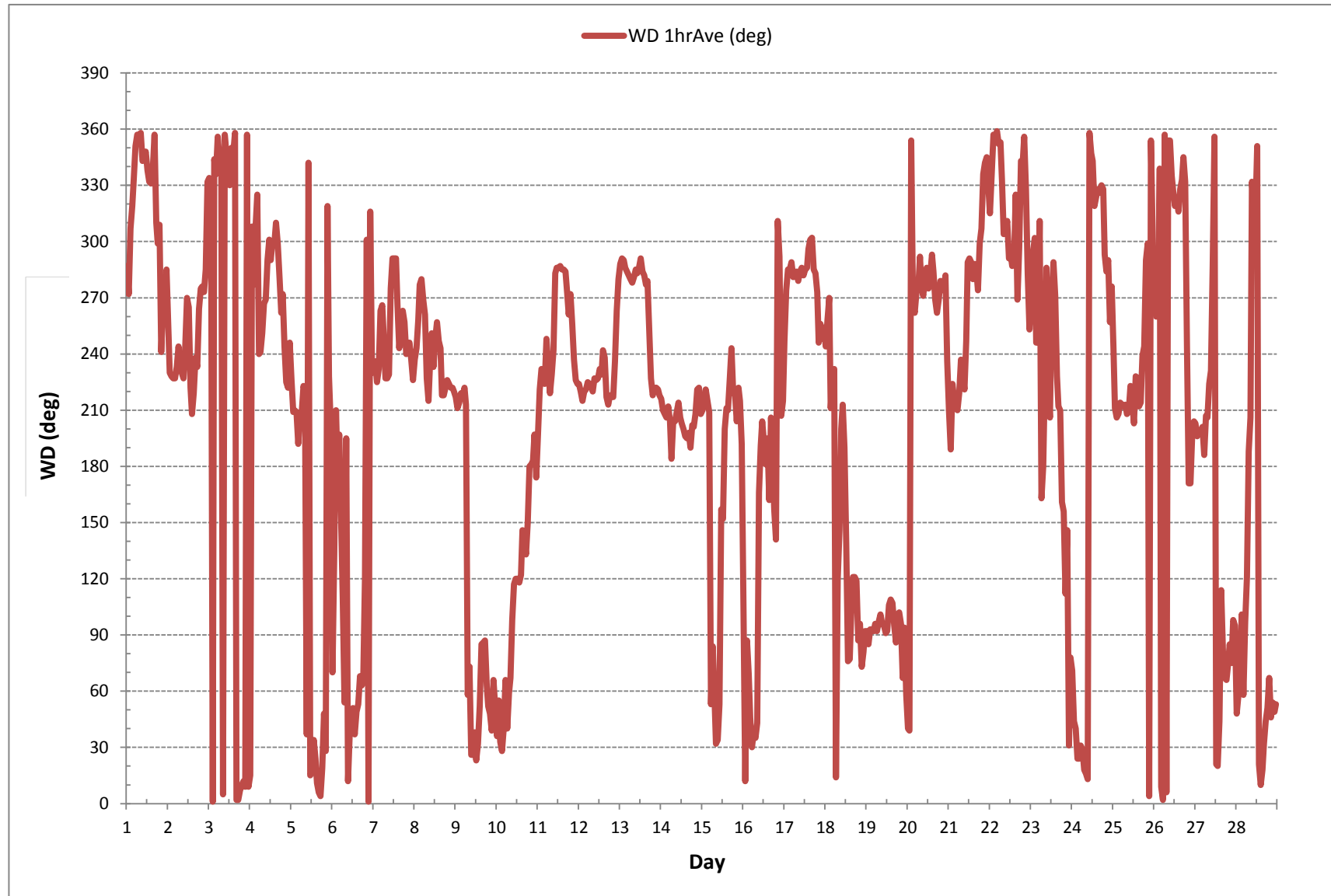
STATUS FLAG CODES

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:	672 hrs
STANDARD DEVIATION:	98	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	18.1 (NNE)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - February 2017

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	29	29	31	37	37	33	30	27	28	35	37	37	39	38	40	37	32	27	26	28	24	26	26	30	24	
2	28	25	24	17	19	24	26	23	21	25	29	34	40	28	19	25	29	24	30	30	30	30	30	41	24	
3	42	37	34	53	40	33	35	39	26	34	40	38	35	37	38	32	25	25	22	23	19	19	23	21	24	
4	22	64	35	35	52	28	27	31	36	36	31	36	30	32	35	39	35	28	33	34	37	30	22	34	24	
5	25	20	12	13	44	14	16	38	50	23	50	24	24	20	18	25	23	21	23	25	25	55	55	20	24	
6	61	54	34	47	51	55	69	35	43	18	20	40	64	25	30	27	32	22	34	39	37	29	53	22	24	
7	23	58	29	41	36	31	30	24	24	26	34	30	28	29	36	35	38	35	32	29	34	31	22	21	24	
8	26	27	29	31	27	33	28	20	16	32	38	30	33	37	36	36	22	21	24	25	24	22	22	25	24	
9	23	15	22	34	37	34	38	51	42	41	28	21	41	25	24	31	28	32	31	22	24	19	26	19	24	
10	16	24	56	28	18	27	18	21	22	33	37	44	37	30	32	32	32	27	24	25	23	22	20	23	24	
11	22	27	35	32	27	34	26	17	24	32	28	28	29	27	28	31	28	31	32	31	36	29	26	23	24	
12	22	19	19	23	23	26	25	23	22	26	25	28	32	31	36	33	22	17	20	18	20	29	34	32	24	
13	28	24	26	23	23	26	27	26	23	25	27	28	27	31	32	36	28	23	17	16	15	16	14	15	24	
14	15	13	14	16	14	47	57	13	16	18	21	19	21	16	16	19	24	18	22	17	19	26	39	23	24	
15	20	36	39	65	72	52	48	34	55	62	45	43	29	21	22	18	31	25	18	21	14	26	20	57	24	
16	33	47	37	42	23	21	18	18	54	34	24	23	36	34	26	47	64	57	68	62	67	47	36	74	24	
17	28	32	26	23	26	25	26	26	25	26	25	30	27	26	29	33	32	29	30	29	28	24	25	27	24	
18	26	30	39	51	19	63	46	37	18	34	24	60	58	38	24	31	30	24	24	26	25	25	28	28	24	
19	28	28	28	29	29	28	29	29	27	26	27	25	28	30	27	28	29	29	27	32	30	25	30	28	24	
20	21	31	41	30	35	34	31	33	33	35	35	33	31	33	27	30	35	37	33	29	31	31	37	46	24	
21	63	42	30	18	15	19	28	33	22	24	36	33	28	32	39	41	30	29	32	34	37	35	36	41	24	
22	36	39	31	32	29	27	27	40	29	37	42	36	31	25	28	36	37	38	38	37	28	47	41	32	24	
23	36	32	26	31	30	58	42	32	27	61	35	22	38	36	29	35	21	16	12	47	49	43	44	45	24	
24	31	34	30	23	17	11	12	21	18	22	29	35	37	36	40	39	36	40	39	33	32	51	56	34	24	
25	33	26	10	12	15	16	21	16	16	19	27	25	24	33	35	25	22	31	37	21	27	27	30	34	24	
26	34	30	30	31	23	25	28	25	33	32	36	38	37	38	43	37	40	38	48	44	20	10	11	17	24	
27	13	15	15	17	15	55	39	26	39	30	32	33	26	35	27	32	30	23	21	23	24	26	28	42	24	
28	35	28	46	69	47	62	68	76	66	45	46	56	45	22	40	25	22	22	21	24	18	18	20	21	24	

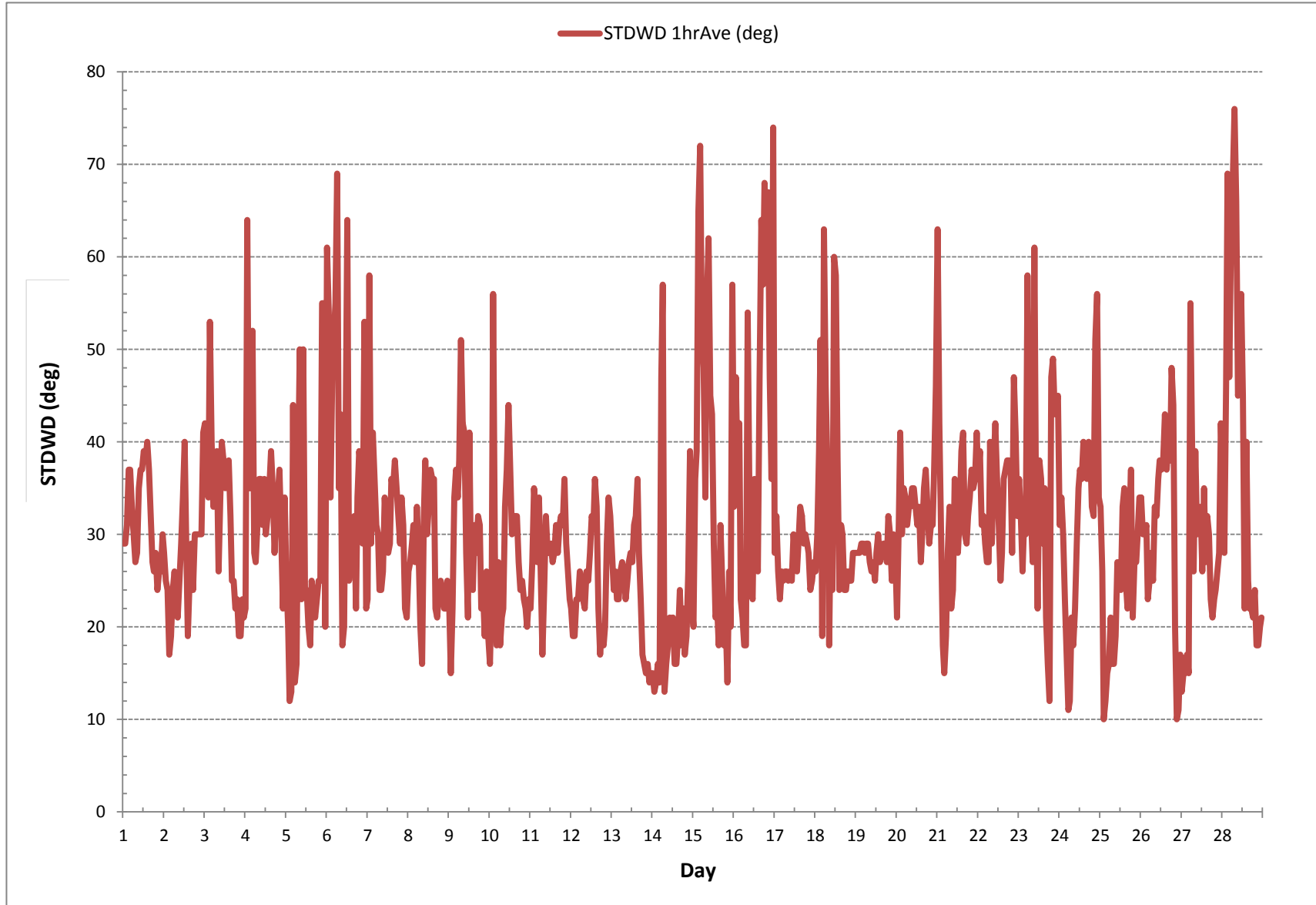
STATUS FLAG CODES

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

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 672 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



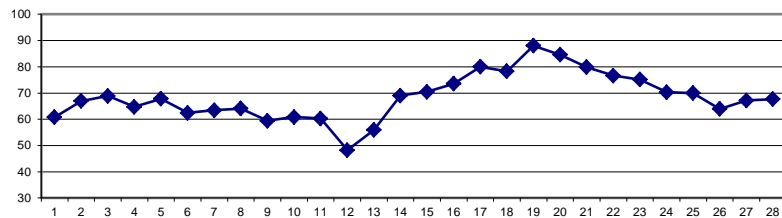
RELATIVE HUMIDITY Hourly Averages (RH %)

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	76	76	76	74	73	69	66	65	66	64	58	49	43	39	37	37	42	50	57	63	66	68	71	74	37	76	61	24
2	73	72	72	73	74	78	78	77	76	76	70	58	52	50	54	57	60	64	64	64	65	65	65	70	50	78	67	24
3	74	74	75	75	73	70	71	69	67	67	65	64	62	61	61	61	65	68	67	70	73	74	74	73	61	75	69	24
4	73	74	73	73	73	75	73	71	71	70	66	57	53	50	50	52	56	59	61	60	62	65	67	70	50	75	65	24
5	73	74	74	74	72	72	72	70	70	71	69	64	63	59	60	61	61	62	67	70	69	68	67	66	59	74	68	24
6	65	64	63	63	62	62	62	61	62	64	65	65	57	55	55	55	57	60	61	65	68	68	69	70	55	70	62	24
7	70	70	69	68	68	68	67	66	66	68	63	59	56	52	49	50	57	61	64	66	66	67	66	67	49	70	63	24
8	68	69	70	69	71	72	71	71	70	71	66	62	56	50	48	48	55	58	62	64	66	66	67	68	48	72	64	24
9	71	70	66	65	66	68	68	67	68	65	60	56	51	51	50	47	47	51	54	55	56	57	58	59	47	71	59	24
10	62	63	68	68	64	62	61	61	61	56	47	42	43	47	52	57	62	62	65	72	72	70	71	72	42	72	61	24
11	72	73	75	78	80	80	81	80	80	72	60	51	45	42	40	38	40	44	50	51	52	53	53	56	38	81	60	24
12	59	62	61	58	58	58	56	55	53	47	44	38	37	35	31	33	38	45	49	51	53	51	43	43	31	62	48	24
13	46	51	54	58	61	63	64	67	68	60	53	46	37	32	31	33	45	56	63	66	69	70	72	76	31	76	56	24
14	79	81	82	82	82	83	87	87	83	74	64	55	51	49	50	49	50	56	56	60	63	71	80	82	49	87	69	24
15	81	79	84	85	86	86	87	86	83	77	72	58	50	52	50	49	51	59	60	65	65	71	74	81	49	87	70	24
16	83	83	84	84	84	83	82	83	84	73	62	61	59	58	56	57	61	67	73	75	75	75	79	84	56	84	74	24
17	83	79	75	76	78	81	84	87	86	81	75	72	74	77	78	75	75	74	76	81	86	89	89	89	72	89	80	24
18	89	90	90	90	90	90	89	89	89	87	80	69	57	59	64	62	64	70	73	74	77	78	79	79	57	90	78	24
19	79	81	82	85	88	89	89	89	90	89	89	89	89	89	88	89	89	90	90	90	90	90	90	90	79	90	88	24
20	90	90	90	90	90	90	90	90	89	87	87	82	78	76	76	77	80	82	82	81	82	83	83	84	76	90	85	24
21	85	85	83	83	82	82	84	84	83	81	76	73	73	70	73	77	78	81	82	80	80	81	80	80	70	85	80	24
22	79	79	80	81	82	83	83	81	78	74	72	63	64	68	67	71	73	79	81	78	79	80	82	82	63	83	77	24
23	82	81	80	80	79	78	77	77	78	77	70	66	61	57	59	63	72	77	82	82	81	81	81	81	57	82	75	24
24	81	82	81	81	81	78	75	74	72	67	62	61	60	60	60	61	66	67	70	70	73	73	73	60	82	70	24	
25	72	76	78	77	76	75	75	75	75	74	68	65	58	53	52	56	60	68	77	79	75	73	71	71	52	79	70	24
26	74	76	79	76	71	66	65	65	61	58	57	54	51	47	47	50	54	61	67	70	72	75	72	67	47	79	64	24
27	67	68	68	68	71	72	72	72	70	65	56	52	54	56	60	60	65	71	71	71	72	75	78	78	52	78	67	24
28	76	75	74	74	73	74	73	73	74	71	58	55	56	63	59	59	60	64	69	69	67	69	69	70	55	76	68	24
HOURLY MAX	90	90	90	90	90	90	90	90	90	89	89	89	89	88	89	89	89	90	90	90	90	90	90	90				
HOURLY AVG	74	75	75	75	75	75	75	75	74	71	66	60	57	56	56	57	60	64	68	69	70	72	72	73				

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

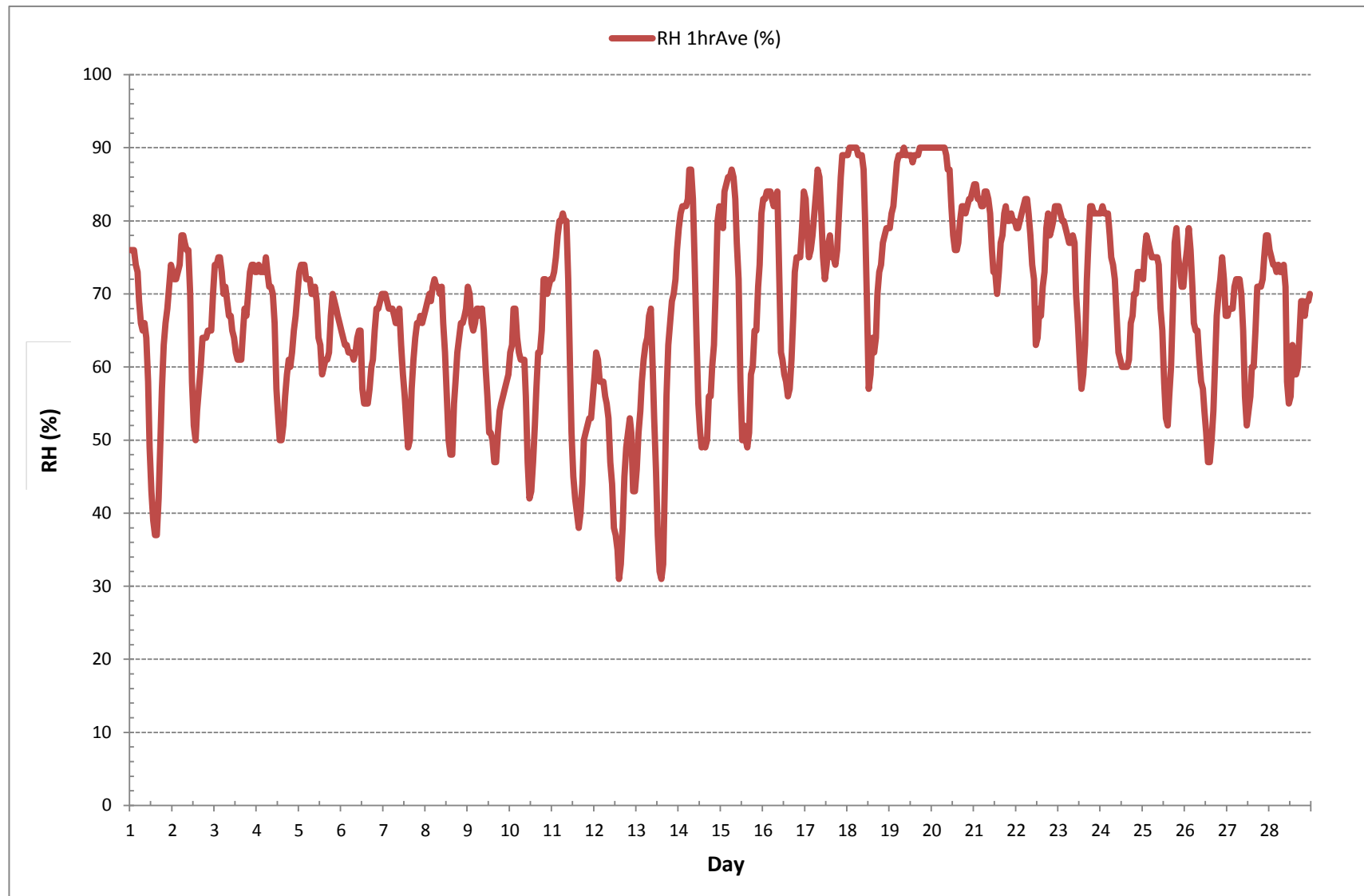
24 HR AVERAGES February 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	31	%	@ HOUR(S)	14 , 14	ON DAY(S)	12 , 13
MAXIMUM 1-HR AVERAGE:	90	%	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 24-HR AVERAGE:	88	%			ON DAY(S)	19
					VAR-VARIOUS	
OPERATIONAL TIME:					672	hrs
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	12				MONTHLY AVERAGE:	69 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



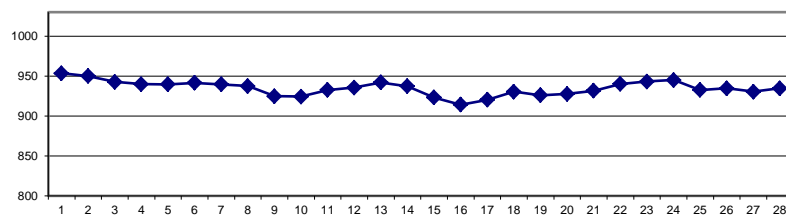
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	950	949	950	950	950	951	952	952	953	954	955	955	955	956	956	956	956	956	956	956	956	956	955	955	949	956	954	24				
2	955	954	954	953	953	953	952	952	951	951	951	951	951	950	949	949	948	948	948	947	947	947	946	946	946	946	955	950	24			
3	946	945	945	945	944	944	943	943	943	943	943	943	942	942	941	942	941	941	941	942	942	942	942	942	942	941	946	943	24			
4	942	942	942	942	941	941	941	940	940	940	940	940	940	939	939	939	939	939	939	939	939	939	939	939	939	939	942	940	24			
5	939	939	939	939	939	939	939	939	939	939	939	939	938	939	939	939	940	940	941	941	941	942	942	942	942	938	942	940	24			
6	943	943	943	943	943	943	943	942	942	942	941	941	941	940	940	940	940	941	941	942	941	941	941	942	941	940	943	942	24			
7	942	942	942	943	943	942	942	942	942	941	940	940	939	938	938	938	937	938	938	938	938	938	938	938	938	937	943	940	24			
8	938	939	939	939	939	940	940	940	939	939	939	939	939	938	938	938	937	937	936	936	935	935	934	933	933	940	938	24				
9	933	932	932	931	931	930	929	928	927	927	926	925	924	923	922	921	921	921	920	919	919	920	920	920	919	933	925	24				
10	920	921	921	922	923	924	924	925	925	925	926	926	926	926	925	925	925	926	926	926	925	925	925	925	920	926	924	24				
11	925	925	926	927	927	928	928	929	930	931	932	933	934	934	935	936	937	937	938	938	939	939	939	939	925	939	933	24				
12	939	939	939	938	938	937	937	936	936	936	936	936	936	936	935	935	935	934	934	934	933	934	934	935	933	939	936	24				
13	936	937	938	939	939	940	941	942	942	943	944	944	944	945	945	944	944	944	944	943	943	943	942	942	936	945	942	24				
14	942	941	941	941	941	941	941	941	940	940	940	940	939	939	938	937	936	934	933	932	931	930	930	929	929	942	937	24				
15	928	928	928	927	926	926	925	924	923	923	922	922	921	921	920	921	922	922	922	922	921	921	921	921	920	928	923	24				
16	921	920	919	918	918	917	916	915	914	914	914	914	914	913	913	912	912	912	912	912	911	911	911	911	910	921	914	24				
17	912	913	914	914	915	916	917	918	919	919	920	921	921	922	922	923	924	925	925	926	926	926	926	927	912	927	920	24				
18	928	928	929	929	929	930	930	930	931	931	932	932	932	932	931	932	931	931	931	931	931	931	930	930	928	932	931	24				
19	930	929	929	928	927	927	926	926	926	925	925	925	925	925	925	925	925	925	926	926	926	926	926	926	925	930	926	24				
20	926	926	926	926	926	926	926	927	927	928	928	928	928	928	928	928	929	929	929	929	929	930	930	930	926	930	928	24				
21	930	930	930	930	930	930	930	930	930	931	931	932	932	932	932	932	933	933	933	934	934	934	935	935	930	935	932	24				
22	936	937	937	938	938	939	939	940	940	940	941	941	941	941	941	941	941	941	942	942	943	943	943	943	936	943	940	24				
23	943	943	943	943	943	944	944	943	944	944	944	944	944	944	943	943	943	943	943	943	943	942	943	943	942	944	943	24				
24	943	943	943	943	944	944	945	946	946	947	947	947	947	947	947	946	946	946	946	946	945	944	944	943	943	947	945	24				
25	942	941	940	939	939	937	936	935	934	933	932	931	930	930	929	928	928	928	928	928	929	930	930	930	928	942	933	24				
26	930	931	931	931	933	934	935	936	937	937	937	937	937	937	937	936	936	936	935	935	935	934	934	933	930	937	935	24				
27	932	932	931	931	930	929	929	929	929	929	929	930	930	930	930	931	931	931	931	931	932	932	932	932	929	932	931	24				
28	932	932	932	932	932	932	932	932	933	933	934	935	935	935	936	936	936	937	937	937	938	938	938	939	932	939	935	24				
HOURLY MAX	955	954	954	953	953	953	952	952	953	954	955	955	955	956	956	956	956	956	956	956	956	956	955	955								
HOURLY AVG	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935								

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

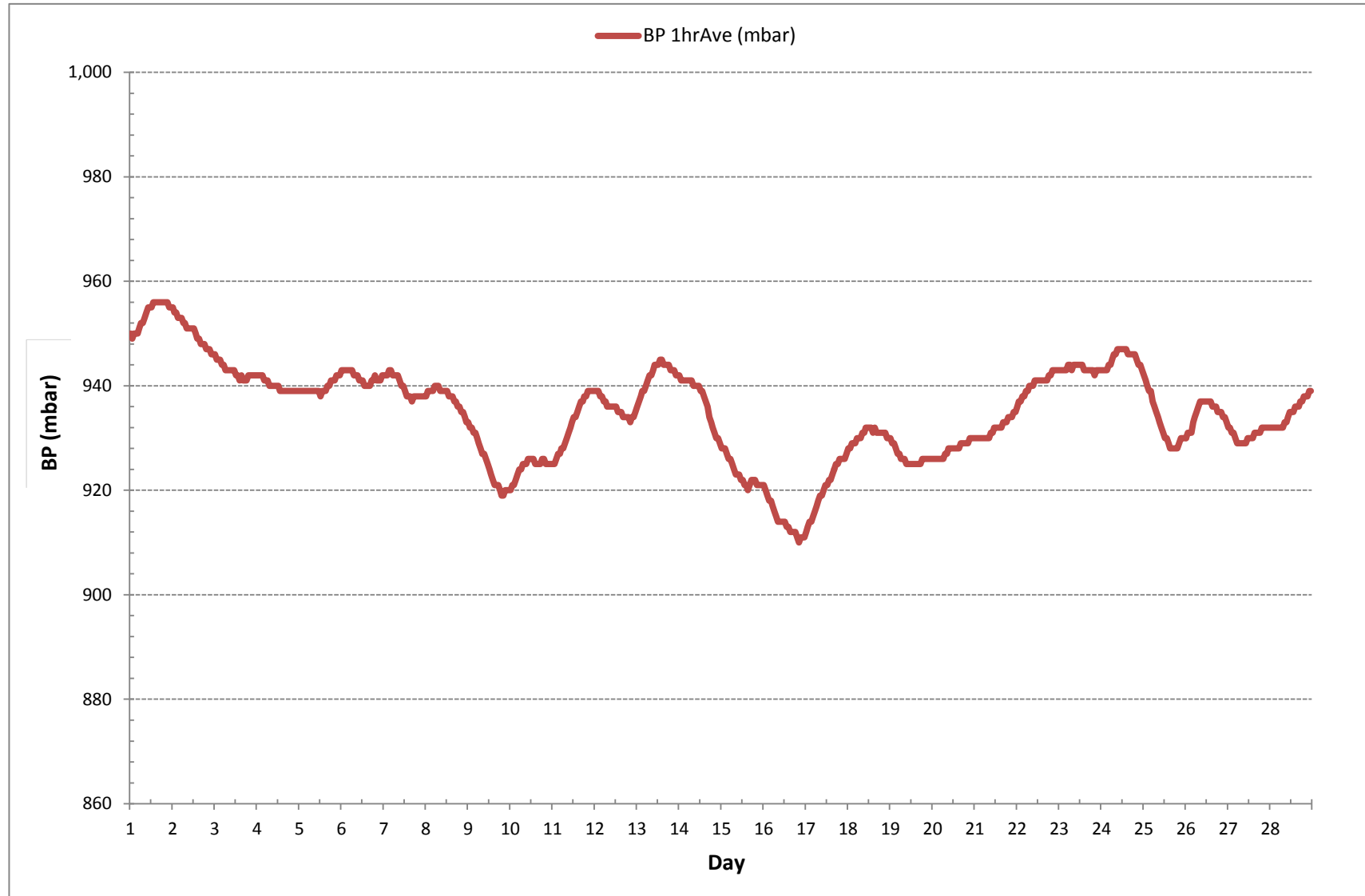
24 HR AVERAGES February 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	910	mbar	@ HOUR(S)	20	ON DAY(S)	16
MAXIMUM 1-HR AVERAGE:	956	mbar	@ HOUR(S)	VAR	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	954	mbar			ON DAY(S)	1
					VAR-VARIOUS	
OPERATIONAL TIME:					672	hrs
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	9				MONTHLY AVERAGE:	935 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



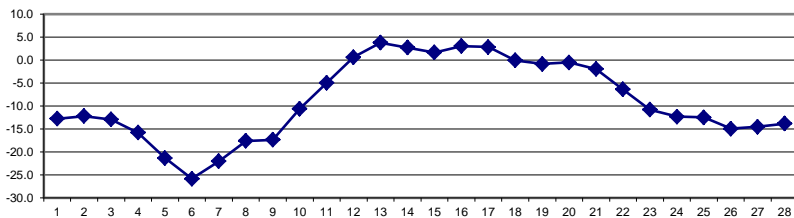
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-13.9	-13.8	-12.4	-11.7	-11.2	-11.2	-11.4	-11.9	-12.6	-12.2	-11.1	-10.2	-9.0	-8.3	-7.9	-8.6	-11.1	-14.0	-15.1	-16.3	-17.2	-17.8	-18.4	-18.8	-18.8	-18.8	-7.9	-12.8	24
2	-16.8	-15.1	-13.8	-14.0	-14.8	-16.2	-16.6	-17.0	-17.3	-15.4	-11.6	-8.3	-6.7	-6.4	-7.6	-8.6	-9.8	-11.1	-10.9	-10.6	-10.6	-10.7	-10.8	-11.2	-17.3	-6.4	-12.2	24	
3	-11.6	-11.7	-11.9	-12.1	-12.1	-12.2	-12.4	-12.6	-12.7	-12.3	-11.5	-11.0	-10.8	-10.7	-10.8	-11.6	-13.1	-13.4	-13.5	-15.6	-16.5	-16.6	-16.3	-16.3	-16.6	-10.7	-12.9	24	
4	-16.7	-16.8	-16.1	-16.0	-17.3	-17.9	-17.3	-16.9	-16.6	-15.5	-14.3	-14.1	-13.4	-13.3	-13.5	-14.0	-14.7	-15.3	-16.0	-15.9	-16.2	-16.6	-16.9	-16.8	-17.9	-13.3	-15.8	24	
5	-17.5	-18.3	-19.7	-20.8	-21.7	-22.1	-22.7	-23.8	-24.1	-21.2	-17.2	-15.7	-16.6	-16.1	-16.7	-17.4	-18.5	-20.0	-23.3	-25.5	-26.4	-27.7	-28.4	-29.3	-29.3	-15.7	-21.3	24	
6	-30.3	-31.1	-32.0	-32.4	-33.0	-33.1	-33.4	-33.6	-31.9	-28.5	-25.3	-21.9	-19.3	-20.4	-20.3	-20.1	-20.5	-21.3	-21.7	-21.9	-21.6	-22.0	-22.4	-33.6	-19.3	-25.8	24		
7	-22.5	-23.9	-25.0	-27.1	-27.4	-27.0	-27.8	-28.8	-28.8	-23.8	-19.3	-18.0	-17.6	-16.0	-14.9	-15.6	-18.0	-19.6	-20.5	-21.0	-21.2	-21.4	-21.1	-21.6	-28.8	-14.9	-22.0	24	
8	-21.2	-21.0	-20.8	-20.5	-21.4	-22.2	-22.8	-23.4	-23.6	-20.2	-17.5	-15.3	-12.3	-10.1	-9.7	-9.7	-12.2	-13.7	-14.9	-15.7	-16.9	-17.8	-18.8	-19.6	-23.6	-9.7	-17.6	24	
9	-21.3	-21.2	-21.1	-21.5	-22.7	-23.7	-23.2	-23.5	-23.1	-21.2	-18.5	-16.6	-14.5	-14.3	-14.1	-12.6	-12.7	-12.8	-13.0	-13.4	-13.3	-12.9	-12.6	-12.2	-23.7	-12.2	-17.3	24	
10	-12.8	-13.2	-15.0	-14.3	-13.5	-13.3	-13.3	-13.6	-13.7	-12.2	-9.2	-7.0	-6.0	-6.5	-6.8	-7.7	-8.4	-8.5	-8.6	-9.0	-9.4	-10.1	-10.6	-10.8	-15.0	-6.0	-10.6	24	
11	-10.5	-10.5	-10.3	-10.0	-10.0	-10.1	-10.8	-11.2	-11.0	-7.2	-2.9	-0.9	0.4	1.2	1.6	1.7	-0.1	-1.4	-2.9	-2.2	-2.3	-3.0	-3.8	-11.2	1.7	-5.0	24		
12	-4.4	-5.1	-5.2	-4.6	-4.4	-4.6	-4.1	-3.7	-2.9	-0.3	1.4	4.6	5.4	6.8	7.8	7.5	5.6	3.2	2.2	1.4	0.1	0.4	3.6	4.8	-5.2	7.8	0.6	24	
13	4.6	4.2	3.9	3.0	2.3	1.8	1.6	0.8	0.7	3.3	5.5	6.9	8.5	9.6	9.8	9.3	6.7	3.8	2.0	1.6	0.8	0.8	0.3	-0.3	-0.3	9.8	3.8	24	
14	-0.9	-0.8	-1.3	-1.5	-1.2	-2.2	-3.9	-2.6	-1.3	1.1	4.3	7.7	8.6	9.3	9.0	9.5	9.1	6.9	6.5	5.2	4.3	1.7	-0.6	-0.9	-3.9	9.5	2.8	24	
15	-0.6	-0.3	-1.6	-2.7	-3.4	-4.0	-4.3	-4.0	-3.4	-1.1	1.5	5.0	6.5	6.2	7.3	8.0	7.5	5.3	5.0	3.8	4.5	2.8	2.0	-0.2	-4.3	8.0	1.7	24	
16	-0.8	-1.4	-1.8	-1.9	-1.8	-1.8	-1.2	-1.1	-0.9	3.5	6.9	7.4	8.1	8.6	9.3	8.8	7.8	5.8	4.2	3.8	4.2	3.9	2.5	1.2	-1.9	9.3	3.1	24	
17	1.5	2.5	3.4	3.5	2.8	2.2	2.9	2.9	3.0	4.2	5.8	6.2	5.5	4.8	4.7	4.3	4.2	3.7	3.0	1.7	0.0	-0.9	-1.3	-1.6	-1.6	6.2	2.9	24	
18	-1.9	-2.2	-2.1	-2.9	-3.0	-3.0	-2.4	-2.8	-2.5	-1.1	0.7	3.5	5.6	4.9	3.2	3.3	2.5	1.1	0.5	0.1	-0.4	-0.7	-0.9	-1.0	-3.0	5.6	-0.1	24	
19	-1.1	-1.2	-1.3	-1.6	-1.7	-1.5	-1.5	-1.5	-1.4	-1.3	-1.2	-1.3	-0.7	0.5	0.0	0.0	-0.4	-0.7	-0.6	-0.3	-0.2	-0.1	-0.1	-0.2	-1.7	0.5	-0.8	24	
20	-0.4	-0.4	-0.3	-0.7	-0.5	-0.3	-0.4	-0.5	-0.4	1.0	1.2	1.5	1.4	1.5	0.9	0.5	0.0	-0.8	-1.3	-2.2	-2.7	-2.9	-3.0	-3.2	-3.2	1.5	-0.5	24	
21	-3.3	-3.2	-2.9	-2.8	-2.6	-2.6	-2.8	-2.8	-2.3	-1.3	0.1	0.7	0.8	2.0	1.4	0.0	-0.9	-1.8	-2.2	-2.8	-3.6	-4.0	-4.7	-4.9	-4.9	2.0	-1.9	24	
22	-4.9	-5.0	-5.4	-6.2	-6.6	-7.0	-7.2	-7.3	-6.9	-6.0	-5.3	-3.7	-3.3	-3.9	-3.8	-4.5	-4.9	-5.6	-6.5	-7.3	-8.1	-10.1	-10.8	-12.1	-12.1	-3.3	-6.4	24	
23	-13.3	-13.8	-12.8	-14.1	-14.5	-16.3	-17.2	-17.0	-14.2	-10.1	-8.7	-8.2	-6.7	-5.0	-5.3	-5.6	-7.0	-8.3	-10.3	-10.0	-10.3	-10.2	-10.1	-10.0	-17.2	-5.0	-10.8	24	
24	-10.4	-12.0	-12.8	-12.9	-12.2	-11.9	-12.5	-13.4	-13.7	-12.8	-11.3	-10.9	-10.5	-10.0	-10.4	-11.0	-11.3	-12.7	-13.3	-13.5	-13.9	-14.3	-14.0	-13.6	-14.3	-10.0	-12.3	24	
25	-13.6	-15.4	-17.1	-17.7	-18.9	-19.8	-20.0	-19.6	-17.8	-15.0	-11.2	-9.5	-7.4	-5.6	-5.1	-6.1	-7.1	-9.2	-12.6	-11.8	-10.3	-9.3	-9.4	-9.7	-20.0	-5.1	-12.5	24	
26	-10.0	-9.9	-9.8	-9.5	-12.7	-14.9	-16.9	-18.6	-18.7	-17.7	-17.3	-15.8	-14.5	-12.2	-11.6	-12.4	-13.6	-14.8	-16.6	-17.8	-18.5	-19.0	-17.9	-17.2	-19.0	-9.5	-14.9	24	
27	-18.1	-19.0	-19.3	-19.1	-19.9	-19.7	-19.1	-18.8	-17.9	-15.0	-10.3	-7.7	-7.7	-7.8	-8.0	-7.6	-10.2	-12.4	-13.3	-13.6	-13.9	-15.2	-16.3	-18.0	-19.9	-7.6	-14.5	24	
28	-19.8	-20.3	-19.8	-20.6	-19.7	-18.9	-19.7	-20.2	-16.8	-13.3	-7.6	-5.3	-4.9	-6.6	-5.6	-6.5	-7.6	-8.7	-10.1	-12.0	-14.4	-16.6	-17.8	-18.9	-20.6	-4.9	-13.8	24	
HOURLY MAX	4.6	4.2	3.9	3.5	2.8	2.2	2.9	2.9	3.0	4.2	6.9	7.7	8.6	9.6	9.8	9.5	9.1	6.9	6.5	5.2	4.5	3.9	3.6	4.8					
HOURLY AVG	-10.4	-10.7	-10.9	-11.2	-11.5	-11.9	-12.2	-12.4	-11.9	-9.7	-7.3	-5.6	-4.7	-4.2	-4.2	-4.5	-5.7	-7.0	-8.0	-8.6	-9.1	-9.6	-9.9	-10.3					

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

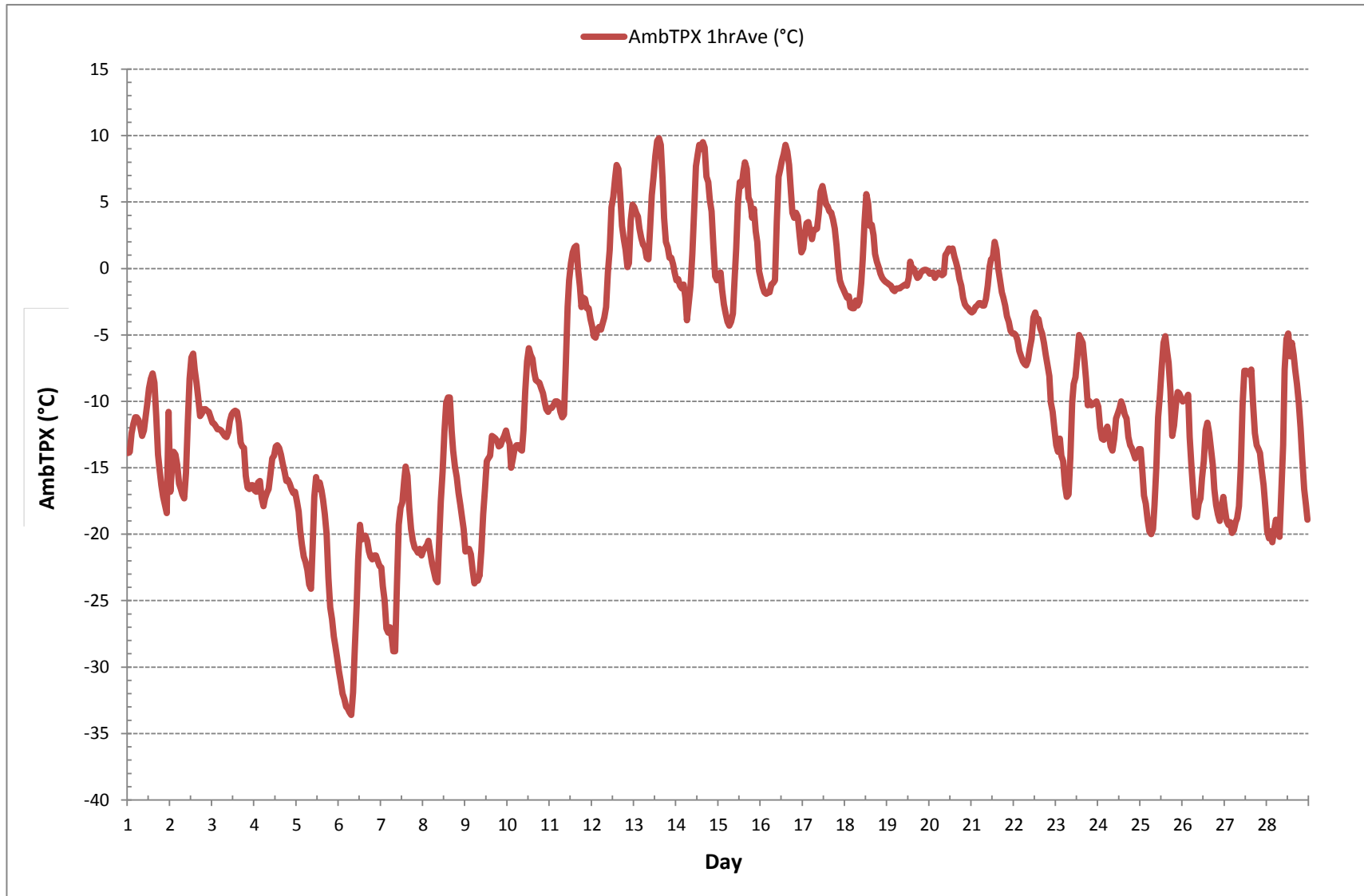
24 HR AVERAGES February 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-33.6 °C	@ HOUR(S)	7	ON DAY(S)	6
MAXIMUM 1-HR AVERAGE:	9.8 °C	@ HOUR(S)	14	ON DAY(S)	13
MAXIMUM 24-HR AVERAGE:	3.8 °C			ON DAY(S)	13
				VAR-VARIOUS	
OPERATIONAL TIME:				672	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	9.2			MONTHLY AVERAGE:	-8.8 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



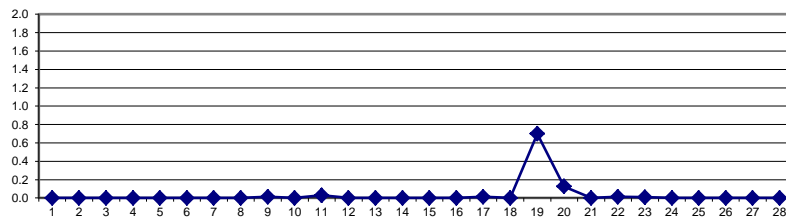
PRECIPITATION Hourly Averages (mm)

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	0.0	0.0	0.0	0.0	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	0.0	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	0.0	0.0	0.0	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	0.0	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	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	0.3	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.1	0.3	0.0	0.0	0.0	0.0	0.0	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	0.3	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	24
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	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	0.2	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	0.4	0.8	1.3	1.7	1.8	1.6	1.2	0.8	1.6	2.1	3.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.0	3.0	0.7	24
20	0.0	0.5	1.0	0.7	0.5	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	0.0	0.0	0.0	0.0	1.0	0.1	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	0.1	0.1	0.1	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	0.1	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
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	0.0	0.0	0.0	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	0.0	0.0	0.0	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	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	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	0.5	1.0	0.7	0.8	1.3	1.7	1.8	1.6	1.2	0.8	1.6	2.1	3.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2				
HOURLY AVG	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	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				

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

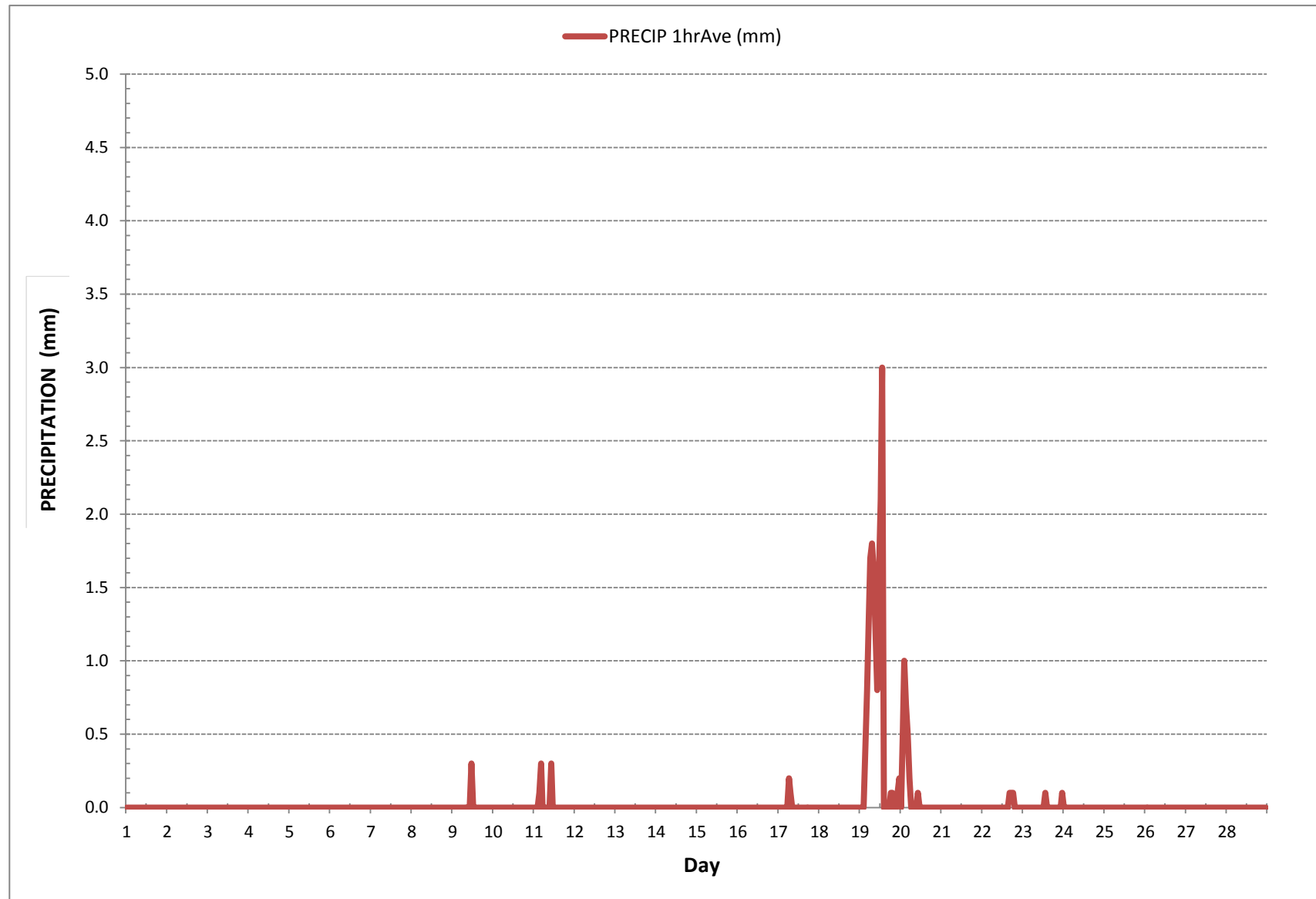
24 HR AVERAGES February 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0 mm	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	3.0 mm	@ HOUR(S)	13	ON DAY(S)	19
MAXIMUM 24-HR AVERAGE:	0.7 mm			ON DAY(S)	19
MONTHLY TOTAL	21.6 mm			VAR-VARIOUS	
STANDARD DEVIATION:	0.2				
OPERATIONAL TIME:				672 hrs	
AMD OPERATION UPTIME:				100.0 %	
MONTHLY AVERAGE:	0.0 mm				

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: February 14, 2017	Barometric Pressure: 0.925 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: shut down
Start Time 24 hr. (mst): 10:56	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 14:52	Cal Gas Expiry Date: July 18, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer: ID# or Serial Number: 508	Range ppb: 1000
Last Calibration Date: January 12, 2017	As Found C.F.: 0.990
Previous C.F.: 1.000	New C.F.: n/a

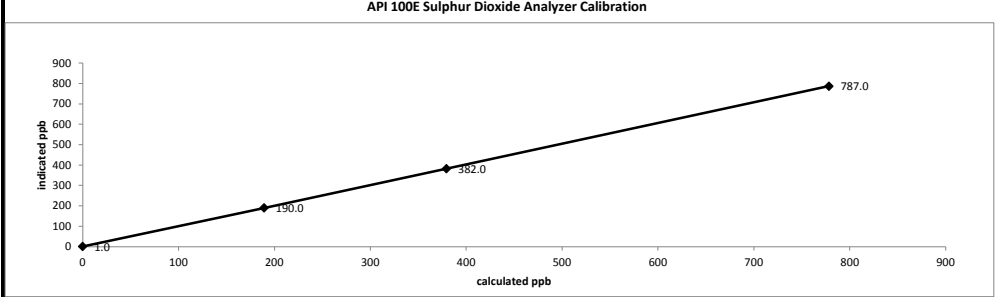
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.6	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
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	1.0	n/a
as found high	4923	76.90	5000	778.2	787.0	0.990
mid	4964	37.50	5002	379.4	382.0	0.996
low	4982	18.70	5001	189.2	190.0	1.001
Average C.F. =						0.996

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 0.989	0.90-1.10
b (Intercept as % of full scale) = 0.03%	± 3% F.S.
% change in C.F. from last cal = 0.99%	± 10%



As found:	As left:
SLOPE: 0.995	SLOPE: n/a
OFFSET: 122.2	OFFSET: n/a
HVPS: 479	HVPS: n/a
RCELL TEMP: 50.0	RCELL TEMP: n/a
BOX TEMP: 31.3	BOX TEMP: n/a
PMT TEMP: 7.7	PMT TEMP: n/a
IZS TEMP: 45.0	IZS TEMP: n/a
PRES: 24.6	PRES: n/a
SAMP FL: 619	SAMP FL: n/a
NORM PMT: 129.4	NORM PMT: n/a
UV LAMP: 2785.7	UV LAMP: n/a
LAMP RATIO: 93.7	LAMP RATIO: n/a
STR. LGT: 60.8	STR. LGT: n/a
DRK PMT: 10.3	DRK PMT: n/a
DRK LMP: -0.4	DRK LMP: n/a
Expected Value: 356.2	Expected Value: n/a

Comments:

Shutdown calibration completed to test the ZS system for leaks.



API 100E Sulphur Dioxide Analyzer Calibration

Date: February 14, 2017	Barometric Pressure: 0.925 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: post repair
Start Time 24 hr. (mst): 17:09	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 20:07	Cal Gas Expiry Date: July 18, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
ID# or Serial Number: 508	Range ppb: 1000
Last Calibration Date: n/a	As Found C.F.: n/a
Previous C.F.: n/a	New C.F.: 1.000

Calibrator:	Flow Meter ID's: n/a	Standard Calibration Points for Ranges
	Make & Model: API 700	
	Serial #: 627	
	Cal Gas Cylinder I.D. #: LL104222	
	Cal Gas Conc. (ppm): 50.6	

Point	ppb
High	780
Mid	380
Low	190

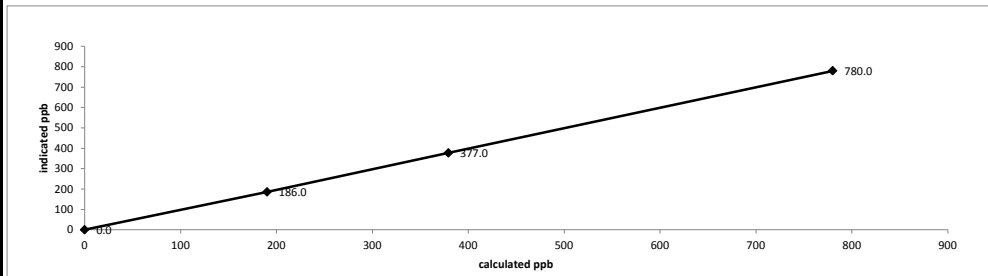
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	77.10	5001	780.1	780.0	1.000
mid	4965	37.50	5003	379.3	377.0	1.006
low	4980	18.80	4999	190.3	186.0	1.023
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F. =						1.010

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.998		.95-1.05
b (Intercept as % of full scale) =	0.22%		± 3% F.S.
% change in C.F. from last cal =	n/a		± 10%

API 100E Sulphur Dioxide Analyzer Calibration

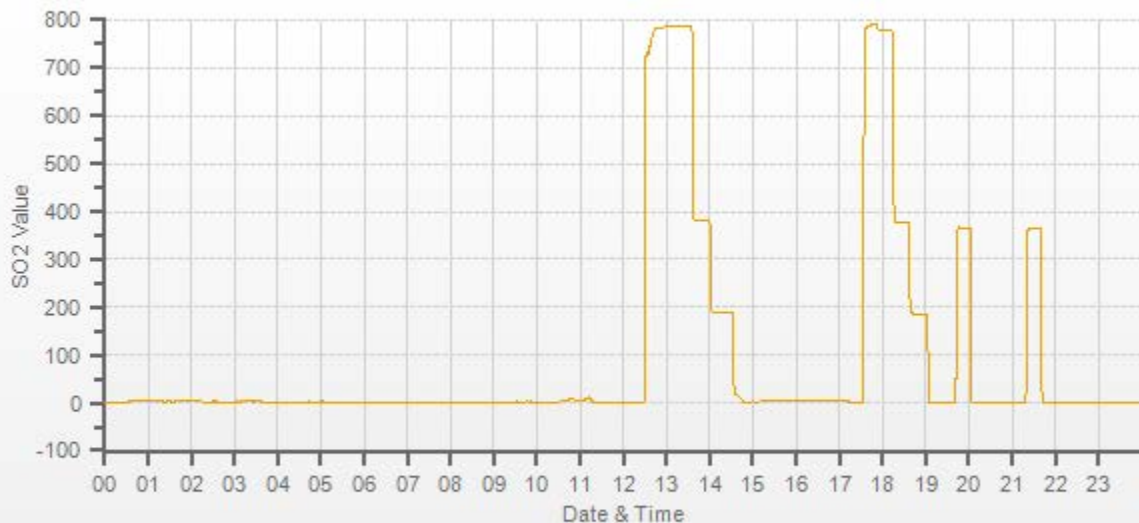


<p>As found:</p> SLOPE: n/a OFFSET: n/a HVPS: n/a RCCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a PRES: n/a SAMP FL: n/a NORM PMT: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Expected Value: n/a	<p>As left:</p> SLOPE: 0.980 OFFSET: 126.3 HVPS: 479 RCCELL TEMP: 50.0 BOX TEMP: 32.5 PMT TEMP: 7.6 IZS TEMP: 45.0 PRES: 24.4 SAMP FL: 616 NORM PMT: 126.2 UV LAMP: 2786.9 LAMP RATIO: 93.7 STR. LGT: 61.9 DRK PMT: 11.2 DRK LMP: -0.5 Expected Value: 365.0
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Comments:
The analyzer sample inlet filter was changed.

Zero-Span system was tested for leaks. No leaks found, the system kept test vacuum of -22 inHg very well.

SO2[ppb] Station: LICA MASKWA Daily: 2017/02/14 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: February 14, 2017	Barometric Pressure: 0.925 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Hydrogen Sulphide	Calibration Purpose: shut down
Start Time 24 hr. (mst): 10:56	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 13:08	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer: ID# or Serial Number: 511	Range ppb: 100
Last Calibration Date: January 18, 2017	As Found C.F.: 1.001
Previous C.F.: 1.000	New C.F.: n/a

Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: EY0000654 Cal Gas Conc. (ppm): 10.2	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
Point	ppb								
High	78								
Mid	38								
Low	19								

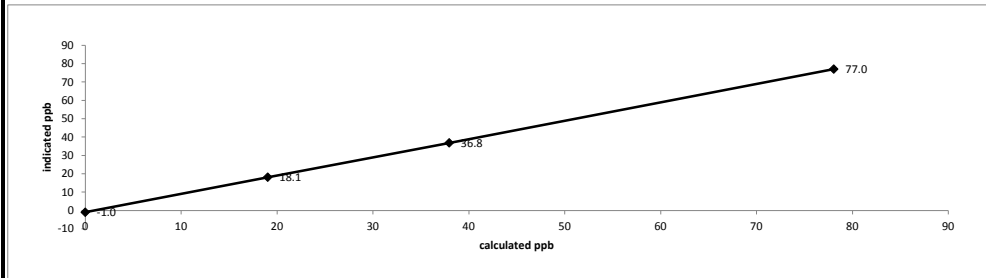
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	-1.0	n/a
as found high	7443	57.40	7500	78.1	77.0	1.001
mid	7471	27.90	7499	37.9	36.8	1.004
low	7486	14.00	7500	19.0	18.1	0.997
Average C.F. =						1.001

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 1.001	0.90-1.10
b (Intercept as % of full scale) = 1.00%	± 3% F.S.
% change in C.F. from last cal = -0.08%	± 10%

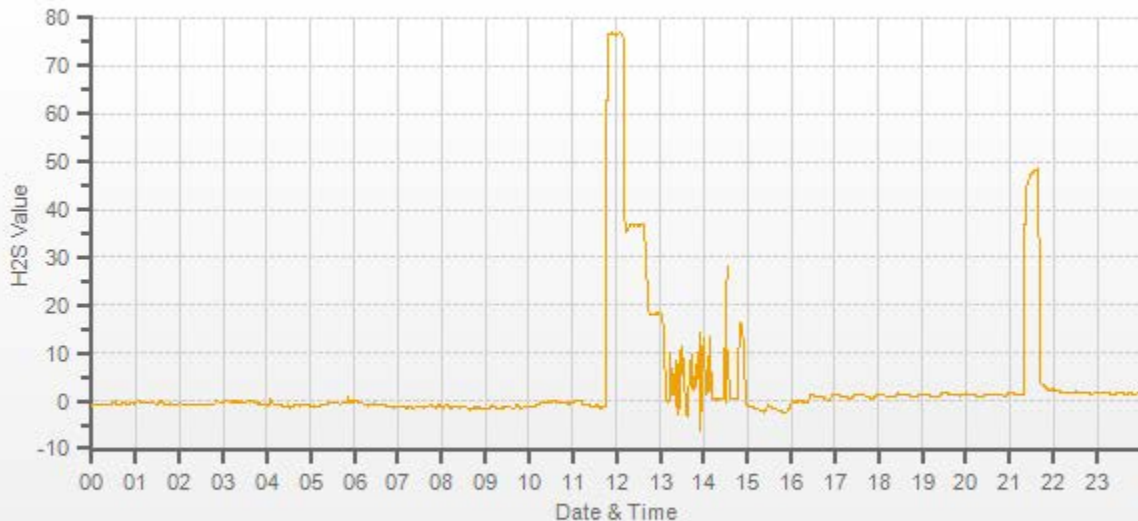
API 101E Hydrogen Sulphide Analyzer Calibration



As found: SLOPE: 0.987 OFFSET: 47.5 HVPS: 596 RCELL TEMP: 50.0 BOX TEMP: 31.7 PMT TEMP: 7.9 IZS TEMP: 50.0 Converter Temp: 315.2 PRES: 21.9 SAMP FL: 612 UV LAMP: 2559.9 LAMP RATIO: 98.8 STR. LGT: 23.4 DRK PMT: 33.2 DRK LMP: 7.2 Expected Value: 52.8	As left: SLOPE: n/a OFFSET: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a Converter Temp: n/a PRES: n/a SAMP FL: n/a UV LAMP: n/a LAMP RATIO: n/a STR. LGT: n/a DRK PMT: n/a DRK LMP: n/a Expected Value: n/a
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Comments:

Shutdown calibration completed to replace the analyzer for repair. Reason: the analyzer was found unstable during ZERO daily checks. The ZS valves require replacement/check/re-installation.



— H2S[ppb]



API 101A Hydrogen Sulphide Analyzer Calibration

Date: February 15, 2017	Barometric Pressure: 0.911 atm
Company/Airshed: LICA	Station Temperature °C: 23
Location/Station Name: Maskwa	Weather Conditions: A few clouds
Parameter: Hydrogen Sulphide	Calibration Purpose: installation
Start Time 24 hr. (mst): 9:30	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 14:38	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
ID# or Serial Number: 324	Range ppb: 100
Last Calibration Date: n/a	As Found C.F.: n/a
Previous C.F.: n/a	New C.F.: 0.999

Calibrator:	Standard Calibration Points for Ranges	SO₂ Scrubber Check (10 mins.)								
Flow Meter ID's: n/a	<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	Start/End Time 24 hr.: 10:34/10:44
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: SABIO 2010 D		Target Concentration (ppb): 780								
Serial #: 11900613		Result (ppb): 0								
Cal Gas Cylinder I.D. #: EY0000654		Zero Corrected Result (ppb): 0								
Cal Gas Conc. (ppm): 10.2										

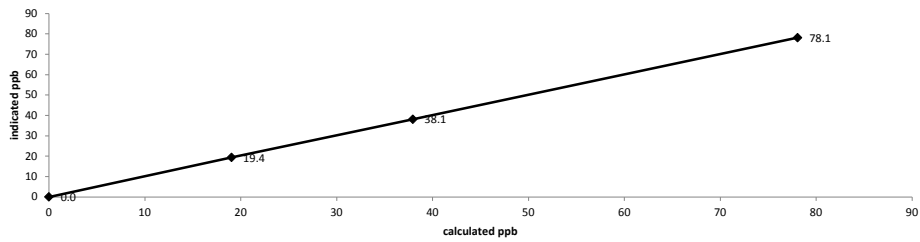
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	57.40	7500	78.1	78.1	0.999
mid	7471	27.90	7499	37.9	38.1	0.996
low	7485	14.00	7499	19.0	19.4	0.982
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F. =						0.992

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	1.001	> or = 0.995
b (Intercept as % of full scale) =	-0.17%	.95-1.05
% change in C.F. from last cal =	n/a	± 3% F.S.
		± 10%

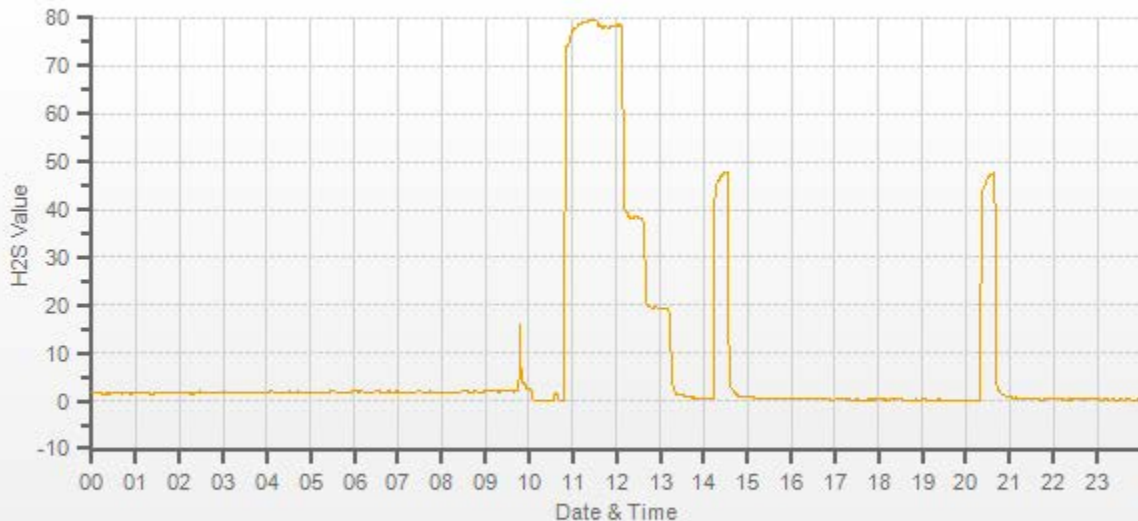
API 101A Hydrogen Sulphide Analyzer Calibration



As found:	As left:
SLOPE: n/a	SLOPE: 0.944
OFFSET: n/a	OFFSET: 25.3
HVPS: n/a	HVPS: 676
DCPS: n/a	DCPS: 2580
RCELL TEMP: n/a	RCELL TEMP: 49.9
BOX TEMP: n/a	BOX TEMP: 30.5
PMT TEMP: n/a	PMT TEMP: 6.8
IZS TEMP: n/a	IZS TEMP: 50.1
Converter Temp: n/a	Converter Temp: 324.3
PRES: n/a	PRES: 23.4
SAMP FL: n/a	SAMP FL: 555
UV LAMP: n/a	UV LAMP: 3558.3
LAMP RATIO: n/a	LAMP RATIO: 101.3
STR. LGT: n/a	STR. LGT: 12.0
DRK PMT: n/a	DRK PMT: 51.5
Expected Value: n/a	Expected Value: 47.7

Comments:
The analyzer sample inlet filter was changed.

The analyzer was installed to replace #511 analyzer for repair. SO₂ scrubber beads were renewed in the SO₂ scrubber before the installation. The H₂S channel configuration was changed to 10 v for "Volts Full Scale".



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: February 15, 2017 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 9:30 / 13:23 Calibration Method: Gas Dilution	Barometric Pressure: 0.911 atm Station Temperature °C: 23 Weather Conditions: A few clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov / Trina Whitsitt Cal Gas Expiry Date: November 25, 2023
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Analyzer: ID# or Serial Number: 436609738 Last Calibration Date: January 12, 2017 Previous Cal High Point C.F.: 0.999	Range ppm: 50 As Found C.F.: 1.018 New C.F.: 1.000
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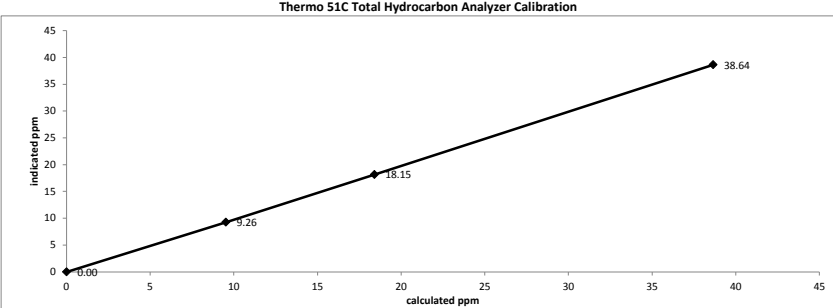
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL165372 CH₄/C₂H₆ Cylinder Conc. (ppm): 606.0 / 212.0 CH₄ as propane/total CH₄ equivalents (ppm): 583.0 / 1189.0	Standard Calibration Points for a Range of: 50 ppm <table border="1" style="width: 100%; border-collapse: 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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2000	0.00	2000	0.0	-0.07	n/a
as found high	1935	65.00	2000	38.64	37.90	1.018
adjusted zero	2000	0.00	2000	0.00	0.00	n/a
adjusted high	1935	65.00	2000	38.64	38.64	1.000
mid	1972	31.00	2003	18.40	18.15	1.014
low	1982	16.00	1998	9.52	9.26	1.028
calibrator zero	2000	0.00	2000	0.0	0.00	n/a
Average C.F.=						1.014

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 0.998 b (Intercept as % of full scale)= 0.32% % change in C.F. from last cal= -1.87%	LIMITS > or = 0.995 .95-1.05 ± 3% F.S. ± 10%
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As found: H2 cylinder (psi): 800 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 900 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 38 measurement alarms: None service alarms: None cnt: 1042 rng: 1 try: 2 flm: 185.7 det: 124.5 Flame: 185 Filter: 125 Base: 125 Sample psi: 07.52 Internal Air Pressure: 20 Internal Fuel Pressure: 12 Measured Flow: n/a Expected Value: 26.23	As left: H2 cylinder (psi): 800 H2 cylinder reg set (psi): 22 Span Cylinder (psi): 900 Span Cylinder Reg Set (psi): 22 Zero Air Gen Pressure: 38 measurement alarms: None service alarms: None cnt: 1003 rng: 1 try: 2 flm: 183.5 det: 125.4 Flame: 183 Filter: 125 Base: 125 Sample psi: 07.52 Internal Air Pressure: 20 Internal Fuel Pressure: 12 Measured Flow: n/a Expected Value: 26.51
---	--

Comments:
 The analyzer sample inlet filter was changed.

 The analyzer cooling fan filter(s) were cleaned.



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

remove

Date: February 14, 2017	Barometric Pressure: 0.925 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 10:56 / 17:51	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: July 18, 2019

Analyzer:	Correction Factors:																
ID# or Serial Number: 1899	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;">Previous C.F.:</td> <td style="text-align: center;">As Found C.F.:</td> <td style="text-align: center;">New C.F.:</td> </tr> <tr> <td>NO =</td> <td style="text-align: center;">0.999</td> <td style="text-align: center;">1.015</td> <td style="text-align: center;">0.998</td> </tr> <tr> <td>NO₂ =</td> <td style="text-align: center;">1.013</td> <td style="text-align: center;">1.000</td> <td style="text-align: center;">1.000</td> </tr> <tr> <td>NOx =</td> <td style="text-align: center;">0.999</td> <td style="text-align: center;">1.007</td> <td style="text-align: center;">0.998</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.015	0.998	NO₂ =	1.013	1.000	1.000	NOx =	0.999	1.007	0.998
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	1.015	0.998														
NO₂ =	1.013	1.000	1.000														
NOx =	0.999	1.007	0.998														
Last Calibration Date: January 18, 2017																	
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. # : LL104222																									
NO/NOx Gas Conc. (ppm): 50.7 50.7																									
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td style="text-align: center;">780</td> <td style="text-align: center;">500</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">380</td> <td style="text-align: center;">275</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">190</td> <td style="text-align: center;">100</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Extra Point #1</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Extra Point #2</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">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	4923	76.9	5000	779.8	779.8	768.0	775.0	1.015	1.007
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4923	76.90	5000	779.8	779.8	781.0	781.0	0.998	0.998
mid	4964	37.50	5002	380.1	380.1	373.0	373.0	1.019	1.019
low	4980	18.70	4999	189.7	189.7	182.0	182.0	1.042	1.042
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.020	1.020

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	4923	76.90	5000	0.0	782.0	782.0	0.0	0.0	0.0	n/a
as found high NO2	4800	76.90	4877	500.0	262.0	782.0	520.0	520.0	520.0	1.000
adjusted high NO2	4800	76.90	4877	500.0	262.0	782.0	520.0	520.0	520.0	1.000
gpt mid	4800	76.90	4877	265.0	500.0	781.0	281.0	282.0	281.0	1.004
gpt low	4800	76.90	4877	90.0	688.0	783.0	95.0	94.0	95.0	0.989
Average NO₂ C.F.=									0.998	

Linear Regression/Calibration Results:

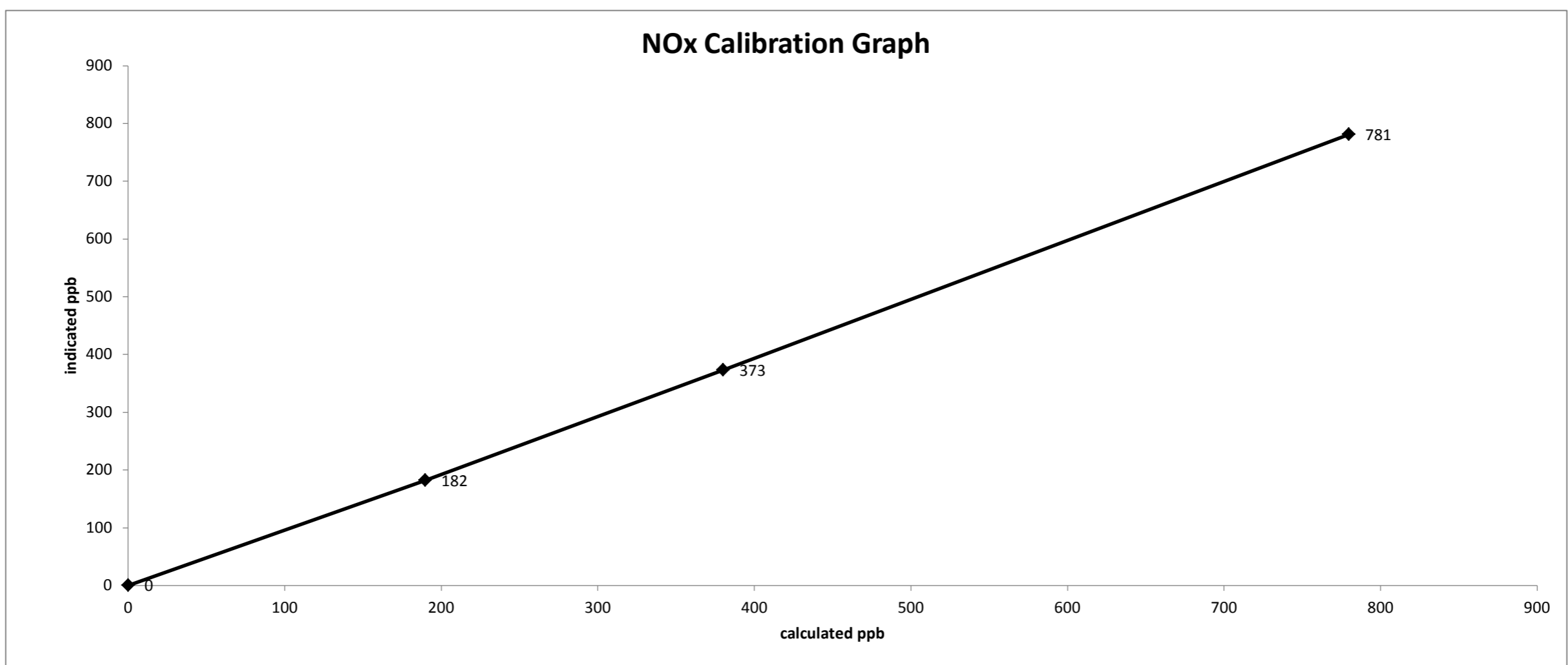
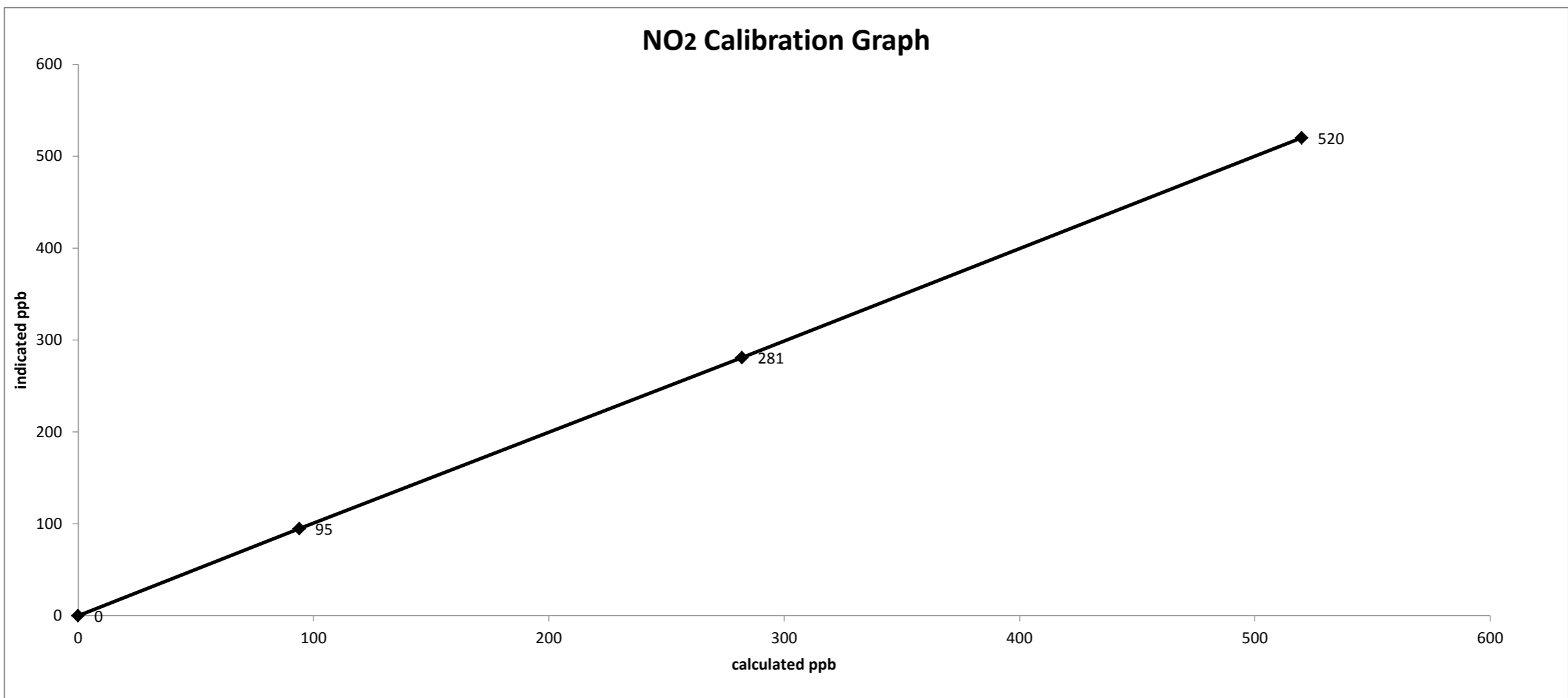
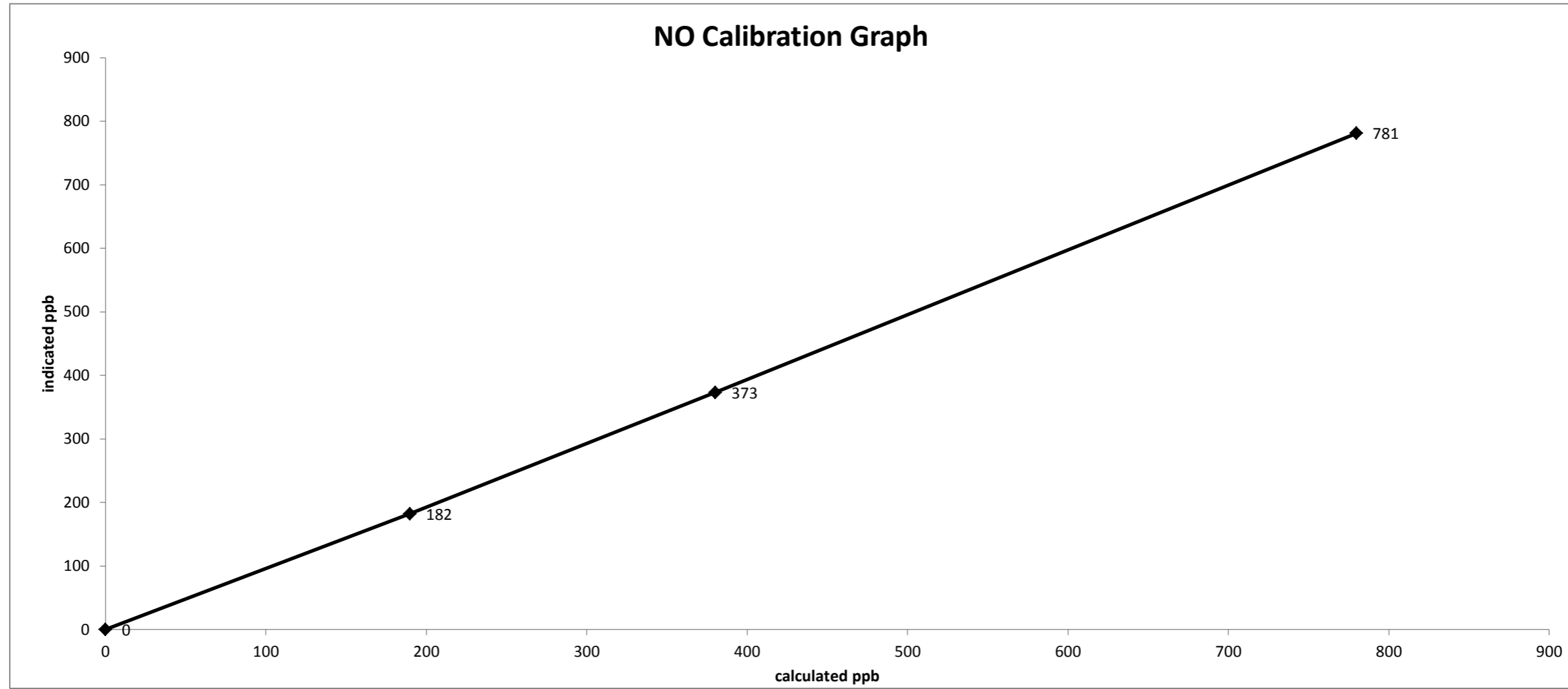
	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.996	0.996	1.001	.95-1.05
b (Intercept as % of full scale)=	-0.48%	-0.48%	0.03%	± 3% F.S.
% change in C.F. from last cal=	-1.64%	-0.85%	1.28%	± 10%
NO2 converter efficiency	n/a	n/a	1.00	0.96 to 1.04

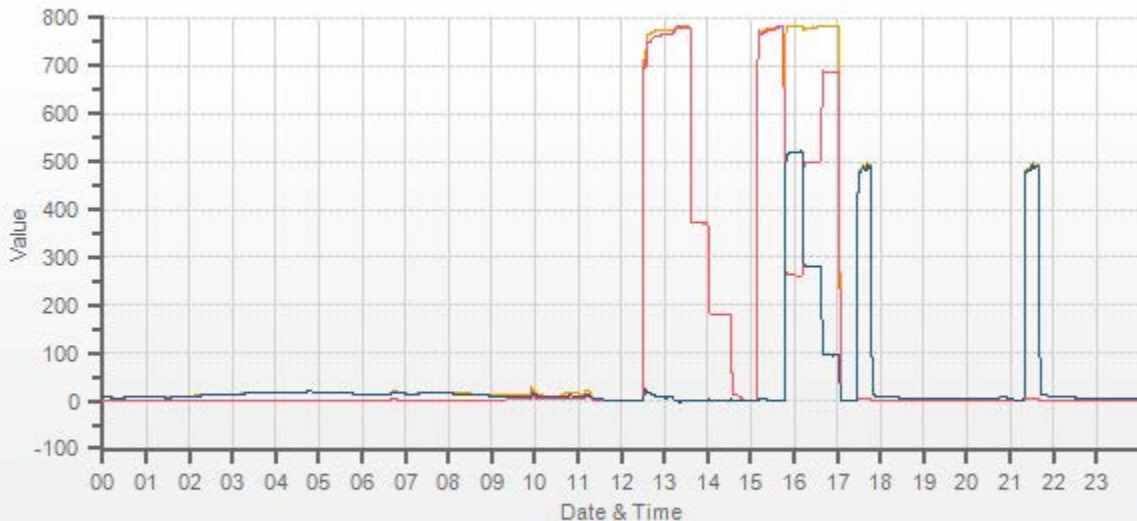
As found:		As left:	
NOx SLOPE:	0.906	NOx SLOPE:	0.913
NOx OFFS:	0.6	NOx OFFS:	-0.1
NO SLOPE:	0.917	NO SLOPE:	0.931
NO OFFS:	-1.0	NO OFFS:	-0.7
SAMP FLW:	549	SAMP FLW:	546
OZONE FL:	77	OZONE FL:	77
NORM PMT:	-1.6	NORM PMT:	0.2
AZERO:	22.5	AZERO:	22.5
HVPS:	686	HVPS:	686
DCPS:	2579	DCPS:	2571
RCELL:	50.9	RCELL:	50.6
BOX TEMP:	30.6	BOX TEMP:	31.9
IZS TEMP:	48.0	IZS TEMP:	48.2
MOLY TEMP:	315.0	MOLY TEMP:	316.7
RCEL:	5.5	RCEL:	5.5
SAMP:	25.7	SAMP:	26.3
Expected Value NO:	4.5	Expected Value NO:	4.5
Expected Value NO2:	499.0	Expected Value NO2:	490.0
Expected Value NOx:	504.0	Expected Value NOx:	494.0

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: February 14, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:56 / 17:51
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

WIND SYSTEM

METEOROLOGICAL SYSTEM CHECK



Meteorological System Checklist

Date:	February 14, 2017
Technician:	Alex Yakupov
Reviewer:	Tom Bourque
Station:	LICA - Maskwa

PRECIPITATION SENSOR CHECK

Checklist:	Reply:	Comments:
Is the sensor Level?	yes	
Is the heater operating properly?	yes	
Are the bucket drain holes clean?	yes	
Is the screen on the housing? (screen should be on between July and September)	no	
Is the housing clean?	yes	
Is the area around the housing clean and free from obstacles?	yes	

TIP TEST - Slowly pour water until 10 tip are heard. (10 tips = 1 ml)

# of Tips	Data Logger Response (ml):	Manual Specification = +/- 0.1 ml
10	1.00	0.00

AMBIENT TEMPERATURE SENSOR CHECK

Previous check date:	unknown
Parameter:	Temperature @ 2 metres (1 C tolerance)
Reference Thermometer ID:	Fluke 4295 expires November 14, 2017
Reference Temperature (°C):	7.1
Station - Ambient Temperature (°C):	6.6
Temperature Difference (°C):	0.5

Meteorological System Checklist

Performed by: Alex Yakupov
 Station: **Maskwa**
 Start: 12:27 End: 12:51

PRECIPITATION SENSOR CHECK

	YES	NO
Is the sensor Level?	YES	
Is the heater operating properly?	YES	
Are the bucket drain holes clean?	YES	
Is the inner screen on the housing? (screen should be on between July and September)		NO
Is the upper screen on the housing? (screen should be on between July and September)		NO
Is the housing clean?	YES	
Is the area around the housing clean and free from obstacle?	YES	
Is the tipping sensor working properly?	YES	
Test with water (12:41 - 1.0 mm)	PASS	

Comments: the rain gauge has been tested with water. Responce is timely and accurate.
 No issues.

Field Technician: Alex Yakupov February 14, 2017

CALIBRATORS

Company Maxxam/SIA **Operator:** Chris

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Definer 530</u>
Serial Number	<u>627</u>	Serial Number	<u>H-148944, L-152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>707.1 mmHg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1	<u>4892</u>	Pt. #3 <u>4951</u>
Pt. #2	<u>4975</u>	
Gas Flow (sccm)		
Pt. #1	<u>79.7</u>	Pt. #3 <u>19.4</u>
Pt. #2	<u>38.8</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

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)= 1.0041	0.90-1.10	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	0.90-1.10
b (Intercept % of FS)= 0.1755	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	Make/Model <u>Thermo 42i</u>
Make/Model <u>Thermo 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU1809</u>	Last Calibration Date <u>January 25, 2017</u>
SRM Gas Cylinder No. <u>CAL018140</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>48.79</u>	Cylinder Gas Expiry Date <u>March 25, 2019</u>

COMMENTS: _____

Auditor: Shea Beaton Date: January 27, 2017
 Operator Signature: _____ Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Mike</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>11900613</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 31, 2016</u>	Temperature (°C)	<u>23.9</u>
NO Cylinder S/N	<u>EY0000769</u>	Barometric Pressure	<u>698mmHg</u>
NO [PPM]	<u>51.1</u>	NOx [PPM]	<u>51.2</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4879</u>	Pt. #2 <u>4932</u>	Pt. #3 <u>4950</u>
Gas Flow (sccm)		
Pt. #1 <u>74.5</u>	Pt. #2 <u>36.4</u>	Pt. #3 <u>18.2</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4965	0.0	0.0000	0.0000	0.0001	0.0000	0.0001	Limit ± 10%	
4954	74.5	0.7685	0.7700	0.7915	0.0008	0.7923	3%	3%
4968	36.4	0.3744	0.3751	0.3832	0.0006	0.3838	2%	2%
4968	18.2	0.1872	0.1876	0.1916	0.0002	0.1918	2%	2%
Absolute Average Percent Difference							3%	2%

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)= 1.0301	0.90-1.10	m (Slope)= 1.0291
b (Intercept % of FS)= -0.0919	± 3% F.S.	b (Intercept % of FS)= -0.0881

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4954	0.000	0.0000	0.7949	0.0005	0.7954	NO ₂	% Diff. Limit
4954	0.510	0.5104	0.2845	0.5072	0.7917	-1%	± 10%
4954	0.250	0.2516	0.5433	0.2514	0.7944	0%	± 10%
4954	0.100	0.1085	0.6864	0.1087	0.7951	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS $y=mx+b$ (where x=calculated concentration, y=indicated concentration)

NO ₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9926	0.90-1.10
b (Intercept % of FS)= 0.0925	± 3% F.S.

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Thermo 42i</u>
Make/Model	<u>Thermo 146i</u>	Serial/AMU Number	<u>1868</u>
Serial/AMU Number	<u>1809</u>	Last Calibration Date	<u>March 15, 2017</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 16, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-335CGA

Company: Maxxam **Operator's Name:** Russell Kirchner

Cylinder #: LL104222 Concentration PPM: 50.6 Tolerance(%) 1 Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMY 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.5 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CA:016625</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623

Instrument Settings: Zero: 9.2 Span: 1.024 Range: 1.0

Last Calibration: Date: Oct 19/16 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	0.000	0.01662	60.183	50.0
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					50.0

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 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: October 19, 2016

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

DocNumber: 000096245

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

MAXXAM ANALYTICS INC *NA*
 9372 49TH ST
 EDMONTON AB T6B 2L7

Praxair Order Number: 26637434
 Customer PO Number: 35-36415
 Customer Reference Number:

Fill Date: 7/5/2016
 Part Number: NI NO50MS2E-AQ
 Lot Number: 109618704
 Cylinder Style and Outlet: AQ CGA 660
 Cylinder Pressure and Volume: 2000 psig 82 cu. ft.

Certified Concentration:

Expiration Date:	07/18/2019	NIST Traceable
Cylinder Number:	LL104222	Expanded Uncertainty:
50.7 ppm	NITRIC OXIDE	± 0.7 %
50.6 ppm	SULFUR DIOXIDE	± 1.0 %
Balance	NITROGEN	

NOx ppm = 50.9 ppm

NOX for Reference Only

Certification Information: Certification Date : 7/18/2016 Term : 36 Months Expiration Date : 07/18/2019

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
 Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1 . Component: NITRIC OXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 50.7 ppm
 Instrument Used: Thermo Electron 42i-LS S/N 1030645077
 Analytical Method: Chemiluminescence
 Last Multipoint Calibration: 06/23/2016

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC222724
 Ref. Std. Conc: 50.96 ppm
 Ref. Std. traceable to SRM #: vs. 1653b
 SRM Sample #: 45-V-42
 SRM Cylinder #: CAL017897

First Analysis Data:				Date: 07/11/2016	
Z:	0	R:	51	C:	50.6
				Conc:	50.6
R:	51	Z:	0	C:	50.8
				Conc:	50.8
Z:	0	C:	50.8	R:	51
				Conc:	50.9
UOM:	ppm		Mean Test Assay:	50.7 ppm	

Second Analysis Data:				Date: 07/18/2016	
Z:	0	R:	51	C:	50.7
				Conc:	50.7
R:	51	Z:	0	C:	50.8
				Conc:	50.8
Z:	0	C:	50.8	R:	51
				Conc:	50.7
UOM:	ppm		Mean Test Assay:	50.7 ppm	

2 . Component: SULFUR DIOXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 50.6 ppm
 Instrument Used: Ametek 921CE S/N AW-921-S321
 Analytical Method: Ultraviolet Absorption
 Last Multipoint Calibration: 06/27/2016

Reference Standard Type: NTRM
 Ref. Std. Cylinder #: CC
 Ref. Std. Conc: 48.58 ppm
 Ref. Std. traceable to SRM #: n/a
 SRM Sample #: 12070103
 SRM Cylinder #: N/A

First Analysis Data:				Date: 07/11/2016	
Z:	0	R:	482.8	C:	503.8
				Conc:	50.7
R:	482.6	Z:	0	C:	503.9
				Conc:	50.7
Z:	0	C:	503.9	R:	482.6
				Conc:	50.7
UOM:	ppm		Mean Test Assay:	50.7 ppm	

Second Analysis Data:				Date: 07/18/2016	
Z:	0	R:	482.1	C:	500.6
				Conc:	50.4
R:	482.7	Z:	0	C:	501.3
				Conc:	50.5
Z:	0	C:	501.3	R:	482.7
				Conc:	50.4
UOM:	ppm		Mean Test Assay:	50.4 ppm	

Analyzed by:

Matthew Angerer

Certified by:

Henry Koung

***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
Wunmi Adekanmbi	Project Manager, 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

13-04-2017




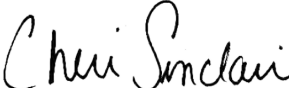
Report Issued Date (dd-mm-yyyy)

***APPENDIX IV
DATA VALIDATION CERTIFICATION FORM***



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-02-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>24-March-17</u>
Level 1 Primary Validation	<u></u>	Date <u>31-March-17</u>
Level 2 Final Validation	<u></u>	Date <u>13-April-17</u>
Level 3 Independent Data Review	<u></u>	Date <u>13-April-17</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.



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

February 22, 2018

Subject: Monthly Report Submission for the LICA St. Lina station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA St. Lina AQM Station in the month of February 2017.

The air monitoring program consists of continuous air monitoring results for 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).

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics

All data collected in February 2017 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 systems.

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

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

Respectfully,



Lakeland Industry & Community Association
5107 50 St
Bonnyville, AB T9N 2J7

A handwritten signature in blue ink that reads 'Michael Bisaga'.

Michael Bisaga
Technical Program Manager
Lakeland Industry & Community Association
780-266-7068
mbisaga@otonabee.ca

A handwritten signature in blue ink that reads 'Lily Lin'.

Lily Lin
Data & Reporting Specialist
587-225-2248
rebbacaa@gmail.com

**AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
ST. LINA CONTINUOUS MONITORING STATION**

JOB #: 2833-2017-02-31-C

February 2017


Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
402 - 19 ST NW
CALGARY, ALBERTA
T2N 2J1

Attention: MIKE BISAGA


DATE: **April 14, 2017**

Prepared by:



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

Reviewed by:



Wunmi Adekanmbi, M.Sc., EPT
Project Manager, Customer Service, Air Services

SUMMARY

In February 2017, 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 the 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.

H₂S: Thirteen hours of downtime were recorded on February 16 and February 22, due to additional quality checks performed around sample pump replacement and permeation tube replacement events, respectively.

NO_x/NO/NO₂: The NO_x gas concentration 50.7 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.9 ppm. A sample of affected calculations has been rerun and the error has no significant effect on the calibration. The NO_x calibration still meets the AMD calibration criteria.

PM_{2.5}: Seventeen hours of data were recorded this month at concentrations less than -3 µg/m³, rendering the data invalid.

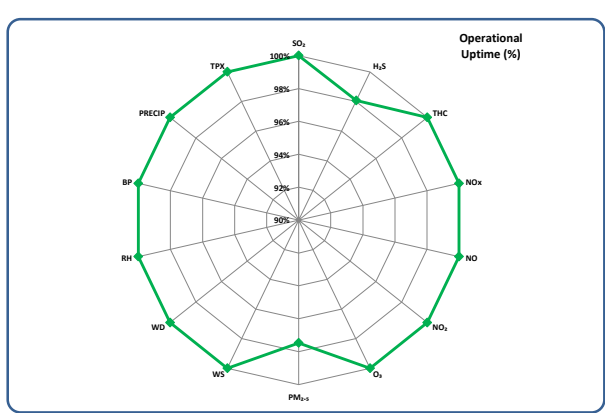
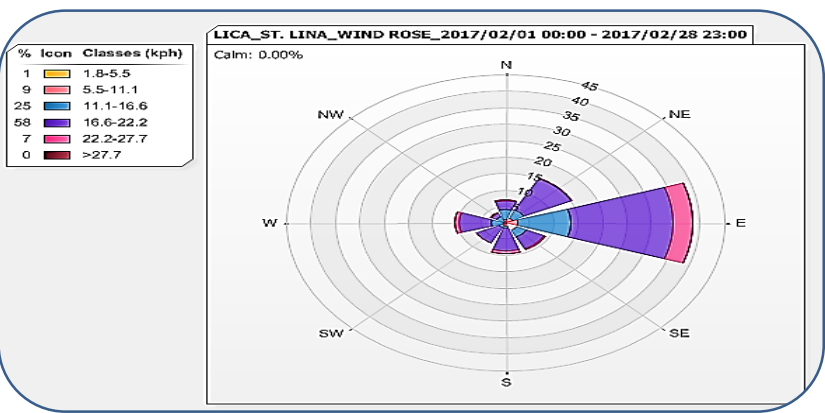
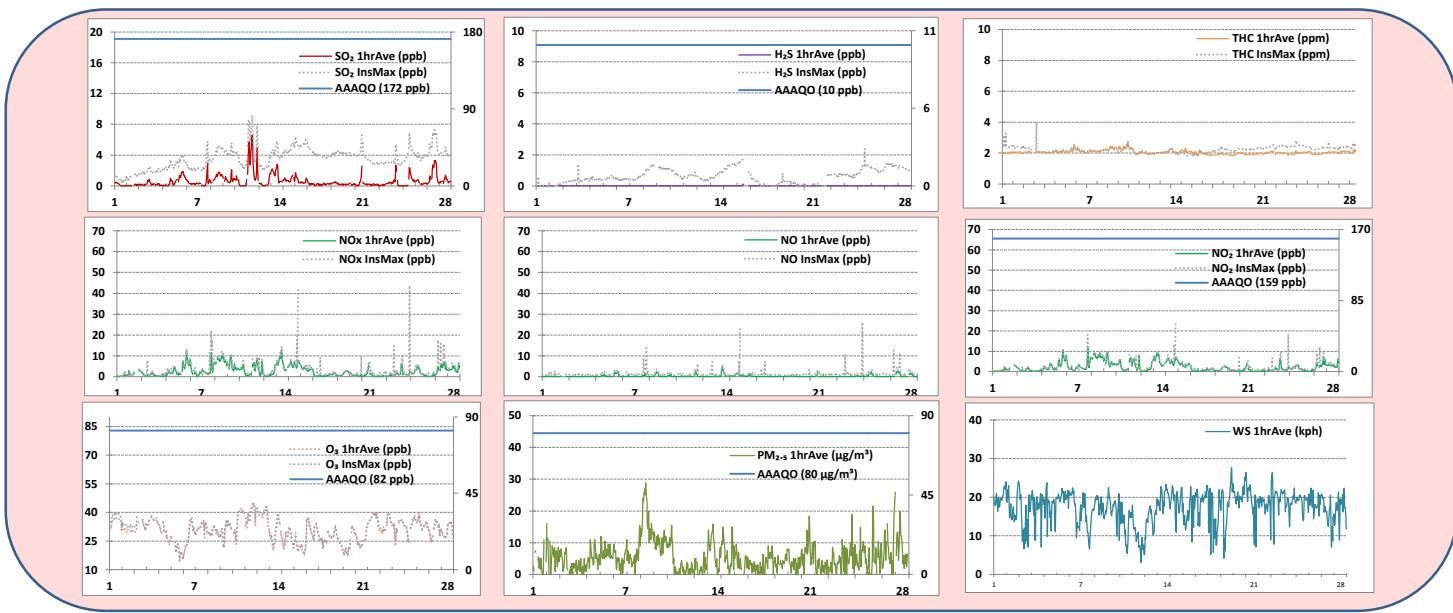
The summary of results is presented on the following pages.

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.

February 2017 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	0.6	100.0%	6.6	February 12	10	172	0	3.0	February 12	48	0
H ₂ S	ppb	0.0	98.1%	0.1	February 16, 16	10, 11	10	0	0.0	ALL	3	0
THC	ppm	2.05	100.0%	2.62	February 10	22	-	-	2.38	February 10	-	-
NO _x	ppb	2.5	100.0%	12.9	February 14	10	-	-	7.8	February 9	-	-
NO	ppb	0.2	100.0%	4.6	February 14	10	-	-	0.9	February 14	-	-
NO ₂	ppb	2.3	100.0%	11.3	February 8	17	159	0	7.3	February 9	-	-
O ₃	ppb	30.5	100.0%	43.8	February 12	16	82	0	38.7	February 13	-	-
PM _{2.5}	µg/m ³	5.6	97.5%	28.9	February 9	9	80	0	17.7	February 9	30	0
WS	kph	6.4	100.0%	27.6	February 19	21	-	-	19.9	February 23	-	-
WD	degree	94 (E)	100.0%	-	-	-	-	-	-	-	-	-
RH	%	67	100.0%	90	February 19, 20	VAR, VAR	-	-	88	February 19	-	-
BP	mbar	921	100.0%	942	February 1	VAR	-	-	940	February 1	-	-
PRECIP	mm	0.0	100.0%	2.1	February 19	5	-	-	0.4	February 19	-	-
AmbTPX	°C	-8.1	100.0%	10.7	February 14	13	-	-	5.1	February 16	-	-



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

H₂S: Thirteen hours of downtime were recorded on February 16 and February 22, due to additional quality checks performed around sample pump replacement and permeation tube replacement events, respectively.
PM_{2.5}: Seventeen hours of data were recorded this month at concentrations less than -3 µg/m³, rendering the data invalid.

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				READING	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.6	6.6	12	10	10	SE	3.0	12	100.0
H ₂ S (ppb)	10	3	0	0	0.0	0.1	16, 16	10, 11	14.0 14.1	NNW NNW	0.0	ALL	98.1
THC (ppm)	-	-	-	-	2.05	2.62	10	22	20.9	WSW	2.38	10	100.0
NO ₂ (ppb)	159	-	0	-	2.3	11.3	8	17	14.1	ESE	7.3	9	100.0
NO (ppb)	-	-	-	-	0.2	4.6	14	10	15.7	ESE	0.9	14	100.0
NO _x (ppb)	-	-	-	-	2.5	12.9	14	10	15.7	ESE	7.8	9	100.0
O ₃ (ppb)	82	-	0	-	30.5	43.8	12	16	3.1	SSE	38.7	13	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	5.6	28.9	9	9	15.9	ESE	17.7	9	97.5
RELATIVE HUMIDITY (%)	-	-	-	-	67	90	19, 20	VAR, VAR	VAR	VAR	88	19	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	921	942	1	VAR	VAR	VAR	940	1	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-8.1	10.7	14	13	21.3	ESE	5.1	16	100.0
PRECIPITATION (mm)	-	-	-	-	0.0	2.1	19	5	20.5	ENE	0.4	19	100.0
VECTOR WS (kph)	-	-	-	-	6.4	27.6	19	21	-	W	19.9	23	100.0
VECTOR WD (sec)	-	-	-	-	94 (E)	-	-	-	-	-	-	-	100.0

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 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), 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%).

Trailer inspection was conducted on February 2. No issues were identified.

SULPHUR DIOXIDE (SO₂)

- There were no issues that impacted operational time this month. The routine monthly calibration was performed on February 2.
- The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the SO₂ channel, on February 3, during the monthly calibration of the Ozone analyzer.

