



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 January 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 January 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,



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

JOB #: 2833-2017-01-01-C

January 2017

Prepared for:

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SUMMARY

In January 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 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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

PM_{2.5}: One hour of downtime was recorded on January 15 due to a maintenance event.

Forty-one hours of data were recorded at concentrations less than -3 ug/m^3 this month, rendering the data invalid.

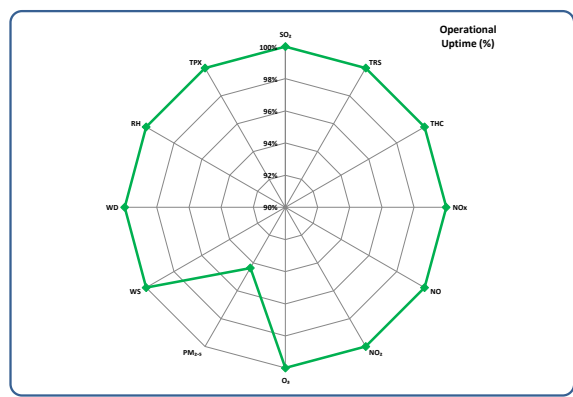
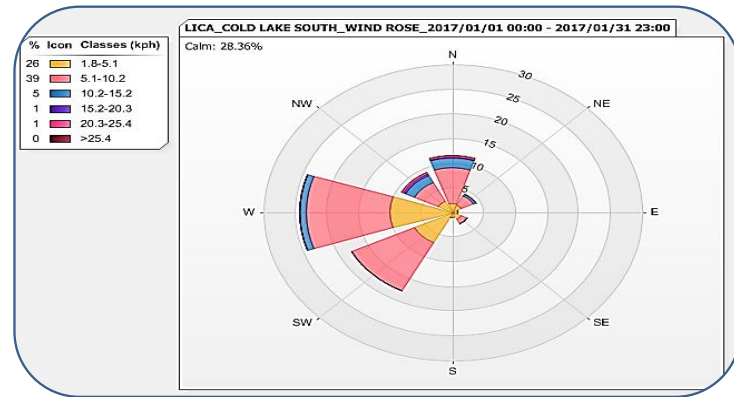
NO_x/NO/NO₂: The NO_x gas concentration 50.7 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.9 ppm. A sample of affected calculations has been rerun and the error has no significant effect on the calibration. The 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 403-219-3689 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	0.3	100.0%	2.2	January 13, 14	22, 20	172	0	1.2	January 14	48	0
TRS	ppb	0.2	100.0%	0.6	January 17, 17	9, 10	-	-	0.4	VAR	-	-
THC	ppm	2.35	100.0%	4.61	January 21	9	-	-	3.08	January 21	9	-
NO _x	ppb	11.4	100.0%	91.7	January 17	9	-	-	39.3	January 19	9	-
NO	ppb	3.7	100.0%	60.7	January 20	9	-	-	24.0	January 19	-	-
NO ₂	ppb	7.7	100.0%	31.9	January 17	9	159	0	15.9	January 17, 18	-	-
O ₃	ppb	23.5	100.0%	43.8	January 11	13	82	0	38.1	January 15	-	-
PM _{2.5}	µg/m ³	4.4	94.4%	23.5	January 20	18	80	0	13.6	January 20	30	0
WS	%	2.7	100.0%	25.3	January 11	14	-	-	9.7	January 30	-	-
WD	degree	289 (WNW)	100.0%	-	-	-	-	-	-	-	-	-
RH	mm	74	100.0%	94	January 18, 18	7, 8	-	-	88	January 19, 20	-	-
AmbTPX	°C	-11.4	100.0%	7.8	January 17	13	-	-	2.1	January 29	-	-



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 AAQO 2016.

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

Operational Issues

* **PM_{2.5}**: One hour of downtime was recorded on January 15 due to a maintenance event. Forty-one 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 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				WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY		
SO ₂ (ppb)	172	48	0	0	0.3	2.2	13, 14	22, 20	5.2 6.5	WSW WSW	1.2	14	100.0
TRS (ppb)	-	-	-	-	0.2	0.6	17, 17	9, 10	1.3 0.9	E WSW	0.4	VAR	100.0
THC (ppm)	-	-	-	-	2.35	4.61	21	9	2.1	W	3.08	21	100.0
NO ₂ (ppb)	159	-	0	-	7.7	31.9	17	9	1.3	E	15.9	17, 18	100.0
NO (ppb)	-	-	-	-	3.7	60.7	20	9	0.8	SE	24.0	19	100.0
NO _x (ppb)	-	-	-	-	11.4	91.7	17	9	1.3	E	39.3	19	100.0
O ₃ (ppb)	82	-	0	-	23.5	43.8	11	13	19.2	WNW	38.1	15	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	4.4	23.5	20	18	1.2	NNE	13.6	20	94.4
RELATIVE HUMIDITY (%)	-	-	-	-	74	94	18, 18	7, 8	2.4 0.7	ENE NE	88	19, 20	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-11.4	7.8	17	13	3.9	SW	2.1	29	100.0
VECTOR WS (kph)	-	-	-	-	2.7	25.3	11	14	-	N	9.7	30	100.0
VECTOR WD (sec)	-	-	-	-	289 (WNW)	-	-	-	-	-	-	-	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.

Passive Sampler Summary

	Sulphur Dioxide (ppb)
Mean	0.7
Minimum	0.3
Maximum	1.7

Note:

Access papers for stations #12 and #25 were not provided and access to the station #11 was blocked by snow. As a result, data is not available for these stations.

	Hydrogen Sulphide (ppb)
Mean	0.14
Minimum	0.09
Maximum	0.33

Note:

Access papers for stations #12 and #25 were not provided and access to the station #11 was blocked by snow. As a result, data is not available for these stations.

	Nitrogen Dioxide (ppb)
Mean	3.6
Minimum	1.2
Maximum	6.9

Note:

Access papers for stations #12 were not provided and access to the station #11 was blocked by snow. As a result, data is not available for these stations.

	Ozone (ppb)
Mean	25.0
Minimum	20.3
Maximum	34.1

Note:

Access papers for stations #12 were not provided and access to the station #11 was blocked by snow. As a result, data is not available for these stations.

Volatile Organics (VOCs) Data Summary

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
January 1, 2017	0.99	Freon-12
January 7, 2017	1.55	n-Butane
January 13, 2017	4.70	Isopropyl alcohol
January 19, 2017	6.72	n-Butane
January 25, 2017	2.05	n-Butane
January 31, 2017	1.50	Acetone

Note: NA

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
January 7, 2017	1.11	2-Methylnaphthalene
January 13, 2017	0.77	2-Methylnaphthalene
January 19, 2017	1.37	2-Methylnaphthalene
January 25, 2017	1.17	2-Methylnaphthalene
January 31, 2017	0.36	Naphthalene

Note: Sample was not collected on January 1 due to a software error.

Partisol Sampler Summary

Sample Collection Date	Concentration (mg)
January 1, 2017	0.024
January 7, 2017	0.063
January 13, 2017	0.169
January 19, 2017	0.235
January 25, 2017	0.307
January 31, 2017	0.034

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, PAHs and the Passive monitoring program are also included in this report.

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

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on January 10. No operational issues were identified this month.

TOTAL REDUCED SULPHUR (TRS)

The routine monthly calibration was performed on January 10. No operational issues were identified this month.

TOTAL HYDROCARBONS (THC)

The routine monthly calibration was performed on January 10. No operational issues were identified this month.

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

The routine monthly calibration was performed on January 10. No operational issues were identified this month.

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)

The routine monthly calibration was performed on January 10. No operational issues were identified this month.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

Two routine TEOM audits were performed this month. The first was completed on January 10, and the second on January 26. The TEOM unit started recording consecutive negative values on January 14, possibly due to abrupt changes in weather conditions. This prompted a site visit on January 15, where the sample filter was replaced. One hour of downtime was recorded during this maintenance event.

Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and $-3 \mu\text{g}/\text{m}^3$ was corrected to $0 \mu\text{g}/\text{m}^3$. Data recorded below $-3 \mu\text{g}/\text{m}^3$ was invalidated. Forty-one hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.

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

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.

No operational issues were identified this month.

RELATIVE HUMIDITY (RH)

No operational issues were identified this month.

AMBIENT TEMPERATURE (AmbTPX)

No operational issues were identified this month.

VOC SAMPLES

The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).

Samples were collected on January 1, 7, 13, 19, 25 and 31. Analytical results are included in this report. VOC results are reported in ppb.

PAH SAMPLES

The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).

Samples were collected on January 7, 13, 19, 25 and 31. They were sent to the lab for analysis. Analytical results are included in this report. PAH results are reported in ug. Sample was not collected on January 1 due to a software error.

PARTISOL SAMPLES

The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).

The routine quarterly Partisol sampler audit was conducted on January 27. Samples were collected on January 1, 7, 13, 19, 25 and 31. Analytical results are included in this report. Partisol results are reported in mg.

PASSIVE SAMPLES

Samples were collected over the months of December and January, as scheduled. Samples were not collected at stations #12 and #25 as access documents were not provided by client. There was no sample collected at station #11 as the access to the station was blocked by snow. Analytical results are included in this report. Passive results are reported in ppb.

2.0 Project Personnel

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

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-00007: TISCH PUF Sampler Operating, Calibration and Maintenance Procedures
- 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-00151: Mass Determination of Particulate Matter (PM_{2.5} and PM₁₀)
- 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

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

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

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

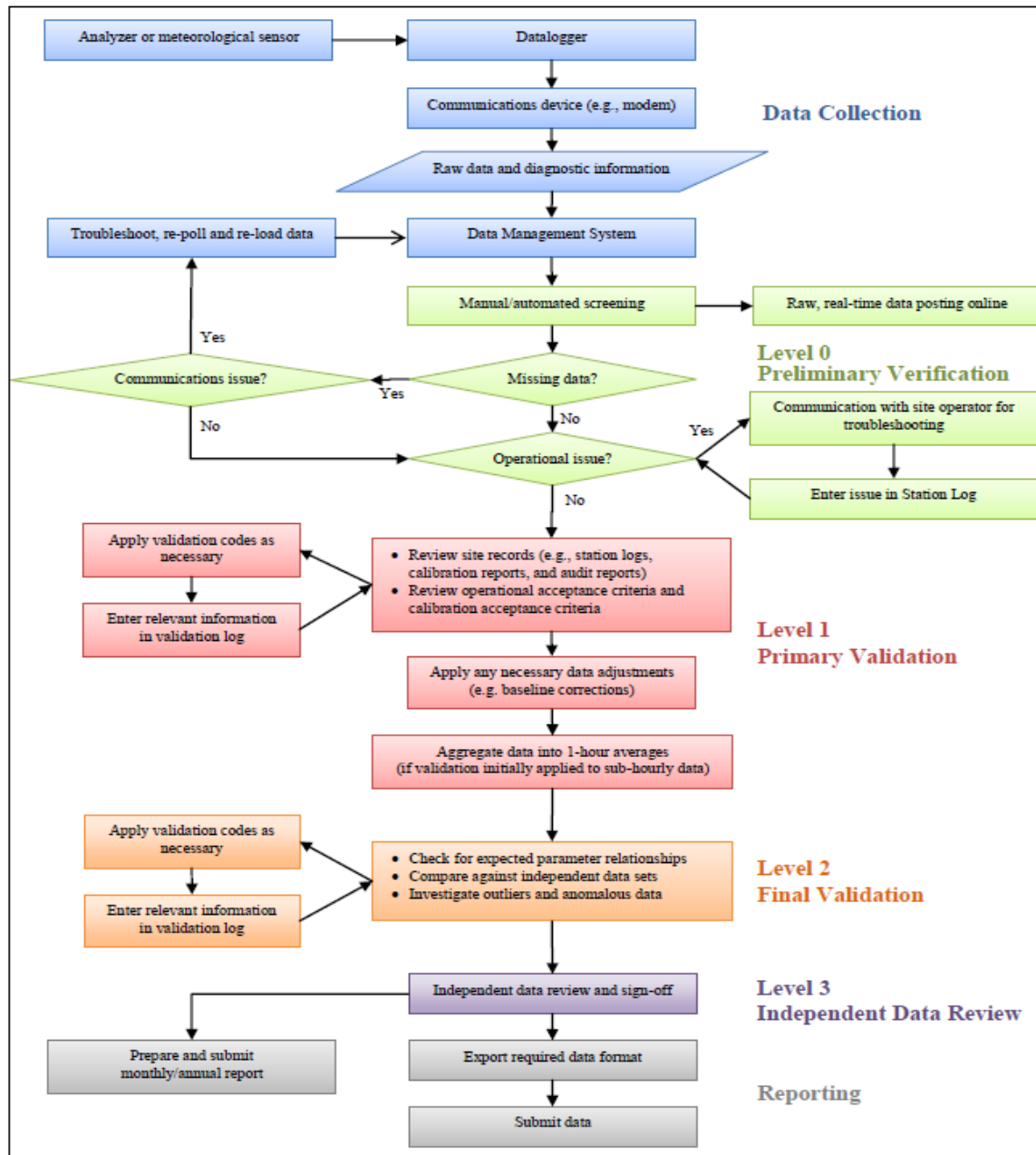
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6	0.5	0.5	S	0.5	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.6	0.2	24
2	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	S	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	24
3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	S	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.2	24
4	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	0.4	S	1.1	1.0	0.5	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	1.1	0.3	24
5	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.2	S	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	24
6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	S	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	24
7	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	S	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	24
9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.1	24
10	0.2	0.1	0.1	0.1	0.1	0.0	0.0	S	0.0	C	C	C	C	0.5	0.6	0.6	0.3	0.6	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2	24
11	0.1	0.1	0.2	0.2	0.5	0.7	S	0.9	0.9	0.5	0.3	0.2	0.2	0.2	0.4	0.5	0.6	0.2	0.1	0.2	0.3	0.4	0.4	0.4	0.0	0.1	0.9	0.4	24
12	0.4	1.0	0.7	0.2	0.1	S	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.6	0.7	0.6	0.7	0.9	0.8	0.4	0.0	1.0	0.4	24	
13	0.3	0.3	0.3	0.3	S	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.8	1.1	1.5	2.0	2.2	0.6	0.1	2.2	0.6	24	
14	0.3	0.2	0.2	S	0.3	0.4	0.6	0.6	0.3	0.5	1.5	1.8	1.5	1.2	1.3	2.0	1.8	2.0	2.0	2.1	2.2	2.1	2.0	1.8	0.2	2.2	1.2	24	
15	1.9	1.8	S	1.6	1.3	1.4	0.9	0.6	0.5	0.4	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	0.1	1.9	0.6	24	
16	0.1	S	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.5	0.3	24	
17	S	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.3	0.5	0.4	0.4	0.5	0.4	0.3	0.3	0.7	0.5	0.3	0.3	0.3	0.2	0.2	S	0.1	0.7	0.3	24	
18	0.2	0.1	0.2	0.1	0.1	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.3	0.2	0.3	0.2	0.4	0.3	S	0.4	0.1	0.5	0.3	24	
19	0.4	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.4	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	S	0.1	0.1	0.1	0.5	0.2	24	
20	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	S	0.1	0.0	0.0	0.0	0.3	0.0	24	
21	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	S	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
22	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.3	0.1	S	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.1	24
23	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.3	0.8	1.3	1.7	S	0.8	0.4	0.2	0.1	0.1	0.1	0.6	0.0	1.7	0.3	24
24	0.8	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	S	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.8	0.1	24	
25	0.1	0.1	0.1	0.2	0.6	1.4	1.8	1.9	1.8	1.3	1.0	0.9	0.9	0.7	0.6	S	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1.9	0.6	24	
26	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.3	0.4	S	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.2	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	0.1	S	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.1	0.0	0.0	0.3	0.0	24	
28	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.3	S	0.5	0.4	0.4	0.5	0.5	0.4	0.2	0.3	0.5	0.6	0.4	0.0	0.6	0.2	24	
29	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.5	0.5	0.5	0.6	0.5	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.1	0.6	0.3	24	
30	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.3	0.4	0.3	0.0	0.4	0.1	24	
31	0.9	0.7	0.7	0.4	0.2	0.1	0.1	0.1	0.1	S	0.1	0.4	0.7	0.7	0.9	0.9	0.4	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.9	0.3	24
HOURLY MAX	1.9	1.8	0.7	1.6	1.3	1.4	1.8	1.9	1.8	1.3	1.5	1.8	1.5	1.2	1.3	2.0	1.8	2.0	2.0	2.1	2.2	2.1	2.2	1.8					
HOURLY AVG	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2					

STATUS FLAG CODES

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

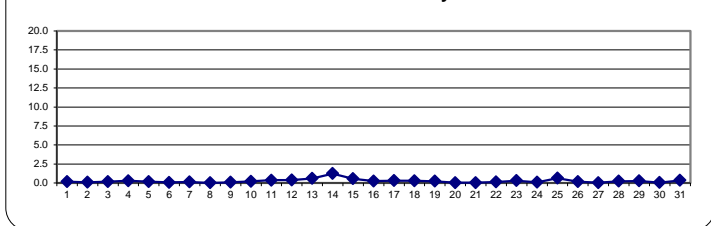
OBJECTIVE LIMIT:

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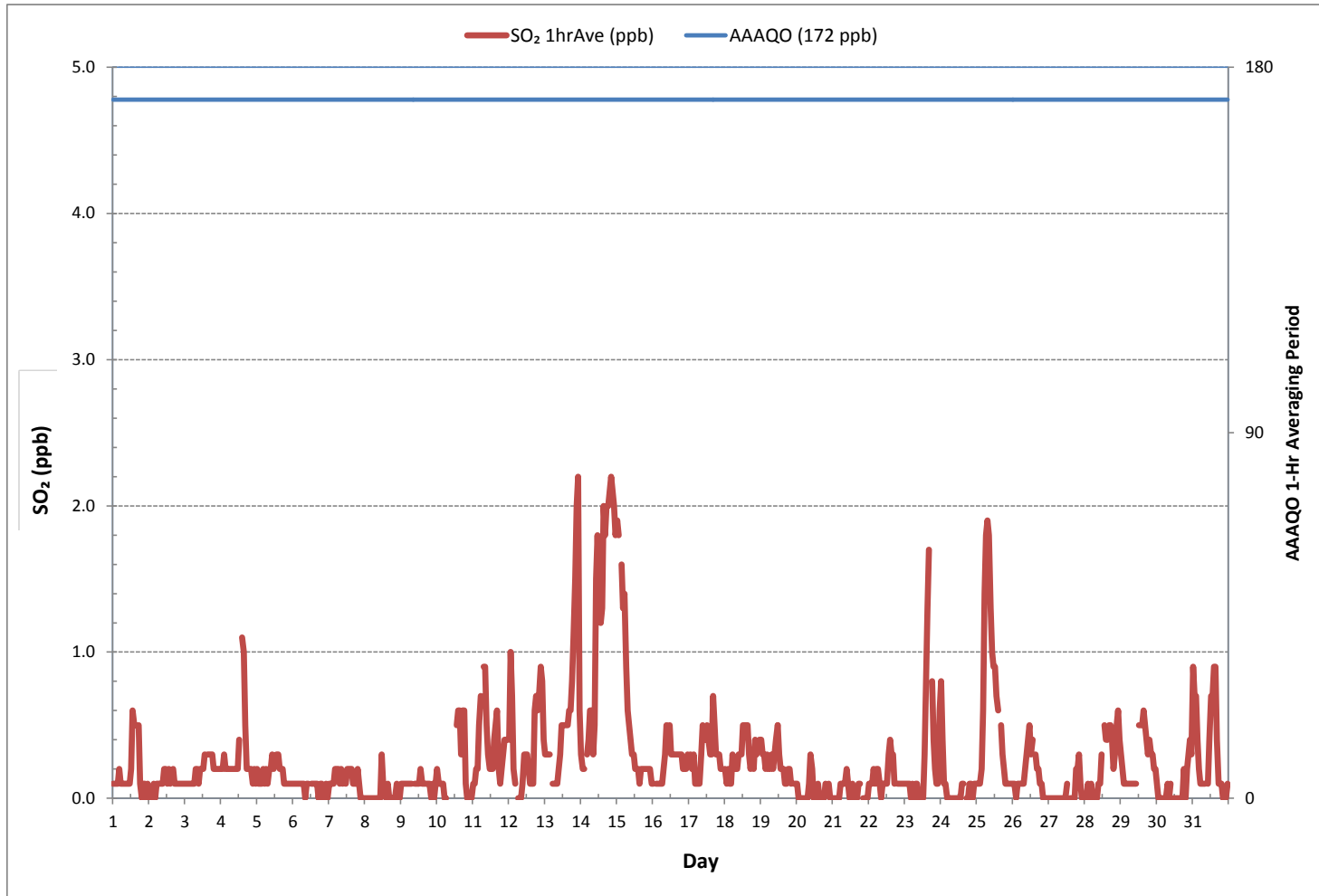
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	566					
MINIMUM 1-HR AVERAGE	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	2.2	ppb	@ HOUR(S)	22 , 20	ON DAY(S)	13 , 14
MAXIMUM 24-HR AVERAGE:	1.2	ppb			ON DAY(S)	14
					VAR-VARIOUS	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs	
MONTHLY CALIBRATION TIME:	4	hrs	AMD OPERATION UPTIME:	100.0	%	
STANDARD DEVIATION:	0.4		MONTHLY AVERAGE:	0.3	ppb	

24 HR AVERAGES January 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - January 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	0.9	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.8	0.6	0.6	0.6	0.7	1.2	1.3	1.1	S	1.1	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.3	0.7	24
2	0.6	0.6	0.6	0.5	0.5	0.9	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.8	S	0.6	0.8	0.7	0.6	0.7	0.6	0.6	0.7	0.5	0.9	0.6	24	
3	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	S	0.7	0.6	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.8	0.6	24
4	0.7	0.8	0.9	0.7	0.7	0.6	0.7	0.7	0.9	0.6	0.7	0.7	1.1	S	1.7	1.7	1.1	0.9	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	1.7	0.8	24
5	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.9	0.7	S	0.8	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.9	0.6	24
6	0.7	0.5	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.8	S	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.8	0.6	24	
7	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.6	0.7	0.6	S	0.6	0.6	0.9	0.8	0.6	0.7	0.7	0.6	0.7	0.8	0.6	0.7	0.6	0.6	0.9	0.7	24	
8	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.6	0.6	S	0.6	1.1	0.8	0.9	0.6	0.6	0.8	0.7	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.5	1.1	0.7	24
9	0.6	0.7	0.8	0.6	0.6	0.6	0.6	0.6	S	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.8	0.6	24	
10	0.7	0.6	0.7	0.6	0.6	0.7	0.7	S	0.6	C	C	C	C	1.4	1.4	1.7	1.1	1.2	1.5	0.6	0.3	0.3	0.3	0.3	0.3	1.7	0.8	24	
11	0.3	0.4	0.4	0.4	0.9	0.9	S	1.1	1.2	0.9	0.6	0.5	0.5	0.4	1.2	1.1	1.1	0.6	0.5	0.5	0.7	0.7	0.7	0.7	0.3	1.2	0.7	24	
12	0.7	1.7	1.6	0.6	0.6	S	0.3	0.3	0.5	0.5	0.6	0.6	0.6	0.4	0.4	0.4	1.2	1.0	0.7	1.2	1.0	1.2	1.0	1.2	0.7	0.3	1.7	0.7	24
13	0.6	0.6	0.4	0.4	S	0.4	0.3	0.4	0.4	0.4	0.6	0.9	0.7	0.7	0.7	0.8	0.9	0.9	1.1	1.5	1.9	2.4	2.5	1.9	0.3	2.5	0.9	24	
14	0.8	0.5	0.6	S	0.6	0.7	0.9	1.1	0.6	1.1	2.1	2.1	2.0	1.5	1.8	2.3	2.1	2.3	2.3	2.4	2.4	2.3	2.1	2.1	0.5	2.4	1.6	24	
15	2.1	2.1	S	1.7	1.7	1.5	1.4	1.1	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.4	0.5	0.6	0.5	0.6	0.5	0.3	2.1	0.9	24	
16	0.5	S	0.5	0.5	0.5	0.5	0.5	0.6	0.9	0.9	0.6	1.2	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.5	0.6	0.8	0.5	1.2	0.6	24	
17	S	0.7	0.6	0.6	0.5	0.5	0.5	0.3	0.7	1.1	0.7	0.9	1.1	0.7	0.6	0.7	1.1	0.9	0.6	0.6	0.6	0.6	0.5	S	0.3	1.1	0.7	24	
18	0.6	0.3	0.5	0.6	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.6	S	0.6	0.3	0.8	0.6	24	
19	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.7	0.6	0.7	0.8	0.7	0.7	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.5	S	0.5	0.6	0.5	0.8	0.6	24	
20	0.3	0.5	0.3	0.5	0.5	0.6	0.5	0.5	0.6	0.8	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	S	0.5	0.5	0.5	0.3	0.8	0.5	24	
21	0.5	0.5	0.3	0.5	0.3	0.6	0.6	0.5	0.6	0.8	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	S	0.5	0.5	0.3	0.3	0.3	0.8	0.5	24	
22	0.5	0.6	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.3	0.5	0.5	0.6	0.7	0.6	0.5	0.7	0.3	S	0.5	0.3	0.3	0.3	0.3	0.3	0.7	0.5	24	
23	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.5	0.3	0.8	1.4	1.7	2.1	S	1.2	0.7	0.6	0.5	0.8	1.2	0.3	2.1	0.7	24	
24	1.2	1.1	0.5	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.3	0.3	0.5	0.3	0.5	0.5	S	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.3	1.2	0.5	24	
25	0.3	0.5	0.5	0.6	1.2	2.0	2.0	2.3	2.1	1.7	1.2	1.2	1.1	0.9	0.9	S	0.6	0.5	0.6	0.5	0.3	0.3	0.3	0.3	0.3	2.3	1.0	24	
26	0.3	0.3	0.3	0.3	0.5	0.5	0.3	0.5	0.6	0.6	0.7	0.7	0.7	0.6	S	0.7	0.6	0.6	0.6	0.3	0.3	0.5	0.3	0.5	0.3	0.7	0.5	24	
27	0.5	0.5	0.5	0.3	0.5	0.5	0.3	0.5	0.4	0.6	0.5	0.5	0.6	S	0.5	0.5	0.5	0.6	0.7	1.1	0.8	0.6	0.5	0.5	0.3	1.1	0.5	24	
28	0.5	0.5	0.5	0.5	0.6	0.5	0.3	0.3	0.3	0.5	0.5	0.7	S	0.9	0.7	0.6	0.9	0.9	0.7	0.5	0.9	0.8	0.9	0.7	0.3	0.9	0.6	24	
29	0.7	0.5	0.5	0.5	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.7	S	0.9	0.8	0.7	0.9	0.7	0.8	0.8	0.7	0.6	0.6	0.6	0.3	0.9	0.6	24	
30	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	S	0.5	0.3	0.3	0.3	0.3	0.3	0.5	0.6	0.5	0.6	0.7	0.7	1.2	0.3	1.2	0.5	24	
31	1.2	0.9	1.2	0.9	0.6	0.3	0.3	0.3	0.3	S	0.4	0.7	1.2	1.2	1.4	1.2	1.2	0.3	0.5	0.3	0.3	0.3	0.5	0.5	0.3	1.4	0.7	24	
HOURLY MAX	2.1	2.1	1.6	1.7	1.7	2.0	2.0	2.3	2.1	1.7	2.1	2.1	2.0	1.5	1.8	2.3	2.1	2.3	2.3	2.4	2.4	2.4	2.5	2.1					
HOURLY AVG	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7					

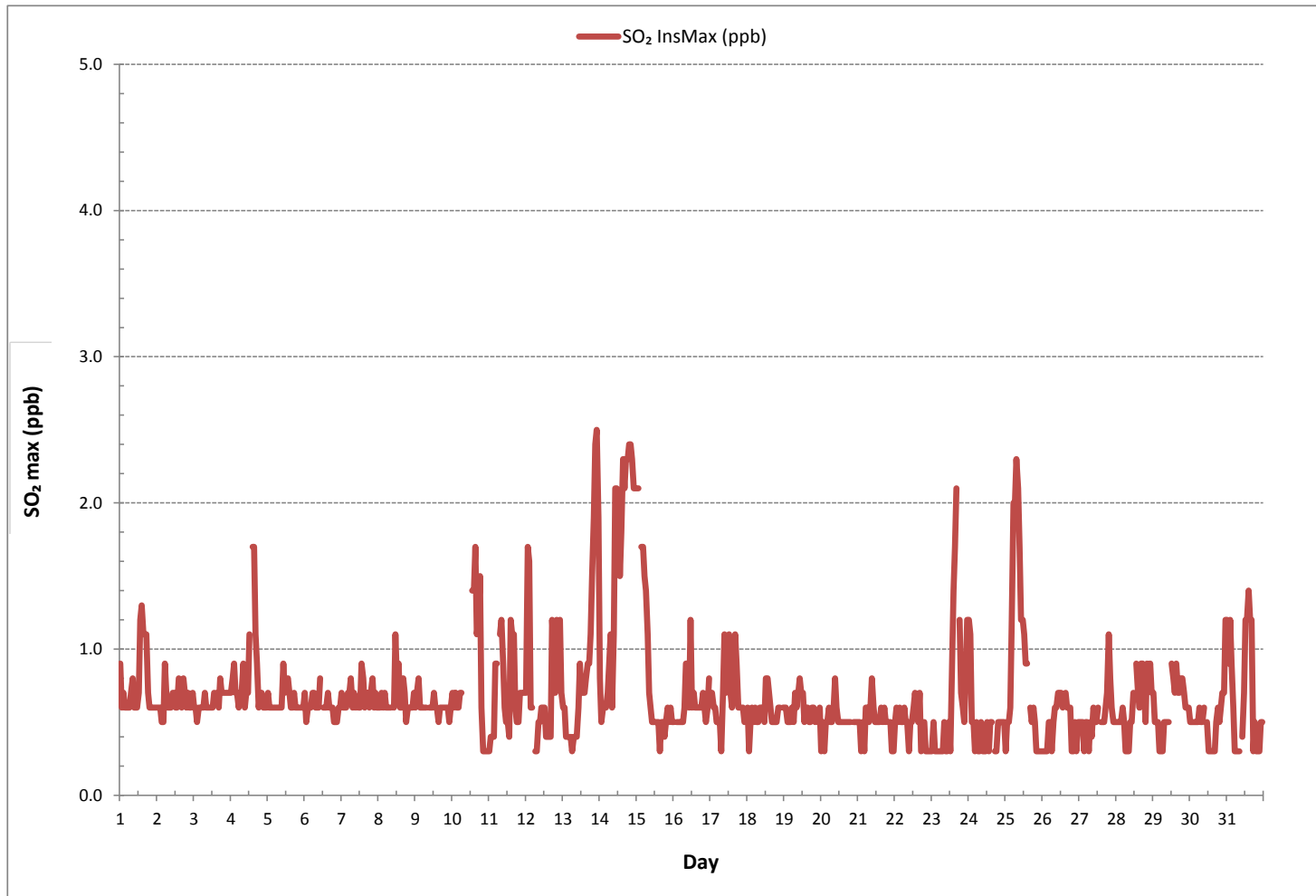
STATUS FLAG CODES

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

MONTHLY SUMMARY







NUMBER OF NON-ZERO READINGS:	708
MAXIMUM INSTANTANEOUS VALUE:	2.5 ppb @ HOUR(S) 22 ON DAY(S) 13
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	0.4
OPERATIONAL TIME:	744 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

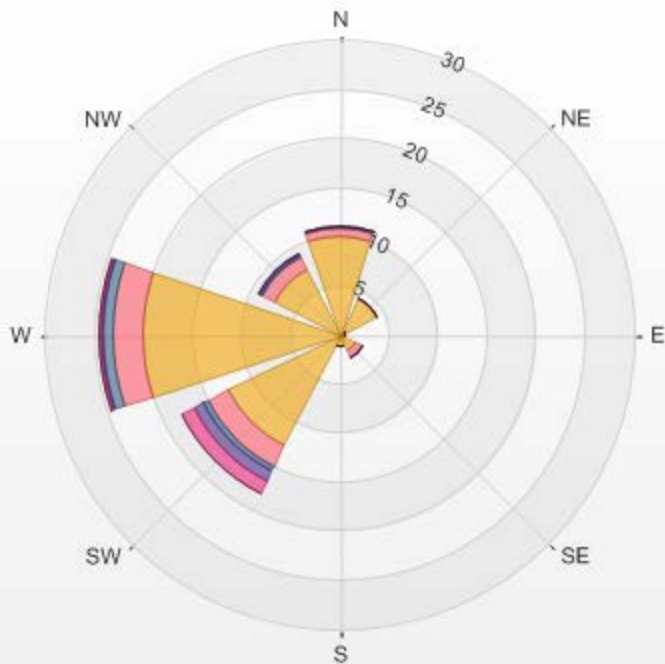


Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 28.25% Valid Data: 95.16% Calm Avg: 0.16 [ppb]

Direction	0.0-0.5	0.5-0.9	0.9-1.4	1.4-1.8	1.8-2.3	>2.3	Total
N	10.03	0.85	0.28	0	0	0	11.16
NE	4.24	0	0	0	0	0	4.24
E	0.71	0	0	0	0	0	0.71
SE	1.84	0.85	0	0	0	0	2.69
S	1.13	0	0	0	0	0	1.13
SW	12.71	2.26	0.56	1.13	1.41	0	18.07
W	20.06	2.97	0.99	0.28	0.28	0	24.58
NW	7.34	1.41	0.28	0.14	0	0	9.17
Summary	58.06	8.34	2.11	1.55	1.69	0	71.75

% Icon	Classes (ppb)	58		0.0-0.5	8		0.5-0.9	2		0.9-1.4	2		1.4-1.8	2		1.8-2.3	0		>2.3
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 01/01/2017 00:00 - 31/01/2017 23:00
Calm: 28.25% Calm Poll Avg: 0.16[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL REDUCED SULPHUR



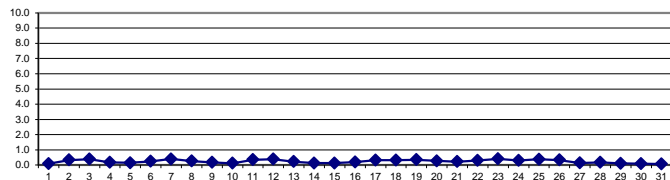
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	24	
2	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	S	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.1	0.5	0.3	24	
3	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	S	0.3	0.4	0.4	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.5	0.4	24	
4	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	S	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.2	24	
5	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	S	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.3	0.1	24	
6	0.2	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	S	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.1	0.3	0.2	24	
7	0.4	0.3	0.3	0.4	0.5	0.4	0.5	0.4	0.4	0.4	S	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.4	24	
8	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	S	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	24	
9	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.3	S	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.3	0.2	24	
10	0.1	0.1	0.0	0.0	0.0	0.0	0.0	S	0.1	C	C	C	C	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.2	0.1	24	
11	0.3	0.2	0.3	0.3	0.3	S	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.2	0.5	0.4	24	
12	0.4	0.5	0.4	0.4	0.4	S	0.4	0.4	0.4	0.5	0.5	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.5	0.4	24	
13	0.3	0.3	0.3	0.3	S	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.2	24	
14	0.1	0.1	0.1	S	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	24	
15	0.1	0.2	S	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	24	
16	0.2	S	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.0	0.4	0.2	24	
17	S	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.4	0.6	0.6	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.5	0.5	0.3	S	0.1	0.6	0.3	24	
18	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	S	0.4	0.2	0.4	0.3	24
19	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	S	0.4	0.2	0.2	0.5	0.3	24	
20	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	S	0.2	0.3	0.2	0.2	0.4	0.3	24	
21	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	S	0.2	0.2	0.2	0.2	0.1	0.3	0.2	24	
22	0.3	0.2	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	0.3	0.3	0.4	S	0.3	0.3	0.4	0.3	0.3	0.2	0.4	0.3	24	
23	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	S	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.3	0.5	0.4	24	
24	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	S	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.4	0.3	24	
25	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	S	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.5	0.4	24	
26	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.3	S	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.5	0.3	24	
27	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	24	
28	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.3	0.2	24	
29	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	S	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.2	0.1	24	
30	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	S	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	24	
31	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	S	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	24	
HOURLY MAX	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5				
HOURLY AVG	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	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

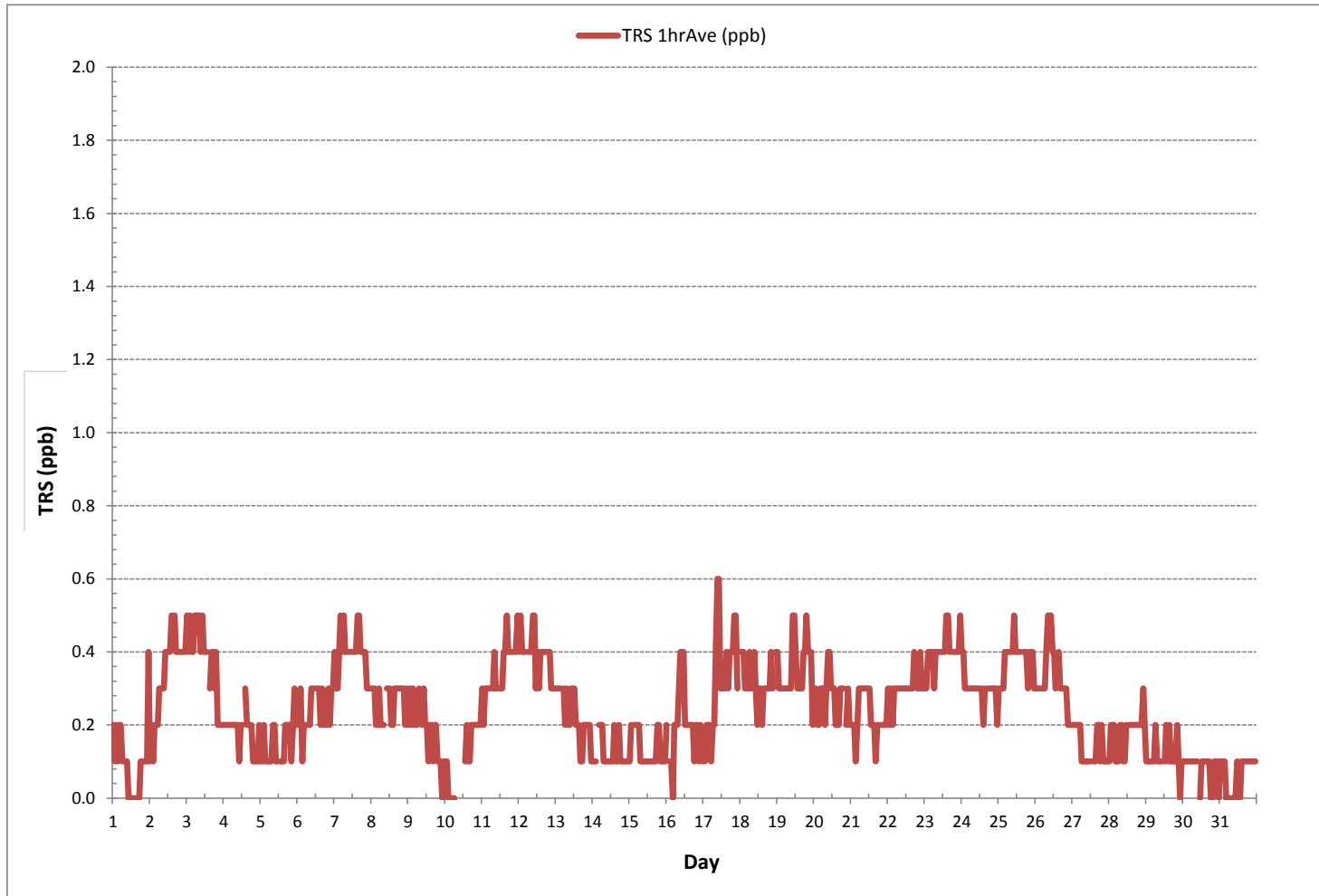
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	681			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	0.6 ppb	@ HOUR(S)	9 , 10	ON DAY(S) 17 , 17
MAXIMUM 24-HR AVERAGE:	0.4 ppb			ON DAY(S) VAR
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 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 - January 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	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.8	0.8	0.7	0.9	0.8	S	0.9	0.8	0.9	0.7	0.9	0.8	0.8	0.7	0.9	0.8	24	
2	0.7	0.9	0.7	0.9	0.8	0.9	0.9	0.8	0.9	0.7	0.9	0.8	1.0	0.8	1.0	S	0.9	0.8	0.9	0.7	0.8	0.8	0.9	1.0	0.7	1.0	0.8	24	
3	1.0	0.8	0.9	0.8	0.9	1.1	0.9	1.0	0.8	0.8	1.0	0.8	1.0	0.8	S	1.0	1.0	0.8	0.8	0.9	0.8	0.7	0.8	0.7	0.7	1.1	0.9	24	
4	1.0	1.0	0.8	0.9	0.8	0.9	1.2	0.9	0.8	0.9	0.9	1.0	0.8	S	1.1	0.7	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.7	1.2	0.9	24	
5	1.0	0.9	0.8	0.9	0.8	0.7	0.9	1.0	0.9	0.9	0.9	0.8	S	0.9	0.9	0.8	0.8	0.9	0.8	1.0	0.9	0.8	0.9	1.0	0.7	1.0	0.9	24	
6	0.9	0.8	1.0	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.9	S	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.9	0.7	0.7	0.9	0.9	0.7	1.0	0.9	24	
7	0.9	1.0	0.7	1.0	1.1	1.0	0.9	0.9	1.1	0.9	S	0.8	1.0	0.9	0.9	1.0	1.0	0.9	1.0	0.9	0.9	0.8	0.9	0.9	0.7	1.1	0.9	24	
8	1.1	0.8	0.9	0.7	0.8	0.9	0.8	0.7	0.7	S	0.8	0.8	0.8	1.0	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.8	1.0	0.7	1.1	0.8	24	
9	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.9	S	1.0	0.8	0.9	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.7	0.9	0.7	1.0	0.8	24	
10	0.8	0.7	0.7	0.8	0.9	0.7	0.8	S	0.9	C	C	C	C	0.9	0.9	0.8	0.7	0.8	0.9	1.0	0.7	0.7	0.9	0.9	0.7	1.0	0.8	24	
11	0.8	0.8	0.8	0.9	0.7	0.7	S	0.8	0.8	0.8	0.9	0.8	0.7	0.7	0.9	0.8	0.8	0.9	0.8	0.9	1.0	0.7	0.9	0.9	0.7	1.0	0.8	24	
12	0.9	0.8	0.7	0.9	0.8	S	0.9	0.9	0.8	1.0	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.8	0.9	0.8	1.0	0.8	0.9	0.8	0.7	1.0	0.9	24	
13	0.7	0.8	0.9	1.0	S	0.9	1.0	1.1	0.8	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.8	1.0	0.9	0.9	0.9	0.9	0.7	1.1	0.9	24	
14	0.8	1.0	0.9	S	0.9	1.0	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.9	0.9	0.8	1.0	0.9	0.9	0.8	0.7	1.0	0.9	24	
15	0.9	0.9	S	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.9	1.0	0.9	0.8	0.8	0.8	0.9	1.1	1.1	0.8	0.8	0.8	0.8	1.1	0.9	24	
16	0.9	S	0.9	0.9	0.7	0.9	0.9	0.9	0.9	1.1	1.1	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.8	1.0	0.8	0.7	1.1	0.9	24	
17	S	0.8	0.9	0.9	0.9	0.9	0.9	1.1	1.3	1.3	1.3	0.9	0.9	1.0	0.8	0.9	0.8	0.9	0.9	1.3	1.0	1.2	0.9	S	0.8	1.3	1.0	24	
18	1.1	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.9	1.0	0.9	0.9	0.9	1.1	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	S	0.9	0.8	1.1	0.9	24	
19	1.0	0.8	0.9	0.9	0.9	0.9	0.8	1.2	0.9	0.9	1.1	1.2	1.1	0.9	1.1	1.0	0.8	0.9	1.1	1.1	0.9	S	0.9	0.8	0.8	1.2	1.0	24	
20	0.9	0.9	0.7	1.0	1.0	1.0	0.9	0.9	0.9	1.1	0.9	0.9	0.9	0.9	0.9	0.8	1.1	1.1	1.0	S	0.8	1.1	0.8	0.7	1.1	0.9	24		
21	1.0	0.8	0.9	0.6	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	1.0	S	0.8	0.9	0.9	0.9	0.8	0.6	1.0	0.9	24		
22	1.0	0.8	0.8	0.9	0.9	1.0	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.9	0.9	0.8	0.9	S	0.9	0.8	0.8	0.9	0.9	0.8	1.0	0.9	24	
23	0.7	0.9	0.9	0.9	0.8	0.7	0.8	0.8	0.8	0.8	1.0	0.8	0.8	0.9	0.9	0.9	S	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.7	1.0	0.8	24
24	0.8	0.8	0.8	0.8	0.9	0.8	0.9	0.8	0.7	0.7	0.9	0.8	0.8	0.7	0.8	S	0.8	0.8	0.7	0.8	0.8	0.7	0.8	0.9	0.8	0.7	0.9	0.8	24
25	0.9	0.9	0.9	0.9	0.9	1.2	0.9	1.0	1.1	1.0	0.9	1.0	1.0	1.0	0.9	S	0.9	0.9	1.0	1.0	0.9	1.0	1.0	0.8	0.8	1.2	1.0	24	
26	0.9	0.9	0.9	0.9	1.0	0.8	0.9	0.9	1.1	1.0	1.0	1.1	0.9	0.9	S	1.0	0.9	0.9	0.8	1.0	0.9	0.9	0.9	0.8	0.8	1.1	0.9	24	
27	0.9	0.9	0.8	0.7	0.8	0.9	0.9	0.9	1.0	0.8	1.0	0.9	S	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7	1.0	0.9	24	
28	0.8	0.9	0.9	1.0	0.8	0.9	0.9	0.8	0.8	0.9	0.8	1.1	S	1.0	0.8	0.9	0.9	0.9	1.0	0.9	0.9	0.9	1.0	0.9	0.8	1.1	0.9	24	
29	0.9	0.8	0.8	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.8	S	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.8	0.8	0.8	1.0	0.9	24	
30	0.8	0.9	0.9	1.0	0.9	1.0	0.9	0.9	0.8	0.9	S	0.8	0.9	0.9	0.8	0.9	1.0	0.9	1.0	0.8	0.9	0.8	0.9	0.8	0.8	1.0	0.9	24	
31	0.8	0.8	0.7	0.7	0.8	0.7	0.7	0.8	0.8	S	0.8	0.9	0.9	0.9	1.0	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	1.0	0.8	24	
HOURLY MAX	1.1	1.0	1.0	1.0	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.2	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.3	1.1	1.2	1.1	1.0					
HOURLY AVG	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	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9					

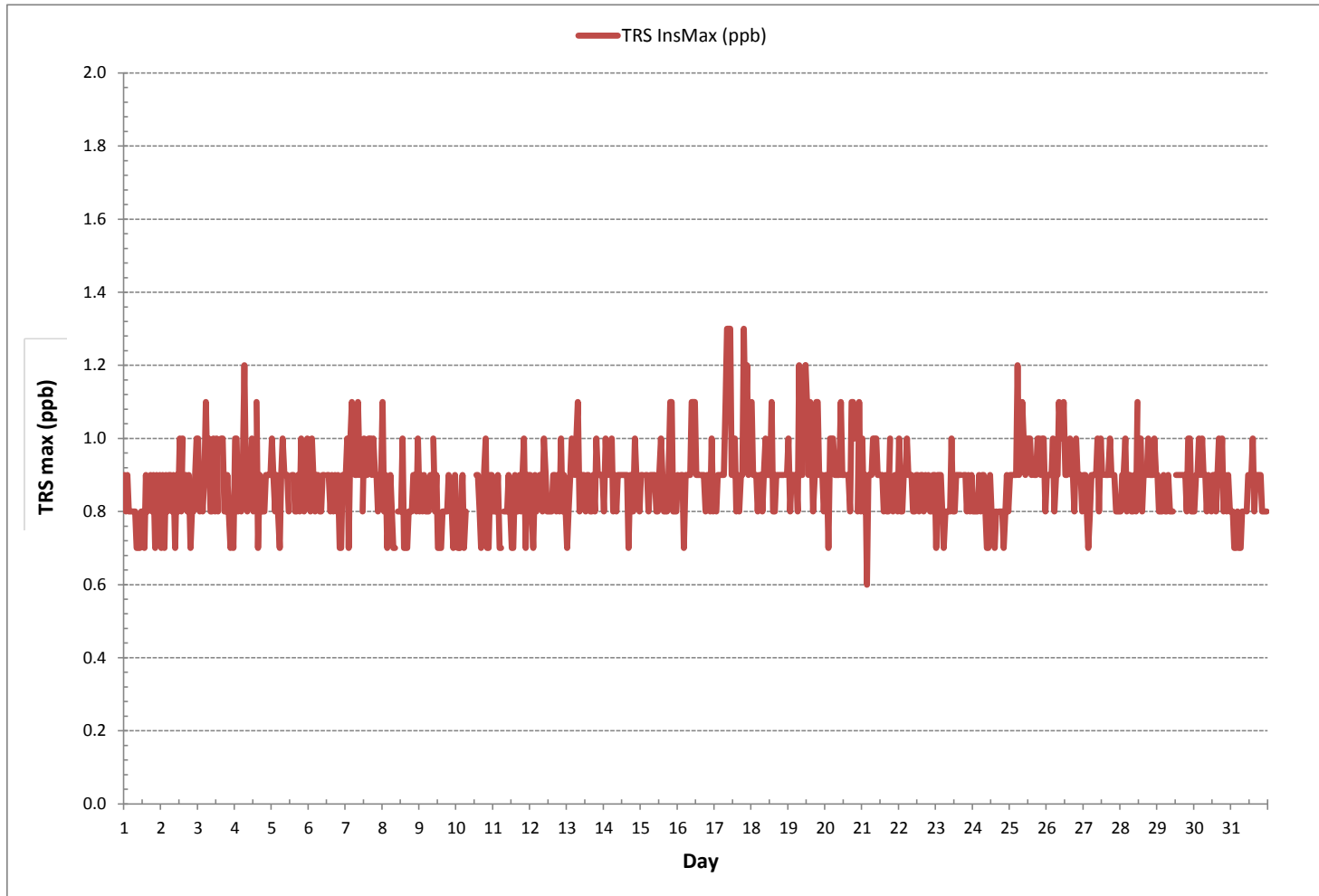
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708
MAXIMUM INSTANTANEOUS VALUE:	1.3 ppb @ HOUR(S) VAR ON DAY(S) 17
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	0.1
OPERATIONAL TIME:	744 hrs

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 28.25% Valid Data: 95.16% Calm Avg: 0.29 [ppb]

Direction	0.0-0.6	0.6-1.2	1.2-1.8	>1.8	Total
N	11.16	0	0	0	11.16
NE	4.24	0	0	0	4.24
E	0.71	0	0	0	0.71
SE	2.68	0	0	0	2.68
S	1.13	0	0	0	1.13
SW	18.08	0	0	0	18.08
W	24.58	0	0	0	24.58
NW	9.18	0	0	0	9.18
Summary	71.76	0	0	0	71.76

% Icon Classes (ppb)

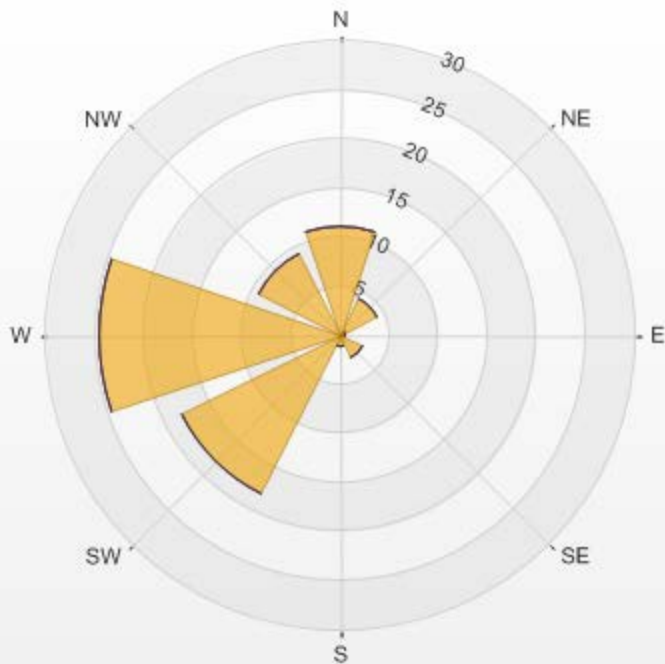
72 0.0-0.6

0 0.6-1.2

0 1.2-1.8

0 >1.8

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 28.25% Calm Poll Avg: 0.29[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON

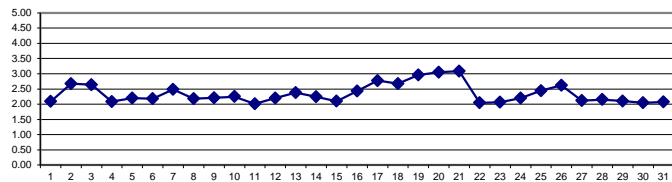
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.06	2.04	2.05	2.02	2.03	2.05	2.03	2.05	2.06	2.05	2.06	2.07	2.05	2.05	2.05	2.06	S	2.11	2.12	2.15	2.19	2.22	2.24	2.26	2.02	2.26	2.09	24	
2	2.29	2.33	2.39	2.46	2.52	2.50	2.71	2.61	2.70	2.84	3.08	3.20	2.94	2.79	2.69	S	2.58	2.59	2.61	2.66	2.68	2.72	2.78	2.75	2.29	3.20	2.67	24	
3	3.00	3.08	3.15	3.21	3.31	3.35	3.27	3.18	2.87	2.71	2.57	2.67	2.51	2.41	S	2.25	2.24	2.23	2.26	2.18	2.10	2.07	2.05	2.05	2.05	3.35	2.64	24	
4	2.02	2.01	2.00	2.02	2.03	2.05	2.05	2.04	2.04	2.07	2.05	2.05	2.07	S	2.08	2.09	2.14	2.25	2.12	2.12	2.18	2.17	2.17	2.14	2.00	2.25	2.09	24	
5	2.18	2.24	2.32	2.41	2.38	2.38	2.35	2.35	2.52	2.36	2.12	2.08	S	2.06	2.05	2.05	2.08	2.11	2.21	2.10	2.05	2.04	2.05	2.04	2.04	2.52	2.20	24	
6	2.05	2.05	2.07	2.06	2.09	2.06	2.05	2.07	2.12	2.15	2.14	S	2.18	2.17	2.20	2.23	2.28	2.28	2.30	2.33	2.32	2.31	2.32	2.34	2.05	2.34	2.18	24	
7	2.37	2.47	2.49	2.66	2.89	2.95	2.76	2.45	2.51	2.56	S	2.34	2.44	2.60	2.58	2.63	2.78	2.75	2.52	2.15	2.06	2.05	2.06	2.05	2.05	2.95	2.48	24	
8	2.16	2.12	2.03	2.04	2.05	2.00	2.02	2.06	2.08	S	2.18	2.15	2.12	2.12	2.17	2.25	2.28	2.35	2.31	2.35	2.42	2.32	2.21	2.25	2.00	2.42	2.18	24	
9	2.42	2.44	2.41	2.30	2.24	2.14	2.17	2.18	S	2.18	2.24	2.23	2.20	2.19	2.18	2.16	2.17	2.21	2.20	2.16	2.16	2.11	2.06	2.04	2.04	2.44	2.21	24	
10	2.00	2.01	2.02	2.06	2.07	2.09	2.16	S	2.30	2.38	2.59	2.45	C	C	C	C	2.17	2.24	2.41	2.48	2.39	2.33	2.30	2.24	2.00	2.59	2.25	24	
11	2.28	2.31	2.31	2.25	2.18	2.14	S	2.04	2.01	1.99	2.01	1.87	1.78	1.72	1.79	1.85	1.90	1.93	1.98	1.98	1.99	2.01	1.99	2.02	1.72	2.31	2.01	24	
12	2.05	2.09	2.08	2.12	2.15	S	2.17	2.23	2.30	2.32	2.35	2.25	2.18	2.10	2.18	2.12	2.07	2.16	2.29	2.29	2.18	2.24	2.27	2.33	2.05	2.35	2.20	24	
13	2.39	2.38	2.40	2.42	S	2.49	2.56	2.59	2.62	2.68	2.65	2.64	2.36	2.22	2.16	2.16	2.19	2.27	2.22	2.21	2.24	2.28	2.28	2.27	2.16	2.68	2.38	24	
14	2.27	2.33	2.38	S	2.45	2.38	2.41	2.37	2.43	2.46	2.34	2.20	2.13	2.15	2.15	2.14	2.14	2.17	2.14	2.11	2.12	2.12	2.12	2.12	2.11	2.46	2.24	24	
15	2.15	2.12	S	2.13	2.13	2.09	2.07	2.05	2.05	2.06	2.13	2.13	2.13	2.09	2.02	2.05	2.10	2.10	2.10	2.09	2.10	2.09	2.11	2.17	2.02	2.17	2.10	24	
16	2.10	S	2.18	2.22	2.30	2.53	2.45	2.57	2.68	2.82	2.66	2.69	2.61	2.61	2.56	2.59	2.47	2.42	2.33	2.28	2.25	2.22	2.20	2.20	2.10	2.82	2.43	24	
17	S	2.37	2.38	2.31	2.34	2.38	2.42	2.47	2.77	3.03	2.92	2.56	2.59	2.36	2.23	2.42	2.76	2.94	2.98	3.80	4.21	3.74	3.05	S	2.23	4.21	2.77	24	
18	2.75	2.69	2.72	2.67	2.67	2.44	2.48	2.51	2.68	2.69	2.52	2.44	2.38	2.42	2.51	2.63	2.65	2.74	2.79	2.76	2.96	2.97	S	3.31	2.38	3.31	2.67	24	
19	3.38	3.23	3.22	3.19	3.18	3.15	3.19	3.22	3.27	3.20	3.04	3.35	2.74	2.52	2.55	2.64	2.56	2.61	2.69	2.77	2.77	S	2.78	2.78	2.52	3.38	2.96	24	
20	2.75	2.73	2.96	3.13	3.43	3.46	3.48	3.48	3.60	3.71	3.26	2.62	2.54	2.38	2.37	2.43	2.57	2.93	3.14	3.27	S	3.23	3.33	3.29	2.37	3.71	3.05	24	
21	3.24	3.22	3.31	3.38	3.83	4.22	4.12	4.17	4.40	4.61	4.17	3.57	3.37	2.77	2.02	2.03	2.07	2.12	2.10	S	2.07	2.05	2.03	2.03	2.02	4.61	3.08	24	
22	2.02	2.04	2.03	2.04	2.05	2.04	2.04	2.06	2.08	2.07	2.10	2.07	2.05	2.05	2.05	2.06	2.05	S	2.02	2.04	2.03	2.01	2.02	2.01	2.10	2.05	24		
23	2.04	2.04	2.04	2.04	2.03	2.04	2.04	2.06	2.10	2.07	2.04	2.03	2.06	2.07	2.07	2.11	2.12	S	2.12	2.11	2.04	2.04	2.06	2.09	2.03	2.12	2.06	24	
24	2.08	2.11	2.10	2.14	2.19	2.23	2.17	2.14	2.22	2.25	2.11	2.08	2.06	2.06	2.12	2.16	S	2.13	2.16	2.19	2.23	2.39	2.60	2.69	2.06	2.69	2.20	24	
25	2.75	2.79	2.76	2.74	2.50	2.29	2.29	2.27	2.32	2.31	2.32	2.30	2.29	2.30	2.31	S	2.36	2.41	2.39	2.40	2.50	2.49	2.49	2.60	2.27	2.79	2.44	24	
26	2.74	2.88	2.92	3.03	3.06	3.08	3.16	3.26	3.31	3.19	2.77	2.60	2.56	2.35	S	2.12	2.10	2.11	2.13	2.21	2.17	2.15	2.16	2.15	2.10	3.31	2.62	24	
27	2.12	2.10	2.17	2.18	2.17	2.16	2.17	2.18	2.15	2.15	2.15	2.13	2.05	S	2.02	2.03	2.05	2.08	2.06	2.07	2.13	2.16	2.15	2.14	2.02	2.18	2.12	24	
28	2.18	2.15	2.20	2.23	2.25	2.18	2.14	2.13	2.08	2.10	2.14	2.10	S	2.01	2.03	2.03	2.06	2.11	2.23	2.30	2.28	2.20	2.15	2.15	2.01	2.30	2.15	24	
29	2.15	2.16	2.14	2.16	2.10	2.14	2.16	2.17	2.16	2.15	2.16	S	2.02	1.98	1.97	2.00	2.01	2.04	2.06	2.08	2.09	2.06	2.14	2.24	1.97	2.24	2.10	24	
30	2.22	2.19	2.11	2.11	2.11	2.09	2.11	2.11	2.12	2.13	S	2.00	2.00	2.00	2.00	2.01	2.01	1.96	1.96	1.95	1.95	1.94	1.97	1.97	1.94	2.22	2.04	24	
31	2.01	1.99	2.00	2.01	2.02	2.03	2.03	2.01	2.04	S	2.09	2.06	2.04	2.08	2.00	2.08	2.09	2.12	2.12	2.11	2.09	2.17	2.13	2.14	2.23	1.99	2.23	2.07	24
HOURLY MAX	3.38	3.23	3.31	3.38	3.83	4.22	4.12	4.17	4.40	4.61	4.17	3.57	3.37	2.79	2.69	2.64	2.78	2.94	3.14	3.80	4.21	3.74	3.33	3.31					
HOURLY AVG	2.34	2.36	2.38	2.39	2.43	2.44	2.44	2.49	2.53	2.45	2.38	2.30	2.24	2.19	2.19	2.24	2.28	2.30	2.32	2.30	2.30	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

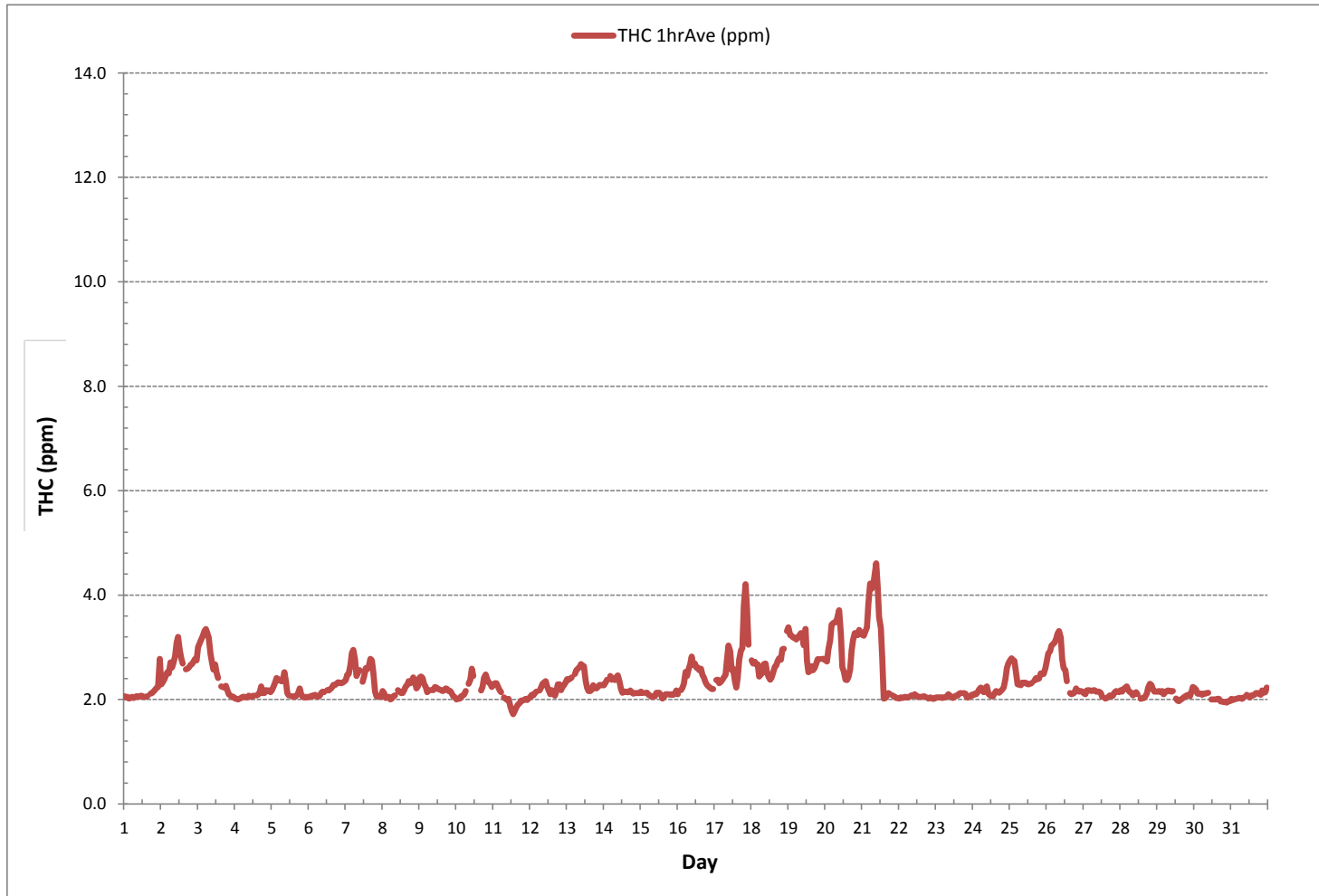
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708			
MINIMUM 1-HR AVERAGE:	1.72 ppm	@ HOUR(S)	13	ON DAY(S) 11
MAXIMUM 1-HR AVERAGE:	4.61 ppm	@ HOUR(S)	9	ON DAY(S) 21
MAXIMUM 24-HR AVERAGE:	3.08 ppm			ON DAY(S) 21
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.41	MONTHLY AVERAGE:	2.35 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - January 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	2.55	2.52	2.53	2.52	2.52	2.55	2.55	2.58	2.61	2.58	2.61	2.62	2.61	2.61	2.62	2.65	S	2.71	2.73	2.80	2.80	2.86	2.86	2.90	2.52	2.90	2.65	24
2	2.95	2.99	3.07	3.17	3.20	3.21	3.61	3.29	3.45	3.66	4.04	4.19	3.72	3.83	12.03	S	3.87	3.38	3.35	3.38	3.38	3.48	3.51	3.52	2.95	12.03	3.84	24
3	3.77	3.83	3.85	3.91	4.00	4.03	3.94	3.93	3.69	3.45	3.31	4.69	3.57	3.19	S	3.02	3.64	3.15	2.88	2.84	2.71	2.68	2.68	2.67	2.67	4.69	3.45	24
4	2.64	2.62	2.61	2.64	2.64	2.68	2.67	3.69	2.68	2.67	2.64	2.64	2.67	S	2.67	2.69	3.47	3.32	2.71	2.73	2.77	2.74	2.73	2.71	2.61	3.69	2.78	24
5	2.76	2.83	2.89	2.98	2.98	2.95	2.89	3.04	3.26	3.12	2.64	2.58	S	2.68	2.61	2.58	2.62	2.70	3.04	2.71	2.59	2.59	2.61	2.61	2.58	3.26	2.79	24
6	2.64	2.62	2.67	2.64	2.71	2.67	2.64	2.68	2.77	2.89	2.77	S	2.86	2.80	3.20	2.92	3.38	3.84	2.95	3.01	2.98	2.95	2.98	3.01	2.62	3.84	2.89	24
7	3.07	3.29	3.20	3.45	3.70	3.69	3.52	3.29	3.47	3.33	S	3.39	3.27	3.32	3.35	3.35	3.54	3.51	3.35	3.04	2.78	2.77	2.83	2.78	2.77	3.70	3.27	24
8	2.92	2.89	2.76	2.80	2.83	2.74	2.77	2.79	2.83	S	2.98	2.86	2.91	2.80	2.89	2.91	2.99	4.56	2.98	3.02	3.16	2.99	2.80	2.84	2.74	4.56	2.96	24
9	3.01	3.01	2.96	2.83	2.77	2.64	2.64	2.65	S	2.80	2.74	4.77	2.86	2.92	2.74	2.74	2.95	3.08	2.64	2.64	3.05	2.62	2.51	2.49	2.49	4.77	2.87	24
10	2.43	2.43	2.46	2.48	2.49	2.52	2.64	S	3.56	2.91	3.29	C	C	C	C	C	2.33	2.81	3.14	2.83	2.43	2.37	2.32	2.24	2.24	3.56	2.65	24
11	2.27	2.31	2.32	2.24	2.18	2.09	S	2.03	2.05	2.06	2.06	2.06	1.87	1.83	2.02	2.06	2.08	2.10	2.21	2.19	2.21	2.24	2.24	2.31	1.83	2.32	2.13	24
12	2.37	2.40	2.40	2.47	2.58	S	2.52	2.58	2.64	2.72	2.71	2.62	2.52	2.40	2.56	2.47	2.36	2.49	2.60	2.57	2.49	2.55	2.55	2.62	2.36	2.72	2.53	24
13	2.68	2.60	2.60	2.62	S	3.05	2.82	2.78	2.80	2.93	3.17	3.17	2.76	2.67	2.37	2.37	2.56	2.45	2.43	2.39	2.43	2.46	2.45	2.48	2.37	3.17	2.65	24
14	2.48	2.55	2.65	S	2.64	2.56	2.55	2.52	2.65	2.69	2.55	2.34	2.36	2.28	2.27	2.31	2.22	2.43	2.25	2.18	2.18	2.15	2.18	2.17	2.15	2.69	2.40	24
15	2.18	2.15	S	2.17	2.16	2.13	2.10	2.09	2.09	2.12	2.53	2.15	2.27	2.22	2.06	2.21	2.25	2.37	2.18	2.18	2.16	2.15	2.21	2.30	2.06	2.53	2.19	24
16	2.19	S	2.31	2.36	2.46	4.73	2.62	2.81	3.04	2.88	3.01	2.74	2.73	2.64	2.58	2.61	2.86	2.36	2.61	2.20	2.27	2.11	2.08	2.09	2.08	4.73	2.62	24
17	S	2.27	2.43	2.28	2.24	2.27	2.52	2.58	3.26	3.66	3.01	2.46	3.85	2.33	2.70	2.95	2.76	2.98	2.90	4.86	5.14	4.37	3.78	S	2.24	5.14	3.07	24
18	2.77	2.84	2.74	2.81	2.64	2.40	2.40	2.43	2.80	2.98	2.67	2.43	2.27	3.27	2.71	2.55	2.51	2.77	2.80	2.68	3.04	2.89	S	3.20	2.27	3.27	2.72	24
19	3.30	3.14	3.08	3.17	3.11	3.11	3.49	3.18	5.98	3.18	3.04	5.83	3.21	2.43	2.46	2.74	2.45	2.52	2.55	2.76	2.77	S	2.68	2.70	2.43	5.98	3.17	24
20	2.75	2.74	2.93	3.18	3.32	3.61	8.24	3.40	3.63	3.90	3.70	2.98	2.78	2.91	2.31	2.37	2.67	3.02	3.16	3.29	S	3.21	3.35	3.26	2.31	8.24	3.34	24
21	3.23	3.21	3.31	3.48	4.09	4.27	4.15	4.18	4.77	4.77	4.63	4.00	3.57	3.33	2.08	2.10	2.13	2.17	2.18	S	2.15	2.13	2.12	2.11	2.08	4.77	3.22	24
22	2.12	2.12	2.12	2.13	2.15	2.15	2.15	2.18	2.21	2.27	2.25	2.21	2.18	2.21	2.21	2.24	2.21	2.24	2.21	S	2.18	2.18	2.18	2.18	2.12	2.27	2.18	24
23	2.18	2.18	2.18	2.20	2.19	2.18	2.18	2.28	2.77	2.27	2.21	2.21	2.36	2.20	2.21	2.27	2.27	S	2.27	2.26	2.17	2.17	2.21	2.22	2.17	2.77	2.25	24
24	2.21	2.27	2.25	2.30	2.34	2.39	2.36	2.27	2.98	2.77	2.26	2.22	2.27	2.21	2.27	2.34	S	2.56	2.33	2.36	2.43	2.64	2.77	2.83	2.21	2.98	2.42	24
25	2.92	2.95	2.92	2.90	2.92	2.43	2.43	2.43	2.74	2.48	2.51	2.45	2.58	2.46	2.68	S	2.55	2.58	2.56	2.55	2.89	2.68	2.71	2.92	2.43	2.95	2.66	24
26	2.98	3.11	3.14	3.23	3.24	3.26	3.38	3.44	3.66	3.42	3.38	2.94	2.77	3.26	S	2.40	2.73	2.30	2.31	2.39	2.37	2.34	2.34	2.33	2.30	3.66	2.90	24
27	2.31	2.29	2.37	2.37	2.37	2.36	2.39	2.40	2.36	2.43	2.42	2.43	2.33	S	2.27	2.58	2.37	2.73	2.24	2.26	2.33	2.37	2.43	2.36	2.24	2.73	2.38	24
28	2.37	2.34	2.43	2.43	2.46	2.43	2.34	2.34	2.37	2.29	2.39	2.34	S	2.24	2.31	2.33	2.28	2.31	2.40	2.46	2.48	2.42	2.31	2.30	2.24	2.48	2.36	24
29	2.29	2.29	2.26	2.27	2.23	2.26	2.27	2.29	2.29	2.24	2.30	S	2.15	2.08	2.06	2.09	2.10	2.18	2.12	2.19	2.21	2.15	2.24	2.33	2.06	2.33	2.21	24
30	2.31	2.27	2.21	2.18	2.18	2.18	2.18	2.21	2.27	2.34	S	2.11	2.11	2.12	2.18	2.21	2.15	2.10	2.12	2.12	2.12	2.17	2.17	2.18	2.10	2.34	2.18	24
31	2.21	2.21	2.22	2.24	2.25	2.29	2.27	2.27	2.31	S	2.73	2.40	2.31	2.37	2.39	2.37	2.76	2.55	2.39	2.37	2.49	2.43	2.43	2.52	2.21	2.76	2.38	24
HOURLY MAX	3.77	3.83	3.85	3.91	4.09	4.73	8.24	4.18	5.98	4.77	4.63	5.83	3.85	3.83	12.03	3.35	3.87	4.56	3.35	4.86	5.14	4.37	3.78	3.52				
HOURLY AVG	2.63	2.64	2.66	2.68	2.72	2.79	2.91	2.75	3.00	2.89	2.85	2.92	2.70	2.63	2.81	2.51	2.66	2.74	2.61	2.65	2.64	2.59	2.58	2.57				

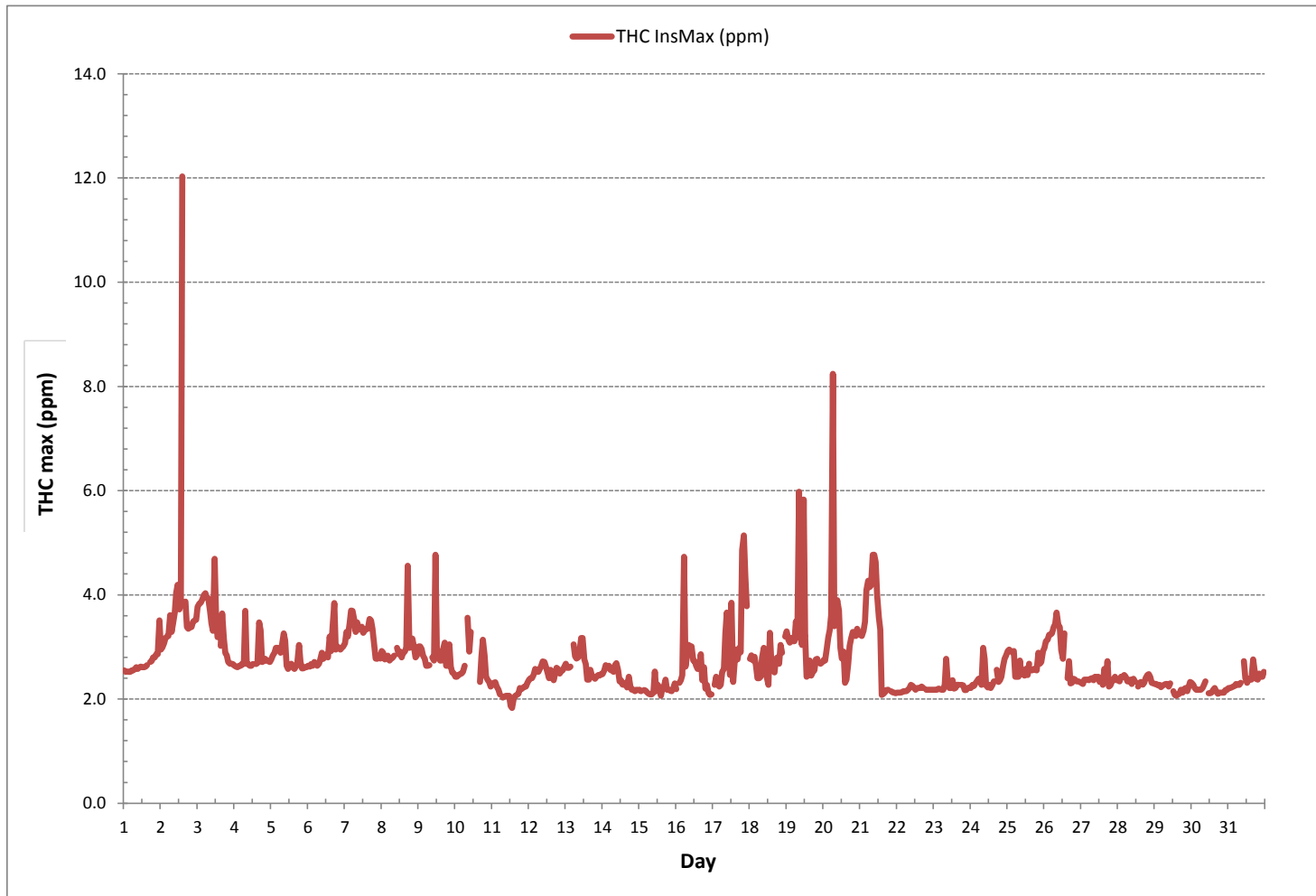
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	707
MAXIMUM INSTANTANEOUS VALUE:	12.03 ppm @ HOUR(S) 14 ON DAY(S) 2
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	0.68

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

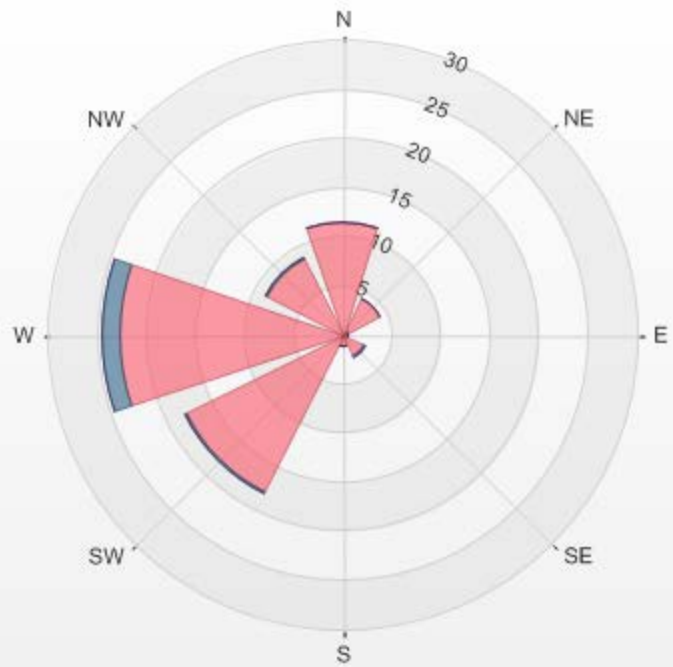


Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 28.39% Valid Data: 95.16% Calm Avg: 2.65 [ppm]

Direction	0.0-1.6	1.6-3.1	3.1-4.7	>4.7	Total
N	0	11.44	0	0	11.44
NE	0	4.24	0	0	4.24
E	0	0.56	0.14	0	0.7
SE	0	2.54	0.14	0	2.68
S	0	1.13	0	0	1.13
SW	0	17.8	0.28	0	18.08
W	0	22.74	1.84	0	24.58
NW	0	8.62	0.14	0	8.76
Summary	0	69.07	2.54	0	71.61

% Icon Classes (ppm) 0 0.0-1.6 69 1.6-3.1 3 3.1-4.7 0 >4.7

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 01/01/2017 00:00 - 31/01/2017 23:00
 Calm: 28.39% Calm Poll Avg: 2.65[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



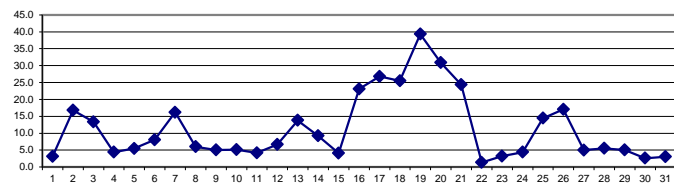
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1.4	1.4	1.4	1.0	2.3	2.2	1.0	1.1	1.9	0.9	0.7	1.2	1.6	2.8	2.2	1.9	S	5.2	4.3	4.7	6.7	6.0	9.4	10.1	0.7	10.1	3.1	24
2	10.1	10.3	9.3	8.8	9.1	12.6	27.2	21.3	20.2	29.8	37.5	24.6	24.1	16.5	14.0	S	15.1	15.4	12.2	11.0	11.6	11.2	16.4	18.6	8.8	37.5	16.8	24
3	22.0	23.2	24.4	25.1	25.3	27.7	23.3	21.1	19.6	15.4	11.0	8.8	8.3	7.7	S	6.2	7.3	7.1	7.4	5.8	3.3	2.4	2.3	2.2	2.2	27.7	13.3	24
4	2.1	2.5	2.2	1.8	2.1	3.0	1.9	2.1	4.4	3.1	1.6	1.9	2.6	S	4.7	6.4	14.7	12.5	8.2	3.9	4.6	4.5	5.4	5.0	1.6	14.7	4.4	24
5	4.0	4.0	5.9	6.2	5.2	6.3	6.3	6.9	11.9	9.6	3.8	3.1	S	2.8	6.4	2.7	6.1	6.6	8.9	7.9	2.6	4.0	2.4	2.2	2.2	11.9	5.5	24
6	2.5	3.3	3.6	2.3	2.1	2.0	2.6	2.9	9.2	18.5	14.3	S	4.1	4.5	4.5	6.8	9.3	17.6	15.1	15.2	14.5	9.9	9.8	10.8	2.0	18.5	8.1	24
7	14.0	24.8	23.1	31.1	45.9	47.2	43.0	12.0	14.7	24.8	S	4.6	5.0	7.2	8.9	11.5	13.6	14.5	10.7	6.7	3.3	1.8	1.5	2.4	1.5	47.2	16.2	24
8	4.9	3.4	1.1	1.5	1.6	1.2	2.0	1.3	2.4	S	8.4	7.1	3.4	2.9	3.9	6.6	9.5	10.9	11.1	19.4	16.4	9.9	4.8	4.3	1.1	19.4	6.0	24
9	5.8	6.6	6.1	4.3	4.0	2.2	3.2	4.3	S	5.0	4.2	5.7	5.3	5.9	5.4	5.6	7.0	7.6	7.8	6.6	3.9	2.7	3.8	3.4	2.2	7.8	5.1	24
10	2.9	1.5	0.9	1.5	2.0	3.4	7.2	S	10.1	C	C	C	C	C	C	C	C	2.8	11.9	8.5	7.3	7.1	5.0	4.4	0.9	11.9	5.1	24
11	6.3	5.3	4.1	4.4	4.8	6.3	S	5.6	6.2	6.0	6.5	3.9	2.9	1.0	17.9	4.5	1.5	0.8	0.9	0.7	1.5	1.9	2.0	1.6	0.7	17.9	4.2	24
12	2.1	4.6	4.9	4.7	6.0	S	6.8	11.3	18.4	21.0	10.6	8.6	4.0	3.7	4.8	5.4	7.2	4.0	5.3	4.0	3.8	3.4	3.5	4.9	2.1	21.0	6.7	24
13	4.7	3.6	3.8	3.8	S	6.6	15.3	15.0	17.4	34.1	41.1	21.9	15.6	12.3	8.8	8.6	9.7	9.6	10.7	12.4	14.9	17.6	15.7	13.9	3.6	41.1	13.8	24
14	12.2	11.4	10.1	S	28.4	14.0	7.1	7.6	7.6	12.9	8.9	9.1	7.7	6.7	7.8	9.0	7.6	7.4	7.1	6.8	6.1	6.0	5.9	4.8	4.8	28.4	9.2	24
15	4.4	5.3	S	5.8	5.9	4.8	3.9	3.6	3.0	2.8	3.8	3.1	3.2	3.4	2.7	3.3	4.2	4.7	3.7	3.5	4.7	4.8	5.3	4.1	2.7	5.9	4.1	24
16	3.0	S	7.6	5.0	10.3	26.1	26.2	40.3	56.3	87.4	65.2	63.1	30.7	25.8	15.7	14.5	16.9	7.7	6.7	5.9	6.9	3.5	3.0	3.1	3.0	87.4	23.1	24
17	S	9.1	6.9	4.9	4.9	7.5	12.8	13.0	52.6	91.7	81.4	28.4	12.0	8.5	7.1	15.0	12.1	21.9	23.4	41.8	51.2	43.1	39.8	S	4.9	91.7	26.8	24
18	34.5	25.4	31.7	23.2	20.4	6.8	21.3	25.5	25.3	36.5	28.8	16.4	12.3	7.5	8.3	11.3	16.0	21.8	30.5	22.9	51.1	50.6	S	57.3	6.8	57.3	25.5	24
19	55.9	42.0	40.4	39.5	34.1	34.7	31.4	53.7	38.5	50.6	74.9	83.6	41.2	17.9	16.7	20.2	15.7	23.2	42.3	44.2	31.2	S	41.8	30.9	15.7	83.6	39.3	24
20	25.9	21.2	17.2	17.5	25.0	29.6	21.6	25.5	44.0	77.8	66.9	18.1	16.0	12.7	15.0	14.8	24.8	35.3	45.3	43.8	S	38.6	41.0	31.9	12.7	77.8	30.8	24
21	31.5	28.3	29.7	24.9	27.5	46.5	48.5	48.7	52.9	60.6	51.9	36.2	32.0	20.4	2.8	3.2	3.2	3.1	2.8	S	2.2	1.5	1.3	1.1	1.1	60.6	24.4	24
22	1.7	1.8	1.5	1.6	1.6	1.6	1.8	1.0	0.9	0.9	1.1	1.0	1.1	1.8	2.0	1.7	1.7	1.1	S	1.2	1.0	1.0	1.2	1.3	0.9	2.0	1.4	24
23	1.4	1.3	1.2	0.8	0.9	1.3	1.0	2.7	3.8	1.9	1.2	1.5	1.4	2.3	4.6	5.9	7.6	S	11.5	7.6	3.9	3.3	2.6	4.4	0.8	11.5	3.2	24
24	4.4	3.6	3.0	3.4	3.6	4.5	3.2	1.9	2.3	2.5	3.0	3.3	2.9	4.2	3.6	3.4	S	4.6	6.1	6.9	8.0	6.2	7.8	9.1	1.9	9.1	4.4	24
25	9.8	10.4	9.9	11.2	13.3	15.8	17.6	18.3	19.8	12.8	11.5	10.7	9.8	10.3	10.4	S	14.8	20.9	20.6	15.2	21.4	16.3	16.1	15.1	9.8	21.4	14.4	24
26	13.4	12.0	11.8	12.3	12.5	12.0	17.8	26.1	42.6	54.9	47.6	38.8	20.9	13.2	S	5.6	4.8	4.7	8.7	7.4	6.4	7.8	6.9	4.7	4.7	54.9	17.1	24
27	4.5	4.1	5.3	5.7	5.5	5.5	5.5	6.3	5.7	6.8	5.0	3.8	3.6	S	4.0	3.8	3.1	3.5	4.0	4.6	6.0	6.1	6.9	5.6	3.1	6.9	5.0	24
28	5.7	5.0	6.0	5.8	5.8	4.6	4.1	3.8	3.1	3.6	3.4	3.1	S	5.1	5.6	6.1	7.1	7.5	7.3	8.0	7.4	7.6	6.8	5.2	3.1	8.0	5.6	24
29	4.8	4.2	3.7	4.1	3.1	3.5	3.9	3.7	3.6	4.1	3.7	S	4.4	5.2	5.1	4.8	5.4	6.1	5.7	6.6	6.9	6.8	8.1	8.8	3.1	8.8	5.1	24
30	7.9	6.3	4.3	4.0	3.4	3.0	3.3	4.5	5.1	3.5	S	1.2	0.8	0.8	1.0	1.5	0.8	0.7	1.6	1.2	1.0	1.4	1.8	1.1	0.7	7.9	2.6	24
31	2.3	2.0	2.2	1.4	1.2	1.4	1.1	1.0	S	1.3	1.9	3.9	3.6	2.5	3.2	3.9	4.8	4.6	4.5	5.0	4.5	4.8	7.1	1.0	7.1	3.0	24	
HOURLY MAX	55.9	42.0	40.4	39.5	45.9	47.2	48.5	53.7	56.3	91.7	81.4	83.6	41.2	25.8	17.9	20.2	24.8	35.3	45.3	44.2	51.2	50.6	41.8	57.3				
HOURLY AVG	10.2	9.6	9.4	8.9	10.6	11.5	12.4	13.1	16.8	24.3	21.4	14.8	10.0	7.7	7.0	6.9	9.0	9.8	11.5	11.3	10.5	9.7	9.4	9.3				