HYDROGEN SULPHIDE (H₂S)

- The operational time was 98.1%, equivalent to thirteen hours of downtime. The routine monthly calibration was performed on February 2.
- The analyzer spanned towards the upper acceptance limit on February 15. A repeat span check was triggered on February 16 and the result confirmed the drift. An immediate site visit was scheduled to troubleshoot the problem. Following a successful shut-down calibration, the sample pump was rebuilt and an output voltage calibration was conducted. A successful post repair calibration was subsequently completed. As the calibration results met the AMD's requirements, no data was discarded due to this event. However, seven hours of downtime were recorded due to the additional quality checks.
- The analyzer spanned towards the lower acceptance limit on February 21. The result of a repeat span check triggered on February 22 suggested that the permeation tube was depleting. This prompted an immediate site visit, where the permeation tube was replaced and a repeat calibration completed. The scrubber material of the zero air filter was also renewed. The expected span value was updated on February 24, following the stabilization of the new permeation device. As the calibration results met the AMD's requirements, no data was discarded due to this event. However, six hours of downtime were recorded due to the additional quality checks.

TOTAL HYDROCARBONS (THC)

- There were no issues that impacted operational time this month. The routine monthly calibration was performed on February 3. The fuel gas was replenished on February 22.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- There were no issues that impacted operational time this month. The routine monthly calibration was performed on February 2. The permeation tube was replaced during the calibration. Expected span value was updated on February 5, following the stabilization of the new permeation device.
- The NO_x gas concentration 50.7 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.9 ppm. A sample of affected calculations has been rerun and the error has no significant effect on the calibration. The NO_x calibration still meets the AMD calibration criteria.

OZONE (O₃)

- There were no issues that impacted operational time this month. The routine monthly calibration was performed on February 3.
- The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the SO₂ channel, on February 2, during the monthly calibration of the Ozone analyzer.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- The operational time was 97.5%, equivalent to seventeen hours of downtime.
- Two routine audits were performed this month: one was completed on February 3 and the other on February 16. Both the FDMS and sample filters were replaced on February 3.
- 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. Seventeen 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 issues that impacted operational time this month.
- Maximum instantaneous data collected on February 6, at hours 18:00 and 21:00, were invalidated as the data exhibited a spike that was considered anomalous.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- | |
|---|
| <ul style="list-style-type: none">• There were no issues that impacted operational time this month. |
|---|

BAROMETRIC PRESSURE (BP)

- | |
|---|
| <ul style="list-style-type: none">• There were no issues that impacted operational time this month. |
|---|

PRECIPITATION (PRECIP)

- | |
|--|
| <ul style="list-style-type: none">• There were no issues that impacted operational time this month. A precipitation sensor was audited on February 3. The result was within acceptance limits. |
|--|

AMBIENT TEMPERATURE (AmbTPX)

- | |
|---|
| <ul style="list-style-type: none">• 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:

- MET One Instruments: Operation Manual Document No. 50.5-9800
- 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

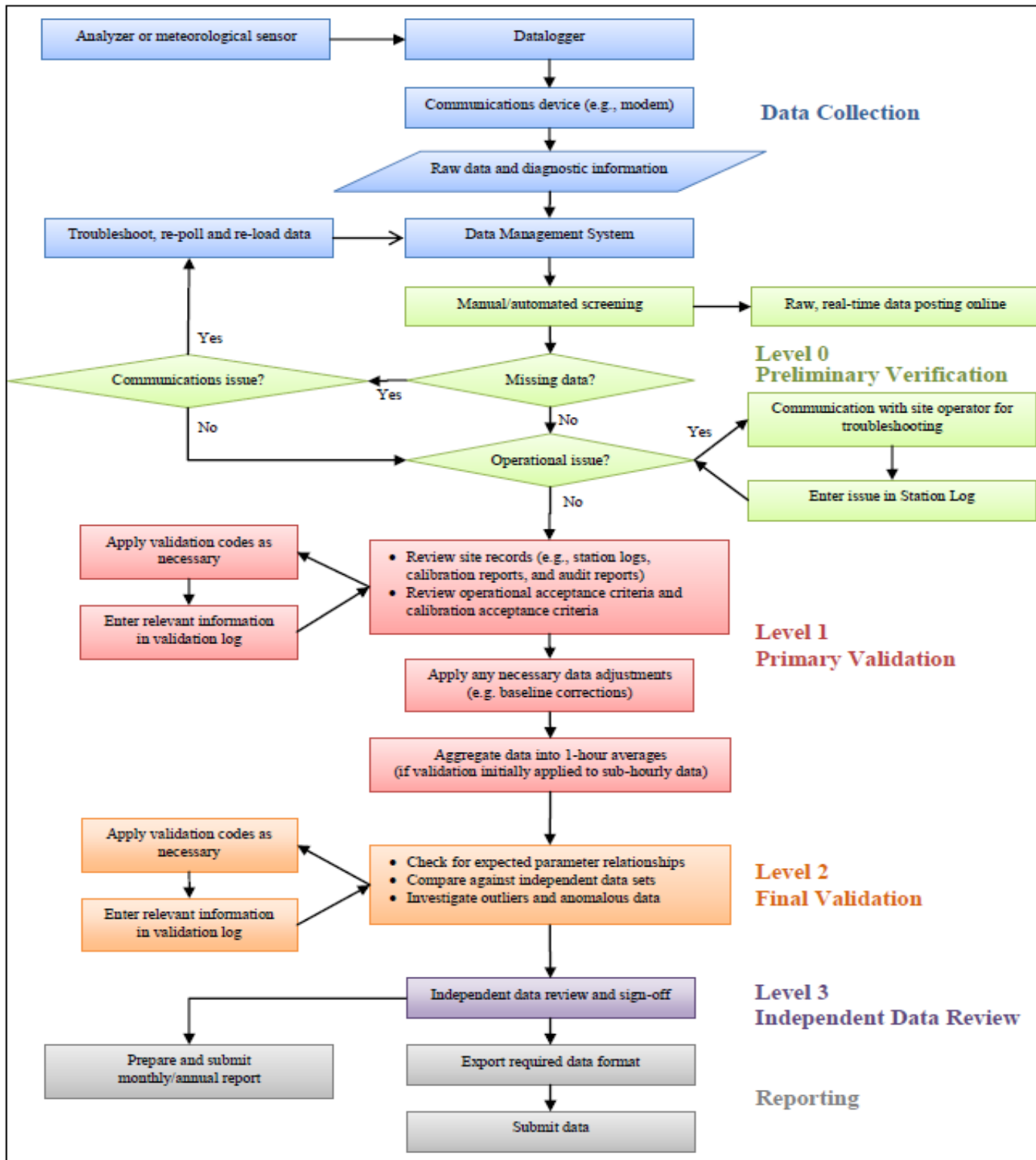
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.2	0.2	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	0.0	0.0	0.0	0.5	0.2	24	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	S	C	C	C	C	0.1	0.2	0.2	0.2	0.1	0.0	0.2	0.1	0.2	0.0	0.2	0.1	0.2	0.1	0.2	24	
3	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.1	S	0.0	0.2	0.1	0.2	0.2	Q	0.2	0.5	0.7	0.6	0.7	0.9	0.5	0.4	0.0	0.9	0.3	0.3	0.2	24		
4	0.3	0.2	0.1	0.2	0.2	0.3	0.2	0.2	S	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.3	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.2	0.2	0.2	24		
5	0.0	0.1	0.1	0.0	0.0	0.0	0.2	S	0.0	0.0	0.0	0.0	0.2	0.2	0.5	1.0	0.6	0.7	0.7	0.6	0.1	0.1	0.2	0.4	0.0	1.0	0.2	0.2	0.2	24		
6	0.4	0.6	0.7	0.8	0.8	0.8	S	0.5	0.8	1.4	1.1	1.2	1.3	1.7	1.8	1.7	1.9	1.6	1.3	1.3	1.1	1.1	0.8	0.8	0.4	1.9	1.1	1.1	1.1	24		
7	0.7	0.6	0.5	0.6	0.3	S	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.1	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.1	0.7	0.3	0.3	24		
8	0.3	0.4	0.3	0.3	S	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.2	1.9	2.9	0.4	0.3	0.5	0.8	0.7	0.5	0.0	2.9	0.5	0.5	0.5	24		
9	0.4	0.4	0.5	S	0.7	0.7	0.8	0.8	1.0	1.1	1.2	1.5	1.2	1.4	1.6	1.8	1.8	1.7	1.5	1.3	1.3	1.5	1.4	1.2	0.4	1.8	1.2	1.2	1.2	24		
10	1.1	1.0	S	0.6	0.7	1.2	0.9	0.8	0.8	0.6	0.5	0.5	0.5	0.4	0.5	0.5	1.3	2.1	0.9	0.6	0.6	0.9	1.0	0.9	0.4	2.1	0.8	0.8	0.8	24		
11	0.8	S	0.7	1.3	0.9	0.8	0.8	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.0	1.3	0.3	0.3	0.3	24		
12	S	1.5	2.8	5.2	5.7	4.5	2.7	3.7	4.8	5.3	6.6	5.0	2.8	1.8	1.2	0.9	0.7	0.9	1.0	1.7	5.0	2.1	0.7	S	0.7	6.6	3.0	3.0	3.0	24		
13	0.3	0.4	0.3	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.9	1.6	S	1.6	0.0	1.6	0.3	0.3	24		
14	1.9	2.0	2.2	2.0	1.9	1.7	1.6	1.3	1.3	1.9	2.2	2.5	2.8	2.6	1.5	0.4	0.4	0.6	0.6	0.6	0.6	S	0.5	0.6	0.4	2.8	1.5	1.5	1.5	24		
15	0.7	0.7	0.9	1.0	1.0	0.7	0.6	0.7	0.7	0.7	0.6	0.5	0.6	0.5	0.6	1.0	1.2	1.2	1.4	S	1.1	0.8	0.6	0.5	1.4	0.8	0.8	0.8	24			
16	1.6	1.7	1.2	1.1	1.0	1.0	0.7	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.4	S	0.4	0.6	1.0	0.9	0.3	1.7	0.7	0.7	0.7	24		
17	0.8	0.5	0.4	0.3	0.2	0.1	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.0	0.1	0.1	S	0.1	0.3	0.3	0.3	0.2	0.0	0.8	0.3	0.3	0.3	24		
18	0.0	0.2	0.1	0.2	0.2	0.0	0.1	0.2	0.2	0.4	0.3	0.2	0.1	0.2	0.2	0.2	0.3	S	0.2	0.3	0.3	0.2	0.3	0.3	0.0	0.4	0.2	0.2	0.2	24		
19	0.2	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.2	0.3	0.2	S	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.5	0.3	0.3	0.3	24		
20	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	S	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.4	0.2	0.2	0.2	24		
21	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.3	0.5	0.5	0.7	1.1	2.6	S	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.0	2.6	0.4	0.4	0.4	24	
22	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.1	0.2	0.1	0.1	0.3	S	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.0	0.3	0.1	0.1	0.1	24		
23	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.2	S	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.0	0.5	0.2	0.2	0.2	24	
24	0.4	0.5	0.3	0.4	0.4	0.7	0.8	0.5	0.6	2.7	1.9	S	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	2.7	0.4	0.4	0.4	24	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.9	2.4	2.3	1.8	1.4	1.1	1.0	0.8	0.7	0.8	0.6	0.7	0.5	0.0	2.4	0.7	0.7	0.7	24		
26	0.5	0.6	0.7	0.7	0.7	0.8	0.8	0.5	0.4	S	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.8	0.4	0.4	0.4	24		
27	0.2	0.3	0.4	0.4	0.6	1.3	1.1	0.8	S	1.0	2.1	2.7	2.4	2.4	3.3	3.1	3.3	3.1	2.9	1.3	0.9	0.6	0.4	0.4	0.2	3.3	1.5	1.5	1.5	24		
28	0.4	0.4	0.6	0.5	0.5	0.6	0.6	S	0.3	0.6	0.9	0.9	1.4	1.2	0.9	0.9	0.7	0.6	0.4	0.5	0.5	0.6	0.6	0.6	0.3	1.4	0.7	0.7	0.7	24		
HOURLY MAX	1.9	2.0	2.8	5.2	5.7	4.5	2.7	3.7	4.8	5.3	6.6	5.0	2.8	2.6	3.3	3.1	3.3	3.1	2.9	1.7	5.0	2.1	1.4	1.6								
HOURLY AVG	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.7	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.7	0.6	0.5	0.6	0.6	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

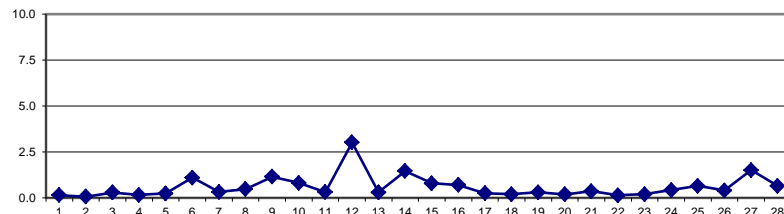
OBJECTIVE LIMIT:

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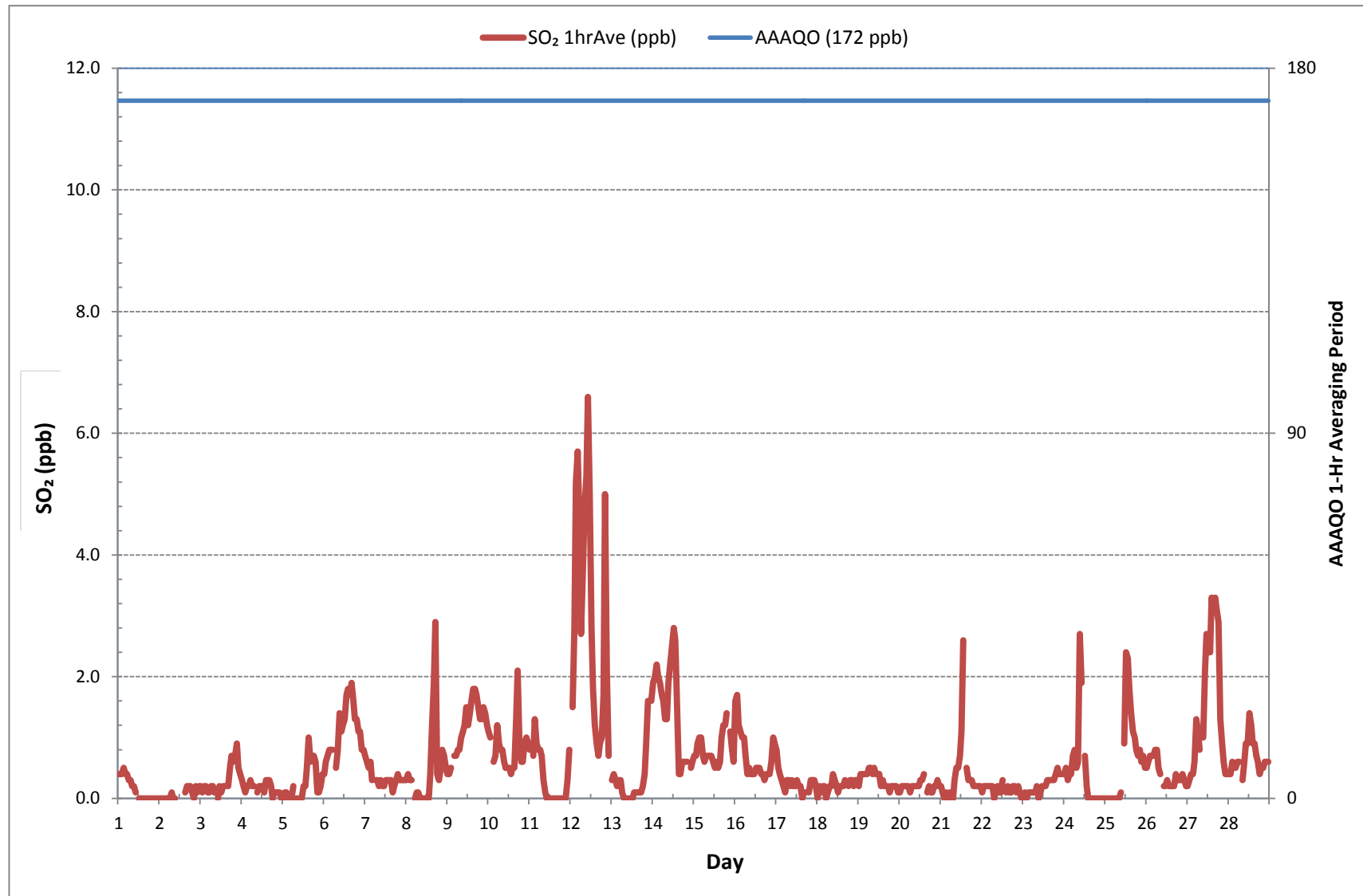
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	549				
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S)	VAR	ON DAY(S)	VAR	
MAXIMUM 1-HR AVERAGE:	6.6 ppb @ HOUR(S)	10	ON DAY(S)	12	
MAXIMUM 24-HR AVERAGE:	3.0 ppb		ON DAY(S)	12	
			VAR-VARIOUS		
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.8		MONTHLY AVERAGE:	0.6	ppb

24 HR AVERAGES February 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2017

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	1.2	1.3	1.1	1.2	1.2	1.0	1.0	0.8	0.9	0.8	0.6	S	0.8	0.6	0.4	0.8	0.5	0.8	0.6	0.5	0.8	0.8	0.7	0.8	0.4	1.3	0.8	24
2	0.8	0.7	0.9	0.6	0.9	0.9	1.0	1.2	1.0	1.1	S	C	C	C	C	C	1.5	1.5	1.6	1.3	1.3	1.5	1.4	1.4	0.6	1.6	1.1	24
3	1.5	1.5	1.7	1.6	1.6	1.5	1.8	1.8	1.8	S	1.6	1.9	1.6	1.7	1.7	Q	1.9	2.2	2.3	2.2	2.3	2.5	2.4	1.9	1.5	2.5	1.9	24
4	1.9	1.8	1.8	1.6	1.8	1.9	1.8	1.9	S	1.8	1.9	2.1	1.9	2.0	2.3	2.2	2.2	2.2	1.9	1.9	2.1	2.0	2.1	2.1	1.6	2.3	2.0	24
5	2.0	2.3	2.2	2.2	2.1	2.1	2.5	S	2.1	2.1	2.2	2.2	2.7	2.3	3.0	3.4	3.1	3.1	3.1	2.7	2.3	2.4	2.3	2.6	2.0	3.4	2.5	24
6	2.7	2.7	3.1	2.9	2.8	3.1	S	2.5	3.1	3.5	3.1	3.3	3.5	3.7	3.8	3.6	3.8	3.8	3.3	3.2	3.0	3.1	3.0	2.8	2.5	3.8	3.2	24
7	2.6	2.7	2.3	2.5	2.3	S	2.2	2.3	2.0	2.3	2.0	2.3	2.4	2.3	2.3	2.2	1.9	2.1	2.3	2.3	2.3	2.3	2.3	2.2	1.9	2.7	2.3	24
8	2.2	2.2	2.2	2.3	S	2.0	2.2	2.4	2.4	2.0	2.1	2.3	2.4	2.3	2.8	5.0	5.4	5.8	3.3	2.8	3.0	3.4	3.2	3.2	2.0	5.8	2.9	24
9	3.1	3.1	3.4	S	3.5	3.6	3.7	3.9	4.0	4.2	4.5	4.6	4.3	5.2	5.1	5.1	5.1	5.1	5.0	4.8	4.8	5.1	5.1	4.9	3.1	5.2	4.4	24
10	4.8	4.7	S	4.4	4.6	4.7	4.7	4.4	4.4	4.1	3.9	4.2	3.9	3.9	4.0	4.4	5.1	5.6	4.7	4.1	3.9	4.4	4.3	4.3	3.9	5.6	4.4	24
11	4.2	S	4.3	4.6	4.0	3.9	4.1	3.8	3.1	3.0	3.1	2.9	2.8	2.6	2.5	2.8	2.3	2.5	2.4	2.3	2.3	2.5	2.9	3.5	2.3	4.6	3.1	24
12	S	5.2	5.7	8.6	8.2	8.0	5.7	6.3	7.2	8.2	9.2	8.5	5.7	4.6	3.6	3.3	3.1	3.5	3.5	6.3	8.1	6.3	3.3	S	3.1	9.2	6.0	24
13	2.6	2.6	2.6	2.5	2.7	2.5	2.3	2.3	2.1	2.1	2.0	2.3	2.3	2.3	2.3	2.5	2.3	2.3	2.4	2.6	3.4	3.9	S	3.8	2.0	3.9	2.6	24
14	4.2	4.5	4.6	4.5	4.7	4.2	4.5	3.9	4.2	4.7	5.1	5.8	5.5	5.4	4.8	3.5	3.5	3.6	3.5	3.6	3.7	S	3.7	3.9	3.5	5.8	4.3	24
15	4.3	4.1	4.5	4.7	4.7	4.4	4.2	4.3	4.5	4.6	4.2	4.5	4.5	4.7	4.6	4.6	5.3	5.3	5.2	5.6	S	5.3	4.9	5.0	4.1	5.6	4.7	24
16	6.4	6.4	5.8	5.6	5.6	5.5	5.1	5.1	5.1	5.0	5.3	5.1	5.3	5.3	5.4	5.4	5.5	5.3	5.4	S	5.4	5.9	6.0	5.7	5.0	6.4	5.5	24
17	5.7	5.3	5.1	5.1	4.9	4.7	4.8	4.7	4.6	4.6	4.4	4.3	4.5	4.2	4.3	3.8	4.2	3.9	S	3.9	4.1	3.9	4.1	4.0	3.8	5.7	4.5	24
18	3.8	3.9	4.0	3.8	3.7	3.7	3.7	3.7	3.9	3.9	3.9	3.9	3.7	3.7	3.8	3.6	3.8	S	3.9	3.8	3.9	3.9	3.8	3.8	3.6	4.0	3.8	24
19	3.9	4.1	4.0	4.3	4.1	4.4	4.4	4.2	4.2	4.5	4.3	4.4	4.5	4.5	4.3	S	4.3	4.1	4.1	4.1	4.5	4.4	4.3	4.1	3.9	4.5	4.3	24
20	4.0	4.3	4.1	4.1	4.1	4.1	4.2	4.3	4.3	3.9	4.0	4.0	4.1	4.3	4.3	S	3.9	4.0	3.9	3.9	3.9	4.1	4.1	3.9	3.9	4.3	4.1	24
21	3.9	3.9	4.0	3.9	3.8	3.8	3.8	4.0	4.1	4.2	4.2	4.4	5.7	6.7	S	5.6	3.9	3.9	3.7	3.7	3.7	3.5	3.5	3.5	3.5	6.7	4.1	24
22	3.5	3.5	3.3	3.2	3.2	3.2	3.3	3.1	3.1	3.1	2.9	2.9	3.1	S	2.8	2.9	3.0	3.0	3.1	3.0	2.9	2.9	2.9	2.7	2.7	3.5	3.1	24
23	2.9	2.9	2.9	3.1	3.0	2.9	2.9	2.9	2.9	2.8	3.0	3.0	S	3.0	3.1	3.0	3.0	2.9	2.9	3.1	3.1	3.1	3.0	3.0	2.8	3.1	3.0	24
24	3.1	2.9	2.9	2.9	3.0	3.2	3.3	2.9	3.5	5.4	4.7	S	3.9	2.9	2.7	2.7	2.7	2.6	2.8	2.9	2.8	3.0	3.1	3.1	2.6	5.4	3.2	24
25	3.1	3.1	3.2	3.3	3.4	3.5	3.6	3.8	4.1	4.2	S	4.9	6.9	6.6	5.6	5.2	4.8	4.7	4.4	4.3	4.3	4.3	4.1	4.2	3.1	6.9	4.3	24
26	3.9	3.9	4.0	3.9	3.8	4.3	4.0	3.8	3.6	S	3.3	3.7	3.7	3.6	3.4	3.7	3.7	3.7	4.0	3.8	4.0	3.9	4.0	3.7	3.3	4.3	3.8	24
27	3.8	3.9	4.1	4.1	4.4	5.5	5.2	5.0	S	5.1	6.1	6.9	6.4	7.1	7.3	6.7	6.9	6.7	7.0	5.6	4.7	4.4	4.3	4.1	3.8	7.3	5.4	24
28	4.0	4.1	4.2	4.2	4.4	4.4	4.5	S	3.9	4.2	4.4	4.5	5.0	5.0	4.5	4.5	4.2	3.9	3.9	3.9	3.9	4.1	4.0	4.1	3.9	5.0	4.3	24
HOURLY MAX	6.4	6.4	5.8	8.6	8.2	8.0	5.7	6.3	7.2	8.2	9.2	8.5	6.9	7.1	7.3	6.7	6.9	6.7	7.0	6.3	8.1	6.3	6.0	5.7				
HOURLY AVG	3.3	3.4	3.4	3.5	3.6	3.6	3.5	3.4	3.5	3.7	3.7	4.0	3.9	3.9	3.7	3.8	3.6	3.6	3.5	3.4	3.5	3.6	3.4	3.4				

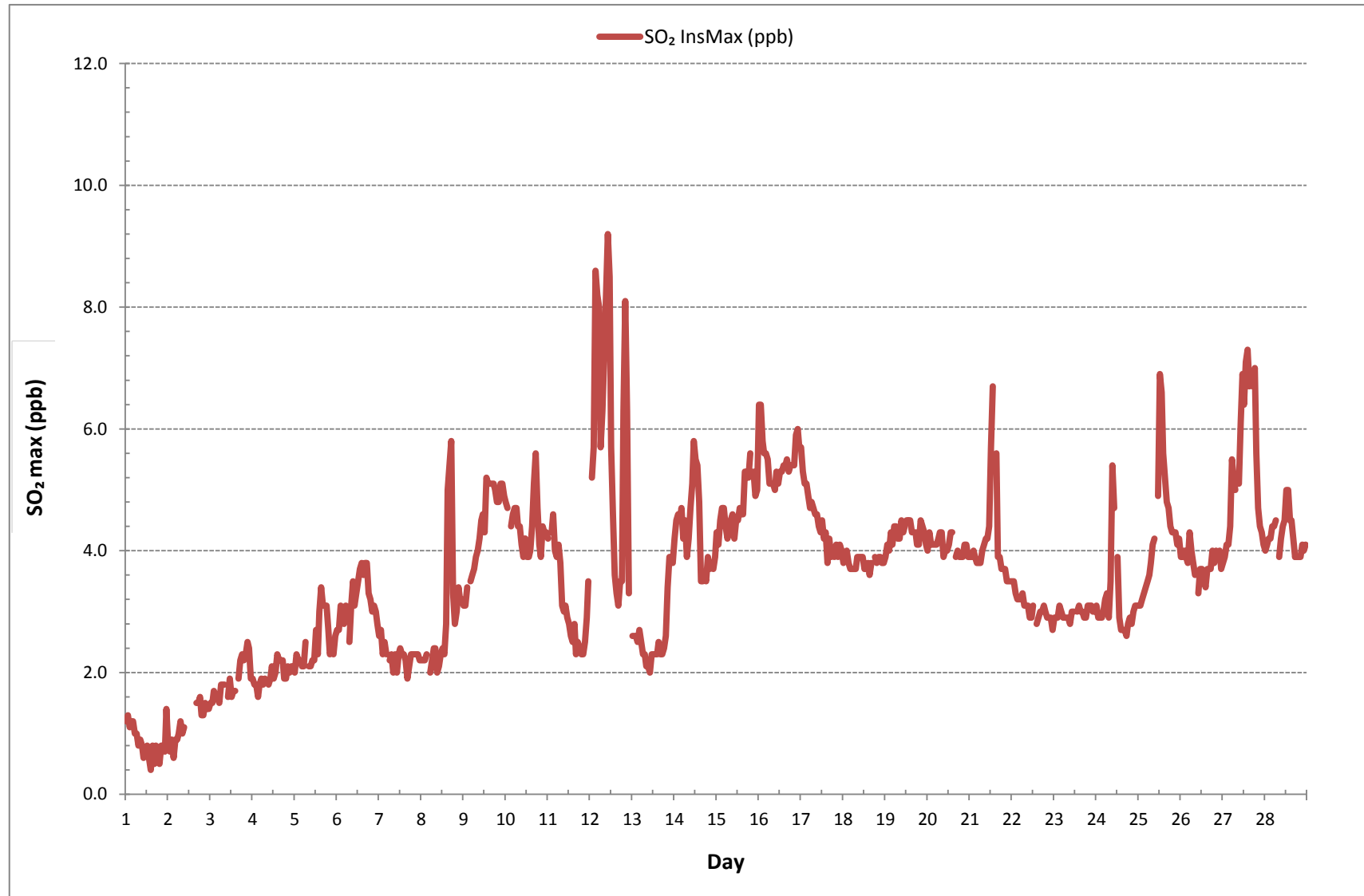
STATUS FLAG CODES

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:	637
MAXIMUM INSTANTANEOUS VALUE:	9.2 ppb @ HOUR(S) 10 ON DAY(S) 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1.4
OPERATIONAL TIME:	672 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO2[ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

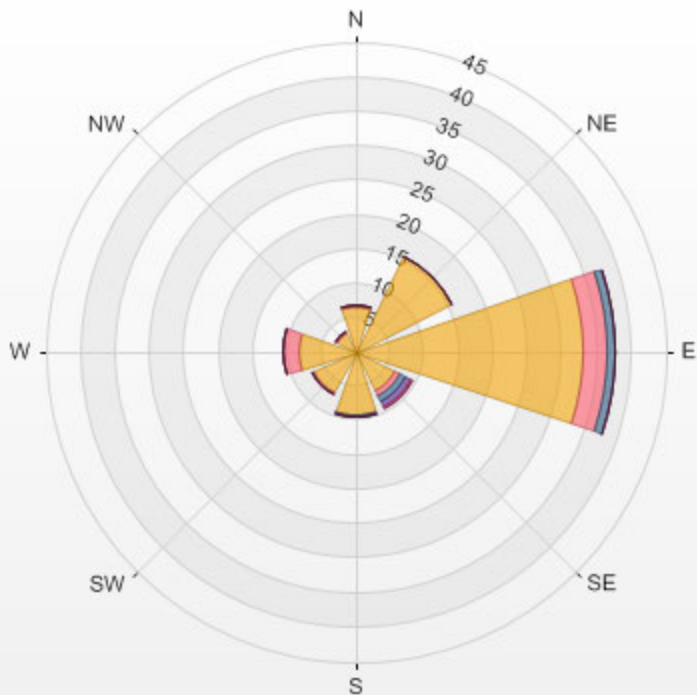
Calm: 0.00%

Calm Avg: 0.00 [ppb]

Direction	0.0-1.3	1.3-2.7	2.7-4.0	4.0-5.4	5.4-6.7	>6.7	Total
N	6.6	0.3	0.0	0.0	0.0	0.0	6.9
NE	15.7	0.0	0.0	0.0	0.0	0.0	15.7
E	33.2	3.5	0.9	0.0	0.0	0.0	37.6
SE	6.3	1.1	0.6	0.9	0.3	0.0	9.3
S	9.3	0.2	0.2	0.0	0.0	0.0	9.6
SW	6.7	0.3	0.0	0.0	0.0	0.0	7.1
W	8.3	2.2	0.0	0.0	0.0	0.0	10.5
NW	3.1	0.3	0.0	0.0	0.0	0.0	3.4
Summary	89.2	7.8	1.7	0.9	0.3	0.0	100.0

% Icon	Classes (ppb)	89		0.0-1.3	8		1.3-2.7	2		2.7-4.0	1		4.0-5.4	0		5.4-6.7	0		>6.7
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LICA ST. LINA Poll.: LICA ST. LINA-SO₂[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 0.00%



SO2[ppb] Calibration: LICA ST. LINA Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

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	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	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		
2	0.0	0.0	0.0	0.0	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	0.0	24		
3	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	0.0	0.0	0.0	24		
4	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	0.0	0.0	24		
5	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	0.0	0.0	24		
6	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	0.0	0.0	0.0	24		
7	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	0.0	0.0	24		
8	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	0.0	0.0	24		
9	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	0.0	0.0	24		
10	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	0.0	0.0	24		
11	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	0.0	0.0	24		
12	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	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	S	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	0.0	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	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S1	0.0	0.1	0.1	C1	C1	C1	C1	C1	C1	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	17	
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	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	
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	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	
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	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	
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	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	
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	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	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S1	S1	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	0.0	0.0	18	
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	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	
24	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	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	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	
26	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	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	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	
28	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	0.0	0.0	0.0	24	
HOURLY MAX	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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

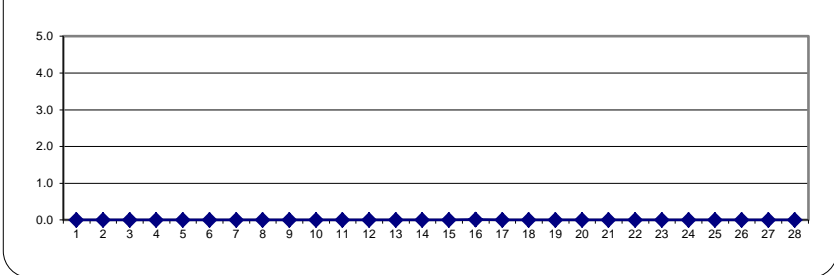
OBJECTIVE LIMIT:

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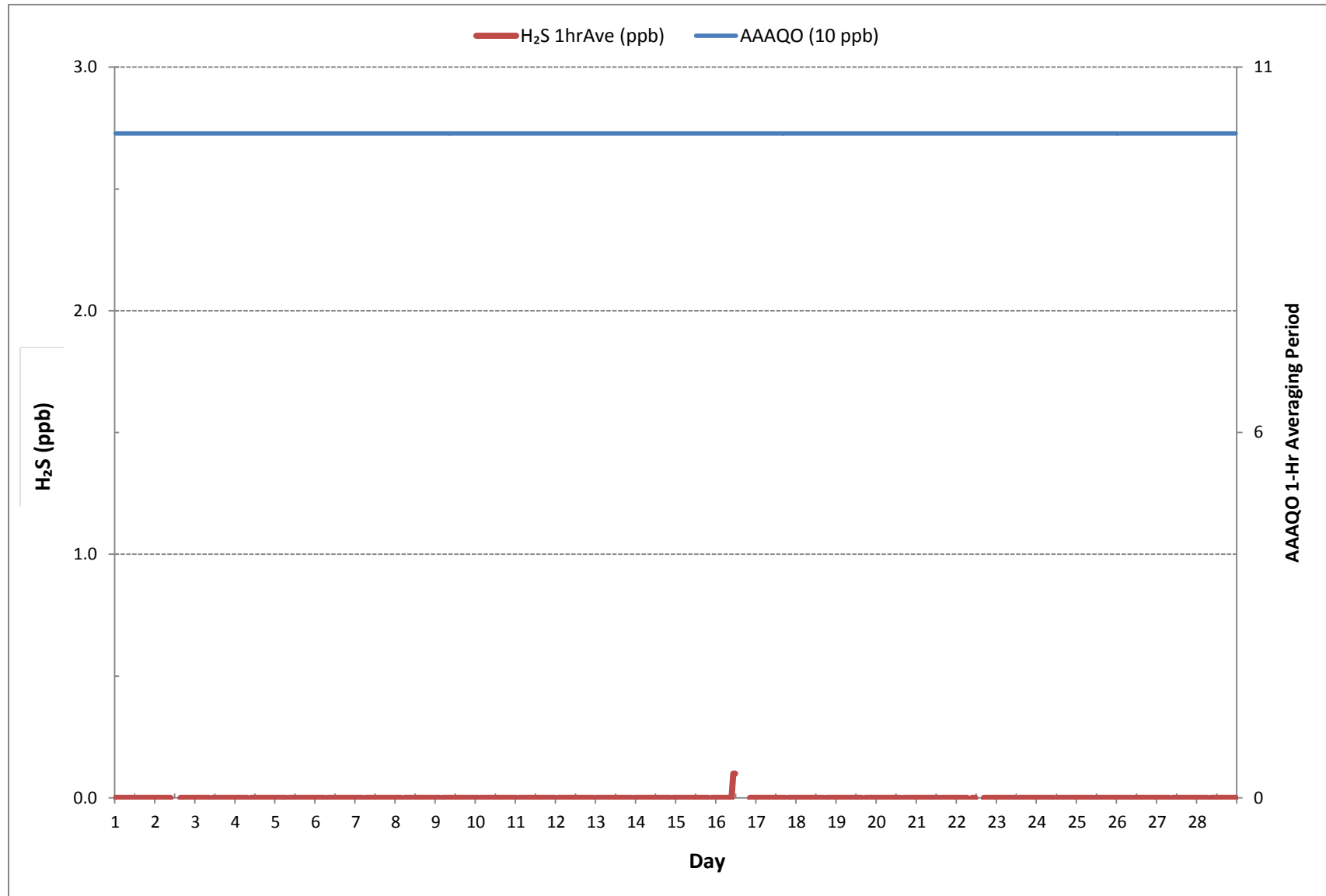
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	2				
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S)	VAR	ON DAY(S)	ALL	
MAXIMUM 1-HR AVERAGE:	0.1 ppb @ HOUR(S)	10 , 11	ON DAY(S)	16 , 16	
MAXIMUM 24-HR AVERAGE:	0.0 ppb		ON DAY(S)	ALL	
			VAR-VARIOUS		
IZS CALIBRATION TIME:	28	hrs	OPERATIONAL TIME:	659	hrs
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	98.1	%
STANDARD DEVIATION:	0.0		MONTHLY AVERAGE:	0.0	ppb

24 HR AVERAGES February 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2017

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	0.6	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	0.6	0.0	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	C	C	C	C	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.0	0.2	0.1	24
3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	S	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.3	24
4	0.4	0.4	0.3	1.4	0.2	0.3	0.4	0.3	S	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.3	0.2	1.4	0.4	24	
5	0.5	0.4	0.4	0.6	0.4	0.6	0.5	S	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.6	0.4	24
6	0.4	0.4	0.4	0.4	0.4	0.5	S	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.5	0.4	0.7	0.5	24	
7	0.4	0.5	0.4	0.3	0.4	S	0.4	0.4	0.5	0.3	0.3	0.4	0.5	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.3	0.5	0.4	24	
8	0.4	0.5	0.4	0.4	S	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.3	0.8	0.5	24	
9	0.8	0.7	0.8	S	1.0	0.9	1.1	1.1	1.1	1.0	1.1	1.1	1.2	1.3	1.4	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	0.7	1.4	1.1	24	
10	1.3	1.3	S	1.2	1.1	1.2	1.2	1.2	1.1	1.1	1.2	1.2	1.0	1.1	1.1	1.0	1.1	1.1	1.0	1.0	1.2	1.1	1.1	1.2	1.0	1.3	1.1	24	
11	1.1	S	1.0	1.0	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.8	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.5	0.4	0.5	0.4	1.1	0.7	24	
12	S	0.6	0.6	0.6	0.5	0.5	0.5	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.9	0.6	0.6	S	0.5	0.9	0.7	24	
13	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.5	0.4	0.3	0.4	0.4	0.3	0.4	S	0.5	0.3	0.6	0.4	24	
14	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.7	0.7	0.8	0.9	0.9	0.8	0.9	0.8	S	0.9	1.0	0.4	1.0	0.7	24	
15	1.1	1.1	1.2	1.1	1.1	1.1	1.3	1.3	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.4	S	1.3	1.3	1.4	1.1	1.4	1.3	24	
16	1.4	1.4	1.5	1.6	1.5	1.6	1.6	1.6	S1	1.7	1.7	1.7	C1	C1	C1	C1	C1	C1	1.0	S	0.9	0.8	0.8	0.8	0.8	1.7	1.4	17	
17	0.6	0.6	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.1	S	0.0	0.1	0.1	0.1	0.0	0.0	0.6	0.3	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	0.1	S	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	24	
19	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.8	0.3	0.2	0.2	0.3	0.3	S	0.3	S	0.3	0.2	0.3	0.3	0.2	0.3	0.0	0.8	0.2	24	
20	0.3	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.1	24	
21	0.1	0.0	0.1	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	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S1	S1	0.0	0.0	0.0	C1	C1	C1	C1	C1	0.7	0.6	0.7	0.7	0.8	0.8	0.7	0.0	0.8	0.3	17	
23	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.6	0.7	S	0.6	0.8	0.7	0.7	0.8	0.7	0.6	0.8	0.8	0.7	0.8	0.6	0.8	0.7	24	
24	0.8	0.7	0.7	0.8	0.7	0.8	0.7	0.7	0.6	0.7	0.5	S	0.6	0.7	0.5	0.6	0.7	0.5	0.6	0.6	0.6	0.8	0.7	0.8	0.5	0.8	0.7	24	
25	0.8	0.8	0.9	0.8	0.9	1.0	1.1	1.1	1.3	1.4	S	1.3	2.4	1.2	1.3	1.3	1.3	1.4	1.2	1.2	1.2	1.2	1.2	1.1	0.8	2.4	1.2	24	
26	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.9	S	1.0	0.9	0.8	0.9	0.9	0.9	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.1	0.8	1.2	1.0	24	
27	1.2	1.3	1.3	1.5	1.4	1.4	1.4	1.4	S	1.4	1.4	1.3	1.4	1.2	1.3	1.4	1.3	1.2	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.5	1.3	24	
28	1.2	1.1	1.3	1.3	1.3	1.2	1.2	S	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.3	1.1	24	
HOURLY MAX	1.4	1.4	1.5	1.6	1.5	1.6	1.6	1.6	1.3	1.7	1.7	1.7	2.4	1.4	1.4	1.4	1.3	1.4	1.3	1.4	1.3	1.3	1.3	1.4	1.0	1.3	1.1		
HOURLY AVG	0.6	0.6	0.6	0.7	0.6	0.6	0.6	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	0.6	0.6	0.6	0.6	0.6	0.6	0.6		

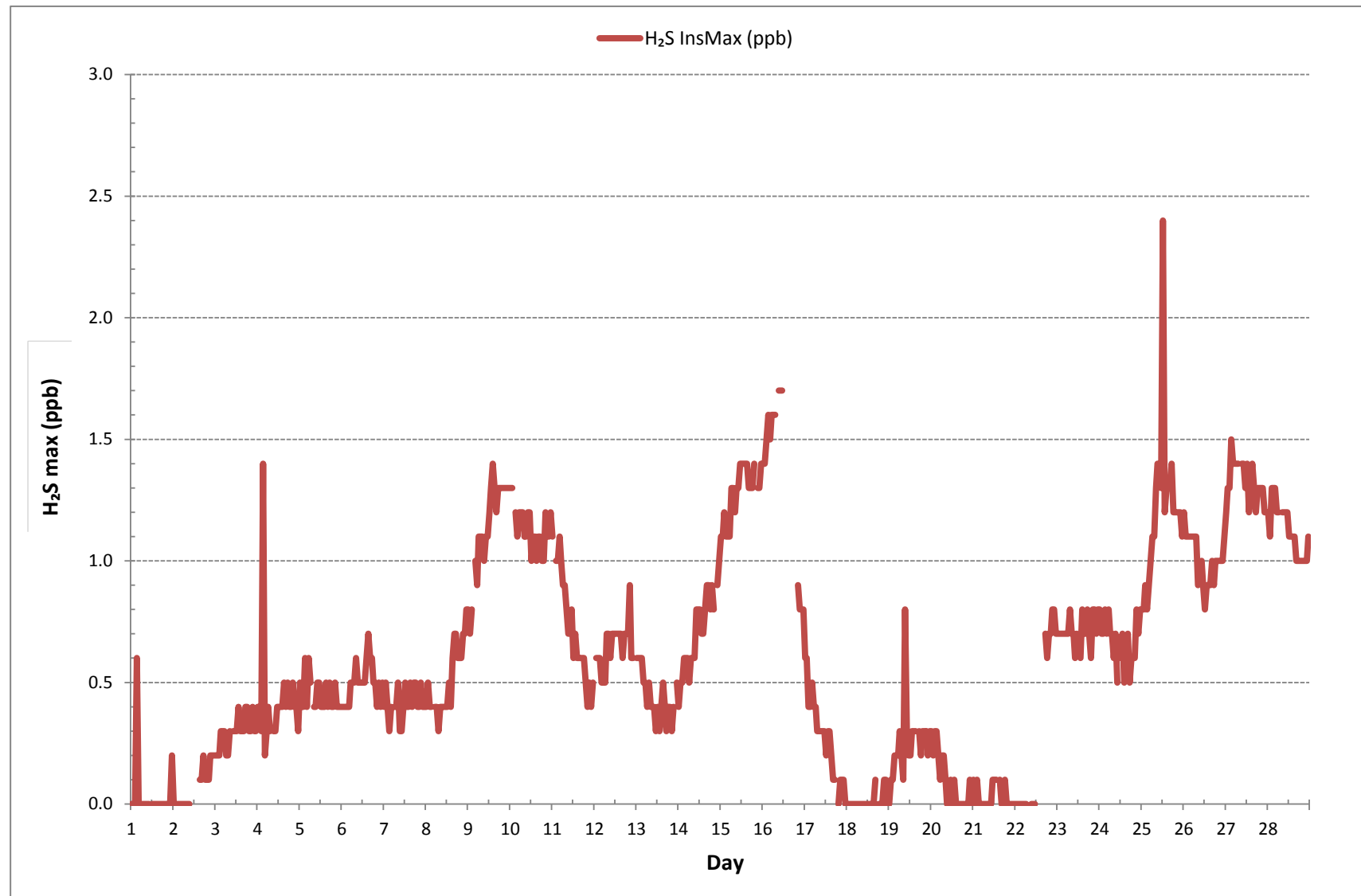
STATUS FLAG CODES

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

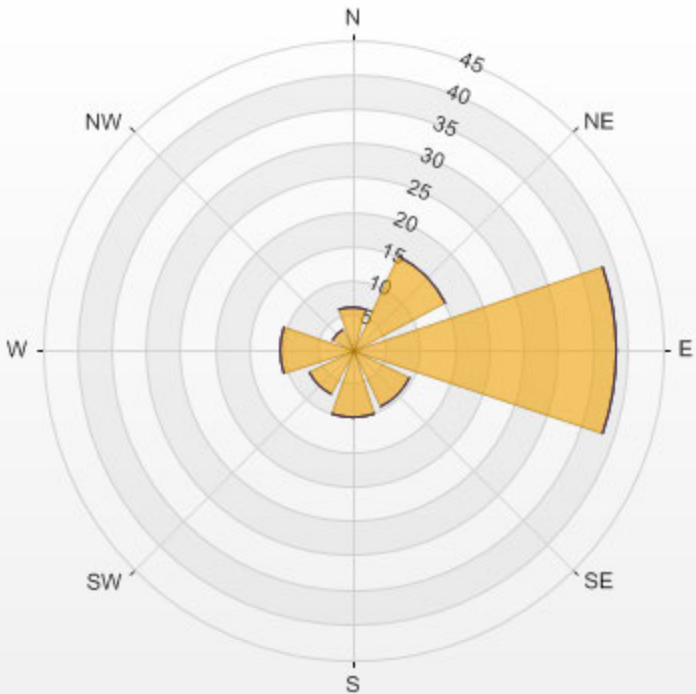
NUMBER OF NON-ZERO READINGS:	534
MAXIMUM INSTANTANEOUS VALUE:	2.4 ppb @ HOUR(S) 12 ON DAY(S) 25
	VAR-VARIOUS
IZS CALIBRATION TIME:	28 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	0.4
OPERATIONAL TIME:	658 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



% Icon Classes (ppb)	100	0.0-0.6	0	0.6-1.3	0	1.3-1.9	0	>1.9
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LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 0.00%



TOTAL HYDROCARBON



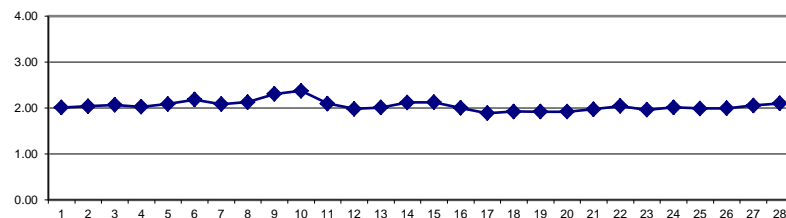
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	1.99	1.97	1.97	1.97	1.97	1.97	1.98	1.98	1.98	2.00	2.01	S	1.99	2.00	2.01	2.02	2.08	2.05	2.06	2.05	2.04	2.08	2.06	2.07	1.97	2.08	2.01	24
2	2.05	2.05	2.05	2.06	2.07	2.06	2.05	2.04	2.05	2.10	S	1.99	1.99	1.96	2.01	1.99	2.03	2.05	2.06	2.06	2.08	2.07	2.06	2.06	1.96	2.10	2.04	24
3	2.08	2.07	2.10	2.09	2.08	2.03	2.03	2.05	2.05	S	2.11	C	C	C	C	2.06	2.10	2.05	2.08	2.08	2.09	2.08	2.08	2.06	2.03	2.11	2.07	24
4	2.06	2.05	2.06	2.04	2.05	2.04	2.03	2.04	S	2.00	2.01	2.01	2.01	2.01	2.00	2.00	2.01	2.02	2.03	2.03	2.04	2.03	2.03	2.04	2.00	2.06	2.03	24
5	2.06	2.09	2.12	2.11	2.11	2.14	2.13	S	2.04	2.09	2.08	2.04	2.06	2.05	2.07	2.10	2.10	2.12	2.11	2.11	2.09	2.08	2.08	2.07	2.04	2.14	2.09	24
6	2.08	2.08	2.06	2.07	2.06	2.07	S	2.09	2.16	2.21	2.20	2.15	2.11	2.15	2.16	2.30	2.47	2.37	2.29	2.25	2.18	2.18	2.20	2.33	2.06	2.47	2.18	24
7	2.23	2.18	2.14	2.10	2.10	S	2.09	2.09	2.10	2.14	2.09	2.05	2.01	2.00	1.99	2.01	2.02	2.05	2.06	2.07	2.07	2.11	2.13	2.14	1.99	2.23	2.09	24
8	2.13	2.11	2.10	2.11	S	2.10	2.13	2.15	2.14	2.13	2.11	2.11	2.11	2.10	2.09	2.11	2.16	2.18	2.11	2.12	2.14	2.19	2.21	2.22	2.09	2.22	2.13	24
9	2.22	2.24	2.24	S	2.24	2.26	2.25	2.26	2.21	2.20	2.23	2.24	2.37	2.46	2.41	2.40	2.44	2.39	2.29	2.29	2.33	2.37	2.37	2.33	2.20	2.46	2.31	24
10	2.38	2.31	S	2.21	2.29	2.43	2.43	2.44	2.33	2.24	2.21	2.21	2.21	2.31	2.46	2.39	2.30	2.38	2.41	2.45	2.57	2.56	2.62	2.51	2.21	2.62	2.38	24
11	2.37	S	2.33	2.36	2.31	2.32	2.34	2.31	2.22	2.10	2.06	1.99	1.94	1.93	1.90	1.92	1.92	1.95	1.96	1.99	1.98	2.01	2.02	2.05	1.90	2.37	2.10	24
12	S	2.05	2.06	2.05	2.03	2.02	2.00	2.02	2.04	2.02	2.00	1.95	1.91	1.93	1.93	1.92	1.93	1.95	1.96	1.97	2.00	1.98	1.97	S	1.91	2.06	1.99	24
13	1.96	1.97	1.99	1.99	1.99	2.01	1.99	2.01	2.01	2.03	2.04	2.03	2.01	2.03	2.01	2.03	2.03	2.03	2.02	2.02	2.03	2.04	S	2.04	1.96	2.04	2.01	24
14	2.06	2.10	2.09	2.10	2.12	2.18	2.25	2.28	2.26	2.26	2.31	2.18	2.12	2.10	2.08	2.08	2.04	2.05	2.04	2.04	2.04	S	2.03	2.07	2.03	2.31	2.13	24
15	2.08	2.09	2.12	2.15	2.19	2.21	2.21	2.16	2.11	2.08	2.13	2.30	2.28	2.16	2.07	2.01	2.04	2.08	2.10	2.09	S	2.10	2.13	2.09	2.01	2.30	2.13	24
16	2.05	2.06	2.00	2.00	1.94	1.98	2.09	2.10	2.01	1.94	1.85	1.85	1.84	2.09	2.13	2.14	2.05	2.06	2.01	S	1.96	1.96	1.99	1.98	1.84	2.14	2.00	24
17	1.95	1.90	1.92	1.93	1.90	1.95	1.90	1.87	1.88	1.88	1.91	1.85	1.86	1.87	1.88	1.88	1.87	1.88	S	1.87	1.87	1.88	1.89	1.89	1.85	1.95	1.89	24
18	1.90	1.91	1.92	1.91	1.91	1.93	1.93	1.98	2.05	1.99	1.93	1.90	1.92	1.93	1.92	1.93	1.96	S	1.91	1.93	1.92	1.89	1.89	1.89	1.89	2.05	1.93	24
19	1.88	1.87	1.86	1.86	1.85	1.83	1.83	1.85	1.85	1.86	1.89	1.91	1.93	1.97	1.96	1.99	S	2.02	2.03	2.02	2.01	2.02	2.01	1.97	1.83	2.03	1.92	24
20	1.97	1.99	1.99	1.93	1.90	1.89	1.89	1.92	1.92	1.91	1.91	1.92	1.91	1.91	1.91	S	1.95	1.92	1.91	1.89	1.90	1.91	1.93	1.95	1.89	1.99	1.92	24
21	1.95	1.95	1.94	1.96	1.98	1.97	1.95	1.94	1.95	1.98	1.99	2.00	2.01	2.01	S	1.94	1.92	1.95	1.95	2.00	2.03	2.02	2.00	2.02	1.92	2.03	1.97	24
22	2.03	2.04	2.04	2.04	2.07	2.08	2.10	2.11	2.12	2.13	2.11	2.12	2.04	S	1.90	1.93	2.00	1.99	2.01	2.04	2.04	2.04	2.04	2.02	1.90	2.13	2.05	24
23	2.02	2.01	2.01	2.00	2.02	2.00	2.00	1.99	1.99	1.99	2.00	1.98	S	1.91	1.89	1.88	1.88	1.91	1.94	1.94	1.94	1.95	1.95	1.94	1.88	2.02	1.96	24
24	1.93	1.93	1.93	1.93	2.03	2.11	2.15	2.07	1.97	1.98	2.01	S	1.97	2.00	2.01	2.00	2.03	2.03	2.05	2.03	2.05	2.05	2.06	2.06	1.93	2.15	2.02	24
25	2.05	2.04	2.06	2.05	2.06	2.09	2.10	2.12	2.10	2.08	S	1.98	1.96	1.92	1.91	1.91	1.91	1.92	1.91	1.92	1.91	1.92	1.93	1.93	1.91	2.12	1.99	24
26	1.93	1.91	1.92	1.90	1.91	1.94	1.96	1.96	1.98	S	2.00	2.02	2.02	2.02	2.02	2.02	2.03	2.02	2.02	2.01	2.11	2.07	2.06	2.06	1.90	2.11	2.00	24
27	2.06	2.06	2.07	2.08	2.08	2.06	2.07	2.08	S	2.06	2.07	2.07	2.03	1.99	1.99	1.98	1.97	1.98	2.05	2.12	2.15	2.09	2.11	2.12	1.97	2.15	2.06	24
28	2.11	2.14	2.10	2.11	2.10	2.10	2.12	S	2.12	2.13	2.15	2.12	2.04	2.03	2.02	2.00	2.00	2.02	2.08	2.20	2.10	2.23	2.22	2.10	2.00	2.23	2.10	24
HOURLY MAX	2.38	2.31	2.33	2.36	2.31	2.43	2.43	2.44	2.33	2.26	2.31	2.30	2.37	2.46	2.46	2.40	2.47	2.39	2.41	2.45	2.57	2.56	2.62	2.51				
HOURLY AVG	2.06	2.04	2.04	2.04	2.05	2.07	2.07	2.07	2.06	2.06	2.05	2.04	2.03	2.03	2.03	2.03	2.05	2.05	2.05	2.06	2.06	2.07	2.08	2.07				

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

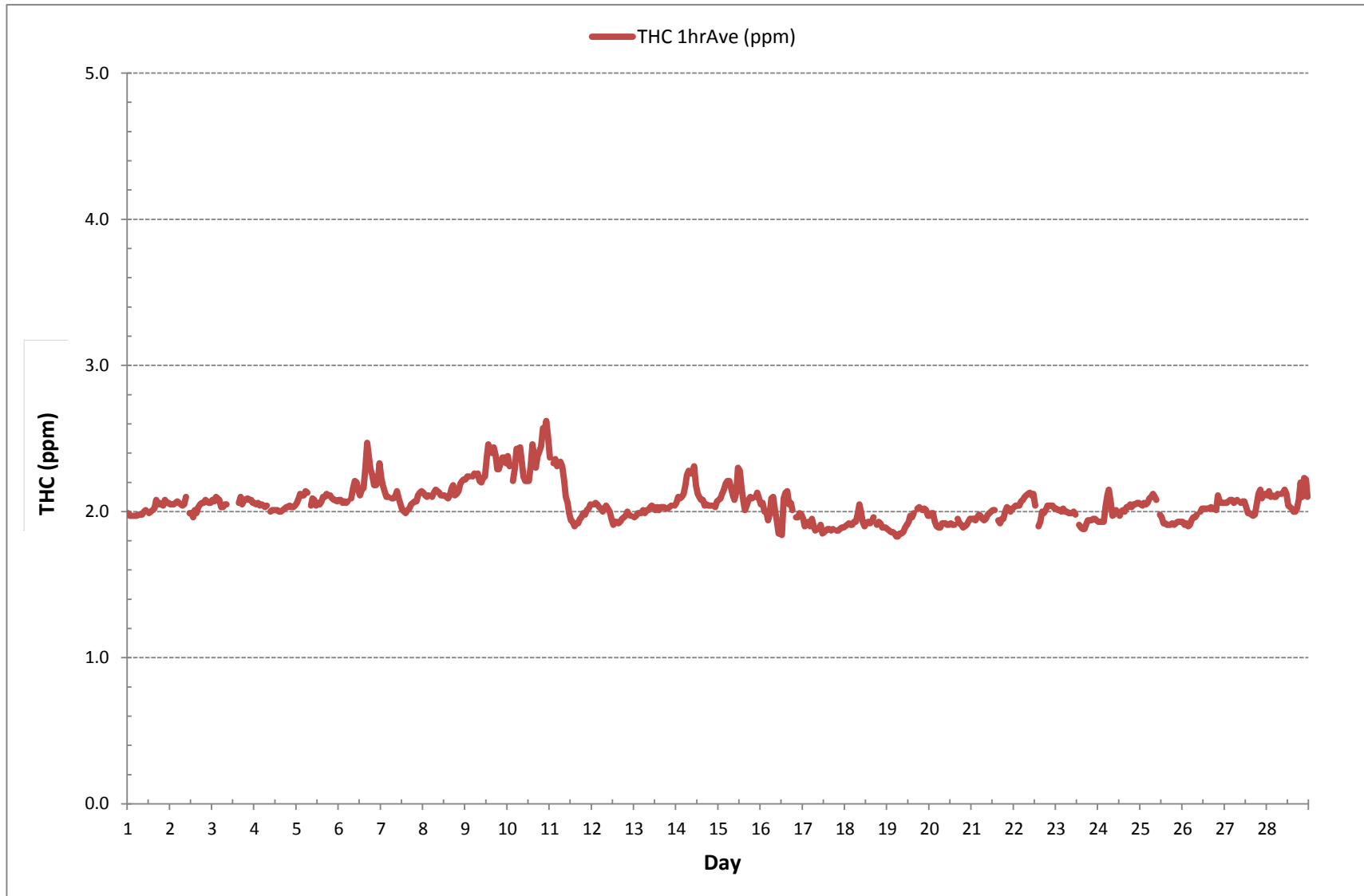
24 HR AVERAGES February 2017



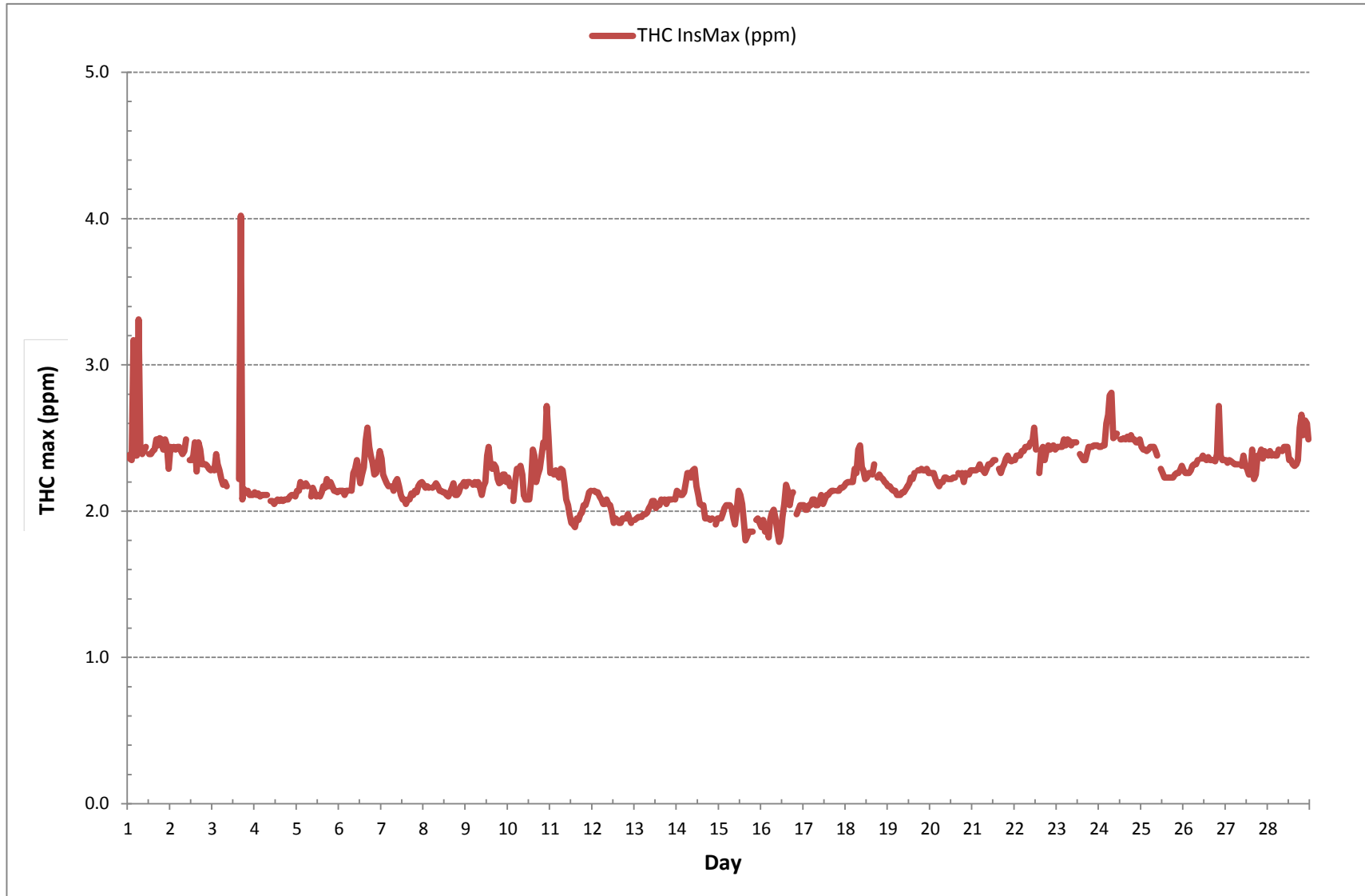
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	639			
MINIMUM 1-HR AVERAGE:	1.83 ppm	@ HOUR(S)	5 , 6	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	2.62 ppm	@ HOUR(S)	22	ON DAY(S)
MAXIMUM 24-HR AVERAGE:	2.38 ppm			ON DAY(S)
				10
				19 , 19
				10
				VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.13	MONTHLY AVERAGE:	2.05 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)

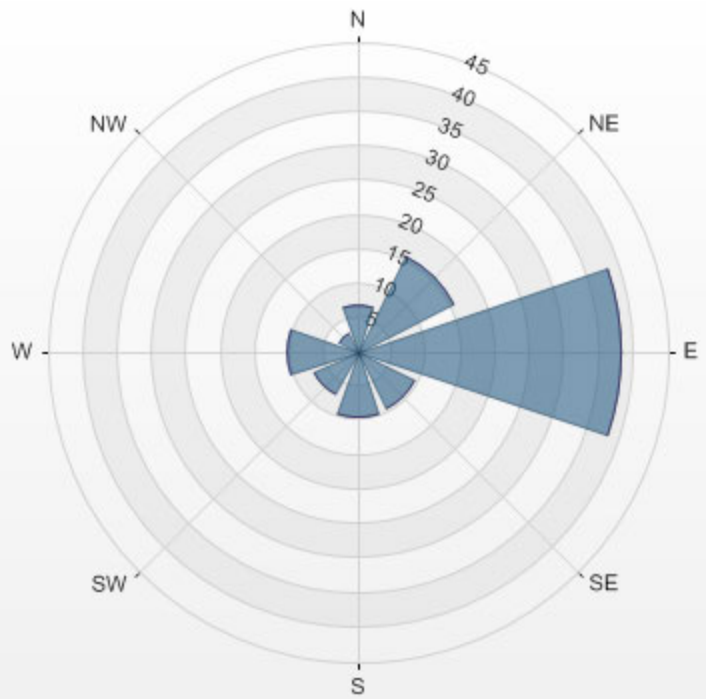


TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

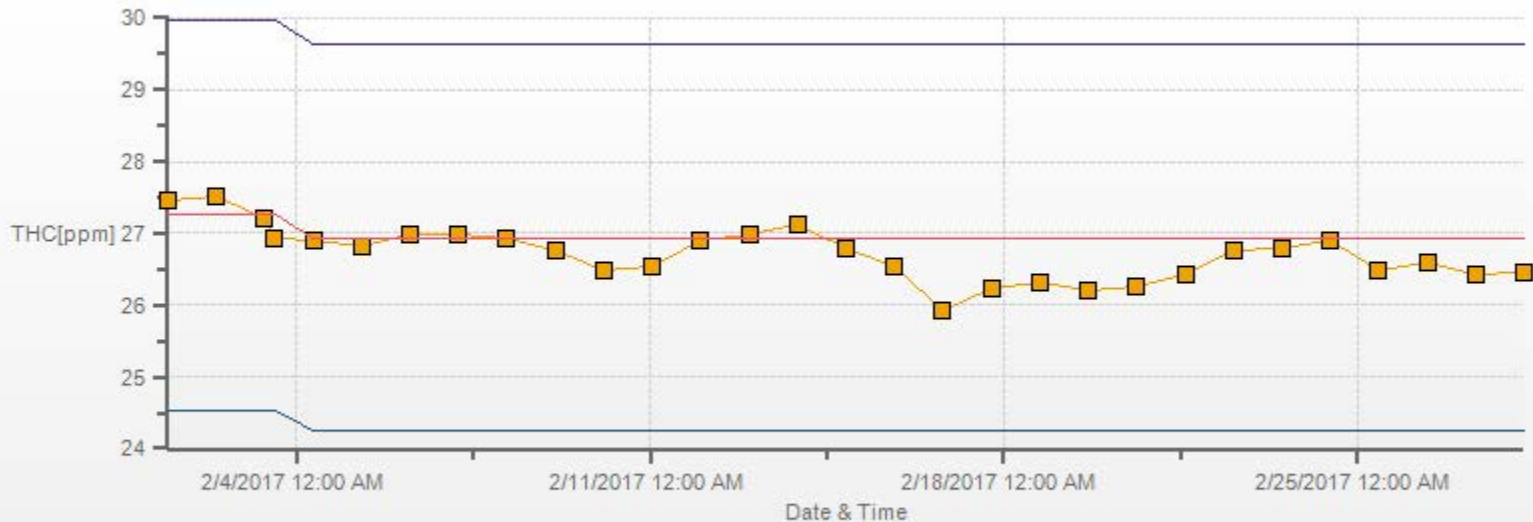


% Icon Classes (ppm) 0 0.0-0.9 0 0.9-1.8 100 1.8-2.6 0 >2.6

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 0.00%



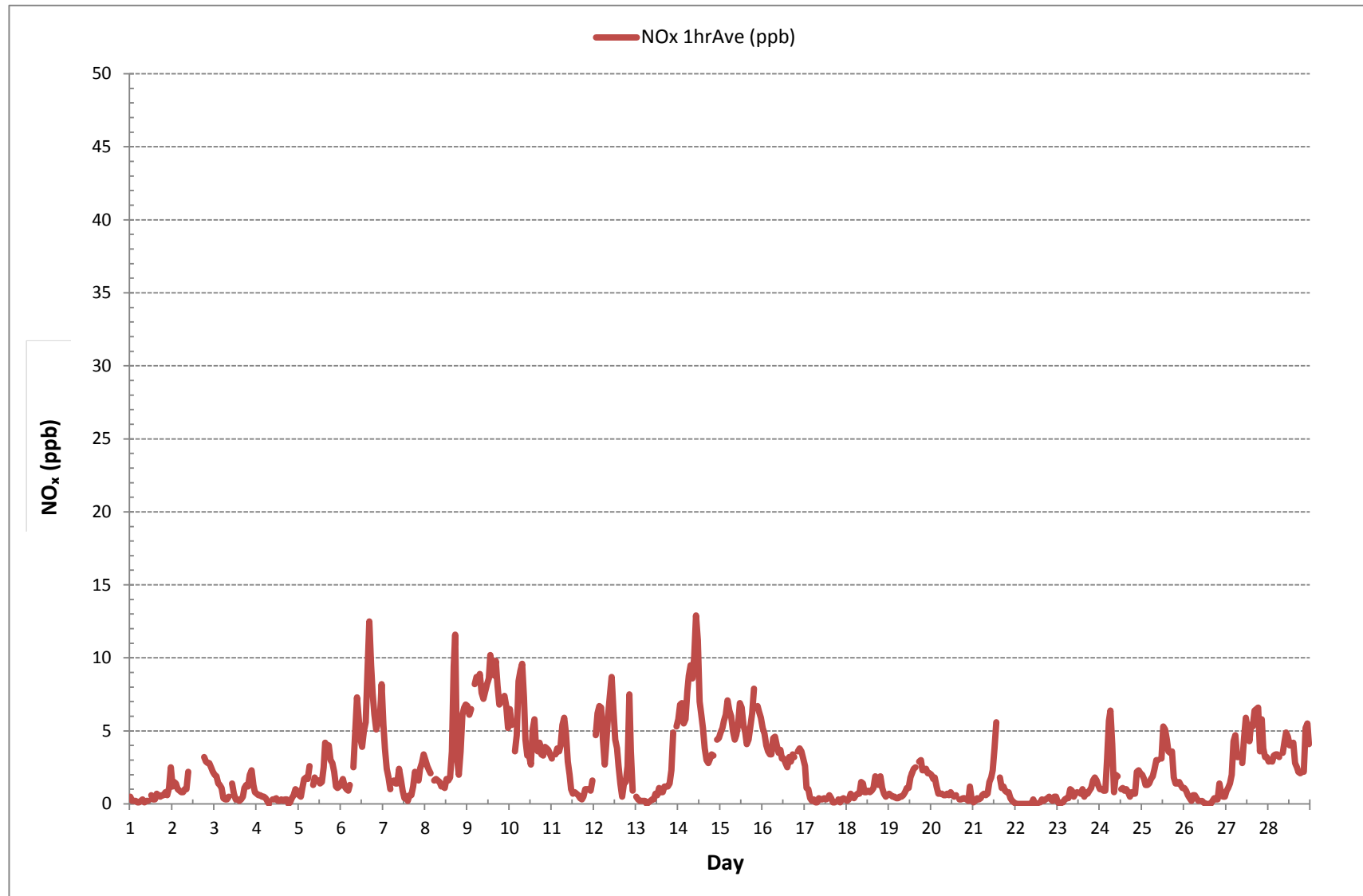
THC[ppm] Calibration: LICA ST. LINA Monthly: 2017/02 Type: Span



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

OXIDES OF NITROGEN

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2017

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	0.5	0.0	0.2	0.0	0.0	0.0	0.0	0.7	0.0	0.4	0.1	S	1.2	0.7	0.4	2.8	1.0	0.7	1.2	1.3	1.0	0.5	3.0	1.1	0.0	3.0	0.7	24
2	1.3	1.8	1.6	0.7	0.6	1.0	0.5	1.0	0.8	2.4	S	C	C	C	C	C	C	C	3.5	3.4	3.2	3.0	2.8	2.8	0.5	3.5	1.9	24
3	2.3	2.0	1.7	1.6	1.4	0.6	0.6	0.5	0.5	S	2.6	7.9	0.2	0.3	0.2	0.7	1.0	1.9	1.3	2.4	2.1	2.4	2.1	0.9	0.2	7.9	1.6	24
4	1.1	0.8	0.6	0.6	0.6	0.5	0.3	0.3	S	0.3	0.6	0.7	0.3	0.5	0.6	0.6	2.1	1.9	0.2	0.9	1.9	1.0	1.3	2.4	0.2	2.4	0.9	24
5	0.8	1.0	3.6	2.2	2.8	2.1	3.9	S	1.9	3.2	4.2	4.2	1.9	1.9	3.7	5.5	5.6	5.0	3.8	3.3	2.8	1.9	1.6	1.8	0.8	5.6	3.0	24
6	1.9	2.6	2.0	1.6	1.2	1.9	S	4.7	7.5	8.0	6.4	4.7	4.3	6.0	8.4	11.9	13.3	10.9	8.7	7.0	5.5	5.9	6.7	8.7	1.2	13.3	6.1	24
7	7.3	4.3	2.8	2.8	1.2	S	3.1	2.0	1.7	4.2	2.3	1.3	0.6	0.8	1.0	1.3	2.1	1.9	3.0	2.0	2.0	3.0	3.0	3.7	0.6	7.3	2.5	24
8	3.4	2.8	2.3	2.2	S	2.1	2.0	2.1	2.2	1.5	1.7	2.1	2.8	11.7	3.6	7.1	22.2	14.1	17.5	2.8	4.5	8.3	7.4	7.4	1.5	22.2	5.8	24
9	7.4	6.9	7.4	S	9.3	9.9	9.3	10.3	8.7	9.1	9.0	9.6	11.2	12.0	10.1	9.7	10.9	10.4	8.0	7.8	7.9	8.5	8.4	6.1	6.1	12.0	9.0	24
10	7.4	6.1	S	4.5	6.3	9.8	9.8	11.0	10.2	6.2	4.1	4.3	3.4	6.3	6.6	6.0	4.6	5.0	4.0	4.1	4.4	4.4	4.5	3.9	3.4	11.0	6.0	24
11	3.9	S	4.4	4.4	4.5	5.4	6.2	7.7	5.9	3.7	2.6	1.8	1.2	1.5	1.8	0.9	0.7	0.7	1.3	1.4	1.3	1.1	1.1	2.5	0.7	7.7	2.9	24
12	S	8.2	8.2	7.9	7.3	5.6	3.4	5.1	7.0	8.1	9.5	8.1	5.4	4.8	9.4	2.4	1.5	1.9	2.1	6.9	8.6	6.4	1.5	S	1.5	9.5	5.9	24
13	1.1	0.9	0.7	0.7	0.7	0.9	0.5	1.1	0.7	0.9	1.3	2.2	2.2	2.4	1.4	1.9	3.3	2.7	2.6	1.9	4.1	5.7	S	5.8	0.5	5.8	2.0	24
14	6.6	7.8	7.9	6.1	7.4	8.2	9.5	11.6	9.9	10.8	14.3	13.6	8.7	7.9	5.4	4.7	4.0	3.2	3.4	3.7	3.4	S	4.8	4.7	3.2	14.3	7.3	24
15	5.2	5.5	6.0	6.7	8.7	7.2	6.4	6.1	4.6	4.8	6.0	7.4	7.1	6.4	6.4	4.6	19.4	5.9	31.6	43.4	S	7.4	7.1	6.4	4.6	43.4	9.6	24
16	5.6	5.1	4.6	4.3	3.7	4.2	5.0	5.0	4.5	4.0	5.4	3.5	4.3	5.3	3.1	4.3	3.7	5.4	3.8	S	4.5	4.3	4.3	3.6	3.1	5.6	4.4	24
17	3.7	1.8	1.6	0.9	0.5	0.7	0.4	0.4	3.9	1.3	1.3	0.9	0.6	0.8	9.1	0.7	0.6	0.4	S	0.7	0.4	0.5	0.4	0.5	0.4	9.1	1.4	24
18	0.4	0.7	0.9	0.7	0.7	1.0	1.1	1.1	2.0	1.5	1.1	1.1	1.1	1.1	1.1	1.4	2.6	S	1.4	2.3	1.4	0.7	0.7	0.6	0.4	2.6	1.2	24
19	0.6	0.6	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.5	0.9	0.9	1.7	1.7	2.0	2.2	S	2.6	2.8	2.0	2.1	2.2	1.8	1.8	0.3	2.8	1.3	24
20	2.0	1.7	1.7	1.2	0.6	0.6	0.7	0.8	0.8	0.6	0.9	1.2	0.9	1.3	1.8	S	0.8	0.9	0.8	0.6	0.7	0.7	9.8	0.7	0.6	9.8	1.4	24
21	0.5	0.6	0.9	0.7	1.0	0.9	1.4	1.9	1.8	2.5	2.6	3.6	5.5	6.8	S	6.6	1.9	3.2	2.2	1.5	2.6	0.9	1.0	0.6	0.5	6.8	2.2	24
22	0.3	0.5	0.3	0.1	0.5	0.4	1.0	1.1	0.3	0.4	2.2	0.3	0.3	S	0.8	0.8	0.7	1.2	1.3	2.1	0.7	0.4	2.9	1.5	0.1	2.9	0.9	24
23	0.2	0.2	0.2	0.2	0.3	0.5	1.6	2.5	0.9	0.6	1.4	0.9	S	0.8	14.7	0.4	2.2	0.7	2.5	1.9	3.0	2.2	1.6	1.1	0.2	14.7	1.8	24
24	1.0	0.9	1.0	1.1	5.1	5.8	8.3	9.9	0.9	2.1	2.1	S	1.2	1.4	0.9	0.9	1.2	0.7	1.7	1.4	0.9	43.7	3.4	2.5	0.7	43.7	4.3	24
25	2.7	1.7	1.4	1.4	1.2	1.6	1.6	2.7	5.1	3.0	S	3.0	6.0	5.5	5.4	5.2	4.1	4.8	3.0	1.7	1.4	1.9	1.6	1.1	1.1	6.0	2.9	24
26	1.3	1.0	0.8	0.7	0.5	1.1	0.9	0.8	0.6	S	1.7	0.3	0.3	0.3	0.2	0.3	0.8	1.3	1.3	0.9	2.4	1.3	0.8	1.0	0.2	2.4	0.9	24
27	1.2	1.3	1.7	2.7	5.4	17.6	3.9	3.6	S	4.0	15.9	6.8	6.5	5.6	6.2	7.7	15.7	9.7	9.9	5.4	6.9	5.2	4.1	4.0	1.2	17.6	6.6	24
28	3.7	3.9	3.8	4.3	4.4	4.4	4.9	S	6.3	5.7	6.2	5.8	5.0	5.0	5.6	4.1	3.5	3.3	3.2	3.4	3.2	6.8	7.2	5.3	3.2	7.2	4.7	24
HOURLY MAX	7.4	8.2	8.2	7.9	9.3	17.6	9.8	11.6	10.2	10.8	15.9	13.6	11.2	12.0	14.7	11.9	22.2	14.1	31.6	43.4	8.6	43.7	9.8	8.7				
HOURLY AVG	2.7	2.6	2.5	2.2	2.8	3.5	3.2	3.6	3.4	3.5	4.1	3.8	3.2	3.8	4.2	3.6	5.0	3.9	4.7	4.3	3.1	4.8	3.5	3.1				

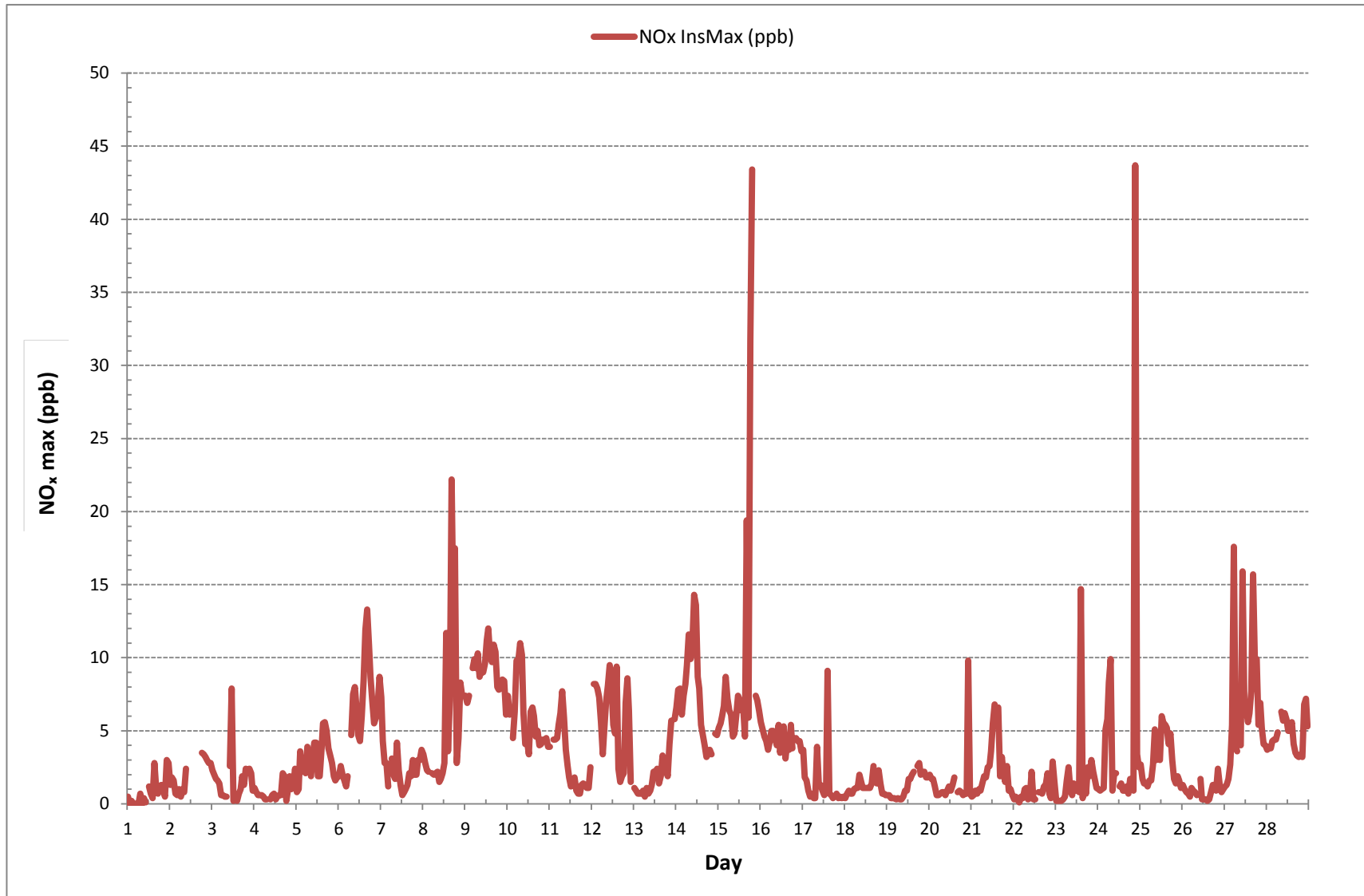
STATUS FLAG CODES

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:	630
MAXIMUM INSTANTANEOUS VALUE:	43.7 ppb @ HOUR(S) 21 ON DAY(S) 24
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	4.1

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



% Icon Classes (ppb)

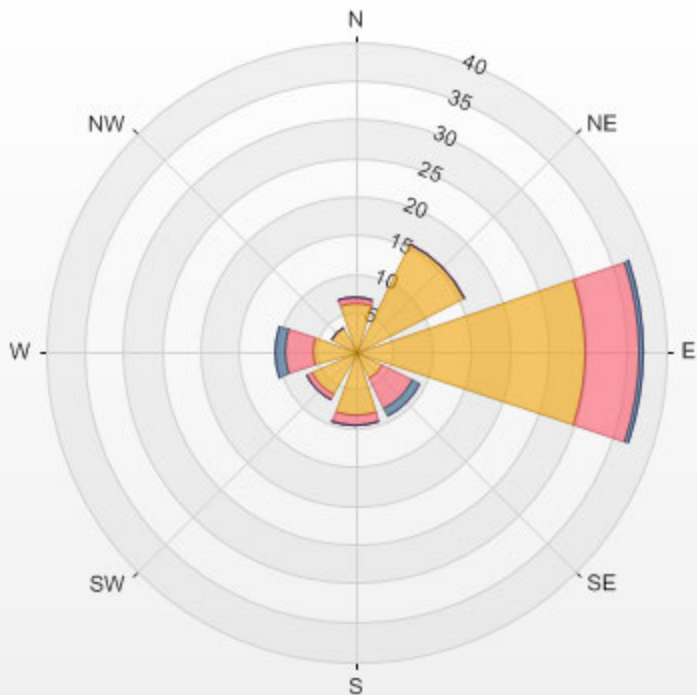
79 0.0-4.3

18 4.3-8.7

3 8.7-13.0

0 >13.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 0.00%



NITRIC OXIDES



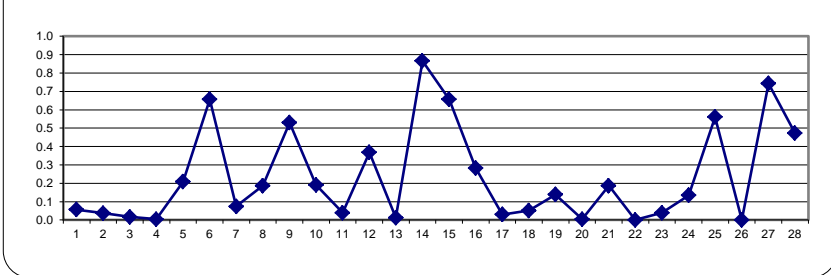
NITRIC OXIDE Hourly Averages (NO ppb)

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	0.1	0.0	S	0.4	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.4	0.1	24				
2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4	S	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24				
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	S	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	0.1	0.0	24				
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.3	0.5	0.7	0.4	0.5	0.8	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2	24				
6	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.2	1.7	2.0	1.6	1.5	1.7	1.7	2.4	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	2.4	0.7	24					
7	0.0	0.0	0.0	0.0	0.0	S	0.2	0.1	0.1	0.4	0.6	0.2	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	0.6	0.1	24				
8	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.6	0.4	0.5	0.7	1.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.2	24				
9	0.0	0.0	0.0	S	0.2	0.1	0.0	0.0	0.3	0.6	1.0	1.5	2.1	2.4	2.0	1.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.5	24				
10	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.3	0.6	0.4	1.0	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.2	24					
11	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.3	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	0.3	0.0	24				
12	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	2.4	2.1	0.9	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	2.4	0.4	24				
13	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	0.2	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					
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	2.5	4.6	3.9	2.4	2.1	1.3	0.8	0.4	0.1	0.1	0.1	0.0	S	0.5	0.2	0.0	4.6	0.9	24					
15	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.6	0.9	1.4	1.6	1.8	1.4	1.2	0.8	0.3	0.6	0.6	S	0.5	0.4	0.3	0.2	1.8	0.7	24					
16	0.4	0.3	0.3	0.0	0.2	0.0	0.0	0.2	0.3	0.8	1.0	0.6	0.8	0.5	0.4	0.4	0.1	0.2	0.0	S	0.0	0.0	0.0	0.0	0.0	1.0	0.3	24					
17	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	0.2	0.2	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24					
18	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	S	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1	24					
19	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.1	0.1	0.1	0.4	0.4	0.3	0.3	S	0.3	0.1	0.1	0.2	0.1	0.0	0.2	0.0	0.4	0.1	24					
20	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	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					
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	1.2	2.1	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.2	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	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				
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	S	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	24				
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	S	0.3	0.3	0.2	0.3	0.2	0.0	0.1	0.0	0.0	0.6	0.2	0.2	0.0	0.6	0.1	24					
25	0.1	0.2	0.2	0.2	0.2	0.3	0.1	0.3	0.8	1.1	S	1.3	2.4	2.1	1.4	0.8	0.7	0.3	0.1	0.0	0.1	0.2	0.0	0.0	0.0	2.4	0.6	24					
26	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				
27	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	S	1.1	1.8	2.7	2.3	1.9	2.3	1.9	1.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.7	24				
28	0.0	0.0	0.0	0.1	0.0	0.1	0.1	S	0.9	1.3	1.6	1.6	1.2	1.4	1.5	0.6	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.6	0.5	24					
HOURLY MAX	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.9	2.5	4.6	3.9	2.4	2.4	2.3	2.4	2.0	0.6	0.6	0.6	0.2	0.6	0.5	0.3									
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.7	0.8	0.7	0.8	0.6	0.5	0.4	0.1	0.0	0.0	0.0	0.1	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

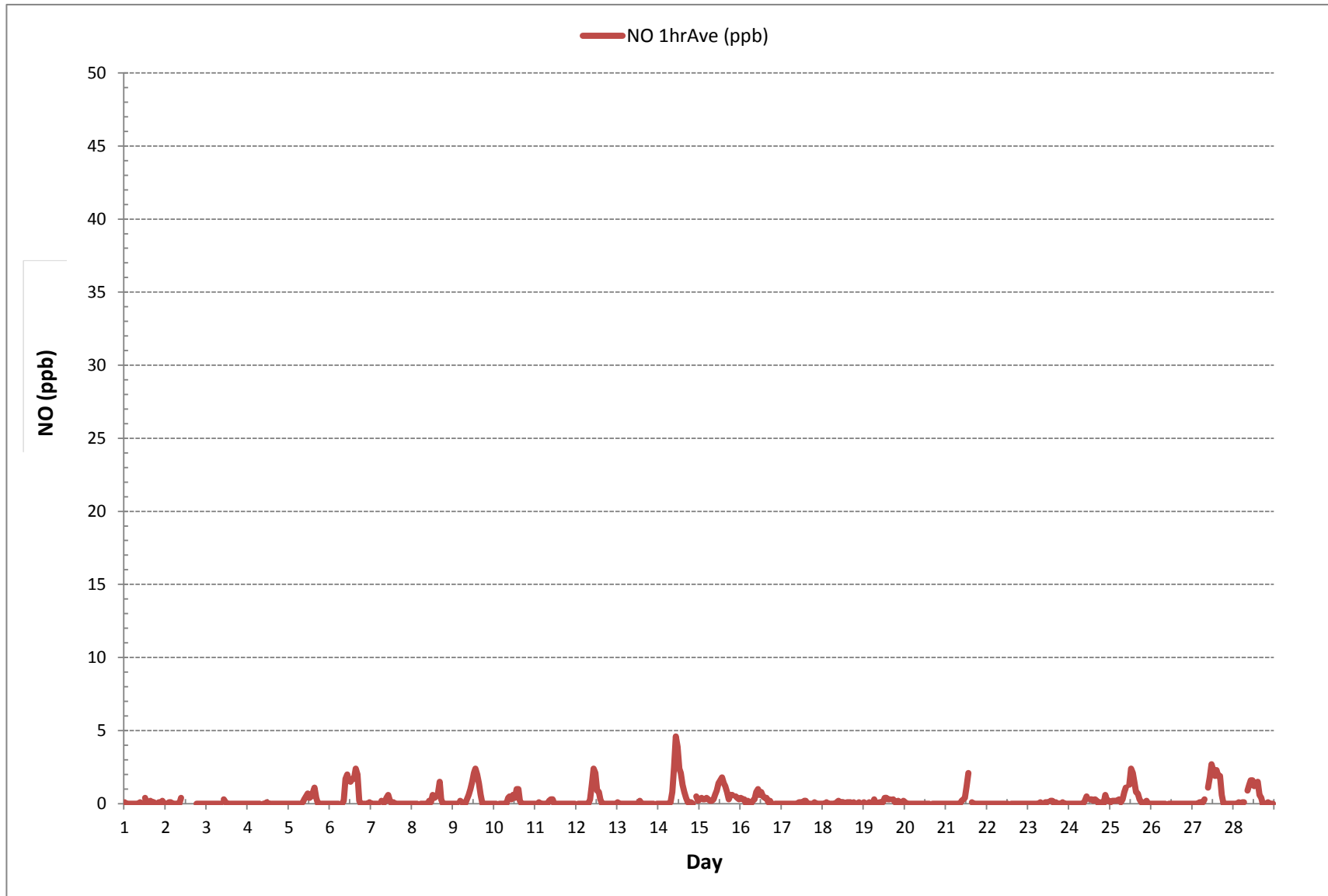
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	237				
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	4.6	ppb	@ HOUR(S)	10	ON DAY(S)
MAXIMUM 24-HR AVERAGE:	0.9	ppb			ON DAY(S)
					VAR-VARIOUS
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.5		MONTHLY AVERAGE:	0.2	ppb

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2017

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	1.1	0.9	1.1	0.7	0.7	0.8	0.7	1.2	0.8	1.1	0.7	S	1.7	1.0	0.9	2.3	1.0	1.0	1.0	1.0	1.4	1.0	2.6	0.8	0.7	2.6	1.1	24
2	0.9	0.9	1.1	1.1	0.8	1.3	0.8	1.0	1.0	1.6	S	C	C	C	C	C	C	C	1.0	0.7	0.8	1.0	0.7	0.8	0.7	1.6	1.0	24
3	0.9	0.6	0.8	0.9	0.8	0.6	0.7	0.6	0.6	S	1.0	1.2	0.8	0.8	0.5	0.6	2.0	1.1	0.8	0.7	0.5	0.5	0.5	0.8	0.5	2.0	0.8	24
4	0.6	0.9	0.7	0.6	0.7	0.6	0.6	0.6	S	0.9	0.9	1.5	0.7	0.7	0.7	0.7	1.3	0.7	0.5	0.8	1.0	0.6	0.4	0.5	0.4	1.5	0.7	24
5	0.6	0.5	1.5	0.7	0.6	0.4	0.7	S	1.1	1.2	2.1	2.1	1.3	1.3	1.8	2.3	1.9	1.0	0.6	0.6	0.8	0.7	0.7	0.9	0.4	2.3	1.1	24
6	0.6	0.9	0.7	0.6	0.4	0.6	S	0.9	1.6	2.7	3.1	2.6	2.4	2.8	3.4	3.4	3.2	1.6	0.7	0.7	0.8	0.8	0.5	0.8	0.4	3.4	1.6	24
7	0.6	0.6	0.6	0.6	0.6	S	2.2	1.4	0.7	1.9	1.5	1.3	0.8	1.3	0.8	1.0	1.5	0.7	1.0	0.6	0.5	0.8	0.6	0.6	0.5	2.2	1.0	24
8	0.6	0.6	0.6	0.6	S	1.1	1.4	0.9	1.0	0.7	1.1	1.0	1.7	9.0	1.7	2.1	4.1	3.1	13.7	0.7	1.3	2.8	0.7	0.9	0.6	13.7	2.2	24
9	0.7	0.7	0.8	S	1.0	1.1	1.1	0.9	1.3	1.8	1.9	2.6	3.4	3.4	3.2	2.6	1.5	1.0	0.7	0.5	0.8	0.7	0.7	0.8	0.5	3.4	1.4	24
10	0.9	0.6	S	0.8	0.9	1.0	0.8	0.9	1.6	1.5	1.5	1.6	1.3	2.0	2.0	1.8	0.8	0.7	0.6	0.6	0.7	0.5	0.8	0.6	0.5	2.0	1.1	24
11	0.6	S	1.3	0.8	0.8	0.7	0.9	1.9	1.5	1.2	1.3	1.1	0.8	1.0	1.2	0.5	0.4	0.5	0.9	0.5	0.5	0.7	0.7	0.8	0.4	1.9	0.9	24
12	S	0.9	0.9	0.9	0.9	0.9	0.8	0.9	1.4	2.6	3.7	3.1	2.2	2.0	6.2	1.0	0.7	0.6	0.7	0.7	0.8	0.7	0.6	S	0.6	6.2	1.5	24
13	1.0	0.8	0.5	0.6	0.7	0.7	0.5	0.7	0.8	0.9	0.7	0.9	1.4	1.0	0.8	0.7	7.1	0.6	1.1	0.7	0.5	0.6	S	0.8	0.5	7.1	1.0	24
14	0.7	0.5	0.4	0.8	0.5	0.7	0.7	1.5	2.3	3.7	5.6	5.2	3.3	3.5	2.2	1.5	0.9	0.6	0.3	0.3	0.1	S	0.7	0.4	0.1	5.6	1.6	24
15	0.5	0.7	0.5	0.5	0.7	0.6	0.4	0.4	0.7	1.2	1.1	1.7	1.9	2.1	2.0	1.5	7.6	0.7	22.8	23.7	S	1.0	0.9	0.6	0.4	23.7	3.2	24
16	0.8	0.8	0.8	0.7	0.6	0.6	0.5	0.7	1.0	1.5	2.0	1.2	1.5	2.0	1.0	1.3	0.7	2.0	0.7	S	0.9	0.9	0.7	0.7	0.5	2.0	1.0	24
17	0.6	0.8	0.8	0.8	0.6	0.7	0.4	0.5	3.9	1.3	1.3	0.8	0.6	0.8	7.4	0.8	0.6	0.7	S	0.9	0.6	0.6	0.7	0.6	0.4	7.4	1.2	24
18	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.9	0.9	0.7	0.8	0.9	0.9	0.9	0.8	0.9	S	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.9	0.7	24
19	0.7	0.6	0.6	0.6	0.6	0.5	0.9	0.6	0.5	0.6	0.6	0.6	0.9	0.8	0.8	0.7	S	0.9	0.6	0.7	0.7	0.9	0.6	0.9	0.5	0.9	0.7	24
20	0.8	0.9	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.8	1.0	1.1	0.9	1.1	1.6	S	1.2	1.1	0.6	0.6	0.7	0.9	3.5	0.6	0.6	3.5	1.0	24
21	0.6	0.6	0.7	0.7	0.8	0.6	0.6	0.7	1.2	1.3	1.3	1.6	2.6	3.3	S	2.2	0.9	1.4	1.1	0.6	1.1	0.7	0.7	1.1	0.6	3.3	1.1	24
22	1.0	1.0	0.7	0.8	0.8	1.0	1.5	1.1	1.0	1.0	1.9	1.1	1.2	S	0.9	0.8	0.9	1.1	1.1	1.5	0.8	0.9	1.8	0.8	0.7	1.9	1.1	24
23	1.0	0.8	0.7	0.7	0.8	0.9	1.4	1.4	1.2	1.1	1.3	1.2	S	1.3	10.8	0.9	1.7	0.9	1.9	0.9	1.6	1.1	1.0	0.8	0.7	10.8	1.5	24
24	0.7	0.8	0.8	1.1	0.7	1.0	1.0	0.9	0.9	1.5	1.7	S	1.4	1.4	1.3	1.5	1.5	0.9	1.4	0.8	0.9	26.1	1.6	1.1	0.7	26.1	2.2	24
25	1.0	0.9	1.1	0.8	1.0	1.0	0.7	1.0	2.4	2.1	S	2.2	3.5	3.1	3.2	3.0	1.5	1.7	1.3	1.0	0.9	1.2	1.3	1.1	0.7	3.5	1.6	24
26	1.0	0.9	0.9	1.1	1.0	0.8	0.9	0.9	1.0	S	1.7	1.1	1.0	1.0	1.0	1.0	1.1	1.1	0.8	1.0	1.1	0.8	0.9	0.7	0.7	1.7	1.0	24
27	0.9	0.7	0.7	0.8	1.1	12.6	1.1	1.3	S	2.2	4.7	3.9	3.7	3.2	3.4	3.9	11.4	1.7	1.5	0.7	0.9	0.9	0.7	0.7	0.7	12.6	2.7	24
28	0.7	0.7	0.7	1.0	0.7	1.0	1.1	S	3.2	2.4	2.9	2.6	2.4	2.4	2.7	1.7	1.4	1.1	1.1	1.1	1.2	0.9	1.1	0.9	0.7	3.2	1.5	24
HOURLY MAX	1.1	1.0	1.5	1.1	1.1	12.6	2.2	1.9	3.9	3.7	5.6	5.2	3.7	9.0	10.8	3.9	11.4	3.1	22.8	23.7	1.6	26.1	3.5	1.1				
HOURLY AVG	0.8	0.8	0.8	0.8	0.7	1.2	0.9	0.9	1.3	1.5	1.8	1.8	1.7	2.0	2.4	1.6	2.2	1.1	2.2	1.6	0.8	1.8	1.0	0.8				

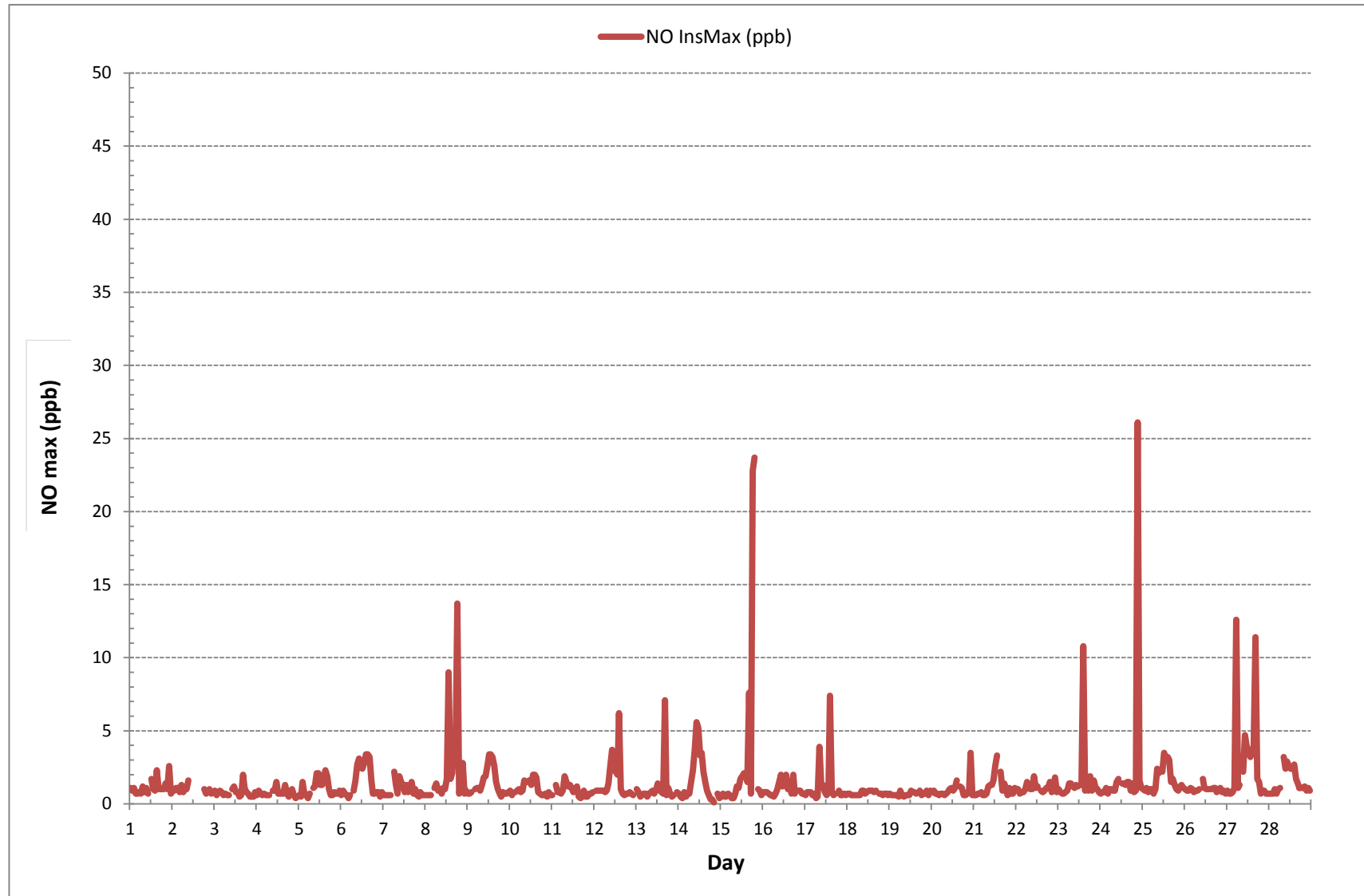
STATUS FLAG CODES

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

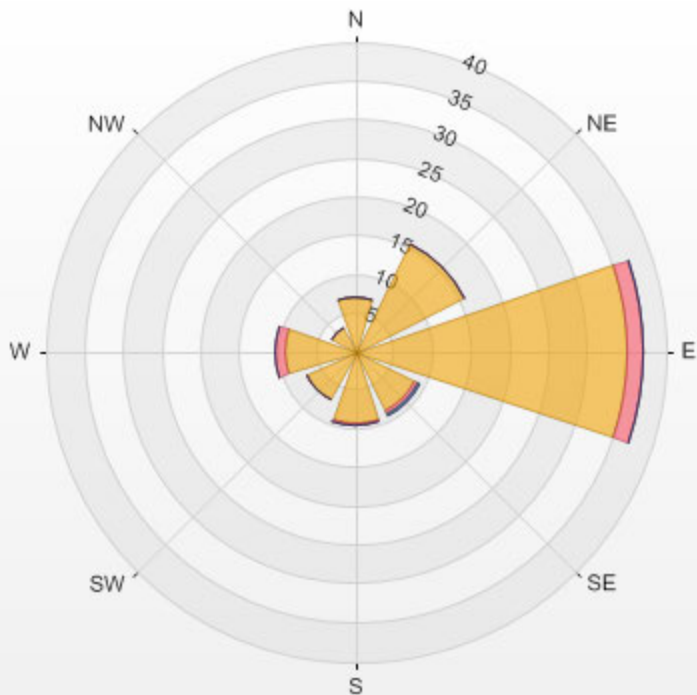
NUMBER OF NON-ZERO READINGS:	636
MAXIMUM INSTANTANEOUS VALUE:	26.1 ppb @ HOUR(S) 21 ON DAY(S) 24
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	2.0
OPERATIONAL TIME:	672 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



% Icon Classes (ppb) 95 0.0-1.6 4 1.6-3.1 0 3.1-4.7 0 >4.7

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 0.00%



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	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.1	0.1	0.2	S	0.2	0.3	0.3	0.5	0.4	0.4	0.6	0.6	0.7	0.6	0.8	1.1	0.1	1.1	0.4	24				
2	1.2	1.5	1.4	0.9	0.9	0.8	0.8	1.0	1.0	1.8	S	C	C	C	C	C	C	C	3.2	2.9	2.8	2.8	2.5	2.2	0.8	3.2	1.7	24				
3	2.0	1.9	1.4	1.3	1.1	0.4	0.3	0.3	0.5	S	1.2	0.6	0.3	0.3	0.2	0.3	0.5	1.1	1.3	1.2	2.0	2.3	1.3	0.8	0.2	2.3	1.0	24				
4	0.7	0.6	0.6	0.5	0.5	0.4	0.2	0.0	S	0.3	0.3	0.4	0.2	0.2	0.3	0.2	0.3	0.3	0.0	0.1	0.4	0.6	1.0	0.9	0.0	1.0	0.4	24				
5	0.6	0.5	1.1	1.7	1.8	1.7	2.6	S	1.1	1.5	1.1	1.0	1.0	1.1	1.7	3.1	3.5	4.0	3.0	2.8	2.2	1.2	1.1	1.2	0.5	4.0	1.8	24				
6	1.4	1.7	1.2	1.0	0.9	1.3	S	2.5	4.7	5.6	3.8	2.9	2.4	3.3	3.9	6.7	10.5	9.3	7.6	6.1	5.1	5.6	5.7	8.0	0.9	10.5	4.4	24				
7	5.4	3.8	2.4	1.8	1.0	S	1.3	1.3	1.3	1.9	1.1	0.7	0.4	0.4	0.2	0.6	0.6	1.2	2.2	1.8	1.6	2.4	2.8	3.4	0.2	5.4	1.7	24				
8	3.0	2.6	2.3	2.1	S	1.6	1.7	1.6	1.5	1.2	1.1	1.0	1.2	1.1	1.3	2.9	7.9	11.3	3.2	2.0	3.6	6.1	6.6	6.8	1.0	11.3	3.2	24				
9	6.7	6.1	6.5	S	8.1	8.7	8.5	8.8	7.3	6.5	6.7	6.7	6.6	7.9	7.3	7.3	9.2	8.1	6.8	7.0	7.1	7.4	6.7	5.2	5.2	9.2	7.3	24				
10	6.5	5.4	S	3.6	4.7	8.4	9.1	9.6	6.8	3.9	3.1	2.7	2.3	4.1	4.8	3.7	3.6	4.2	3.4	3.3	3.9	3.8	3.7	3.4	2.3	9.6	4.7	24				
11	3.1	S	4.7	3.3	3.8	3.6	4.0	5.4	5.9	4.6	2.6	1.7	1.0	0.7	0.8	0.7	0.6	0.4	0.3	0.5	1.0	1.0	0.9	1.6	0.3	5.9	2.1	24				
12	S	4.7	6.2	6.7	6.6	4.4	2.7	4.1	5.7	6.2	6.3	4.3	3.5	2.9	2.2	1.4	0.5	1.4	1.5	2.6	7.5	3.6	0.9	S	0.5	7.5	3.9	24				
13	0.5	0.3	0.2	0.2	0.2	0.2	0.0	0.1	0.2	0.3	0.3	0.7	0.6	0.9	0.8	0.8	1.2	1.2	1.2	1.4	2.3	4.9	S	5.3	0.0	5.3	1.0	24				
14	5.8	6.8	6.9	5.5	5.8	7.7	8.8	9.4	7.7	7.6	8.4	7.3	4.5	4.1	3.8	3.0	2.6	2.6	3.0	3.3	3.3	S	4.0	4.3	2.6	9.4	5.5	24				
15	4.6	4.8	5.4	5.8	6.7	6.1	5.8	4.8	4.0	4.1	4.5	5.6	5.0	3.6	3.6	2.9	3.6	5.0	5.6	7.2	S	6.2	5.9	5.6	2.9	7.2	5.1	24				
16	4.8	4.4	3.8	3.6	3.3	3.4	4.4	4.5	3.7	2.6	2.7	2.5	2.3	2.3	2.1	2.8	2.8	3.2	3.2	S	3.5	3.8	3.6	3.1	2.1	4.8	3.3	24				
17	2.6	1.1	1.0	0.3	0.2	0.3	0.1	0.1	0.4	0.3	0.2	0.4	0.3	0.3	0.4	0.4	0.1	0.1	S	0.2	0.1	0.3	0.4	0.3	0.1	2.6	0.4	24				
18	0.2	0.3	0.6	0.5	0.4	0.6	0.7	0.7	1.4	1.2	0.7	0.7	0.8	0.8	0.8	1.0	1.7	S	1.2	1.8	1.1	0.5	0.5	0.6	0.2	1.8	0.8	24				
19	0.6	0.6	0.5	0.4	0.4	0.4	0.2	0.4	0.5	0.6	0.9	1.0	1.3	1.8	2.1	2.3	S	2.6	2.9	2.2	2.1	2.3	2.0	2.0	0.2	2.9	1.3	24				
20	1.9	1.7	1.8	1.2	0.7	0.7	0.7	0.6	0.6	0.7	0.6	0.8	0.6	0.5	0.6	S	0.3	0.3	0.4	0.4	0.3	0.2	1.2	0.3	0.2	1.9	0.7	24				
21	0.1	0.2	0.4	0.3	0.4	0.6	0.7	0.6	0.7	1.3	1.5	1.9	2.6	3.5	S	1.7	1.1	1.2	0.9	0.8	0.8	0.4	0.2	0.1	0.1	3.5	1.0	24				
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	S	0.1	0.3	0.2	0.3	0.4	0.5	0.3	0.2	0.5	0.5	0.0	0.5	0.2	24				
23	0.1	0.0	0.1	0.1	0.3	0.4	0.4	1.0	0.9	0.5	0.6	0.8	S	0.5	0.8	0.5	0.8	0.7	0.9	1.1	1.5	1.8	1.6	1.3	0.0	1.8	0.7	24				
24	1.0	1.0	0.9	0.9	3.1	5.7	6.4	4.1	0.8	1.8	1.4	S	0.8	0.8	0.7	0.8	0.6	0.5	0.7	0.7	0.7	1.6	2.1	1.9	0.5	6.4	1.7	24				
25	1.9	1.5	1.2	1.1	1.2	1.4	1.8	2.1	2.2	1.9	S	1.8	2.9	3.0	3.0	2.8	2.9	3.2	1.7	1.4	1.3	1.3	1.3	1.1	1.1	3.2	1.9	24				
26	1.1	0.9	0.6	0.4	0.2	0.6	0.6	0.4	0.2	S	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.3	1.4	0.7	0.5	0.5	0.0	1.4	0.4	24				
27	0.9	1.1	1.4	2.0	4.3	4.6	3.1	2.8	S	1.8	2.7	3.3	2.8	2.5	3.1	3.4	4.5	5.9	6.5	3.6	5.7	3.8	3.2	3.2	0.9	6.5	3.3	24				
28	2.9	3.0	2.9	3.2	3.4	3.3	3.1	S	2.6	3.0	3.2	3.0	2.9	2.6	2.7	2.2	2.2	2.2	2.1	2.2	2.1	5.2	5.5	4.1	2.1	5.5	3.0	24				
HOURLY MAX	6.7	6.8	6.9	6.7	8.1	8.7	9.1	9.6	7.7	7.6	8.4	7.3	6.6	7.9	7.3	7.3	10.5	11.3	7.6	7.2	7.5	7.4	6.7	8.0								
HOURLY AVG	2.2	2.1	2.0	1.8	2.2	2.5	2.6	2.6	2.3	2.3	2.1	2.0	1.8	1.9	1.8	2.0	2.4	2.7	2.4	2.2	2.4	2.6	2.5	2.5								

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

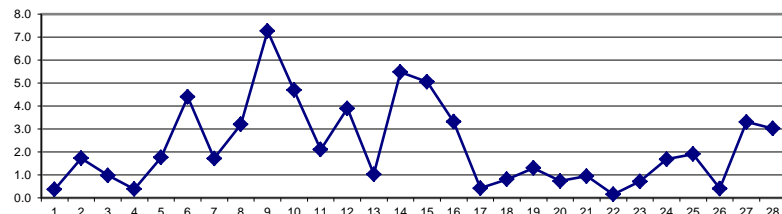
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	616			
MINIMUM 1-HR AVERAGE	0.0	ppb	@ HOUR(S)	VAR ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	11.3	ppb	@ HOUR(S)	17 ON DAY(S) 8
MAXIMUM 24-HR AVERAGE:	7.3	ppb		ON DAY(S) 9
				VAR-VARIOUS
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2.2		MONTHLY AVERAGE:	2.3 ppb

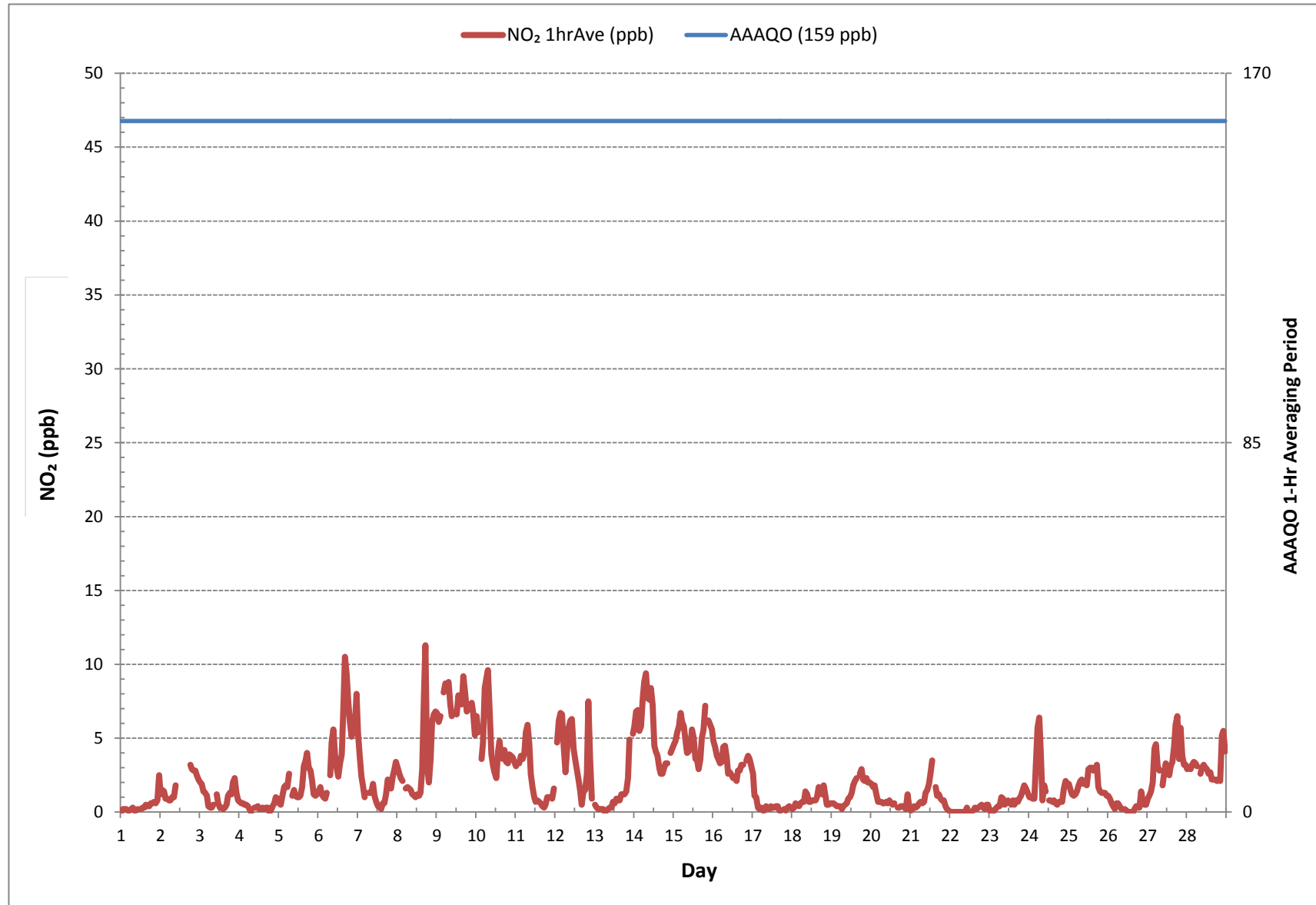
24 HR AVERAGES February 2017





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2017

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2017

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	0.4	0.2	0.2	0.3	0.2	0.1	0.1	0.4	0.1	0.2	0.1	S	0.1	0.6	0.4	1.1	0.6	0.6	0.8	0.9	0.7	0.4	1.1	1.2	0.1	1.2	0.5	24	
2	1.3	1.9	1.7	0.9	0.7	0.7	0.5	0.7	0.9	1.9	S	C	C	C	C	C	C	C	3.2	3.2	2.8	2.6	2.5	2.3	0.5	3.2	1.7	24	
3	1.9	1.9	1.5	1.3	1.0	0.6	0.4	0.6	0.6	S	2.1	1.1	0.2	0.4	0.3	0.9	0.8	1.5	1.1	1.9	1.9	2.3	2.2	0.8	0.2	2.3	1.2	24	
4	0.9	0.6	0.7	0.6	0.4	0.5	0.4	0.2	S	0.2	0.4	0.2	0.1	0.2	0.2	0.1	1.0	1.5	0.3	0.6	1.1	0.9	1.4	2.0	0.1	2.0	0.6	24	
5	1.1	1.0	2.7	2.0	2.6	2.2	3.7	S	1.5	2.1	2.4	2.4	1.0	2.1	3.9	4.0	4.4	3.5	3.0	2.5	1.7	1.5	1.6	1.0	4.4	4.4	2.3	24	
6	2.0	2.4	1.8	1.8	1.8	2.1	S	4.5	6.3	6.4	4.2	2.9	2.3	3.6	5.4	9.0	11.5	9.9	8.3	6.8	5.4	5.7	6.1	8.6	1.8	11.5	5.2	24	
7	6.8	4.1	2.5	2.4	1.3	S	1.7	1.3	1.4	2.7	1.3	0.7	0.2	0.2	0.4	0.7	0.6	1.3	2.2	1.9	1.8	2.4	2.8	3.5	0.2	6.8	1.9	24	
8	3.4	2.7	2.2	2.1	S	1.5	1.7	1.6	1.5	1.4	1.3	1.2	1.5	2.7	2.2	5.3	18.2	13.1	9.1	2.6	4.3	7.2	6.8	7.2	1.2	18.2	4.4	24	
9	7.2	6.5	7.0	S	9.0	9.2	9.0	9.7	8.2	8.0	7.5	7.7	8.2	8.9	7.8	8.1	9.8	9.6	7.7	7.8	7.8	8.1	8.0	5.6	5.6	9.8	8.1	24	
10	7.2	5.9	S	3.9	5.7	9.6	9.6	10.5	9.6	5.0	3.2	3.2	2.6	4.9	5.4	4.7	4.2	4.7	3.8	3.8	4.2	4.3	4.0	3.7	2.6	10.5	5.4	24	
11	3.7	S	3.7	4.3	4.4	5.2	6.5	6.4	5.6	3.3	2.2	1.3	1.0	0.8	1.1	0.9	0.8	0.5	0.6	1.3	1.0	0.9	1.1	2.3	0.5	6.5	2.6	24	
12	S	8.3	8.4	7.5	7.3	5.5	3.3	4.9	6.2	6.6	6.8	5.4	3.6	3.3	7.8	1.9	1.1	1.8	1.7	6.6	8.3	6.6	1.5	S	1.1	8.4	5.2	24	
13	0.7	0.6	0.4	0.7	0.6	0.6	0.4	0.7	0.4	0.7	0.9	1.6	1.5	1.6	1.0	1.7	2.4	2.4	1.8	1.8	4.0	5.5	S	5.6	0.4	5.6	1.6	24	
14	6.5	7.6	7.9	5.9	7.4	8.4	9.0	10.2	8.2	7.9	9.2	8.7	5.7	5.0	4.5	3.7	3.3	3.1	3.4	3.4	3.6	S	4.4	4.5	3.1	10.2	6.2	24	
15	4.9	5.2	5.7	6.5	8.3	6.9	6.5	5.8	4.5	4.5	5.3	6.2	6.0	4.9	4.8	3.6	13.5	5.8	13.3	23.7	S	7.0	6.6	6.1	3.6	23.7	7.2	24	
16	5.6	4.8	4.3	4.0	3.8	4.3	5.1	5.3	4.3	3.0	3.3	2.6	2.8	3.7	2.6	3.6	3.3	4.0	3.6	S	4.1	4.2	4.0	3.7	2.6	5.6	3.9	24	
17	3.4	1.9	1.3	1.0	0.9	0.8	0.7	0.5	2.1	0.7	0.6	0.7	0.6	0.6	2.3	0.7	0.5	0.5	S	0.5	0.6	0.6	0.6	0.5	0.5	0.5	3.4	1.0	24
18	0.5	0.6	0.9	0.9	0.8	1.1	1.1	0.9	1.8	1.3	1.0	0.9	1.1	1.0	1.1	1.3	2.1	S	1.3	2.3	1.5	0.8	0.8	0.7	0.5	2.3	1.1	24	
19	0.8	0.7	0.6	0.6	0.5	0.4	0.3	0.6	0.5	0.6	0.8	1.0	1.3	1.8	1.9	2.1	S	2.6	2.6	2.1	2.1	2.2	1.9	1.9	0.3	2.6	1.3	24	
20	1.9	1.7	1.9	1.3	0.9	0.6	0.9	0.8	0.7	0.7	0.5	0.6	0.6	0.7	0.7	S	0.5	0.6	1.0	0.6	0.6	0.6	0.6	6.8	0.8	0.5	6.8	1.1	24
21	0.7	0.6	0.8	0.9	1.1	1.2	1.3	1.7	1.3	2.1	2.1	2.9	3.4	4.3	S	5.1	1.7	2.3	1.3	1.6	2.1	1.1	1.2	0.9	0.6	5.1	1.8	24	
22	0.4	0.6	0.4	0.3	0.4	0.4	0.4	0.7	0.4	0.4	1.2	0.2	0.2	S	0.6	0.5	0.6	1.1	1.1	1.4	0.7	0.6	1.7	1.6	0.2	1.7	0.7	24	
23	0.3	0.3	0.4	0.3	0.3	0.5	1.1	1.8	1.0	0.4	0.9	0.5	S	0.4	6.7	0.2	1.2	0.7	1.5	1.7	2.3	2.0	1.7	1.2	0.2	6.7	1.2	24	
24	1.1	0.9	1.1	0.9	5.1	5.8	8.1	9.8	0.8	1.7	1.2	S	0.6	0.7	0.6	0.7	0.4	0.7	1.2	1.4	0.9	18.5	2.6	2.6	0.4	18.5	2.9	24	
25	2.3	1.5	1.3	1.2	1.3	1.7	1.9	2.5	3.3	1.9	S	1.7	3.4	3.1	2.8	2.8	3.0	3.6	2.2	1.1	1.1	1.4	1.2	0.9	0.9	3.6	2.1	24	
26	1.1	0.9	0.6	0.4	0.5	1.3	1.0	0.6	0.2	S	1.0	0.2	0.1	0.1	0.2	0.2	0.6	1.1	1.3	0.9	2.2	1.1	0.9	0.9	0.1	2.2	0.8	24	
27	1.1	1.4	1.5	2.6	5.3	9.0	3.7	3.2	S	2.5	12.0	3.9	3.6	3.4	4.0	4.9	6.6	8.9	9.0	5.5	6.8	5.4	4.1	3.9	1.1	12.0	4.9	24	
28	3.8	4.2	3.9	4.1	4.1	4.2	4.4	S	4.1	4.1	4.5	4.0	3.7	3.5	3.5	2.8	2.8	2.8	2.6	3.1	2.9	6.9	7.0	5.4	2.6	7.0	4.0	24	
HOURLY MAX	7.2	8.3	8.4	7.5	9.0	9.6	9.6	10.5	9.6	8.0	12.0	8.7	8.2	8.9	7.8	9.0	18.2	13.1	13.3	23.7	8.3	18.5	8.0	8.6					
HOURLY AVG	2.6	2.6	2.4	2.2	2.8	3.1	3.1	3.3	2.9	2.7	2.9	2.5	2.1	2.4	2.7	2.7	3.7	3.4	3.3	3.4	2.9	3.7	3.1	3.0					

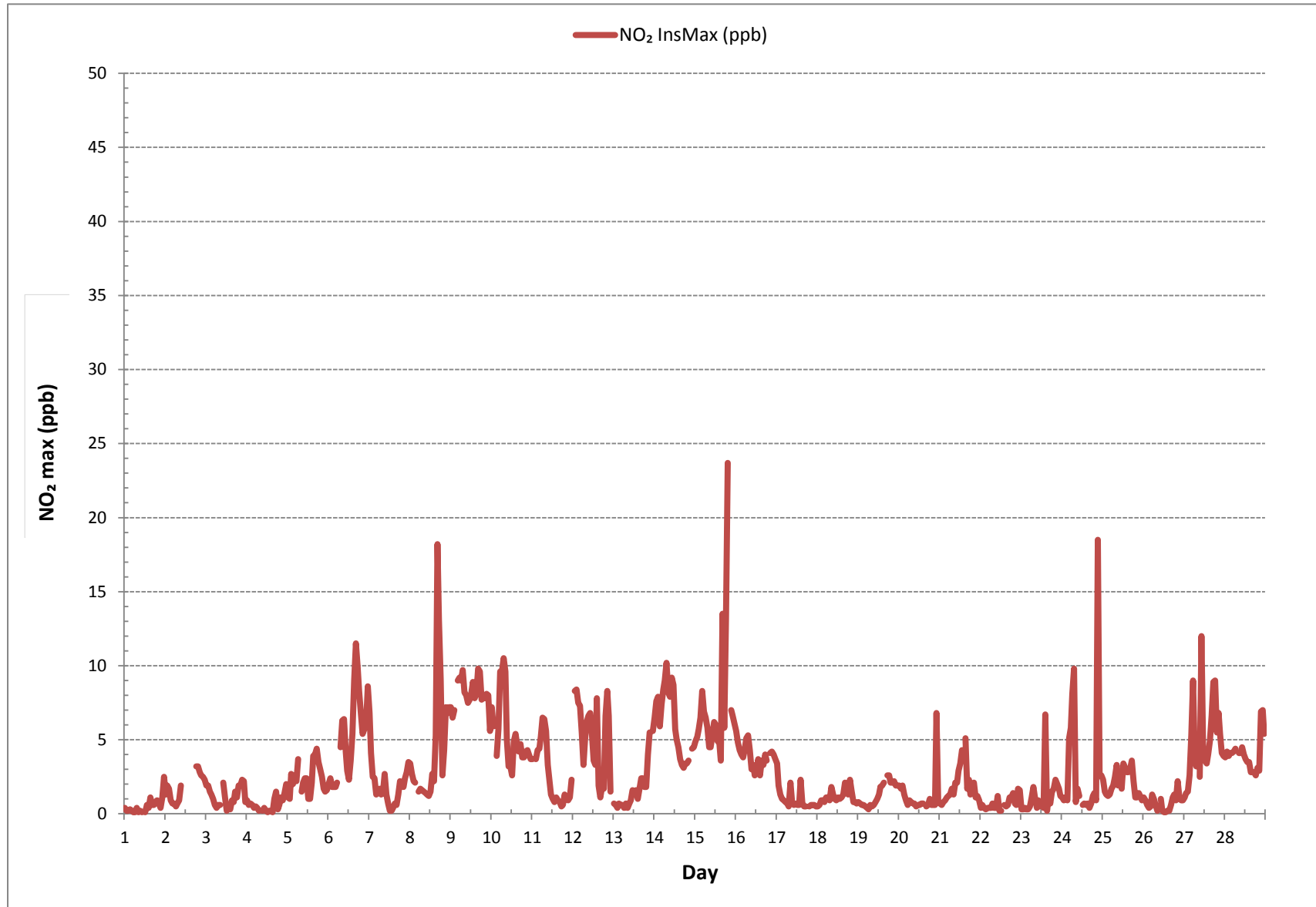
STATUS FLAG CODES

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:	636
MAXIMUM INSTANTANEOUS VALUE:	23.7 ppb @ HOUR(S) 19 ON DAY(S) 15
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	2.9
OPERATIONAL TIME:	672 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



% Icon Classes (ppb)

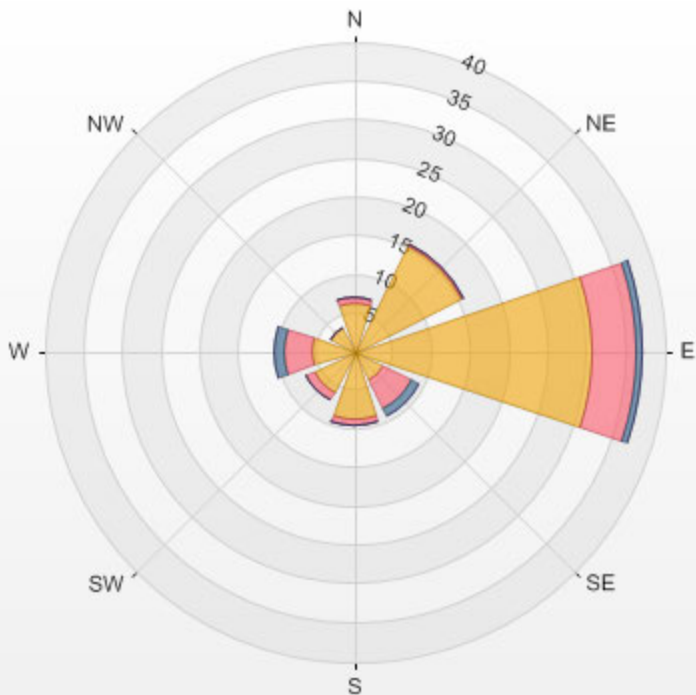
80 0.0-3.8

17 3.8-7.6

3 7.6-11.4

0 >11.4

LICA ST. LINA Poll.: LICA ST. LINA-NO₂[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 0.00%



OZONE



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2017

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	31.8	33.0	31.7	31.9	34.5	35.5	35.6	35.3	36.1	36.8	36.7	S	36.9	37.4	37.5	36.9	36.9	36.8	36.5	36.6	36.1	35.6	35.2	33.9	31.7	37.5	35.4	24
2	32.9	32.6	31.9	31.9	31.1	31.9	32.2	32.0	31.8	29.6	S	30.8	30.9	30.5	Q	32.3	31.7	30.3	29.6	30.6	30.2	29.8	29.9	30.4	29.6	32.9	31.1	24
3	30.2	29.9	29.8	30.0	30.6	34.8	35.0	34.9	34.3	S	34.2	C	C	C	C	C	35.3	33.8	33.1	32.8	31.6	30.2	31.9	33.7	29.8	35.3	32.6	24
4	33.0	33.2	32.9	33.5	35.0	35.7	35.4	35.4	S	37.4	37.0	36.5	36.3	35.8	35.9	35.8	36.0	36.3	36.3	35.8	34.6	34.5	33.9	33.5	32.9	37.4	35.2	24
5	33.6	33.0	31.9	30.3	29.8	29.2	28.4	S	34.5	31.6	30.0	30.6	30.5	30.6	28.4	26.1	26.7	25.2	24.5	23.4	23.0	24.9	26.1	27.0	23.0	34.5	28.7	24
6	27.4	27.3	27.2	27.1	27.1	26.7	S	24.5	21.3	18.8	20.3	21.9	23.6	22.9	22.4	19.0	14.3	16.4	18.1	19.4	19.0	17.5	16.4	15.2	14.3	27.4	21.5	24
7	17.9	18.9	20.0	20.8	22.8	S	22.8	24.6	25.9	23.6	27.3	30.9	33.9	35.4	36.9	35.9	36.0	32.8	30.6	31.7	32.0	30.9	29.3	27.9	17.9	36.9	28.2	24
8	28.8	29.9	30.5	30.6	S	31.6	31.2	31.1	31.4	32.5	33.0	34.1	34.1	35.2	35.5	34.9	30.0	26.6	33.8	34.8	33.6	30.0	29.4	28.7	26.6	35.5	31.8	24
9	28.6	29.2	29.4	S	28.2	27.6	27.6	27.4	29.5	31.0	31.0	32.2	32.3	30.7	30.9	30.6	28.5	30.1	30.4	29.0	27.9	26.8	27.1	28.5	26.8	32.3	29.3	24
10	26.8	29.0	S	31.4	28.8	22.8	21.3	22.0	24.6	30.1	33.0	34.1	35.4	33.6	32.4	34.5	34.1	32.8	34.0	33.5	32.3	31.1	30.7	30.5	21.3	35.4	30.4	24
11	30.2	S	29.4	28.9	30.1	28.0	24.2	23.3	27.5	33.3	35.9	39.1	40.2	40.8	41.2	41.3	41.4	41.2	40.8	39.8	40.1	39.8	39.5	37.8	23.3	41.4	35.4	24
12	S	33.4	32.0	31.7	32.4	36.3	38.3	36.0	34.9	35.2	35.9	38.2	40.4	41.1	42.0	43.4	43.8	42.6	41.8	40.2	33.1	37.6	40.6	S	31.7	43.8	37.8	24
13	40.4	39.9	39.3	38.7	38.6	38.6	38.6	38.3	38.1	37.6	37.5	37.9	39.2	39.4	40.1	40.6	41.1	42.1	42.2	40.5	37.9	32.8	S	30.1	30.1	42.2	38.7	24
14	28.3	26.3	25.9	27.5	26.4	23.9	21.6	20.2	21.3	22.1	23.1	26.6	30.2	30.8	33.4	37.6	38.8	38.4	36.2	34.4	32.7	S	29.0	27.5	20.2	38.8	28.8	24
15	26.4	24.4	23.0	22.1	20.9	22.1	23.5	26.0	29.5	28.6	28.1	27.4	28.3	30.3	31.0	32.4	31.1	29.8	28.1	25.3	S	23.7	22.0	21.3	20.9	32.4	26.3	24
16	24.0	25.0	25.9	25.6	25.0	24.7	22.5	20.2	21.0	21.7	22.2	22.3	22.7	23.4	23.1	21.5	22.1	20.9	20.1	S	17.9	19.5	22.2	23.5	17.9	25.9	22.5	24
17	27.8	36.8	36.3	36.9	37.2	34.0	32.9	33.2	30.6	29.8	29.4	28.2	27.0	25.7	25.4	26.7	32.5	32.2	S	33.8	32.6	31.5	29.7	28.5	25.4	37.2	31.2	24
18	27.8	26.2	24.6	25.6	26.0	24.9	25.6	24.2	20.7	21.8	25.0	25.8	25.3	25.4	24.4	24.3	24.9	S	30.1	29.8	28.8	27.8	28.0	28.4	20.7	30.1	25.9	24
19	27.3	27.0	27.2	26.9	27.0	27.9	29.1	30.5	32.0	32.3	30.1	28.9	27.5	26.9	26.4	25.7	S	24.2	23.3	23.3	23.2	21.4	20.5	20.6	20.5	32.3	26.5	24
20	18.8	17.4	17.9	19.9	20.8	21.5	19.2	17.8	17.6	17.7	20.8	20.1	20.6	21.3	24.1	S	29.5	33.2	31.8	31.4	31.6	30.3	29.1	29.7	17.4	33.2	23.6	24
21	29.0	27.9	26.8	25.2	23.1	24.5	23.7	23.1	22.3	21.3	22.5	22.7	22.3	23.8	S	25.2	25.5	25.1	25.1	25.3	26.6	29.2	33.3	33.7	21.3	33.7	25.5	24
22	34.1	35.2	35.6	35.8	36.0	36.7	36.5	37.0	37.7	38.4	38.6	39.2	39.3	S	38.7	38.1	37.0	39.2	38.8	36.3	33.8	31.9	30.9	31.3	30.9	39.3	36.4	24
23	31.6	30.7	29.8	30.2	29.4	28.7	31.5	30.6	31.5	31.3	30.3	30.9	S	33.0	36.4	38.6	39.1	39.3	38.3	37.0	35.7	34.2	33.4	33.0	28.7	39.3	33.2	24
24	33.1	32.7	32.9	32.2	28.4	24.4	22.4	25.7	30.9	29.2	30.3	S	34.5	34.8	35.1	34.8	35.6	35.9	35.7	36.0	35.3	33.7	33.5	33.1	22.4	36.0	32.2	24
25	33.0	32.7	32.8	32.7	31.4	28.8	26.3	24.9	24.2	24.7	S	31.9	31.8	32.2	33.7	35.4	35.5	35.2	37.7	37.8	36.6	35.8	35.3	35.2	24.2	37.8	32.4	24
26	34.5	34.7	36.0	37.5	38.8	36.2	33.8	33.7	32.0	S	30.7	31.0	31.4	32.0	32.7	33.3	34.0	33.9	33.3	33.6	32.1	32.2	31.6	30.4	30.4	38.8	33.5	24
27	29.1	27.7	26.6	25.2	23.8	24.9	27.0	27.9	S	31.2	32.3	33.6	35.3	36.1	34.8	34.8	33.8	32.2	31.5	32.4	27.0	29.6	31.1	31.0	23.8	36.1	30.4	24
28	30.6	29.3	28.0	27.5	27.1	26.9	27.2	S	26.9	27.0	28.0	28.3	32.3	33.5	33.2	34.5	34.1	33.7	34.2	34.3	34.4	29.4	26.6	26.5	26.5	34.5	30.2	24
HOURLY MAX	40.4	39.9	39.3	38.7	38.8	38.6	38.6	38.3	38.1	38.4	38.6	39.2	40.4	41.1	42.0	43.4	43.8	42.6	42.2	40.5	40.1	39.8	40.6	37.8				
HOURLY AVG	29.5	29.8	29.5	29.5	29.3	29.2	28.6	28.5	28.8	29.0	30.1	30.5	31.6	31.6	32.6	32.9	32.9	32.6	32.4	32.5	31.1	30.1	29.9	29.3				

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

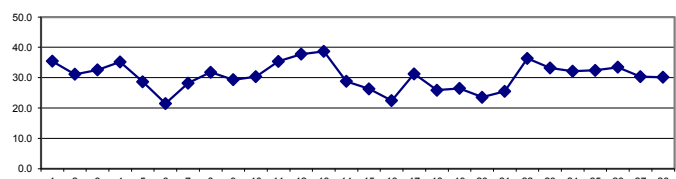
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

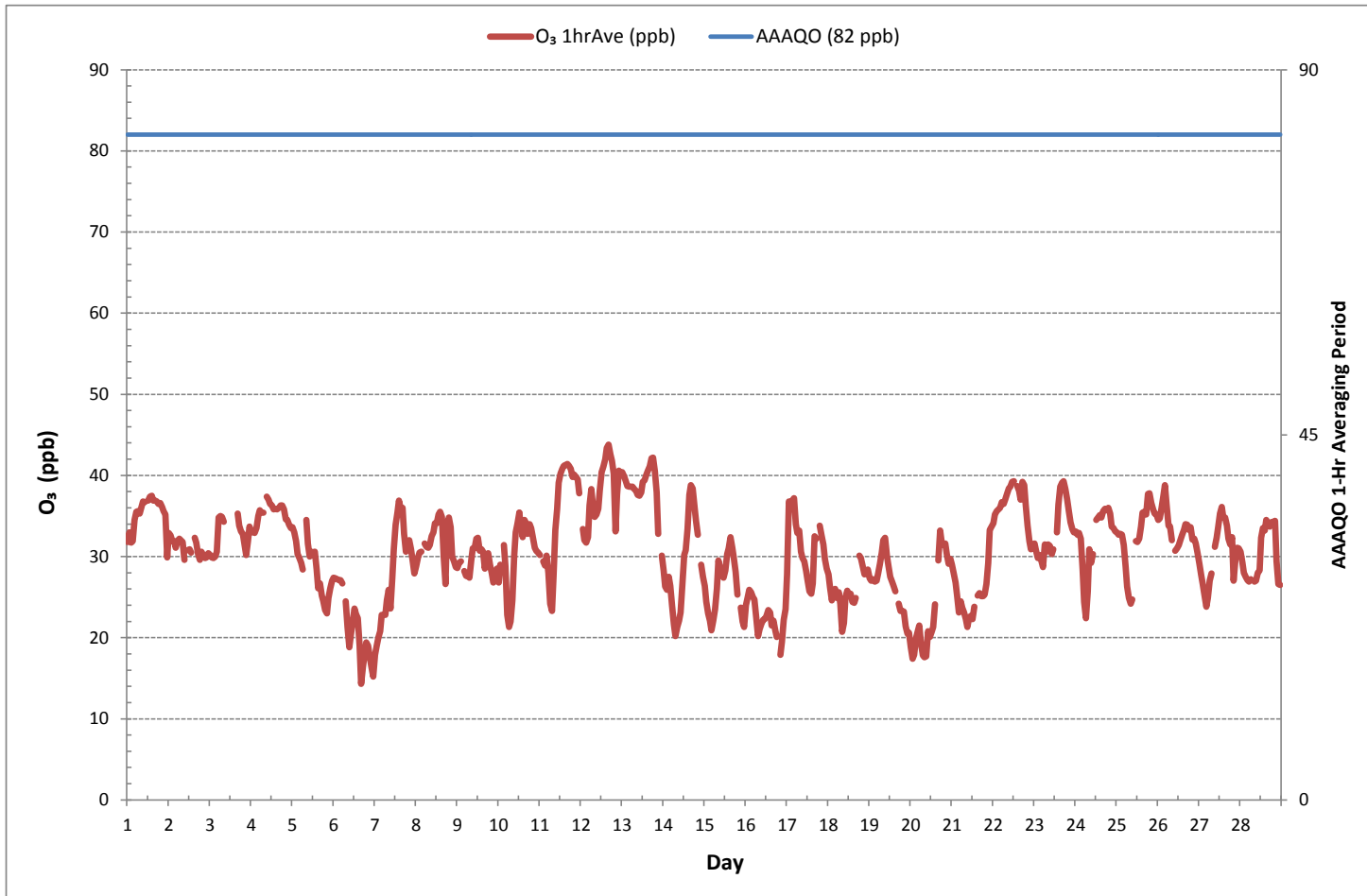
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	637					
MINIMUM 1-HR AVERAGE:	14.3	ppb	@ HOUR(S)	16	ON DAY(S)	6
MAXIMUM 1-HR AVERAGE:	43.8	ppb	@ HOUR(S)	16	ON DAY(S)	12
MAXIMUM 24-HR AVERAGE:	38.7	ppb			ON DAY(S)	13
					VAR-VARIOUS	
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs	
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	5.6		MONTHLY AVERAGE:	30.5	ppb	

24 HR AVERAGES February 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2017

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	35.2	35.3	34.0	34.7	37.4	38.7	38.1	37.9	38.9	39.2	39.2	S	39.2	40.0	40.0	39.2	39.3	39.2	38.7	38.6	38.6	37.7	37.4	36.2	34.0	40.0	37.9	24
2	35.1	34.5	33.8	33.8	33.4	33.9	33.9	33.6	33.4	33.0	S	32.6	32.7	32.4	Q	Q	33.5	32.9	32.1	32.6	32.5	31.8	31.9	32.4	31.8	35.1	33.1	24
3	32.5	32.1	32.1	32.4	33.9	37.9	37.5	37.2	37.0	S	36.2	C	C	C	C	C	36.3	34.3	33.4	33.2	32.2	30.9	33.9	34.4	30.9	37.9	34.3	24
4	33.6	33.8	33.5	34.6	36.0	36.3	36.3	36.3	S	38.1	38.1	37.2	37.0	36.3	36.3	36.3	36.6	37.1	37.1	36.3	35.4	35.0	34.7	34.3	33.5	38.1	35.9	24
5	34.2	33.2	33.1	30.6	30.1	29.4	28.6	S	35.1	33.1	30.3	30.5	30.5	30.6	30.4	26.8	27.2	25.7	24.3	23.7	23.8	24.8	26.2	26.8	23.7	35.1	29.1	24
6	26.9	26.9	26.9	26.8	26.6	26.2	S	24.4	23.5	19.0	20.7	22.2	23.8	23.5	23.1	20.2	14.8	17.3	18.3	19.6	19.2	17.5	16.1	15.6	14.8	26.9	21.7	24
7	17.9	18.8	19.5	20.6	22.6	S	23.1	25.5	25.7	24.7	28.8	33.1	34.3	36.5	37.2	37.2	36.9	34.3	30.6	32.1	32.1	31.4	29.6	28.2	17.9	37.2	28.7	24
8	29.5	30.4	30.8	31.0	S	31.8	31.7	31.3	31.8	32.9	33.4	34.8	34.9	35.6	35.8	36.0	31.5	30.8	34.7	35.3	34.4	32.4	29.6	28.9	28.9	36.0	32.6	24
9	28.8	29.4	29.4	S	28.9	27.8	28.0	28.1	30.4	31.4	31.4	33.1	33.6	32.1	31.5	30.9	29.7	30.8	31.3	30.0	28.3	27.6	28.3	28.8	27.6	33.6	30.0	24
10	27.8	30.5	S	31.4	30.9	26.0	21.7	23.8	27.0	31.8	33.2	35.1	35.4	35.2	33.1	35.6	35.2	33.2	34.0	33.6	32.7	31.7	30.6	30.5	21.7	35.6	31.3	24
11	30.1	S	29.4	29.4	31.0	30.5	26.0	24.8	31.2	34.9	38.1	39.9	41.0	41.3	41.7	41.8	41.9	41.9	41.5	40.6	40.7	40.7	40.6	39.6	24.8	41.9	36.5	24
12	S	37.0	34.0	34.0	35.4	38.8	40.1	38.8	36.2	37.3	37.9	41.0	42.0	43.1	44.0	45.1	45.4	44.6	43.5	43.8	36.2	42.1	42.2	S	34.0	45.4	40.1	24
13	42.2	41.5	40.9	40.5	40.1	39.9	39.9	39.8	39.4	39.0	38.9	39.9	40.6	40.9	41.4	41.7	42.4	43.6	43.8	42.2	40.5	35.6	S	31.3	31.3	43.8	40.3	24
14	30.1	27.4	27.3	28.5	27.7	25.2	24.0	21.4	21.9	23.4	24.8	28.8	32.5	33.0	35.4	38.9	39.3	39.5	37.7	35.3	34.0	S	30.1	28.2	21.4	39.5	30.2	24
15	27.0	25.5	23.6	22.5	21.8	23.2	23.8	28.4	30.0	28.8	28.2	27.6	28.6	30.3	32.1	32.2	31.2	29.6	28.4	26.1	S	23.6	22.0	21.3	21.3	32.2	26.8	24
16	24.4	24.6	25.7	29.4	24.5	24.4	22.1	19.5	19.8	20.8	20.9	21.0	21.8	22.0	21.9	20.4	20.9	19.8	18.4	S	18.6	19.2	21.8	23.5	18.4	29.4	22.0	24
17	32.7	36.3	35.7	36.9	36.7	35.7	32.7	33.0	31.3	29.7	29.3	28.6	27.8	25.7	25.6	30.2	32.9	32.6	S	34.2	33.8	32.1	30.4	28.8	25.6	36.9	31.9	24
18	28.2	26.9	24.8	25.7	26.0	26.2	27.1	26.4	21.4	22.3	26.1	25.7	25.2	25.4	24.0	23.9	25.5	S	29.6	29.3	28.6	27.3	27.6	27.9	21.4	29.6	26.1	24
19	27.2	26.5	26.8	26.5	26.6	28.0	29.2	30.5	33.2	32.6	30.5	29.1	27.4	26.6	26.1	25.6	S	24.1	24.0	23.5	23.5	22.1	21.1	20.5	20.5	33.2	26.6	24
20	19.8	17.9	18.4	19.8	20.7	21.4	20.8	18.2	17.4	18.2	21.7	20.5	20.6	21.9	26.6	S	31.8	33.1	32.1	31.4	31.7	31.0	30.0	29.6	17.4	33.1	24.1	24
21	28.9	28.2	27.1	25.5	23.1	24.6	23.9	22.7	22.3	20.9	22.5	23.1	22.3	23.9	S	24.8	25.1	25.0	24.7	25.2	26.8	31.2	33.5	33.5	20.9	33.5	25.6	24
22	34.7	35.4	35.4	35.7	36.1	36.9	36.9	37.5	38.4	38.6	38.9	39.6	39.7	S	39.3	38.4	37.7	40.0	40.0	37.4	35.7	32.5	31.9	31.9	31.9	40.0	36.9	24
23	31.9	31.6	30.5	30.8	30.6	30.6	32.4	31.9	32.1	31.8	30.9	31.8	S	34.4	38.4	39.3	39.8	39.8	39.2	38.1	36.5	35.6	34.4	33.5	30.5	39.8	34.2	24
24	33.5	33.1	34.5	32.9	33.4	25.9	24.7	30.6	32.1	30.5	30.9	S	35.6	35.4	35.6	35.7	36.3	36.1	36.0	36.3	36.2	34.3	34.3	33.1	24.7	36.3	33.3	24
25	33.2	33.1	33.1	33.2	31.6	30.4	26.5	25.2	24.2	24.7	S	31.9	32.1	32.9	34.1	36.6	36.3	36.1	38.6	38.4	36.9	36.1	35.6	35.6	24.2	38.6	32.9	24
26	34.9	35.2	37.4	37.9	39.5	39.6	34.8	34.7	33.2	S	31.3	31.7	32.1	32.6	33.5	34.0	34.7	34.7	33.8	34.5	33.5	32.7	32.1	31.0	31.0	39.6	34.3	24
27	30.0	28.9	27.2	26.4	24.7	26.5	27.4	28.8	S	31.7	32.9	34.4	36.5	36.3	35.1	35.1	34.6	33.8	33.5	34.4	28.1	30.5	31.3	31.3	24.7	36.5	31.3	24
28	30.8	30.4	28.4	27.8	27.3	27.0	27.6	S	27.3	27.3	28.8	30.1	33.4	33.8	33.8	34.8	34.7	34.0	34.6	34.8	34.8	32.9	27.4	28.0	27.0	34.8	30.9	24
HOURLY MAX	42.2	41.5	40.9	40.5	40.1	39.9	40.1	39.8	39.4	39.2	39.2	41.0	42.0	43.1	44.0	45.1	45.4	44.6	43.8	43.8	40.7	42.1	42.2	39.6				
HOURLY AVG	30.4	30.5	30.1	30.3	30.2	30.5	29.6	29.6	29.8	29.8	30.9	31.3	32.3	32.4	33.4	33.6	33.8	33.5	33.1	33.4	32.0	31.1	30.5	29.8				

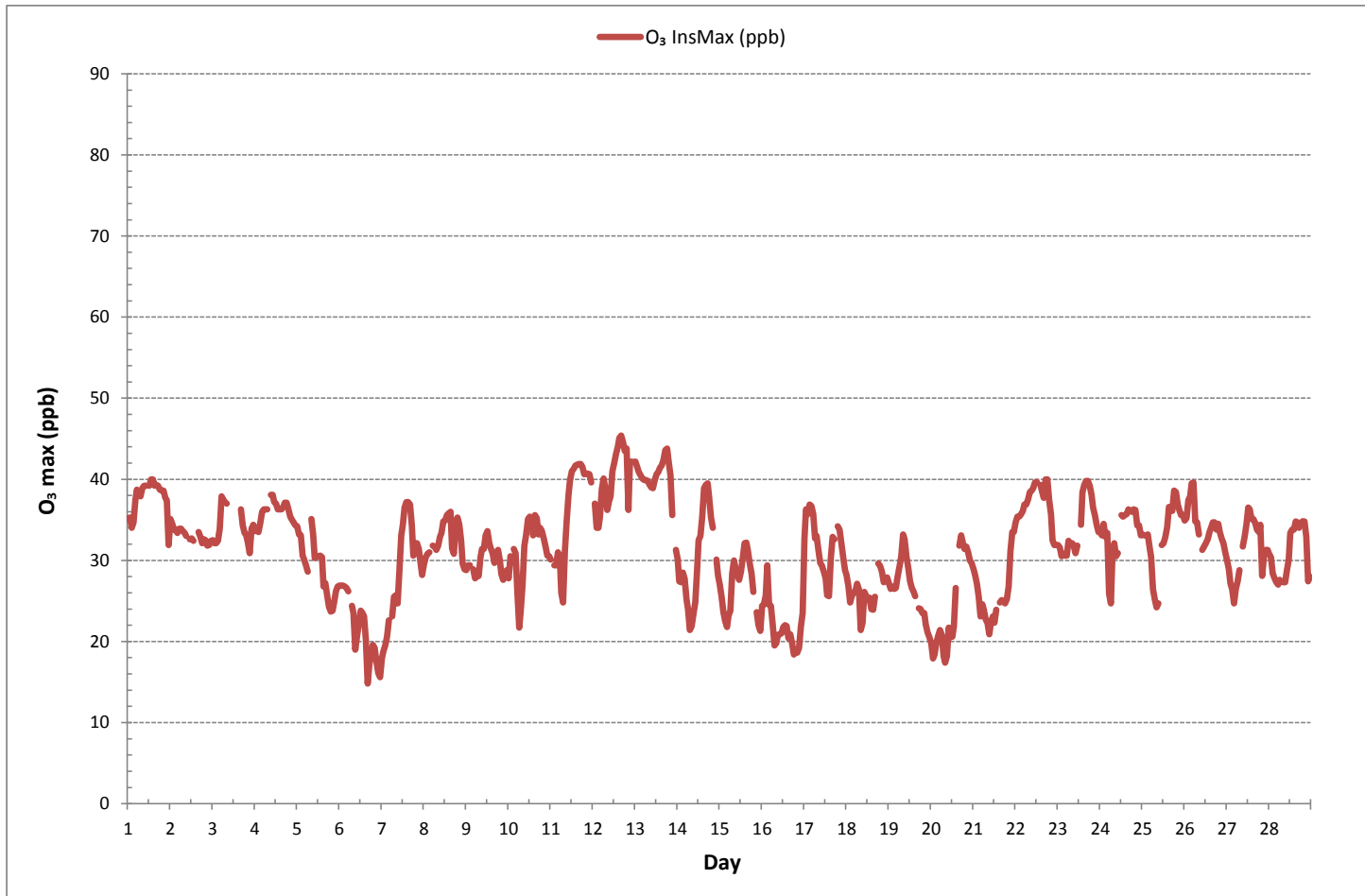
STATUS FLAG CODES

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

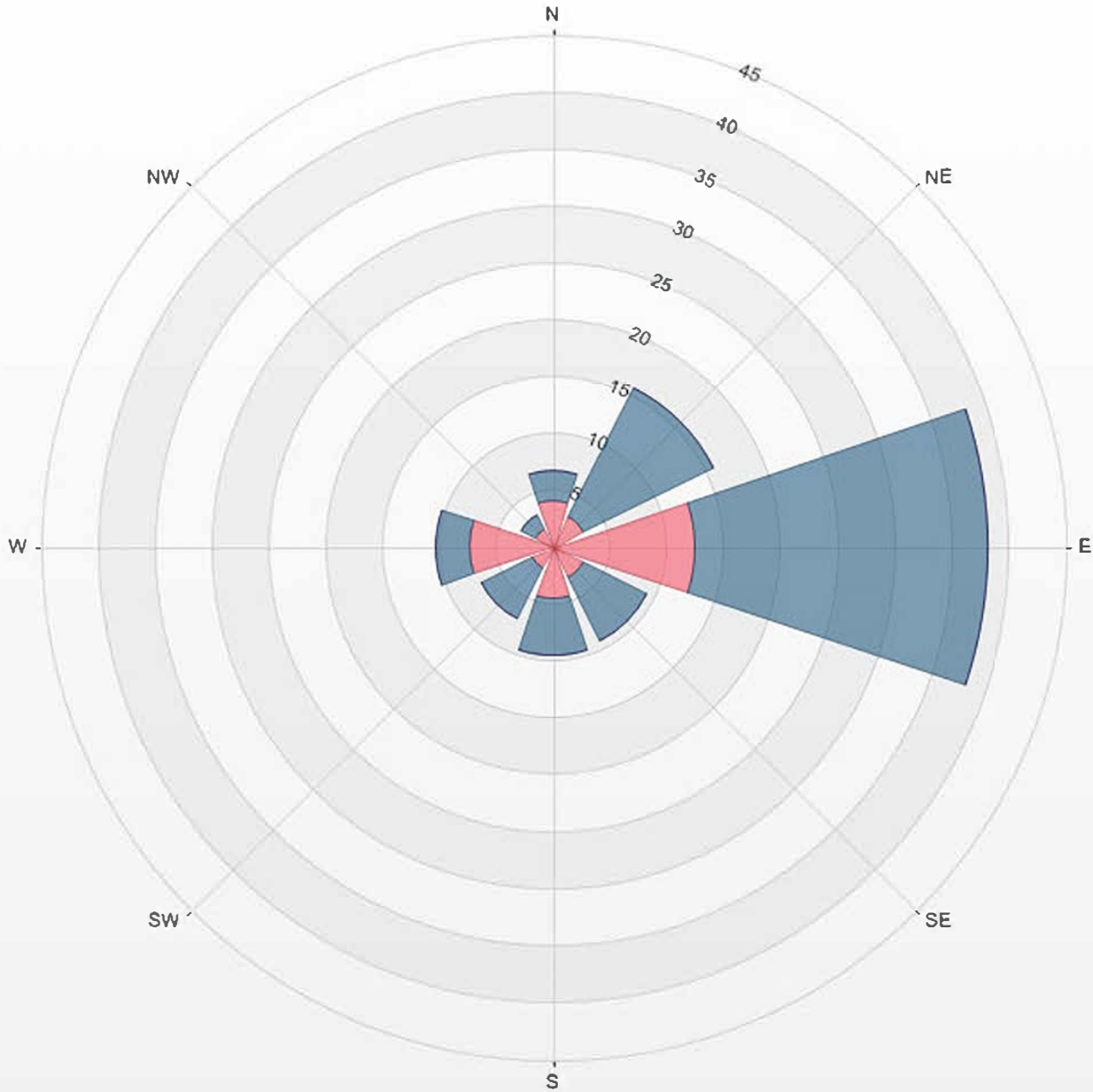
NUMBER OF NON-ZERO READINGS:	636
MAXIMUM INSTANTANEOUS VALUE:	45.4 ppb @ HOUR(S) 16 ON DAY(S) 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	6.0
OPERATIONAL TIME:	672 hrs

OZONE Instantaneous Maximum (O₃ ppb)



% Icon Classes (ppb) 0 0.0-14.6 38 14.6-29.3 62 29.3-43.9 0 >43.9

LICA ST. LINA Poll.: LICA ST. LINA-03[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 0.00%



O3[ppb] Calibration: LICA ST. LINA Monthly: 2017/02 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	2.5	1.0	X	6.9	7.5	X	3.5	X	4.5	5.5	2.0	2.0	5.0	1.5	5.0	1.5	0.0	0.0	0.0	10.9	X	9.5	X	7.5	0.0	10.9	4.0	19				
2	16.0	X	11.5	5.5	0.0	X	10.5	0.0	4.0	6.5	9.0	6.4	7.9	5.4	8.5	1.0	6.9	7.5	5.4	2.4	7.0	8.5	4.0	7.5	0.0	16.0	6.4	22				
3	5.5	8.0	8.0	5.5	4.5	1.0	1.5	2.5	7.0	6.5	7.5	8.4	1.9	1.4	C	C	0.0	1.5	0.0	2.5	0.5	3.5	0.0	3.5	0.0	8.4	3.7	24				
4	2.0	3.0	3.5	2.0	1.0	4.5	0.0	2.5	1.5	4.5	4.0	1.0	3.0	5.0	0.5	0.0	2.5	1.5	0.0	5.0	1.0	2.0	3.0	1.0	0.0	5.0	2.3	24				
5	3.5	4.0	5.0	5.4	1.9	3.5	10.9	8.0	5.5	5.0	5.4	3.0	3.5	10.0	10.9	8.0	5.0	6.4	5.5	1.5	5.0	4.0	6.4	3.0	1.5	10.9	5.4	24				
6	5.0	12.0	10.5	5.4	5.0	6.4	7.5	5.0	10.5	6.4	5.4	8.0	6.4	5.9	9.5	5.9	5.4	9.5	5.0	5.9	5.4	5.4	5.0	7.5	5.0	12.0	6.8	24				
7	9.5	7.5	6.9	7.5	1.9	1.5	5.0	5.4	4.0	5.0	1.4	3.5	0.0	1.4	4.0	5.0	0.4	4.4	3.5	6.4	6.4	7.5	8.0	10.9	0.0	10.9	4.9	24				
8	4.4	7.5	6.4	3.5	5.0	6.4	5.0	5.0	2.4	2.9	4.0	3.5	5.0	5.9	0.0	6.4	4.0	8.0	5.9	5.0	4.4	9.9	15.5	9.0	0.0	15.5	5.6	24				
9	14.5	12.0	13.0	17.4	24.0	22.9	25.9	27.0	25.0	28.9	24.5	23.4	15.5	14.5	19.9	9.9	14.5	13.5	10.9	16.0	14.5	13.0	12.5	10.5	9.9	28.9	17.7	24				
10	13.5	12.5	8.0	9.9	7.9	12.0	9.0	12.5	9.5	11.5	9.5	6.4	5.9	6.9	11.5	6.4	7.0	12.0	14.0	10.4	11.5	12.0	10.5	8.5	5.9	14.0	10.0	24				
11	9.5	9.5	8.5	10.5	11.5	9.0	10.9	15.5	12.0	9.0	3.5	5.0	0.0	0.0	2.4	0.4	0.0	0.9	0.0	0.4	0.0	1.9	0.4	1.9	0.0	15.5	5.1	24				
12	3.5	4.4	2.9	0.9	2.4	0.0	1.4	0.9	0.0	0.9	3.9	1.9	3.4	0.0	0.0	1.5	1.9	0.0	1.0	3.9	3.0	0.5	1.5	1.5	0.0	4.4	1.7	24				
13	0.0	5.0	1.5	5.0	X	3.9	0.0	0.0	0.0	0.0	1.5	1.0	2.5	1.5	0.0	0.0	3.0	7.0	0.5	5.4	1.9	3.0	1.4	4.4	0.0	7.0	2.1	23				
14	7.5	14.0	9.9	9.0	7.5	9.4	12.4	12.9	13.4	15.9	11.4	10.5	8.4	4.4	3.9	2.4	4.9	0.0	0.0	1.9	0.9	5.9	8.4	5.4	0.0	15.9	7.5	24				
15	9.0	10.4	9.4	14.9	12.9	9.9	8.4	3.9	5.9	5.0	5.0	7.5	1.9	2.9	0.0	0.0	1.9	3.4	2.5	15.0	14.0	6.0	1.5	9.0	0.0	15.0	6.7	24				
16	5.0	7.0	6.4	9.5	6.4	2.5	2.0	7.0	2.5	1.9	5.0	3.0	1.5	X	C	C	0.0	0.5	3.5	5.5	6.0	5.0	2.0	5.5	0.0	9.5	4.2	23				
17	5.0	1.5	4.5	4.0	4.4	2.9	3.5	0.5	0.9	3.5	0.9	4.0	3.0	0.0	1.0	3.0	2.4	0.0	3.0	0.0	0.0	1.0	3.9	0.4	0.0	5.0	2.2	24				
18	2.4	0.4	0.4	6.4	0.0	0.4	0.0	4.4	5.4	3.9	4.0	1.9	9.0	5.4	5.0	6.9	6.9	5.0	5.0	9.0	5.9	0.0	3.4	3.9	0.0	9.0	4.0	24				
19	5.4	2.4	3.4	2.9	0.4	5.9	3.5	X	3.0	3.4	4.4	3.5	2.9	1.9	4.4	3.9	3.4	3.9	4.4	6.4	5.4	4.4	8.0	7.5	0.4	8.0	4.1	23				
20	8.0	7.5	4.0	3.5	2.5	0.5	4.0	2.5	3.0	5.0	1.5	3.5	5.0	5.0	0.0	3.5	0.0	0.0	5.4	1.9	5.4	2.4	2.9	6.9	0.0	8.0	3.5	24				
21	7.9	3.4	2.9	6.4	0.0	6.9	8.4	7.9	6.9	14.0	6.4	7.5	11.9	18.4	16.4	7.0	3.0	5.0	5.0	9.9	9.9	3.4	10.4	9.0	0.0	18.4	7.8	24				
22	10.4	1.4	1.4	0.0	4.5	1.9	3.4	5.0	2.9	2.4	0.0	0.4	4.4	1.0	0.9	2.9	0.4	1.9	3.9	2.9	0.0	4.5	4.5	0.0	0.0	10.4	2.5	24				
23	0.4	2.4	X	0.9	3.9	2.9	0.4	8.4	5.4	6.9	3.4	2.9	3.5	0.9	0.0	2.9	3.9	3.4	3.5	5.9	4.0	5.4	0.0	0.0	0.0	8.4	3.1	23				
24	10.9	9.0	7.9	0.9	9.0	0.0	2.4	8.4	0.0	7.9	5.4	3.4	3.4	4.5	7.5	9.9	5.9	6.4	18.9	1.9	2.9	8.4	0.0	9.4	0.0	18.9	6.0	24				
25	2.9	5.0	6.4	4.0	2.4	3.4	1.4	6.9	7.9	14.9	2.4	7.5	7.5	8.4	10.4	6.9	6.9	9.0	3.5	5.0	1.9	0.0	1.9	2.4	0.0	14.9	5.4	24				
26	8.4	0.0	X	0.0	0.4	0.0	4.5	21.5	17.9	3.9	X	3.4	8.4	6.4	0.0	X	5.4	10.4	5.4	4.0	0.4	8.4	9.9	5.0	0.0	21.5	5.9	21				
27	1.9	1.9	3.5	7.9	12.9	14.0	4.5	10.4	X	16.0	9.5	7.9	5.4	4.5	3.4	6.9	6.4	0.4	4.5	0.0	9.0	18.9	22.4	25.9	0.0	25.9	8.6	23				
28	X	5.9	12.9	13.4	11.4	4.5	8.4	17.9	19.9	12.5	12.0	9.4	7.9	3.4	5.9	1.9	5.9	3.4	6.4	2.4	3.0	6.4	6.4	X	1.9	19.9	8.2	22				
HOURLY MAX	16.0	14.0	13.0	17.4	24.0	22.9	25.9	27.0	25.0	28.9	24.5	23.4	15.5	18.4	19.9	9.9	14.5	13.5	18.9	16.0	14.5	18.9	22.4	25.9								
HOURLY AVG	6.5	5.9	6.3	6.0	5.6	5.2	5.7	7.8	6.7	7.5	5.7	5.4	5.1	4.7	5.0	4.2	3.9	4.5	4.5	5.3	4.8	5.7	5.7	6.2								

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

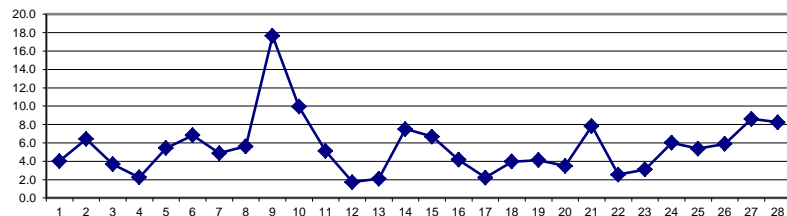
OBJECTIVE LIMIT:

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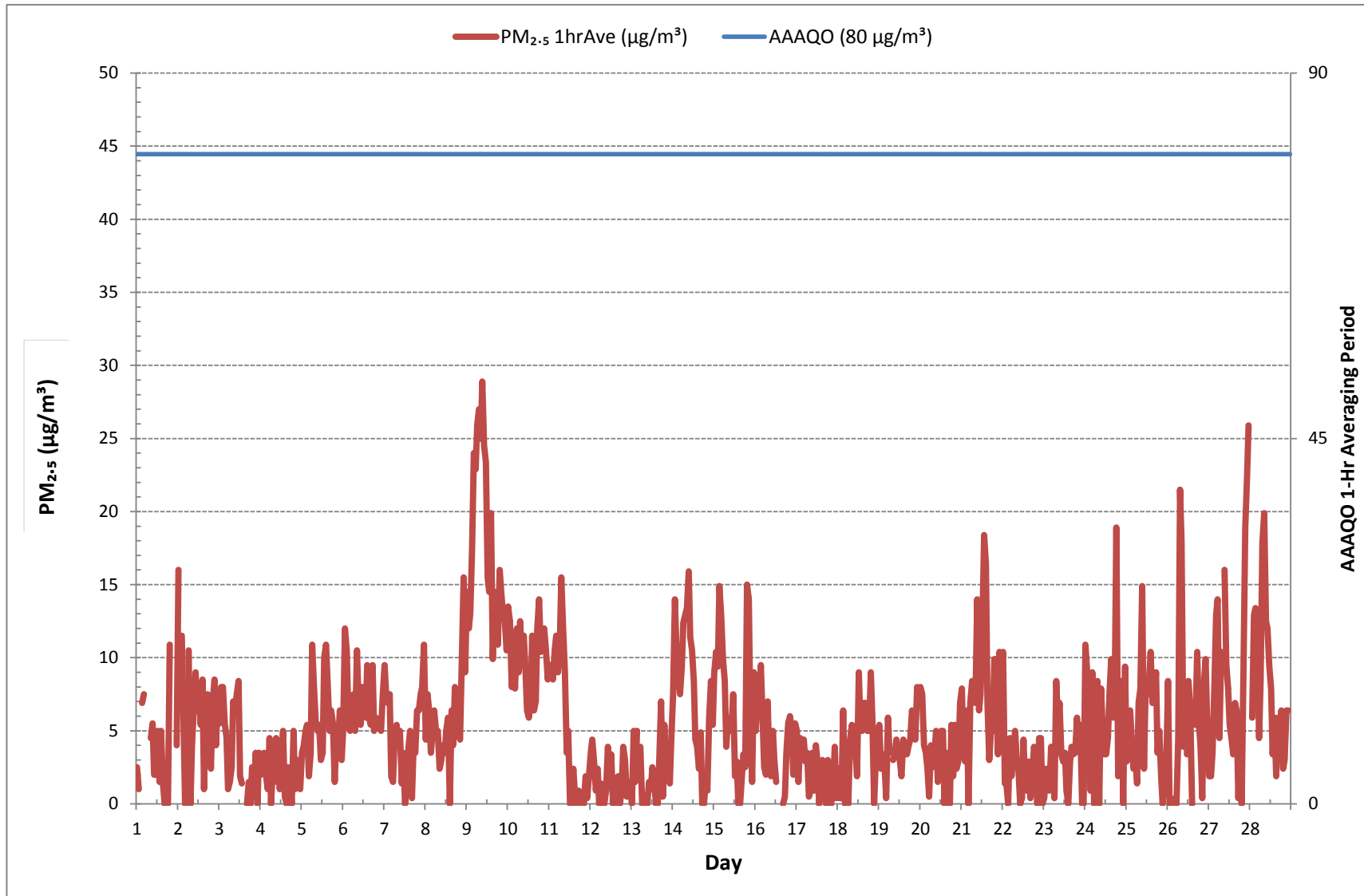
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	589					
MINIMUM 1-HR AVERAGE:	0.0	µg/m ³	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	28.9	µg/m ³	@ HOUR(S)	9	ON DAY(S)	9
MAXIMUM 24-HR AVERAGE:	17.7	µg/m ³			ON DAY(S)	9
					VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	4	hrs			OPERATIONAL TIME:	655 hrs
STANDARD DEVIATION:	4.8				AMD OPERATION UPTIME:	97.5 %
					MONTHLY AVERAGE:	5.6 µg/m ³

24 HR AVERAGES February 2017



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



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-PM25[ug/m3(L)]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

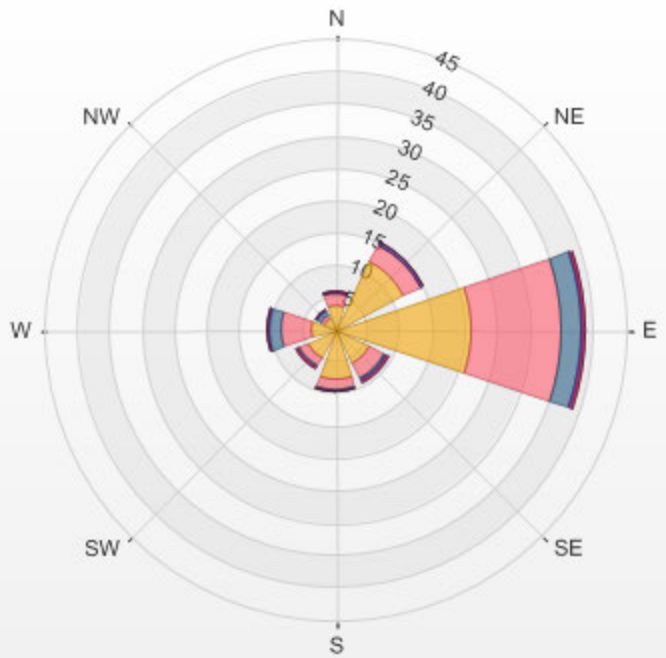
Calm: 0.00%

Calm Avg: 0.00 [ppb]

Direction	0.0-5.8	5.8-11.6	11.6-17.4	17.4-23.2	23.2-29.0	>29.0	Total
N	4.0	1.7	0.0	0.3	0.2	0.0	6.1
NE	11.8	2.9	0.0	0.5	0.0	0.0	15.2
E	20.9	14.0	3.2	0.2	0.3	0.0	38.6
SE	6.0	2.3	0.3	0.3	0.5	0.0	9.4
S	7.7	1.7	0.3	0.0	0.0	0.0	9.7
SW	4.9	1.4	0.3	0.0	0.3	0.0	6.9
W	3.8	4.6	2.0	0.2	0.0	0.0	10.6
NW	2.2	0.6	0.5	0.3	0.0	0.0	3.5
Summary	61.3	29.2	6.6	1.7	1.2	0.0	100.0

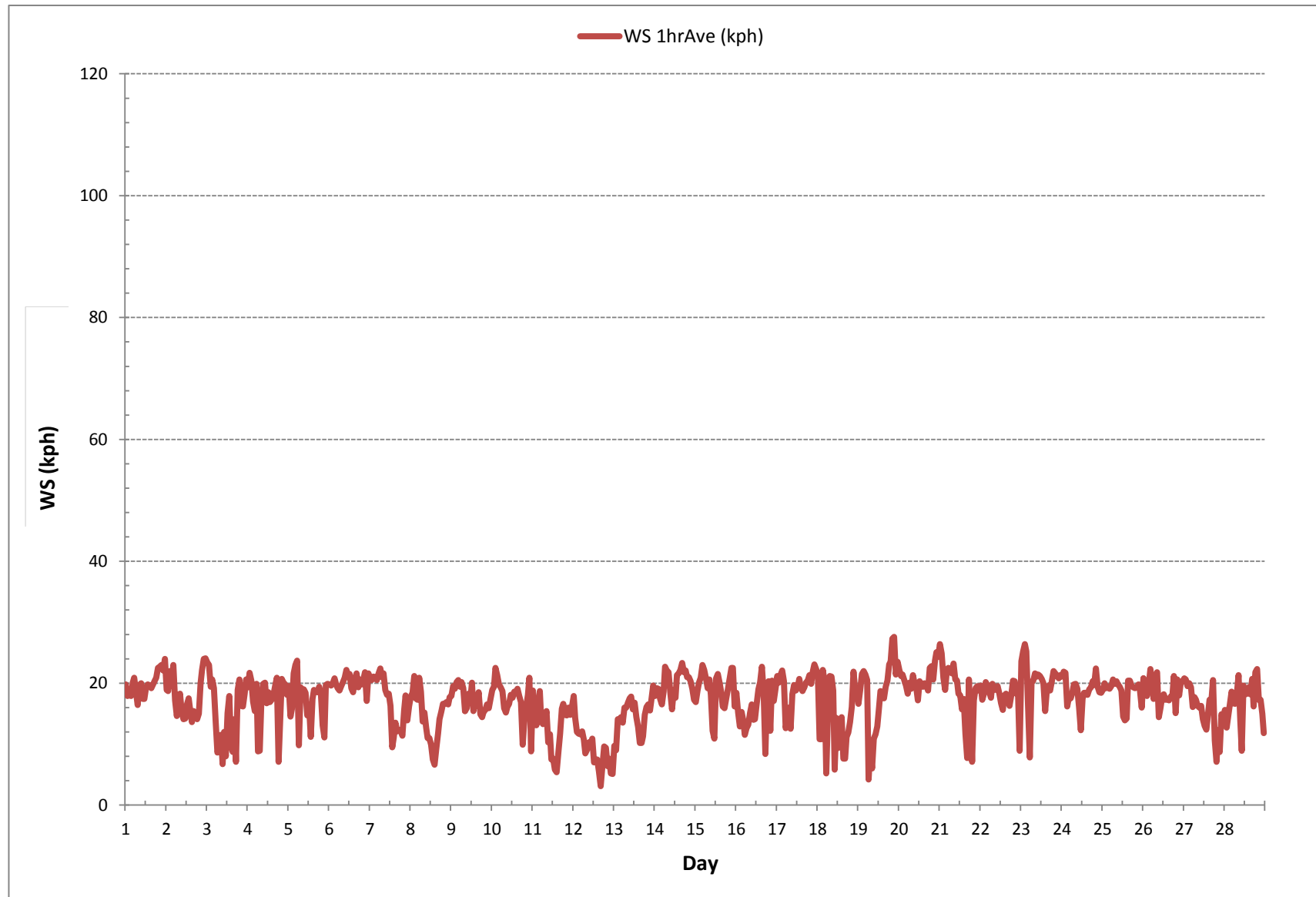
% Icon	Classes (ug/m3(L))	29		5.8-11.6	7		11.6-17.4	2		17.4-23.2	1		23.2-29.0	0		>29.0
61		0.0-5.8														

LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 0.00%

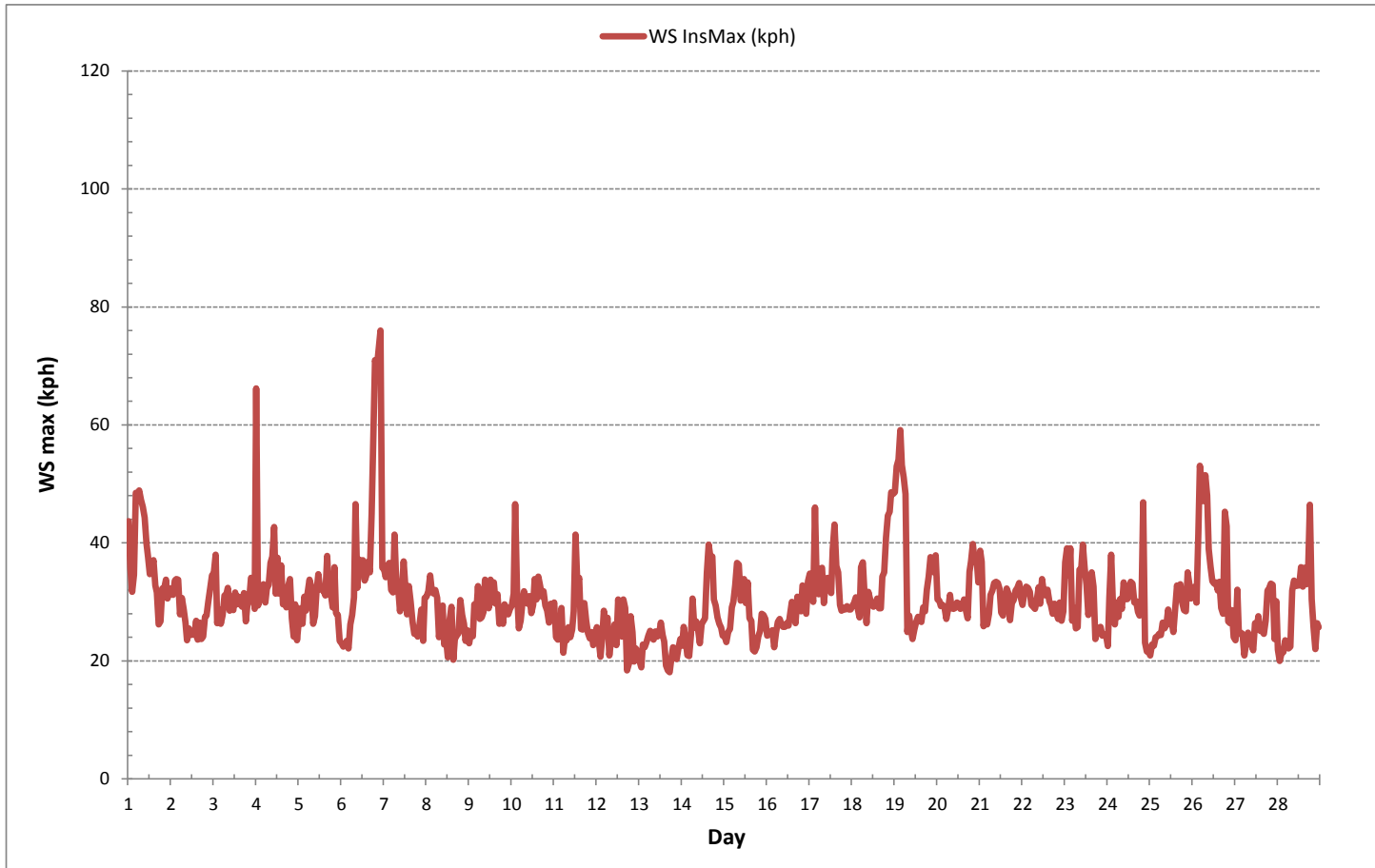


WIND SPEED

WIND SPEED Hourly Averages (WS kph)



WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 2017/02
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

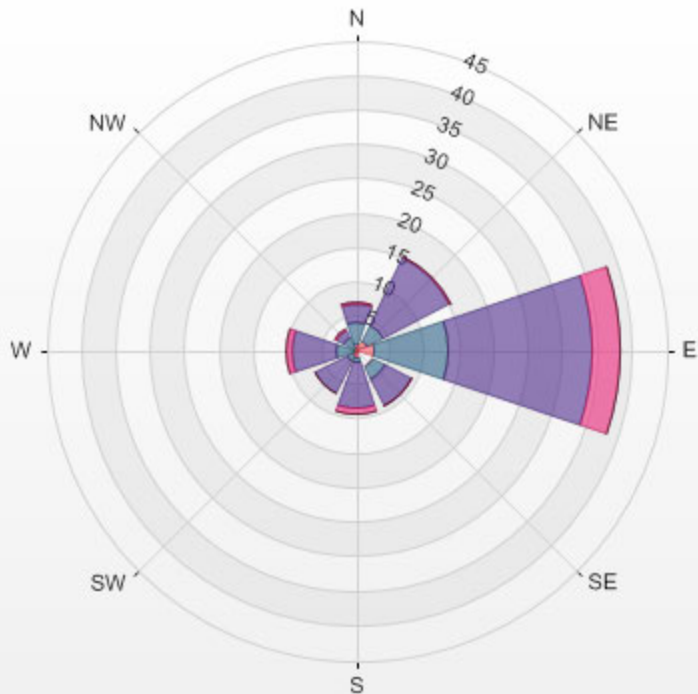
Calm: 0.00%

Calm Avg: 0.00 [ppb]

Direction	1.8-5.5	5.5-11.1	11.1-16.6	16.6-22.2	22.2-27.7	>27.7	Total
N	0.0	0.9	3.3	2.7	0.2	0.0	7.0
NE	0.3	1.3	2.7	10.9	0.2	0.0	15.3
E	0.3	2.4	10.7	21.0	4.0	0.0	38.4
SE	0.2	2.4	2.2	4.2	0.2	0.0	9.1
S	0.3	0.7	0.6	6.9	0.9	0.0	9.4
SW	0.0	0.7	0.9	5.2	0.0	0.0	6.8
W	0.0	0.5	2.7	6.4	0.9	0.0	10.4
NW	0.0	0.5	1.6	1.2	0.3	0.0	3.6
Summary	1.1	9.4	24.7	58.3	6.6	0.0	100.0

% Icon Classes (kph) 1 1.8-5.5 9 5.5-11.1 25 11.1-16.6 58 16.6-22.2 7 22.2-27.7 0 >27.7

LICA ST. LINA 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 0.00%



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - February 2017

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	ENE	NE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	E	E	E	E	E	E	NE	24		
2	ENE	ENE	E	ENE	E	ENE	ENE	ENE	E	E	E	E	E	ESE	E	ESE	E	E	E	E	E	E	E	E	E	E	E	24	
3	ENE	ENE	ENE	ENE	ENE	ENE	NNE	NNE	WNW	NNE	NE	NNE	WNW	WNW	NW	NNE	WNW	NE	ENE	ENE	NE	NW	WNW	W	NNE	24			
4	S	S	S	S	S	S	SW	SW	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	S	S	WNW	SSW	NNW	NNW	NNW	NNW	SSW	24			
5	NNW	NNW	NNW	NNW	NNW	NNW	SE	ENE	ENE	ENE	NE	NNE	NE	N	NE	NE	NE	NE	ENE	NE	NE	NW	WNW	W	NNE	24			
6	W	W	W	W	W	W	W	W	W	W	W	W	WSW	W	W	W	W	W	S	SSE	SSE	S	SE	ENE	WSW	24			
7	ENE	ENE	ENE	ENE	ENE	ENE	E	E	E	E	ENE	ENE	ENE	E	ENE	E	E	E	E	E	E	E	E	E	E	E	24		
8	ENE	ENE	ENE	ENE	ENE	E	E	E	E	ESE	ESE	ESE	SE	SSE	SSE	SE	SE	ESE	SE	SE	SE	SE	ESE	ESE	ESE	ESE	24		
9	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	WSW	SW	WSW	W	WSW	W	W	W	W	W	WNW	W	W	W	SSW	24			
10	W	W	W	W	W	W	W	W	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	S	SW	SW	SW	WSW	S	WSW	SSW	24			
11	ESE	ESE	E	E	E	E	E	E	E	E	ENE	NE	NNE	NE	ENE	ENE	ENE	E	E	E	ESE	ESE	ESE	E	E	24			
12	ESE	ESE	SE	SE	SSE	SSE	SSE	SE	SE	SE	SE	SE	SSE	SSE	SE	S	SSE	ESE	ESE	SE	SE	E	ENE	E	SE	24			
13	E	E	E	E	E	ENE	ENE	ENE	E	E	E	E	E	ESE	ESE	ESE	ESE	ESE	E	E	E	ESE	ESE	ESE	E	24			
14	ESE	ESE	ESE	ESE	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	24		
15	ESE	ESE	ESE	ESE	ESE	ESE	SE	ESE	ESE	ESE	S	S	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	ESE	ESE	E	ESE	24			
16	N	N	N	N	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	NNW	N	NNW	W	SSW	SSW	NNW	24		
17	SSW	SSW	SSW	SSW	SSW	WSW	WSW	SW	WNW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	SSW	SSW	24		
18	SSW	WSW	W	SSW	S	ESE	SE	NNW	NNW	NNW	NE	NNE	ESE	NNE	NNE	ESE	ENE	ESE	ENE	E	ENE	NE	ENE	E	ENE	24			
19	E	ENE	E	ENE	ENE	ENE	ENE	WSW	SSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	S	WSW	24			
20	S	S	SSW	SSW	SSW	SSW	SSW	SSW	S	S	S	SSW	S	S	S	SSW	S	S	S	S	E	E	E	E	S	24			
21	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	NW	NNW	ENE	NE	N	NE	NE	NE	NE	ENE	24			
22	ENE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	ENE	ENE	ENE	NE	ENE	ENE	ENE	ENE	ENE	ENE	W	ENE	24			
23	ENE	E	E	E	ENE	NNE	ENE	ENE	ENE	ENE	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	24		
24	E	E	ENE	W	W	W	WNW	WNW	WNW	WNW	WNW	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	E	E	E	E	NE	24			
25	E	E	E	E	ESE	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	NE	E	24			
26	ENE	ENE	ENE	NE	NNE	NNE	N	NNE	NNE	N	NNE	NE	NE	NE	NE	ENE	NE	ENE	W	E	ESE	ESE	ESE	ESE	NE	24			
27	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	ESE	ESE	E	E	NE	ESE	ENE	N	NNW	E	24			
28	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	SSW	S	S	SSE	SSE	SSE	SSE	S	W	WSW	WSW	WSW	W	W	W	24			

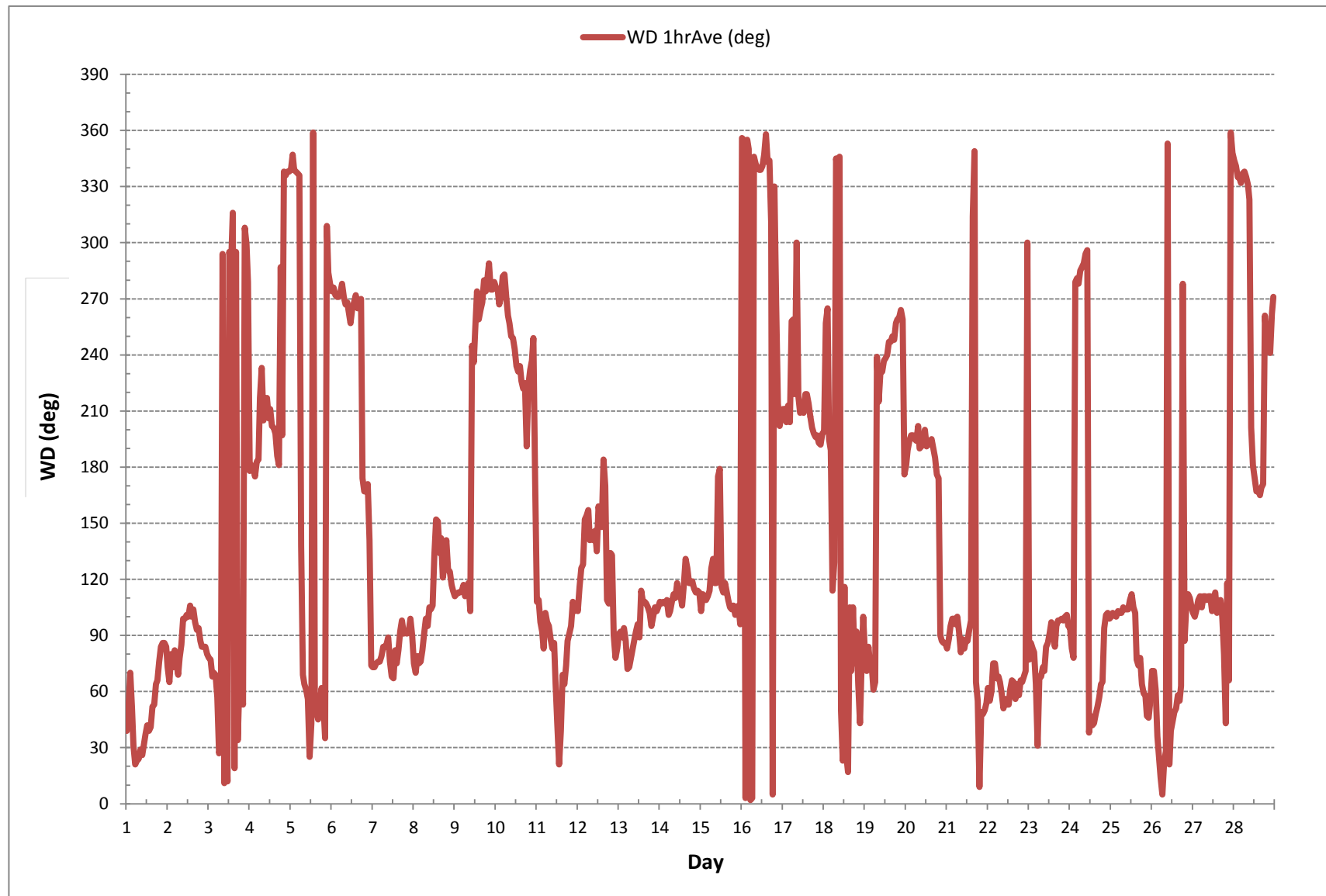
STATUS FLAG CODES

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:	September 12, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0 hrs	OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	90	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	94 (E)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Continuous Monitoring Station - February 2017

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	27	31	10	16	33	37	43	50	36	36	41	38	21	21	29	24	18	7	6	3	3	2	1	4	24
2	7	7	4	6	3	8	11	7	3	5	7	7	6	6	8	9	7	6	7	8	4	3	2	4	24
3	4	8	27	19	29	53	66	60	60	67	59	58	47	31	60	68	52	63	29	7	39	46	33	12	24
4	30	4	4	6	8	8	61	71	49	33	28	19	24	17	17	19	13	2	26	27	2	2	3	3	24
5	4	2	3	2	1	1	40	6	8	12	23	50	39	64	31	15	26	24	14	23	45	47	16	2	24
6	2	2	2	1	2	4	4	3	8	7	10	7	8	7	7	7	7	29	25	5	5	14	31	3	24
7	4	4	6	4	4	3	4	2	2	3	9	13	22	40	32	19	19	12	11	15	5	4	6	6	24
8	8	7	5	10	9	4	3	6	6	11	17	18	21	36	48	27	16	11	11	13	9	9	6	6	24
9	5	6	5	5	8	7	6	22	44	44	29	33	9	12	9	10	7	10	14	10	12	8	9	8	24
10	6	7	6	8	10	6	6	14	11	12	11	15	29	22	23	28	38	41	59	53	44	33	16	50	24
11	27	6	9	8	7	7	8	10	9	26	23	48	49	63	65	37	24	12	6	7	7	10	8	6	24
12	5	11	13	14	19	17	21	24	22	17	22	22	40	36	36	54	66	33	16	22	34	33	51	48	24
13	20	22	7	6	8	13	9	6	5	4	4	8	10	10	12	15	14	10	5	4	4	5	4	3	24
14	6	4	4	4	4	3	4	4	5	5	6	6	9	9	22	34	20	11	10	7	6	5	4	4	24
15	7	5	4	3	16	20	36	43	25	43	60	61	30	10	8	8	6	6	3	3	3	5	4	38	24
16	3	6	11	14	8	17	15	14	10	7	12	12	9	7	28	11	8	44	47	10	41	25	12	15	24
17	19	14	32	33	29	59	51	54	54	44	29	40	37	20	18	17	15	14	31	19	35	29	16	28	24
18	34	43	54	13	6	52	20	11	2	40	68	59	58	64	58	63	74	68	65	64	58	39	54	53	24
19	58	54	49	47	48	48	48	41	59	24	23	17	13	10	8	9	6	7	4	3	2	1	34	3	24
20	22	21	18	18	10	11	13	35	22	29	31	43	24	29	20	19	16	7	3	2	38	3	1	2	24
21	7	4	28	37	13	11	10	5	5	5	6	6	7	12	9	63	73	22	51	79	41	26	27	28	24
22	17	38	25	8	8	11	12	13	25	21	18	17	16	17	13	11	14	14	28	11	18	36	34	65	24
23	8	5	1	6	44	75	19	14	4	13	16	5	5	6	12	9	6	4	5	11	4	3	3	2	24
24	1	3	5	44	7	8	9	14	13	26	43	50	30	30	24	26	17	20	9	21	5	3	3	2	24
25	1	2	2	2	4	4	6	17	7	8	10	10	13	16	12	12	14	6	9	13	10	20	31	44	24
26	7	8	11	28	29	40	51	35	23	52	47	29	21	22	18	17	27	29	46	40	11	30	17	3	24
27	3	8	4	5	5	5	5	6	5	7	7	14	16	16	13	7	6	5	57	46	64	51	3	3	24
28	2	5	3	3	2	3	3	3	35	65	23	17	8	8	15	23	12	50	28	3	4	5	10	23	24

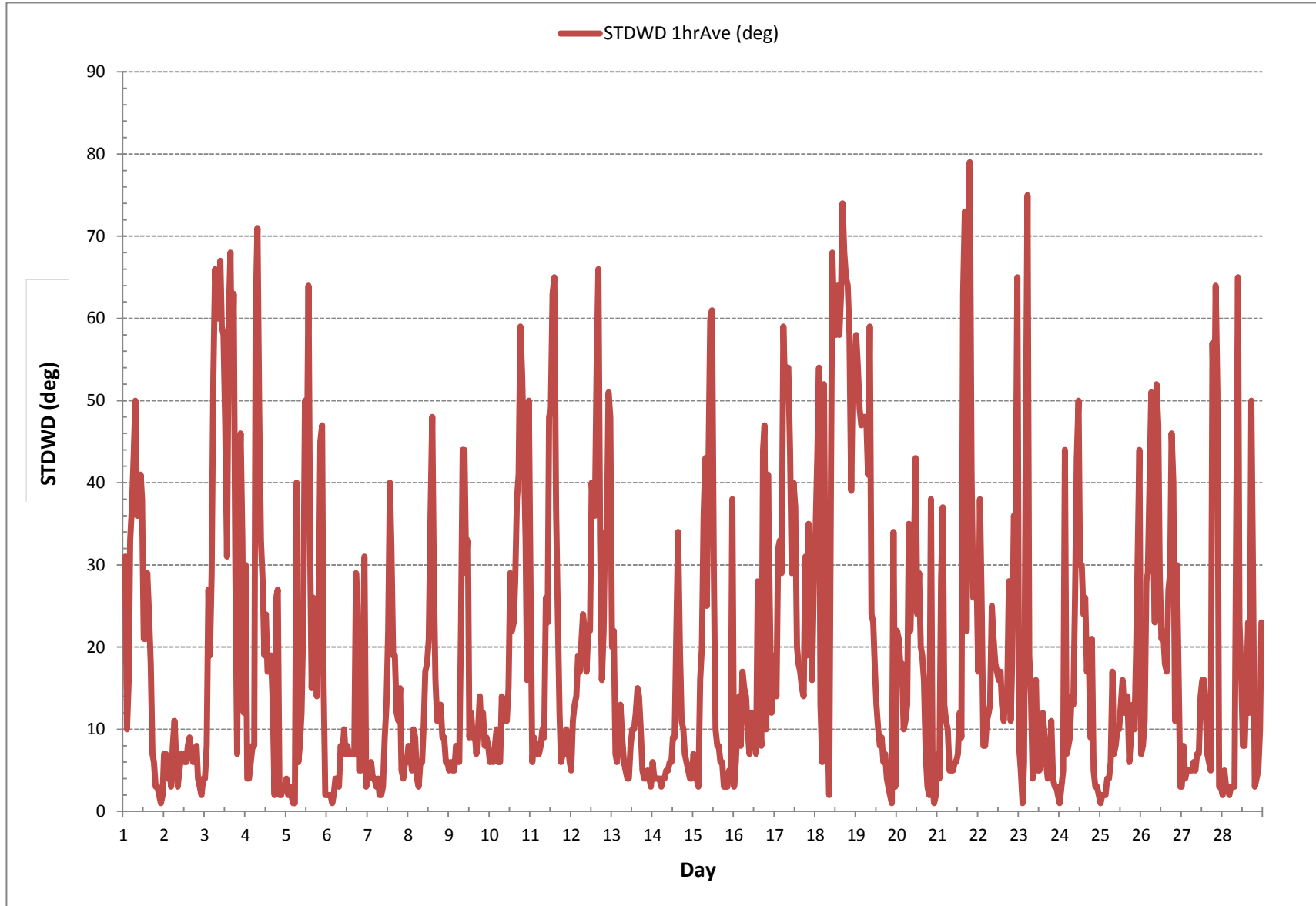
STATUS FLAG CODES

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: September 12, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 672 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



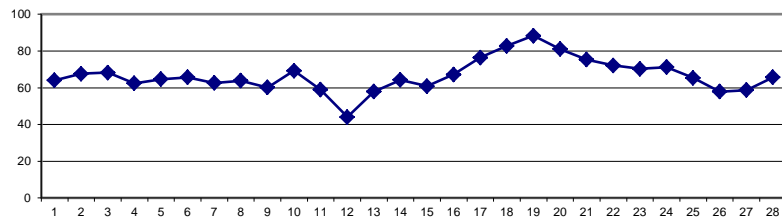
RELATIVE HUMIDITY Hourly Averages (RH %)

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	74	73	76	76	70	67	67	68	64	60	56	50	48	46	46	49	54	61	65	68	71	75	76	77	46	77	64	24
2	76	77	77	76	78	79	77	76	74	68	64	60	56	55	54	56	60	64	67	66	66	66	66	65	54	79	68	24
3	66	68	70	72	73	70	69	69	69	69	66	65	65	62	63	64	67	69	68	70	70	70	72	72	62	73	68	24
4	71	72	73	71	68	68	68	69	67	62	59	51	53	49	45	47	51	59	62	62	64	68	68	70	45	73	62	24
5	71	73	72	72	72	72	72	72	72	70	64	58	52	51	51	53	56	62	60	63	65	65	67	68	51	73	65	24
6	69	69	70	70	69	69	69	68	67	66	64	61	57	57	60	62	65	67	68	68	68	68	69	69	57	70	66	24
7	70	70	69	69	68	68	68	67	67	66	64	56	49	49	49	50	55	61	63	63	64	65	66	66	49	70	63	24
8	67	69	69	69	69	71	71	71	69	67	64	60	56	53	52	53	57	62	63	63	63	65	65	64	52	71	64	24
9	64	63	62	61	61	60	60	60	59	55	54	51	47	51	51	53	57	63	67	65	65	68	73	75	47	75	60	24
10	75	75	75	75	73	70	69	68	66	64	60	59	60	61	64	65	67	71	73	73	74	74	75	76	59	76	69	24
11	78	78	78	80	82	81	80	78	69	56	49	42	38	36	38	40	41	43	47	53	54	58	58	58	36	82	59	24
12	57	56	54	54	51	49	49	49	48	45	41	37	35	35	35	34	36	42	43	42	41	41	40	44	34	57	44	24
13	49	53	57	60	61	62	63	65	63	57	53	48	43	47	46	48	52	58	62	65	68	68	69	72	43	72	58	24
14	73	73	73	73	74	75	77	79	75	64	59	51	47	43	44	45	49	54	60	64	68	72	74	75	43	79	64	24
15	74	77	76	73	69	67	63	59	55	56	55	54	52	50	51	47	49	52	57	60	61	64	69	70	47	77	61	24
16	66	64	64	65	66	65	66	72	73	67	65	66	63	59	58	63	66	69	72	74	76	73	70	72	58	76	67	24
17	74	71	76	78	77	81	80	79	74	67	70	80	82	76	76	76	72	71	74	76	78	81	83	83	67	83	76	24
18	84	85	86	86	86	86	88	88	86	82	84	85	85	82	80	80	80	80	77	77	78	80	81	81	77	88	83	24
19	82	85	88	88	88	88	88	89	89	89	88	88	88	88	88	89	89	89	89	90	90	90	90	90	82	90	88	24
20	90	90	90	90	90	90	89	89	88	87	82	79	75	75	71	70	71	73	75	75	76	77	77	77	70	90	81	24
21	78	79	79	79	81	81	81	81	80	77	71	70	66	59	63	71	74	75	76	78	79	78	76	76	59	81	75	24
22	77	77	77	77	77	76	77	77	76	71	68	65	61	60	63	66	69	61	65	74	78	79	81	80	60	81	72	24
23	79	80	81	81	81	80	79	80	77	71	63	62	59	58	57	57	58	62	65	66	69	71	74	78	57	81	70	24
24	80	81	79	82	81	80	80	80	79	75	64	59	57	56	56	56	56	63	70	73	73	76	76	76	56	82	71	24
25	76	75	75	75	75	75	75	75	74	72	67	60	52	52	53	47	47	53	57	62	64	67	70	71	47	76	65	24
26	76	78	75	73	64	64	64	64	54	51	48	45	44	42	41	41	43	50	57	59	62	63	64	67	41	78	58	24
27	69	70	71	72	74	73	73	72	63	57	52	45	41	38	37	37	37	40	46	54	69	73	73	73	37	74	59	24
28	76	77	78	78	77	77	76	75	71	62	52	46	46	48	47	48	52	58	68	71	73	71	74	76	46	78	66	24
HOURLY MAX	90	90	90	90	90	90	89	89	89	89	88	88	88	88	88	89	89	89	89	90	90	90	90	90				
HOURLY AVG	73	74	74	74	73	73	73	73	70	66	62	59	56	55	55	56	58	62	65	67	69	70	71	72				