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

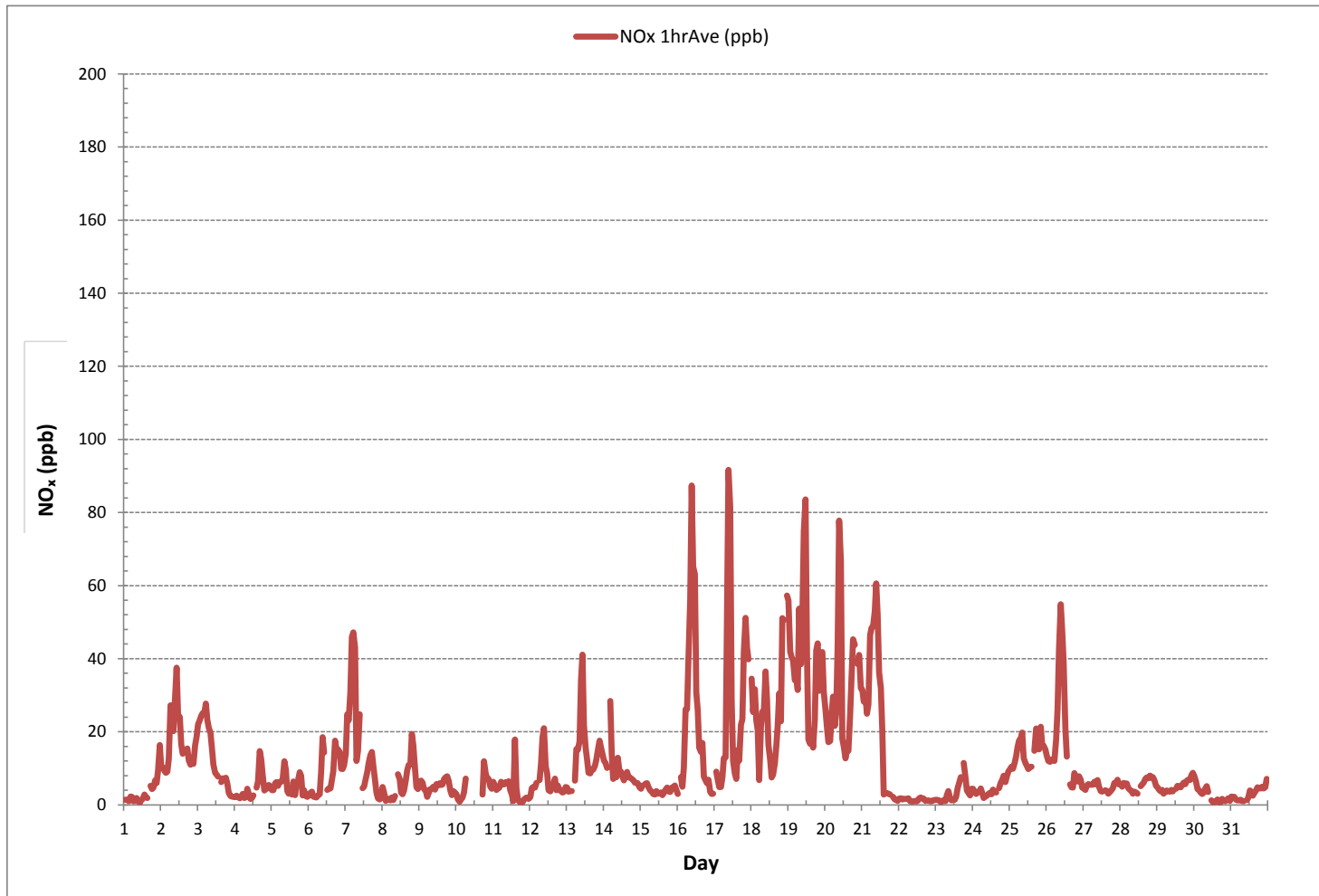
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	704			
MINIMUM 1-HR AVERAGE:	0.7 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	91.7 ppb	@ HOUR(S)	9	ON DAY(S) 17
MAXIMUM 24-HR AVERAGE:	39.3 ppb			ON DAY(S) 19
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	13.9	MONTHLY AVERAGE:	11.4 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - January 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	3.1	2.7	2.8	2.4	4.2	3.5	1.8	1.7	3.0	1.9	1.4	2.3	2.7	3.4	3.3	2.8	S	11.3	5.9	7.3	8.7	8.2	19.0	13.8	1.4	19.0	5.1	24
2	14.4	13.4	11.9	12.6	12.6	25.7	37.5	26.1	28.3	36.7	45.3	39.5	30.5	20.5	21.7	S	26.0	35.5	20.1	14.2	14.5	15.4	20.8	24.8	11.9	45.3	23.8	24
3	25.7	25.7	28.0	26.8	29.1	29.9	26.5	25.8	23.9	19.2	13.5	19.5	19.1	18.3	S	15.5	20.4	9.1	9.4	10.0	4.8	3.5	2.9	3.7	2.9	29.9	17.8	24
4	2.8	4.0	3.2	2.7	2.8	4.4	3.6	6.1	13.2	14.6	2.8	3.1	4.0	S	6.9	12.5	63.7	29.6	13.5	5.9	6.7	6.3	6.7	6.7	2.7	63.7	9.8	24
5	4.9	7.5	8.6	8.3	7.1	9.0	7.5	12.3	15.0	13.4	7.3	6.2	S	6.3	29.5	7.6	15.7	15.8	21.4	16.5	4.4	9.6	5.3	4.0	4.0	29.5	10.6	24
6	5.8	7.2	9.1	4.7	8.4	6.4	9.0	6.4	23.0	25.8	36.0	S	8.3	6.7	9.5	19.3	23.4	35.5	19.2	20.0	18.9	12.7	12.5	14.7	4.7	36.0	14.9	24
7	20.9	40.6	28.1	44.0	56.8	50.5	47.3	35.9	29.3	40.4	S	14.5	8.6	10.3	14.3	15.5	16.2	17.1	14.6	8.8	4.9	3.1	2.6	6.1	2.6	56.8	23.1	24
8	7.2	5.9	2.2	2.6	2.8	2.5	3.6	4.5	10.9	S	12.3	9.9	6.4	4.6	7.3	9.1	24.7	22.8	19.2	29.1	29.1	14.2	7.8	5.0	2.2	29.1	10.6	24
9	6.9	7.8	7.6	5.1	6.3	3.1	4.7	5.9	S	10.0	5.3	13.0	8.2	9.5	9.5	16.2	12.5	16.4	11.2	9.1	7.5	5.1	5.4	4.5	3.1	16.4	8.3	24
10	4.0	2.2	1.9	2.4	3.3	11.5	18.5	S	17.8	C	C	C	C	C	C	C	C	5.0	23.7	12.6	9.2	11.5	8.9	7.2	1.9	23.7	9.3	24
11	8.6	8.2	5.4	7.0	6.3	9.4	S	7.1	7.2	7.6	7.3	5.7	4.1	3.5	41.2	34.1	2.3	1.4	1.7	1.1	2.6	3.0	2.8	2.3	1.1	41.2	7.8	24
12	5.8	5.8	7.0	8.5	9.1	S	10.2	15.1	30.7	45.7	13.0	17.1	5.1	5.5	6.7	13.2	19.4	9.6	40.3	5.5	6.5	4.8	9.5	8.3	4.8	45.7	13.1	24
13	8.5	8.3	10.9	7.2	S	40.4	25.8	19.8	31.2	47.1	67.1	28.9	21.5	24.1	11.1	10.7	12.9	11.7	12.7	14.5	17.3	18.7	18.2	17.6	7.2	67.1	21.1	24
14	14.1	19.1	18.5	S	43.0	33.8	8.6	15.2	18.6	23.1	12.2	12.9	12.3	7.8	8.7	25.5	10.7	11.0	8.3	8.3	7.5	7.8	7.1	7.1	7.1	43.0	14.8	24
15	6.0	6.4	S	8.0	7.6	5.8	4.9	5.3	3.6	3.9	5.4	3.9	4.1	5.0	4.1	5.1	8.8	20.1	6.6	5.8	6.9	6.4	8.7	7.6	3.6	20.1	6.5	24
16	4.7	S	13.1	10.7	20.8	58.4	48.0	52.8	99.8	99.2	111.6	188.8	40.6	107.7	34.0	28.2	48.7	10.8	11.3	9.9	18.1	4.4	4.6	5.0	4.4	188.8	44.8	24
17	S	13.8	13.0	11.7	13.5	23.1	27.8	28.0	89.0	120.4	119.8	53.1	14.7	11.9	13.2	33.2	15.5	29.6	31.9	57.8	68.0	58.1	44.5	S	11.7	120.4	40.5	24
18	43.3	34.7	41.4	39.9	28.4	15.1	36.8	38.2	36.3	78.9	73.3	22.8	21.6	13.2	12.0	22.4	21.5	39.5	44.7	42.7	110.6	76.3	S	66.9	12.0	110.6	41.8	24
19	62.6	57.1	47.3	55.8	48.0	83.0	46.1	65.3	53.7	76.3	86.1	109.0	74.7	34.1	26.5	48.2	23.0	41.3	49.2	64.0	55.0	S	48.6	46.5	23.0	109.0	56.6	24
20	42.2	26.8	20.4	24.8	26.9	86.2	34.1	41.4	84.9	89.5	155.8	24.4	28.7	14.9	17.3	19.0	40.0	42.8	49.3	54.0	S	45.9	55.2	37.6	14.9	155.8	46.2	24
21	40.2	31.9	33.1	29.8	40.0	49.7	51.5	65.8	65.7	63.8	62.6	47.7	34.1	32.0	3.7	4.7	12.5	4.5	4.5	S	3.1	2.2	2.2	1.8	1.8	65.8	29.9	24
22	2.3	2.3	2.2	1.9	2.2	2.2	2.6	1.8	1.5	1.4	2.7	2.8	1.9	2.9	2.7	2.4	2.6	2.2	S	2.0	2.0	1.9	2.2	5.9	1.4	5.9	2.4	24
23	4.1	3.1	2.2	1.5	1.7	9.4	2.3	9.1	8.7	5.0	5.0	3.0	2.7	3.7	5.9	8.7	9.4	S	14.3	12.4	6.2	7.2	4.9	7.2	1.5	14.3	6.0	24
24	5.9	4.8	6.4	5.8	4.7	6.3	6.3	2.7	3.3	5.4	4.6	4.4	4.0	13.7	10.3	4.2	S	17.4	7.1	10.0	12.1	7.3	9.5	10.8	2.7	17.4	7.3	24
25	10.8	12.6	14.6	13.7	16.2	17.1	19.7	21.4	22.2	16.1	14.1	11.3	15.0	11.9	14.6	S	18.7	37.9	31.7	19.7	35.9	19.8	19.4	17.1	10.8	37.9	18.8	24
26	15.7	15.0	13.0	13.4	13.7	15.9	30.2	36.9	93.5	73.4	81.4	89.9	37.0	21.8	S	7.3	6.7	7.8	12.0	10.8	7.6	14.4	12.3	7.6	6.7	93.5	27.7	24
27	6.3	6.6	9.9	7.8	8.0	9.6	8.1	9.5	7.2	9.9	7.5	5.0	6.7	S	5.8	7.2	4.4	12.9	5.9	7.8	8.0	10.1	13.5	8.3	4.4	13.5	8.1	24
28	9.2	6.7	7.5	7.5	7.3	6.3	5.9	4.7	4.6	4.8	6.9	4.0	S	5.8	10.2	9.2	9.5	10.9	9.9	10.5	10.5	9.1	8.7	7.8	4.0	10.9	7.7	24
29	13.4	5.0	5.4	6.1	4.4	4.4	5.8	6.2	4.5	6.1	7.2	S	5.7	6.0	7.6	5.8	7.5	14.2	6.7	7.8	8.6	8.6	11.0	10.7	4.4	14.2	7.3	24
30	10.3	7.9	6.2	5.3	4.7	4.9	4.5	7.1	7.2	5.6	S	1.8	1.4	1.4	1.5	3.2	1.7	1.3	2.1	1.9	1.4	2.1	2.4	2.9	1.3	10.3	3.9	24
31	3.1	2.8	3.1	2.3	1.8	1.9	1.8	2.0	1.7	S	4.2	2.8	5.0	4.8	3.5	5.0	10.5	7.6	7.6	7.9	6.8	5.7	6.2	9.6	1.7	10.5	4.7	24
HOURLY MAX	62.6	57.1	47.3	55.8	56.8	86.2	51.5	65.8	99.8	120.4	155.8	188.8	74.7	107.7	41.2	48.2	63.7	42.8	49.3	64.0	110.6	76.3	55.2	66.9				
HOURLY AVG	13.8	13.2	12.8	12.7	14.7	21.0	18.0	19.3	28.0	33.8	34.7	26.7	15.3	14.7	12.2	14.1	17.5	17.8	17.2	16.3	16.8	13.4	12.8	12.6				

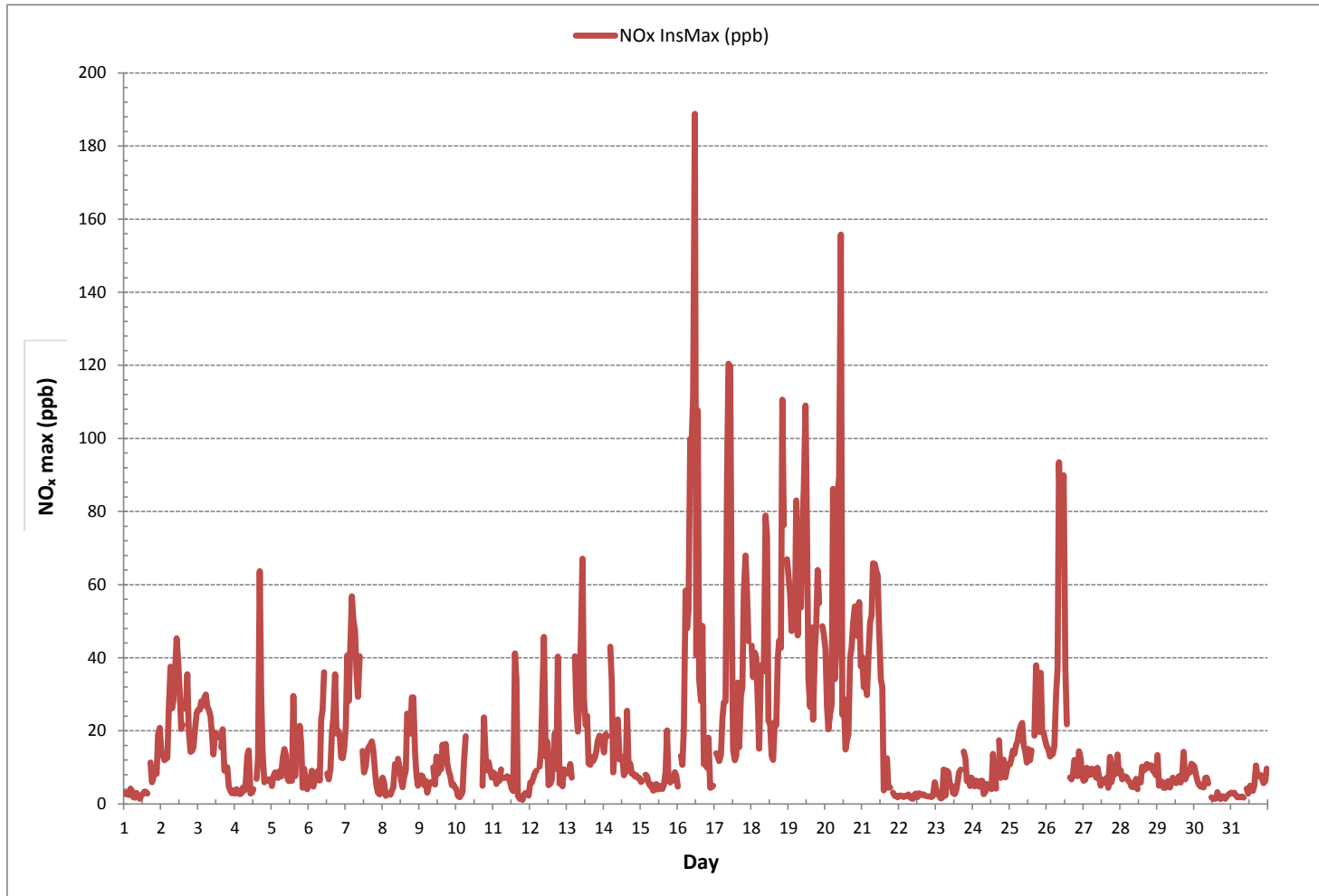
STATUS FLAG CODES

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:	704
MAXIMUM INSTANTANEOUS VALUE:	188.8 ppb @ HOUR(S) 11 ON DAY(S) 16
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	21.5
OPERATIONAL TIME:	744 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

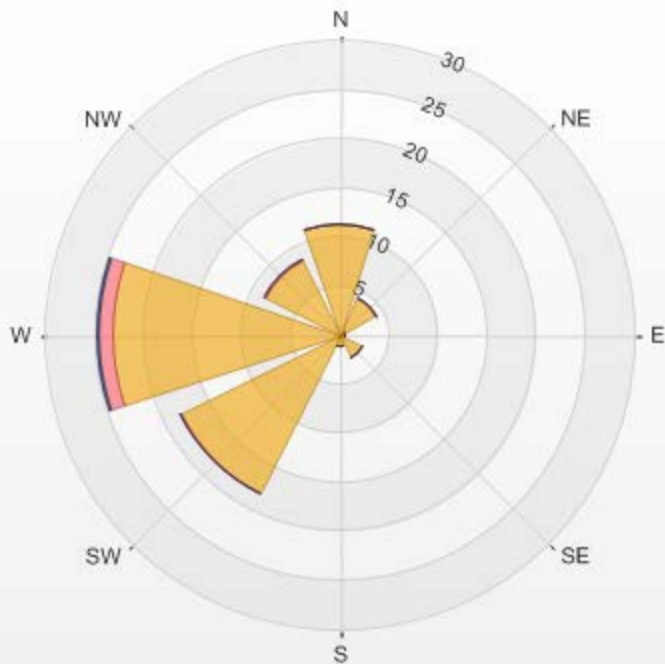


Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 28.41% Valid Data: 94.62% Calm Avg: 22.73 [ppb]

Direction	0.0-26.7	26.7-53.3	53.3-80.0	>80.0	Total
N	11.22	0	0	0	11.22
NE	4.12	0.14	0	0	4.26
E	0.57	0	0.14	0	0.71
SE	2.56	0.14	0	0	2.7
S	1.14	0	0	0	1.14
SW	18.04	0.14	0	0	18.18
W	23.01	1.42	0.28	0	24.71
NW	8.52	0.14	0	0	8.66
Summary	69.18	1.98	0.42	0	71.58

% Icon Classes (ppb) 69 0.0-26.7 2 26.7-53.3 0 53.3-80.0 0 >80.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 01/01/2017 00:00 - 31/01/2017 23:00
Calm: 28.41% Calm Poll Avg: 22.73[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/01 Type: Span



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

NITRIC OXIDES

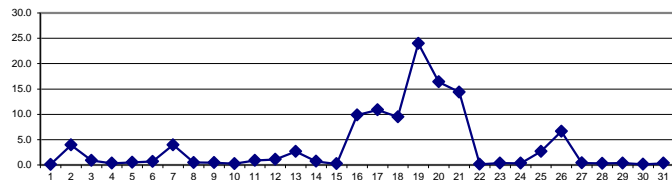
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.1	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.6	0.3	0.1	S	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.6	0.1	24
2	0.1	0.1	0.1	0.1	0.1	1.0	6.6	2.7	3.6	13.8	22.9	13.2	12.0	6.5	3.7	S	1.0	1.7	0.2	0.2	0.2	0.3	0.4	0.2	0.1	0.0	22.9	3.9	24
3	0.3	0.3	0.6	1.3	2.1	1.4	0.6	0.9	0.8	1.8	2.0	2.0	2.4	1.9	S	0.8	0.7	0.4	0.5	0.3	0.1	0.0	0.0	0.1	0.0	2.4	0.9	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.3	0.8	0.2	0.4	0.4	S	0.7	0.6	1.6	0.5	0.3	0.2	0.2	0.3	0.1	0.2	0.0	1.6	0.4	24	
5	0.0	0.0	0.2	0.4	0.1	0.1	0.0	0.2	0.3	1.0	0.9	1.0	S	0.7	3.5	0.4	0.8	0.2	0.3	0.4	0.3	0.7	0.3	0.2	0.0	3.5	0.5	24	
6	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.5	3.4	4.3	S	0.8	1.0	1.0	0.9	0.7	1.7	0.2	0.1	0.1	0.1	0.1	0.2	0.1	4.3	0.7	24	
7	0.3	4.1	2.5	7.6	20.3	21.6	17.2	1.1	1.7	6.0	S	1.0	0.9	1.5	1.7	1.4	0.5	0.5	0.3	0.1	0.1	0.2	0.1	0.4	0.1	21.6	4.0	24	
8	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.1	S	2.3	2.1	1.0	0.8	0.7	0.8	0.9	0.4	0.3	0.6	0.3	0.2	0.1	0.0	0.0	2.3	0.5	24	
9	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.3	S	0.4	0.5	1.3	1.2	1.4	1.1	1.1	0.5	0.7	0.3	0.5	0.3	0.1	0.1	0.0	0.0	1.4	0.5	24	
10	0.0	0.0	0.0	0.0	0.1	0.1	0.1	S	0.4	C	C	C	C	C	C	C	C	0.1	0.6	0.5	0.5	0.7	0.6	0.4	0.0	0.7	0.3	24	
11	0.4	0.1	0.0	0.0	0.0	0.1	S	0.2	0.4	0.7	1.2	0.8	0.6	0.2	12.8	3.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8	0.9	24	
12	0.1	0.2	0.1	0.0	0.0	S	0.2	0.3	2.1	6.3	3.4	3.3	1.3	1.5	1.3	1.1	1.4	0.3	1.1	0.2	0.4	0.1	0.2	0.3	0.0	6.3	1.1	24	
13	0.1	0.1	0.2	0.1	S	1.4	0.6	0.2	1.5	13.4	19.9	8.4	5.5	3.7	1.7	0.9	0.7	0.7	0.5	0.4	0.3	0.5	0.3	0.3	0.1	19.9	2.7	24	
14	0.1	0.2	0.1	S	4.2	0.9	0.1	0.1	0.3	1.7	1.3	1.3	1.3	1.0	1.0	1.5	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	4.2	0.7	24	
15	0.1	0.1	S	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.5	0.2	24	
16	0.1	S	0.2	0.1	0.6	4.3	6.8	16.3	32.0	60.4	41.6	37.7	11.5	7.8	3.0	1.7	2.0	0.1	0.2	0.1	0.6	0.1	0.1	0.1	0.1	60.4	9.9	24	
17	S	0.2	0.2	0.1	0.2	0.4	1.0	1.3	25.3	59.5	53.9	14.1	2.7	1.9	1.3	2.2	0.6	0.8	1.0	13.4	24.7	20.1	14.1	S	0.1	59.5	10.9	24	
18	9.3	4.5	8.1	5.2	3.1	0.5	4.0	5.4	7.6	20.9	13.9	6.4	5.3	2.7	2.2	2.2	1.7	3.5	9.4	6.7	28.1	31.7	S	35.4	0.5	35.4	9.5	24	
19	37.0	25.3	22.5	22.6	19.5	19.9	19.0	36.7	26.0	37.8	54.3	58.2	25.3	8.4	6.7	6.7	3.5	7.5	23.7	26.7	17.9	S	27.0	19.0	3.5	58.2	24.0	24	
20	15.5	11.4	5.4	4.2	8.8	13.8	10.0	13.5	30.0	60.7	48.3	6.8	5.6	4.1	4.3	3.2	5.3	11.9	24.1	23.3	S	22.1	25.1	19.3	3.2	60.7	16.4	24	
21	19.6	17.1	18.6	13.6	12.0	26.8	28.4	30.1	35.2	42.2	34.2	21.7	18.4	10.3	0.5	0.5	0.5	0.3	0.3	S	0.1	0.1	0.1	0.1	0.1	42.2	14.4	24	
22	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	0.3	0.3	0.2	0.1	0.1	S	0.2	0.2	0.1	0.2	0.3	0.0	0.3	0.2	24	
23	0.3	0.2	0.2	0.1	0.1	0.3	0.1	0.6	0.9	0.4	0.3	0.4	0.3	0.6	1.0	1.0	0.5	S	0.3	0.2	0.3	0.1	0.1	0.3	0.1	1.0	0.4	24	
24	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.0	0.1	0.4	0.6	1.0	0.9	1.4	0.8	0.4	S	0.6	0.1	0.1	0.2	0.0	0.1	0.2	0.0	1.4	0.3	24	
25	0.2	0.2	0.3	0.5	0.7	0.2	0.7	3.0	3.5	4.3	4.3	4.0	4.1	3.7	S	2.8	4.7	5.3	2.2	7.6	3.1	2.6	2.3	0.2	7.6	2.7	24		
26	1.2	0.7	0.5	0.4	0.4	0.8	6.1	12.9	27.8	38.5	26.1	20.9	8.9	4.5	S	0.8	0.4	0.2	0.4	0.2	0.2	0.2	0.8	0.2	0.2	38.5	6.7	24	
27	0.2	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	1.0	1.1	0.9	0.8	S	0.5	0.5	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.1	1.1	0.4	24	
28	0.5	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.5	0.4	S	0.7	0.8	0.6	0.3	0.3	0.4	0.2	0.3	0.2	0.3	0.2	0.1	0.8	0.3	24	
29	0.3	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.1	0.5	0.7	S	1.0	1.2	1.0	0.5	0.4	0.3	0.2	0.1	0.3	0.2	0.3	0.3	0.1	1.2	0.4	24	
30	0.4	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.4	S	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	24	
31	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	S	0.3	0.5	1.3	1.1	0.6	0.6	0.6	0.7	0.4	0.6	0.2	0.2	0.2	0.4	0.0	1.3	0.3	24	
HOURLY MAX	37.0	25.3	22.5	22.6	20.3	26.8	28.4	36.7	35.2	60.7	54.3	58.2	25.3	10.3	12.8	6.7	5.3	11.9	24.1	26.7	28.1	31.7	27.0	35.4					
HOURLY AVG	2.9	2.2	2.1	1.9	2.5	3.2	3.4	4.2	6.7	13.4	12.1	7.5	4.1	2.5	2.0	1.2	1.0	1.3	2.4	2.6	2.8	2.7	2.5	2.7					

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

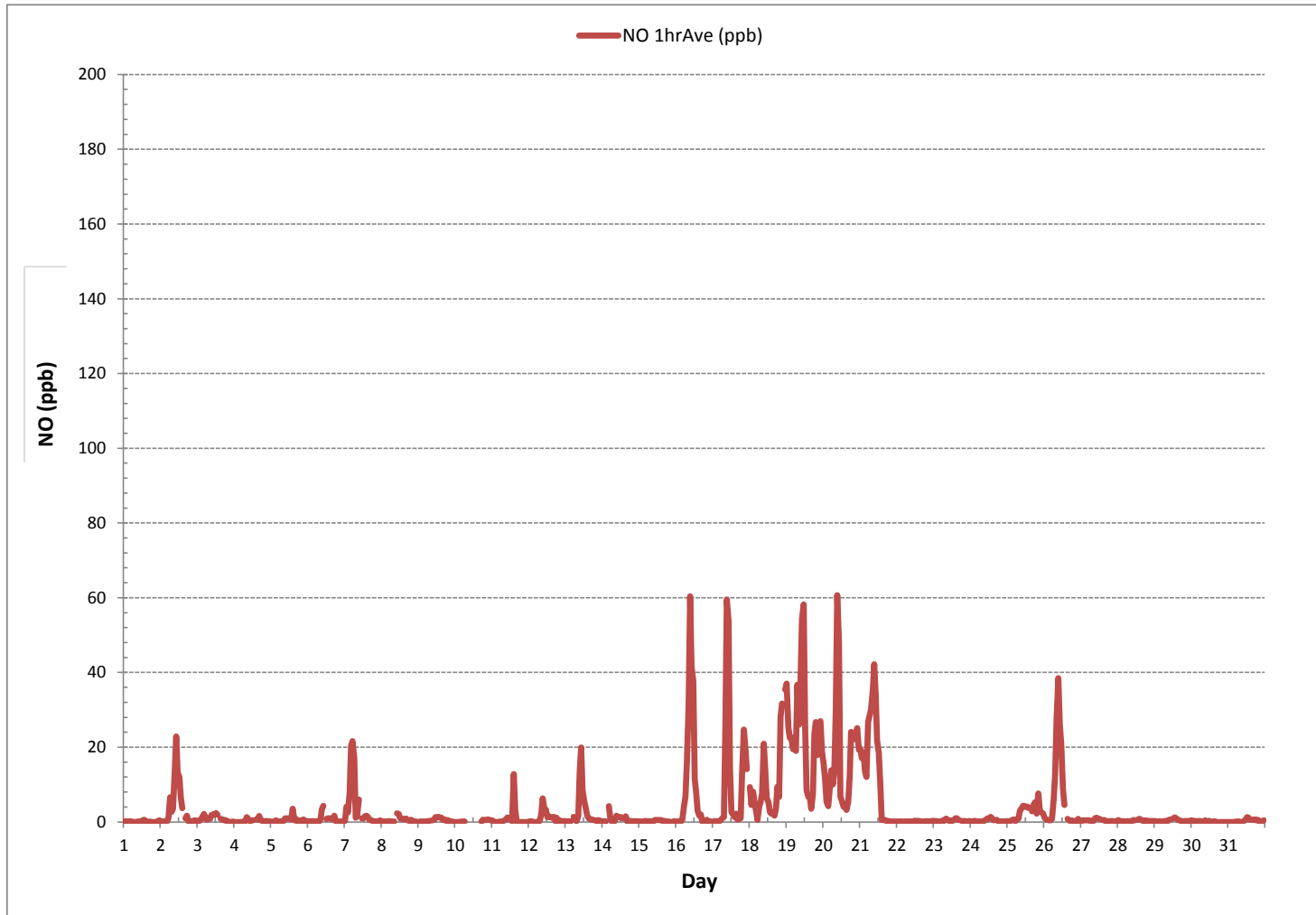
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	645			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	60.7 ppb	@ HOUR(S)	9	ON DAY(S) 20
MAXIMUM 24-HR AVERAGE:	24.0 ppb			ON DAY(S) 19
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	8.9	MONTHLY AVERAGE:	3.7 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - January 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	0.9	1.0	0.8	0.7	1.4	0.8	0.5	0.3	0.4	0.7	0.5	0.8	0.9	1.1	0.9	0.5	S	1.7	0.5	0.6	0.7	0.8	2.0	1.6	0.3	2.0	0.9	24
2	1.0	1.4	0.9	1.2	1.1	6.9	13.6	6.4	11.0	20.8	29.3	24.5	16.4	9.8	10.5	S	8.5	15.2	3.0	1.2	3.9	3.3	2.9	1.6	0.9	29.3	8.5	24
3	1.7	1.6	2.2	2.2	3.1	3.5	2.0	2.2	2.2	2.7	3.7	12.1	13.7	7.2	S	8.1	8.7	1.6	2.0	2.0	0.7	0.5	0.4	0.9	0.4	13.7	3.7	24
4	0.5	0.5	0.4	0.4	0.3	0.4	0.9	2.0	6.4	6.1	1.1	1.2	1.1	S	2.5	2.3	28.9	6.8	3.0	1.3	1.3	1.7	0.9	1.6	0.3	28.9	3.1	24
5	0.4	0.8	1.2	1.4	0.9	1.3	0.5	0.8	1.3	2.6	2.5	2.5	S	2.1	30.1	2.6	6.4	1.6	4.5	3.9	2.0	4.0	1.2	1.3	0.4	30.1	3.3	24
6	2.0	1.8	2.5	1.3	5.1	2.0	3.3	2.0	5.6	7.8	14.3	S	1.8	2.2	5.7	7.6	6.1	15.3	0.8	0.9	1.1	1.1	1.7	1.7	0.8	15.3	4.1	24
7	1.3	13.1	5.7	17.8	30.7	24.0	21.9	11.0	6.7	16.9	S	12.5	2.6	2.7	3.4	4.3	1.6	2.3	1.4	0.8	0.7	0.8	0.8	3.5	0.7	30.7	8.1	24
8	1.4	0.8	0.5	0.9	0.8	0.7	0.7	0.5	1.2	S	3.9	3.0	3.3	1.4	1.6	2.0	8.5	7.9	2.0	2.1	1.8	0.9	1.2	0.4	0.4	8.5	2.1	24
9	0.5	0.8	1.4	0.3	0.9	0.7	1.2	2.0	S	2.2	1.1	7.2	2.4	2.3	4.9	16.9	5.1	6.5	1.8	2.2	1.7	1.3	0.5	0.4	0.3	16.9	2.8	24
10	0.4	0.4	0.7	0.4	0.9	0.8	1.8	S	3.8	C	C	C	C	C	C	C	C	0.9	2.6	2.1	1.8	2.7	1.9	1.8	0.4	3.8	1.5	24
11	1.5	1.3	0.6	0.6	0.5	1.1	S	0.9	1.1	1.2	1.6	1.6	1.3	1.0	37.0	33.2	0.4	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.2	37.0	3.8	24
12	1.5	0.9	1.3	0.4	0.8	S	1.1	2.8	7.3	20.5	4.3	8.9	2.1	10.7	2.4	5.2	8.8	3.9	27.8	0.9	2.1	0.7	4.0	1.4	0.4	27.8	5.2	24
13	1.0	1.2	1.4	0.9	S	28.6	3.1	0.6	7.8	23.6	39.0	11.3	8.8	13.9	2.9	1.8	4.9	2.2	1.4	1.2	1.3	2.4	2.0	1.8	0.6	39.0	7.1	24
14	0.4	2.6	0.5	S	12.7	5.6	0.7	3.0	4.5	6.2	2.1	2.2	2.1	1.3	1.3	14.4	1.0	2.3	1.2	1.6	0.9	0.8	1.2	2.1	0.4	14.4	3.1	24
15	0.5	0.9	S	2.1	1.2	1.1	0.9	0.9	0.4	0.5	1.2	0.8	0.9	0.9	1.3	0.8	2.1	2.9	1.2	0.9	0.4	0.4	0.7	1.3	0.4	2.9	1.1	24
16	0.7	S	2.1	1.6	5.3	17.6	20.6	26.4	71.4	71.4	74.2	135.4	19.7	49.3	9.2	5.2	14.5	0.7	1.6	0.8	6.1	0.8	0.8	0.8	0.7	135.4	23.3	24
17	S	1.2	1.6	1.4	1.4	6.1	8.4	9.6	55.7	87.9	87.6	32.9	4.2	3.8	11.2	8.0	3.0	2.7	4.3	25.8	37.5	33.2	18.7	S	1.2	87.9	20.3	24
18	16.6	12.8	18.0	15.5	8.9	1.7	17.5	12.1	16.7	38.9	47.4	9.7	10.7	7.1	5.6	7.5	4.4	13.3	21.3	19.8	64.5	54.8	S	47.0	1.7	64.5	20.5	24
19	44.4	35.4	28.0	37.3	31.9	60.5	32.3	44.9	37.9	58.2	63.3	79.7	49.4	21.3	13.3	16.2	9.2	22.9	29.4	44.8	37.7	S	32.6	30.9	9.2	79.7	37.5	24
20	29.7	17.6	10.2	9.2	10.9	58.8	18.9	27.5	64.2	69.7	111.1	10.0	10.9	5.1	5.5	5.2	17.8	20.8	27.9	33.2	S	28.0	44.5	24.5	5.1	111.1	28.7	24
21	24.5	20.2	20.9	18.2	20.9	28.5	31.0	42.7	45.5	45.7	45.2	31.3	19.3	17.4	1.4	3.1	6.7	0.8	1.1	S	0.7	0.4	0.6	0.5	0.4	45.7	18.5	24
22	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.6	0.4	0.4	0.8	1.1	0.8	0.8	0.7	0.5	0.7	S	0.8	0.7	0.7	1.6	2.2	0.3	2.2	0.7	24	
23	1.4	0.8	0.7	0.7	0.4	3.9	0.7	2.7	3.5	3.9	1.8	1.0	0.9	1.2	2.2	1.8	1.1	S	2.1	2.7	1.5	0.5	0.8	1.7	0.4	3.9	1.7	24
24	0.8	1.7	4.8	1.8	1.1	0.9	1.4	0.8	0.8	2.7	1.3	1.7	2.1	5.2	3.1	0.7	S	9.6	1.2	0.9	0.7	0.3	0.9	1.8	0.3	9.6	2.0	24
25	1.4	0.9	3.0	2.0	3.0	1.2	1.7	2.2	6.7	4.4	5.9	4.8	7.2	5.1	5.5	S	5.6	18.5	13.2	5.6	19.8	7.0	5.2	3.9	0.9	19.8	5.8	24
26	3.1	3.4	1.3	0.9	1.3	3.7	16.5	21.9	72.6	54.7	58.2	48.7	19.7	8.4	S	1.6	1.4	1.3	2.3	2.1	1.8	1.2	3.1	1.4	0.9	72.6	14.4	24
27	2.0	1.8	2.2	2.5	2.5	2.1	1.8	1.3	0.9	2.1	2.0	1.4	1.8	S	1.3	3.8	0.9	2.2	0.9	1.3	1.7	1.2	0.9	1.7	0.9	3.8	1.8	24
28	4.5	1.3	0.8	1.2	0.8	0.8	1.2	1.0	0.8	0.9	2.5	1.3	S	1.2	3.0	2.0	1.3	2.2	1.8	2.0	1.3	1.1	1.7	1.4	0.8	4.5	1.6	24
29	3.5	0.5	0.5	1.1	1.1	0.4	1.1	2.0	0.5	1.2	2.0	S	1.6	1.6	2.4	1.4	1.4	3.5	0.9	0.4	1.4	0.9	2.2	1.8	0.4	3.5	1.5	24
30	3.0	1.2	1.3	1.1	0.9	1.1	0.8	1.2	0.9	1.2	S	0.5	0.4	0.4	0.8	2.2	0.5	0.2	0.3	0.3	0.2	0.4	0.4	0.3	0.2	3.0	0.9	24
31	0.3	0.3	0.5	0.3	0.4	0.7	0.4	0.4	0.5	S	3.1	1.1	2.0	1.8	1.2	1.6	7.1	4.3	1.7	2.2	1.3	1.3	1.2	1.8	0.3	7.1	1.5	24
HOURLY MAX	44.4	35.4	28.0	37.3	31.9	60.5	32.3	44.9	72.6	87.9	111.1	135.4	49.4	49.3	37.0	33.2	28.9	22.9	29.4	44.8	64.5	54.8	44.5	47.0				
HOURLY AVG	5.0	4.3	3.9	4.2	5.1	8.9	6.9	7.8	14.6	19.8	21.8	16.0	7.4	6.7	6.1	5.7	5.9	5.8	5.4	5.5	6.6	5.1	4.6	4.8				

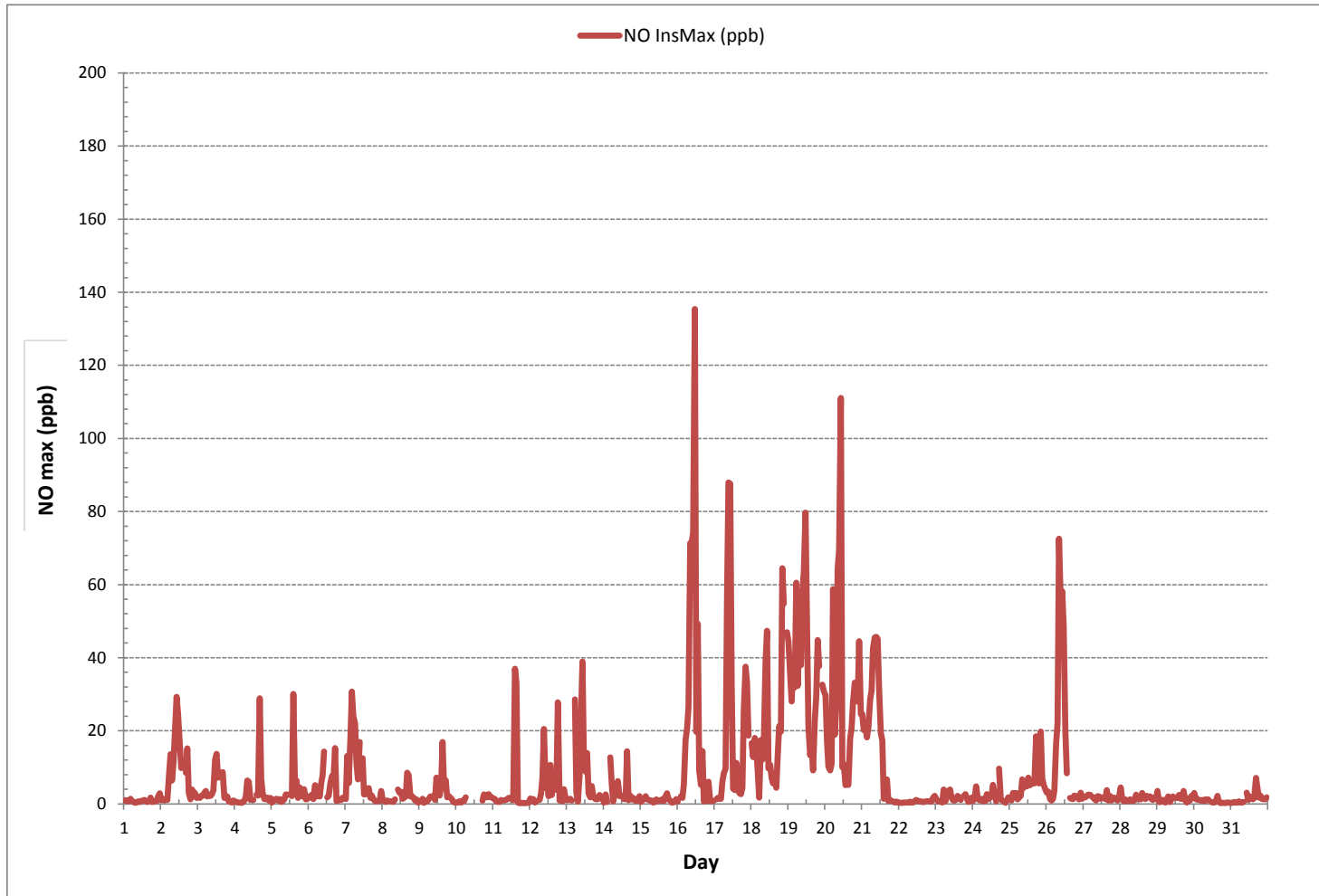
STATUS FLAG CODES

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:	704
MAXIMUM INSTANTANEOUS VALUE:	135.4 ppb @ HOUR(S) 11 ON DAY(S) 16
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	15.0
OPERATIONAL TIME:	744 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)

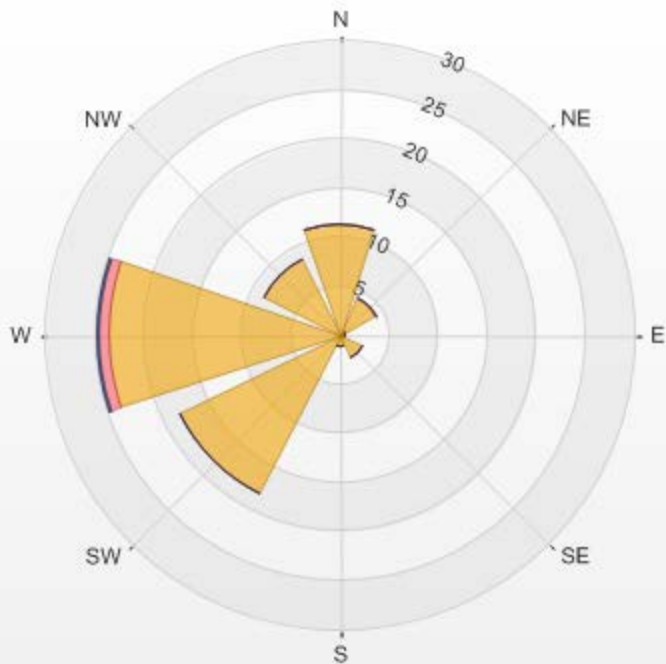


Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 28.41% Valid Data: 94.62% Calm Avg: 8.89 [ppb]

Direction	0.0-20.3	20.3-40.7	40.7-61.0	>61.0	Total
N	11.22	0	0	0	11.22
NE	4.12	0.14	0	0	4.26
E	0.57	0.14	0	0	0.71
SE	2.7	0	0	0	2.7
S	1.14	0	0	0	1.14
SW	18.18	0	0	0	18.18
W	23.44	1.14	0.14	0	24.72
NW	8.66	0	0	0	8.66
Summary	70.03	1.42	0.14	0	71.59

% Icon Classes (ppb) 70 0.0-20.3 1 20.3-40.7 0 40.7-61.0 0 >61.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 28.41% Calm Poll Avg: 8.89[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	1.2	1.2	1.3	0.9	2.0	2.0	1.0	1.1	1.8	0.8	0.6	0.9	1.2	2.1	1.8	1.7	S	5.1	4.3	4.8	6.7	6.0	9.2	10.0	0.6	10.0	2.9	24
2	10.1	10.2	9.3	8.8	9.1	11.6	20.5	18.5	16.6	15.9	14.4	11.3	12.2	10.1	10.3	S	14.1	13.8	12.1	10.9	11.4	11.0	16.1	18.3	8.8	20.5	12.9	24
3	21.7	22.9	23.8	23.8	23.2	26.3	22.6	20.2	18.8	13.6	9.0	6.8	5.9	5.9	S	5.4	6.6	6.7	7.0	5.5	3.2	2.4	2.3	2.1	2.1	26.3	12.4	24
4	2.1	2.5	2.2	1.8	2.1	2.9	1.8	1.8	3.1	2.2	1.3	1.5	2.1	S	4.0	5.8	13.1	12.0	8.0	3.8	4.4	4.2	5.3	4.8	1.3	13.1	4.0	24
5	4.0	4.0	5.8	5.9	5.2	6.3	6.3	6.8	11.7	8.6	2.9	2.0	S	2.0	2.9	2.2	5.3	6.4	8.6	7.5	2.2	3.2	2.0	1.9	1.9	11.7	4.9	24
6	2.2	3.1	3.3	2.1	1.7	1.8	2.3	2.6	8.7	15.0	9.9	S	3.3	3.5	3.4	5.9	8.6	15.9	14.9	15.1	14.4	9.8	9.7	10.6	1.7	15.9	7.3	24
7	13.7	20.6	20.5	23.3	25.4	25.5	25.7	11.0	13.0	18.7	S	3.6	4.1	5.8	7.2	10.2	13.2	14.1	10.4	6.6	3.2	1.6	1.4	2.0	1.4	25.7	12.2	24
8	4.8	3.3	1.0	1.4	1.4	1.0	1.8	1.2	2.2	S	6.1	5.0	2.3	2.1	3.2	5.9	8.7	10.5	10.8	18.8	16.1	9.8	4.7	4.3	1.0	18.8	5.5	24
9	5.8	6.6	6.0	4.3	3.9	2.1	3.0	4.0	S	4.6	3.6	4.5	4.1	4.6	4.3	4.5	6.4	6.9	7.5	6.1	3.6	2.6	3.7	3.4	2.1	7.5	4.6	24
10	2.9	1.4	0.8	1.4	1.9	3.3	7.0	S	9.8	C	C	C	C	C	C	C	C	2.7	11.4	8.1	6.9	6.5	4.5	4.1	0.8	11.4	4.8	24
11	5.9	5.3	4.1	4.4	4.8	6.2	S	5.4	5.8	5.4	5.4	3.0	2.3	0.7	5.1	1.3	1.4	0.7	0.9	0.6	1.4	1.9	1.9	1.5	0.6	6.2	3.3	24
12	1.9	4.3	4.7	4.7	5.9	S	6.6	11.0	16.2	14.6	7.1	5.2	2.6	2.1	3.4	4.2	5.9	3.6	4.1	3.7	3.4	3.2	3.2	4.6	1.9	16.2	5.5	24
13	4.5	3.4	3.6	3.7	S	5.1	14.7	14.8	15.9	20.6	21.0	13.5	10.1	8.6	7.1	7.8	9.0	8.9	10.2	12.1	14.6	17.1	15.4	13.7	3.4	21.0	11.1	24
14	12.2	11.3	10.1	S	24.2	13.2	7.1	7.5	7.3	11.2	7.7	7.8	6.5	5.7	6.9	7.6	7.5	7.2	7.0	6.8	6.0	5.9	5.8	4.7	4.7	24.2	8.6	24
15	4.4	5.2	S	5.7	5.6	4.7	3.7	3.4	2.9	2.6	3.2	2.6	2.7	2.9	2.2	3.0	4.0	4.4	3.5	3.4	4.6	4.8	5.2	3.9	2.2	5.7	3.9	24
16	2.9	S	7.4	4.9	9.7	21.7	19.4	23.9	24.2	26.8	23.4	25.3	19.0	18.0	12.7	12.8	14.8	7.6	6.6	5.8	6.2	3.3	2.9	2.9	2.9	26.8	13.1	24
17	S	9.0	6.7	4.7	4.7	7.1	11.9	11.7	27.1	31.9	27.3	14.2	9.3	6.6	5.8	12.8	11.7	21.1	22.3	28.2	26.4	22.9	25.7	S	4.7	31.9	15.9	24
18	25.1	20.8	23.5	18.0	17.3	6.4	17.3	20.0	17.7	15.5	14.8	10.0	7.0	4.9	6.1	9.2	14.4	18.2	21.0	16.1	22.8	18.7	S	21.6	4.9	25.1	15.9	24
19	18.6	16.6	17.7	16.7	14.5	14.7	12.4	16.7	12.4	12.6	20.4	25.1	15.8	9.5	9.9	13.5	12.2	15.7	18.5	17.3	13.2	S	14.7	11.9	9.5	25.1	15.2	24
20	10.3	9.8	11.8	13.4	16.2	15.7	11.6	12.1	13.9	17.0	18.5	11.3	10.4	8.7	10.8	11.6	19.5	23.3	21.0	20.3	S	16.3	15.8	12.5	8.7	23.3	14.4	24
21	11.9	11.1	11.1	11.2	15.4	19.5	19.8	18.4	17.4	18.1	17.5	14.4	13.6	10.1	2.3	2.6	2.7	2.8	2.5	S	2.0	1.4	1.1	1.0	1.0	19.8	9.9	24
22	1.6	1.6	1.4	1.5	1.5	1.4	1.7	0.8	0.8	0.8	0.9	0.8	0.8	1.4	1.6	1.4	1.5	0.9	S	0.9	0.8	0.8	0.9	1.0	0.8	1.7	1.2	24
23	1.1	1.1	1.0	0.7	0.8	1.0	0.9	2.0	2.9	1.5	0.9	1.1	1.0	1.8	3.6	5.0	7.2	S	11.3	7.4	3.7	3.2	2.5	4.2	0.7	11.3	2.9	24
24	4.4	3.4	2.7	3.2	3.5	4.4	3.0	1.9	2.2	2.1	2.3	2.3	2.0	2.7	2.8	2.9	S	4.0	6.1	6.9	7.9	6.2	7.8	8.9	1.9	8.9	4.1	24
25	9.6	10.3	9.6	10.8	12.7	15.6	16.8	17.3	16.9	9.4	7.2	6.3	5.8	6.2	6.7	S	12.0	16.1	15.3	13.0	13.7	13.1	13.5	12.8	5.8	17.3	11.8	24
26	12.3	11.4	11.3	12.0	12.2	11.2	11.7	13.2	14.7	16.1	21.4	17.8	12.0	8.7	S	4.9	4.5	4.5	8.4	7.2	6.2	7.7	6.2	4.6	4.5	21.4	10.4	24
27	4.3	3.7	5.0	5.3	5.2	5.1	5.3	6.1	5.4	5.8	3.9	2.8	2.8	S	3.5	3.3	2.9	3.2	3.8	4.4	5.8	6.0	6.9	5.4	2.8	6.9	4.6	24
28	5.2	4.8	5.9	5.6	5.7	4.4	3.9	3.6	2.9	3.2	2.8	2.6	S	4.5	4.8	5.6	6.8	7.3	7.0	7.8	7.3	7.5	6.6	5.0	2.6	7.8	5.3	24
29	4.6	4.1	3.6	4.0	3.0	3.4	3.8	3.5	3.5	3.6	3.0	S	3.4	4.0	4.2	4.3	5.1	5.9	5.6	6.6	6.6	6.7	7.8	8.5	3.0	8.5	4.7	24
30	7.6	6.1	4.0	3.8	3.2	2.7	3.0	4.2	4.9	3.0	S	1.0	0.7	0.7	0.8	1.2	0.7	0.7	1.5	1.2	0.9	1.3	1.7	1.0	0.7	7.6	2.4	24
31	2.2	1.9	2.2	1.4	1.1	1.1	1.3	1.0	0.9	S	1.0	1.4	2.5	2.4	1.8	2.5	3.2	4.1	4.2	3.9	4.8	4.3	4.6	6.7	0.9	6.7	2.6	24
HOURLY MAX	25.1	22.9	23.8	23.8	25.4	26.3	25.7	23.9	27.1	31.9	27.3	25.3	19.0	18.0	12.7	13.5	19.5	23.3	22.3	28.2	26.4	22.9	25.7	21.6				
HOURLY AVG	7.3	7.4	7.4	7.0	8.1	8.2	8.9	8.9	10.1	10.8	9.2	7.3	5.9	5.2	5.0	5.7	8.0	8.5	9.2	8.7	7.7	7.0	7.0	6.6				

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

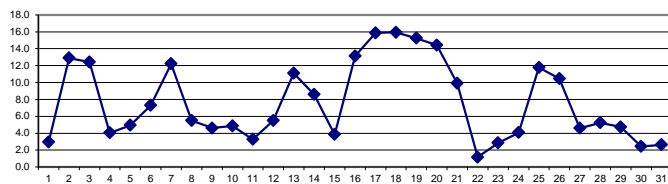
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

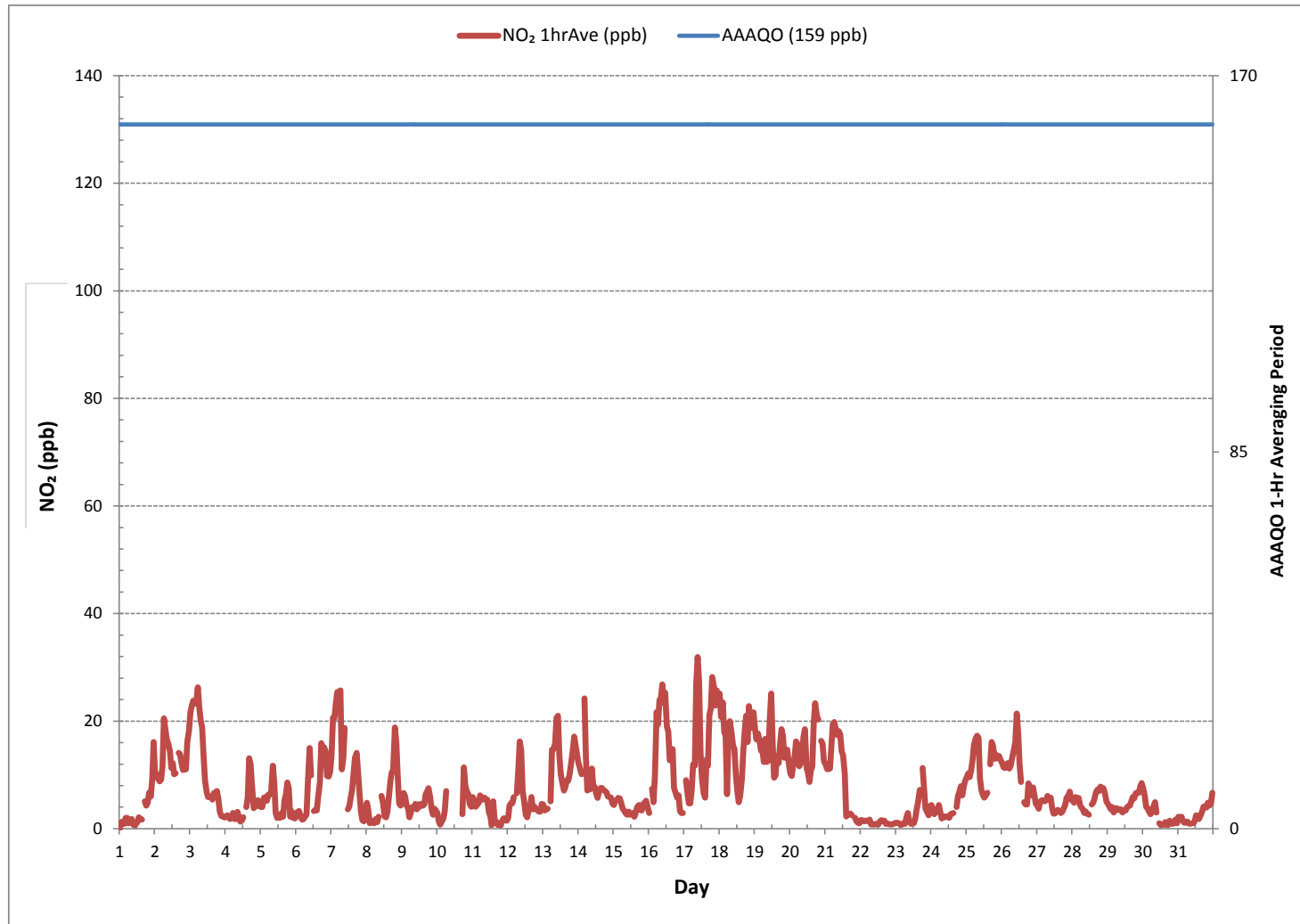
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	704				
MINIMUM 1-HR AVERAGE:	0.6 ppb	@ HOUR(S)	10 , 19	ON DAY(S)	1 , 11
MAXIMUM 1-HR AVERAGE:	31.9 ppb	@ HOUR(S)	9	ON DAY(S)	17
MAXIMUM 24-HR AVERAGE:	15.9 ppb			ON DAY(S)	17, 18
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs		
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	100.0 %		
STANDARD DEVIATION:	6.3	MONTHLY AVERAGE:	7.7 ppb		

24 HR AVERAGES January 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - January 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	2.2	1.9	2.2	1.8	3.4	2.9	1.4	1.4	2.6	1.4	0.9	1.5	1.8	2.3	2.5	2.3	S	9.7	5.6	6.7	8.0	7.7	17.4	13.0	0.9	17.4	4.4	24	
2	13.5	13.0	11.0	11.5	11.6	18.9	24.3	19.7	18.5	18.2	15.9	15.0	14.2	11.2	13.1	S	17.8	21.0	17.3	13.3	13.9	13.6	19.9	23.2	11.0	24.3	16.1	24	
3	24.4	24.9	26.7	25.1	26.0	27.9	24.6	24.0	21.8	16.9	10.8	12.4	8.0	11.0	S	7.7	12.9	7.9	8.1	8.4	4.2	2.9	2.7	3.0	2.7	27.9	14.9	24	
4	2.3	3.4	2.9	2.3	2.5	3.9	3.2	5.5	7.2	8.9	2.0	2.3	3.0	S	4.7	10.6	38.9	22.9	12.9	4.8	5.6	5.2	5.9	5.9	2.0	38.9	7.3	24	
5	4.6	6.8	7.6	7.6	6.4	7.6	7.1	11.6	13.8	11.4	5.0	3.8	S	4.4	15.2	5.0	12.7	14.7	17.4	15.6	3.4	7.1	4.2	2.7	2.7	17.4	8.5	24	
6	3.9	5.4	6.8	3.4	3.9	4.6	5.9	5.9	17.3	18.2	21.4	S	6.8	4.9	6.0	12.0	21.3	24.3	18.5	19.1	18.2	12.0	13.5	3.4	24.3	11.5	24		
7	19.6	27.6	22.6	26.2	27.3	26.9	28.6	25.2	22.5	26.1	S	7.9	6.0	7.6	11.2	13.1	15.6	15.5	13.1	8.5	4.4	2.3	2.0	3.3	2.0	28.6	15.8	24	
8	6.4	5.6	1.5	1.8	2.1	2.0	3.1	3.8	9.8	S	8.7	7.0	3.8	3.3	5.9	8.0	16.2	14.8	18.3	27.1	27.1	13.4	7.1	4.6	1.5	27.1	8.8	24	
9	6.8	7.2	7.2	4.9	5.4	2.7	3.9	4.8	S	7.8	4.2	6.4	6.0	7.6	5.4	7.1	8.8	11.3	9.3	7.9	5.9	3.9	4.9	4.0	2.7	11.3	6.2	24	
10	3.6	1.8	1.2	2.0	2.5	10.8	16.6	S	14.0	C	C	C	C	C	C	C	C	C	4.2	22.2	11.8	8.4	8.9	7.3	5.7	1.2	22.2	8.1	24
11	7.4	8.0	5.1	6.5	6.1	8.2	S	6.8	6.6	6.8	6.0	4.4	2.9	2.3	21.2	17.8	1.8	1.3	1.4	0.9	2.3	2.7	2.6	2.2	0.9	21.2	5.7	24	
12	4.3	5.3	6.1	8.2	8.9	S	9.9	14.2	23.5	25.3	9.3	8.2	3.2	3.3	4.4	8.8	10.7	5.7	15.2	4.8	4.8	4.4	5.3	7.7	3.2	25.3	8.8	24	
13	7.4	7.4	9.4	6.4	S	19.3	22.6	19.3	24.6	26.2	31.8	17.4	12.7	11.6	8.2	8.9	11.2	10.5	11.5	13.6	16.4	17.8	17.8	16.5	6.4	31.8	15.2	24	
14	13.6	16.5	18.0	S	30.2	28.3	8.3	12.1	14.0	17.7	10.2	10.8	10.2	6.6	7.5	15.7	9.7	8.8	7.6	7.6	6.6	7.2	6.4	5.6	5.6	30.2	12.1	24	
15	5.6	5.9	S	7.1	6.6	5.1	4.3	4.5	3.4	3.3	4.2	3.0	3.1	4.2	3.0	4.3	7.1	18.1	5.4	5.0	6.6	6.1	8.3	7.5	3.0	18.1	5.7	24	
16	4.0	S	12.6	10.4	18.8	40.9	28.7	27.3	32.1	30.3	37.7	58.4	26.2	60.1	26.5	23.2	34.2	10.4	10.3	9.2	12.0	3.8	3.9	4.6	3.8	60.1	22.9	24	
17	S	12.7	11.4	10.6	12.1	18.7	24.4	20.4	33.3	37.0	34.6	19.8	11.6	8.3	10.0	25.4	13.9	27.5	27.4	32.6	34.4	26.6	29.8	S	8.3	37.0	21.9	24	
18	29.4	25.0	29.2	24.9	21.4	13.9	23.2	26.6	22.0	43.1	37.8	13.4	10.9	6.1	9.1	15.1	19.1	26.9	26.1	22.7	47.0	26.7	S	24.4	6.1	47.0	23.7	24	
19	22.5	21.8	19.2	19.8	18.8	26.4	15.1	20.1	16.0	19.2	22.6	38.0	25.1	15.6	14.0	33.5	16.2	19.3	19.7	19.8	17.6	S	16.4	15.6	14.0	38.0	20.5	24	
20	13.4	12.4	14.3	16.0	16.9	28.4	15.1	13.8	21.0	21.0	44.7	14.5	17.7	10.4	12.1	13.9	23.9	25.4	22.4	22.2	S	18.1	19.8	15.9	10.4	44.7	18.8	24	
21	16.6	12.4	12.7	12.5	19.0	21.6	21.0	23.7	22.6	20.4	18.2	16.2	15.1	15.1	2.8	3.1	6.3	3.6	3.4	S	2.5	1.7	1.5	1.4	1.4	23.7	11.9	24	
22	2.0	2.0	1.8	1.6	1.8	1.8	2.3	1.1	1.2	1.0	2.1	1.7	1.3	2.3	2.1	1.8	2.1	1.4	S	1.5	1.3	1.1	1.4	3.8	1.0	3.8	1.8	24	
23	3.0	2.2	1.5	1.0	1.3	5.6	1.5	6.2	5.2	3.9	3.1	2.0	1.7	2.6	4.4	6.8	8.8	S	12.3	10.8	5.1	7.0	4.4	5.5	1.0	12.3	4.6	24	
24	5.2	4.3	3.4	4.4	3.9	5.5	4.8	2.2	2.7	3.5	3.2	3.0	2.5	8.4	7.2	3.5	S	7.7	7.0	9.7	11.6	7.1	8.7	10.1	2.2	11.6	5.6	24	
25	10.4	12.0	12.6	12.6	14.8	16.5	18.1	19.3	19.5	12.3	8.9	6.6	8.3	7.0	9.3	S	14.7	19.5	18.3	14.7	17.5	14.3	14.7	14.2	6.6	19.5	13.7	24	
26	13.5	13.4	12.2	13.0	13.1	12.4	13.5	14.8	21.8	19.1	38.0	58.6	18.4	14.2	S	6.3	5.8	7.5	11.6	9.6	7.2	13.8	10.4	6.3	5.8	58.6	15.4	24	
27	5.4	5.1	8.0	6.8	6.4	7.7	6.5	8.3	6.4	7.9	5.6	3.6	5.0	S	4.9	5.5	4.0	10.7	5.4	7.1	6.5	9.8	12.7	7.5	3.6	12.7	6.8	24	
28	7.2	5.9	6.8	6.5	6.5	5.5	4.8	4.2	4.2	3.8	4.6	3.0	S	5.0	7.8	7.4	8.3	8.8	8.8	10.3	9.8	8.5	7.5	7.0	3.0	10.3	6.6	24	
29	9.8	4.7	5.0	5.1	3.6	4.0	4.8	4.9	4.2	5.2	5.4	S	4.0	4.6	5.6	4.8	6.4	10.8	6.1	7.5	8.0	8.2	8.8	9.7	3.6	10.8	6.1	24	
30	9.2	7.1	5.2	4.4	4.2	4.2	3.8	5.9	7.0	4.6	S	1.4	0.9	1.0	1.0	2.1	1.3	1.2	1.8	1.8	1.2	1.8	2.2	2.6	0.9	9.2	3.3	24	
31	2.7	2.6	2.7	2.1	1.4	1.8	1.5	1.7	1.2	S	2.0	1.5	3.0	3.0	2.5	3.9	5.2	5.2	6.0	5.8	6.5	4.7	5.4	8.2	1.2	8.2	3.5	24	
HOURLY MAX	29.4	27.6	29.2	26.2	30.2	40.9	28.7	27.3	33.3	43.1	44.7	58.6	26.2	60.1	26.5	33.5	38.9	27.5	27.4	32.6	47.0	26.7	29.8	24.4					
HOURLY AVG	9.3	9.5	9.6	8.9	10.2	12.8	11.8	12.0	14.0	15.0	14.2	12.2	8.3	8.7	8.1	9.9	12.7	12.6	12.3	11.3	10.8	8.9	9.0	8.5					

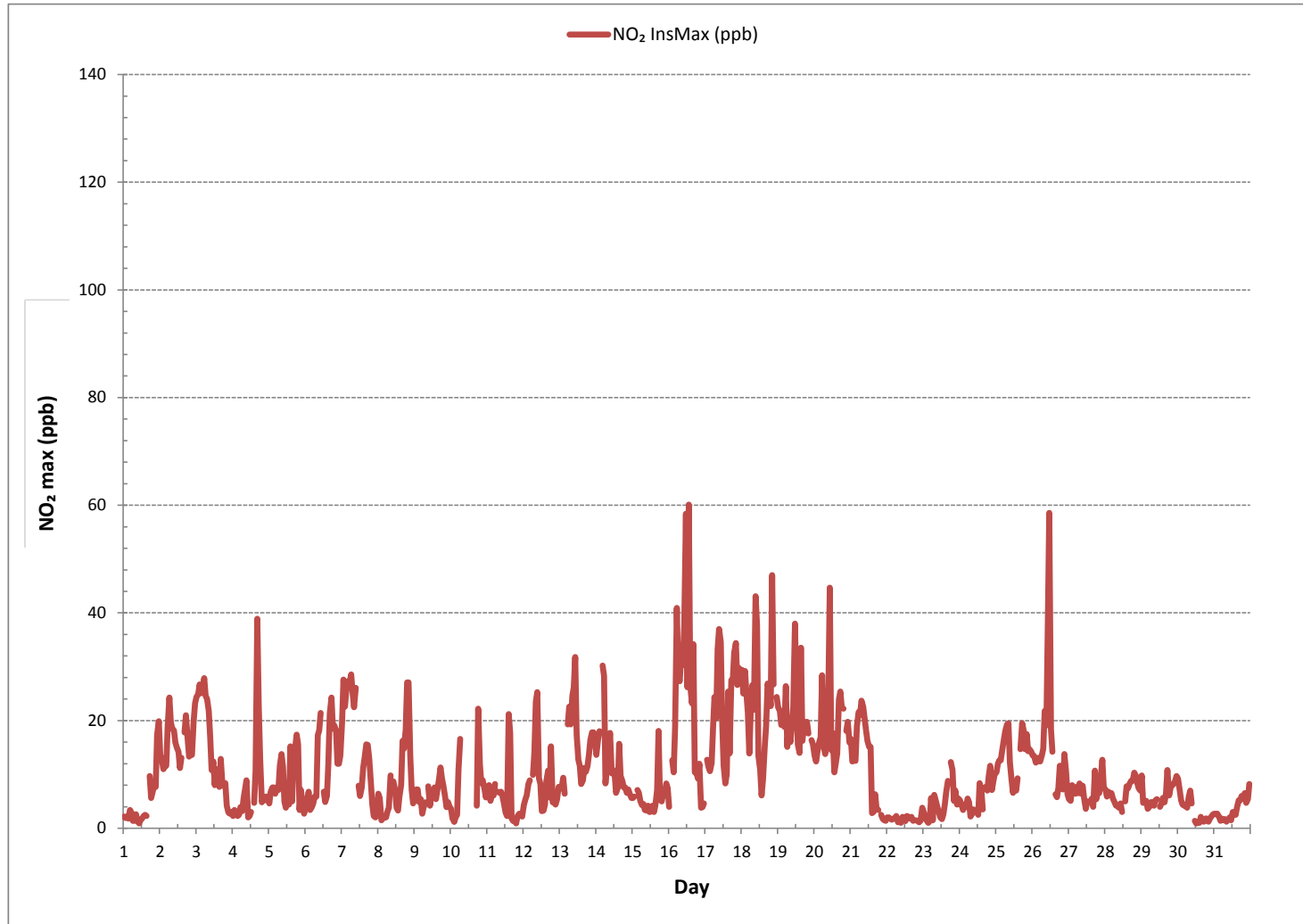
STATUS FLAG CODES

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:	704
MAXIMUM INSTANTANEOUS VALUE:	60.1 ppb @ HOUR(S) 13 ON DAY(S) 16
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	9.0
OPERATIONAL TIME:	744 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

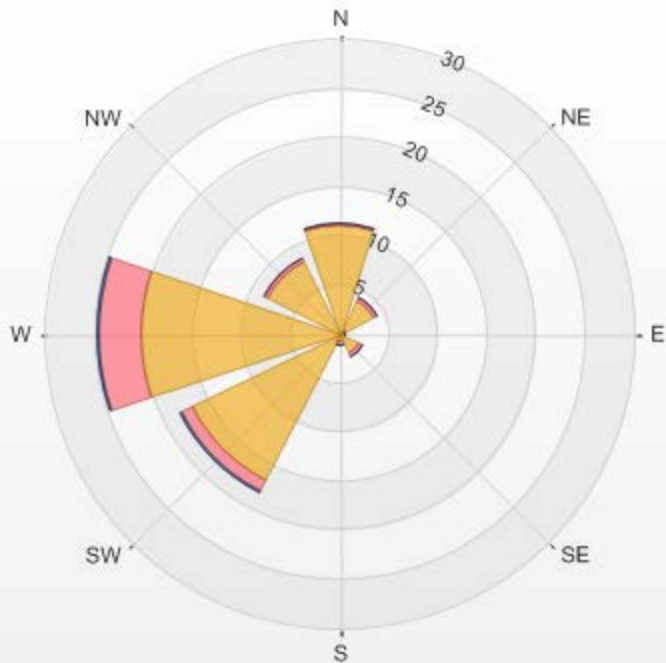


Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 28.41% Valid Data: 94.62% Calm Avg: 13.80 [ppb]

Direction	0.0-10.7	10.7-21.3	21.3-32.0	>32.0	Total
N	11.08	0.14	0	0	11.22
NE	3.84	0.43	0	0	4.27
E	0.14	0.43	0.14	0	0.71
SE	2.27	0.43	0	0	2.7
S	0.85	0.28	0	0	1.13
SW	16.76	1.14	0.28	0	18.18
W	20.31	4.26	0.14	0	24.71
NW	8.24	0.43	0	0	8.67
Summary	63.49	7.54	0.56	0	71.59

% Icon Classes (ppb) 63 0.0-10.7 8 10.7-21.3 1 21.3-32.0 0 >32.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 01/01/2017 00:00 - 31/01/2017 23:00
 Calm: 28.41% Calm Poll Avg: 13.80[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/01 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	35.9	35.9	36.1	36.7	34.9	34.8	35.9	35.6	35.0	36.4	36.1	35.2	34.6	34.2	34.8	35.1	S	31.4	27.8	25.0	21.5	20.6	16.4	14.0	14.0	36.7	31.5	24	
2	13.2	11.6	13.1	12.3	11.9	8.5	1.3	1.7	2.1	4.1	6.1	12.4	13.6	17.7	20.4	S	15.3	13.3	12.4	13.3	11.9	11.8	10.5	8.7	1.3	20.4	10.7	24	
3	6.9	4.1	2.3	1.0	0.7	2.0	5.7	7.9	10.1	15.9	20.5	22.6	22.9	23.5	S	24.6	23.2	23.6	23.9	26.2	28.4	29.5	30.6	32.4	0.7	32.4	16.9	24	
4	33.6	33.8	34.7	35.0	34.3	32.8	33.9	33.5	32.0	32.7	33.3	33.4	33.1	S	31.1	29.8	21.1	18.7	25.4	30.8	30.3	29.6	28.2	28.5	18.7	35.0	30.9	24	
5	29.0	28.5	26.3	25.8	25.6	23.8	22.6	22.2	17.5	19.3	27.1	29.8	S	30.5	30.2	31.9	30.4	25.3	19.2	20.2	31.7	30.6	31.2	31.3	17.5	31.9	26.5	24	
6	31.0	27.7	27.0	30.5	31.0	31.2	30.8	29.5	21.7	15.4	21.3	S	31.3	31.5	31.6	28.4	23.1	14.7	13.7	10.6	10.4	14.9	13.1	12.2	10.4	31.6	23.2	24	
7	7.7	2.5	1.4	0.7	0.5	0.5	0.6	16.4	13.9	10.1	S	26.0	26.5	26.3	24.5	21.7	17.7	16.2	18.8	18.8	23.2	28.0	28.6	27.2	0.5	28.6	15.6	24	
8	23.6	26.3	31.5	31.7	32.9	35.1	32.8	29.6	25.5	S	24.4	27.9	31.0	32.7	31.9	28.7	24.3	20.1	18.2	10.3	13.4	20.0	26.7	25.9	10.3	35.1	26.3	24	
9	23.7	23.8	25.3	27.9	29.2	32.6	30.9	28.9	S	27.0	27.1	26.5	26.8	26.4	26.2	25.6	23.9	22.8	21.8	23.1	25.5	26.2	26.3	27.6	21.8	32.6	26.3	24	
10	31.3	32.9	34.4	33.3	32.7	29.9	24.0	S	17.4	18.3	24.6	30.1	31.0	32.7	31.9	C	C	C	C	C	27.7	28.5	31.2	31.8	17.4	34.4	29.1	24	
11	30.2	28.3	31.0	31.5	30.9	29.5	S	30.9	30.7	32.0	32.7	37.1	39.8	43.8	38.4	38.1	39.2	36.6	35.0	34.6	33.6	33.0	32.9	33.1	28.3	43.8	34.0	24	
12	32.1	29.3	27.1	24.3	21.9	S	19.2	15.2	12.7	16.2	24.8	28.2	31.0	31.0	30.4	30.2	29.2	31.6	31.6	31.6	32.1	32.2	31.9	29.7	12.7	32.2	27.1	24	
13	29.1	30.5	29.9	28.2	S	22.4	13.1	12.0	10.5	7.5	12.6	23.2	27.2	30.5	33.9	34.2	32.7	32.7	30.9	28.2	24.9	21.3	22.6	17.9	7.5	34.2	24.2	24	
14	15.4	13.2	13.5	S	3.7	18.3	29.3	27.4	22.9	19.7	32.2	34.5	37.6	38.6	37.6	37.5	38.0	38.1	38.5	37.7	38.3	38.0	37.0	38.7	3.7	38.7	29.8	24	
15	39.0	37.2	S	35.1	34.5	35.4	37.8	38.9	38.8	40.0	39.8	40.6	40.3	40.1	41.1	40.0	38.2	37.1	37.8	37.8	36.6	37.2	36.4	37.0	34.5	41.1	38.1	24	
16	37.5	S	27.0	21.8	15.9	6.8	4.4	1.3	1.3	2.1	4.2	12.1	13.0	23.6	30.2	27.7	27.6	36.4	36.7	37.6	35.5	40.2	40.5	39.8	1.3	40.5	22.7	24	
17	S	28.9	29.8	29.9	24.2	20.4	13.7	14.5	2.3	3.7	4.8	15.6	30.7	32.9	33.2	23.6	24.3	13.0	7.3	1.5	1.3	0.9	1.1	S	0.9	33.2	16.3	24	
18	2.2	3.1	1.9	4.8	4.0	17.8	7.7	4.0	2.5	2.8	6.9	12.0	18.2	22.0	23.1	20.1	12.7	6.6	1.5	1.6	1.1	0.7	S	1.0	0.7	23.1	7.8	24	
19	0.8	0.6	0.5	0.5	0.4	0.4	0.4	0.7	0.7	1.3	2.2	3.4	6.5	8.7	9.9	9.5	6.3	2.4	0.9	1.2	0.7	S	0.7	0.5	0.4	9.9	2.6	24	
20	0.5	0.5	0.9	0.6	0.6	0.6	0.6	0.7	0.5	1.0	1.9	5.3	15.1	18.6	21.2	19.1	16.1	7.1	1.5	0.6	0.6	S	0.5	0.6	0.5	0.5	21.2	5.0	24
21	0.5	0.5	0.5	0.4	0.5	0.6	0.6	0.6	0.9	2.0	3.6	7.9	11.6	17.6	26.1	25.0	23.7	22.0	23.1	S	24.3	26.6	27.4	26.4	0.4	27.4	11.8	24	
22	26.5	27.6	28.2	27.5	27.1	27.5	27.6	28.9	28.6	28.4	28.3	28.2	28.1	27.7	27.4	27.2	26.6	27.6	S	27.4	27.6	27.9	29.1	29.6	26.5	29.6	27.9	24	
23	29.6	29.4	29.3	29.4	29.2	28.6	28.7	27.9	27.1	27.7	28.5	28.4	27.8	26.7	24.7	23.7	21.1	S	14.9	20.5	25.7	26.1	27.1	25.8	14.9	29.6	26.4	24	
24	25.6	26.1	26.9	26.3	25.5	22.9	25.1	27.2	26.4	27.0	26.5	26.4	26.8	26.3	26.0	25.2	S	23.1	20.8	18.5	16.1	17.5	16.1	14.4	14.4	27.2	23.6	24	
25	12.8	10.4	9.1	7.9	5.8	4.6	3.5	3.1	3.4	9.5	12.0	13.4	15.1	15.2	17.0	S	9.1	2.8	2.1	2.3	0.7	1.2	0.7	0.7	0.7	17.0	7.1	24	
26	1.1	1.1	0.9	0.9	0.9	0.7	0.4	0.5	1.0	3.0	11.9	19.1	22.3	26.8	S	35.2	34.5	34.0	28.6	29.2	27.6	24.1	26.0	27.6	0.4	35.2	15.5	24	
27	31.4	33.7	34.0	33.7	34.3	33.9	33.0	32.4	33.4	33.6	35.8	37.6	38.9	S	38.6	38.5	38.4	39.0	39.1	38.3	34.3	31.0	25.3	29.6	25.3	39.1	34.7	24	
28	31.3	35.8	34.5	33.7	32.8	32.6	34.3	35.1	37.0	37.4	38.1	38.7	S	36.6	35.8	34.8	32.8	31.4	29.6	23.7	24.8	27.5	29.8	32.4	23.7	38.7	33.1	24	
29	33.7	34.6	36.8	35.9	36.1	35.0	34.9	36.3	36.3	36.4	38.0	S	37.9	38.7	39.6	39.6	37.9	36.5	35.3	33.4	32.6	31.3	30.9	29.0	29.0	39.6	35.5	24	
30	29.7	30.8	32.9	33.0	33.5	33.5	33.2	32.3	32.5	34.7	S	39.6	41.5	41.6	41.9	41.7	42.2	43.0	41.7	42.5	42.5	37.7	35.1	35.3	29.7	43.0	37.1	24	
31	30.9	31.2	30.9	31.3	31.3	31.8	31.6	32.3	33.4	S	36.1	35.7	35.4	34.8	36.1	36.6	34.9	33.6	33.5	33.5	31.3	31.0	30.3	28.3	28.3	36.6	32.9	24	
HOURLY MAX	39.0	37.2	36.8	36.7	36.1	35.4	37.8	38.9	38.8	40.0	39.8	40.6	41.5	43.8	41.9	41.7	42.2	43.0	41.7	42.5	42.5	40.2	40.5	39.8					
HOURLY AVG	22.5	22.0	21.9	22.4	20.9	21.2	19.9	20.2	18.6	18.8	22.2	25.5	27.6	29.0	30.1	29.7	26.3	24.7	23.1	22.8	23.9	24.2	24.1	23.9					

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

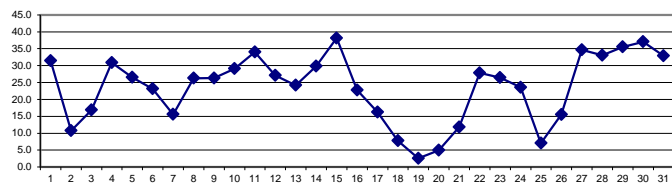
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

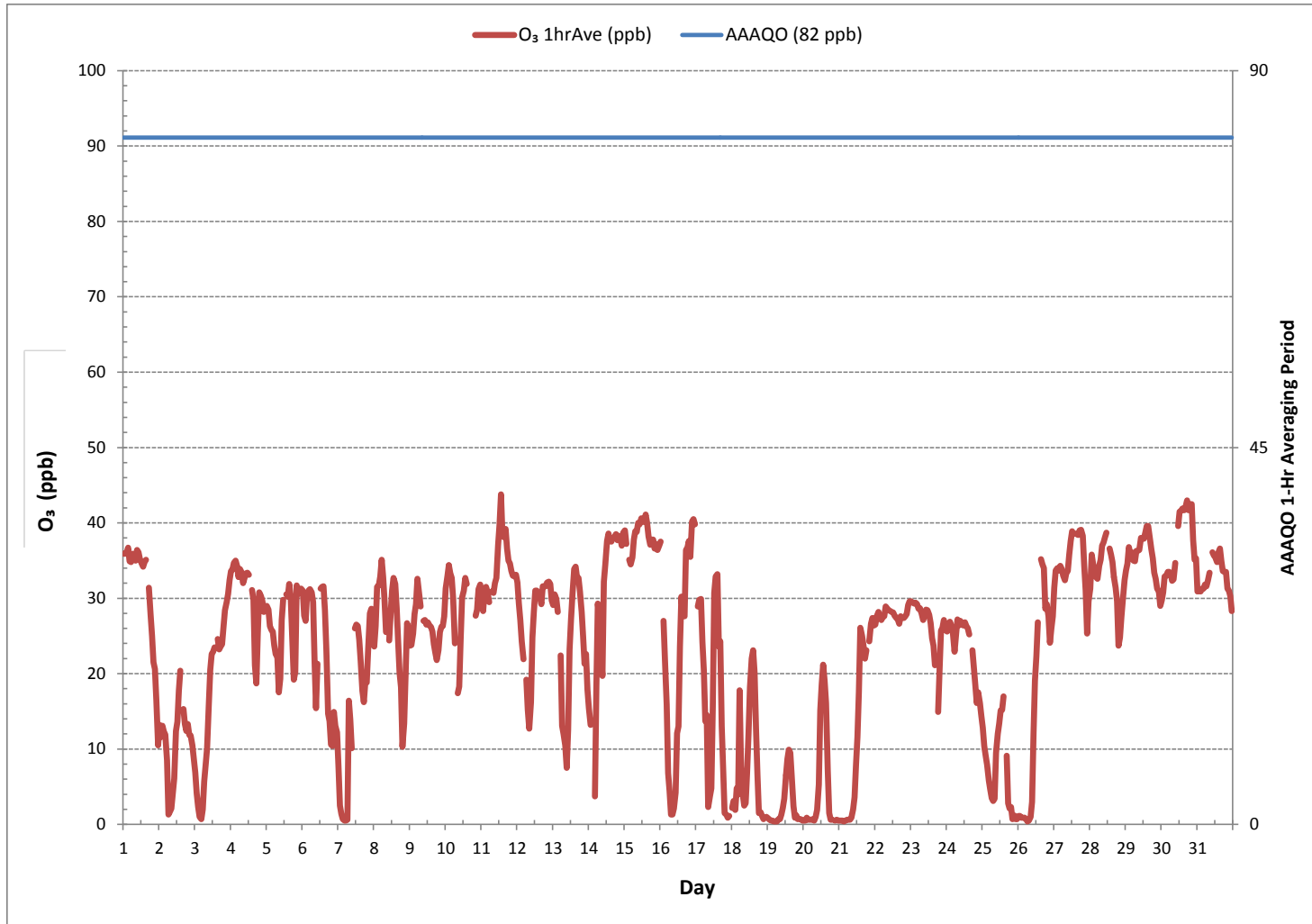
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	707				
MINIMUM 1-HR AVERAGE:	0.4	ppb	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	43.8	ppb	@ HOUR(S)	13	11
MAXIMUM 24-HR AVERAGE:	38.1	ppb			15
					VAR-VARIOUS
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	12.2		MONTHLY AVERAGE:	23.5	ppb

24 HR AVERAGES January 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - January 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	36.5	36.7	37.3	37.3	35.7	35.7	36.2	36.1	36.2	36.8	36.5	36.1	35.3	35.1	35.7	35.6	S	33.5	30.8	27.2	24.3	22.4	20.8	18.2	18.2	37.3	32.9	24	
2	15.8	15.2	19.2	15.3	14.6	12.8	2.3	3.8	3.1	5.4	7.9	16.5	16.2	20.1	25.2	S	17.8	18.7	14.9	16.5	14.0	13.8	11.3	11.0	2.3	25.2	13.5	24	
3	10.7	6.2	3.1	1.7	1.0	4.2	8.5	10.0	13.2	19.8	21.9	23.1	23.6	24.9	S	25.6	24.1	24.7	24.7	28.5	29.1	29.9	31.5	33.5	1.0	33.5	18.4	24	
4	33.9	34.2	35.6	35.4	34.8	33.6	34.5	34.2	33.0	33.6	33.8	33.8	33.5	S	31.6	31.5	26.2	23.6	31.0	32.0	32.0	30.7	29.1	29.2	23.6	35.6	32.2	24	
5	29.5	29.5	27.7	27.3	26.5	25.2	23.5	24.0	19.3	25.6	29.4	30.7	S	31.2	31.7	33.6	34.4	31.0	21.4	30.2	32.9	31.9	32.0	32.2	19.3	34.4	28.7	24	
6	32.4	30.8	30.5	31.5	32.4	32.6	31.9	32.0	25.9	19.6	30.7	S	32.3	32.6	32.6	30.4	28.0	20.5	22.3	13.7	15.0	18.3	15.5	16.7	13.7	32.6	26.4	24	
7	15.2	9.3	2.4	3.0	0.8	0.6	4.8	22.7	21.4	14.4	S	26.7	27.9	27.7	26.1	23.3	20.5	17.2	21.2	20.5	25.5	29.1	29.1	28.3	0.6	29.1	18.2	24	
8	25.9	31.2	32.6	32.7	35.0	35.6	34.1	32.3	29.4	S	27.1	30.2	32.6	34.4	33.9	30.1	27.4	22.9	20.9	16.7	20.9	24.4	27.6	26.7	16.7	35.6	28.9	24	
9	25.2	24.6	28.0	28.3	32.6	33.0	31.9	29.7	S	28.2	27.6	26.9	27.4	26.9	26.5	26.5	25.9	24.3	22.9	24.7	26.3	26.6	28.2	28.9	22.9	33.0	27.4	24	
10	32.9	34.5	34.7	34.7	33.2	32.6	28.9	S	18.9	21.2	28.8	32.0	32.4	33.3	32.9	C	C	C	C	C	C	C	30.6	31.3	31.9	18.9	34.7	30.9	24
11	31.1	29.5	32.0	32.2	31.4	29.3	S	31.0	30.8	32.4	33.6	38.7	40.7	44.2	44.1	42.5	43.8	37.1	34.7	34.4	33.9	33.5	33.0	32.9	29.3	44.2	35.1	24	
12	32.7	29.8	28.4	25.9	24.1	S	20.2	19.5	17.1	24.1	26.0	30.2	31.3	30.8	30.7	30.6	30.2	31.7	31.7	31.7	31.9	32.0	31.7	30.8	17.1	32.7	28.4	24	
13	30.3	32.1	31.6	29.9	S	25.7	20.3	14.2	14.2	12.1	19.5	26.4	28.6	32.7	34.1	34.4	33.9	33.3	31.3	29.5	25.9	22.0	23.0	21.5	12.1	34.4	26.4	24	
14	17.5	15.5	19.8	S	8.4	28.0	29.7	29.7	26.2	25.6	33.5	34.7	38.9	39.0	37.7	37.5	37.6	38.0	38.2	38.2	38.0	38.1	37.0	39.4	8.4	39.4	31.6	24	
15	39.4	37.0	S	35.6	34.8	35.6	38.0	39.6	39.6	39.8	39.6	40.5	40.2	40.0	41.0	41.0	39.0	38.0	37.9	37.9	37.3	38.0	37.8	38.1	34.8	41.0	38.5	24	
16	37.8	S	32.0	27.6	22.7	13.8	10.9	3.0	2.0	2.1	5.5	26.7	22.7	33.3	32.9	33.5	36.5	37.4	38.0	38.4	39.6	40.3	40.6	40.2	2.0	40.6	26.8	24	
17	S	33.0	37.3	34.1	29.5	27.0	19.5	22.0	3.9	5.4	6.3	25.6	35.6	33.8	35.7	31.6	25.5	20.3	11.5	2.0	0.8	0.5	0.6	S	0.5	37.3	20.1	24	
18	4.2	7.2	4.5	11.9	7.9	19.8	13.7	5.7	5.2	3.3	11.8	14.3	22.1	22.6	23.3	21.4	19.9	11.3	6.3	3.6	2.0	0.3	S	0.5	0.3	23.3	10.6	24	
19	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.4	1.3	2.0	5.1	12.1	11.6	12.5	11.8	9.3	3.8	0.5	0.8	0.4	S	0.2	0.0	0.0	12.5	3.2	24	
20	0.0	0.0	0.5	0.3	0.0	0.2	7.2	0.0	1.4	2.1	11.6	17.9	20.3	24.0	21.7	16.8	12.8	3.9	0.0	0.1	S	0.0	0.2	0.0	0.0	24.0	6.1	24	
21	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.6	1.7	4.4	10.5	12.6	26.9	26.5	26.6	24.3	22.1	24.1	S	24.1	28.0	27.9	26.5	0.0	28.0	12.5	24	
22	26.2	27.9	28.0	27.0	27.1	27.6	28.0	28.3	28.2	28.3	28.0	27.9	27.9	27.4	27.4	27.0	26.4	27.7	S	27.1	27.3	27.7	29.1	29.4	26.2	29.4	27.7	24	
23	29.5	29.4	29.1	29.1	28.8	28.5	28.5	28.5	27.9	28.0	28.5	28.3	27.7	28.0	25.6	24.0	22.4	S	15.2	24.9	26.4	28.6	28.6	26.1	15.2	29.5	27.0	24	
24	25.5	26.5	26.9	26.5	25.6	24.7	26.8	27.0	26.4	26.9	26.8	26.4	26.8	26.8	26.4	25.6	S	24.1	21.5	19.5	18.3	18.2	16.5	14.6	14.6	27.0	24.1	24	
25	13.2	11.5	9.3	8.4	6.7	4.8	3.9	3.0	6.9	10.6	12.2	13.4	15.2	15.3	17.7	S	12.3	5.1	3.9	3.3	1.9	1.5	0.6	1.6	0.6	17.7	7.9	24	
26	1.2	0.6	0.4	0.4	0.5	0.3	0.0	0.0	1.7	3.9	19.0	21.4	23.6	28.6	S	35.6	34.7	34.7	30.4	30.2	28.2	27.6	28.3	29.4	0.0	35.6	16.6	24	
27	32.9	34.1	34.4	33.6	34.5	34.2	33.3	33.2	33.6	34.1	36.4	38.2	39.6	S	38.7	38.7	38.4	39.0	41.2	39.6	36.5	33.3	31.1	32.0	31.1	41.2	35.7	24	
28	34.5	35.9	35.6	33.8	33.0	33.3	34.7	35.1	36.9	37.3	38.3	38.3	S	36.7	35.7	35.4	33.0	31.3	31.0	27.6	29.2	28.8	30.4	32.9	27.6	38.3	33.9	24	
29	33.9	35.0	37.0	36.1	36.6	35.4	35.6	36.2	37.1	36.7	38.3	S	38.2	39.1	39.6	39.9	38.7	37.3	35.4	34.2	33.3	32.0	31.3	28.8	28.8	39.9	35.9	24	
30	29.9	31.5	33.3	33.2	33.3	33.5	33.0	33.0	34.7	34.8	S	41.7	41.9	41.7	41.7	41.8	42.1	42.9	41.8	42.5	42.5	41.7	35.4	35.9	29.9	42.9	37.6	24	
31	30.8	31.9	30.8	31.3	31.2	31.5	31.5	32.2	34.2	S	36.4	35.5	35.6	35.7	36.4	37.0	35.3	34.1	33.8	33.6	32.9	31.3	30.2	29.4	29.4	37.0	33.2	24	
HOURLY MAX	39.4	37.0	37.3	37.3	36.6	35.7	38.0	39.6	39.6	39.8	39.6	41.7	41.9	44.2	44.1	42.5	43.8	42.9	41.8	42.5	42.5	41.7	40.6	40.2					
HOURLY AVG	23.6	23.4	23.4	23.5	22.1	22.6	21.7	21.5	20.3	20.5	24.2	27.5	29.1	30.5	31.2	31.0	28.6	26.5	24.8	24.5	25.2	25.4	25.0	24.9					

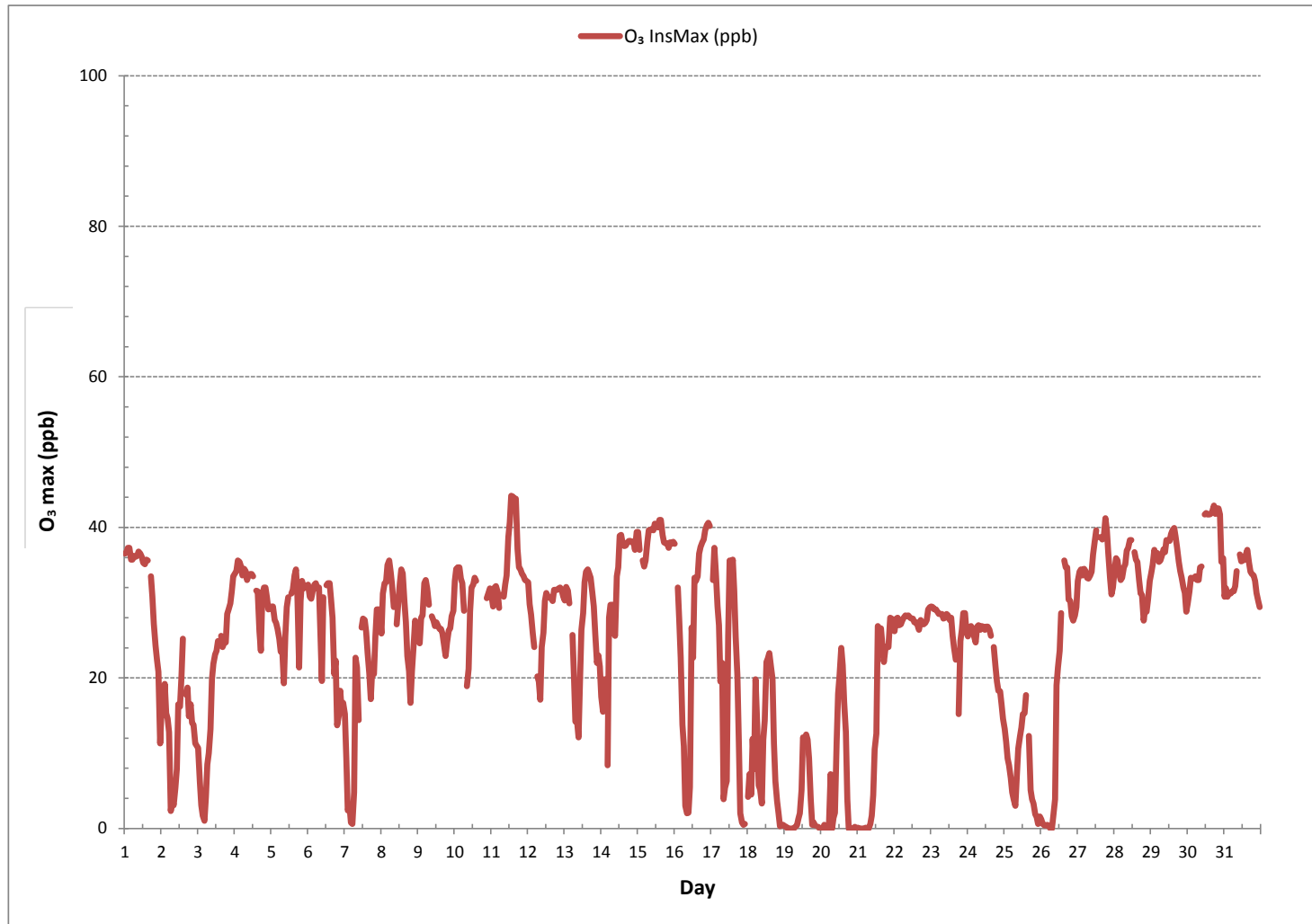
STATUS FLAG CODES

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:	685
MAXIMUM INSTANTANEOUS VALUE:	44.2 ppb @ HOUR(S) 13 ON DAY(S) 11
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	11.9

OZONE Instantaneous Maximum (O₃ ppb)

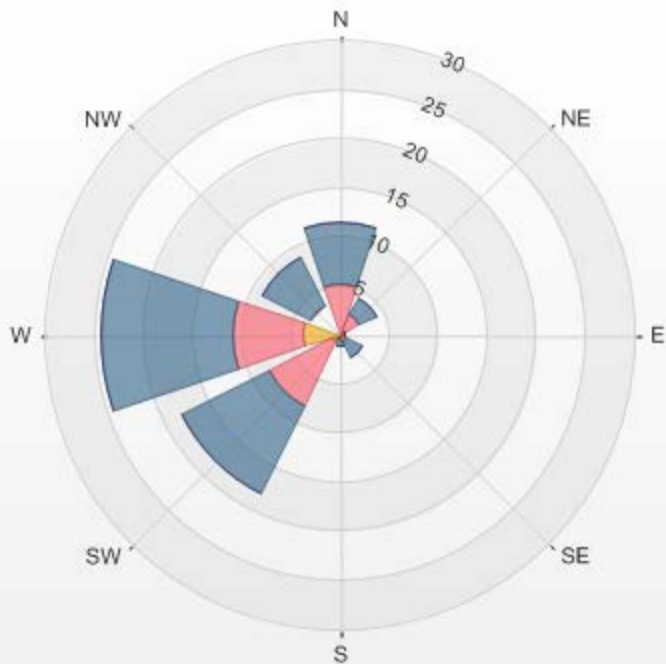


Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 28.43% Valid Data: 95.03% Calm Avg: 10.76 [ppb]

Direction	0.0-14.6	14.6-29.3	29.3-43.9	>43.9	Total
N	0	5.23	6.36	0	11.59
NE	0.57	1.7	1.98	0	4.25
E	0.57	0.14	0	0	0.71
SE	0.28	0.57	1.84	0	2.69
S	0.14	0.28	0.71	0	1.13
SW	0.85	7.21	10.04	0	18.1
W	3.68	7.21	13.44	0	24.33
NW	0.14	3.25	5.37	0	8.76
Summary	6.23	25.59	39.74	0	71.56

% Icon	Classes (ppb)	6	0.0-14.6	26	14.6-29.3	40	29.3-43.9	0	>43.9

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-03[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 28.43% Calm Poll Avg: 10.76[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 2017/01 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	0.0	0.0	1.4	0.0	0.0	0.5	0.0	1.9	1.9	0.0	1.0	2.5	0.0	1.0	0.0	1.9	7.0	0.5	2.9	0.0	0.0	1.4	2.5	4.0	0.0	7.0	1.3	24
2	4.0	1.9	2.5	4.4	0.0	4.4	7.0	0.5	8.4	3.4	6.4	2.9	4.4	1.9	5.0	5.5	5.5	2.9	0.5	1.4	2.5	4.0	1.0	2.9	0.0	8.4	3.5	24
3	8.4	4.0	7.5	12.0	5.0	7.0	8.4	1.4	4.4	6.5	1.0	0.0	4.0	5.0	10.5	16.0	19.5	22.0	17.0	9.0	2.9	2.5	1.9	1.0	0.0	22.0	7.4	24
4	0.0	X	2.5	1.4	0.0	0.0	0.0	0.5	0.0	0.5	0.4	0.0	1.0	1.0	0.0	1.9	3.4	2.5	X	0.0	0.0	2.9	2.9	0.0	3.4	1.0	22	
5	0.0	1.4	0.5	0.0	0.0	X	0.0	0.0	0.5	0.0	X	0.0	X	X	0.0	0.0	3.4	9.4	4.0	0.0	0.0	0.0	0.4	0.0	9.4	1.0	20	
6	0.0	4.4	2.9	0.0	1.9	1.0	2.9	1.9	0.0	0.5	1.0	1.9	0.0	4.0	0.0	0.5	2.9	2.9	3.4	4.0	6.0	3.4	4.0	6.5	0.0	6.5	2.3	24
7	5.5	5.5	2.5	7.5	6.5	8.4	5.5	0.5	1.4	5.0	4.0	0.0	0.0	2.5	4.0	0.5	1.9	5.5	7.0	1.4	0.0	0.0	0.0	1.0	0.0	8.4	3.2	24
8	3.4	0.0	1.0	0.0	0.4	3.4	2.5	1.9	4.0	5.9	0.0	0.0	4.0	X	1.4	7.9	4.0	5.5	0.0	5.0	9.9	2.9	0.0	1.9	0.0	9.9	2.8	23
9	0.0	0.0	0.0	1.4	0.0	X	X	0.0	0.0	1.4	0.0	2.9	4.4	0.0	1.9	4.4	5.5	1.4	2.5	1.9	0.4	0.0	X	2.9	0.0	5.5	1.5	21
10	0.0	0.0	4.0	0.5	0.0	0.0	X	0.0	3.4	0.0	1.0	1.4	0.0	0.0	0.5	1.9	1.9	C	C	2.9	1.0	1.4	0.0	0.0	0.0	4.0	0.9	23
11	0.0	0.0	1.4	1.9	3.9	4.4	8.4	4.0	1.9	0.0	0.0	X	X	X	0.0	0.0	X	5.5	9.4	1.4	4.4	1.4	5.5	3.4	0.0	9.4	2.8	20
12	1.0	4.9	0.0	0.0	6.9	12.4	5.9	4.4	5.4	5.4	2.4	4.9	5.4	5.4	9.4	0.0	4.9	2.4	0.0	6.9	2.9	0.0	4.9	0.0	0.0	12.4	4.0	24
13	0.0	6.4	0.0	2.4	0.0	1.9	2.4	0.4	3.9	0.4	12.5	16.5	10.5	X	2.5	4.4	0.0	0.0	0.0	1.0	6.5	7.0	5.9	7.0	0.0	16.5	4.0	23
14	7.9	7.5	6.5	7.0	6.5	2.9	0.0	X	0.5	0.0	X	X	X	7.9	X	X	X	X	1.9	X	X	0.0	0.4	X	0.0	7.9	3.8	13
15	X	X	X	X	0.0	1.4	0.0	X	X	0.0	X	X	0.0	X	0.0	Y	0.0	1.0	0.0	3.4	1.9	7.5	2.9	3.4	0.0	7.5	1.5	14
16	2.9	0.0	5.0	X	9.0	0.0	5.0	16.0	14.4	19.0	14.9	5.5	4.4	7.0	1.0	5.0	2.9	1.9	0.0	7.9	6.5	7.0	1.0	7.5	0.0	19.0	6.3	23
17	6.0	9.0	7.5	5.5	6.0	5.0	11.5	9.9	8.4	19.0	19.0	5.5	17.0	0.0	0.0	4.4	3.4	3.4	5.0	7.9	11.5	10.9	5.5	9.0	0.0	19.0	7.9	24
18	9.4	7.0	1.9	0.5	5.9	2.9	0.0	4.0	7.0	4.0	0.0	1.9	9.0	2.9	5.0	4.4	4.4	9.0	1.4	7.5	10.5	9.0	9.4	13.5	0.0	13.5	5.4	24
19	12.5	22.0	11.5	5.5	7.5	8.4	7.0	10.9	11.4	12.5	13.9	14.5	11.5	7.0	11.5	9.9	13.0	15.0	13.0	15.5	13.9	7.0	7.5	9.9	5.5	22.0	11.3	24
20	8.4	11.5	10.9	12.0	8.4	8.4	11.5	9.0	7.9	14.4	13.5	13.5	12.5	15.5	13.9	17.5	17.5	17.0	23.5	17.0	16.5	15.5	16.5	14.9	7.9	23.5	13.6	24
21	18.5	13.9	18.0	18.0	18.0	16.0	13.9	15.0	18.0	18.0	21.0	18.0	17.0	13.9	1.4	0.0	0.0	0.0	7.5	4.4	0.0	1.4	5.0	2.5	0.0	21.0	10.8	24
22	0.0	0.0	4.4	1.9	2.9	2.5	1.4	4.0	1.9	1.4	1.9	0.0	1.0	0.9	1.4	0.4	0.0	0.0	0.0	0.9	0.0	0.5	0.0	0.0	0.0	4.4	1.1	24
23	0.0	0.4	1.2	0.0	0.0	0.3	1.9	2.5	1.3	0.0	0.0	0.0	X	0.0	0.0	0.6	2.3	0.1	0.0	1.3	0.5	0.0	2.5	0.0	2.5	0.6	23	
24	0.8	0.0	1.7	0.0	1.0	1.2	0.0	0.0	0.0	0.5	0.0	1.0	1.9	0.0	1.4	1.6	1.7	4.8	2.9	4.7	0.0	0.5	2.4	2.7	0.0	4.8	1.3	24
25	3.2	4.6	4.5	7.5	11.0	18.6	15.2	14.7	16.7	14.7	12.5	14.2	15.2	20.5	13.7	13.9	12.8	18.7	13.7	15.0	12.9	14.8	15.8	10.8	3.2	20.5	13.1	24
26	10.8	10.7	9.9	14.8	13.0	12.7	12.0	13.0	12.0	C	C	C	9.0	16.0	9.4	15.5	5.0	2.9	3.4	3.4	6.0	5.0	4.4	4.0	2.9	16.0	9.2	24
27	6.5	0.0	7.5	4.4	5.5	5.5	7.5	4.4	2.9	2.9	6.0	4.4	6.0	2.9	6.5	0.4	5.0	2.9	5.5	4.4	4.4	4.4	5.5	2.5	0.0	7.5	4.5	24
28	3.4	5.0	4.4	4.4	1.9	0.0	1.9	0.5	1.9	0.0	4.0	0.0	4.0	3.4	4.4	2.9	6.5	4.0	4.4	4.0	4.4	2.5	7.5	5.0	0.0	7.5	3.4	24
29	1.0	4.4	2.9	2.9	2.5	1.4	0.5	0.0	2.9	2.9	2.5	3.4	7.0	4.0	3.4	5.5	7.0	4.0	5.0	2.9	2.9	5.5	4.0	1.9	0.0	7.0	3.4	24
30	2.5	0.0	1.9	0.0	1.9	1.0	0.0	0.0	1.4	1.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.5	0.0	0.0	0.0	0.0	2.9	X	0.0	2.9	0.6	23
31	X	0.0	0.0	2.9	1.0	0.5	1.0	1.0	0.0	2.9	0.0	0.0	1.0	0.5	0.0	2.9	1.9	1.9	X	0.0	0.0	1.0	0.0	0.5	0.0	2.9	0.9	22
HOURLY MAX	18.5	22.0	18.0	18.0	18.0	18.6	15.2	16.0	18.0	19.0	21.0	18.0	17.0	20.5	13.9	17.5	19.5	22.0	23.5	17.0	16.5	15.5	16.5	14.9				
HOURLY AVG	4.0	4.3	4.2	4.1	4.1	4.4	4.8	4.2	4.8	4.7	5.0	4.4	5.3	4.7	3.8	4.6	4.7	5.1	4.6	4.9	4.2	3.9	3.9	4.2				

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

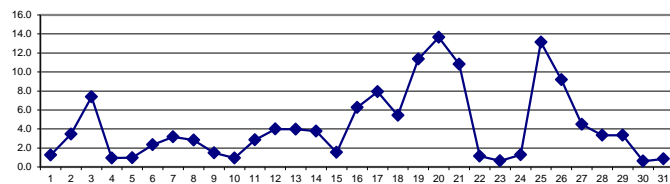
OBJECTIVE LIMIT:

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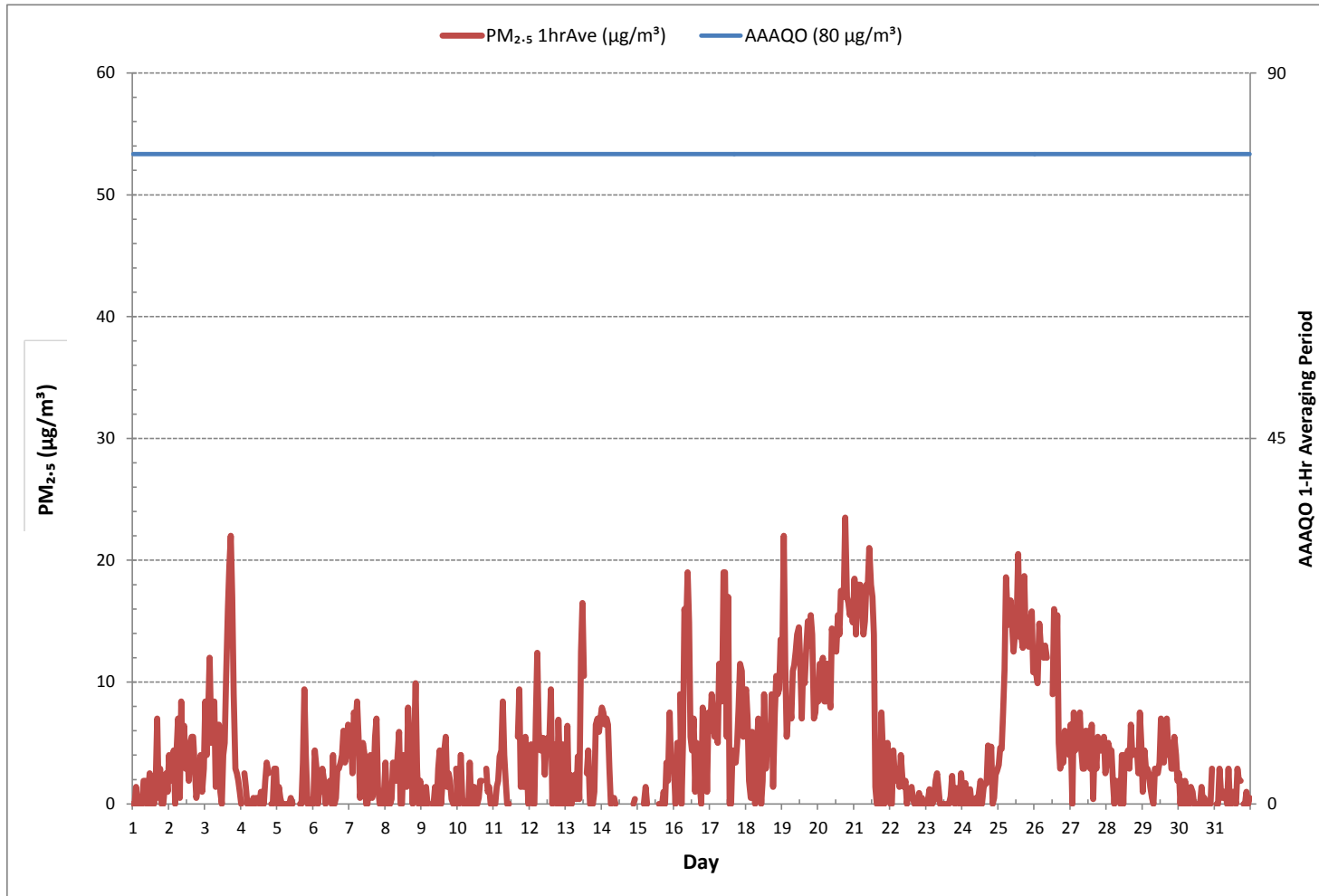
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	532					
MINIMUM 1-HR AVERAGE	0.0	µg/m ³	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	23.5	µg/m ³	@ HOUR(S)	18	ON DAY(S)	20
MAXIMUM 24-HR AVERAGE:	13.6	µg/m ³			ON DAY(S)	20
					VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	5	hrs	OPERATIONAL TIME:	702 hrs		
STANDARD DEVIATION:	5.0		AMD OPERATION UPTIME:	94.4 %		
			MONTHLY AVERAGE:	4.4 µg/m ³		

24 HR AVERAGES January 2017



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

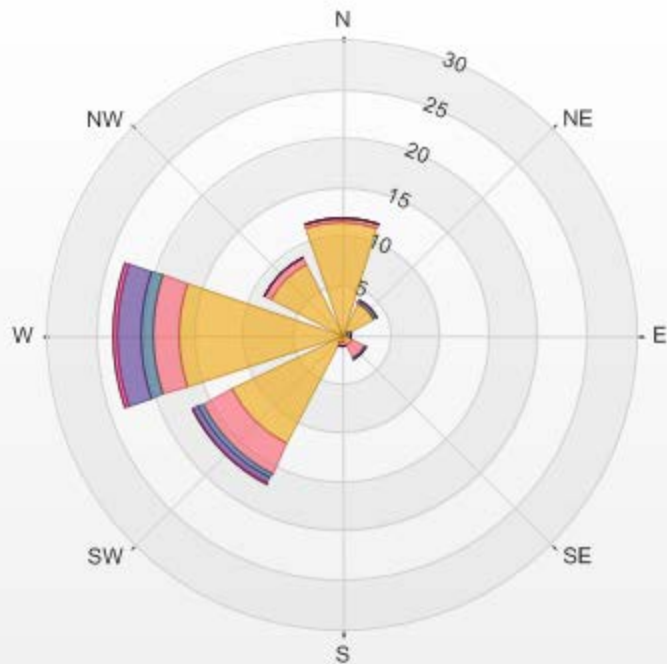


Wind: LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM25[ug/m3(L)] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 29.70% Valid Data: 93.68% Calm Avg: 7.29 [ug/m3]

Direction	0.0-4.7	4.7-9.4	9.4-14.0	14.0-18.7	18.7-23.4	>23.4	Total
N	11.48	0.43	0	0	0	0	11.91
NE	3.59	0.14	0.29	0	0	0	4.02
E	0.14	0.57	0.29	0	0	0	1
SE	1.29	1.43	0.14	0	0	0	2.86
S	0.86	0.29	0	0	0	0	1.15
SW	12.48	3.3	0.57	0.57	0.14	0	17.06
W	16.64	2.58	1.29	2.44	0.43	0	23.38
NW	8.03	0.72	0.14	0	0	0	8.89
Summary	54.51	9.46	2.72	3.01	0.57	0	70.27

% Icon	Classes (ug/m3(L))	55	 0.0-4.7	9	 4.7-9.4	3	 9.4-14.0	3	 14.0-18.7	1	 18.7-23.4	0	 >23.4
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM25[ug/m3(L)] 01/01/2017 00:00 - 31/01/2017 23:00
Calm: 29.70% Calm Poll Avg: 7.29[ug/m3(L)]



WIND SPEED



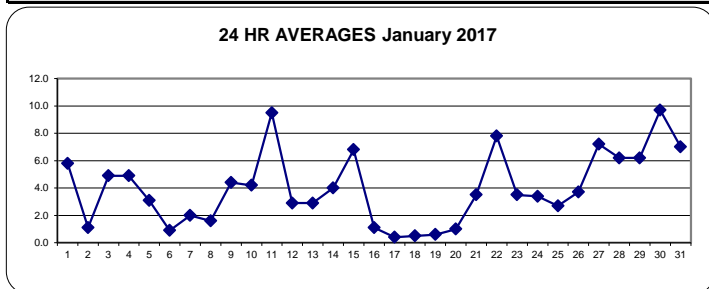
WIND SPEED Hourly Averages (WS kph)

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	9.6	9.5	9.2	8.6	8.7	9.3	8.6	9.5	9.3	8.9	8.5	10.9	10.7	9.9	8.8	8.5	7.3	4.0	1.4	1.1	0.3	0.7	0.5	0.1	0.1	10.9	5.8	24
2	0.3	0.7	0.9	0.3	0.3	0.7	0.2	1.5	0.2	0.8	1.4	3.6	3.0	1.9	1.7	1.7	1.8	1.8	0.2	0.4	0.6	1.6	3.0	1.5	0.2	3.6	1.1	24
3	1.6	0.8	0.4	0.2	1.6	3.8	4.5	3.6	3.0	4.1	5.2	6.5	7.5	8.1	8.0	6.4	6.4	7.5	8.6	7.7	7.7	10.0	9.4	8.5	0.2	10.0	4.9	24
4	10.0	8.4	12.4	11.2	8.7	6.8	10.0	10.1	8.5	7.7	5.6	5.6	7.7	6.8	5.2	3.7	0.6	1.9	4.1	4.4	4.4	4.8	5.0	2.9	0.6	12.4	4.9	24
5	4.0	2.0	3.4	3.9	1.6	1.4	1.3	2.3	3.1	5.4	10.5	10.4	8.1	7.8	6.6	6.5	3.0	1.4	0.3	1.9	7.5	4.7	5.2	5.0	0.3	10.5	3.1	24
6	3.6	1.2	1.9	3.2	2.7	2.5	1.6	2.2	1.3	0.4	1.9	4.0	5.0	2.1	4.1	2.3	0.2	1.2	1.1	0.4	1.1	0.4	0.4	0.4	0.2	5.0	0.9	24
7	1.0	0.4	0.5	0.4	0.8	1.0	1.0	3.1	1.5	2.8	3.8	3.1	5.5	5.8	5.1	4.7	5.1	5.7	5.6	9.1	8.5	9.4	7.1	4.1	0.4	9.4	2.0	24
8	3.3	5.0	5.8	5.3	5.2	7.8	1.9	0.7	0.2	0.8	1.6	3.0	4.3	4.5	4.8	1.5	0.9	0.2	0.3	0.3	0.3	0.7	2.4	1.3	0.2	7.8	1.6	24
9	2.0	3.7	4.6	3.9	4.4	6.8	5.1	5.1	4.7	5.7	4.6	6.3	5.0	6.7	7.3	5.0	3.8	4.1	4.7	5.6	4.7	4.4	5.1	4.4	2.0	7.3	4.4	24
10	9.1	8.7	8.1	5.3	5.5	2.3	1.6	0.2	0.6	1.6	3.8	4.7	3.7	8.1	9.6	8.0	6.8	6.2	3.5	6.2	4.9	6.5	7.3	6.1	0.2	9.6	4.2	24
11	4.4	1.8	5.1	3.0	7.6	6.9	8.8	8.9	9.9	12.8	11.0	10.2	11.2	19.2	25.3	24.2	24.8	21.4	20.6	16.5	13.8	12.4	12.9	8.1	1.8	25.3	9.5	24
12	5.2	3.5	1.8	1.6	0.9	0.2	0.5	1.0	0.1	0.9	4.7	5.0	8.0	6.2	7.0	5.0	4.4	8.4	6.6	7.5	6.0	6.6	4.2	1.3	0.1	8.4	2.9	24
13	1.5	1.4	1.6	1.1	0.4	0.7	0.1	0.1	0.9	0.9	2.6	3.7	2.3	3.2	5.0	5.9	6.0	7.2	8.0	7.6	5.3	5.0	5.2	1.3	0.1	8.0	2.9	24
14	0.8	0.6	0.8	0.4	0.2	1.6	1.4	1.0	0.9	1.0	4.3	5.2	7.1	6.4	7.5	9.3	7.2	7.5	7.1	5.5	6.5	6.3	5.4	7.4	0.2	9.3	4.0	24
15	9.5	9.2	8.6	5.8	5.7	6.8	8.2	7.2	5.8	5.5	7.5	8.9	7.5	7.0	8.5	6.3	6.3	6.5	5.7	4.2	6.0	6.9	6.2	6.1	4.2	9.5	6.8	24
16	5.1	4.0	0.6	1.0	0.2	0.1	0.4	0.3	0.5	0.2	0.4	1.0	0.7	1.9	2.5	1.4	2.0	2.4	2.0	2.1	3.3	1.8	2.1	3.2	0.1	5.1	1.1	24
17	1.8	1.1	1.2	1.0	0.8	0.4	0.7	1.1	1.2	1.3	0.9	1.8	3.7	3.9	3.4	1.4	1.3	1.1	1.0	1.3	0.5	0.6	1.8	2.0	0.4	3.9	0.4	24
18	1.8	1.1	1.2	2.1	2.1	4.8	2.6	2.4	0.7	0.4	0.3	0.7	1.4	2.8	4.5	3.9	1.8	0.6	0.5	0.9	1.1	0.7	0.7	2.1	0.3	4.8	0.5	24
19	0.3	0.9	0.8	0.2	0.4	1.8	0.2	1.3	0.6	0.9	0.4	1.4	3.0	2.7	1.8	1.5	1.5	0.4	0.4	0.3	0.9	0.7	0.3	0.1	0.1	3.0	0.6	24
20	0.4	0.7	5.5	3.4	5.2	0.2	0.8	1.1	0.9	0.8	1.5	3.2	3.3	3.1	1.3	1.1	1.6	1.5	1.2	1.1	0.5	0.3	0.1	0.3	0.1	5.5	1.0	24
21	1.0	0.8	0.1	2.6	3.7	2.6	2.4	1.5	2.6	2.1	3.3	3.4	3.6	3.4	9.7	7.3	9.5	10.3	9.6	8.4	9.3	9.8	9.0	8.9	0.1	10.3	3.5	24
22	8.5	7.6	10.4	8.7	8.6	9.0	9.3	8.8	8.0	7.5	6.8	7.6	7.4	8.1	8.0	9.4	7.9	7.8	7.4	8.9	8.6	8.2	7.7	6.4	6.4	10.4	7.8	24
23	5.7	6.0	5.5	8.3	7.5	6.2	6.3	5.3	5.1	5.1	4.7	4.2	4.2	3.7	3.1	3.4	2.9	1.8	2.9	2.5	1.9	2.4	2.5	3.9	1.8	8.3	3.5	24
24	3.8	4.4	4.7	4.5	4.3	4.1	5.8	6.7	5.4	5.8	3.6	3.4	4.0	4.6	4.0	4.2	3.4	2.4	2.7	0.7	0.8	2.3	2.2	1.9	0.7	6.7	3.4	24
25	1.8	1.3	2.1	2.3	4.2	4.8	4.3	4.2	2.6	5.2	4.6	5.4	6.0	6.1	5.1	3.8	1.7	0.6	1.3	0.3	0.7	0.2	0.3	0.7	0.2	6.1	2.7	24
26	1.0	0.6	0.5	0.0	0.8	0.3	1.4	1.3	0.7	2.7	5.5	5.1	5.2	7.8	7.9	7.9	8.2	5.7	4.6	5.7	4.8	3.8	5.1	5.7	0.0	8.2	3.7	24
27	6.4	6.8	7.2	6.8	7.8	7.1	6.8	6.8	8.2	8.3	9.1	9.5	9.5	9.9	9.2	9.7	7.7	8.1	8.4	6.5	6.0	1.5	3.4	3.4	1.5	9.9	7.2	24
28	5.7	6.3	6.6	5.5	5.3	4.8	5.9	5.5	5.7	6.4	8.4	9.5	8.4	10.1	8.2	8.4	6.3	5.4	3.9	2.1	4.1	4.6	6.5	6.9	2.1	10.1	6.2	24
29	5.9	6.2	6.7	6.4	5.6	5.8	5.9	5.9	6.0	5.4	6.1	8.2	8.5	9.8	7.9	6.6	5.4	5.3	4.4	5.2	5.9	5.3	6.5	5.5	4.4	9.8	6.2	24
30	5.6	5.5	7.4	6.5	6.7	5.8	7.8	8.7	11.0	11.2	14.8	12.7	13.4	15.0	13.8	11.2	14.3	15.8	12.7	14.4	10.1	10.8	10.9	13.4	5.5	15.8	9.7	24
31	13.5	13.5	14.1	16.7	13.6	12.4	11.7	11.0	10.6	11.2	8.4	7.2	8.7	8.3	7.7	8.4	7.5	8.1	7.3	7.4	6.0	5.5	4.7	6.5	4.7	16.7	7.0	24
HOURLY MAX	13.5	13.5	14.1	16.7	13.6	12.4	11.7	11.0	11.0	12.8	14.8	12.7	13.4	19.2	25.3	24.2	24.8	21.4	20.6	16.5	13.8	12.4	12.9	13.4				
HOURLY AVG	2.5	2.5	2.8	2.7	2.6	2.1	2.5	2.3	2.2	2.3	2.6	3.3	3.7	4.4	4.0	3.7	3.2	3.0	2.8	2.6	2.2	2.0	2.2	2.1				

STATUS FLAG CODES

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

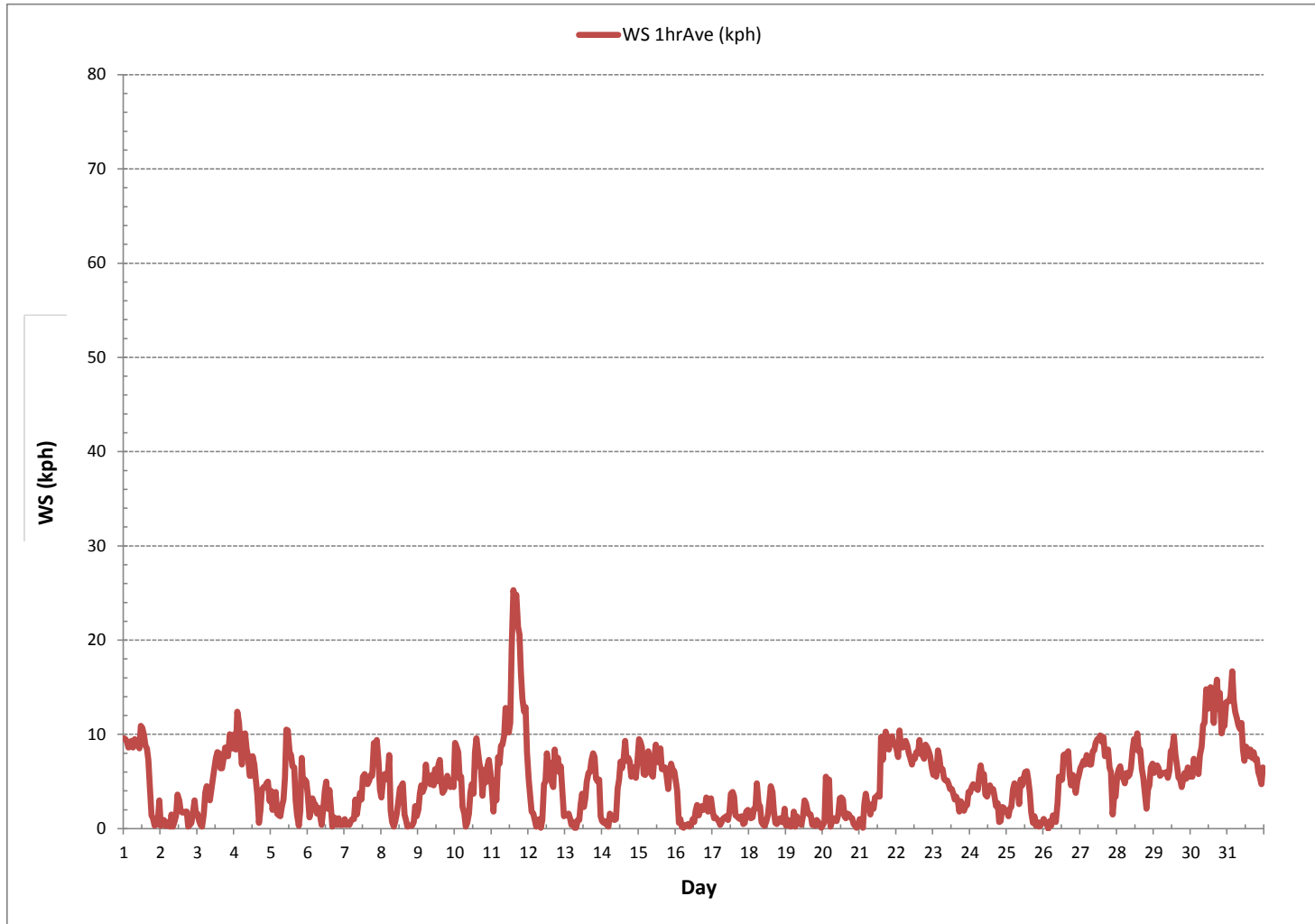
LAST CALIBRATION:	April 1, 2015
DECLINATION :	MAGNETIC DECLINATION 14 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	743
MINIMUM 1-HR AVERAGE:	0.0 kph @ HOUR(S) 3 ON DAY(S) 26
MAXIMUM 1-HR AVERAGE:	25.3 kph @ HOUR(S) 14 ON DAY(S) 11
MAXIMUM 24-HR AVERAGE:	9.7 kph ON DAY(S) 30
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.8
MONTHLY AVERAGE:	2.7 kph

WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - January 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	16.1	12.9	13.8	12.9	13.0	15.8	13.3	15.3	16.1	14.2	16.8	16.0	15.7	15.7	14.4	14.9	9.7	6.6	4.6	3.0	7.4	2.5	8.6	3.0	2.5	16.8	11.8	24
2	2.8	2.4	4.4	2.1	2.7	3.3	3.0	3.9	7.6	4.2	3.8	5.5	6.8	3.9	5.2	3.9	3.1	4.2	3.3	1.6	3.3	5.0	6.5	4.0	1.6	7.6	4.0	24
3	3.6	2.8	3.5	2.2	5.0	6.1	6.9	8.6	6.4	7.8	9.3	9.3	11.9	11.4	11.6	11.9	9.9	11.7	12.7	12.2	14.1	16.7	14.3	14.3	2.2	16.7	9.3	24
4	15.1	13.9	18.6	15.9	11.7	10.6	16.9	16.4	12.3	12.4	9.5	8.8	12.9	10.7	10.2	9.4	2.8	4.2	6.1	6.6	7.0	7.6	6.8	6.5	2.8	18.6	10.5	24
5	6.6	5.2	6.2	7.1	4.7	3.3	3.5	4.6	5.2	11.5	15.1	15.8	15.3	12.3	11.1	11.2	9.0	2.5	1.7	7.9	12.3	8.4	10.8	9.1	1.7	15.8	8.4	24
6	7.7	4.0	5.1	5.6	5.1	4.7	4.9	7.3	4.8	2.5	5.1	9.6	9.5	5.9	7.5	5.7	1.7	3.0	3.7	2.1	2.9	2.0	2.4	3.8	1.7	9.6	4.9	24
7	3.5	2.8	3.7	3.2	4.2	3.4	3.1	7.0	4.9	5.3	7.1	5.9	9.1	10.3	9.1	8.3	8.1	8.3	14.6	13.4	12.8	15.4	12.3	6.3	2.8	15.4	7.6	24
8	5.8	9.4	10.6	8.2	9.9	11.0	4.3	3.0	2.8	2.7	4.0	7.1	8.2	7.8	8.2	5.5	3.1	1.7	3.5	2.0	2.1	2.1	4.6	3.3	1.7	11.0	5.5	24
9	5.1	6.5	7.5	6.6	8.7	12.3	9.2	8.9	8.9	8.8	8.7	10.2	9.7	12.2	12.3	9.0	10.0	6.9	7.8	8.5	7.3	6.7	14.5	12.5	5.1	14.5	9.1	24
10	13.9	16.2	11.6	8.6	8.7	4.5	4.9	2.8	3.0	3.5	7.5	9.5	7.9	16.4	14.8	13.4	10.6	12.0	7.3	9.8	8.1	10.4	12.1	8.9	2.8	16.4	9.4	24
11	6.8	4.4	9.4	7.5	12.2	11.4	14.8	16.2	15.0	16.2	15.3	16.7	21.0	32.6	36.8	37.8	37.9	31.0	32.3	29.1	21.9	22.9	23.9	14.4	4.4	37.9	20.3	24
12	9.7	5.3	5.9	4.9	9.3	2.3	6.5	3.3	2.9	21.1	7.6	11.7	11.8	11.3	13.7	13.0	10.5	12.2	9.4	10.9	9.1	9.9	9.6	4.0	2.3	21.1	9.0	24
13	3.9	5.0	4.1	3.9	3.3	5.9	3.6	1.7	2.9	3.7	7.8	6.9	7.1	7.8	7.9	10.2	9.0	10.5	10.5	10.9	8.5	8.0	7.8	3.0	1.7	10.9	6.4	24
14	3.0	2.2	2.4	5.2	3.9	3.7	3.9	3.9	4.3	4.0	8.3	7.6	10.3	9.3	13.3	13.4	11.5	10.5	11.3	8.8	8.9	8.9	7.5	11.7	2.2	13.4	7.4	24
15	13.5	13.8	13.6	8.6	9.4	10.8	13.0	11.0	11.8	8.5	11.4	12.3	11.0	11.4	13.3	9.4	8.6	9.9	8.9	7.2	8.7	9.2	10.2	8.1	7.2	13.8	10.6	24
16	8.1	6.5	4.6	4.6	2.5	2.7	2.8	2.7	4.6	2.6	3.0	5.2	3.8	4.9	6.0	3.5	6.3	6.7	6.8	4.8	8.3	4.5	5.0	5.8	2.5	8.3	4.8	24
17	4.6	3.1	2.6	3.4	4.3	3.0	3.5	5.6	3.6	4.4	2.7	4.9	6.9	8.6	6.1	5.3	5.4	2.1	2.8	3.3	2.9	4.3	5.1	5.0	2.1	8.6	4.3	24
18	4.9	4.9	4.8	5.8	5.1	10.9	5.2	4.7	4.7	4.8	6.9	5.2	5.6	8.1	6.8	6.4	6.4	3.6	4.1	3.5	3.1	4.0	5.5	4.7	3.1	10.9	5.4	24
19	6.8	6.4	6.0	2.6	5.2	4.8	3.4	3.8	4.2	3.6	2.3	3.5	6.6	4.7	4.7	3.2	3.9	4.7	2.5	2.5	8.1	5.2	2.4	3.0	2.3	8.1	4.3	24
20	4.0	3.9	10.1	6.5	7.2	3.7	3.0	4.1	4.1	3.5	4.4	5.3	5.8	5.8	3.1	2.2	2.5	2.9	2.6	2.7	2.5	2.3	4.3	2.1	2.1	10.1	4.1	24
21	5.2	3.0	3.3	5.8	6.1	5.0	4.5	3.6	6.6	6.2	6.6	6.2	6.2	12.8	14.5	11.0	15.3	16.0	14.0	15.4	14.5	14.5	13.4	13.0	3.0	16.0	9.3	24
22	13.5	11.5	13.5	11.8	14.2	13.8	15.1	13.9	10.5	11.4	11.7	12.3	12.4	11.5	13.9	13.1	11.3	12.5	12.8	12.3	12.2	13.7	14.2	12.5	10.5	15.1	12.7	24
23	9.2	9.6	8.6	12.8	11.6	10.2	9.2	9.8	8.2	10.3	8.5	7.2	7.0	7.1	6.2	6.8	5.7	4.5	5.3	6.1	4.6	6.8	5.8	6.6	4.5	12.8	7.8	24
24	7.3	8.4	7.3	8.8	8.9	8.4	9.3	9.4	9.1	9.8	8.3	7.3	7.6	8.1	7.3	6.7	6.2	5.1	5.0	1.9	3.2	4.9	4.0	4.4	1.9	9.8	6.9	24
25	5.8	4.2	4.9	4.7	7.3	7.2	8.4	6.7	8.0	8.2	8.9	8.8	9.9	9.2	8.5	6.5	4.4	2.3	3.9	2.9	2.6	2.6	4.0	3.3	2.3	9.9	6.0	24
26	4.4	2.4	2.2	1.9	2.2	2.7	4.6	3.7	2.9	6.0	8.7	8.3	8.5	15.0	11.0	12.3	10.5	10.5	6.4	8.0	6.6	5.6	7.1	8.5	1.9	15.0	6.7	24
27	8.7	9.4	10.6	9.8	11.3	10.2	9.0	9.4	11.1	11.8	14.9	19.0	14.4	15.1	15.7	17.8	12.0	13.0	14.0	12.4	10.0	4.3	5.3	6.0	4.3	19.0	11.5	24
28	9.1	8.6	9.9	8.6	7.7	6.0	7.5	7.7	9.4	9.1	13.1	13.7	12.9	17.8	13.3	13.4	8.8	7.8	6.3	4.3	7.9	7.4	8.9	9.6	4.3	17.8	9.5	24
29	8.0	8.8	9.2	9.3	8.2	8.3	9.3	8.7	7.5	7.5	10.1	13.4	12.4	13.3	11.8	12.1	8.4	8.2	7.7	7.3	8.9	9.1	8.9	7.9	7.3	13.4	9.3	24
30	7.6	8.4	11.2	10.6	9.7	8.8	11.3	12.5	18.9	15.8	25.4	22.6	21.2	22.3	22.0	18.9	28.1	26.8	24.5	22.8	19.1	18.3	18.2	21.3	7.6	28.1	17.8	24
31	21.1	20.3	19.9	23.1	20.3	21.1	19.1	16.4	18.9	21.1	25.4	22.6	21.2	32.6	36.8	37.8	37.9	31.0	32.3	29.1	21.9	22.9	23.9	21.3	7.6	23.1	14.6	24
HOURLY MAX	21.1	20.3	19.9	23.1	20.3	21.1	19.1	16.4	18.9	21.1	25.4	22.6	21.2	32.6	36.8	37.8	37.9	31.0	32.3	29.1	21.9	22.9	23.9	21.3				
HOURLY AVG	7.9	7.3	8.0	7.5	7.9	7.6	7.6	7.6	7.7	8.3	9.2	10.0	10.4	11.5	11.4	10.6	9.4	8.8	8.6	8.3	8.3	8.1	8.8	7.6				

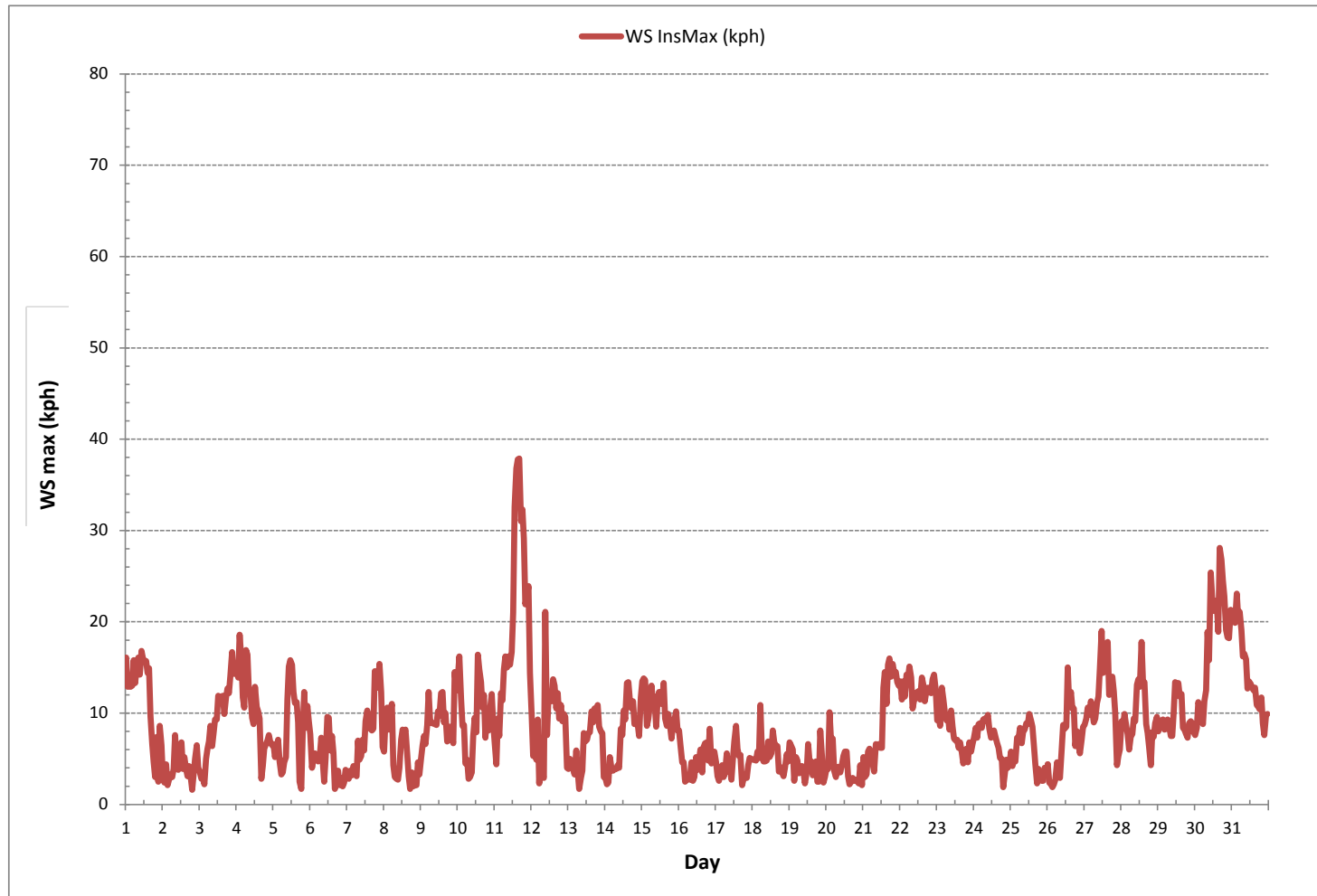
STATUS FLAG CODES

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:	37.9	kph	@ HOUR(S)	16	ON DAY(S)	11
					VAR-VARIOUS	
OPERATIONAL TIME:					744	hrs

WIND SPEED Instantaneous Maximum (WS kph)

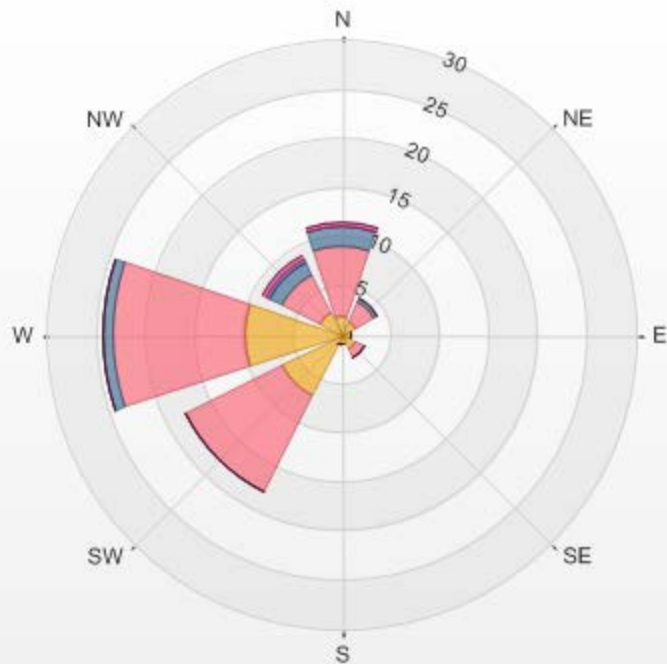


Wind: LICA COLD LAKE SOUTH Monitor: WSP [kph] Monthly: 01/2017 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 28.36% Valid Data: 100.00%

Direction	1.8-5.1	5.1-10.2	10.2-15.2	15.2-20.3	20.3-25.4	>25.4	Total
N	1.88	7.12	2.02	0.13	0.4	0	11.55
NE	1.61	2.15	0.4	0	0	0	4.16
E	0.94	0	0	0	0	0	0.94
SE	1.61	1.08	0	0	0	0	2.69
S	1.08	0	0	0	0	0	1.08
SW	6.85	11.02	0	0	0	0	17.87
W	9.95	13.31	1.08	0	0	0	24.34
NW	2.55	4.17	1.61	0.4	0.27	0	9
Summary	26.47	38.85	5.11	0.53	0.67	0	71.63

% Icon Classes (kph) 26 1.8-5.1 39 5.1-10.2 5 10.2-15.2 1 15.2-20.3 1 20.3-25.4 0 >25.4

LICA COLD LAKE SOUTH 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 28.36% Calm Wind Avg Speed: 0.84 (kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - January 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	WNW	W	W	W	WNW	NW	NNW	N	NNW	NNW	NNW	NNW	NNW	NW	NNW	WNW	WSW	SW	W	SSE	WSW	NW	24		
2	NW	WNW	WSW	WNW	SW	NNW	WNW	W	WNW	WNW	NW	WNW	W	W	W	WSW	WSW	SSE	SW	WSW	W	W	SW	W	24		
3	WSW	W	W	S	W	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WNW	WNW	NW	WNW	W	24	
4	NW	NW	NW	NW	NW	NW	N	N	N	NNE	NNE	N	N	N	NNW	N	SSW	W	WSW	WSW	WSW	WSW	WSW	WSW	NW	24	
5	SW	WSW	WSW	WSW	WSW	NW	NNW	N	NNW	NNE	NE	NE	NE	NE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	24	
6	NE	NNE	NNE	NNE	NNE	NNE	N	W	WSW	SSE	W	WSW	WSW	WNW	WSW	W	W	WSW	WSW	E	WSW	E	WNW	W	WNW	24	
7	W	NNE	WSW	NNW	N	W	SW	SSE	N	SE	SE	SSW	WSW	WSW	W	W	W	W	NW	N	NNW	N	N	NW	WNW	24	
8	WNW	NNW	N	N	N	NNE	N	NNW	WSW	W	W	WSW	W	W	WSW	W	WSW	S	W	NNE	SSW	WNW	SW	S	NW	24	
9	SW	SW	WSW	SW	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	W	W	NW	NNW	NW	WSW	24
10	NNW	NNW	N	NNW	NNW	WNW	WSW	SW	NW	WNW	NNW	N	NNE	NW	NW	NW	NW	NW	W	WSW	WSW	WSW	WSW	WSW	NW	24	
11	WSW	WSW	SW	SW	SW	SW	SW	SW	WSW	W	W	W	WNW	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	24
12	NW	WNW	W	WSW	W	ESE	W	WSW	SSW	SSE	SE	SE	SE	SE	SE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	24
13	ESE	SSW	SSW	SSW	W	W	S	SSW	WNW	ESE	W	W	W	W	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24
14	S	SSE	SE	NE	ENE	SSE	SSW	S	S	SSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	24
15	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	WSW	WSW	WSW	SW	SW	SW	WSW	WSW	24
16	WSW	WSW	SSW	S	NE	WSW	S	E	SSE	SE	NNW	S	NNW	ESE	SE	SSE	SSE	SSW	S	S	SE	SSE	S	SE	S	24	
17	E	SE	SSE	SSE	WSW	WNW	SW	W	E	E	WSW	NW	W	SW	SW	S	S	ENE	SE	E	E	NE	E	E	SSW	24	
18	ENE	ESE	ENE	ENE	ESE	SE	E	ENE	NE	SSW	NNE	WSW	SE	WSW	WSW	SW	SW	ESE	SSE	ESW	E	ESE	ENE	E	SE	24	
19	WSW	NE	ESE	ENE	NW	SE	NE	SE	W	ENE	ENE	ENE	ENE	NE	ENE	NE	NNE	ESE	E	NNE	W	ESE	ENE	ESE	ENE	24	
20	NNW	WSW	W	WSW	W	WSW	SW	WNW	ESE	SE	WSW	WSW	WSW	WSW	WSW	NW	NE	NE	NNE	NE	WSW	N	E	SW	W	24	
21	W	SW	SW	W	WSW	WSW	W	W	W	W	WSW	WSW	W	NE	NNE	NNE	NNE	NNE	NNE	N	N	N	N	NNW	N	24	
22	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	NNW	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNE	NNE	NNE	NNE	NNE	NNE	N	24
23	NE	NNE	NNE	NNE	NNE	N	NNE	NE	NE	NNE	N	N	NNW	WNW	W	NNW	NW	WNW	WNW	NW	NNE	N	WNW	WNW	N	24	
24	NW	WNW	W	W	WNW	WSW	WSW	SW	WSW	SW	W	WSW	WSW	WSW	WSW	SW	WSW	WSW	SW	SSW	SSW	SSW	SW	SW	WSW	24	
25	WSW	SSW	SSW	W	WSW	WSW	W	W	W	WSW	WSW	WSW	WSW	WSW	SW	WSW	WSW	SSW	SSE	SW	SSE	WNW	WNW	S	WSW	24	
26	SW	SSW	WSW	E	W	WNW	NW	WSW	WSW	W	WSW	W	WSW	WSW	W	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24	
27	WSW	WSW	W	W	WSW	W	WSW	WSW	WSW	WSW	W	W	W	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	W	WSW	WSW	WSW	24	
28	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24	
29	SW	SW	SW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	24	
30	W	W	W	W	W	W	W	W	W	W	NW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	N	N	NNW	NNW	24		
31	N	NNW	N	N	N	N	N	N	N	N	NNE	NNW	NW	W	W	W	W	W	W	W	W	WSW	WSW	WSW	W	24	

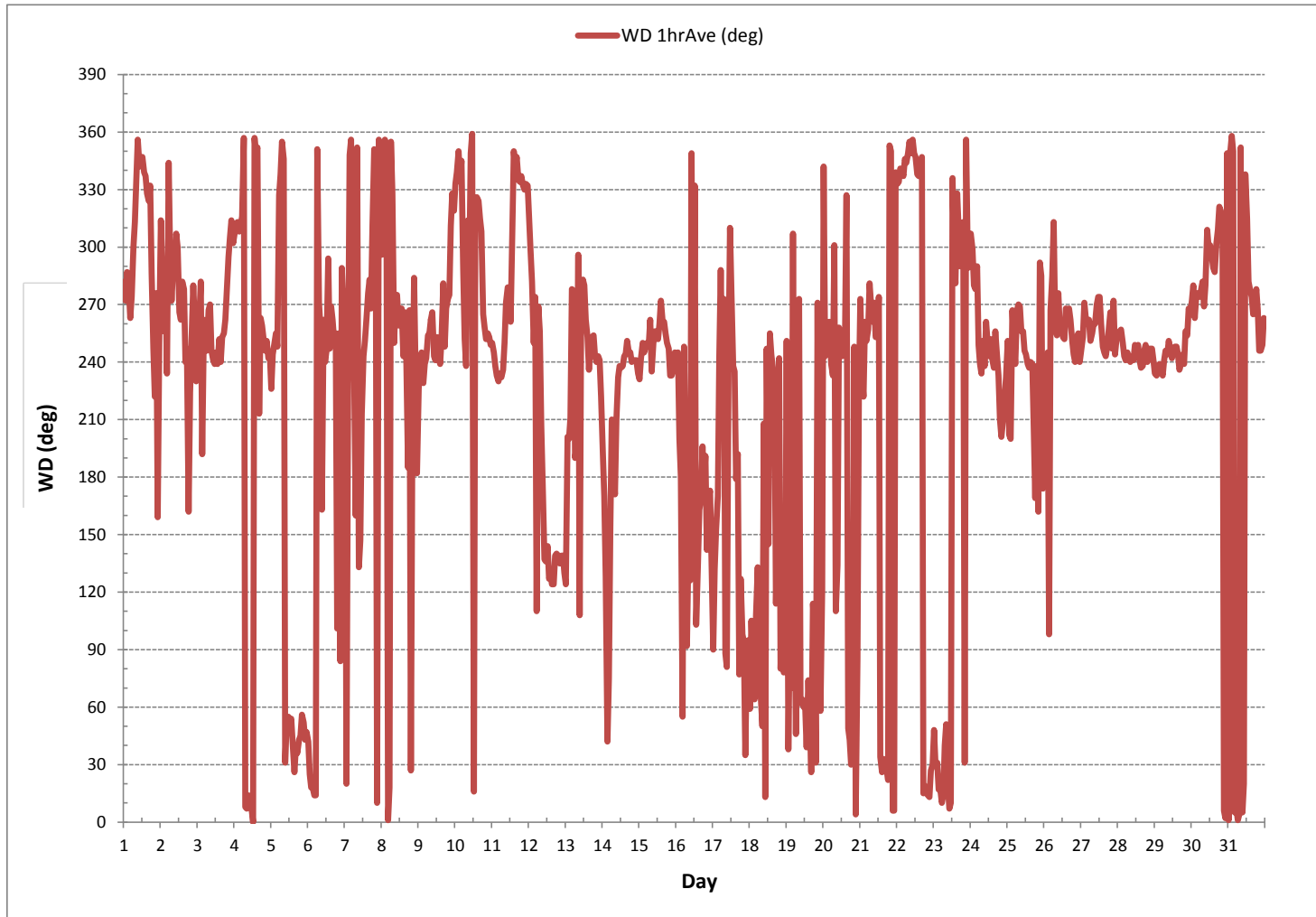
STATUS FLAG CODES

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

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	94		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	289 (WNW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake Continuous Monitoring Station - January 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	20	20	20	22	19	20	17	14	14	17	17	17	16	18	16	14	11	13	25	39	51	64	53	69	24	
2	58	69	57	60	68	53	49	54	50	58	36	19	26	37	32	28	33	28	64	61	45	59	30	38	24	
3	35	49	58	51	47	30	26	30	32	25	19	18	19	17	19	20	20	19	18	20	20	16	14	17	24	
4	16	17	14	14	12	12	19	18	16	17	20	21	22	20	23	28	64	28	17	16	17	17	17	24	24	
5	16	52	18	20	33	30	41	22	22	19	17	17	20	18	20	19	23	19	47	54	19	20	21	21	24	
6	26	60	40	22	27	32	34	35	52	41	29	24	23	43	24	28	56	50	36	59	44	56	65	64	24	
7	45	47	42	59	47	61	34	37	36	22	24	33	22	22	23	22	18	16	17	15	15	20	17	17	24	
8	18	15	18	19	16	14	30	61	58	47	41	29	31	30	20	59	36	59	59	66	51	65	31	37	24	
9	44	21	20	17	21	17	21	21	21	19	22	20	25	20	17	20	25	20	21	18	20	17	13	17	24	
10	14	14	16	18	20	24	41	63	71	31	22	22	27	22	17	14	11	14	22	16	18	18	17	17	24	
11	21	30	18	33	20	18	16	19	20	18	19	20	21	19	20	17	15	14	17	14	15	15	15	15	24	
12	17	28	40	56	69	69	61	50	66	57	16	27	16	24	22	25	24	15	14	13	15	13	49	51	24	
13	39	45	40	47	74	56	55	55	58	56	37	25	38	23	18	17	15	16	15	18	17	17	15	41	24	
14	40	67	42	64	68	50	54	48	41	68	23	15	18	17	19	20	17	16	16	18	19	17	16	14	24	
15	15	19	17	18	19	18	18	19	23	18	17	19	18	20	22	18	14	13	14	18	15	14	16	15	24	
16	14	17	43	60	46	71	60	55	71	74	56	53	47	37	47	38	50	34	56	31	33	51	53	38	24	
17	47	62	59	38	67	60	38	53	49	50	40	49	23	25	19	41	66	39	46	48	50	76	42	44	24	
18	49	52	50	29	32	28	32	26	69	60	54	53	53	33	20	16	36	46	41	37	39	53	53	26	24	
19	43	57	34	48	44	37	53	31	40	41	55	31	26	26	31	32	29	47	71	62	55	51	73	76	24	
20	70	53	13	29	12	28	50	37	34	56	31	19	22	25	41	28	24	25	26	30	36	69	50	56	24	
21	54	54	55	14	14	21	21	37	39	52	17	25	24	48	19	21	19	19	18	17	17	18	17	18	24	
22	14	15	14	14	15	16	14	20	18	16	19	18	17	18	20	16	15	17	17	15	16	17	21	20	24	
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24	24	25	23	25	25	24	19	18	26	22	28	34	30	33	25	21	20	21	18	41	52	31	31	42	24	
25	49	57	24	27	15	19	23	21	27	25	26	24	23	22	21	21	38	50	43	63	57	72	58	50	24	
26	34	45	58	72	40	70	49	59	42	32	16	21	23	19	21	17	17	17	14	14	12	11	10	12	24	
27	12	14	18	15	14	14	15	16	17	16	20	19	18	17	18	19	19	18	19	21	15	34	23	14	24	
28	13	14	15	13	13	11	14	14	15	18	18	18	20	19	17	15	15	16	16	34	21	18	17	16	24	
29	14	14	16	15	13	12	13	15	13	15	20	20	20	20	19	20	15	14	14	14	17	15	17	17	24	
30	20	18	16	19	18	17	18	19	18	20	16	21	19	21	21	21	20	16	16	15	16	20	21	17	24	
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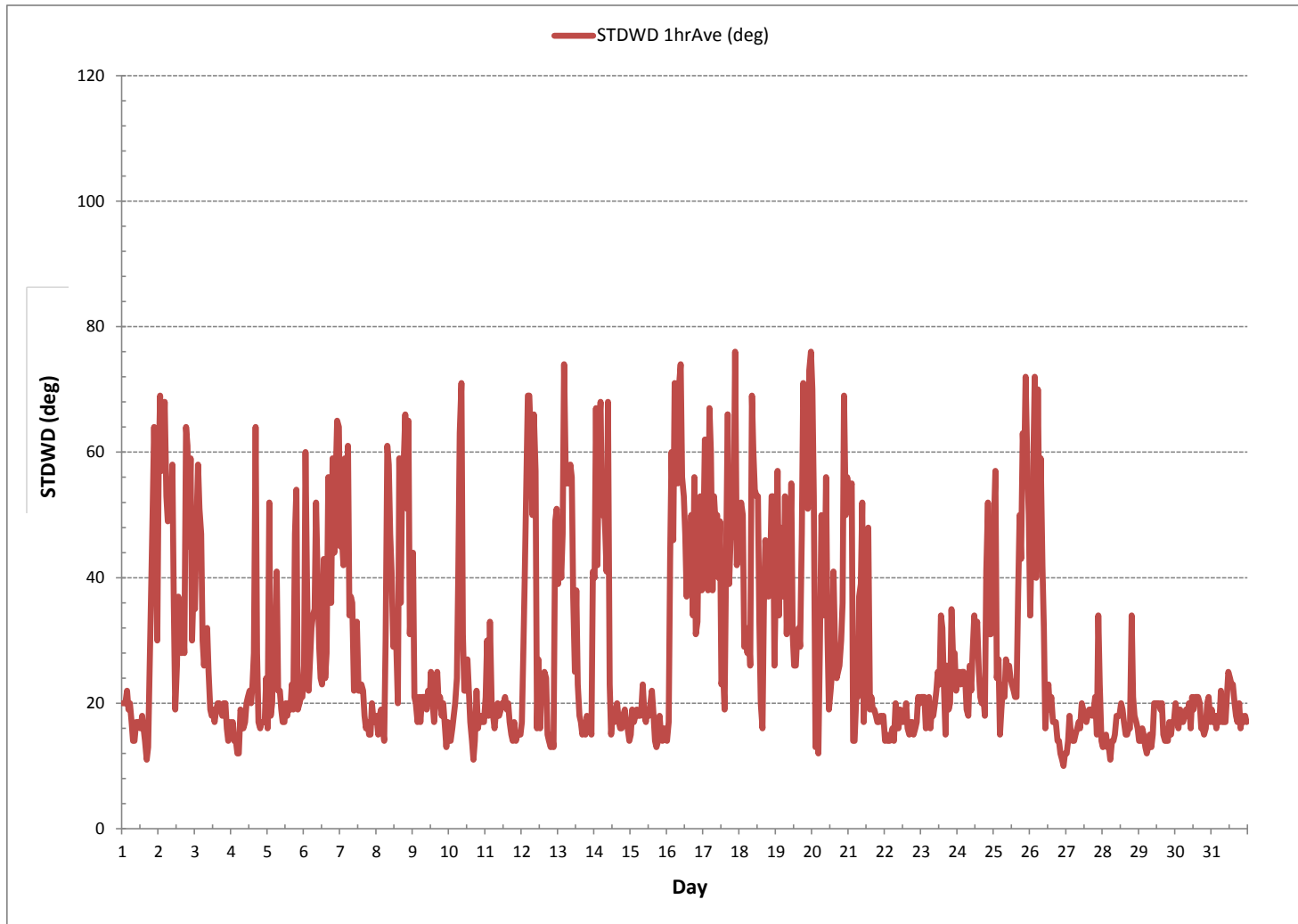
STATUS FLAG CODES

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

LAST CALIBRATION: April 1, 2015

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



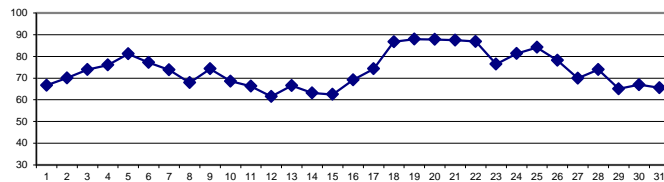
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	69	71	72	70	73	74	74	69	67	65	62	57	56	56	54	53	56	61	69	74	75	75	75	73	53	75	67	24	
2	73	72	71	71	71	70	72	69	69	69	68	68	65	61	62	66	71	74	74	73	73	73	74	61	74	70	24		
3	73	73	72	71	71	73	74	74	74	74	74	75	74	73	72	72	73	74	75	76	76	75	76	79	71	79	74	24	
4	80	79	77	78	79	81	76	71	71	71	71	71	69	69	70	71	75	78	79	79	81	82	83	83	69	83	76	24	
5	83	85	83	83	83	83	83	83	83	83	83	82	80	79	78	78	78	79	83	82	81	82	81	77	75	75	85	81	24
6	75	78	79	79	80	80	81	80	78	77	75	78	82	80	77	78	78	76	74	75	73	73	73	72	72	82	77	24	
7	71	73	72	73	74	74	74	75	75	76	74	74	73	72	73	74	75	77	77	73	72	74	73	73	71	77	74	24	
8	74	74	71	71	71	67	70	72	72	68	64	59	57	54	56	60	68	72	72	73	73	70	70	72	54	74	68	24	
9	72	72	72	72	73	73	73	73	74	74	73	73	73	72	74	74	75	77	77	78	78	78	77	75	72	78	74	24	
10	67	66	63	67	69	72	73	74	73	73	72	68	67	61	60	60	64	66	69	71	72	73	73	72	60	74	69	24	
11	71	70	71	72	74	74	76	78	80	80	78	73	73	62	68	62	57	49	46	49	53	57	58	59	46	80	66	24	
12	61	65	66	68	68	68	67	67	67	67	63	59	55	53	51	51	53	55	58	60	61	62	64	67	51	68	62	24	
13	69	68	68	69	71	71	72	71	71	67	62	61	54	52	59	63	67	68	68	67	67	69	68	75	52	75	67	24	
14	78	78	81	80	80	75	63	66	76	71	53	52	49	49	52	52	56	57	57	58	57	58	60	57	49	81	63	24	
15	54	57	60	62	63	63	61	61	64	64	59	57	58	55	51	53	59	65	69	71	73	73	73	74	51	74	62	24	
16	74	77	82	85	87	87	86	86	85	83	81	67	63	54	50	52	54	53	60	59	63	58	57	58	50	87	69	24	
17	64	67	70	73	78	78	82	84	85	83	74	66	62	51	54	61	62	71	79	84	88	88	89	51	89	74	24		
18	90	90	90	93	93	93	93	94	94	93	91	86	75	67	66	67	77	87	89	90	91	90	91	66	94	87	24		
19	90	91	91	91	89	89	88	89	87	87	87	86	87	84	81	80	83	87	90	90	90	93	91	90	80	93	88	24	
20	89	90	90	90	91	89	87	86	86	88	89	90	87	81	77	80	86	90	90	90	90	90	90	90	77	91	88	24	
21	89	89	88	87	90	89	88	86	85	87	90	91	88	85	88	86	85	87	88	87	86	86	87	87	85	91	87	24	
22	89	92	91	90	90	91	90	89	89	88	87	86	88	87	84	84	84	85	83	82	83	83	85	84	82	92	87	24	
23	82	81	81	80	79	78	78	78	78	75	74	71	68	67	68	70	73	75	77	80	80	81	82	67	82	76	24		
24	82	83	84	85	86	86	85	85	85	85	84	83	82	76	76	76	76	76	76	79	80	80	80	80	76	86	81	24	
25	81	82	84	84	85	87	86	86	86	87	87	87	87	86	86	84	84	84	84	82	81	80	80	79	79	87	84	24	
26	78	78	78	77	77	77	77	78	78	78	81	79	75	73	68	66	70	74	79	82	85	89	89	90	66	90	78	24	
27	86	81	73	72	74	76	78	78	77	71	65	59	56	58	60	64	66	66	61	61	66	73	78	78	56	86	70	24	
28	78	74	76	79	82	85	85	84	80	74	68	67	64	64	63	63	67	70	74	81	80	75	72	69	63	85	74	24	
29	67	67	65	68	71	74	75	74	74	70	62	58	55	53	51	54	59	63	66	67	68	68	65	67	51	75	65	24	
30	69	72	74	76	76	77	77	77	80	84	80	68	57	54	52	52	51	47	55	56	65	71	71	65	47	84	67	24	
31	67	68	66	64	65	66	69	69	68	69	68	63	58	54	52	54	60	66	68	69	71	73	73	74	52	74	66	24	
HOURLY MAX	90	92	91	93	93	93	93	94	94	93	91	91	88	87	88	86	86	90	90	90	91	93	91	91					
HOURLY AVG	76	76	76	77	78	78	78	78	78	77	74	71	69	66	66	66	69	71	73	74	75	76	76	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
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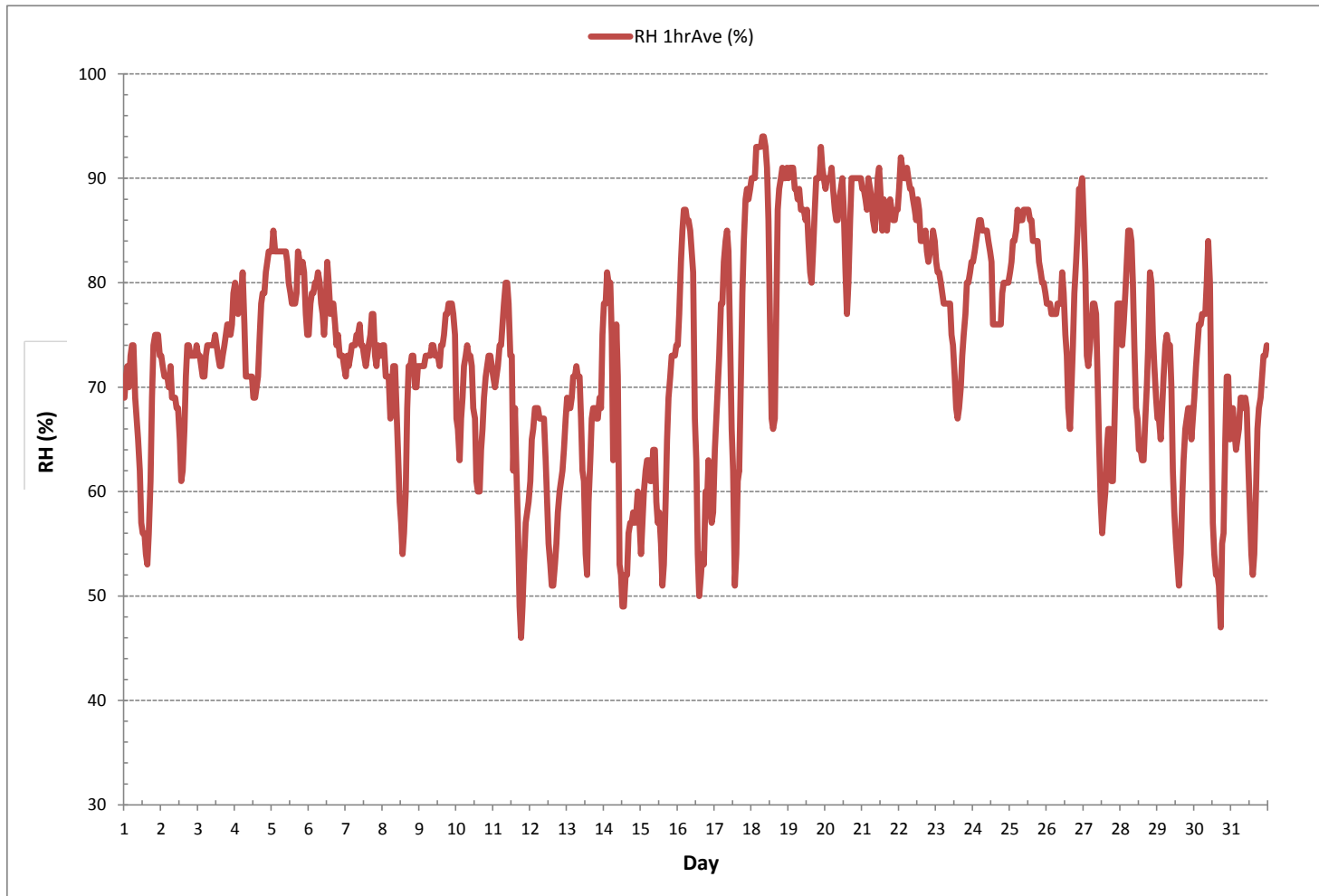
24 HR AVERAGES January 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	46	%	@ HOUR(S)	18	ON DAY(S)	11
MAXIMUM 1-HR AVERAGE:	94	%	@ HOUR(S)	7, 8	ON DAY(S)	18, 18
MAXIMUM 24-HR AVERAGE:	88	%			ON DAY(S)	19, 20
					VAR-VARIOUS	
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	10					
MONTHLY AVERAGE:						74 %

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE



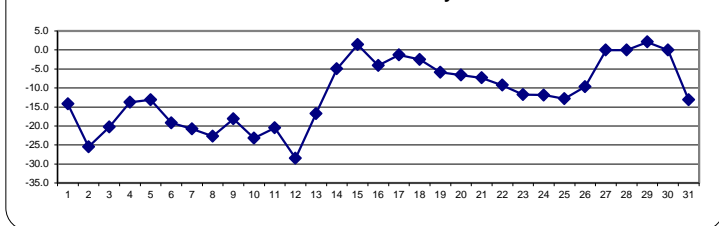
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-9.3	-9.2	-9.0	-8.6	-8.7	-8.9	-9.2	-9.9	-10.9	-12.0	-12.1	-12.5	-12.3	-12.7	-12.8	-13.4	-14.7	-16.5	-19.3	-21.5	-22.9	-24.1	-25.1	-25.9	-25.9	-8.6	-14.2	24	
2	-26.8	-27.6	-28.5	-29.0	-29.5	-29.9	-29.6	-30.6	-31.0	-29.8	-27.3	-24.8	-21.6	-18.9	-18.1	-18.9	-20.6	-23.0	-24.6	-25.0	-25.7	-25.0	-23.4	-23.0	-31.0	-18.1	-25.5	24	
3	-23.0	-24.6	-26.6	-27.7	-27.6	-25.8	-24.9	-24.1	-23.2	-22.5	-21.2	-19.8	-18.6	-17.9	-17.0	-16.8	-16.7	-16.5	-16.2	-15.7	-15.4	-14.9	-14.8	-14.7	-27.7	-14.7	-20.3	24	
4	-14.6	-14.2	-13.7	-13.6	-13.3	-13.2	-12.9	-13.1	-13.3	-13.5	-13.3	-13.3	-13.3	-13.2	-12.8	-12.8	-13.9	-15.0	-14.5	-13.9	-14.2	-14.5	-15.2	-14.9	-15.2	-12.8	-13.8	24	
5	-14.9	-14.3	-13.9	-13.4	-12.8	-12.6	-12.4	-12.5	-12.4	-12.1	-11.8	-12.1	-12.1	-11.8	-11.4	-11.6	-12.3	-14.1	-15.3	-15.9	-14.0	-13.6	-13.8	-14.3	-15.9	-11.4	-13.1	24	
6	-15.0	-16.3	-16.6	-16.1	-16.4	-16.6	-16.9	-17.5	-18.7	-19.6	-17.6	-17.1	-17.3	-16.4	-15.9	-17.5	-19.5	-21.6	-23.0	-23.7	-24.5	-25.1	-25.6	-26.0	-26.0	-15.0	-19.2	24	
7	-26.2	-25.8	-26.2	-25.5	-23.5	-22.4	-21.4	-20.9	-22.3	-21.6	-18.6	-17.9	-17.5	-17.3	-17.1	-17.0	-17.1	-17.5	-18.6	-19.6	-20.9	-20.9	-21.3	-21.2	-26.2	-17.0	-20.8	24	
8	-21.0	-21.0	-20.6	-20.8	-21.3	-22.3	-23.8	-26.1	-27.9	-26.9	-24.1	-22.0	-21.2	-20.3	-20.6	-21.3	-23.3	-25.4	-25.8	-24.0	-22.7	-21.5	-20.9	-20.6	-27.9	-20.3	-22.7	24	
9	-19.7	-19.1	-18.9	-19.0	-18.9	-19.1	-19.0	-19.0	-19.1	-19.1	-18.7	-18.3	-17.6	-17.4	-17.6	-17.4	-17.2	-17.3	-17.2	-17.1	-17.0	-17.2	-17.4	-17.4	-19.7	-17.0	-18.2	24	
10	-18.1	-19.0	-19.9	-20.6	-21.7	-23.3	-24.1	-24.8	-25.4	-25.0	-23.3	-22.0	-21.6	-20.5	-20.6	-21.2	-22.6	-23.9	-25.4	-26.1	-26.6	-27.2	-27.2	-27.6	-27.6	-18.1	-23.2	24	
11	-27.8	-29.1	-27.5	-25.3	-22.8	-21.4	-19.6	-17.7	-15.9	-14.5	-13.1	-10.6	-8.9	-7.7	-11.4	-16.0	-20.2	-23.0	-24.7	-25.9	-26.6	-27.0	-27.5	-28.2	-29.1	-7.7	-20.5	24	
12	-28.9	-29.5	-30.4	-32.5	-33.9	-34.8	-35.4	-35.9	-35.6	-33.6	-30.4	-27.8	-26.7	-25.2	-24.0	-23.4	-23.5	-23.9	-24.3	-25.0	-24.9	-24.8	-24.9	-25.4	-35.9	-23.4	-28.5	24	
13	-25.6	-24.6	-24.5	-24.8	-25.9	-26.4	-26.4	-26.7	-27.2	-24.7	-19.7	-15.2	-10.6	-7.9	-7.7	-7.8	-8.4	-8.8	-8.8	-8.9	-9.1	-9.8	-10.0	-12.6	-27.2	-7.7	-16.8	24	
14	-13.9	-13.4	-13.9	-13.1	-11.6	-10.1	-7.5	-7.8	-10.7	-9.1	-4.5	-2.3	-0.8	-0.2	-0.1	0.1	-0.7	-1.0	-0.7	-0.4	0.4	0.4	0.0	1.1	-13.9	1.1	-5.0	24	
15	2.1	2.5	1.8	1.0	0.3	0.0	1.0	1.6	1.0	1.4	2.7	3.7	3.8	4.7	5.5	5.0	2.9	0.9	-0.2	-0.7	-1.3	-1.7	-2.1	-2.7	-2.7	5.5	1.4	24	
16	-2.9	-4.1	-5.7	-8.0	-9.2	-10.0	-11.0	-11.1	-11.2	-9.9	-7.8	-3.1	-1.1	0.6	1.1	1.1	-0.1	-0.3	-1.3	-1.0	-1.8	-0.9	-0.8	-0.9	-11.2	1.1	-4.1	24	
17	-2.2	-2.7	-2.8	-3.5	-4.9	-4.8	-6.0	-7.0	-7.2	-6.7	-4.1	0.0	3.7	7.8	7.5	5.5	5.0	3.1	0.8	-0.3	-1.9	-3.1	-3.4	-3.9	-7.2	7.8	-1.3	24	
18	-4.0	-4.2	-4.3	-4.4	-4.5	-2.3	-2.8	-3.6	-4.3	-4.2	-2.2	-1.0	1.5	3.5	4.0	3.6	0.9	-2.0	-3.4	-4.7	-5.2	-5.6	-6.1	-5.5	-6.1	4.0	-2.5	24	
19	-6.3	-7.3	-7.4	-7.9	-9.1	-9.4	-10.1	-9.9	-10.1	-8.5	-6.1	-3.9	-2.2	-1.4	-0.6	0.0	-1.3	-2.8	-3.8	-4.2	-5.8	-6.8	-7.7	-8.7	-10.1	0.0	-5.9	24	
20	-9.5	-10.1	-9.7	-9.0	-8.7	-9.9	-11.4	-12.3	-12.5	-10.2	-5.3	-3.7	-2.6	-1.1	-0.1	-0.1	-1.7	-3.0	-4.6	-5.8	-6.2	-6.7	-7.1	-7.9	-12.5	-0.1	-6.6	24	
21	-8.8	-10.0	-10.8	-11.7	-10.9	-11.0	-11.4	-12.2	-13.0	-11.5	-9.7	-7.9	-5.7	-2.2	-1.8	-1.4	-2.1	-3.8	-4.5	-4.4	-4.6	-5.1	-5.6	-6.5	-13.0	-1.4	-7.4	24	
22	-6.9	-7.0	-7.2	-7.5	-7.9	-8.3	-8.8	-9.2	-9.6	-9.8	-9.7	-9.6	-9.4	-9.1	-8.9	-9.1	-9.5	-9.7	-10.1	-10.5	-10.9	-11.3	-11.5	-11.7	-11.7	-6.9	-9.3	24	
23	-12.0	-12.2	-12.3	-12.7	-13.0	-13.1	-13.1	-13.1	-13.2	-12.9	-12.7	-12.3	-11.4	-10.5	-10.1	-10.1	-10.3	-10.9	-10.9	-10.7	-10.8	-11.0	-11.1	-11.3	-13.2	-10.1	-11.7	24	
24	-11.4	-11.5	-11.9	-12.2	-12.4	-12.5	-13.2	-14.3	-14.7	-14.4	-13.7	-12.6	-12.2	-10.5	-10.7	-10.5	-10.3	-10.5	-10.6	-11.0	-11.2	-11.1	-10.9	-10.8	-14.7	-10.3	-11.9	24	
25	-10.9	-11.0	-11.8	-13.0	-13.6	-13.2	-13.3	-12.9	-12.2	-11.4	-11.0	-10.8	-10.7	-10.0	-8.5	-10.0	-12.7	-14.5	-15.5	-16.1	-16.8	-17.6	-18.1	-18.1	-8.5	-12.9	24		
26	-18.7	-18.9	-19.0	-19.2	-19.4	-19.7	-19.9	-19.4	-18.5	-15.3	-8.8	-4.9	-2.7	-1.1	0.8	1.3	0.4	-0.6	-2.1	-3.2	-4.7	-6.4	-6.3	-5.7	-19.9	1.3	-9.7	24	
27	-4.5	-2.9	-0.7	-0.4	-1.3	-2.0	-2.8	-2.9	-2.6	-1.3	0.4	2.1	3.0	2.9	3.2	2.4	2.2	2.0	3.2	3.0	1.5	-0.5	-2.2	-2.5	-4.5	3.2	0.0	24	
28	-2.5	-1.2	-1.2	-1.8	-2.4	-3.5	-3.6	-3.6	-2.8	-1.3	0.3	1.6	2.7	3.3	3.7	3.7	3.1	2.7	1.6	-0.5	-0.6	-0.2	0.3	0.8	-3.6	3.7	-0.1	24	
29	0.8	0.7	1.0	0.2	-0.5	-1.2	-1.4	-1.1	-1.0	0.2	2.6	4.3	5.4	6.1	6.7	5.8	4.4	3.2	2.6	2.2	2.0	2.5	2.0	-1.4	6.7	2.1	24		
30	1.9	1.5	1.2	0.9	0.9	0.5	0.6	1.0	1.0	1.2	0.9	1.3	1.2	1.6	1.3	1.0	0.7	0.0	-0.8	-1.5	-2.1	-3.9	-5.1	-5.9	-5.9	1.9	0.0	24	
31	-7.4	-8.5	-9.7	-11.1	-12.8	-13.8	-13.9	-14.1	-14.7	-15.1	-14.7	-14.0	-13.2	-12.4	-12.0	-12.3	-13.2	-14.4	-14.8	-14.7	-15.0	-14.9	-14.5	-13.9	-15.1	-7.4	-13.1	24	
HOURLY MAX	2.1	2.5	1.8	1.0	0.9	0.5	1.0	1.6	1.0	1.4	2.7	4.3	5.4	7.8	7.5	5.8	5.0	3.2	3.2	3.0	2.2	2.0	2.5	2.0					
HOURLY AVG	-12.5	-12.7	-12.9	-13.2	-13.5	-13.6	-13.7	-13.9	-14.2	-13.4	-11.5	-9.9	-8.7	-7.6	-7.3	-7.7	-8.7	-9.9	-10.7	-11.2	-11.6	-11.9	-12.1	-12.4					