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

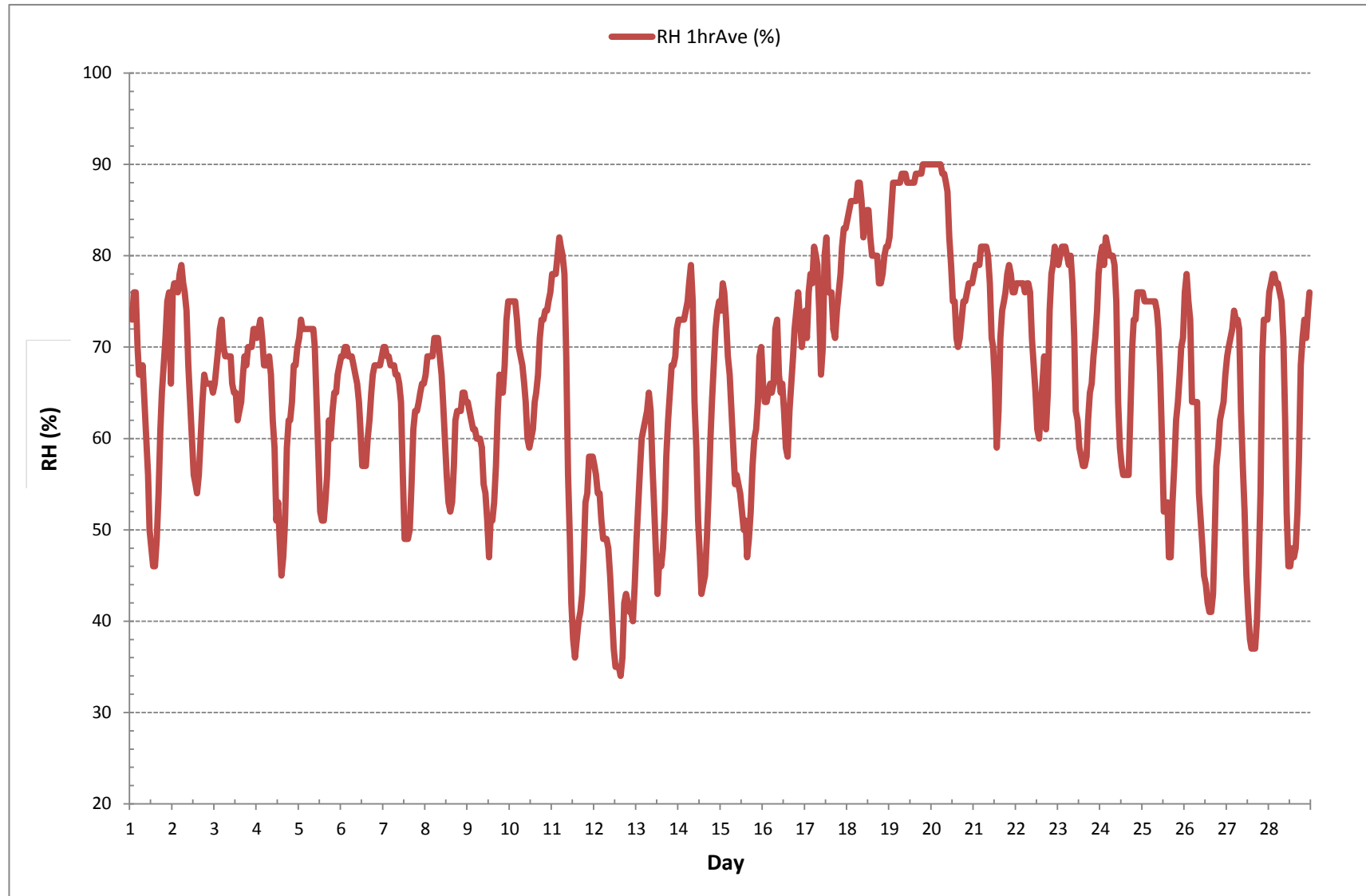
24 HR AVERAGES February 2017



MONTHLY SUMMARY

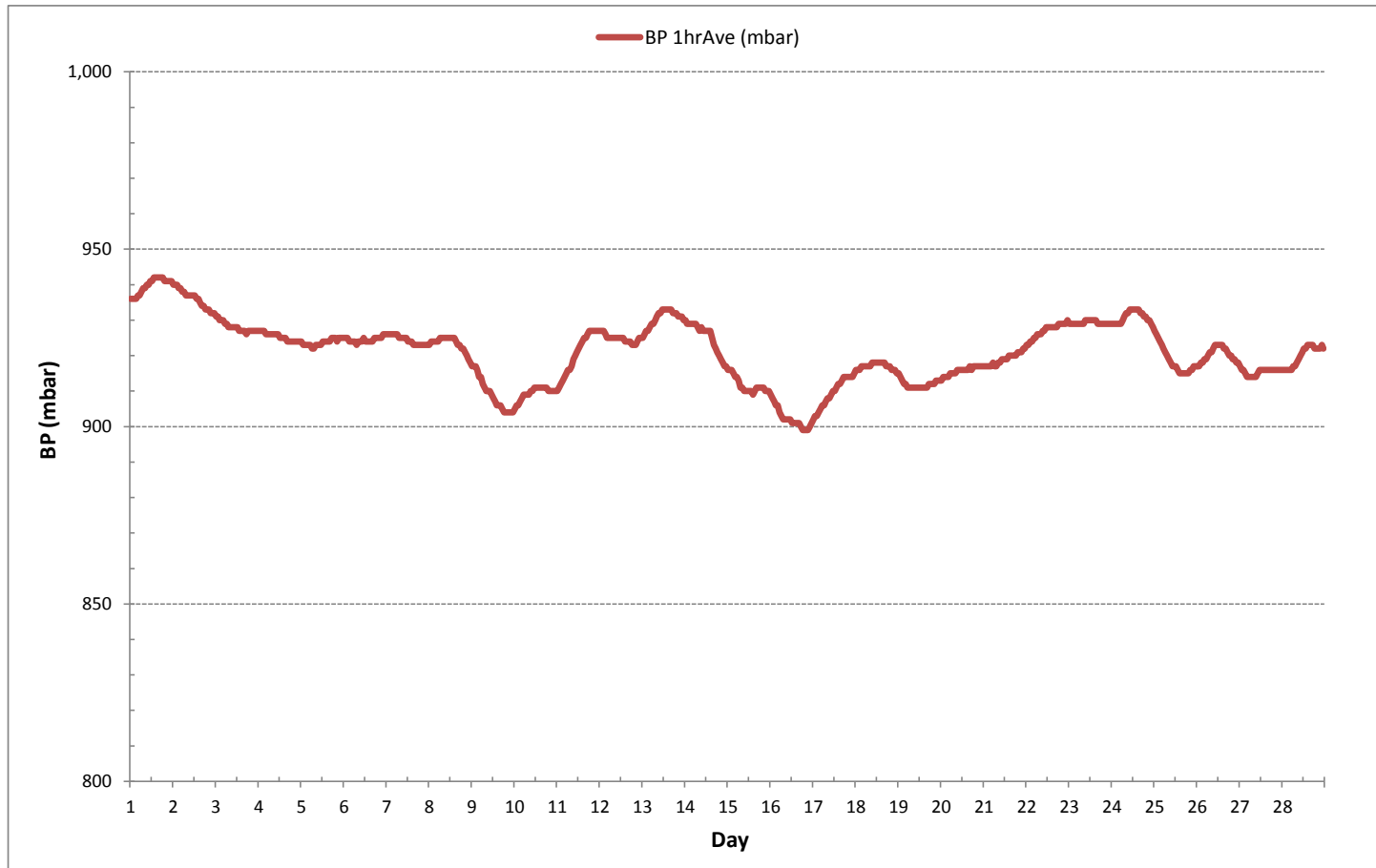
MINIMUM 1-HR AVERAGE:	34	%	@ HOUR(S)	15	ON DAY(S)	12
MAXIMUM 1-HR AVERAGE:	90	%	@ HOUR(S)	VAR , VAR	ON DAY(S)	19 , 20
MAXIMUM 24-HR AVERAGE:	88	%			ON DAY(S)	19
					VAR-VARIOUS	
OPERATIONAL TIME:						672 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	12					
MONTHLY AVERAGE:						67 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



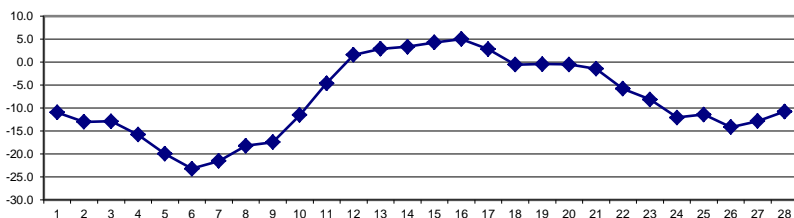
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-11.3	-11.2	-11.1	-10.8	-10.4	-10.4	-10.5	-10.6	-10.7	-10.6	-9.4	-7.8	-7.3	-7.6	-7.8	-8.1	-9.8	-11.9	-12.6	-13.3	-13.9	-14.6	-15.1	-15.5	-15.5	-7.3	-10.9	24
2	-14.7	-14.3	-14.7	-14.0	-15.1	-15.2	-15.3	-16.1	-16.1	-15.7	-13.6	-11.3	-9.5	-9.1	-8.8	-9.6	-11.0	-12.5	-13.2	-12.8	-12.5	-12.3	-12.1	-11.8	-16.1	-8.8	-13.0	24
3	-12.0	-12.3	-12.3	-12.5	-12.6	-12.5	-12.6	-12.8	-12.8	-12.5	-12.3	-12.0	-11.7	-11.3	-11.4	-11.7	-12.7	-13.8	-13.8	-14.4	-14.1	-14.3	-15.1	-15.1	-15.1	-11.3	-12.9	24
4	-15.1	-15.3	-15.3	-15.2	-15.8	-16.5	-16.5	-16.3	-15.7	-15.2	-14.7	-13.4	-13.2	-13.0	-12.4	-13.1	-14.6	-17.1	-17.9	-17.4	-18.3	-18.9	-18.8	-19.1	-19.1	-12.4	-15.8	24
5	-19.0	-19.7	-20.4	-20.4	-20.8	-21.2	-21.2	-19.5	-19.0	-19.2	-17.2	-16.2	-15.4	-15.7	-16.1	-17.2	-18.6	-20.8	-21.9	-22.7	-23.4	-23.8	-24.4	-24.7	-24.7	-15.4	-19.9	24
6	-24.7	-24.9	-25.2	-25.3	-25.3	-25.6	-26.1	-26.7	-26.8	-24.8	-22.6	-21.0	-19.5	-20.2	-20.5	-21.0	-21.4	-21.8	-22.0	-22.3	-22.1	-22.0	-21.9	-22.4	-26.8	-19.5	-23.2	24
7	-22.8	-23.3	-23.9	-24.3	-24.7	-25.2	-25.3	-25.1	-24.7	-24.4	-21.1	-17.5	-15.8	-15.8	-15.7	-16.0	-17.4	-20.2	-21.6	-22.1	-22.3	-22.5	-22.3	-22.3	-25.3	-15.7	-21.5	24
8	-21.7	-21.1	-20.5	-20.7	-21.1	-22.1	-22.3	-22.7	-21.4	-19.0	-17.2	-15.1	-13.3	-12.5	-11.9	-12.2	-13.5	-15.2	-16.2	-17.1	-18.3	-19.6	-20.4	-21.0	-22.7	-11.9	-18.2	24
9	-21.5	-22.3	-22.5	-22.8	-23.0	-22.7	-22.3	-21.8	-20.5	-18.2	-16.4	-15.0	-13.5	-13.8	-13.0	-13.5	-13.9	-14.5	-14.6	-14.4	-14.5	-14.3	-14.4	-14.4	-23.0	-13.0	-17.4	24
10	-14.2	-14.2	-13.9	-14.1	-13.8	-13.5	-13.4	-13.5	-13.3	-12.7	-11.5	-9.6	-7.9	-7.7	-8.2	-8.4	-9.1	-9.9	-10.3	-10.7	-11.2	-11.3	-11.5	-11.8	-14.2	-7.7	-11.5	24
11	-12.0	-11.7	-10.9	-10.1	-8.8	-9.0	-9.6	-9.8	-8.0	-4.2	-1.9	0.6	1.9	2.3	2.2	1.3	0.1	-1.0	-2.0	-2.9	-3.0	-4.1	-4.3	-4.9	-12.0	2.3	-4.6	24
12	-5.0	-4.6	-3.7	-3.8	-2.8	-2.3	-2.2	-1.9	-1.1	0.3	2.5	4.5	5.9	5.9	6.5	6.7	5.9	4.0	3.3	3.3	4.1	4.5	4.8	4.2	-5.0	6.7	1.6	24
13	2.9	2.0	0.8	-0.1	-0.1	0.1	0.1	-0.4	0.4	2.1	3.6	6.0	8.5	7.1	7.6	6.9	5.9	4.3	3.2	2.6	1.9	2.2	1.9	0.9	-0.4	8.5	2.9	24
14	0.5	0.4	0.4	0.3	-0.1	-0.2	-1.0	-1.6	-0.9	1.8	4.0	7.2	8.9	10.7	10.4	9.7	8.2	6.5	4.9	3.9	2.9	1.8	1.2	0.9	-1.6	10.7	3.4	24
15	1.0	0.1	0.1	0.5	0.8	0.8	1.5	2.2	3.4	3.5	4.3	5.0	5.9	7.3	7.8	9.6	9.1	8.3	7.0	6.2	6.3	5.3	4.0	3.6	0.1	9.6	4.3	24
16	4.8	5.2	5.0	4.5	4.3	4.6	4.4	3.1	3.2	4.8	5.9	5.8	6.8	8.0	8.4	6.9	6.3	5.3	4.6	4.0	3.6	4.0	4.2	3.6	3.1	8.4	5.1	24
17	3.2	4.3	3.0	2.7	3.6	3.1	3.3	3.2	4.1	5.2	4.6	3.5	3.3	3.9	3.9	3.3	3.3	3.1	1.8	1.2	0.9	0.2	-0.2	-0.4	-0.4	5.2	2.8	24
18	-0.8	-1.4	-2.2	-1.6	-1.4	-2.3	-2.8	-3.0	-3.4	-1.6	0.2	0.3	0.6	1.1	1.9	2.0	1.7	1.0	0.6	0.1	-0.1	-0.3	-0.5	-0.8	-3.4	2.0	-0.5	24
19	-0.9	-1.0	-1.3	-1.4	-1.6	-1.6	-1.4	-1.1	-0.8	-0.3	-0.3	0.3	0.5	0.5	0.5	0.3	0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-1.6	0.5	-0.4	24
20	-0.1	-0.2	-0.3	-0.5	-0.5	-0.6	-0.6	-0.7	-0.6	0.0	1.1	1.0	1.6	1.4	1.5	1.0	0.0	-1.7	-1.9	-2.0	-2.2	-2.3	-2.4	-2.4	-2.4	1.6	-0.5	24
21	-2.4	-2.4	-2.6	-2.5	-2.6	-2.4	-2.3	-2.2	-1.7	-0.8	0.8	1.2	2.5	4.5	3.2	0.3	-1.3	-1.7	-2.2	-2.5	-3.2	-3.9	-4.6	-5.2	-5.2	4.5	-1.4	24
22	-5.3	-5.5	-5.6	-5.6	-5.6	-5.7	-5.9	-6.1	-6.2	-5.8	-5.4	-4.8	-4.1	-3.7	-4.0	-4.3	-4.8	-5.0	-5.7	-7.0	-7.5	-7.7	-8.2	-9.0	-9.0	-3.7	-5.8	24
23	-9.7	-10.0	-10.1	-10.2	-10.2	-11.1	-12.0	-12.4	-11.4	-9.6	-7.1	-6.5	-4.9	-4.2	-3.8	-4.1	-4.8	-6.1	-6.7	-6.9	-7.4	-8.0	-8.3	-8.7	-12.4	-3.8	-8.1	24
24	-8.9	-9.1	-9.1	-11.1	-11.4	-11.1	-11.2	-11.3	-11.4	-11.2	-9.7	-9.2	-9.4	-10.0	-10.2	-11.0	-11.3	-13.3	-15.1	-15.6	-15.6	-17.1	-17.6	-18.0	-18.0	-8.9	-12.0	24
25	-18.4	-19.0	-19.1	-18.6	-19.0	-18.8	-18.5	-17.9	-16.5	-12.8	-9.3	-7.0	-5.2	-4.3	-5.1	-4.1	-4.6	-6.4	-7.5	-7.9	-8.0	-8.1	-8.3	-8.5	-19.1	-4.1	-11.4	24
26	-8.7	-8.9	-8.8	-8.9	-10.6	-12.1	-14.0	-15.4	-16.4	-15.8	-15.4	-14.6	-14.0	-13.0	-12.2	-11.9	-12.4	-14.5	-16.7	-17.2	-18.5	-19.1	-19.6	-19.9	-19.9	-8.7	-14.1	24
27	-19.8	-19.1	-18.8	-18.9	-19.1	-19.1	-19.4	-19.1	-16.3	-13.4	-10.0	-6.5	-5.5	-5.3	-4.6	-4.6	-5.1	-6.8	-9.1	-10.9	-14.1	-14.8	-13.6	-13.6	-19.8	-4.6	-12.8	24
28	-14.0	-15.1	-15.6	-16.0	-15.8	-16.2	-16.6	-16.5	-13.2	-8.5	-6.4	-4.8	-3.7	-3.6	-3.3	-3.5	-5.1	-7.2	-10.1	-10.8	-11.3	-11.5	-13.3	-15.2	-16.6	-3.3	-10.7	24
HOURLY MAX	4.8	5.2	5.0	4.5	4.3	4.6	4.4	3.2	4.1	5.2	5.9	7.2	8.9	10.7	10.4	9.7	9.1	8.3	7.0	6.2	6.3	5.3	4.8	4.2				
HOURLY AVG	-9.7	-9.8	-10.0	-10.1	-10.1	-10.3	-10.5	-10.6	-9.9	-8.5	-6.9	-5.6	-4.6	-4.2	-4.1	-4.5	-5.4	-6.7	-7.7	-8.2	-8.6	-9.0	-9.3	-9.7				

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

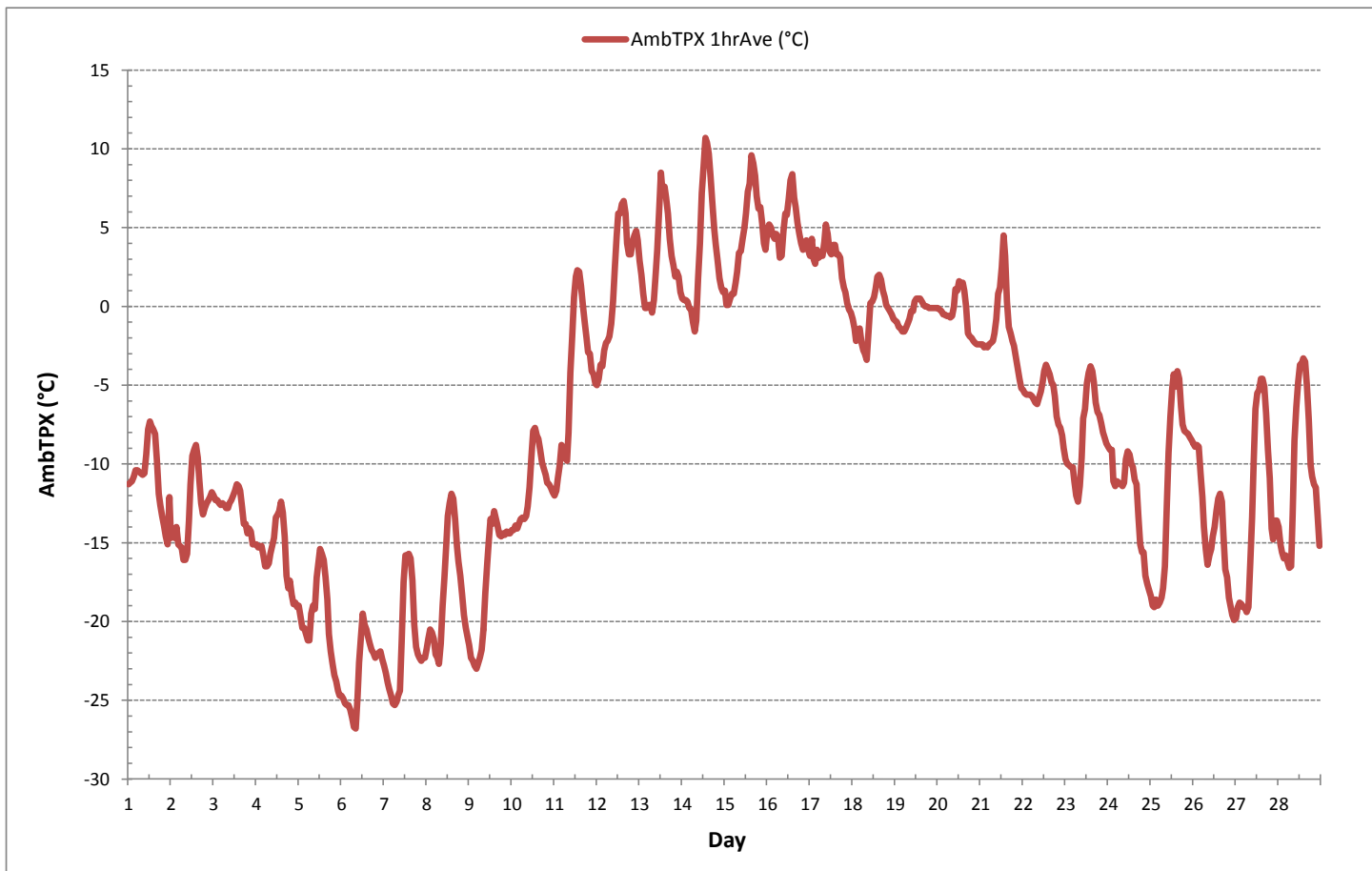
24 HR AVERAGES February 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-26.8 °C	@ HOUR(S)	8	ON DAY(S)	6
MAXIMUM 1-HR AVERAGE:	10.7 °C	@ HOUR(S)	13	ON DAY(S)	14
MAXIMUM 24-HR AVERAGE:	5.1 °C			ON DAY(S)	16
				VAR-VARIOUS	
OPERATIONAL TIME:				672	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	9.0			MONTHLY AVERAGE:	-8.1 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



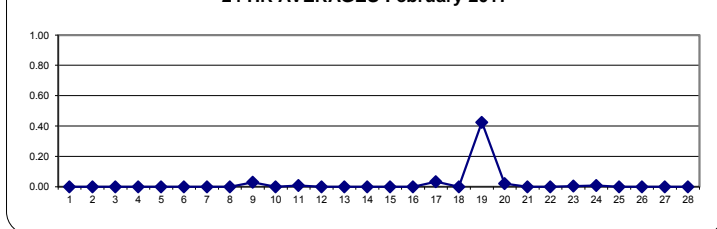
PRECIPITATION Hourly Averages (mm)

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 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	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	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	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	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	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.2	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.2	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	0.0	0.2	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	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	0.7	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	0.2	0.5	1.1	1.6	2.1	1.5	0.4	1.6	0.6	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	2.1	0.4	24
20	0.1	0.2	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	0.0	0.0	0.2	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	0.0	0.0	0.0	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	0.1	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	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	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
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	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	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	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	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	0.5	1.1	1.6	2.1	1.5	0.4	1.6	0.6	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.1	0.1	0.0				
HOURLY AVG	0.0	0.0	0.0	0.0	0.1	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	

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

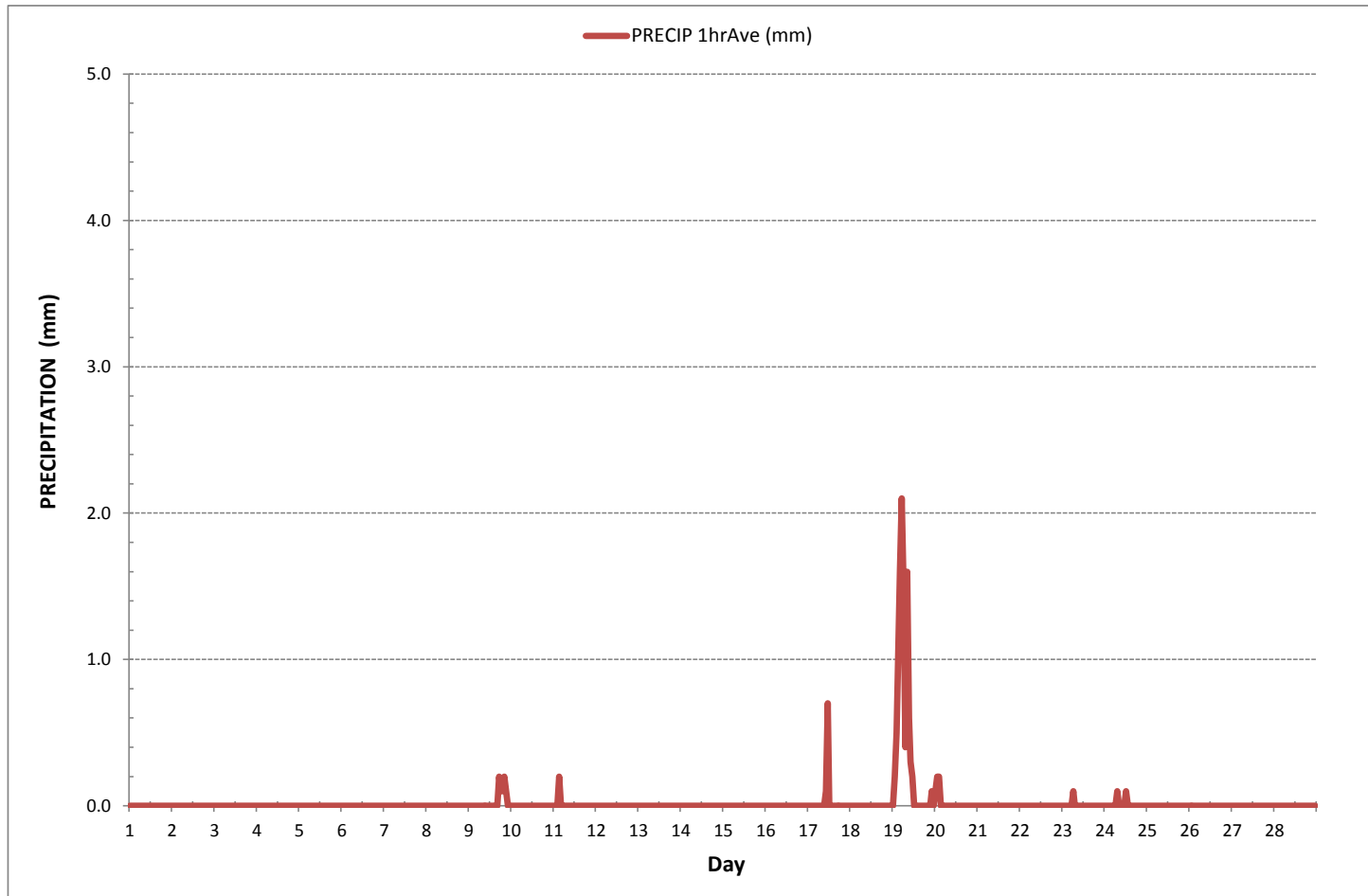
24 HR AVERAGES February 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	2.1	mm	@ HOUR(S)	5	ON DAY(S)	19
MAXIMUM 24-HR AVERAGE:	0.4	mm			ON DAY(S)	19
MONTHLY TOTAL	12.7	mm			VAR-VARIOUS	
STANDARD DEVIATION:	0.1					
				OPERATIONAL TIME:		672 hrs
				AMD OPERATION UPTIME:		100.0 %
				MONTHLY AVERAGE:		0.0 mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

<input checked="" type="checkbox"/> Remove	
Date: February 2, 2017	Barometric Pressure: 0.932 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 11:26	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 15:11	Cal Gas Expiry Date: July 18, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a
<input checked="" type="checkbox"/> Skip	

Analyzer:	
ID# or Serial Number: 468	Range ppb: 1000
Last Calibration Date: January 25, 2017	As Found C.F.: 0.992
Previous C.F.: 1.000	New C.F.: 1.000

Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<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
Point	ppb								
High	780								
Mid	380								
Low	190								
Make & Model: API 700									
Serial #: 627									
Cal Gas Cylinder I.D. #: LL104222									
Cal Gas Conc. (ppm): 50.6									

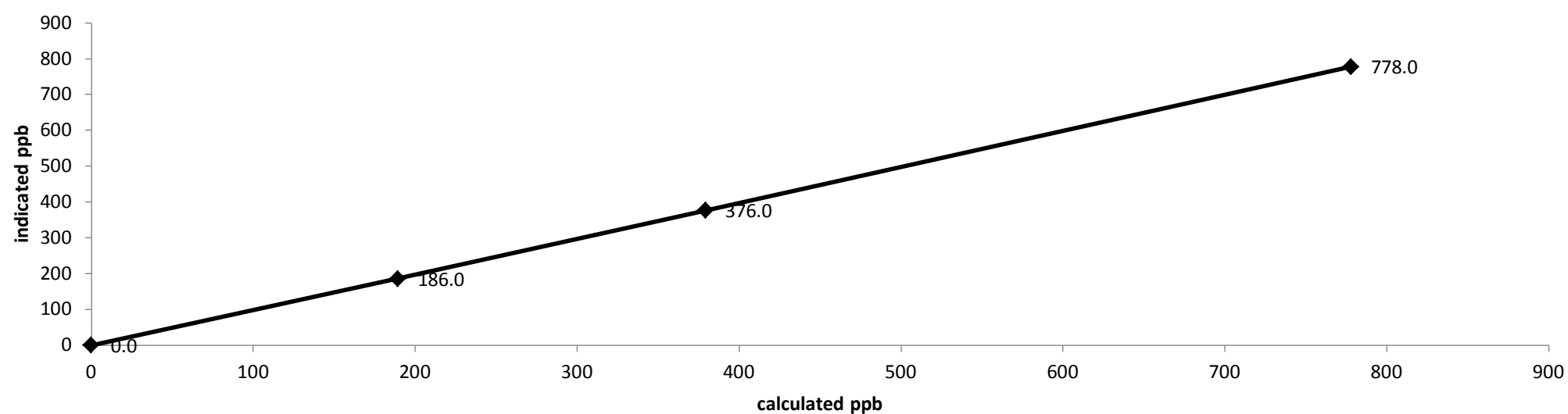
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	4924	76.90	5001	778.1	784.0	0.992
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4924	76.90	5001	778.1	778.0	1.000
mid	4965	37.50	5003	379.3	376.0	1.009
low	4980	18.70	4999	189.3	186.0	1.018
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F. =						1.009

Linear Regression/Calibration Results:

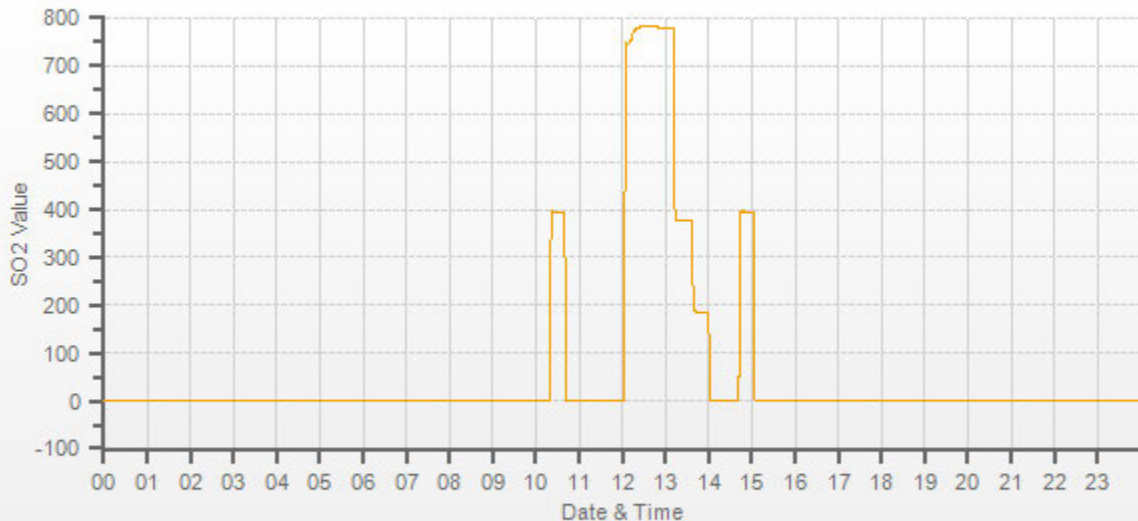
Correlation Coefficient =	1.000	LIMITS
Slope =	0.999	> or = 0.995
b (Intercept as % of full scale) =	0.20%	.95-1.05
% change in C.F. from last cal =	0.75%	± 3% F.S.
		± 10%

API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
SLOPE: 0.997	SLOPE: 0.987
OFFSET: 117.8	OFFSET: 117.8
HVPS: 651	HVPS: 651
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 30.4	BOX TEMP: 30.8
PMT TEMP: 7.9	PMT TEMP: 7.9
IZS TEMP: 50.0	IZS TEMP: 50.0
PRES: 24.2	PRES: 24.2
SAMP FL: 622	SAMP FL: 621
NORM PMT: 116.5	NORM PMT: 117.1
UV LAMP: 3174.9	UV LAMP: 3174.5
LAMP RATIO: 97.3	LAMP RATIO: 97.3
STR. LGT: 58.7	STR. LGT: 58.1
DRK PMT: 5.4	DRK PMT: 5.8
DRK LMP: 6.8	DRK LMP: 6.9
Expected Value: 400.0	Expected Value: 395.0

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.



— SO2[ppb]

HYDROGEN SULPHIDE

API 101E Hydrogen Sulphide Analyzer Calibration

Date:	February 2, 2017	Barometric Pressure:	0.932 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly
Start Time 24 hr. (mst):	11:26	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst):	14:46	Cal Gas Expiry Date:	June 14, 2019
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a

Analyzer:	
ID# or Serial Number:	509
Last Calibration Date:	January 25, 2017
Previous C.F.:	0.997
Range ppb:	100
As Found C.F.:	1.003
New C.F.:	0.997

Calibrator:	Standard Calibration Points for Ranges	SO₂ Scrubber Check (10 mins.)								
Flow Meter ID's:	n/a	Start/End Time 24 hr.: 11:49/11:59								
Make & Model:	SABIO 2010 D	Target Concentration (ppb): 780								
Serial #:	11900613	Result (ppb): 0								
Cal Gas Cylinder I.D. #:	EY0000654	Zero Corrected Result (ppb): 0								
Cal Gas Conc. (ppm):	10.2									
	<table border="1"> <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	
Point	ppb									
High	78									
Mid	38									
Low	19									

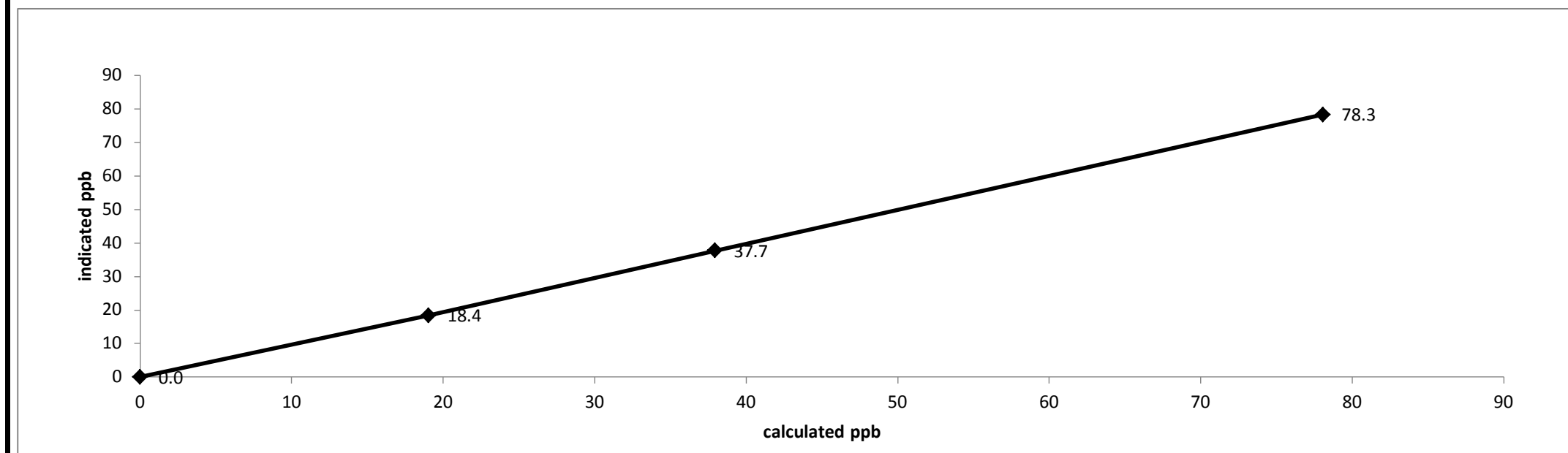
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	7442	57.40	7499	78.1	77.8	1.003
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.40	7499	78.1	78.3	0.997
mid	7471	27.90	7499	37.9	37.7	1.007
low	7486	14.00	7500	19.0	18.4	1.035
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.013

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.994		.95-1.05
b (Intercept as % of full scale)=	0.35%		± 3% F.S.
% change in C.F. from last cal=	-0.65%		± 10%

API 101E Hydrogen Sulphide Analyzer Calibration

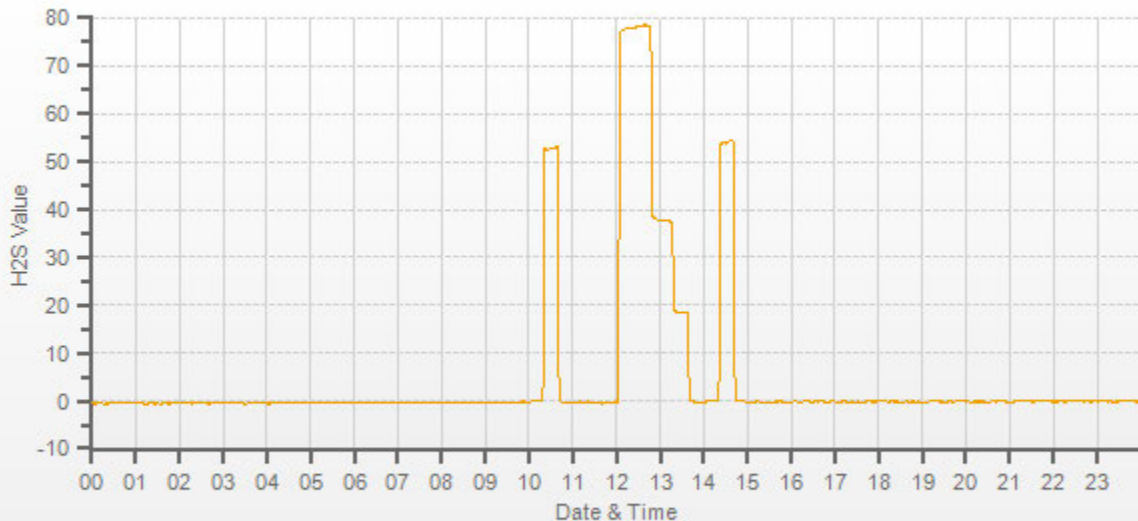


As found:	As left:		
SLOPE:	0.933	SLOPE:	0.941
OFFSET:	53.5	OFFSET:	53.5
HVPS:	675	HVPS:	675
RCELL TEMP:	50.0	RCELL TEMP:	50.0
BOX TEMP:	31.6	BOX TEMP:	31.7
PMT TEMP:	8.0	PMT TEMP:	8.0
IZS TEMP:	48.0	IZS TEMP:	48.0
Converter Temp:	314.5	Converter Temp:	313.9
PRES:	20.8	PRES:	20.8
SAMP FL:	572	SAMP FL:	571
UV LAMP:	3488.3	UV LAMP:	3486.5
LAMP RATIO:	93.4	LAMP RATIO:	93.3
STR. LGT	25.0	STR. LGT	25.2
DRK PMT:	0.4	DRK PMT:	0.4
DRK LMP:	0.5	DRK LMP:	0.6
Expected Value:	55.2	Expected Value:	54.3

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]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: February 16, 2017	Barometric Pressure: 0.890 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: St. Lina	Weather Conditions: A few clouds
Parameter: Hydrogen Sulphide	Calibration Purpose: shut down
Start Time 24 hr. (mst): 12:39	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 14:18	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
ID# or Serial Number: 509	Range ppb: 100
Last Calibration Date: February 2, 2017	As Found C.F.: 0.964
Previous C.F.: 0.997	New C.F.: n/a

Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<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
Point	ppb								
High	78								
Mid	38								
Low	19								
Make & Model: SABIO 2010 D									
Serial #: 11900613									
Cal Gas Cylinder I.D. #: EY0000654									
Cal Gas Conc. (ppm): 10.2									

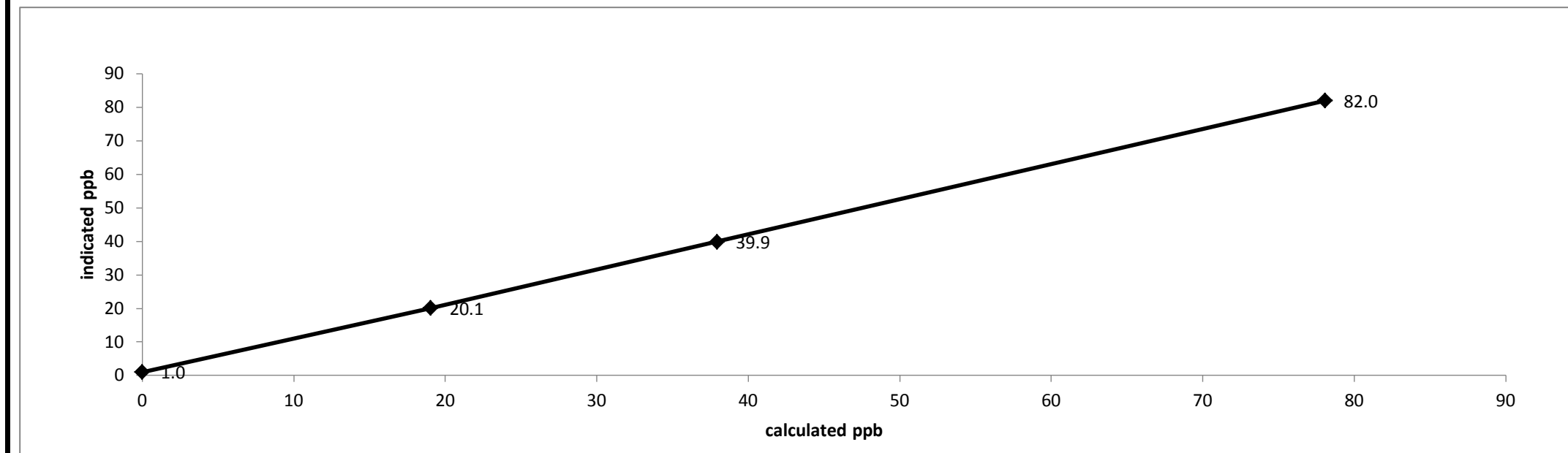
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	7442	57.40	7499	78.1	82.0	0.964
mid	7473	27.90	7501	37.9	39.9	0.975
low	7485	14.00	7499	19.0	20.1	0.997
Average C.F.=						0.979

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.962	> or = 0.995
b (Intercept as % of full scale)= -0.61%	0.90-1.10
% change in C.F. from last cal= 3.33%	± 3% F.S.
	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



As found:	As left:
SLOPE: 0.941	SLOPE: n/a
OFFSET: 53.5	OFFSET: n/a
HVPS: 675	HVPS: n/a
RCELL TEMP: 50.0	RCELL TEMP: n/a
BOX TEMP: 33.1	BOX TEMP: n/a
PMT TEMP: 8.0	PMT TEMP: n/a
IZS TEMP: 48.0	IZS TEMP: n/a
Converter Temp: 314.9	Converter Temp: n/a
PRES: 19.8	PRES: n/a
SAMP FL: 541	SAMP FL: n/a
UV LAMP: 3461.9	UV LAMP: n/a
LAMP RATIO: 92.7	LAMP RATIO: n/a
STR. LGT: 25.2	STR. LGT: n/a
DRK PMT: 0.5	DRK PMT: n/a
DRK LMP: 0.3	DRK LMP: n/a
Expected Value: 54.3	Expected Value: n/a

Comments:

No High Point adjustment made. "As Found-Shutdown" calibration completed because according to a daily report a daily ZS check results were as follows: zero: 1.6ppb. SPAN: 60.76/54.3.



API 101E Hydrogen Sulphide Analyzer Calibration

Date: February 16, 2017	Barometric Pressure: 0.890 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: St. Lina	Weather Conditions: A few clouds
Parameter: Hydrogen Sulphide	Calibration Purpose: post repair
Start Time 24 hr. (mst): 14:39	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 17:45	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
ID# or Serial Number: 509	Range ppb: 100
Last Calibration Date: n/a	As Found C.F.: n/a
Previous C.F.: n/a	New C.F.: 1.000

Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<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
Point	ppb								
High	78								
Mid	38								
Low	19								
Make & Model: SABIO 2010 D									
Serial #: 11900613									
Cal Gas Cylinder I.D. #: EY0000654									
Cal Gas Conc. (ppm): 10.2									

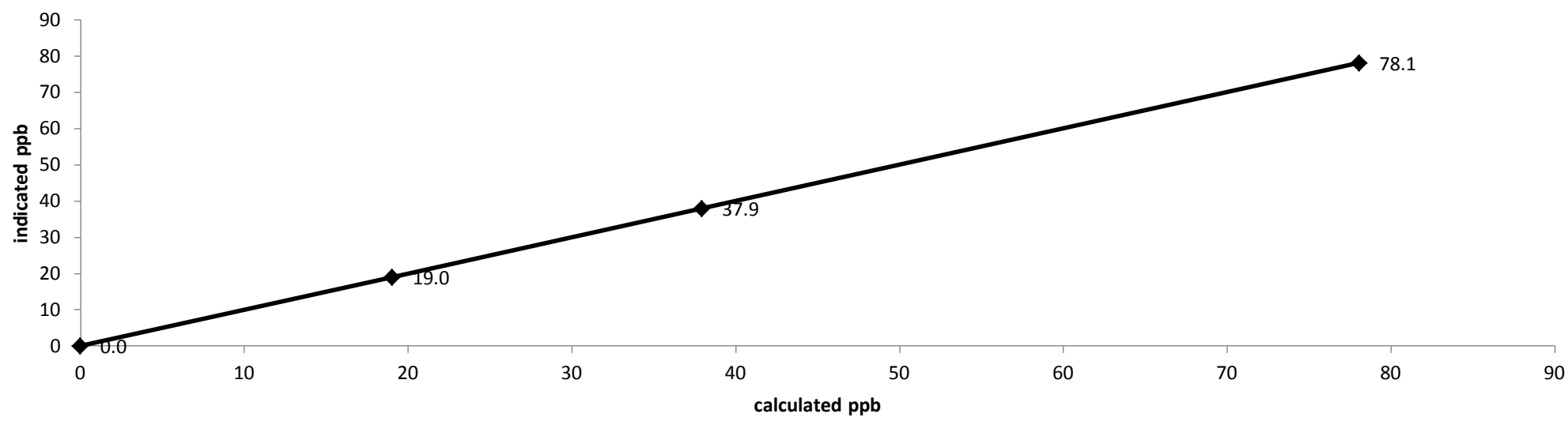
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.40	7499	78.1	78.1	1.000
mid	7473	27.90	7501	37.9	37.9	1.001
low	7485	14.00	7499	19.0	19.0	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 =	<u>1.000</u>	LIMITS
Slope =	<u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) =	<u>0.03%</u>	.95-1.05
% change in C.F. from last cal =	<u>n/a</u>	± 3% F.S.
		± 10%

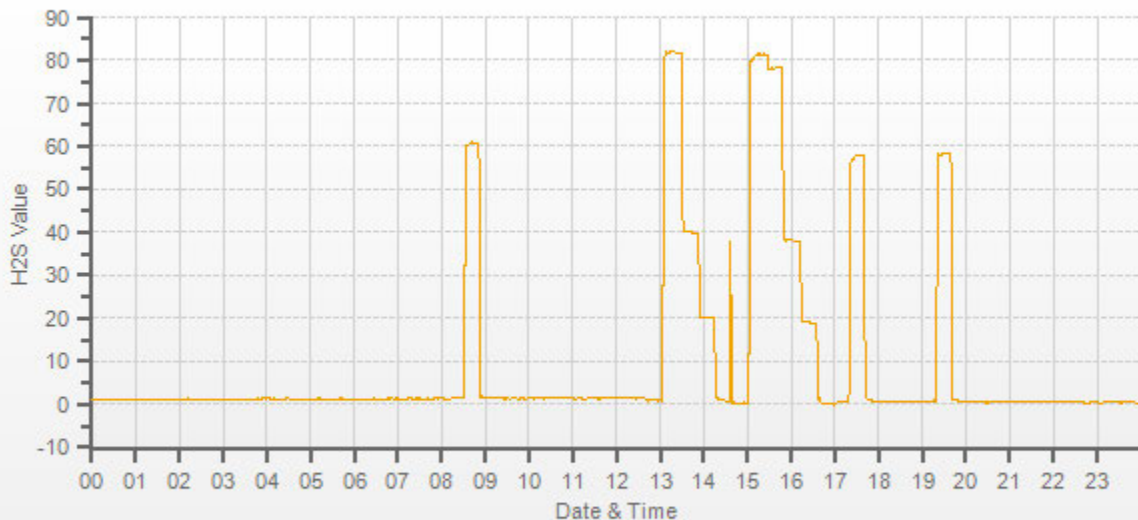
API 101E Hydrogen Sulphide Analyzer Calibration



As found:	As left:
SLOPE: <u>n/a</u>	SLOPE: <u>0.920</u>
OFFSET: <u>n/a</u>	OFFSET: <u>55.6</u>
HVPS: <u>n/a</u>	HVPS: <u>675</u>
RCELL TEMP: <u>n/a</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>n/a</u>	BOX TEMP: <u>31.6</u>
PMT TEMP: <u>n/a</u>	PMT TEMP: <u>8.0</u>
IZS TEMP: <u>n/a</u>	IZS TEMP: <u>48.0</u>
Converter Temp: <u>n/a</u>	Converter Temp: <u>314.5</u>
PRES: <u>n/a</u>	PRES: <u>19.8</u>
SAMP FL: <u>n/a</u>	SAMP FL: <u>542</u>
UV LAMP: <u>n/a</u>	UV LAMP: <u>3468.0</u>
LAMP RATIO: <u>n/a</u>	LAMP RATIO: <u>92.8</u>
STR. LGT: <u>n/a</u>	STR. LGT: <u>25.6</u>
DRK PMT: <u>n/a</u>	DRK PMT: <u>0.5</u>
DRK LMP: <u>n/a</u>	DRK LMP: <u>0.4</u>
Expected Value: <u>n/a</u>	Expected Value: <u>57.7</u>

Comments:

Post-repair calibration completed after a sample pump had been rebuilt and output voltage calibrated.



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: February 22, 2017	Barometric Pressure: 0.917 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: St. Lina	Weather Conditions: Light snow
Parameter: Hydrogen Sulphide	Calibration Purpose: repeat
Start Time 24 hr. (mst): 12:21	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 16:13	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
ID# or Serial Number: 509	Range ppb: 100
Last Calibration Date: February 16, 2017	As Found C.F.: 1.006
Previous C.F.: 1.000	New C.F.: 0.999

Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<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
Point	ppb								
High	78								
Mid	38								
Low	19								
Make & Model: SABIO 2010 D									
Serial #: 11900613									
Cal Gas Cylinder I.D. #: EY0000654									
Cal Gas Conc. (ppm): 10.2									

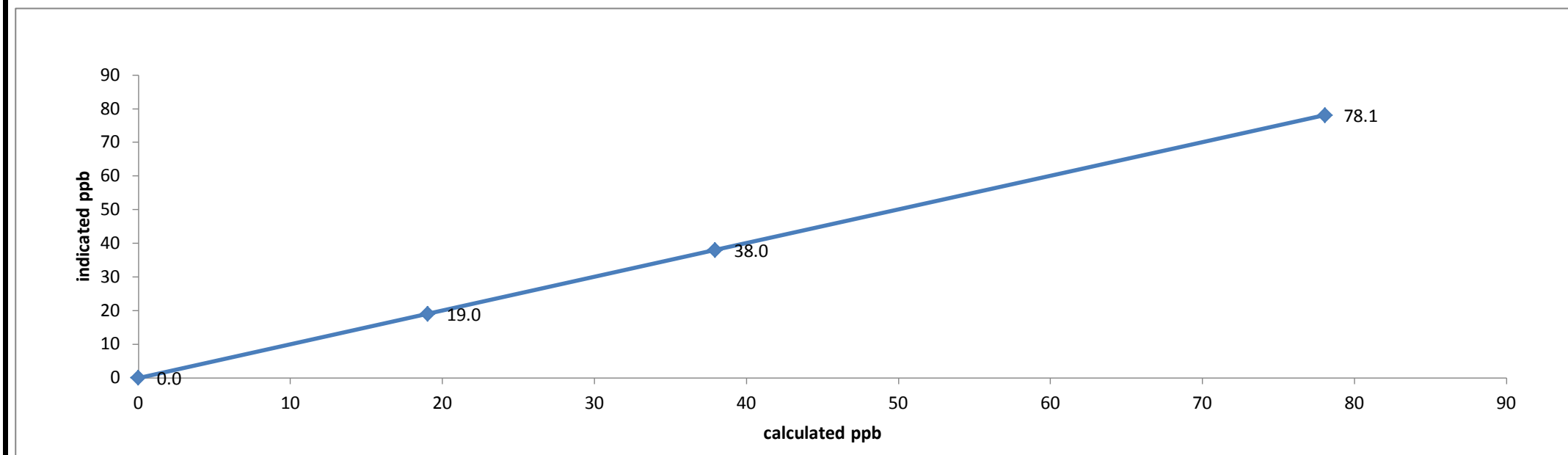
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	57.40	7500	78.1	76.6	1.006
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7443	57.40	7500	78.1	78.1	0.999
mid	7471	27.90	7499	37.9	38.0	0.999
low	7486	14.00	7500	19.0	19.0	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 = 1.000	LIMITS
Slope = 0.999	> or = 0.995
b (Intercept as % of full scale)= 0.01%	.95-1.05
% change in C.F. from last cal= -0.59%	± 3% F.S.
	± 10%

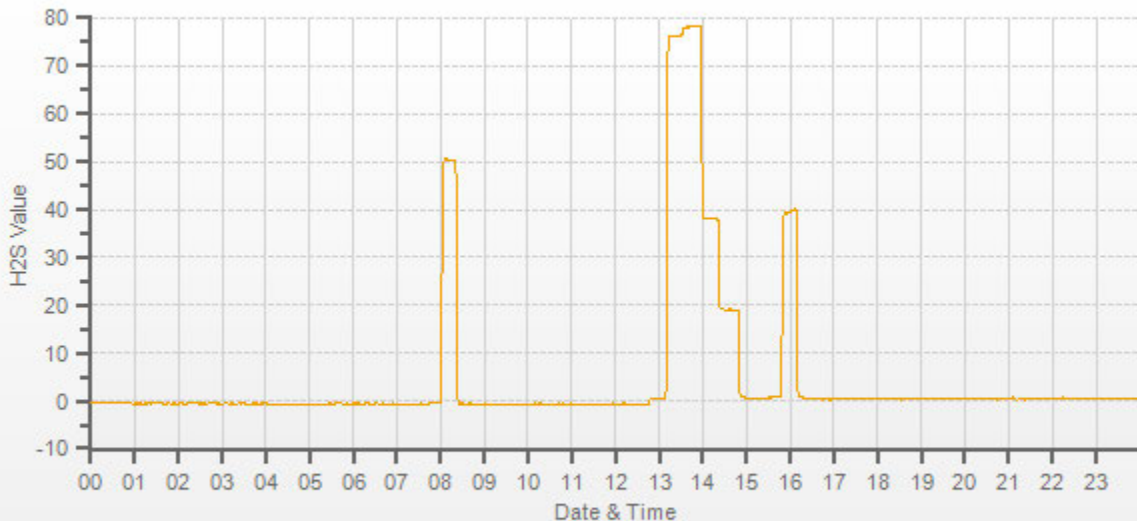
API 101E Hydrogen Sulphide Analyzer Calibration



As found:	As left:
SLOPE: 0.920	SLOPE: 0.924
OFFSET: 55.6	OFFSET: 52.9
HVPS: 675	HVPS: 675
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 30.0	BOX TEMP: 31.4
PMT TEMP: 8.0	PMT TEMP: 8.0
IZS TEMP: 48.0	IZS TEMP: 48.0
Converter Temp: 315.2	Converter Temp: 313.9
PRES: 20.5	PRES: 20.0
SAMP FL: 560	SAMP FL: 560
UV LAMP: 3460.4	UV LAMP: 3456.1
LAMP RATIO: 92.6	LAMP RATIO: 92.5
STR. LGT: 25.6	STR. LGT: 24.5
DRK PMT: 0.4	DRK PMT: 0.4
DRK LMP: 0.5	DRK LMP: 0.4
Expected Value: 57.7	Expected Value: 57.7

Comments:

"Repeat" calibration completed to adjust the EV and correct ZERO drift. Zero Air filter charcoal was renewed. A new perm tube installed.



— H2S[ppb]

TOTAL HYDROCARBON

Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: February 3, 2017 <input checked="" type="checkbox"/> remove	Barometric Pressure: 0.920 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: St. Lina	Weather Conditions: Light snow
Parameter: Total Hydrocarbon	Calibration Purpose: routine monthly
Start/End Time 24 hr. (mst): 11:09 / 14:32	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: January 24, 2017	As Found C.F.: 0.991
Previous Cal High Point C.F.: 1.003	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	<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								
Cal Gas Cylinder I.D. #: LL165372									
CH₄/C₃H₈ Cylinder Conc. (ppm): 606.0 212.0									
CH₄ as propane/total CH₄ equivalents (ppm): 583.0 1189.0									

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

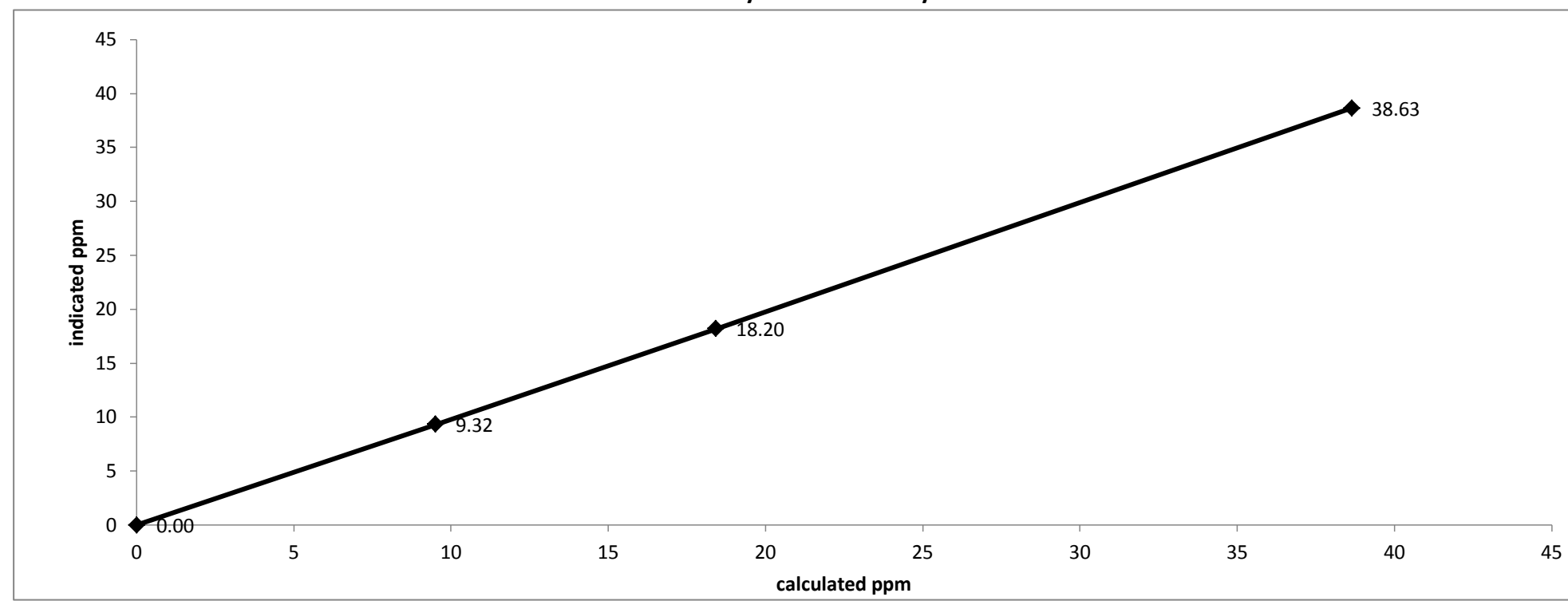
Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2000	0.00	2000	0.0	0.10	n/a
as found high	1935	65.00	2000	38.64	39.11	0.991
adjusted zero	2000	0.00	2000	0.00	0.00	n/a
adjusted high	1935	65.00	2000	38.64	38.63	1.000
mid	1969	31.00	2000	18.43	18.20	1.013
low	1984	16.00	2000	9.51	9.32	1.021
calibrator zero	2000	0.00	2000	0.0	0.00	n/a

Average C.F.= 1.011

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>0.25%</u>	.95-1.05
% change in C.F. from last cal = <u>1.24%</u>	± 3% F.S.
	± 10%

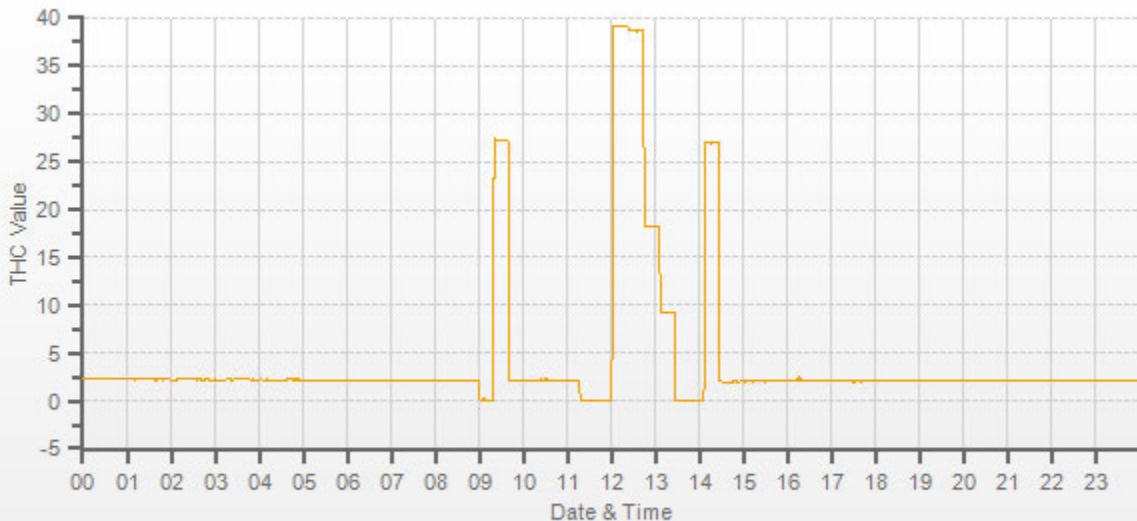
Thermo 51C Total Hydrocarbon Analyzer Calibration



As found:	As left:
H2 cylinder (psi): 600	H2 cylinder (psi): 600
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 22
Span Cylinder (psi): 750	Span Cylinder (psi): 750
Span Cylinder Reg Set (psi): 23	Span Cylinder Reg Set (psi): 23
Zero Air Gen Pressure: 47	Zero Air Gen Pressure: 47
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1902	cnt: 1862
rng: 1	rng: 1
try: 0	try: 0
flm: 192.0	flm: 191.5
det: 125.1	det: 125.5
Flame: 192	Flame: 191
Filter: 125	Filter: 125
Base: 125	Base: 125
Sample psi: 06.91	Sample psi: 06.91
Internal Air Pressure: 20	Internal Air Pressure: 20
Internal Fuel Pressure: 13	Internal Fuel Pressure: 13
Measured Flow: n/a	Measured Flow: n/a
Expected Value: 27.26	Expected Value: 26.94

Comments:
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

remove

Date: February 2, 2017	Barometric Pressure: 0.932 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 11:26 / 17:19	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: July 18, 2019

Analyzer:	Correction Factors:																
ID# or Serial Number: 594	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Previous C.F.:</td> <td style="text-align: center;">As Found C.F.:</td> <td style="text-align: center;">New C.F.:</td> </tr> <tr> <td>NO =</td> <td style="text-align: center;">0.999</td> <td style="text-align: center;">0.993</td> <td style="text-align: center;">1.000</td> </tr> <tr> <td>NO₂ =</td> <td style="text-align: center;">1.012</td> <td style="text-align: center;">1.012</td> <td style="text-align: center;">1.012</td> </tr> <tr> <td>NO_x =</td> <td style="text-align: center;">0.999</td> <td style="text-align: center;">0.991</td> <td style="text-align: center;">1.000</td> </tr> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	0.993	1.000	NO₂ =	1.012	1.012	1.012	NO_x =	0.999	0.991	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	0.993	1.000														
NO₂ =	1.012	1.012	1.012														
NO_x =	0.999	0.991	1.000														
Last Calibration Date: January 25, 2017																	
Range ppb: 1000																	

Calibrator:	Standard Calibration Points for a Range of: 1000 ppb																								
Flow Meter ID's: n/a	<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 style="text-align: center;">780</td> <td style="text-align: center;">500</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Mid</td> <td style="text-align: center;">380</td> <td style="text-align: center;">275</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Low</td> <td style="text-align: center;">190</td> <td style="text-align: center;">100</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Extra Point #1</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td>Extra Point #2</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">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																						
Make & Model: API 700																									
Serial #: 627																									
Cal Gas Cylinder I.D. #: LL104222																									
NO/NOx Gas Conc. (ppm): 50.7 50.7																									

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NO _x	Indicated NO	Indicated NO _x	NO C.F.	NO _x 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	4924	76.9	5001	779.6	779.6	785.0	787.0	0.993	0.991
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	76.90	5001	779.6	779.6	780.0	780.0	1.000	1.000
mid	4965	37.50	5003	380.1	380.1	378.0	378.0	1.005	1.005
low	4980	18.70	4999	189.7	189.7	188.0	188.0	1.009	1.009
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.005	1.005

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NO _x	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	76.90	5001	0.0	781.0	781.0	0.0	0.0	0.0	n/a
as found high NO2	4800	76.90	4877	500.0	267.0	775.0	508.0	514.0	508.0	1.012
adjusted high NO2	4800	76.90	4877	500.0	267.0	775.0	508.0	514.0	508.0	1.012
gpt mid	4800	76.90	4877	275.0	498.0	776.0	278.0	283.0	278.0	1.018
gpt low	4800	76.90	4877	100.0	679.0	781.0	102.0	102.0	102.0	1.000
Average NO₂ C.F.=										1.010

Linear Regression/Calibration Results:

	NO	NO _x	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.013	.95-1.05
b (Intercept as % of full scale) =	-0.12%	-0.12%	0.02%	± 3% F.S.
% change in C.F. from last cal =	0.59%	0.84%	0.02%	± 10%
NO ₂ converter efficiency	n/a	n/a	1.01	0.96 to 1.04

As found:	As left:
NOx SLOPE: 1.007	NOx SLOPE: 0.998
NOx OFFS: 2.2	NOx OFFS: 2.2
NO SLOPE: 1.018	NO SLOPE: 1.008
NO OFFS: 0.3	NO OFFS: 0.3
SAMP FLW: 489	SAMP FLW: 489
OZONE FL: 79	OZONE FL: 79
PMT: 19.5	PMT: 14.9
NORM PMT: -0.5	NORM PMT: 1.3
AZERO: 16.2	AZERO: 16.4
HVPS: 767	HVPS: 767
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 30.9	BOX TEMP: 31.7
PMT TEMP: 6.7	PMT TEMP: 6.7
IZS TEMP: 45.2	IZS TEMP: 40.0
MOLY TEMP: 316.2	MOLY TEMP: 315.8
RCEL: 5.1	RCEL: 5.1
SAMP: 26.5	SAMP: 26.9
Expected Value NO: 7.3	Expected Value NO: 8.7
Expected Value NO ₂ : 518.0	Expected Value NO ₂ : 579.0
Expected Value NO _x : 524.0	Expected Value NO _x : 587.0

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.

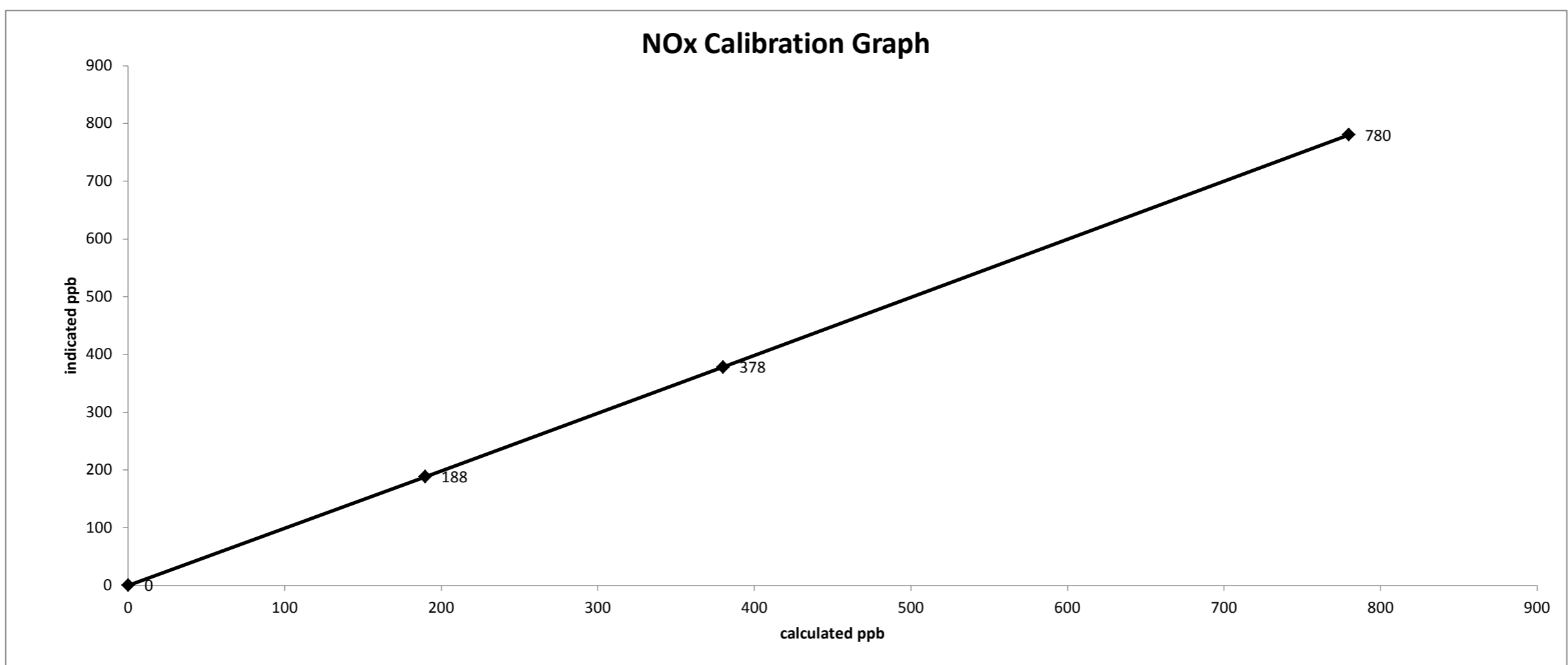
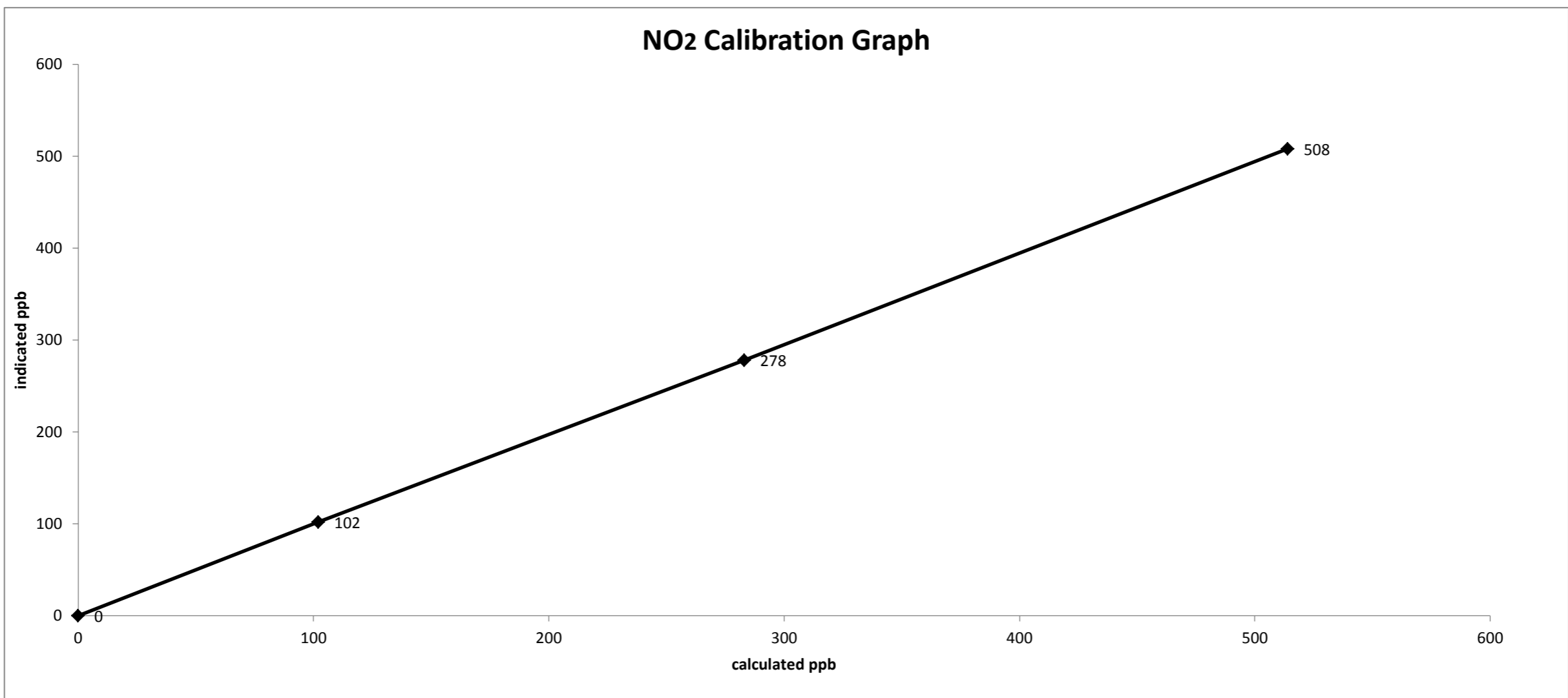
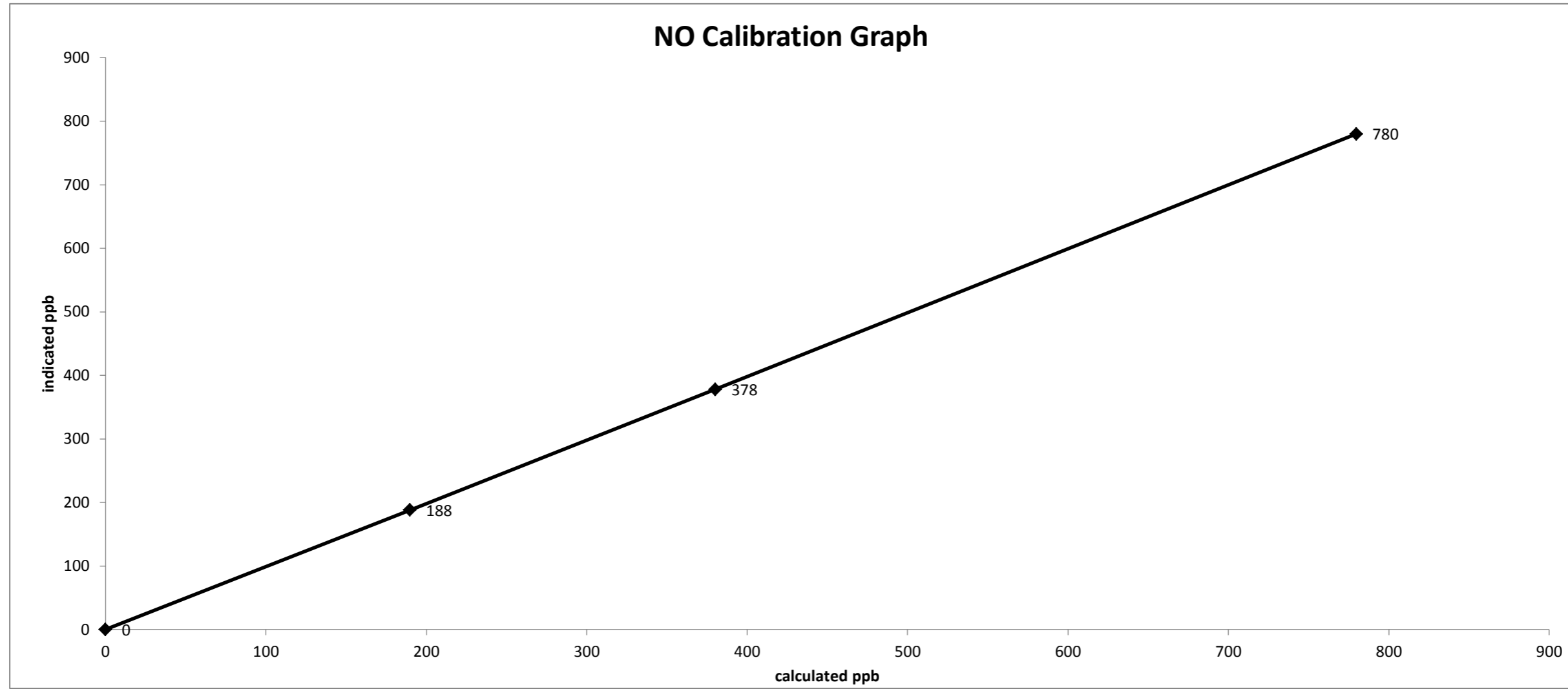
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

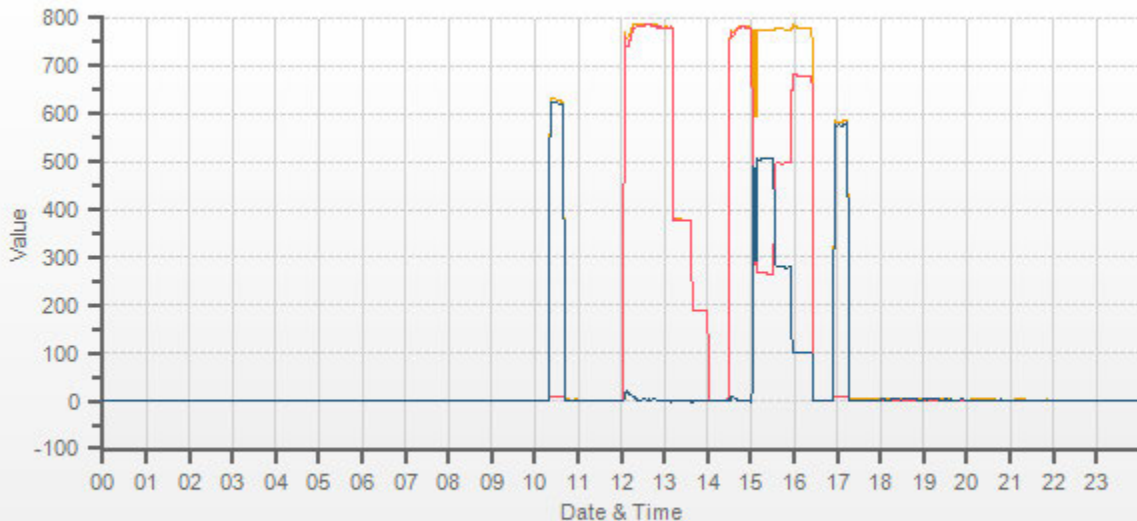
The analyzer perm tube was changed, new expected value to be updated once the perm tube temperature has stabilized.

The IZS temperature was reduced to 40 degrees after the post-calibration ZS check. Two days (48 hours) are required to re-adjust the EV.

Date: February 2, 2017
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 11:26 / 17:19
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date:	February 3, 2017	<input checked="" type="checkbox"/> remove Barometric Pressure:	0.920 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	St. Lina	Weather Conditions:	Light snow
Start/End Time 24 hr. (mst):	11:09 / 15:57	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:	January 24, 2017
As Found C.F.:	1.005
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

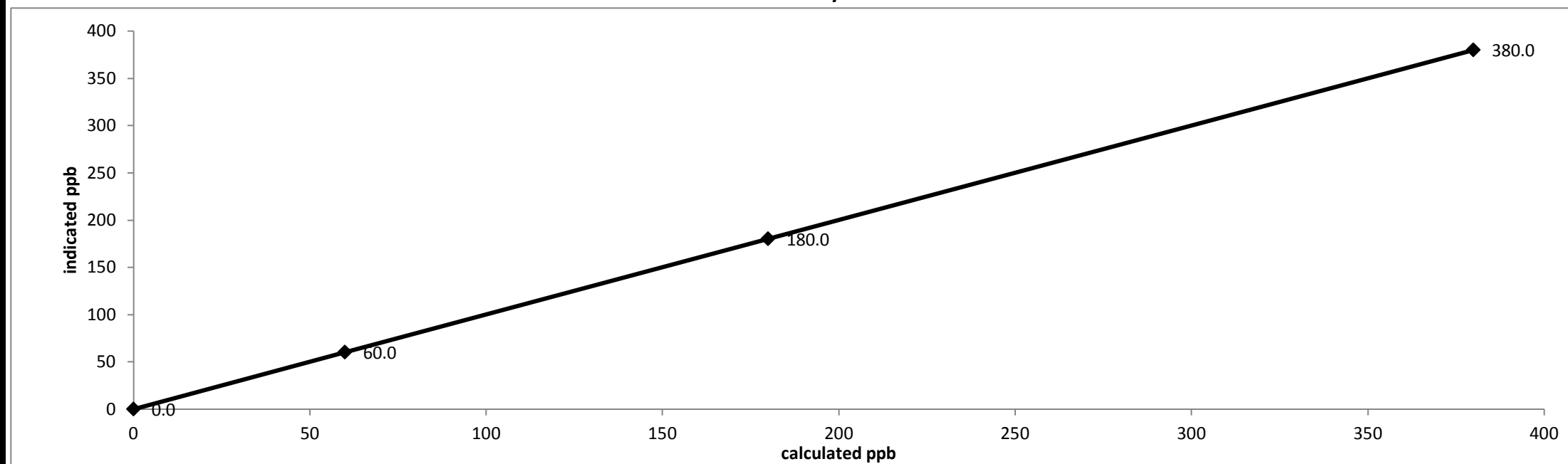
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	378.0	1.005
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:

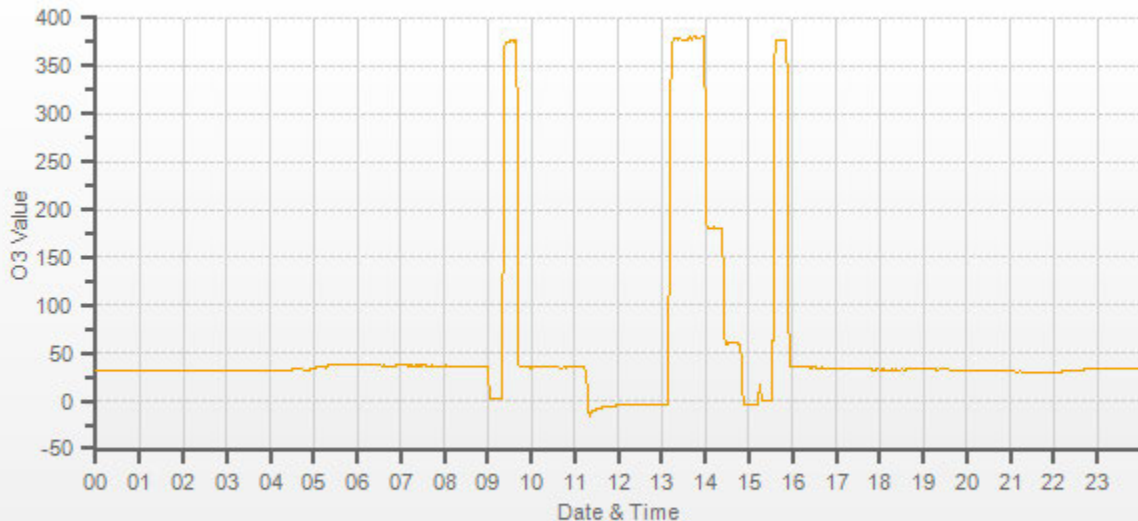
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		.95-1.05
b (Intercept as % of full scale)=	0.00%		± 3% F.S.
% change in C.F. from last cal=	-0.53%		± 10%

Thermo 49i Ozone Analyzer Calibration



As found:	As left:
O3 Bkg: 1.9	O3 Bkg: 3.7
O3 Coef: 0.967	O3 Coef: 0.973
Photo Lamp: 9.4	Photo Lamp: 9.4
O3 Lamp: 7.8	O3 Lamp: 7.8
Bench: 27.1	Bench: 27.2
Bench Lamp: 53.6	Bench Lamp: 53.6
O3 Lamp: 67.8	O3 Lamp: 67.9
Pressure: 682.6	Pressure: 684.7
Cell A lpm: 0.727	Cell A lpm: 0.729
Cell B lpm: 0.721	Cell B lpm: 0.724
O3 ppb: -9.0	O3 ppb: -0.4
Cell A ppb: -7.2	Cell A ppb: 1.0
Cell B ppb: -10.8	Cell B ppb: -1.7
Cell A int: 55717	Cell A int: 55683
Expected Value: 370.0	Expected Value: 377.0

Comments:
 The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: <u>February 3, 2017</u> Company: <u>LICA</u> Station Name/Location: <u>St. Lina</u> Previous Audit Date: <u>January 24, 2017</u> Parameter: <u>PM 2.5</u>	<input type="checkbox"/> remove color Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u> Start Time (mst): <u>13:55</u> End Time (mst): <u>15:23</u> Calibration Purpose: <u>Bi-monthly #1</u> Weather Conditions: <u>Light snow</u>
--	--

1400A Information and Status:

ID# or Serial Number: <u>1405A208301003</u>	As Found Filter Loading %: <u>29.10</u>
Ko Factor: <u>13125</u>	As Left Filter Loading %: <u>21.44</u>
Ambient Temperature °C: <u>-12.12</u>	As Found Noise: <u>0.004</u>
Ambient Pressure atm: <u>0.919</u>	As Left Noise: <u>0.000</u>
Main Flow Reading lpm: <u>3.00</u>	Pump Vacuum: <u>0.30</u>
Aux Flow Reading lpm: <u>13.67</u>	Warnings: <u>None</u>

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>#3</u>	<u>#05544</u>	<u>4295</u>
Calibration Date:	<u>January 1, 2017</u>	<u>December 5, 2016</u>	<u>November 15, 2016</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	-0.13	0.00	-0.13
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-1.71	0.00	-1.71
	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	-0.13	0.00	-0.13
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-1.71	0.00	-1.71
	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>-12.1</u>	1405F pressure atm: <u>0.919</u>
reference temperature °C: <u>-11.4</u>	reference pressure: <u>0.920</u>
difference °C: <u>0.7</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>-11.4</u>	1405F pressure atm: <u>0.920</u>
reference temperature °C: <u>-11.4</u>	reference pressure: <u>0.920</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>3.07</u>	reference total/aux flow lpm: <u>16.70</u>
difference lpm: <u>0.07</u>	difference lpm: <u>0.03</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>3.04</u>	reference total/aux flow lpm: <u>16.70</u>
difference lpm: <u>0.04</u>	difference lpm: <u>0.03</u>

K_o Audit:

Last K_o audit date: <u>February 3, 2017</u>
1405F K_o factor: <u>13125</u>
Measured K_o factor: <u>13126.5000</u>
% difference: <u>0.01</u>

Comments:

The TEOM sample filter was changed. The TEOM intake head and associated sharp cut components were cleaned.
 The 47 mm FDMS filter was changed.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

remove color

Date: February 16, 2017
 Company: LICA
 Station Name/Location: St. Lina
 Previous Audit Date: February 3, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 14:43
 End Time (mst): 15:54
 Calibration Purpose: Bi-monthly #2
 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 %: 27.16
 Ambient Temperature °C: 7.94 As Found Noise: 0.002
 Ambient Pressure atm: 0.888 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>Fisher</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>FB1291</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#3</u>	<u>#05544</u>	<u>4295</u>
Calibration Date:	<u>January 1, 2017</u>	<u>December 5, 2016</u>	<u>November 15, 2016</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	-0.15	0.00	-0.15
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-1.91	0.00	-1.91
	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	-0.15	0.00	-0.15
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-1.91	0.00	-1.91
	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>7.9</u>	1405F pressure atm: <u>0.888</u>
reference temperature °C: <u>7.6</u>	reference pressure: <u>0.890</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>7.6</u>	1405F pressure atm: <u>0.890</u>
reference temperature °C: <u>7.6</u>	reference pressure: <u>0.890</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>3.04</u>	reference total/aux flow lpm: <u>17.11</u>
difference lpm: <u>0.04</u>	difference lpm: <u>0.44</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>13.67</u>
reference main flow lpm: <u>3.00</u>	reference total/aux flow lpm: <u>13.65</u>
difference lpm: <u>0.00</u>	difference lpm: <u>-0.02</u>

K_o Audit:

Last K_o audit date: February 3, 2017
 1405F K_o factor: 13125
 Measured K_o factor: 13126.5000
 % difference: 0.01

Comments:

The TEOM intake head and associated sharp cut components were cleaned.

The 47 mm FDMS filter was changed.

Flows were calibrated

WIND SYSTEM

METEOROLOGICAL SYSTEM CHECK

Meteorological System Checklist

Performed by: Alex Yakupov
 Station: **St. Lina**
 Start: 12:32 End: 12:46

PRECIPITATION SENSOR CHECK

	YES	NO
Is the sensor Level?	YES	
Is the heater operating properly?	YES	
Are the bucket drain holes clean?	YES	
Is the inner screen on the housing? (screen should be on between July and September		NO
Is the upper screen on the housing? (screen should be on between July and September)		NO
Is the housing clean?	YES	
Is the area around the housing clean and free from obstacle?	YES	
Is the tipping sensor working properly? (test quantity 2.5 mm at 12:36-12:37)	YES	
	PASS	

Comments: Rain gauge was tested with water. The heater was tested with snow. Responce is timely and accurate. No issues.

Field Technician: Alex Yakupov February 03, 2017

CALIBRATORS

Company Maxxam/SIA **Operator:** Chris

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Definer 530</u>
Serial Number	<u>627</u>	Serial Number	<u>H-148944, L-152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>707.1 mmHg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1	<u>4892</u>	Pt. #3 <u>4951</u>
Pt. #2	<u>4975</u>	
Gas Flow (sccm)		
Pt. #1	<u>79.7</u>	Pt. #3 <u>19.4</u>
Pt. #2	<u>38.8</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

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)= 1.0041	0.90-1.10	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

<u>NO₂</u>	<u>LIMITS</u>
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	0.90-1.10
b (Intercept % of FS)= 0.1755	± 3% F.S.

AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Thermo 42i</u>
Make/Model	<u>Thermo 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU1809</u>	Last Calibration Date	<u>January 25, 2017</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 25, 2019</u>

COMMENTS:

Auditor: Shea Beaton
Operator Signature: 

Date: January 27, 2017
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. 2016-335CGA

Company: Maxxam **Operator's Name:** Russell Kirchner

Cylinder #: LL104222 Concentration PPM: 50.6 Tolerance(%) 1 Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMY 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.5 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CA:016625</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623

Instrument Settings: Zero: 9.2 Span: 1.024 Range: 1.0

Last Calibration: Date: Oct 19/16 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	0.000			
4935	82.0	0.830	0.01662	60.183	50.0
4968	40.8	0.412	0.00821	121.765	50.2
4955	20.2	0.203	0.00408	245.297	49.8
Average Cylinder Concentration:					50.0

Previous Stated Concentration PPM: 50.6

Percent variance from Stated: 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: October 19, 2016

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. 688mmHg

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



DocNumber: 000096245

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

MAXXAM ANALYTICS INC *NA*
 9372 49TH ST
 EDMONTON AB T6B 2L7

Praxair Order Number: 26637434
 Customer PO Number: 35-36415
 Customer Reference Number:

Fill Date: 7/5/2016
 Part Number: NI NO50MS2E-AQ
 Lot Number: 109618704
 Cylinder Style and Outlet: AQ CGA 660
 Cylinder Pressure and Volume: 2000 psig 82 cu. ft.

Certified Concentration:

Expiration Date:	07/18/2019	NIST Traceable
Cylinder Number:	LL104222	Expanded Uncertainty:
50.7 ppm	NITRIC OXIDE	± 0.7 %
50.6 ppm	SULFUR DIOXIDE	± 1.0 %
Balance	NITROGEN	

NOx ppm = 50.9 ppm

NOX for Reference Only

Certification Information: Certification Date : 7/18/2016 Term : 36 Months Expiration Date : 07/18/2019

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
 Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1 . Component: NITRIC OXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 50.7 ppm
 Instrument Used: Thermo Electron 42i-LS S/N 1030645077
 Analytical Method: Chemiluminescence
 Last Multipoint Calibration: 06/23/2016

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC222724
 Ref. Std. Conc: 50.96 ppm
 Ref. Std. traceable to SRM #: vs. 1653b
 SRM Sample #: 45-V-42
 SRM Cylinder #: CAL017897

First Analysis Data:				Date: 07/11/2016	
Z:	0	R:	51	C:	50.6
				Conc:	50.6
R:	51	Z:	0	C:	50.8
				Conc:	50.8
Z:	0	C:	50.8	R:	51
				Conc:	50.9
UOM:	ppm		Mean Test Assay:	50.7 ppm	

Second Analysis Data:				Date: 07/18/2016	
Z:	0	R:	51	C:	50.7
				Conc:	50.7
R:	51	Z:	0	C:	50.8
				Conc:	50.8
Z:	0	C:	50.8	R:	51
				Conc:	50.7
UOM:	ppm		Mean Test Assay:	50.7 ppm	

2 . Component: SULFUR DIOXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 50.6 ppm
 Instrument Used: Ametek 921CE S/N AW-921-S321
 Analytical Method: Ultraviolet Absorption
 Last Multipoint Calibration: 06/27/2016

Reference Standard Type: NTRM
 Ref. Std. Cylinder #: CC
 Ref. Std. Conc: 48.58 ppm
 Ref. Std. traceable to SRM #: n/a
 SRM Sample #: 12070103
 SRM Cylinder #: N/A

First Analysis Data:				Date: 07/11/2016	
Z:	0	R:	482.8	C:	503.8
				Conc:	50.7
R:	482.6	Z:	0	C:	503.9
				Conc:	50.7
Z:	0	C:	503.9	R:	482.6
				Conc:	50.7
UOM:	ppm		Mean Test Assay:	50.7 ppm	

Second Analysis Data:				Date: 07/18/2016	
Z:	0	R:	482.1	C:	500.6
				Conc:	50.4
R:	482.7	Z:	0	C:	501.3
				Conc:	50.5
Z:	0	C:	501.3	R:	482.7
				Conc:	50.4
UOM:	ppm		Mean Test Assay:	50.4 ppm	

Analyzed by:

Matthew Angerer

Certified by:

Henry Koung

***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
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

14-04-2017





Report Issued Date (dd-mm-yyyy)

APPENDIX IV
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-02-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	 _____	Date <u>10-March-17</u>
Level 1 Primary Validation	 _____	Date <u>27-March-17</u>
Level 2 Final Validation	 _____	Date <u>10-April-17</u>
Level 3 Independent Data Review	 _____	Date <u>14-April-17</u>
Post-Final Validation	NA _____	Date NA _____

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.



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

February 22, 2018

Subject: Monthly Report Submission for the LICA Portable (Bonnyville) station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Portable (Bonnyville) AQM Station in the month of February 2017.

The air monitoring program consists of continuous air monitoring, intermittent sampling, including both VOC and PAH sampling program, and VOC canister sampling program. All the air monitoring activities were conducted by contractors.

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

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

All data collected in February 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

As the LICA Environmental Program Manager and Data & Reporting Specialist, we certify that we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also certify all air data that are required by the AMD to be electronically submitted to AEP and Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission, with the exception of electronic submission for the results of intermittent samples and VOC canister samples. The results for both intermittent samples and VOC canister samples is scheduled to be submitted by the end of February 2018.

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

Respectfully,



Lakeland Industry & Community Association
5107 50 St
Bonnyville, AB T9N 2J7

A handwritten signature in blue ink that reads 'Michael Bisaga'.

Michael Bisaga
Technical Program Manager
Lakeland Industry & Community Association
780-266-7068
mbisaga@otonabee.ca

A handwritten signature in blue ink that reads 'Lily Lin'.

Lily Lin
Data & Reporting Specialist
587-225-2248
rebbacaa@gmail.com



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 CONTINUOUS MONITORING STATION

JOB #: 2833-2017-02-35-C


February 2017

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
BOX 8237, 5107W - 50 STREET
CALGARY, ALBERTA
T2N 2J1

Attention: MIKE BISAGA

DATE: **April 14, 2017**

Prepared by: 

Maram Galeb, B.Sc.
Project Manager, Customer Service, Air Services

Reviewed by: 

Wunmi Adekanmbi, M.Sc., EPt.
Project Manager, Customer Service, Air Services

SUMMARY

In February 2017, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Bonnyville 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.

SO₂: A repeat calibration was performed on February 17 to correct a zero drift, causing four hours of downtime.

NO_x/NO/NO₂: The analyzer was replaced for repair on February 24 in response to a malfunction that occurred on February 22. Fifty-five hours of downtime were recorded due to this event and the subsequent corrective actions performed.

The NO_x gas concentration 50.7 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.9 ppm. A sample of affected calculations has been rerun and the error has no significant effect on the calibration. The NO_x calibration still meets the AMD calibration criteria.

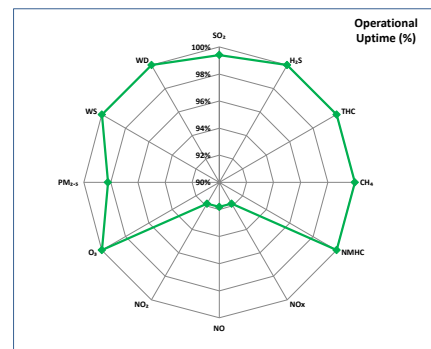
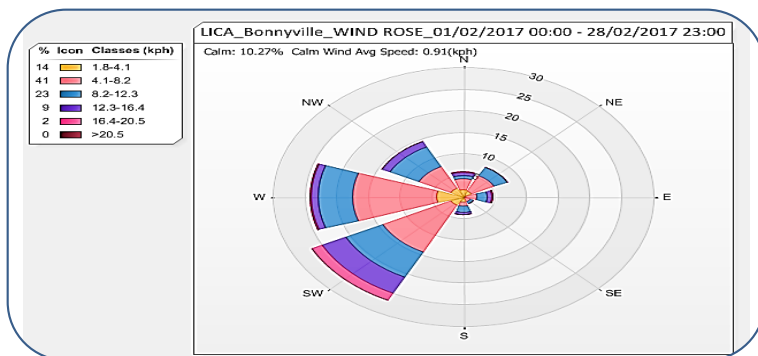
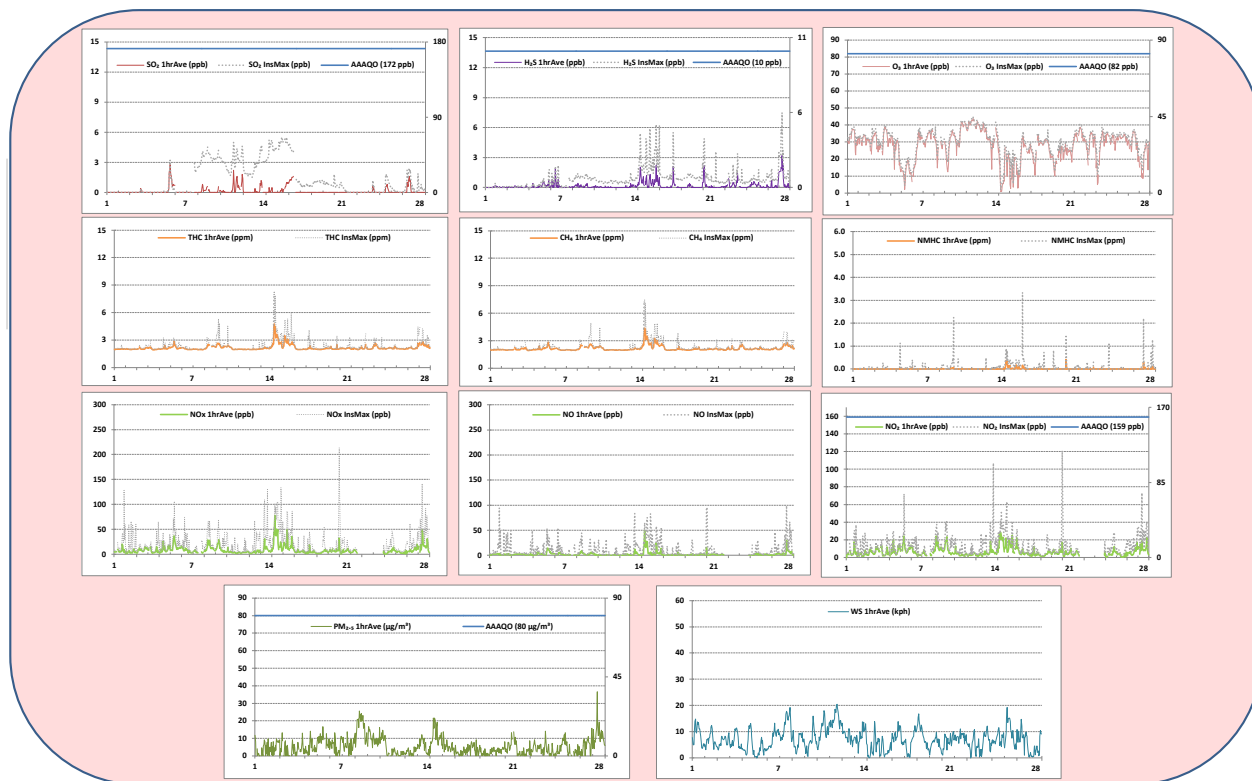
PM_{2.5}: One hour of data collected at hour 15:00, on February 6, at a concentration of 161.6 µg/m³, shortly after an onsite audit, was invalidated as the data was considered anomalous. Eleven hours of data were recorded at concentrations less than -3 µg/m³ this month, rendering the data invalid.

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 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			AAAQO Objective	Exceed. Hours	Maximum		AAAQO Objective	Exceed. Days
				Conc.	Date	Hour			Conc.	Date		
SO ₂	ppb	0.1	99.4%	2.8	February 6	13	172	0	0.8	February 12	48	0
H ₂ S	ppb	0.2	100.0%	3.2	February 28	6	10	0	0.8	February 28	3	0
THC	ppm	2.15	100.0%	4.76	February 15	4	-	-	3.02	February 15	-	-
CH ₄	ppm	2.14	100.0%	4.38	February 15	4	-	-	2.93	February 15	-	-
NMHC	ppm	0.01	100.0%	0.42	February 20	17	-	-	0.09	February 15	-	-
NO _x	ppb	8.8	91.8%	78.3	February 15	6	-	-	27.1	February 15	-	-
NO	ppb	2.4	91.8%	49.4	February 15	6	-	-	11.2	February 15	-	-
NO ₂	ppb	6.4	91.8%	28.9	February 15	6	159	0	15.9	February 15	-	-
O ₃	ppb	27.5	100.0%	43.8	February 12	15	82	0	40.4	February 12	-	-
PM _{2.5}	µg/m ³	5.5	98.2%	36.6	February 28	8	80	0	16.6	February 9	30	0
WS	kph	3.5	100.0%	20.4	February 12	14	-	-	14.8	February 12	-	-
WD	degree	265 (W)	100.0%	-	-	-	-	-	-	-	-	-



Monthly Update

The sampling, correction and reporting of air monitoring data was performed by Maxxam Analytics and complies with the quality assurance practices outlined in the Alberta Air Monitoring Directive (Alberta Environment and Parks 2016).
 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: A repeat calibration was performed on February 17 to correct a zero drift, causing four hours of downtime.
 NO_x/NO/NO₂: The analyzer was replaced for repair on February 24, in response to a malfunction that occurred on February 22. Fifty-five hours of downtime were recorded due to this event and the subsequent corrective actions performed.
 PM_{2.5}: One hour of data collected at hour 15:00, on February 6, at a concentration of 161.6 µg/m³, shortly after an onsite audit, was invalidated as the data was considered anomalous. Eleven hours of data were recorded at concentrations less than -3 µg/m³ this month, rendering the data invalid.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Bonnyville 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	0.1	2.8	6	13	7.9	NE	0.8	12	99.4
H ₂ S (ppb)	10	3	0	0	0.2	3.2	28	6	0.3	WSW	0.8	28	100.0
THC (ppm)	-	-	-	-	2.15	4.76	15	4	0.1	NNW	3.02	15	100.0
CH ₄ (ppm)	-	-	-	-	2.14	4.38	15	4	0.1	NNW	2.93	15	100.0
NMHC (ppm)	-	-	-	-	0.01	0.42	20	17	4.4	WNW	0.09	15	100.0
NO ₂ (ppb)	159	-	0	-	6.4	28.9	15	6	1.2	NNE	15.9	15	91.8
NO (ppb)	-	-	-	-	2.4	49.4	15	6	1.2	NNE	11.2	15	91.8
NO _x (ppb)	-	-	-	-	8.8	78.3	15	6	1.2	NNE	27.1	15	91.8
O ₃ (ppb)	82	-	0	-	27.5	43.8	12	15	19.1	SW	40.4	12	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	5.5	36.6	28	8	0.5	WNW	16.6	9	98.2
VECTOR WS (kph)	-	-	-	-	3.5	20.4	12	14	-	SW	14.8	12	100.0
VECTOR WD (sec)	-	-	-	-	265 (W)	-	-	-	-	-	-	-	100.0

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
February 6, 2017	1.5	Acetone
February 12, 2017	1.5	Acetone
February 18, 2017	1.9	Acetone
February 24, 2017	1.9	Acetone

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
February 6, 2017	1.50	Naphthalene
February 12, 2017	0.18	Naphthalene
February 18, 2017	0.34	Phenanthrene
February 24, 2017	0.46	2-Methylnaphthalene

Note: NA

Volatile Organics (VOCs) Data Summary - NMHC Canister System

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
February 6, 2017	1.9	Acetone
February 10, 2017	2.88	n-Butane
February 13, 2017	1.9	Acetone
February 15, 2017	11.7	n-Butane
February 20, 2017	46.1	n-Butane
February 23, 2017	7.05	n-Butane
February 27, 2017	81.0	Acetone

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 non-continuous monitoring data results for VOCs and PAHs 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%).