STATUS FLAG CODES

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

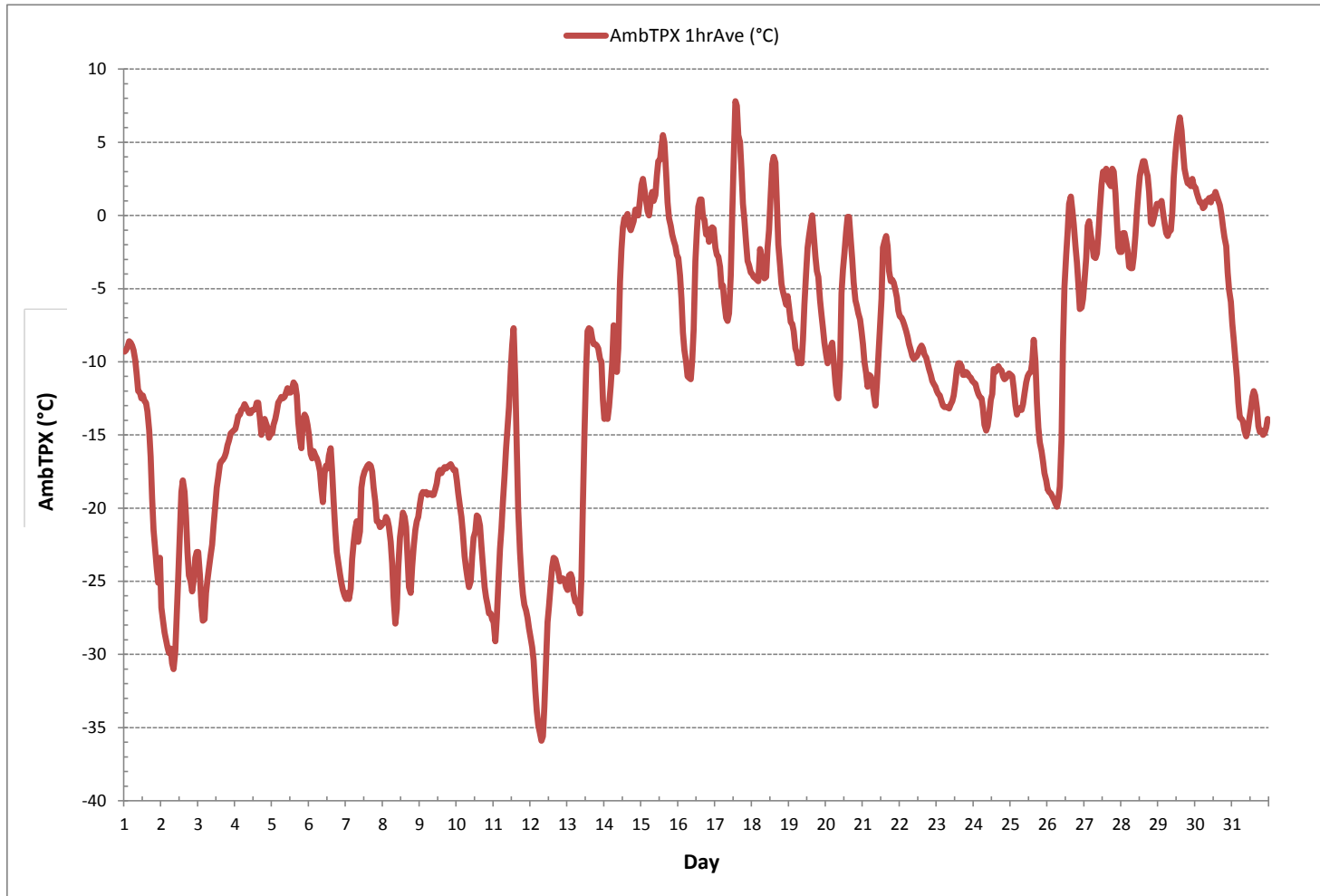
24 HR AVERAGES January 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-35.9 °C	@ HOUR(S)	7	ON DAY(S)	12
MAXIMUM 1-HR AVERAGE:	7.8 °C	@ HOUR(S)	13	ON DAY(S)	17
MAXIMUM 24-HR AVERAGE:	2.1 °C			ON DAY(S)	29
				VAR-VARIOUS	
OPERATIONAL TIME:				744	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	9.3	MONTHLY AVERAGE:		-11.4	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

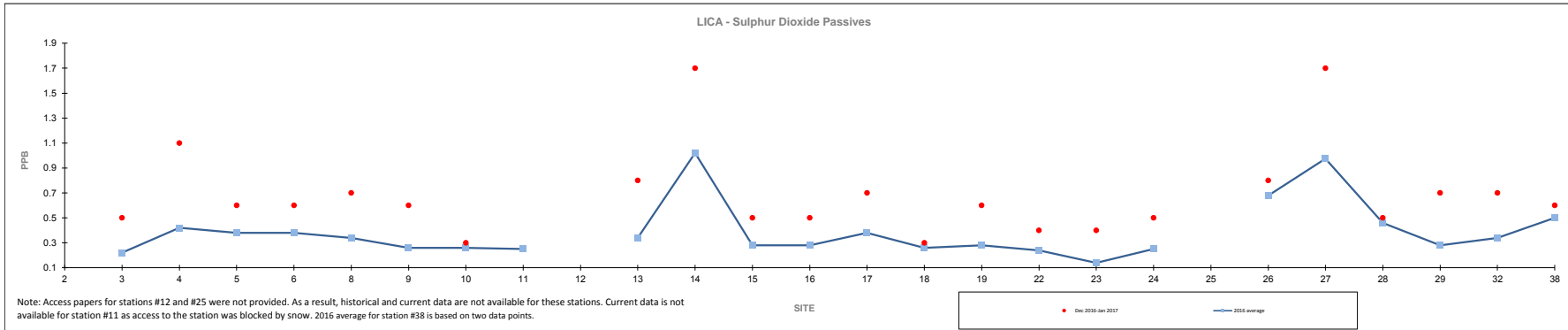


APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

PASSIVE RESULTS

Passive Summary Results for December 2016 - January 2017
Lakeland Industry & Community Association

		Sulphur Dioxide ppb																												December 2016 - January 2017	
		2016																												Reading	
Mean		2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	22	23	24	25	26	27	28	29	32	38		Site	
		NA	0.2	0.4	0.4	0.4	0.3	0.3	0.3	0.3	NA	0.3	1.0	0.3	0.3	0.4	0.3	0.3	0.2	0.1	0.3	NA	0.7	1.0	0.5	0.3	0.3	0.5	0.7	-	
Minimum		NA	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	NA	0.2	0.8	0.2	0.2	0.3	0.1	0.1	0.2	0.1	0.2	NA	0.4	0.8	0.3	0.2	0.2	0.3	0.3	#10 and #18	
Maximum		NA	0.4	0.6	0.5	0.6	0.5	0.3	0.4	0.3	NA	0.5	1.3	0.4	0.5	0.6	0.4	0.6	0.4	0.2	0.4	NA	1.3	1.3	0.6	0.4	0.6	0.7	1.7	#14	

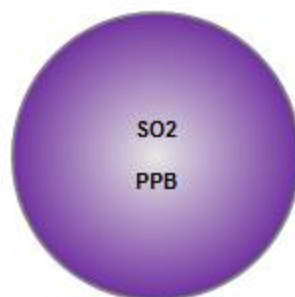


Lakeland Industry & Community Association SO₂ Passive Bubble Map

DECEMBER 2016 - JANUARY 2017

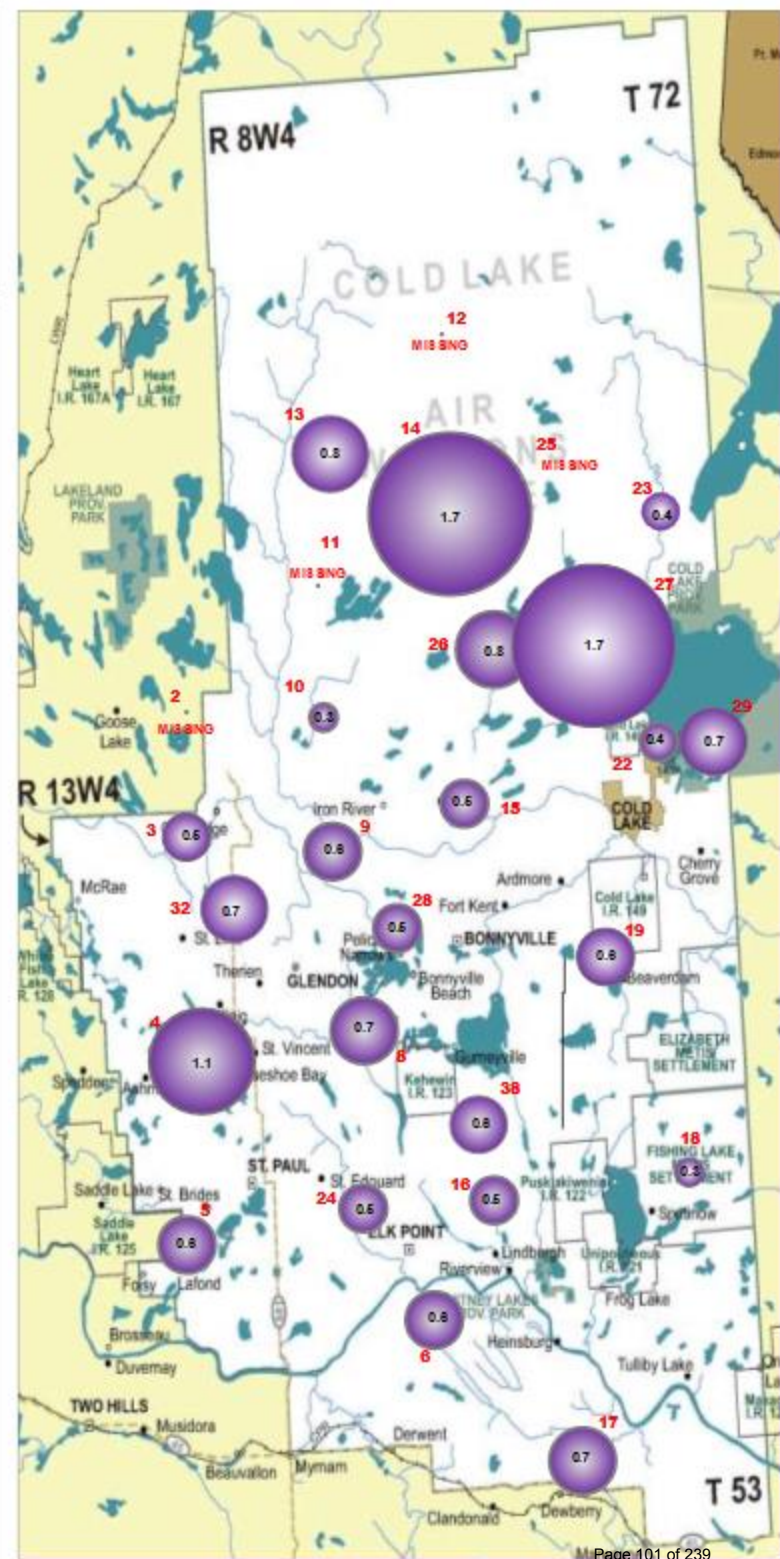
PASSIVE STATIONS

		DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	0.5 PPB	NA
4 – Flat Lake	1.1 PPB	NA
5 – Lake Eliza	0.6 PPB	NA
6 – Telegraph Creek	0.6 PPB	NA
8 – Muriel-Kehewin	0.7 PPB	NA
9 – Dupre	0.6 PPB	NA
10 – La Corey	0.3 PPB	NA
11 – Wolf Lake	MISSING	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	0.8 PPB	0.8 PPB
14 – Maskwa	1.6 PPB	1.8 PPB
15 – Ardmore	0.5 PPB	0.5 PPB
16 – Frog Lake	0.5 PPB	NA
17 – Clear Range	0.7 PPB	NA
18 – Fishing Lake	0.3 PPB	NA
19 – Beaverdam	0.6 PPB	NA
22 – Cold Lake South	0.4 PPB	NA
23 – Medley-Martineau	0.4 PPB	NA
24 – Fort George	0.5 PPB	NA
25 – Burnt Lake	MISSING	NA
26 – Mahikan	0.8 PPB	NA
27 – Mahkeses	1.7 PPB	NA
28 – Town of Bonnyville	0.5 PPB	NA
29 – Cold Lake South 2	0.7 PPB	NA
32 – St. Lina	0.7 PPB	NA
38 – Bonnyville	0.6 PPB	NA



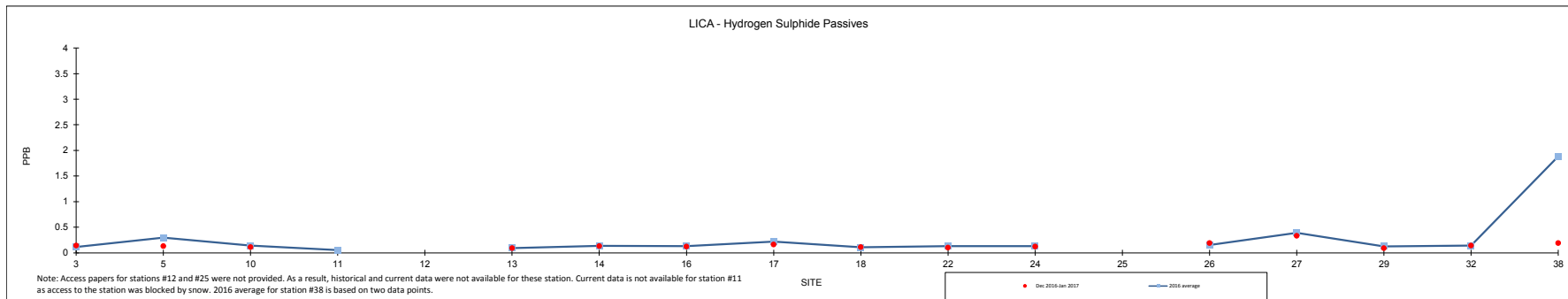
Summary

Minimum : 0.3 PPB – La Corey and Fishing Lake
 Maximum: 1.7 PPB – Maskwa
 Average: 0.7 PPB *Includes Duplicates



Passive Summary Results for December 2016 - January 2017 Lakeland Industry & Community Association

Hydrogen Sulphide ppb																	December 2016 - January 2017			
	3	5	10	11	12	13	14	2016 16	17	18	22	24	25	26	27	29	32	38	Reading	Site
Mean	0.11	0.30	0.14	0.05	NA	0.09	0.14	0.13	0.22	0.11	0.13	0.13	NA	0.15	0.39	0.13	0.14	1.86	0.14	-
Minimum	0.08	0.13	0.09	0.05	NA	0.08	0.10	0.09	0.14	0.05	0.06	0.09	NA	0.14	0.15	0.08	0.08	0.16	0.09	#13 and #29
Maximum	0.17	0.51	0.21	0.06	NA	0.12	0.17	0.16	0.33	0.14	0.20	0.19	NA	0.17	0.67	0.17	0.20	3.61	0.33	#27

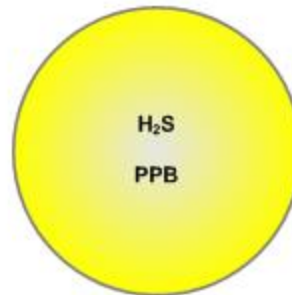


Lakeland Industry & Community Association H₂S Passive Bubble Map

DECEMBER 2016 - JANUARY 2017

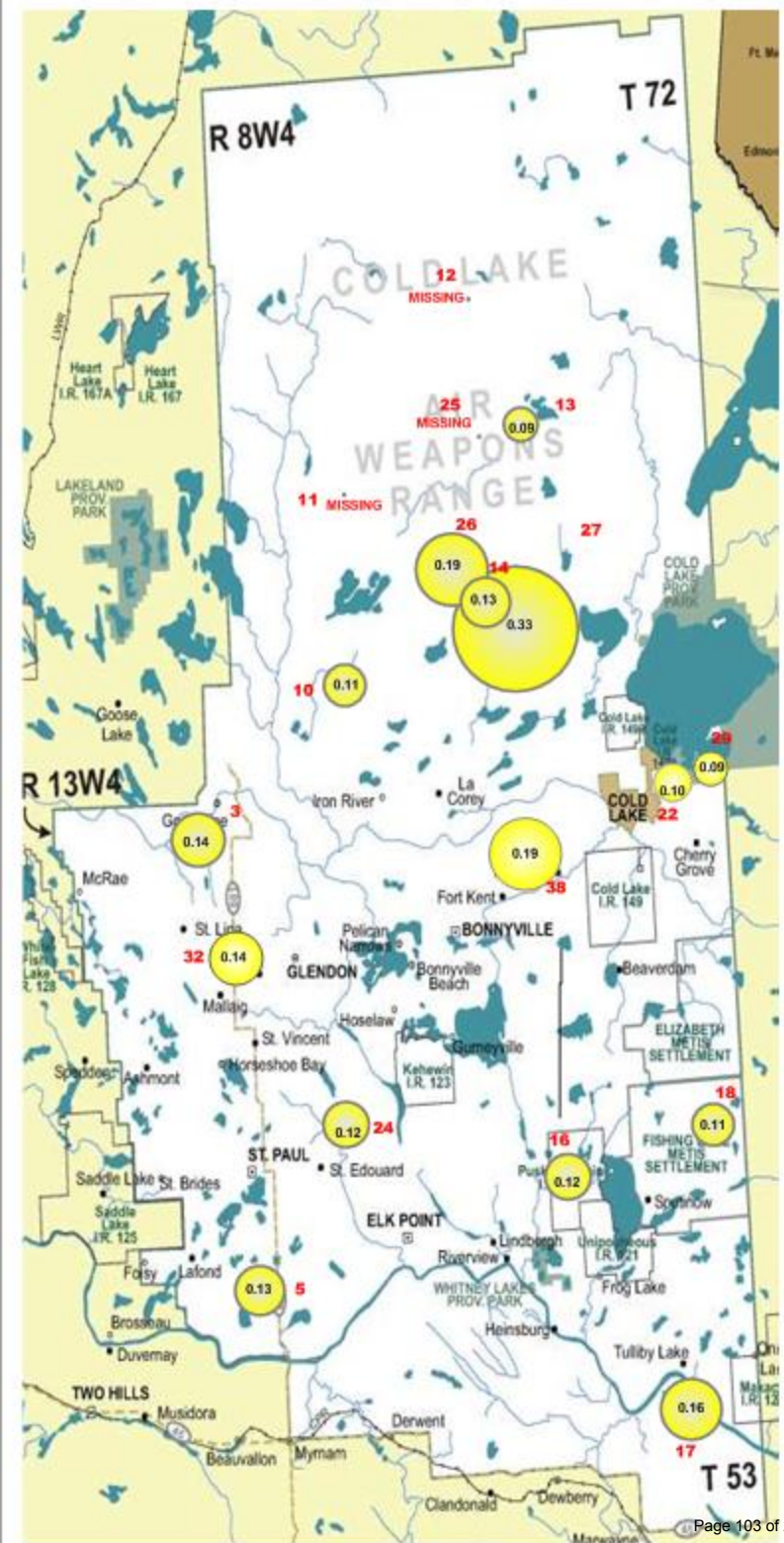
PASSIVE STATIONS

Station	Reading	Duplicate
3 - Therien	0.14 PPB	NA
5 - Lake Eliza	0.13 PPB	NA
10 - La Corey	0.11 PPB	NA
11 - Wolf Lake	MISSING	NA
12 - Foster Creek	MISSING	NA
13 - Primrose	0.09 PPB	NA
14 - Maskwa	0.13 PPB	NA
16 - Frog Lake	0.12 PPB	NA
17 - Clear Range	0.16 PPB	0.16 PPB
18 - Fishing Lake	0.11 PPB	0.10 PPB
22 - Cold Lake South	0.10 PPB	NA
24 - Fort George	0.12 PPB	NA
25 - Burnt Lake	MISSING	NA
26 - Mahihkan	0.19 PPB	NA
27 - Mahkeses	0.33 PPB	NA
29 - Cold Lake South 2	0.09 PPB	NA
32 - St. Lina	0.14 PPB	NA
38 - Bonnyville	0.19 PPB	NA



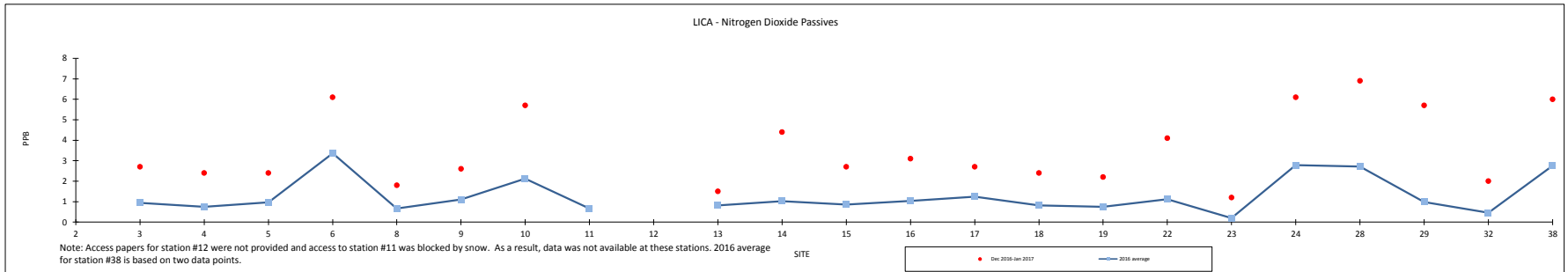
Summary

Minimum : 0.09 PPB – Primrose and Cold Lake South 2
 Maximum: 0.33 PPB – Mahkeses
 Average: 0.14 PPB *Includes Duplicates



Passive Summary Results for December 2016 - January 2017
Lakeland Industry & Community Association

	Nitrogen Dioxide ppb																				December 2016 - January 2017					
	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	22	23	24	28	29	32	38	Reading	Site
Mean	NA	0.9	0.7	1.0	3.4	0.7	1.1	2.1	0.7	NA	0.8	1.0	0.9	1.0	1.2	0.8	0.8	1.1	0.2	2.8	2.7	1.0	0.5	2.8	3.6	-
Minimum	NA	0.5	0.3	0.4	2.1	0.3	0.2	1.2	0.3	NA	0.2	0.5	0.3	0.5	0.6	0.4	0.4	0.5	0.1	1.6	1.4	0.4	0.2	1.3	1.2	#23
Maximum	NA	1.8	1.4	2.2	5.0	1.4	2.2	3.7	1.1	NA	2.6	2.6	1.4	2.3	2.1	1.4	1.5	2.4	0.4	4.6	4.9	2.3	1.1	4.2	6.9	#28



Lakeland Industry & Community Association

NO₂ Passive Bubble Map

DECEMBER 2016 – JANUARY 2017

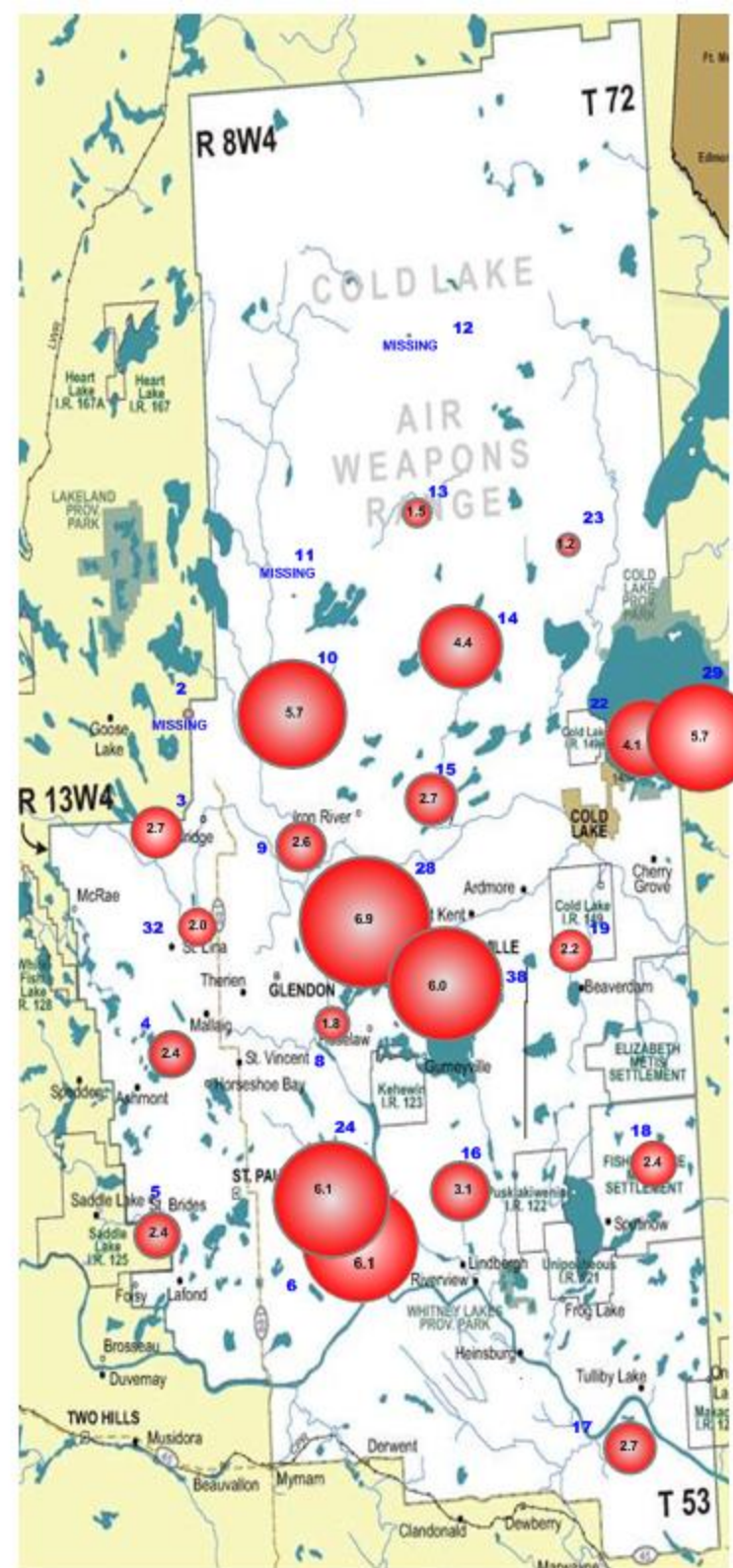
PASSIVE STATIONS

	PASSIVE STATIONS	DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	2.7 PPB	NA
4 – Flat Lake	2.2 PPB	2.5 PPB
5 – Lake Eliza	2.7 PPB	2.1 PPB
6 – Telegraph Creek	6.1 PPB	NA
8 – Muriel-Kehewin	1.8 PPB	NA
9 – Dupre	2.6 PPB	NA
10 – La Corey	5.7 PPB	NA
11 – Wolf Lake	MISSING	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	1.5 PPB	NA
14 – Maskwa	4.4 PPB	NA
15 – Ardmore	2.7 PPB	NA
16 – Frog Lake	3.1 PPB	NA
17 – Clear Range	2.7 PPB	NA
18 – Fishing Lake	2.4 PPB	NA
19 – Beaverdam	2.2 PPB	NA
22 – Cold Lake South	4.1 PPB	NA
23 – Medley-Martineau	1.2 PPB	NA
24 – Fort George	6.1 PPB	NA
28 – Town of Bonnyville	6.9 PPB	NA
29 – Cold Lake South 2	5.7 PPB	NA
32 – St. Lina	2.0 PPB	NA
38 – Bonnyville	6.0 PPB	NA



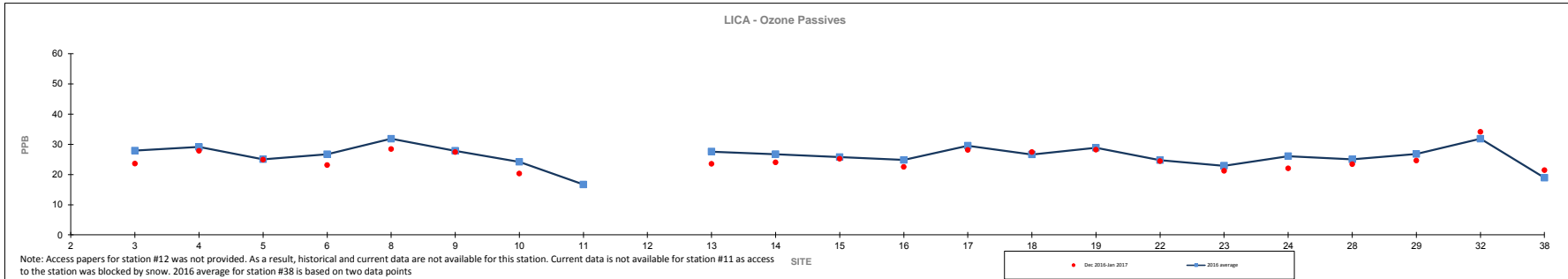
Summary

Minimum : 1.2 PPB – Medley-Martineau
 Maximum: 6.9 PPB – Town of Bonnyville
 Average: 3.6 PPB *Includes Duplicates



Passive Summary Results for December 2016 - January 2017 Lakeland Industry & Community Association

	Ozone ppb																		December 2016 - January 2017							
	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	22	23	24	28	29	32	38	Reading	Site
Mean	NA	27.9	29.1	25.0	26.7	31.8	27.8	24.2	16.7	NA	27.6	26.7	25.7	24.8	29.5	26.6	28.8	24.8	22.9	26.0	25.0	26.7	31.8	18.9	25.0	-
Minimum	NA	14.9	17.0	16.0	14.9	19.3	17.7	13.1	11.8	NA	16.5	16.9	14.9	13.0	19.4	15.1	19.0	14.5	12.2	15.9	16.2	16.1	22.9	16.3	20.3	#10
Maximum	NA	41.8	47.4	32.8	47.3	43.8	43.3	38.7	21.5	NA	37.7	40.0	39.3	35.3	49.3	41.4	46.5	32.6	33.2	40.8	34.2	36.7	39.1	21.5	34.1	#32



Lakeland Industry & Community Association O₃ Passive Bubble Map

DECEMBER 2016 – JANUARY 2017

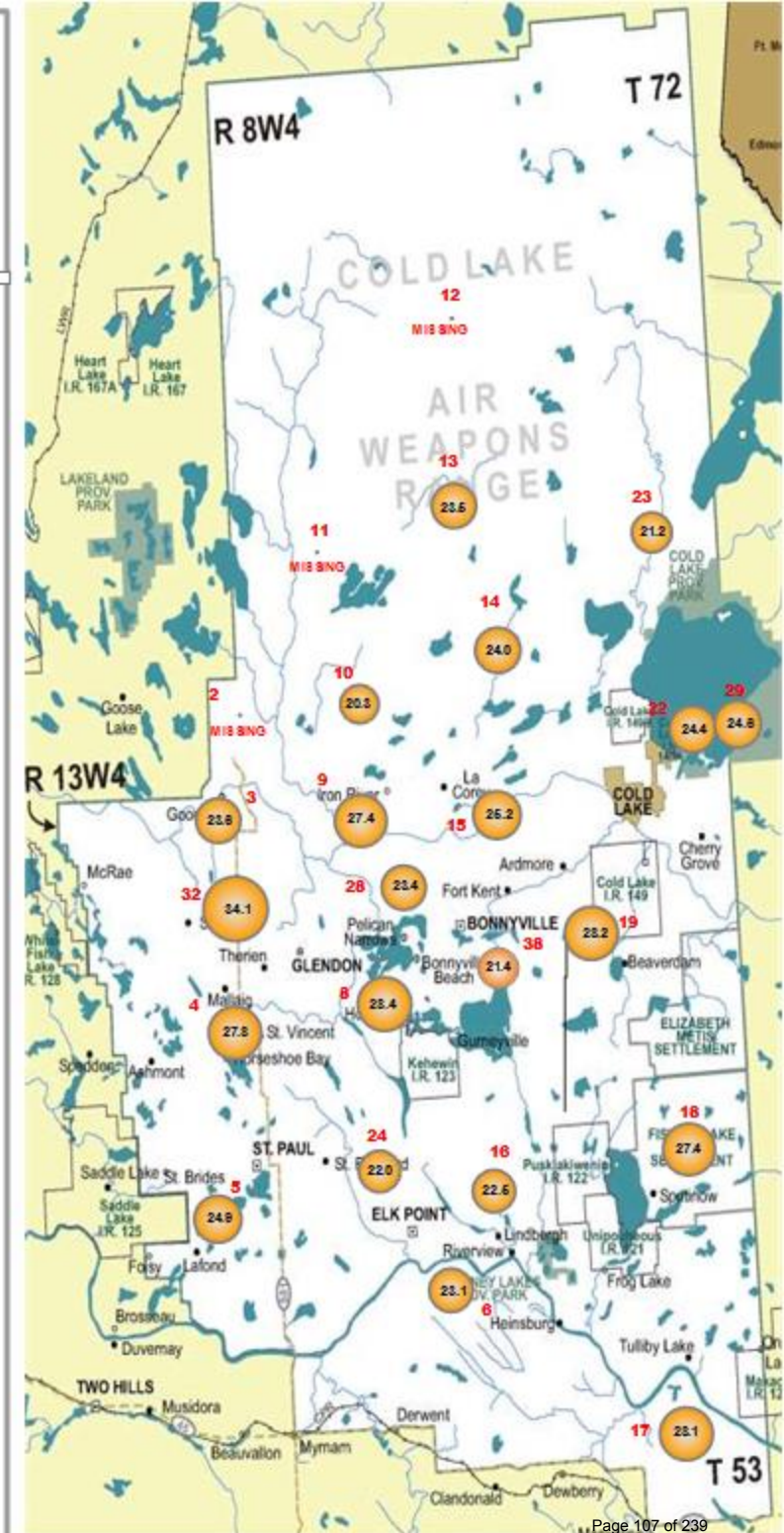
PASSIVE STATIONS

		DUPLICATE
2 – Sand River	MISSING	NA
3 – Therien	23.6 PPB	NA
4 – Flat Lake	29.1 PPB	26.5 PPB
5 – Lake Eliza	26.5 PPB	23.2 PPB
6 – Telegraph Creek	23.1 PPB	NA
8 – Muriel-Kehewin	28.4 PPB	NA
9 – Dupre	27.4 PPB	NA
10 – La Corey	20.3 PPB	NA
11 – Wolf Lake	MISSING	NA
12 – Foster Creek	MISSING	NA
13 – Primrose	23.5 PPB	NA
14 – Maskwa	24.0 PPB	NA
15 – Ardmore	25.2 PPB	NA
16 – Frog Lake	22.5 PPB	NA
17 – Clear Range	28.1 PPB	NA
18 – Fishing Lake	27.4 PPB	NA
19 – Beaverdam	28.2 PPB	NA
22 – Cold Lake South	24.4 PPB	NA
23 – Medley-Martineau	21.2 PPB	NA
24 – Fort George	22.0 PPB	NA
28 – Town of Bonnyville	23.4 PPB	NA
29 – Cold Lake South 2	24.6 PPB	NA
32 – St. Lina	34.1 PPB	NA
38 – Bonnyville	21.4 PPB	NA



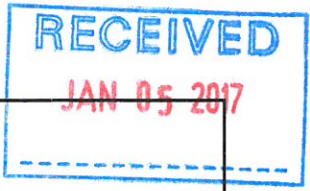
Summary

Minimum: 20.3 PPB – La Corey
 Maximum: 34.1 PPB – St. Lina
 Average: 25.0 PPB *Includes Duplicates



VOC RESULTS

Sample ID: 17010017-003



Customer ID: LICA
Cust Samp ID: LICA/VOC/CLS/Jan 01, 2017

Maxxam Analytics

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

Client: LICA Sampler S/N: 6167
Location: Cold Lake South Canister ID: H3300
Station ID: LICA 01 Installation Date/Time (mst): Dec 27, 2016 @ 09:48
Sample ID: LICA/VOC/CLS/Jan 01, 2017 Removal Date/Time (mst): Jan 03, 2017 @ 09:44

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 01, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Jan 02, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.8</u>	<u>+ 23.7</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: n/a
Date of last audit: Dec 19, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jan 03, 2017

Volatile Organics Data Results

Date: January 1, 2017
Canister ID: H3300

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	< 0.03
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.03
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	0.03
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	< 0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	< 0.01
2-Methylhexane	0.02
2-Methylpentane	0.04
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.02
Acetone	0.90
Acrolein	< 0.3
Benzene	0.08
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.16
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.04
Chloromethane	0.79
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.03
cis-2-Pentene	< 0.02
Cyclohexane	< 0.02
Cyclopentane	< 0.01
Dibromochloromethane	0.02
Ethanol	< 0.3
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.47
Freon-113	0.08

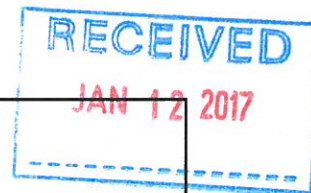
Volatile Organics Data Results

Date: January 1, 2017
Canister ID: H3300

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.03
Freon-12	0.99
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.23
Isopentane	0.17
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	< 0.03
m-Diethylbenzene	< 0.04
m-Ethyltoluene	< 0.08
Methyl butyl ketone	< 0.50
Methyl ethyl ketone	< 0.3
Methyl isobutyl ketone	< 0.4
Methyl methacrylate	< 0.07
Methyl tert butyl ether	< 0.03
Methylcyclohexane	0.01
Methylcyclopentane	0.02
Methylene chloride	< 0.3
n-Butane	0.48
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.02
n-Hexane	0.04
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	< 0.1
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	< 0.01
o-Xylene	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.04
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.04
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/Jan 07, 2017



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: 2660
 Station ID: LICA 01 Installation Date/Time (mst): Jan 03, 2017 @ 09:44
 Sample ID: LICA/VOC/CLS/Jan 07, 2017 Removal Date/Time (mst): Jan 10, 2017 @ 10:59

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 07, 2017</u>	<u>00:00</u>	<u>00:00 Jan 08, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.8</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: Date of last audit - Dec 19, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Limin Li Date: Jan 10, 2017

Volatile Organics Data Results

Date: January 7, 2017
Canister ID: 2660

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	0.06
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	0.01
1,3,5-Trimethylbenzene	0.03
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.10
1-Hexene	< 0.02
1-Pentene	0.03
2,2,4-Trimethylpentane	0.06
2,2-Dimethylbutane	0.05
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.07
2,3-Dimethylpentane	0.08
2,4-Dimethylpentane	0.03
2-Methylheptane	0.04
2-Methylhexane	0.10
2-Methylpentane	0.22
3-Methylheptane	0.03
3-Methylhexane	0.09
3-Methylpentane	0.13
Acetone	1.10
Acrolein	< 0.3
Benzene	0.25
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.10
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	0.03
cis-2-Pentene	< 0.02
Cyclohexane	0.11
Cyclopentane	0.06
Dibromochloromethane	< 0.01
Ethanol	1.20
Ethyl acetate	< 0.4
Ethylbenzene	0.05
Freon-11	0.28
Freon-113	0.09

Volatile Organics Data Results

Date: January 7, 2017
Canister ID: 2660

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.64
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.88
Isopentane	0.81
Isoprene	0.01
Isopropyl alcohol	0.60
Isopropylbenzene	0.01
m,p-Xylene	0.18
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	0.19
Methylcyclopentane	0.16
Methylene chloride	< 0.3
n-Butane	1.55
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.11
n-Hexane	0.19
n-Nonane	0.03
n-Octane	0.05
n-Pentane	0.50
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.02
o-Xylene	0.08
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.30
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.03
trans-2-Pentene	0.03
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: H2834
 Station ID: LICA 01 13 Installation Date/Time (mst): Jan 10, 2017 @ 13:30
 Sample ID: LICA/VOC/CLS/Jan 07, 2017 (A.V.) Removal Date/Time (mst): Jan 17, 2017 @ 09:54

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
January 13, 2017	0:00	January 14, 2017 <u>00:00 A.V.</u>	24.0

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
-27.9	<u>+24.4</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
10.00	6.52	24.0

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: December 19, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: November 9, 2016 (due every 6 months)

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

Comments: Date of last audit - Dec 19, 2016

Results also to Cheri Sinclair as per email.
JMP

Deployment Technician Signature: *Limin Li*

Collection Technician Signature: *Alex Yakupov* Date: *Jan 17, 2017*



Sample ID: 17010134-001
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Jan 13, 2017

Volatile Organics Data Results

Date: January 13, 2017
Canister ID: H2834

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	0.10
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.04
1,3-Butadiene	0.04
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.08
1-Hexene	< 0.02
1-Pentene	0.01
2,2,4-Trimethylpentane	0.04
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.01
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.04
2,4-Dimethylpentane	0.02
2-Methylheptane	0.02
2-Methylhexane	0.07
2-Methylpentane	0.19
3-Methylheptane	< 0.02
3-Methylhexane	0.06
3-Methylpentane	0.11
Acetone	1.00
Acrolein	< 0.3
Benzene	0.32
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.12
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
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	0.09
Cyclopentane	0.04
Dibromochloromethane	< 0.01
Ethanol	0.70
Ethyl acetate	< 0.4
Ethylbenzene	0.06
Freon-11	0.33
Freon-113	0.09

Volatile Organics Data Results

Date: January 13, 2017
Canister ID: H2834

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.66
Hexachloro-1,3-butadiene	< 0.50
Isobutane	2.01
Isopentane	0.84
Isoprene	< 0.01
Isopropyl alcohol	4.70
Isopropylbenzene	0.01
m,p-Xylene	0.34
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	0.16
Methylcyclopentane	0.12
Methylene chloride	< 0.3
n-Butane	3.13
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.08
n-Hexane	0.22
n-Nonane	0.02
n-Octane	0.04
n-Pentane	0.90
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.02
o-Xylene	0.12
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.56
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

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: S5632
 Station ID: LICA 01 Installation Date/Time (mst): Jan 17, 2017 @ 09:54
 Sample ID: LICA/VOC/CLS/Jan 19, 2017 Removal Date/Time (mst): Jan 20, 2017 @ 08:47

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 19, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Jan 20, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.7</u>	<u>+23.1</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: Date of last audit - Dec 19, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jan 20, 2017

Sample ID: 17010189-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/Jan 19, 2017



Volatile Organics Data Results

Date: January 19, 2017
Canister ID: 55632

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	0.08
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.03
1,3-Butadiene	0.06
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.19
1-Hexene	< 0.02
1-Pentene	0.04
2,2,4-Trimethylpentane	0.19
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.05
2,3-Dimethylbutane	0.11
2,3-Dimethylpentane	0.21
2,4-Dimethylpentane	0.08
2-Methylheptane	0.06
2-Methylhexane	0.18
2-Methylpentane	0.32
3-Methylheptane	0.04
3-Methylhexane	0.18
3-Methylpentane	0.22
Acetone	2.00
Acrolein	< 0.3
Benzene	0.37
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.12
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.04
Chloromethane	0.46
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.04
cis-2-Pentene	0.02
Cyclohexane	0.12
Cyclopentane	0.06
Dibromochloromethane	< 0.01
Ethanol	3.00
Ethyl acetate	< 0.4
Ethylbenzene	0.09
Freon-11	0.33
Freon-113	0.10

Volatile Organics Data Results

Date: January 19, 2017
Canister ID: 55632

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.73
Hexachloro-1,3-butadiene	< 0.50
Isobutane	2.80
Isopentane	1.90
Isoprene	0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.28
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	0.24
Methylcyclopentane	0.24
Methylene chloride	< 0.3
n-Butane	6.72
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.18
n-Hexane	0.29
n-Nonane	0.03
n-Octane	0.06
n-Pentane	0.70
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.03
o-Xylene	0.12
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	0.07
Tetrahydrofuran	< 0.4
Toluene	0.62
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.04
trans-2-Pentene	0.04
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: H 2823
 Station ID: LICA01 Installation Date/Time (mst): Jan 20, 2017 @ 08:47
 Sample ID: LICA/VOC/CLS/Jan 25, 2017 Removal Date/Time (mst): Jan 27, 2017 @ 09:17

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 25, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Jan 26, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.1</u>	<u>+23.9</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

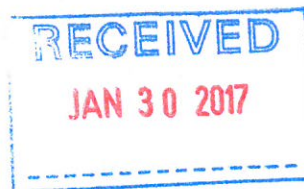
Comments: Date of last audit - Dec 19, 2016

Deployment Technician Signature: Alex Yakupov

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

Sample ID: 17010212-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/ Jan 25, 2017



Volatile Organics Data Results

Date: January 25, 2017
Canister ID: H2823

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	0.01
2-Methylheptane	0.02
2-Methylhexane	0.05
2-Methylpentane	0.11
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.07
Acetone	0.80
Acrolein	< 0.3
Benzene	0.18
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	0.07
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	0.70
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.36
Freon-113	0.10

Volatile Organics Data Results

Date: January 25, 2017
Canister ID: H2823

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.74
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.92
Isopentane	0.62
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	0.10
Methylcyclopentane	0.09
Methylene chloride	< 0.3
n-Butane	2.05
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.06
n-Hexane	0.14
n-Nonane	< 0.01
n-Octane	0.03
n-Pentane	0.50
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	0.12
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

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

Client: LICA
 Location: Cold Lake South
 Station ID: LICA 01
 Sample ID: LICA/VOC/CLS/Jan 31, 2017

Sampler S/N: 6167
 Canister ID: 35619
 Installation Date/Time (mst): Jan 27, 2017 @ 09:17
 Removal Date/Time (mst): Feb 01, 2017 @ 11:39

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 31, 2017</u>	<u>00:00</u>	<u>00:00 Feb 01, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum

Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.3</u>	<u>+23.7</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

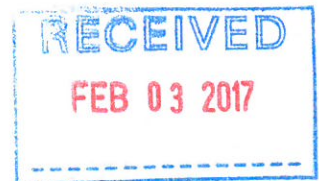
Comments: Date of last audit - Dec 19, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Feb 01, 2017

Sample ID: 17020030-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/CLS/Jan 31, 2017



Volatile Organics Data Results

Date: January 31, 2017
Canister ID: 55619

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	0.04
3-Methylheptane	< 0.02
3-Methylhexane	< 0.02
3-Methylpentane	0.05
Acetone	1.50
Acrolein	< 0.3
Benzene	0.09
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.06
Carbon tetrachloride	0.12
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.56
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.03
Cyclopentane	< 0.01
Dibromochloromethane	< 0.01
Ethanol	< 0.3
Ethyl acetate	< 0.4
Ethylbenzene	< 0.01
Freon-11	0.36
Freon-113	0.11

Volatile Organics Data Results

Date: January 31, 2017
Canister ID: 55619

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.79
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.28
Isopentane	0.17
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	0.04
Methylene chloride	< 0.3
n-Butane	0.36
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.03
n-Hexane	0.13
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.10
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	0.13
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

PAH RESULTS

Sample ID: 17010017-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/Jan 01, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client: LICA Puf+ S/N: P13-01
Location: Cold Lake South Motor S/N: 1138/100-1020
Station ID: LICA 01 Installation Date/Time: Dec 27, 2016 11:11
Field Sample ID: LICA/PUF/CLS/Jan 01, 2017 Removal Date/Time: Jan 03, 2017/09:59

Sample Data Collection Information

Sample Date: Jan 01, 2017 Average Pressure (mmHg) n/a
Start Time (mst): 00:00 Average Flow (Q_{std}) n/a
End Time (mst): 00:00 Jan 02, 2017 Average Temperature (°C) n/a
Elapsed Time (Hours): 24:00 Volume (Vstd m³) n/a

Sample Recovery Checklist

(circle one)

- Flow Rate 230 slpm +/- 0.2 slpm ? YES NO
- Average temperature appears correct? YES NO
- Average pressure appears correct? YES NO
- Any error messages? (if yes list below) YES NO
- Sample duration 24 hours? YES NO

Date of last calibration/audit: Dec 28, 2016

Other observations?

The PUF does not require analysis. No data saved due to the software ERROR FOOT assumingly caused by extremely low ambient temperature of ~ -35°C

Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Jan 03, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 7, 2017
PUF S/N: TE-01

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.67
2-Methylnaphthalene	1.11
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.08
Acenaphthylene	0.06
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	0.02
Benzo(b,j,k)fluoranthene	0.07
Benzo(c)phenanthrene	0.02
Benzo(e)pyrene	0.02
Benzo(ghi)perylene	0.02
Chrysene	0.04
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	0.13
Indeno(1,2,3-cd)pyrene	0.02
Naphthalene	0.99
Perylene	0.01
Phenanthrene	0.27
Pyrene	0.08
Retene	0.17

Sample ID: 17010134-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Jan 13, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	LICA	Puf+ S/N:	TE-11
Location:	Cold Lake South	Motor S/N:	1138/100-1020
Station ID:	LICA 01	Installation Date/Time:	Jan 10, 2017 @ 14:20
Field Sample ID:	LICA/PUF/CLS/JAN 13, 2017	Removal Date/Time:	Jan 17, 2017 @ 09:46

Sample Data Collection Information

Sample Date:	January 13, 2017	Average Pressure (mmHg)	717
Start Time (mst):	0:00	Average Flow (Q _{std})	229
End Time (mst):	January 14, 2017	Average Temperature (°C)	-15.8°
Elapsed Time (Hours):	24	Volume (V _{std} m ³)	330.16

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:	December 28, 2016	
Other observations?	n/a	

Deployed By: LIMIN LI

Collected By: Alex Yakupov Date: Jan 17, 2017

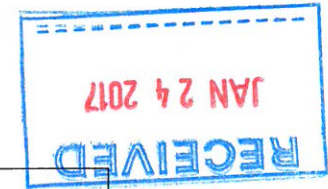
Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 13 , 2017
PUF S/N: TE-11

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.49
2-Methylnaphthalene	0.77
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.12
Acenaphthylene	0.09
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.01
Benzo(a)pyrene	0.02
Benzo(b,j,k)fluoranthene	0.06
Benzo(c)phenanthrene	0.02
Benzo(e)pyrene	0.02
Benzo(ghi)perylene	0.02
Chrysene	0.03
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.01
Fluoranthene	0.09
Fluorene	0.25
Indeno(1,2,3-cd)pyrene	0.02
Naphthalene	0.75
Perylene	0.01
Phenanthrene	0.36
Pyrene	0.05
Retene	0.10

Sample ID: 17010189-002

Customer ID: LICA
Cust Samp ID: LICA/PUF/CLS/Jan 19, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	LICA	Puf+ S/N:	TE-09
Location:	Cold Lake South	Motor S/N:	1138/100-1020
Station ID:	LICA 01	Installation Date/Time:	Jan 17, 2017/09:46
Field Sample ID:	LICA/PUF/CLS/Jan 19, 2017	Removal Date/Time:	Jan 20, 2017/09:04

Sample Data Collection Information

Sample Date:	January 19, 2017	Average Pressure (mmHg)	696
Start Time (mst):	00:00	Average Flow (Q _{std})	22.9
End Time (mst):	Jan 20, 2017/00:00	Average Temperature (°C)	-4.5°
Elapsed Time (Hours):	24.0	Volume (V _{std} m ³)	330.18

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:	Dec 28, 2016	
Other observations?	n/a	

Deployed By:	Alex Yakupov	
Collected By:	Alex Yakupov	Date: Jan 20, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 19 , 2017
PUF S/N: TE-09

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.75
2-Methylnaphthalene	1.37
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.23
Acenaphthylene	0.74
Acridine	< 0.01
Anthracene	0.07
Benzo(a)anthracene	0.05
Benzo(a)pyrene	0.07
Benzo(b,j,k)fluoranthene	0.12
Benzo(c)phenanthrene	0.03
Benzo(e)pyrene	0.05
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	0.16
Fluorene	0.31
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	1.00
Perylene	0.01
Phenanthrene	0.51
Pyrene	0.14
Retene	0.16

Sample ID: 17010212-001

Customer ID: LICA

Cust Samp ID: LICA/VOC/CLS/ Jan 25, 2017

ISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-03</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>Jan 20, 2017/09:04</u>
Field Sample ID:	<u>LICA/PUF/CLS/Jan 25, 2017</u>	Removal Date/Time:	<u>Jan 27, 2017/09:38</u>

Sample Data Collection Information

Sample Date:	<u>Jan 25, 2017</u>	Average Pressure (mmHg)	<u>716</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>Jan 26, 2017, 00:00</u>	Average Temperature (°C)	<u>-11.5°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.17</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO

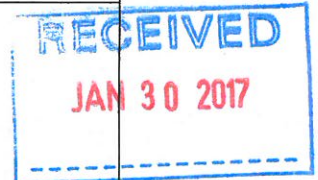
Date of last calibration/audit: Dec 28, 2016

Other observations? No AITF "green tag" provided with the PUF filter

Deployed By: Alex Yakupov

Collected By: Alex Yakupov

Date: Jan 27, 2017



Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 25 , 2017
PUF S/N: TE-03

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.70
2-Methylnaphthalene	1.17
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.11
Acenaphthylene	0.15
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.02
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	0.15
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.90
Perylene	< 0.01
Phenanthrene	0.23
Pyrene	0.04
Retene	0.12

Sample ID: 17020030-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/CLS/Jan 31, 2017

SCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-08</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>Jan 27, 2017 / 09:38</u>
Field Sample ID:	<u>LICA/PUF/CLS/Jan 31, 2017</u>	Removal Date/Time:	<u>Feb 01, 2017 / 11:30</u>

Sample Data Collection Information

Sample Date:	<u>Jan 31, 2017</u>	Average Pressure (mmHg)	<u>720</u>
Start Time (mst):	<u>00:00 (A.Y.)</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Jan Feb 01, 2017</u>	Average Temperature (°C)	<u>-12.5°</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)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>Dec 28, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Feb 01, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 31, 2017
PUF S/N: TE-08

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.18
2-Methylnaphthalene	0.31
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.03
Acenaphthylene	0.03
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.03
Benzo(c)phenanthrene	0.02
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	0.07
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.36
Perylene	< 0.01
Phenanthrene	0.11
Pyrene	0.02
Retene	0.04

PARTISOL RESULTS

Sample ID: 17010016-001

Customer ID: LICA
Cust Samp ID: P6129415

Priority: Normal

Partisol Sample Data Sheet



Date Sampled: Jan 01, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P 612 94 15

Start Time 00:00 Jan 01, 2017

End Time 00:00 Jan 02, 2017

Status OK

Std Vol 24.096

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

n/a

Sample inlet cleaned on Oct 24, 2016

Date of last calibration: Oct 24, 2016

Technician Signature: Alex Yakupov

Date: Jan 03, 2017

Time: 10:12

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: 17010128-001

Customer ID: LICA

Cust Samp ID: P6129416

AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Jan 07, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P 612 94 16

Start Time 00:00 Jan 07, 2017

End Time 00:00 Jan 08, 2017

Status OK

Std Vol 27.014

Valid Time 24.0

Total Time 24.0

Comments: Weather Conditions, etc.

Sample inlet cleaned on Oct 24, 2016
Date of last calibration: Oct 24, 2016

Technician Signature:

Alex Yakupov
Date: Jan 10, 2017
Time: 15:30
collected by: Limin Li

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: 17010128-002

Customer ID: LICA

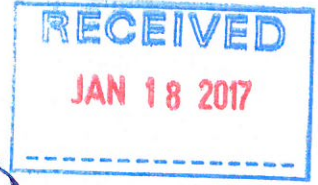
Cust Samp ID: P6129417

AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal

Date Sampled: Jan 13, 2017
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: P6129417



PM2.5

Start Time Jan 13, 2017 @ 00:00
 End Time Jan 14, 2017 @ 00:00
 Status OK
 Std Vol 26.375
 Valid Time 24:00
 Total Time 24.0

Comments: Weather Conditions, etc.

n/a

Sample inlet cleaned on Oct 24, 2016
Date of last calibration: Oct 24, 2016

Technician Signature: Limin Li

 Date: Jan 17, 2017
 Time: 10:21
 Collected by: Alex Yakupov

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: 17010191-001

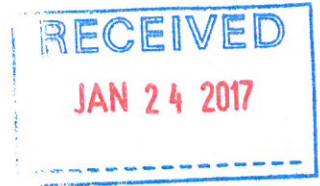
Customer ID: LICA

Cust Samp ID: LICA Fit # P6129418

AIR FCD-01318/2

Partisol Sample Data Sheet

Priority: Normal



Date Sampled: Jan 19, 2017

Location: Cold Lake South

Parameter: TSP PM10

PM2.5

Filter #: P 612 94 18

Start Time 00:00 Jan 19, 2017

End Time 00:00 Jan 20, 2017

Status OK

Std Vol 24.568

Valid Time 24:00

Total Time 24.0

Comments: Weather Conditions, etc.

n/a

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

Technician Signature: Alex Yakupov

Date: Jan 20, 2017

Time: 09:21

Programming

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

Note: Beginning & End Date should be same date

Sample ID: 17010214-001

Customer ID: LICA

Cust Samp ID: P6031618

Priority: Normal

Partisol Sample Data Sheet



Date Sampled: Jan 25, 2017
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: P603 16 18

PM2.5

Start Time 00:00 Jan 25, 2017
 End Time 00:00 Jan 26, 2017
 Status OK
 Std Vol 25.961
 Valid Time 24:00
 Total Time 24.0

Comments: Weather Conditions, etc.

n/a

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

Technician Signature: Alex Yakupov
Date: Jan 27, 2017
Time: 09:52

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: 17020029-001

Customer ID: LICA

AIR FCD-01318/2

Cust Samp ID: LICA Fit # P6031619

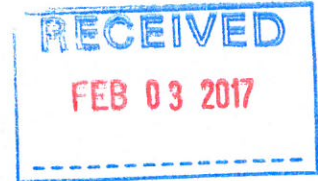
Artisol Sample Data Sheet

Priority: Normal

Date Sampled: Jan 31, 2017
 Location: Cold Lake South
 Parameter: TSP PM10
 Filter #: P603 16 19

PM2.5

Start Time 00:00 Jan 31, 2017
 End Time 00:00 Feb 01, 2017
 Status OK
 Std Vol 26.112
 Valid Time 24.00
 Total Time 24.0



Comments: Weather Conditions, etc.

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

Technician Signature: Alex Yakupov
 Date: Feb 01, 2017
 Time: 11:54

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



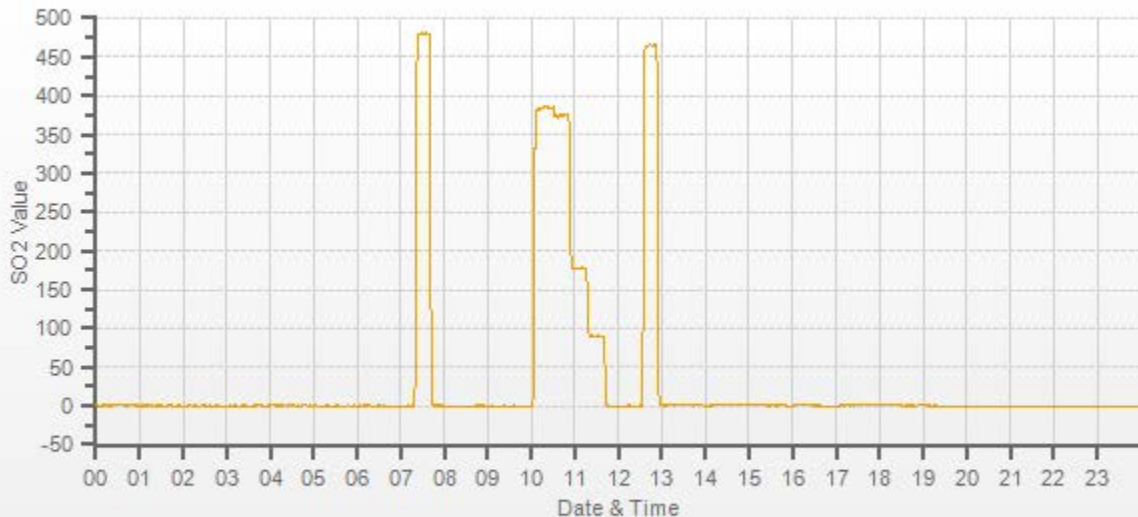
Partisol Sampler Results

Date	Filter NO.	Concentration (mg)
January 1	P6129415	0.024
January 7	P6129416	0.063
January 13	P6129417	0.169
January 19	P6129418	0.235
January 25	P6031618	0.307
January 31	P6031619	0.034

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE

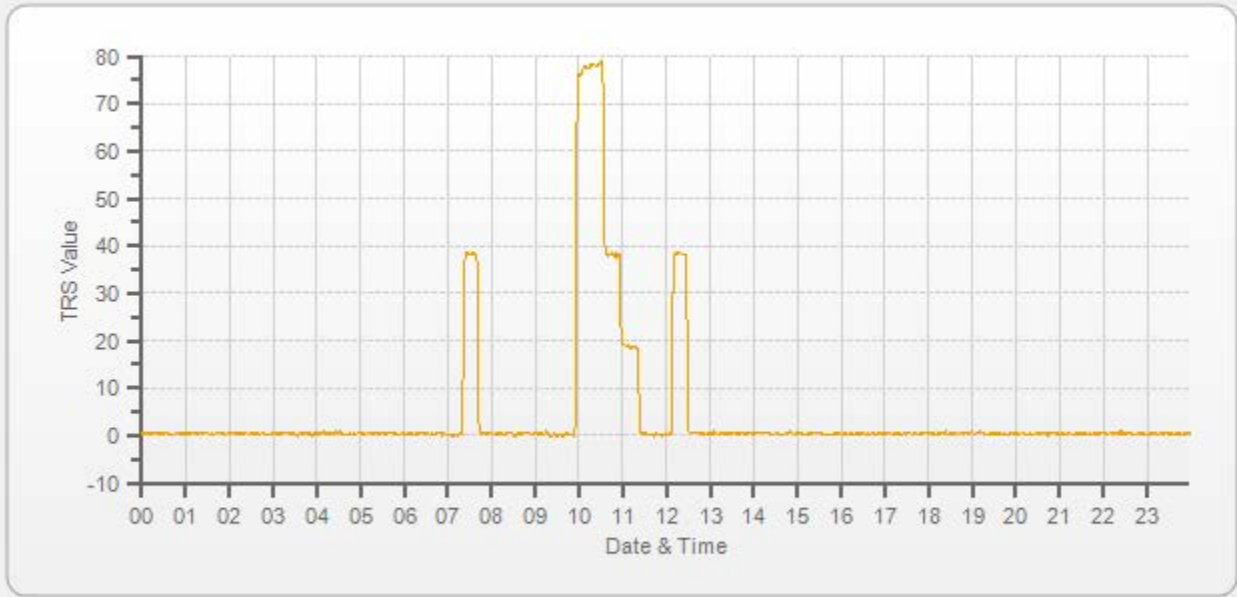
Thermo 43i Sulphur Dioxide Analyzer Calibration																																																																						
Date: January 10, 2017 Company/Airshed: LICA Location/Station Name: Cold Lake South Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 9:20 End Time 24 hr. (mst): 13:00 Calibration Method: Gas Dilution	Barometric Pressure: 27.88 inHg Station Temperature °C: 23 Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Limin Li / Trina Whitsitt Cal Gas Expiry Date: December 25, 2018 Converter Model & s/n (if applicable): n/a																																																																					
Analyzer: ID# or Serial Number: 806528242 Last Calibration Date: December 6, 2016 Previous C.F.: 1.001																																																																						
Range ppb: 500 As Found C.F.: 0.972 New C.F.: 1.000																																																																						
Calibrator: Flow Meter ID's: n/a Make & Model: Sabio 2010 Serial #: 17200415 Cal Gas Cylinder I.D. #: BLM002756T Cal Gas Conc. (ppm): 49.9	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																																																													
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Thermo 43i Sulphur Dioxide Analyzer Calibration 																																																																						
As found: BKG: 8.0 COEF: 0.985 PMT: -623.5 FLASH: 775 INTERNAL: 30.2 CHAMBER: 45.1 PERM OVEN GAS: 45.0 PERM OVEN HEATER: 44.2 PRESSURE: 682.8 SAMPLE FLOW: 0.470 LAMP INTENSITY: 96 CONVERTER: n/a CONVERTER SET: n/a Expected Value: 484.8	As left: BKG: 7.9 COEF: 0.954 PMT: -623.8 FLASH: 775 INTERNAL: 30.2 CHAMBER: 45.0 PERM OVEN GAS: 45.0 PERM OVEN HEATER: 44.20 PRESSURE: 682.8 SAMPLE FLOW: 0.470 LAMP INTENSITY: 96 CONVERTER: n/a CONVERTER SET: n/a Expected Value: 465.1																																																																					
Comments: The analyzer sample inlet filter was changed.																																																																						



— SO2[ppb]

TOTAL REDUCED SULPHUR

Thermo 450i Total Reduced Sulphur Analyzer Calibration																																																																							
Date: January 10, 2017 Company/Airshed: LICA Location/Station Name: Cold Lake South Parameter: Total Reduced Sulphur Start Time 24 hr. (mst): 9:20 End Time 24 hr. (mst): 12:30 Calibration Method: Gas Dilution	Barometric Pressure: 27.88 inHg Station Temperature °C: 23 Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Limin Li / Trina Whitsitt Cal Gas Expiry Date: January 8, 2018 Converter Model & s/n (if applicable): CDNova CDN-101 #501																																																																						
Analyzer: ID# or Serial Number: 812728560 Last Calibration Date: December 6, 2016 Previous C.F.: 1.000	Range ppb: 100 As Found C.F.: 1.000 New C.F.: 1.000																																																																						
Calibrator: Flow Meter ID's: n/a Make & Model: AI700 Serial #: 690 Cal Gas Cylinder I.D. # : BLM002508 Cal Gas Conc. (ppm): 10.2	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Standard Calibration Points for Ranges</th> </tr> <tr> <th>Point</th> <th>ppb</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>78</td> </tr> <tr> <td>Mid</td> <td>38</td> </tr> <tr> <td>Low</td> <td>19</td> </tr> </tbody> </table> SO₂ Scrubber Check (10 mins.) Start/End Time 24 hr.: 09:40/09:50 Target Concentration (ppb): 780 Result (ppb): 0 Zero Corrected Result (ppb): 0	Standard Calibration Points for Ranges		Point	ppb	High	78	Mid	38	Low	19																																																												
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PMT: -650.5	PMT: -650.5																																																																						
FLASH: 739	FLASH: 739																																																																						
INTERNAL: 33.5	INTERNAL: 33.5																																																																						
CHAMBER: 45.2	CHAMBER: 45.2																																																																						
CONVERTER TEMP: 825	CONVERTER TEMP: 825																																																																						
CONVERTER SET: 825	CONVERTER SET: 825																																																																						
PERM OVEN GAS: 45.0	PERM OVEN GAS: 45.00																																																																						
PERM OVEN HTR: 44.37	PERM OVEN HTR: 44.38																																																																						
PRESSURE: 649.3	PRESSURE: 649.3																																																																						
SAMPLE FLOW: 0.502	SAMPLE FLOW: 0.502																																																																						
LAMP INTENSITY: 91	LAMP INTENSITY: 91																																																																						
Expected Value: 37.0	Expected Value: 38.2																																																																						
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. No high point adjusted.																																																																							



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: January 10, 2017	Barometric Pressure: 27.91 inHg
Company/Airshed: UCA	Station Temperature °C: 23
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny
Parameter: Total Hydrocarbon	Calibration Purpose: routine monthly
Start/End Time 24 hr. (mst): 11:45/ 16:00	Performed By/Reviewer: Limin Li Trina Whitsitt
Calibration Method: Gas Dilution	Cal Gas Expiry Date: January 7, 2022

Analyzer: ID# or Serial Number: 427408718	Range ppm: 50
Last Calibration Date: December 19, 2016	As Found C.F.: 0.992
Previous Cal High Point C.F.: 1.000	New C.F.: 0.999

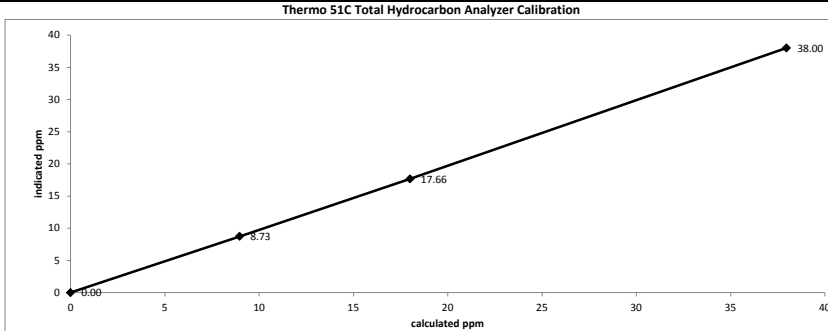
Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 627 Cal Gas Cylinder I.D. #: LL83638 CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm): 582.0 203.0 CH ₄ as propane/total CH ₄ equivalents (ppm): 558.3 1140.3	Standard Calibration Points for a Range of: 50 ppm <table border="1" style="width: 100%; border-collapse: 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	1995	0.00	1995	0.0	0.35	n/a
as found high	1995	68.70	2064	37.96	38.60	0.992
adjusted zero	1995	0.00	1995	0.00	0.00	n/a
adjusted high	1995	68.70	2064	37.96	38.00	0.999
mid	1995	32.00	2027	18.00	17.66	1.019
low	1995	15.80	2011	8.96	8.73	1.026
calibrator zero	1995	0.00	1995	0.0	0.00	n/a
Average C.F. =						1.015

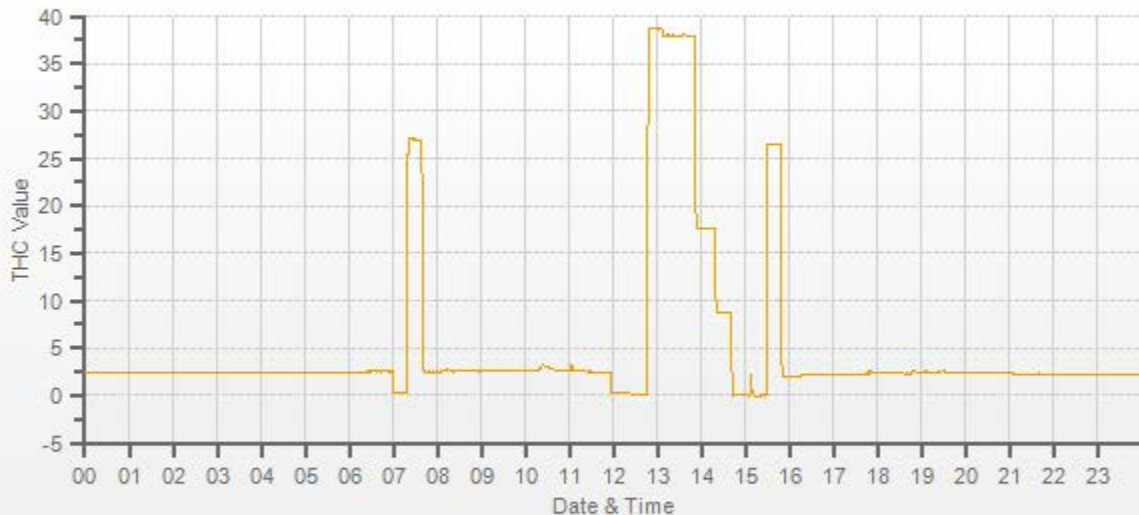
Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 0.997	> or = 0.995
b (Intercept as % of full scale) = 0.35%	.95-1.05
% change in C.F. from last cal = 0.76%	± 3% F.S.
	± 10%



As found: H2 cylinder (psi): 950 H2 cylinder reg set (psi): 24 Span Cylinder (psi): 1000 Span Cylinder Reg Set (psi): 24 Zero Air Gen Pressure: 36 measurement alarms: None service alarms: None cnt: 2373 rng: 1 try: 0 flm: 181.4 det: 125.5 Flame: 181 Filter: 125 Base: 125 Sample psi: 6.5 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Measured Flow: 0.89 Expected Value: 26.58	As left: H2 cylinder (psi): 950 H2 cylinder reg set (psi): 24 Span Cylinder (psi): 1000 Span Cylinder Reg Set (psi): 24 Zero Air Gen Pressure: 36 measurement alarms: None service alarms: None cnt: 2373 rng: 1 try: 0 flm: 181.4 det: 125.5 Flame: 181 Filter: 125 Base: 125 Sample psi: 6.5 Internal Air Pressure: 20 Internal Fuel Pressure: 14 Measured Flow: 0.89 Expected Value: 26.43
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Comments:
The analyzer sample inlet filter was changed.



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

remove

Date: January 10, 2017
 Company/Airshed: LICA
 Location/Station Name: Cold Lake South
 Start/End Time 24 hr. (mst): 9:20 / 16:30
 G.P.T. to be used for Ozone? Yes with 500 ppb NOx full scale
 Calibration Method: Gas Dilution & Gas Phase Titration

Barometric Pressure: 27.88 inHg
 Station Temperature °C: 23
 Weather Conditions: Mainly sunny
 Calibration Purpose: routine monthly
 Performed By/Reviewer: Limin Li Trina Whitsitt
 Cal Gas Expiry Date: December 25, 2018

Analyzer:

ID# or Serial Number: 1505664393
 Last Calibration Date: December 6, 2016
 Range ppb: 500

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	1.000	0.996	1.000
NO ₂ =	1.008	1.008	1.000
NOx =	1.000	0.996	1.000

Calibrator:

Flow Meter ID's: n/a
 Make & Model: Sabio 2010
 Serial #: 17200415
 Cal Gas Cylinder I.D. #: BLM002756T
 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	330	<--high ozone
Mid	180	245	n/a
Low	90	175	n/a
Extra Point #1	n/a	133	<--mid ozone
Extra Point #2	n/a	53	<--low ozone

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	6030	0.0	6030	0	0	0.2	0.3	n/a	n/a
as found high	5983	45.2	6028	380.2	380.2	382.0	382.0	0.996	0.996
adjusted zero	6030	0.00	6030	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5983	45.20	6028	380.2	380.2	380.0	380.0	1.000	1.000
mid	6009	21.50	6031	180.8	180.8	181.3	181.3	0.997	0.997
low	6018	10.90	6029	91.7	91.7	92.4	92.4	0.992	0.992
calibrator zero	6029	0.00	6029	0	0	0.1	0.1	n/a	n/a
Average C.F.=								0.996	0.996

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	5983	45.20	6028	0.0	380.0	380.0	0.0	0.0	0.0	
as found high NO2	5983	45.20	6028	250.0	125.0	378.0	253.0	255.0	253.0	1.008
adjusted high NO2	5983	45.20	6028	250.0	126.0	380.0	254.0	254.0	254.0	1.000
gpt mid	5983	45.20	6028	145.0	231.0	380.0	149.0	149.0	149.0	1.000
gpt low	5983	45.20	6028	56.0	325.0	381.0	55.0	55.0	55.0	1.000
Average NO ₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.001	1.001	1.000	.95-1.05
b (Intercept as % of full scale)=	0.09%	0.09%	0.00%	± 3% F.S.
% change in C.F. from last cal=	0.43%	0.41%	0.01%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:

NO Bkg: 3.5
 NOx Bkg: 3.6
 NO Coef: 1.018
 NO2 Coef: 1.000
 NOx Coef: 0.999
 PMT: -854.7
 Internal: 27.6
 Chamber: 50.3
 Cooler: -2.8
 NO2 Converter: 323.7
 NO2 Converter Set: 325.0
 Pressure: 178.4
 Flow: 0.774
 Ozonator Flow: OK
 Expected Value NO: 2.4
 Expected Value NO2: 261.0
 Expected Value NOx: 264.0

As left:

NO Bkg: 3.6
 NOx Bkg: 3.8
 NO Coef: 1.004
 NO2 Coef: 0.995
 NOx Coef: 0.999
 PMT: -854.7
 Internal: 27.6
 Chamber: 50.3
 Cooler: -2.8
 NO2 Converter: 323.2
 NO2 Converter Set: 325.0
 Pressure: 178.4
 Flow: 0.774
 Ozonator Flow: OK
 Expected Value NO: 2.0
 Expected Value NO2: 266.0
 Expected Value NOx: 268.0

Comments:

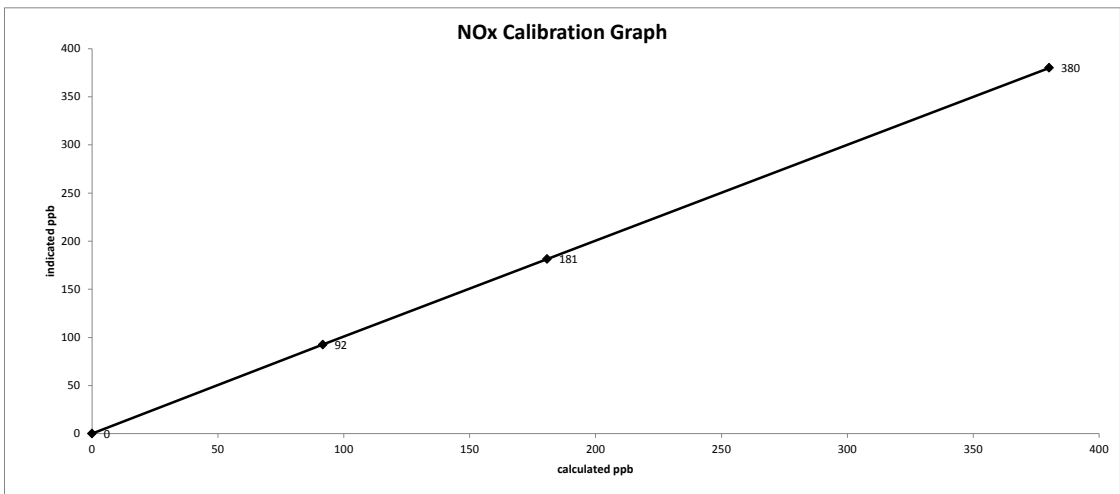
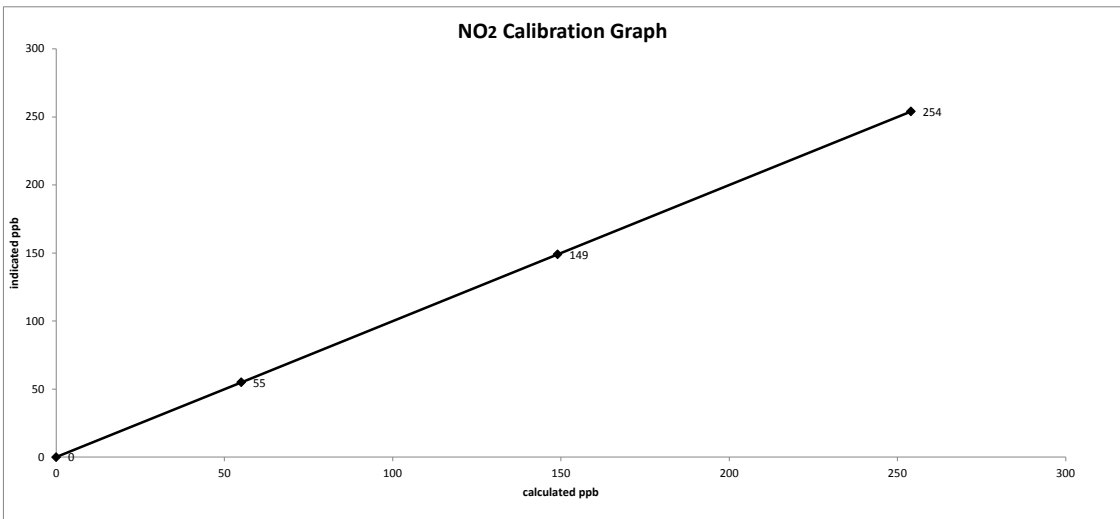
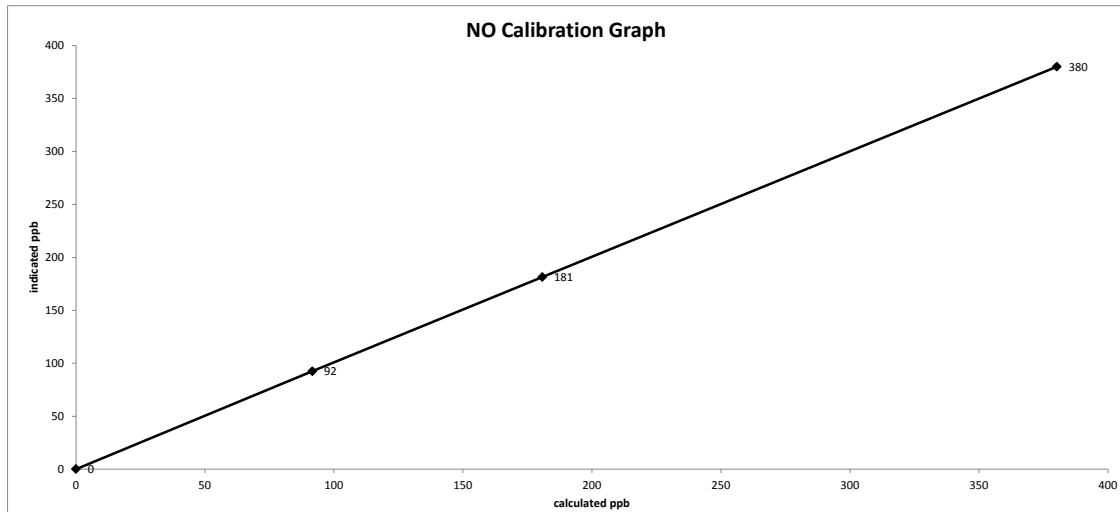
The analyzer sample inlet filter was changed.

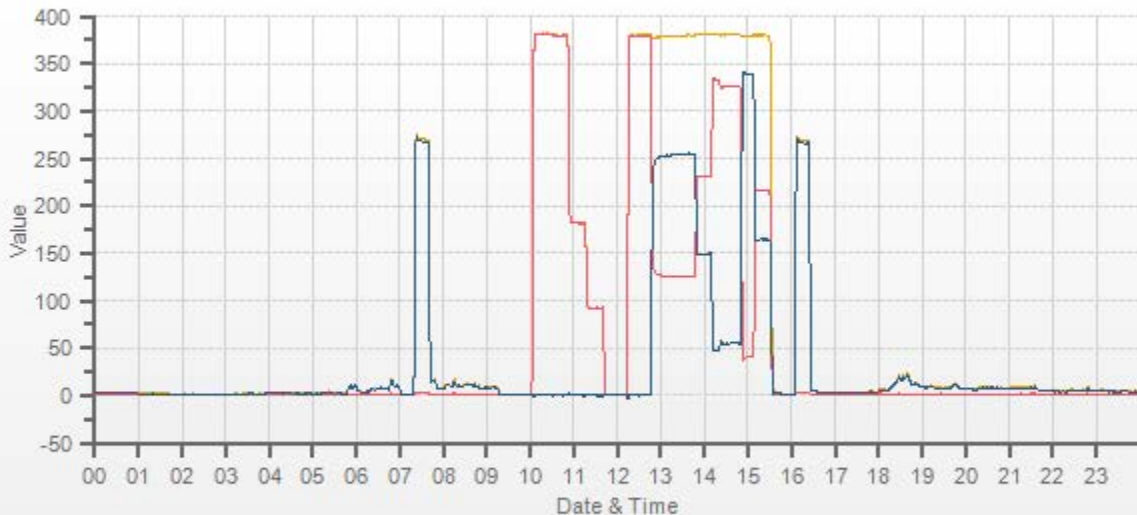
O3=330, NOX/NO/NO2=380/40/340 ; O3=160, NOX/NO/NO2=380/216/164.

Calibration gas audit certificate is included in the report. Concentrations are based on meeting AEP's acceptance criteria and may not match actual.

Date: January 10, 2017
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:20 / 16:30
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: January 10, 2017
 Company/Airshed: LICA
 Location/Station Name: Cold Lake South
 Start/End Time 24 hr. (mst): 15:40 / 20:00
 Ozone Calibration Method: Direct G.P.T.
 G.P.T. Date: January 10, 2017

Barometric Pressure: 27.91 inHg
 Station Temperature °C: 23
 Weather Conditions: Mainly sunny
 Calibration Purpose: routine monthly
 Performed By/Reviewer: Limin Li / Trina Whitsitt
 Cal Gas Expiry Date: n/a

Analyzer:
 ID# or Serial Number: 700419951
 Last Calibration Date: December 7, 2016
 Previous Cal High Point C.F.: 1.000

Ozone Range ppb: 500
 As Found C.F.: 1.047
 New C.F.: 1.000

Calibrator:
 Flow Meter ID's: n/a
 Make & Model: SABIO 2010
 Serial #: 17200415
 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

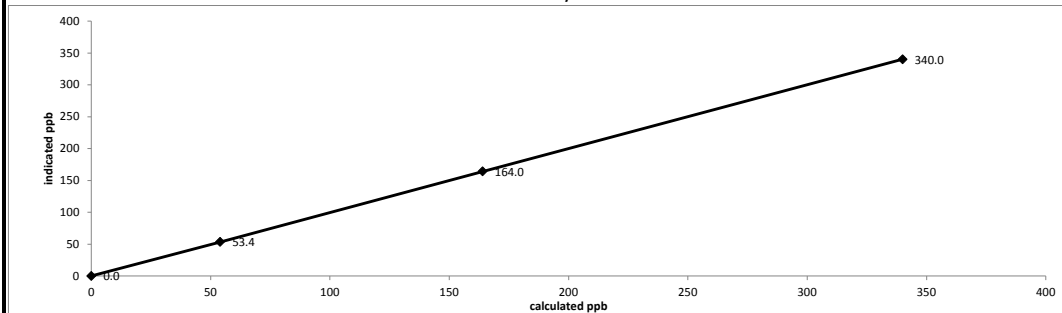
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	6028	6028	0.0	n/a	1.3	n/a
as found high	6028	6028	340.0	340.0	326.0	1.047
adjusted zero	6028	6028	0.0	0.0	0.0	n/a
adjusted high	6028	6028	340.0	340.0	340.0	1.000
mid	6028	6028	164.0	164.0	164.0	1.000
low	6028	6028	54.0	54.0	53.4	1.011
calibrator zero	6028	6028	0.0	n/a	-0.1	n/a
Average C.F. =						1.004

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000
 Slope = 0.999
 b (Intercept as % of full scale) = 0.05%
 % change in C.F. from last cal = -4.71%

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

Thermo 49i Ozone Analyzer Calibration

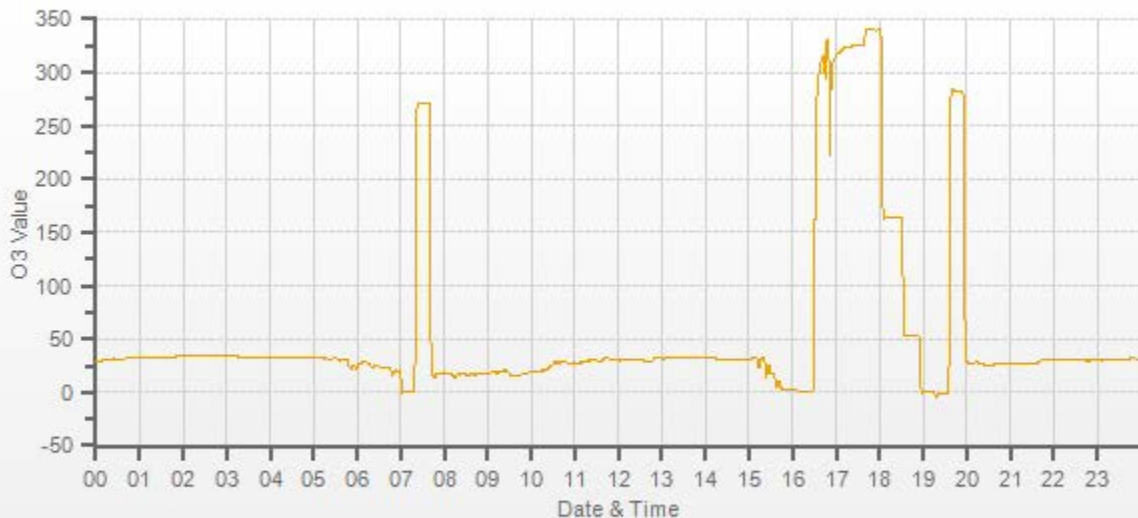


As found:
 O3 Bkg: 0.1
 O3 Coef: 1.004
 Photo Lamp: 9.6
 O3 Lamp: 9.0
 Bench: 29.8
 Bench Lamp: 53.5
 O3 Lamp: 67.4
 Pressure: 698.6
 Cell A lpm: 0.712
 Cell B lpm: 0.751
 O3 ppb: 31
 Cell A ppb: 23.2
 Cell B ppb: 38
 Cell A int: 88751
 Expected Value: 271.0

As left:
 O3 Bkg: 0.7
 O3 Coef: 1.047
 Photo Lamp: 9.6
 O3 Lamp: 9.0
 Bench: 28.3
 Bench Lamp: 53.5
 O3 Lamp: 67.4
 Pressure: 698.6
 Cell A lpm: 0.712
 Cell B lpm: 0.751
 O3 ppb: 31
 Cell A ppb: 23.2
 Cell B ppb: 38
 Cell A int: 88751
 Expected Value: 283.1

Comments:

The analyzer sample inlet filter was changed.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: January 10, 2017
Company: LICA
Station Name/Location: Cold Lake South
Previous Audit Date: December 19, 2016
Parameter: PM 2.5

Performed By/Reviewer: Limin Li | Trina Whitsitt
Start Time (mst): 17:30
End Time (mst): 18:30
Calibration Purpose: Bi-monthly #1
Weather Conditions: Light snow

1400A Information and Status:

ID# or Serial Number: <u>1405A201620804</u>	As Found Filter Loading %: <u>35.33</u>
Ko Factor: <u>14578</u>	As Left Filter Loading %: <u>22.26</u>
Ambient Temperature °C: <u>-24.32</u>	As Found Noise: <u>0.008</u>
Ambient Pressure atm: <u>0.933</u>	As Left Noise: <u>0.000</u>
Main Flow Reading lpm: <u>3.00</u>	Pump Vacuum: <u>0.37</u>
Aux Flow Reading lpm: <u>13.67</u>	Warnings: <u>none</u>

Reference Standards:

Make: <u>Dwyer</u>	Pressure: <u>BRUNTON</u>	Temperature: <u>BRUNTON</u>
Model: <u>475 Mark III</u>	<u>BIO</u>	<u>BIO</u>
Serial Number: <u>#2</u>	<u>BPO 14</u>	<u>BPO 14</u>
Calibration Date: <u>January 15, 2016</u>	<u>July 7, 2016</u>	<u>July 7, 2016</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	0.10	0.02	0.10
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.01	0.17	0.19	0.17
	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	0.10	0.02	0.10
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.01	0.17	0.19	0.17
	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>-24.4</u>	1405F pressure atm: <u>0.934</u>
reference temperature °C: <u>-25.7</u>	reference pressure: <u>0.934</u>
difference °C: <u>-1.3</u>	difference : <u>0.000</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>-25.7</u>	1405F pressure atm: <u>0.934</u>
reference temperature °C: <u>-25.7</u>	reference pressure: <u>0.934</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>13.67</u>
reference main flow lpm: <u>3.08</u>	reference total/aux flow lpm: <u>14.24</u>
difference lpm: <u>0.08</u>	difference lpm: <u>0.57</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>3.08</u>	reference total/aux flow lpm: <u>14.24</u>
difference lpm: <u>0.08</u>	difference lpm: <u>0.57</u>

K_o Audit:

Last K_o audit date: November 25, 2016
1405F K_o factor: 14578
Measured K_o factor: 14754.1000
% difference: 1.21

Comments:

The TEOM sample filter was changed.

The 47 mm FDMS filter was changed.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: January 26, 2017
Company: LICA
Station Name/Location: Cold Lake South
Previous Audit Date: January 10, 2016
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
Start Time (mst): 9:08
End Time (mst): 11:38
Calibration Purpose: Bi-monthly #1
Weather Conditions: Sunny

1400A Information and Status:

ID# or Serial Number: <u>1405A201620804</u>	As Found Filter Loading %: <u>35.53</u>
Ko Factor: <u>14578</u>	As Left Filter Loading %: <u>19.40</u>
Ambient Temperature °C: <u>-17.92</u>	As Found Noise: <u>0.008</u>
Ambient Pressure atm: <u>0.938</u>	As Left Noise: <u>0.000</u>
Main Flow Reading lpm: <u>3.00</u>	Pump Vacuum: <u>0.37</u>
Aux Flow Reading lpm: <u>13.67</u>	Warnings: <u>none</u>

Reference Standards:

Make: <u>Dwyer</u>	Pressure: <u>Fisher Scientific</u>	Temperature: <u>FLUKE</u>
Model: <u>475 Mark III</u>	ID#: <u>FB 1291</u>	ID#: <u>1551A Ex STIK</u>
Serial Number: <u>#3</u>	ID#: <u>O5544</u>	ID#: <u>4295</u>
Calibration Date: <u>January 1, 2017</u>	Calibration Date: <u>December 5, 2016</u>	Calibration Date: <u>November 15, 2016</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.09	0.00	0.09
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	0.20	0.00	0.20
	limit	0.60	0.60	0.60	0.60

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

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

As found temperature and pressure:

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>-17.9</u>	1405F pressure atm: <u>0.938</u>
reference temperature °C: <u>-17.2</u>	reference pressure: <u>0.937</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>-4.1</u>	1405F pressure atm: <u>0.937</u>
reference temperature °C: <u>-4.1</u>	reference pressure: <u>0.937</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: <u>3.00</u>	1400A total/aux flow lpm: <u>13.67</u>
reference main flow lpm: <u>3.06</u>	reference total/aux flow lpm: <u>14.26</u>
difference lpm: <u>0.06</u>	difference lpm: <u>0.59</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>13.66</u>
difference lpm: <u>0.00</u>	difference lpm: <u>-0.01</u>

K_o Audit:

Last K_o audit date: November 25, 2016
1405F K_o factor: 14578
Measured K_o factor: 14754.1000
% difference: 1.21

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.

After the "AS FOUND" part, replacement of two out of order case fans (FDMS compartment and power unit) was completed. Flows were calibrated.

PARTISOL SAMPLER



PARTISOL 2000 Audit

Date: January 27, 2017
Company: LICA
Station: Cold Lake South
Parameter: PM 2.5
Weather Conditions: Mainly sunny
Start Time (mst): 10:13
End Time (mst): 11:26
Performed By/Reviewer: Alex Yakupov | Trina Whitsitt

Sampler

Instrument Data

Make/Model: R & P
Unit # # 2873
ID# or Serial Number: 2000B206140102
Temperature (°C) 0.6
Pressure (atm) 0.944
Set Flow (litres/min) 16.67

Reference Standards

	Flow	Pressure	Temperature	Manometer
Make:	FTS	Fisher	FLUKE	Dwyer
Model:	Orifice #2	FB1291	1551A Ex STIK	475 Mark III
Serial Number:	91001	ID# 05544	ID# 4295	#3
Calibration Date:	February 21, 2016	December 5, 2016	November 15, 2016	January 1, 2017

Temperature/Pressure/Flow Audit

Reference Temperature: (±2 °C)	0.5	Δ °C	-0.1
Reference Pressure: (±0.02 ATM)	0.941	Δ atm	-0.003
Reference Flow (± 1.0 litres/min)	16.98	litres/min	-0.31

Leak Check - Manual Mode

mmHg

Flow Controller Valve Closed (V1): 23.0
Pump Valve Closed after 10 Secs. (V2): 23.0
1/2*V1=(VL): 11.5
Pass/Fail? Pass

Other Checks:

Rubber Seal Condition: OK
Inlet Head Cleanliness: Sample inlet head cleaned on Jan 27, 2017
Inline Filter Condition: OK
Status Alarms: OK
Insulating Jacket Condition: OK
Side Hoods and Dust Filters: Side Dust Filter was cleaned on Jan 27, 2017
Location v.s. AMD: OK
Flow Setting Actual or Standard ?: Actual

	As Found	As Left	% Change
Did the temperature require adjustment?	No		
Did the ambient pressure require adjustment?	No		
Did the ambient flow require adjustment?	No		

Recommendations/Comments:

Calculations for Total Flow:

Enter Barometric Pressure in. Hg 28.17
 Barometric Pressure atm 0.941
 Enter Ambient Temperature °C 0.54
 Enter "m" variable 0.395
 Enter "b" variable 0.0089
 Enter Δp in. H₂O 6.35
Actual Flow lpm= 16.98

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

WIND SYSTEM



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

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

Sonic Wind Sensor Certificate of Calibration

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

Calibration Equipment

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

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

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

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

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

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

CALIBRATORS

Company Maxxam Operator: Christopher Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>17200415</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>May 2015</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>48.5/48.5</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5029	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5030	80.6	0.777	0.777	0.805	-0.005	0.800	4%	3%
5025	39.4	0.380	0.380	0.394	-0.002	0.392	4%	3%
5028	19.8	0.191	0.191	0.198	-0.001	0.197	4%	3%
Absolute Average Percent Difference							3.65%	3.09%

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)=	1.0360	0.90-1.10		m (Slope)=	1.0295		
b (Intercept % of FS)=	0.0110	± 3% F.S.		b (Intercept % of FS)=	0.0293		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5030	Lamp C.	0.000	0.804	-0.004	0.800	NO ₂	% Diff. Limit
5030	1.388	0.495	0.309	0.491	0.800	0%	± 10%
5030	0.745	0.241	0.563	0.239	0.802	1%	± 10%
5030	0.367	0.091	0.713	0.089	0.801	2%	± 10%
Absolute Average Percent Difference						1%	± 10%

LINEAR REGRESSION ANALYSIS				$y=mx+b$ (where x =calculated concentration, y =indicated concentration)			
NO ₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9988	0.90-1.10					
b (Intercept % of FS)=	-0.2760	± 3% F.S.					

AENV Standards		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
		Last Calibration Date	<u>May 18, 2016</u>
		Full Scale (ppm)	<u>1.0</u>

 COMMENTS: Contains 50.3 ppm SO₂. Flows not measured as per Chapter 7, Section 5 of AMD.

 Auditor: AI Clark
 Operator Signature: *AI Clark*

 Date: May 18, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-164

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>690</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 2, 2015</u>	Temperature (°C)	<u>24</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>700 mmHg</u>
NO/NOX Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4998</u>	Pt. #2 <u>4994</u>	Pt. #3 <u>4996</u>
Gas Flow (sccm)		
Pt. #1 <u>77.5</u>	Pt. #2 <u>37.7</u>	Pt. #3 <u>18.8</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4998	0.0	0.000	0.000	0.001	0.001	0.001	Limit ± 10%	
4998	77.5	0.780	0.780	0.785	-0.002	0.783	1%	0%
4994	37.7	0.380	0.380	0.381	-0.001	0.380	0%	0%
4996	18.8	0.189	0.189	0.189	0.000	0.190	0%	0%
Absolute Average Percent Difference							0%	0%

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)= 1.0063	0.90-1.10	m (Slope)= 1.0024
b (Intercept % of FS)= -0.0486	± 3% F.S.	b (Intercept % of FS)= 0.0457

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4998	0	0.000	0.782	0.000	0.782	NO ₂	% Diff. Limit
4998	0.48	0.512	0.270	0.510	0.779	0%	± 10%
4998	0.24	0.269	0.513	0.269	0.782	0%	± 10%
4998	0.95	0.109	0.673	0.110	0.783	1%	± 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)= 0.9953	0.90-1.10	
b (Intercept % of FS)= 0.0789	± 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 O₂ has 49.9ppb SO₂ - Flows not manually measured

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 30, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-342CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: BLM002756T **Concentration PPM:** 49.9 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: March 31, 2015
 Gas Type: SO2 Conc. 98.57
 Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 22.5 C
 B.P. 690 mmHg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
 Last Calibration: Date: Mar 31/15 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	0.000	0.000
4976	82.6	0.821	0.01660	60.242	49.5
4993	41.0	0.410	0.00821	121.780	49.9
4977	20.2	0.202	0.00406	246.386	49.8
Average Cylinder Concentration:					49.7

Previous Stated Concentration PPM: 49.9

Percent variance from Stated: 0.4

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: March 31, 2015
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-338CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: BLM002508 **Concentration PPM:** 10.2 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU1690
 Last Verification Date: March 31, 2015
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P.: 689 mmhg

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 14.5 Span: 1.035 Range: 0.1
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	132.984	9.6
5080	38.2	0.0725	0.00752	132.984	9.6
5078	17.9	0.0340	0.00353	283.687	9.6
5066	9.1	0.0170	0.00180	556.703	9.5
Average Cylinder Concentration:					9.6

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 6.0

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: March 31, 2015
 Location: McIntyre Center Edmonton



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Tel: (323) 585-2154 Fax: (714) 542-6689
 PGVPID: F22014

DocNumber: 000068924

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

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

Praxair Order Number: 21137117
 Customer P. O. Number: 35-55963
 Customer Reference Number:

Fill Date: 7/1/2014
 Part Number: NI ME600P2E-AQ
 Lot Number: 109418203
 Cylinder Style & Outlet: AQ CGA 350
 Cylinder Pressure & Volume: 2200 psig 78 cu. ft.

Certified Concentration:

Expiration Date:	7/7/2022	NIST Traceable
Cylinder Number:	LL83638	Analytical Uncertainty:
582 ppm	METHANE	± 1.5 %
203 ppm	PROPANE	± 0.9 %
Balance	NITROGEN	

Certification Information: Certification Date: 7/7/2014 Term: 96 Months Expiration Date: 7/7/2022

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: METHANE

Requested Concentration: 600 ppm
 Certified Concentration: 582 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC139480
 Ref. Std. Conc: 246 ppm
 Ref. Std. Traceable to SRM #: 2751
 SRM Sample #: 212-09-AL
 SRM Cylinder #: SX-20000

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 249.5	C: 589.4	Conc: 581.21
R: 249.5	Z: 0	C: 589	Conc: 580.82
Z: 0	C: 592	R: 249.4	Conc: 583.77
UOM: ppm	Mean Test Assay:	581.93 ppm	

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay:	0 ppm	

2. Component: PROPANE

Requested Concentration: 200 ppm
 Certified Concentration: 203 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC 163442
 Ref. Std. Conc: 265.8 ppm
 Ref. Std. Traceable to SRM #: vs 2644a
 SRM Sample #: 101-C-45
 SRM Cylinder #: XF003829B

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 273.6	C: 208.4	Conc: 202.43
R: 273.7	Z: 0	C: 208.6	Conc: 202.63
Z: 0	C: 208.5	R: 273.6	Conc: 202.53
UOM: ppm	Mean Test Assay:	202.53 ppm	

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay:	0 ppm	

Analyzed by:

Jack Fu

Certified by:

Ying Yu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-343CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: BLM002756T **Conc (PPM)** 50.7/50.7 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146i
Serial Number AMU 1809
Last Verification Date March 31, 2015
Gas Type NO **Conc.** 48.79
Cylinder Number CAL018024

Flow Measurement Device:

Make/Model Bios DC2
Serial Number AMU 1659
Temp. °C 22.5 C
B.P. 690 mmhg

Reference Analyzer:

Make/Model Teco 42i **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.2 **Span:** 1.008 **Range:** 1.0
Last Calibration: **Date:** Mar 31/15 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000	0.01660	60.242	50.7	49.5
4976	82.6	0.842	0.822	0.01660	60.242	50.7	49.5
4993	41.0	0.420	0.410	0.00821	121.780	51.1	49.9
4977	20.2	0.208	0.205	0.00406	246.386	51.2	50.5
Average Cylinder Concentration:						51.0	50.0

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.7</u>
Percent variance from Stated: <u>0.7</u>	<u>1.4</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 49.9 ppm SO2 in cylinder
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark **Date:** March 31, 2015
Operator Signature: *Al Clark* **Location:** McIntyre Center Edmonton

APPENDIX IV
ANALYTICAL RESULTS

PASSIVE SAMPLES

Your Project #: 2016/11/29 - 2017/01/30
Site Location: LICA

Attention:MICHAEL BISAGA

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
PO BOX 8237
5107W- 50TH STREET
BONNYVILLE, AB
CANADA T9N 2J5

Report Date: 2017/02/09
Report #: R2343468
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B708450

Received: 2017/02/06, 10:45

Sample Matrix: Air
Samples Received: 33

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
H2S Passive Analysis (1)	20	2017/02/09	2017/02/09	PTC SOP-00150	Tang.Passive H2S in
NO2 Passive Analysis (1)	21	2017/02/07	2017/02/09	PTC SOP-00148	Passive NO2 in ATM
NO2 Passive Analysis (1)	4	2017/02/08	2017/02/09	PTC SOP-00148	Passive NO2 in ATM
O3 Passive Analysis (1)	20	2017/02/07	2017/02/09	PTC SOP-00197	EPA 300 R2.1
O3 Passive Analysis (1)	5	2017/02/08	2017/02/09	PTC SOP-00197	EPA 300 R2.1
SO2 Passive Analysis (1)	29	2017/02/07	2017/02/09	PTC SOP-00149	Passive SO2 in Air

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) The detection limit is based on a 30 day sampling period.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Levi Manchak, Project Manager
Email: LManchak@maxxam.ca
Phone# (780)468-3536

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B708450
Report Date: 2017/02/09

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/11/29 - 2017/01/30
Site Location: LICA
Sampler Initials: AY

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		QM8543	QM8544	QM8545	QM8546	QM8547	QM8548	QM8549		
Sampling Date		2016/11/29 17:12	2016/11/30 11:18	2016/11/30 12:03	2016/11/30 13:20	2016/11/30 09:17	2016/11/29 14:25	2016/11/29 16:15		
	UNITS	3	4	5	6	8	9	10	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.14		0.13				0.11	0.02	8548583
Calculated NO2	ppb	2.7	2.2	2.7	6.1	1.8	2.6	5.7	0.1	8546939
Calculated O3	ppb	23.6	29.1	26.5	23.1	28.4	27.4	20.3	0.1	8547129
Calculated SO2	ppb	0.5	1.1	0.6	0.6	0.7	0.6	0.3	0.1	8547158
RDL = Reportable Detection Limit										

Maxxam ID		QM8550	QM8551	QM8552	QM8553	QM8554	QM8555	QM8556		
Sampling Date		2016/11/29 15:25	2016/02/27 17:36	2016/11/29 13:05	2016/11/29 11:30	2016/11/29 11:58	2016/11/30 16:05	2016/11/30 14:08		
	UNITS	11	12	13	14	15	16	17	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	MISSING	MISSING	0.09	0.13		0.12	0.16	0.02	8548583
Calculated NO2	ppb	MISSING	MISSING	1.5	4.4	2.7	3.1	2.7	0.1	8546939
Calculated O3	ppb	MISSING	MISSING	23.5	24.0	25.2	22.5	28.1	0.1	8547129
Calculated SO2	ppb	MISSING	MISSING	0.8	1.6	0.5	0.5	0.7	0.1	8547158
RDL = Reportable Detection Limit										

Maxxam ID		QM8557	QM8558		QM8559	QM8560		QM8561		
Sampling Date		2016/11/30 15:17	2016/11/30 16:33		2016/11/29 08:44	2016/11/29 09:55		2016/11/30 12:40		
	UNITS	18	19	QC Batch	22	23	QC Batch	24	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.11		8548583	0.10		8548583	0.12	0.02	8548583
Calculated NO2	ppb	2.4	2.2	8546939	4.1	1.2	8546939	6.1	0.1	8546939
Calculated O3	ppb	27.4	28.2	8547129	24.4	21.2	8547129	22.0	0.1	8547702
Calculated SO2	ppb	0.3	0.6	8547158	0.4	0.4	8547168	0.5	0.1	8547168
RDL = Reportable Detection Limit										

Maxxam ID		QM8562	QM8563	QM8564		QM8565	QM8566	QM8567		
Sampling Date		2016/02/27 18:58	2016/11/29 11:41	2016/11/29 10:55		2016/11/29 14:10	2016/11/29 08:52	2016/11/30 10:17		
	UNITS	25	26	27	QC Batch	28	29	32	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	MISSING	0.19	0.33	8548583		0.09	0.14	0.02	8548583
Calculated NO2	ppb				8546939	6.9	5.7	2.0	0.1	8548102
Calculated O3	ppb				8547702	23.4	24.6	34.1	0.1	8547702
Calculated SO2	ppb	MISSING	0.8	1.7	8547168	0.5	0.7	0.7	0.1	8547168
RDL = Reportable Detection Limit										

Maxxam Job #: B708450
Report Date: 2017/02/09

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/11/29 - 2017/01/30
Site Location: LICA
Sampler Initials: AY

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		QM8568		QM8571	QM8572	QM8573	QM8574	QM8575		
Sampling Date		2016/11/29 13:49		2016/11/30 11:18	2016/11/30 12:03	2016/11/29 13:05	2016/11/29 11:30	2016/11/29 11:58		
	UNITS	38	QC Batch	4 DUP	5 DUP	13 DUP	14 DUP	15 DUP	RDL	QC Batch

Passive Monitoring										
Calculated H2S	ppb	0.19	8548583						0.02	8548583
Calculated NO2	ppb	6.0	8548102	2.5	2.1				0.1	8546939
Calculated O3	ppb	21.4	8547702	26.5	23.2				0.1	8547129
Calculated SO2	ppb	0.6	8547168			0.8	1.8	0.5	0.1	8547168

RDL = Reportable Detection Limit

Maxxam ID		QM8576	QM8577		
Sampling Date		2016/11/30 14:08	2016/11/30 15:17		
	UNITS	17 DUP	18 DUP	RDL	QC Batch

Passive Monitoring					
Calculated H2S	ppb	0.16	0.10	0.02	8548584

RDL = Reportable Detection Limit

Maxxam Job #: B708450
Report Date: 2017/02/09

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/11/29 - 2017/01/30
Site Location: LICA
Sampler Initials: AY

GENERAL COMMENTS

Stations 11, 12, 25 inaccessible.

Results relate only to the items tested.

Maxxam Job #: B708450
Report Date: 2017/02/09

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/11/29 - 2017/01/30
Site Location: LICA
Sampler Initials: AY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8546939	IK2	Spiked Blank	Calculated NO2	2017/02/07		100	%	90 - 110
8546939	IK2	Method Blank	Calculated NO2	2017/02/07	<0.1		ppb	
8547129	SS6	Spiked Blank	Calculated O3	2017/02/07		99	%	90 - 110
8547129	SS6	Method Blank	Calculated O3	2017/02/07	<0.1		ppb	
8547158	OZ	Spiked Blank	Calculated SO2	2017/02/07		98	%	90 - 110
8547158	OZ	Method Blank	Calculated SO2	2017/02/07	<0.1		ppb	
8547168	OZ	Spiked Blank	Calculated SO2	2017/02/07		98	%	90 - 110
8547168	OZ	Method Blank	Calculated SO2	2017/02/07	<0.1		ppb	
8547702	SS6	Spiked Blank	Calculated O3	2017/02/08		102	%	90 - 110
8547702	SS6	Method Blank	Calculated O3	2017/02/08	<0.1		ppb	
8548102	IK2	Spiked Blank	Calculated NO2	2017/02/08		101	%	90 - 110
8548102	IK2	Method Blank	Calculated NO2	2017/02/08	<0.1		ppb	
8548583	LCH	Spiked Blank	Calculated H2S	2017/02/09		100	%	90 - 110
8548584	LCH	Spiked Blank	Calculated H2S	2017/02/09		100	%	90 - 110

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


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

Maxxam Job #: B708450
Report Date: 2017/02/09

LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION
Client Project #: 2016/11/29 - 2017/01/30
Site Location: LICA
Sampler Initials: AY

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Linda Lin, Supervisor, Centre for Passive Sampling Technology

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 01, 2017	H3300	Ambient Air	01-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010017-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Jan-17
17010017-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	10-Jan-17
17010017-003	1,2,4-Trimethylbenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Jan-17
17010017-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Jan-17
17010017-003	1,2-Dichloroethane	I	0.03	ppbv	0.01	AC-058	10-Jan-17
17010017-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Jan-17
17010017-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-003	1-Butene	I	0.03	ppbv	0.02	AC-058	10-Jan-17
17010017-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	2,2-Dimethylbutane	I	0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 01, 2017	H3300	Ambient Air	01-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010017-003	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	2-Methylhexane	I	0.02	ppbv	0.01	AC-058	10-Jan-17
17010017-003	2-Methylpentane	I	0.04	ppbv	0.01	AC-058	10-Jan-17
17010017-003	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	3-Methylpentane	I	0.02	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Acetone		0.9	ppbv	0.4	AC-058	10-Jan-17
17010017-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Jan-17
17010017-003	Benzene	I	0.08	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Carbon tetrachloride	I	0.16	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Chloroform	I	0.04	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Chloromethane		0.79	ppbv	0.02	AC-058	10-Jan-17
17010017-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-003	cis-2-Butene	I	0.03	ppbv	0.02	AC-058	10-Jan-17
17010017-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 01, 2017	H3300	Ambient Air	01-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010017-003	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Dibromochloromethane	I	0.02	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Ethanol	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Jan-17
17010017-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-003	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Freon-11		0.47	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Freon-113	I	0.08	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Freon-114	I	0.03	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Freon-12		0.99	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	10-Jan-17
17010017-003	Isobutane	I	0.23	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Isopentane	I	0.17	ppbv	0.03	AC-058	10-Jan-17
17010017-003	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Jan-17
17010017-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	10-Jan-17
17010017-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	10-Jan-17
17010017-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Jan-17
17010017-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Jan-17
17010017-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Jan-17
17010017-003	Methylcyclohexane	I	0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	Methylcyclopentane	I	0.02	ppbv	0.02	AC-058	10-Jan-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Jan 01, 2017	H3300	Ambient Air	01-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010017-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Jan-17
17010017-003	n-Butane		0.48	ppbv	0.03	AC-058	10-Jan-17
17010017-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	10-Jan-17
17010017-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-003	n-Heptane	I	0.02	ppbv	0.01	AC-058	10-Jan-17
17010017-003	n-Hexane	I	0.04	ppbv	0.01	AC-058	10-Jan-17
17010017-003	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	n-Pentane	K, T, U	< 0.1	ppbv	0.1	AC-058	10-Jan-17
17010017-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Jan-17
17010017-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	10-Jan-17
17010017-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	10-Jan-17
17010017-003	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Jan-17
17010017-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-003	Toluene	I	0.04	ppbv	0.01	AC-058	10-Jan-17
17010017-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-003	trans-2-Butene	I	0.04	ppbv	0.01	AC-058	10-Jan-17
17010017-003	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Jan 01, 2017	H3300	Ambient Air	01-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010017-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Jan-17
17010017-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Jan 07, 2017	2660	Ambient Air	07-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-003	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-003	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-003	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	19-Jan-17
17010086-003	1,2,4-Trimethylbenzene	I	0.06	ppbv	0.03	AC-058	19-Jan-17
17010086-003	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-003	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-003	1,2-Dichloropropane	I	0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-003	1,3,5-Trimethylbenzene	I	0.03	ppbv	0.02	AC-058	19-Jan-17
17010086-003	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Jan-17
17010086-003	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-003	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-003	1-Butene	I	0.10	ppbv	0.02	AC-058	19-Jan-17
17010086-003	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	1-Pentene	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-003	2,2,4-Trimethylpentane	I	0.06	ppbv	0.01	AC-058	19-Jan-17
17010086-003	2,2-Dimethylbutane	I	0.05	ppbv	0.01	AC-058	19-Jan-17
17010086-003	2,3,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-003	2,3-Dimethylbutane	I	0.07	ppbv	0.02	AC-058	19-Jan-17
17010086-003	2,3-Dimethylpentane	I	0.08	ppbv	0.02	AC-058	19-Jan-17

Report certified by:	Krista Gegolick, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Wednesday, February 08, 2017	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Jan 07, 2017	2660	Ambient Air	07-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-003	2,4-Dimethylpentane	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-003	2-Methylheptane	I	0.04	ppbv	0.01	AC-058	19-Jan-17
17010086-003	2-Methylhexane	I	0.10	ppbv	0.01	AC-058	19-Jan-17
17010086-003	2-Methylpentane	I	0.22	ppbv	0.01	AC-058	19-Jan-17
17010086-003	3-Methylheptane	I	0.03	ppbv	0.02	AC-058	19-Jan-17
17010086-003	3-Methylhexane	I	0.09	ppbv	0.02	AC-058	19-Jan-17
17010086-003	3-Methylpentane	I	0.13	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Acetone		1.1	ppbv	0.4	AC-058	19-Jan-17
17010086-003	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Jan-17
17010086-003	Benzene	I	0.25	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Chloroform	I	0.03	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Chloromethane		0.57	ppbv	0.02	AC-058	19-Jan-17
17010086-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-003	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-003	cis-2-Butene	I	0.03	ppbv	0.02	AC-058	19-Jan-17
17010086-003	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Cyclohexane	I	0.11	ppbv	0.02	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Jan 07, 2017	2660	Ambient Air	07-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-003	Cyclopentane	I	0.06	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Ethanol		1.2	ppbv	0.3	AC-058	19-Jan-17
17010086-003	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-003	Ethylbenzene	I	0.05	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Freon-11	I	0.28	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Freon-113	I	0.09	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Freon-114	I	0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Freon-12		0.64	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	19-Jan-17
17010086-003	Isobutane		0.88	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Isopentane		0.81	ppbv	0.03	AC-058	19-Jan-17
17010086-003	Isoprene	I	0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Isopropyl alcohol		0.6	ppbv	0.4	AC-058	19-Jan-17
17010086-003	Isopropylbenzene	I	0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-003	m,p-Xylene	I	0.18	ppbv	0.03	AC-058	19-Jan-17
17010086-003	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-003	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	19-Jan-17
17010086-003	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	19-Jan-17
17010086-003	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Jan-17
17010086-003	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-003	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Jan-17
17010086-003	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-003	Methylcyclohexane	I	0.19	ppbv	0.01	AC-058	19-Jan-17
17010086-003	Methylcyclopentane	I	0.16	ppbv	0.02	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 07, 2017	2660	Ambient Air	07-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-003	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Jan-17
17010086-003	n-Butane		1.55	ppbv	0.03	AC-058	19-Jan-17
17010086-003	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Jan-17
17010086-003	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-003	n-Heptane	I	0.11	ppbv	0.01	AC-058	19-Jan-17
17010086-003	n-Hexane	I	0.19	ppbv	0.01	AC-058	19-Jan-17
17010086-003	n-Octane	I	0.05	ppbv	0.02	AC-058	19-Jan-17
17010086-003	n-Pentane		0.5	ppbv	0.1	AC-058	19-Jan-17
17010086-003	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-003	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-003	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-003	n-Nonane	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-003	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-003	o-Xylene	I	0.08	ppbv	0.01	AC-058	19-Jan-17
17010086-003	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-003	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Jan-17
17010086-003	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-003	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-003	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-003	Toluene		0.30	ppbv	0.01	AC-058	19-Jan-17
17010086-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-003	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-003	trans-2-Butene	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-003	trans-2-Pentene	I	0.03	ppbv	0.02	AC-058	19-Jan-17
17010086-003	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17

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

Date: Wednesday, February 08, 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/Jan 07, 2017	2660	Ambient Air	07-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010086-003	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	19-Jan-17
17010086-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 13, 2017	H2834	Ambient Air	13-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010134	REPORT CREATED:	07-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010134-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010134-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010134-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	20-Jan-17
17010134-001	1,2,4-Trimethylbenzene		0.10	ppbv	0.05	AC-058	20-Jan-17
17010134-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010134-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	20-Jan-17
17010134-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	1,3,5-Trimethylbenzene		0.04	ppbv	0.02	AC-058	20-Jan-17
17010134-001	1,3-Butadiene	I	0.04	ppbv	0.02	AC-058	20-Jan-17
17010134-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jan-17
17010134-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010134-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010134-001	1-Butene		0.08	ppbv	0.02	AC-058	20-Jan-17
17010134-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	1-Pentene		0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	2,2,4-Trimethylpentane		0.04	ppbv	0.01	AC-058	20-Jan-17
17010134-001	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	20-Jan-17
17010134-001	2,3,4-Trimethylpentane		0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	20-Jan-17
17010134-001	2,3-Dimethylpentane		0.04	ppbv	0.02	AC-058	20-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Tuesday, February 07, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 13, 2017	H2834	Ambient Air	13-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010134	REPORT CREATED:	07-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010134-001	2,4-Dimethylpentane		0.02	ppbv	0.01	AC-058	20-Jan-17
17010134-001	2-Methylheptane		0.02	ppbv	0.01	AC-058	20-Jan-17
17010134-001	2-Methylhexane		0.07	ppbv	0.01	AC-058	20-Jan-17
17010134-001	2-Methylpentane		0.19	ppbv	0.01	AC-058	20-Jan-17
17010134-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	3-Methylhexane		0.06	ppbv	0.02	AC-058	20-Jan-17
17010134-001	3-Methylpentane		0.11	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Acetone		1.0	ppbv	0.4	AC-058	20-Jan-17
17010134-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jan-17
17010134-001	Benzene		0.32	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010134-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Chloroform	I	0.03	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Chloromethane		0.52	ppbv	0.02	AC-058	20-Jan-17
17010134-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010134-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Cyclohexane		0.09	ppbv	0.02	AC-058	20-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Tuesday, February 07, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 13, 2017	H2834	Ambient Air	13-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010134	REPORT CREATED:	07-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010134-001	Cyclopentane		0.04	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Ethanol		0.7	ppbv	0.3	AC-058	20-Jan-17
17010134-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010134-001	Ethylbenzene		0.06	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Freon-11		0.33	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Freon-113	I	0.09	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Freon-114	I	0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Freon-12		0.66	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	20-Jan-17
17010134-001	Isobutane		2.01	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Isopentane		0.84	ppbv	0.03	AC-058	20-Jan-17
17010134-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Isopropyl alcohol		4.7	ppbv	0.4	AC-058	20-Jan-17
17010134-001	Isopropylbenzene		0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	m,p-Xylene		0.34	ppbv	0.03	AC-058	20-Jan-17
17010134-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010134-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	20-Jan-17
17010134-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	20-Jan-17
17010134-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jan-17
17010134-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010134-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	20-Jan-17
17010134-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010134-001	Methylcyclohexane		0.16	ppbv	0.01	AC-058	20-Jan-17
17010134-001	Methylcyclopentane		0.12	ppbv	0.02	AC-058	20-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Tuesday, February 07, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Jan 13, 2017	H2834	Ambient Air	13-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010134	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010134-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jan-17
17010134-001	n-Butane		3.13	ppbv	0.03	AC-058	20-Jan-17
17010134-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	20-Jan-17
17010134-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010134-001	n-Heptane		0.08	ppbv	0.01	AC-058	20-Jan-17
17010134-001	n-Hexane		0.22	ppbv	0.01	AC-058	20-Jan-17
17010134-001	n-Octane		0.04	ppbv	0.02	AC-058	20-Jan-17
17010134-001	n-Pentane		0.9	ppbv	0.1	AC-058	20-Jan-17
17010134-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010134-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010134-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010134-001	n-Nonane		0.02	ppbv	0.01	AC-058	20-Jan-17
17010134-001	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	20-Jan-17
17010134-001	o-Xylene		0.12	ppbv	0.01	AC-058	20-Jan-17
17010134-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010134-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	20-Jan-17
17010134-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010134-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010134-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010134-001	Toluene		0.56	ppbv	0.01	AC-058	20-Jan-17
17010134-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010134-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010134-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010134-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Tuesday, February 07, 2017

Inquiries: (780) 632 8455

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/Jan 13, 2017	H2834	Ambient Air	13-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010134	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010134-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jan-17
17010134-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Tuesday, February 07, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 19, 2017	S5632	Ambient Air	19-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010189	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
				VERSION: Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010189-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010189-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Feb-17
17010189-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	02-Feb-17
17010189-001	1,2,4-Trimethylbenzene		0.08	ppbv	0.05	AC-058	02-Feb-17
17010189-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Feb-17
17010189-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	02-Feb-17
17010189-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010189-001	1,3,5-Trimethylbenzene		0.03	ppbv	0.02	AC-058	02-Feb-17
17010189-001	1,3-Butadiene	I	0.06	ppbv	0.02	AC-058	02-Feb-17
17010189-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Feb-17
17010189-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010189-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010189-001	1-Butene		0.19	ppbv	0.02	AC-058	02-Feb-17
17010189-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	1-Pentene		0.04	ppbv	0.01	AC-058	02-Feb-17
17010189-001	2,2,4-Trimethylpentane		0.19	ppbv	0.01	AC-058	02-Feb-17
17010189-001	2,2-Dimethylbutane		0.03	ppbv	0.01	AC-058	02-Feb-17
17010189-001	2,3,4-Trimethylpentane		0.05	ppbv	0.01	AC-058	02-Feb-17
17010189-001	2,3-Dimethylbutane		0.11	ppbv	0.02	AC-058	02-Feb-17
17010189-001	2,3-Dimethylpentane		0.21	ppbv	0.02	AC-058	02-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 19, 2017	S5632	Ambient Air	19-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010189	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
				VERSION: Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010189-001	2,4-Dimethylpentane		0.08	ppbv	0.01	AC-058	02-Feb-17
17010189-001	2-Methylheptane		0.06	ppbv	0.01	AC-058	02-Feb-17
17010189-001	2-Methylhexane		0.18	ppbv	0.01	AC-058	02-Feb-17
17010189-001	2-Methylpentane		0.32	ppbv	0.01	AC-058	02-Feb-17
17010189-001	3-Methylheptane		0.04	ppbv	0.02	AC-058	02-Feb-17
17010189-001	3-Methylhexane		0.18	ppbv	0.02	AC-058	02-Feb-17
17010189-001	3-Methylpentane		0.22	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Acetone		2.0	ppbv	0.4	AC-058	02-Feb-17
17010189-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Feb-17
17010189-001	Benzene		0.37	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010189-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Chloroform	I	0.04	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Chloromethane		0.46	ppbv	0.02	AC-058	02-Feb-17
17010189-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010189-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010189-001	cis-2-Butene		0.04	ppbv	0.02	AC-058	02-Feb-17
17010189-001	cis-2-Pentene		0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Cyclohexane		0.12	ppbv	0.02	AC-058	02-Feb-17

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	February-22-17	Inquiries:	(780) 632 8455
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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 19, 2017	S5632	Ambient Air	19-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010189	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010189-001	Cyclopentane		0.06	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Ethanol		3.0	ppbv	0.3	AC-058	02-Feb-17
17010189-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010189-001	Ethylbenzene		0.09	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Freon-11		0.33	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Freon-113	I	0.10	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Freon-114	I	0.02	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Freon-12		0.73	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Feb-17
17010189-001	Isobutane		2.80	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Isopentane		1.90	ppbv	0.03	AC-058	02-Feb-17
17010189-001	Isoprene		0.01	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010189-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010189-001	m,p-Xylene		0.28	ppbv	0.03	AC-058	02-Feb-17
17010189-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010189-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	02-Feb-17
17010189-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Feb-17
17010189-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Feb-17
17010189-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010189-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Feb-17
17010189-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Feb-17
17010189-001	Methylcyclohexane		0.24	ppbv	0.01	AC-058	02-Feb-17
17010189-001	Methylcyclopentane		0.24	ppbv	0.02	AC-058	02-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 19, 2017	S5632	Ambient Air	19-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010189	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
				VERSION: Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010189-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Feb-17
17010189-001	n-Butane		6.72	ppbv	0.03	AC-058	02-Feb-17
17010189-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Feb-17
17010189-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010189-001	n-Heptane		0.18	ppbv	0.01	AC-058	02-Feb-17
17010189-001	n-Hexane		0.29	ppbv	0.01	AC-058	02-Feb-17
17010189-001	n-Octane		0.06	ppbv	0.02	AC-058	02-Feb-17
17010189-001	n-Pentane		0.7	ppbv	0.1	AC-058	02-Feb-17
17010189-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Feb-17
17010189-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Feb-17
17010189-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Feb-17
17010189-001	n-Nonane		0.03	ppbv	0.01	AC-058	02-Feb-17
17010189-001	o-Ethyltoluene	I	0.03	ppbv	0.01	AC-058	02-Feb-17
17010189-001	o-Xylene		0.12	ppbv	0.01	AC-058	02-Feb-17
17010189-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010189-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Feb-17
17010189-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010189-001	Tetrachloroethylene	I	0.07	ppbv	0.04	AC-058	02-Feb-17
17010189-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010189-001	Toluene		0.62	ppbv	0.01	AC-058	02-Feb-17
17010189-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010189-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010189-001	trans-2-Butene		0.04	ppbv	0.01	AC-058	02-Feb-17
17010189-001	trans-2-Pentene		0.04	ppbv	0.02	AC-058	02-Feb-17
17010189-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	February-22-17	Inquiries:	(780) 632 8455
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 19, 2017	S5632	Ambient Air	19-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010189	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
				VERSION: Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010189-001	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010189-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/ Jan 25, 2017	H2823	Ambient Air	25-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010212	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010212-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17
17010212-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010212-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	03-Feb-17
17010212-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010212-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010212-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	03-Feb-17
17010212-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Feb-17
17010212-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010212-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010212-001	1-Butene		0.05	ppbv	0.02	AC-058	03-Feb-17
17010212-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	2,2,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	03-Feb-17
17010212-001	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	03-Feb-17
17010212-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	03-Feb-17
17010212-001	2,3-Dimethylpentane		0.03	ppbv	0.02	AC-058	03-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/ Jan 25, 2017	H2823	Ambient Air	25-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010212	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010212-001	2,4-Dimethylpentane		0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	2-Methylheptane		0.02	ppbv	0.01	AC-058	03-Feb-17
17010212-001	2-Methylhexane		0.05	ppbv	0.01	AC-058	03-Feb-17
17010212-001	2-Methylpentane		0.11	ppbv	0.01	AC-058	03-Feb-17
17010212-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	3-Methylhexane		0.04	ppbv	0.02	AC-058	03-Feb-17
17010212-001	3-Methylpentane		0.07	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Acetone		0.8	ppbv	0.4	AC-058	03-Feb-17
17010212-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Feb-17
17010212-001	Benzene		0.18	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010212-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Carbon disulfide	I	0.04	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Chloroform	I	0.03	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Chloromethane		0.45	ppbv	0.02	AC-058	03-Feb-17
17010212-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17
17010212-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Cyclohexane		0.07	ppbv	0.02	AC-058	03-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/ Jan 25, 2017	H2823	Ambient Air	25-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010212	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010212-001	Cyclopentane		0.03	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Ethanol		0.7	ppbv	0.3	AC-058	03-Feb-17
17010212-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010212-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Freon-11		0.36	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Freon-113	I	0.10	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Freon-114	I	0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Freon-12		0.74	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Feb-17
17010212-001	Isobutane		0.92	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Isopentane		0.62	ppbv	0.03	AC-058	03-Feb-17
17010212-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010212-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	m,p-Xylene		0.05	ppbv	0.03	AC-058	03-Feb-17
17010212-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17
17010212-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Feb-17
17010212-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	03-Feb-17
17010212-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Feb-17
17010212-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010212-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Feb-17
17010212-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010212-001	Methylcyclohexane		0.10	ppbv	0.01	AC-058	03-Feb-17
17010212-001	Methylcyclopentane		0.09	ppbv	0.02	AC-058	03-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/CLS/ Jan 25, 2017	H2823	Ambient Air	25-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010212	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010212-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	03-Feb-17
17010212-001	n-Butane		2.05	ppbv	0.03	AC-058	03-Feb-17
17010212-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	03-Feb-17
17010212-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010212-001	n-Heptane		0.06	ppbv	0.01	AC-058	03-Feb-17
17010212-001	n-Hexane		0.14	ppbv	0.01	AC-058	03-Feb-17
17010212-001	n-Octane		0.03	ppbv	0.02	AC-058	03-Feb-17
17010212-001	n-Pentane		0.5	ppbv	0.1	AC-058	03-Feb-17
17010212-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010212-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010212-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010212-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	o-Ethyltoluene	I	0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	o-Xylene		0.02	ppbv	0.01	AC-058	03-Feb-17
17010212-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17
17010212-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Feb-17
17010212-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17
17010212-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17
17010212-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010212-001	Toluene		0.12	ppbv	0.01	AC-058	03-Feb-17
17010212-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17
17010212-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010212-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	03-Feb-17
17010212-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17

Report certified by: Graham Knox, Team Lead

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/ Jan 25, 2017	H2823	Ambient Air	25-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010212	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010212-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	03-Feb-17
17010212-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	03-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 31, 2017	S5619	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020030	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020030-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020030-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Feb-17
17020030-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	15-Feb-17
17020030-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Feb-17
17020030-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Feb-17
17020030-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	15-Feb-17
17020030-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Feb-17
17020030-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020030-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020030-001	1-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	2,2-Dimethylbutane		0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	2,3-Dimethylpentane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 31, 2017	S5619	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020030	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020030-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	2-Methylheptane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	2-Methylhexane		0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	2-Methylpentane		0.04	ppbv	0.01	AC-058	15-Feb-17
17020030-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	3-Methylhexane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	3-Methylpentane		0.05	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Acetone		1.5	ppbv	0.4	AC-058	15-Feb-17
17020030-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Feb-17
17020030-001	Benzene		0.09	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020030-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Carbon disulfide	I	0.06	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Chloroform	I	0.03	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Chloromethane		0.56	ppbv	0.02	AC-058	15-Feb-17
17020030-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020030-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Cyclohexane		0.03	ppbv	0.02	AC-058	15-Feb-17

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Date: Wednesday, February 22, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 31, 2017	S5619	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020030	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020030-001	Cyclopentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Ethanol	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Feb-17
17020030-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020030-001	Ethylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Freon-11		0.36	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Freon-113	I	0.11	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Freon-114	I	0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Freon-12		0.79	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	15-Feb-17
17020030-001	Isobutane		0.28	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Isopentane		0.17	ppbv	0.03	AC-058	15-Feb-17
17020030-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020030-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Feb-17
17020030-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020030-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	15-Feb-17
17020030-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	15-Feb-17
17020030-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Feb-17
17020030-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020030-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Feb-17
17020030-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Feb-17
17020030-001	Methylcyclohexane		0.02	ppbv	0.01	AC-058	15-Feb-17
17020030-001	Methylcyclopentane		0.04	ppbv	0.02	AC-058	15-Feb-17

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

Date: Wednesday, February 22, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 31, 2017	S5619	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020030	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020030-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Feb-17
17020030-001	n-Butane		0.36	ppbv	0.03	AC-058	15-Feb-17
17020030-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	15-Feb-17
17020030-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020030-001	n-Heptane		0.03	ppbv	0.01	AC-058	15-Feb-17
17020030-001	n-Hexane		0.13	ppbv	0.01	AC-058	15-Feb-17
17020030-001	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	n-Pentane		0.1	ppbv	0.1	AC-058	15-Feb-17
17020030-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Feb-17
17020030-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	15-Feb-17
17020030-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	15-Feb-17
17020030-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020030-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Feb-17
17020030-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020030-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020030-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020030-001	Toluene		0.13	ppbv	0.01	AC-058	15-Feb-17
17020030-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020030-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020030-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020030-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/CLS/Jan 31, 2017	S5619	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020030	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020030-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	15-Feb-17
17020030-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	15-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

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PAHS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Jan 07, 2017	TE-01	Air Filter	07-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-004	1-Methylnaphthalene		0.67	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	2-Methylnaphthalene		1.11	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	3-Methylcholanthrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Acenaphthene		0.08	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Acenaphthylene		0.06	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Acridine	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Anthracene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Benzo(a)anthracene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Benzo(a)pyrene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Benzo(b,j,k)fluoranthene		0.07	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Benzo(c)phenanthrene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Benzo(e)pyrene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Benzo(ghi)perylene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Chrysene		0.04	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Dibenzo(ah)anthracene		0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Fluoranthene		0.11	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Fluorene		0.13	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Indeno(1,2,3-cd)pyrene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Naphthalene		0.99	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Perylene		0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Phenanthrene		0.27	ug/PUF	0.01	NA-017	28-Jan-17

Report certified by:	Krista Gegolick, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Wednesday, February 08, 2017	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca



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 Vegreville, Alberta
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Jan 07, 2017	TE-01	Air Filter	07-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010086-004	Pyrene		0.08 ug/PUF	0.01	NA-017	28-Jan-17
17010086-004	Retene		0.17 ug/PUF	0.01	NA-017	28-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 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/Jan 13, 2017	CANISTER ID TE11	Matrix Air Filter	Priority Normal
	DESCRIPTION: Cold Lake South			
INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 13-Jan-17 0:00	DATE RECEIVED: 18-Jan-17		
	REPORT CREATED: 07-Feb-17	REPORT NUMBER: 17010134		
		VERSION: Version 01		

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010134-002	1-Methylnaphthalene		0.49 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	2-Methylnaphthalene		0.77 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Acenaphthene		0.12 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Acenaphthylene		0.09 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Acridine	K, T, U	< 0.01 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Anthracene		0.02 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Benzo(a)anthracene		0.01 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Benzo(a)pyrene		0.02 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Benzo(b,j,k)fluoranthene		0.06 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Benzo(c)phenanthrene		0.02 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Benzo(e)pyrene		0.02 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Benzo(ghi)perylene		0.02 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Chrysene		0.03 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/PUF	0.01	NA-017	28-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Tuesday, February 07, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/Jan 13, 2017	TE11	Air Filter	13-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010134	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010134-002	Dibenzo(ah)anthracene		0.01 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Fluoranthene		0.09 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Fluorene		0.25 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Indeno(1,2,3-cd)pyrene		0.02 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Naphthalene		0.75 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Perylene		0.01 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Phenanthrene		0.36 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Pyrene		0.05 ug/PUF	0.01	NA-017	28-Jan-17
17010134-002	Retene		0.10 ug/PUF	0.01	NA-017	28-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Tuesday, February 07, 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/Jan 19, 2017	CANISTER ID TE09	Matrix Air Filter	Priority Normal
	DESCRIPTION: Cold Lake South			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 19-Jan-17	0:00	DATE RECEIVED: 24-Jan-17	
	REPORT CREATED: 21-Feb-17		REPORT NUMBER: 17010189	
	REPORT REVISED: 22-Feb-17		VERSION: Version 02	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010189-002	1-Methylnaphthalene		0.75	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	2-Methylnaphthalene		1.37	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Acenaphthene		0.23	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Acenaphthylene		0.74	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Anthracene		0.07	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Benzo(a)anthracene		0.05	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Benzo(a)pyrene		0.07	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Benzo(b,j,k)fluoranthene		0.12	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Benzo(c)phenanthrene		0.03	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Benzo(e)pyrene		0.05	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Chrysene		0.06	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Jan 19, 2017	TE09	Air Filter	19-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17010189	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
				VERSION: Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010189-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Fluoranthene		0.16	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Fluorene		0.31	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Naphthalene		1.00	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Perylene		0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Phenanthrene		0.51	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Pyrene		0.14	ug/Filter	0.01	NA-017	08-Feb-17
17010189-002	Retene		0.16	ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

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/ Jan 25, 2017	CANISTER ID TE03	Matrix Air Filter	Priority Normal
	DESCRIPTION: Cold Lake South			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 25-Jan-17	0:00	DATE RECEIVED: 30-Jan-17	
	REPORT CREATED: 22-Feb-17		REPORT NUMBER: 17010212	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010212-002	1-Methylnaphthalene		0.70 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	2-Methylnaphthalene		1.17 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Acenaphthene		0.11 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Acenaphthylene		0.15 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Benzo(a)anthracene		0.02 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Benzo(b,j,k)fluoranthene		0.04 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Benzo(c)phenanthrene		0.02 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Chrysene		0.02 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/CLS/ Jan 25, 2017	TE03	Air Filter	25-Jan-17 0:00
DESCRIPTION:	Cold Lake South		
REPORT NUMBER:	17010212	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010212-002	Dibenzo(ah)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Fluoranthene		0.06 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Fluorene		0.15 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Naphthalene		0.90 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Phenanthrene		0.23 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Pyrene		0.04 ug/Filter	0.01	NA-017	08-Feb-17
17010212-002	Retene		0.12 ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

<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/PUF/CLS/Jan 31, 2017</p> <p>CANISTER ID TE08</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 31-Jan-17 0:00</p> <p>REPORT CREATED: 22-Feb-17</p> <p>DATE RECEIVED: 03-Feb-17</p> <p>REPORT NUMBER: 17020030</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020030-002	1-Methylnaphthalene		0.18 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	2-Methylnaphthalene		0.31 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	3-Methylcholanthrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Acenaphthene		0.03 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Acenaphthylene		0.03 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Acridine	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Anthracene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Benzo(a)anthracene		0.02 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Benzo(a)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Benzo(b,j,k)fluoranthene		0.03 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Benzo(c)phenanthrene		0.02 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Benzo(e)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Benzo(ghi)perylene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Chrysene		0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01 ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/CLS/Jan 31, 2017	TE08	Air Filter	31-Jan-17	0:00
DESCRIPTION:	Cold Lake South			
REPORT NUMBER:	17020030	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020030-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Fluoranthene		0.03	ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Fluorene		0.07	ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Naphthalene		0.36	ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Phenanthrene		0.11	ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Pyrene		0.02	ug/Filter	0.01	NA-017	08-Feb-17
17020030-002	Retene		0.04	ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

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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 P6129415</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 01-Jan-17 0:00</p> <p>REPORT CREATED: 24-Jan-17</p> <p>DATE RECEIVED: 05-Jan-17</p> <p>REPORT NUMBER: 17010016</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010016-001	Particulate Weight		0.024	mg	0.004	AC-029	06-Jan-17

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

Date: Tuesday, January 24, 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 P6129416</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 07-Jan-17 0:00</p> <p>REPORT CREATED: 08-Feb-17</p> <p>DATE RECEIVED: 18-Jan-17</p> <p>REPORT NUMBER: 17010128</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010128-001	Particulate Weight		0.063 mg	0.004	AC-029	19-Jan-17

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

Date: Wednesday, February 08, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID P6129417	CANISTER ID	Matrix Air Filter	DATE SAMPLED 13-Jan-17 0:00	
DESCRIPTION: Cold Lake South				
REPORT NUMBER: 17010128	REPORT CREATED: 08-Feb-17		VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010128-002	Particulate Weight		0.169 mg	0.004	AC-029	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Wednesday, February 08, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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

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 Filter # P6129418</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 19-Jan-17 0:00</p> <p>REPORT CREATED: 08-Feb-17</p> <p>DATE RECEIVED: 24-Jan-17</p> <p>REPORT NUMBER: 17010191</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010191-001	Particulate Weight		0.235	mg	0.004	AC-029	31-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Wednesday, February 08, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID P6031618	CANISTER ID	Matrix Air Filter	Priority Normal
	DESCRIPTION: Cold Lake South			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 25-Jan-17 0:00	DATE RECEIVED: 30-Jan-17	REPORT NUMBER: 17010214	
	REPORT CREATED: 13-Feb-17	VERSION: Version 01		
	780 812 2182			

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010214-001	Particulate Weight		0.307 mg	0.004	AC-029	31-Jan-17

Report certified by: Krista Gegolick, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Monday, February 13, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

<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 Flt # P6031619</p> <p>CANISTER ID</p> <p>Matrix Air Filter</p> <p>Priority Normal</p> <p>DESCRIPTION: Cold Lake South</p> <p>DATE SAMPLED: 31-Jan-17 0:00</p> <p>REPORT CREATED: 17-Feb-17</p> <p>DATE RECEIVED: 03-Feb-17</p> <p>REPORT NUMBER: 17020029</p> <p>VERSION: Version 01</p>
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Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020029-001	Particulate Weight		0.034	mg	0.004	AC-029	07-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

***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
Kim Wilson	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.

Kim Wilson

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

13-Mar-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>2833-2017-01-1-C</u>
Site: <u>Cold Lake Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Kim Wilson</u>	Date <u>13-Mar-2017</u>
Level 1 Primary Validation	<u>Kim Wilson</u>	Date <u>13-Mar-2017</u>
Level 2 Final Validation	<u>Kim Wilson</u>	Date <u>13-Mar-2017</u>
Level 3 Independent Data Review	<u>CSA Wilson</u>	Date <u>13-Mar-2017</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 January 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 January 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 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



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T2E 6P7

maxxam.ca
Toll Free 800-386-7247
Fax 403-219-3673

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

JOB #: 2833-2017-01-30-C

January 2017

Prepared for:

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

Attention: MIKE BISAGA

DATE: **March 2, 2017**

Prepared by: 

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

Reviewed by: 

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

SUMMARY

In January 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 recorded on January 12, due to a maintenance event.

H₂S: In total, fourteen hours of downtime were recorded this month.

- The analyzer exhibited a biased low span response on January 2, prompting an additional quality check. Two hours of downtime were incurred.
- Two hours of downtime were recorded on January 12, due to a maintenance event.
- The analyzer exhibited a biased high span response on January 17, prompting additional quality checks and maintenance activities. Ten hours of downtime were incurred.

THC: In total, fifty hours of downtime were recorded this month.

- Three hour of data, collected on January 12, were discarded as the concentrations were lower than the required baseline of 1.5 ppm.
- Eleven hours of downtime were recorded on January 15 due to an analyzer flame-out event.
- Thirty-six hours of downtime were recorded between January 29 and January 30 due to analyzer malfunction that was likely caused by low temperatures.

NO₂: The analyzer exhibited a biased high span response on January 17, prompting additional quality checks. Nine hours of downtime were incurred.

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.

Wind Parameters: Three hours of downtime were recorded on January 2 as the wind system was being inspected.

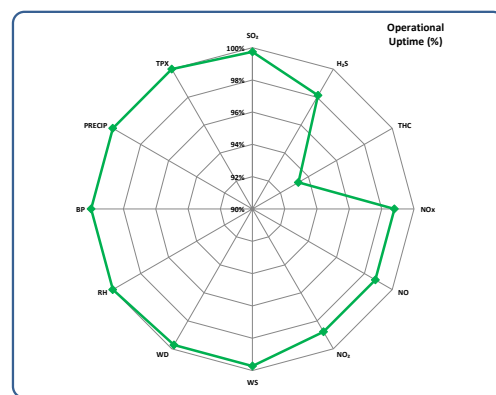
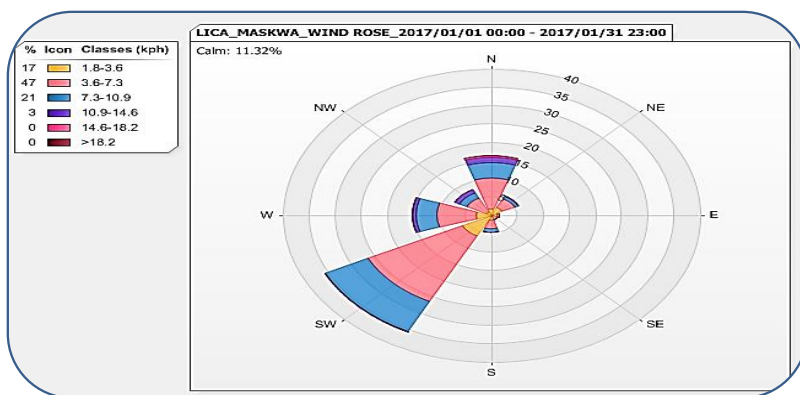
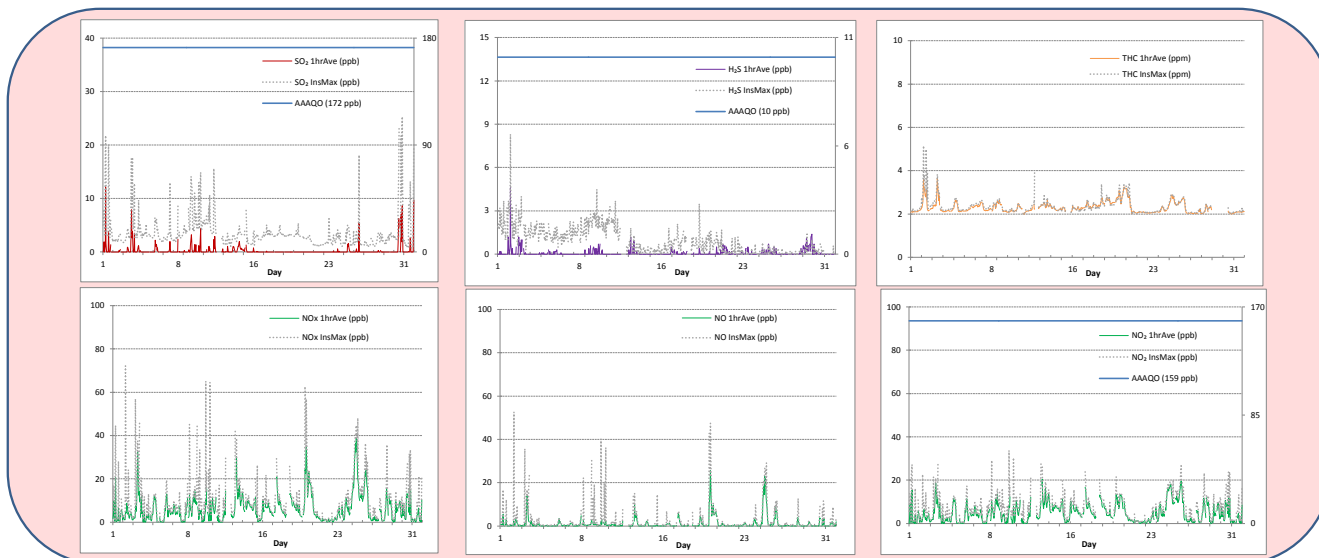
The summary of results is presented on the following pages.

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.

January 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	0.3	99.7%	12.2	January 1	6	172	0	1.7	January 30	48	0
H ₂ S	ppb	0.1	98.1%	4.6	January 2	4	10	0	0.6	January 29	3	0
THC	ppm	2.30	93.3%	3.64	January 2, 3	4, 11	-	-	2.87	January 20	-	-
NO _x	ppb	6.0	98.8%	39.2	January 25	9	-	-	20.8	January 25	-	-
NO	ppb	1.1	98.8%	25.6	January 20	9	-	-	7.6	January 25	-	-
NO ₂	ppb	4.9	98.8%	20.4	January 13	9	159	0	13.2	January 25	-	-
WS	kph	2.1	99.7%	18.1	January 11	14	-	-	9.3	January 30	-	-
WD	degree	267 (W)	99.7%	-	-	-	-	-	-	-	-	-
RH	%	71	100.0%	89	January 20, 20	17, 18	-	-	86	January 20	-	-
BP	mbar	938	100.0%	957	January 2	22	-	-	954	January 2	-	-
PRECIP	mm	0.0	100.0%	0.2	January 9, 12	8, VAR	-	-	0.0	ALL	-	-
AmbTPX	°C	-11.4	100.0%	8.1	January 29	14	-	-	3.0	January 29	-	-



Monthly Update

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

Operational Issues

- SO₂:** Two hours of downtime were recorded on January 12, due to a maintenance event.
- H₂S:** In total, fourteen hours of downtime were recorded this month.
- The analyzer exhibited a biased low span response on January 2, prompting an additional quality check. Two hours of downtime were incurred.
 - Two hours of downtime were recorded on January 12, due to a maintenance event.
 - The analyzer exhibited a biased high span response on January 17, prompting additional quality checks and maintenance activities. Ten hours of downtime were incurred.
- THC:** In total, fifty hours of downtime were recorded this month.
- Three hour of data, collected on January 12, were discarded as the concentrations were lower than the required baseline of 1.5 ppm.
 - Eleven hours of downtime were recorded on January 15 due to an analyzer flame-out event.
 - Thirty-six hours of downtime were recorded between January 29 and January 30 due to analyzer malfunction that was likely caused by low temperatures.
- NO₂:** The analyzer exhibited a biased high span response on January 17, prompting additional quality checks. Nine hours of downtime were incurred.
- Wind Parameters:** Three hours of downtime were recorded on January 2 as the wind system was being inspected.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.3	12.2	1	6	7.6	NW	1.7	30	99.7
H ₂ S (ppb)	10	3	0	0	0.1	4.6	2	4	0.3	SE	0.6	29	98.1
THC (ppm)	-	-	-	-	2.30	3.64	2, 3	4, 11	0.3 7.6	SE SSW	2.87	20	93.3
NO ₂ (ppb)	159	-	0	-	4.9	20.4	13	9	6.6	SSW	13.2	25	98.8
NO (ppb)	-	-	-	-	1.1	25.6	20	9	3.1	W	7.6	25	98.8
NO _x (ppb)	-	-	-	-	6.0	39.2	25	9	2.5	WSW	20.8	25	98.8
RELATIVE HUMIDITY (%)	-	-	-	-	71	89	20, 20	17, 18	0.6 0.7	ENE ESE	86	20	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	938	957	2	22	1.8	SW	954	2	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-11.4	8.1	29	14	7.2	WSW	3.0	29	100.0
PRECIPITATION (mm)	-	-	-	-	0.0	0.2	9, 12	8, VAR	3.8 VAR	SW VAR	0.0	ALL	100.0
VECTOR WS (kph)	-	-	-	-	2.1	18.1	11	14	-	N	9.3	30	99.7
VECTOR WD (sec)	-	-	-	-	267 (W)	-	-	-	-	-	-	-	99.7

VAR-VARIOUS

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

In accordance with EPEA and the Substance Release Regulation.

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

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1.0 Discussion

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

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

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO₂)

A shut-down calibration was performed on January 12, prior to maintenance. The exhaust orifice of the zero/span system was replaced and a post-repair calibration was subsequently completed. Both calibrations met AMD requirements. Two hours of downtime were recorded due to this maintenance event.

HYDROGEN SULPHIDE (H₂S)

- The analyzer span exceeded the lower acceptance limit on January 2. A repeat zero/span check was triggered on January 3 and the result met AMD requirements. No further action was taken. The daily zero recorded during the failed span on January 2 at 18:00 was not applied for baseline correction as the data was considered anomalous. The previous valid zero reading was applied. Two hours of downtime were incurred due to the repeat zero/span check.
- A shut-down calibration was performed on January 12, prior to replacing the external pump. A post-repair calibration was subsequently completed. Both calibrations met AMD requirements. Two hours of downtime were recorded due to this maintenance event.
- The analyzer spanned towards the upper acceptance limit on January 17. A repeat zero/span check performed afterwards exceeded the limit. This prompted a site visit on January 18, where a shut-down calibration was completed. The valves of the zero/span system were checked for leaks, no leaks were found. The scrubber material of the zero air filter was renewed on January 18 to increase the stability of the daily zero challenge. A post-repair calibration was subsequently completed. As both the shut-down and post-repair calibrations were successful, no data was discarded. Ten hours of downtime were, however, recorded due to the additional quality checks.

TOTAL HYDROCARBONS (THC)

- A low concentration alarm was triggered on January 12. This prompted an immediate site visit where the routine monthly calibration was completed. All minute data was reviewed, data with concentrations lower than the required baseline of 1.5 ppm were discarded and the hourly averages were re-calculated. In cases where more than 25% minute data were impacted, that hourly average was invalidated. Three hours of data, collected before the calibration, were discarded due to this event.
- The analyzer flamed out on January 15 due to low fuel gas pressure. The fuel gas cylinder was replaced the same day and analyzer operations returned to normal. Eleven hours of downtime were recorded due to this event.
- A low concentration alarm was triggered on January 29, likely due to low temperatures. Analyzer operations returned to normal on January 30. Thirty-six hours of downtime were recorded due to this event.

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

- The routine monthly calibration was performed on January 12.
- The analyzer spanned above the upper acceptance limit on January 17 as the expected span value required adjustment after a PMT adjustment on January 12. A repeat zero/span check performed afterwards confirmed the drift. This prompted a site visit on January 18, where a repeat 3-point calibration was completed. As the calibration was successful, no data was discarded. Nine hours of downtime were, however, recorded due to the additional quality checks.
- 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.

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

- 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.
- The maximum instantaneous channel was recording intermittent spikes, this prompted a site visit on January 2. The wind system was inspected and no operations issues were identified. It was noticed, however, that an owl was using the sensor as a perch. This could account for the anomalous spikes.
- Two hours of downtime were recorded on all wind parameter channels while troubleshooting and inspection were being performed on January 2.
- Maximum instantaneous data above 75 kph were discarded, twenty hours of data were lost as a result.

RELATIVE HUMIDITY (RH)

No operational issues were identified this month.

BAROMETRIC PRESSURE (BP)

No operational issues were identified this month.

PRECIPITATION (PRECIP)

No operational issues were identified this month.

AMBIENT TEMPERATURE (AmbTPX)

No operational issues were identified this month.

2.0 Project Personnel

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

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-00208: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

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

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

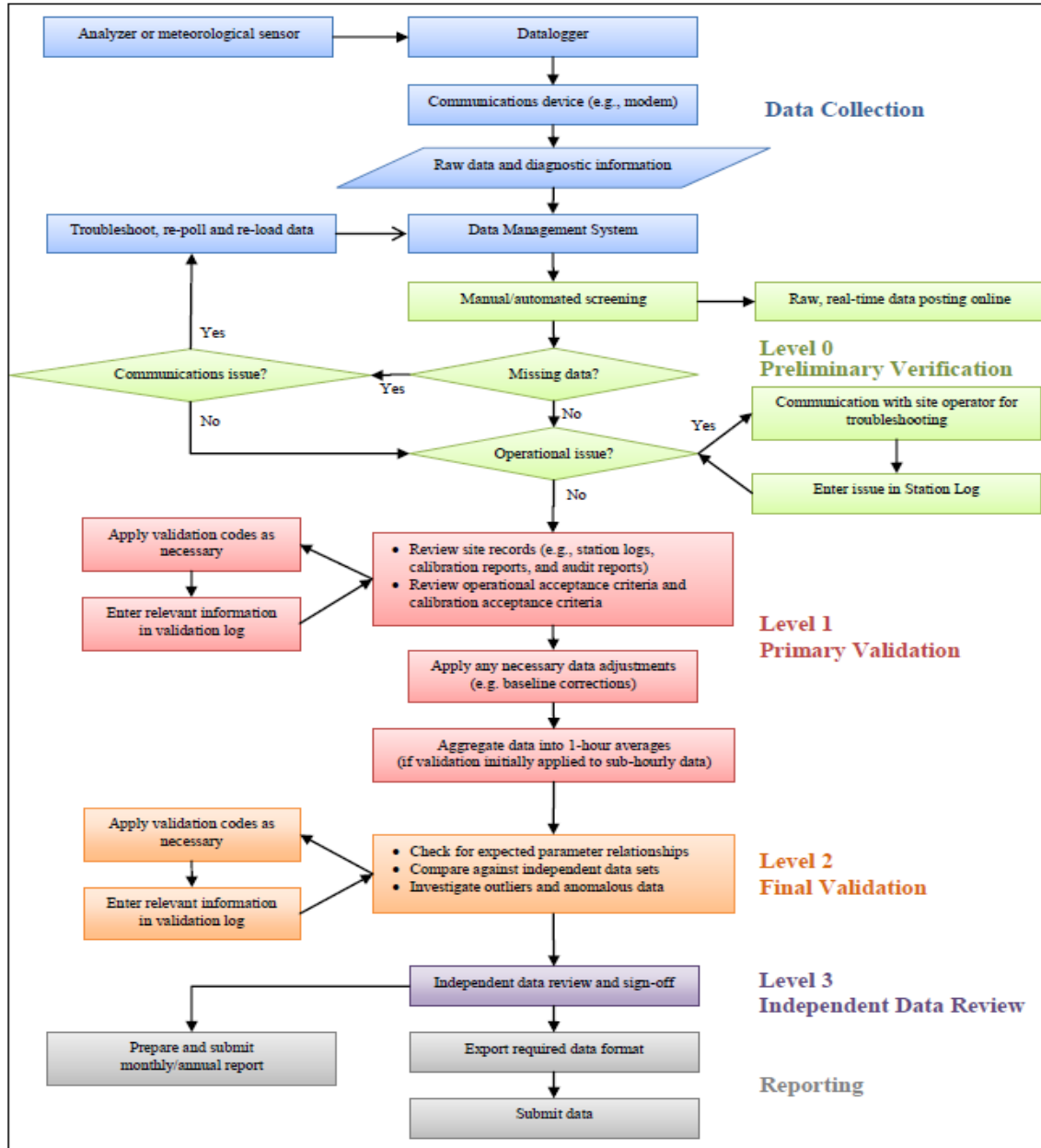
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.						
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.							
DAY																																		
1	0.0	0.6	1.9	0.0	0.0	1.3	12.2	1.7	0.0	0.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	1.4	S	0.0	0.0	0.0	0.0	0.0	0.0	12.2	1.0	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	0.3	0.1	0.2	0.5	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	24					
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.5	0.1	0.0	0.0	0.0	S	0.0	5.0	7.9	2.6	3.9	1.5	0.0	0.0	7.9	1.0	24					
4	0.0	0.0	0.6	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.1	1.2	0.0	0.0	S	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.3	24					
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24					
6	0.0	0.0	0.0	0.0	0.7	2.2	1.1	1.2	1.4	0.3	0.8	0.1	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.3	24					
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	1.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.1	24					
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	S	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	2.4	0.1	24					
9	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.4	0.0	0.0	0.0	0.0	1.3	2.6	3.2	2.2	0.5	0.0	0.0	0.0	3.2	0.5	24					
10	0.0	0.0	0.1	1.4	0.0	0.6	1.4	0.2	0.0	0.0	S	0.0	0.2	1.2	0.0	0.0	1.4	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.5	24					
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	S	0.0	0.0	0.2	1.1	0.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.1	24					
12	0.0	2.3	0.6	2.9	1.3	0.0	0.0	0.0	S	0.0	C	C	C	C	Y	Y	C	C	C	C	0.0	0.0	0.6	0.0	0.0	0.0	2.9	0.6	22					
13	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.0	0.0	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	1.0	0.0	1.1	0.1	24						
14	1.0	0.9	0.6	0.2	0.0	0.0	S	0.0	0.0	0.3	0.8	1.1	1.0	1.8	2.0	1.3	0.7	0.6	0.5	0.7	0.5	0.4	0.4	0.3	0.0	2.0	0.7	24						
15	0.4	0.3	0.1	0.7	0.8	S	1.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.2	24					
16	0.8	0.0	0.0	0.0	S	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	24					
17	0.0	0.0	0.0	S	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24					
18	0.0	0.0	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					
19	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24					
20	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	24					
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	24					
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	24					
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.2	0.0	0.2	0.2	0.0	24					
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.2	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	0.6	0.0	24					
25	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5	1.1	1.6	0.9	0.3	0.2	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.2	24					
26	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.0	0.0	5.5	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	5.5	0.3	24					
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24					
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0	S	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24				
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24					
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	6.3	4.6	S	0.1	0.0	1.2	7.0	1.9	7.2	8.7	0.0	0.0	0.0	0.0	0.0	8.7	1.7	24					
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	S	0.0	1.2	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	0.0	9.7	0.6	24					
HOURLY MAX	1.0	2.3	1.9	3.5	1.3	2.2	12.2	1.7	1.4	1.5	1.6	6.3	5.5	3.9	2.0	2.7	2.0	7.0	2.6	7.2	8.7	2.6	3.9	9.7										
HOURLY AVG	0.1	0.1	0.1	0.3	0.1	0.1	0.6	0.1	0.1	0.1	0.2	0.5	0.5	0.4	0.2	0.2	0.2	0.5	0.2	0.6	0.6	0.1	0.2	0.4										

STATUS FLAG CODES

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

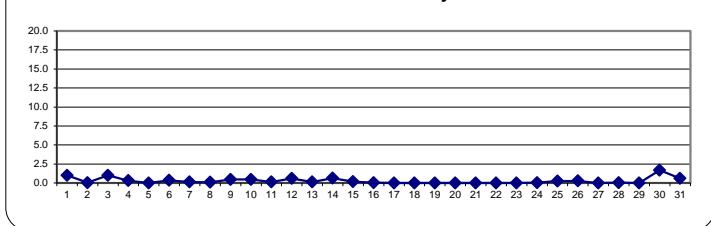
OBJECTIVE LIMIT:

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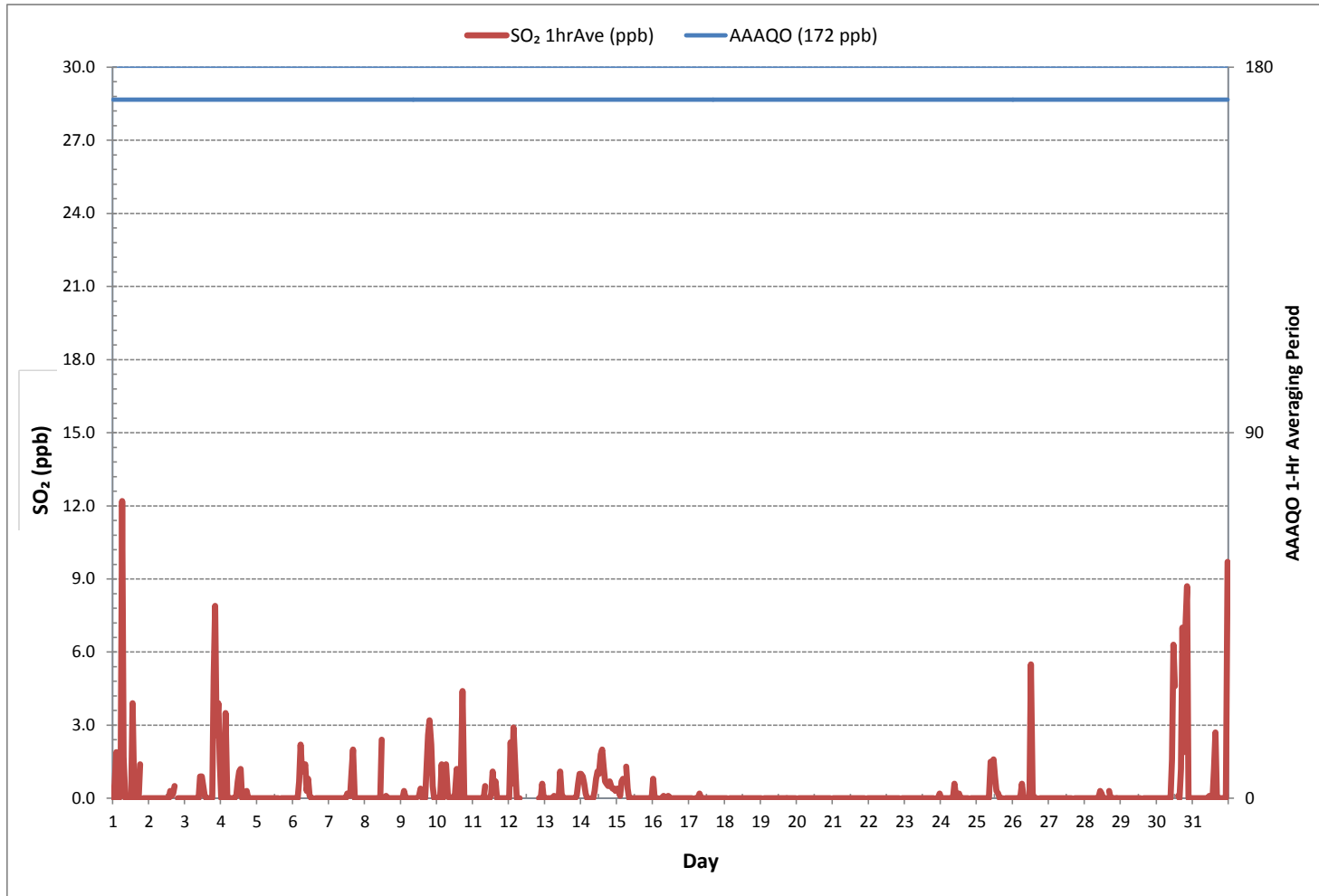
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	133			
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	12.2 ppb @ HOUR(S)	6	ON DAY(S)	1
MAXIMUM 24-HR AVERAGE:	1.7 ppb		ON DAY(S)	30
			VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	742 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	99.7 %	
STANDARD DEVIATION:	1.0	MONTHLY AVERAGE:	0.3 ppb	

24 HR AVERAGES January 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - January 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	5.0	8.0	7.0	5.7	3.2	17.9	21.8	15.0	3.3	3.2	3.0	3.0	4.6	20.1	12.2	5.6	2.7	3.5	6.4	S	4.3	3.3	2.4	2.4	2.4	21.8	7.1	24
2	2.3	2.1	2.2	2.1	2.2	2.0	2.5	2.2	2.0	2.0	1.9	2.4	2.2	2.9	3.2	3.1	3.2	3.3	S	2.2	2.0	2.0	1.9	1.8	1.8	3.3	2.3	24
3	1.8	1.8	1.8	1.9	1.9	2.0	2.6	2.6	2.9	3.5	4.0	4.4	3.8	3.3	2.5	3.0	3.0	S	2.5	17.4	17.3	8.3	17.7	6.7	1.8	17.7	5.1	24
4	4.3	4.3	9.0	12.8	2.8	2.7	2.7	3.4	3.6	2.6	3.6	4.4	4.2	9.7	3.8	3.7	S	5.1	3.8	2.8	2.7	2.6	3.6	2.9	2.6	12.8	4.4	24
5	3.2	3.0	3.1	3.5	3.3	3.5	4.2	5.2	3.0	3.0	2.9	2.9	3.1	3.2	3.3	S	3.0	3.0	2.9	2.9	2.9	2.9	2.7	2.6	2.6	5.2	3.2	24
6	2.6	2.8	3.0	3.5	6.4	6.2	5.4	6.1	6.1	4.1	4.5	4.1	2.9	3.3	S	2.4	2.4	2.4	2.3	2.2	2.0	2.2	2.2	2.0	2.0	6.4	3.5	24
7	2.2	2.8	2.7	2.5	2.5	2.4	2.5	2.3	2.4	2.2	3.0	3.0	3.8	S	3.5	7.8	13.0	2.8	3.2	2.7	2.4	2.4	2.3	2.4	2.2	13.0	3.3	24
8	2.1	2.4	2.2	2.2	2.2	2.3	2.0	2.9	2.4	2.3	3.1	8.7	S	3.0	3.7	2.9	3.0	2.7	2.6	2.6	3.0	3.0	3.1	3.2	2.0	8.7	2.9	24
9	3.3	4.3	4.9	4.0	3.8	4.1	3.4	4.2	3.9	3.8	4.0	S	8.1	5.9	4.4	4.0	6.4	9.1	14.1	13.2	12.3	12.0	4.0	4.2	3.3	14.1	6.1	24
10	4.5	4.0	8.4	11.0	6.1	5.8	7.4	5.2	4.5	5.3	S	4.5	9.1	13.0	4.3	8.0	11.9	14.9	6.1	4.0	4.2	5.1	5.4	5.8	4.0	14.9	6.9	24
11	5.1	5.9	5.9	5.4	5.1	5.0	5.4	6.7	6.9	S	5.3	5.6	6.8	8.7	5.6	10.7	5.1	4.1	4.0	3.7	3.7	3.4	3.4	3.4	3.4	10.7	5.4	24
12	3.4	15.6	10.7	10.4	7.2	3.8	3.4	3.0	S	3.4	C	C	C	C	Y	Y	C	C	C	C	2.5	2.5	3.0	2.2	2.2	15.6	5.5	22
13	1.5	1.6	1.7	1.5	1.5	2.4	2.6	S	1.5	3.0	3.5	2.6	2.2	2.0	1.4	2.3	1.2	1.1	1.4	1.7	2.2	2.4	3.0	3.2	1.1	3.5	2.1	24
14	3.2	3.2	2.8	2.8	2.0	2.0	S	2.0	2.2	2.7	3.5	3.7	3.5	4.4	4.9	4.1	3.4	3.2	3.3	3.3	3.3	3.2	3.3	3.3	2.0	4.9	3.2	24
15	3.3	3.2	3.2	4.3	4.2	S	7.8	5.7	1.9	2.7	1.8	1.6	1.6	1.6	1.6	1.7	1.7	1.6	1.4	1.4	1.5	1.4	2.0	2.6	1.4	7.8	2.6	24
16	4.0	3.9	1.3	2.3	S	2.8	3.2	3.2	3.0	3.0	3.2	2.6	2.4	2.3	2.4	2.2	2.2	2.2	2.5	2.5	2.8	2.8	2.7	2.7	1.3	4.0	2.7	24
17	3.7	3.6	2.9	S	3.2	3.3	3.2	5.1	4.1	3.3	3.9	4.0	3.4	3.6	4.0	3.0	3.5	3.8	3.5	3.5	3.5	3.0	3.0	2.9	2.9	5.1	3.5	24
18	2.9	2.9	S	3.0	3.0	3.1	3.2	3.3	3.3	3.0	3.3	3.4	3.7	3.7	4.5	5.1	3.5	3.2	3.3	3.3	3.5	3.5	3.2	3.3	2.9	5.1	3.4	24
19	3.4	S	3.0	3.2	3.0	2.9	3.0	3.0	3.0	3.0	3.2	3.0	3.2	3.1	3.3	3.3	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.0	2.9	3.4	3.1	24
20	S	2.9	3.0	3.0	2.9	3.3	4.0	3.5	3.2	3.3	4.3	5.4	2.9	3.0	3.0	3.0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	S	2.8	5.4	3.2	24
21	2.6	2.6	2.5	2.4	2.4	2.5	2.5	2.4	2.6	2.6	3.0	3.0	2.9	3.1	2.5	2.1	2.2	2.0	1.9	1.7	1.7	S	1.4	1.4	3.1	2.4	24	
22	1.6	1.5	1.3	1.3	1.3	1.4	1.5	1.4	1.2	1.2	1.1	1.2	1.1	1.4	1.3	1.3	1.2	1.4	1.6	1.5	1.5	S	1.4	1.4	1.1	1.6	1.4	24
23	1.4	1.3	1.3	1.5	1.8	1.8	2.0	1.9	1.7	1.7	1.5	2.0	6.2	4.3	3.4	2.1	2.4	2.2	1.8	1.5	S	1.4	2.6	3.2	1.3	6.2	2.2	24
24	2.8	2.2	2.3	1.7	1.7	2.1	3.5	2.8	2.8	4.1	3.9	2.6	3.1	2.4	3.2	3.5	2.1	1.3	1.4	S	1.1	1.2	1.7	1.7	1.1	4.1	2.4	24
25	1.9	1.9	1.8	1.3	1.9	3.6	1.9	4.1	3.6	5.0	4.8	4.8	4.5	3.3	3.2	2.9	1.2	1.2	S	1.3	1.5	1.4	1.4	4.0	1.2	5.0	2.7	24
26	1.3	1.4	1.4	1.4	2.4	3.5	3.8	3.0	1.9	2.4	2.0	3.6	18.1	5.3	1.8	1.6	1.4	S	1.4	1.4	1.5	1.5	1.4	1.4	1.3	18.1	2.8	24
27	1.4	1.3	1.9	1.7	1.6	1.8	1.7	1.2	1.4	1.2	1.3	1.0	1.0	1.3	1.4	1.4	S	2.5	2.5	2.5	2.2	1.9	1.3	1.3	1.0	2.5	1.6	24
28	1.4	1.2	1.1	1.4	1.4	1.4	1.7	2.2	2.5	3.0	3.5	3.2	3.1	3.2	1.7	S	3.5	2.1	2.4	3.2	3.3	2.1	2.1	1.8	1.1	3.5	2.3	24
29	1.7	1.6	1.6	1.6	2.2	1.6	1.9	2.2	2.7	2.6	3.1	2.9	2.1	3.4	S	3.2	3.6	3.7	3.0	2.7	2.7	2.7	3.0	3.2	1.6	3.7	2.6	24
30	2.5	3.1	2.9	2.4	2.5	2.4	2.4	2.2	2.1	2.9	8.2	15.8	23.1	S	4.5	2.7	6.3	21.7	10.7	23.9	25.3	2.0	1.9	2.4	1.9	25.3	7.6	24
31	2.1	2.2	1.8	1.2	1.3	1.0	1.2	1.0	0.9	0.8	0.8	9.1	S	6.2	8.5	13.2	2.0	0.8	0.8	0.8	0.7	0.8	6.0	19.6	0.7	19.6	3.6	24
HOURLY MAX	5.1	15.6	10.7	12.8	7.2	17.9	21.8	15.0	6.9	5.3	8.2	15.8	23.1	20.1	12.2	13.2	13.0	21.7	14.1	23.9	25.3	12.0	17.7	19.6				
HOURLY AVG	2.8	3.3	3.3	3.4	2.9	3.4	3.8	3.6	2.9	2.9	3.3	4.1	4.9	4.7	3.7	3.9	3.6	4.0	3.5	4.1	4.1	3.0	3.3	3.4				

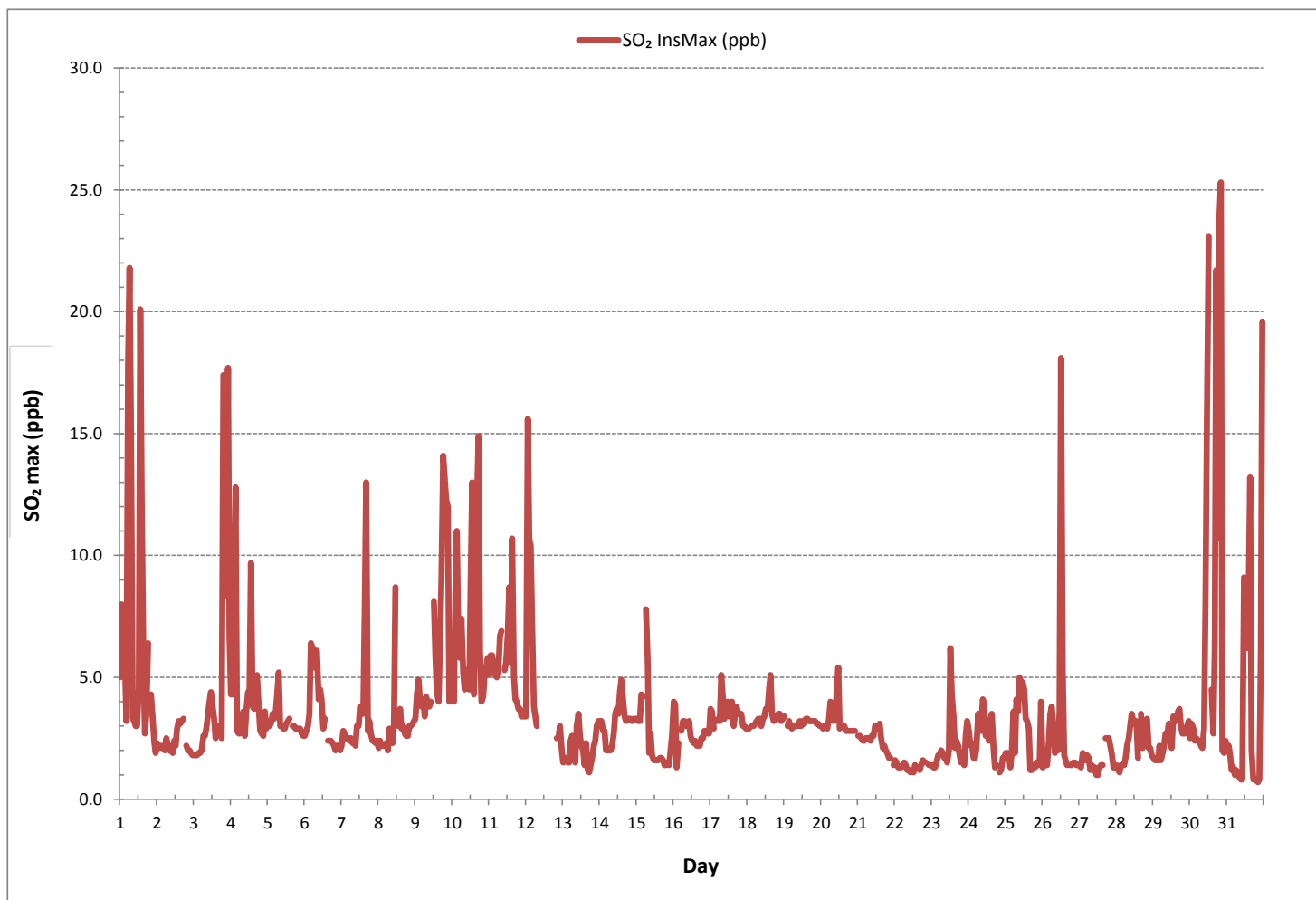
STATUS FLAG CODES

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:	702
MAXIMUM INSTANTANEOUS VALUE:	25.3 ppb @ HOUR(S) 20 ON DAY(S) 30
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	742 hrs
STANDARD DEVIATION:	3.1

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

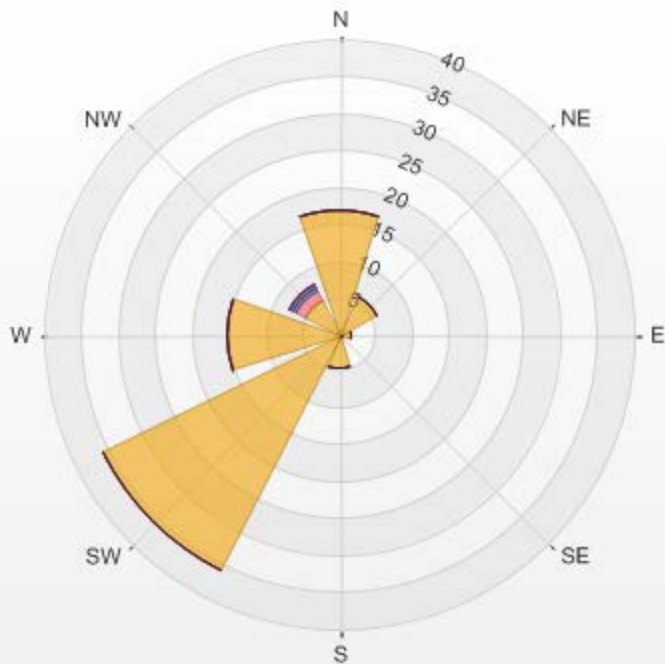


Wind: LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 11.43% Valid Data: 94.09% Calm Avg: 0.07 [ppb]