Trailer inspection was conducted on February 8. No issues were identified.

<p>SULPHUR DIOXIDE (SO₂)</p> <ul style="list-style-type: none"> Operational time was 99.4%, equivalent to four hours of downtime. The routine monthly calibration was performed on February 8. A repeat calibration was performed on February 17 to correct a zero drift, causing four hours of downtime. Between February 8 to 17, instantaneous data was recorded higher than historical due to zero drift. The zero correction was not applied on the instantaneous data.
<p>HYDROGEN SULPHIDE (H₂S)</p> <ul style="list-style-type: none"> There were no issues that impacted operational time this month. The routine monthly calibration was performed on February 8.
<p>TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)</p> <ul style="list-style-type: none"> There were no issues that impacted operational time this month. The routine monthly calibration was performed on February 9.
<p>OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)</p> <ul style="list-style-type: none"> Operational time was 91.8%, equivalent to fifty-five hours of downtime. The routine monthly calibration was performed on February 8. The analyzer failed on February 22. The LICA-owned API 200A (s/n: 2166) analyzer was replaced with a Maxxam-supplied API 200E (s/n: 593). A successful installation calibration was completed on February 24. Data was invalidated back to the point of analyzer failure which was determined to be on February 22 at hour 14:00. Fifty-five hours of downtime were recorded due to this malfunction and the subsequent corrective actions performed. An anomalous spike was observed in the maximum instantaneous data collected on February 1 at hour 03:00, the data was therefore discarded. The NO_x gas concentration 50.7 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.9 ppm. A sample of affected calculations has been rerun and the error has no significant effect on the calibration. The NO_x calibration still meets the AMD calibration criteria.
<p>OZONE (O₃)</p> <ul style="list-style-type: none"> There were no issues that impacted operational time this month. The routine monthly calibration was performed on February 9.
<p>PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})</p> <ul style="list-style-type: none"> Operational time was 98.2% equivalent to twelve hours of downtime. Two routine TEOM audits were performed this month: one was completed on February 6 and the other on February 21. Shortly after the audit on February 6, Maxxam's on site technician observed that smoke from a barbeque in the AER yard was blowing directly at the station. It is unknown if the TEOM was still recovering from an audit and filter change, or, if the reading from the smoke were a real artifact. This episode occurred within the window of recovery of filter change recovery therefore the data collected at hour 15:00 on February 6 (161.6 ug/m³), is considered invalid. Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, <i>Zero Adjustment Criteria</i>. Data recorded between 0 and -3 ug/m³ was corrected to 0 ug/m³. Data recorded below -3 ug/m³ was invalidated. Eleven hours of data were invalidated as the data was below -3 ug/m³ this month.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)
<ul style="list-style-type: none"> • There were no issues that impacted operational time this month. • Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.
VOC SAMPLES
<ul style="list-style-type: none"> • The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule). • Samples were collected on February 6, 12, 18, and 24. They were sent to the lab for analysis. Analytical results are included in this report.
PAH SAMPLES
<ul style="list-style-type: none"> • The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule). • Samples were collected on February 6, 12, 18, and 24. They were sent to the lab for analysis. Analytical results are included in this report.
NMHC CANISTER SAMPLES
<ul style="list-style-type: none"> • 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. <p>Seven canister events were recorded this month. The date, time and initial 5-min average concentration measurements are as follows:</p> <ul style="list-style-type: none"> • February 6 at 11:25 - 0.31 ppm • February 10 at 07:00 - 0.51 ppm • February 13 at 07:05 - 0.31 ppm • February 15 at 03:20 - 0.38 ppm • February 20 at 17:30 - 0.78 ppm • February 23 at 06:05 - 0.37 ppm • February 27 at 21:15 - 0.91 ppm • Other five-minute averages recorded at concentrations above 0.30 ppm, are not considered sample-collection events as they occurred between events, before the canisters were replaced. 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 technicians were Alexander Yakupov, Limin Li, 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-00001 - Methane, Non-Methane Hydrocarbon Analyzer Monitoring
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech
- Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00007: TISCH PUF Sampler Operating, Calibration and Maintenance Procedures

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
- Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Oxides of Nitrogen - API 200A Chemiluminescent 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

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

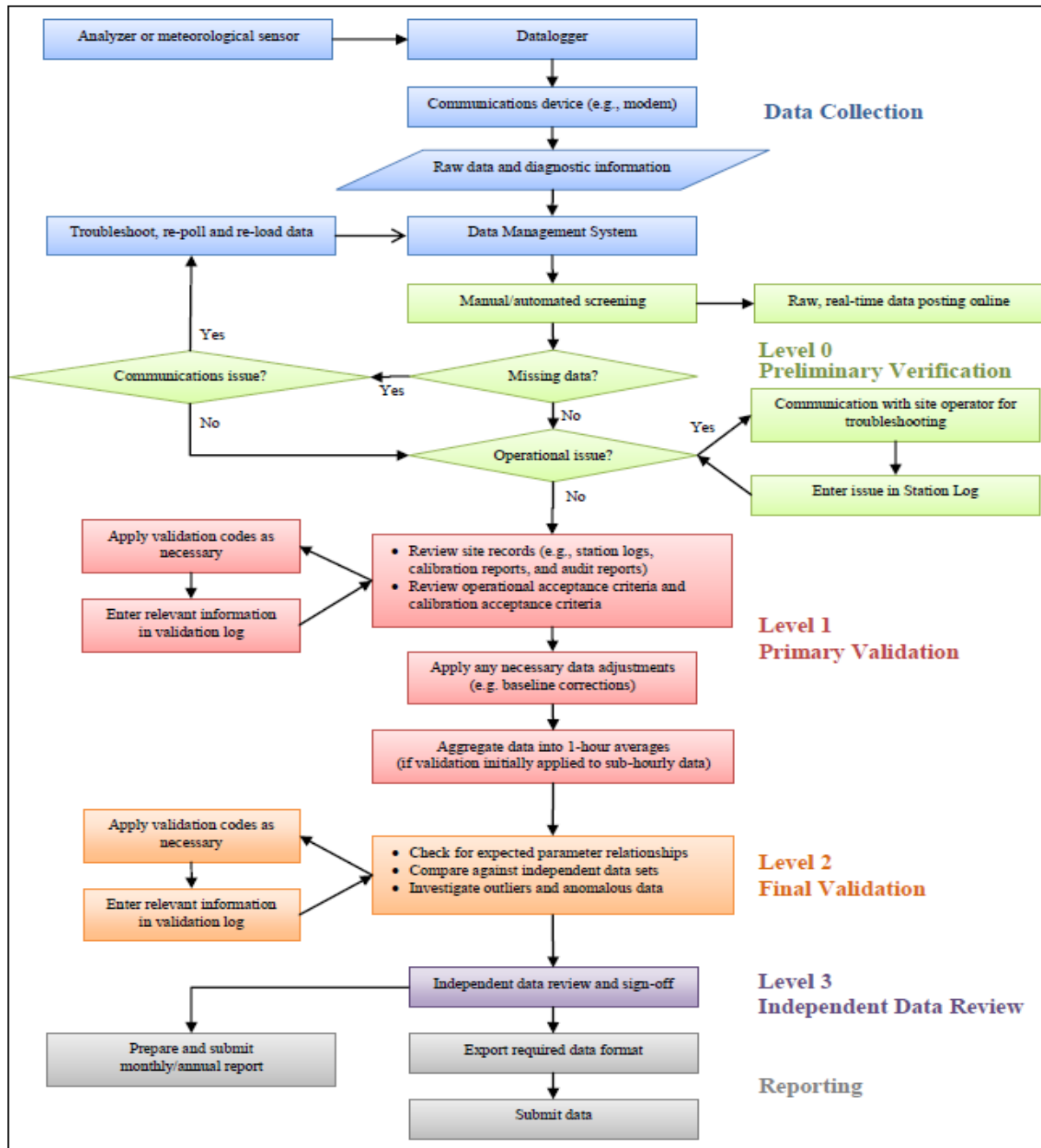
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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

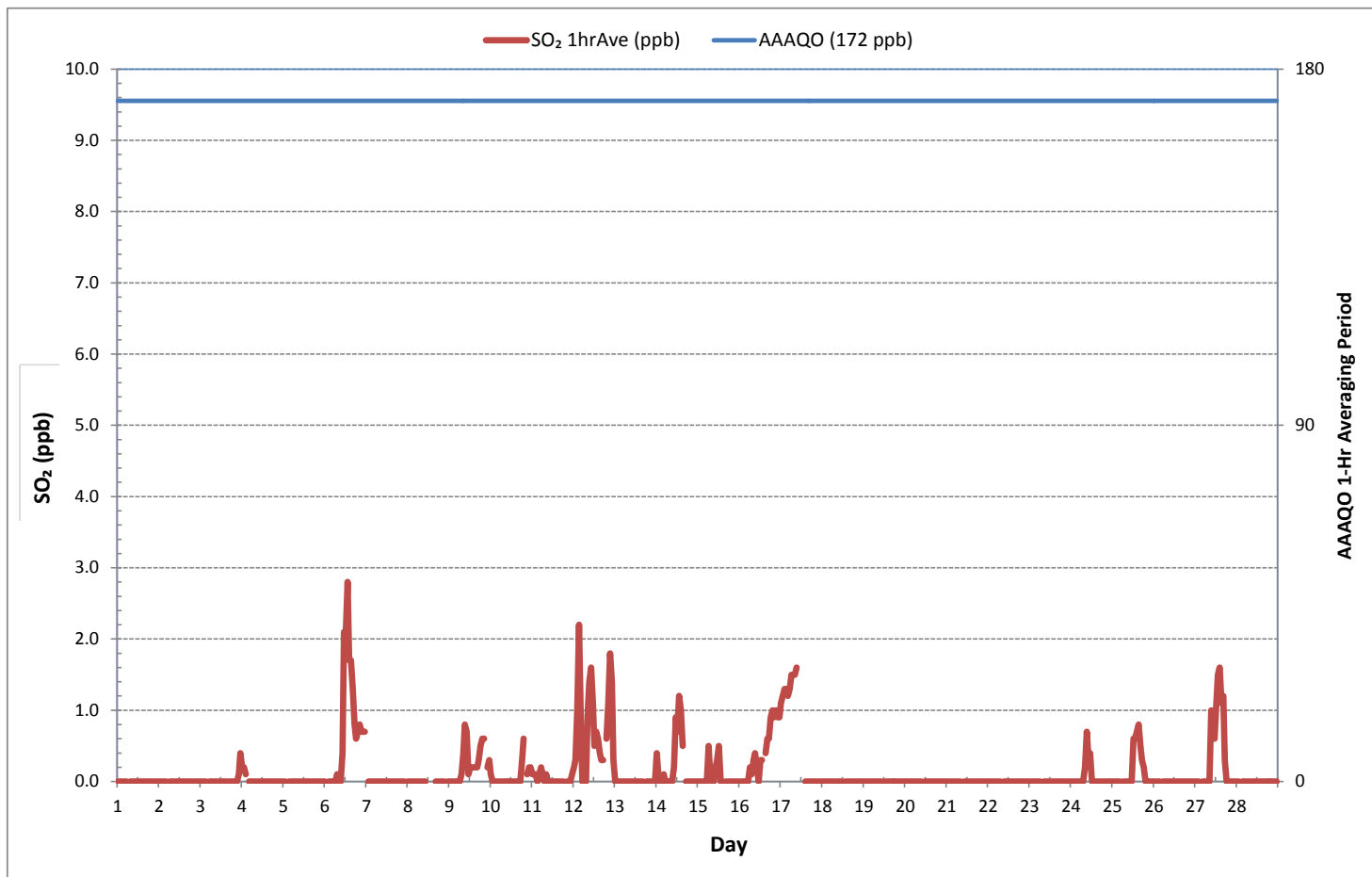


Source: Air Monitoring Directive (Aug 3, 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	0.0	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
2	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
3	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	0.4	0.0	0.4	0.0	24
4	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
5	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
6	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.0	1.9	2.3	3.2	1.3	1.5	1.3	0.5	0.3	0.3	0.5	0.4	0.3	0.3	0.0	3.2	0.7	24	
7	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
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	2.9	2.3	2.1	2.0	2.3	2.4	S	2.5	0.0	2.9	0.9	24	
9	2.5	2.7	2.6	2.6	2.8	2.8	3.0	3.3	3.6	4.1	4.1	3.5	3.5	3.7	3.7	3.8	3.8	3.9	4.1	4.2	4.5	S	3.9	4.0	2.5	4.5	3.5	24	
10	3.8	3.8	3.6	3.5	3.4	3.4	3.1	3.2	3.4	3.3	3.3	3.4	3.3	3.4	3.3	3.3	3.5	3.5	4.0	4.2	S	3.5	3.6	3.6	3.1	4.2	3.5	24	
11	3.5	3.3	3.1	3.1	3.1	3.2	3.0	3.1	3.1	2.8	2.7	2.6	2.4	2.2	2.3	2.2	1.9	2.0	2.1	S	1.7	1.9	1.9	3.1	1.7	3.5	2.6	24	
12	2.9	3.0	4.2	5.0	4.5	2.6	2.4	2.7	3.8	4.1	4.4	4.1	3.2	3.4	3.3	3.3	3.0	3.0	S	3.6	4.1	4.6	4.1	3.2	2.4	5.0	3.6	24	
13	2.5	2.1	1.9	1.9	1.9	1.9	1.8	1.9	1.7	1.6	1.9	1.9	1.7	1.7	1.7	1.9	1.7	S	1.5	1.7	1.9	1.9	2.2	2.7	1.5	2.7	1.9	24	
14	3.0	2.6	2.5	2.4	3.1	2.8	2.8	3.1	2.9	3.3	3.6	4.3	4.1	4.7	4.6	4.1	S	3.0	3.2	3.0	3.1	3.0	3.1	3.0	2.4	4.7	3.3	24	
15	3.1	3.3	3.3	3.3	3.6	3.8	5.2	4.7	4.5	4.7	4.9	5.2	5.1	4.8	4.2	S	4.2	4.1	4.2	4.5	4.4	4.4	4.3	4.3	3.1	5.2	4.3	24	
16	4.3	4.3	4.3	5.0	4.6	5.0	5.1	5.0	5.4	5.5	5.2	5.0	5.2	5.2	S	5.3	5.2	5.0	5.4	5.5	4.9	4.9	4.9	4.6	4.3	5.5	5.0	24	
17	4.7	4.8	4.7	4.4	4.3	4.3	4.1	4.1	4.0	4.1	C1	C1	C1	C1	C1	1.3	1.1	1.1	1.1	1.0	0.9	1.1	0.9	0.8	0.8	4.8	2.8	19	
18	0.8	0.9	0.6	0.7	0.6	0.5	0.6	0.6	0.8	0.6	0.5	0.6	S	0.8	0.6	0.7	0.8	0.8	0.7	0.5	0.6	0.7	0.7	0.6	0.5	0.9	0.7	24	
19	0.6	0.8	0.9	0.9	1.0	0.9	1.1	1.2	1.2	1.0	1.1	S	1.1	1.2	1.2	1.1	1.1	1.2	1.0	1.0	1.2	1.2	1.2	1.0	0.6	1.2	1.1	24	
20	1.0	0.8	1.1	0.9	0.8	0.9	0.8	1.0	0.8	1.0	S	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.8	1.8	0.6	1.8	0.9	24	
21	1.4	0.8	0.5	0.6	0.6	0.7	0.6	0.6	0.6	S	0.5	0.8	0.7	0.9	1.0	0.7	0.6	0.6	0.6	0.4	0.3	0.3	0.3	0.0	0.0	1.4	0.6	24	
22	0.1	0.1	0.0	0.1	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	0.1	0.0	24	
23	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
24	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.6	1.2	0.6	0.7	0.2	S	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.2	24	
25	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.4	0.4	1.8	1.7	1.8	1.5	1.4	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.0	1.8	0.6	24	
26	0.6	0.6	0.3	0.4	S	0.2	0.3	0.3	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	0.6	0.1	24	
27	0.0	0.2	0.0	S	0.2	0.5	0.6	0.6	1.0	2.2	1.7	1.4	1.9	2.4	2.4	2.0	2.2	1.2	0.8	0.3	0.7	0.4	0.4	0.2	0.0	2.4	1.0	24	
28	0.3	0.6	S	0.0	0.2	0.2	0.1	0.8	1.9	0.7	0.2	0.4	0.4	0.4	0.5	0.8	0.3	0.4	0.2	0.3	0.2	0.2	0.4	0.0	0.0	1.9	0.4	24	
HOURLY MAX	4.7	4.8	4.7	5.0	4.6	5.0	5.2	5.0	5.4	5.5	5.2	5.2	5.2	5.2	4.6	5.3	5.2	5.0	5.4	5.5	4.9	4.9	4.9	4.6					
HOURLY AVG	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.5	1.5	1.4	1.5	1.5	1.6	1.4	1.3	1.3	1.3	1.2	1.3	1.2	1.2	1.2	1.4					

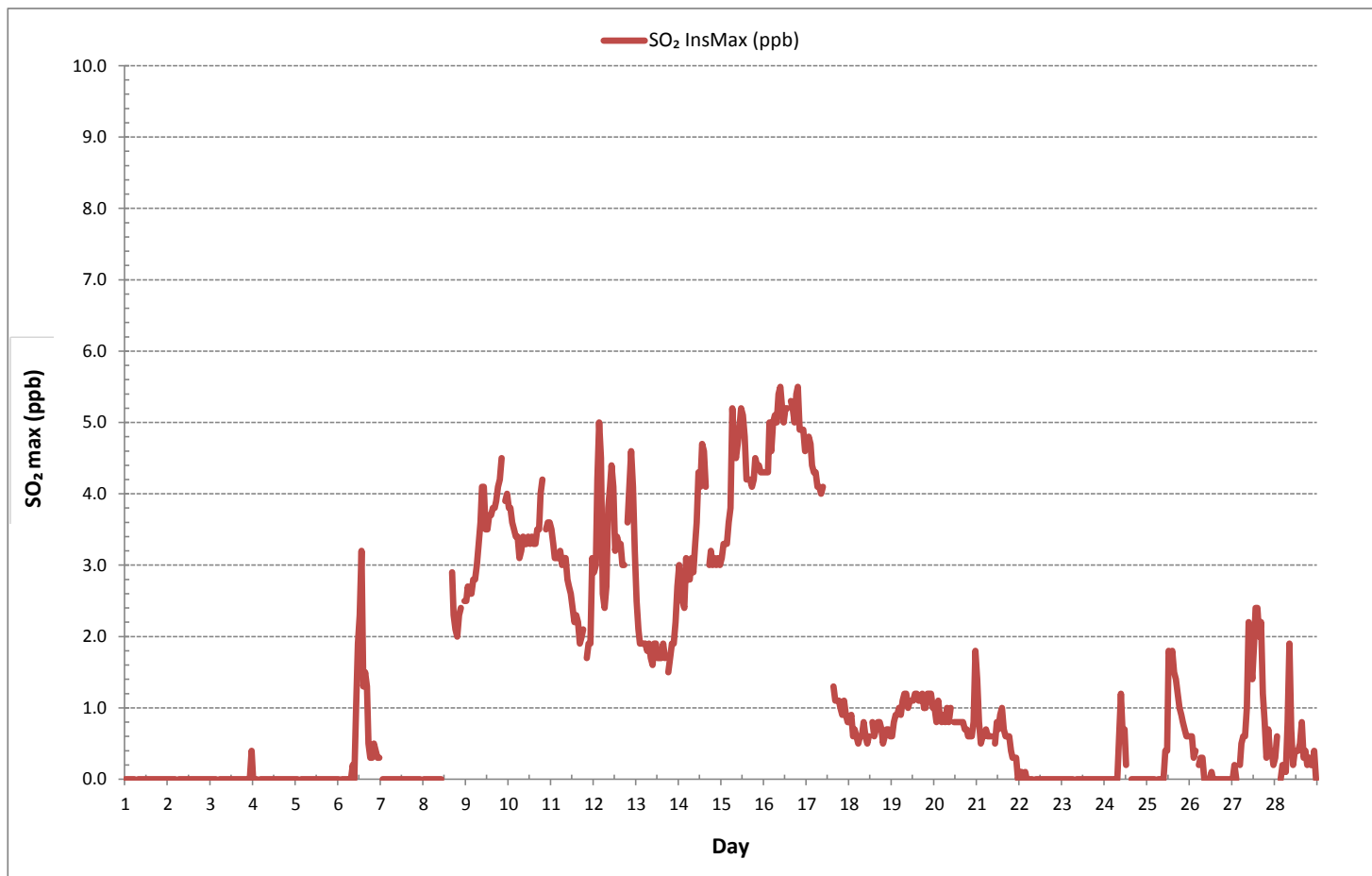
STATUS FLAG CODES

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:	389
MAXIMUM INSTANTANEOUS VALUE:	5.5 ppb @ HOUR(S) 9, 19 ON DAY(S) 16, 16
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	667 hrs
STANDARD DEVIATION:	1.6

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)









Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-SO2[ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

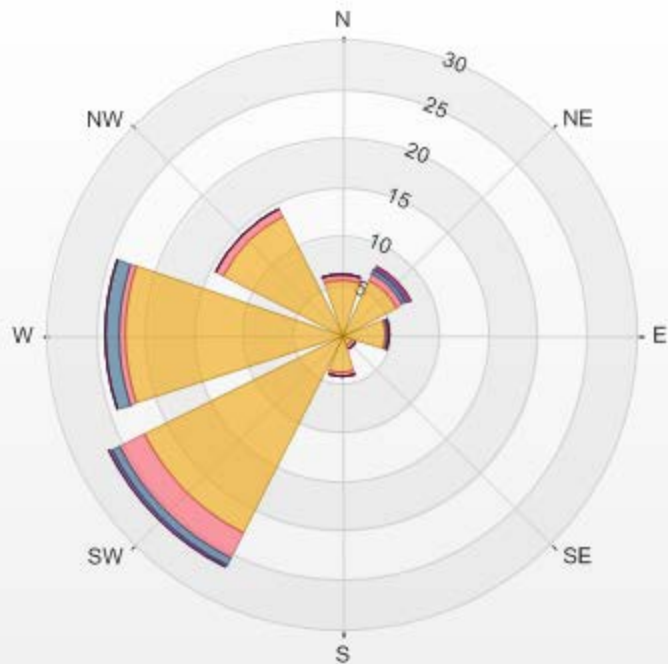
Calm: 10.39%

Calm Avg: 0.09 [ppb]

Direction	0.0-0.6	0.6-1.2	1.2-1.7	1.7-2.3	2.3-2.9	>2.9	Total
N	5.7	0.5	0.0	0.0	0.0	0.0	6.1
NE	6.3	0.6	0.5	0.3	0.2	0.0	7.9
E	4.6	0.2	0.2	0.0	0.0	0.0	4.9
SE	1.3	0.3	0.0	0.0	0.0	0.0	1.6
S	3.9	0.3	0.0	0.0	0.0	0.0	4.3
SW	22.5	2.8	0.8	0.3	0.0	0.0	26.5
W	22.1	0.6	1.4	0.0	0.0	0.0	24.1
NW	13.5	0.8	0.0	0.0	0.0	0.0	14.3
Summary	79.9	6.1	2.8	0.6	0.2	0.0	89.6

% Icon	Classes (ppb)	80	 0.0-0.6	6	 0.6-1.2	3	 1.2-1.7	1	 1.7-2.3	0	 2.3-2.9	0	 >2.9
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LICA Bonnyville Poll.: LICA Bonnyville-SO2[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.39%
Calm Poll Avg: 0.09[ppb]



SO2[ppb] Calibration: LICA Bonnyville Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

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	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	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	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.2	0.0	24
2	0.1	0.0	0.1	0.0	0.0	S	0.1	0.1	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	0.1	0.0	24
3	0.0	0.0	0.0	0.1	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24
4	0.0	0.0	0.0	S	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24
5	0.0	0.0	S	0.0	0.0	0.0	0.0	0.1	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.0	0.4	0.0	24	
6	0.2	S	0.2	0.2	0.1	0.2	0.4	0.6	0.6	0.5	0.2	0.3	0.1	0.0	0.2	0.1	0.2	0.3	0.2	0.8	0.3	0.0	0.2	0.0	0.0	0.0	0.8	0.3	24
7	S	0.0	0.4	0.8	0.0	0.7	0.0	0.1	0.4	0.8	1.9	0.2	0.1	0.5	0.0	0.7	0.8	0.0	0.0	0.2	0.1	0.1	0.0	S	0.0	1.9	0.4	24	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	0.1	0.1	0.0	0.0	0.0	0.1	S	0.0	0.0	0.1	0.0	24	
9	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.1	0.4	0.4	0.2	0.0	0.1	0.2	0.1	0.3	0.1	0.1	S	0.1	0.0	0.0	0.4	0.2	24	
10	0.0	0.1	0.0	0.1	0.2	0.3	0.2	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.0	0.1	0.1	0.0	0.4	0.1	24	
11	0.1	0.0	0.2	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.2	0.1	24	
12	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	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	
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	S	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	24	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.1	0.1	0.3	0.2	0.1	0.2	0.3	S	0.1	0.2	0.2	0.0	0.1	0.1	0.3	0.0	0.4	0.1	24	
15	0.2	0.5	0.3	0.6	1.1	2.0	1.9	1.0	0.6	0.4	0.7	0.9	1.1	0.3	0.2	S	0.6	0.3	0.9	1.2	0.4	0.0	0.0	0.1	0.0	2.0	0.7	24	
16	0.0	0.7	1.1	1.3	0.4	0.4	0.2	0.4	0.8	0.8	0.1	0.4	0.3	0.8	S	0.5	2.2	1.0	0.6	1.2	0.7	0.2	0.6	1.0	0.0	2.2	0.7	24	
17	0.2	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	S	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
18	0.0	0.1	0.0	0.2	0.3	0.6	2.1	0.5	0.4	0.2	0.2	0.3	S	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.2	24	
19	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	0.3	0.2	0.1	0.4	0.2	0.3	0.1	0.0	0.0	0.0	0.4	0.1	24	
20	0.0	0.1	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	0.1	0.5	0.0	0.5	0.0	24	
21	0.5	1.7	2.2	1.3	0.6	0.1	0.1	0.3	0.1	S	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	2.2	0.3	24	
22	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	24	
23	0.1	0.0	0.2	0.2	0.1	0.2	0.3	S	0.9	0.6	0.2	0.0	0.0	0.1	0.1	0.2	0.2	0.4	0.5	0.4	0.3	0.3	0.0	0.0	0.0	0.9	0.2	24	
24	0.2	0.2	0.7	0.5	1.4	0.7	S	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	1.4	0.2	24	
25	0.0	0.0	0.0	0.1	0.1	S	0.1	0.2	0.3	0.1	0.2	0.5	0.3	0.3	0.3	0.4	0.6	0.5	0.4	0.3	0.3	0.3	0.1	0.2	0.0	0.6	0.2	24	
26	0.3	0.3	0.5	0.2	S	0.0	0.2	0.1	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	0.3	0.1	0.1	0.0	0.5	0.1	24	
27	0.1	0.0	0.0	S	0.0	0.0	0.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.2	0.9	1.5	0.0	1.5	0.2	24	
28	1.6	1.6	S	1.6	2.0	1.9	3.2	1.7	2.2	0.9	0.2	0.1	0.3	0.1	0.1	0.0	0.1	0.2	0.1	0.4	0.0	0.0	0.0	0.0	0.0	3.2	0.8	24	
HOURLY MAX	1.6	1.7	2.2	1.6	2.0	2.0	3.2	1.7	2.2	0.9	1.9	0.9	1.1	0.8	0.3	0.7	2.2	1.0	0.9	1.2	0.7	0.3	0.9	1.5					
HOURLY AVG	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	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

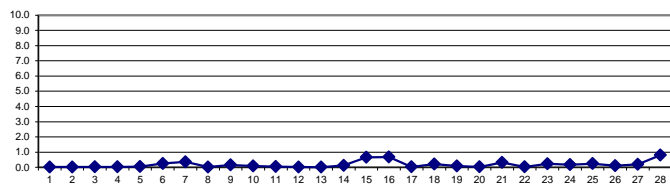
OBJECTIVE LIMIT:

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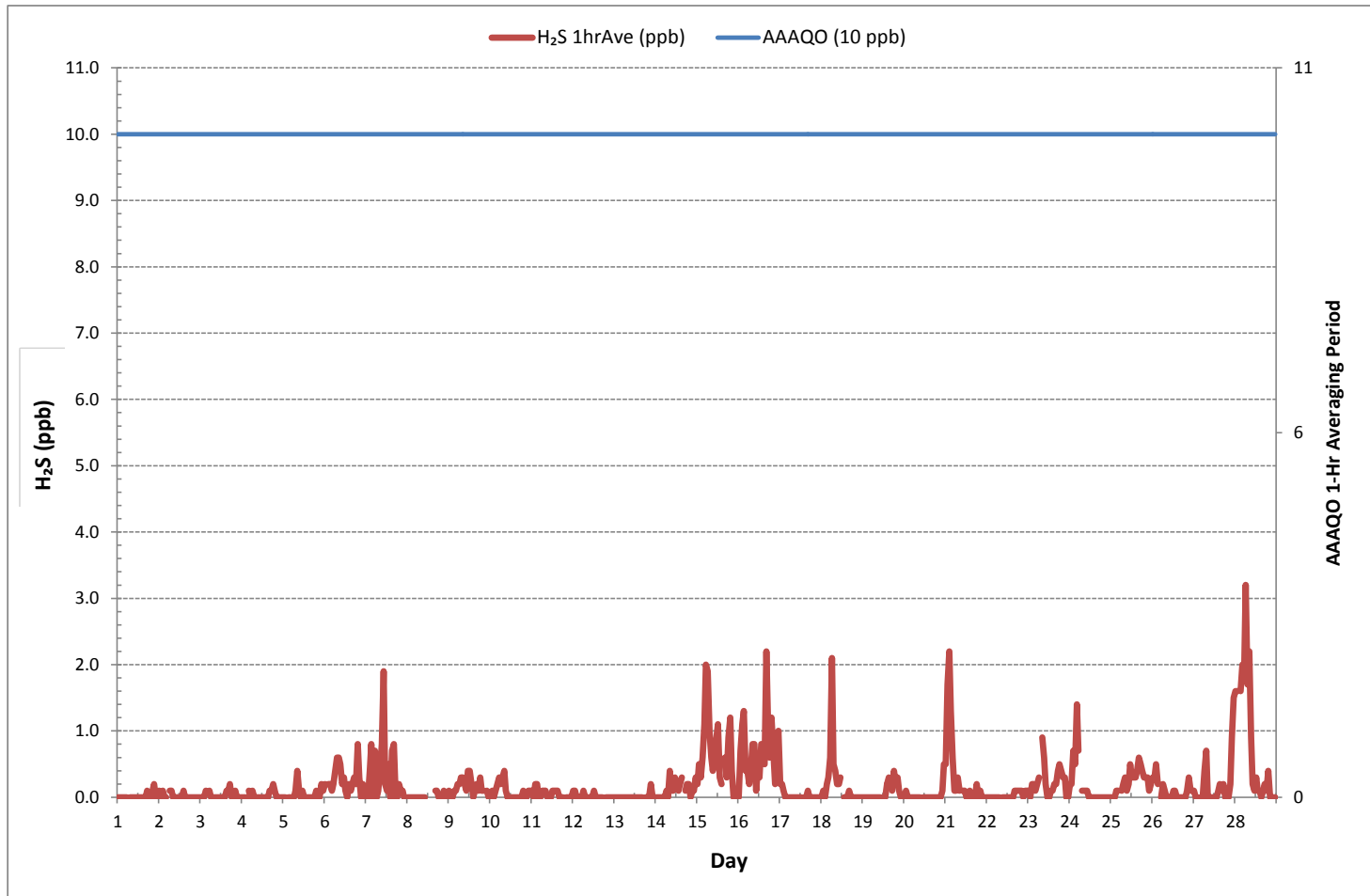
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	303					
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	3.2	ppb	@ HOUR(S)	6	ON DAY(S)	28
MAXIMUM 24-HR AVERAGE:	0.8	ppb			ON DAY(S)	28
					VAR-VARIOUS	
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs	
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	0.4		MONTHLY AVERAGE:	0.2	ppb	

24 HR AVERAGES February 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	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	0.4	0.0	0.0	0.0	0.4	0.0	24	
2	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	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	24
3	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	24
4	0.0	0.0	0.0	S	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.0	0.0	0.1	0.1	0.1	0.0	0.4	0.1	24
5	0.0	0.0	S	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.4	0.1	0.0	0.4	0.1	24	
6	0.5	S	0.5	0.4	0.2	0.3	0.8	0.6	0.9	0.6	0.2	0.3	0.1	0.0	0.1	0.0	0.1	0.1	0.0	1.6	1.8	0.1	0.5	0.4	0.0	1.8	0.4	24	
7	S	0.0	1.4	1.4	0.2	1.0	0.8	0.4	0.6	1.4	2.1	1.5	0.7	0.5	0.3	1.0	2.2	1.5	0.0	0.0	0.0	0.0	0.0	S	0.0	2.2	0.8	24	
8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4	C	C	C	C	C	0.9	1.0	0.6	0.6	0.7	0.7	S	0.6	0.0	1.0	0.3	24	
9	0.8	0.6	0.7	0.7	0.9	1.1	0.9	1.1	1.2	1.0	1.0	1.4	1.3	1.0	0.9	0.9	1.0	0.9	1.2	1.1	1.1	S	1.1	1.0	0.6	1.4	1.0	24	
10	1.0	1.0	0.9	1.2	1.2	1.4	1.3	1.2	1.3	1.0	0.9	0.8	0.8	0.9	1.0	0.8	0.7	0.9	0.8	1.1	S	0.9	1.0	0.9	0.7	1.4	1.0	24	
11	0.9	1.0	1.0	0.9	0.7	0.7	0.7	0.7	0.6	0.4	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	S	0.4	0.4	0.4	0.6	0.4	1.0	0.6	24	
12	0.5	0.5	0.5	0.4	0.4	0.6	0.6	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7	0.4	0.7	S	0.6	0.6	0.6	0.5	0.7	0.4	0.7	0.6	24	
13	0.5	0.5	0.5	0.5	0.3	0.5	0.6	0.5	0.5	0.4	0.5	0.6	0.4	0.4	0.5	0.6	0.6	S	0.5	0.3	0.5	0.7	0.6	0.4	0.3	0.7	0.5	24	
14	0.6	0.5	0.5	0.5	0.4	0.5	0.7	0.8	1.5	0.8	0.7	0.9	0.9	0.7	0.9	1.0	S	0.7	0.9	1.0	0.8	0.8	1.0	1.0	0.4	1.5	0.8	24	
15	1.1	1.9	1.7	2.9	2.7	5.4	4.9	2.2	1.6	1.7	2.0	2.3	2.3	2.0	1.4	S	2.4	1.9	4.9	4.5	1.9	1.2	1.2	1.5	1.1	5.4	2.4	24	
16	1.7	2.1	5.9	5.8	1.9	2.2	1.6	1.7	2.7	2.8	1.4	2.9	2.0	4.0	S	3.7	6.3	3.1	2.0	3.8	2.4	1.5	2.9	6.2	1.4	6.3	3.1	24	
17	1.3	1.4	1.2	1.2	1.1	1.1	1.0	1.0	1.1	1.0	1.0	1.0	0.9	S	1.0	1.0	1.2	1.0	1.0	0.8	0.8	1.0	0.8	1.3	0.8	1.4	1.1	24	
18	0.9	1.2	0.8	1.4	1.4	2.0	5.5	2.6	1.5	1.3	1.2	1.1	S	0.9	0.7	0.8	0.9	1.0	0.8	0.8	0.7	0.7	0.8	0.9	0.7	5.5	1.3	24	
19	0.8	0.7	0.8	0.8	0.8	0.8	0.9	1.0	1.0	0.9	1.0	S	1.0	1.1	1.3	1.4	1.4	1.2	1.4	1.4	1.3	1.3	1.0	1.0	0.7	1.4	1.1	24	
20	1.0	1.2	1.1	1.0	1.0	0.9	0.8	0.9	0.9	0.9	S	1.0	0.9	0.8	0.7	0.7	1.1	0.9	1.0	0.8	0.9	0.9	2.0	2.5	0.7	2.5	1.0	24	
21	1.9	4.3	4.9	4.4	1.6	1.4	0.9	1.4	1.0	S	1.3	0.8	0.7	0.8	0.8	0.7	0.7	0.7	1.2	0.6	0.7	0.7	0.6	0.6	0.6	4.9	1.4	24	
22	0.6	0.7	0.6	0.6	3.6	0.6	0.6	0.4	S	0.6	0.4	0.5	0.4	0.6	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.4	0.5	0.5	0.4	3.6	0.7	24	
23	0.6	0.4	0.6	0.6	0.6	0.5	0.9	S	1.4	1.2	0.7	0.6	0.4	0.5	0.5	0.7	0.7	1.2	2.3	1.1	0.9	0.8	0.4	0.5	0.4	2.3	0.8	24	
24	0.7	0.8	1.8	1.2	3.4	1.9	S	0.8	0.6	0.6	0.6	0.5	0.5	1.8	0.5	0.4	0.5	0.5	0.6	0.4	0.3	0.6	0.6	0.5	0.3	3.4	0.9	24	
25	0.5	0.5	0.4	0.8	0.8	S	0.6	0.6	0.8	0.6	0.8	1.0	0.7	0.7	0.8	1.0	1.2	1.1	0.8	0.8	0.7	0.8	0.6	0.7	0.4	1.2	0.8	24	
26	0.8	0.8	1.8	0.6	S	0.6	0.7	0.7	0.6	0.6	0.5	0.7	0.7	0.8	0.7	0.6	0.5	0.6	0.6	0.9	1.0	1.4	1.1	0.9	0.5	1.8	0.8	24	
27	1.1	1.0	1.3	S	0.6	0.9	1.6	1.9	0.8	0.7	0.9	0.7	0.6	0.7	0.9	0.9	0.8	0.9	0.9	0.7	0.8	1.0	2.0	3.5	0.6	3.5	1.1	24	
28	3.0	3.0	S	3.3	5.8	5.3	7.5	2.8	3.7	2.1	1.2	0.9	1.1	0.9	0.8	0.9	1.1	1.1	1.3	1.7	1.3	0.5	0.6	0.7	0.5	7.5	2.2	24	
HOURLY MAX	3.0	4.3	5.9	5.8	5.8	5.4	7.5	2.8	3.7	2.8	2.1	2.9	2.3	4.0	1.4	3.7	6.3	3.1	4.9	4.5	2.4	1.5	2.9	6.2					
HOURLY AVG	0.8	0.9	1.1	1.2	1.1	1.2	1.3	0.9	0.9	0.8	0.7	0.8	0.7	0.8	0.6	0.7	1.0	0.8	0.9	1.0	0.8	0.6	0.8	1.0					

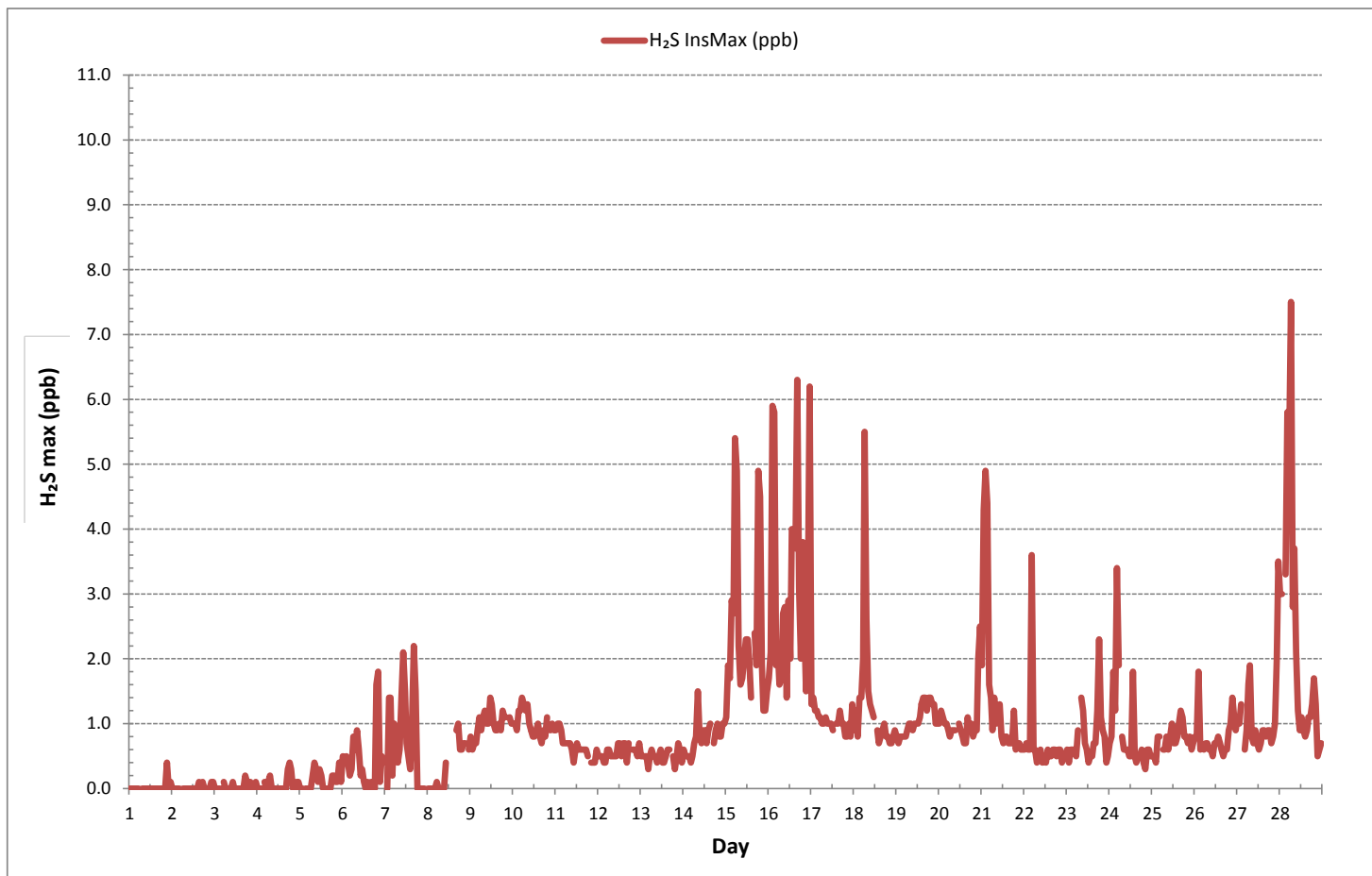
STATUS FLAG CODES

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:	536
MAXIMUM INSTANTANEOUS VALUE:	7.5 ppb @ HOUR(S) 6 ON DAY(S) 28
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	1.0

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)



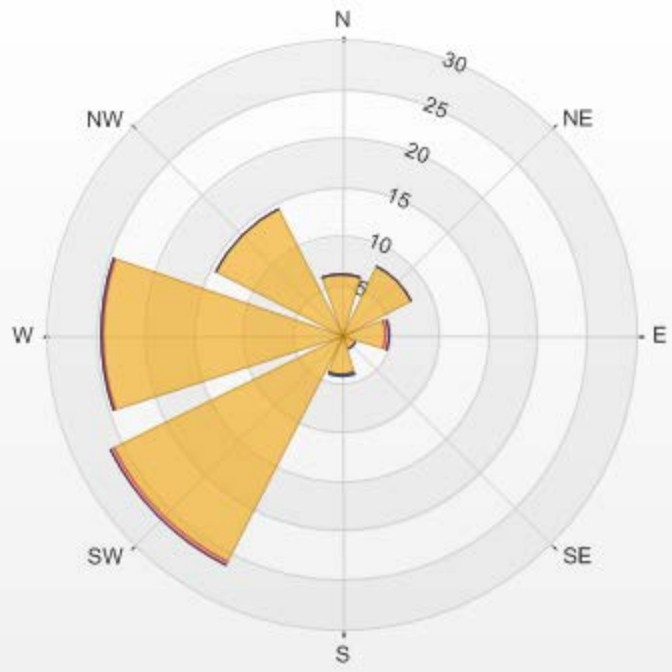
Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-H2S[ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

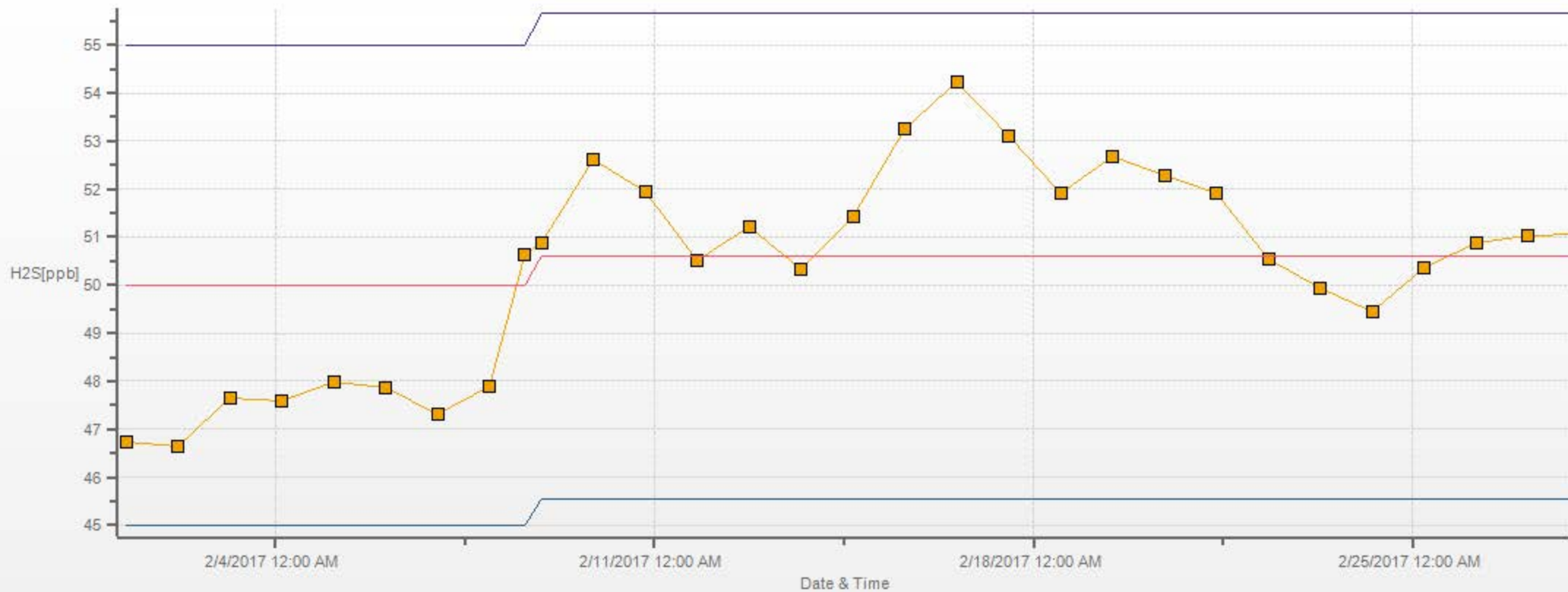
Calm: 10.34% Calm Avg: 0.71 [ppb]

Direction	0.0-1.1	1.1-2.2	2.2-3.3	>3.3	Total
N	6.1	0.0	0.0	0.0	6.1
NE	7.8	0.0	0.0	0.0	7.8
E	4.6	0.3	0.0	0.0	4.9
SE	1.6	0.0	0.0	0.0	1.6
S	4.1	0.0	0.2	0.0	4.2
SW	25.9	0.5	0.0	0.0	26.3
W	24.3	0.2	0.0	0.0	24.5
NW	14.3	0.0	0.0	0.0	14.3
Summary	88.6	0.9	0.2	0.0	89.7

% Icon Classes (ppb) 89 0.0-1.1 1 1.1-2.2 0 2.2-3.3 0 >3.3

LICA Bonnyville Poll.: LICA Bonnyville-H2S[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.34%
 Calm Poll Avg: 0.71[ppb]





Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON



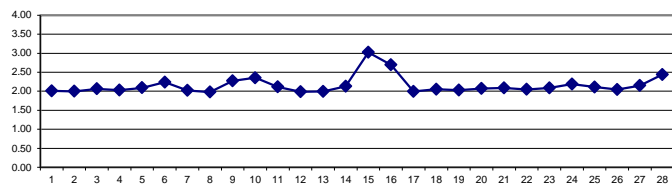
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	1.98	1.98	1.99	2.00	1.99	S	1.99	2.01	2.03	1.99	1.99	1.99	2.02	2.01	2.02	2.08	2.04	2.01	2.03	2.01	2.03	2.02	2.03	1.98	2.08	2.01	24
2	2.01	2.02	2.06	2.03	2.01	S	2.01	2.01	2.00	1.98	1.96	1.97	1.98	1.98	1.99	1.99	2.00	2.00	2.00	1.99	2.00	2.00	2.00	2.00	1.96	2.06	2.00	24
3	2.01	2.00	2.02	2.05	S	2.23	2.17	2.05	2.05	2.01	2.01	2.00	1.99	1.99	1.99	2.00	2.01	2.04	2.09	2.19	2.18	2.19	2.14	2.12	1.99	2.23	2.07	24
4	2.14	2.11	2.20	S	2.13	2.26	2.19	2.12	1.99	1.95	1.94	1.94	1.94	1.94	1.95	1.95	1.96	1.97	1.97	1.99	2.01	2.00	2.03	2.04	1.94	2.26	2.03	24
5	2.02	2.00	S	2.01	2.03	2.02	2.04	2.05	2.10	2.14	2.05	2.43	2.20	2.02	2.02	2.02	1.99	2.03	2.07	2.14	2.13	2.18	2.25	2.15	1.99	2.43	2.09	24
6	2.19	S	2.23	2.23	2.25	2.35	2.57	2.85	2.53	2.47	2.30	2.25	2.14	2.04	2.04	2.05	2.06	2.11	2.11	2.14	2.10	2.17	2.16	2.15	2.04	2.85	2.24	24
7	S	2.17	2.16	2.15	2.11	2.08	2.05	2.05	2.03	2.01	2.00	1.98	1.97	1.95	1.96	1.96	1.96	1.97	1.96	1.97	1.98	1.98	1.99	S	1.95	2.17	2.02	24
8	2.02	2.01	2.01	2.00	2.00	2.00	1.99	1.99	1.97	1.94	1.95	1.96	1.97	1.97	1.98	1.97	1.98	1.96	1.94	1.95	1.96	S	2.02	1.94	2.02	1.98	24	
9	2.02	2.03	2.05	2.09	2.13	2.23	2.31	2.53	2.54	2.45	2.45	C	C	C	C	2.28	2.30	2.30	2.31	2.35	2.30	S	2.23	2.23	2.02	2.54	2.27	24
10	2.22	2.38	2.53	2.63	2.66	2.64	2.52	2.55	2.50	2.41	2.25	2.19	2.14	2.14	2.18	2.23	2.17	2.33	2.33	2.33	S	2.30	2.25	2.27	2.14	2.66	2.35	24
11	2.29	2.47	2.42	2.34	2.30	2.25	2.21	2.21	2.20	2.15	2.05	1.99	1.98	1.97	1.97	1.98	1.99	1.98	1.99	S	1.98	1.98	1.99	2.00	1.97	2.47	2.12	24
12	2.01	2.01	2.00	1.99	1.99	1.99	1.99	2.00	1.99	1.98	1.98	1.98	1.99	1.98	1.99	1.98	1.98	1.98	S	1.99	1.99	1.99	1.99	1.98	1.98	2.01	1.99	24
13	1.97	1.98	1.98	1.98	1.97	1.97	1.98	2.02	1.98	1.98	1.99	1.99	1.98	1.98	1.98	1.99	2.01	S	2.01	2.01	2.04	2.10	2.02	2.01	1.97	2.10	2.00	24
14	2.03	2.03	2.06	2.05	2.05	2.07	2.10	2.24	2.18	2.13	2.11	2.08	2.15	2.09	2.12	2.11	S	2.03	2.14	2.22	2.12	2.18	2.25	2.41	2.03	2.41	2.13	24
15	2.39	2.62	2.57	3.78	4.76	3.81	4.47	3.22	3.40	3.58	3.59	3.31	3.21	2.78	2.53	S	2.71	2.60	2.58	2.81	2.24	2.13	2.10	2.28	2.10	4.76	3.02	24
16	2.30	2.90	3.45	3.21	3.02	2.78	2.69	2.67	3.13	2.85	2.56	2.56	2.47	2.40	S	2.52	2.64	2.55	2.81	2.66	2.52	2.49	2.47	2.37	2.30	3.45	2.70	24
17	2.22	2.08	2.04	2.00	1.99	1.96	1.95	1.96	1.97	1.97	1.96	1.96	1.96	S	1.97	1.98	1.99	1.99	1.99	1.99	1.99	2.00	1.98	1.99	1.95	2.22	2.00	24
18	1.98	2.00	1.99	2.00	2.11	2.10	2.16	2.08	2.38	2.15	2.05	2.03	S	2.06	2.06	1.99	2.02	2.02	2.03	2.02	2.00	2.00	1.99	1.99	1.98	2.38	2.05	24
19	1.98	1.99	1.98	1.99	1.98	1.98	1.98	1.97	1.98	1.99	1.99	S	2.00	2.05	2.04	2.05	2.05	2.06	2.19	2.07	2.06	2.11	2.08	2.11	1.97	2.19	2.03	24
20	2.07	2.06	2.11	2.22	2.30	2.10	2.03	2.01	2.02	2.01	S	2.01	2.01	2.00	2.01	2.00	2.01	2.49	2.02	2.01	2.01	2.02	2.07	2.00	2.49	2.07	24	
21	2.09	2.08	2.05	2.14	2.09	2.07	2.07	2.06	2.11	S	2.03	2.04	2.05	2.06	2.09	2.13	2.10	2.14	2.18	2.14	2.16	2.06	2.05	1.99	1.99	2.18	2.09	24
22	2.07	2.03	2.05	2.01	2.08	2.04	2.06	2.06	S	2.01	2.01	2.03	1.97	1.97	1.97	1.97	1.99	2.00	2.10	2.07	2.15	2.23	2.22	2.04	1.97	2.23	2.05	24
23	2.02	2.04	2.03	2.03	2.10	2.24	2.53	S	2.17	2.05	2.02	2.00	1.99	1.99	1.99	2.00	2.00	2.02	2.04	2.06	2.07	2.27	2.31	1.99	2.53	2.09	24	
24	2.51	2.41	2.34	2.65	2.54	2.42	S	2.32	2.17	2.10	2.07	2.08	2.05	2.04	2.06	2.09	2.10	2.03	2.04	2.03	2.04	2.08	2.15	2.05	2.03	2.65	2.19	24
25	2.03	2.01	2.03	2.06	2.08	S	2.11	2.09	2.16	2.16	2.15	2.15	2.13	2.13	2.06	2.02	2.09	2.06	2.04	2.20	2.31	2.26	2.14	2.10	2.01	2.31	2.11	24
26	2.05	2.08	2.07	2.07	S	2.04	2.04	2.05	2.05	2.04	2.03	2.04	2.04	2.05	2.04	2.01	2.01	2.01	2.01	2.02	2.03	2.10	2.07	2.04	2.01	2.10	2.04	24
27	2.04	2.11	2.16	S	2.14	2.16	2.18	2.25	2.12	2.08	2.03	2.03	2.03	2.04	2.04	2.05	2.08	2.16	2.12	2.07	2.17	2.63	2.30	2.44	2.03	2.63	2.15	24
28	2.58	2.73	S	2.45	2.46	2.61	2.60	2.78	2.82	2.49	2.40	2.41	2.38	2.52	2.50	2.30	2.26	2.34	2.26	2.50	2.32	2.12	2.09	2.14	2.09	2.82	2.44	24
HOURLY MAX	2.58	2.90	3.45	3.78	4.76	3.81	4.47	3.22	3.40	3.58	3.59	3.31	3.21	2.78	2.53	2.52	2.71	2.60	2.81	2.81	2.52	2.63	2.47	2.44				
HOURLY AVG	2.12	2.16	2.18	2.24	2.28	2.25	2.27	2.23	2.24	2.19	2.14	2.13	2.10	2.08	2.06	2.06	2.09	2.12	2.12	2.15	2.11	2.12	2.12	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

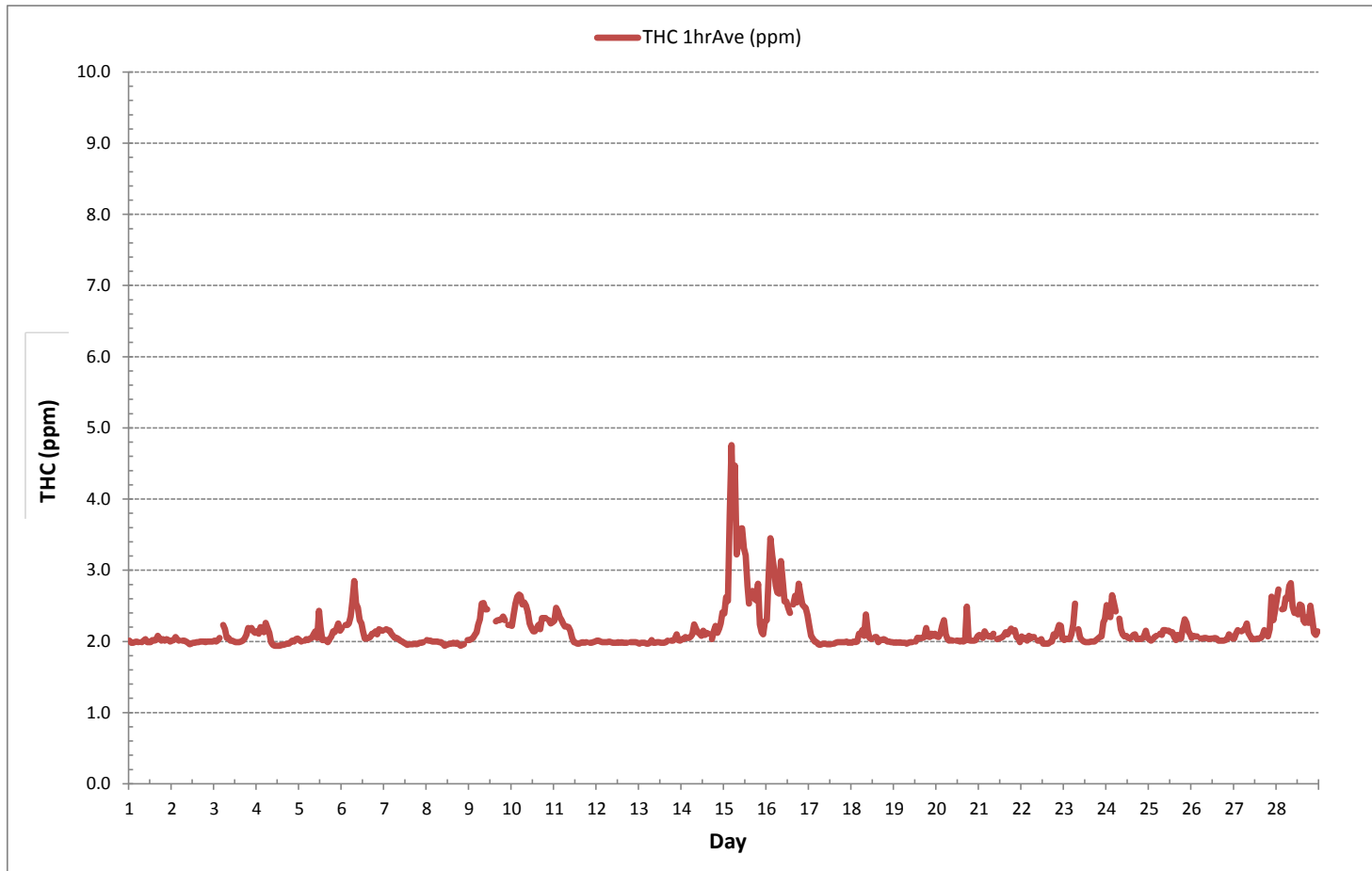
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	639			
MINIMUM 1-HR AVERAGE:	1.94 ppm	@ HOUR(S)	VAR , VAR	ON DAY(S) 4 , 8
MAXIMUM 1-HR AVERAGE:	4.76 ppm	@ HOUR(S)	4	ON DAY(S) 15
MAXIMUM 24-HR AVERAGE:	3.02 ppm			ON DAY(S) 15
				VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.29	MONTHLY AVERAGE:	2.15 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	2.14	2.09	2.01	2.02	2.07	2.06	S	2.09	2.12	2.18	2.06	2.05	2.06	2.07	2.07	2.49	2.22	2.23	2.05	2.06	2.05	2.06	2.04	2.06	2.01	2.49	2.10	24
2	2.03	2.04	2.07	2.05	2.04	S	2.02	2.11	2.02	2.01	1.97	2.09	1.99	2.00	2.00	2.00	2.01	2.09	2.10	2.01	2.02	2.01	2.02	2.02	1.97	2.11	2.03	24
3	2.02	2.03	2.03	2.07	S	2.43	2.37	2.25	2.22	2.12	2.15	2.08	2.08	2.15	2.09	2.13	2.11	2.14	2.40	2.44	2.51	2.33	2.29	2.25	2.02	2.51	2.20	24
4	2.38	2.46	2.40	S	2.90	2.41	2.32	2.16	2.04	1.96	1.97	1.96	2.04	1.96	2.08	1.97	2.00	2.01	2.01	2.03	2.07	2.06	2.11	2.16	1.96	2.90	2.15	24
5	2.05	2.05	S	2.12	2.08	2.04	2.06	2.09	3.27	2.32	2.13	2.66	2.68	2.11	2.12	2.14	2.14	2.18	2.22	2.51	2.29	2.59	2.75	2.39	2.04	3.27	2.30	24
6	2.35	S	2.57	2.49	2.32	2.60	3.23	3.11	3.09	2.88	2.53	2.60	2.36	2.14	2.13	2.39	2.25	2.80	2.59	2.45	2.34	2.51	2.33	2.19	2.13	3.23	2.53	24
7	S	2.19	2.19	2.17	2.14	2.10	2.07	2.34	2.05	2.03	2.30	1.99	1.99	1.96	1.98	1.98	2.21	1.99	1.97	1.98	1.99	2.01	S	1.96	2.34	2.07	24	
8	2.03	2.02	2.02	2.01	2.01	2.02	2.02	2.00	2.00	1.99	1.97	1.96	1.97	2.00	1.98	1.98	2.06	2.06	1.98	1.96	1.96	1.98	S	2.11	1.96	2.11	2.00	24
9	2.04	2.04	2.12	2.23	2.37	3.31	2.89	3.16	3.14	2.57	C	C	C	C	C	2.40	2.44	2.52	2.34	2.43	2.34	S	2.29	2.36	2.04	3.31	2.50	24
10	2.40	3.62	3.52	3.87	3.87	5.33	3.08	4.84	2.88	2.72	2.48	2.34	2.27	2.27	2.41	2.30	2.27	2.74	2.60	2.64	S	2.33	2.27	2.29	2.27	5.33	2.93	24
11	2.30	4.52	2.83	2.36	2.36	2.26	2.23	2.23	2.23	2.18	2.10	2.01	2.00	1.98	1.99	2.01	2.00	2.00	2.01	S	2.00	1.99	2.00	2.01	1.98	4.52	2.24	24
12	2.02	2.02	2.02	2.00	2.00	2.00	2.00	2.01	2.01	1.99	1.99	1.99	1.99	1.99	2.00	1.99	1.98	1.99	S	2.00	2.00	2.00	2.00	1.99	1.98	2.02	2.00	24
13	1.98	1.99	1.99	2.00	1.98	1.98	1.99	2.49	2.00	2.00	2.01	2.00	1.98	1.99	2.02	2.03	S	2.02	2.02	2.74	2.19	2.05	2.02	1.98	2.02	2.06	24	
14	2.04	2.04	2.85	2.19	2.06	2.07	2.65	2.81	2.29	2.20	2.18	2.16	2.28	2.16	2.30	2.13	S	2.08	2.23	2.31	2.18	2.22	2.38	3.01	2.04	3.01	2.30	24
15	3.25	3.21	4.67	7.93	8.33	4.86	7.89	4.90	4.11	3.84	4.24	3.88	3.44	3.24	2.85	S	3.11	3.62	3.55	3.80	3.28	2.15	2.26	3.53	2.15	8.33	4.17	24
16	2.70	3.43	5.15	5.23	4.28	4.12	3.20	2.96	5.31	4.03	3.43	3.74	3.05	2.59	S	3.09	5.92	3.66	3.20	3.06	3.12	2.60	3.71	2.47	5.92	3.65	24	
17	2.36	2.10	2.06	2.16	2.01	1.97	1.97	1.97	1.99	1.99	1.97	1.99	1.97	S	1.98	2.00	2.00	2.01	2.06	2.00	2.01	2.01	1.99	2.00	1.97	2.36	2.02	24
18	1.99	2.01	2.00	2.01	3.51	2.97	4.10	2.22	3.02	2.81	2.07	2.05	S	2.23	2.28	2.06	2.88	2.04	2.05	2.03	2.09	2.17	2.02	2.05	1.99	4.10	2.38	24
19	2.00	2.08	2.00	2.00	2.01	2.11	2.03	2.02	1.99	2.06	2.04	S	2.06	2.76	2.22	2.26	2.20	2.09	2.65	2.51	2.16	2.31	2.24	2.37	1.99	2.76	2.18	24
20	2.10	2.12	2.13	2.33	2.35	2.18	2.05	2.03	2.03	2.03	S	2.08	2.10	2.01	2.09	2.02	2.02	3.46	2.04	2.02	2.03	2.05	2.10	2.15	2.01	3.46	2.15	24
21	2.27	2.11	2.07	2.23	2.26	2.20	2.13	2.13	2.16	S	2.03	2.05	2.15	2.13	2.18	2.37	2.19	2.36	2.43	2.35	3.33	2.17	2.16	2.01	2.01	3.33	2.24	24
22	2.24	2.16	2.23	2.17	2.24	2.12	2.16	2.23	S	2.10	2.13	2.12	1.99	2.04	1.98	1.98	2.32	2.03	2.25	2.15	2.30	2.48	2.35	2.30	1.98	2.48	2.18	24
23	2.04	2.05	2.04	2.07	2.19	3.00	3.68	S	2.35	2.11	2.27	2.01	2.00	2.00	2.00	2.01	2.01	2.01	2.05	2.07	2.11	2.11	2.34	2.48	2.00	3.68	2.22	24
24	3.22	3.00	2.51	3.00	2.87	3.32	S	2.49	2.51	2.17	2.16	2.20	2.12	2.10	2.13	2.19	3.30	2.05	2.06	2.13	2.07	2.21	2.33	2.07	2.05	3.32	2.44	24
25	2.05	2.02	2.05	2.09	2.09	S	2.12	2.10	2.20	2.21	2.17	2.17	2.15	2.16	2.15	2.04	2.18	2.19	2.10	2.48	2.45	2.53	2.23	2.29	2.02	2.53	2.18	24
26	2.07	2.13	2.11	2.24	S	2.10	2.09	2.11	2.12	2.08	2.11	2.09	2.08	2.10	2.12	2.02	2.02	2.02	2.02	2.04	2.11	2.16	2.12	2.10	2.02	2.24	2.09	24
27	2.13	2.18	2.21	S	2.19	2.18	2.24	2.42	2.18	2.09	2.06	2.04	2.04	2.04	2.07	2.11	2.16	2.19	2.17	2.12	2.28	4.44	3.50	3.55	2.04	4.44	2.37	24
28	3.98	4.37	S	2.63	2.56	2.95	2.72	4.23	4.14	2.83	2.67	2.52	2.48	2.60	3.16	2.41	2.50	3.50	3.13	3.34	2.92	2.20	2.18	2.41	2.18	4.37	2.98	24
HOURLY MAX	3.98	4.52	5.15	7.93	8.33	5.33	7.89	4.90	5.31	4.03	4.24	3.88	3.44	3.24	3.16	3.09	5.92	3.66	3.55	3.80	3.33	4.44	3.71	3.55				
HOURLY AVG	2.30	2.45	2.46	2.60	2.66	2.64	2.67	2.57	2.57	2.35	2.28	2.26	2.21	2.18	2.17	2.17	2.39	2.37	2.31	2.33	2.32	2.29	2.30	2.32				

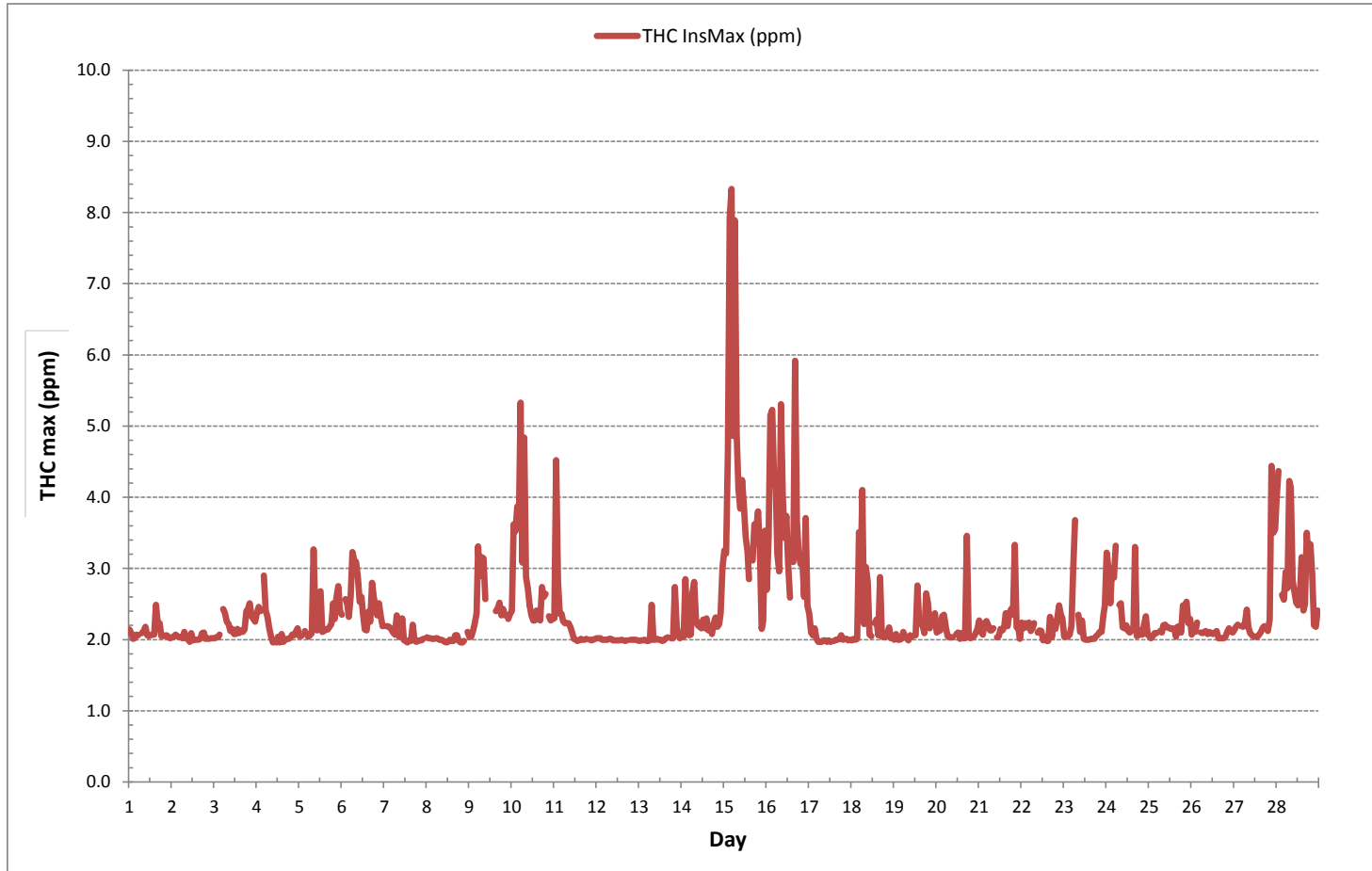
STATUS FLAG CODES

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:	638
MAXIMUM INSTANTANEOUS VALUE:	8.33 ppm @ HOUR(S) 4 ON DAY(S) 15
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	0.70

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



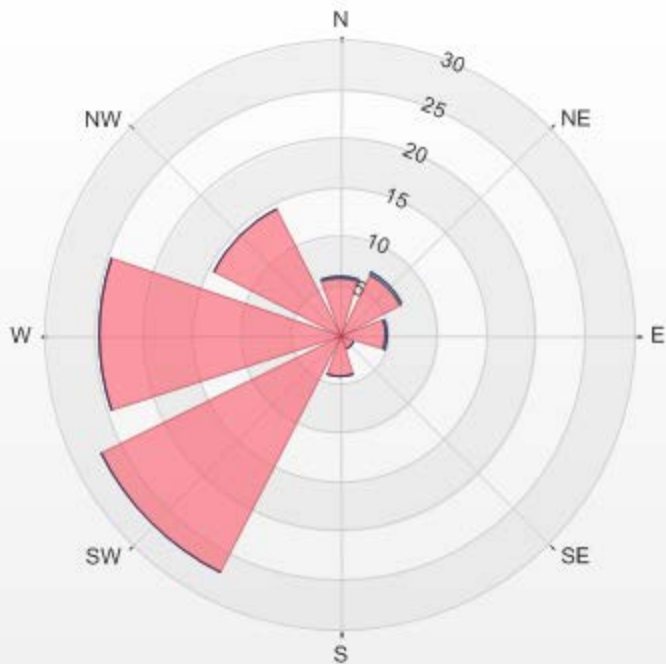
Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-THC55[ppm]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 10.33% Calm Avg: 2.54 [ppb]

Direction	0.0-1.6	1.6-3.2	3.2-4.8	>4.8	Total
N	0.0	5.8	0.3	0.0	6.1
NE	0.0	6.9	0.3	0.0	7.2
E	0.0	4.7	0.2	0.0	4.9
SE	0.0	1.6	0.0	0.0	1.6
S	0.0	4.2	0.0	0.0	4.2
SW	0.0	27.1	0.0	0.0	27.1
W	0.0	24.4	0.0	0.0	24.4
NW	0.0	14.2	0.0	0.0	14.2
Summary	0.0	88.9	0.8	0.0	89.7

% Icon	Classes (ppm)	0	0.0-1.6	89	1.6-3.2	1	3.2-4.8	0	>4.8
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LICA Bonnyville Poll.: LICA Bonnyville-THC55[ppm] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.33%
 Calm Poll Avg: 2.54[ppm]



THC55[ppm] Calibration: LICA Bonnyville Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

METHANE



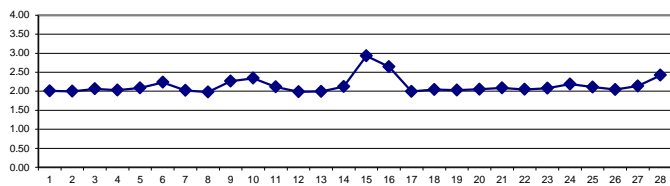
METHANE Hourly Averages (CH₄ ppm)

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	2.01	1.98	1.98	1.99	2.00	1.99	S	1.99	2.01	2.03	1.99	1.99	1.99	2.02	2.01	2.02	2.08	2.04	2.01	2.03	2.01	2.03	2.02	2.03	1.98	2.08	2.01	24	
2	2.01	2.02	2.05	2.03	2.01	S	2.01	2.01	2.00	1.98	1.96	1.97	1.98	1.98	1.99	1.99	2.00	2.00	2.00	1.99	2.00	2.00	2.00	2.00	1.96	2.05	2.00	24	
3	2.01	2.00	2.02	2.05	S	2.23	2.17	2.05	2.05	2.01	2.01	2.00	1.99	1.99	1.99	2.00	2.01	2.04	2.08	2.19	2.18	2.19	2.14	2.12	1.99	2.23	2.07	24	
4	2.14	2.11	2.20	S	2.12	2.26	2.19	2.12	1.99	1.95	1.94	1.94	1.94	1.94	1.95	1.95	1.96	1.97	1.97	1.99	2.01	2.00	2.03	2.04	1.94	2.26	2.03	24	
5	2.02	2.00	S	2.01	2.03	2.02	2.04	2.05	2.09	2.14	2.05	2.43	2.20	2.02	2.02	2.02	1.99	2.03	2.07	2.14	2.13	2.18	2.24	2.15	1.99	2.43	2.09	24	
6	2.19	S	2.23	2.23	2.25	2.35	2.56	2.84	2.52	2.47	2.30	2.18	2.14	2.04	2.04	2.05	2.06	2.11	2.11	2.14	2.10	2.17	2.16	2.15	2.04	2.84	2.23	24	
7	S	2.17	2.16	2.15	2.11	2.08	2.05	2.05	2.03	2.01	1.99	1.98	1.97	1.95	1.96	1.96	1.96	1.97	1.96	1.97	1.98	1.98	1.99	S	1.95	2.17	2.02	24	
8	2.02	2.01	2.01	2.00	2.00	2.00	1.99	1.99	1.97	1.94	1.95	1.96	1.97	1.97	1.98	1.97	1.98	1.96	1.94	1.95	1.96	S	2.02	1.94	2.02	1.94	2.02	1.98	24
9	2.02	2.03	2.05	2.08	2.13	2.22	2.29	2.52	2.53	2.45	2.45	C	C	C	C	2.28	2.30	2.30	2.31	2.35	2.30	S	2.23	2.23	2.02	2.53	2.27	24	
10	2.22	2.36	2.50	2.58	2.63	2.62	2.50	2.48	2.50	2.41	2.25	2.19	2.14	2.14	2.18	2.23	2.17	2.32	2.33	2.32	S	2.30	2.25	2.27	2.14	2.63	2.34	24	
11	2.29	2.46	2.42	2.34	2.30	2.25	2.21	2.21	2.20	2.15	2.05	1.99	1.98	1.97	1.97	1.98	1.99	1.98	1.99	S	1.98	1.98	1.99	2.00	1.97	2.46	2.12	24	
12	2.01	2.01	2.00	1.99	1.99	1.99	1.99	2.00	1.99	1.98	1.98	1.98	1.99	1.98	1.99	1.98	1.98	1.98	S	1.99	1.99	1.99	1.99	1.98	1.98	2.01	1.99	24	
13	1.97	1.98	1.98	1.98	1.97	1.97	1.98	1.99	1.98	1.98	1.99	1.99	1.98	1.98	1.98	1.99	2.00	S	2.01	2.01	2.04	2.10	2.02	2.01	1.97	2.10	1.99	24	
14	2.03	2.03	2.06	2.05	2.05	2.07	2.10	2.22	2.18	2.13	2.10	2.08	2.14	2.09	2.11	2.11	S	2.03	2.14	2.22	2.12	2.18	2.25	2.39	2.03	2.39	2.13	24	
15	2.38	2.58	2.54	3.57	4.38	3.61	4.16	3.13	3.33	3.45	3.46	3.22	3.06	2.71	2.53	S	2.70	2.59	2.56	2.78	2.23	2.13	2.10	2.26	2.10	4.38	2.93	24	
16	2.28	2.78	3.27	3.08	2.98	2.77	2.68	2.66	3.02	2.80	2.55	2.55	2.46	2.39	S	2.47	2.48	2.52	2.70	2.57	2.50	2.49	2.46	2.37	2.28	3.27	2.64	24	
17	2.22	2.08	2.04	2.00	1.99	1.96	1.95	1.96	1.97	1.97	1.96	1.96	1.96	S	1.97	1.98	1.99	1.99	1.99	1.99	1.99	2.00	1.98	1.99	1.95	2.22	2.00	24	
18	1.98	2.00	1.99	2.00	2.09	2.10	2.15	2.08	2.34	2.13	2.05	2.03	S	2.06	2.06	1.99	2.00	2.02	2.03	2.02	2.00	1.99	1.99	1.99	1.98	2.34	2.05	24	
19	1.98	1.99	1.98	1.99	1.98	1.98	1.98	1.97	1.98	1.99	1.99	S	2.00	2.03	2.04	2.05	2.05	2.06	2.19	2.07	2.06	2.11	2.08	2.11	1.97	2.19	2.03	24	
20	2.07	2.06	2.11	2.22	2.30	2.10	2.03	2.01	2.02	2.01	S	2.01	2.01	2.00	2.01	2.00	2.01	2.07	2.02	2.01	2.01	2.01	2.02	2.07	2.00	2.30	2.05	24	
21	2.09	2.08	2.05	2.14	2.09	2.07	2.07	2.06	2.11	S	2.03	2.04	2.05	2.06	2.09	2.12	2.10	2.14	2.18	2.14	2.15	2.06	2.05	1.99	1.99	2.18	2.09	24	
22	2.07	2.03	2.05	2.01	2.08	2.04	2.06	2.06	S	2.01	2.01	2.03	1.97	1.97	1.97	1.97	1.98	2.00	2.10	2.06	2.15	2.23	2.22	2.04	1.97	2.23	2.05	24	
23	2.02	2.04	2.02	2.03	2.10	2.23	2.45	S	2.17	2.05	2.01	2.00	1.99	1.99	1.99	2.00	2.00	2.02	2.04	2.06	2.07	2.27	2.31	1.99	2.45	2.08	24		
24	2.48	2.39	2.34	2.63	2.53	2.42	S	2.32	2.17	2.10	2.07	2.08	2.05	2.04	2.06	2.09	2.07	2.03	2.04	2.03	2.04	2.08	2.15	2.05	2.03	2.63	2.19	24	
25	2.03	2.01	2.03	2.06	2.08	S	2.11	2.09	2.16	2.15	2.15	2.13	2.13	2.06	2.02	2.09	2.06	2.04	2.20	2.30	2.25	2.14	2.10	2.01	2.30	2.11	24		
26	2.05	2.08	2.07	2.07	S	2.04	2.04	2.05	2.05	2.04	2.03	2.04	2.04	2.05	2.04	2.01	2.01	2.01	2.01	2.02	2.03	2.10	2.07	2.04	2.01	2.10	2.04	24	
27	2.04	2.11	2.16	S	2.14	2.16	2.18	2.25	2.12	2.08	2.03	2.03	2.03	2.04	2.04	2.05	2.08	2.16	2.12	2.07	2.17	2.33	2.30	2.42	2.03	2.42	2.14	24	
28	2.55	2.68	S	2.45	2.46	2.60	2.60	2.76	2.78	2.49	2.40	2.41	2.38	2.52	2.43	2.30	2.25	2.23	2.25	2.45	2.32	2.12	2.09	2.14	2.09	2.78	2.42	24	
HOURLY MAX	2.55	2.78	3.27	3.57	4.38	3.61	4.16	3.13	3.33	3.45	3.46	3.22	3.06	2.71	2.53	2.47	2.70	2.59	2.70	2.78	2.50	2.49	2.46	2.42					
HOURLY AVG	2.12	2.15	2.17	2.22	2.26	2.24	2.25	2.22	2.23	2.18	2.14	2.12	2.10	2.08	2.06	2.06	2.08	2.10	2.12	2.14	2.10	2.11	2.12	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

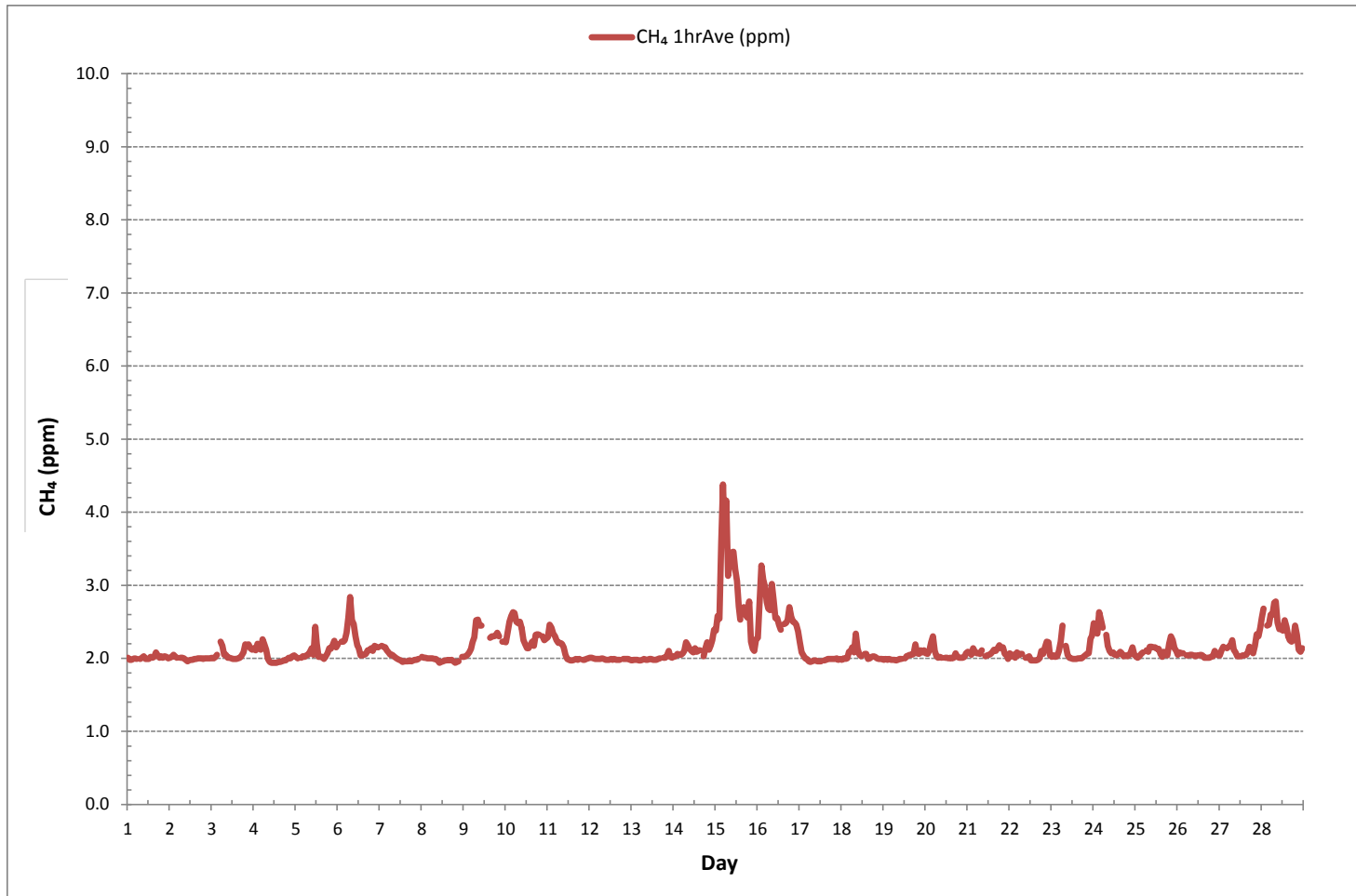
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	639					
MINIMUM 1-HR AVERAGE:	1.94 ppm	@ HOUR(S)	VAR , VAR	ON DAY(S)	4 , 8	
MAXIMUM 1-HR AVERAGE:	4.38 ppm	@ HOUR(S)	4	ON DAY(S)	15	
MAXIMUM 24-HR AVERAGE:	2.93 ppm				ON DAY(S)	15
					VAR-VARIOUS	
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	672 hrs			
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %			
STANDARD DEVIATION:	0.26	MONTHLY AVERAGE:	2.14 ppm			

METHANE Hourly Averages (CH₄ ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	2.14	2.09	2.01	2.02	2.08	2.06	S	2.10	2.13	2.18	2.06	2.05	2.06	2.07	2.07	2.42	2.22	2.23	2.05	2.06	2.05	2.06	2.04	2.06	2.01	2.42	2.10	24
2	2.03	2.04	2.07	2.05	2.04	S	2.02	2.04	2.02	2.01	1.97	1.99	1.99	2.00	2.00	2.00	2.00	2.09	2.02	2.01	2.02	2.02	2.02	2.02	1.97	2.09	2.02	24
3	2.02	2.03	2.04	2.08	S	2.43	2.32	2.25	2.22	2.12	2.16	2.08	2.09	2.14	2.10	2.14	2.11	2.15	2.27	2.38	2.46	2.33	2.29	2.25	2.02	2.46	2.19	24
4	2.32	2.40	2.38	S	2.80	2.41	2.33	2.16	2.05	1.95	1.96	1.95	2.04	1.96	2.09	1.97	2.00	2.01	2.02	2.04	2.07	2.06	2.12	2.16	1.95	2.80	2.14	24
5	2.05	2.05	S	2.12	2.09	2.04	2.06	2.09	2.17	2.32	2.14	2.66	2.68	2.12	2.12	2.14	2.15	2.18	2.22	2.45	2.27	2.52	2.68	2.40	2.04	2.68	2.25	24
6	2.35	S	2.57	2.48	2.33	2.60	3.13	3.03	2.99	2.88	2.53	2.39	2.36	2.15	2.14	2.34	2.25	2.69	2.52	2.41	2.35	2.46	2.33	2.20	2.14	3.13	2.50	24
7	S	2.20	2.19	2.18	2.14	2.11	2.07	2.34	2.05	2.03	2.03	1.99	1.99	1.96	1.97	1.97	1.99	1.99	1.97	1.98	1.99	1.98	2.02	S	1.96	2.34	2.05	24
8	2.03	2.02	2.02	2.01	2.00	2.02	2.02	2.00	2.00	1.99	1.96	1.96	1.96	2.00	1.97	1.98	1.98	1.99	1.98	1.95	1.96	1.98	S	2.11	1.95	2.11	2.00	24
9	2.04	2.04	2.13	2.23	2.32	3.13	2.80	3.02	3.02	2.55	C	C	C	C	C	2.40	2.44	2.38	2.34	2.41	2.34	S	2.29	2.36	2.04	3.13	2.46	24
10	2.40	3.44	3.34	3.64	3.64	4.94	2.96	2.98	2.83	2.65	2.47	2.34	2.27	2.27	2.41	2.31	2.27	2.35	2.36	2.36	S	2.33	2.27	2.29	2.27	4.94	2.74	24
11	2.30	4.44	2.83	2.36	2.36	2.26	2.23	2.23	2.22	2.19	2.10	2.01	2.00	1.98	1.99	2.01	2.00	2.00	2.01	S	2.00	1.99	2.00	2.01	1.98	4.44	2.24	24
12	2.02	2.02	2.02	2.00	2.00	2.00	2.00	2.01	1.99	1.98	1.99	2.00	1.99	2.00	1.99	1.98	1.99	1.98	1.99	S	2.00	2.00	2.00	1.99	1.98	2.02	2.00	24
13	1.98	1.99	1.99	2.00	1.98	1.98	2.00	2.01	2.00	2.00	2.01	2.01	2.00	1.98	1.99	2.02	2.03	S	2.02	2.02	2.67	2.20	2.05	2.02	1.98	2.67	2.04	24
14	2.04	2.04	2.74	2.20	2.06	2.08	2.56	2.67	2.27	2.20	2.13	2.13	2.25	2.17	2.17	2.14	S	2.09	2.22	2.31	2.19	2.22	2.31	2.91	2.04	2.91	2.27	24
15	3.12	3.05	4.35	7.22	7.47	4.51	7.11	4.51	3.92	3.68	4.02	3.72	3.26	2.91	2.85	S	3.10	3.41	3.47	3.72	3.13	2.15	2.26	3.33	2.15	7.47	3.92	24
16	2.62	3.23	4.75	4.86	4.02	3.87	3.11	2.87	4.91	3.80	3.30	3.52	2.92	2.52	S	2.99	3.61	3.46	3.02	2.93	3.03	2.55	3.52	2.46	2.46	4.91	3.39	24
17	2.36	2.11	2.06	2.02	2.01	1.97	1.97	1.98	1.99	1.99	1.97	1.99	1.97	S	1.98	2.00	2.00	2.01	2.01	2.00	2.01	1.99	2.00	1.97	2.36	2.02	24	
18	1.99	2.01	2.00	2.01	3.31	2.85	3.86	2.23	2.89	2.71	2.07	2.05	S	2.21	2.29	2.06	2.16	2.04	2.05	2.04	2.09	2.18	2.02	2.05	1.99	3.86	2.31	24
19	2.00	2.08	2.00	2.00	2.01	2.11	2.04	2.03	2.00	2.06	2.04	S	2.06	2.18	2.23	2.26	2.11	2.10	2.66	2.52	2.17	2.31	2.24	2.38	2.00	2.66	2.16	24
20	2.10	2.13	2.13	2.33	2.35	2.18	2.05	2.03	2.03	2.03	S	2.08	2.10	2.01	2.09	2.02	2.02	2.26	2.04	2.02	2.03	2.05	2.10	2.15	2.01	2.35	2.10	24
21	2.28	2.11	2.07	2.24	2.26	2.21	2.13	2.13	2.17	S	2.04	2.05	2.08	2.14	2.19	2.28	2.19	2.32	2.36	2.30	3.14	2.17	2.16	2.01	2.01	3.14	2.22	24
22	2.24	2.17	2.23	2.17	2.23	2.12	2.17	2.23	S	2.11	2.13	2.12	1.98	1.98	1.98	1.98	2.03	2.03	2.25	2.16	2.30	2.44	2.35	2.26	1.98	2.44	2.16	24
23	2.05	2.05	2.04	2.07	2.20	2.88	3.35	S	2.35	2.12	2.27	2.01	2.00	2.00	2.00	2.01	2.01	2.01	2.05	2.07	2.12	2.12	2.34	2.48	2.00	3.35	2.20	24
24	3.11	2.89	2.52	2.90	2.82	3.16	S	2.48	2.52	2.18	2.17	2.21	2.13	2.10	2.13	2.20	2.17	2.05	2.06	2.14	2.07	2.21	2.33	2.07	2.05	3.16	2.37	24
25	2.05	2.02	2.05	2.10	2.10	S	2.12	2.10	2.21	2.21	2.17	2.17	2.15	2.17	2.15	2.04	2.19	2.19	2.10	2.43	2.41	2.48	2.23	2.29	2.02	2.48	2.18	24
26	2.07	2.13	2.12	2.24	S	2.11	2.09	2.12	2.12	2.09	2.12	2.09	2.08	2.11	2.13	2.02	2.02	2.02	2.02	2.04	2.12	2.17	2.13	2.11	2.02	2.24	2.10	24
27	2.14	2.19	2.21	S	2.20	2.18	2.24	2.42	2.19	2.09	2.07	2.04	2.04	2.04	2.07	2.12	2.16	2.20	2.18	2.13	2.28	2.51	3.30	3.37	2.04	3.37	2.28	24
28	3.73	4.09	S	2.63	2.56	2.88	2.64	3.96	3.87	2.79	2.68	2.52	2.47	2.60	2.49	2.38	2.27	2.30	2.96	3.15	2.82	2.21	2.19	2.36	2.19	4.09	2.81	24
HOURLY MAX	3.73	4.44	4.75	7.22	7.47	4.94	7.11	4.51	4.91	3.80	4.02	3.72	3.26	2.91	2.85	2.99	3.61	3.46	3.47	3.72	3.14	2.55	3.52	3.37				
HOURLY AVG	2.28	2.41	2.42	2.54	2.59	2.58	2.59	2.45	2.49	2.33	2.25	2.24	2.19	2.14	2.14	2.16	2.20	2.24	2.27	2.30	2.30	2.21	2.28	2.30				

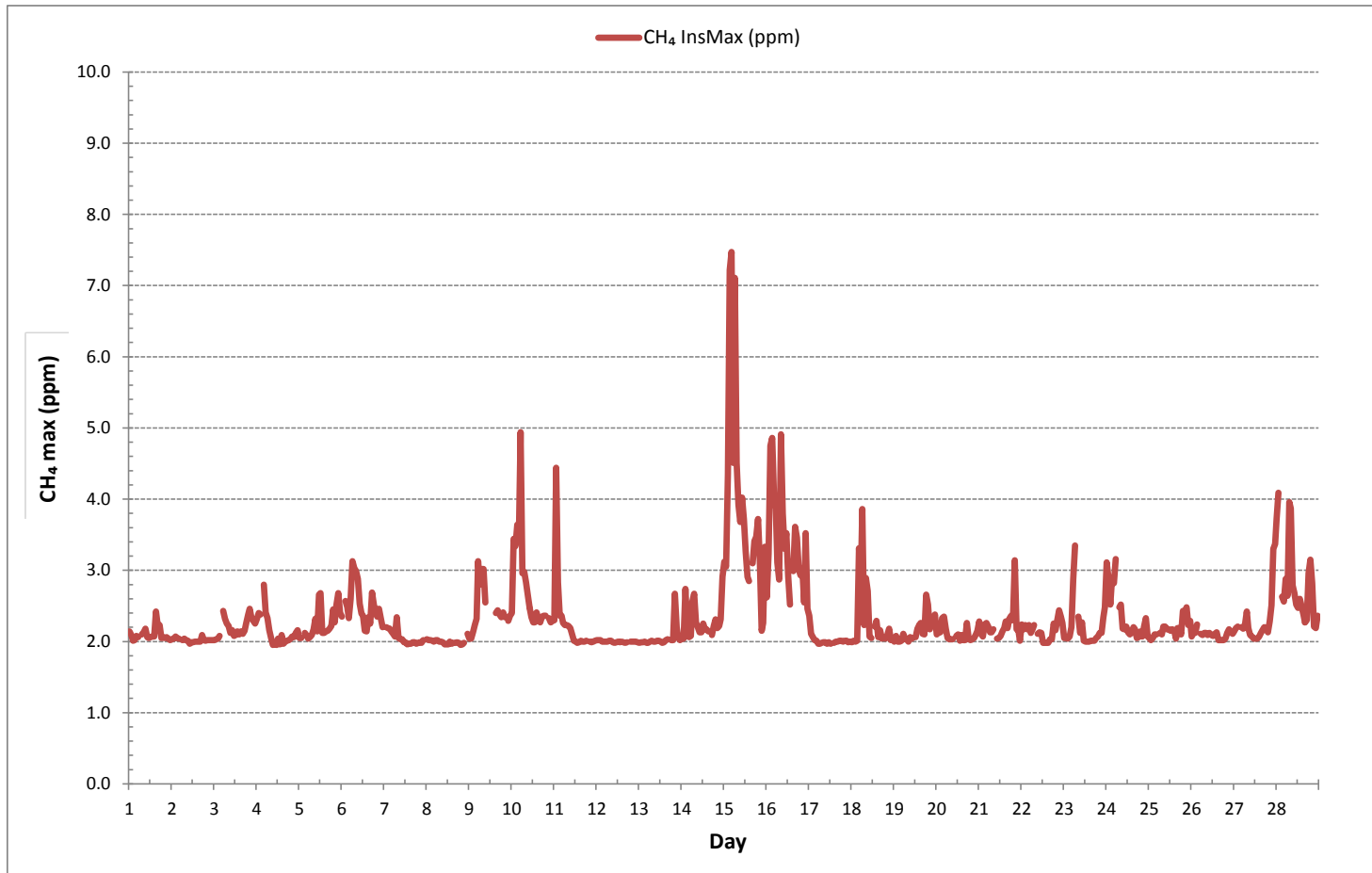
STATUS FLAG CODES

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

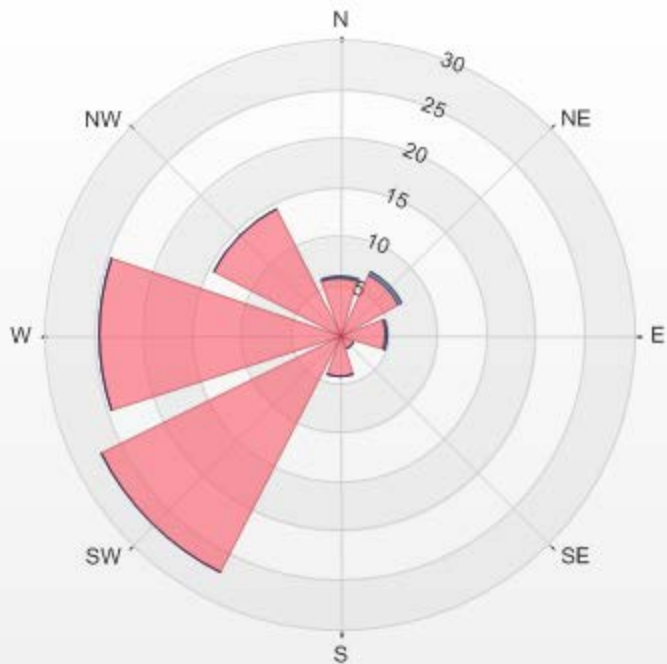
NUMBER OF NON-ZERO READINGS:	638
MAXIMUM INSTANTANEOUS VALUE:	7.47 ppm @ HOUR(S) 4 ON DAY(S) 15
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	672 hrs
STANDARD DEVIATION:	0.59

METHANE MAX Instantaneous Maximum (CH₄ ppm)

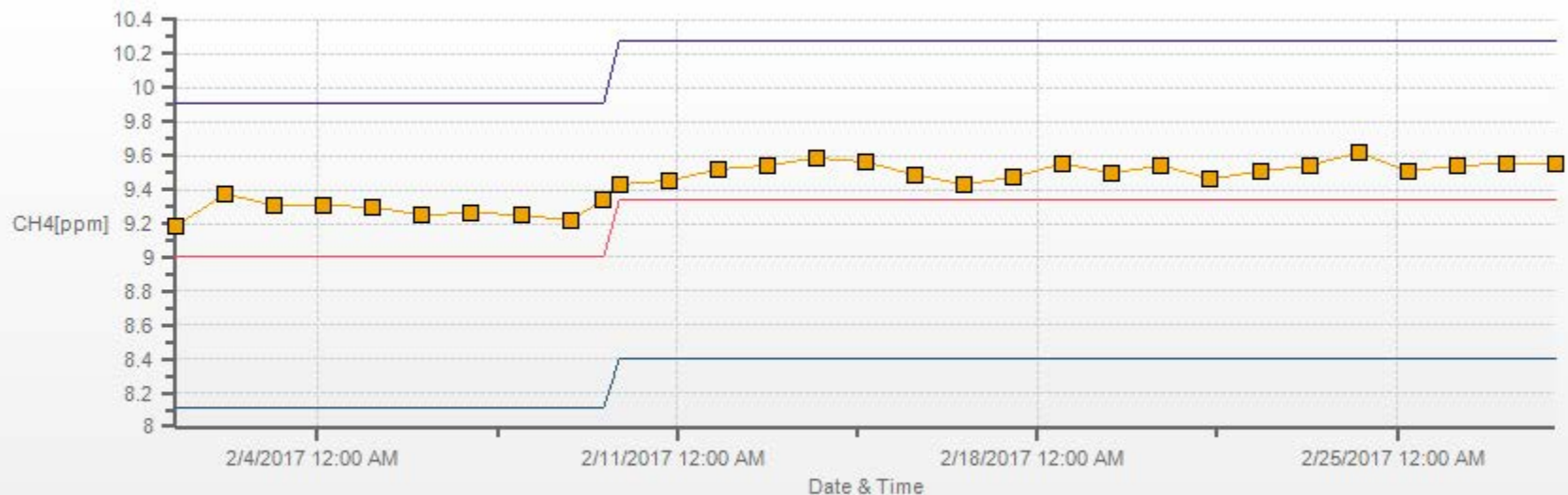


% Icon Classes (ppm) 0 0.0-1.5 89 1.5-2.9 1 2.9-4.4 0 >4.4

LICA Bonnyville Poll.: LICA Bonnyville-CH4[ppm] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.33%
Calm Poll Avg: 2.50[ppm]



CH4[ppm] Calibration: LICA Bonnyville Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