Direction	0.0-2.5	2.5-4.9	4.9-7.4	7.4-9.8	9.8-12.3	>12.3	Total
N	16.86	0	0	0	0	0	16.86
NE	5.71	0	0	0	0	0	5.71
E	1.57	0	0	0	0	0	1.57
SE	0.57	0	0	0	0	0	0.57
S	4.71	0	0	0	0	0	4.71
SW	35.86	0	0	0	0	0	35.86
W	15.29	0.14	0	0	0	0	15.43
NW	5.29	1.29	0.71	0.43	0.14	0	7.86
Summary	85.86	1.43	0.71	0.43	0.14	0	88.57

% Icon Classes (ppb) 86 0.0-2.5 1 2.5-4.9 1 4.9-7.4 0 7.4-9.8 0 9.8-12.3 0 >12.3

LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 11.43% Calm Poll
Avg: 0.07[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 2017/01 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	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24
2	0.4	0.0	0.0	0.7	4.6	0.8	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	S	0.0	0.0	0.0	1.2	0.6	0.0	4.6	0.4	24
3	0.6	0.8	0.0	0.4	1.0	0.2	1.0	S1	S1	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.2	22
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	24
5	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.0	24
6	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.2	0.2	0.3	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	S	0.6	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.4	0.1	0.0	0.4	0.0	0.6	0.1	0.1	24
10	0.0	0.0	0.4	0.2	0.0	0.2	0.7	0.0	0.2	0.7	S	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	C	C	C	Y	Y	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22
13	0.1	0.3	0.0	0.0	0.2	1.2	0.0	S	0.5	0.5	0.0	0.4	0.9	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.2	24
14	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.2	0.0	0.5	0.0	24	
17	0.2	0.1	0.2	S	0.0	0.3	0.1	S1	S1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.1	22	
18	0.0	0.2	S	0.1	0.0	0.0	0.0	0.0	0.2	0.2	C1	C1	C1	Y	C1	C1	C1	C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	16	
19	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	24	
20	S	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24
21	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.1	0.7	0.3	0.1	0.4	0.6	0.4	S	0.0	0.0	0.7	0.2	24	
22	0.5	0.1	0.3	0.0	0.0	0.0	0.2	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	0.0	S	0.0	0.0	0.0	0.5	0.1	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	S	0.3	0.2	0.5	0.0	0.5	0.1	24	
24	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	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
25	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.0	0.3	0.3	0.0	0.0	0.1	0.3	0.3	0.0	S	0.1	0.7	0.7	0.1	0.4	0.0	0.7	0.2	0.2	24	
26	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.5	0.2	0.0	0.0	0.4	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24	
27	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.0	0.1	0.4	0.1	0.0	0.1	0.0	0.4	0.0	0.4	24	
29	0.3	0.6	0.4	0.4	0.5	0.0	0.7	0.3	1.1	0.9	0.4	0.2	0.6	0.6	S	0.7	0.2	0.6	1.2	1.3	1.4	0.0	0.3	0.0	0.0	1.4	0.6	24	
30	0.5	0.7	0.0	0.1	0.2	0.1	0.0	0.1	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	0.7	0.1	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
HOURLY MAX	0.6	0.8	0.5	0.7	4.6	1.2	1.0	0.3	1.1	0.9	0.4	0.4	0.9	0.6	0.3	0.7	0.7	0.6	1.2	1.3	1.4	0.7	1.2	0.6					
HOURLY AVG	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	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

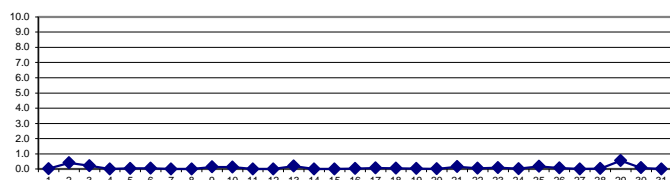
OBJECTIVE LIMIT:

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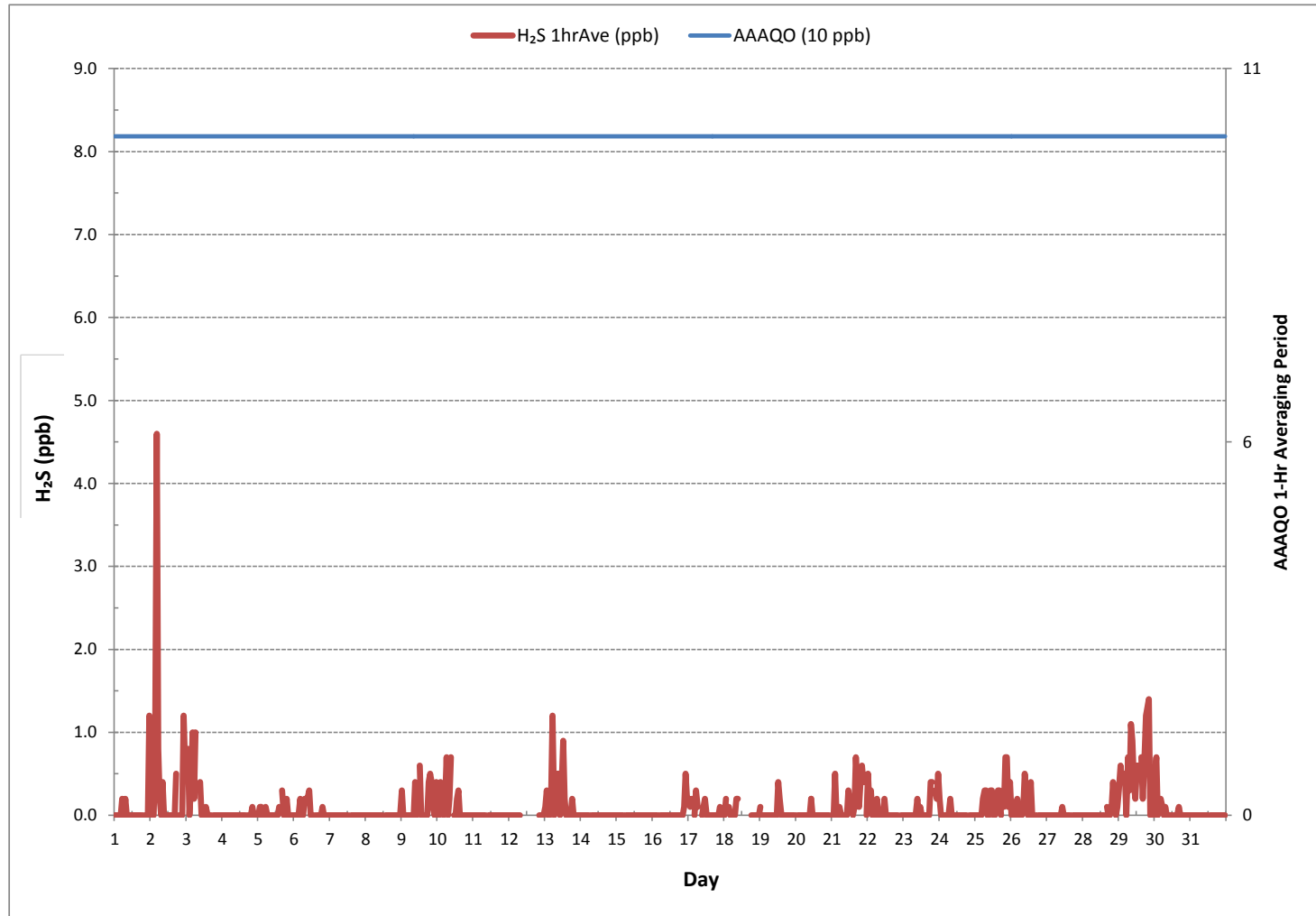
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	154					
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	4.6	ppb	@ HOUR(S)	4	ON DAY(S)	2
MAXIMUM 24-HR AVERAGE:	0.6	ppb			ON DAY(S)	29
					VAR-VARIOUS	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	730	hrs	
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	98.1	%	
STANDARD DEVIATION:	0.3		MONTHLY AVERAGE:	0.1	ppb	

24 HR AVERAGES January 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - January 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	1.9	2.1	2.1	1.7	2.1	3.2	1.9	2.7	2.8	1.4	1.4	1.8	1.4	3.7	2.1	2.3	2.2	1.0	1.5	S	3.2	1.8	0.9	1.4	0.9	3.7	2.0	24	
2	3.7	3.1	2.8	3.6	8.3	4.5	2.3	2.0	3.2	1.1	2.0	2.2	1.0	1.7	2.3	1.8	1.4	3.6	S	0.9	0.6	1.7	3.1	2.4	0.6	8.3	2.6	24	
3	2.3	2.5	1.9	2.6	4.0	2.5	2.6	S1	S1	2.0	2.0	1.3	1.6	2.1	0.3	1.0	1.5	S	1.3	1.3	1.8	1.6	1.3	1.2	0.3	4.0	1.8	22	
4	1.1	2.2	1.9	1.5	1.4	1.5	1.1	1.4	1.4	2.0	1.3	1.4	2.0	1.7	2.3	1.9	S	1.4	0.9	1.2	2.1	1.7	1.5	1.4	0.9	2.3	1.6	24	
5	2.1	2.2	1.9	1.5	1.5	2.1	2.0	1.0	1.2	0.9	1.3	1.6	1.0	1.1	1.6	S	2.1	1.5	1.4	1.5	1.3	1.1	0.9	1.0	0.9	2.2	1.5	24	
6	1.2	0.9	0.8	1.4	1.6	1.1	1.0	1.9	1.5	1.1	1.9	1.7	1.2	0.4	S	1.1	1.0	1.1	1.2	1.4	0.9	0.6	1.4	1.2	0.4	1.9	1.2	24	
7	0.9	1.4	0.8	1.2	1.5	1.0	1.0	1.4	1.7	1.6	1.2	0.9	0.8	S	1.4	2.3	2.2	0.9	1.0	0.8	1.8	1.2	2.2	2.2	0.8	2.3	1.4	24	
8	1.3	1.6	1.7	1.8	1.3	1.5	1.3	1.3	1.9	2.1	1.6	1.6	S	1.0	0.8	2.3	2.6	1.5	1.5	1.3	1.4	1.6	1.4	2.1	0.8	2.6	1.6	24	
9	2.5	2.2	1.3	1.0	2.6	2.2	2.0	2.3	1.4	2.5	1.8	S	3.0	2.2	2.3	2.2	1.8	2.6	2.6	2.8	2.4	2.9	2.4	2.7	1.0	3.0	2.2	24	
10	1.9	1.9	4.5	2.4	1.8	1.8	2.7	1.8	2.6	2.5	S	1.9	2.1	2.0	2.8	1.6	1.6	2.2	1.8	1.5	1.7	2.2	1.5	1.1	1.1	4.5	2.1	24	
11	2.5	2.0	2.5	2.2	2.4	2.1	3.0	3.3	3.0	S	2.2	2.5	2.2	2.4	2.1	2.4	2.2	1.5	2.4	3.7	1.5	1.4	1.7	1.5	1.4	3.7	2.3	24	
12	2.5	1.3	0.9	1.2	1.3	1.7	1.8	1.9	S	2.4	C	C	C	Y	Y	C	C	C	C	C	C	0.5	0.0	0.4	0.5	0.0	2.5	1.3	22
13	0.5	0.5	0.9	0.5	0.9	1.8	1.0	S	0.7	0.5	0.0	1.0	1.3	1.0	0.2	0.0	0.0	0.5	0.7	0.4	0.3	0.0	0.0	0.7	0.0	1.8	0.6	24	
14	0.7	0.4	0.7	0.0	0.4	0.5	S	0.1	0.2	0.5	0.4	0.3	0.1	0.3	0.0	0.0	0.0	0.2	0.5	0.5	0.3	0.2	0.2	0.0	0.0	0.7	0.3	24	
15	0.1	0.5	0.4	0.4	0.3	S	0.2	0.0	0.0	0.4	0.1	0.3	0.2	0.3	0.0	0.3	0.2	0.3	0.7	0.6	0.2	0.3	0.0	0.0	0.0	0.7	0.3	24	
16	0.2	0.4	0.3	0.1	S	0.1	0.0	0.7	0.8	0.3	0.6	0.2	0.3	0.2	0.1	0.2	1.1	1.8	0.5	0.5	0.2	0.4	1.0	0.7	0.0	1.8	0.5	24	
17	0.6	0.2	0.8	S	0.7	1.1	0.9	S1	S1	1.0	1.1	1.1	2.1	1.4	0.4	0.4	0.6	0.8	0.8	0.2	1.0	1.0	0.9	1.2	0.2	2.1	0.9	22	
18	1.3	1.6	S	1.1	0.8	1.3	0.9	1.2	1.2	1.3	C1	C1	C1	Y	C1	C1	C1	C1	C1	0.3	0.2	1.2	0.6	0.5	1.2	0.2	1.6	1.0	16
19	1.2	S	0.6	0.6	0.6	1.2	0.9	0.4	0.5	0.5	0.5	0.4	3.5	1.8	0.5	0.5	0.5	0.4	0.2	1.1	0.7	0.1	0.5	0.8	0.1	3.5	0.8	24	
20	S	0.4	0.7	1.2	0.2	0.9	1.3	1.2	1.3	0.9	1.5	0.8	0.1	1.6	0.9	1.0	0.8	0.7	0.3	0.7	0.7	0.9	1.1	S	0.1	1.6	0.9	24	
21	0.8	1.0	1.5	1.3	0.8	1.0	0.4	0.8	0.2	0.3	0.5	1.0	0.5	1.7	0.0	0.3	0.7	0.1	0.1	0.1	0.2	0.4	S	0.0	0.0	1.7	0.6	24	
22	0.2	0.1	0.1	0.0	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.6	1.1	0.0	0.0	0.0	0.3	0.2	0.1	1.2	0.0	S	0.0	0.0	0.0	1.2	0.2	24	
23	0.1	1.2	0.5	0.0	0.8	0.5	0.0	0.0	0.0	0.6	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	S	0.0	0.0	0.1	0.0	1.2	0.2	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.7	0.1	0.0	0.0	S	0.0	0.1	0.0	0.0	0.0	0.7	0.1	24	
25	0.0	0.2	0.0	0.0	0.0	0.2	0.3	0.8	0.0	0.2	0.2	0.4	0.0	0.0	0.0	0.1	0.0	0.0	S	0.1	0.6	0.5	0.1	0.5	0.0	0.8	0.2	24	
26	0.0	0.0	0.0	0.2	0.2	0.4	0.0	0.0	0.4	0.6	0.2	0.0	0.3	0.4	0.3	0.2	0.2	S	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.6	0.2	24	
27	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.0	S	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.4	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	S	0.2	0.1	0.2	0.1	0.3	0.1	0.0	0.0	0.0	0.3	0.1	24	
29	0.0	0.1	0.0	0.0	0.0	0.0	0.5	0.0	0.4	1.4	0.0	0.0	0.0	S	0.0	0.0	0.1	0.4	0.6	1.0	0.4	0.4	0.4	0.0	0.0	1.4	0.2	24	
30	0.5	0.7	0.0	0.3	0.2	0.3	0.1	0.2	0.0	0.0	0.4	0.3	0.0	S	0.7	0.5	0.5	0.4	0.0	0.3	0.3	0.3	0.1	0.0	0.0	0.7	0.3	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.6	0.0	24	
HOURLY MAX	3.7	3.1	4.5	3.6	8.3	4.5	3.0	3.3	3.2	2.5	2.2	2.5	3.5	3.7	2.8	2.4	2.6	3.6	2.6	3.7	3.2	2.9	3.1	2.7					
HOURLY AVG	1.0	1.0	1.0	0.9	1.2	1.2	1.0	1.0	1.0	1.0	0.8	0.9	1.0	1.0	0.8	0.9	0.9	0.8	0.7	0.9	0.9	0.9	0.8	0.8	0.8				

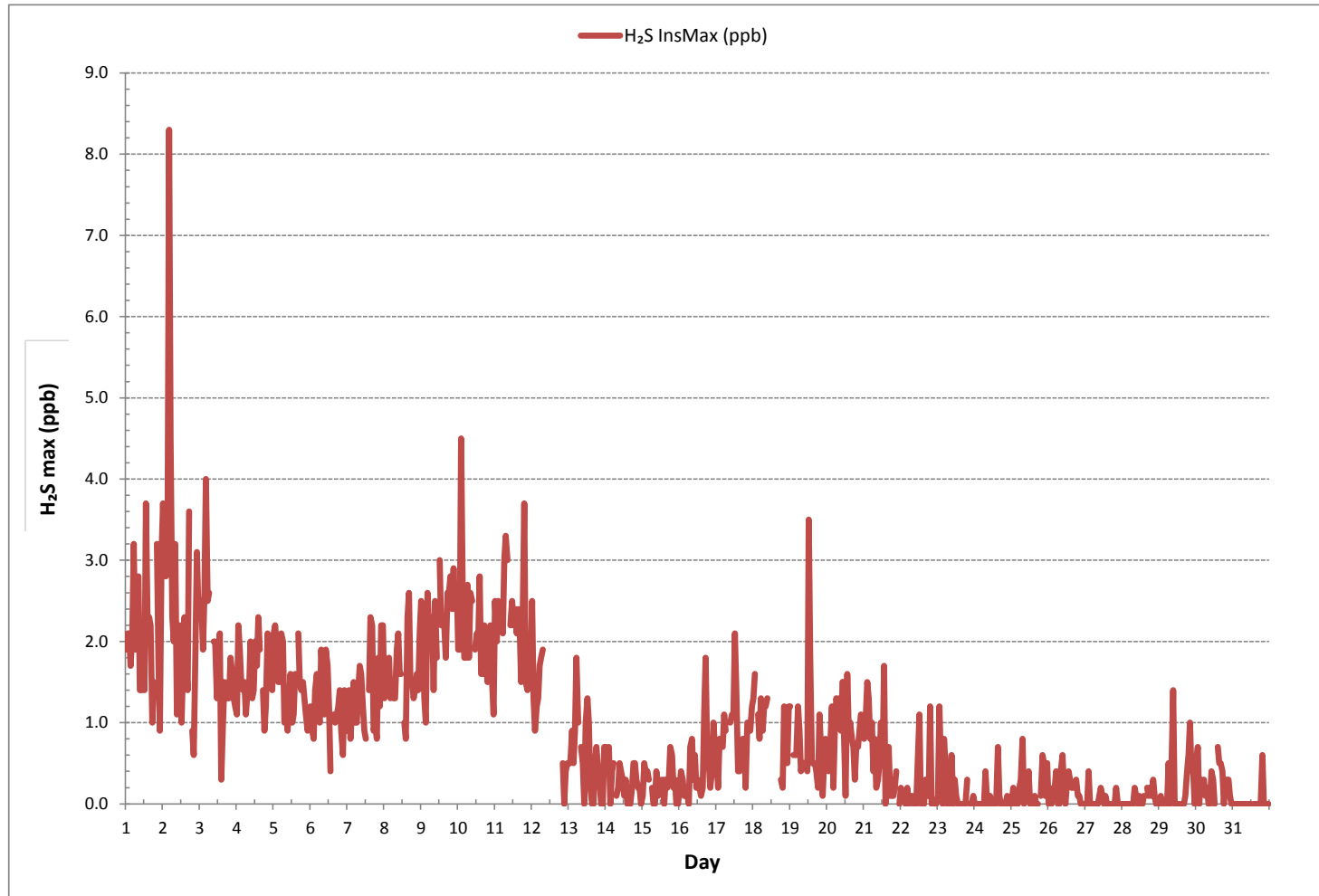
STATUS FLAG CODES

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:	541
MAXIMUM INSTANTANEOUS VALUE:	8.3 ppb @ HOUR(S) 4 ON DAY(S) 2
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	730 hrs
STANDARD DEVIATION:	0.9

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

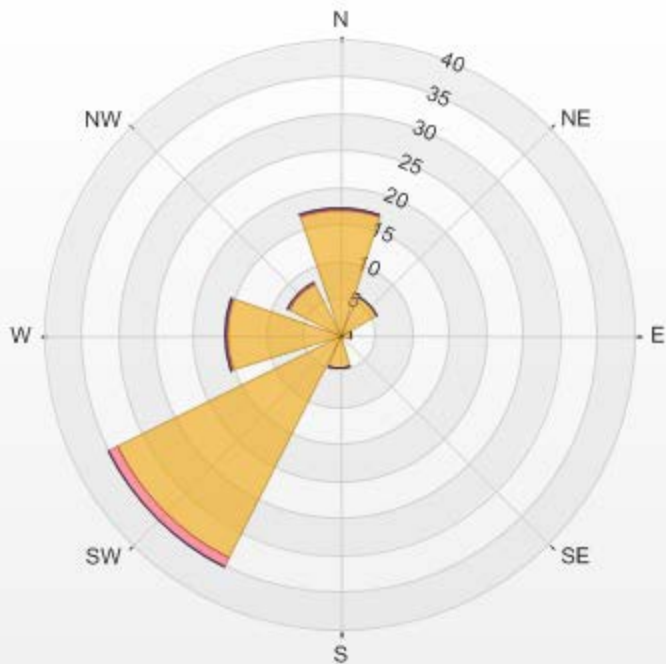


Wind: LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr
 Calm: 11.34% Valid Data: 92.47% Calm Avg: 0.16 [ppb]

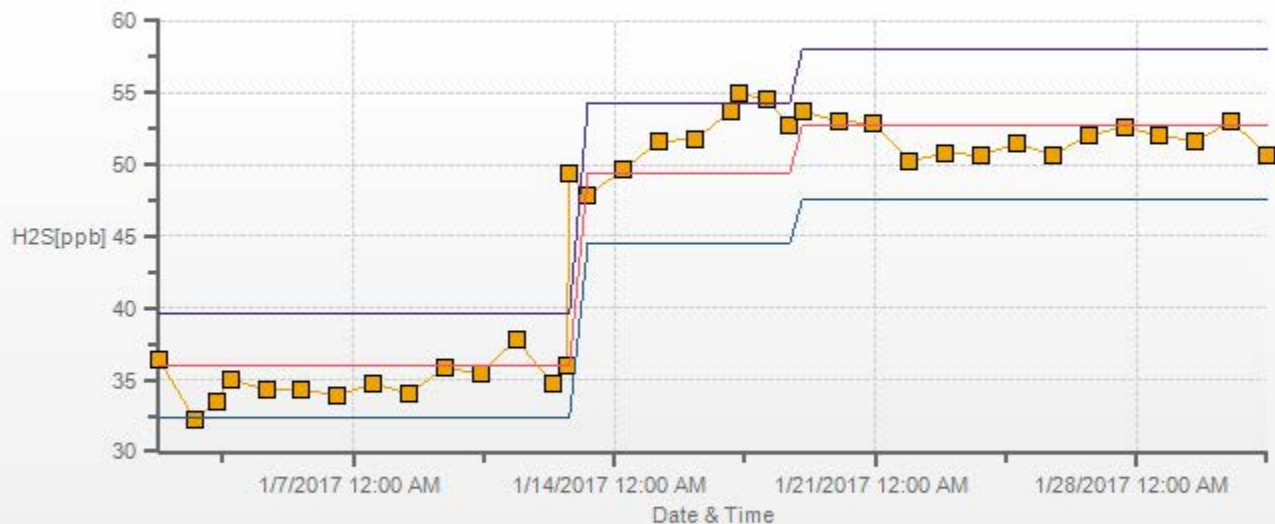
Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	17.01	0.15	0	0	17.16
NE	5.81	0	0	0	5.81
E	1.6	0	0	0	1.6
SE	0.58	0	0	0	0.58
S	4.65	0	0	0	4.65
SW	33.87	1.31	0	0	35.18
W	15.26	0.29	0.15	0	15.7
NW	7.85	0.15	0	0	8
Summary	86.63	1.9	0.15	0	88.68

% Icon Classes (ppb) 87 0.0-0.7 2 0.7-1.3 0 1.3-2.0 0 >2.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 11.34% Calm Poll
Avg: 0.16[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON

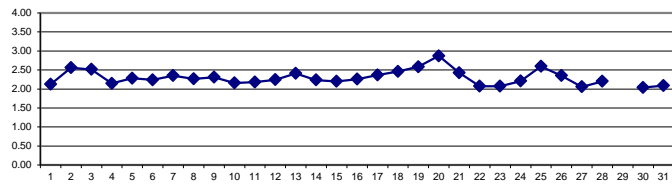
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.08	2.10	2.14	2.09	2.07	2.11	2.12	2.09	2.10	2.10	2.10	2.10	2.11	2.11	2.11	2.13	2.13	2.16	S	2.18	2.18	2.21	2.23	2.07	2.23	2.12	24		
2	2.30	2.30	2.47	2.58	3.64	3.27	3.23	2.99	2.86	2.79	2.91	3.10	2.38	2.22	2.15	2.15	2.15	2.18	S	2.21	2.24	2.25	2.24	2.27	2.15	3.64	2.56	24	
3	2.26	2.27	2.34	2.42	2.41	2.39	2.36	2.42	2.39	2.55	3.16	3.64	3.38	2.97	2.63	2.84	2.41	S	2.16	2.19	2.19	2.15	2.14	2.13	2.13	3.64	2.51	24	
4	2.11	2.11	2.11	2.12	2.11	2.11	2.12	2.12	2.13	2.15	2.15	2.16	2.15	2.15	2.14	2.12	S	2.14	2.14	2.14	2.17	2.19	2.24	2.25	2.11	2.25	2.14	24	
5	2.28	2.44	2.54	2.63	2.56	2.58	2.64	2.49	2.43	2.23	2.12	2.12	2.11	2.10	2.12	S	2.11	2.14	2.17	2.16	2.13	2.13	2.13	2.10	2.10	2.24	2.28	24	
6	2.13	2.13	2.15	2.14	2.15	2.15	2.15	2.18	2.19	2.19	2.23	2.22	2.23	2.28	S	2.35	2.35	2.33	2.30	2.29	2.31	2.35	2.36	2.36	2.13	2.36	2.24	24	
7	2.38	2.38	2.40	2.41	2.40	2.33	2.34	2.35	2.38	2.36	2.39	2.50	2.55	S	2.55	2.51	2.46	2.36	2.27	2.18	2.16	2.16	2.15	2.15	2.15	2.55	2.35	24	
8	2.16	2.16	2.15	2.16	2.17	2.19	2.18	2.21	2.24	2.25	2.26	2.19	S	2.14	2.16	2.27	2.40	2.43	2.46	2.43	2.37	2.25	2.33	2.50	2.14	2.50	2.26	24	
9	2.57	2.60	2.55	2.47	2.55	2.63	2.51	2.48	2.42	2.45	2.41	S	2.22	2.12	2.11	2.15	2.14	2.13	2.12	2.12	2.13	2.10	2.09	2.08	2.08	2.63	2.31	24	
10	2.09	2.09	2.09	2.09	2.09	2.12	2.15	2.13	2.13	2.21	S	2.13	2.10	2.10	2.11	2.15	2.16	2.16	2.15	2.19	2.25	2.33	2.47	2.09	2.47	2.16	24		
11	2.48	2.42	2.33	2.34	2.34	2.29	2.25	2.23	2.26	S	2.05	2.02	1.99	2.00	2.05	2.07	2.09	2.12	2.13	2.14	2.14	2.14	2.13	2.15	1.99	2.48	2.18	24	
12	2.15	2.16	2.16	2.19	2.17	2.18	2.21	2.33	S	X	2.44	2.22	2.22	X	X	C	C	C	C	C	C	2.30	2.26	2.30	2.33	2.15	2.44	2.24	21
13	2.34	2.36	2.37	2.38	2.44	2.42	2.40	S	2.46	2.54	2.47	2.40	2.29	2.41	2.31	2.42	2.66	2.42	2.39	2.33	2.36	2.39	2.45	2.43	2.29	2.66	2.41	24	
14	2.39	2.32	2.26	2.27	2.25	2.29	S	2.33	2.27	2.23	2.22	2.20	2.17	2.16	2.17	2.17	2.17	2.16	2.20	2.22	2.22	2.22	2.29	2.22	2.16	2.39	2.23	24	
15	2.19	2.19	2.22	2.33	2.32	S	2.26	2.25	2.11	2.16	X	X	X	X	X	X	X	X	X	X	X	2.11	2.10	2.16	2.10	2.33	2.20	13	
16	2.22	2.37	2.27	2.28	S	2.28	2.27	2.24	2.20	2.20	2.23	2.25	2.33	2.34	2.28	2.19	2.21	2.18	2.19	2.28	2.30	2.28	2.26	2.27	2.18	2.37	2.26	24	
17	2.29	2.28	2.29	S	2.30	2.33	2.37	2.43	2.38	2.61	2.60	2.49	2.39	2.32	2.28	2.32	2.35	2.26	2.28	2.28	2.32	2.35	2.38	2.47	2.26	2.61	2.36	24	
18	2.42	2.44	S	2.37	2.37	2.39	2.40	2.35	2.32	2.33	2.39	2.41	2.36	2.38	2.40	2.47	2.60	2.71	2.74	2.70	2.56	2.49	2.47	2.44	2.32	2.74	2.46	24	
19	2.49	S	2.62	2.63	2.73	2.76	2.68	2.63	2.63	2.76	2.70	2.52	2.44	2.45	2.47	2.50	2.51	2.54	2.54	2.54	2.53	2.53	2.54	2.44	2.44	2.76	2.58	24	
20	S	2.55	2.69	2.76	2.76	2.78	2.77	2.80	3.08	3.04	2.87	2.64	2.46	2.52	2.65	2.84	2.89	3.02	3.15	3.24	3.25	3.15	3.16	S	2.46	3.25	2.87	24	
21	3.19	3.17	2.96	2.81	2.77	2.82	2.76	2.88	2.61	2.30	2.33	2.28	2.02	2.01	2.06	2.12	2.14	2.12	2.09	2.08	2.07	2.05	S	2.04	2.01	3.19	2.42	24	
22	2.03	2.05	2.07	2.08	2.08	2.10	2.09	2.11	2.09	2.09	2.08	2.08	2.08	2.07	2.11	2.10	2.07	2.06	2.06	2.06	2.05	S	2.05	2.07	2.03	2.11	2.08	24	
23	2.05	2.06	2.05	2.05	2.05	2.05	2.06	2.06	2.06	2.06	2.07	2.06	2.06	2.07	2.07	2.08	2.08	2.08	2.09	2.11	S	2.12	2.10	2.09	2.05	2.12	2.07	24	
24	2.09	2.08	2.09	2.12	2.10	2.15	2.26	2.30	2.33	2.37	2.31	2.25	2.19	2.13	2.14	2.17	2.13	2.16	2.18	S	2.22	2.26	2.34	2.42	2.08	2.42	2.21	24	
25	2.45	2.51	2.60	2.62	2.82	2.87	2.87	2.86	2.71	2.80	2.77	2.67	2.47	2.46	2.47	2.41	2.40	2.41	S	2.41	2.48	2.57	2.51	2.52	2.40	2.87	2.59	24	
26	2.52	2.54	2.58	2.62	2.65	2.68	2.73	2.75	2.73	2.69	2.58	2.41	2.22	2.09	2.06	2.03	2.03	S	2.03	2.03	2.03	2.03	2.06	2.03	2.03	2.75	2.35	24	
27	2.06	2.04	2.03	2.03	2.02	2.03	2.02	2.02	2.03	2.03	2.04	2.03	2.03	2.02	2.03	2.02	S	2.11	2.10	2.11	2.22	2.20	2.06	2.02	2.02	2.22	2.06	24	
28	2.02	2.02	2.03	2.02	2.02	2.06	2.11	2.11	2.16	2.32	2.45	2.38	2.33	2.23	2.10	S	2.25	2.31	2.29	2.34	2.32	2.33	2.19	X	2.02	2.45	2.20	23	
29	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	X	X	X	24
30	X	X	X	X	X	X	X	X	X	X	X	X	2.14	2.06	S	2.05	2.03	2.05	2.02	2.00	2.00	2.01	2.01	2.02	2.03	2.00	2.14	2.04	13
31	2.04	2.05	2.06	2.07	2.08	2.09	2.09	2.09	2.09	2.09	2.09	2.10	S	2.08	2.11	2.11	2.09	2.08	2.12	2.09	2.12	2.10	2.11	2.12	2.04	2.12	2.09	24	
HOURLY MAX	3.19	3.17	2.96	2.81	3.64	3.27	3.23	2.99	3.08	3.04	3.16	3.64	3.38	2.97	2.65	2.84	2.89	3.02	3.15	3.24	3.25	3.15	3.16	2.54					
HOURLY AVG	2.28	2.29	2.31	2.32	2.37	2.37	2.37	2.37	2.35	2.36	2.39	2.35	2.27	2.23	2.22	2.26	2.27	2.26	2.25	2.26	2.27	2.26	2.27	2.25					

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

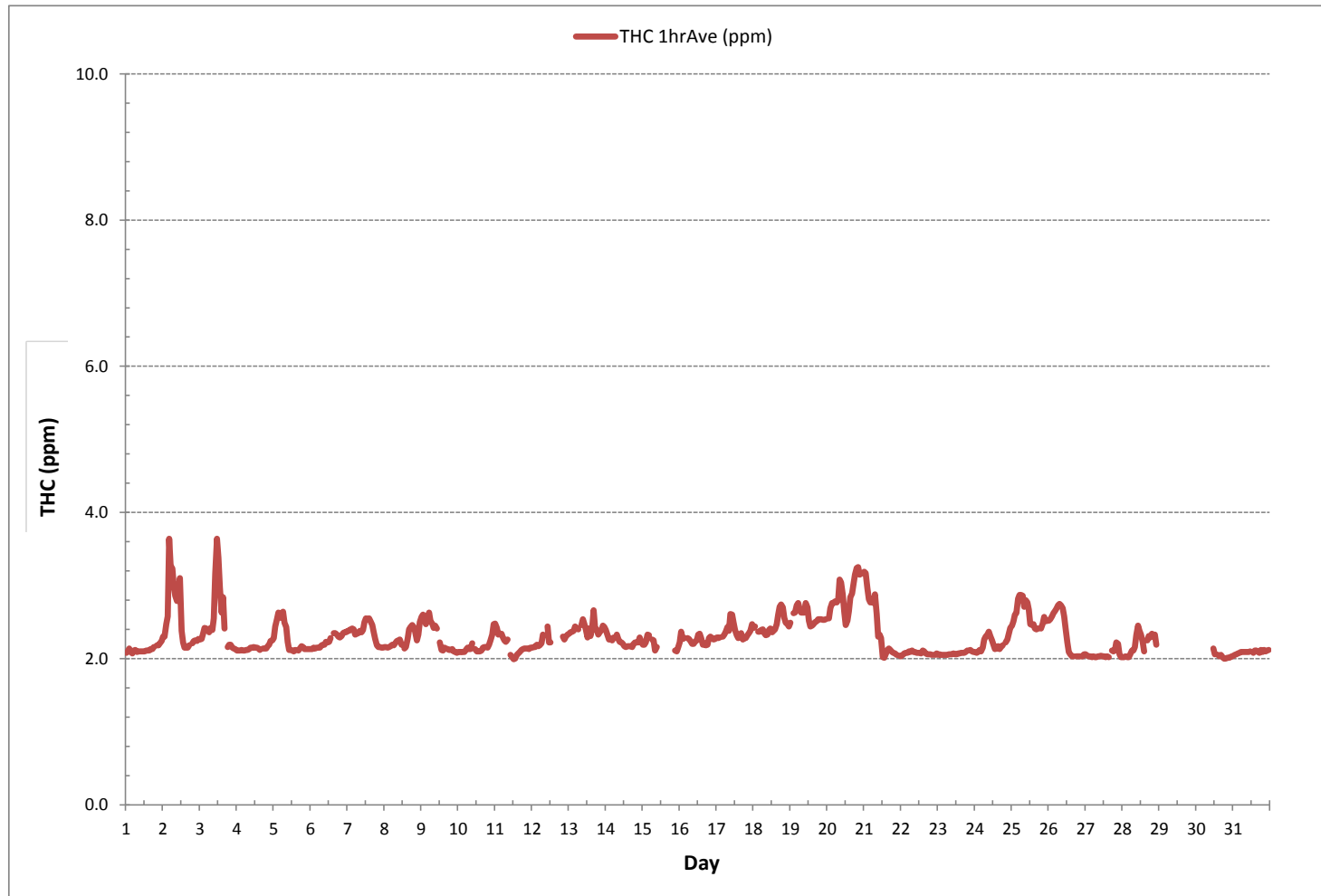
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	658			
MINIMUM 1-HR AVERAGE:	1.99 ppm	@ HOUR(S)	12	ON DAY(S) 11
MAXIMUM 1-HR AVERAGE:	3.64 ppm	@ HOUR(S)	4, 11	ON DAY(S) 2, 3
MAXIMUM 24-HR AVERAGE:	2.87 ppm			ON DAY(S) 20
				VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	694 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	93.3 %	
STANDARD DEVIATION:	0.26	MONTHLY AVERAGE:	2.30 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - January 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	2.12	2.20	2.20	2.20	2.10	2.23	2.21	2.14	2.14	2.14	2.15	2.15	2.15	2.20	2.18	2.17	2.18	2.20	2.23	S	2.26	2.31	2.29	2.32	2.10	2.32	2.19	24	
2	2.75	2.45	2.66	2.98	5.15	3.60	3.81	3.21	3.06	3.03	4.99	4.15	2.63	3.94	2.26	2.26	2.28	2.31	S	2.35	2.38	2.39	2.35	2.41	2.26	5.15	3.02	24	
3	2.38	2.38	2.58	2.58	2.61	2.60	2.50	2.51	2.51	2.92	3.47	3.84	3.66	3.15	2.95	3.03	2.70	S	2.23	2.34	2.31	2.23	2.23	2.20	2.20	3.84	2.69	24	
4	2.17	2.17	2.18	2.20	2.17	2.17	2.18	2.20	2.20	2.20	2.20	2.23	2.21	2.23	2.24	2.20	S	2.23	2.25	2.20	2.23	2.26	2.32	2.31	2.17	2.32	2.22	24	
5	2.38	2.52	2.69	2.69	2.64	2.72	2.73	2.63	2.57	2.34	2.17	2.17	2.16	2.14	2.17	S	2.17	2.20	2.24	2.24	2.19	2.19	2.19	2.19	2.14	2.73	2.36	24	
6	2.19	2.19	2.20	2.20	2.20	2.21	2.23	2.26	2.26	2.26	2.32	2.32	2.38	2.37	S	2.42	2.43	2.44	2.44	2.39	2.41	2.44	2.44	2.44	2.19	2.44	2.32	24	
7	2.47	2.47	2.51	2.51	2.51	2.44	2.44	2.44	2.52	2.52	2.57	2.61	2.64	S	2.63	2.61	2.57	2.47	2.44	2.29	2.25	2.24	2.23	2.23	2.23	2.64	2.46	24	
8	2.25	2.25	2.23	2.25	2.26	2.28	2.26	2.32	2.35	2.38	2.37	2.32	S	2.21	2.23	2.43	2.51	2.51	2.54	2.51	2.48	2.32	2.45	2.60	2.21	2.60	2.36	24	
9	2.63	2.64	2.64	2.54	2.69	2.70	2.54	2.54	2.47	2.47	2.45	S	2.32	2.15	2.17	2.17	2.17	2.17	2.15	2.16	2.17	2.13	2.10	2.10	2.10	2.70	2.36	24	
10	2.10	2.10	2.11	2.13	2.11	2.20	2.20	2.17	2.17	2.29	S	2.17	2.11	2.17	2.11	2.13	2.17	2.17	2.16	2.14	2.20	2.29	2.36	2.47	2.10	2.47	2.18	24	
11	2.50	2.45	2.32	2.32	2.32	2.24	2.23	2.20	2.21	S	2.01	1.98	1.99	2.04	2.05	2.07	2.20	2.13	2.13	2.14	2.16	2.16	2.16	2.17	1.98	2.50	2.18	24	
12	2.19	2.21	2.23	2.26	2.25	2.26	2.42	2.44	S	X	2.55	2.42	4.00	X	X	C	C	C	C	C	C	2.31	2.36	2.38	2.19	4.00	2.45	21	
13	2.38	2.38	2.41	2.41	2.48	2.48	2.42	S	2.52	2.85	2.54	2.44	2.35	2.46	2.39	2.61	2.75	2.57	2.41	2.35	2.38	2.47	2.47	2.44	2.35	2.85	2.48	24	
14	2.45	2.35	2.29	2.27	2.26	2.33	S	2.35	2.27	2.23	2.23	2.20	2.16	2.15	2.15	2.15	2.17	2.13	2.17	2.18	2.18	2.21	2.26	2.20	2.13	2.45	2.23	24	
15	2.17	2.14	2.25	2.34	2.29	S	2.28	2.29	2.10	2.15	X	X	X	X	X	X	X	X	X	X	X	2.08	2.11	2.16	2.08	2.34	2.20	13	
16	2.26	2.41	2.34	2.29	S	2.25	2.25	2.21	2.17	2.18	2.19	2.29	2.32	2.32	2.23	2.13	2.16	2.11	2.17	2.25	2.21	2.19	2.17	2.17	2.11	2.41	2.23	24	
17	2.18	2.17	2.17	S	2.19	2.23	2.38	2.32	2.32	2.64	2.54	2.60	2.32	2.23	2.20	2.23	2.35	2.16	2.19	2.18	2.21	2.28	2.31	2.56	2.16	2.64	2.30	24	
18	2.44	2.46	S	2.27	2.44	2.29	2.35	2.26	2.23	2.31	2.32	2.35	2.26	2.28	2.31	2.41	2.60	3.38	2.72	2.70	2.47	2.46	2.44	2.36	2.23	3.38	2.44	24	
19	2.41	S	2.60	2.57	2.86	2.89	2.72	2.63	2.64	2.63	2.81	2.63	2.52	2.35	2.35	2.39	2.41	2.42	2.45	2.46	2.47	2.42	2.44	2.44	2.35	2.89	2.54	24	
20	S	2.60	2.69	2.69	2.67	2.69	2.69	2.81	3.21	3.33	3.18	2.66	2.47	2.47	2.72	2.79	2.84	3.01	3.12	3.35	3.26	3.18	3.12	S	2.47	3.35	2.89	24	
21	3.29	3.20	3.18	3.09	2.78	3.27	3.29	3.44	2.70	2.53	2.48	2.32	2.13	1.98	2.05	2.11	2.13	2.10	2.07	2.07	2.05	2.04	S	2.02	1.98	3.44	2.54	24	
22	2.02	2.04	2.07	2.07	2.08	2.10	2.10	2.11	2.10	2.08	2.08	2.07	2.07	2.07	2.11	2.10	2.10	2.10	2.07	2.07	2.07	S	2.07	2.07	2.02	2.11	2.08	24	
23	2.07	2.07	2.05	2.05	2.07	2.05	2.05	2.07	2.07	2.07	2.07	2.07	2.07	2.10	2.07	2.10	2.10	2.08	2.10	2.13	S	2.13	2.11	2.13	2.05	2.13	2.08	24	
24	2.14	2.16	2.13	2.14	2.11	2.19	2.31	2.32	2.35	2.38	2.35	2.29	2.20	2.17	2.20	2.20	2.17	2.20	2.21	S	2.25	2.35	2.38	2.47	2.11	2.47	2.25	24	
25	2.47	2.63	2.67	2.81	2.92	2.92	2.92	2.90	2.81	2.86	2.81	2.78	2.57	2.51	2.53	2.44	2.42	2.44	S	2.44	2.57	2.60	2.54	2.58	2.42	2.92	2.66	24	
26	2.54	2.57	2.62	2.66	2.67	2.72	2.79	2.79	2.78	2.79	2.67	2.55	2.31	2.17	2.10	2.07	2.05	S	2.04	2.05	2.04	2.05	2.04	2.08	2.04	2.79	2.40	24	
27	2.08	2.07	2.07	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.07	2.04	2.07	2.07	2.04	2.04	S	2.17	2.17	2.19	2.26	2.26	2.11	2.04	2.04	2.26	2.09	24	
28	2.02	2.02	2.04	2.04	2.01	2.10	2.11	2.13	2.19	2.42	2.48	2.41	2.35	2.29	2.16	S	2.26	2.29	2.31	2.37	2.35	2.39	2.41	X	2.01	2.48	2.23	23	
29	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	-	-	-	-
30	X	X	X	X	X	X	X	X	X	X	X	X	2.29	2.13	S	2.08	2.05	2.08	2.08	2.01	2.04	2.06	2.02	2.04	2.07	2.01	2.29	2.08	13
31	2.07	2.07	2.08	2.10	2.10	2.11	2.10	2.11	2.11	2.11	2.11	2.11	2.17	S	2.13	2.20	2.17	2.13	2.10	2.26	2.13	2.16	2.13	2.19	2.22	2.07	2.26	2.13	24
HOURLY MAX	3.29	3.20	3.18	3.09	5.15	3.60	3.81	3.44	3.21	3.33	4.99	4.15	4.00	3.94	2.95	3.03	2.84	3.38	3.12	3.35	3.26	3.18	3.12	2.60					
HOURLY AVG	2.33	2.33	2.36	2.38	2.46	2.44	2.45	2.42	2.40	2.45	2.53	2.45	2.39	2.32	2.25	2.29	2.31	2.31	2.28	2.30	2.30	2.29	2.30	2.28					

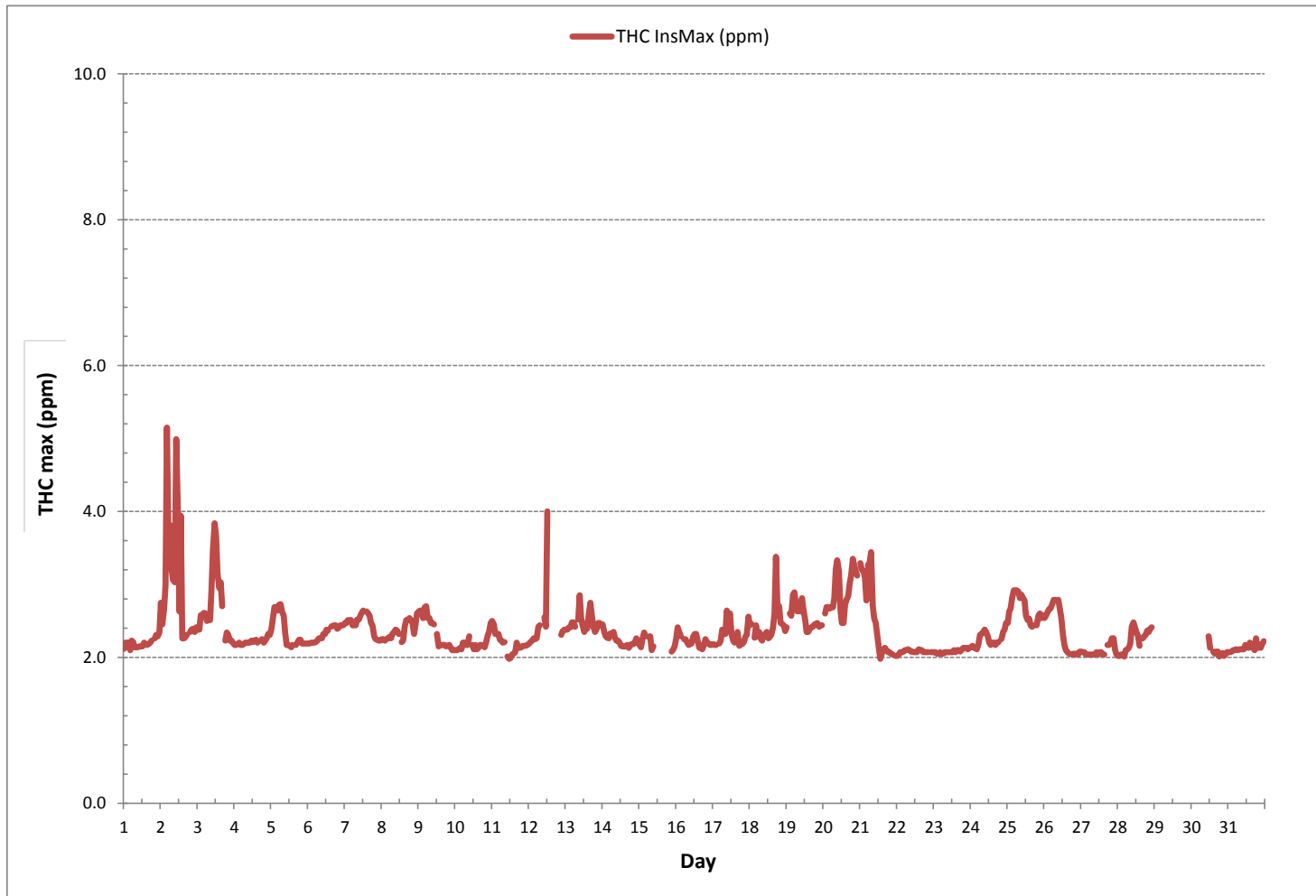
STATUS FLAG CODES

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:	657
MAXIMUM INSTANTANEOUS VALUE:	5.15 ppm @ HOUR(S) 4 ON DAY(S) 2
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	694 hrs
STANDARD DEVIATION:	0.34

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

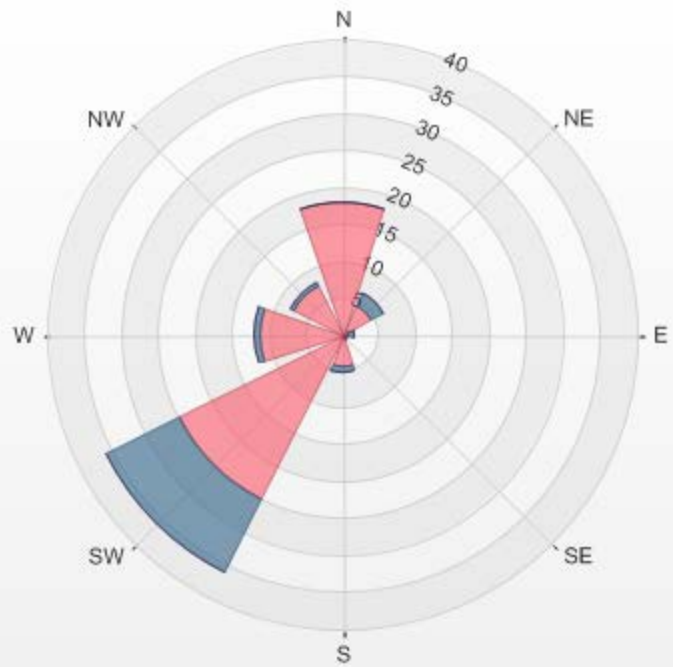


Wind: LICA MASKWA Poll.: LICA MASKWA-THC[ppm] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.04% Valid Data: 88.17% Calm Avg: 2.56 [ppm]

Direction	0.0-1.2	1.2-2.4	2.4-3.7	>3.7	Total
N	0	17.99	0	0	17.99
NE	0	4.42	1.83	0	6.25
E	0	0.91	0.76	0	1.67
SE	0	0.61	0.15	0	0.76
S	0	4.27	0.91	0	5.18
SW	0	24.85	11.13	0	35.98
W	0	11.28	0.76	0	12.04
NW	0	7.47	0.61	0	8.08
Summary	0	71.8	16.15	0	87.95

% Icon Classes (ppm)	0	0.0-1.2	72	1.2-2.4	16	2.4-3.7	0	>3.7
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LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 12.04% Calm
 Poll Avg: 2.56[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

OXIDES OF NITROGEN



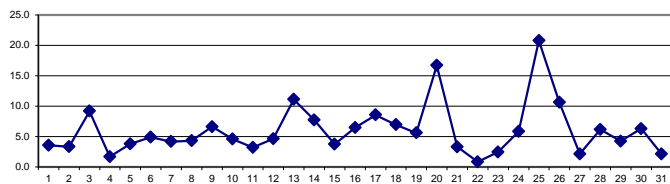
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	1.7	5.2	10.0	2.8	0.0	6.2	20.6	3.3	0.4	0.6	0.6	1.4	0.6	6.5	1.1	0.3	0.0	0.0	4.1	S	6.0	4.7	3.3	2.7	0.0	20.6	3.6	24				
2	3.0	2.6	1.7	1.2	1.0	1.2	4.8	4.2	5.6	8.8	7.5	5.5	3.6	4.3	2.3	1.8	2.4	3.7	S	4.8	3.0	1.8	1.0	1.0	1.0	8.8	3.3	24				
3	1.1	2.1	1.6	2.0	2.0	1.9	5.4	7.7	5.1	10.0	21.6	32.6	27.0	18.8	12.4	14.1	9.3	S	2.3	10.8	12.0	4.0	4.9	2.4	1.1	32.6	9.2	24				
4	0.0	0.0	0.9	4.7	0.1	0.3	0.1	0.9	1.2	3.1	2.4	1.9	2.7	4.1	1.4	1.2	S	3.0	1.6	0.8	0.6	1.0	3.4	3.5	0.0	4.7	1.7	24				
5	4.1	8.2	9.9	12.0	10.5	10.8	11.0	8.4	6.5	1.9	0.0	0.2	0.1	0.0	0.0	S	2.1	0.6	0.2	0.2	0.2	0.0	0.0	0.0	0.0	12.0	3.8	24				
6	0.0	0.1	0.4	1.6	3.0	6.4	5.3	8.6	12.5	13.1	10.8	4.1	2.4	5.4	S	5.8	5.0	4.5	3.5	3.7	4.1	4.4	4.4	4.1	0.0	13.1	4.9	24				
7	3.8	5.3	8.2	7.5	7.4	4.8	3.9	3.4	4.7	4.3	4.0	3.7	5.4	S	7.6	6.0	7.0	2.6	4.5	1.7	0.4	0.0	0.1	0.0	0.0	8.2	4.2	24				
8	0.0	0.0	0.4	0.5	0.1	0.2	4.3	3.4	6.1	6.5	7.7	11.3	S	2.1	2.4	3.5	12.6	8.2	6.4	5.4	5.1	2.7	3.9	7.0	0.0	12.6	4.3	24				
9	9.7	11.6	11.7	9.2	11.1	14.1	8.7	9.8	8.4	8.0	9.0	S	7.2	4.3	1.2	1.7	5.6	3.8	5.1	4.7	5.3	1.6	0.0	0.5	0.0	14.1	6.6	24				
10	1.1	0.2	1.3	2.9	0.6	3.4	5.2	10.4	8.2	15.4	S	4.6	3.8	3.2	1.4	0.5	3.7	10.2	5.0	0.7	1.4	4.3	7.2	11.1	0.2	15.4	4.6	24				
11	8.8	7.8	5.4	4.5	4.0	5.4	7.3	8.7	11.4	S	1.9	2.7	0.7	3.3	0.1	1.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	11.4	3.2	24				
12	0.6	3.3	2.1	4.9	5.5	3.3	3.8	14.4	S	11.0	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.8	2.5	3.0	2.4	0.6	14.4	4.7	24
13	1.9	2.3	2.4	2.8	4.7	6.9	12.0	S	19.8	30.3	16.9	13.1	10.7	15.6	11.7	13.6	17.1	12.5	8.2	7.6	9.2	10.3	11.9	13.8	1.9	30.3	11.1	24				
14	12.6	10.8	6.1	5.5	4.9	5.1	S	9.3	6.4	6.0	7.3	9.6	9.6	8.8	10.0	9.1	8.5	7.6	7.2	7.0	6.8	6.9	7.1	5.8	4.9	12.6	7.7	24				
15	5.3	5.6	6.1	8.6	9.2	S	11.5	9.5	3.6	4.9	2.1	3.1	0.3	0.5	0.3	0.4	1.6	1.5	0.7	0.6	1.4	1.5	1.6	5.9	0.3	11.5	3.7	24				
16	9.2	10.5	4.8	5.5	S	8.5	8.6	6.9	7.0	6.8	6.6	6.7	7.4	8.9	8.2	6.7	6.5	5.0	4.5	4.9	4.9	4.4	3.5	3.1	3.1	10.5	6.5	24				
17	3.3	3.3	2.7	S	4.6	4.4	7.1	S1	S1	20.5	20.9	16.1	11.3	8.9	8.4	7.9	10.6	9.1	9.4	8.1	6.8	5.9	5.5	4.8	2.7	20.9	8.6	22				
18	4.7	4.0	S	5.1	3.9	3.1	3.1	2.3	3.6	3.6	C1	C1	C1	C1	C1	C1	C1	12.7	13.3	12.5	11.2	11.2	9.1	8.0	2.3	13.3	7.0	17				
19	7.4	S	9.3	8.0	7.5	6.8	7.0	6.5	5.7	5.3	8.2	8.0	6.7	5.2	4.5	4.7	8.1	3.5	3.3	2.9	2.8	2.7	2.4	2.4	2.4	9.3	5.6	24				
20	S	3.5	3.5	5.7	7.8	9.3	24.3	22.6	30.9	34.4	22.8	20.7	11.5	14.6	18.2	23.0	19.4	18.0	18.2	17.3	17.0	13.3	11.3	S	3.5	34.4	16.7	24				
21	13.5	9.6	6.3	4.4	3.6	3.4	3.4	3.3	3.0	1.9	2.3	3.7	2.7	2.2	2.2	1.6	1.7	1.6	1.2	1.1	1.1	0.4	S	1.8	0.4	13.5	3.3	24				
22	0.9	0.7	1.2	1.2	0.9	1.2	1.0	1.3	1.3	0.8	0.4	0.0	0.3	0.4	1.4	1.1	0.3	0.6	0.9	0.9	0.5	S	1.7	0.8	0.0	1.7	0.9	24				
23	0.6	0.1	0.3	0.6	1.1	1.4	2.2	1.6	1.2	1.0	0.9	1.4	3.3	3.7	4.2	5.0	6.5	3.1	1.9	2.0	S	3.6	3.7	7.2	0.1	7.2	2.5	24				
24	4.3	2.4	1.9	0.9	1.5	2.7	6.7	8.0	9.5	11.2	8.3	6.6	6.9	5.0	4.8	7.1	3.8	3.3	4.3	S	7.1	6.1	9.8	12.1	0.9	12.1	5.8	24				
25	14.3	15.5	18.0	15.9	22.4	28.9	30.8	36.3	32.4	39.2	35.7	32.6	22.7	20.1	17.5	14.2	11.6	9.9	S	12.0	11.4	13.2	10.8	12.3	9.9	39.2	20.8	24				
26	9.7	10.6	10.9	12.5	16.4	17.0	21.2	23.4	21.1	24.3	18.1	16.3	16.5	9.4	3.7	2.0	1.9	S	4.0	1.8	1.2	0.8	0.6	1.0	0.6	24.3	10.6	24				
27	1.1	0.6	1.2	2.1	1.2	2.5	2.2	0.8	0.6	1.4	0.8	0.5	1.1	0.7	1.2	0.9	S	6.0	6.1	4.8	5.7	5.6	1.6	0.6	0.5	6.1	2.1	24				
28	0.6	0.6	0.6	0.6	0.6	1.4	3.5	4.8	5.9	12.0	15.6	12.1	10.3	7.5	3.2	S	12.2	9.1	8.3	9.1	9.9	7.9	5.4	0.9	0.6	15.6	6.2	24				
29	1.2	0.3	0.0	0.0	1.2	0.6	0.4	1.6	9.5	5.4	4.5	6.9	6.4	5.0	S	6.6	7.8	9.0	9.7	8.2	5.2	2.9	2.1	3.3	0.0	9.7	4.3	24				
30	3.0	8.0	6.3	3.2	5.8	4.8	1.7	1.3	1.2	2.7	12.0	13.2	11.3	S	9.5	4.6	8.7	15.6	3.4	12.0	15.0	0.6	0.3	1.1	0.3	15.6	6.3	24				
31	1.2	1.3	1.0	0.2	0.8	1.0	1.3	0.2	0.0	0.4	1.0	3.3	S	3.5	5.6	6.6	3.3	0.7	2.1	0.4	0.9	0.2	3.4	10.4	0.0	10.4	2.1	24				
HOURLY MAX	14.3	15.5	18.0	15.9	22.4	28.9	30.8	36.3	32.4	39.2	35.7	32.6	27.0	20.1	18.2	23.0	19.4	18.0	18.2	17.3	17.0	13.3	11.9	13.8								
HOURLY AVG	4.3	4.5	4.5	4.6	4.8	5.6	7.6	7.7	8.0	9.8	8.9	8.6	7.1	6.4	5.4	5.6	6.6	5.9	5.0	5.2	5.3	4.2	4.1	4.3								

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

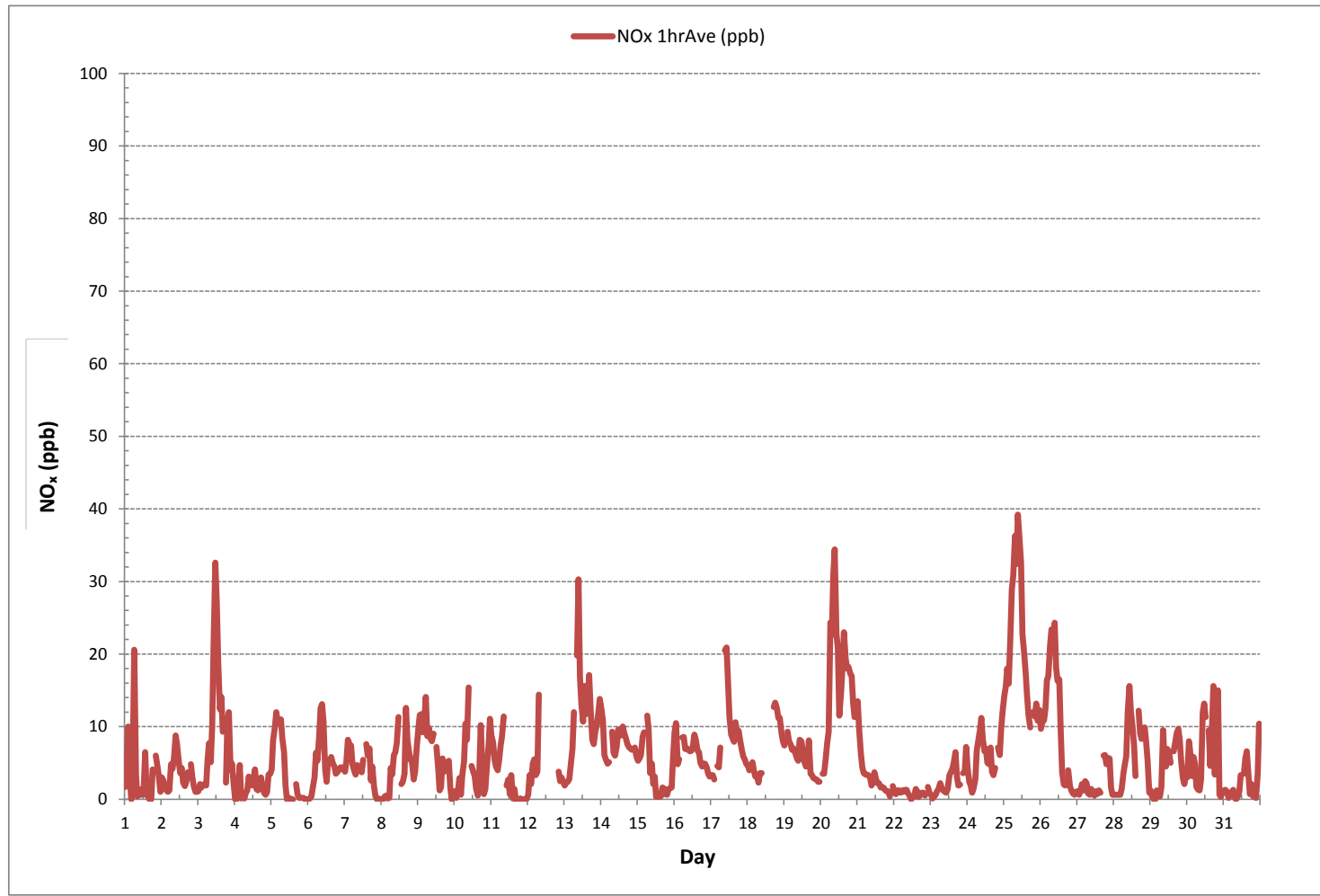
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	666			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	39.2 ppb	@ HOUR(S)	9	ON DAY(S) 25
MAXIMUM 24-HR AVERAGE:	20.8 ppb			ON DAY(S) 25
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	735 hrs	
MONTHLY CALIBRATION TIME:	10 hrs	AMD OPERATION UPTIME:	98.8 %	
STANDARD DEVIATION:	6.1	MONTHLY AVERAGE:	6.0 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - January 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	5.3	17.0	13.5	10.6	0.0	31.7	44.6	20.0	1.2	0.6	1.2	1.8	1.2	28.1	8.8	1.8	0.0	0.6	5.9	S	10.6	5.3	3.6	3.6	0.0	44.6	9.4	24	
2	3.6	3.0	2.4	1.8	1.8	1.8	72.1	10.0	10.6	11.2	11.2	7.6	7.1	24.1	3.6	3.6	3.6	5.3	S	7.6	3.6	3.0	1.8	1.8	1.8	72.1	8.8	24	
3	1.8	3.0	2.4	3.0	3.0	3.0	56.9	16.4	7.6	15.8	26.4	37.6	31.7	21.8	15.8	32.2	46.4	S	4.7	20.6	20.0	10.6	13.5	6.5	1.8	56.9	17.4	24	
4	1.2	1.8	6.4	11.8	1.2	1.2	0.6	1.8	2.4	8.8	5.9	3.0	4.1	13.0	3.6	3.6	S	6.5	3.0	1.8	1.3	2.4	5.3	4.7	0.6	13.0	4.1	24	
5	5.9	10.0	12.4	13.0	12.4	11.8	13.0	10.6	10.6	3.6	0.6	0.0	0.6	0.0	0.6	S	4.1	1.8	0.6	0.6	0.6	0.6	0.6	0.6	0.0	13.0	5.0	24	
6	0.0	0.6	1.2	2.4	6.4	7.6	6.5	12.4	19.4	18.8	14.1	7.1	5.3	7.1	S	7.6	5.9	6.4	4.1	7.1	7.1	5.9	5.3	4.7	0.0	19.4	7.1	24	
7	4.7	8.2	10.0	8.8	8.8	7.6	4.7	4.7	8.2	7.6	6.5	5.9	7.1	S	10.0	10.0	14.1	4.1	7.6	3.6	1.2	0.6	0.6	0.6	0.6	14.1	6.3	24	
8	0.6	0.6	1.3	1.2	0.6	1.8	9.4	4.7	8.8	8.2	10.0	18.8	S	4.7	4.1	6.5	45.1	10.6	7.7	7.1	7.1	4.1	5.9	8.8	0.6	45.1	7.7	24	
9	11.2	13.0	14.1	11.2	15.2	16.4	11.2	12.4	10.6	11.2	44.5	S	10.6	21.2	3.0	3.6	33.4	7.6	11.2	11.2	11.2	11.1	0.6	2.4	0.6	44.5	13.0	24	
10	2.4	1.2	4.7	9.4	3.6	5.9	7.1	65.1	14.1	22.9	S	7.1	5.9	7.1	24.7	4.1	9.4	64.5	11.2	3.6	3.6	8.2	11.2	13.0	1.2	65.1	13.5	24	
11	11.2	11.2	7.6	7.1	5.9	8.2	11.2	12.4	15.2	S	4.7	5.9	4.7	7.1	2.4	17.0	1.2	0.6	0.1	0.6	0.6	0.0	0.0	0.6	0.0	17.0	5.9	24	
12	1.2	11.2	6.4	10.0	8.8	5.3	6.4	29.9	S	25.2	C	C	C	C	C	C	C	C	C	C	C	8.2	4.1	4.7	4.1	1.2	29.9	9.7	24
13	3.5	3.5	3.5	4.7	6.5	9.4	42.2	S	29.9	38.7	20.6	16.4	14.1	20.0	17.0	18.2	20.0	20.6	10.0	10.0	11.2	13.0	13.5	15.2	3.5	42.2	15.7	24	
14	15.2	13.0	8.8	6.5	6.5	7.1	S	12.9	8.2	7.6	9.4	11.2	11.2	10.6	12.4	10.0	9.4	8.8	8.2	7.7	7.7	8.2	7.1	6.5	15.2	9.4	24		
15	5.9	7.1	7.1	11.2	10.0	S	20.0	15.2	5.9	7.6	3.5	26.4	0.6	1.2	0.6	1.2	3.0	2.4	1.2	1.2	1.8	1.8	4.7	7.7	0.6	26.4	6.4	24	
16	10.6	11.8	8.2	6.5	S	10.6	11.2	8.2	21.7	10.6	7.6	7.7	8.2	10.0	10.6	10.0	8.8	6.5	5.9	5.3	5.3	5.3	4.7	3.5	3.5	21.7	8.6	24	
17	4.1	4.1	3.5	S	7.6	5.9	12.4	S1	S1	29.3	22.9	20.6	14.6	11.2	10.6	9.4	13.0	10.6	10.6	9.4	7.6	6.5	6.4	5.9	3.5	29.3	10.8	22	
18	5.3	4.1	S	7.6	4.7	3.5	5.9	3.5	8.8	9.4	C1	C1	C1	C1	C1	C1	C1	25.8	14.6	14.1	12.4	12.4	10.0	9.4	3.5	25.8	9.5	17	
19	9.4	S	11.2	8.8	8.2	8.8	8.8	8.2	6.4	5.9	14.1	10.0	8.8	5.9	5.9	5.9	15.2	4.1	3.5	3.0	3.0	3.0	2.4	2.4	2.4	15.2	7.1	24	
20	S	5.9	4.1	7.6	8.2	12.4	62.1	54.5	33.5	56.9	36.4	27.6	12.4	17.6	22.3	24.1	20.6	18.8	19.4	18.8	18.2	16.4	13.0	S	4.1	62.1	23.2	24	
21	15.8	11.2	8.8	5.9	4.1	4.1	4.1	4.7	3.5	3.0	3.0	5.3	3.0	3.0	3.0	2.4	2.4	1.8	1.2	1.3	1.8	0.6	S	4.1	0.6	15.8	4.3	24	
22	1.2	1.2	1.8	1.2	1.2	1.2	1.3	1.8	1.8	1.2	0.6	0.0	0.6	0.6	1.8	1.8	1.2	0.6	1.2	1.2	0.6	S	4.1	1.2	0.0	4.1	1.3	24	
23	0.6	0.6	0.6	1.2	1.2	2.4	2.4	2.4	1.8	1.8	1.2	2.4	5.9	4.7	4.7	7.6	8.8	4.1	2.4	2.4	S	5.9	7.6	9.4	0.6	9.4	3.6	24	
24	5.9	5.3	3.5	1.8	4.1	4.1	9.4	10.6	11.8	12.9	12.4	8.8	8.2	14.6	8.8	11.2	6.4	4.7	5.9	S	10.6	8.8	11.8	14.1	1.8	14.6	8.5	24	
25	15.8	18.8	21.7	19.4	28.2	35.8	38.1	40.5	38.1	44.6	39.9	39.9	28.2	48.1	20.0	18.2	14.6	11.8	S	15.2	14.1	15.2	13.0	17.0	11.8	48.1	25.9	24	
26	11.2	11.8	12.4	15.2	20.6	20.0	27.6	36.4	23.5	31.1	22.9	20.6	28.2	18.2	5.9	3.5	4.1	S	7.6	3.0	2.4	1.8	1.8	1.8	1.8	36.4	14.4	24	
27	1.8	1.8	6.4	7.1	3.5	6.5	6.4	1.8	1.8	3.0	2.4	1.2	2.4	1.2	1.8	1.8	S	7.6	11.2	10.0	7.1	7.1	3.0	1.3	1.2	11.2	4.3	24	
28	0.6	0.6	0.6	0.6	0.6	3.0	4.1	6.5	9.4	17.0	21.2	35.8	11.8	10.0	4.7	S	13.0	10.6	11.2	13.0	13.0	10.6	10.0	3.5	0.6	35.8	9.2	24	
29	4.7	0.6	0.6	0.6	2.4	1.3	1.8	8.8	13.5	7.6	8.8	8.2	8.2	6.5	S	8.2	8.8	10.0	10.0	10.0	6.5	4.1	11.2	11.8	0.6	13.5	6.7	24	
30	5.9	9.4	8.2	4.1	8.8	8.8	2.4	1.8	1.8	7.0	16.4	23.5	26.9	S	17.0	6.5	11.8	31.7	8.2	33.4	31.7	0.6	1.2	1.8	0.6	33.4	11.7	24	
31	1.8	1.8	1.3	0.6	1.2	1.8	1.8	0.6	0.6	1.2	1.8	10.0	S	7.6	8.2	14.1	21.2	1.8	4.1	1.2	3.0	1.2	11.1	21.2	0.6	21.2	5.2	24	
HOURLY MAX	15.8	18.8	21.7	19.4	28.2	35.8	72.1	65.1	38.1	56.9	44.5	39.9	31.7	48.1	24.7	32.2	46.4	64.5	19.4	33.4	31.7	16.4	13.5	21.2					
HOURLY AVG	5.6	6.4	6.5	6.7	6.5	8.3	16.9	14.4	11.4	14.3	13.2	13.2	10.1	12.0	8.6	9.0	12.8	10.4	6.9	8.0	7.8	5.9	6.4	6.3					

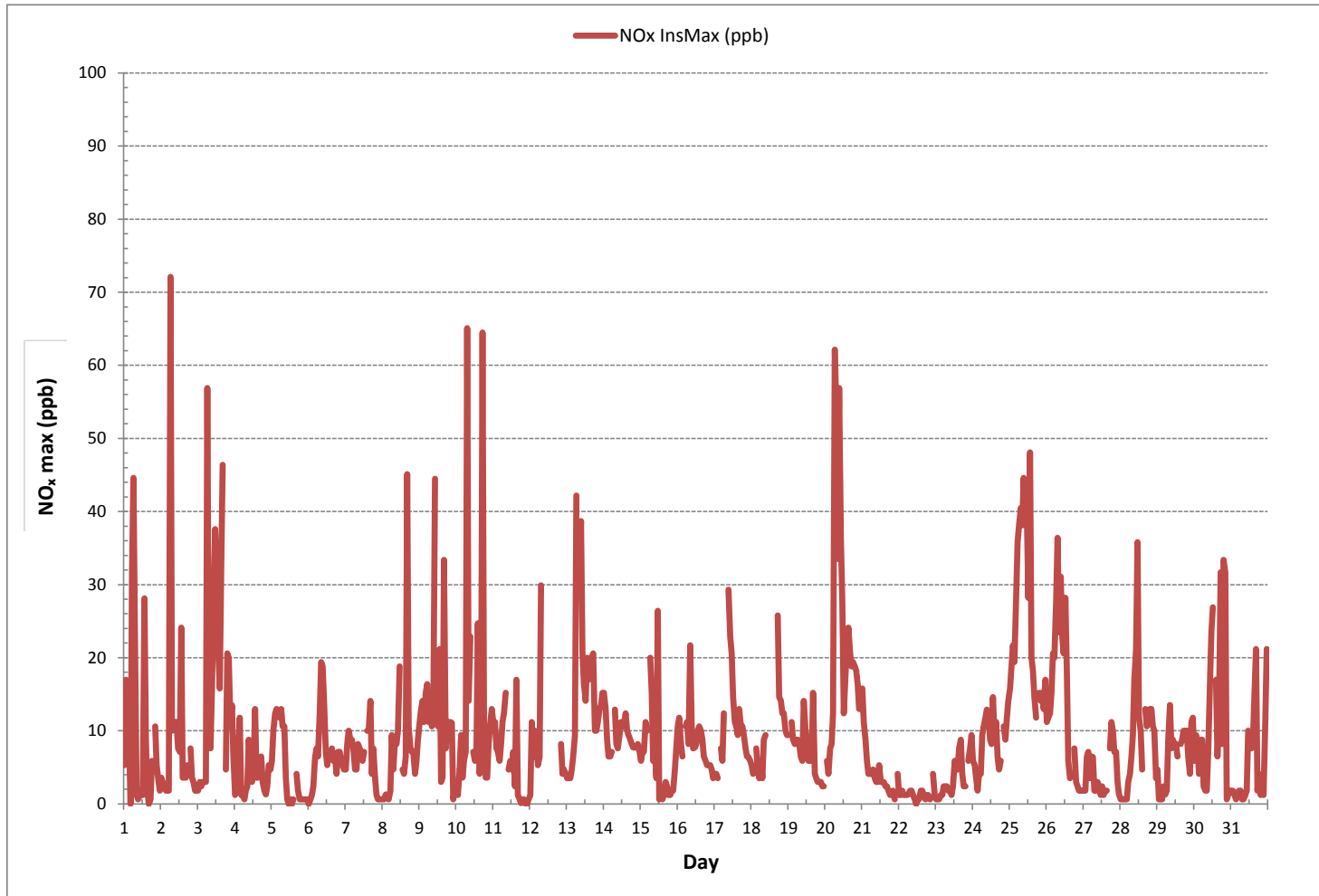
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	685
MAXIMUM INSTANTANEOUS VALUE:	72.1 ppb @ HOUR(S) 6 ON DAY(S) 2
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	10 hrs
STANDARD DEVIATION:	10.0
OPERATIONAL TIME:	735 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

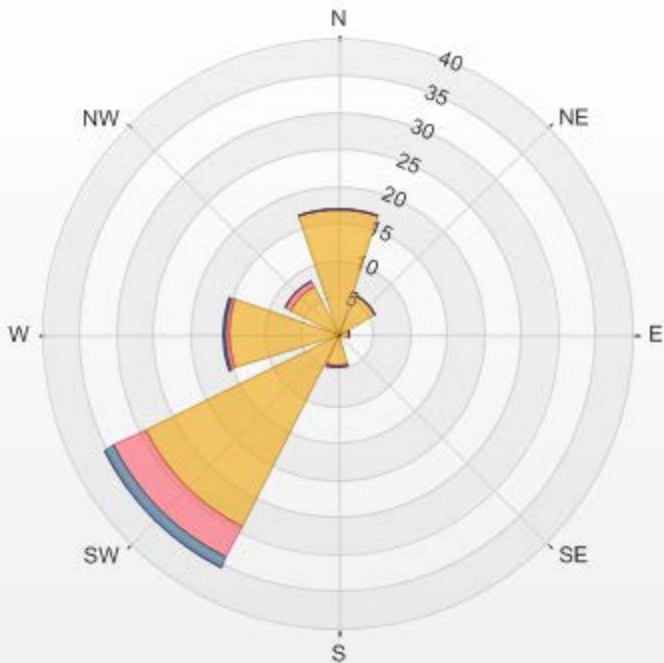


Wind: LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 11.29% Valid Data: 92.88% Calm Avg: 6.56 [ppb]

Direction	0.0-13.1	13.1-26.2	26.2-39.3	>39.3	Total
N	17.08	0	0	0	17.08
NE	5.79	0	0	0	5.79
E	1.59	0	0	0	1.59
SE	0.58	0	0	0	0.58
S	4.34	0.29	0	0	4.63
SW	29.23	4.78	1.45	0	35.46
W	14.76	0.58	0.29	0	15.63
NW	7.24	0.72	0	0	7.96
Summary	80.61	6.37	1.74	0	88.72

% Icon	Classes (ppb)	81	0.0-13.1	6	13.1-26.2	2	26.2-39.3	0	>39.3

LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 11.29% Calm
 Poll Avg: 6.56[ppb]



NOX[ppb] Calibration: LICA MASKWA Monthly: 2017/01 Type: Span



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

NITRIC OXIDES

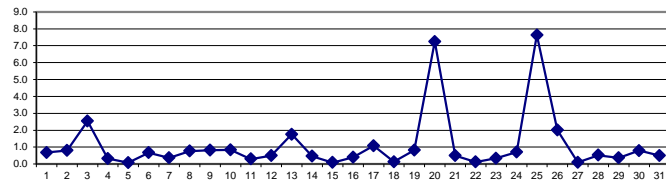
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.7	0.8	0.4	0.0	1.2	5.3	0.9	0.0	0.0	0.3	0.6	0.6	2.9	0.6	0.3	0.0	0.0	0.1	S	0.1	0.0	0.5	0.3	0.0	5.3	0.7	24	
2	0.2	0.2	0.4	0.4	0.3	0.0	2.2	0.9	0.4	2.1	3.0	2.4	1.8	1.6	0.7	0.6	0.1	0.1	S	0.1	0.4	0.1	0.2	0.2	0.0	3.0	0.8	24	
3	0.1	0.4	0.0	0.2	0.1	0.1	1.3	1.3	0.4	1.5	6.7	14.0	10.9	6.5	3.2	2.3	1.8	S	0.1	2.1	2.6	1.0	1.3	0.5	0.0	14.0	2.5	24	
4	0.0	0.0	0.4	1.0	0.1	0.1	0.0	0.1	0.1	1.1	0.8	0.6	0.6	1.2	0.5	0.2	S	0.2	0.0	0.0	0.0	0.2	0.1	0.1	0.0	1.2	0.3	24	
5	0.0	0.2	0.0	0.2	0.2	0.3	0.2	0.3	0.0	0.0	0.0	0.2	0.1	0.0	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24	
6	0.0	0.1	0.0	0.1	0.2	0.2	0.1	0.8	0.9	2.0	3.4	1.7	1.2	2.1	S	0.8	0.2	0.1	0.1	0.3	0.3	0.0	0.5	0.3	0.0	3.4	0.7	24	
7	0.2	0.2	0.1	0.3	0.4	0.2	0.1	0.0	0.4	0.5	0.7	1.1	1.4	S	1.3	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.4	0.4	24	
8	0.0	0.0	0.2	0.1	0.1	0.2	0.5	0.3	0.4	1.2	2.7	4.8	S	0.7	0.9	0.6	2.5	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.0	4.8	0.8	24	
9	0.4	0.5	0.2	0.3	0.5	0.6	0.6	0.6	0.7	1.2	2.9	S	2.0	1.5	0.7	0.6	1.9	0.5	0.7	1.1	0.8	0.5	0.0	0.2	0.0	2.9	0.8	24	
10	0.1	0.2	0.2	0.4	0.2	0.2	0.2	2.2	0.7	3.0	S	1.4	1.7	1.5	1.3	0.5	0.9	2.2	0.6	0.3	0.2	0.5	0.3	0.4	0.1	3.0	0.8	24	
11	0.5	0.5	0.2	0.5	0.2	0.0	0.6	0.8	0.6	S	0.6	0.5	0.2	0.9	0.0	0.6	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.3	24	
12	0.0	0.6	0.0	0.3	0.2	0.0	0.2	2.3	S	2.5	C	C	C	C	C	C	C	C	C	C	C	0.1	0.1	0.1	0.1	0.0	2.5	0.5	24
13	0.0	0.0	0.0	0.0	0.0	0.4	1.5	S	2.3	9.9	5.3	4.9	3.9	5.6	2.9	2.2	0.8	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	9.9	1.8	24	
14	0.1	0.0	0.0	0.0	0.0	0.0	S	0.1	0.1	0.4	1.0	2.0	2.2	1.8	1.7	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.5	24	
15	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.1	0.4	0.3	1.1	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	1.1	0.1	24	
16	0.0	0.0	0.0	0.0	S	0.1	0.2	0.0	0.7	1.1	1.1	1.0	1.2	1.4	0.9	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.4	24	
17	0.0	0.0	0.0	S	0.0	0.0	0.4	S1	S1	3.8	6.0	5.0	3.1	2.0	1.2	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	1.1	22	
18	0.0	0.0	S	0.0	0.0	0.0	0.2	0.0	0.4	0.7	C1	C1	C1	C1	C1	C1	C1	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	17	
19	0.0	S	0.0	0.0	0.0	0.0	0.2	0.1	0.4	1.5	4.4	4.2	3.1	1.4	0.9	0.8	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.8	24	
20	S	0.0	0.0	0.0	0.0	0.4	10.9	11.2	18.8	25.6	12.8	10.4	4.6	6.6	8.1	9.7	6.4	5.1	5.7	5.8	6.4	6.5	4.4	S	0.0	25.6	7.2	24	
21	3.2	1.8	0.5	0.0	0.0	0.0	0.0	0.0	0.2	0.5	1.0	1.4	0.7	0.6	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	3.2	0.5	24	
22	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.0	0.2	0.3	0.6	0.3	0.0	0.1	0.0	0.1	0.0	S	0.0	0.4	0.0	0.6	0.1	24	
23	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.1	0.5	0.6	0.6	1.2	1.3	1.2	1.1	0.7	0.0	0.0	0.0	S	0.0	0.0	0.2	0.0	1.3	0.3	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.3	3.0	2.8	2.9	1.7	1.1	1.5	0.2	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	3.0	0.7	24	
25	0.0	0.4	1.5	1.0	5.9	12.6	13.8	18.2	14.6	22.9	20.5	13.3	11.3	8.4	4.6	2.2	0.3	S	0.4	0.2	0.4	0.1	0.8	0.0	22.9	7.6	24		
26	0.0	0.1	0.1	0.3	1.1	1.0	2.8	3.8	3.3	8.5	7.0	6.7	6.4	3.2	1.1	0.4	0.2	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	8.5	2.0	24	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.2	0.3	0.3	0.2	0.3	0.2	0.2	S	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6	3.9	2.4	1.7	1.3	0.5	S	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	3.9	0.5	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.6	1.1	2.0	2.0	1.2	S	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.4	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	3.7	3.4	S	0.0	0.0	0.3	3.0	0.5	2.5	3.5	0.0	0.0	0.0	0.0	3.7	0.8	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.7	1.6	S	1.0	2.0	1.9	1.1	0.0	0.0	0.4	0.1	0.4	2.0	0.0	0.0	2.0	0.5	24	
HOURLY MAX	3.2	1.8	1.5	1.0	5.9	12.6	13.8	18.2	18.8	25.6	22.1	20.5	13.3	11.3	8.4	9.7	6.4	5.1	5.7	5.8	6.4	6.5	4.4	2.0					
HOURLY AVG	0.2	0.2	0.2	0.2	0.3	0.6	1.4	1.5	1.6	3.2	3.3	3.5	2.6	2.2	1.5	1.2	0.9	0.5	0.3	0.5	0.5	0.3	0.3	0.2					