NON-METHANE HYDROCARBON



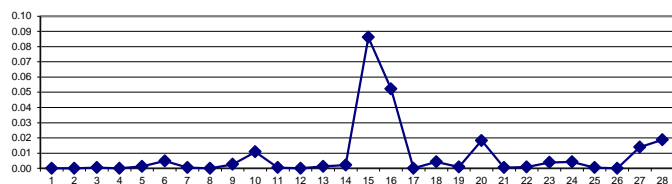
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	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																						
2	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																						
3	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24																						
4	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																						
5	0.00	0.00	S	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	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	24																						
6	0.00	S	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	24																					
7	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.01	0.00	24																						
8	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	S	0.00	0.00	0.00	0.00	24																					
9	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	C	C	C	C	0.00	0.00	0.01	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	0.00	24																					
10	0.00	0.02	0.03	0.04	0.04	0.03	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.06	0.01	24																					
11	0.00	0.01	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	S	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24																					
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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24																					
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	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	0.03	0.00	24																					
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.02	0.00	24																				
15	0.00	0.04	0.02	0.21	0.37	0.20	0.31	0.09	0.07	0.12	0.13	0.09	0.15	0.07	0.00	S	0.01	0.02	0.02	0.03	0.01	0.00	0.00	0.02	0.00	0.37	0.09	24																						
16	0.01	0.12	0.18	0.13	0.05	0.01	0.01	0.02	0.11	0.06	0.01	0.01	0.00	0.00	S	0.06	0.16	0.03	0.11	0.09	0.02	0.00	0.01	0.00	0.00	0.18	0.05	24																						
17	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	0.00	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																					
18	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.03	0.02	0.00	0.00	S	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	24																					
19	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	0.02	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	24																					
20	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	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.02	24																					
21	0.00	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	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	24																					
22	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	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	24																					
23	0.00	0.00	0.00	0.00	0.00	0.01	0.08	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	0.08	0.00	24																					
24	0.03	0.01	0.00	0.02	0.00	0.01	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	24																					
25	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	0.01	0.00	0.00	0.00	0.01	0.00	0.00	24																					
26	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	0.00	0.00	0.00	24																					
27	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	0.30	0.00	0.02	0.00	0.30	0.01	24																					
28	0.04	0.06	S	0.00	0.00	0.01	0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.01	0.11	0.01	0.05	0.01	0.00	0.00	0.00	0.00	0.11	0.02	0.00	24																					
HOURLY MAX	0.04	0.12	0.18	0.21	0.37	0.20	0.31	0.09	0.11	0.12	0.13	0.09	0.15	0.07	0.07	0.06	0.16	0.42	0.11	0.09	0.02	0.30	0.01	0.02																										
HOURLY AVG	0.00	0.01	0.01	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.01	0.00	0.00																										

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 HR AVERAGES February 2017



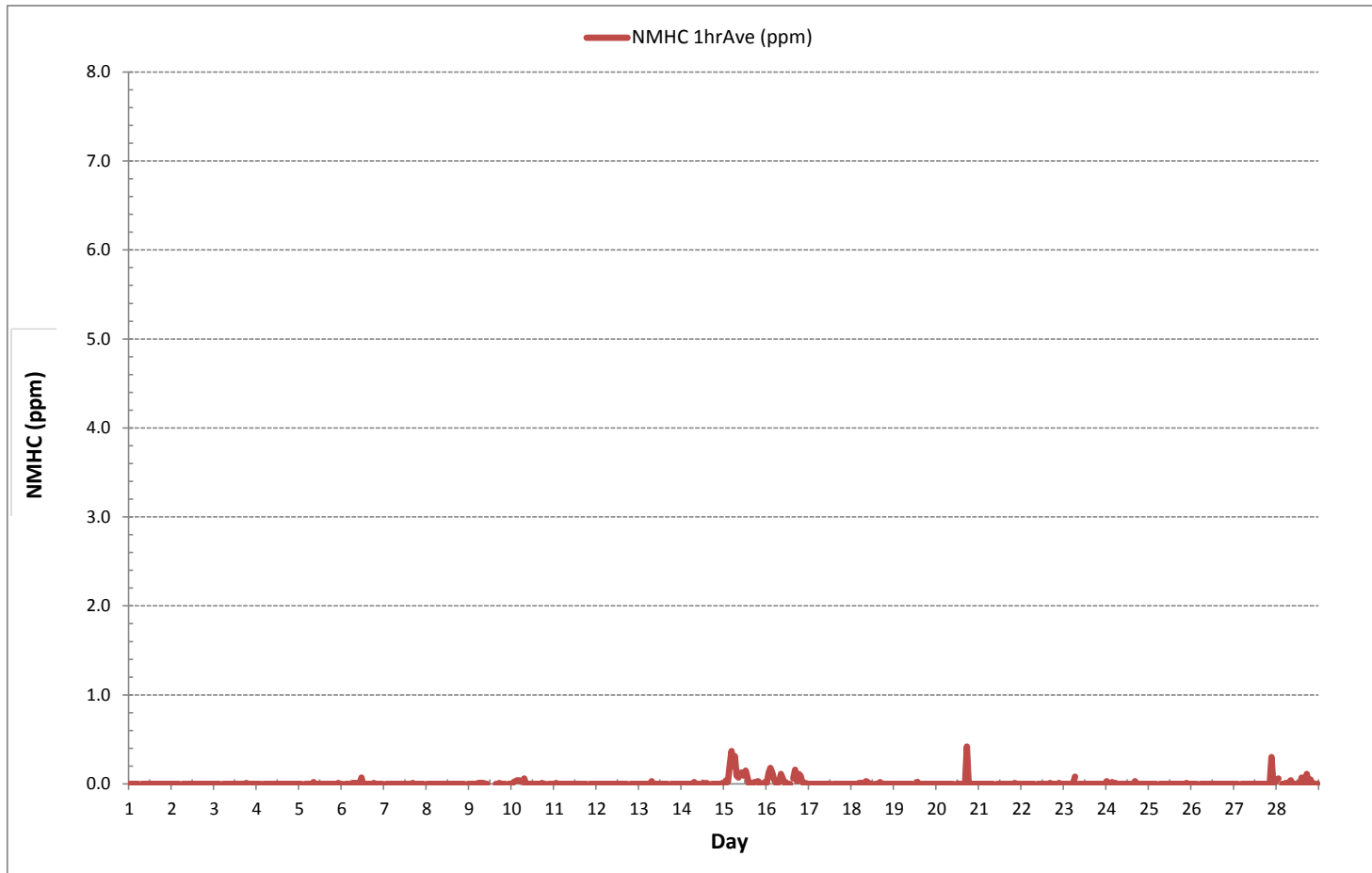
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	98				
MINIMUM 1-HR AVERAGE:	0.00	ppm	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	0.42	ppm	@ HOUR(S)	17	20
MAXIMUM 24-HR AVERAGE:	0.09	ppm			15
					VAR-VARIOUS
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.04		MONTHLY AVERAGE:	0.01	ppm



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	24
2	0.00	0.00	0.00	0.00	0.00	S	0.00	0.08	0.00	0.00	0.00	0.11	0.00	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	0.11	0.01	24
3	0.00	0.00	0.00	0.00	S	0.07	0.06	0.02	0.05	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.28	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.28	0.03	24
4	0.07	0.05	0.06	S	0.10	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	0.10	0.01	24
5	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.04	0.07	0.08	0.00	0.00	1.13	0.06	24	
6	0.00	S	0.00	0.00	0.00	0.05	0.12	0.15	0.15	0.00	0.00	0.40	0.00	0.00	0.00	0.06	0.00	0.12	0.08	0.05	0.00	0.04	0.00	0.00	0.00	0.40	0.05	24	
7	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.27	0.02	24	
8	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	0.09	0.09	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.09	0.01	24	
9	0.00	0.00	0.00	0.06	0.05	0.18	0.10	0.16	0.18	0.05	C	C	C	C	C	0.00	0.00	0.15	0.00	0.06	0.00	S	0.00	0.00	0.00	0.18	0.06	24	
10	0.04	0.18	0.18	0.22	0.31	0.39	0.26	2.24	0.07	0.07	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.44	0.25	0.29	S	0.00	0.00	0.00	0.00	2.24	0.22	24	
11	0.00	0.08	0.05	0.00	0.00	0.00	0.00	0.00	0.01	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	0.00	0.00	0.00	0.08	0.01	24	
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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.48	0.02	24	
14	0.00	0.00	0.11	0.00	0.00	0.00	0.10	0.13	0.07	0.05	0.07	0.05	0.16	0.00	0.17	0.00	S	0.00	0.00	0.00	0.00	0.00	0.13	0.14	0.00	0.17	0.05	24	
15	0.13	0.18	0.32	0.74	0.89	0.35	0.80	0.38	0.23	0.34	0.33	0.24	0.41	0.34	0.00	S	0.24	0.21	0.19	0.29	0.16	0.00	0.05	0.21	0.00	0.89	0.31	24	
16	0.10	0.24	0.40	0.38	0.27	0.25	0.10	0.11	0.40	0.23	0.13	0.22	0.14	0.09	S	0.62	3.34	0.47	0.36	0.45	0.17	0.10	0.19	0.00	0.00	3.34	0.38	24	
17	0.00	0.00	0.00	0.16	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	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.01	24	
18	0.00	0.00	0.00	0.00	0.20	0.13	0.24	0.00	0.14	0.11	0.00	0.00	S	0.17	0.00	0.00	0.72	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.72	0.08	24	
19	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	0.80	0.00	0.00	0.15	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.05	24	
20	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	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	0.06	24	
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.09	0.00	0.08	0.10	0.00	0.13	0.09	0.07	0.19	0.05	0.00	0.00	0.00	0.19	0.03	24	
22	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.30	0.00	0.04	0.00	0.00	0.07	0.05	0.06	0.00	0.30	0.03	24	
23	0.00	0.00	0.00	0.00	0.00	0.13	0.43	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	0.43	0.02	24	
24	0.13	0.11	0.00	0.10	0.09	0.15	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14	0.07	24	
25	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	0.06	0.04	0.06	0.00	0.00	0.00	0.06	0.01	24	
26	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	0.00	0.00	0.00	24
27	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	0.09	0.00	0.00	0.00	0.00	0.04	2.20	0.20	0.18	0.00	2.20	0.12	24	
28	0.25	0.29	S	0.00	0.00	0.08	0.15	0.27	0.27	0.04	0.00	0.00	0.00	0.00	0.77	0.11	0.26	1.22	0.16	0.20	0.11	0.00	0.00	0.05	0.00	1.22	0.18	24	
HOURLY MAX	0.25	0.29	0.40	0.74	0.89	0.39	0.80	2.24	1.13	0.34	0.33	0.40	0.41	0.80	0.77	0.62	3.34	1.42	0.36	0.45	0.19	2.20	0.20	0.21					
HOURLY AVG	0.03	0.04	0.04	0.06	0.07	0.07	0.09	0.15	0.10	0.03	0.03	0.04	0.03	0.06	0.04	0.04	0.24	0.16	0.06	0.06	0.03	0.10	0.03	0.02					

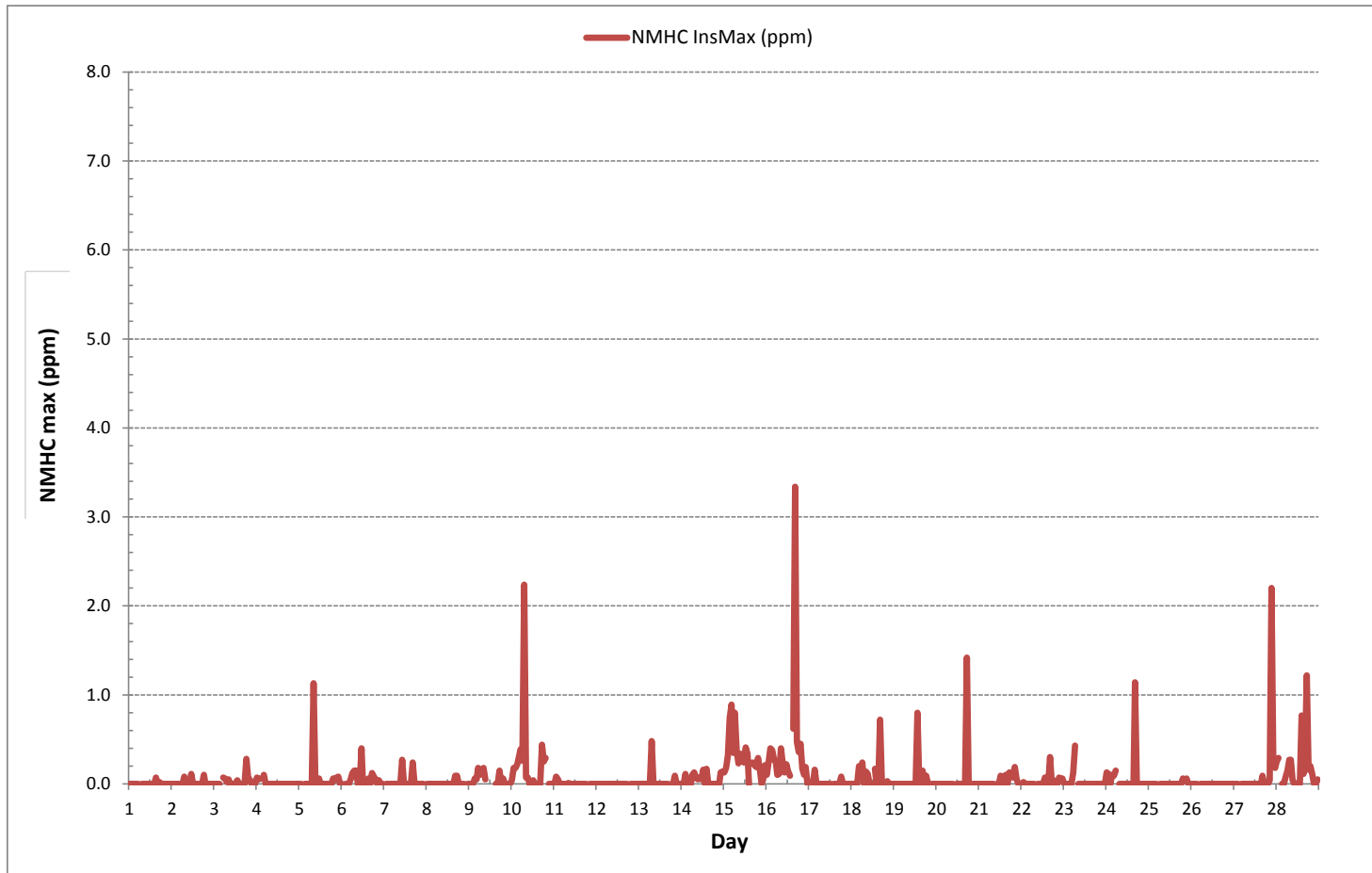
STATUS FLAG CODES

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:	179
MAXIMUM INSTANTANEOUS VALUE:	3.34 ppm @ HOUR(S) 16 ON DAY(S) 16
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0.23
OPERATIONAL TIME:	672 hrs

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-NMHC[ppm]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

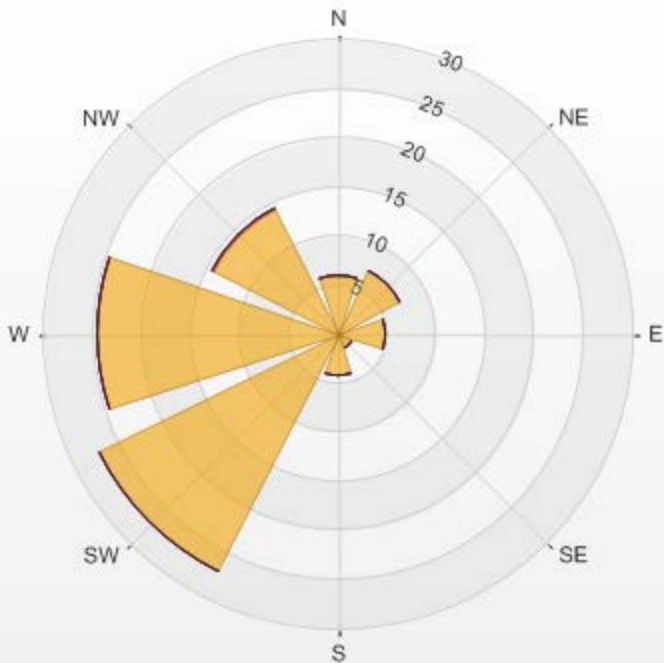
Calm: 10.33%

Calm Avg: 0.04 [ppb]

Direction	0.0-0.4	0.4-0.8	0.8-1.1	1.1-1.5	1.5-1.9	>1.9	Total
N	6.1	0.0	0.0	0.0	0.0	0.0	6.1
NE	7.2	0.0	0.0	0.0	0.0	0.0	7.2
E	4.9	0.0	0.0	0.0	0.0	0.0	4.9
SE	1.6	0.0	0.0	0.0	0.0	0.0	1.6
S	4.2	0.0	0.0	0.0	0.0	0.0	4.2
SW	27.1	0.0	0.0	0.0	0.0	0.0	27.1
W	24.4	0.0	0.0	0.0	0.0	0.0	24.4
NW	14.1	0.2	0.0	0.0	0.0	0.0	14.2
Summary	89.5	0.2	0.0	0.0	0.0	0.0	89.7

% Icon Classes (ppm) 90 0.0-0.4 0 0.4-0.8 0 0.8-1.1 0 1.1-1.5 0 1.5-1.9 0 >1.9

LICA Bonnyville Poll.: LICA Bonnyville-NMHC[ppm] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.33%
 Calm Poll Avg: 0.04[ppm]



NMHC[ppm] Calibration: LICA Bonnyville Monthly: 2017/02 Type: Span



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

OXIDES OF NITROGEN



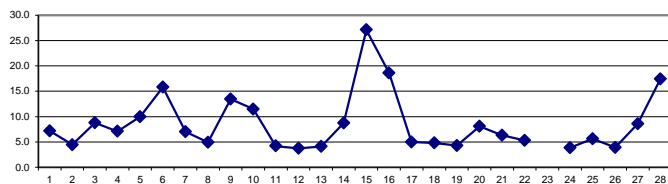
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	5.3	4.5	4.6	5.3	5.8	4.8	S	9.9	9.4	7.5	5.1	4.4	4.9	5.4	5.0	6.0	9.7	20.6	17.0	8.1	4.4	9.5	4.8	3.6	3.6	20.6	7.2	24			
2	1.3	2.0	6.2	2.2	1.9	S	4.5	6.9	7.5	5.2	2.1	3.5	3.8	2.9	2.4	5.6	5.8	10.9	9.6	3.3	4.1	3.3	4.9	2.8	1.3	10.9	4.5	24			
3	2.9	2.4	5.0	9.2	S	12.8	8.4	7.9	10.4	8.0	7.5	7.8	5.6	6.4	5.4	6.6	8.5	15.0	13.1	11.4	14.0	10.8	10.5	12.4	2.4	15.0	8.8	24			
4	8.0	9.1	8.8	S	12.7	13.6	15.2	6.2	3.3	2.2	4.1	3.2	3.0	3.5	3.6	4.3	5.5	9.8	15.1	10.6	3.7	4.7	6.2	7.1	2.2	15.2	7.1	24			
5	2.4	2.0	S	3.7	9.8	5.9	5.0	16.1	26.1	9.7	8.6	17.1	11.0	6.2	5.1	5.7	6.3	7.8	9.6	17.3	12.8	13.7	18.3	9.6	2.0	26.1	10.0	24			
6	7.3	S	8.0	8.0	7.7	18.4	27.6	37.1	33.5	25.8	21.1	17.3	14.5	9.9	13.2	9.9	10.4	11.7	13.1	14.1	12.5	12.2	13.3	17.2	7.3	37.1	15.8	24			
7	S	12.3	15.3	9.1	6.5	8.0	7.4	7.9	12.3	8.6	9.3	9.7	7.8	4.1	2.6	7.6	5.3	4.8	3.4	3.1	3.3	2.8	3.4	S	2.6	15.3	7.0	24			
8	4.9	6.2	5.9	6.9	9.2	8.0	3.9	3.3	4.3	2.8	3.1	C	C	C	C	C	C	C	C	5.1	3.2	2.5	3.4	S	5.9	2.5	9.2	4.9	24		
9	6.5	5.4	7.3	9.4	7.4	10.6	14.8	28.5	27.8	19.0	19.2	27.9	17.0	13.4	11.3	12.4	12.6	12.3	14.0	9.8	9.1	S	7.5	6.6	5.4	28.5	13.5	24			
10	8.1	9.7	11.2	15.8	21.8	21.5	22.2	29.1	23.6	12.0	12.7	10.9	7.5	8.4	6.5	8.2	4.3	5.7	4.5	7.3	S	4.8	4.2	4.1	4.1	29.1	11.5	24			
11	4.8	5.8	13.6	4.7	4.3	3.7	4.7	4.7	5.7	5.3	3.8	2.7	3.0	2.9	2.8	3.1	4.8	4.5	2.5	S	2.2	1.8	1.8	3.5	1.8	13.6	4.2	24			
12	3.6	4.2	4.2	4.5	2.8	1.8	1.6	2.2	3.7	3.9	4.4	3.6	3.6	3.4	4.5	3.5	3.9	3.4	S	6.0	4.8	5.5	4.7	2.7	1.6	6.0	3.8	24			
13	2.3	3.2	2.2	1.4	1.4	2.0	2.8	3.9	5.0	3.9	4.5	6.8	4.0	1.8	2.0	6.7	5.7	S	9.0	3.6	3.3	8.4	6.0	4.4	1.4	9.0	4.1	24			
14	4.9	4.2	3.6	3.4	3.7	4.2	6.3	13.9	31.4	12.3	10.4	10.5	16.1	12.0	10.6	8.6	S	5.4	7.4	6.0	5.5	4.1	6.1	9.7	3.4	31.4	8.7	24			
15	5.9	13.5	10.8	19.8	43.5	39.4	78.3	49.8	40.1	37.0	50.5	40.9	49.1	21.3	9.3	S	13.8	14.7	24.9	21.3	17.5	6.3	7.0	8.8	5.9	78.3	27.1	24			
16	11.1	24.0	23.2	18.8	20.3	12.7	12.0	24.2	50.0	36.7	9.8	11.9	10.6	7.9	S	12.1	17.3	13.4	35.5	33.6	11.8	12.7	10.3	8.2	7.9	50.0	18.6	24			
17	5.4	4.5	3.3	4.9	2.8	5.8	4.5	9.7	4.9	5.2	5.7	3.9	4.4	S	5.6	5.5	5.7	6.5	6.5	3.6	6.8	4.5	2.3	3.0	2.3	9.7	5.0	24			
18	3.3	2.9	4.0	1.2	4.4	5.8	2.5	5.1	18.8	10.4	4.5	3.0	S	5.2	3.7	3.0	6.3	7.2	5.6	3.9	2.9	2.5	2.6	2.3	1.2	18.8	4.8	24			
19	1.6	1.7	1.7	1.7	1.6	1.4	1.6	2.1	2.8	2.4	3.8	S	5.6	5.4	5.0	6.7	8.8	6.7	9.6	5.7	7.2	6.7	5.4	3.7	1.4	9.6	4.3	24			
20	3.5	5.4	6.1	6.8	10.2	7.0	5.2	4.2	6.6	10.5	S	6.9	7.0	5.8	6.6	4.9	5.2	11.0	10.8	6.9	6.5	8.3	7.6	32.7	3.5	32.7	8.1	24			
21	16.2	4.2	1.3	1.8	1.1	6.0	7.7	3.9	10.0	S	5.8	4.5	6.2	7.2	6.4	8.3	9.1	9.4	12.1	6.6	4.6	4.3	3.5	4.6	1.1	16.2	6.3	24			
22	3.8	2.9	3.8	4.2	4.0	5.7	8.0	9.1	S	8.7	7.0	5.5	4.0	2.1	X	X	X	X	X	X	X	X	X	X	2.1	9.1	5.3	14			
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0		
24	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	2.7	7.6	1.3	1.3	7.6	3.9	3
25	1.0	0.1	0.3	0.7	1.2	S	6.5	2.4	5.9	4.8	5.0	6.3	5.5	7.5	5.0	4.0	10.8	8.3	12.4	14.5	8.5	7.7	8.0	6.0	0.1	14.5	5.6	24			
26	7.1	5.7	3.3	4.1	S	6.0	6.3	5.6	4.9	3.4	2.2	2.5	2.7	2.2	2.1	1.4	1.7	3.1	5.2	4.3	0.6	5.2	7.3	2.9	0.6	7.3	3.9	24			
27	2.5	5.0	5.9	S	6.0	4.9	9.2	9.1	5.7	5.4	4.3	5.9	5.8	7.1	7.8	10.9	10.8	14.4	13.2	8.3	11.8	20.6	12.7	10.2	2.5	20.6	8.6	24			
28	14.6	16.6	S	4.0	8.5	19.8	9.0	19.6	48.3	42.0	21.0	17.0	17.9	15.3	16.7	16.2	12.5	13.2	19.1	30.9	21.9	8.1	5.2	3.6	3.6	48.3	17.4	24			
HOURLY MAX	16.2	24.0	23.2	19.8	43.5	39.4	78.3	49.8	50.0	42.0	50.5	40.9	49.1	21.3	16.7	16.2	17.3	20.6	35.5	33.6	21.9	20.6	18.3	32.7							
HOURLY AVG	5.5	6.3	6.7	6.3	8.3	9.6	10.9	12.4	16.1	11.7	9.4	9.7	9.2	7.0	6.2	7.0	8.0	9.6	11.6	10.1	7.6	7.0	6.8	7.1							

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

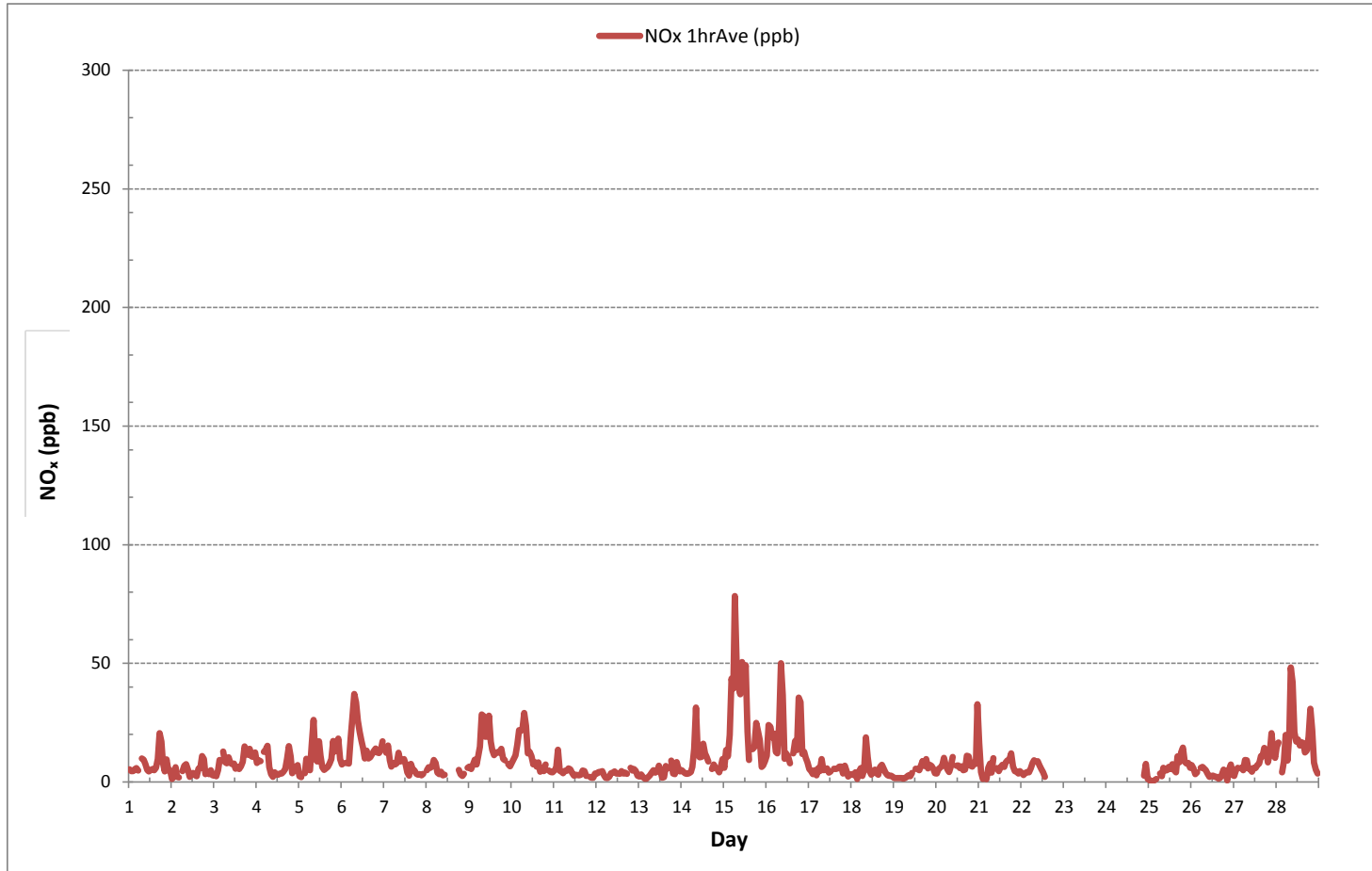
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	583			
MINIMUM 1-HR AVERAGE:	0.1 ppb	@ HOUR(S)	1	ON DAY(S) 25
MAXIMUM 1-HR AVERAGE:	78.3 ppb	@ HOUR(S)	6	ON DAY(S) 15
MAXIMUM 24-HR AVERAGE:	27.1 ppb			ON DAY(S) 15
				VAR-VARIOUS
IZS CALIBRATION TIME:	27 hrs	OPERATIONAL TIME:	617 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	91.8 %	
STANDARD DEVIATION:	8.4	MONTHLY AVERAGE:	8.8 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	8.9	5.4	6.5	X	8.3	6.5	S	23.5	13.6	14.2	7.1	6.0	12.4	8.3	7.7	8.3	15.9	38.8	42.9	24.1	23.5	128.0	28.9	27.0	5.4	128.0	21.2	23			
2	2.4	3.6	11.9	3.6	3.6	S	6.4	58.8	14.2	17.7	9.5	25.9	65.8	21.2	4.2	58.2	45.3	45.8	32.9	7.1	5.4	18.2	59.9	9.4	2.4	65.8	23.1	24			
3	4.1	4.8	8.3	12.4	S	18.2	12.4	20.0	16.5	11.8	13.6	11.2	8.3	8.3	10.0	8.3	12.4	20.6	20.0	14.2	17.6	16.5	15.3	15.3	4.1	20.6	13.0	24			
4	11.8	14.7	11.9	S	17.1	16.5	24.7	8.9	16.5	4.1	5.4	4.8	4.2	4.8	5.4	7.1	8.9	17.1	50.0	17.6	25.9	21.8	65.2	22.4	4.1	65.2	16.8	24			
5	3.0	29.4	S	7.1	28.3	13.6	8.3	32.9	43.5	21.2	13.6	26.5	22.9	7.6	10.1	7.1	7.6	10.0	17.1	20.0	16.5	20.6	41.1	12.4	3.0	43.5	18.3	24			
6	34.1	S	9.5	13.0	21.8	38.8	71.7	46.4	106.3	36.4	34.7	47.1	19.4	14.8	24.7	25.9	16.5	39.4	16.5	28.3	20.0	16.5	15.9	20.0	9.5	106.3	31.2	24			
7	S	14.2	29.4	12.4	26.4	11.8	74.0	24.7	41.7	41.1	15.3	42.9	15.9	6.0	6.0	27.7	10.1	9.4	8.2	5.4	4.8	3.6	4.2	S	3.6	74.0	19.8	24			
8	6.0	7.6	8.2	8.9	11.2	15.9	6.0	17.7	10.7	6.0	4.8	C	C	C	C	C	C	C	25.9	27.7	10.0	19.4	S	9.5	4.8	27.7	12.2	24			
9	13.6	8.3	18.8	21.2	16.5	17.7	48.2	50.0	66.4	48.2	34.1	67.0	43.5	17.1	15.9	17.7	16.5	16.5	20.6	15.3	13.0	S	11.2	9.5	8.3	67.0	26.4	24			
10	11.8	15.3	16.5	25.9	48.2	49.4	69.9	44.1	31.1	20.6	20.6	15.9	11.8	13.6	11.2	32.9	15.3	32.3	13.0	45.3	S	25.3	17.1	24.1	11.2	69.9	26.6	24			
11	44.7	41.2	26.5	7.1	7.1	6.0	6.5	8.2	8.2	7.7	19.4	4.2	18.8	4.8	5.4	5.4	21.2	34.1	6.0	S	4.1	3.6	8.3	21.2	3.6	44.7	13.9	24			
12	4.8	5.4	5.4	6.5	4.8	3.0	2.4	3.6	5.4	4.8	7.1	5.4	13.6	5.4	32.3	4.8	27.6	4.2	S	9.5	6.0	6.5	6.5	5.4	2.4	32.3	7.8	24			
13	4.2	6.0	4.2	3.0	3.0	4.8	6.0	18.2	8.2	7.7	9.5	67.0	15.3	4.2	11.2	45.3	26.5	S	40.0	27.6	28.8	31.7	44.7	6.0	3.0	67.0	18.4	24			
14	7.6	6.0	4.8	4.2	5.4	7.1	33.5	85.7	109.2	31.7	37.0	37.0	29.4	40.5	130.3	25.9	S	18.8	30.6	21.8	36.4	13.0	18.8	17.6	4.2	130.3	32.7	24			
15	11.2	31.7	28.8	40.0	54.6	50.0	101.5	82.2	94.6	68.7	77.5	105.1	104.6	63.4	52.3	S	68.1	42.3	50.0	133.8	119.7	22.4	37.0	65.8	11.2	133.8	65.4	24			
16	24.1	30.6	30.0	40.0	34.1	16.5	18.8	37.1	86.3	78.1	37.1	31.2	43.5	15.9	S	30.6	50.6	40.6	52.9	86.3	19.4	17.0	24.1	13.6	13.6	86.3	37.3	24			
17	16.5	7.7	4.8	7.7	4.2	9.5	8.3	15.9	35.3	8.9	8.3	6.5	7.1	S	7.1	7.7	8.3	10.1	10.1	5.9	37.7	13.6	4.2	6.5	4.2	37.7	11.0	24			
18	4.8	5.4	6.5	4.8	31.7	11.2	4.8	20.0	45.3	32.3	7.1	12.4	S	20.0	17.1	5.4	10.7	10.1	7.1	6.5	6.0	4.1	4.8	3.6	3.6	45.3	12.2	24			
19	3.0	3.0	3.6	2.4	3.0	2.4	3.6	4.2	4.2	6.4	7.1	S	15.9	28.3	40.0	53.4	25.3	10.7	11.9	8.3	10.6	10.1	8.3	5.4	2.4	53.4	11.8	24			
20	6.0	7.7	8.3	10.6	13.6	10.0	8.9	5.4	9.5	17.1	S	11.2	9.5	10.7	9.4	6.5	8.3	28.3	24.1	11.2	8.9	14.2	60.5	213.6	5.4	213.6	22.3	24			
21	133.8	52.3	2.4	4.2	3.6	31.1	24.1	21.2	31.1	S	33.5	8.3	8.9	8.9	8.9	11.8	28.3	18.8	18.2	9.5	8.9	7.1	6.5	10.1	2.4	133.8	21.4	24			
22	6.4	6.0	6.5	8.3	7.7	8.9	11.8	13.0	S	13.0	11.2	9.5	11.2	7.1	X	X	X	X	X	X	X	X	X	X	X	6.0	13.0	9.3	14		
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0		
24	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	7.5	19.0	4.7	4.7	19.0	10.4	3
25	4.7	3.8	2.6	4.4	30.9	S	7.6	16.2	14.0	7.4	17.4	13.3	30.9	19.3	14.0	28.9	46.6	40.5	31.7	31.6	13.3	14.4	12.3	10.9	2.6	46.6	18.1	24			
26	10.3	9.6	6.3	7.9	S	10.5	9.4	9.6	7.3	6.8	4.7	5.4	6.6	6.0	6.2	4.8	4.8	6.9	8.4	9.8	7.3	17.0	19.7	20.6	4.7	20.6	9.0	24			
27	26.0	17.5	17.5	S	15.0	9.0	61.2	24.1	22.6	9.4	23.6	17.5	11.6	31.9	31.3	15.3	18.6	19.3	18.8	14.0	19.6	27.6	45.6	27.5	9.0	61.2	22.8	24			
28	42.4	56.5	S	10.3	71.2	39.9	19.7	98.4	141.4	58.9	42.3	44.0	52.5	20.8	63.6	92.2	38.9	51.2	77.1	61.3	43.9	13.9	11.6	7.7	7.7	141.4	50.4	24			
HOURLY MAX	133.8	56.5	30.0	40.0	71.2	50.0	101.5	98.4	141.4	78.1	77.5	105.1	104.6	63.4	130.3	92.2	68.1	51.2	77.1	133.8	119.7	128.0	65.2	213.6							
HOURLY AVG	17.8	15.7	11.6	11.6	19.6	17.0	26.0	30.4	39.3	23.2	20.1	26.1	24.3	16.2	22.8	23.1	23.1	24.6	26.4	26.8	21.1	19.7	23.6	23.6							

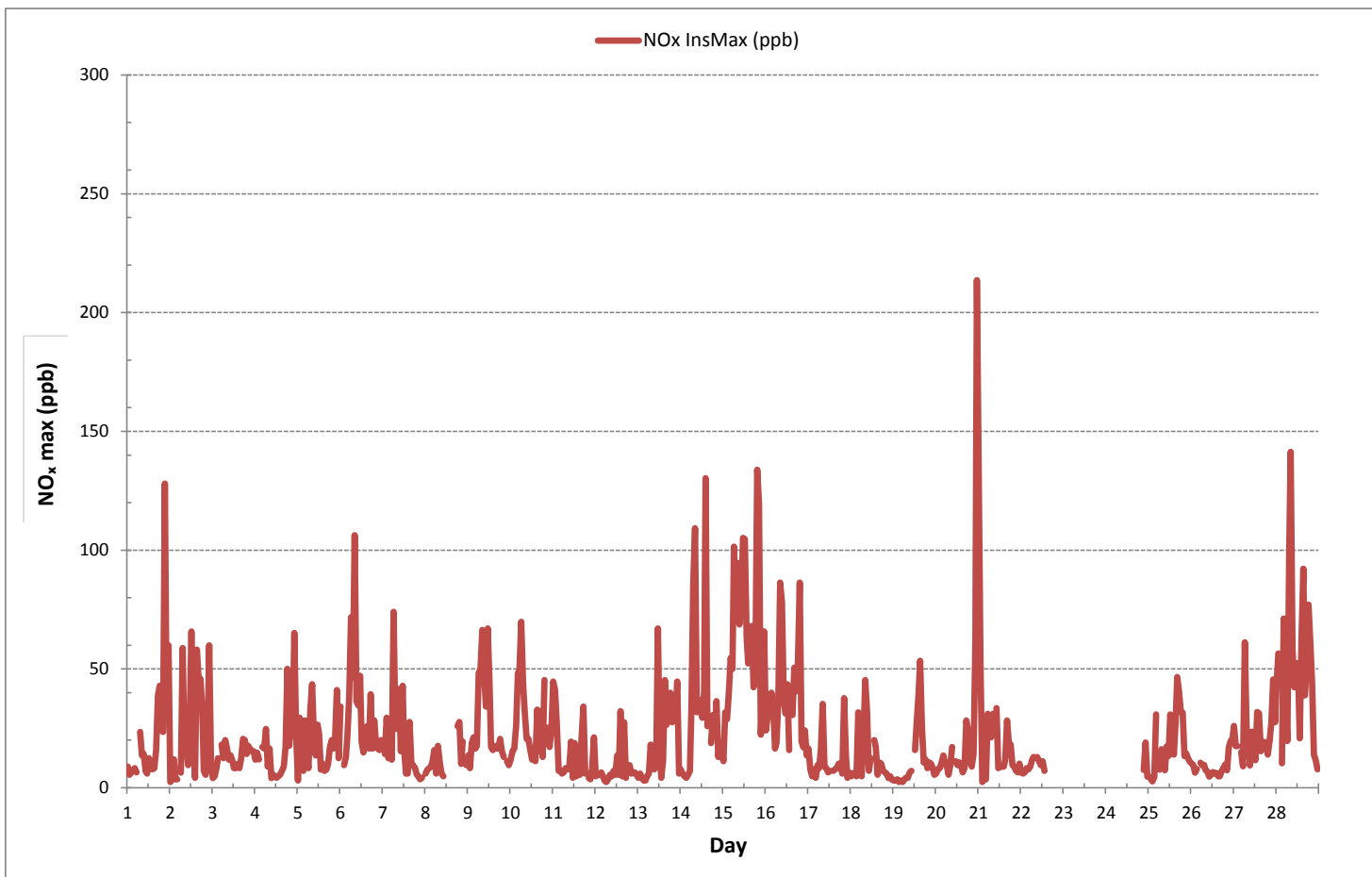
STATUS FLAG CODES

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:	582
MAXIMUM INSTANTANEOUS VALUE:	213.6 ppb @ HOUR(S) 23 ON DAY(S) 20
	VAR-VARIOUS
IZS CALIBRATION TIME:	27 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	616 hrs
STANDARD DEVIATION:	23.6

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



% Icon Classes (ppb)

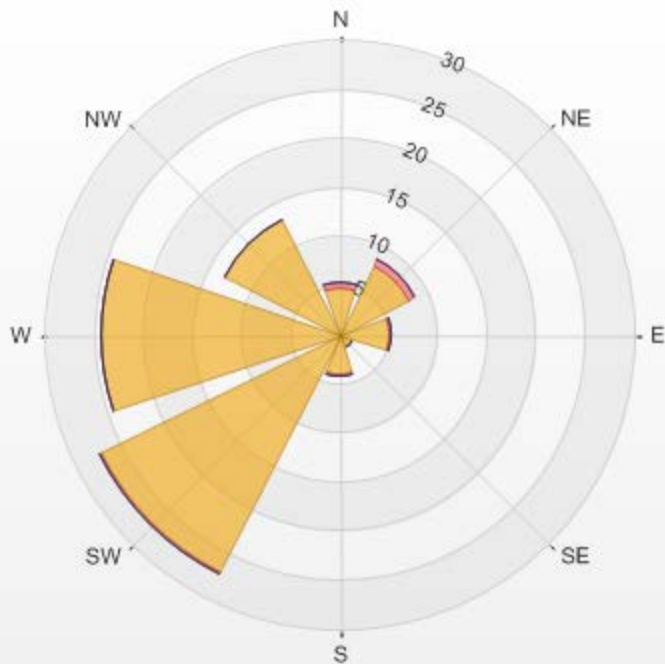
88 0.0-26.1

2 26.1-52.3

0 52.3-78.4

0 >78.4

LICA Bonnyville Poll.: LICA Bonnyville-NOX[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.29%
Calm Poll Avg: 19.28[ppb]



NOX[ppb] Calibration: LICA Bonnyville Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES



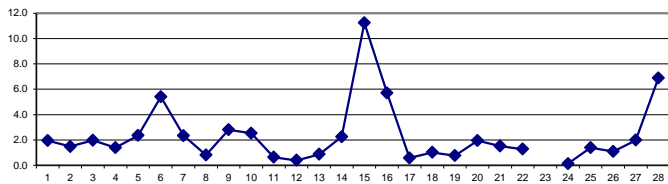
NITRIC OXIDE Hourly Averages (NO ppb)

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	1.3	0.7	0.6	0.7	1.4	1.8	S	2.2	2.6	2.6	2.3	2.2	2.4	2.6	2.1	2.2	2.8	3.4	2.9	1.5	1.0	3.8	1.1	0.7	0.6	3.8	2.0	24	
2	0.3	0.4	0.7	0.5	0.5	S	1.0	2.7	2.2	2.0	1.2	2.0	2.2	1.6	1.4	3.1	2.1	2.9	3.3	0.6	0.8	0.5	1.7	0.4	0.3	3.3	1.5	24	
3	0.2	0.0	0.4	0.9	S	2.0	1.7	1.8	2.7	2.5	2.7	3.0	2.2	2.5	1.8	2.4	2.7	3.0	2.4	2.3	2.2	2.0	1.7	2.2	0.0	3.0	2.0	24	
4	1.8	2.0	2.2	S	1.5	2.5	1.5	0.6	0.8	0.7	1.3	1.2	1.1	1.5	1.4	1.3	1.3	3.4	1.2	0.5	0.6	1.4	1.1	0.5	3.4	1.4	24		
5	0.0	0.2	S	0.2	0.8	0.5	0.2	1.1	6.1	2.7	3.2	7.8	4.8	2.9	2.4	2.2	2.3	2.1	2.3	3.7	2.7	1.9	3.8	0.1	0.0	7.8	2.3	24	
6	0.5	S	0.0	0.0	0.4	3.5	10.3	13.1	14.5	11.8	11.0	9.7	8.0	5.2	7.1	4.1	3.3	3.0	3.3	3.1	3.0	2.9	3.3	3.3	0.0	14.5	5.4	24	
7	S	1.2	2.6	1.1	1.0	1.3	2.7	1.9	5.2	3.9	5.3	5.6	4.3	2.3	1.5	3.8	1.8	1.8	1.1	1.0	0.9	0.6	0.7	S	0.6	5.6	2.3	24	
8	0.7	0.7	1.0	1.0	1.1	1.0	0.6	1.1	1.6	1.0	1.2	C	C	C	C	C	C	C	0.7	0.7	0.2	0.2	S	0.3	0.2	1.6	0.8	24	
9	0.4	0.2	0.2	0.6	0.1	0.2	1.6	4.3	6.7	5.2	6.3	9.6	6.7	4.3	3.6	3.8	2.6	2.1	2.4	1.5	1.3	S	0.6	0.4	0.1	9.6	2.8	24	
10	0.9	1.2	0.8	1.4	3.4	2.3	4.2	5.8	6.4	3.7	4.9	4.0	2.8	3.3	2.2	3.7	1.3	1.6	0.7	1.7	S	0.5	0.6	0.6	0.5	6.4	2.5	24	
11	0.9	1.1	1.0	0.0	0.2	0.0	0.3	0.2	0.9	1.2	1.0	0.9	1.1	0.9	0.8	0.7	0.9	1.5	0.4	S	0.2	0.2	0.1	0.2	0.0	1.5	0.6	24	
12	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.8	1.3	1.1	1.2	0.9	1.3	0.6	0.7	0.0	S	0.4	0.0	0.2	0.1	0.0	0.0	1.3	0.4	24	
13	0.0	0.1	0.1	0.1	0.1	0.1	0.6	0.6	0.7	1.0	1.2	3.0	1.8	0.6	0.7	2.9	1.7	S	2.0	0.4	0.4	1.2	0.7	0.1	0.0	3.0	0.9	24	
14	0.1	0.2	0.0	0.0	0.0	0.2	0.6	4.7	12.9	4.0	3.9	4.2	6.8	4.8	3.2	2.5	S	0.7	1.2	0.5	0.6	0.2	0.1	0.2	0.0	12.9	2.2	24	
15	0.0	0.8	0.3	2.2	17.2	18.6	49.4	24.2	16.0	16.4	27.8	21.9	27.1	8.6	3.2	S	4.1	2.7	3.1	6.4	5.6	0.2	1.0	1.8	0.0	49.4	11.2	24	
16	0.7	3.9	4.1	4.0	4.1	1.0	1.1	5.5	25.0	19.3	4.3	5.2	5.1	3.3	S	3.0	6.0	3.1	13.5	13.6	1.3	1.8	1.4	0.8	0.7	25.0	5.7	24	
17	0.4	0.2	0.0	0.0	0.1	0.1	0.1	0.3	1.0	1.1	1.0	0.7	1.0	S	1.2	1.0	1.1	0.8	0.8	0.4	1.3	0.5	0.1	0.2	0.0	1.3	0.6	24	
18	0.1	0.1	0.2	0.0	1.5	0.4	0.1	0.4	6.4	3.4	1.6	1.3	S	1.5	0.9	0.6	1.0	1.1	0.8	0.4	0.5	0.5	0.3	0.5	0.0	6.4	1.0	24	
19	0.2	0.2	0.3	0.4	0.3	0.1	0.2	0.4	0.5	0.6	0.9	S	2.0	1.5	1.4	2.3	2.1	0.9	0.9	0.6	1.0	0.5	0.5	0.0	0.0	2.3	0.8	24	
20	0.1	0.4	0.3	0.5	1.2	1.1	0.6	0.4	1.7	4.6	S	2.7	2.7	2.2	2.3	1.3	1.0	1.8	1.5	0.4	0.3	0.3	1.6	15.6	0.1	15.6	1.9	24	
21	4.8	0.7	0.0	0.0	0.0	0.5	0.6	0.5	2.5	S	1.8	1.6	2.3	2.7	2.5	2.6	2.3	2.0	2.0	1.4	1.3	1.1	1.0	0.7	0.0	4.8	1.5	24	
22	0.9	0.9	0.7	0.5	1.1	1.3	1.4	1.6	S	2.1	1.8	2.0	1.2	1.1	X	X	X	X	X	X	X	X	X	X	0.5	2.1	1.3	14	
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0
24	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	0.0	0.4	0.1	3	
25	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	1.4	1.9	2.2	3.1	2.6	3.7	2.1	1.2	3.6	1.8	0.4	2.3	1.7	1.4	1.5	1.0	0.0	3.7	1.4	24	
26	0.4	0.3	0.2	0.8	S	1.3	1.7	1.7	2.2	2.1	1.7	2.0	2.1	1.6	1.5	0.9	0.7	0.6	0.5	0.5	0.1	0.7	1.2	0.4	0.1	2.2	1.1	24	
27	0.6	0.6	0.2	S	0.4	0.1	2.3	2.3	2.3	2.2	2.0	2.8	2.9	3.4	3.3	4.1	3.1	2.9	2.0	1.3	1.6	2.6	1.7	0.9	0.1	4.1	2.0	24	
28	2.4	4.9	S	0.0	1.7	4.6	1.1	7.1	29.6	27.0	11.1	9.1	9.8	7.3	7.4	7.8	4.5	3.5	5.6	8.1	3.9	0.9	0.6	0.4	0.0	29.6	6.9	24	
HOURLY MAX	4.8	4.9	4.1	4.0	17.2	18.6	49.4	24.2	29.6	27.0	27.8	21.9	27.1	8.6	7.4	7.8	6.0	3.5	13.5	13.6	5.6	3.8	3.8	15.6					
HOURLY AVG	0.7	0.8	0.7	0.6	1.6	1.9	3.4	3.3	6.1	5.0	4.1	4.4	4.3	2.9	2.4	2.5	2.3	1.9	2.4	2.3	1.4	1.0	1.1	1.3					

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

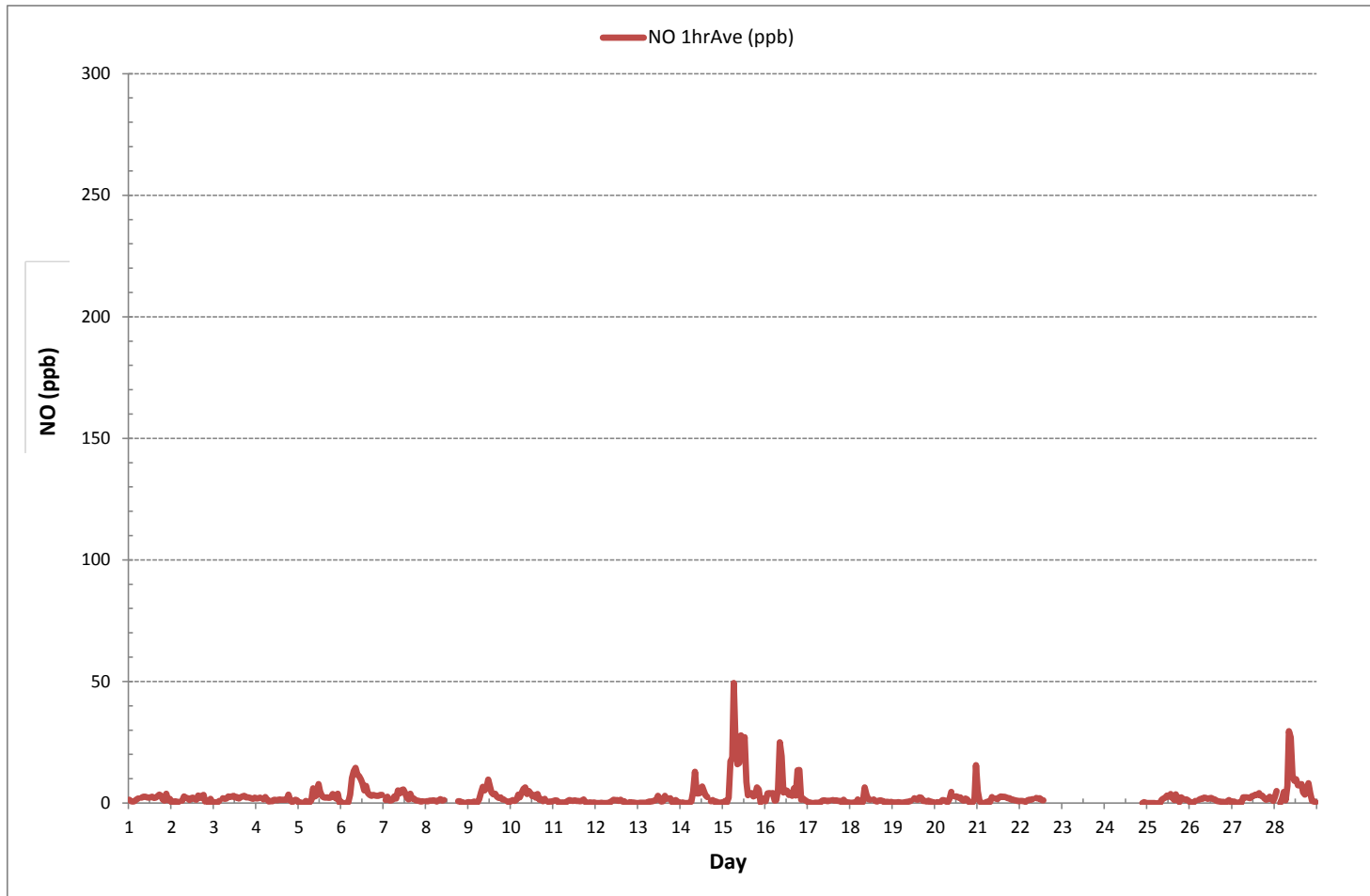
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	546			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	49.4 ppb	@ HOUR(S)	6	ON DAY(S) 15
MAXIMUM 24-HR AVERAGE:	11.2 ppb			ON DAY(S) 15
				VAR-VARIOUS
IZS CALIBRATION TIME:	27 hrs	OPERATIONAL TIME:	617 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	91.8 %	
STANDARD DEVIATION:	4.2	MONTHLY AVERAGE:	2.4 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	3.7	2.0	1.4	X	3.2	3.2	S	9.6	3.8	4.9	3.8	3.2	9.6	4.3	3.8	3.8	7.8	9.6	25.4	19.0	13.2	94.1	14.3	17.8	1.4	94.1	11.9	23				
2	0.8	0.8	1.4	0.8	1.4	S	2.0	50.1	5.5	12.5	7.8	17.2	41.8	12.6	2.6	45.9	26.6	21.3	23.1	2.6	2.0	10.8	48.9	3.2	0.8	50.1	14.9	24				
3	1.4	0.8	1.4	2.6	S	5.5	3.8	7.8	4.9	3.8	5.5	4.9	3.7	4.3	3.7	3.8	4.9	4.9	5.5	4.3	3.2	3.2	3.2	3.7	0.8	7.8	3.9	24				
4	3.8	6.6	4.9	S	4.9	4.3	4.3	1.4	7.2	1.4	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	26.6	4.9	12.5	12.5	48.9	13.2	1.4	48.9	7.7	24				
5	0.8	15.5	S	0.8	13.1	2.6	1.4	3.7	18.4	6.6	6.6	14.3	11.4	4.3	5.5	4.3	3.7	4.3	4.9	5.5	4.9	4.3	23.1	1.4	0.8	23.1	1.4	7.0	24			
6	24.3	S	1.4	0.8	10.2	13.2	53.5	21.9	41.8	18.4	20.7	34.2	12.0	9.6	16.0	16.1	8.4	21.3	5.0	12.6	7.2	6.6	6.1	6.1	0.8	53.5	16.0	24				
7	S	2.6	9.0	2.0	16.1	2.6	54.7	7.8	25.4	21.9	8.4	20.2	9.0	3.2	3.2	16.7	3.8	4.9	3.2	2.6	2.0	1.4	1.4	S	1.4	54.7	10.1	24				
8	1.4	1.4	2.0	2.0	2.6	2.0	1.4	12.0	5.5	3.2	2.6	C	C	C	C	C	C	C	14.3	20.7	6.6	10.2	S	0.8	0.8	20.7	5.5	24				
9	2.0	1.4	1.4	6.6	2.0	0.8	17.8	29.0	29.0	33.0	19.0	44.8	27.8	6.1	5.5	6.1	3.8	3.8	4.3	2.6	2.6	S	1.4	1.4	0.8	44.8	11.0	24				
10	2.0	2.6	2.0	3.2	23.1	24.8	31.9	11.3	10.2	10.8	8.4	6.1	3.8	4.9	6.1	27.8	7.2	11.4	6.6	20.2	S	6.1	6.6	7.2	2.0	31.9	10.6	24				
11	31.3	22.5	3.7	0.2	0.8	0.8	1.4	0.8	2.0	2.0	15.5	1.4	10.2	1.4	2.0	1.4	6.0	31.9	2.0	S	0.8	0.8	2.6	7.2	0.2	31.9	6.5	24				
12	0.2	0.2	0.2	1.4	0.8	0.2	0.8	0.8	0.8	1.4	2.0	2.0	5.0	2.0	16.7	1.4	14.9	0.8	S	3.2	0.8	0.8	0.8	0.8	0.2	16.7	2.5	24				
13	0.2	0.8	0.8	0.8	0.8	0.8	2.0	9.0	2.0	2.6	2.6	43.0	7.8	2.0	4.3	23.7	12.6	S	20.8	9.0	14.9	16.0	20.2	0.8	0.2	43.0	8.6	24				
14	0.8	1.4	0.2	0.2	0.8	1.4	14.3	50.1	83.5	16.7	23.1	26.6	18.4	23.1	24.3	13.7	S	16.7	14.3	8.4	15.5	7.8	2.0	0.8	0.2	83.5	15.8	24				
15	0.2	4.3	10.8	12.0	27.8	25.5	64.7	51.2	44.2	31.9	46.6	75.3	75.3	34.8	36.0	S	39.0	17.2	16.7	82.9	58.9	9.0	19.6	42.4	0.2	82.9	35.9	24				
16	3.2	7.2	7.8	23.7	13.2	2.0	3.2	13.2	57.7	51.2	30.7	18.4	30.7	8.4	S	16.1	36.6	24.3	27.8	55.9	6.6	4.3	19.6	4.3	2.0	57.7	20.3	24				
17	9.6	1.4	0.8	0.8	0.8	0.8	0.8	0.8	18.4	2.0	2.0	2.0	2.6	S	2.0	2.0	1.4	2.0	2.6	2.0	16.1	3.2	0.8	0.8	0.8	18.4	3.3	24				
18	0.8	0.8	0.8	0.8	19.0	3.2	1.4	7.8	26.6	18.4	3.2	7.8	S	9.6	7.8	1.4	1.4	2.0	1.4	0.8	2.6	1.4	1.4	0.8	0.8	26.6	5.3	24				
19	0.8	0.8	0.8	0.8	1.4	0.8	0.8	1.4	1.4	2.6	2.6	S	4.9	5.5	16.1	31.3	20.2	2.6	1.4	2.0	2.0	1.4	0.8	0.8	0.8	31.3	4.5	24				
20	0.8	1.4	0.8	0.8	3.2	2.6	2.0	0.8	2.6	7.8	S	4.3	3.8	3.8	3.7	2.6	2.0	10.8	5.0	0.8	1.4	0.8	34.8	95.3	0.8	95.3	8.3	24				
21	95.3	31.9	0.2	0.2	0.8	15.5	11.3	15.5	13.2	S	18.4	3.2	3.2	3.2	3.8	4.3	13.2	4.9	3.8	2.6	3.7	2.6	2.6	2.6	0.2	95.3	11.1	24				
22	2.6	2.0	1.4	2.0	2.6	2.6	3.2	3.2	S	3.8	3.2	3.2	3.2	2.6	X	X	X	X	X	X	X	X	X	X	1.4	3.8	2.7	14				
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0				
24	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	C1	C1	C1	C1	C1	C1	C1	C1	1.4	3.1	1.1	1.1	3.1	1.9	3			
25	1.2	1.2	0.5	1.2	20.0	S	1.5	5.3	4.0	3.2	7.9	6.6	20.4	14.3	5.8	15.2	29.6	22.8	4.0	4.8	3.7	4.1	3.0	3.1	0.5	29.6	8.0	24				
26	1.5	1.3	1.0	2.7	S	2.3	2.9	2.8	3.3	3.3	2.9	3.2	4.0	3.4	4.1	2.4	1.8	2.1	2.1	2.1	1.8	10.9	5.0	14.3	1.0	14.3	3.5	24				
27	5.3	3.6	2.0	S	2.2	1.5	45.7	14.7	9.2	8.1	17.2	6.8	5.6	13.5	23.5	6.3	5.4	4.8	4.1	3.2	3.6	5.3	12.9	4.5	1.5	45.7	9.1	24				
28	10.6	21.8	S	1.5	41.5	15.3	5.4	62.4	98.6	37.5	25.9	13.3	30.5	10.4	37.8	67.2	29.6	27.1	50.5	22.2	11.5	2.8	2.1	1.9	1.5	98.6	27.3	24				
HOURLY MAX	95.3	31.9	10.8	23.7	41.5	25.5	64.7	62.4	98.6	51.2	46.6	75.3	75.3	34.8	37.8	67.2	39.0	31.9	50.5	82.9	58.9	94.1	48.9	95.3								
HOURLY AVG	8.2	5.5	2.4	3.0	8.8	5.6	13.3	15.2	20.8	12.4	11.6	15.2	14.5	7.9	10.3	13.7	12.3	11.0	11.5	12.3	8.3	8.9	11.4	9.5								

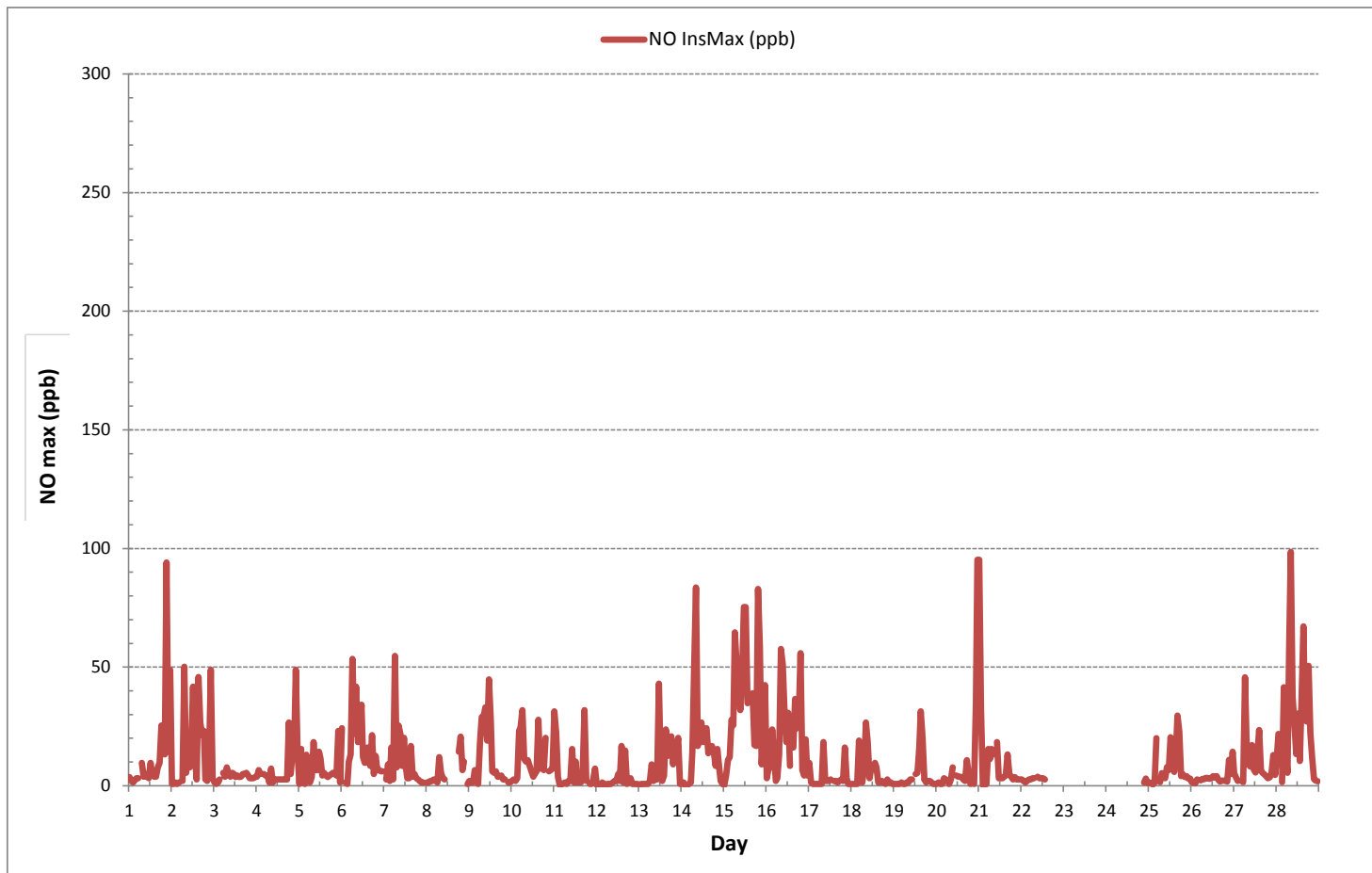
STATUS FLAG CODES

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:	582
MAXIMUM INSTANTANEOUS VALUE:	98.6 ppb @ HOUR(S) 3 ON DAY(S) 1
	VAR-VARIOUS
IZS CALIBRATION TIME:	27 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	15.2
OPERATIONAL TIME:	616 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)




% Icon Classes (ppb)

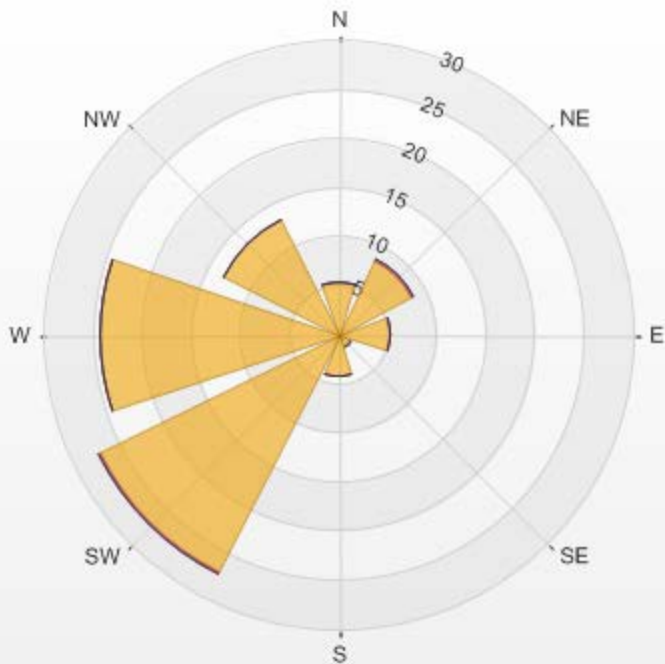
89  0.0-16.5

1  16.5-33.0

0  33.0-49.5

0  >49.5

LICA Bonnyville Poll.: LICA Bonnyville-NO[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.29%
Calm Poll Avg: 6.59[ppb]



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	4.1	3.9	4.1	4.9	4.5	3.0	S	7.9	7.0	5.1	3.1	2.4	2.7	3.0	3.2	4.0	7.1	17.5	14.3	7.0	3.7	6.1	4.2	3.2	2.4	17.5	5.5	24		
2	1.3	2.0	6.0	2.2	1.8	S	4.0	4.6	5.8	3.6	1.3	1.9	2.0	1.7	1.5	2.9	4.1	8.3	6.7	3.0	3.7	3.1	3.5	2.7	1.3	8.3	3.4	24		
3	2.8	2.5	4.8	8.6	S	11.1	6.9	6.3	8.0	5.8	5.0	5.1	3.6	4.1	3.8	4.5	6.1	12.2	10.9	9.3	12.1	9.0	8.9	10.4	2.5	12.2	7.0	24		
4	6.4	7.3	6.9	S	11.4	11.3	13.8	5.7	2.7	1.7	3.0	2.1	2.0	2.1	2.3	3.0	4.3	8.5	11.8	9.5	3.3	4.2	4.8	6.0	1.7	13.8	5.8	24		
5	2.3	1.6	S	3.6	9.0	5.5	4.8	15.0	20.1	7.0	5.3	9.3	6.2	3.4	2.7	3.6	4.1	5.8	7.4	13.7	10.1	11.9	14.6	9.6	1.6	20.1	7.7	24		
6	7.0	S	8.1	8.3	7.6	15.0	17.3	24.1	19.1	14.1	10.2	7.7	6.7	4.9	6.2	6.0	7.3	8.8	10.0	11.2	9.7	9.5	10.2	14.1	4.9	24.1	10.6	24		
7	S	11.3	12.9	8.2	5.8	6.9	4.9	6.3	7.3	4.9	4.3	4.3	3.7	2.1	1.2	4.0	3.7	3.2	2.6	2.4	2.7	2.4	2.8	S	1.2	12.9	4.9	24		
8	4.4	5.6	5.1	6.2	8.4	7.3	3.5	2.5	3.0	2.0	2.1	C	C	C	C	C	C	C	2.5	2.5	2.1	2.9	S	5.5	2.0	8.4	4.2	24		
9	5.9	5.1	6.9	8.8	7.2	10.4	13.3	24.2	21.1	13.8	12.9	18.3	10.4	9.2	7.8	8.7	10.2	10.4	11.8	8.4	7.9	S	7.1	6.3	5.1	24.2	10.7	24		
10	7.4	8.7	10.6	14.7	18.6	19.4	18.3	23.5	17.4	8.5	8.0	7.2	4.9	5.3	4.6	4.8	3.2	4.4	4.1	5.8	S	4.5	3.9	3.7	3.2	23.5	9.2	24		
11	4.1	5.0	12.8	4.9	4.3	3.8	4.5	4.7	5.2	4.4	2.8	2.0	2.1	2.2	2.2	2.6	4.1	3.2	2.3	S	2.1	1.8	1.7	3.4	1.7	12.8	3.7	24		
12	3.7	4.2	4.4	4.4	2.8	1.8	1.5	2.0	3.3	3.1	3.0	2.5	2.3	2.4	3.1	2.7	3.0	3.1	S	5.4	4.5	5.1	4.6	2.6	1.5	5.4	3.3	24		
13	2.1	3.0	2.1	1.2	1.3	2.0	2.2	3.4	4.4	3.0	3.4	3.9	2.3	1.4	1.5	4.1	4.2	S	7.1	3.3	3.1	7.2	5.4	4.3	1.2	7.2	3.3	24		
14	4.9	3.9	3.5	3.3	3.7	3.9	5.6	9.0	18.4	8.0	6.2	5.9	9.0	6.9	7.0	5.7	S	4.3	5.8	5.2	4.6	3.6	5.7	9.3	3.3	18.4	6.2	24		
15	5.7	12.5	10.3	17.4	26.2	20.7	28.9	25.6	24.2	20.6	22.8	19.1	22.2	12.9	6.4	S	10.0	12.1	22.0	15.2	12.0	6.2	6.2	7.2	5.7	28.9	15.9	24		
16	10.6	20.3	19.2	14.9	16.4	11.9	11.1	18.8	25.1	17.6	5.6	6.9	5.7	4.8	S	9.2	11.4	10.5	22.2	20.1	10.7	11.1	9.0	7.5	4.8	25.1	13.1	24		
17	5.1	4.4	3.5	5.0	3.0	5.7	4.5	9.6	4.1	4.4	4.9	3.3	3.7	S	4.5	4.7	4.8	5.8	5.8	3.3	5.6	4.0	2.3	2.9	2.3	9.6	4.6	24		
18	3.2	2.9	3.8	1.1	2.8	5.3	2.4	4.7	12.3	6.9	2.8	1.7	S	3.7	2.6	2.3	5.3	6.1	4.8	3.4	2.4	2.1	2.2	2.0	1.1	12.3	3.8	24		
19	1.4	1.4	1.5	1.5	1.4	1.3	1.4	1.9	2.5	2.0	3.0	S	3.9	4.1	3.7	4.7	7.0	6.0	8.9	5.2	6.4	6.3	5.1	3.8	1.3	8.9	3.7	24		
20	3.6	5.2	5.9	6.6	9.2	6.0	4.8	3.9	5.1	6.0	S	4.3	4.5	3.7	4.5	3.7	4.4	9.3	9.3	6.5	6.2	8.0	6.1	17.1	3.6	17.1	6.3	24		
21	11.4	3.4	1.5	1.8	1.2	5.4	7.0	3.4	7.6	S	4.1	3.0	4.0	4.7	4.1	5.8	6.9	7.5	10.3	5.2	3.4	3.3	2.6	4.0	1.2	11.4	4.9	24		
22	3.0	2.2	3.2	3.9	3.1	4.6	6.7	7.7	S	6.8	5.4	3.7	3.0	1.6	X	X	X	X	X	X	X	X	X	X	1.6	7.7	4.2	14		
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0		
24	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	C1	C1	C1	C1	C1	C1	C1	C1	C1	2.8	7.3	1.5	1.5	7.3	3.9	3
25	1.3	0.4	0.9	1.2	1.5	S	3.7	2.6	4.6	3.1	3.1	3.3	2.9	3.8	3.0	2.9	7.2	6.4	11.8	12.2	6.8	6.3	6.4	4.9	0.4	12.2	4.4	24		
26	6.6	5.4	3.2	3.4	S	4.7	4.6	4.1	2.9	1.5	0.5	0.6	0.6	0.6	0.6	0.4	0.8	2.4	4.6	3.9	0.5	4.6	6.1	2.5	0.4	6.6	2.8	24		
27	2.0	4.5	5.7	S	5.6	4.7	6.9	6.8	3.4	3.2	2.3	3.1	3.0	3.6	4.5	6.6	7.4	11.2	11.1	7.0	10.2	17.8	10.9	9.2	2.0	17.8	6.6	24		
28	12.1	11.6	S	4.0	6.7	15.2	8.0	12.6	18.6	14.8	9.7	7.8	8.0	7.7	9.0	8.2	7.8	9.5	13.4	22.6	17.9	7.1	4.6	3.2	3.2	22.6	10.4	24		
HOURLY MAX	12.1	20.3	19.2	17.4	26.2	20.7	28.9	25.6	25.1	20.6	22.8	19.1	22.2	12.9	9.0	9.2	11.4	17.5	22.2	22.6	17.9	17.8	14.6	17.1						
HOURLY AVG	4.9	5.5	6.1	5.8	6.8	7.8	7.6	9.3	10.1	6.9	5.4	5.4	5.0	4.2	3.9	4.6	5.8	7.7	9.3	8.0	6.3	6.0	5.8	5.9						

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

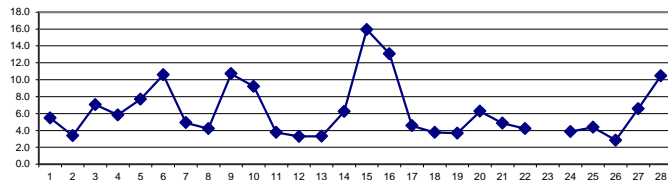
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

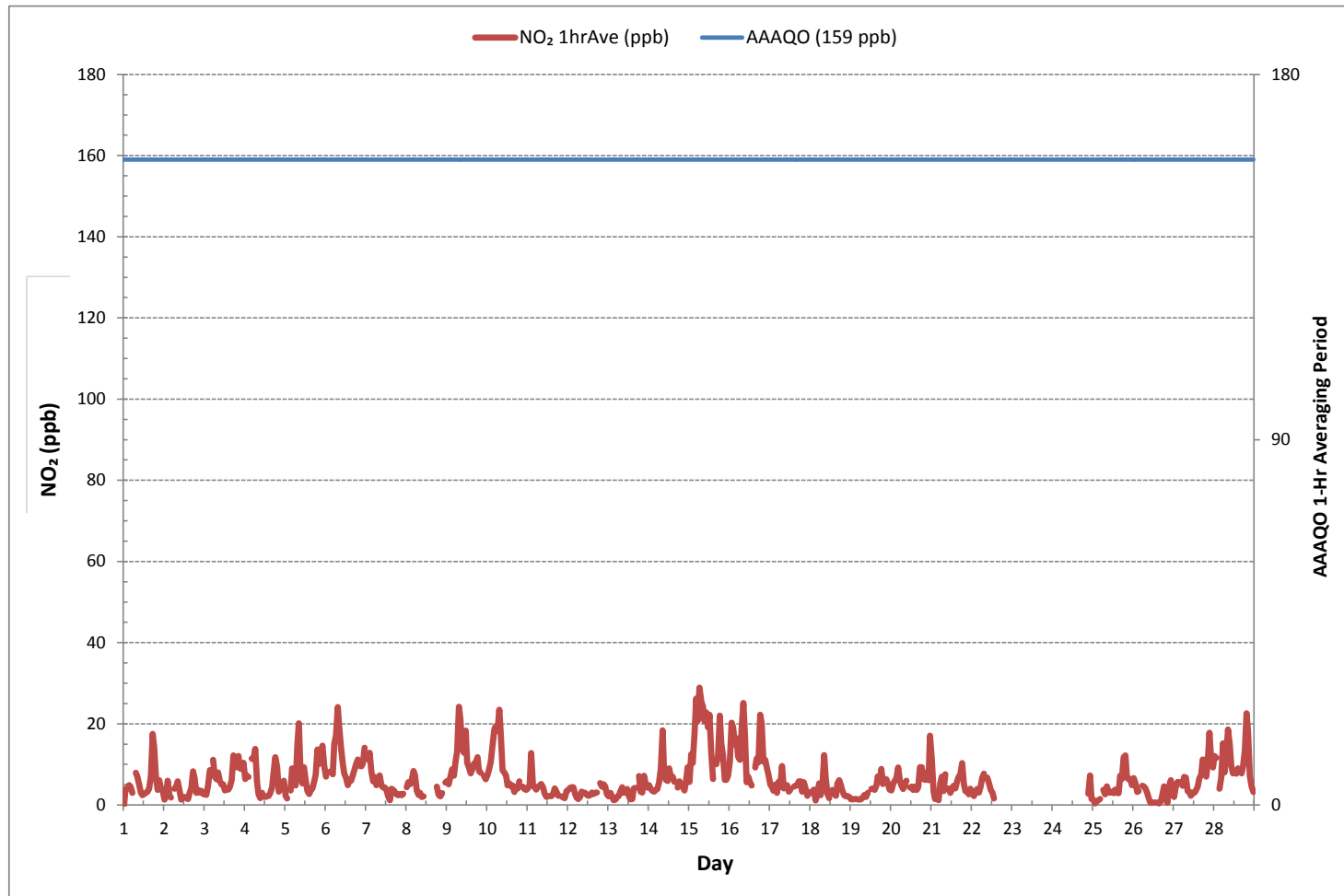
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	583				
MINIMUM 1-HR AVERAGE:	0.4 ppb	@ HOUR(S)	1, 15	ON DAY(S)	25, 26
MAXIMUM 1-HR AVERAGE:	28.9 ppb	@ HOUR(S)	6	ON DAY(S)	15
MAXIMUM 24-HR AVERAGE:	15.9 ppb			ON DAY(S)	15
				VAR-VARIOUS	
IZS CALIBRATION TIME:	27 hrs	OPERATIONAL TIME:	617 hrs		
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	91.8 %		
STANDARD DEVIATION:	4.9	MONTHLY AVERAGE:	6.4 ppb		

24 HR AVERAGES February 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	4.9	4.3	5.4	X	6.5	3.7	S	15.9	9.5	8.9	3.7	2.5	3.1	3.7	4.3	4.9	11.3	30.6	30.0	14.8	11.3	37.0	15.4	8.9	2.5	37.0	10.9	23			
2	1.3	2.5	10.7	2.5	1.9	S	4.8	19.5	9.5	8.9	1.9	8.3	24.7	15.4	1.9	13.0	20.6	28.3	18.9	4.9	3.7	7.1	17.1	6.5	1.3	28.3	10.2	24			
3	3.7	3.7	7.7	9.5	S	14.2	8.9	13.0	12.5	7.7	7.7	6.6	4.9	4.9	6.5	5.4	7.7	17.1	14.8	11.3	14.2	13.6	13.0	12.5	3.7	17.1	9.6	24			
4	7.7	8.3	8.9	S	14.2	11.9	20.1	7.7	9.5	2.5	3.1	2.5	2.5	2.5	2.5	4.2	6.6	15.4	25.9	15.4	16.6	16.5	21.2	13.0	2.5	25.9	10.4	24			
5	2.5	15.4	S	6.6	16.5	10.7	7.2	28.9	30.0	14.2	7.2	12.5	11.3	3.1	6.5	3.7	4.2	6.6	12.5	14.8	12.5	17.1	25.3	10.1	2.5	30.0	12.1	24			
6	13.6	S	8.3	11.9	13.6	25.9	27.1	25.3	72.1	18.2	15.4	13.0	8.3	5.4	8.3	10.1	8.9	17.6	13.0	18.2	13.0	11.3	11.9	15.4	5.4	72.1	16.8	24			
7	S	12.5	20.6	10.1	10.1	8.9	20.6	16.6	23.0	18.8	7.2	24.2	6.6	2.5	2.5	14.2	6.0	5.4	4.9	3.1	3.7	2.5	3.1	S	2.5	24.2	10.3	24			
8	5.4	6.0	6.0	7.7	9.5	13.6	4.9	7.2	5.4	3.1	2.5	C	C	C	C	C	C	C	13.0	11.9	6.0	10.1	S	8.9	2.5	13.6	7.6	24			
9	11.3	7.2	17.1	15.9	14.8	16.6	31.7	32.3	37.6	18.8	19.5	28.8	18.8	11.3	11.3	11.9	13.0	12.5	16.6	13.0	10.7	S	9.5	8.3	7.2	37.6	16.9	24			
10	10.1	13.6	14.8	22.4	40.5	30.0	40.6	32.9	22.4	12.5	12.5	10.1	8.3	8.3	7.7	19.4	10.7	23.6	11.3	25.3	S	19.4	11.3	17.1	7.7	40.6	18.5	24			
11	14.2	18.8	22.4	7.1	6.6	5.4	6.0	7.1	6.0	5.4	7.7	3.1	10.7	3.7	3.7	4.3	17.1	11.3	4.2	S	3.1	3.1	6.0	14.8	3.1	22.4	8.3	24			
12	4.3	4.9	5.4	5.4	4.3	2.5	2.5	3.1	4.8	3.7	4.9	3.7	11.3	3.1	15.9	3.1	13.6	3.7	S	6.5	5.4	6.0	5.4	4.3	2.5	15.9	5.6	24			
13	3.7	5.4	3.1	1.9	2.5	3.7	4.2	10.1	6.1	5.4	6.5	27.1	7.2	2.5	8.9	21.8	14.8	S	20.6	18.8	14.8	18.2	26.5	5.4	1.9	27.1	10.4	24			
14	6.5	4.9	4.3	4.3	4.9	6.0	18.9	39.4	37.0	19.4	14.8	15.4	16.0	20.6	106.8	21.8	S	11.9	18.9	14.2	22.4	6.0	17.6	16.6	4.3	106.8	19.5	24			
15	10.7	27.7	20.1	28.3	30.0	27.1	41.1	32.3	51.1	39.4	32.3	34.7	36.4	30.6	17.7	S	31.7	28.8	37.6	55.7	63.3	13.6	18.2	24.2	10.7	63.3	31.9	24			
16	20.6	23.0	22.4	21.2	20.6	14.8	16.0	24.2	41.1	29.4	9.5	14.8	18.8	8.3	S	15.9	21.8	21.8	28.8	32.3	15.4	13.0	15.4	10.7	8.3	41.1	20.0	24			
17	8.3	6.6	4.3	7.2	4.3	8.9	7.1	14.8	18.3	7.2	6.6	4.9	4.9	S	5.4	5.4	6.6	8.9	8.9	4.9	21.8	10.1	3.7	6.0	3.7	21.8	8.0	24			
18	4.3	4.9	5.4	4.3	13.6	10.7	4.9	12.5	21.8	17.6	4.2	4.9	S	10.1	10.1	3.7	8.9	8.3	6.0	5.4	3.7	3.1	3.7	3.1	3.1	21.8	7.6	24			
19	1.9	2.5	2.5	1.9	1.9	1.9	2.5	3.1	3.1	3.7	5.4	S	10.7	22.4	25.9	23.0	10.7	8.3	10.7	7.1	8.9	8.9	7.2	4.9	1.9	25.9	7.8	24			
20	6.0	6.6	7.2	9.5	10.1	7.7	6.5	4.9	7.2	9.5	S	6.5	5.4	6.6	6.0	4.9	6.6	18.2	18.9	10.7	8.3	13.0	25.3	120.8	4.9	120.8	14.2	24			
21	83.9	23.0	2.5	4.3	3.1	17.7	14.2	10.1	20.1	S	16.5	5.4	5.5	5.4	5.4	8.3	15.4	16.5	14.8	7.7	4.9	5.4	4.9	7.2	2.5	83.9	13.1	24			
22	4.9	4.2	5.4	6.5	5.4	6.6	9.5	10.7	S	9.5	8.3	6.0	8.3	4.3	X	X	X	X	X	X	X	X	X	X	X	4.2	10.7	6.9	14		
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0		
24	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	7.2	18.4	3.9	3.9	18.4	9.8	3
25	3.8	2.9	2.9	3.5	11.9	S	6.5	11.8	10.3	5.0	9.8	7.0	12.7	9.0	8.8	17.8	20.3	23.9	28.0	27.9	10.6	10.8	10.2	9.1	2.9	28.0	11.5	24			
26	9.9	8.7	6.1	6.0	S	8.5	7.5	7.4	4.9	4.2	2.4	2.6	3.2	3.2	2.7	2.9	3.4	5.2	7.5	8.9	6.7	13.7	15.3	11.3	2.4	15.3	6.6	24			
27	20.9	15.5	15.8	S	14.1	7.8	19.8	17.2	15.2	5.9	8.5	12.7	6.3	20.6	22.6	9.2	13.7	15.2	15.3	11.7	16.4	22.8	32.8	23.6	5.9	32.8	15.8	24			
28	31.8	34.8	S	9.1	30.7	28.5	17.0	36.4	73.0	30.1	16.8	31.5	22.3	10.6	26.7	30.7	19.3	26.2	36.0	39.6	32.5	11.6	10.1	6.5	6.5	73.0	26.6	24			
HOURLY MAX	83.9	34.8	22.4	28.3	40.5	30.0	41.1	39.4	73.0	39.4	32.3	34.7	36.4	30.6	106.8	30.7	31.7	30.6	37.6	55.7	63.3	37.0	32.8	120.8							
HOURLY AVG	11.8	10.7	9.6	9.0	12.2	12.2	14.0	17.1	22.1	12.4	9.4	12.0	11.2	9.1	13.8	11.3	12.7	15.9	17.4	16.0	13.7	12.0	13.9	14.9							

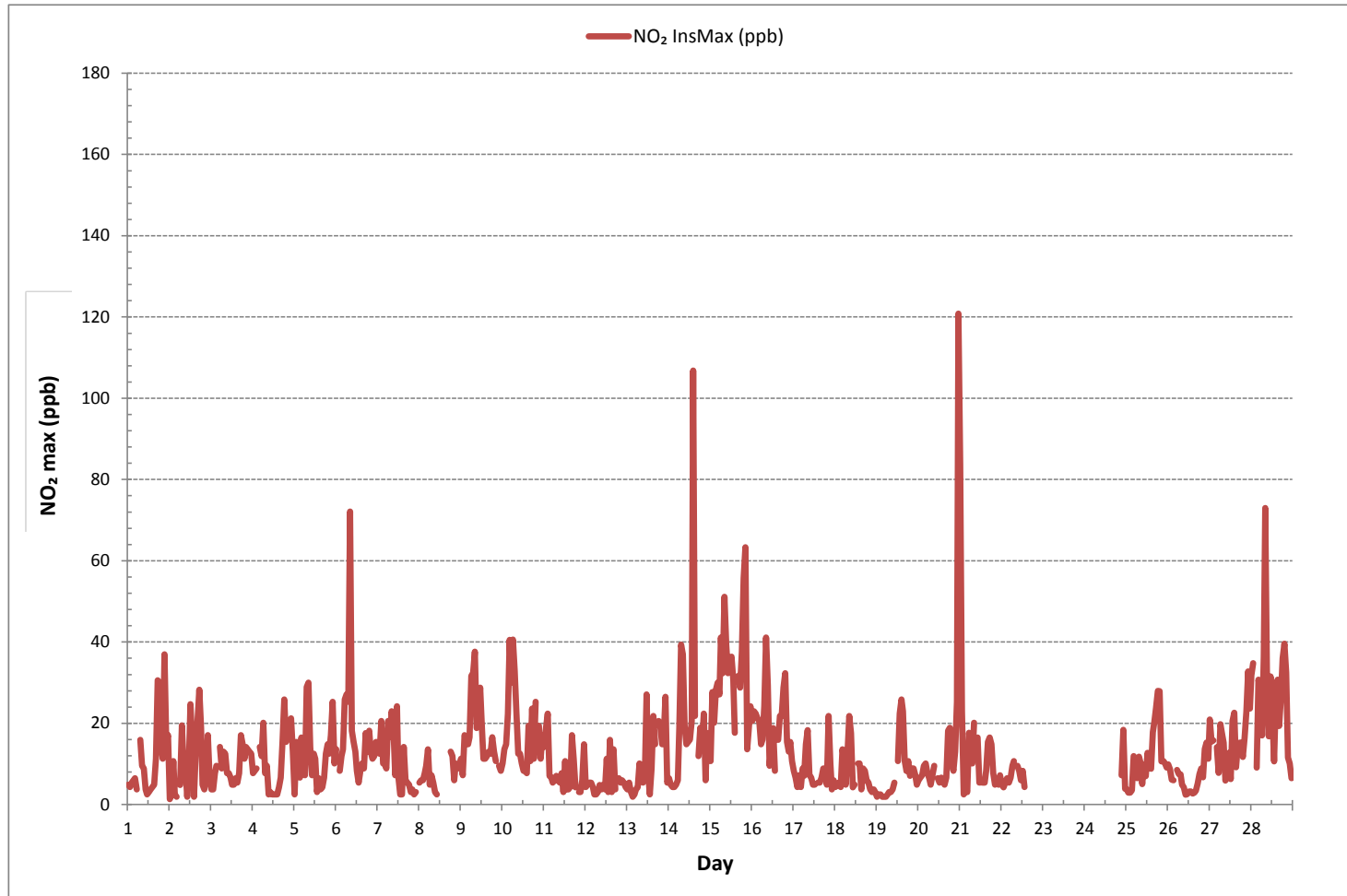
STATUS FLAG CODES

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:	582
MAXIMUM INSTANTANEOUS VALUE:	120.8 ppb @ HOUR(S) 23 ON DAY(S) 20
	VAR-VARIOUS
IZS CALIBRATION TIME:	27 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	616 hrs
STANDARD DEVIATION:	11.9

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-NO2[ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 10.29% Calm Avg: 12.73 [ppb]

Direction	0.0-9.7	9.7-19.3	19.3-29.0	>29.0	Total
N	3.8	1.2	0.5	0.0	5.5
NE	5.5	2.6	0.5	0.0	8.6
E	4.5	0.7	0.2	0.0	5.3
SE	1.2	0.2	0.0	0.0	1.4
S	3.8	0.5	0.0	0.0	4.3
SW	25.9	1.2	0.2	0.0	27.3
W	22.6	1.7	0.0	0.0	24.4
NW	10.5	2.6	0.0	0.0	13.0
Summary	77.7	10.6	1.4	0.0	89.7

% Icon Classes (ppb)

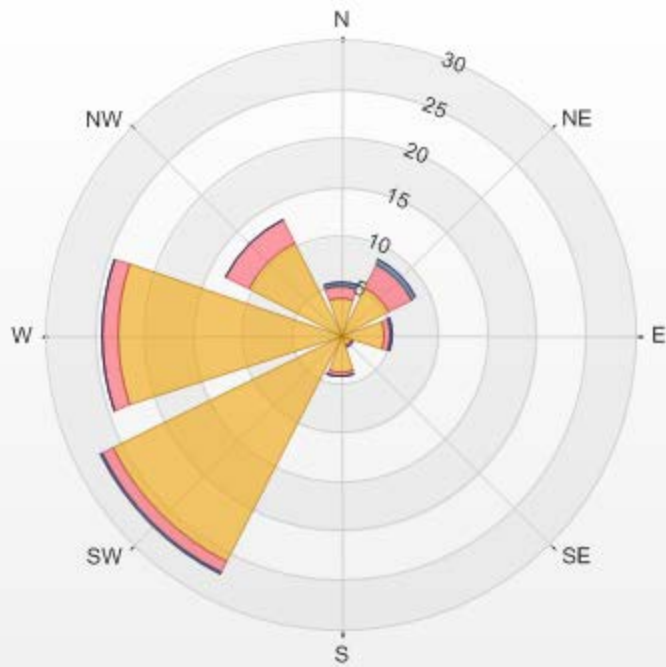
78  0.0-9.7

11  9.7-19.3

1  19.3-29.0

0  >29.0

LICA Bonnyville Poll.: LICA Bonnyville-NO2[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.29%
Calm Poll Avg: 12.73[ppb]



NO2[ppb] Calibration: LICA Bonnyville Monthly: 2017/02 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	30.5	29.8	30.0	29.1	30.5	33.3	S	31.9	32.0	35.0	37.1	37.5	37.5	37.4	37.4	36.6	34.3	23.8	22.5	27.7	30.7	28.2	31.5	32.0	22.5	37.5	32.0	24
2	32.6	32.4	28.8	32.4	33.4	S	31.1	28.5	27.9	30.8	32.7	33.3	33.6	34.1	34.0	32.7	30.9	28.1	29.3	31.9	31.1	31.2	31.1	31.5	27.9	34.1	31.5	24
3	30.7	30.7	28.5	24.8	S	22.9	31.0	32.6	30.8	33.8	33.7	33.5	35.0	35.3	35.9	34.7	32.4	25.9	26.9	27.7	24.2	28.3	28.4	25.6	22.9	35.9	30.1	24
4	28.4	27.2	26.7	S	24.4	24.2	22.5	29.7	34.1	37.0	37.5	38.8	38.3	37.6	37.2	36.3	35.0	30.5	27.3	29.6	32.1	32.1	31.2	29.4	22.5	38.8	31.6	24
5	31.8	33.9	S	33.5	28.1	30.3	30.8	20.6	13.9	22.4	28.6	25.2	29.0	30.6	31.2	30.7	30.0	28.2	24.1	16.5	17.7	14.4	12.4	12.9	12.4	33.9	25.1	24
6	14.4	S	13.3	12.4	11.8	7.7	6.0	2.1	6.9	11.9	15.6	16.4	16.6	18.9	19.3	18.9	16.3	13.4	11.4	11.1	12.1	11.1	10.1	6.6	2.1	19.3	12.4	24
7	S	10.6	9.6	13.7	15.6	15.1	17.2	16.8	18.8	24.3	26.1	27.3	30.2	35.6	35.7	32.9	34.8	31.2	33.3	32.1	31.8	32.9	32.0	S	9.6	35.7	25.3	24
8	29.5	28.7	29.8	28.7	26.9	27.8	31.0	31.5	31.7	33.3	34.1	34.8	35.4	35.8	36.5	35.3	34.9	31.7	35.0	37.3	37.0	36.0	S	33.3	26.9	37.3	32.9	24
9	32.4	33.7	31.2	31.3	31.0	27.3	24.5	14.8	18.5	25.5	26.8	C	C	C	C	30.4	28.3	27.3	26.0	28.2	28.5	S	30.3	30.2	14.8	33.7	27.7	24
10	29.6	28.2	25.8	21.2	17.8	13.9	12.6	12.4	17.1	26.1	28.6	30.1	32.9	33.0	33.6	34.5	36.7	35.9	35.7	33.7	S	34.3	33.5	32.2	12.4	36.7	27.8	24
11	30.7	29.4	22.0	27.8	28.2	29.8	30.5	28.7	26.9	29.6	35.1	38.6	40.2	41.5	41.6	41.4	39.5	38.8	39.7	S	41.5	41.1	40.5	38.5	22.0	41.6	34.9	24
12	37.8	36.9	36.6	36.9	39.8	41.6	42.0	41.0	39.9	40.6	41.4	42.5	43.0	43.0	42.5	43.8	43.3	42.3	S	39.1	39.4	37.9	37.9	40.7	36.6	43.8	40.4	24
13	42.0	40.6	40.5	40.3	39.9	39.2	38.2	36.7	35.9	36.8	36.6	37.0	38.8	40.8	41.0	37.2	35.9	S	36.1	38.3	36.7	31.8	32.3	32.2	31.8	42.0	37.6	24
14	31.2	31.7	31.3	31.3	32.2	30.9	28.1	24.4	13.9	25.3	28.0	29.8	26.8	31.0	31.0	32.1	S	38.5	35.6	33.4	34.1	34.1	28.4	23.9	13.9	38.5	29.9	24
15	26.0	17.1	19.0	10.0	0.8	1.0	1.0	2.8	4.8	5.7	5.6	7.6	7.1	21.0	26.9	S	23.1	18.6	9.8	16.0	19.6	22.6	20.8	20.2	0.8	26.9	13.4	24
16	17.6	5.0	2.6	8.3	8.3	14.4	16.3	9.3	3.4	10.7	20.8	19.3	20.9	20.9	S	17.5	11.0	13.1	2.9	3.2	10.5	9.5	9.7	10.4	2.6	20.9	11.5	24
17	15.5	21.5	26.5	29.4	32.3	31.5	33.6	26.9	29.0	28.7	28.0	28.1	27.0	S	24.8	23.9	23.5	23.7	23.7	25.3	23.5	26.4	28.4	26.5	15.5	33.6	26.4	24
18	25.7	24.5	23.6	23.8	21.4	17.6	18.0	16.8	10.5	14.9	20.4	24.3	S	31.0	32.3	34.5	30.7	27.9	28.6	29.3	29.6	30.8	29.5	29.3	10.5	34.5	25.0	24
19	29.2	28.2	28.1	28.3	29.0	29.9	31.1	31.6	31.2	31.2	30.9	S	31.0	29.8	29.1	27.4	24.2	24.2	20.6	23.5	21.5	20.9	21.1	21.8	20.6	31.6	27.1	24
20	21.5	19.0	14.9	12.6	10.1	14.7	16.9	18.8	17.3	17.5	S	22.3	20.8	25.7	24.0	24.8	26.8	18.7	22.0	27.2	27.6	25.6	25.7	19.7	10.1	26.6	20.6	24
21	20.5	23.6	25.1	24.8	28.4	24.5	22.9	26.6	22.1	S	23.9	25.0	24.7	24.5	25.4	24.0	22.6	20.9	18.2	23.8	26.1	27.9	31.4	31.0	18.2	31.4	24.7	24
22	32.4	34.9	34.4	33.4	35.4	34.0	32.1	30.3	S	33.8	34.8	36.7	38.6	38.6	37.9	37.2	35.6	32.5	34.9	30.6	31.6	30.5	32.1	31.2	30.3	38.6	34.1	24
23	30.4	30.5	28.9	25.7	26.5	22.1	16.4	S	22.4	27.0	32.1	34.7	35.5	35.0	35.6	34.4	34.7	31.8	26.9	30.4	32.8	33.6	26.8	26.7	16.4	35.6	29.6	24
24	14.8	18.3	16.7	4.9	6.1	10.7	S	16.4	23.9	27.1	29.7	30.7	31.7	33.6	36.6	36.0	34.1	29.7	27.6	30.3	31.2	33.7	29.6	34.5	4.9	36.6	25.6	24
25	34.3	35.6	34.9	33.8	33.4	S	32.4	32.1	28.6	29.5	30.4	31.9	34.2	32.4	33.8	34.1	29.0	30.3	25.1	27.2	31.8	31.9	31.3	33.4	25.1	35.6	31.8	24
26	31.1	31.1	32.0	33.3	S	34.4	32.6	31.9	32.0	32.6	32.6	32.6	32.9	33.5	34.5	34.2	34.1	33.2	30.5	30.3	32.5	28.3	28.2	30.4	28.2	34.5	32.1	24
27	31.0	28.8	26.1	S	27.9	27.5	24.4	25.9	32.3	33.2	35.9	36.2	35.8	36.0	35.4	33.1	32.0	25.6	26.1	30.3	26.5	18.6	21.6	21.6	18.6	36.2	29.2	24
28	16.2	15.1	S	17.8	16.2	9.3	11.6	10.6	8.6	13.1	21.8	23.9	24.6	26.8	26.5	28.8	29.2	27.5	22.8	13.7	18.5	26.8	29.6	30.2	8.6	30.2	20.4	24
HOURLY MAX	42.0	40.6	40.5	40.3	39.9	41.6	42.0	41.0	39.9	40.6	41.4	42.5	43.0	43.0	42.5	43.8	43.3	42.3	39.7	39.1	41.5	41.1	40.5	40.7				
HOURLY AVG	27.7	26.9	25.7	25.0	24.4	23.7	24.4	23.4	22.8	26.6	29.2	29.9	30.9	32.4	33.1	32.1	30.5	27.9	26.0	27.0	28.2	28.2	27.6	27.3				

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

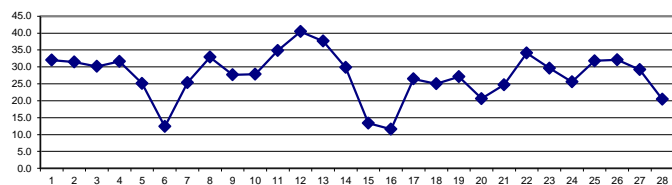
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

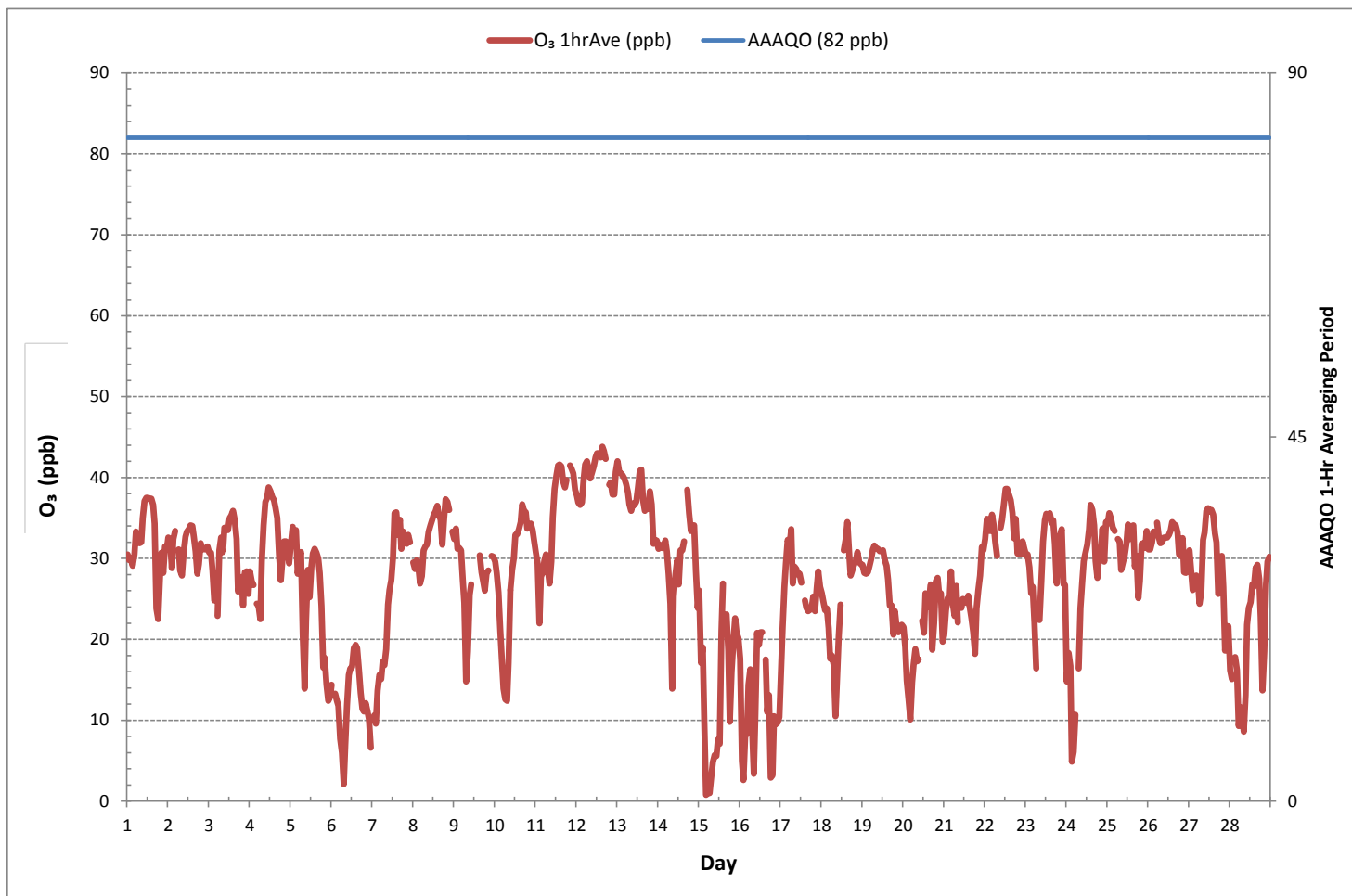
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	639					
MINIMUM 1-HR AVERAGE:	0.8	ppb	@ HOUR(S)	4	ON DAY(S)	15
MAXIMUM 1-HR AVERAGE:	43.8	ppb	@ HOUR(S)	15	ON DAY(S)	12
MAXIMUM 24-HR AVERAGE:	40.4	ppb			ON DAY(S)	12
					VAR-VARIOUS	
IZS CALIBRATION TIME:	29	hrs	OPERATIONAL TIME:	672	hrs	
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	8.7		MONTHLY AVERAGE:	27.5	ppb	

24 HR AVERAGES February 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	32.6	31.7	31.8	30.7	33.4	35.1	S	34.9	34.4	37.2	38.4	38.6	39.0	38.8	38.8	38.6	38.7	32.1	27.8	30.1	33.5	31.5	33.2	34.0	27.8	39.0	34.6	24
2	33.5	33.7	32.1	32.9	34.1	S	32.2	31.2	30.4	32.3	33.4	34.3	34.3	34.7	34.7	34.7	33.4	32.2	32.1	32.9	32.8	32.1	32.5	32.0	30.4	34.7	33.0	24
3	31.5	31.6	30.3	27.2	S	29.2	34.1	38.6	34.3	36.3	36.1	36.8	36.8	37.1	37.9	36.9	35.3	32.6	30.0	30.2	27.8	31.7	31.8	28.0	27.2	38.6	33.1	24
4	30.0	28.7	29.3	S	28.2	25.6	28.1	32.4	36.6	38.0	39.8	40.1	39.6	38.7	38.4	37.5	36.8	34.5	34.3	35.6	34.5	35.4	35.0	32.9	25.6	40.1	34.3	24
5	33.5	34.9	S	35.4	32.8	32.9	32.8	31.8	19.4	29.0	31.3	29.0	32.1	32.0	32.2	32.0	31.5	30.0	27.3	18.3	20.1	18.9	18.6	15.1	15.1	35.4	28.3	24
6	15.4	S	14.8	13.8	12.9	12.3	11.3	4.3	12.6	14.7	18.5	17.9	17.4	21.0	21.3	20.7	18.4	16.0	13.6	13.0	13.6	13.2	12.3	8.4	4.3	21.3	14.7	24
7	S	12.4	12.6	15.3	17.0	17.5	18.5	20.5	23.8	27.2	28.1	29.3	34.8	36.9	37.9	35.6	38.1	33.5	35.6	33.9	32.9	33.8	33.7	S	12.4	38.1	27.7	24
8	30.7	30.4	31.0	30.0	29.7	31.5	32.3	33.1	33.5	34.3	35.3	35.7	36.6	36.6	37.2	37.4	36.1	34.6	37.6	38.1	38.3	36.8	S	34.7	29.7	38.3	34.4	24
9	34.1	34.7	33.8	39.3	33.1	31.7	29.8	21.4	23.7	30.4	C	C	C	C	C	32.8	32.1	29.2	28.5	30.2	30.0	S	31.6	31.7	21.4	39.3	31.0	24
10	31.5	31.3	29.2	25.4	23.5	19.7	20.2	18.0	23.8	28.8	32.5	32.4	35.0	35.4	36.3	37.2	37.6	37.4	36.9	36.1	S	35.3	34.9	33.5	18.0	37.6	31.0	24
11	31.9	31.6	28.1	28.4	30.2	30.7	31.3	31.3	28.0	32.3	37.2	39.4	42.2	42.5	42.8	42.5	41.1	41.2	41.4	S	42.0	42.0	41.7	40.0	28.0	42.8	36.5	24
12	38.7	38.4	37.4	37.5	41.7	42.2	42.6	41.6	40.6	41.2	42.2	43.5	43.8	43.4	43.4	44.6	44.3	42.8	S	40.5	40.0	38.6	38.8	42.7	37.4	44.6	41.3	24
13	42.9	41.6	41.2	41.0	40.5	40.2	39.7	38.6	37.2	38.1	37.8	39.6	40.8	41.9	42.0	41.2	38.7	S	39.9	39.7	39.7	34.2	34.3	33.1	33.1	42.9	39.3	24
14	32.0	32.8	32.0	31.8	34.0	32.3	30.0	28.2	25.4	28.1	30.3	32.0	29.7	33.9	33.7	34.0	S	41.6	41.1	37.6	36.9	35.1	34.1	27.9	25.4	41.6	32.8	24
15	28.4	27.5	23.5	20.5	2.0	3.0	4.8	6.4	6.5	7.3	7.0	11.7	10.9	28.0	29.3	S	27.0	23.4	17.7	21.1	24.4	24.6	22.9	24.0	2.0	29.3	17.5	24
16	23.3	11.5	8.1	19.8	15.1	17.0	18.0	25.1	5.5	18.5	22.8	21.9	23.2	23.2	S	20.5	17.8	15.7	14.1	10.8	14.0	10.9	11.5	12.1	5.5	25.1	16.5	24
17	20.1	24.6	29.9	32.1	33.4	33.9	36.3	31.3	31.0	30.3	29.7	29.6	28.2	S	25.8	25.7	25.7	25.1	25.8	27.3	26.7	29.9	29.7	28.4	20.1	36.3	28.7	24
18	27.0	25.8	25.4	24.9	23.3	21.1	19.8	19.9	18.3	18.6	25.8	26.0	S	34.4	34.2	35.1	34.4	29.7	29.7	30.3	30.9	31.5	30.7	29.8	18.3	35.1	27.2	24
19	29.9	29.1	29.1	29.1	29.8	30.4	32.0	32.1	32.1	31.8	32.1	S	31.5	37.4	30.3	29.3	27.5	26.0	22.9	25.1	23.8	23.3	22.3	22.8	22.3	37.4	28.7	24
20	22.9	20.7	16.7	14.7	12.9	16.8	19.1	20.1	20.2	20.5	S	25.7	24.3	28.5	25.4	27.3	31.1	23.3	32.1	30.2	30.0	29.0	28.7	25.7	12.9	32.1	23.7	24
21	24.0	26.3	26.3	27.5	29.4	30.6	28.7	28.1	26.7	S	25.3	26.1	25.8	25.8	26.6	26.6	25.6	24.6	23.8	26.4	28.0	30.3	32.9	32.8	23.8	32.9	27.3	24
22	34.2	36.3	36.9	37.2	37.6	36.8	35.3	34.3	S	36.2	37.6	38.3	40.3	40.0	39.6	40.0	38.7	37.1	36.6	32.6	33.5	32.8	33.5	33.2	32.6	40.3	36.5	24
23	32.0	31.5	31.2	28.2	28.7	26.4	19.5	S	25.7	30.0	34.1	35.4	36.2	36.0	36.2	36.5	36.5	35.9	31.3	34.6	34.9	35.3	32.0	29.4	19.5	36.5	32.1	24
24	24.4	26.1	20.1	10.9	12.3	19.5	S	24.5	27.5	29.1	31.5	32.9	32.9	38.8	38.3	37.6	37.5	35.0	30.1	33.1	35.1	35.4	36.2	35.7	10.9	38.8	29.8	24
25	35.9	36.5	35.7	34.9	34.1	S	33.5	33.5	32.0	30.2	31.7	35.1	35.7	35.1	35.4	35.4	33.7	32.9	32.6	32.6	33.9	33.8	34.4	34.9	30.2	36.5	34.1	24
26	34.0	32.8	33.4	35.0	S	35.7	34.8	35.3	33.7	33.4	33.2	33.2	33.5	34.3	35.4	34.9	35.0	35.3	32.8	33.1	33.8	32.2	32.5	34.5	32.2	35.7	34.0	24
27	34.3	31.3	30.7	S	30.4	28.2	27.6	29.9	34.0	33.8	37.4	37.4	37.5	37.0	37.1	34.9	35.0	28.1	31.5	32.0	29.6	22.0	26.9	26.0	22.0	37.5	31.9	24
28	24.1	24.0	S	21.1	22.8	17.3	14.3	14.4	13.2	21.6	25.1	25.1	25.8	28.0	28.1	31.3	31.2	30.3	30.7	27.8	26.1	28.8	31.2	31.8	13.2	31.8	25.0	24
HOURLY MAX	42.9	41.6	41.2	41.0	41.7	42.2	42.6	41.6	40.6	41.2	42.2	43.5	43.8	43.4	43.4	44.6	44.3	42.8	41.4	40.5	42.0	41.7	42.7					
HOURLY AVG	30.1	29.5	28.1	27.9	27.0	26.8	27.2	27.4	26.3	29.2	31.3	31.8	32.6	34.6	34.6	34.1	33.3	31.1	30.3	30.1	30.6	30.3	30.3	29.4				

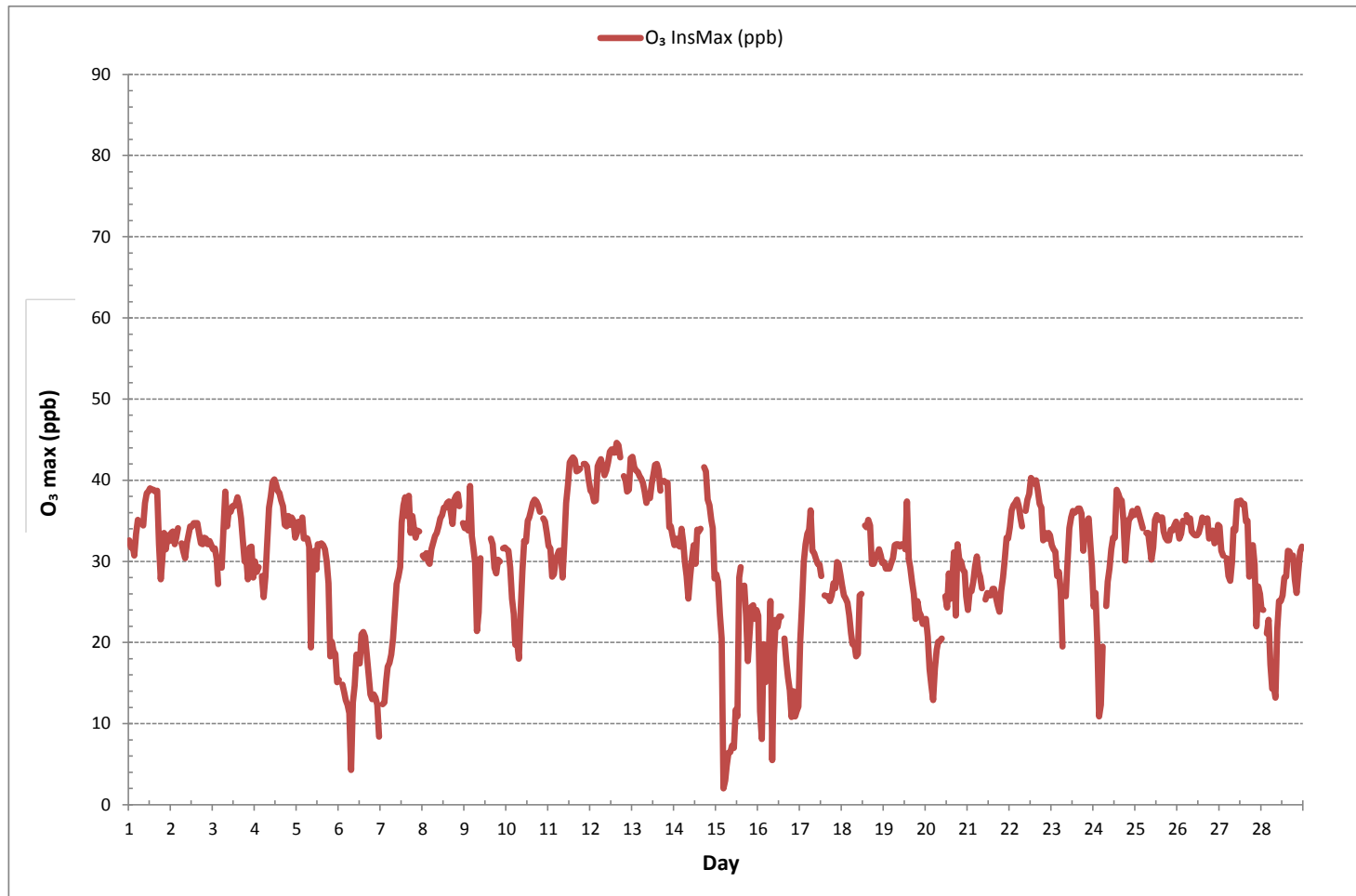
STATUS FLAG CODES

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:	638
MAXIMUM INSTANTANEOUS VALUE:	44.6 ppb @ HOUR(S) 15 ON DAY(S) 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	7.8
OPERATIONAL TIME:	672 hrs

OZONE Instantaneous Maximum (O₃ ppb)



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-O3[ppb]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 10.33% Calm Avg: 15.34 [ppb]

Direction	0.0-14.6	14.6-29.3	29.3-43.9	>43.9	Total
N	1.1	2.5	2.5	0.0	6.1
NE	0.9	4.4	1.9	0.0	7.2
E	0.5	1.7	2.7	0.0	4.9
SE	0.0	0.3	1.3	0.0	1.6
S	0.3	1.7	2.2	0.0	4.2
SW	0.6	6.3	20.2	0.0	27.1
W	1.3	11.0	12.2	0.0	24.4
NW	0.9	5.0	8.3	0.0	14.2
Summary	5.6	32.9	51.2	0.0	89.7

% Icon Classes (ppb)

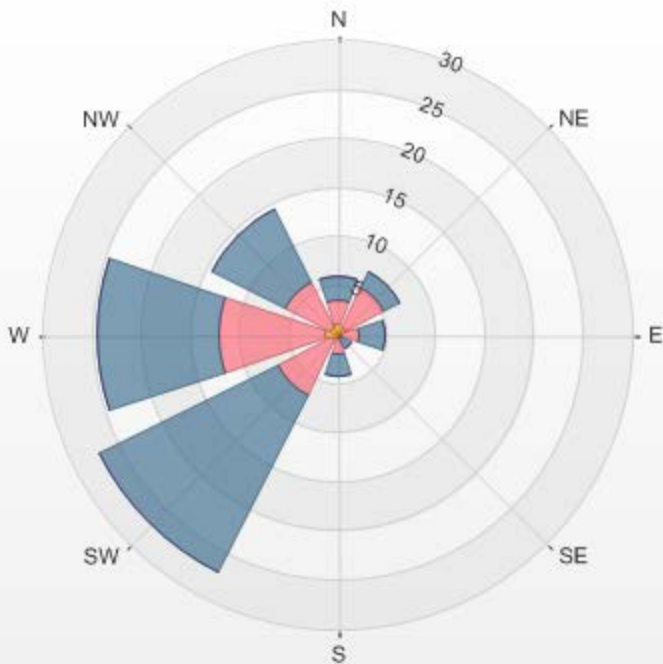
6 0.0-14.6

33 14.6-29.3

51 29.3-43.9

0 >43.9

LICA Bonnyville Poll.: LICA Bonnyville-O3[ppb] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.33%
Calm Poll Avg: 15.34[ppb]



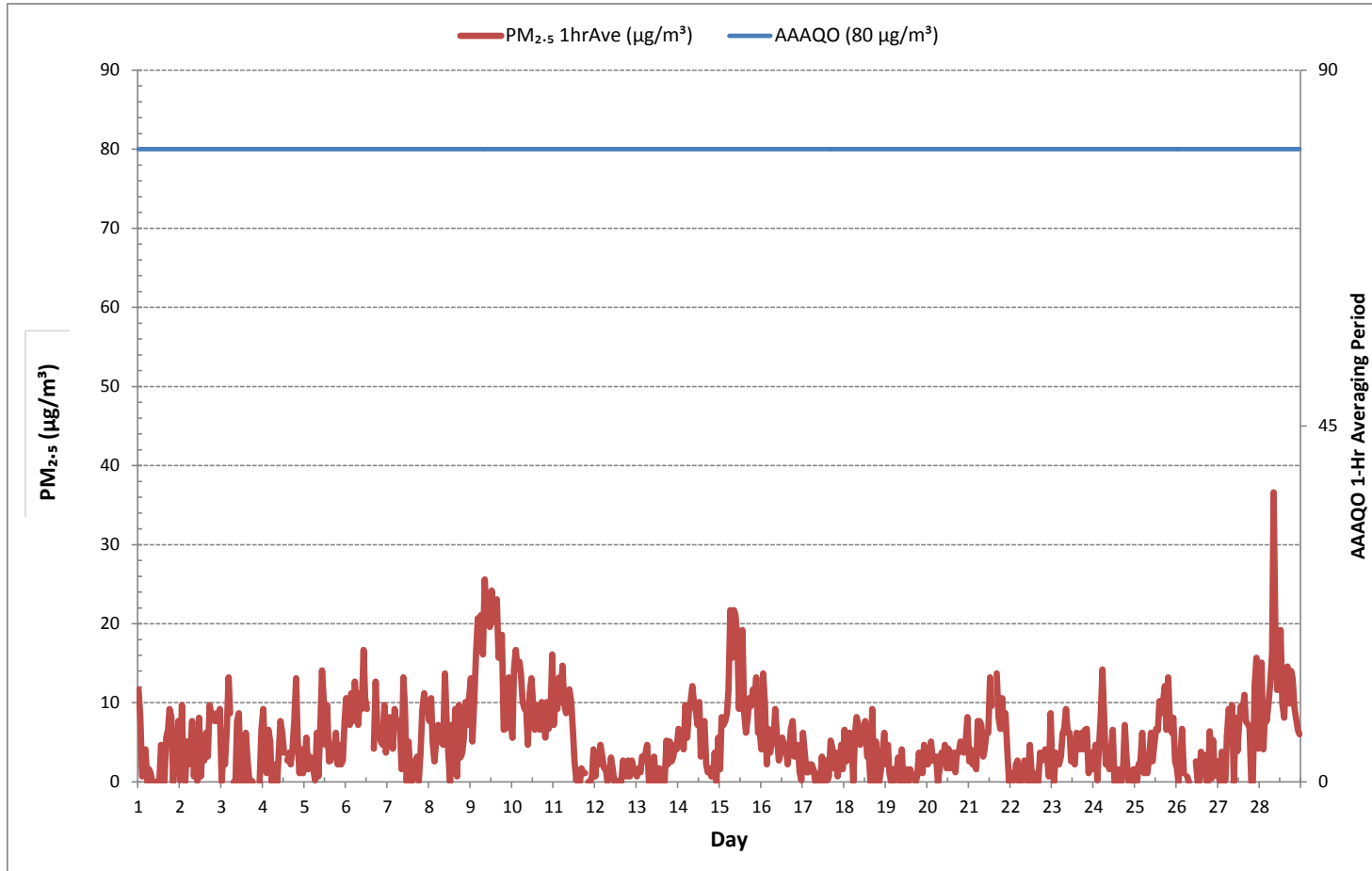
O3[ppb] Calibration: LICA Bonnyville Monthly: 2017/02 Type: Span



Span Meas Span Ref Span Low Span High

PARTICULATE MATTER 2.5

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



Wind: LICA Bonnyville
 Poll.: LICA Bonnyville-PM25[ug/m3(L)]
 Monthly: 2017/02
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

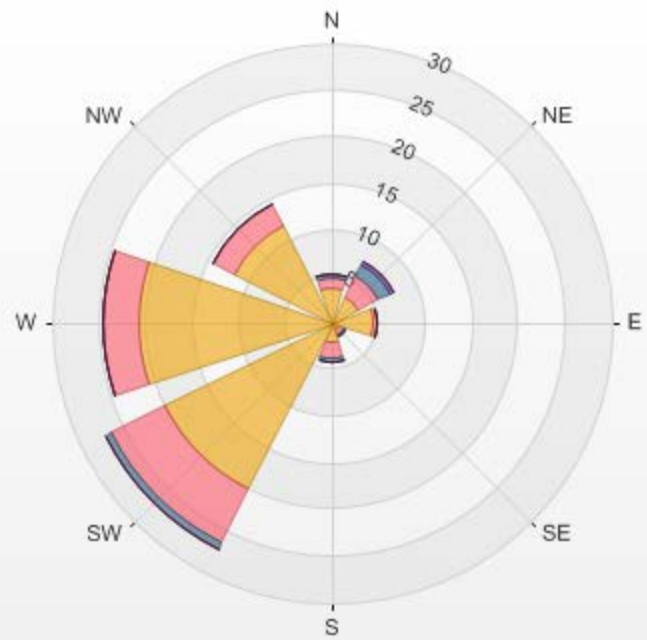
Calm: 10.52%

Calm Avg: 9.19 [ppb]

Direction	0.0-7.3	7.3-14.7	14.7-22.0	22.0-29.4	29.4-36.7	>36.7	Total
N	3.7	1.2	0.3	0.0	0.0	0.0	5.2
NE	3.2	2.4	1.4	0.5	0.0	0.0	7.5
E	4.6	0.3	0.0	0.0	0.0	0.0	4.9
SE	0.8	0.8	0.3	0.0	0.0	0.0	1.8
S	2.1	1.8	0.3	0.0	0.0	0.0	4.3
SW	20.0	6.4	0.8	0.0	0.0	0.0	27.1
W	20.7	3.8	0.0	0.0	0.0	0.0	24.5
NW	11.7	2.4	0.0	0.0	0.0	0.0	14.2
Summary	66.8	19.2	3.0	0.5	0.0	0.0	89.5

% Icon	Classes (ug/m3(L))	19		7.3-14.7	3		14.7-22.0	0		22.0-29.4	0		29.4-36.7	0		>36.7	
67		0.0-7.3															

LICA Bonnyville Poll.: LICA Bonnyville-PM25[ug/m3(L)] 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.52%
 Calm Poll Avg: 9.19[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

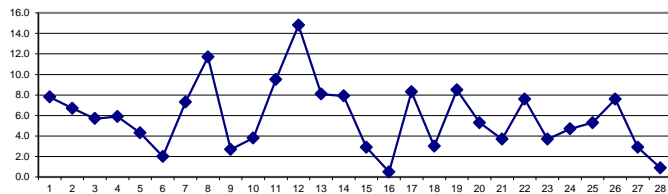
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	7.8	5.2	5.0	5.1	10.0	14.0	14.8	10.1	9.5	12.4	13.7	12.8	13.5	11.0	11.1	9.9	8.2	5.7	3.9	3.6	3.8	5.1	5.5	4.8	3.6	14.8	7.8	24
2	5.1	3.6	3.1	5.8	7.0	6.9	7.4	5.6	7.6	7.7	9.1	9.5	11.8	12.4	11.0	8.9	6.2	3.2	5.3	6.2	5.9	5.2	4.5	4.2	3.1	12.4	6.7	24
3	4.2	3.2	3.0	4.1	5.2	4.8	5.6	4.7	8.2	8.1	7.4	7.0	6.9	7.2	7.8	8.3	7.7	5.9	5.0	4.9	5.1	8.4	9.6	7.6	3.0	9.6	5.7	24
4	5.1	3.9	5.1	4.4	5.5	6.6	4.6	5.7	6.6	9.2	11.1	10.3	11.2	11.4	10.4	9.8	7.9	3.8	4.4	3.6	3.8	3.6	5.3	3.4	3.4	11.4	5.9	24
5	3.6	3.1	3.0	3.1	2.9	3.0	2.4	1.3	1.0	1.8	4.5	6.9	10.0	12.3	11.2	12.3	13.1	11.0	8.1	5.1	3.7	1.3	2.9	1.3	1.0	13.1	4.3	24
6	0.4	0.4	0.4	0.6	0.0	0.2	1.4	1.9	1.1	3.8	2.6	3.6	6.3	7.9	5.5	6.5	2.6	1.0	3.1	3.6	3.5	2.6	3.4	2.8	0.0	7.9	2.0	24
7	3.5	3.4	3.5	4.5	4.4	4.6	4.6	3.8	4.8	5.2	7.9	9.6	8.2	9.8	13.3	10.5	9.3	8.2	9.7	10.4	9.8	10.9	8.8	9.6	3.4	13.3	7.3	24
8	8.7	7.9	6.5	7.9	7.7	7.0	8.9	8.2	10.5	13.6	12.7	14.1	16.7	17.8	17.2	15.0	14.4	16.0	15.9	18.2	19.2	14.0	7.7	6.2	6.2	19.2	11.7	24
9	7.2	9.1	10.5	5.2	4.1	4.5	4.1	1.6	1.5	3.1	3.5	5.1	4.1	9.4	8.9	9.2	9.4	8.5	7.8	9.6	6.7	6.1	7.3	6.7	1.5	10.5	2.7	24
10	4.7	3.6	1.6	2.8	4.6	0.9	0.5	3.3	5.2	5.9	6.3	6.7	6.4	5.6	6.1	10.8	15.9	12.8	11.2	8.6	9.1	6.7	5.3	6.2	0.5	15.9	3.8	24
11	3.9	3.1	4.0	5.4	8.0	6.7	8.1	9.9	11.7	13.3	12.2	12.5	14.0	18.0	17.0	14.5	8.6	7.8	8.5	11.3	11.9	8.8	11.5	13.2	3.1	18.0	9.5	24
12	13.8	11.8	14.4	13.0	12.3	11.6	14.5	13.5	14.2	15.0	18.5	18.0	17.3	20.1	20.4	19.1	17.7	15.5	13.4	11.1	14.2	14.2	12.7	12.1	11.1	20.4	14.8	24
13	13.2	9.2	9.9	9.7	10.2	10.1	8.6	7.6	7.9	7.9	7.0	5.9	9.6	11.2	10.3	7.4	5.2	8.5	7.3	6.2	4.2	6.7	6.8	7.6	4.2	13.2	8.1	24
14	8.0	7.7	6.9	5.6	8.6	7.0	5.5	1.8	6.1	6.3	10.0	9.1	7.3	8.0	7.6	13.7	9.9	13.6	10.4	10.6	11.0	13.0	8.1	5.5	1.8	13.7	7.9	24
15	5.0	0.6	1.0	0.1	0.1	0.1	1.2	3.9	6.0	2.0	1.7	2.3	1.0	5.7	13.9	13.0	8.2	2.3	4.4	6.0	5.3	7.5	6.2	7.3	0.1	13.9	2.9	24
16	0.8	1.0	0.7	2.4	5.0	8.2	7.0	5.4	1.4	0.3	1.1	1.4	1.6	1.5	1.4	1.7	2.9	1.9	2.4	3.2	4.2	5.8	2.9	5.8	0.3	8.2	0.5	24
17	9.3	7.5	7.6	6.1	8.1	9.4	9.8	6.6	7.9	7.9	8.1	13.7	13.9	10.3	12.3	11.6	12.1	8.2	5.4	6.0	4.9	5.9	5.1	6.3	4.9	13.9	8.3	24
18	6.5	5.8	7.1	3.9	2.8	0.4	0.9	1.6	0.6	1.2	0.2	2.2	5.9	6.2	7.2	7.3	7.9	8.3	10.4	10.6	12.3	10.0	9.9	10.5	0.2	12.3	3.0	24
19	11.9	13.0	15.5	16.8	14.4	12.6	10.2	10.2	12.5	11.3	10.2	8.7	8.2	7.5	5.9	6.1	6.3	5.4	3.5	5.8	4.3	3.0	3.5	3.1	3.0	16.8	8.5	24
20	1.0	2.8	3.7	4.8	5.4	5.8	6.4	6.1	6.8	6.0	6.9	7.8	7.6	9.7	6.2	5.8	7.3	4.4	7.1	5.1	4.0	3.7	2.9	1.8	1.0	9.7	5.3	24
21	1.4	1.0	3.5	3.1	3.7	9.1	8.8	7.9	8.0	3.0	5.7	7.5	5.6	5.9	5.2	6.1	9.4	5.8	4.6	6.8	8.4	9.8	10.1	6.8	1.0	10.1	3.7	24
22	8.2	8.7	7.1	6.5	7.9	8.1	8.1	8.0	5.6	8.3	8.4	11.0	7.3	9.3	9.0	9.0	9.4	7.8	9.5	5.3	8.3	6.6	8.9	6.1	5.3	11.0	7.6	24
23	5.4	5.0	4.9	4.4	5.5	4.1	2.7	0.0	0.4	4.3	5.8	6.6	7.3	10.2	10.8	7.2	1.6	0.5	3.7	4.5	4.0	4.1	7.3	4.9	0.0	10.8	3.7	24
24	0.5	3.1	0.8	3.2	0.6	2.1	4.9	6.0	9.4	9.9	8.2	8.2	8.1	9.9	11.8	12.2	9.0	7.1	6.6	7.0	2.8	2.3	5.7	4.7	0.5	12.2	4.7	24
25	6.6	6.9	5.6	6.5	6.1	6.3	5.3	6.0	7.2	8.1	8.5	9.2	10.7	11.6	9.7	4.7	6.0	6.2	4.3	8.9	8.4	7.7	9.6	5.8	4.3	11.6	5.3	24
26	3.9	6.0	7.2	9.5	15.4	19.2	13.5	14.9	15.1	15.2	15.1	13.9	10.8	9.8	7.5	9.7	10.5	7.3	5.7	4.0	3.4	5.3	3.3	6.4	3.3	19.2	7.6	24
27	10.8	6.2	5.9	10.2	8.4	6.1	6.2	9.2	14.7	12.2	7.8	7.6	8.3	8.8	1.0	7.9	8.0	9.8	8.6	8.4	5.8	3.1	1.1	0.4	0.4	14.7	2.9	24
28	0.8	1.4	2.0	0.5	0.7	0.7	0.3	0.5	0.5	4.3	4.6	1.2	2.1	3.3	4.6	3.7	2.0	2.6	0.8	1.4	8.2	10.5	9.3	9.1	0.3	10.5	0.9	24
HOURLY MAX	13.8	13.0	15.5	16.8	15.4	19.2	14.8	14.9	15.1	15.2	18.5	18.0	17.3	20.1	20.4	19.1	17.7	16.0	15.9	18.2	19.2	14.2	12.7	13.2				
HOURLY AVG	3.6	3.3	3.4	3.3	3.5	3.1	3.0	2.5	3.0	4.0	4.5	4.8	4.7	5.4	5.0	4.1	3.7	2.9	2.6	2.5	2.5	2.7	2.8	3.0				

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

LAST CALIBRATION: January 26, 2016
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

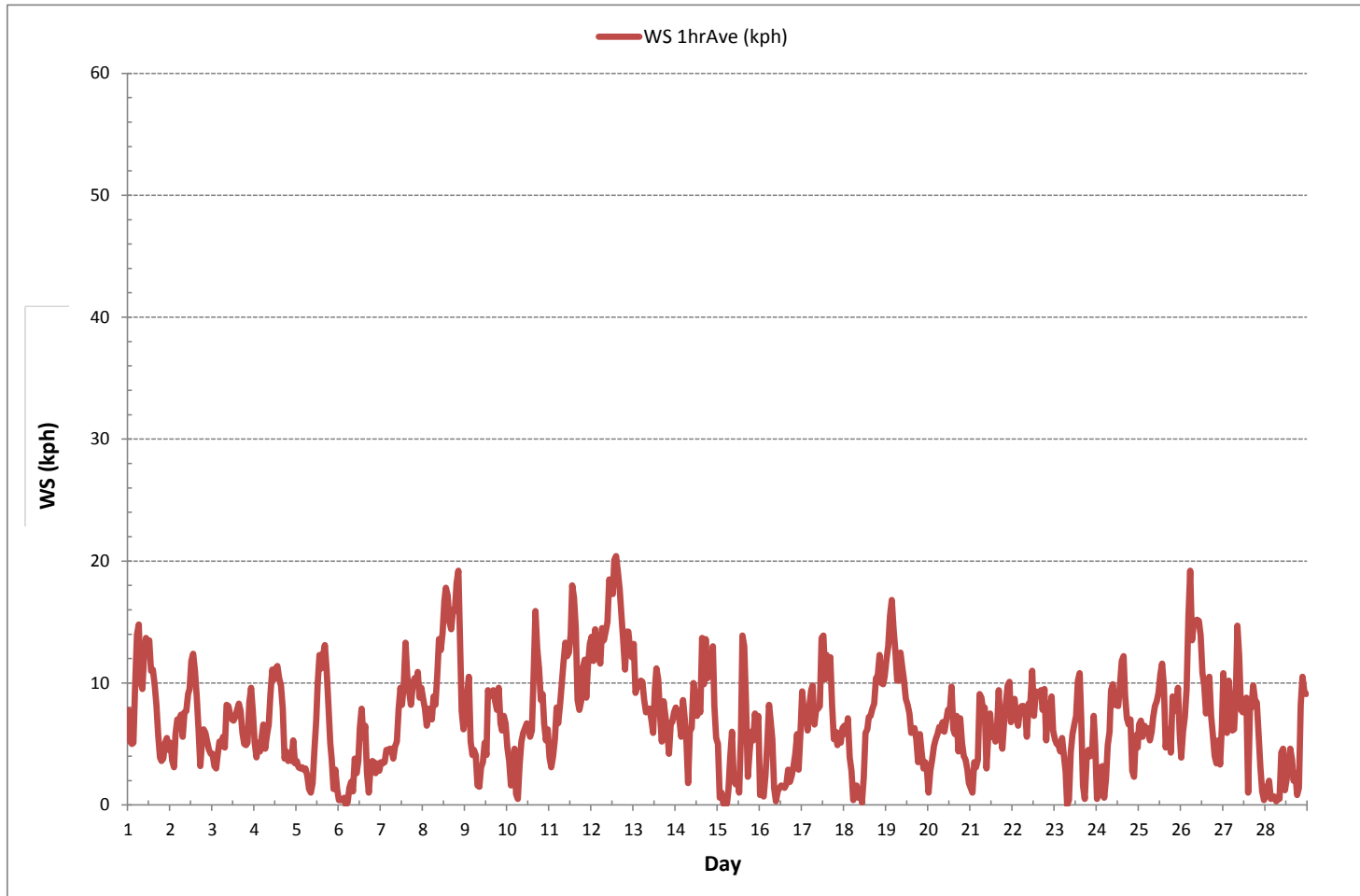
24 HR AVERAGES February 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	670
MINIMUM 1-HR AVERAGE:	0.0 kph @ HOUR(S) 4, 7 ON DAY(S) 6, 23
MAXIMUM 1-HR AVERAGE:	20.4 kph @ HOUR(S) 14 ON DAY(S) 12
MAXIMUM 24-HR AVERAGE:	14.8 kph ON DAY(S) 12
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	672 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.0
MONTHLY AVERAGE:	3.5 kph

WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	20.0	13.9	13.9	12.9	29.4	36.2	32.7	25.2	22.7	26.4	29.1	29.9	28.6	21.6	21.4	20.7	17.8	12.7	8.3	8.3	8.0	8.2	10.3	9.6	8.0	36.2	19.5	24
2	8.9	8.1	9.8	12.7	12.6	14.8	15.2	10.7	14.7	14.2	16.9	18.6	20.0	22.3	18.7	17.2	10.2	8.3	9.6	14.2	12.9	10.0	9.8	8.2	8.1	22.3	13.3	24
3	10.2	7.7	8.0	10.3	11.4	11.2	12.1	11.2	16.2	17.5	18.3	15.6	15.1	17.8	17.5	19.5	17.6	13.6	9.9	9.7	13.5	18.2	17.7	17.0	7.7	19.5	14.0	24
4	14.9	8.3	9.3	9.1	14.6	14.1	10.2	15.8	13.6	22.7	26.1	25.0	29.1	24.8	22.2	21.5	19.7	9.1	10.5	10.0	8.6	10.1	10.9	11.3	8.3	29.1	15.5	24
5	7.8	8.6	7.5	7.7	7.1	5.9	5.9	4.7	5.0	6.2	11.5	14.1	21.4	26.0	21.5	25.2	30.9	20.5	19.2	10.7	8.7	5.9	8.4	5.2	4.7	30.9	12.3	24
6	3.7	2.3	2.7	3.8	0.6	5.4	7.0	5.8	7.7	10.5	9.2	9.5	12.4	15.3	14.6	14.4	7.6	7.7	6.0	9.0	8.6	6.1	7.5	6.8	0.6	15.3	7.7	24
7	7.6	8.3	8.1	11.5	8.1	10.1	10.3	10.0	10.0	11.2	15.4	18.6	17.5	21.2	27.3	20.6	19.4	17.6	19.2	21.8	19.7	21.4	17.6	20.6	7.6	27.3	15.5	24
8	19.4	17.7	16.4	18.1	17.3	14.8	16.8	15.0	21.7	26.3	23.6	27.0	32.1	33.9	36.0	29.0	28.5	25.4	28.4	32.8	29.7	20.0	18.5	16.0	14.8	36.0	23.5	24
9	13.7	15.2	14.9	12.6	7.7	18.9	10.3	7.4	7.9	8.3	10.4	12.2	10.9	19.4	20.1	21.8	20.3	17.8	21.0	23.3	19.0	14.3	16.4	15.9	7.4	23.3	15.0	24
10	10.8	11.5	6.1	6.2	8.9	5.2	6.8	10.4	13.3	15.4	14.8	15.7	17.3	13.3	15.8	19.9	26.4	22.4	21.3	17.9	20.2	13.2	10.4	12.0	5.2	26.4	14.0	24
11	9.7	11.1	10.7	10.3	15.4	13.4	16.6	19.7	22.4	22.7	24.0	25.7	46.4	44.3	40.2	36.3	22.6	15.0	16.3	22.5	23.0	22.2	23.8	28.4	9.7	46.4	22.6	24
12	27.5	23.5	27.8	28.7	23.7	22.8	30.2	26.1	27.9	30.8	34.4	33.9	38.7	38.4	34.7	39.6	32.5	28.5	25.1	23.0	30.4	27.1	24.5	33.6	22.8	39.6	29.7	24
13	31.1	26.3	18.3	18.2	18.2	20.3	16.1	15.0	19.4	16.7	17.2	14.1	22.0	23.8	21.1	12.6	12.6	16.4	13.7	15.8	8.4	11.1	12.6	15.7	8.4	31.1	17.4	24
14	13.6	13.2	11.2	10.9	18.4	12.7	8.0	5.7	8.7	13.5	16.5	15.6	11.8	12.4	13.9	21.1	24.4	20.5	19.8	18.3	19.4	13.8	9.4	5.7	24.4	14.7	24	
15	11.7	6.8	6.7	4.7	5.6	3.4	10.3	13.2	12.6	11.6	7.8	7.1	5.0	17.7	21.5	20.4	13.8	9.7	8.4	8.9	9.4	13.2	10.1	11.4	3.4	21.5	10.5	24
16	8.1	6.5	6.1	13.3	12.9	17.9	15.5	13.5	8.7	4.9	6.4	6.4	7.1	7.0	8.2	8.7	7.8	7.3	9.5	18.1	17.8	12.5	12.4	15.0	4.9	18.1	10.5	24
17	24.5	16.9	16.4	15.9	17.1	21.8	22.6	15.5	16.5	21.6	31.3	38.5	31.7	39.6	30.8	25.9	30.0	20.9	17.5	11.5	10.7	13.2	11.4	13.8	10.7	39.6	21.5	24
18	14.8	12.2	14.6	10.6	7.3	3.5	5.6	5.7	5.5	6.8	3.7	8.3	16.0	13.8	15.4	18.5	16.7	17.9	21.6	23.8	26.1	24.3	21.8	22.9	3.5	26.1	14.1	24
19	28.2	29.8	31.4	34.7	35.3	28.1	26.0	26.6	27.6	27.0	24.9	21.5	18.8	15.5	11.1	13.2	13.3	12.6	8.9	11.6	10.1	8.5	7.2	6.9	6.9	35.3	20.0	24
20	5.6	6.9	10.5	11.0	12.9	15.6	16.8	15.6	17.9	17.4	20.5	20.6	20.1	21.0	14.9	12.9	21.2	10.9	19.9	12.1	10.1	8.7	7.7	5.6	5.6	21.2	14.0	24
21	5.8	7.1	6.8	7.5	7.8	15.0	16.0	13.3	18.1	8.4	13.3	14.7	13.4	12.7	11.6	13.5	21.0	16.8	16.3	15.3	21.0	25.6	23.4	15.4	5.8	25.6	14.2	24
22	16.8	19.8	17.9	17.0	18.9	18.1	18.5	16.9	14.4	18.3	22.2	25.0	20.8	24.7	25.7	20.6	25.6	23.5	22.6	15.5	17.9	13.7	18.8	12.0	12.0	25.7	19.4	24
23	12.3	11.2	12.1	10.5	11.8	10.0	6.0	1.2	6.6	11.6	12.6	11.7	12.2	18.2	18.3	13.6	8.4	2.7	7.8	7.7	7.2	9.4	11.9	11.6	1.2	18.3	10.3	24
24	5.3	10.3	7.8	8.1	4.0	10.8	11.3	15.1	21.9	19.1	18.8	17.0	17.6	22.6	25.8	25.9	20.2	16.5	14.4	17.0	10.8	8.3	9.6	9.2	4.0	25.9	14.5	24
25	14.8	11.9	8.9	8.2	9.9	7.7	9.5	8.8	9.9	12.4	13.2	16.4	18.3	18.6	14.7	10.9	10.3	13.6	11.3	21.6	17.6	21.5	20.5	15.0	7.7	21.6	13.6	24
26	8.8	13.3	15.6	23.0	38.7	47.6	29.8	41.5	32.3	31.5	32.3	28.4	21.4	21.6	19.3	22.9	22.1	17.3	15.6	10.4	9.5	12.6	10.3	20.5	8.8	47.6	22.8	24
27	17.8	8.8	8.6	18.6	18.6	13.3	11.5	15.2	22.5	20.4	17.5	18.5	16.3	14.4	12.2	15.7	19.5	20.9	21.1	19.1	13.7	8.8	7.4	4.7	4.7	22.5	15.2	24
28	4.0	6.7	7.4	4.4	3.4	3.6	4.0	4.1	4.2	8.9	13.5	8.8	7.3	9.1	7.4	8.6	5.1	7.8	6.6	8.4	22.4	21.7	21.9	22.0	3.4	22.4	9.2	24
HOURLY MAX	31.1	29.8	31.4	34.7	38.7	47.6	32.7	41.5	32.3	31.5	34.4	38.5	46.4	44.3	40.2	39.6	32.5	28.5	28.4	32.8	30.4	27.1	24.5	33.6				
HOURLY AVG	13.5	12.3	12.0	12.9	14.2	15.1	14.3	13.9	15.4	16.5	18.1	18.5	19.6	21.1	20.1	19.7	18.7	15.6	15.4	15.7	15.5	14.6	14.2	14.1				

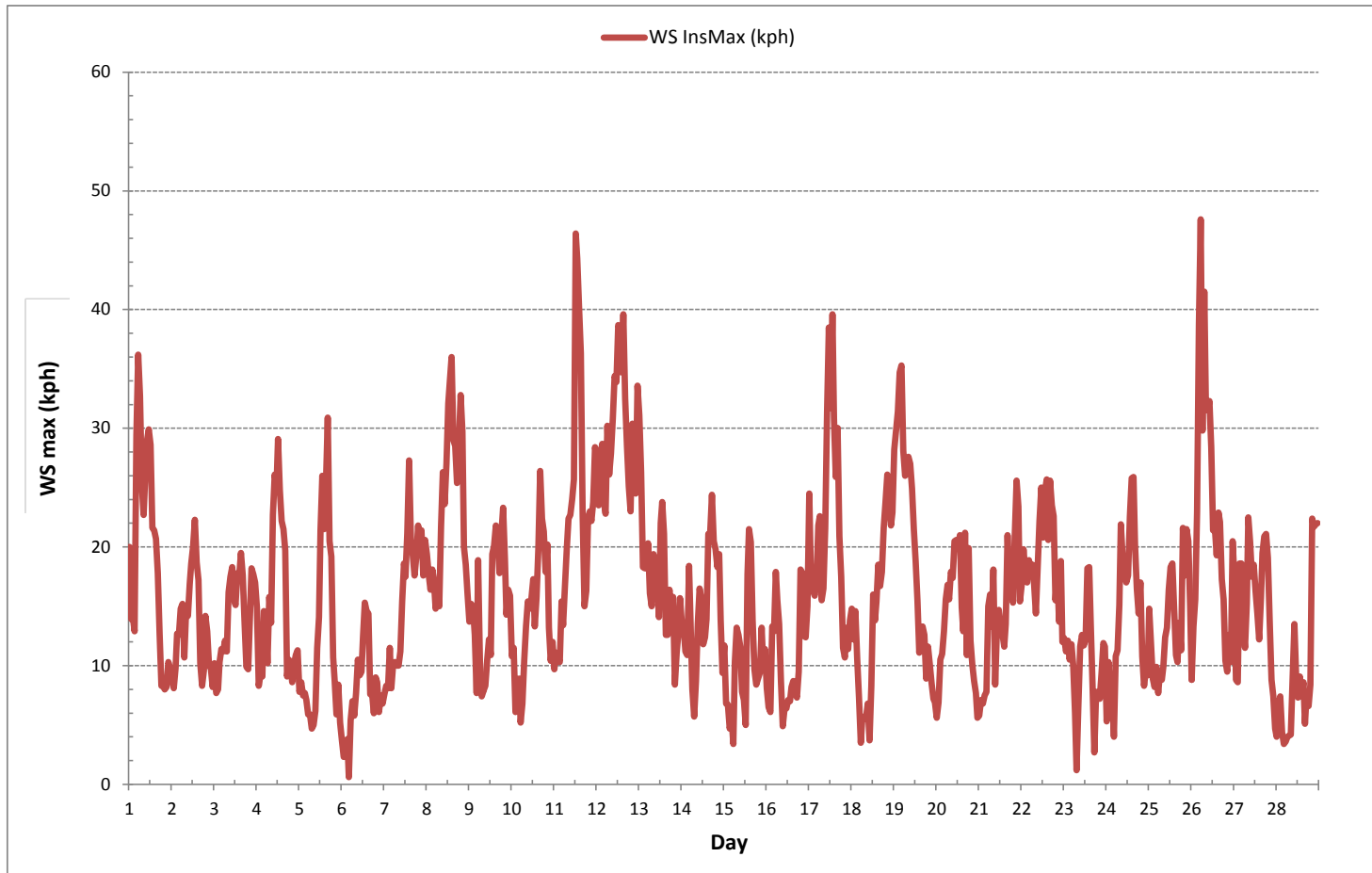
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	47.6	kph	@ HOUR(S)	5	ON DAY(S)	26
					VAR-VARIOUS	
OPERATIONAL TIME:					672	hrs

WIND SPEED Instantaneous Maximum (WS kph)



Wind: LICA Bonnyville
 Monitor: WSP [kph]
 Monthly: 2017/02
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

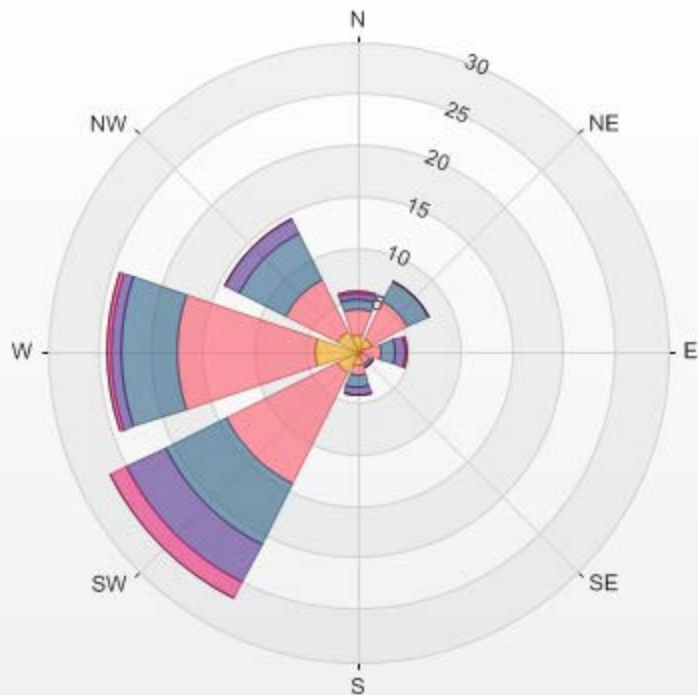
Calm: 10.27%

Calm Avg: 0.00 [ppb]

Direction	1.8-4.1	4.1-8.2	8.2-12.3	12.3-16.4	16.4-20.5	>20.5	Total
N	1.6	2.5	0.9	0.6	0.2	0.0	5.8
NE	1.5	4.0	2.2	0.0	0.0	0.0	7.7
E	0.5	1.8	1.5	0.9	0.2	0.0	4.8
SE	0.5	0.9	0.5	0.0	0.0	0.0	1.8
S	1.3	0.9	1.3	0.6	0.0	0.0	4.2
SW	2.2	12.1	6.6	4.2	1.8	0.0	26.8
W	4.2	13.4	5.4	1.0	0.3	0.0	24.3
NW	2.2	5.7	5.1	1.5	0.0	0.0	14.4
Summary	14.0	41.2	23.4	8.8	2.4	0.0	89.8

% Icon Classes (kph) 14 1.8-4.1 41 4.1-8.2 23 8.2-12.3 9 12.3-16.4 2 16.4-20.5 0 >20.5

LICA Bonnyville 2017/02/01 00:00 - 2017/02/28 23:00 Calm: 10.27% Calm Wind Avg Speed: 0.91(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	WNW	W	W	W	WNW	NW	NNW	NNW	NNW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	W	W	W	WSW	WSW	WSW	NW	24		
2	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	WSW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24	
3	WSW	WSW	W	WNW	NW	NW	NW	NW	NNW	NNW	NNW	N	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24	
4	NW	NW	NW	NW	WNW	NW	WNW	WSW	WSW	WSW	W	W	W	W	W	W	W	WNW	W	W	SW	SW	SW	WSW	W	24		
5	SSW	SW	SSW	SW	W	WSW	W	W	WNW	SW	W	NW	NW	NNW	NW	NW	NNW	NNW	NNW	NNW	N	NW	NNW	NW	NW	24		
6	W	WNW	WNW	NW	WNW	NNW	NNE	N	SSE	NNE	NE	ENE	NE	NE	NNE	NE	ESE	NE	NNW	NNW	NNW	NW	NW	WNW	NNE	24		
7	W	W	W	W	WSW	W	WSW	WSW	SW	WSW	WSW	WSW	WSW	W	WSW	SW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24	
8	WSW	W	W	W	W	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	24	
9	SW	SW	SSW	WSW	S	SSW	SSE	ESE	ENE	ESE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	24	
10	NE	N	N	NNW	N	NNW	SE	ENE	ENE	E	NE	NE	ENE	ENE	ESE	SSE	SSE	SSE	SSE	SE	SSE	SSE	SSE	SSE	SSE	ESE	24	
11	SSE	S	W	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	WSW	SW	SW	SW	SW	WSW	SW	SW	SW	WSW	WSW	24	
12	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	SW	24	
13	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	WSW	WSW	24	
14	SW	SW	SW	SW	WSW	SW	SW	S	SW	SSW	SW	SSW	SW	S	S	S	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24	
15	SW	W	SSW	SW	NNW	NNW	NNE	NE	NE	N	NNE	N	WNW	SW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	24	
16	S	NNE	NE	ENE	ENE	E	E	NE	N	W	S	WSW	S	SSE	ENE	SE	SW	S	NNW	ESE	W	WNW	WSW	WSW	ESE	24		
17	WSW	WSW	WSW	W	WSW	W	W	W	WSW	W	W	WNW	W	W	WNW	W	W	W	W	W	WSW	W	WSW	WSW	WSW	W	24	
18	WSW	WSW	WSW	WSW	WSW	WNW	S	S	NW	WSW	W	S	SE	ESE	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
19	ENE	ENE	ENE	ENE	ENE	E	E	ENE	ENE	ENE	ENE	ENE	ENE	E	E	E	ENE	ENE	NE	NE	NE	NE	NNE	NNE	ENE	ENE	24	
20	N	WNW	W	W	W	W	W	W	W	WNW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	WNW	WNW	24
21	WNW	S	S	SSW	S	SSW	SSW	SW	SW	W	WSW	WSW	W	WNW	NNW	N	NNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	24	
22	NW	NW	NW	WNW	NW	NNW	NNW	NNW	NW	WNW	WNW	NW	W	W	WNW	W	WNW	W	NW	NW	NW	NW	NW	NW	WNW	NW	24	
23	W	W	W	W	NW	NW	NW	W	W	WSW	SW	SW	SW	SW	SW	SW	WSW	WNW	SE	SSE	SSE	S	SW	WSW	WSW	NW	24	
24	NW	NNW	SE	N	NNW	NNE	NNE	N	N	N	N	NNW	NNW	NW	NW	NW	WNW	W	WNW	WNW	SW	SW	SW	SW	NW	NW	24	
25	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SW	SW	SSW	SW	W	NW	NW	NW	NNW	NNW	SW	SW	SW	24	
26	WNW	W	WSW	WNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	WNW	W	W	W	W	W	SW	SW	SSW	SSW	NW	NW	24	
27	SSW	SW	SSW	SSW	SSW	SW	SSW	SSW	SSW	SW	WSW	WSW	SW	WSW	SW	WSW	NE	NE	NE	NE	NE	ENE	NNE	NNE	SSW	SSW	24	
28	NW	NNW	NNW	NNW	NW	NNW	WSW	WNW	WNW	SSW	WNW	WSW	SW	NNW	S	S	WSW	SSE	S	NE	ENE	ENE	NE	NE	NE	NE	24	

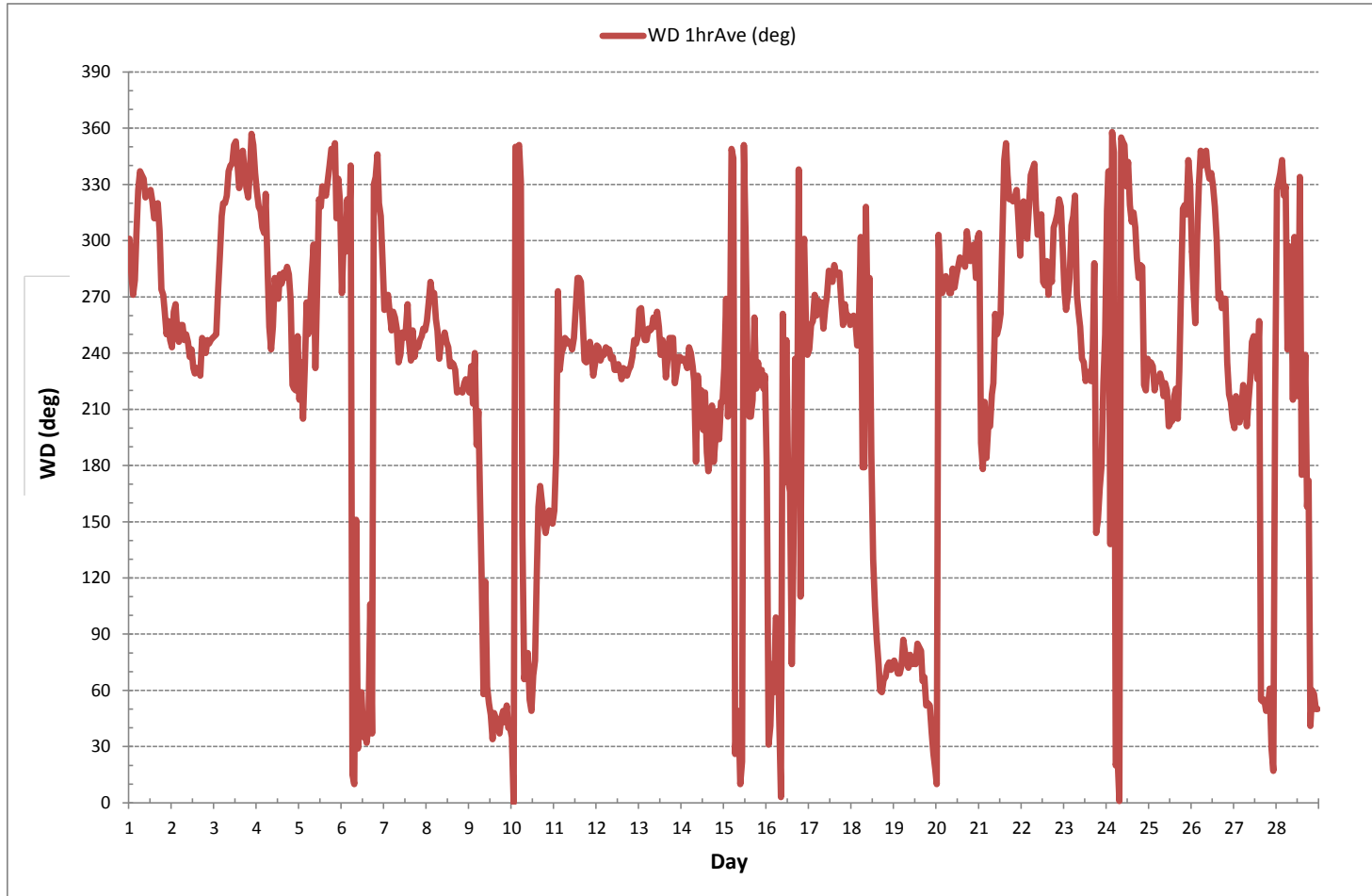
STATUS FLAG CODES

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:	672	hrs
STANDARD DEVIATION:	88		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	265	(W)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - February 2017

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	14	16	15	16	15	14	15	14	14	14	15	15	15	15	14	14	12	11	15	11	14	8	10	8	24	
2	9	15	16	13	11	13	13	10	12	13	12	15	13	12	12	11	9	15	12	14	14	13	16	13	24	
3	17	16	15	13	11	12	11	13	12	13	15	16	18	18	16	13	14	12	11	10	11	14	13	12	24	
4	15	9	10	10	12	11	13	15	14	15	18	19	20	18	19	20	16	11	12	25	12	17	16	25	24	
5	15	14	10	16	11	12	14	7	9	22	18	15	15	15	14	14	14	13	12	11	12	9	9	7	24	
6	21	5	3	8	0	39	14	16	42	29	38	25	20	18	24	24	53	56	10	10	11	11	10	12	24	
7	11	12	11	12	11	11	10	17	20	16	18	13	17	20	18	13	16	13	13	13	13	13	15	14	24	
8	15	16	16	16	15	14	13	10	13	14	15	14	13	14	14	13	12	7	7	8	7	7	14	14	24	
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10	24	20	11	10	10	19	46	30	26	26	24	22	24	33	30	10	8	10	11	13	12	13	24	12	24	
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15	12	19	24	52	19	11	29	28	28	18	22	25	13	15	8	6	11	20	17	7	12	10	6	8	24	
16	43	20	34	38	21	34	22	25	19	27	71	25	56	52	52	61	26	55	27	55	41	15	29	20	24	
17	13	15	14	15	15	15	15	16	13	17	17	16	17	18	16	17	17	16	14	11	13	14	13	14	24	
18	14	13	13	11	11	10	26	25	19	17	12	29	32	26	22	23	18	17	17	19	19	22	19	21	24	
19	20	20	17	17	19	19	20	20	19	20	20	21	21	18	19	18	18	18	21	16	17	17	14	14	24	
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25	13	10	6	6	7	4	9	7	7	7	8	8	9	9	8	22	10	10	12	12	11	13	14	13	24	
26	12	16	14	15	16	16	16	15	16	14	16	16	16	18	22	20	18	17	15	14	14	18	30	22	24	
27	8	7	10	8	14	17	6	6	6	8	15	20	16	9	28	19	20	17	19	19	22	20	30	27	24	
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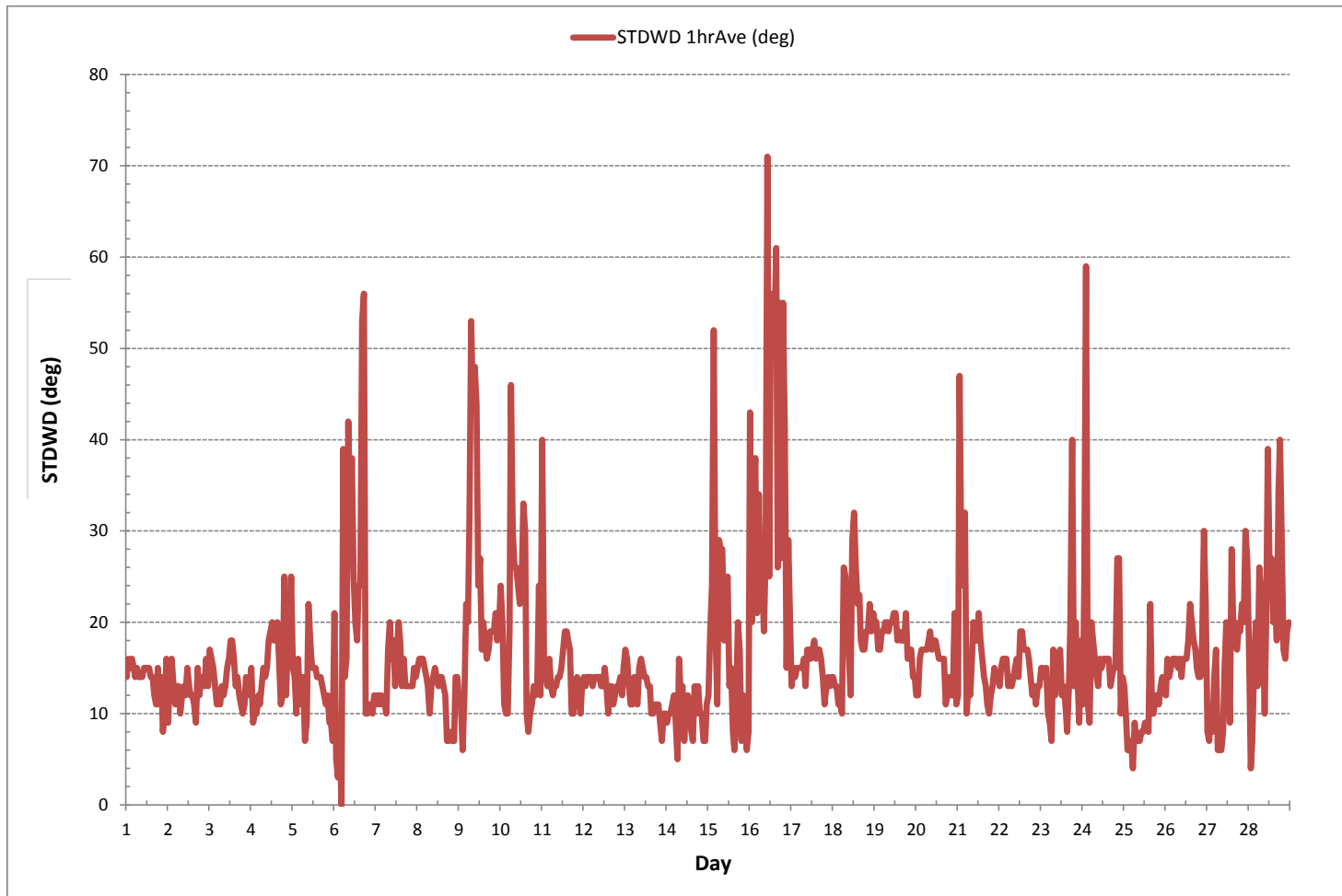
STATUS FLAG CODES

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: 672 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



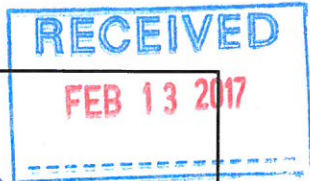
APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Sample ID: 17020107-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/Feb 06, 2017



Maxxam Analytics

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

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: 1098
 Station ID: LICA 37 Installation Date/Time (mst): Feb 01, 2017 @ 14:54
 Sample ID: LICA/VOC/Bonnyville/Feb 06, 2017 Removal Date/Time (mst): Feb 10, 2017 @ 13:42

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Feb 06, 2017</u>	<u>00:00</u>	<u>00:00 Feb 07, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.4</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>27.5</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: Jan 27, 2017 (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: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Feb 10, 2017

Volatile Organics Data Results

Date: February 6, 2017
Canister ID: 1098

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	< 0.05
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	0.04
2,3-Dimethylpentane	0.05
2,4-Dimethylpentane	0.01
2-Methylheptane	0.03
2-Methylhexane	0.05
2-Methylpentane	0.10
3-Methylheptane	< 0.02
3-Methylhexane	0.05
3-Methylpentane	0.07
Acetone	1.50
Acrolein	< 0.3
Benzene	0.18
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.01
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.52
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.12
Cyclopentane	0.06
Dibromochloromethane	< 0.01
Ethanol	0.50
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.37

Volatile Organics Data Results

Date: February 6, 2017
Canister ID: 1098

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.12
Freon-114	0.02
Freon-12	0.76
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.72
Isopentane	0.56
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	0.17
Methylcyclopentane	0.15
Methylene chloride	< 0.3
n-Butane	1.46
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.09
n-Hexane	0.13
n-Nonane	0.01
n-Octane	0.05
n-Pentane	0.40
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	0.15
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: 6200
 Location: Bonnyville - AER Canister ID: 2475
 Station ID: LICA 37 Installation Date/Time (mst): Feb 10, 2017 @ 13:42
 Sample ID: LICA/VOC/Bonnyville/Feb 12, 2017 Removal Date/Time (mst): Feb 13, 2017 @ 12:09

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Feb 12, 2017</u>	<u>00:00</u>	<u>00:00 Feb 13, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-28.0</u>	<u>+18.3</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>27.5</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: Jan 27, 2017 (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: n/a

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Feb 13, 2017

Sample ID: 17020168-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Feb 12, 2017



Volatile Organics Data Results

Date: February 12, 2017
Canister ID: 2475

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	0.02
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	0.01
2-Methylpentane	0.03
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.03
Acetone	1.50
Acrolein	< 0.3
Benzene	0.09
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.14
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.64
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	0.70
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.39

Volatile Organics Data Results

Date: February 12, 2017
Canister ID: 2475

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.11
Freon-114	0.03
Freon-12	0.84
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.61
Isopentane	0.29
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	0.88
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	0.20
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: 6200
 Location: Bonnyville - AER Canister ID: 1154
 Station ID: LICA 37 Installation Date/Time (mst): Feb 13, 2017 @ 12:09
 Sample ID: LICA/VOC/Bonnyville/Feb 18, 2017 Removal Date/Time (mst): Feb 21, 2017 @ 13:52

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Feb 18, 2017</u>	<u>00:00</u>	<u>00:00 Feb 19, 2017</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>27.5</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: Jan 27, 2017 (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

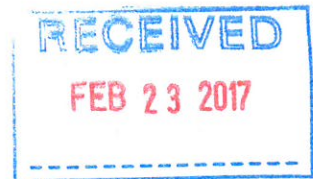
Comments: The canister is not equipped with a pressure gauge.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Feb 21, 2017

Sample ID: 17020226-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Feb 18, 2017



Volatile Organics Data Results

Date: February 18, 2017
Canister ID: 1154

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	0.25
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	0.02
2-Methylpentane	0.04
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.02
Acetone	1.90
Acrolein	< 0.3
Benzene	0.12
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.04
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.45
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	1.30
Ethyl acetate	< 0.4
Ethylbenzene	0.01
Freon-11	0.34

Volatile Organics Data Results

Date: February 18, 2017
Canister ID: 1154

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.11
Freon-114	0.02
Freon-12	0.73
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.50
Isopentane	0.33
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	0.76
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
n-Hexane	0.04
n-Nonane	0.01
n-Octane	< 0.02
n-Pentane	0.20
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	0.06
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: 6200
 Location: Bonnyville - AER Canister ID: 2262
 Station ID: LICA 37 Installation Date/Time (mst): Feb 21, 2017 @ 13:52
 Sample ID: LICA/VOC/Bonnyville/Feb 24, 2017 Removal Date/Time (mst): Feb 27, 2017 @ 12:48

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Feb 24, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Feb 25, 2017</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>27.5</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: Jan 27, 2017 (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: The canister is not equipped with a pressure gauge

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Feb 27, 2017

Sample ID: 17020269-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Feb 24, 2017



Volatile Organics Data Results

Date: February 24, 2017
Canister ID: 2262

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	< 0.05
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	0.11
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	0.02
2,3-Dimethylpentane	0.03
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.02
2-Methylhexane	0.03
2-Methylpentane	0.06
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.04
Acetone	1.90
Acrolein	< 0.3
Benzene	0.14
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.67
Carbon tetrachloride	0.15
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.49
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.07
cis-2-Pentene	< 0.02
Cyclohexane	0.05
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	1.70
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.40

Volatile Organics Data Results

Date: February 24, 2017
Canister ID: 2262

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.12
Freon-114	0.02
Freon-12	0.82
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.65
Isopentane	0.35
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.06
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	0.09
Methylcyclopentane	0.08
Methylene chloride	< 0.3
n-Butane	0.80
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.06
n-Nonane	0.02
n-Octane	0.02
n-Pentane	0.20
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	0.09
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

PAH RESULTS

Sample ID: 17020107-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Feb
06, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-01</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139 / 100 - 1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Feb 01, 2017 / 14:39</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Feb 06, 2017</u>	Removal Date/Time:	<u>Feb 10, 2017 / 13:35</u>

Sample Data Collection Information

Sample Date:	<u>Feb 06, 2017</u>	Average Pressure (mmHg)	<u>707</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Feb 07, 2017</u>	Average Temperature (°C)	<u>-23.6</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (Vstd m ³)	<u>330.15</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>Jan 27, 2017</u>	
Other observations?	<u>n/a</u>	

Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	<u>Date: Feb 10, 2017</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: February 6, 2017
PUF S/N: TE-01

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.84
2-Methylnaphthalene	1.30
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.15
Acenaphthylene	0.08
Acridine	< 0.01
Anthracene	0.01
Benzo(a)anthracene	0.02
Benzo(a)pyrene	0.02
Benzo(b,j,k)fluoranthene	0.09
Benzo(c)phenanthrene	0.01
Benzo(e)pyrene	0.03
Benzo(ghi)perylene	< 0.01
Chrysene	0.06
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.01
Fluoranthene	0.11
Fluorene	0.14
Indeno(1,2,3-cd)pyrene	0.03
Naphthalene	1.50
Perylene	0.01
Phenanthrene	0.36
Pyrene	0.07
Retene	0.08

Sample ID: 17020168-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Feb
12, 2017

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>A13-02</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139 / 100 - 1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Feb 10, 2017/13:35</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Feb 12, 2017</u>	Removal Date/Time:	<u>Feb 13, 2017/12:22</u>

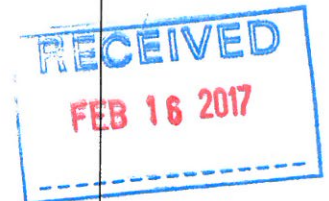
Sample Data Collection Information

Sample Date:	<u>Feb 12, 2017</u>	Average Pressure (mmHg)	<u>701</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Feb 13, 2017</u>	Average Temperature (°C)	<u>+0.6°</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	<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>Jan 27, 2017</u>	
Other observations?	<u>n/a</u>	



Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>Alex Yakupov</u>	<u>Date: Feb 13, 2017</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: February 12, 2017
PUF S/N: A13-02

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.12
2-Methylnaphthalene	0.12
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.02
Acenaphthylene	< 0.01
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.03
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.04
Fluorene	0.06
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.18
Perylene	< 0.01
Phenanthrene	0.13
Pyrene	0.01
Retene	0.03

Sample ID: 17020226-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/Feb 18, 2017

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puff S/N:	<u>TE-08</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1138/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Feb 13, 2017 / 12:22</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Feb 18, 2017</u>	Removal Date/Time:	<u>Feb 21, 2017 / 13:44</u>

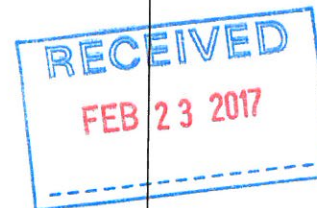
Sample Data Collection Information

Sample Date:	<u>Feb 18, 2017</u>	Average Pressure (mmHg)	<u>696</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Feb 19, 2017</u>	Average Temperature (°C)	<u>+0.2°</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 ?	<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>Jan 27, 2017</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Feb 21, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: February 18, 2017
PUF S/N: TE-08

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.13
2-Methylnaphthalene	0.10
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.05
Acenaphthylene	0.07
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.03
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	0.08
Fluorene	0.13
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.12
Perylene	< 0.01
Phenanthrene	0.34
Pyrene	0.06
Retene	0.04

Sample ID: 17020269-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Feb 24, 2017

PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>P13-01</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Feb 21, 2017/13:44</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Feb 24, 2017</u>	Removal Date/Time:	<u>Feb 27, 2017/12:56</u>

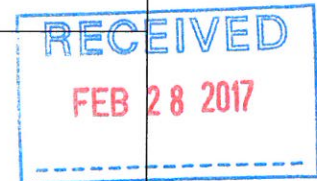
Sample Data Collection Information

Sample Date:	<u>Feb 24, 2017</u>	Average Pressure (mmHg)	<u>708</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Feb 25, 2017</u>	Average Temperature (°C)	<u>-12.0°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} 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)	<input checked="" type="radio"/> YES <u>A.Y.</u>	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>Jan 27, 2017</u>	
Other observations?	<u>N/A</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Feb 27, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: February 24 , 2017
PUF S/N: P13-01

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.34
2-Methylnaphthalene	0.46
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.08
Acenaphthylene	0.02
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	0.04
Benzo(a)pyrene	0.07
Benzo(b,j,k)fluoranthene	0.08
Benzo(c)phenanthrene	< 0.01
Benzo(e)pyrene	0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.01
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.05
Fluoranthene	0.05
Fluorene	0.07
Indeno(1,2,3-cd)pyrene	0.01
Naphthalene	0.42
Perylene	< 0.01
Phenanthrene	0.17
Pyrene	0.04
Retene	0.02

NMHC CANISTER RESULTS

Sample ID: 17020065-001

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/Feb 06,
2017

AIR FCD-01320/2



Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: 2534
 Station ID: LICA 37 Canister Installation Date/Time: January 26, 2017 / 14:25
 Field Sample ID: LICA/NMHC VOC/Bonnyville/ Canister Removal Date/Time: February 06, 2017 / 14:33
Feb 06, 2017

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Feb 06, 2017</u>	<u>11:30</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>-27.4</u>	<u>-2.0</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: Feb 06, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: February 6, 2017
Canister ID: 2534

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2,2-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	< 0.07
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	0.06
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.17
1-Hexene	< 0.03
1-Pentene	0.02
2,2,4-Trimethylpentane	0.06
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.06
2,3-Dimethylpentane	0.08
2,4-Dimethylpentane	0.03
2-Methylheptane	0.06
2-Methylhexane	0.06
2-Methylpentane	0.13
3-Methylheptane	0.03
3-Methylhexane	0.06
3-Methylpentane	0.09
Acetone	1.9
Acrolein	< 0.4
Benzene	0.22
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.09
Carbon tetrachloride	0.13
Chlorobenzene	< 0.03
Chloroethane	0.14
Chloroform	0.03
Chloromethane	0.54
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.05
cis-2-Pentene	< 0.03
Cyclohexane	0.14
Cyclopentane	0.06
Dibromochloromethane	< 0.01
Ethanol	1.4
Ethyl acetate	< 0.5
Ethylbenzene	0.03
Freon-11	0.37

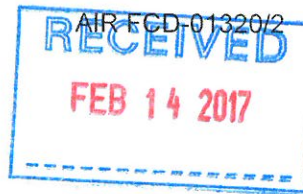
Volatile Organics Data Results (NMHC Canister System)

Date: February 6, 2017
Canister ID: 2534

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.11
Freon-114	< 0.03
Freon-12	0.8
Hexachloro-1,3-butadiene	< 0.66
Isobutane	0.92
Isopentane	0.7
Isoprene	< 0.01
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.09
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.11
Methyl butyl ketone	< 0.66
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.2
Methylcyclopentane	0.16
Methylene chloride	< 0.4
n-Butane	1.79
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.13
n-Hexane	0.13
n-Nonane	0.02
n-Octane	0.07
n-Pentane	0.4
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	< 0.01
o-Xylene	0.03
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	0.14
Tetrahydrofuran	< 0.5
Toluene	0.21
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.03
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.03

Sample ID: 17020122-001

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/Feb 10,
2017



Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: 14703
 Station ID: LICA 37 Canister Installation Date/Time: February 06, 2017 / 14:33
 Field Sample ID: LICA/NMHC VOC/Bonnyville/ Canister Removal Date/Time: February 10, 2017 / 13:24
Feb 10, 2017

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Feb 10, 2017</u>	<u>07:00</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>- 27.4</u>	<u>- 2.8</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments:

NMHC canister

Technician Signature: Alex Yankov

Date: Feb 10, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: February 10, 2017
Canister ID: 14703

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2,2-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	< 1.1
1,2,4-Trimethylbenzene	< 0.07
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.02
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	0.15
1-Hexene	< 0.03
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.11
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.08
2,3-Dimethylpentane	0.12
2,4-Dimethylpentane	0.04
2-Methylheptane	0.04
2-Methylhexane	0.09
2-Methylpentane	0.17
3-Methylheptane	< 0.03
3-Methylhexane	0.1
3-Methylpentane	0.13
Acetone	1.6
Acrolein	< 0.4
Benzene	0.28
Benzyl chloride	< 0.6
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.12
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	0.03
Chloromethane	0.58
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	0.05
cis-2-Pentene	< 0.03
Cyclohexane	0.17
Cyclopentane	0.09
Dibromochloromethane	< 0.01
Ethanol	2.2
Ethyl acetate	< 0.6
Ethylbenzene	0.05
Freon-11	0.34

Volatile Organics Data Results (NMHC Canister System)

Date: February 10, 2017
Canister ID: 14703

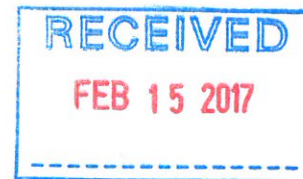
PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.11
Freon-114	< 0.03
Freon-12	0.78
Hexachloro-1,3-butadiene	< 0.70
Isobutane	1.66
Isopentane	0.92
Isoprene	< 0.01
Isopropyl alcohol	< 0.6
Isopropylbenzene	< 0.01
m,p-Xylene	0.14
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.11
Methyl butyl ketone	< 0.70
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.6
Methyl methacrylate	< 0.10
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.24
Methylcyclopentane	0.22
Methylene chloride	< 0.4
n-Butane	2.88
n-Decane	< 0.08
n-Dodecane	< 0.6
n-Heptane	0.12
n-Hexane	0.22
n-Nonane	0.02
n-Octane	0.05
n-Pentane	0.6
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	0.02
o-Xylene	0.05
p-Diethylbenzene	< 0.06
p-Ethyltoluene	< 0.10
Styrene	< 0.06
Tetrachloroethylene	< 0.06
Tetrahydrofuran	< 0.6
Toluene	0.25
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.03
Trichloroethylene	< 0.06
Vinyl acetate	< 0.6
Vinyl chloride	< 0.03

Sample ID: 17020145-001

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/Feb 13,
2017

Maxxam



VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: 2655
 Station ID: LICA 37 Canister Installation Date/Time: Feb 10, 2017 / 13:24
 Field Sample ID: LICA/NMHC VOC/Bonnyville / Feb 13, 2017 Canister Removal Date/Time: Feb 13, 2017 / 12:40

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Feb 13, 2017</u>	<u>07:10</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>-2.4</u>	<u>-1.0</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: Alex Yankov

Date: Feb 13, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: February 13, 2017
Canister ID: 2655

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2,2-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	< 1.1
1,2,4-Trimethylbenzene	< 0.07
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.02
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	0.14
1-Hexene	< 0.03
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.11
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	0.04
2,3-Dimethylbutane	< 0.03
2,3-Dimethylpentane	0.07
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.02
2-Methylpentane	0.03
3-Methylheptane	< 0.03
3-Methylhexane	0.03
3-Methylpentane	0.02
Acetone	1.9
Acrolein	< 0.4
Benzene	0.13
Benzyl chloride	< 0.6
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.06
Carbon tetrachloride	0.14
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	0.03
Chloromethane	0.6
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	0.04
cis-2-Pentene	< 0.03
Cyclohexane	< 0.03
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	1
Ethyl acetate	< 0.6
Ethylbenzene	0.02
Freon-11	0.4

Volatile Organics Data Results (NMHC Canister System)

Date: February 13, 2017
Canister ID: 2655

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.12
Freon-114	< 0.03
Freon-12	0.83
Hexachloro-1,3-butadiene	< 0.69
Isobutane	0.23
Isopentane	0.22
Isoprene	< 0.01
Isopropyl alcohol	< 0.6
Isopropylbenzene	< 0.01
m,p-Xylene	0.05
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.11
Methyl butyl ketone	< 0.69
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.6
Methyl methacrylate	< 0.10
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.01
Methylcyclopentane	< 0.03
Methylene chloride	< 0.4
n-Butane	0.66
n-Decane	< 0.08
n-Dodecane	< 0.6
n-Heptane	0.02
n-Hexane	0.03
n-Nonane	< 0.01
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	< 0.06
Tetrahydrofuran	< 0.6
Toluene	0.11
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.03
Trichloroethylene	< 0.06
Vinyl acetate	< 0.6
Vinyl chloride	< 0.03

Sample ID: 17020202-001

Customer ID: LICA

Cust Samp ID: LICA/NMHC
VOC/Bonnyville/Feb 15,
2017



Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: 35590
 Station ID: LICA 37 Canister Installation Date/Time: Feb 13, 2017 / 12:40
 Field Sample ID: LICA/NMHC VOC/Bonnyville/ Feb 15, 2017 Canister Removal Date/Time: Feb 17, 2017 / 11:21

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Feb 15, 2017</u>	<u>03:20</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>-27.6</u>	<u>-2.0</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: Feb 17, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: February 15, 2017
Canister ID: 55590

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2,2-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	< 1.1
1,2,4-Trimethylbenzene	< 0.07
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.02
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	0.19
1-Hexene	< 0.03
1-Pentene	0.04
2,2,4-Trimethylpentane	0.16
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.04
2,3-Dimethylbutane	0.12
2,3-Dimethylpentane	0.21
2,4-Dimethylpentane	0.07
2-Methylheptane	0.04
2-Methylhexane	0.15
2-Methylpentane	0.26
3-Methylheptane	0.03
3-Methylhexane	0.13
3-Methylpentane	0.19
Acetone	2.8
Acrolein	< 0.4
Benzene	0.19
Benzyl chloride	< 0.6
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.26
Carbon tetrachloride	0.13
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	0.05
Chloromethane	0.5
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.06
cis-2-Butene	0.09
cis-2-Pentene	0.04
Cyclohexane	0.1
Cyclopentane	0.08
Dibromochloromethane	< 0.01
Ethanol	7.9
Ethyl acetate	< 0.6
Ethylbenzene	0.05
Freon-11	0.38

Volatile Organics Data Results (NMHC Canister System)

Date: February 15, 2017
Canister ID: 55590

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.11
Freon-114	< 0.03
Freon-12	0.79
Hexachloro-1,3-butadiene	< 0.70
Isobutane	7.21
Isopentane	2.18
Isoprene	0.03
Isopropyl alcohol	< 0.6
Isopropylbenzene	< 0.01
m,p-Xylene	0.18
m-Diethylbenzene	< 0.06
m-Ethyltoluene	< 0.11
Methyl butyl ketone	< 0.70
Methyl ethyl ketone	0.5
Methyl isobutyl ketone	< 0.6
Methyl methacrylate	< 0.10
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.18
Methylcyclopentane	0.16
Methylene chloride	< 0.4
n-Butane	11.7
n-Decane	< 0.08
n-Dodecane	< 0.6
n-Heptane	0.16
n-Hexane	0.27
n-Nonane	0.02
n-Octane	0.06
n-Pentane	1.1
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	0.02
o-Xylene	0.09
p-Diethylbenzene	< 0.06
p-Ethyltoluene	< 0.10
Styrene	< 0.06
Tetrachloroethylene	0.13
Tetrahydrofuran	< 0.6
Toluene	0.56
trans-1,2-Dichloroethylene	0.02
trans-1,3-Dichloropropylene	< 0.06
trans-2-Butene	0.03
trans-2-Pentene	0.05
Trichloroethylene	< 0.06
Vinyl acetate	< 0.6
Vinyl chloride	< 0.03

Sample ID: 17020226-001

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/VOC/Bonnyville/Feb 18, 2017

Maxxam



VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 87
Field Sample ID: LICA/NMHC VOC/Bonnyville/
Feb 20, 2017

Sampler S/N: n/a
Canister ID: 35682
Canister Installation Date/Time: Feb 17, 2017 / 11:21
Canister Removal Date/Time: Feb 21, 2017 / 13:21

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Feb 20, 2017</u>	<u>17:30</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>-27.6</u>	<u>-1.3</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: Feb 21, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: February 20, 2017
Canister ID: S5682

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.03
1,1,2,2-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	0.13
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.03
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.03
1,3-Butadiene	< 0.03
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	2.37
1-Hexene	< 0.03
1-Pentene	0.18
2,2,4-Trimethylpentane	0.14
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.04
2,3-Dimethylbutane	0.21
2,3-Dimethylpentane	0.21
2,4-Dimethylpentane	0.1
2-Methylheptane	0.03
2-Methylhexane	0.13
2-Methylpentane	0.6
3-Methylheptane	< 0.03
3-Methylhexane	0.13
3-Methylpentane	0.35
Acetone	3
Acrolein	< 0.4
Benzene	0.23
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.12
Carbon tetrachloride	0.14
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	0.04
Chloromethane	0.76
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.88
cis-2-Pentene	0.2
Cyclohexane	0.05
Cyclopentane	0.06
Dibromochloromethane	< 0.01
Ethanol	6.3
Ethyl acetate	< 0.5
Ethylbenzene	0.03
Freon-11	0.36

Volatile Organics Data Results (NMHC Canister System)

Date: February 20, 2017
Canister ID: S5682

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.12
Freon-114	0.03
Freon-12	0.9
Hexachloro-1,3-butadiene	< 0.67
Isobutane	18
Isopentane	8.8
Isoprene	< 0.01
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.1
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.11
Methyl butyl ketone	< 0.67
Methyl ethyl ketone	0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.1
Methylcyclopentane	0.29
Methylene chloride	< 0.4
n-Butane	46.1
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.1
n-Hexane	0.2
n-Nonane	< 0.01
n-Octane	0.04
n-Pentane	1.1
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	0.01
o-Xylene	0.05
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	0.23
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	1.4
trans-2-Pentene	0.34
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.03

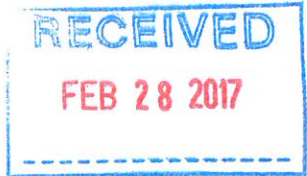
Sample ID: 17020269-003

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/Feb 23,
2017

Maxxam

VOC Sample Collection Data Sheet



Client: LICA Sampler S/N: n/a
Location: Bonnyville - AER Canister ID: 2485
Station ID: LICA 37 Canister Installation Date/Time: Feb 21, 2017 / 13:21
Field Sample ID: LICA/NMHC VOC/Bonnyville/ Canister Removal Date/Time: Feb 24, 2017 A.Y. / 15:01
Feb 23, 2017

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Feb 23, 2017</u>	<u>06:05</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>-27.2</u>	<u>-1.0</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: Feb 24, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: February 23 , 2017
Canister ID: 2485

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	< 0.05
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 1.0
1,2,4-Trimethylbenzene	< 0.06
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.03
1,2-Dichloropropane	0.02
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.07
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.04
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.06
2,3-Dimethylpentane	0.08
2,4-Dimethylpentane	0.03
2-Methylheptane	0.04
2-Methylhexane	0.07
2-Methylpentane	0.31
3-Methylheptane	< 0.02
3-Methylhexane	0.11
3-Methylpentane	0.23
Acetone	1.1
Acrolein	< 0.4
Benzene	0.18
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.04
Carbon tetrachloride	0.14
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.04
Chloromethane	0.52
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.13
Cyclopentane	0.13
Dibromochloromethane	< 0.01
Ethanol	0.9
Ethyl acetate	< 0.5
Ethylbenzene	0.03
Freon-11	0.38

Volatile Organics Data Results (NMHC Canister System)

Date: February 23, 2017
Canister ID: 2485

PARAMETERS	CONCENTRATION (PPB)
Freon-113	0.12
Freon-114	< 0.02
Freon-12	0.94
Hexachloro-1,3-butadiene	< 0.62
Isobutane	3.17
Isopentane	2.02
Isoprene	< 0.01
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.08
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.62
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.19
Methylcyclopentane	0.25
Methylene chloride	< 0.4
n-Butane	7.05
n-Decane	< 0.07
n-Dodecane	< 0.5
n-Heptane	0.15
n-Hexane	0.39
n-Nonane	0.02
n-Octane	0.06
n-Pentane	1.8
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	< 0.6
o-Ethyltoluene	< 0.01
o-Xylene	0.04
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	0.14
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.02

Sample ID: 17030077-003

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/Feb 27,
2017

Maxxam

VOC Sample Collection Data Sheet



Client: LICA Sampler S/N: n/a
Location: Bonnyville - AER Canister ID: 14735
Station ID: LICA 37 Canister Installation Date/Time: Feb 24, 2017 / 15:01
Field Sample ID: LICA/NMHC VOC/Bonnyville Canister Removal Date/Time: Mar 03, 2017 / 16:05
Feb 27, 2017

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Feb 27, 2017</u>	<u>21:15</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>-1.0</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: Alex Yanupov

Date: Mar 03, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: February 27, 2017
Canister ID: 14735

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	< 0.05
1,2,3-Trimethylbenzene	< 0.06
1,2,4-Trichlorobenzene	< 1.0
1,2,4-Trimethylbenzene	0.08
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.03
1,2-Dichloropropane	0.01
1,3,5-Trimethylbenzene	0.06
1,3-Butadiene	0.03
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.22
1-Hexene	0.07
1-Pentene	0.28
2,2,4-Trimethylpentane	0.26
2,2-Dimethylbutane	0.08
2,3,4-Trimethylpentane	0.09
2,3-Dimethylbutane	0.27
2,3-Dimethylpentane	0.29
2,4-Dimethylpentane	0.15
2-Methylheptane	0.05
2-Methylhexane	0.15
2-Methylpentane	0.76
3-Methylheptane	0.04
3-Methylhexane	0.17
3-Methylpentane	0.42
Acetone	81.0
Acrolein	< 0.4
Benzene	0.41
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.06
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.04
Chloromethane	0.81
cis-1,2-Dichloroethene	0.04
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.08
cis-2-Pentene	0.23
Cyclohexane	0.27
Cyclopentane	0.25
Dibromochloromethane	< 0.01
Ethanol	5.4
Ethyl acetate	< 0.5
Ethylbenzene	0.07
Freon-11	0.30
Freon-113	0.15
Freon-114	< 0.02
Freon-12	0.56

Volatile Organics Data Results (NMHC Canister System)

Date: February 27, 2017
Canister ID: 14735

PARAMETERS	CONCENTRATION (PPB)
Hexachloro-1,3-butadiene	< 0.62
Isobutane	5.37
Isopentane	5.38
Isoprene	0.04
Isopropyl alcohol	< 0.5
Isopropylbenzene	0.02
m,p-Xylene	0.23
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.62
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.25
Methylcyclopentane	0.42
Methylene chloride	< 0.4
n-Butane	39.4
n-Decane	< 0.07
n-Dodecane	< 0.5
n-Heptane	0.15
n-Hexane	0.46
n-Nonane	0.05
n-Octane	0.05
n-Pentane	2.1
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	< 0.6
n-Nonane	0.05
o-Ethyltoluene	0.03
o-Xylene	0.06
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	0.90
Tetrahydrofuran	< 0.5
Toluene	0.49
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.06
trans-2-Pentene	0.49
Trichloroethylene	< 0.05
Vinyl acetate	1.0
Vinyl chloride	< 0.02

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: February 8, 2017	Barometric Pressure: 0.935 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: Bonnyville - AER	Weather Conditions: A few clouds
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 11:03	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 15:33	Cal Gas Expiry Date: July 18, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Range ppb: 1000
ID# or Serial Number: 467	As Found C.F.: 1.008
Last Calibration Date: January 20, 2017	New C.F.: 1.000
Previous C.F.: 1.000	

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.6	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></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
Point	ppb								
High	780								
Mid	380								
Low	190								

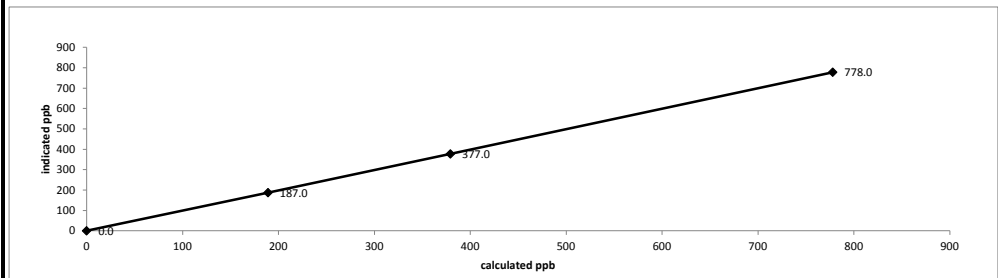
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	-2.0			n/a	
as found high	4924	76.90	5001	778.1	770.0			1.008	
adjusted zero	5000	0.00	5000	0.0	0.0			n/a	
adjusted high	4924	76.90	5001	778.1	778.0			1.000	
mid	4965	37.50	5003	379.3	377.0			1.006	
low	4981	18.70	5000	189.3	187.0			1.012	
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>-0.79%</u>	± 10%

API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
SLOPE: 0.956	SLOPE: 0.962
OFFSET: 130.4	OFFSET: 125.6
HVPS: 524	HVPS: 524
RCCELL TEMP: 50.0	RCCELL TEMP: 50.0
BOX TEMP: 31.6	BOX TEMP: 33.2
PMT TEMP: 8.1	PMT TEMP: 8.1
IZS TEMP: 50.0	IZS TEMP: 50.0
PRES: 25.5	PRES: 25.5
SAMP FL: 544	SAMP FL: 544
NORM PMT: 125.7	NORM PMT: 125.3
UV LAMP: 2712.3	UV LAMP: 2714.1
LAMP RATIO: 97.6	LAMP RATIO: 97.7
STR. LGT: 62.3	STR. LGT: 60.4
DRK PMT: 14.9	DRK PMT: 15.9
DRK LMP: 2.7	DRK LMP: 2.7
Expected Value: 452.0	Expected Value: 434.0

Comments:
The analyzer sample inlet filter was changed.