STATUS FLAG CODES

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

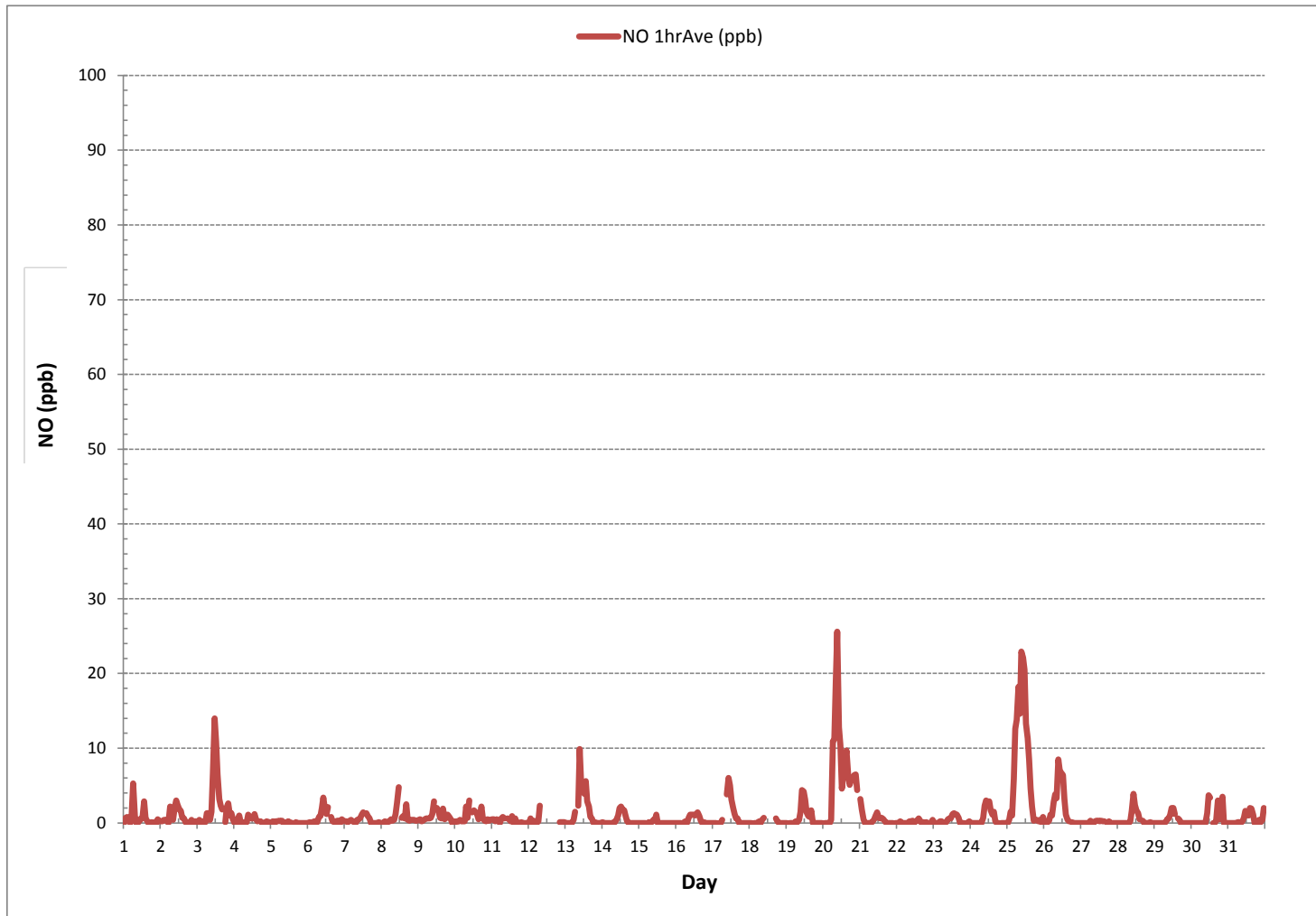
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	428			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	25.6 ppb	@ HOUR(S)	9	20
MAXIMUM 24-HR AVERAGE:	7.6 ppb			25
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	735 hrs	
MONTHLY CALIBRATION TIME:	10 hrs	AMD OPERATION UPTIME:	98.8 %	
STANDARD DEVIATION:	2.8	MONTHLY AVERAGE:	1.1 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	3.4	1.7	2.3	0.0	9.3	16.8	5.7	0.4	0.0	0.5	0.5	0.5	12.2	3.4	0.5	0.5	0.5	0.5	S	0.5	0.5	0.5	0.5	0.0	16.8	2.6	24	
2	0.5	0.5	0.5	0.5	0.5	0.0	52.7	2.3	1.1	2.3	5.1	3.4	3.9	9.3	1.1	0.5	0.5	0.5	S	0.5	0.5	0.5	0.5	0.5	0.0	52.7	3.8	24	
3	0.5	0.5	0.5	0.5	0.5	0.5	35.6	5.7	0.5	2.8	9.9	16.8	13.4	7.5	5.1	17.4	23.4	S	0.5	5.7	5.1	2.3	3.9	1.1	0.5	35.6	6.9	24	
4	0.5	0.5	1.1	2.3	0.5	0.5	0.0	0.5	0.5	3.4	1.7	0.5	1.1	3.9	0.5	0.5	S	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.0	3.9	0.9	24
5	0.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.5	0.5	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	0.5	0.2	24
6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.1	2.3	2.3	3.9	2.3	1.7	2.3	S	1.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	3.9	1.1	24
7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.5	1.1	1.1	2.3	1.7	S	1.7	1.7	2.3	0.0	0.5	0.5	0.0	0.5	0.5	0.5	0.0	2.3	0.8	24	
8	0.5	0.5	0.5	0.5	0.5	0.5	1.1	0.5	0.5	2.2	3.4	7.5	S	1.1	1.1	0.5	22.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	22.2	2.0	24
9	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.1	1.1	2.8	31.5	S	2.8	13.4	1.1	1.1	19.2	0.5	1.7	2.8	2.8	2.8	0.0	0.5	0.0	31.5	3.9	24	
10	0.5	0.5	0.5	1.1	0.5	0.5	0.5	40.3	2.3	5.1	S	1.7	2.3	2.8	20.4	1.1	2.3	36.2	2.3	0.5	0.5	0.5	0.5	0.5	0.5	40.3	5.4	24	
11	0.5	0.5	0.5	0.5	0.5	0.5	2.3	2.3	1.1	S	1.7	1.1	1.7	1.7	0.5	6.9	0.5	0.0	0.5	0.5	0.4	0.5	0.5	0.5	0.0	6.9	1.1	24	
12	0.5	2.3	1.1	1.1	0.5	0.5	1.1	8.7	S	12.8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	0.5	12.8	2.4	24	
13	0.0	0.5	0.5	0.5	0.0	0.5	14.0	S	5.7	15.1	6.9	5.1	4.6	6.9	5.1	3.9	1.7	1.7	0.5	0.5	0.0	0.0	0.5	0.0	0.0	15.1	3.2	24	
14	0.5	0.0	0.5	0.0	0.0	0.0	S	0.5	0.5	0.5	1.1	2.3	2.3	2.3	2.8	1.1	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	2.8	0.7	24	
15	0.0	0.0	0.0	0.0	0.0	S	1.1	1.1	0.5	0.5	0.5	14.5	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	14.5	0.8	24	
16	0.0	0.0	0.0	0.0	S	0.5	1.1	0.0	6.9	2.3	1.7	1.7	1.1	1.7	1.7	2.3	1.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	6.9	1.0	24	
17	0.0	0.0	0.0	S	0.0	0.0	1.7	S1	S1	5.8	6.3	6.9	4.5	2.3	1.7	1.1	2.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	6.9	1.6	22	
18	0.0	0.0	S	0.0	0.0	0.0	1.1	0.0	2.8	2.8	C1	C1	C1	C1	C1	C1	C1	6.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.8	17	
19	0.0	S	0.0	0.0	0.0	0.5	1.1	0.5	0.5	2.3	8.7	5.1	4.5	1.7	1.1	1.1	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	1.4	24		
20	S	0.0	0.0	0.0	0.5	0.5	2.3	42.7	42.7	22.8	47.4	23.9	15.1	5.1	8.7	9.3	10.5	7.5	5.1	5.7	6.3	7.5	8.1	5.7	S	47.4	12.6	24	
21	4.6	3.4	1.1	0.5	0.0	0.0	0.0	0.0	0.5	0.5	1.1	2.3	1.1	1.1	1.1	0.5	0.5	0.0	0.0	0.0	0.5	0.0	S	0.0	4.6	0.8	24		
22	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.5	0.0	0.5	0.0	S	0.5	0.5	0.0	0.5	0.3	24	
23	0.5	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	2.3	1.7	1.7	1.1	0.0	0.5	0.5	S	0.0	0.5	0.5	0.5	0.0	2.3	0.6	24	
24	0.5	0.5	0.0	0.5	0.0	0.5	1.1	1.1	1.7	3.9	3.9	3.9	3.4	9.9	2.8	3.4	1.6	0.5	0.5	S	0.5	0.0	0.5	0.5	0.0	9.9	1.8	24	
25	0.5	1.1	3.9	3.4	11.0	18.1	19.8	21.0	19.2	26.8	25.7	25.7	16.9	29.2	9.9	6.9	3.4	0.5	S	0.5	0.5	0.5	0.5	2.3	0.5	29.2	10.8	24	
26	0.0	0.5	0.5	0.5	2.3	1.7	5.7	9.3	5.1	11.7	8.1	9.3	11.7	6.3	1.1	0.5	0.5	S	0.5	0.0	0.0	0.0	0.0	0.0	0.0	11.7	3.3	24	
27	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.5	0.5	1.1	1.7	0.5	0.5	0.5	0.5	0.5	S	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.4	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.4	6.3	12.8	1.7	1.7	0.5	S	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	12.8	1.2	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	1.1	2.3	2.3	2.3	1.1	S	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.5	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.8	8.7	9.3	S	0.0	0.0	0.5	8.0	1.1	11.6	8.7	0.0	0.0	0.0	0.0	11.6	2.2	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.5	1.1	4.5	S	1.7	3.4	3.9	8.7	0.0	0.5	0.0	1.1	0.5	1.1	3.9	0.0	8.7	1.4	24	
HOURLY MAX	4.6	3.4	3.9	3.4	11.0	18.1	52.7	42.7	22.8	47.4	31.5	25.7	16.9	29.2	20.4	17.4	23.4	36.2	5.7	11.6	8.7	8.1	5.7	3.9					
HOURLY AVG	0.4	0.6	0.5	0.6	0.7	1.3	6.8	5.1	2.7	5.4	5.8	5.6	3.8	4.9	2.9	2.6	4.0	2.2	0.7	1.1	1.0	0.7	0.6	0.5					

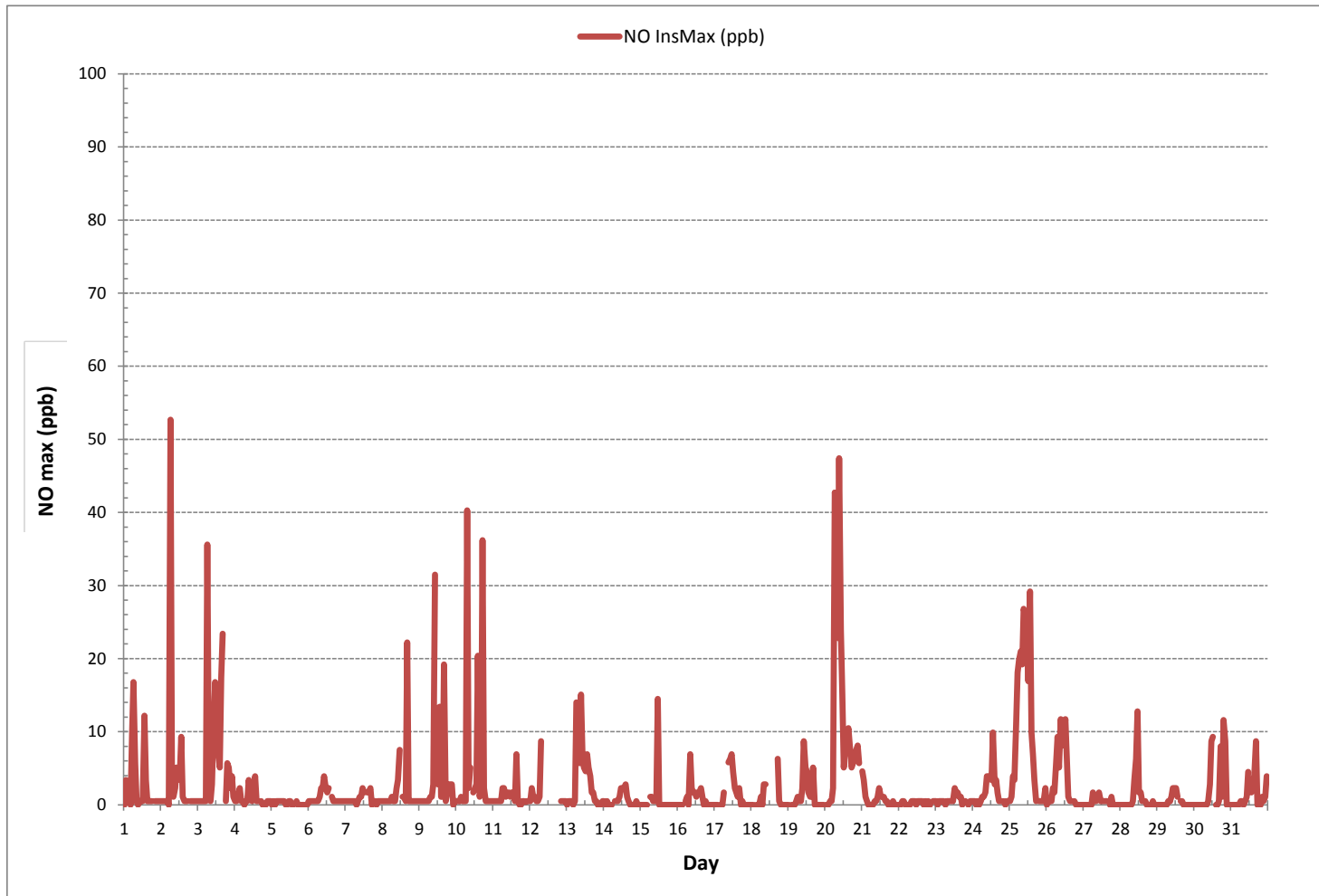
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	493
MAXIMUM INSTANTANEOUS VALUE:	52.7 ppb @ HOUR(S) 6 ON DAY(S) 2
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	10 hrs
STANDARD DEVIATION:	5.9
OPERATIONAL TIME:	735 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA MASKWA Poll.: LICA MASKWA-NO[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 11.29% Valid Data: 92.88% Calm Avg: 1.29 [ppb]

Direction	0.0-8.6	8.6-17.1	17.1-25.7	>25.7	Total
N	17.08	0	0	0	17.08
NE	5.79	0	0	0	5.79
E	1.59	0	0	0	1.59
SE	0.58	0	0	0	0.58
S	4.34	0.29	0	0	4.63
SW	33.57	1.3	0.58	0	35.45
W	15.2	0.14	0.29	0	15.63
NW	7.96	0	0	0	7.96
Summary	86.11	1.73	0.87	0	88.71

% Icon Classes (ppb)

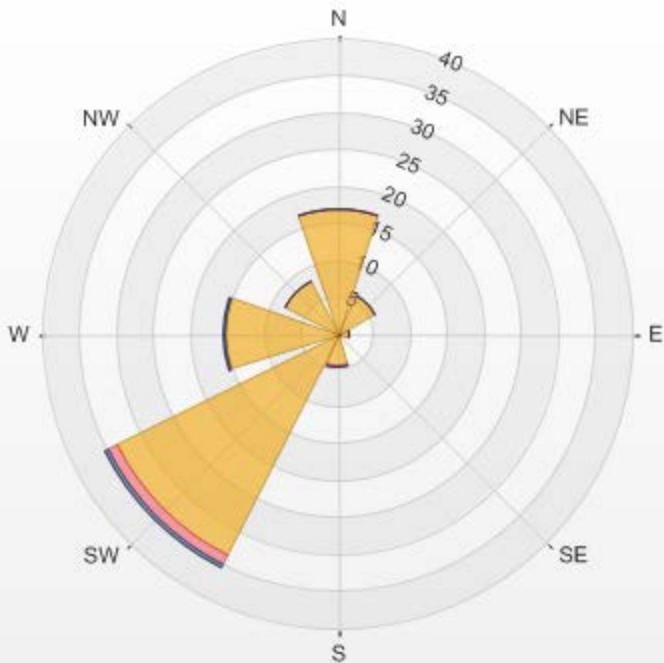
86 0.0-8.6

2 8.6-17.1

1 17.1-25.7

0 >25.7

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 11.29% Calm Poll
Avg: 1.29[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	1.7	4.5	9.2	2.5	0.0	5.0	15.4	2.4	0.4	0.6	0.3	0.8	0.0	3.7	0.5	0.0	0.0	0.0	4.0	S	5.9	4.7	2.8	2.4	0.0	15.4	2.9	24				
2	2.8	2.4	1.3	0.8	0.7	1.2	2.5	3.3	5.2	6.7	4.6	3.1	1.8	2.7	1.7	1.2	2.4	3.5	S	4.7	2.6	1.7	0.7	0.8	0.7	6.7	2.5	24				
3	1.0	1.7	1.6	1.8	1.9	1.8	4.1	6.4	4.8	8.5	15.0	18.6	16.1	12.4	9.1	11.8	7.5	S	2.2	8.7	9.4	3.0	3.5	1.9	1.0	18.6	6.6	24				
4	0.0	0.0	0.5	3.7	0.0	0.2	0.1	0.8	1.1	2.0	1.6	1.2	2.1	2.9	1.0	1.0	S	2.8	1.5	0.8	0.6	0.8	3.3	3.4	0.0	3.7	1.4	24				
5	4.1	8.0	9.9	11.7	10.3	10.5	10.8	8.1	6.4	1.9	0.0	0.0	0.0	0.0	0.0	S	2.1	0.6	0.2	0.2	0.2	0.0	0.0	0.0	0.0	11.7	3.7	24				
6	0.0	0.0	0.4	1.4	2.8	6.1	5.2	7.8	11.5	11.0	7.4	2.3	1.2	3.3	S	5.0	4.9	4.4	3.4	3.4	3.8	4.4	3.9	3.8	0.0	11.5	4.2	24				
7	3.6	5.0	8.1	7.2	7.0	4.6	3.8	3.4	4.3	3.8	3.3	2.6	4.0	S	6.3	5.2	6.4	2.6	4.5	1.7	0.4	0.0	0.0	0.0	0.0	8.1	3.8	24				
8	0.0	0.0	0.2	0.4	0.0	0.0	3.8	3.1	5.7	5.2	5.1	6.6	S	1.4	1.4	2.9	10.1	7.9	6.2	5.0	4.7	2.4	3.6	6.7	0.0	10.1	3.6	24				
9	9.2	11.1	11.5	8.9	10.6	13.5	8.1	9.2	7.8	6.7	6.1	S	5.2	2.8	0.6	1.1	3.7	3.3	4.4	3.6	4.5	1.1	0.0	0.3	0.0	13.5	5.8	24				
10	1.0	0.0	1.1	2.5	0.4	3.2	5.0	8.2	7.5	12.3	S	3.2	2.0	1.7	0.0	0.0	2.9	8.0	4.4	0.4	1.2	3.9	7.0	10.7	0.0	12.3	3.8	24				
11	8.3	7.3	5.3	4.0	3.8	5.3	6.6	7.9	10.8	S	1.3	2.2	0.4	2.4	0.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	2.9	24			
12	0.6	2.8	2.1	4.6	5.2	3.2	3.6	12.1	S	8.5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.7	2.5	2.9	2.4	0.6	12.1	4.2	24
13	1.9	2.3	2.4	2.7	4.7	6.5	10.6	S	17.5	20.4	11.6	8.2	6.8	10.1	8.8	11.4	16.3	11.9	8.2	7.5	9.2	10.3	11.9	13.8	1.9	20.4	9.3	24				
14	12.4	10.8	6.1	5.5	4.9	5.1	S	9.2	6.4	5.6	6.2	7.6	7.5	7.0	8.3	8.2	8.2	7.6	7.2	7.0	6.8	6.9	7.1	5.8	4.9	12.4	7.3	24				
15	5.3	5.6	6.1	8.6	9.2	S	11.3	9.4	3.5	4.5	1.8	2.0	0.3	0.5	0.3	0.4	1.6	1.5	0.6	0.6	1.4	1.5	1.6	5.9	0.3	11.3	3.6	24				
16	9.2	10.4	4.8	5.5	S	8.5	8.4	6.9	6.4	5.7	5.5	5.6	6.4	7.7	6.8	5.7	6.2	5.0	4.4	4.9	4.9	4.4	3.5	3.1	3.1	10.4	6.1	24				
17	3.3	3.3	2.7	S	4.6	4.4	6.7	S1	S1	16.7	14.9	11.0	8.2	6.9	7.1	7.2	10.0	9.1	9.4	8.1	6.8	5.9	5.5	4.8	2.7	16.7	7.5	22				
18	4.7	4.0	S	5.1	3.9	3.1	2.9	2.3	3.3	2.9	C1	C1	C1	C1	C1	C1	C1	12.1	13.2	12.5	11.2	11.2	9.1	8.0	2.3	13.2	6.8	17				
19	7.4	S	9.3	8.0	7.5	6.7	6.8	6.4	5.4	3.8	3.8	3.6	3.9	3.6	4.0	6.4	3.5	3.3	2.9	2.8	2.7	2.4	2.4	2.4	2.4	9.3	4.8	24				
20	S	3.5	3.5	5.7	7.7	8.8	13.4	11.4	12.1	8.8	10.0	10.2	6.9	8.0	10.1	13.3	13.0	13.0	12.6	11.4	10.6	6.8	6.9	S	3.5	13.4	9.4	24				
21	10.3	7.8	5.8	4.4	3.6	3.4	3.4	3.3	2.8	1.4	1.3	2.3	2.0	1.6	1.5	1.1	1.5	1.6	1.2	1.1	1.1	0.4	S	1.8	0.4	10.3	2.8	24				
22	0.9	0.7	1.0	1.2	0.9	1.2	1.0	1.3	1.1	0.6	0.1	0.0	0.1	0.1	0.9	0.8	0.3	0.5	0.9	0.8	0.5	S	1.6	0.4	0.0	1.6	0.7	24				
23	0.5	0.1	0.2	0.6	0.9	1.2	2.2	1.6	1.0	0.4	0.3	0.8	2.1	2.4	3.0	3.9	5.8	3.1	1.9	2.0	S	3.6	3.6	7.0	0.1	7.0	2.1	24				
24	4.3	2.4	1.9	0.9	1.5	2.7	6.7	8.0	8.9	8.9	5.3	3.8	4.0	3.3	3.7	5.6	3.6	3.3	4.3	S	7.1	6.1	9.8	12.1	0.9	12.1	5.1	24				
25	14.3	15.1	16.5	14.9	16.5	16.3	17.0	18.2	17.7	16.3	13.7	12.1	9.4	8.9	9.1	9.6	9.4	9.6	S	11.6	11.2	12.8	10.7	11.6	8.9	18.2	13.2	24				
26	9.7	10.4	10.9	12.3	15.3	16.0	18.4	19.6	17.8	15.8	11.1	9.6	10.1	6.2	2.7	1.6	1.7	S	3.9	1.8	1.2	0.8	0.6	1.0	0.6	19.6	8.6	24				
27	1.1	0.6	1.2	2.1	1.2	2.5	1.9	0.7	0.6	1.2	0.5	0.3	0.9	0.5	1.0	0.8	S	6.0	5.9	4.8	5.7	5.6	1.6	0.6	0.3	6.0	2.1	24				
28	0.6	0.6	0.6	0.6	0.6	1.4	3.5	4.8	5.6	10.4	11.7	9.8	8.6	6.2	2.7	S	11.9	9.1	8.3	9.1	9.9	7.8	5.4	0.9	0.6	11.9	5.7	24				
29	1.2	0.3	0.0	0.0	1.2	0.6	0.4	1.5	9.0	4.8	3.4	4.9	4.3	3.8	S	6.0	7.3	9.0	9.7	8.2	5.2	2.9	2.1	3.3	0.0	9.7	3.9	24				
30	3.0	8.0	6.3	3.2	5.8	4.8	1.7	1.3	1.2	2.7	10.7	9.5	7.9	S	9.5	4.6	8.3	12.6	2.9	9.5	11.5	0.6	0.3	1.1	0.3	12.6	5.5	24				
31	1.2	1.3	1.0	0.2	0.8	1.0	1.2	0.2	0.0	0.2	0.3	1.7	S	2.5	3.6	4.7	2.2	0.7	2.0	0.4	0.6	0.1	3.0	8.4	0.0	8.4	1.6	24				
HOURLY MAX	14.3	15.1	16.5	14.9	16.5	16.3	18.4	19.6	17.8	20.4	15.0	18.6	16.1	12.4	10.1	13.3	16.3	13.0	13.2	12.5	11.5	12.8	11.9	13.8								
HOURLY AVG	4.1	4.3	4.4	4.4	4.5	5.0	6.2	6.2	6.4	6.6	5.6	5.1	4.5	4.2	3.8	4.4	5.7	5.4	4.7	4.7	4.8	3.8	3.8	4.1								

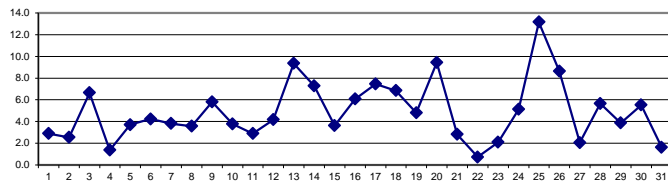
STATUS FLAG CODES

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 159 ppb

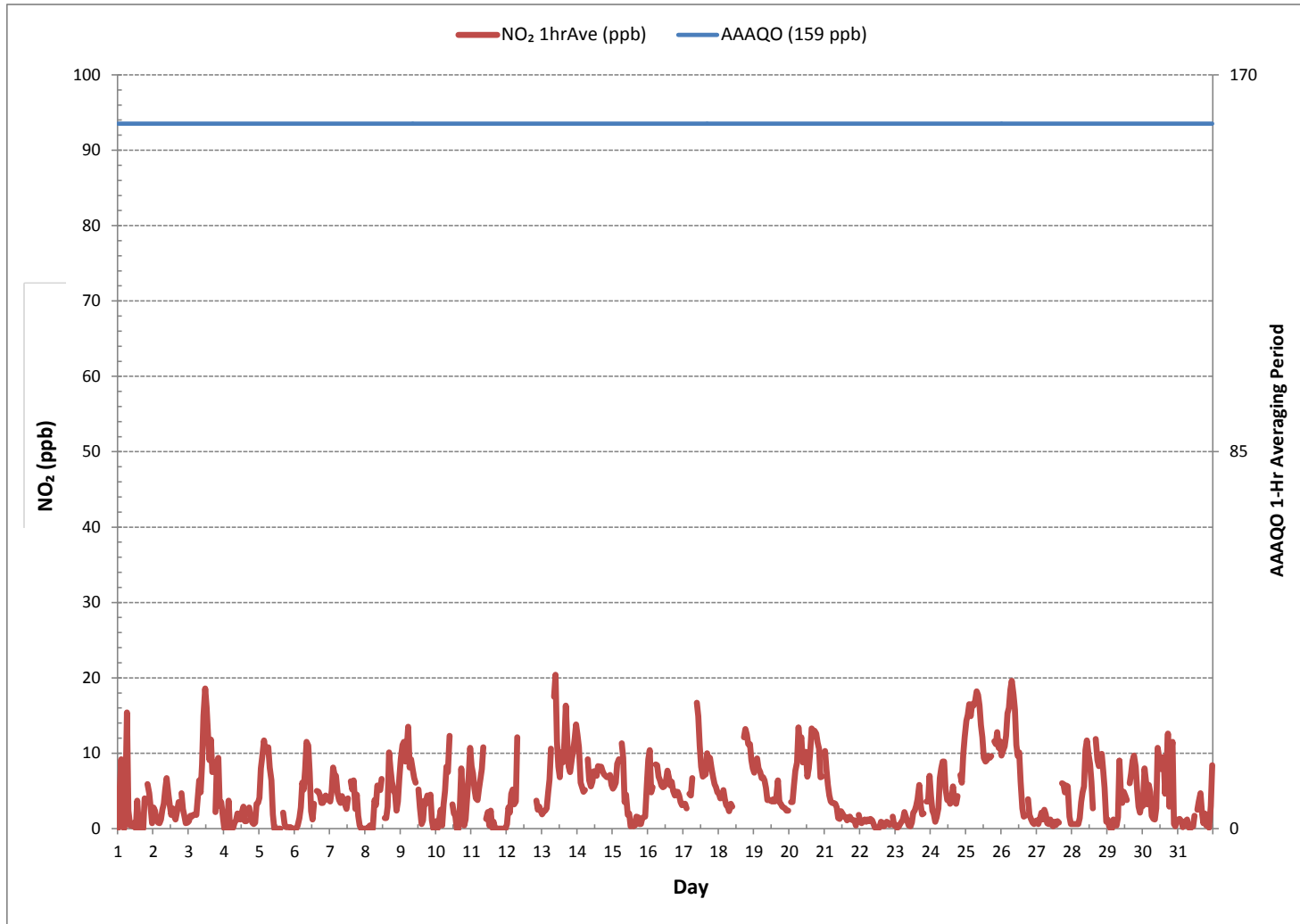
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	653				
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)
MAXIMUM 1-HR AVERAGE:	20.4	ppb	@ HOUR(S)	9	13
MAXIMUM 24-HR AVERAGE:	13.2	ppb			25
					VAR-VARIOUS
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	735	hrs
MONTHLY CALIBRATION TIME:	10	hrs	AMD OPERATION UPTIME:	98.8	%
STANDARD DEVIATION:	4.2		MONTHLY AVERAGE:	4.9	ppb

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - January 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	5.6	13.9	12.7	8.5	0.0	23.2	27.3	14.4	1.5	0.9	0.9	1.5	0.9	16.2	5.6	1.5	0.0	0.3	5.6	S	10.9	5.0	3.8	3.3	0.0	27.3	7.1	24	
2	3.3	3.3	2.1	1.5	1.5	1.5	22.6	7.9	9.7	9.7	6.2	5.0	14.4	2.7	3.3	3.8	5.6	S	7.3	3.9	2.7	1.5	1.5	1.5	1.5	22.6	5.5	24	
3	1.5	2.7	2.7	2.7	2.7	2.7	21.4	10.4	7.3	13.3	16.8	20.9	17.9	14.4	11.5	15.0	27.3	S	5.0	15.0	15.0	8.5	9.7	5.6	1.5	27.3	10.9	24	
4	0.9	1.5	5.6	9.1	0.9	0.9	0.9	1.5	2.1	5.6	3.8	2.7	3.3	9.1	2.7	2.7	S	6.2	3.3	1.5	1.5	2.1	5.0	4.4	0.9	9.1	3.4	24	
5	6.2	9.7	12.1	12.7	12.1	11.5	12.1	10.9	10.3	3.8	0.9	0.3	0.3	0.3	S	3.8	1.5	0.9	0.9	0.3	0.3	0.3	0.3	0.3	0.3	12.7	4.9	24	
6	0.3	0.3	0.9	2.1	6.2	7.3	6.2	12.1	17.3	16.7	10.3	5.0	3.3	5.0	S	6.7	5.6	6.2	4.4	6.8	6.8	5.6	5.0	4.4	0.3	17.3	6.3	24	
7	4.4	7.9	9.7	8.5	8.5	7.3	4.4	4.4	7.9	7.3	5.0	3.8	5.0	S	8.5	8.5	12.1	3.8	7.3	3.3	1.5	0.9	0.3	0.3	0.3	12.1	5.7	24	
8	0.9	0.9	1.5	0.9	0.9	2.1	8.5	4.4	8.5	7.3	6.8	10.9	S	3.8	3.3	5.6	29.1	10.4	7.3	6.7	7.3	3.8	5.6	8.5	0.9	29.1	6.3	24	
9	10.9	12.7	13.9	10.9	15.0	16.2	10.9	11.5	10.4	8.5	14.4	S	7.9	9.7	2.1	2.7	16.2	6.8	9.1	8.5	7.9	7.9	0.9	2.1	0.9	16.2	9.4	24	
10	2.1	1.5	4.4	8.5	3.3	5.6	6.8	33.8	12.1	17.9	S	5.6	3.8	4.4	6.2	3.3	7.3	30.3	9.1	3.3	3.3	7.9	10.9	12.7	1.5	33.8	8.9	24	
11	10.9	10.4	7.3	6.8	5.6	7.9	9.1	12.1	14.4	S	4.4	5.0	3.3	5.6	1.5	10.9	0.9	0.9	0.3	0.3	0.3	0.3	0.0	0.3	0.9	0.0	14.4	5.2	24
12	1.5	8.5	5.6	9.7	8.5	5.0	5.6	20.9	S	14.4	C	C	C	C	C	C	C	C	C	C	C	7.9	3.8	4.4	3.8	1.5	20.9	7.7	24
13	3.3	3.3	3.3	4.4	6.8	9.1	27.8	S	24.4	26.1	13.9	11.5	9.7	13.3	13.3	16.2	19.1	19.1	9.7	9.7	10.9	13.3	13.9	15.6	3.3	27.8	12.9	24	
14	15.0	12.7	8.5	6.7	6.2	6.7	S	12.7	7.9	7.3	7.9	9.1	9.1	8.5	9.7	9.1	9.1	8.5	7.9	7.9	7.9	7.9	7.9	6.7	6.2	15.0	8.7	24	
15	6.2	6.7	7.3	11.5	9.7	S	19.7	15.6	5.0	7.3	3.2	16.2	0.9	0.9	0.9	0.9	3.2	2.7	1.5	1.5	2.1	2.1	4.4	7.9	0.9	19.7	6.0	24	
16	10.9	12.1	8.5	6.7	S	10.3	10.3	8.5	15.5	9.1	6.2	6.7	7.3	8.5	8.5	7.9	7.9	6.2	5.6	5.6	5.6	5.0	4.4	3.2	3.2	15.5	7.8	24	
17	4.4	4.4	3.2	S	7.3	5.6	10.9	S1	S1	23.8	17.3	14.3	10.3	8.5	9.1	8.5	12.1	10.9	10.3	9.1	7.9	6.7	6.7	5.6	3.2	23.8	9.4	22	
18	5.0	4.4	S	7.9	4.4	3.8	4.9	3.8	6.2	6.2	C1	C1	C1	C1	C1	C1	C1	20.3	14.4	14.4	12.1	12.1	10.3	9.1	3.8	20.3	8.7	17	
19	9.1	S	10.9	8.5	8.5	7.9	7.9	7.9	6.2	5.0	5.6	5.0	4.4	4.4	4.4	5.0	9.7	4.4	3.8	3.2	3.2	2.7	2.7	2.7	2.7	10.9	5.8	24	
20	S	6.2	4.4	7.3	7.9	10.9	21.4	15.0	14.4	13.3	12.7	12.7	7.3	9.1	13.9	13.9	13.9	13.9	13.3	13.3	12.1	9.1	S	4.4	4.4	21.4	11.6	24	
21	11.5	10.3	7.3	5.6	3.8	4.4	4.4	4.4	3.3	2.7	2.1	3.2	2.1	2.1	2.1	1.5	2.1	2.1	1.5	1.5	0.9	S	4.4	0.9	11.5	3.7	24		
22	0.9	0.9	1.5	1.5	0.9	1.5	0.9	1.5	1.5	0.9	0.3	0.3	0.3	0.3	1.5	1.5	0.9	0.9	0.9	0.9	0.9	S	3.8	0.9	0.3	3.8	1.1	24	
23	0.9	0.3	0.9	0.9	1.5	2.1	2.1	2.1	1.5	0.9	0.9	1.5	3.8	3.3	3.8	6.8	7.9	3.8	2.1	2.1	S	5.6	7.3	9.1	0.3	9.1	3.1	24	
24	5.6	5.0	3.3	1.5	3.8	3.8	9.1	9.7	9.7	10.4	8.5	5.0	5.6	5.6	6.2	7.9	5.6	4.4	6.2	S	10.3	8.5	11.5	13.9	1.5	13.9	7.0	24	
25	15.6	17.3	17.9	16.2	17.3	17.9	19.1	19.1	19.1	17.9	15.0	14.4	11.5	20.3	10.3	12.1	11.5	11.5	S	15.0	13.9	15.0	12.7	15.0	10.3	20.3	15.5	24	
26	11.5	12.1	12.1	15.0	17.9	18.5	22.6	26.7	20.3	19.7	14.4	12.1	16.7	12.1	4.4	3.2	3.2	S	7.9	3.3	2.7	2.1	1.5	2.1	1.5	26.7	11.4	24	
27	2.1	1.5	6.7	7.3	3.2	6.7	6.7	1.5	1.5	2.1	0.9	0.9	2.1	0.9	1.5	1.5	S	7.9	10.3	9.7	7.3	7.3	2.7	0.9	0.9	10.3	4.1	24	
28	0.9	0.9	0.9	0.9	0.3	3.2	3.8	6.2	9.1	13.9	15.0	23.2	9.7	8.5	4.4	S	12.7	10.9	11.5	12.7	12.7	10.3	9.7	3.2	0.3	23.2	8.0	24	
29	5.0	0.3	0.3	0.3	2.7	1.5	1.5	8.4	13.3	7.3	6.7	6.1	5.6	5.6	S	7.9	9.1	10.3	10.3	9.7	6.7	4.4	11.5	12.1	0.3	13.3	6.4	24	
30	6.1	9.1	8.5	4.4	9.1	9.1	2.6	2.0	1.5	6.7	13.8	14.3	19.1	S	17.3	6.1	11.5	23.7	6.7	23.8	23.2	0.9	0.9	2.1	0.9	23.8	9.7	24	
31	2.1	1.5	1.5	0.9	0.9	1.5	1.5	0.3	0.3	0.9	0.9	6.2	S	5.6	5.6	10.3	13.3	1.5	3.8	0.9	2.7	0.9	10.3	17.3	0.3	17.3	3.9	24	
HOURLY MAX	15.6	17.3	17.9	16.2	17.9	23.2	27.8	33.8	24.4	26.1	17.3	23.2	19.1	20.3	17.3	16.2	29.1	30.3	14.4	23.8	23.2	15.0	13.9	17.3					
HOURLY AVG	5.5	6.1	6.2	6.3	5.9	7.2	10.4	10.0	9.0	9.6	7.7	8.0	6.5	7.4	6.0	6.7	9.6	8.4	6.4	7.1	7.0	5.4	6.0	6.0					

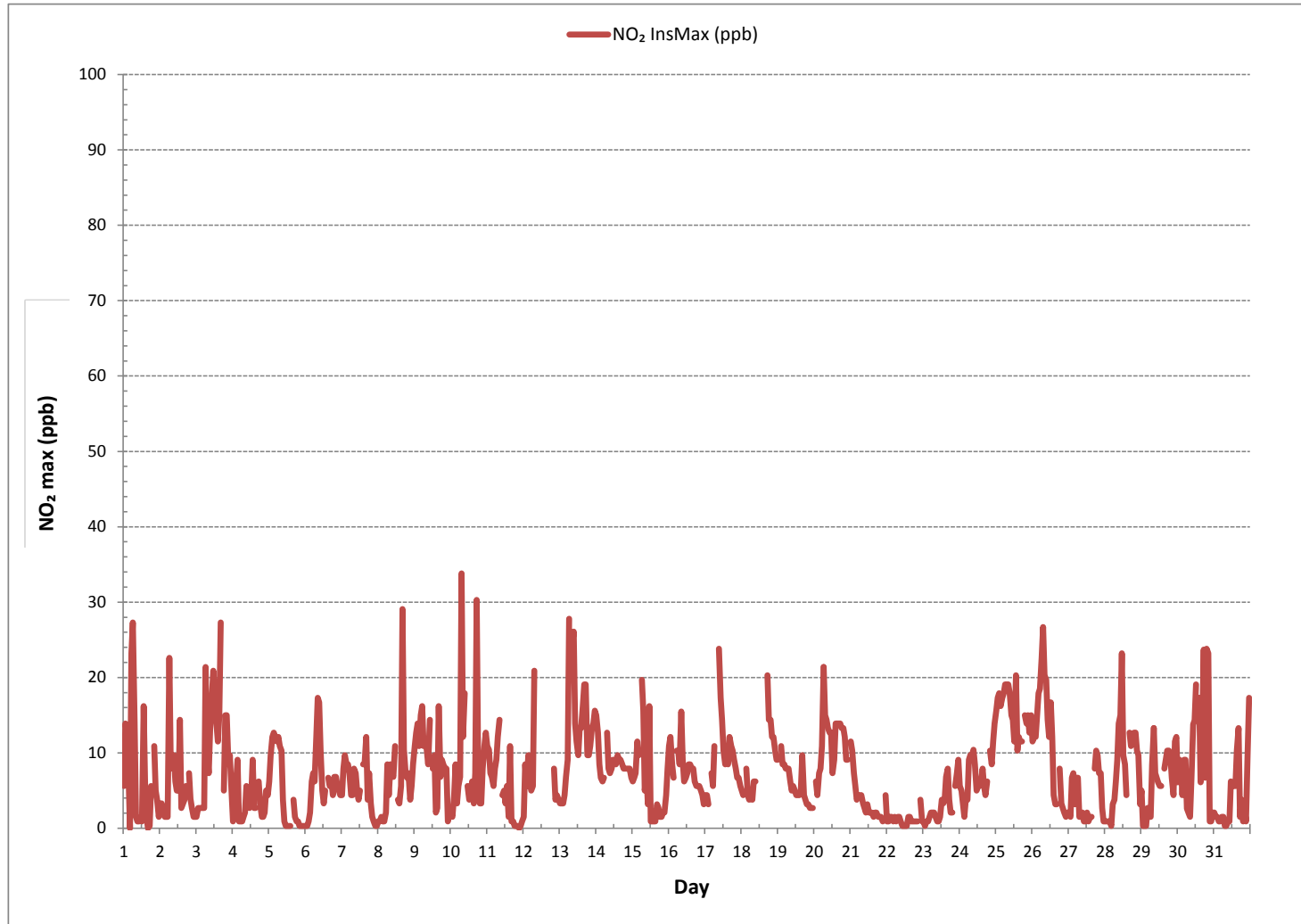
STATUS FLAG CODES

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:	690
MAXIMUM INSTANTANEOUS VALUE:	33.8 ppb @ HOUR(S) 7 ON DAY(S) 10
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	10 hrs
STANDARD DEVIATION:	5.7
OPERATIONAL TIME:	735 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

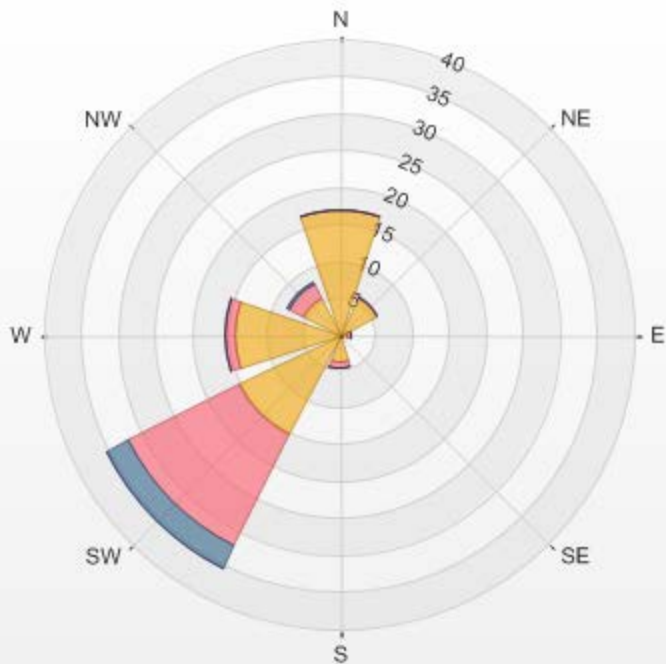


Wind: LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 11.29% Valid Data: 92.88% Calm Avg: 5.27 [ppb]

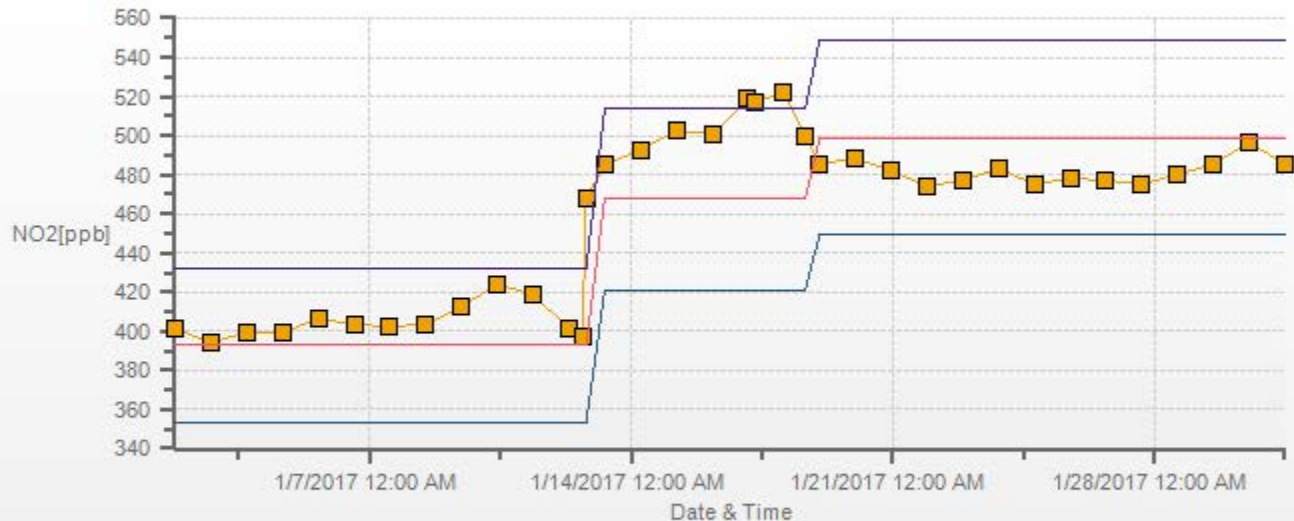
Direction	0.0-6.8	6.8-13.7	13.7-20.5	>20.5	Total
N	17.08	0	0	0	17.08
NE	5.64	0.14	0	0	5.78
E	1.01	0.58	0	0	1.59
SE	0.43	0.14	0	0	0.57
S	3.76	0.87	0	0	4.63
SW	15.2	16.93	3.33	0	35.46
W	14.33	1.16	0.14	0	15.63
NW	5.64	2.17	0.14	0	7.95
Summary	63.09	21.99	3.61	0	88.69

% Icon	Classes (ppb)	63	0.0-6.8	22	6.8-13.7	4	13.7-20.5	0	>20.5

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 11.29% Calm
Poll Avg: 5.27[ppb]



NO₂[ppb] Calibration: LICA MASKWA Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

WIND SPEED

WIND SPEED Hourly Averages (WS kph)

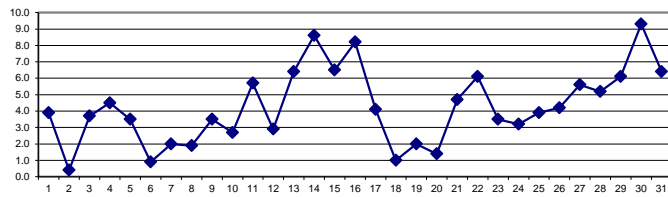
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	6.4	8.8	7.9	6.8	5.8	8.2	7.6	5.9	4.5	6.6	6.9	7.2	6.0	5.8	5.3	5.2	2.8	2.3	1.2	0.9	1.4	1.8	0.3	0.5	0.3	8.8	3.9	24
2	0.6	0.5	0.5	0.3	0.3	0.1	0.5	0.7	2.6	1.2	0.6	Y	Y	5.5	5.5	1.8	2.0	2.2	2.6	3.0	1.0	2.5	1.8	2.4	0.1	5.5	0.4	22
3	1.4	1.5	2.0	2.5	1.5	2.4	5.0	4.4	4.4	5.7	6.2	7.6	7.7	6.3	6.1	6.4	4.8	5.8	7.4	7.6	7.0	7.3	7.2	6.5	1.4	7.7	3.7	24
4	7.8	8.3	7.8	7.5	6.6	7.4	7.6	10.2	7.6	8.3	7.8	8.6	6.4	5.9	4.9	3.8	5.2	3.7	3.5	4.5	4.4	4.4	4.9	3.9	3.5	10.2	4.5	24
5	5.9	4.5	6.7	4.3	3.4	2.0	1.2	1.6	3.9	7.3	8.5	10.9	9.7	7.2	4.8	4.5	2.7	6.3	4.6	7.1	9.1	6.7	7.9	7.1	1.2	10.9	3.5	24
6	3.4	3.1	5.1	4.6	2.4	1.4	2.5	3.0	2.2	0.5	3.7	4.8	4.9	2.3	5.1	5.0	2.7	3.6	3.1	1.5	1.1	2.0	1.1	0.8	0.5	5.1	0.9	24
7	0.9	2.5	1.2	1.9	3.1	3.5	1.9	0.3	5.8	0.9	2.7	7.0	5.5	4.3	4.6	4.3	4.2	5.0	9.2	7.4	5.9	3.6	6.2	8.5	0.3	9.2	2.0	24
8	4.7	5.3	6.4	5.4	3.2	1.1	2.0	3.0	0.9	3.0	2.5	4.5	5.8	5.0	6.3	5.2	3.8	3.3	3.6	0.4	2.7	5.8	5.7	6.3	0.4	6.4	1.9	24
9	5.3	4.4	3.9	3.2	6.1	4.0	4.7	4.7	3.8	2.2	3.9	4.8	5.3	4.7	5.2	4.8	3.8	4.1	5.3	6.7	6.2	7.0	5.7	6.8	2.2	7.0	3.5	24
10	7.7	5.2	4.9	2.9	0.9	3.1	0.9	0.6	0.8	2.8	2.4	4.0	5.2	7.0	7.0	6.2	5.7	4.4	4.6	4.6	5.5	6.7	6.7	8.6	0.6	8.6	2.7	24
11	8.7	7.3	7.0	8.5	8.8	8.4	8.3	6.8	6.1	11.7	10.5	10.8	8.6	13.7	18.1	14.2	17.1	14.8	14.3	11.1	9.3	8.2	8.0	5.9	5.9	18.1	5.7	24
12	3.6	4.1	3.0	2.5	3.2	3.4	5.0	3.4	1.9	1.7	4.3	4.7	6.5	7.2	6.5	6.2	6.0	6.1	6.5	5.5	5.2	5.3	6.2	3.4	1.7	7.2	2.9	24
13	4.2	6.4	6.4	5.7	6.2	6.3	4.9	4.5	1.9	6.6	7.3	7.6	7.0	7.7	6.8	7.8	7.5	8.0	7.2	7.2	6.5	6.8	7.0	8.1	1.9	8.1	6.4	24
14	9.0	8.9	9.0	7.3	9.7	8.6	7.3	6.5	6.7	10.6	9.8	9.0	9.8	9.3	9.6	7.6	7.5	7.2	7.8	7.8	8.0	9.8	9.0	10.2	6.5	10.6	8.6	24
15	9.9	9.4	8.5	8.7	7.9	7.7	7.8	6.5	5.5	6.5	5.6	9.2	11.4	9.7	9.5	6.8	4.5	4.5	6.1	5.4	4.6	5.3	5.8	6.8	4.5	11.4	6.5	24
16	7.4	8.9	9.7	10.6	8.4	9.2	9.3	8.3	10.3	10.2	10.4	7.8	8.5	5.5	6.6	6.9	8.9	10.1	9.5	7.0	9.4	4.8	6.3	6.1	4.8	10.6	8.2	24
17	4.6	4.0	6.2	7.5	7.9	7.2	5.4	4.7	2.8	1.2	2.7	6.8	10.3	7.8	5.4	7.2	9.5	8.2	1.5	2.5	1.0	2.4	1.6	3.7	1.0	10.3	4.1	24
18	2.4	3.4	4.6	5.1	3.5	2.4	4.5	4.7	3.6	2.1	0.9	1.7	4.3	6.8	5.0	7.4	6.5	3.6	3.4	7.4	6.3	2.3	2.5	2.5	0.9	7.4	1.0	24
19	3.4	0.8	0.4	1.7	0.4	2.3	1.8	2.4	1.1	2.7	0.5	3.7	4.8	5.9	4.4	2.9	2.9	4.3	1.1	3.0	0.4	1.6	0.8	0.4	0.4	5.9	2.0	24
20	0.4	0.9	2.8	4.5	4.3	3.9	3.5	3.4	3.9	3.1	3.0	2.8	1.1	1.1	1.9	0.9	1.3	0.6	0.7	0.3	0.9	1.1	0.8	0.3	0.3	4.5	1.4	24
21	1.2	0.4	0.5	0.6	0.9	0.4	0.9	0.2	1.0	2.5	1.0	2.1	8.7	10.2	9.9	10.7	10.3	9.6	8.3	9.3	10.1	9.2	9.4	7.5	0.2	10.7	4.7	24
22	6.9	6.8	6.9	6.4	6.9	7.1	6.6	6.2	5.0	4.2	5.3	7.0	5.6	6.5	5.5	5.9	7.9	7.0	5.9	5.6	6.5	5.3	5.0	4.6	4.2	7.9	6.1	24
23	4.4	3.9	5.4	6.7	5.6	4.3	4.7	5.1	4.2	4.2	2.3	2.9	3.3	3.3	3.5	3.0	3.3	5.0	3.9	3.1	3.5	0.9	0.7	3.0	0.7	6.7	3.5	24
24	3.1	2.6	3.0	2.9	2.6	1.9	3.3	4.1	4.2	3.9	4.2	4.8	4.8	4.7	5.5	4.4	3.8	2.4	2.7	2.1	2.9	3.9	2.5	2.1	1.9	5.5	3.2	24
25	3.6	3.5	3.1	2.8	3.5	2.4	4.0	5.1	3.4	2.5	3.0	4.0	5.1	5.4	5.6	5.6	4.0	2.9	3.8	3.9	4.8	4.3	3.0	6.1	2.4	6.1	3.9	24
26	6.6	4.8	4.3	4.4	3.6	6.6	6.0	4.0	4.4	3.4	2.8	2.2	6.6	7.7	7.7	7.2	5.8	4.7	3.8	3.8	3.7	3.4	3.5	4.6	2.2	7.7	4.2	24
27	2.9	7.1	9.9	8.9	8.0	5.9	6.2	5.7	4.9	6.6	9.2	7.9	7.3	6.7	4.7	4.7	5.5	4.8	5.6	3.6	4.5	3.3	4.8	5.8	2.9	9.9	5.6	24
28	4.8	5.2	5.9	6.1	4.4	3.4	5.2	6.3	7.5	7.4	6.8	6.7	7.5	6.3	5.0	4.6	4.3	3.6	6.8	5.9	4.7	4.5	7.4	10.6	3.4	10.6	5.2	24
29	10.0	8.1	8.2	6.9	5.0	5.0	6.8	5.4	7.0	3.8	5.0	9.5	11.7	8.9	7.2	7.6	6.5	7.6	5.4	5.1	4.9	5.4	7.9	8.8	3.8	11.7	6.1	24
30	9.4	8.1	6.5	9.3	8.3	9.2	9.4	10.1	7.2	11.6	11.1	11.7	12.3	12.9	13.0	13.7	12.4	10.0	9.6	10.0	10.1	11.1	10.1	12.8	6.5	13.7	9.3	24
31	11.2	10.0	12.7	14.3	13.5	10.5	11.6	10.6	7.4	8.9	6.7	6.4	7.0	6.8	6.7	6.9	7.6	7.0	4.8	4.3	4.3	4.4	4.3	6.7	4.3	14.3	6.4	24
HOURLY MAX	11.2	10.0	12.7	14.3	13.5	10.5	11.6	10.6	10.3	11.7	11.1	11.7	12.3	13.7	18.1	14.2	17.1	14.8	14.3	11.1	10.1	11.1	10.1	12.8				
HOURLY AVG	1.9	2.3	2.4	2.3	2.2	2.2	2.3	2.0	1.7	1.8	2.3	2.7	3.2	3.0	2.7	2.6	2.2	2.1	2.3	1.9	1.7	1.4	1.7	1.7				

STATUS FLAG CODES

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

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

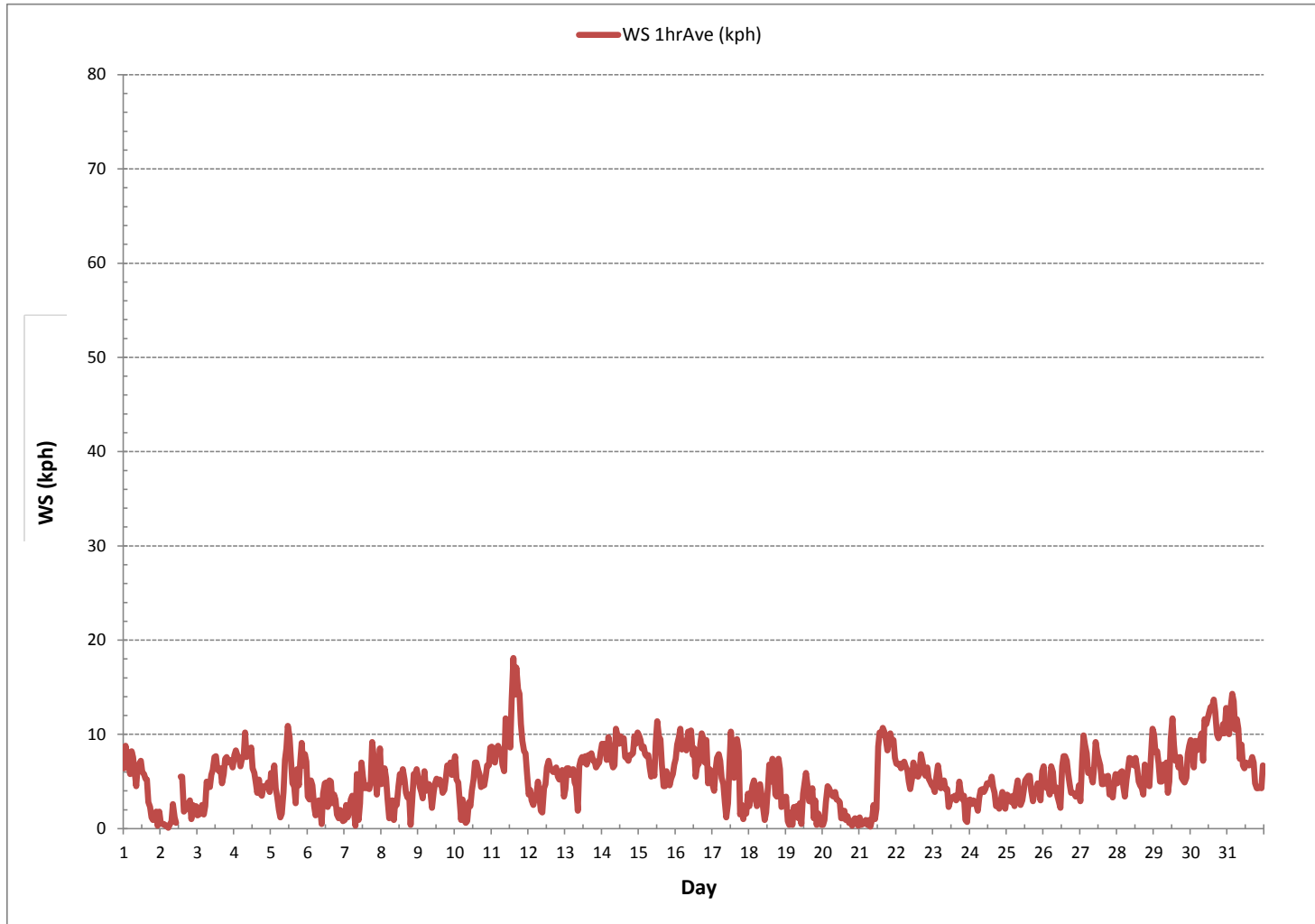
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	742
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR(S) 5 ON DAY(S) 2
MAXIMUM 1-HR AVERAGE:	18.1 kph @ HOUR(S) 14 ON DAY(S) 11
MAXIMUM 24-HR AVERAGE:	9.3 kph ON DAY(S) 30
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	742 hrs
AMD OPERATION UPTIME:	99.7 %
STANDARD DEVIATION:	2.9
MONTHLY AVERAGE:	2.1 kph

WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - January 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	27.4	35.0	27.3	24.5	21.2	34.4	36.0	33.5	14.4	21.9	21.0	21.6	23.9	26.5	23.2	23.9	25.0	26.8	33.8	17.7	21.2	20.6	34.9	X	14.4	36.0	28.8	23
2	50.2	25.2	32.7	X	25.6	41.7	X	28.7	X	X	28.9	Y	Y	Y	20.1	26.6	33.6	65.0	48.8	25.2	35.0	69.0	X	29.3	20.1	69.0	61.6	16
3	19.6	X	X	52.8	X	54.9	16.3	17.9	15.8	16.3	17.2	15.0	15.9	19.0	18.8	15.9	16.5	25.6	27.0	26.5	22.5	25.8	24.1	26.5	15.0	54.9	31.8	21
4	34.0	29.9	28.0	26.7	23.8	21.7	23.9	30.8	18.5	21.0	21.6	20.1	16.4	21.3	20.7	17.6	17.5	19.0	18.5	13.7	15.1	23.2	12.5	14.0	12.5	34.0	21.2	24
5	12.0	12.2	12.8	12.4	11.0	21.5	10.5	21.0	19.2	23.9	25.9	34.1	24.2	25.9	20.1	13.9	19.1	15.8	15.1	26.7	24.9	20.0	20.5	15.3	10.5	34.1	19.1	24
6	23.4	37.1	16.9	19.7	17.7	53.5	60.1	71.2	21.6	23.0	17.5	13.3	19.5	18.3	11.9	12.1	18.3	12.0	19.9	31.6	21.8	44.2	32.4	57.2	11.9	71.2	28.1	24
7	37.1	38.6	22.3	43.4	X	24.3	54.5	28.7	27.5	20.2	19.8	16.4	16.2	17.0	16.0	17.3	16.1	18.6	27.6	21.1	38.1	68.7	19.5	24.6	16.0	68.7	30.4	23
8	17.3	38.0	19.1	X	X	X	53.0	25.7	41.7	27.6	X	19.5	17.0	14.6	17.1	15.3	15.0	23.2	23.4	64.0	62.4	11.9	16.0	16.1	11.9	64.0	36.8	20
9	17.5	13.9	15.2	19.9	15.7	13.7	17.6	18.4	16.1	56.8	16.3	17.1	16.4	19.7	18.0	20.4	18.3	17.3	19.3	25.4	19.9	21.9	20.4	23.8	13.7	56.8	20.0	24
10	26.2	22.5	28.7	30.8	47.5	74.7	46.6	65.0	67.0	X	31.8	44.5	17.5	25.6	25.8	25.3	27.8	31.4	24.6	19.5	16.8	15.1	15.4	18.8	15.1	74.7	34.9	23
11	17.5	22.2	17.8	24.4	22.3	21.3	22.7	20.1	21.5	36.6	34.3	33.4	47.8	51.6	65.5	50.9	64.4	56.1	55.6	52.5	39.3	33.0	30.7	18.5	17.5	65.5	35.8	24
12	25.0	31.3	X	X	29.5	31.8	19.3	30.9	43.0	X	X	24.1	17.9	21.7	19.4	28.0	18.3	21.7	24.3	16.2	30.8	17.9	19.7	20.6	16.2	43.0	39.3	20
13	16.1	17.3	18.7	15.2	15.9	17.8	13.4	11.8	X	20.3	14.6	15.6	16.3	17.8	14.7	15.3	16.9	17.1	17.5	18.0	16.4	14.9	14.9	17.8	11.8	20.3	19.5	23
14	17.5	18.0	20.1	18.0	21.7	18.5	18.0	15.4	17.4	22.4	23.1	25.1	25.9	29.0	23.0	20.5	18.7	21.4	19.2	20.7	19.3	20.9	20.0	21.1	15.4	29.0	20.6	24
15	21.7	21.3	17.3	18.5	19.4	24.0	20.3	19.8	18.7	14.3	20.5	39.8	40.2	29.5	28.9	24.7	12.8	15.9	18.3	23.2	16.9	14.0	13.8	17.5	12.8	40.2	21.3	24
16	17.3	20.2	22.2	22.0	18.7	18.0	21.7	18.8	23.0	19.8	23.5	23.2	17.6	15.2	18.5	19.6	20.7	25.0	23.1	20.6	25.0	16.0	19.7	17.1	15.2	25.0	20.3	24
17	15.0	11.4	15.3	21.4	20.4	18.6	15.2	12.3	12.1	10.7	12.8	19.2	20.3	18.7	13.4	17.8	20.7	20.9	10.3	11.9	5.3	11.9	11.3	13.1	5.3	21.4	15.0	24
18	13.0	13.2	15.4	11.8	13.5	13.0	12.9	13.6	13.6	12.3	12.1	12.7	13.1	18.1	11.2	12.6	13.0	11.6	10.5	22.5	26.0	12.1	7.8	11.3	7.8	26.0	13.6	24
19	15.9	18.4	12.9	10.7	10.3	13.0	13.1	13.1	10.7	14.0	11.2	11.2	7.9	10.1	12.3	12.0	12.7	13.3	11.4	13.4	12.7	13.3	11.4	11.9	7.9	18.4	12.4	24
20	11.8	13.1	12.5	12.7	12.5	15.6	5.7	12.5	8.5	32.2	13.6	10.3	4.1	4.3	9.6	3.9	10.3	10.0	12.9	2.3	2.6	11.1	9.8	9.4	2.3	32.2	10.5	24
21	10.3	15.5	13.8	9.4	13.3	2.1	9.4	8.9	10.5	12.0	9.8	9.6	21.4	31.3	27.3	26.7	31.2	24.1	24.5	37.2	32.0	26.9	30.2	26.8	2.1	37.2	19.3	24
22	22.1	21.9	21.0	19.7	21.9	20.1	20.9	18.8	16.0	14.6	15.7	18.6	13.6	20.4	16.4	15.9	17.9	16.8	14.4	15.4	14.4	13.8	13.3	14.0	13.3	22.1	17.4	24
23	13.4	13.3	16.6	17.1	14.6	13.8	14.1	14.0	13.8	12.9	12.2	11.7	12.7	12.0	14.6	12.9	12.2	13.4	13.5	12.0	13.1	17.1	13.3	16.7	11.7	17.1	13.8	24
24	13.5	15.1	12.5	14.9	14.9	20.1	12.2	11.4	12.2	10.6	9.8	12.4	13.3	10.7	11.1	12.1	10.7	11.6	11.4	20.4	10.5	10.6	10.0	11.6	9.8	20.4	12.7	24
25	8.9	10.9	17.7	11.2	11.4	19.5	9.8	10.5	10.6	18.4	13.8	12.9	14.6	12.8	14.2	13.7	11.1	19.7	12.0	12.2	14.7	12.0	13.1	16.2	8.9	19.7	13.4	24
26	17.3	17.3	14.6	14.9	12.7	16.0	16.0	11.6	10.9	11.6	12.2	18.6	23.6	25.0	22.4	21.8	19.4	15.7	14.6	13.1	13.5	17.3	16.2	12.3	10.9	25.0	16.2	24
27	10.8	32.0	30.4	24.9	23.4	18.4	19.2	19.0	22.1	19.4	29.2	26.3	24.0	25.8	22.5	18.6	18.1	16.2	24.9	14.4	9.8	15.3	16.2	17.0	9.8	32.0	20.7	24
28	15.6	18.4	20.1	17.3	16.2	11.6	14.0	14.2	14.6	17.7	17.8	17.6	22.3	21.6	18.1	17.0	10.9	10.5	16.4	15.1	15.5	13.3	29.3	33.1	10.5	33.1	17.4	24
29	34.0	30.3	26.0	22.5	19.4	15.5	18.8	18.4	16.9	13.7	13.5	21.4	24.9	21.4	23.3	18.4	14.3	14.0	13.7	15.5	15.6	18.1	25.7	22.5	13.5	34.0	19.9	24
30	23.1	28.9	21.2	24.2	22.3	27.5	26.0	30.8	25.8	36.3	38.0	40.7	37.0	40.3	44.8	46.2	46.9	39.8	37.3	40.2	39.8	28.4	35.6	46.3	21.2	46.9	34.5	24
31	49.4	43.5	36.9	43.9	35.3	29.4	36.7	29.4	23.0	25.0	24.3	21.3	22.4	19.4	27.0	23.9	24.1	23.6	18.4	17.5	21.5	15.5	17.3	20.8	15.5	49.4	27.1	24
HOURLY MAX	50.2	43.5	36.9	52.8	47.5	74.7	60.1	71.2	67.0	56.8	38.0	44.5	47.8	51.6	65.5	50.9	64.4	65.0	55.6	64.0	62.4	69.0	35.6	57.2				
HOURLY AVG	21.1	24.8	25.7	31.4	27.2	26.1	24.6	22.5	27.8	31.0	24.6	20.9	20.3	21.5	21.0	20.0	20.4	21.7	21.4	22.1	21.7	21.7	21.2	23.1				

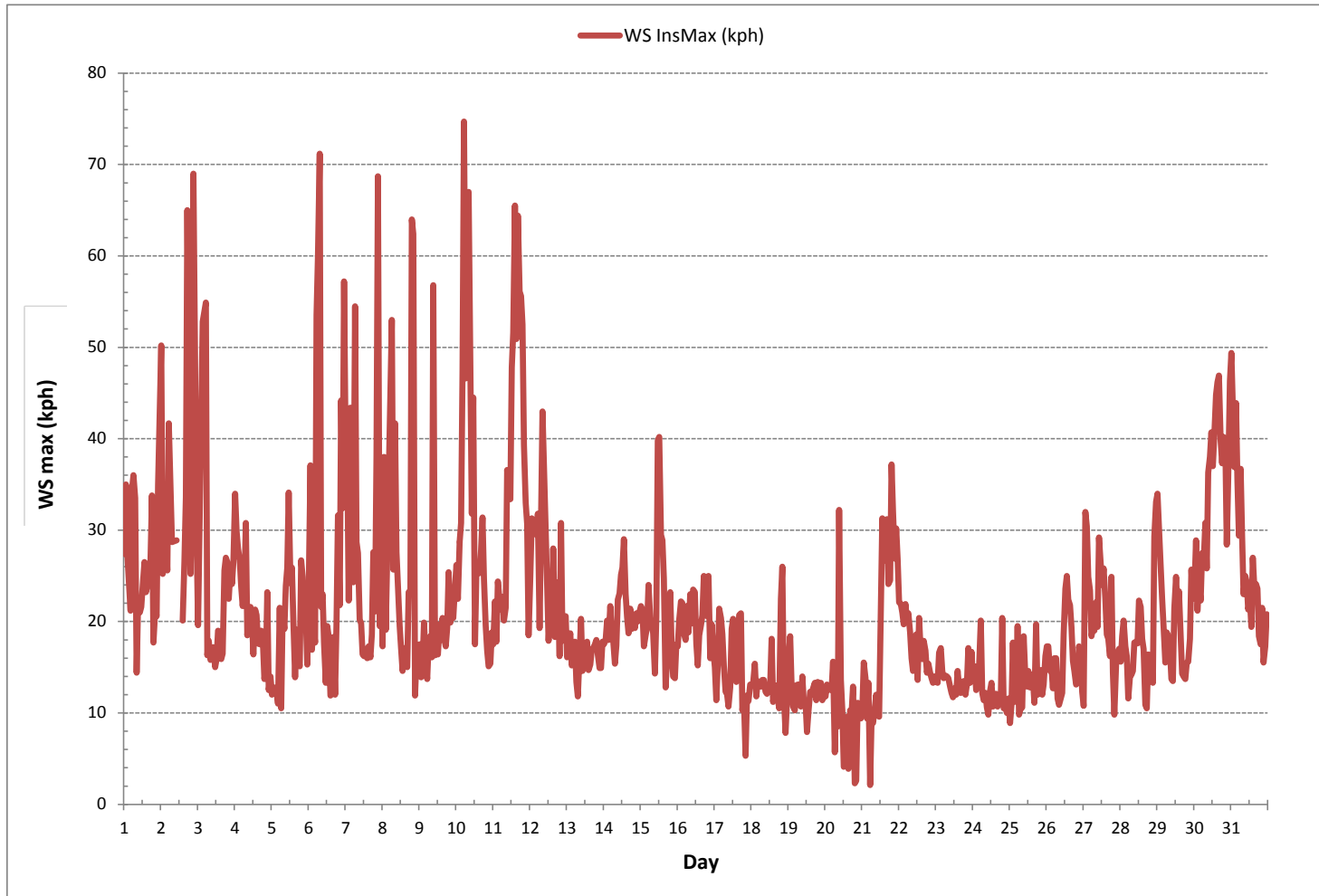
STATUS FLAG CODES

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:	74.7	kph	@ HOUR(S)	8	ON DAY(S)	2
					VAR-VARIOUS	
OPERATIONAL TIME:					721	hrs

WIND SPEED Instantaneous Maximum (WS kph)

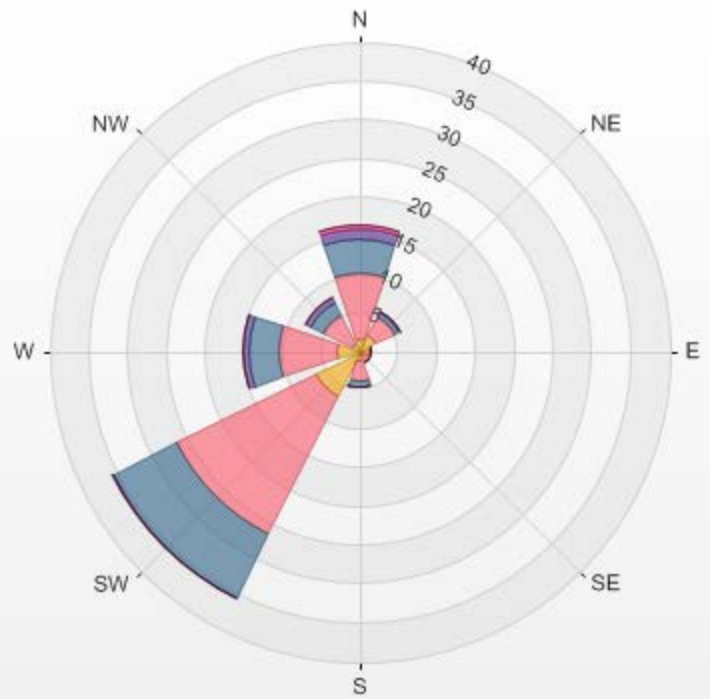


Wind: LICA MASKWA Monitor: WSP [kph] Monthly: 01/2017 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 11.32% Valid Data: 99.73%

Direction	1.8-3.6	3.6-7.3	7.3-10.9	10.9-14.6	14.6-18.2	>18.2	Total
N	1.75	8.49	4.31	1.35	0.4	0	16.3
NE	2.43	2.7	0.67	0.13	0	0	5.93
E	1.21	0.4	0	0	0	0	1.61
SE	0.27	1.21	0	0	0	0	1.48
S	1.35	2.43	0.94	0	0	0	4.72
SW	6.33	20.08	9.16	0.13	0	0	35.7
W	2.96	7.41	4.04	0.67	0	0	15.08
NW	1.08	4.18	1.75	0.81	0	0	7.82
Summary	17.38	46.9	20.87	3.09	0.4	0	88.64

% Icon Classes (kph) 17 1.8-3.6 47 3.6-7.3 21 7.3-10.9 3 10.9-14.6 0 14.6-18.2 0 >18.2

LICA MASKWA 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 11.32% Calm Wind Avg Speed: 0.91(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - January 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	WNW	WNW	W	W	WNW	NW	NW	N	N	N	N	NW	NW	NNW	NW	NNW	NW	NW	WSW	S	SSW	NNE	SE	NW	24	
2	NE	NNW	WSW	NW	SE	E	ESE	ESE	SSE	NW	SSW	Y	Y	N	N	N	WNW	SW	SW	SW	W	SW	SW	SSE	W	22	
3	SSW	SW	SSW	SSW	W	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SW	SW	SW	WSW	W	W	WNW	NW	NW	NW	NW	WSW	24	
4	NNW	NNW	NW	NW	NNW	N	N	NNE	NNE	NNE	N	NNE	N	N	N	NNW	WNW	NW	W	SW	WSW	SW	SW	SW	NNW	24	
5	SSW	SSW	SSW	SSW	SSW	WNW	NNW	N	NNE	NE	NE	NE	NE	ENE	NE	NE	NNE	NNE	NNE	NNE	NE	NE	NE	NNE	NE	24	
6	NNE	NNE	NNE	NNE	NNE	S	W	W	WSW	NW	SW	SSW	SW	SW	SSW	S	SSE	SSW	SW	S	SE	ESE	ENE	ESE	SW	24	
7	E	ENE	E	NE	ENE	ENE	NE	NNE	ESE	NNE	SW	SSW	SW	WNW	WNW	WNW	NW	NNW	N	N	NNE	N	N	NNE	N	24	
8	N	N	N	NNE	N	NNE	W	SSW	SW	SSW	SW	SSW	SSW	SW	S	SSW	SSW	SSW	SSE	SSW	SSW	SSW	SSW	SSW	SW	24	
9	SW	SW	SW	SW	SSW	WSW	WSW	SW	SW	W	WSW	WSW	WNW	W	WSW	W	W	NW	NW	NW	NNW	NNW	N	W	W	24	
10	N	N	NW	NW	SW	W	WNW	SSE	S	W	NNW	NNW	NNW	NNW	NNW	NNW	NW	WNW	WSW	WSW	SW	SW	SW	SSW	WNW	24	
11	SSW	SSW	SSW	SW	SSW	SSW	SSW	SW	SW	WNW	WNW	WNW	W	NW	N	NNW	N	NNW	NNW	NNW	N	NNW	NNW	N	NW	24	
12	NNW	WNW	NW	NW	SSW	SSE	SSW	SW	SSW	ENE	NNE	SSE	SE	SE	SE	SE	ESE	SE	SE	SE	SE	SE	SSE	SSE	SSE	24	
13	S	SSW	SSW	SSW	SSW	SW	SW	SW	WSW	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SSW	SSW	SW	SW	SW	SSW	SW	SSW	SSW	24
14	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	24
15	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	W	W	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
16	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	S	S	SSE	SSW	24	
17	SSE	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	NNW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	ENE	ESE	NNE	ESE	ENE	SSW	24	
18	ENE	ENE	ENE	NE	ENE	ENE	NE	NE	ENE	NE	W	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSE	24
19	ENE	W	SSE	SE	SE	ENE	E	ENE	NE	ENE	NNE	NNE	NNE	NE	NE	NE	NE	ENE	E	NE	NE	ENE	ENE	SE	NE	24	
20	WSW	SSE	SW	SW	WSW	WSW	S	SW	SSW	W	W	SSW	SW	W	SW	SW	NE	ENE	ESE	SE	E	ENE	E	WNW	SW	24	
21	SSE	WSW	SSE	SW	SW	SSW	SSE	ESE	NNE	ENE	NE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	N	N	NNE	N	NNE	N	24	
22	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	NNE	NNE	NNE	NNE	NNE	NNE	N	N	N	24
23	NNE	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNW	NNW	NNW	NW	NNE	N	N	NNE	N	NNE	NNE	NNE	NE	WSW	WNW	N	24
24	WNW	WSW	WSW	W	WSW	WSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
25	SSW	SW	SSW	SW	SSW	SSW	SSW	SSW	SW	WSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SSW	SSW	SSW	24
26	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SW	WSW	W	WNW	WNW	WNW	W	W	W	W	W	W	W	W	W	W	SSW	SSW	24
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28	W	W	W	W	W	WSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
29	WNW	WNW	WNW	W	WSW	W	W	WSW	SW	WSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
30	WNW	WNW	W	WNW	WNW	WNW	WNW	WNW	W	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NNW	N	N	N	WNW	24	
31	N	N	N	NNE	N	NNE	N	N	N	N	N	NNW	NW	NNW	WNW	WNW	W	W	W	WSW	WSW	WSW	W	NW	NNW	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:	742	hrs
STANDARD DEVIATION:	101		AMD OPERATION UPTIME:	99.7	%
			MONTHLY AVERAGE:	267	(W)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - January 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	30	29	28	27	28	27	36	36	27	24	28	31	38	36	37	40	40	32	43	52	34	23	57	54	24	
2	71	52	65	55	53	51	48	63	50	37	58	Y	Y	39	27	51	46	34	29	30	64	36	44	35	22	
3	48	51	32	44	58	55	30	28	30	21	19	17	17	24	30	20	31	28	32	33	37	40	39	42	24	
4	39	35	35	36	37	28	23	20	24	20	25	21	29	33	32	45	38	48	45	21	27	27	24	29	24	
5	18	25	19	24	39	39	49	47	31	21	24	23	22	29	28	23	36	11	14	15	20	21	19	20	24	
6	36	39	20	30	37	53	43	33	34	38	38	34	36	55	24	16	31	17	19	35	53	33	60	42	24	
7	53	36	63	47	33	27	38	46	17	55	52	24	29	36	32	35	37	36	25	22	21	35	21	20	24	
8	27	26	23	21	29	42	26	27	60	44	26	32	26	24	24	19	20	35	23	36	57	18	21	21	24	
9	27	24	32	40	17	36	35	24	27	44	35	33	34	38	37	37	38	41	40	33	36	37	36	34	24	
10	19	36	34	49	48	38	66	59	46	42	36	42	38	37	38	38	42	36	29	26	19	17	19	12	24	
11	14	18	22	20	20	19	20	25	25	25	27	25	36	31	26	36	28	36	34	35	33	37	30	35	24	
12	40	33	37	56	42	23	14	25	35	44	18	37	26	29	28	29	23	26	23	28	32	31	28	50	24	
13	23	19	24	21	19	23	19	20	52	17	17	16	18	16	18	15	14	14	17	16	17	16	17	16	24	
14	14	15	18	19	20	18	22	20	21	18	19	23	22	21	20	22	21	21	19	19	17	14	18	14	24	
15	15	14	14	23	15	29	22	27	28	20	29	32	30	29	29	32	24	26	28	30	28	24	20	16	24	
16	13	14	15	15	18	15	16	19	15	15	15	18	18	31	16	22	15	18	17	19	17	26	26	25	24	
17	33	39	27	18	23	20	26	20	40	62	43	37	14	19	20	16	14	14	39	31	64	45	62	32	24	
18	53	34	24	17	50	55	22	20	24	57	62	56	37	23	23	13	13	24	27	19	20	39	56	32	24	
19	36	52	44	57	73	54	25	30	51	39	40	17	12	18	28	42	26	17	47	36	59	62	56	51	24	
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21	29	43	47	27	43	37	36	29	30	25	32	41	15	17	19	21	27	22	26	24	19	22	20	27	24	
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23	26	23	20	16	17	23	17	16	21	20	39	38	37	32	34	32	30	24	27	34	17	49	71	32	24	
24	36	31	38	40	37	50	32	23	22	27	23	23	29	19	19	21	22	31	26	36	32	25	40	35	24	
25	16	17	41	25	12	25	14	13	30	36	34	30	22	20	23	17	25	29	26	26	25	24	24	16	24	
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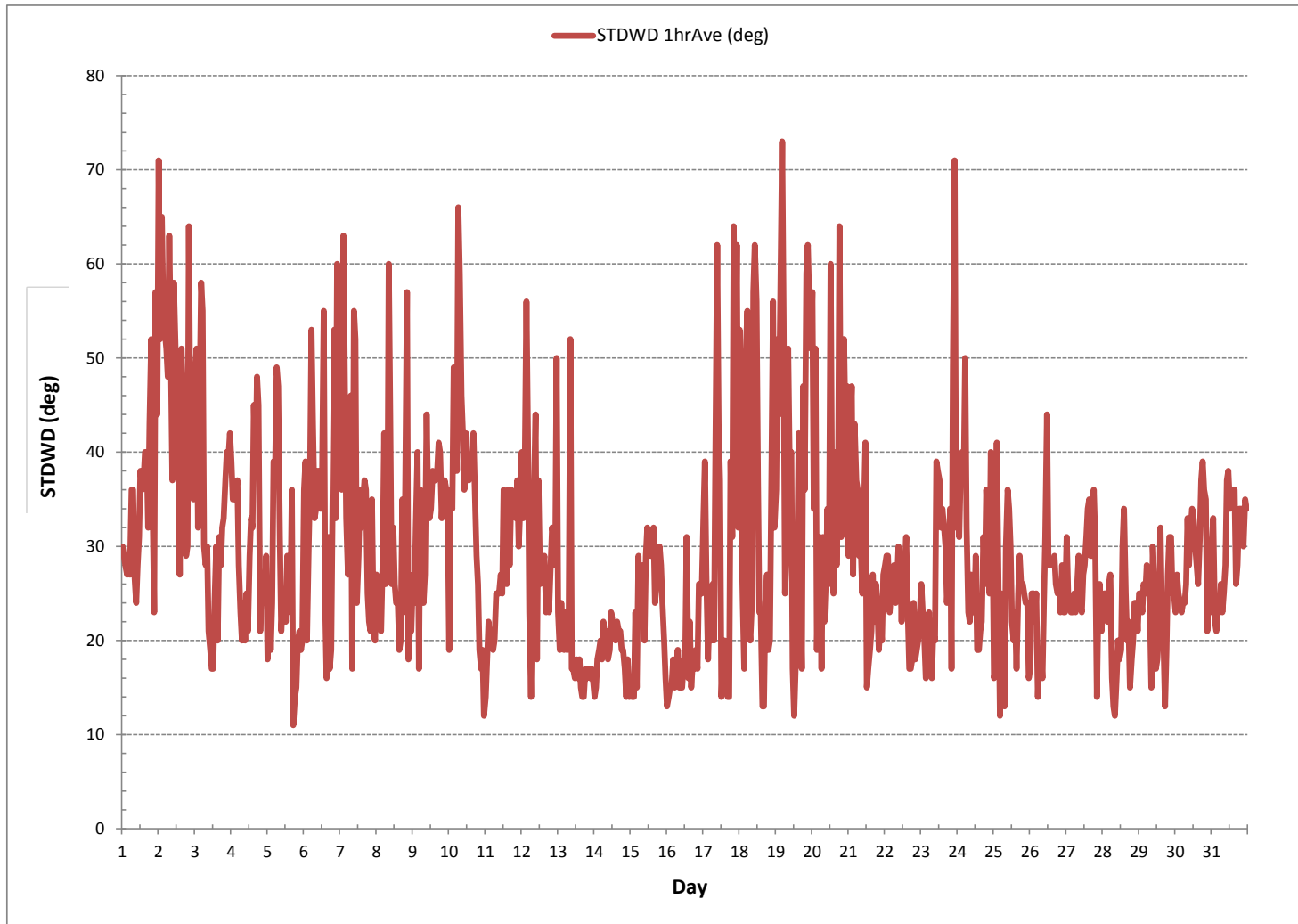
STATUS FLAG CODES

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

LAST CALIBRATION: March 30, 2016

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 742 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



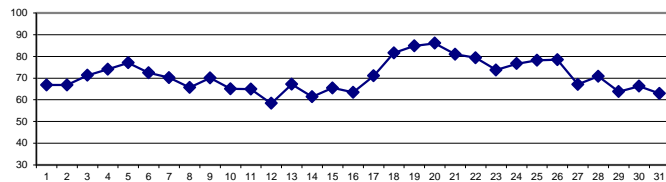
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	71	72	72	73	74	73	70	67	71	68	62	57	55	52	50	55	60	68	73	75	74	72	70	69	50	75	67	24
2	68	67	67	66	66	65	65	64	65	65	66	66	65	64	61	65	71	73	71	70	68	69	68	68	61	73	67	24
3	68	68	67	68	68	69	70	71	71	71	71	71	71	70	70	71	72	73	74	74	74	74	77	77	67	77	71	24
4	76	76	75	76	76	75	75	73	73	72	71	70	68	68	68	70	74	75	77	78	78	78	78	78	68	78	74	24
5	78	78	78	78	78	78	78	78	78	78	78	77	76	75	73	75	78	79	78	78	77	76	74	74	73	79	77	24
6	75	75	76	76	75	77	76	75	74	73	74	72	69	65	66	73	74	73	72	71	70	69	69	68	65	77	72	24
7	68	68	68	69	70	71	72	71	72	71	71	69	69	69	69	71	73	73	70	70	70	71	70	70	68	73	70	24
8	70	69	69	68	69	70	68	67	66	65	66	60	56	53	55	62	68	69	68	67	67	68	70	53	70	66	24	
9	71	71	72	72	72	72	72	72	72	70	69	68	64	64	65	68	71	73	72	71	71	71	71	67	64	73	70	24
10	66	66	68	69	70	71	69	67	66	67	66	62	56	54	55	59	62	65	67	68	68	67	67	67	54	71	65	24
11	66	66	66	67	67	69	70	71	73	77	76	72	73	66	68	63	61	52	53	56	57	58	60	52	77	65	24	
12	61	63	63	64	62	61	61	61	60	60	61	55	49	46	45	51	56	58	58	61	60	61	61	62	45	64	58	24
13	66	65	64	66	67	68	70	70	68	71	69	62	58	55	59	63	66	70	72	73	74	74	73	70	55	74	67	24
14	68	67	65	64	61	61	61	64	65	60	56	53	53	53	54	55	60	62	65	65	65	65	66	66	53	68	61	24
15	65	65	68	68	68	66	67	68	68	70	63	57	56	54	51	57	65	70	68	67	71	72	73	74	51	74	65	24
16	74	75	75	74	74	73	72	70	67	63	60	57	56	53	52	54	56	55	55	59	60	63	63	62	52	75	63	24
17	61	62	64	67	68	71	74	78	82	78	70	61	61	59	59	62	65	66	72	81	85	86	86	86	59	86	71	24
18	86	86	87	87	87	87	87	88	88	87	84	78	65	64	63	67	75	81	86	85	81	85	87	87	63	88	82	24
19	86	86	86	87	87	86	85	85	85	85	84	81	80	79	78	82	86	87	87	87	88	87	87	87	78	88	85	24
20	85	84	85	85	86	86	85	83	83	83	86	87	88	85	85	86	88	88	88	88	87	87	87	86	83	89	86	24
21	85	84	83	83	83	82	82	81	81	83	84	85	77	66	66	73	80	83	84	84	84	83	83	84	66	85	81	24
22	84	84	84	83	83	82	82	81	80	79	78	78	75	76	74	74	77	78	77	76	77	80	81	81	74	84	79	24
23	80	79	79	78	78	77	76	75	75	73	69	66	63	62	64	68	71	75	75	76	76	77	78	79	62	80	74	24
24	80	80	80	80	80	79	79	79	78	77	76	73	70	70	72	74	75	76	76	77	76	76	77	79	70	80	77	24
25	81	81	80	80	79	78	78	77	77	77	77	75	71	70	75	79	81	81	81	81	80	80	80	80	70	81	78	24
26	80	80	80	80	80	80	80	80	80	81	83	82	72	65	64	64	72	79	83	83	85	86	83	81	64	86	78	24
27	82	77	68	69	72	75	77	77	77	71	62	54	53	54	55	57	62	66	61	62	66	73	70	70	53	82	67	24
28	73	74	75	77	79	81	82	81	80	77	70	67	65	60	57	57	62	64	68	73	73	76	69	58	57	82	71	24
29	58	62	64	66	69	73	72	73	77	72	60	58	56	52	49	54	59	62	64	65	66	66	68	49	77	64	24	
30	70	72	76	75	75	76	76	75	76	78	69	58	55	57	54	53	53	59	57	62	61	71	68	65	53	78	66	24
31	65	65	66	63	64	67	67	66	67	67	63	56	51	48	46	51	60	63	65	66	68	69	72	74	46	74	63	24
HOURLY MAX	86	86	87	87	87	87	88	88	87	86	87	88	88	85	85	86	88	89	89	88	88	88	88	87	87			
HOURLY AVG	73	73	73	73	74	74	74	74	74	73	71	67	65	62	62	65	69	71	72	72	73	74	74	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

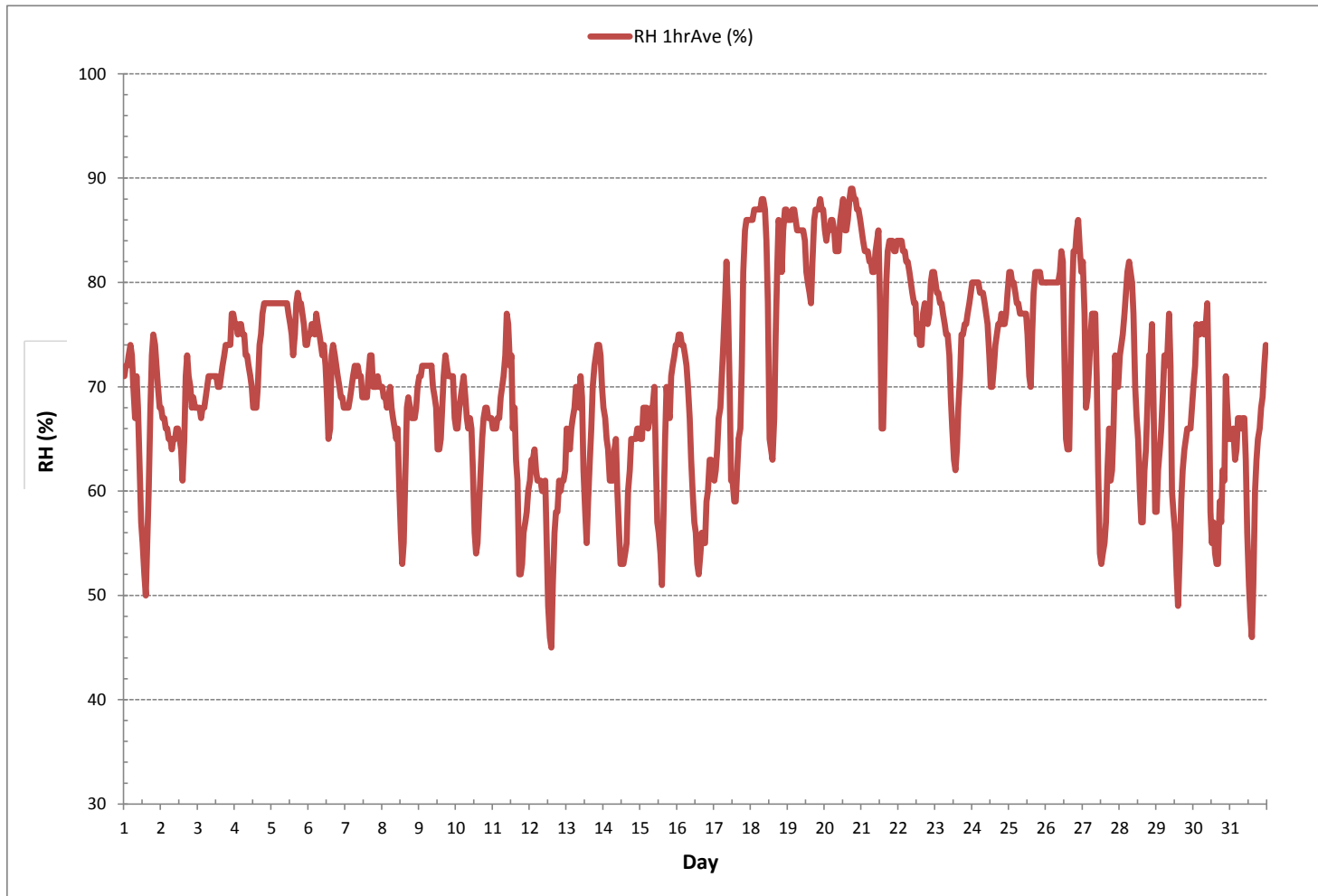
24 HR AVERAGES January 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	45	%	@ HOUR(S)	14	ON DAY(S)	12
MAXIMUM 1-HR AVERAGE:	89	%	@ HOUR(S)	17, 18	ON DAY(S)	20, 20
MAXIMUM 24-HR AVERAGE:	86	%			ON DAY(S)	20
					VAR-VARIOUS	
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	9					
MONTHLY AVERAGE:						71 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