— SO2[ppb]



API 100E Sulphur Dioxide Analyzer Calibration

Date: February 17, 2017	Barometric Pressure: 0.911 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: Bonnyville - AER	Weather Conditions: A few clouds
Parameter: Sulphur Dioxide	Calibration Purpose: repeat
Start Time 24 hr. (mst): 10:29	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 14:00	Cal Gas Expiry Date: July 18, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer: ID# or Serial Number: 467	Range ppb: 1000
Last Calibration Date: February 8, 2017	As Found C.F.: 0.990
Previous C.F.: 1.000	New C.F.: 1.000

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL104222 Cal Gas Conc. (ppm): 50.6	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></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
Point	ppb								
High	780								
Mid	380								
Low	190								

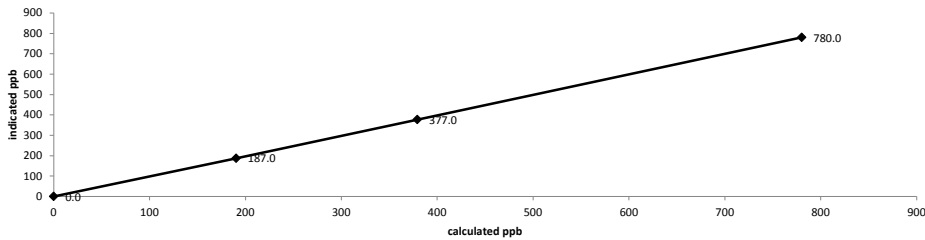
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	3.0				n/a
as found high	4924	77.10	5001	780.1	791.0				0.990
adjusted zero	5000	0.00	5000	0.0	0.0				n/a
adjusted high	4924	77.10	5001	780.1	780.0				1.000
mid	4965	37.50	5003	379.3	377.0				1.006
low	4980	18.80	4999	190.3	187.0				1.018
calibrator zero	5000	0.00	5000	0.0	0.0				n/a
Average C.F.=									1.008

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 0.999	.95-1.05
b (Intercept as % of full scale) = 0.18%	± 3% F.S.
% change in C.F. from last cal = 1.01%	± 10%

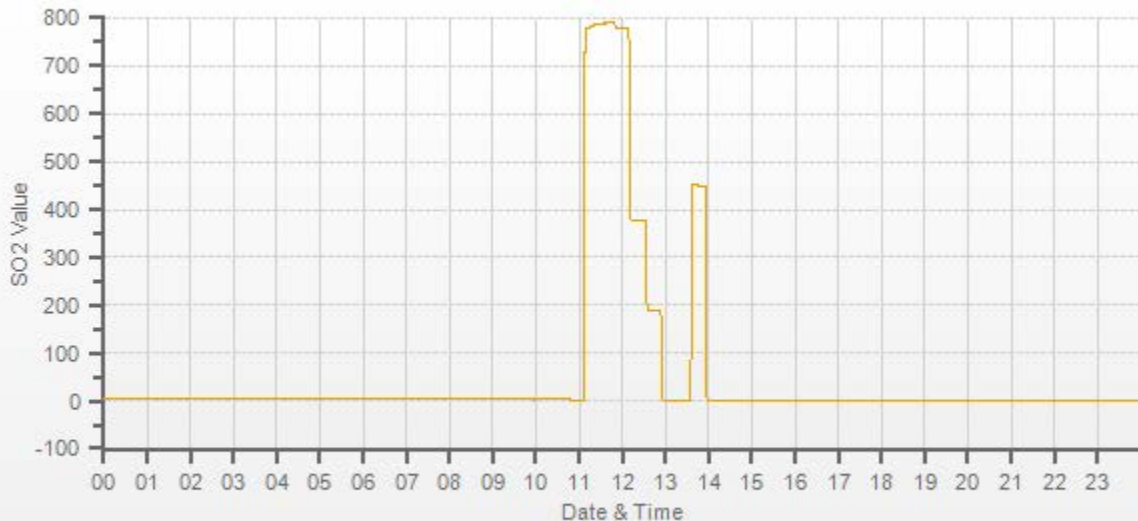
API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
SLOPE: 0.962	SLOPE: 0.952
OFFSET: 125.6	OFFSET: 130.6
HVPS: 524	HVPS: 524
RCCELL TEMP: 50.0	RCCELL TEMP: 50.0
BOX TEMP: 33.1	BOX TEMP: 33.2
PMT TEMP: 8.1	PMT TEMP: 8.1
IZS TEMP: 50.0	IZS TEMP: 50.0
PRES: 24.8	PRES: 24.6
SAMP FL: 530	SAMP FL: 530
NORM PMT: 130.7	NORM PMT: 132.1
UV LAMP: 2705.9	UV LAMP: 2704.2
LAMP RATIO: 97.4	LAMP RATIO: 97.3
STR. LGT: 60.4	STR. LGT: 62.2
DRK PMT: 15.4	DRK PMT: 15.9
DRK LMP: 2.7	DRK LMP: 2.7
Expected Value: 434.0	Expected Value: 450.0

Comments:

Repeat calibration completed to correct ZERO drift and the EV.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: February 8, 2017	Barometric Pressure: 0.935 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: Bonnyville - AER	Weather Conditions: A few clouds
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 11:03	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 15:24	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	
ID# or Serial Number: 510	Range ppb: 100
Last Calibration Date: January 20, 2017	As Found C.F.: 1.040
Previous C.F.: 0.998	New C.F.: 0.998

Calibrator:	Standard Calibration Points for Ranges	SO₂ Scrubber Check (10 mins.)								
Flow Meter ID's: n/a	<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	Start/End Time 24 hr.: 11:53/12:03
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: SABIO 2010 D		Target Concentration (ppb): 780								
Serial #: 11900613		Result (ppb): 0.3								
Cal Gas Cylinder I.D. # : EY0000654		Zero Corrected Result (ppb): 0								
Cal Gas Conc. (ppm): 10.2										

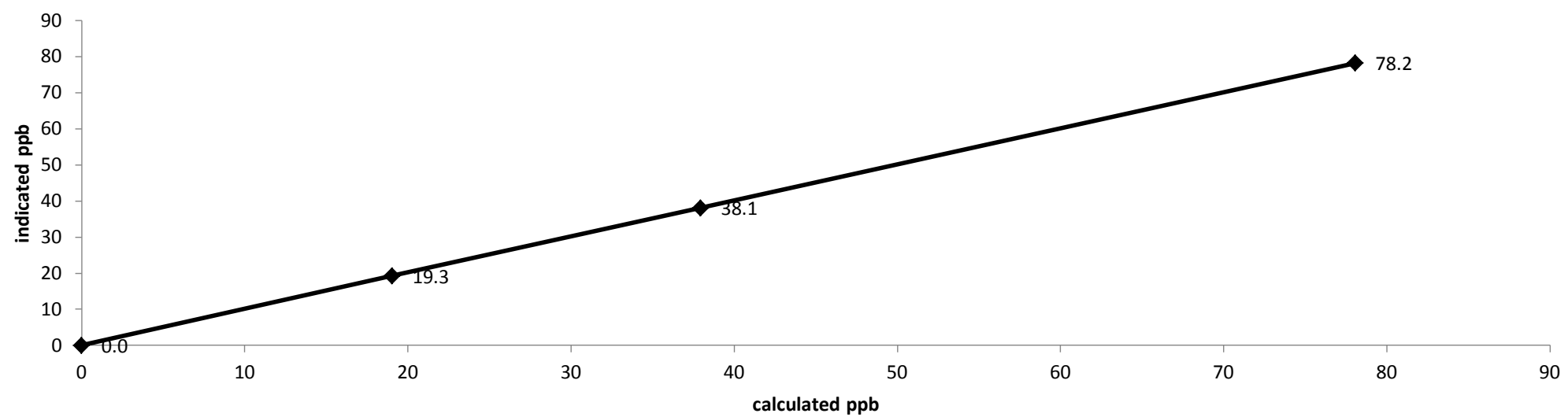
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	57.40	7499	78.1	75.1	1.040
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.40	7499	78.1	78.2	0.998
mid	7471	27.90	7499	37.9	38.1	0.996
low	7486	14.00	7500	19.0	19.3	0.987
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						0.994

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.999	> or = 0.995
b (Intercept as % of full scale)= -0.11%	.95-1.05
% change in C.F. from last cal= -4.16%	± 3% F.S.
	± 10%

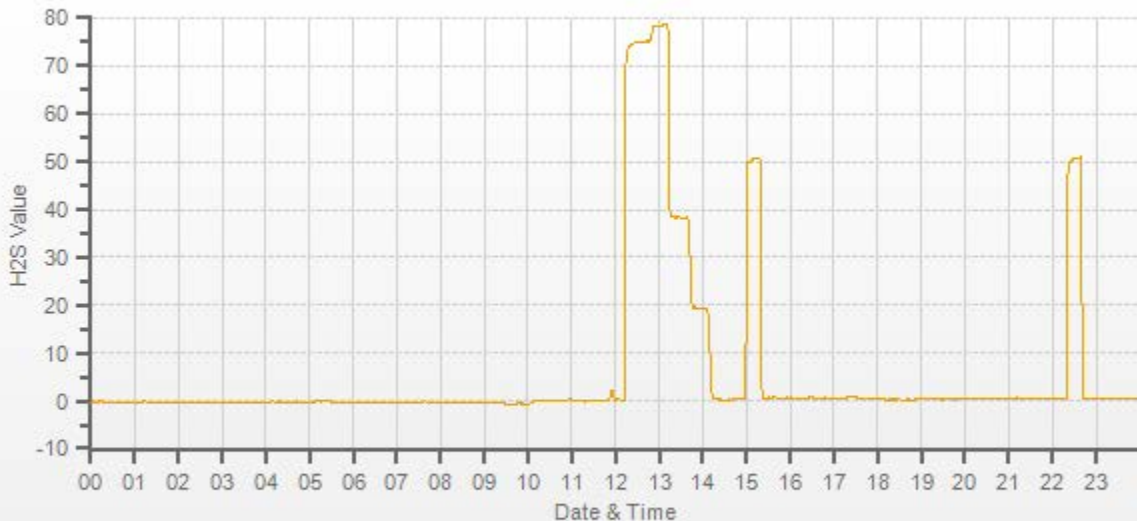
API 101E Hydrogen Sulphide Analyzer Calibration



As found:	As left:
SLOPE: 0.918	SLOPE: 0.951
OFFSET: 32.0	OFFSET: 30.8
HVPS: 530	HVPS: 530
RCELL TEMP: 50.0	RCELL TEMP: 50.0
BOX TEMP: 34.5	BOX TEMP: 35.6
PMT TEMP: 8.4	PMT TEMP: 8.4
IZS TEMP: 45.0	IZS TEMP: 45.0
Converter Temp: 314.4	Converter Temp: 315.0
PRES: 20.9	PRES: 20.9
SAMP FL: 544	SAMP FL: 542
UV LAMP: 3459.7	UV LAMP: 3457.6
LAMP RATIO: 91.2	LAMP RATIO: 91.1
STR. LGT: 14.7	STR. LGT: 14.6
DRK PMT: 36.3	DRK PMT: 35.1
DRK LMP: -1.8	DRK LMP: -1.9
Expected Value: 50.0	Expected Value: 50.6

Comments:

The analyzer sample inlet filter was changed.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date: February 9, 2017	Barometric Pressure: 0.920 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): 10:51 / 14:34	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: n/a	CH ₄ = 0.999 1.027 1.001
Last Calibration Date: January 11, 2017	NMHC = 0.998 0.989 1.000
Range ppm: 20 CH ₄ /20 NMHC/40 THC	THC = 0.999 1.007 1.000

Calibrator:	Standard Calibration Points for Analyzer Range of 20/20/40 ppm																
Flow Meter ID's: n/a	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>CH₄</th> <th>NMHC</th> <th>THC</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>13.00</td> <td>13.00</td> <td>26.00</td> </tr> <tr> <td>Mid</td> <td>7.00</td> <td>7.00</td> <td>14.00</td> </tr> <tr> <td>Low</td> <td>3.00</td> <td>3.00</td> <td>6.00</td> </tr> </tbody> </table>	Point	CH ₄	NMHC	THC	High	13.00	13.00	26.00	Mid	7.00	7.00	14.00	Low	3.00	3.00	6.00
Point		CH ₄	NMHC	THC													
High		13.00	13.00	26.00													
Mid		7.00	7.00	14.00													
Low		3.00	3.00	6.00													
Make & Model: API 700																	
Serial #: 627																	
Cal Gas Cylinder I.D. # : LL165372																	
CH₄ Cylinder Conc. = 606.0 212.0 =C ₃ H ₈ Cylinder Conc.																	
CH₄ as C₃H₈ = 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	13.26	13.26	26.55	1.027	0.989	1.007
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	13.61	13.11	26.73	1.001	1.000	1.000
mid	2000	24.00	2024	7.19	6.91	14.10	7.20	6.94	14.15	0.998	0.996	0.996
low	2000	11.00	2011	3.31	3.19	6.50	3.35	3.22	6.56	0.989	0.990	0.991
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. =										0.996	0.995	0.996

Linear Regression/Calibration Results:

	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	1.000	0.999	.95-1.05
b (Intercept as % of full scale) =	0.10%	0.09%	0.08%	± 3% F.S.
% change in C.F. from last cal =	-2.85%	0.95%	-0.79%	± 10%

Interface Board Voltages:	Bias Supply: -292.6	Calibration History cnt'd: NM Peak Area: 82544
Temperatures:	Detector Oven: 175.0	Crucial Settings: Methane Start: n/a
	Filter: 175.0	Methane End: n/a
	Column Oven: 75.0	Backflush: n/a
	Internal: 31.5	NMHV Start: n/a
Cylinder Pressures/reg.:	Carrier: 600 50	NMHC End: n/a
	Fuel: 400 60	Run History>1: Date: Feb 09, 2017
	Span Gas: 1400 22	Time: 11:14
	Zero Air Generator: 55	CH ₄ PK HT: 0
Internal Pressures:	Carrier: 31.1	CH ₄ RT: 8.0
	Fuel: 40.3	CH ₄ Baseline: 2424
	Air: 32.3	CH ₄ LOD: 58
FID Status:	Status: LIT	CH ₄ SD: 19
	Counts: 27527	CH ₄ CONC: 0.00
	Flame: 371.0	NM PK HT: 0
	Det Base: 175.1	NM Peak Area: 0
Flame and Power Stats:	Last Power On: August 3, 2016	NM CONC: 0.00
	Flameouts: 3	NM Base Start: 2357
	Det Oven at Start: 169.0	NM Base End: 2367
	Col Oven at Start: 74.5	NM LOD: 16
Calibration History:	Time: Jan 11, 2017 / 10:30	NM Start IDX: 51
	Type: SPAN	NM End IDX: 74
	Status: GOOD	NM Max Slope: 6.3e-01
	Check/Adjust: ADJUST	NM Min Slope: -4.8e-01
	CH₄ Span Conc: 13.11	NM PT Count: 0
	CH₄ SP Ratio: 0.000726	Expected Values: Previous CH ₄ : 9.01
	CH₄ RT: 13.2	Previous NMHC: 13.93
	CH₄ PK IDX: 26	Previous THC: 22.97
	CH₄ PK HT: 18052	New CH ₄ : 9.34
	NM Span Conc: 12.58	New NMHC: 13.77
	NM SP Ratio: 0.000152	New THC: 23.13

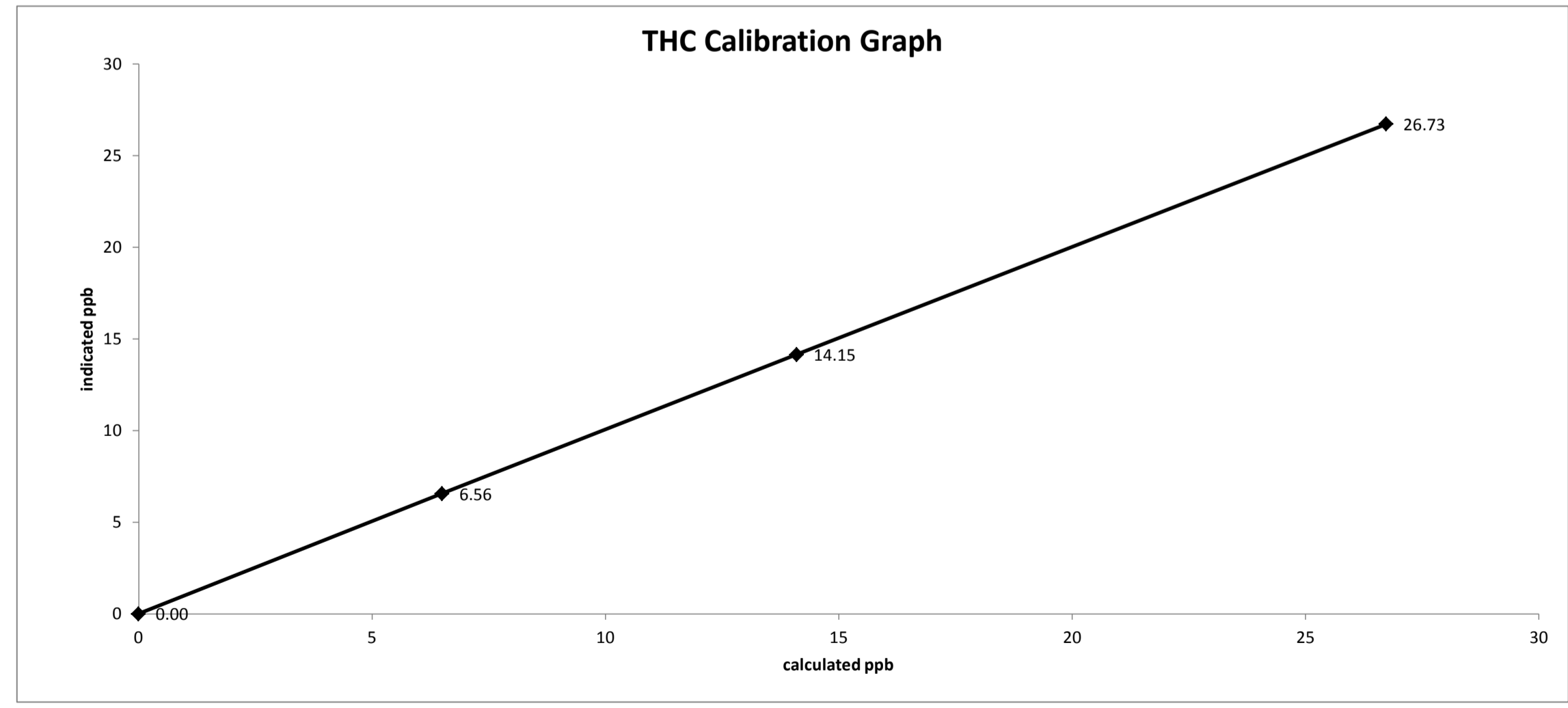
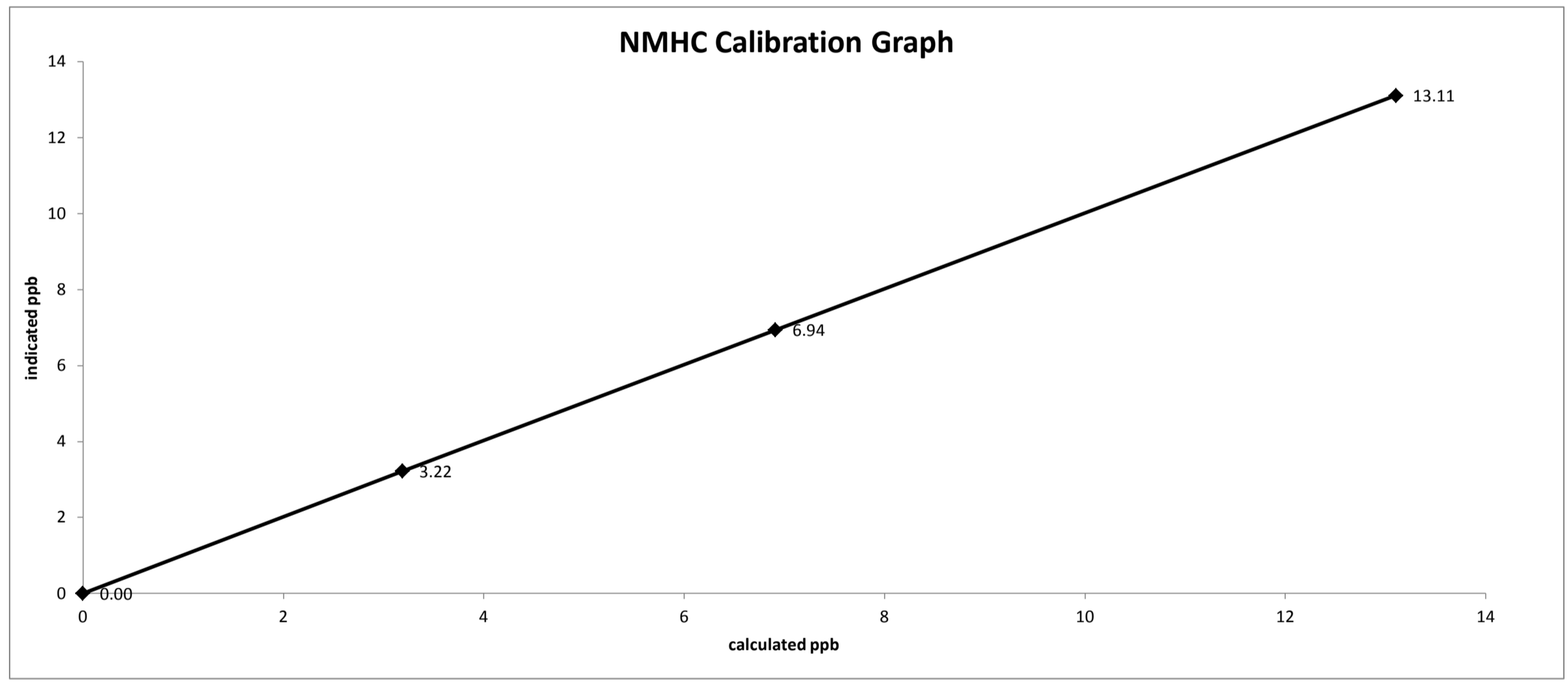
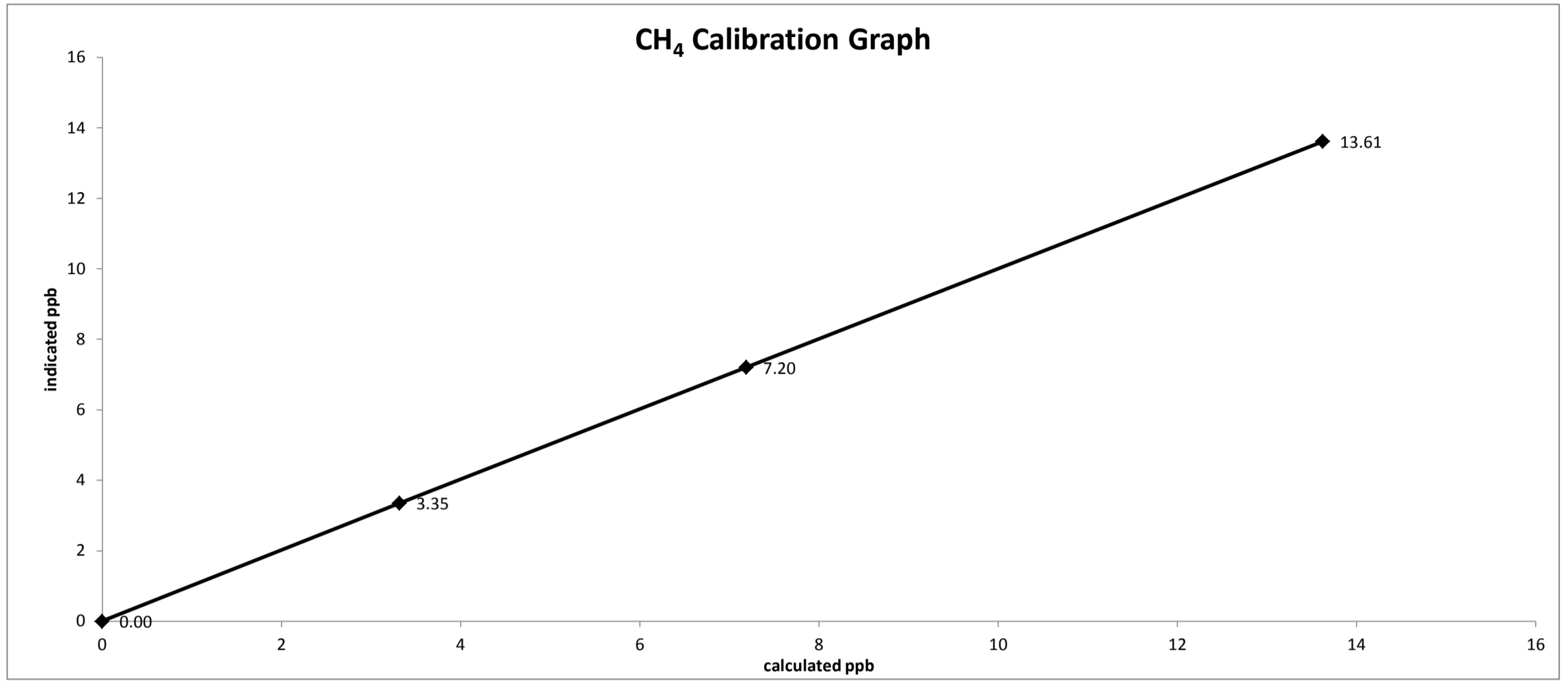
Comments:

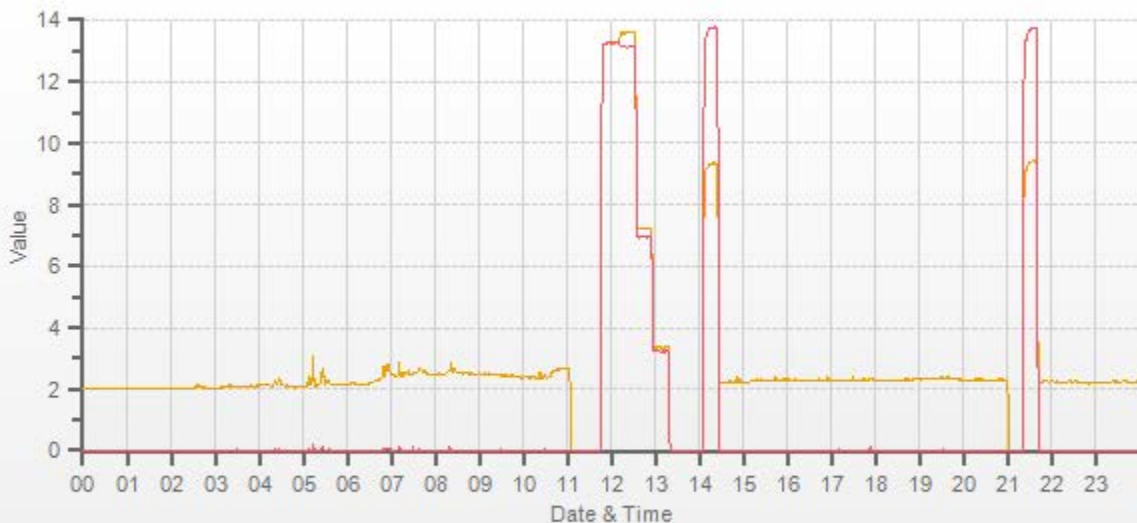
The analyzer sample inlet filter was changed.

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:	February 9, 2017	Start/End Time 24 hr. (mst):	10:51 / 14:34
Company/Airshed:	LICA	Calibration Purpose:	routine monthly
Location/Station Name:	Bonnyville - AER	Calibration Method:	Gas Dilution





— CH4[ppm] — NMHC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: February 8, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER
Start/End Time 24 hr. (mst): 11:03 / 17:55
G.P.T. to be used for Ozone? No
Calibration Method: Gas Dilution & Gas Phase Titration

Barometric Pressure: 0.935 atm
Station Temperature °C: 20
Weather Conditions: A few clouds
Calibration Purpose: routine monthly
Performed By/Reviewer: Alex Yakupov / Trina Whitsitt
Cal Gas Expiry Date: July 18, 2019

Analyzer:
ID# or Serial Number: 2166
Last Calibration Date: January 6, 2017
Range ppb: 1000

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	1.000	1.022	1.001
NO ₂ =	1.000	1.014	1.014
NOx =	1.000	1.026	1.001

Calibrator:
Flow Meter ID's: n/a
Make & Model: API 700
Serial #: 627
Cal Gas Cylinder I.D. #: LL104222
NO/NOx Gas Conc. (ppm): 50.7 | 50.7

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	0.0	n/a	n/a
as found high	4924	76.9	5001	779.6	779.6	763.0	760.0	1.022	1.026
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4924	76.90	5001	779.6	779.6	779.0	779.0	1.001	1.001
mid	4965	37.50	5003	380.1	380.1	373.0	373.0	1.019	1.019
low	4981	18.70	5000	189.6	189.6	183.0	183.0	1.036	1.036
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.019	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	76.90	5001	0.0	781.0	780.0	-1.0	0.0	-1.0	
as found high NO ₂	4802	76.90	4879	500.0	263.0	773.0	510.0	518.0	511.0	1.014
adjusted high NO ₂	4802	76.90	4879	500.0	263.0	773.0	510.0	518.0	511.0	1.014
gpt mid	4802	76.90	4879	270.0	500.0	776.0	276.0	281.0	277.0	1.014
gpt low	4802	76.90	4879	105.0	680.0	780.0	100.0	101.0	101.0	1.000
Average NO₂ C.F.=										1.009

Linear Regression/Calibration Results:

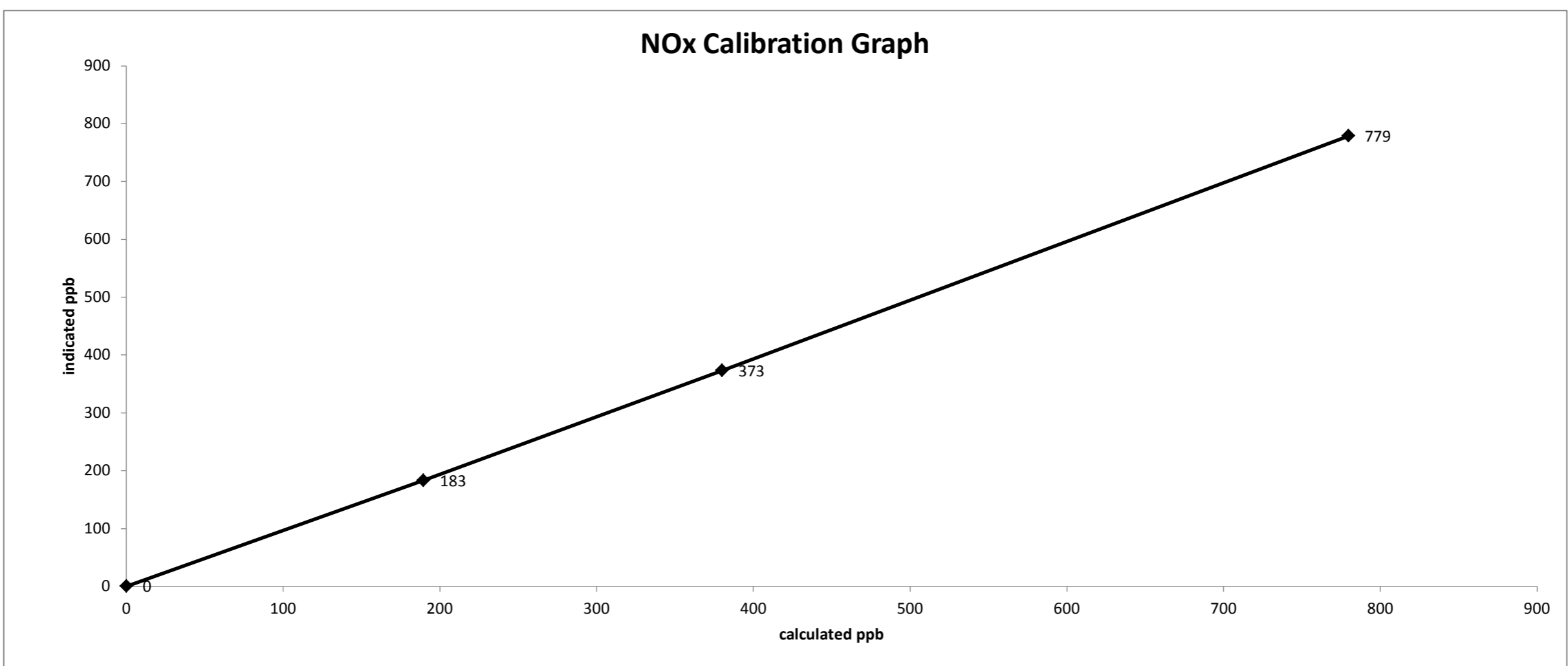
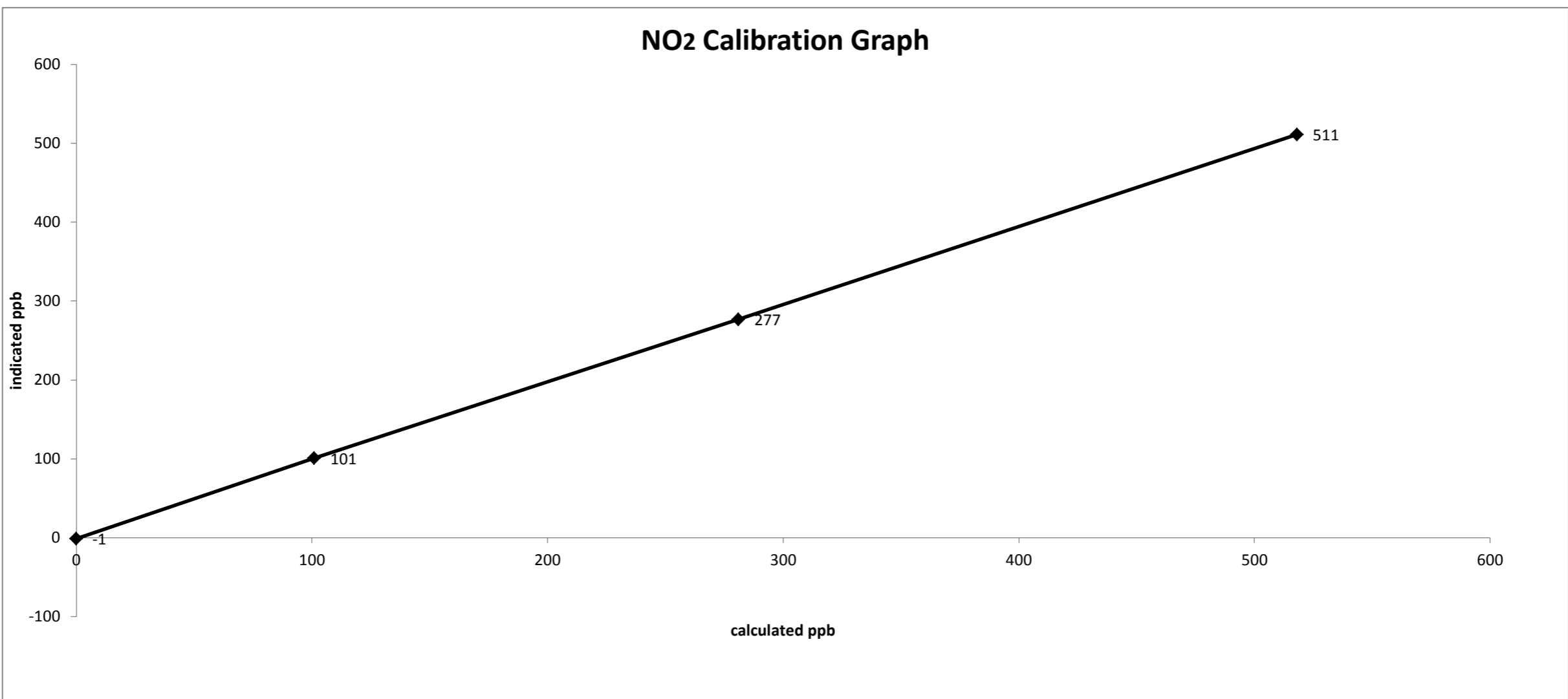
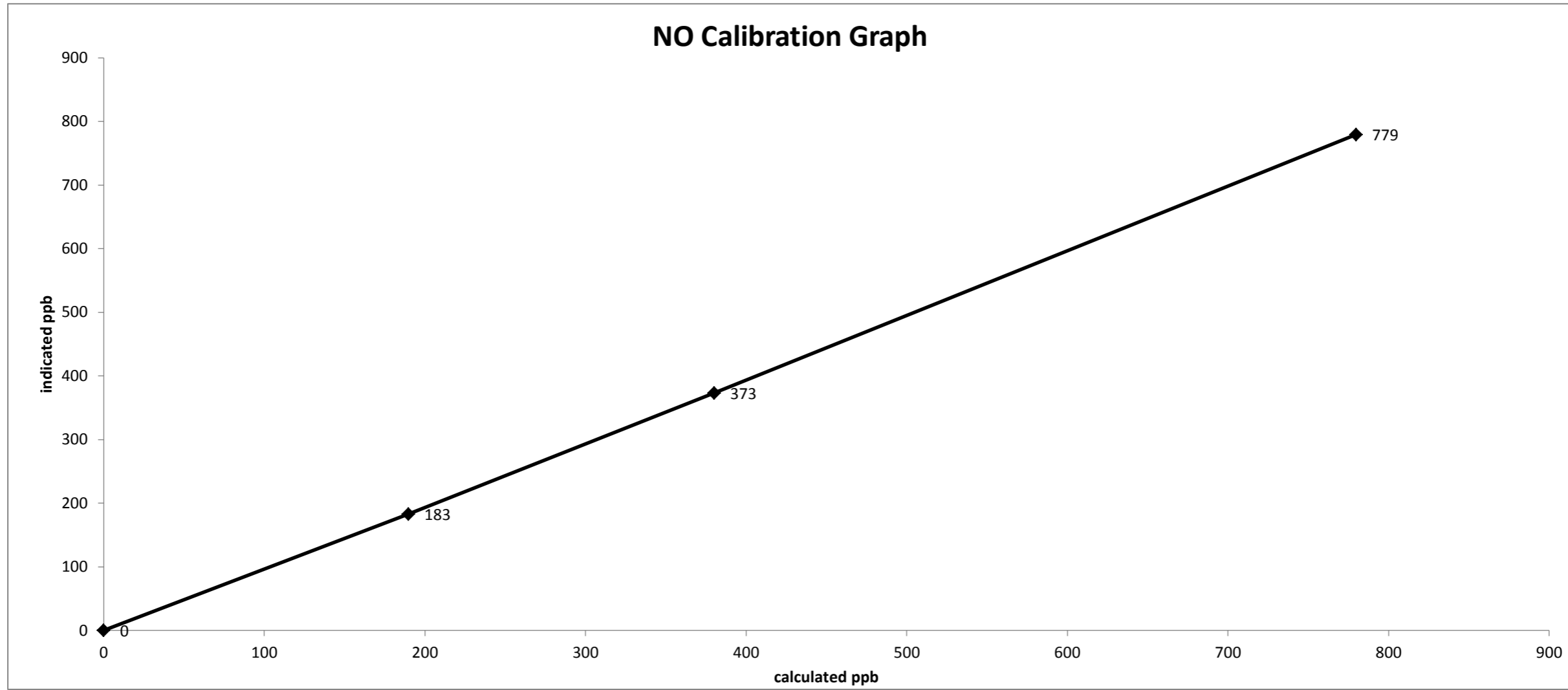
	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	1.013	.95-1.05
b (Intercept as % of full scale)=	-0.40%	-0.40%	0.00%	± 3% F.S.
% change in C.F. from last cal=	-2.18%	-2.58%	-1.37%	± 10%
NO ₂ converter efficiency			1.01	0.96 to 1.04

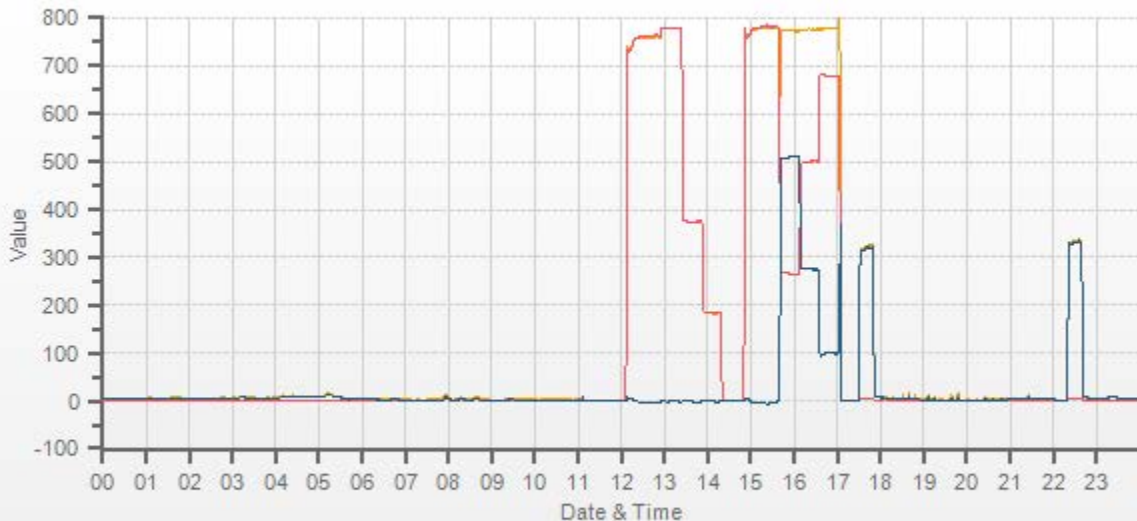
As found:		As left:	
NOx SLOPE:	0.821	NOx SLOPE:	0.841
NOx OFFS:	1.5	NOx OFFS:	-0.3
NO SLOPE:	0.814	NO SLOPE:	0.831
NO OFFS:	-1.8	NO OFFS:	-1.2
SAMP FLW:	482	SAMP FLW:	482
OZONE FL:	78	OZONE FL:	78
NORM PMT:	-2.8	NORM PMT:	0.8
AZERO:	11.8	AZERO:	12.4
HVPS:	695	HVPS:	695
DCPS:	2619	DCPS:	2620
RCCELL:	50.1	RCCELL:	50.2
BOX TEMP:	26.9	BOX TEMP:	29.3
IZS TEMP:	45.3	IZS TEMP:	45.0
MOLY TEMP:	314.5	MOLY TEMP:	315.5
RCCEL:	6.9	RCCEL:	6.9
SAMP:	25.9	SAMP:	26.1
Expected Value NO:	4.4	Expected Value NO:	320.0
Expected Value NO ₂ :	347.4	Expected Value NO ₂ :	4.0
Expected Value NOx:	352.0	Expected Value NOx:	324.0

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: February 8, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 11:03 / 17:55
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:	February 9, 2017	Barometric Pressure:	0.920 atm
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Bonnyville - AER	Weather Conditions:	A few clouds
Start/End Time 24 hr. (mst):	10:51 / 14:16	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:	1002240372
Ozone Range ppb:	500
Last Calibration Date:	January 3, 2017
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

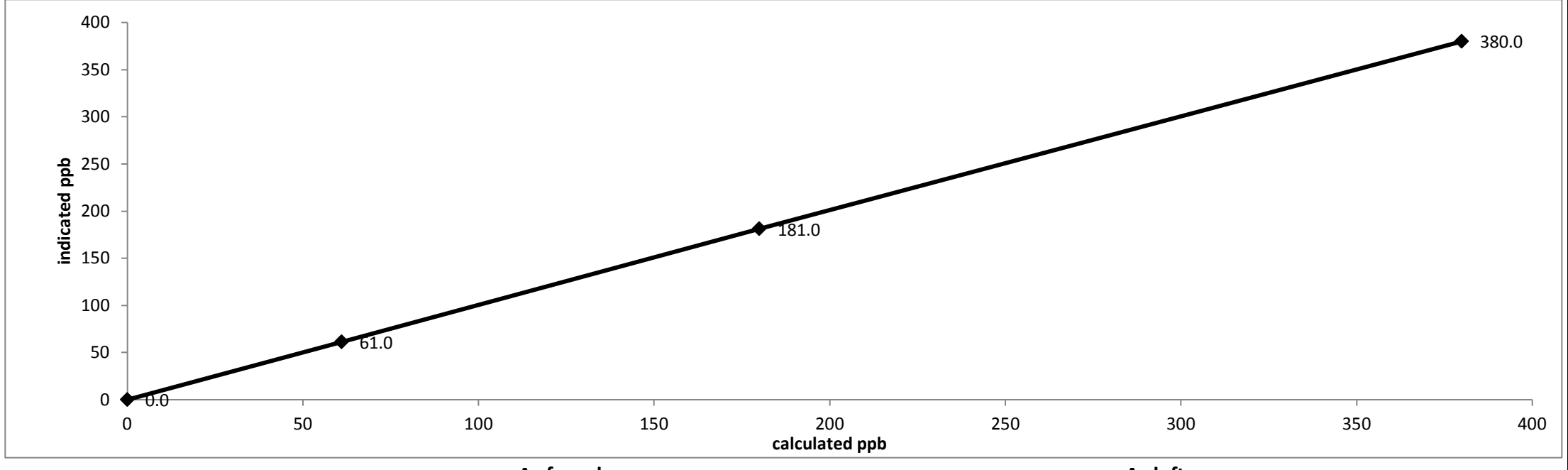
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	181.0	0.994
low	5000	5000	61.0	61.0	61.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						0.998

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=	0.00%		± 10%

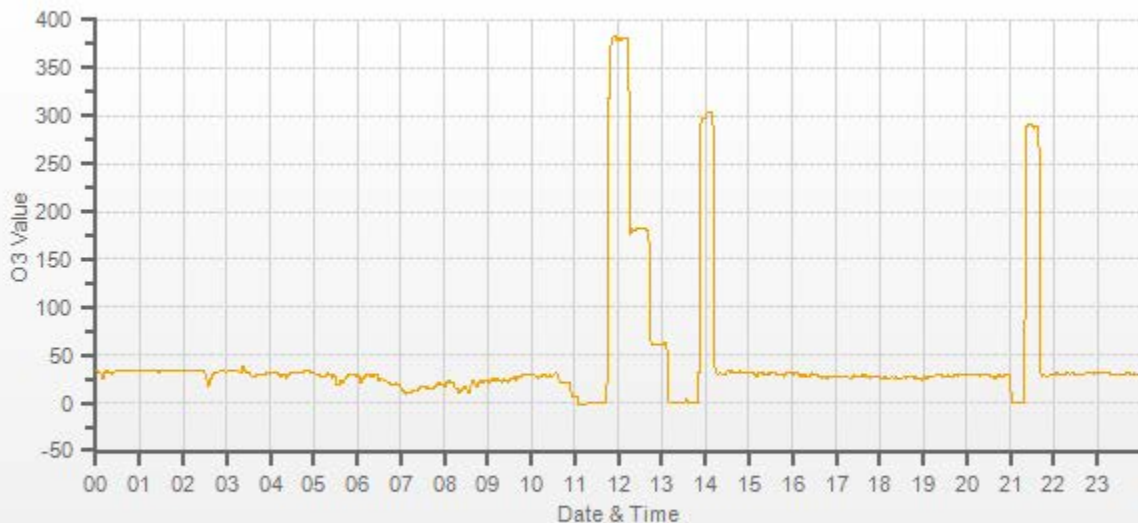
Thermo 49i Ozone Analyzer Calibration



As found:	As left:
O3 Bkg: -0.1	O3 Bkg: -0.1
O3 Coef: 0.984	O3 Coef: 0.984
Photo Lamp: 14.2	Photo Lamp: 14.2
O3 Lamp: 5.8	O3 Lamp: 5.8
Bench: 29.0	Bench: 30.4
Bench Lamp: 54.1	Bench Lamp: 54.1
O3 Lamp: 68.1	O3 Lamp: 68.2
Pressure: 692.6	Pressure: 691.4
Cell A lpm: 0.735	Cell A lpm: 0.734
Cell B lpm: 0.745	Cell B lpm: 0.745
O3 ppb: 0.5	O3 ppb: 0.1
Cell A ppb: -1.6	Cell A ppb: 0.1
Cell B ppb: 0.6	Cell B ppb: -0.3
Cell A int: 80242	Cell A int: 80194
Expected Value: 293.0	Expected Value: 303.0

Comments:
 The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned.

No ZERO adjustment made. No High Point adjustment made.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: February 6, 2017
 Company: LICA
 Station Name/Location: Bonnyville - AER
 Previous Audit Date: January 26, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 12:54
 End Time (mst): 14:22
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: Light snow

1400A Information and Status:

ID# or Serial Number: 1405A207691003 As Found Filter Loading %: 41.25
 Ko Factor: 15635 As Left Filter Loading %: 21.03
 Ambient Temperature °C: -19.56 As Found Noise: 0.003
 Ambient Pressure atm: 0.933 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.32
 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:	#3	#05544	4295
Calibration Date:	January 1, 2017	December 5, 2016	November 15, 2016

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.11	0.00	0.11
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.29	0.00	-0.29
	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	0.11	0.00	0.11
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.29	0.00	-0.29
	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: -19.6	1405F pressure atm: 0.933
reference temperature °C: -19.8	reference pressure: 0.934
difference °C: -0.3	difference: -0.001

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: -19.8	1405F pressure atm: 0.934
reference temperature °C: -19.8	reference pressure: 0.934
difference °C: 0.0	difference: 0.000

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: 3.00	1400A total/aux flow lpm: 16.67
reference main flow lpm: 3.02	reference total/aux flow lpm: 17.12
difference lpm: 0.02	difference lpm: 0.45

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: 3.00	1400A total/aux flow lpm: 16.67
reference main flow lpm: 3.02	reference total/aux flow lpm: 17.12
difference lpm: 0.02	difference lpm: 0.45

K_o Audit:

Last K_o audit date: February 6, 2017
 1405F K_o factor: 15635
 Measured K_o factor: 15808.3000
 % difference: 1.11

Comments:

The TEOM sample filter was changed. The TEOM intake head and associated sharp cut components were cleaned.
 The 47 mm FDMS filter was changed.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: February 21, 2017
 Company: LICA
 Station Name/Location: Bonnyville - AER
 Previous Audit Date: February 6, 2017
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 14:15
 End Time (mst): 15:34
 Calibration Purpose: Bi-monthly #2
 Weather Conditions: A few clouds

1400A Information and Status:

ID# or Serial Number: 1405A207691003 As Found Filter Loading %: 27.18
 Ko Factor: 15635 As Left Filter Loading %: 25.73
 Ambient Temperature °C: 2.04 As Found Noise: 0.004
 Ambient Pressure atm: 0.925 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.31
 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:	#3	#05544	4295
Calibration Date:	January 1, 2017	December 5, 2016	November 15, 2016

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.11	0.00	0.11
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.28	0.00	-0.28
	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	0.11	0.00	0.11
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.28	0.00	-0.28
	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: 2.0	1405F pressure atm: 0.925
reference temperature °C: 2.8	reference pressure: 0.923
difference °C: 0.8	difference: 0.002

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: 2.8	1405F pressure atm: 0.923
reference temperature °C: 2.8	reference pressure: 0.923
difference °C: 0.0	difference: 0.000

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: 3.00	1400A total/aux flow lpm: 16.67
reference main flow lpm: 3.07	reference total/aux flow lpm: 17.11
difference lpm: 0.07	difference lpm: 0.44

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: 3.00	1400A total/aux flow lpm: 13.67
reference main flow lpm: 3.00	reference total/aux flow lpm: 13.67
difference lpm: 0.00	difference lpm: 0.00

K_o Audit:

Last K_o audit date: February 6, 2017
 1405F K_o factor: 15635
 Measured K_o factor: 15808.3000
 % difference: 1.11

Comments:

The TEOM intake head and associated sharp cut components were cleaned.

The 47 mm FDMS filter was changed.

Flows were calibrated.

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

CALIBRATORS

Company Maxxam/SIA **Operator:** Chris

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Definer 530</u>
Serial Number	<u>627</u>	Serial Number	<u>H-148944, L-152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>23.5</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>707.1 mmHg</u>
NO [PPM]	<u>49.0</u>	NOx [PPM]	<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1	<u>4892</u>	Pt. #3 <u>4951</u>
Pt. #2	<u>4975</u>	
Gas Flow (sccm)		
Pt. #1	<u>79.7</u>	Pt. #3 <u>19.4</u>
Pt. #2	<u>38.8</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
	0.0	0.0000	0.0000	0.0000	-0.0004	-0.0004	Limit ± 10%	
4972	79.7	0.7855	0.7855	0.7883	0.0004	0.7887	0.4%	0.5%
4936	38.8	0.3822	0.3822	0.3816	0.0005	0.3822	-0.2%	0.1%
4970	19.4	0.1913	0.1913	0.1902	0.0006	0.1913	-0.6%	0.2%
Absolute Average Percent Difference							0.1%	0.3%

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)= 1.0041	0.90-1.10	m (Slope)= 1.0046
b (Intercept % of FS)= -0.1118	± 3% F.S.	b (Intercept % of FS)= -0.0871

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4972	0	0.0000	0.7867	0.0014	0.7881	NO ₂	% Diff, Limit
4972	500	0.5127	0.2740	0.5104	0.7849	-0.7%	± 10%
4972	275	0.2863	0.5004	0.2860	0.7865	-0.6%	± 10%
4972	90	0.0940	0.6927	0.0954	0.7880	0.0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9924	0.90-1.10
b (Intercept % of FS)= 0.1755	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	Make/Model <u>Thermo 42i</u>
Make/Model <u>Thermo 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU1809</u>	Last Calibration Date <u>January 25, 2017</u>
SRM Gas Cylinder No. <u>CAL018140</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>48.79</u>	Cylinder Gas Expiry Date <u>March 25, 2019</u>

COMMENTS: _____

Auditor: Shea Beaton
Operator Signature: _____

Date: January 27, 2017
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>			
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				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO₂		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

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-334CGA

Company: Maxxam **Operator's Name:** Russell Kirchner
Cylinder #: EY0000654 **Concentration PPM:** 10.2 **Tolerance(%)** 2 **Certified By:** Praxair
Expiry Date: June 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMU 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.0 C</u>
Gas Type: <u>H2S</u> Conc. <u>20.43</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CAL015584</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:
 Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 16.6 Span: 1.231 Range: 0.1
 Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0000
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					10.1

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 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: October 19, 2016
 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	<u>CH4</u>	Conc.	<u>999.2</u>
Cylinder Number	<u>D751932</u>		
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>
Cylinder Number	<u>XF0037998</u>		

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. 2016-336CGA

Company: Maxxam **Operators name:** Russell Kirchner

Cylinder #: LL104222 Conc (PPM) 50.7/50.9 Tolerance (%) 1 Certified By: Praxair

Expiry Date: July 2019

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>AMU 1659</u>
Last Verification Date	<u>October 19, 2019</u>			Temp. °C	<u>24.5 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>706 mmhg</u>
Cylinder Number	<u>CAL018188</u>				
Expiry Date	<u>March 2019</u>				

Reference Analyzer:

Make/Model Teco 42i Serial/AMU Number: 1868

Instrument Settings Zero: 4.4 Span: 1.080 Range: 1.0

Last Calibration: Date: Oct 18/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4935	82.0	0.838	0.837	0.017	60.183	50.4	50.4
4968	40.8	0.417	0.417	0.008	121.765	50.8	50.8
4955	20.2	0.207	0.207	0.004	245.297	50.8	50.8
Average Cylinder Concentration:						50.7	50.6

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.9</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:**

< =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 50.6 ppm SO2.

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: October 19, 2016

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Feb 06, 2017	1098	Ambient Air	06-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020107	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020107-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020107-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020107-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	16-Feb-17
17020107-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020107-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020107-001	1,2-Dichloroethane	I	0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020107-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020107-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020107-001	1-Butene		0.07	ppbv	0.02	AC-058	16-Feb-17
17020107-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020107-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	2,3-Dimethylbutane		0.04	ppbv	0.02	AC-058	16-Feb-17
17020107-001	2,3-Dimethylpentane		0.05	ppbv	0.02	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Feb 06, 2017	1098	Ambient Air	06-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020107	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020107-001	2,4-Dimethylpentane		0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	2-Methylheptane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020107-001	2-Methylhexane		0.05	ppbv	0.01	AC-058	16-Feb-17
17020107-001	2-Methylpentane		0.10	ppbv	0.01	AC-058	16-Feb-17
17020107-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	3-Methylhexane		0.05	ppbv	0.02	AC-058	16-Feb-17
17020107-001	3-Methylpentane		0.07	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Acetone		1.5	ppbv	0.4	AC-058	16-Feb-17
17020107-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020107-001	Benzene		0.18	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020107-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Carbon disulfide	I	0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Chloroform	I	0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Chloromethane		0.52	ppbv	0.02	AC-058	16-Feb-17
17020107-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020107-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Cyclohexane		0.12	ppbv	0.02	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Feb 06, 2017	1098	Ambient Air	06-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020107	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020107-001	Cyclopentane		0.06	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Ethanol		0.5	ppbv	0.3	AC-058	16-Feb-17
17020107-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020107-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Freon-11		0.37	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Freon-113	I	0.12	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Freon-114	I	0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Freon-12		0.76	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Feb-17
17020107-001	Isobutane		0.72	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Isopentane		0.56	ppbv	0.03	AC-058	16-Feb-17
17020107-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020107-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	m,p-Xylene		0.05	ppbv	0.03	AC-058	16-Feb-17
17020107-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020107-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	16-Feb-17
17020107-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Feb-17
17020107-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020107-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020107-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020107-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020107-001	Methylcyclohexane		0.17	ppbv	0.01	AC-058	16-Feb-17
17020107-001	Methylcyclopentane		0.15	ppbv	0.02	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Feb 06, 2017	1098	Ambient Air	06-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020107	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020107-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020107-001	n-Butane		1.46	ppbv	0.03	AC-058	16-Feb-17
17020107-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020107-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020107-001	n-Heptane		0.09	ppbv	0.01	AC-058	16-Feb-17
17020107-001	n-Hexane		0.13	ppbv	0.01	AC-058	16-Feb-17
17020107-001	n-Octane		0.05	ppbv	0.02	AC-058	16-Feb-17
17020107-001	n-Pentane		0.4	ppbv	0.1	AC-058	16-Feb-17
17020107-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020107-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020107-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020107-001	n-Nonane		0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	o-Xylene		0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020107-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020107-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020107-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020107-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020107-001	Toluene		0.15	ppbv	0.01	AC-058	16-Feb-17
17020107-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020107-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020107-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020107-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, 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
.ICA/VOC/Bonnyville/Feb 06, 2017	1098	Ambient Air	06-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020107	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020107-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	16-Feb-17
17020107-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Feb 12, 2017	2475	Ambient Air	12-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020168	REPORT CREATED:	23-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020168-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020168-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020168-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	16-Feb-17
17020168-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020168-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020168-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	16-Feb-17
17020168-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020168-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020168-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020168-001	1-Butene		0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, March 23, 2017

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Feb 12, 2017	2475	Ambient Air	12-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020168	REPORT CREATED:	23-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020168-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	2-Methylhexane		0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	2-Methylpentane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020168-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	3-Methylpentane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Acetone		1.5	ppbv	0.4	AC-058	16-Feb-17
17020168-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020168-001	Benzene		0.09	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020168-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Carbon tetrachloride	I	0.14	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Chloroform	I	0.03	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Chloromethane		0.64	ppbv	0.02	AC-058	16-Feb-17
17020168-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020168-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Feb 12, 2017	2475	Ambient Air	12-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020168	REPORT CREATED:	23-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020168-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Ethanol		0.7	ppbv	0.3	AC-058	16-Feb-17
17020168-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020168-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Freon-11		0.39	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Freon-113	I	0.11	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Freon-114	I	0.03	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Freon-12		0.84	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Feb-17
17020168-001	Isobutane		0.61	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Isopentane		0.29	ppbv	0.03	AC-058	16-Feb-17
17020168-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020168-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020168-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020168-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	16-Feb-17
17020168-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	16-Feb-17
17020168-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020168-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020168-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020168-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020168-001	Methylcyclohexane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020168-001	Methylcyclopentane		0.02	ppbv	0.02	AC-058	16-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Feb 12, 2017	2475	Ambient Air	12-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020168	REPORT CREATED:	23-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020168-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	16-Feb-17
17020168-001	n-Butane		0.88	ppbv	0.03	AC-058	16-Feb-17
17020168-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020168-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020168-001	n-Heptane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020168-001	n-Hexane		0.06	ppbv	0.01	AC-058	16-Feb-17
17020168-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	n-Pentane		0.2	ppbv	0.1	AC-058	16-Feb-17
17020168-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020168-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020168-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020168-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020168-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020168-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020168-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020168-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020168-001	Toluene		0.04	ppbv	0.01	AC-058	16-Feb-17
17020168-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020168-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020168-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Feb-17
17020168-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/Feb 12, 2017	2475	Ambient Air	12-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020168	REPORT CREATED:	23-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020168-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	16-Feb-17
17020168-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	16-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, March 23, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Feb 18, 2017	1154	Ambient Air	18-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020226-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020226-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Mar-17
17020226-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	01-Mar-17
17020226-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Mar-17
17020226-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020226-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	01-Mar-17
17020226-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020226-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020226-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020226-001	1-Butene		0.25	ppbv	0.02	AC-058	01-Mar-17
17020226-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	01-Mar-17
17020226-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	2,3-Dimethylbutane		0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17

Report certified by: Graham Knox, Team Lead

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Feb 18, 2017	1154	Ambient Air	18-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020226-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	2-Methylhexane		0.02	ppbv	0.01	AC-058	01-Mar-17
17020226-001	2-Methylpentane		0.04	ppbv	0.01	AC-058	01-Mar-17
17020226-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	3-Methylhexane		0.04	ppbv	0.02	AC-058	01-Mar-17
17020226-001	3-Methylpentane		0.02	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Acetone		1.9	ppbv	0.4	AC-058	01-Mar-17
17020226-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020226-001	Benzene		0.12	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020226-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Carbon disulfide	I	0.04	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Chloroform	I	0.03	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Chloromethane		0.45	ppbv	0.02	AC-058	01-Mar-17
17020226-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020226-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Feb 18, 2017	1154	Ambient Air	18-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020226-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Ethanol		1.3	ppbv	0.3	AC-058	01-Mar-17
17020226-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020226-001	Ethylbenzene		0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Freon-11		0.34	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Freon-113	I	0.11	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Freon-114	I	0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Freon-12		0.73	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	01-Mar-17
17020226-001	Isobutane		0.50	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Isopentane		0.33	ppbv	0.03	AC-058	01-Mar-17
17020226-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020226-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	m,p-Xylene		0.04	ppbv	0.03	AC-058	01-Mar-17
17020226-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020226-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	01-Mar-17
17020226-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	01-Mar-17
17020226-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020226-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020226-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Mar-17
17020226-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020226-001	Methylcyclohexane		0.03	ppbv	0.01	AC-058	01-Mar-17
17020226-001	Methylcyclopentane		0.03	ppbv	0.02	AC-058	01-Mar-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Feb 18, 2017	1154	Ambient Air	18-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020226-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Mar-17
17020226-001	n-Butane		0.76	ppbv	0.03	AC-058	01-Mar-17
17020226-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020226-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020226-001	n-Heptane		0.03	ppbv	0.01	AC-058	01-Mar-17
17020226-001	n-Hexane		0.04	ppbv	0.01	AC-058	01-Mar-17
17020226-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	n-Pentane		0.2	ppbv	0.1	AC-058	01-Mar-17
17020226-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Mar-17
17020226-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	01-Mar-17
17020226-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	01-Mar-17
17020226-001	n-Nonane		0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	o-Xylene		0.02	ppbv	0.01	AC-058	01-Mar-17
17020226-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020226-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Mar-17
17020226-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020226-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020226-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020226-001	Toluene		0.06	ppbv	0.01	AC-058	01-Mar-17
17020226-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020226-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020226-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Mar-17
17020226-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17

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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/VOC/Bonnyville/Feb 18, 2017	1154	Ambient Air	18-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020226-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	01-Mar-17
17020226-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	01-Mar-17

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

Date: Monday, March 27, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Feb 24, 2017	2262	Ambient Air	24-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020269-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020269-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020269-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	02-Mar-17
17020269-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020269-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020269-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-001	1,2-Dichloropropane	I	0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Mar-17
17020269-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-001	1-Butene		0.11	ppbv	0.02	AC-058	02-Mar-17
17020269-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-001	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	2,3-Dimethylbutane		0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	2,3-Dimethylpentane		0.03	ppbv	0.02	AC-058	02-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Feb 24, 2017	2262	Ambient Air	24-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020269-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	2-Methylheptane		0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-001	2-Methylhexane		0.03	ppbv	0.01	AC-058	02-Mar-17
17020269-001	2-Methylpentane		0.06	ppbv	0.01	AC-058	02-Mar-17
17020269-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	3-Methylhexane		0.03	ppbv	0.02	AC-058	02-Mar-17
17020269-001	3-Methylpentane		0.04	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Acetone		1.9	ppbv	0.4	AC-058	02-Mar-17
17020269-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Mar-17
17020269-001	Benzene		0.14	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Carbon disulfide		0.67	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Carbon tetrachloride	I	0.15	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Chloroform	I	0.03	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Chloromethane		0.49	ppbv	0.02	AC-058	02-Mar-17
17020269-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020269-001	cis-2-Butene		0.07	ppbv	0.02	AC-058	02-Mar-17
17020269-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Cyclohexane		0.05	ppbv	0.02	AC-058	02-Mar-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Feb 24, 2017	2262	Ambient Air	24-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020269-001	Cyclopentane		0.03	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Ethanol		1.7	ppbv	0.3	AC-058	02-Mar-17
17020269-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Freon-11		0.40	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Freon-113	I	0.12	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Freon-114	I	0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Freon-12		0.82	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Mar-17
17020269-001	Isobutane		0.65	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Isopentane		0.35	ppbv	0.03	AC-058	02-Mar-17
17020269-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	m,p-Xylene		0.06	ppbv	0.03	AC-058	02-Mar-17
17020269-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020269-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	02-Mar-17
17020269-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Mar-17
17020269-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Mar-17
17020269-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Mar-17
17020269-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020269-001	Methylcyclohexane		0.09	ppbv	0.01	AC-058	02-Mar-17
17020269-001	Methylcyclopentane		0.08	ppbv	0.02	AC-058	02-Mar-17

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LICA/VOC/Bonnyville/Feb 24, 2017	2262	Ambient Air	24-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020269-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Mar-17
17020269-001	n-Butane		0.80	ppbv	0.03	AC-058	02-Mar-17
17020269-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Mar-17
17020269-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-001	n-Heptane		0.04	ppbv	0.01	AC-058	02-Mar-17
17020269-001	n-Hexane		0.06	ppbv	0.01	AC-058	02-Mar-17
17020269-001	n-Octane		0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	n-Pentane		0.2	ppbv	0.1	AC-058	02-Mar-17
17020269-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020269-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020269-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020269-001	n-Nonane		0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	o-Xylene		0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020269-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Mar-17
17020269-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020269-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020269-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-001	Toluene		0.09	ppbv	0.01	AC-058	02-Mar-17
17020269-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020269-001	trans-2-Butene		0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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/VOC/Bonnyville/Feb 24, 2017	2262	Ambient Air	24-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020269-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	02-Mar-17
17020269-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

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PAHS SAMPLES

RESULTS:	Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE		CLIENT SAMPLE ID	CANISTER ID	Matrix	Priority
	Calgary AB	T2E 6P8	ICA/PUF/Bonnyville/Feb 06, 2017	TE-01	Air Filter	Normal
INVOICE:	Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB		780 812 2182		DESCRIPTION:	
		T9N 2J5			Bonnyville - AER	
			DATE SAMPLED:	06-Feb-17 0:00	DATE RECEIVED:	13-Feb-17
			REPORT CREATED:	24-Mar-17	REPORT NUMBER:	17020107
					VERSION:	Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020107-002	1-Methylnaphthalene		0.84	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	2-Methylnaphthalene		1.30	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Acenaphthene		0.15	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Acenaphthylene		0.08	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Anthracene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Benzo(a)anthracene		0.02	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Benzo(a)pyrene		0.02	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Benzo(b,j,k)fluoranthene		0.09	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Benzo(c)phenanthrene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Benzo(e)pyrene		0.03	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Chrysene		0.06	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Feb 06, 2017	TE-01	Air Filter	06-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020107	REPORT CREATED:	24-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020107-002	Dibenzo(ah)anthracene		0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Fluoranthene		0.11 ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Fluorene		0.14 ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Indeno(1,2,3-cd)pyrene		0.03 ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Naphthalene		1.50 ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Perylene		0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Phenanthrene		0.36 ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Pyrene		0.07 ug/Filter	0.01	NA-017	17-Mar-17
17020107-002	Retene		0.08 ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Friday, March 24, 2017

Inquiries: (780) 632 8455

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RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID ICA/PUF/Bonnyville/Feb 12, 2017	CANISTER ID A13-02	Matrix Air Filter	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 12-Feb-17	0:00	DATE RECEIVED: 16-Feb-17	
	REPORT CREATED: 23-Mar-17		REPORT NUMBER: 17020168	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020168-002	1-Methylnaphthalene		0.12	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	2-Methylnaphthalene		0.12	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Acenaphthene		0.02	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Acenaphthylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Benzo(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Benzo(a)pyrene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Benzo(b,j,k)fluoranthene		0.03	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Chrysene		0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, March 23, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Feb 12, 2017	A13-02	Air Filter	12-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020168	REPORT CREATED:	23-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020168-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Fluoranthene		0.04 ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Fluorene		0.06 ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Naphthalene		0.18 ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Phenanthrene		0.13 ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Pyrene		0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020168-002	Retene		0.03 ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Thursday, March 23, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Feb 18, 2017	TE08	Air Filter	18-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020226-002	1-Methylnaphthalene		0.13 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	2-Methylnaphthalene		0.10 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Acenaphthene		0.05 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Acenaphthylene		0.07 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Anthracene		0.02 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Benzo(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Benzo(b,j,k)fluoranthene		0.03 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Benzo(e)pyrene		0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Chrysene		0.02 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Fluoranthene		0.08 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Fluorene		0.13 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Naphthalene		0.12 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Phenanthrene		0.34 ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Feb 18, 2017	TE08	Air Filter	18-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020226-002	Pyrene		0.06 ug/Filter	0.01	NA-017	17-Mar-17
17020226-002	Retene		0.04 ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Feb 24, 2017	P13-01	Air Filter	24-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020269-002	1-Methylnaphthalene		0.34 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	2-Methylnaphthalene		0.46 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Acenaphthene		0.08 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Acenaphthylene		0.02 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Benzo(a)anthracene		0.04 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Benzo(a)pyrene		0.07 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Benzo(b,j,k)fluoranthene		0.08 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Benzo(c)phenanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Benzo(e)pyrene		0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Chrysene		0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Dibenzo(ah)anthracene		0.05 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Fluoranthene		0.05 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Fluorene		0.07 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Indeno(1,2,3-cd)pyrene		0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Naphthalene		0.42 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Phenanthrene		0.17 ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Feb 24, 2017	P13-01	Air Filter	24-Feb-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020269-002	Pyrene		0.04 ug/Filter	0.01	NA-017	17-Mar-17
17020269-002	Retene		0.02 ug/Filter	0.01	NA-017	17-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

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NMHC CANISTER 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: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5</p>	<p>CLIENT SAMPLE ID /NMHC VOC/Bonnyville/Feb 06, 2</p> <p>CANISTER ID 2534</p> <p>Matrix Ambient Air</p> <p>Priority Normal</p> <p>DESCRIPTION: Bonnyville - AER</p> <p>DATE SAMPLED: 06-Feb-17 11:30</p> <p>REPORT CREATED: 28-Feb-17</p> <p>DATE RECEIVED: 08-Feb-17</p> <p>REPORT NUMBER: 17020065</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020065-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020065-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020065-001	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	16-Feb-17
17020065-001	1,2,4-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020065-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020065-001	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	1,3-Butadiene	I	0.06	ppbv	0.03	AC-058	16-Feb-17
17020065-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020065-001	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020065-001	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020065-001	1-Butene		0.17	ppbv	0.03	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Tuesday, February 28, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC VOC/Bonnyville/Feb 06, 2	2534	Ambient Air	06-Feb-17	11:30
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17020065	REPORT CREATED:	28-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020065-001	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	1-Pentene		0.02	ppbv	0.01	AC-058	16-Feb-17
17020065-001	2,2,4-Trimethylpentane		0.06	ppbv	0.01	AC-058	16-Feb-17
17020065-001	2,2-Dimethylbutane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020065-001	2,3,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020065-001	2,3-Dimethylbutane		0.06	ppbv	0.03	AC-058	16-Feb-17
17020065-001	2,3-Dimethylpentane		0.08	ppbv	0.03	AC-058	16-Feb-17
17020065-001	2,4-Dimethylpentane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020065-001	2-Methylheptane		0.06	ppbv	0.01	AC-058	16-Feb-17
17020065-001	2-Methylhexane		0.06	ppbv	0.01	AC-058	16-Feb-17
17020065-001	2-Methylpentane		0.13	ppbv	0.01	AC-058	16-Feb-17
17020065-001	3-Methylheptane		0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	3-Methylhexane		0.06	ppbv	0.03	AC-058	16-Feb-17
17020065-001	3-Methylpentane		0.09	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Acetone		1.9	ppbv	0.5	AC-058	16-Feb-17
17020065-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020065-001	Benzene		0.22	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020065-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Carbon disulfide	I	0.09	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Chloroethane	I	0.14	ppbv	0.03	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Tuesday, February 28, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC VOC/Bonnyville/Feb 06, 2	2534	Ambient Air	06-Feb-17	11:30
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17020065	REPORT CREATED:	28-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020065-001	Chloroform	I	0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Chloromethane		0.54	ppbv	0.03	AC-058	16-Feb-17
17020065-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020065-001	cis-2-Butene		0.05	ppbv	0.03	AC-058	16-Feb-17
17020065-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Cyclohexane		0.14	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Cyclopentane		0.06	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Ethanol		1.4	ppbv	0.4	AC-058	16-Feb-17
17020065-001	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020065-001	Ethylbenzene		0.03	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Freon-11	I	0.37	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Freon-113	I	0.11	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Freon-12		0.80	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Hexachloro-1,3-butadiene	K, T, U	< 0.66	ppbv	0.66	AC-058	16-Feb-17
17020065-001	Isobutane		0.92	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Isopentane		0.70	ppbv	0.04	AC-058	16-Feb-17
17020065-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020065-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	m,p-Xylene		0.09	ppbv	0.04	AC-058	16-Feb-17
17020065-001	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020065-001	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	16-Feb-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC VOC/Bonnyville/Feb 06, 2	2534	Ambient Air	06-Feb-17	11:30
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17020065	REPORT CREATED:	28-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020065-001	Methyl butyl ketone	K, T, U	< 0.66	ppbv	0.66	AC-058	16-Feb-17
17020065-001	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020065-001	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020065-001	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	16-Feb-17
17020065-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020065-001	Methylcyclohexane		0.20	ppbv	0.01	AC-058	16-Feb-17
17020065-001	Methylcyclopentane		0.16	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020065-001	n-Butane		1.79	ppbv	0.04	AC-058	16-Feb-17
17020065-001	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	16-Feb-17
17020065-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020065-001	n-Heptane		0.13	ppbv	0.01	AC-058	16-Feb-17
17020065-001	n-Hexane		0.13	ppbv	0.01	AC-058	16-Feb-17
17020065-001	n-Octane		0.07	ppbv	0.03	AC-058	16-Feb-17
17020065-001	n-Pentane		0.4	ppbv	0.1	AC-058	16-Feb-17
17020065-001	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020065-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	16-Feb-17
17020065-001	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	16-Feb-17
17020065-001	n-Nonane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020065-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	o-Xylene		0.03	ppbv	0.01	AC-058	16-Feb-17
17020065-001	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020065-001	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	16-Feb-17
17020065-001	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020065-001	Tetrachloroethylene	I	0.14	ppbv	0.05	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Tuesday, February 28, 2017

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PO Bag 4000
 Vegreville, Alberta
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC VOC/Bonnyville/Feb 06, 2	2534	Ambient Air	06-Feb-17	11:30
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17020065	REPORT CREATED:	28-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020065-001	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020065-001	Toluene		0.21	ppbv	0.01	AC-058	16-Feb-17
17020065-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020065-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020065-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020065-001	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Feb-17
17020065-001	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Feb-17
17020065-001	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Tuesday, February 28, 2017

Inquiries: (780) 632 8455

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PO Bag 4000
 Vegreville, Alberta
 Canada T9C 1T4
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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/Feb 10, 2	CANISTER ID 14703	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 10-Feb-17	7:00	DATE RECEIVED: 14-Feb-17	
	REPORT CREATED: 01-Mar-17		REPORT NUMBER: 17020122	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020122-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	1,1-Dichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020122-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020122-001	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	16-Feb-17
17020122-001	1,2,4-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020122-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020122-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	16-Feb-17
17020122-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020122-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020122-001	1,4-Dichlorobenzene	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020122-001	1,4-Dioxane	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020122-001	1-Butene		0.15	ppbv	0.03	AC-058	16-Feb-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, March 01, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 10, 2	14703	Ambient Air	10-Feb-17 7:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020122	REPORT CREATED:	01-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020122-001	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020122-001	2,2,4-Trimethylpentane		0.11	ppbv	0.01	AC-058	16-Feb-17
17020122-001	2,2-Dimethylbutane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020122-001	2,3,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020122-001	2,3-Dimethylbutane		0.08	ppbv	0.03	AC-058	16-Feb-17
17020122-001	2,3-Dimethylpentane		0.12	ppbv	0.03	AC-058	16-Feb-17
17020122-001	2,4-Dimethylpentane		0.04	ppbv	0.01	AC-058	16-Feb-17
17020122-001	2-Methylheptane		0.04	ppbv	0.01	AC-058	16-Feb-17
17020122-001	2-Methylhexane		0.09	ppbv	0.01	AC-058	16-Feb-17
17020122-001	2-Methylpentane		0.17	ppbv	0.01	AC-058	16-Feb-17
17020122-001	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	3-Methylhexane		0.10	ppbv	0.03	AC-058	16-Feb-17
17020122-001	3-Methylpentane		0.13	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Acetone		1.6	ppbv	0.6	AC-058	16-Feb-17
17020122-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020122-001	Benzene		0.28	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Benzyl chloride	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020122-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17

Report certified by: Krista Gegolick, Account Coordinator

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

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 10, 2	14703	Ambient Air	10-Feb-17 7:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020122	REPORT CREATED:	01-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020122-001	Chloroform	I	0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Chloromethane		0.58	ppbv	0.03	AC-058	16-Feb-17
17020122-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020122-001	cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020122-001	cis-2-Butene		0.05	ppbv	0.03	AC-058	16-Feb-17
17020122-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Cyclohexane		0.17	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Cyclopentane		0.09	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Ethanol		2.2	ppbv	0.4	AC-058	16-Feb-17
17020122-001	Ethyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020122-001	Ethylbenzene		0.05	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Freon-11	I	0.34	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Freon-113	I	0.11	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Freon-12		0.78	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Hexachloro-1,3-butadiene	K, T, U	< 0.70	ppbv	0.70	AC-058	16-Feb-17
17020122-001	Isobutane		1.66	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Isopentane		0.92	ppbv	0.04	AC-058	16-Feb-17
17020122-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Isopropyl alcohol	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020122-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020122-001	m,p-Xylene		0.14	ppbv	0.04	AC-058	16-Feb-17
17020122-001	m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020122-001	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	16-Feb-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, March 01, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 10, 2	14703	Ambient Air	10-Feb-17 7:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020122	REPORT CREATED:	01-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020122-001	Methyl butyl ketone	K, T, U	< 0.70	ppbv	0.70	AC-058	16-Feb-17
17020122-001	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020122-001	Methyl isobutyl ketone	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020122-001	Methyl methacrylate	K, T, U	< 0.10	ppbv	0.10	AC-058	16-Feb-17
17020122-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020122-001	Methylcyclohexane		0.24	ppbv	0.01	AC-058	16-Feb-17
17020122-001	Methylcyclopentane		0.22	ppbv	0.03	AC-058	16-Feb-17
17020122-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020122-001	n-Butane		2.88	ppbv	0.04	AC-058	16-Feb-17
17020122-001	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	16-Feb-17
17020122-001	n-Dodecane	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020122-001	n-Heptane		0.12	ppbv	0.01	AC-058	16-Feb-17
17020122-001	n-Hexane		0.22	ppbv	0.01	AC-058	16-Feb-17
17020122-001	n-Octane		0.05	ppbv	0.03	AC-058	16-Feb-17
17020122-001	n-Pentane		0.6	ppbv	0.1	AC-058	16-Feb-17
17020122-001	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020122-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	16-Feb-17
17020122-001	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	16-Feb-17
17020122-001	n-Nonane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020122-001	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	16-Feb-17
17020122-001	o-Xylene		0.05	ppbv	0.01	AC-058	16-Feb-17
17020122-001	p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020122-001	p-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	16-Feb-17
17020122-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020122-001	Tetrachloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, March 01, 2017

Inquiries: (780) 632 8455

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 10, 2	14703	Ambient Air	10-Feb-17 7:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020122	REPORT CREATED:	01-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020122-001	Tetrahydrofuran	K, T, U	< 0.6 ppbv	0.6	AC-058	16-Feb-17
17020122-001	Toluene		0.25 ppbv	0.01	AC-058	16-Feb-17
17020122-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	16-Feb-17
17020122-001	trans-1,3-Dichloropropylene	K, T, U	< 0.06 ppbv	0.06	AC-058	16-Feb-17
17020122-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	16-Feb-17
17020122-001	trans-2-Pentene	K, T, U	< 0.03 ppbv	0.03	AC-058	16-Feb-17
17020122-001	Trichloroethylene	K, T, U	< 0.06 ppbv	0.06	AC-058	16-Feb-17
17020122-001	Vinyl acetate	K, T, U	< 0.6 ppbv	0.6	AC-058	16-Feb-17
17020122-001	Vinyl chloride	K, T, U	< 0.03 ppbv	0.03	AC-058	16-Feb-17

Report certified by: Krista Gegolick, Account Coordinator	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Wednesday, March 01, 2017	Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca



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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/Feb 13, 2	CANISTER ID 2655	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 13-Feb-17	7:10	DATE RECEIVED: 15-Feb-17	
	REPORT CREATED: 28-Feb-17		REPORT NUMBER: 17020145	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020145-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	1,1-Dichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020145-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020145-001	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	16-Feb-17
17020145-001	1,2,4-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020145-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020145-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	16-Feb-17
17020145-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020145-001	1,4-Dichlorobenzene	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020145-001	1,4-Dioxane	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020145-001	1-Butene		0.14	ppbv	0.03	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Tuesday, February 28, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 13, 2	2655	Ambient Air	13-Feb-17 7:10
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020145	REPORT CREATED:	28-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020145-001	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	2,2,4-Trimethylpentane		0.11	ppbv	0.01	AC-058	16-Feb-17
17020145-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	2,3,4-Trimethylpentane		0.04	ppbv	0.01	AC-058	16-Feb-17
17020145-001	2,3-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	2,3-Dimethylpentane		0.07	ppbv	0.03	AC-058	16-Feb-17
17020145-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	2-Methylhexane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020145-001	2-Methylpentane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020145-001	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	3-Methylhexane		0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	3-Methylpentane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Acetone		1.9	ppbv	0.6	AC-058	16-Feb-17
17020145-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020145-001	Benzene		0.13	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Benzyl chloride	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020145-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Carbon disulfide	I	0.06	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Carbon tetrachloride	I	0.14	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Tuesday, February 28, 2017

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 13, 2	2655	Ambient Air	13-Feb-17 7:10
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020145	REPORT CREATED:	28-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020145-001	Chloroform	I	0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Chloromethane		0.60	ppbv	0.03	AC-058	16-Feb-17
17020145-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020145-001	cis-2-Butene		0.04	ppbv	0.03	AC-058	16-Feb-17
17020145-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Cyclohexane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Ethanol		1.0	ppbv	0.4	AC-058	16-Feb-17
17020145-001	Ethyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020145-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Freon-11	I	0.40	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Freon-113	I	0.12	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Freon-12		0.83	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Hexachloro-1,3-butadiene	K, T, U	< 0.69	ppbv	0.69	AC-058	16-Feb-17
17020145-001	Isobutane		0.23	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Isopentane		0.22	ppbv	0.04	AC-058	16-Feb-17
17020145-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Isopropyl alcohol	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020145-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	m,p-Xylene		0.05	ppbv	0.04	AC-058	16-Feb-17
17020145-001	m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020145-001	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Tuesday, February 28, 2017

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 13, 2	2655	Ambient Air	13-Feb-17 7:10
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020145	REPORT CREATED:	28-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020145-001	Methyl butyl ketone	K, T, U	< 0.69	ppbv	0.69	AC-058	16-Feb-17
17020145-001	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020145-001	Methyl isobutyl ketone	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020145-001	Methyl methacrylate	K, T, U	< 0.10	ppbv	0.10	AC-058	16-Feb-17
17020145-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Feb-17
17020145-001	Methylcyclohexane		0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	Methylcyclopentane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Feb-17
17020145-001	n-Butane		0.66	ppbv	0.04	AC-058	16-Feb-17
17020145-001	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	16-Feb-17
17020145-001	n-Dodecane	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Feb-17
17020145-001	n-Heptane		0.02	ppbv	0.01	AC-058	16-Feb-17
17020145-001	n-Hexane		0.03	ppbv	0.01	AC-058	16-Feb-17
17020145-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	16-Feb-17
17020145-001	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	16-Feb-17
17020145-001	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Feb-17
17020145-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	16-Feb-17
17020145-001	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	16-Feb-17
17020145-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Feb-17
17020145-001	o-Xylene		0.02	ppbv	0.01	AC-058	16-Feb-17
17020145-001	p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020145-001	p-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	16-Feb-17
17020145-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17
17020145-001	Tetrachloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Tuesday, February 28, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 13, 2	2655	Ambient Air	13-Feb-17 7:10
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020145	REPORT CREATED:	28-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020145-001	Tetrahydrofuran	K, T, U	< 0.6 ppbv	0.6	AC-058	16-Feb-17
17020145-001	Toluene		0.11 ppbv	0.01	AC-058	16-Feb-17
17020145-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	16-Feb-17
17020145-001	trans-1,3-Dichloropropylene	K, T, U	< 0.06 ppbv	0.06	AC-058	16-Feb-17
17020145-001	trans-2-Butene	K, T, U	< 0.01 ppbv	0.01	AC-058	16-Feb-17
17020145-001	trans-2-Pentene	K, T, U	< 0.03 ppbv	0.03	AC-058	16-Feb-17
17020145-001	Trichloroethylene	K, T, U	< 0.06 ppbv	0.06	AC-058	16-Feb-17
17020145-001	Vinyl acetate	K, T, U	< 0.6 ppbv	0.6	AC-058	16-Feb-17
17020145-001	Vinyl chloride	K, T, U	< 0.03 ppbv	0.03	AC-058	16-Feb-17

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

Date: Tuesday, February 28, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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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/Feb 15, 2	CANISTER ID S5590	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 15-Feb-17	3:20	DATE RECEIVED: 21-Feb-17	
	REPORT CREATED: 21-Mar-17		REPORT NUMBER: 17020202	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020202-001	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	1,1-Dichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020202-001	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Mar-17
17020202-001	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	01-Mar-17
17020202-001	1,2,4-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Mar-17
17020202-001	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020202-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	01-Mar-17
17020202-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020202-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020202-001	1,4-Dichlorobenzene	K, T, U	< 0.6	ppbv	0.6	AC-058	01-Mar-17
17020202-001	1,4-Dioxane	K, T, U	< 0.6	ppbv	0.6	AC-058	01-Mar-17
17020202-001	1-Butene		0.19	ppbv	0.03	AC-058	01-Mar-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Tuesday, March 21, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 15, 2	S5590	Ambient Air	15-Feb-17 3:20
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020202	REPORT CREATED:	21-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020202-001	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	1-Pentene		0.04	ppbv	0.01	AC-058	01-Mar-17
17020202-001	2,2,4-Trimethylpentane		0.16	ppbv	0.01	AC-058	01-Mar-17
17020202-001	2,2-Dimethylbutane		0.03	ppbv	0.01	AC-058	01-Mar-17
17020202-001	2,3,4-Trimethylpentane		0.04	ppbv	0.01	AC-058	01-Mar-17
17020202-001	2,3-Dimethylbutane		0.12	ppbv	0.03	AC-058	01-Mar-17
17020202-001	2,3-Dimethylpentane		0.21	ppbv	0.03	AC-058	01-Mar-17
17020202-001	2,4-Dimethylpentane		0.07	ppbv	0.01	AC-058	01-Mar-17
17020202-001	2-Methylheptane		0.04	ppbv	0.01	AC-058	01-Mar-17
17020202-001	2-Methylhexane		0.15	ppbv	0.01	AC-058	01-Mar-17
17020202-001	2-Methylpentane		0.26	ppbv	0.01	AC-058	01-Mar-17
17020202-001	3-Methylheptane		0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	3-Methylhexane		0.13	ppbv	0.03	AC-058	01-Mar-17
17020202-001	3-Methylpentane		0.19	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Acetone		2.8	ppbv	0.6	AC-058	01-Mar-17
17020202-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020202-001	Benzene		0.19	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Benzyl chloride	K, T, U	< 0.6	ppbv	0.6	AC-058	01-Mar-17
17020202-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Carbon disulfide	I	0.26	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Tuesday, March 21, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 15, 2	S5590	Ambient Air	15-Feb-17 3:20
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020202	REPORT CREATED:	21-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020202-001	Chloroform	I	0.05	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Chloromethane		0.50	ppbv	0.03	AC-058	01-Mar-17
17020202-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020202-001	cis-1,3-Dichloropropene	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020202-001	cis-2-Butene		0.09	ppbv	0.03	AC-058	01-Mar-17
17020202-001	cis-2-Pentene		0.04	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Cyclohexane		0.10	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Cyclopentane		0.08	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Ethanol		7.9	ppbv	0.4	AC-058	01-Mar-17
17020202-001	Ethyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	01-Mar-17
17020202-001	Ethylbenzene		0.05	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Freon-11	I	0.38	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Freon-113	I	0.11	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Freon-12		0.79	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Hexachloro-1,3-butadiene	K, T, U	< 0.70	ppbv	0.70	AC-058	01-Mar-17
17020202-001	Isobutane		7.21	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Isopentane		2.18	ppbv	0.04	AC-058	01-Mar-17
17020202-001	Isoprene		0.03	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Isopropyl alcohol	K, T, U	< 0.6	ppbv	0.6	AC-058	01-Mar-17
17020202-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Mar-17
17020202-001	m,p-Xylene		0.18	ppbv	0.04	AC-058	01-Mar-17
17020202-001	m-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020202-001	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	01-Mar-17

Report certified by:	Krista Gegolick, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Tuesday, March 21, 2017	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 15, 2	S5590	Ambient Air	15-Feb-17 3:20
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020202	REPORT CREATED:	21-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020202-001	Methyl butyl ketone	K, T, U	< 0.70	ppbv	0.70	AC-058	01-Mar-17
17020202-001	Methyl ethyl ketone		0.5	ppbv	0.4	AC-058	01-Mar-17
17020202-001	Methyl isobutyl ketone	K, T, U	< 0.6	ppbv	0.6	AC-058	01-Mar-17
17020202-001	Methyl methacrylate	K, T, U	< 0.10	ppbv	0.10	AC-058	01-Mar-17
17020202-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Mar-17
17020202-001	Methylcyclohexane		0.18	ppbv	0.01	AC-058	01-Mar-17
17020202-001	Methylcyclopentane		0.16	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Mar-17
17020202-001	n-Butane		11.7	ppbv	0.04	AC-058	01-Mar-17
17020202-001	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	01-Mar-17
17020202-001	n-Dodecane	K, T, U	< 0.6	ppbv	0.6	AC-058	01-Mar-17
17020202-001	n-Heptane		0.16	ppbv	0.01	AC-058	01-Mar-17
17020202-001	n-Hexane		0.27	ppbv	0.01	AC-058	01-Mar-17
17020202-001	n-Octane		0.06	ppbv	0.03	AC-058	01-Mar-17
17020202-001	n-Pentane		1.1	ppbv	0.1	AC-058	01-Mar-17
17020202-001	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Mar-17
17020202-001	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	01-Mar-17
17020202-001	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	01-Mar-17
17020202-001	n-Nonane		0.02	ppbv	0.01	AC-058	01-Mar-17
17020202-001	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	01-Mar-17
17020202-001	o-Xylene		0.09	ppbv	0.01	AC-058	01-Mar-17
17020202-001	p-Diethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020202-001	p-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	01-Mar-17
17020202-001	Styrene	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020202-001	Tetrachloroethylene	I	0.13	ppbv	0.06	AC-058	01-Mar-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Tuesday, March 21, 2017

Inquiries: (780) 632 8455

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 Vegreville, Alberta
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 15, 2	S5590	Ambient Air	15-Feb-17 3:20
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020202	REPORT CREATED:	21-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020202-001	Tetrahydrofuran	K, T, U	< 0.6	ppbv	0.6	AC-058	01-Mar-17
17020202-001	Toluene		0.56	ppbv	0.01	AC-058	01-Mar-17
17020202-001	trans-1,2-Dichloroethylene	I	0.02	ppbv	0.01	AC-058	01-Mar-17
17020202-001	trans-1,3-Dichloropropylene	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020202-001	trans-2-Butene		0.03	ppbv	0.01	AC-058	01-Mar-17
17020202-001	trans-2-Pentene		0.05	ppbv	0.03	AC-058	01-Mar-17
17020202-001	Trichloroethylene	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Mar-17
17020202-001	Vinyl acetate	K, T, U	< 0.6	ppbv	0.6	AC-058	01-Mar-17
17020202-001	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Mar-17

Report certified by:	Krista Gegolick, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Tuesday, March 21, 2017	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

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID /NMHC VOC/Bonnyville/Feb 20, :	CANISTER ID S5682	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 20-Feb-17	17:30	DATE RECEIVED: 23-Feb-17	
	REPORT CREATED: 27-Mar-17		REPORT NUMBER: 17020226	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RD L	Method	Analysis Date
17020226-003	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020226-003	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Mar-17
17020226-003	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	02-Mar-17
17020226-003	1,2,4-Trimethylbenzene		0.13	ppbv	0.07	AC-058	02-Mar-17
17020226-003	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020226-003	1,2-Dichloroethane	I	0.03	ppbv	0.01	AC-058	02-Mar-17
17020226-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020226-003	1,3,5-Trimethylbenzene		0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020226-003	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020226-003	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020226-003	1-Butene		2.37	ppbv	0.03	AC-058	02-Mar-17

Report certified by: Graham Knox, Team Lead

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/Feb 20, 2	S5682	Ambient Air	20-Feb-17 17:30
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020226-003	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	1-Pentene		0.18	ppbv	0.01	AC-058	02-Mar-17
17020226-003	2,2,4-Trimethylpentane		0.14	ppbv	0.01	AC-058	02-Mar-17
17020226-003	2,2-Dimethylbutane		0.03	ppbv	0.01	AC-058	02-Mar-17
17020226-003	2,3,4-Trimethylpentane		0.04	ppbv	0.01	AC-058	02-Mar-17
17020226-003	2,3-Dimethylbutane		0.21	ppbv	0.03	AC-058	02-Mar-17
17020226-003	2,3-Dimethylpentane		0.21	ppbv	0.03	AC-058	02-Mar-17
17020226-003	2,4-Dimethylpentane		0.10	ppbv	0.01	AC-058	02-Mar-17
17020226-003	2-Methylheptane		0.03	ppbv	0.01	AC-058	02-Mar-17
17020226-003	2-Methylhexane		0.13	ppbv	0.01	AC-058	02-Mar-17
17020226-003	2-Methylpentane		0.60	ppbv	0.01	AC-058	02-Mar-17
17020226-003	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	3-Methylhexane		0.13	ppbv	0.03	AC-058	02-Mar-17
17020226-003	3-Methylpentane		0.35	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Acetone		3.0	ppbv	0.5	AC-058	02-Mar-17
17020226-003	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020226-003	Benzene		0.23	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020226-003	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Carbon disulfide	I	0.12	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Carbon tetrachloride	I	0.14	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Mar-17

Report certified by: Graham Knox, Team Lead

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/Feb 20, 2	S5682	Ambient Air	20-Feb-17 17:30
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020226-003	Chloroform	I	0.04	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Chloromethane		0.76	ppbv	0.03	AC-058	02-Mar-17
17020226-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020226-003	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020226-003	cis-2-Butene		0.88	ppbv	0.03	AC-058	02-Mar-17
17020226-003	cis-2-Pentene		0.20	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Cyclohexane		0.05	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Cyclopentane		0.06	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Ethanol		6.3	ppbv	0.4	AC-058	02-Mar-17
17020226-003	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020226-003	Ethylbenzene		0.03	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Freon-11	I	0.36	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Freon-113	I	0.12	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Freon-114	I	0.03	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Freon-12		0.90	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Hexachloro-1,3-butadiene	K, T, U	< 0.67	ppbv	0.67	AC-058	02-Mar-17
17020226-003	Isobutane		18.0	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Isopentane		8.80	ppbv	0.04	AC-058	02-Mar-17
17020226-003	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020226-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020226-003	m,p-Xylene		0.10	ppbv	0.04	AC-058	02-Mar-17
17020226-003	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020226-003	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	02-Mar-17

Report certified by: Graham Knox, Team Lead

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

Date: Monday, March 27, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/Feb 20, 2	S5682	Ambient Air	20-Feb-17 17:30
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020226-003	Methyl butyl ketone	K, T, U	< 0.67	ppbv	0.67	AC-058	02-Mar-17
17020226-003	Methyl ethyl ketone		0.4	ppbv	0.4	AC-058	02-Mar-17
17020226-003	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020226-003	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	02-Mar-17
17020226-003	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020226-003	Methylcyclohexane		0.10	ppbv	0.01	AC-058	02-Mar-17
17020226-003	Methylcyclopentane		0.29	ppbv	0.03	AC-058	02-Mar-17
17020226-003	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020226-003	n-Butane		46.1	ppbv	0.12	AC-058	02-Mar-17
17020226-003	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	02-Mar-17
17020226-003	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020226-003	n-Heptane		0.10	ppbv	0.01	AC-058	02-Mar-17
17020226-003	n-Hexane		0.20	ppbv	0.01	AC-058	02-Mar-17
17020226-003	n-Octane		0.04	ppbv	0.03	AC-058	02-Mar-17
17020226-003	n-Pentane		1.1	ppbv	0.1	AC-058	02-Mar-17
17020226-003	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Mar-17
17020226-003	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	02-Mar-17
17020226-003	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	02-Mar-17
17020226-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020226-003	o-Ethyltoluene	I	0.01	ppbv	0.01	AC-058	02-Mar-17
17020226-003	o-Xylene		0.05	ppbv	0.01	AC-058	02-Mar-17
17020226-003	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020226-003	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	02-Mar-17
17020226-003	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020226-003	Tetrachloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17

Report certified by: Graham Knox, Team Lead

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/Feb 20, 2	S5682	Ambient Air	20-Feb-17 17:30
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020226	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020226-003	Tetrahydrofuran	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Mar-17
17020226-003	Toluene		0.23 ppbv	0.01	AC-058	02-Mar-17
17020226-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Mar-17
17020226-003	trans-1,3-Dichloropropylene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Mar-17
17020226-003	trans-2-Butene		1.40 ppbv	0.01	AC-058	02-Mar-17
17020226-003	trans-2-Pentene		0.34 ppbv	0.03	AC-058	02-Mar-17
17020226-003	Trichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Mar-17
17020226-003	Vinyl acetate	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Mar-17
17020226-003	Vinyl chloride	K, T, U	< 0.03 ppbv	0.03	AC-058	02-Mar-17

Report certified by: Graham Knox, Team Lead

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID /NMHC VOC/Bonnyville/Feb 23, :	CANISTER ID 2485	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 23-Feb-17	6:05	DATE RECEIVED: 28-Feb-17	
	REPORT CREATED: 27-Mar-17		REPORT NUMBER: 17020269	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020269-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020269-003	1,2,3-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Mar-17
17020269-003	1,2,4-Trichlorobenzene	K, T, U	< 1.0	ppbv	1.0	AC-058	02-Mar-17
17020269-003	1,2,4-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Mar-17
17020269-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020269-003	1,2-Dichloroethane	I	0.03	ppbv	0.01	AC-058	02-Mar-17
17020269-003	1,2-Dichloropropane	I	0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-003	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020269-003	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020269-003	1-Butene		0.07	ppbv	0.02	AC-058	02-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/Feb 23, 2	2485	Ambient Air	23-Feb-17 6:05
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020269-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-003	2,2,4-Trimethylpentane		0.04	ppbv	0.01	AC-058	02-Mar-17
17020269-003	2,2-Dimethylbutane		0.03	ppbv	0.01	AC-058	02-Mar-17
17020269-003	2,3,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-003	2,3-Dimethylbutane		0.06	ppbv	0.02	AC-058	02-Mar-17
17020269-003	2,3-Dimethylpentane		0.08	ppbv	0.02	AC-058	02-Mar-17
17020269-003	2,4-Dimethylpentane		0.03	ppbv	0.01	AC-058	02-Mar-17
17020269-003	2-Methylheptane		0.04	ppbv	0.01	AC-058	02-Mar-17
17020269-003	2-Methylhexane		0.07	ppbv	0.01	AC-058	02-Mar-17
17020269-003	2-Methylpentane		0.31	ppbv	0.01	AC-058	02-Mar-17
17020269-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	3-Methylhexane		0.11	ppbv	0.02	AC-058	02-Mar-17
17020269-003	3-Methylpentane		0.23	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Acetone		1.1	ppbv	0.5	AC-058	02-Mar-17
17020269-003	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-003	Benzene		0.18	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020269-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Carbon disulfide	I	0.04	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Carbon tetrachloride	I	0.14	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/Feb 23, 2	2485	Ambient Air	23-Feb-17 6:05
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020269-003	Chloroform	I	0.04	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Chloromethane		0.52	ppbv	0.02	AC-058	02-Mar-17
17020269-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-003	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020269-003	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Cyclohexane		0.13	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Cyclopentane		0.13	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Ethanol		0.9	ppbv	0.4	AC-058	02-Mar-17
17020269-003	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020269-003	Ethylbenzene		0.03	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Freon-11		0.38	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Freon-113	I	0.12	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Freon-12		0.94	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Hexachloro-1,3-butadiene	K, T, U	< 0.62	ppbv	0.62	AC-058	02-Mar-17
17020269-003	Isobutane		3.17	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Isopentane		2.02	ppbv	0.04	AC-058	02-Mar-17
17020269-003	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020269-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-003	m,p-Xylene		0.08	ppbv	0.04	AC-058	02-Mar-17
17020269-003	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020269-003	m-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	02-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/Feb 23, 2	2485	Ambient Air	23-Feb-17 6:05
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020269-003	Methyl butyl ketone	K, T, U	< 0.62	ppbv	0.62	AC-058	02-Mar-17
17020269-003	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-003	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020269-003	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	02-Mar-17
17020269-003	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Mar-17
17020269-003	Methylcyclohexane		0.19	ppbv	0.01	AC-058	02-Mar-17
17020269-003	Methylcyclopentane		0.25	ppbv	0.02	AC-058	02-Mar-17
17020269-003	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Mar-17
17020269-003	n-Butane		7.05	ppbv	0.04	AC-058	02-Mar-17
17020269-003	n-Decane	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Mar-17
17020269-003	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Mar-17
17020269-003	n-Heptane		0.15	ppbv	0.01	AC-058	02-Mar-17
17020269-003	n-Hexane		0.39	ppbv	0.01	AC-058	02-Mar-17
17020269-003	n-Octane		0.06	ppbv	0.02	AC-058	02-Mar-17
17020269-003	n-Pentane		1.8	ppbv	0.1	AC-058	02-Mar-17
17020269-003	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Mar-17
17020269-003	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	02-Mar-17
17020269-003	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	02-Mar-17
17020269-003	n-Nonane		0.02	ppbv	0.01	AC-058	02-Mar-17
17020269-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Mar-17
17020269-003	o-Xylene		0.04	ppbv	0.01	AC-058	02-Mar-17
17020269-003	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020269-003	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	02-Mar-17
17020269-003	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17
17020269-003	Tetrachloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/Feb 23, 2	2485	Ambient Air	23-Feb-17 6:05
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17020269	REPORT CREATED:	27-Mar-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020269-003	Tetrahydrofuran	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Mar-17
17020269-003	Toluene		0.14 ppbv	0.01	AC-058	02-Mar-17
17020269-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Mar-17
17020269-003	trans-1,3-Dichloropropylene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Mar-17
17020269-003	trans-2-Butene		0.01 ppbv	0.01	AC-058	02-Mar-17
17020269-003	trans-2-Pentene	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Mar-17
17020269-003	Trichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Mar-17
17020269-003	Vinyl acetate	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Mar-17
17020269-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: Monday, March 27, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID /NMHC VOC/Bonnyville/Feb 27, 2017	CANISTER ID 14735	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 27-Feb-17	21:15	DATE RECEIVED: 09-Mar-17	
	REPORT CREATED: 13-Apr-17		REPORT NUMBER: 17030077	
	780 812 2182		VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17030077-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17
17030077-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17
17030077-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17
17030077-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17
17030077-003	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Mar-17
17030077-003	1,2,3-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Mar-17
17030077-003	1,2,4-Trichlorobenzene	K, T, U	< 1.0	ppbv	1.0	AC-058	16-Mar-17
17030077-003	1,2,4-Trimethylbenzene		0.08	ppbv	0.06	AC-058	16-Mar-17
17030077-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17
17030077-003	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Mar-17
17030077-003	1,2-Dichloroethane	I	0.03	ppbv	0.01	AC-058	16-Mar-17
17030077-003	1,2-Dichloropropane	I	0.01	ppbv	0.01	AC-058	16-Mar-17
17030077-003	1,3,5-Trimethylbenzene		0.06	ppbv	0.02	AC-058	16-Mar-17
17030077-003	1,3-Butadiene	I	0.03	ppbv	0.02	AC-058	16-Mar-17
17030077-003	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Mar-17
17030077-003	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Mar-17
17030077-003	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Mar-17
17030077-003	1-Butene		0.22	ppbv	0.02	AC-058	16-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: April-13-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 27, 2	14735	Ambient Air	27-Feb-17 21:15
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17030077	REPORT CREATED:	13-Apr-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17030077-003	1-Hexene	I	0.07	ppbv	0.02	AC-058	16-Mar-17
17030077-003	1-Pentene		0.28	ppbv	0.01	AC-058	16-Mar-17
17030077-003	2,2,4-Trimethylpentane		0.26	ppbv	0.01	AC-058	16-Mar-17
17030077-003	2,2-Dimethylbutane		0.08	ppbv	0.01	AC-058	16-Mar-17
17030077-003	2,3,4-Trimethylpentane		0.09	ppbv	0.01	AC-058	16-Mar-17
17030077-003	2,3-Dimethylbutane		0.27	ppbv	0.02	AC-058	16-Mar-17
17030077-003	2,3-Dimethylpentane		0.29	ppbv	0.02	AC-058	16-Mar-17
17030077-003	2,4-Dimethylpentane		0.15	ppbv	0.01	AC-058	16-Mar-17
17030077-003	2-Methylheptane		0.05	ppbv	0.01	AC-058	16-Mar-17
17030077-003	2-Methylhexane		0.15	ppbv	0.01	AC-058	16-Mar-17
17030077-003	2-Methylpentane		0.76	ppbv	0.01	AC-058	16-Mar-17
17030077-003	3-Methylheptane		0.04	ppbv	0.02	AC-058	16-Mar-17
17030077-003	3-Methylhexane		0.17	ppbv	0.02	AC-058	16-Mar-17
17030077-003	3-Methylpentane		0.42	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Acetone		81.0	ppbv	3.0	AC-058	16-Mar-17
17030077-003	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Mar-17
17030077-003	Benzene		0.41	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Mar-17
17030077-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Carbon disulfide	I	0.06	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: April-13-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 27, 2	14735	Ambient Air	27-Feb-17 21:15
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17030077	REPORT CREATED:	13-Apr-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17030077-003	Chloroform	I	0.04	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Chloromethane		0.81	ppbv	0.02	AC-058	16-Mar-17
17030077-003	cis-1,2-Dichloroethene	I	0.04	ppbv	0.01	AC-058	16-Mar-17
17030077-003	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Mar-17
17030077-003	cis-2-Butene		0.08	ppbv	0.02	AC-058	16-Mar-17
17030077-003	cis-2-Pentene		0.23	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Cyclohexane		0.27	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Cyclopentane		0.25	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Ethanol		5.4	ppbv	0.4	AC-058	16-Mar-17
17030077-003	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Mar-17
17030077-003	Ethylbenzene		0.07	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Freon-11	I	0.30	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Freon-113	I	0.15	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Freon-12		0.56	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Hexachloro-1,3-butadiene	K, T, U	< 0.62	ppbv	0.62	AC-058	16-Mar-17
17030077-003	Isobutane		5.37	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Isopentane		5.38	ppbv	0.04	AC-058	16-Mar-17
17030077-003	Isoprene		0.04	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Mar-17
17030077-003	Isopropylbenzene		0.02	ppbv	0.01	AC-058	16-Mar-17
17030077-003	m,p-Xylene		0.23	ppbv	0.04	AC-058	16-Mar-17
17030077-003	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Mar-17
17030077-003	m-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	16-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: April-13-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC VOC/Bonnyville/Feb 27, 2	14735	Ambient Air	27-Feb-17 21:15
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17030077	REPORT CREATED:	13-Apr-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17030077-003	Methyl butyl ketone	K, T, U	< 0.62	ppbv	0.62	AC-058	16-Mar-17
17030077-003	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Mar-17
17030077-003	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Mar-17
17030077-003	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	16-Mar-17
17030077-003	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	16-Mar-17
17030077-003	Methylcyclohexane		0.25	ppbv	0.01	AC-058	16-Mar-17
17030077-003	Methylcyclopentane		0.42	ppbv	0.02	AC-058	16-Mar-17
17030077-003	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	16-Mar-17
17030077-003	n-Butane		39.4	ppbv	0.22	AC-058	16-Mar-17
17030077-003	n-Decane	K, T, U	< 0.07	ppbv	0.07	AC-058	16-Mar-17
17030077-003	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	16-Mar-17
17030077-003	n-Heptane		0.15	ppbv	0.01	AC-058	16-Mar-17
17030077-003	n-Hexane		0.46	ppbv	0.01	AC-058	16-Mar-17
17030077-003	n-Octane		0.05	ppbv	0.02	AC-058	16-Mar-17
17030077-003	n-Pentane		2.1	ppbv	0.1	AC-058	16-Mar-17
17030077-003	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	16-Mar-17
17030077-003	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Mar-17
17030077-003	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	16-Mar-17
17030077-003	n-Nonane		0.05	ppbv	0.01	AC-058	16-Mar-17
17030077-003	o-Ethyltoluene	I	0.03	ppbv	0.01	AC-058	16-Mar-17
17030077-003	o-Xylene		0.06	ppbv	0.01	AC-058	16-Mar-17
17030077-003	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Mar-17
17030077-003	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	16-Mar-17
17030077-003	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	16-Mar-17
17030077-003	Tetrachloroethylene		0.90	ppbv	0.05	AC-058	16-Mar-17

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

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
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DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17030077	REPORT CREATED:	13-Apr-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17030077-003	Tetrahydrofuran	K, T, U	< 0.5 ppbv	0.5	AC-058	16-Mar-17
17030077-003	Toluene		0.49 ppbv	0.01	AC-058	16-Mar-17
17030077-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	16-Mar-17
17030077-003	trans-1,3-Dichloropropylene	K, T, U	< 0.05 ppbv	0.05	AC-058	16-Mar-17
17030077-003	trans-2-Butene		0.06 ppbv	0.01	AC-058	16-Mar-17
17030077-003	trans-2-Pentene		0.49 ppbv	0.02	AC-058	16-Mar-17
17030077-003	Trichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	16-Mar-17
17030077-003	Vinyl acetate		1.0 ppbv	0.5	AC-058	16-Mar-17
17030077-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	16-Mar-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: April-13-17

Inquiries: (780) 632 8455

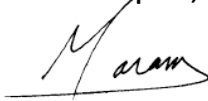
E-mail: EAS.Results@innotechalberta.ca

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	Bonnyville Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Maram Galeb	Project Manager, 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

14-04-2017



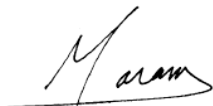

Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-02-35-C</u>
Site: <u>Bonnyville Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	 _____	Date <u>10-March-17</u>
Level 1 Primary Validation	 _____	Date <u>28-March-17</u>
Level 2 Final Validation	 _____	Date <u>10-April-17</u>
Level 3 Independent Data Review	 _____	Date <u>14-April-17</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.