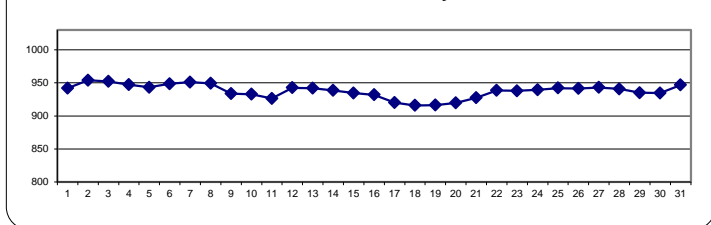
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	936	937	937	937	937	937	938	939	940	941	942	942	943	943	943	944	944	945	945	946	946	947	948	949	936	949	942	24	
2	949	950	951	951	952	952	953	954	954	955	955	954	954	954	954	955	955	955	956	956	956	956	957	956	949	957	954	24	
3	956	956	956	956	955	955	955	955	954	954	953	953	952	951	951	950	950	949	948	948	948	948	948	947	947	947	956	952	24
4	947	947	947	947	947	947	947	947	947	948	948	948	948	948	948	948	948	948	948	948	947	947	946	945	944	944	948	947	24
5	944	944	943	943	942	942	942	942	942	942	943	943	942	943	943	943	944	944	944	944	944	944	945	945	942	942	945	943	24
6	945	945	946	946	946	946	946	946	947	947	948	948	948	948	949	949	950	951	951	951	951	952	952	953	953	945	953	948	24
7	953	953	953	953	953	952	952	952	952	952	951	951	950	950	949	949	949	949	949	950	950	950	950	950	949	949	953	951	24
8	951	951	951	952	952	953	953	953	953	953	953	952	950	949	949	948	948	948	947	946	944	943	943	942	942	942	953	949	24
9	941	940	939	938	937	937	936	935	935	934	934	933	932	931	931	931	930	930	930	930	931	931	931	931	930	941	934	24	
10	931	931	932	932	932	933	933	933	933	933	933	933	933	932	933	934	934	934	934	934	934	933	933	932	931	931	934	933	24
11	931	929	928	926	924	922	921	919	918	918	918	917	916	916	920	923	927	930	933	935	937	939	940	941	916	941	926	24	
12	942	943	944	945	945	946	946	947	947	946	945	943	942	941	941	941	941	940	940	940	939	939	938	938	938	938	947	942	24
13	938	938	938	939	939	939	940	940	941	942	942	942	942	942	943	943	944	944	944	944	944	944	944	943	938	944	942	24	
14	943	943	943	943	942	941	940	940	940	940	939	938	938	937	937	936	936	935	935	935	935	934	934	934	934	934	943	939	24
15	933	933	933	933	933	933	933	933	933	933	934	934	934	934	934	935	935	935	936	936	936	936	937	937	938	933	938	934	24
16	937	937	937	937	936	936	935	935	934	934	934	934	933	932	931	931	930	929	928	927	926	924	923	922	922	922	937	932	24
17	921	921	920	920	919	919	919	919	920	920	920	920	921	921	921	922	922	922	921	920	919	919	919	919	919	919	922	920	24
18	918	918	918	917	917	917	916	915	915	915	915	915	915	916	916	916	915	915	914	915	916	915	916	916	914	918	916	24	
19	916	916	916	916	917	917	917	917	917	917	917	917	916	916	916	916	916	916	916	916	915	915	915	916	915	917	916	24	
20	916	916	917	917	918	918	919	919	919	919	920	920	921	921	921	921	921	921	921	921	921	921	922	922	922	922	922	920	24
21	922	922	922	923	923	923	923	924	924	924	925	925	926	927	928	929	930	931	931	932	933	933	934	935	935	922	935	928	24
22	936	936	937	938	938	938	938	939	939	939	940	940	939	939	939	939	939	939	939	939	939	939	938	938	938	936	940	938	24
23	938	938	938	938	938	938	938	937	938	938	938	938	938	937	937	937	937	938	938	938	938	938	938	938	938	937	938	938	24
24	938	938	938	938	938	938	938	939	939	939	940	940	939	939	939	940	940	940	940	941	941	941	941	941	938	941	939	24	
25	941	941	941	941	941	942	942	942	942	942	943	943	943	943	943	943	943	943	942	942	942	942	942	941	941	943	942	24	
26	941	940	940	940	940	940	940	940	940	941	942	942	942	943	943	943	942	942	942	942	941	942	942	942	941	940	943	941	24
27	941	941	942	942	943	943	943	944	944	944	945	945	945	944	943	943	942	942	943	942	942	942	942	942	941	945	943	24	
28	942	943	943	943	943	942	942	942	942	942	942	941	941	940	940	940	940	939	938	938	938	938	938	938	938	938	943	941	24
29	938	938	938	938	938	938	938	938	938	938	938	937	936	935	935	934	933	932	931	930	930	929	929	930	929	938	935	24	
30	930	931	931	932	932	933	933	933	933	934	934	935	935	935	935	936	936	937	937	937	937	937	937	938	939	930	939	935	24
31	940	941	942	943	944	945	945	946	947	948	948	949	949	949	949	949	949	949	949	949	949	949	949	949	940	949	947	24	
HOURLY MAX	956	956	956	956	955	955	955	955	954	955	955	954	954	954	954	955	955	955	956	956	956	956	957	956					
HOURLY AVG	937	937	937	938	937	938	937	938	938	938	938	938	938	937	937	938	938	938	938	938	938	938	938	938					

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

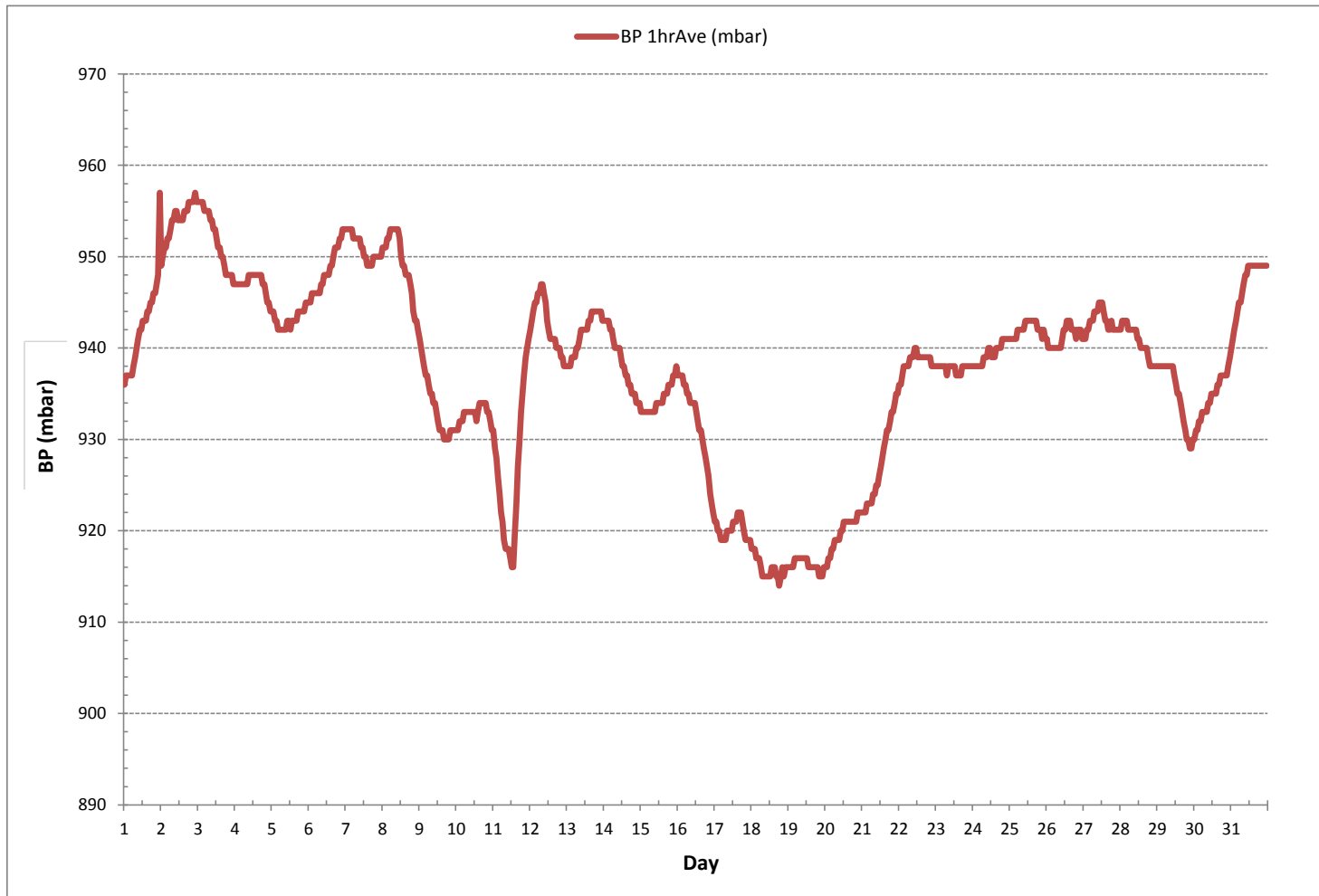
24 HR AVERAGES January 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	914 mbar	@ HOUR(S)	18	ON DAY(S)	18
MAXIMUM 1-HR AVERAGE:	957 mbar	@ HOUR(S)	22	ON DAY(S)	2
MAXIMUM 24-HR AVERAGE:	954 mbar			ON DAY(S)	2
				VAR-VARIOUS	
		OPERATIONAL TIME:		744	hrs
		AMD OPERATION UPTIME:		100.0	%
STANDARD DEVIATION:	10	MONTHLY AVERAGE:		938	mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



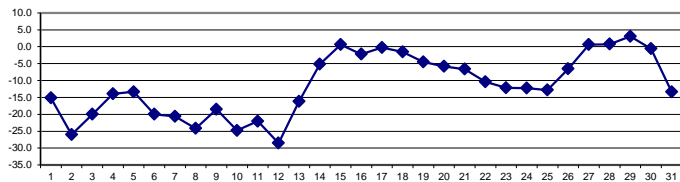
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-9.9	-9.6	-9.3	-9.4	-9.6	-9.9	-10.0	-11.3	-12.6	-12.8	-13.2	-12.7	-12.6	-11.8	-12.3	-14.6	-16.6	-18.9	-21.0	-22.3	-23.3	-24.9	-26.6	-27.6	-27.6	-9.3	-15.1	24	
2	-28.8	-29.3	-29.5	-29.8	-30.4	-31.0	-31.1	-31.4	-30.8	-29.5	-26.6	-20.1	-17.9	-17.5	-17.5	-19.2	-22.1	-24.1	-25.3	-25.7	-26.3	-26.4	-26.7	-26.8	-31.4	-17.5	-26.0	24	
3	-26.2	-26.1	-26.8	-26.2	-24.7	-23.5	-22.7	-22.1	-21.5	-21.1	-20.6	-19.8	-18.9	-17.6	-16.7	-17.2	-17.1	-16.7	-16.4	-16.0	-15.5	-15.5	-15.4	-15.2	-26.8	-15.2	-20.0	24	
4	-14.8	-14.4	-14.2	-13.8	-13.4	-13.2	-13.2	-13.6	-13.8	-13.9	-13.6	-13.5	-13.0	-12.7	-12.4	-12.7	-13.2	-13.7	-14.8	-15.4	-15.3	-15.3	-15.4	-14.9	-15.4	-15.4	-12.4	-13.9	24
5	-14.6	-14.6	-14.5	-14.0	-13.7	-13.1	-12.4	-12.2	-11.9	-11.8	-11.7	-12.0	-11.4	-11.1	-11.2	-11.3	-13.7	-14.7	-15.5	-15.7	-14.3	-14.5	-14.8	-14.8	-15.3	-15.7	-11.1	-13.3	24
6	-16.2	-16.9	-17.1	-17.2	-18.0	-18.7	-18.9	-20.0	-21.2	-21.4	-19.0	-16.5	-15.8	-14.7	-14.9	-17.8	-21.0	-22.9	-23.9	-24.4	-24.9	-25.9	-26.0	-26.1	-26.1	-14.7	-20.0	24	
7	-26.4	-26.1	-25.9	-24.2	-22.5	-20.9	-20.5	-22.2	-23.1	-19.7	-17.7	-17.2	-17.0	-16.1	-15.8	-16.6	-17.7	-17.9	-19.9	-21.8	-22.3	-21.9	-20.6	-20.7	-26.4	-15.8	-20.6	24	
8	-21.4	-21.2	-21.2	-22.7	-25.8	-27.3	-28.1	-29.6	-30.7	-30.1	-25.5	-21.7	-20.7	-19.4	-19.3	-22.1	-25.1	-27.3	-27.5	-24.9	-23.0	-22.1	-21.7	-21.3	-30.7	-19.3	-24.2	24	
9	-21.1	-20.7	-20.2	-19.9	-20.0	-20.0	-19.8	-19.7	-19.8	-19.3	-18.5	-17.7	-16.2	-16.2	-16.3	-17.0	-17.5	-17.5	-17.4	-17.5	-17.5	-17.7	-18.0	-18.6	-21.1	-16.2	-18.5	24	
10	-19.7	-21.1	-22.6	-23.2	-25.4	-26.4	-27.7	-29.0	-28.7	-26.3	-23.2	-21.2	-19.8	-19.3	-20.3	-22.4	-24.2	-25.7	-27.2	-27.6	-28.0	-28.4	-28.6	-29.0	-29.0	-19.3	-24.8	24	
11	-29.5	-28.9	-27.3	-26.6	-26.6	-25.5	-23.2	-21.5	-20.1	-15.7	-12.3	-9.6	-8.6	-8.9	-14.0	-18.0	-21.9	-24.6	-26.1	-27.0	-27.6	-28.0	-28.6	-29.2	-29.5	-8.6	-22.1	24	
12	-30.1	-31.0	-31.7	-32.6	-34.4	-35.5	-36.1	-34.6	-35.3	-35.0	-30.1	-24.8	-23.8	-23.0	-22.3	-24.2	-25.8	-25.7	-25.1	-25.3	-24.9	-24.5	-23.9	-24.2	-36.1	-22.3	-28.5	24	
13	-25.2	-24.5	-24.4	-24.7	-24.5	-24.1	-23.8	-24.1	-24.8	-22.7	-16.8	-13.3	-9.2	-7.5	-7.3	-8.1	-9.2	-9.7	-10.3	-10.4	-10.6	-11.0	-11.1	-10.4	-25.2	-7.3	-16.2	24	
14	-9.8	-9.9	-9.7	-9.4	-8.8	-8.2	-7.8	-8.6	-8.5	-6.9	-5.0	-3.6	-2.7	-1.8	-1.6	-1.6	-2.6	-2.8	-3.2	-2.9	-2.6	-2.3	-2.3	-1.9	-9.9	-1.6	-5.2	24	
15	-1.2	-1.1	-1.7	-1.2	-0.9	0.1	0.0	-0.4	0.3	-0.3	2.0	4.5	4.9	5.5	6.2	4.0	1.2	-0.4	0.0	0.0	-1.2	-1.5	-1.8	-2.2	-2.2	6.2	0.6	24	
16	-2.6	-3.1	-3.5	-3.9	-4.4	-4.6	-5.0	-4.8	-4.4	-3.5	-2.7	-1.7	-1.0	0.1	0.8	0.7	-0.1	-0.3	-0.5	-1.5	-1.1	-2.1	-2.1	-2.0	-5.0	0.8	-2.2	24	
17	-1.5	-1.6	-2.0	-2.5	-2.1	-2.4	-3.1	-3.4	-4.5	-3.9	-1.2	3.9	4.4	5.6	5.6	4.6	4.5	4.3	2.2	-0.8	-2.0	-3.1	-3.5	-3.7	-4.5	5.6	-0.3	24	
18	-3.7	-3.9	-3.7	-3.6	-3.8	-3.8	-4.3	-4.3	-3.8	-3.1	-1.7	0.7	4.6	4.7	4.9	3.4	0.7	-1.7	-3.4	-2.2	-0.9	-1.9	-3.3	-3.4	-4.3	4.9	-1.6	24	
19	-3.5	-3.7	-4.3	-5.6	-6.4	-7.2	-7.9	-8.0	-8.3	-6.8	-5.2	-3.6	-1.6	-0.9	-0.4	-0.1	-2.0	-3.1	-3.9	-3.8	-4.2	-5.1	-6.0	-7.5	-8.3	-0.1	-4.5	24	
20	-8.3	-9.0	-8.6	-8.2	-7.0	-7.1	-8.5	-10.2	-10.4	-10.0	-5.7	-3.4	-1.0	0.3	0.7	-0.7	-2.3	-3.7	-4.4	-5.5	-6.1	-6.4	-6.8	-7.9	-10.4	0.7	-5.8	24	
21	-8.2	-9.3	-9.7	-10.1	-10.1	-11.2	-11.3	-12.3	-13.0	-10.2	-6.5	-2.3	1.1	2.4	1.2	-2.2	-4.5	-5.2	-5.3	-5.5	-5.9	-6.6	-7.3	-7.7	-13.0	2.4	-6.7	24	
22	-7.8	-8.0	-8.4	-8.8	-9.2	-9.5	-10.1	-10.5	-10.9	-10.5	-10.2	-10.1	-9.4	-9.4	-9.3	-9.7	-10.5	-11.3	-11.8	-12.2	-12.7	-12.8	-12.8	-12.7	-12.8	-7.8	-10.4	24	
23	-12.7	-12.9	-13.3	-13.6	-14.0	-14.1	-14.0	-14.0	-13.8	-13.5	-12.4	-11.4	-10.3	-9.7	-9.7	-9.8	-10.1	-10.8	-11.2	-11.5	-11.7	-12.3	-12.5	-12.5	-14.1	-9.7	-12.2	24	
24	-12.8	-13.4	-13.6	-13.6	-13.7	-13.8	-13.9	-14.5	-15.2	-15.1	-13.6	-11.2	-10.0	-10.0	-10.1	-10.3	-10.8	-11.1	-11.4	-11.6	-11.3	-11.2	-11.2	-11.3	-15.2	-10.0	-12.3	24	
25	-11.9	-11.9	-12.3	-13.9	-14.9	-16.1	-16.2	-16.8	-16.6	-15.5	-13.7	-11.5	-9.9	-8.4	-7.7	-9.0	-11.1	-12.8	-12.6	-12.7	-12.2	-12.7	-13.5	-13.2	-16.8	-7.7	-12.8	24	
26	-13.0	-13.2	-13.6	-13.6	-13.4	-13.2	-13.1	-13.3	-12.7	-10.9	-7.5	-3.0	0.6	2.0	1.9	1.5	-0.6	-2.0	-3.0	-3.2	-3.8	-4.2	-3.3	-3.1	-13.6	2.0	-6.6	24	
27	-3.5	-1.7	0.8	0.0	-0.7	-1.7	-2.4	-2.5	-2.5	-0.8	1.7	3.9	4.2	4.1	4.0	4.0	2.7	1.5	3.0	2.3	0.8	-1.3	-0.2	0.0	-3.5	4.2	0.7	24	
28	-0.7	-0.8	-0.9	-1.0	-1.4	-2.1	-2.5	-2.3	-2.1	-1.3	0.6	1.8	2.5	4.3	5.3	5.8	3.6	2.4	1.4	0.5	0.4	-0.9	1.0	4.4	-2.5	5.8	0.8	24	
29	4.6	3.6	3.2	2.5	1.2	0.1	0.9	0.6	-1.0	0.8	4.6	5.1	5.7	7.0	8.1	6.2	4.0	2.8	2.1	1.9	2.1	2.3	2.5	2.2	-1.0	8.1	3.0	24	
30	1.8	1.2	0.1	0.5	0.3	0.1	0.6	1.1	0.8	0.8	0.7	1.3	1.5	1.2	1.0	0.4	-0.2	-1.2	-2.0	-2.5	-3.0	-5.3	-6.1	-7.4	-7.4	1.8	-0.6	24	
31	-8.7	-9.7	-11.0	-12.6	-14.3	-14.6	-14.7	-15.4	-15.7	-15.5	-14.8	-13.1	-12.0	-11.4	-10.6	-11.5	-13.7	-14.4	-15.1	-14.9	-14.7	-14.2	-14.1	-13.5	-15.7	-8.7	-13.3	24	
HOURLY MAX	4.6	3.6	3.2	2.5	1.2	0.1	0.9	1.1	0.8	0.8	4.6	5.1	5.7	7.0	8.1	6.2	4.5	4.3	3.0	2.3	2.1	2.3	2.5	4.4					
HOURLY AVG	-12.5	-12.7	-12.8	-13.0	-13.3	-13.5	-13.6	-13.9	-14.1	-13.1	-10.9	-8.8	-7.5	-6.8	-6.8	-7.9	-9.6	-10.6	-11.3	-11.6	-11.7	-12.2	-12.3	-12.3					

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

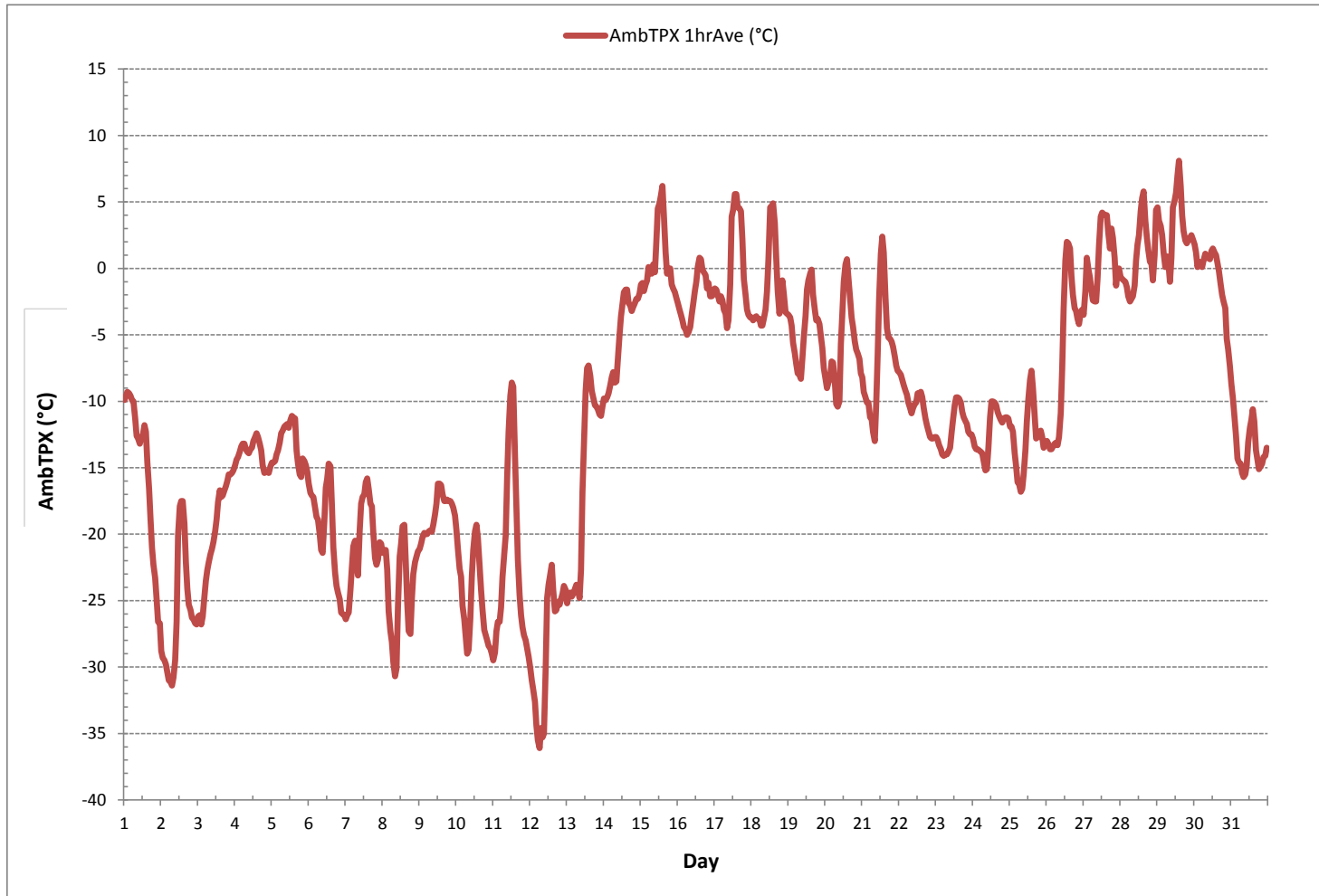
24 HR AVERAGES January 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-36.1 °C	@ HOUR(S)	6	ON DAY(S)	12
MAXIMUM 1-HR AVERAGE:	8.1 °C	@ HOUR(S)	14	ON DAY(S)	29
MAXIMUM 24-HR AVERAGE:	3.0 °C			ON DAY(S)	29
				VAR-VARIOUS	
OPERATIONAL TIME:				744	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	9.7			MONTHLY AVERAGE:	-11.4 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



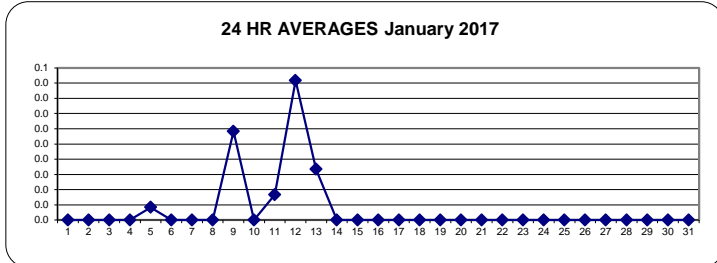
PRECIPITATION Hourly Averages (mm)

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	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	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	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	0.0	0.0	0.0	0.0	0.0	0.0	24		
5	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24		
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.2	0.0	0.1	0.0	0.1	0.0	0.1	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	0.0	0.0	0.0	0.0	0.0	24		
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.1	0.0	24		
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24		
13	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	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	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	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
HOURLY MAX	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24

STATUS FLAG CODES

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

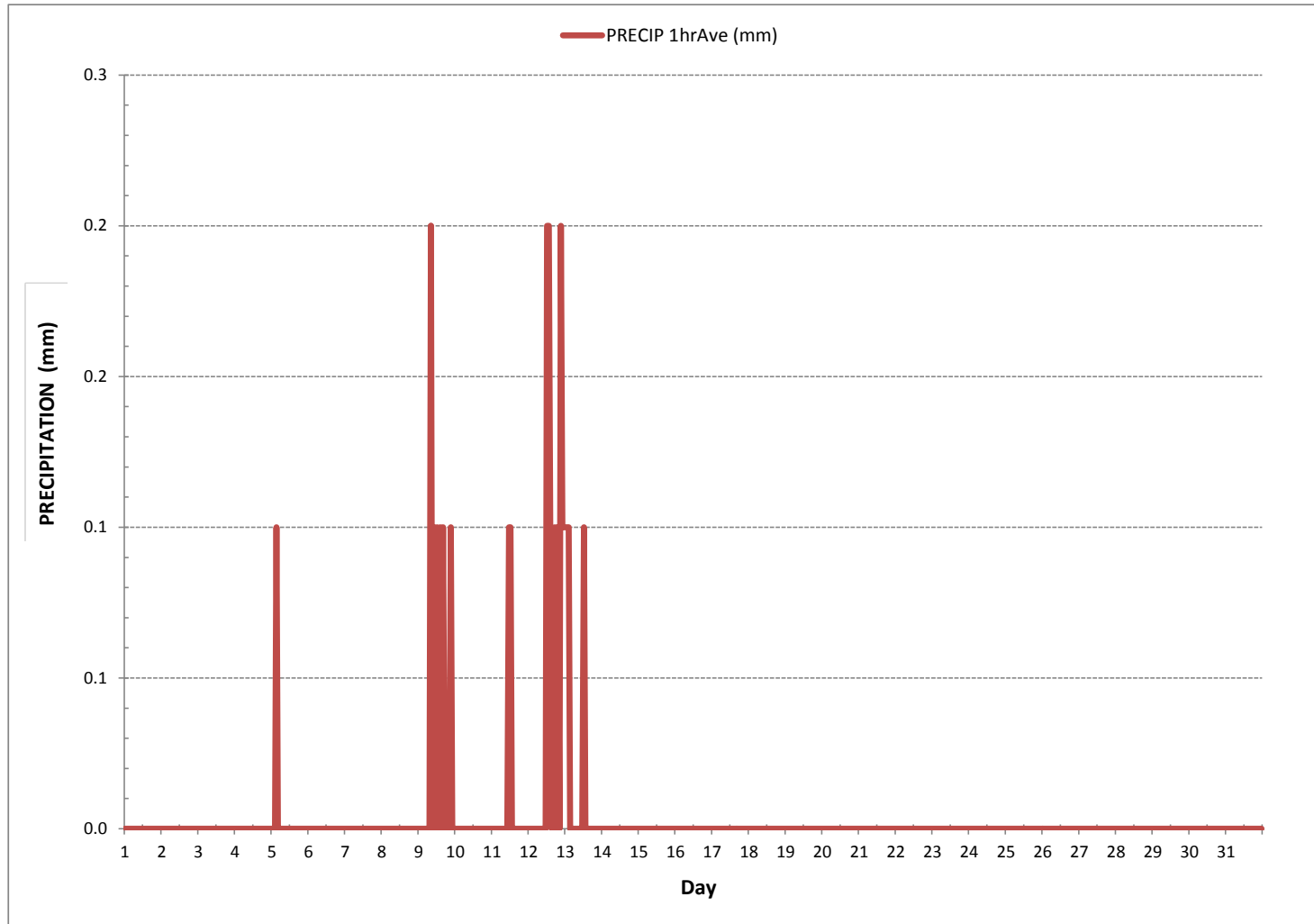
24 HR AVERAGES January 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	0.2	mm	@ HOUR(S)	8 , VAR	ON DAY(S)	9 , 12
MAXIMUM 24-HR AVERAGE:	0.0	mm			ON DAY(S)	ALL
MONTHLY TOTAL	2.5	mm			VAR-VARIOUS	
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	0.0					MONTHLY AVERAGE: 0.0 mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>January 12, 2017</u>	Barometric Pressure: <u>27.94 inHg</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>20</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Mainly sunny</u>
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>shut down</u>
Start Time 24 hr. (mst): <u>10:00</u>	Performed By/Reviewer: <u>Limin Li</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>13:15</u>	Cal Gas Expiry Date: <u>December 25, 2018</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>508</u>	Range ppb: <u>1000</u>	Station SO2 Analyzer Range? <u>ppb</u>
Last Calibration Date: <u>December 2, 2016</u>	As Found C.F.: <u>0.986</u>	
Previous C.F.: <u>1.000</u>	New C.F.: <u>n/a</u>	

Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								
Make & Model: <u>Sabio 2010</u>									
Serial #: <u>17200415</u>									
Cal Gas Cylinder I.D. #: <u>BLM002756T</u>									
Cal Gas Conc. (ppm): <u>49.9</u>									

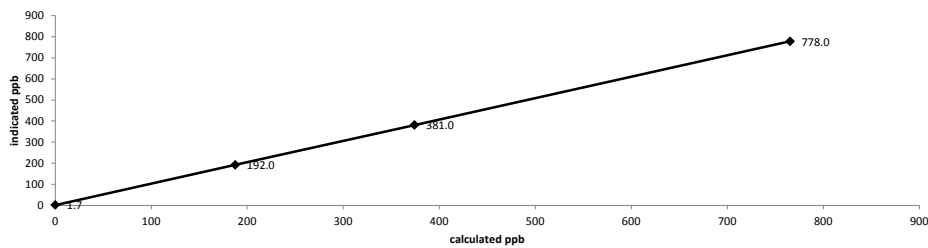
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	5028	0.00	5028	0.0	1.7	n/a
as found high	4950	77.10	5027	765.3	778.0	0.986
mid	4989	37.70	5027	374.2	381.0	0.987
low	5009	18.90	5028	187.6	192.0	0.986
Average C.F. =						0.986

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.986</u>	> or = 0.995
b (Intercept as % of full scale) = <u>-0.16%</u>	0.90-1.10
% change in C.F. from last cal = <u>1.42%</u>	± 3% F.S.
	± 10%

API 100E Sulphur Dioxide Analyzer Calibration



<p style="text-align: center;">As found:</p> SLOPE: <u>1.013</u> OFFSET: <u>119</u> HVPS: <u>479</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>27.1</u> PMT TEMP: <u>7.6</u> IZS TEMP: <u>45.0</u> PRES: <u>24.7</u> SAMP FL: <u>622</u> NORM PMT: <u>122.7</u> UV LAMP: <u>2812</u> LAMP RATIO: <u>94.5</u> STR. LGT: <u>60.3</u> DRK PMT: <u>9.7</u> DRK LMP: <u>-0.5</u> Expected Value: <u>475.0</u>	<p style="text-align: center;">As left:</p> SLOPE: <u>n/a</u> OFFSET: <u>n/a</u> HVPS: <u>n/a</u> RCELL TEMP: <u>n/a</u> BOX TEMP: <u>n/a</u> PMT TEMP: <u>n/a</u> IZS TEMP: <u>n/a</u> PRES: <u>n/a</u> SAMP FL: <u>n/a</u> NORM PMT: <u>n/a</u> UV LAMP: <u>n/a</u> LAMP RATIO: <u>n/a</u> STR. LGT: <u>n/a</u> DRK PMT: <u>n/a</u> DRK LMP: <u>n/a</u> Expected Value: <u>n/a</u>
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Comments:
The analyzer sample inlet filter was changed.

After the shutdown calibration, the IZS fittings were tightened. The IZS exhaust orifice was changed to 250 ccm.



API 100E Sulphur Dioxide Analyzer Calibration

Date: January 12, 2017	Barometric Pressure: 27.94 inHg
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): 16:40	Performed By/Reviewer: Limin Li / Trina Whitsitt
End Time 24 hr. (mst): 19:25	Cal Gas Expiry Date: December 25, 2018
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Range ppb: 1000	Station SO2 Analyzer Range?
ID# or Serial Number: 508	As Found C.F.: n/a	ppb
Last Calibration Date: n/a	New C.F.: 1.000	
Previous 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>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: Sabio 2010									
Serial #: 17200415									
Cal Gas Cylinder I.D. #: BLM002756T									
Cal Gas Conc. (ppm): 49.9									

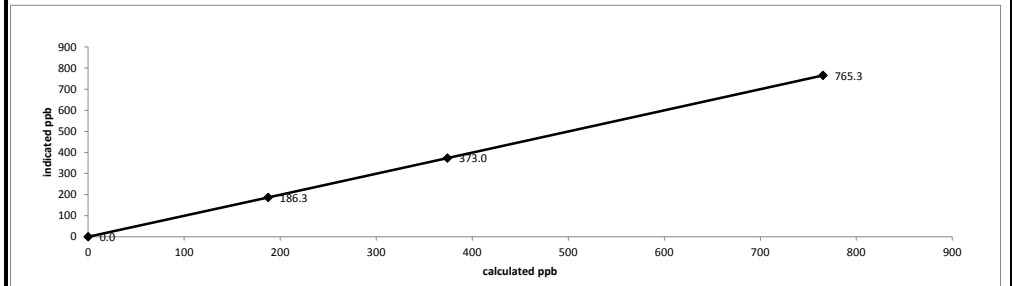
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	5028	0.00	5028	0.0	0.0	n/a
adjusted high	4950	77.10	5027	765.3	765.3	1.000
mid	4989	37.70	5027	374.2	373.0	1.003
low	5009	18.90	5028	187.6	186.3	1.007
calibrator zero	5028	0.00	5028	0.0	0.0	n/a
Average C.F. =						1.003

Linear Regression/Calibration Results:

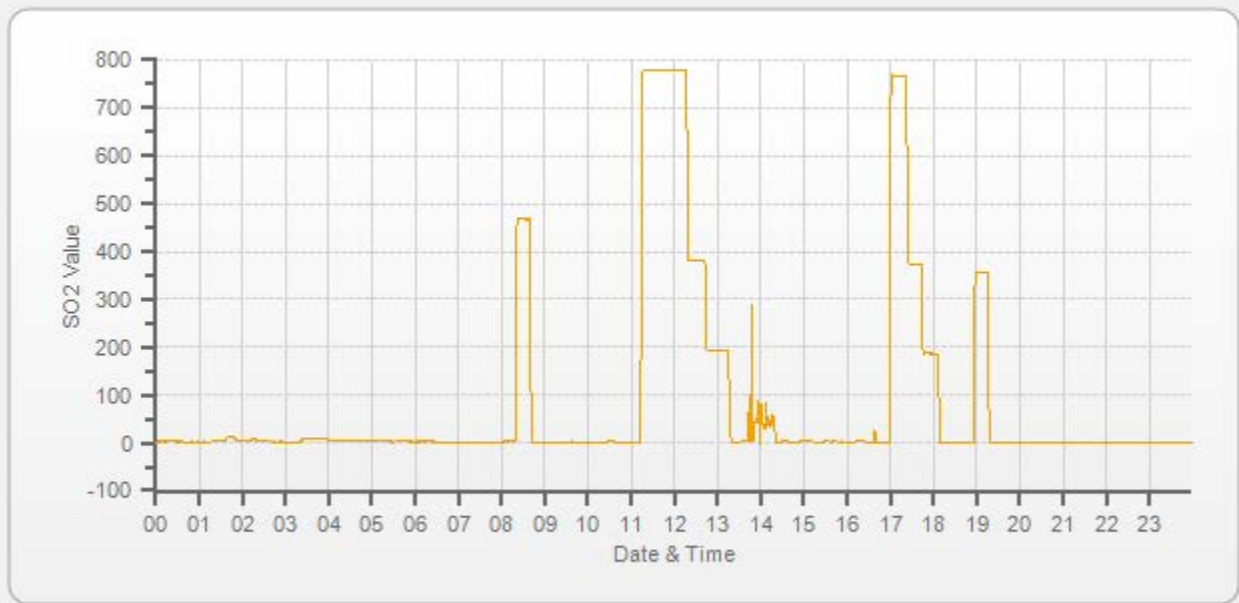
Correlation Coefficient = 1.000	LIMITS
Slope = 1.000	> or = 0.995
b (Intercept as % of full scale) = 0.08%	.95-1.05
% change in C.F. from last cal = n/a	± 3% F.S.
	± 10%

API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
SLOPE: n/a	SLOPE: 0.995
OFFSET: n/a	OFFSET: 122.2
HVPS: n/a	HVPS: 479
RCELL TEMP: n/a	RCELL TEMP: 50.0
BOX TEMP: n/a	BOX TEMP: 30.9
PMT TEMP: n/a	PMT TEMP: 7.7
IZS TEMP: n/a	IZS TEMP: 45
PRES: n/a	PRES: 24.7
SAMP FL: n/a	SAMP FL: 621
NORM PMT: n/a	NORM PMT: 121.8
UV LAMP: n/a	UV LAMP: 2847
LAMP RATIO: n/a	LAMP RATIO: 95.7
STR. LGT: n/a	STR. LGT: 60.8
DRK PMT: n/a	DRK PMT: 10.4
DRK LMP: n/a	DRK LMP: -0.5
Expected Value: n/a	Expected Value: 356.2

Comments:
The analyzer sample inlet filter was changed.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>January 12, 2017</u>	Barometric Pressure: <u>27.94 inHg</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>20</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Mainly sunny</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>shut down</u>
Start Time 24 hr. (mst): <u>10:00</u>	Performed By/Reviewer: <u>Limin Li</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>12:50</u>	Cal Gas Expiry Date: <u>January 8, 2018</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>511</u>	Range ppb: <u>100</u>	Station SO2 Analyzer Range? <u>1000</u> ppb
Last Calibration Date: <u>December 14, 2016</u>	As Found C.F.: <u>1.034</u>	
Previous C.F.: <u>0.999</u>	New C.F.: <u>n/a</u>	

Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>API700</u> Serial #: <u>690</u> Cal Gas Cylinder I.D. #: <u>BLM002508</u> Cal Gas Conc. (ppm): <u>10.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	SO₂ Scrubber Check (10 mins.) Start/End Time 24 hr.: <u>11:05/ 11:15</u> Target Concentration (ppb): <u>780</u> Result (ppb): <u>-0.5</u> Zero Corrected Result (ppb): <u>0</u> **warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**
Point	ppb									
High	78									
Mid	38									
Low	19									

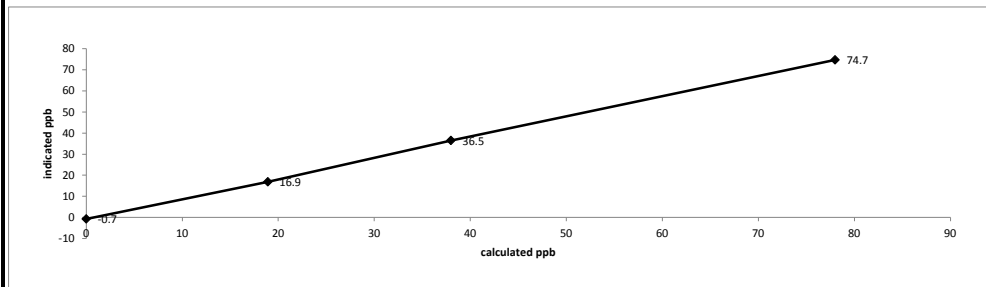
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7497	0.00	7497	0.0	-0.7	n/a
as found high	7436	57.30	7493	78.0	74.7	1.034
mid	7464	27.90	7492	38.0	36.5	1.021
low	7481	13.90	7495	18.9	16.9	1.075
Average C.F. =						1.043

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.030</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.91%</u>	0.90-1.10
% change in C.F. from last cal = <u>-3.55%</u>	± 3% F.S.
	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



As found: SLOPE: <u>0.958</u> OFFSET: <u>44.2</u> HVPS: <u>596</u> RCELL TEMP: <u>50</u> BOX TEMP: <u>29.8</u> PMT TEMP: <u>7.9</u> IZS TEMP: <u>45</u> Converter Temp: <u>315.4</u> PRES: <u>22.1</u> SAMP FL: <u>617</u> UV LAMP: <u>2571</u> LAMP RATIO: <u>99.2</u> STR. LGT: <u>21.2</u> DRK PMT: <u>33.4</u> DRK LMP: <u>7.1</u> Expected Value: <u>36.0</u>	As left: SLOPE: <u>n/a</u> OFFSET: <u>n/a</u> HVPS: <u>n/a</u> RCELL TEMP: <u>n/a</u> BOX TEMP: <u>n/a</u> PMT TEMP: <u>n/a</u> IZS TEMP: <u>n/a</u> Converter Temp: <u>n/a</u> PRES: <u>n/a</u> SAMP FL: <u>n/a</u> UV LAMP: <u>n/a</u> LAMP RATIO: <u>n/a</u> STR. LGT: <u>n/a</u> DRK PMT: <u>n/a</u> DRK LMP: <u>n/a</u> Expected Value: <u>n/a</u>
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Comments:

The analyzer sample inlet filter was changed.

After shutdown calibration, the large 22 pump was changed and the IZS tubes and fittings were tightened.



API 101E Hydrogen Sulphide Analyzer Calibration

Date: January 12, 2017	Barometric Pressure: 27.94 inHg
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Hydrogen Sulphide	Calibration Purpose: post repair
Start Time 24 hr. (mst): 15:29	Performed By/Reviewer: Limin Li / Trina Whitsitt
End Time 24 hr. (mst): 18:10	Cal Gas Expiry Date: January 8, 2018
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:		
ID# or Serial Number: 511	Range ppb: 100	Station SO2 Analyzer Range?
Last Calibration Date: n/a	As Found C.F.: n/a	1000 ppb
Previous C.F.: n/a	New C.F.: 1.000	

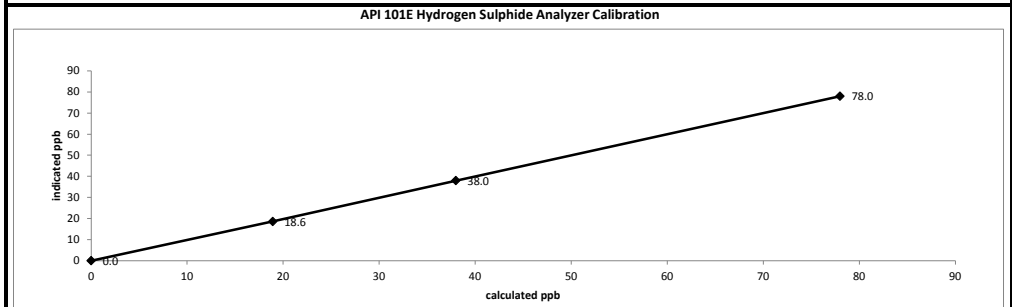
Calibrator:	Standard Calibration Points for Ranges	SO₂ Scrubber Check (10 mins.)								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: 11:05/ 11:15
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: API700		Target Concentration (ppb): 780								
Serial #: 690		Result (ppb): -0.5								
Cal Gas Cylinder I.D. # : BLM002508		Zero Corrected Result (ppb): -1								
Cal Gas Conc. (ppm): 10.2		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

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

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	7497	0.00	7497	0.0	0.0	n/a
adjusted high	7436	57.30	7493	78.0	78.0	1.000
mid	7464	27.90	7492	38.0	38.0	1.000
low	7481	13.90	7495	18.9	18.6	1.017
calibrator zero	7497	0.00	7497	0.0	0.0	n/a
Average C.F. =						1.006

Linear Regression/Calibration Results:

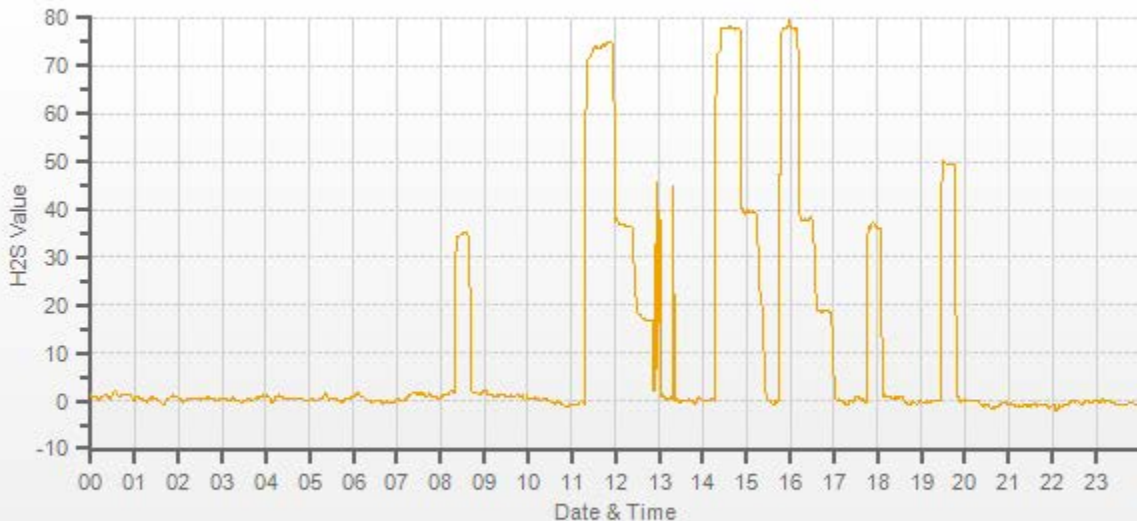
Correlation Coefficient = 1.000	LIMITS
Slope = 0.999	> or = 0.995
b (Intercept as % of full scale) = 0.12%	.95-1.05
% change in C.F. from last cal = n/a	± 3% F.S.
	± 10%



As found:	As left:
SLOPE: n/a	SLOPE: 1.016
OFFSET: n/a	OFFSET: 46.9
HVPS: n/a	HVPS: 596
RCELL TEMP: n/a	RCELL TEMP: 50.0
BOX TEMP: n/a	BOX TEMP: 31.6
PMT TEMP: n/a	PMT TEMP: 7.9
IZS TEMP: n/a	IZS TEMP: 50
Converter Temp: n/a	Converter Temp: 314.7
PRES: n/a	PRES: 22
SAMP FL: n/a	SAMP FL: 612
UV LAMP: n/a	UV LAMP: 2565
LAMP RATIO: n/a	LAMP RATIO: 99
STR. LGT: n/a	STR. LGT: 23.8
DRK PMT: n/a	DRK PMT: 32.7
DRK LMP: n/a	DRK LMP: 7.7
Expected Value: n/a	Expected Value: 49.4

Comments:

IZS temperature was increased from 45 to 50 degC.



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>January 18, 2017</u>	Barometric Pressure: <u>0.903 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>22</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>A few clouds</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>shut down</u>
Start Time 24 hr. (mst): <u>10:15</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>12:09</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>511</u>	Range ppb: <u>100</u>	Station SO2 Analyzer Range? <u>1000</u> ppb
Last Calibration Date: <u>January 12, 2017</u>	As Found C.F.: <u>0.969</u>	
Previous C.F.: <u>1.000</u>	New C.F.: <u>n/a</u>	

Calibrator: Flow Meter ID's: <u>n/a</u> Make & Model: <u>SABIO 2010 D</u> Serial #: <u>11900613</u> Cal Gas Cylinder I.D. #: <u>EY0000654</u> Cal Gas Conc. (ppm): <u>10.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	SO₂ Scrubber Check (10 mins.) Start/End Time 24 hr.: Target Concentration (ppb): <u>780</u> Result (ppb): <u>0</u> Zero Corrected Result (ppb): <u>0</u> **warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**
Point	ppb									
High	78									
Mid	38									
Low	19									

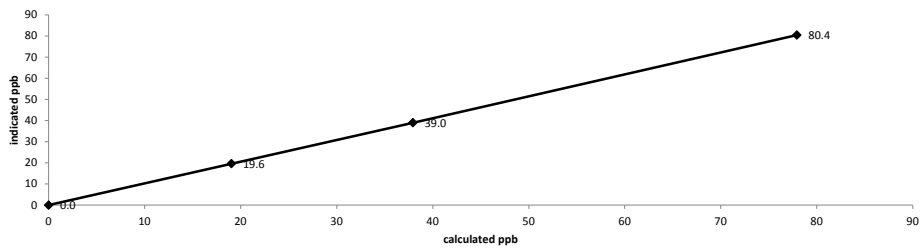
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppb)	Indicated Concentration: (ppb)	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	0.0	n/a
as found high	7442	57.30	7499	77.9	80.4	0.969
mid	7471	27.90	7499	37.9	39.0	0.973
low	7486	14.00	7500	19.0	19.6	0.971
Average C.F. =						0.971

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.969</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.05%</u>	0.90-1.10
% change in C.F. from last cal = <u>3.07%</u>	± 3% F.S.
	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



As found: SLOPE: <u>1.016</u> OFFSET: <u>46.9</u> HVPS: <u>596</u> RCELL TEMP: <u>50.0</u> BOX TEMP: <u>32.3</u> PMT TEMP: <u>7.9</u> IZS TEMP: <u>50.0</u> Converter Temp: <u>314.4</u> PRES: <u>21.2</u> SAMP FL: <u>594</u> UV LAMP: <u>2558.6</u> LAMP RATIO: <u>98.7</u> STR. LGT: <u>23.8</u> DRK PMT: <u>33.4</u> DRK LMP: <u>7.1</u> Expected Value: <u>49.4</u>	As left: SLOPE: <u>n/a</u> OFFSET: <u>n/a</u> HVPS: <u>n/a</u> RCELL TEMP: <u>n/a</u> BOX TEMP: <u>n/a</u> PMT TEMP: <u>n/a</u> IZS TEMP: <u>n/a</u> Converter Temp: <u>n/a</u> PRES: <u>n/a</u> SAMP FL: <u>n/a</u> UV LAMP: <u>n/a</u> LAMP RATIO: <u>n/a</u> STR. LGT: <u>n/a</u> DRK PMT: <u>n/a</u> DRK LMP: <u>n/a</u> Expected Value: <u>n/a</u>
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Comments:

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

No High Point adjustment made. The shutdown calibration completed to perform a leak check of the ZS valves. Reason: unstable zero readings during daily ZS checks.



API 101E Hydrogen Sulphide Analyzer Calibration

Date: January 18, 2017	Barometric Pressure: 0.903 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Maskwa	Weather Conditions: A few clouds
Parameter: Hydrogen Sulphide	Calibration Purpose: post repair
Start Time 24 hr. (mst): 14:21	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 17:34	Cal Gas Expiry Date: June 14, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Range ppb: 100	Station SO2 Analyzer Range?
ID# or Serial Number: 511	As Found C.F.: n/a	1000 ppb
Last Calibration Date: n/a	New C.F.: 1.000	
Previous C.F.: n/a		

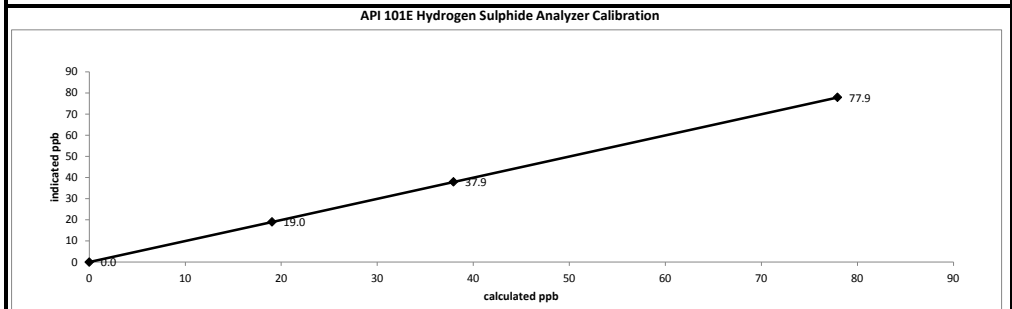
Calibrator: Flow Meter ID's: n/a Make & Model: SABIO 2010 D Serial #: 11900613 Cal Gas Cylinder I.D. #: EY0000654 Cal Gas Conc. (ppm): 10.2	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	SO₂ Scrubber Check (10 mins.) Start/End Time 24 hr.: Target Concentration (ppb): 780 Result (ppb): 0 Zero Corrected Result (ppb): 0 <i>**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**</i>
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)	
adjusted zero	7500	0.00	7500	0.0	0.0	n/a
adjusted high	7442	57.30	7499	77.9	77.9	1.000
mid	7472	27.90	7500	37.9	37.9	1.001
low	7487	14.00	7501	19.0	19.0	1.002
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F. =						1.001

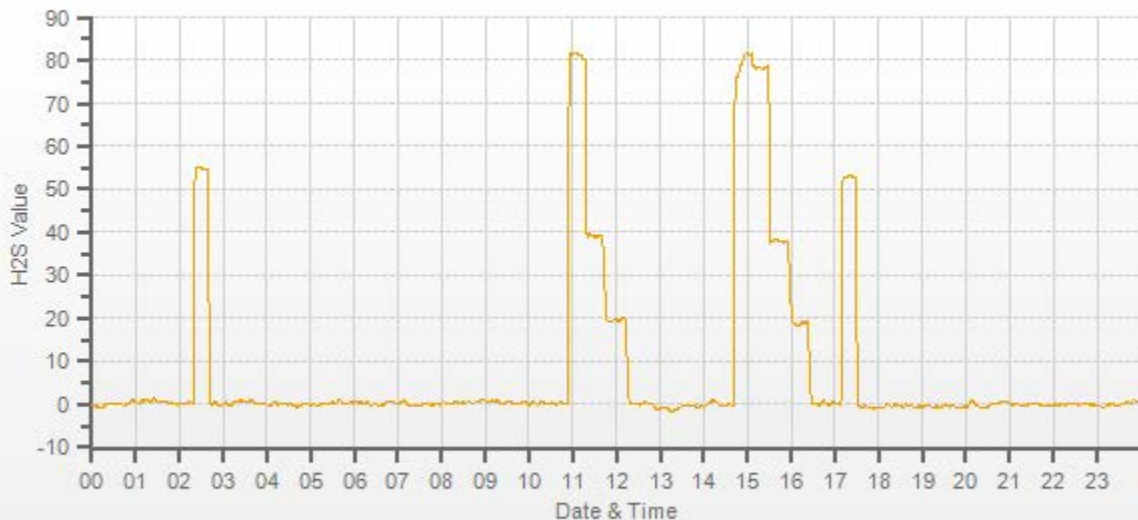
Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS > or = 0.995
Slope = 1.000	.95-1.05
b (Intercept as % of full scale) = 0.02%	± 3% F.S.
% change in C.F. from last cal = n/a	± 10%



Comments:

Leak check of the ZS valves was completed and a post-repair calibration performed. Charcoal of the Zero Air filter was renewed. No leaks found.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: January 12, 2017	Barometric Pressure: 27.94 inHg
Company/Airshed: UCA	Station Temperature °C: 20
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Parameter: Total Hydrocarbon	Calibration Purpose: routine monthly
Start/End Time 24 hr. (mst): 14:40/ 20:05	Performed By/Reviewer: Limin Li Trina Whitsitt
Calibration Method: Gas Dilution	Cal Gas Expiry Date: January 7, 2022

Analyzer:	
ID# or Serial Number: 436609738	Range ppm: 50
Last Calibration Date: December 2, 2016	As Found C.F.: 0.976
Previous Cal High Point C.F.: 1.000	New C.F.: 0.999

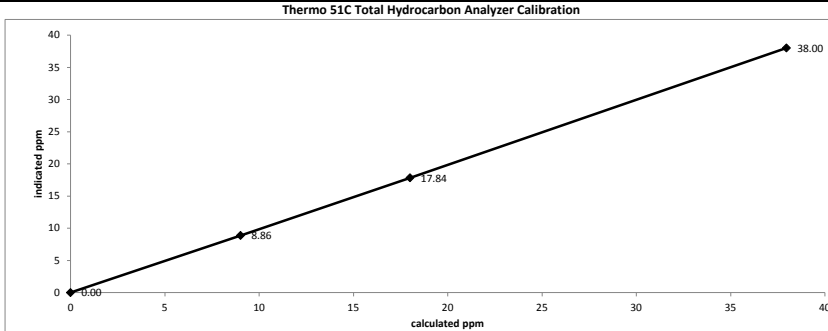
Calibrator:	
Flow Meter ID's: n/a	Standard Calibration Points for a Range of: 50 ppm
Make & Model: API700	
Serial #: 690	
Cal Gas Cylinder I.D. #: LL83638	
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm): 582.0 203.0	
CH ₄ as propane/total CH ₄ equivalents (ppm): 558.3 1140.3	

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	1995	0.00	1995	0.0	0.00	n/a
as found high	1995	68.70	2064	37.96	38.90	0.976
adjusted zero	1995	0.00	1995	0.00	0.00	n/a
adjusted high	1995	68.70	2064	37.96	38.00	0.999
mid	1995	32.00	2027	18.00	17.84	1.009
low	1995	15.90	2011	9.02	8.86	1.018
calibrator zero	1995	0.00	1995	0.0	0.01	n/a
Average C.F. =						1.009

Linear Regression/Calibration Results:

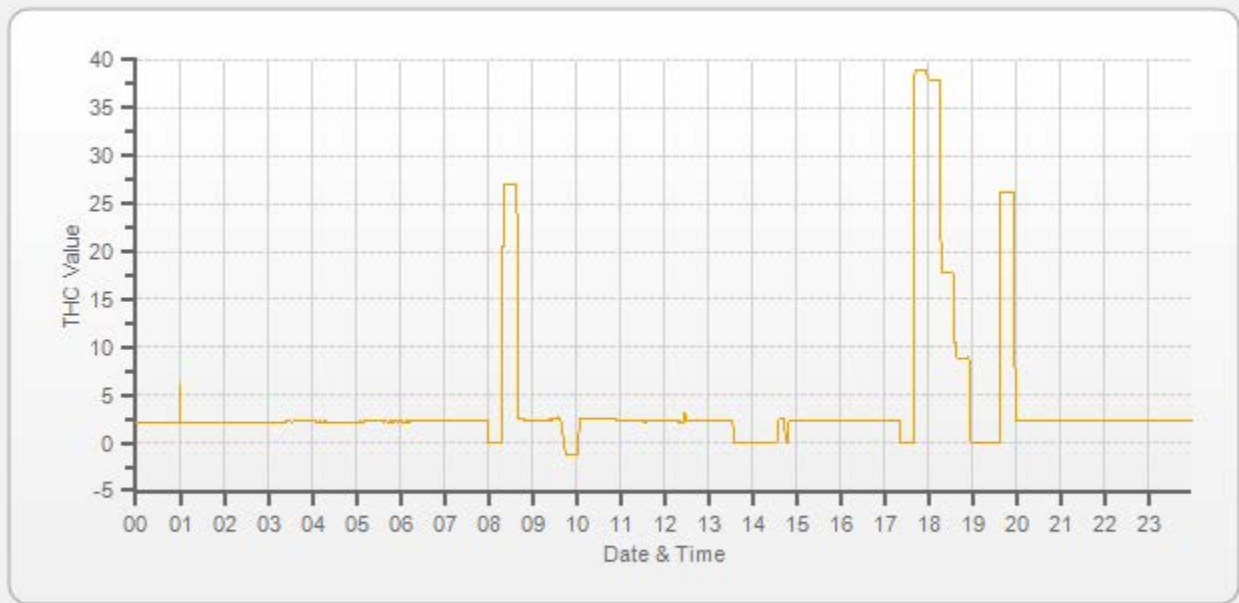
Correlation Coefficient = 1.000	LIMITS
Slope = 0.998	> or = 0.995
b (Intercept as % of full scale) = 0.21%	.95-1.05
% change in C.F. from last cal = 2.42%	± 3% F.S.
	± 10%



<p>As found:</p> <p>H2 cylinder (psi): 300</p> <p>H2 cylinder reg set (psi): 22</p> <p>Span Cylinder (psi): 1200</p> <p>Span Cylinder Reg Set (psi): 22</p> <p>Zero Air Gen Pressure: 38</p> <p>measurement alarms: None</p> <p>service alarms: Flow Reg Fail</p> <p>cnt: 2685</p> <p>rng: 1</p> <p>try: 2</p> <p>flm: 188.1</p> <p>det: 125.8</p> <p>Flame: 188</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 07.50</p> <p>Internal Air Pressure: 20</p> <p>Internal Fuel Pressure: 12</p> <p>Measured Flow: 0.857</p> <p>Expected Value: 26.68</p>	<p>As left:</p> <p>H2 cylinder (psi): 300</p> <p>H2 cylinder reg set (psi): 22</p> <p>Span Cylinder (psi): 1200</p> <p>Span Cylinder Reg Set (psi): 22</p> <p>Zero Air Gen Pressure: 38</p> <p>measurement alarms: None</p> <p>service alarms: None</p> <p>cnt: 1100</p> <p>rng: 1</p> <p>try: 3</p> <p>flm: 187.9</p> <p>det: 125.3</p> <p>Flame: 187</p> <p>Filter: 125</p> <p>Base: 125</p> <p>Sample psi: 07.50</p> <p>Internal Air Pressure: 20</p> <p>Internal Fuel Pressure: 12</p> <p>Measured Flow: 0.857</p> <p>Expected Value: 26.23</p>
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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

Date: January 12, 2017	Barometric Pressure: 27.94 inHg
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny
Start/End Time 24 hr. (mst): 10:00 / 17:25	Calibration Purpose: routine monthly
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Limin Li / Trina Whitsitt
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: December 25, 2018

Analyzer:	Correction Factors:												
ID# or Serial Number: 1899	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <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 style="text-align: center;">NO = 1.000</td> <td style="text-align: center;">0.988</td> <td style="text-align: center;">0.999</td> </tr> <tr> <td style="text-align: center;">NO₂ = 1.000</td> <td style="text-align: center;">1.010</td> <td style="text-align: center;">1.000</td> </tr> <tr> <td style="text-align: center;">NOx = 1.000</td> <td style="text-align: center;">0.987</td> <td style="text-align: center;">0.999</td> </tr> </table>	Previous C.F.:	As Found C.F.:	New C.F.:	NO = 1.000	0.988	0.999	NO ₂ = 1.000	1.010	1.000	NOx = 1.000	0.987	0.999
Previous C.F.:	As Found C.F.:	New C.F.:											
NO = 1.000	0.988	0.999											
NO ₂ = 1.000	1.010	1.000											
NOx = 1.000	0.987	0.999											
Last Calibration Date: December 2, 2016													
Range ppb: 1000													

Calibrator:	Standard Calibration Points for a Range of: 1000 ppb																								
Flow Meter ID's: n/a																									
Make & Model: Sabio 2010																									
Serial #: 17200415																									
Cal Gas Cylinder I.D. #: BLM002756T																									
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>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5028	0.0	5028	0	0	0.0	0.0	n/a	n/a
as found high	4950	77.1	5027	777.6	777.6	787.0	788.0	0.988	0.987
adjusted zero	5028	0.00	5028	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4950	77.10	5027	777.6	777.6	778.0	778.0	0.999	0.999
mid	4989	37.70	5027	380.2	380.2	379.0	378.0	1.003	1.006
low	5009	18.90	5028	190.6	190.6	186.0	186.0	1.025	1.025
calibrator zero	5028	0.00	5028	0	0	0.4	0.0	n/a	n/a
Average C.F.=								1.009	1.010

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	4950	77.10	5027	0.0	776.0	776.0	0.0	0.0	0.0	
as found high NO ₂	4950	77.10	5027	510.0	249.0	771.0	522.0	527.0	522.0	1.010
adjusted high NO ₂	4950	77.10	5027	475.0	250.0	776.0	526.0	526.0	526.0	1.000
gpt mid	4950	77.10	5027	260.0	498.0	779.0	281.0	278.0	281.0	0.989
gpt low	4950	77.10	5027	95.0	678.0	778.0	100.0	98.0	100.0	0.980
Average NO₂ C.F.=										0.990

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.998	1.001	.95-1.05
b (Intercept as % of full scale)=	-0.22%	-0.24%	0.14%	± 3% F.S.
% change in C.F. from last cal=	1.20%	1.32%	-0.96%	± 10%
NO ₂ converter efficiency	0.99		0.99	0.96 to 1.04

As found:		As left:	
NOx SLOPE:	0.958	NOx SLOPE:	0.958
NOx OFFS:	0.6	NOx OFFS:	0.6
NO SLOPE:	0.968	NO SLOPE:	0.970
NO OFFS:	-1.0	NO OFFS:	-1.0
SAMP FLW:	551	SAMP FLW:	550
OZONE FL:	78	OZONE FL:	78
NORM PMT:	6.0	NORM PMT:	-0.7
AZERO:	20.5	AZERO:	21.7
HVPS:	687	HVPS:	686
DCPS:	2577	DCPS:	2582
RCELL:	50.7	RCELL:	50.6
BOX TEMP:	22.3	BOX TEMP:	29.7
IZS TEMP:	45	IZS TEMP:	48
MOLY TEMP:	314.9	MOLY TEMP:	314.9
RCEL:	5.6	RCEL:	5.6
SAMP:	26.4	SAMP:	26.4
Expected Value NO:	4.2	Expected Value NO:	3.9
Expected Value NO ₂ :	393.0	Expected Value NO ₂ :	467.4
Expected Value NOx:	398.0	Expected Value NOx:	471.4

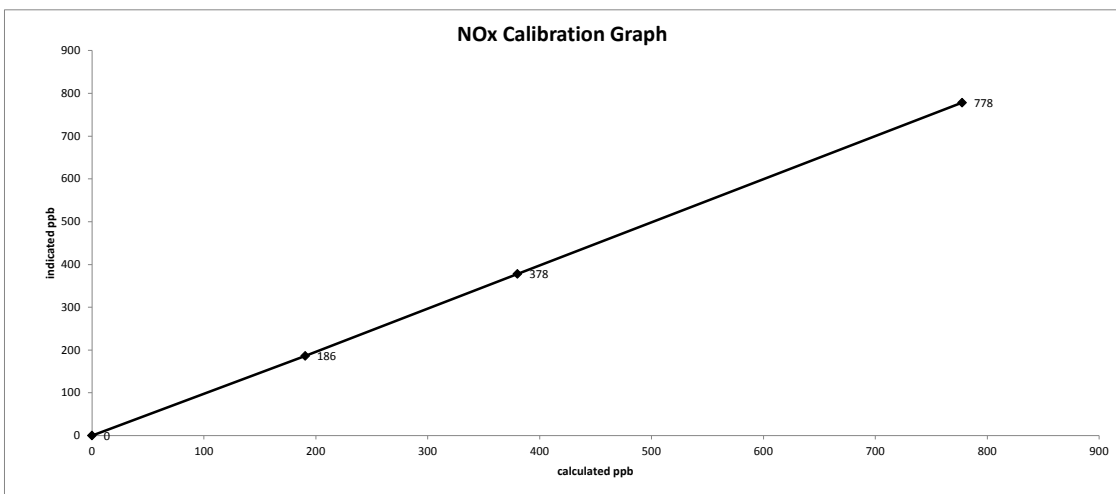
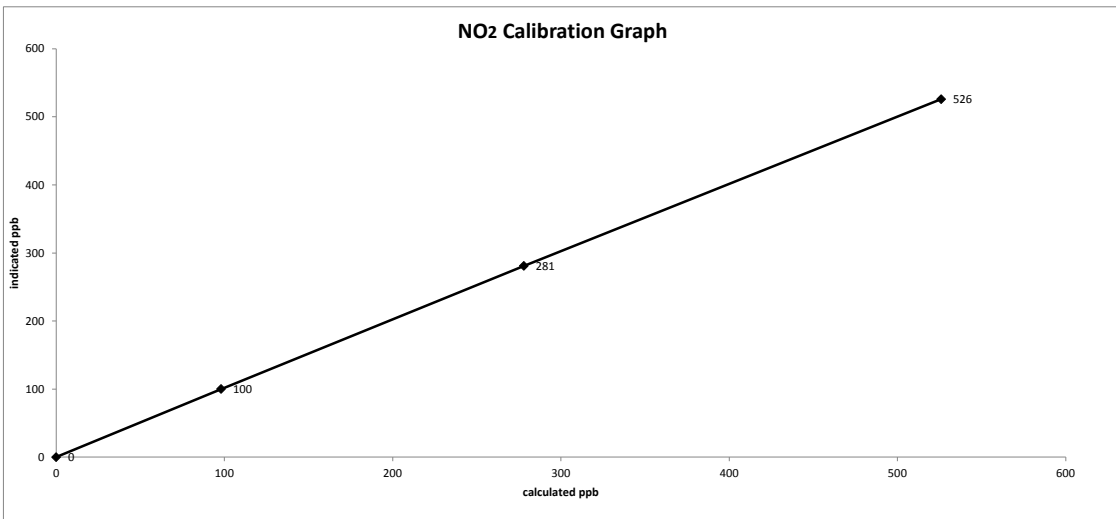
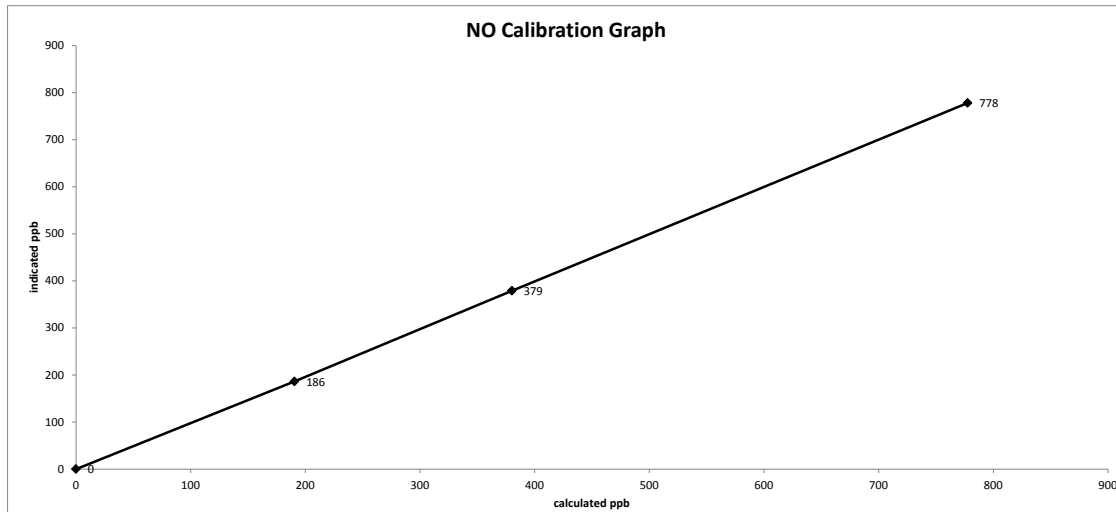
Comments:
 The analyzer sample inlet filter was changed.

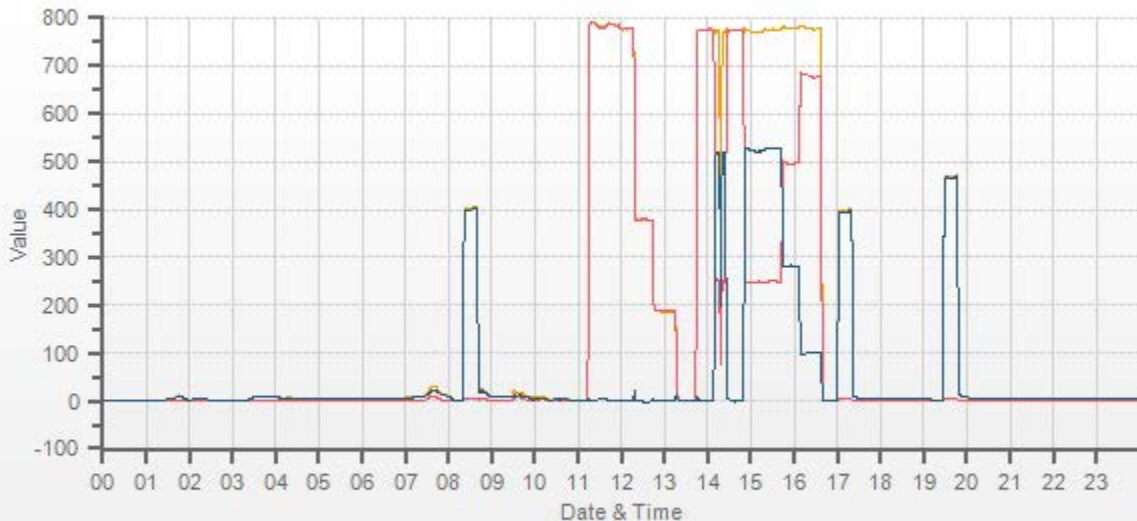
 No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

PMT TEMP: 7.4. The IZS temperature was increased from 45 to 48 degC.

Date: January 12, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:00 / 17:25
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

Date: January 18, 2017 Company/Airshed: LICA Location/Station Name: Maskwa Start/End Time 24 hr. (mst): 10:15 / 16:31 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Gas Phase Titration	Barometric Pressure: 0.903 atm Station Temperature °C: 22 Weather Conditions: A few clouds Calibration Purpose: repeat Performed By/Reviewer: Alex Yakupov Trina Whatsitt Cal Gas Expiry Date: July 18, 2019
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Analyzer: ID# or Serial Number: 1899 Last Calibration Date: January 12, 2017 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>0.999</td> <td>0.948</td> <td>0.999</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.013</td> <td>1.013</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>0.948</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	0.948	0.999	NO ₂ =	1.000	1.013	1.013	NOx =	0.999	0.948	0.999
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	0.948	0.999														
NO ₂ =	1.000	1.013	1.013														
NOx =	0.999	0.948	0.999														

Calibrator: Flow Meter ID's: n/a Make & Model: API 700 Serial #: 690 Cal Gas Cylinder I.D. #: LL104222 NO/NOx Gas Conc. (ppm): 50.7 50.7	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Point	Calibrator Flow Rates (cc/min)			Calculated NO (ppb)	Calculated NOx (ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	NO C.F.	NOx C.F.
	Diluent	Cal Gas	Total Flow						
as found zero	5000	0.0	5000	0	0	0.0	0.0	n/a	n/a
as found high	4920	76.9	4997	780.2	780.2	823.0	823.0	0.948	0.948
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4920	76.90	4997	780.2	780.2	781.0	781.0	0.999	0.999
mid	4956	37.50	4994	380.7	380.7	374.0	374.0	1.018	1.018
low	4976	18.70	4995	189.8	189.8	185.0	185.0	1.026	1.026
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
								Average C.F.=	1.014

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

Point	Calibrator Flow Rates (cc/min)			Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	Indicated NO ₂ (ppb)	NO drop (ppb)	NO ₂ gain (ppb)	NO ₂ C.F.	
	Diluent	Cal Gas	Total Flow								
NOx reference	4920	76.90	4997	0.0	787.0	787.0	0.0	0.0	0.0		
as found high NO ₂	4814	76.90	4891	480.0	260.0	779.0	520.0	527.0	520.0	1.013	
adjusted high NO ₂	4814	76.90	4891	480.0	260.0	779.0	520.0	527.0	520.0	1.013	
gpt mid	4814	76.90	4891	240.0	509.0	785.0	276.0	278.0	276.0	1.007	
gpt low	4814	76.90	4891	85.0	686.0	789.0	103.0	101.0	103.0	0.981	
										Average NO ₂ C.F.=	1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.998	1.016	.95-1.05
b (Intercept as % of full scale)=	-0.35%	-0.35%	0.17%	± 3% F.S.
% change in C.F. from last cal- NO ₂ converter efficiency	5.10%	5.10%	-1.35%	± 10%
			1.00	0.96 to 1.04

As found: NOx SLOPE: 0.958 NOx OFFS: 0.6 NO SLOPE: 0.970 NO OFFS: -1.0 SAMP FLW: 534 OZONE FL: 76 NORM PMT: -2.0 AZERO: 22.7 HVPS: 685 DCPS: 2573 RCELL: 50.5 BOX TEMP: 32.1 IZS TEMP: 48.0 MOLY TEMP: 315.9 RCEL: 5.5 SAMP: 25.2 Expected Value NO: 4.0 Expected Value NO ₂ : 467.4 Expected Value NOx: 471.4	As left: NOx SLOPE: 0.906 NOx OFFS: 0.6 NO SLOPE: 0.917 NO OFFS: -1.0 SAMP FLW: 534 OZONE FL: 76 NORM PMT: -0.2 AZERO: 23.1 HVPS: 685 DCPS: 2581 RCELL: 50.1 BOX TEMP: 34.2 IZS TEMP: 48.0 MOLY TEMP: 315.0 RCEL: 5.5 SAMP: 25.7 Expected Value NO: 4.5 Expected Value NO ₂ : 499.0 Expected Value NOx: 504.0
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Comments:

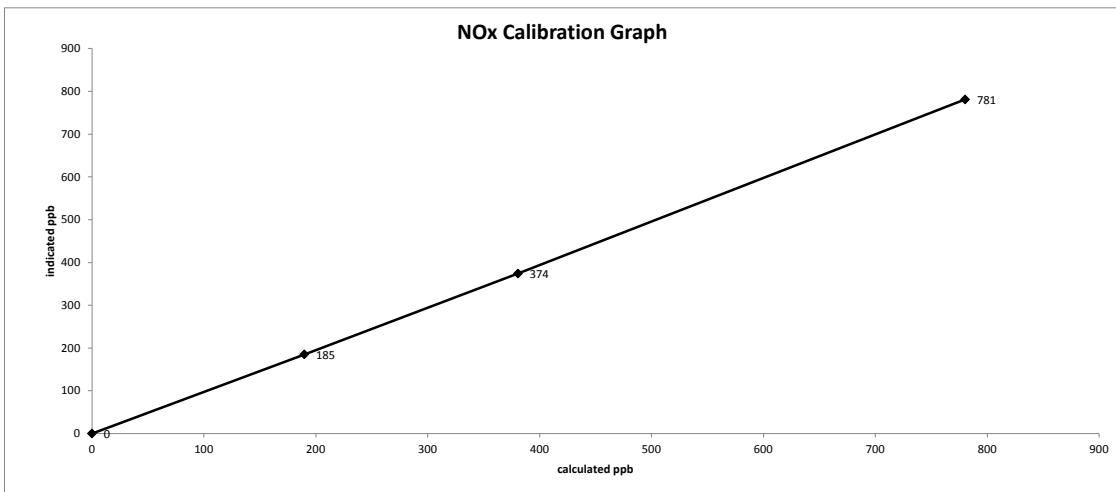
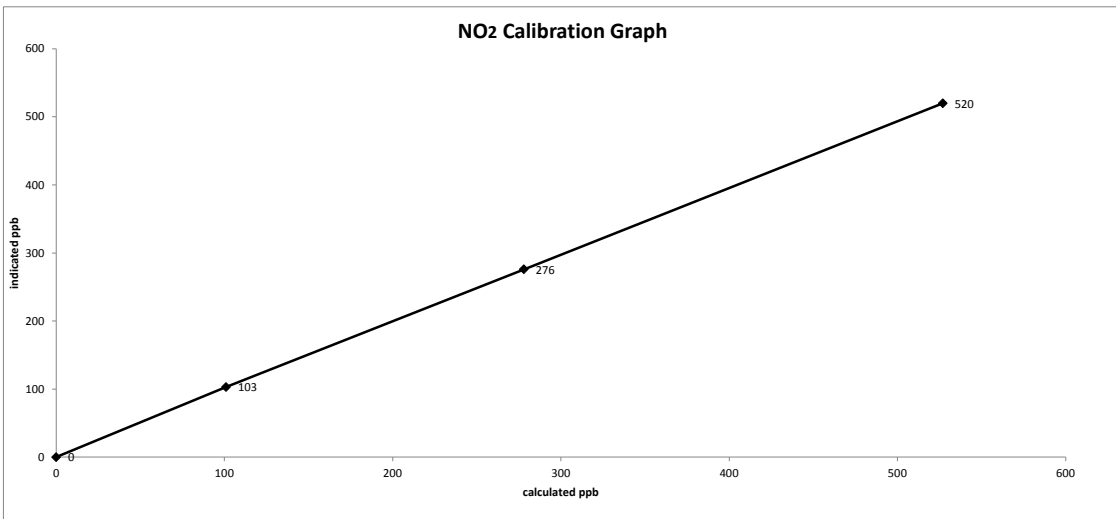
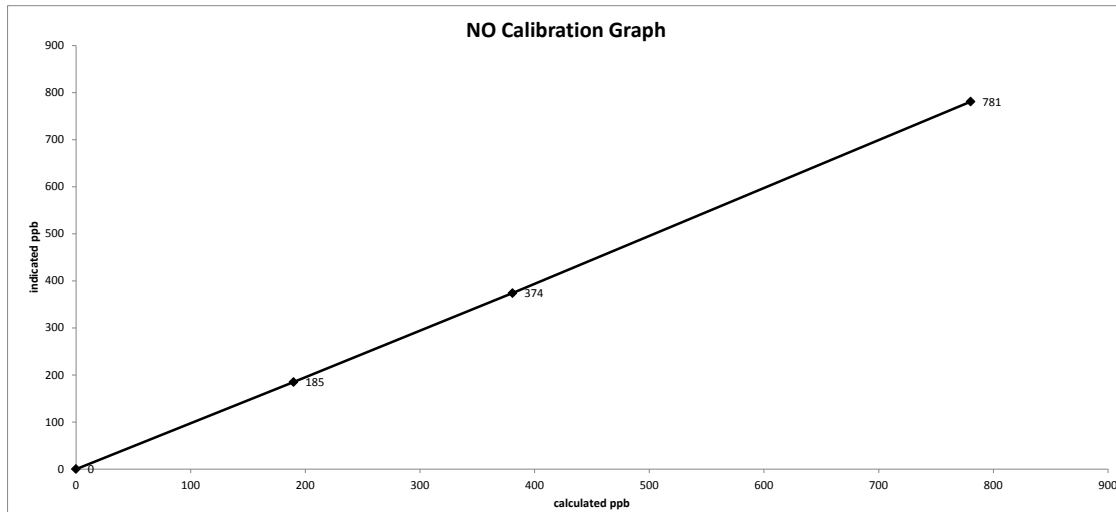
No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

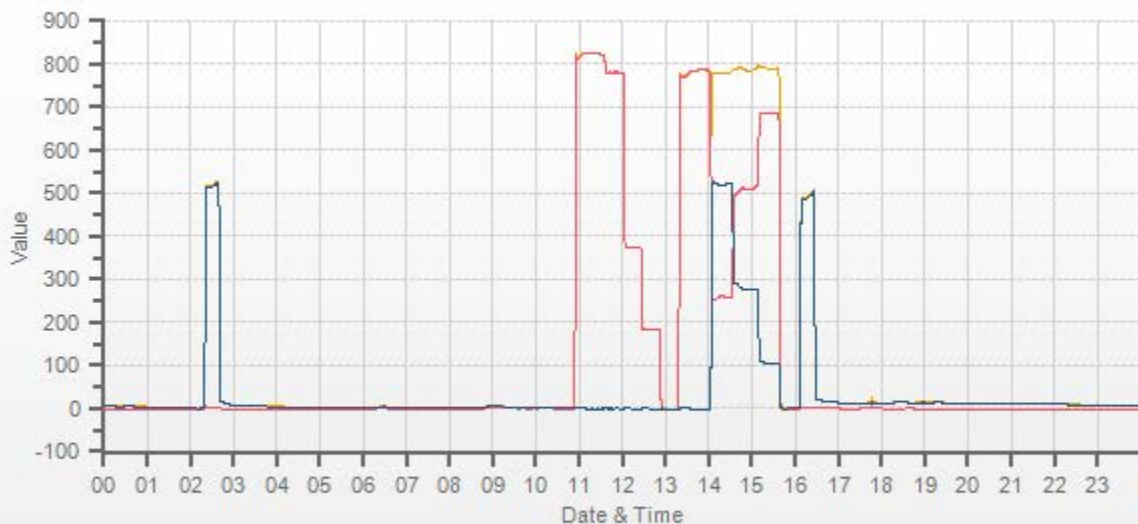
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

Repeat calibration required to correct the EV after the PMT temperature had been increased on January 12, 2017.

Date: January 18, 2017
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:15 / 16:31
Calibration Purpose: repeat
Calibration Method: Gas Dilution & Gas Phase Titration





— NOX[ppb] — NO[ppb] — NO2[ppb]

WIND SYSTEM

CALIBRATORS

Company Maxxam Operator: Christopher Wesson

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>N/A</u>
Serial Number	<u>17200415</u>	Serial Number	<u>N/A</u>
Last Verification Date	<u>May 2015</u>	Temperature (°C)	<u>N/A</u>
NO Cylinder S/N	<u>LL42475</u>	Barometric Pressure	<u>N/A</u>
NO/NOx Concentration	<u>48.5/48.5</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5029	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
5030	80.6	0.777	0.777	0.805	-0.005	0.800	4%	3%
5025	39.4	0.380	0.380	0.394	-0.002	0.392	4%	3%
5028	19.8	0.191	0.191	0.198	-0.001	0.197	4%	3%
Absolute Average Percent Difference							3.65%	3.09%

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)=	1.0360	0.90-1.10		m (Slope)=	1.0295		
b (Intercept % of FS)=	0.0110	± 3% F.S.		b (Intercept % of FS)=	0.0293		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5030	Lamp C.	0.000	0.804	-0.004	0.800	NO ₂	% Diff. Limit
5030	1.388	0.495	0.309	0.491	0.800	0%	± 10%
5030	0.745	0.241	0.563	0.239	0.802	1%	± 10%
5030	0.367	0.091	0.713	0.089	0.801	2%	± 10%
Absolute Average Percent Difference						1%	± 10%

LINEAR REGRESSION ANALYSIS				$y=mx+b$ (where x=calculated concentration, y=indicated concentration)			
NO ₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9988	0.90-1.10					
b (Intercept % of FS)=	-0.2760	± 3% F.S.					

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
		Last Calibration Date	<u>May 18, 2016</u>
		Full Scale (ppm)	<u>1.0</u>

COMMENTS: Contains 50.3 ppm SO₂. Flows not measured as per Chapter 7, Section 5 of AMD.

Auditor: AI Clark
Operator Signature: *AI Clark*

Date: May 18, 2016
Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-164

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>690</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 2, 2015</u>	Temperature (°C)	<u>24</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>700 mmHg</u>
NO/NOX Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4998</u>	Pt. #2 <u>4994</u>	Pt. #3 <u>4996</u>
Gas Flow (sccm)		
Pt. #1 <u>77.5</u>	Pt. #2 <u>37.7</u>	Pt. #3 <u>18.8</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4998	0.0	0.000	0.000	0.001	0.001	0.001	Limit ± 10%	
4998	77.5	0.780	0.780	0.785	-0.002	0.783	1%	0%
4994	37.7	0.380	0.380	0.381	-0.001	0.380	0%	0%
4996	18.8	0.189	0.189	0.189	0.000	0.190	0%	0%
Absolute Average Percent Difference							0%	0%

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NOx			
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000		
m (Slope)=	1.0063	0.90-1.10		m (Slope)=	1.0024		
b (Intercept % of FS)=	-0.0486	± 3% F.S.		b (Intercept % of FS)=	0.0457		

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4998	0	0.000	0.782	0.000	0.782	NO ₂	% Diff. Limit
4998	0.48	0.512	0.270	0.510	0.779	0%	± 10%
4998	0.24	0.269	0.513	0.269	0.782	0%	± 10%
4998	0.95	0.109	0.673	0.110	0.783	1%	± 10%
Absolute Average Percent Difference						0%	± 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)=	0.9953	0.90-1.10					
b (Intercept % of FS)=	0.0789	± 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 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

COMMENTS: NO O₂ has 49.9ppb SO₂ - Flows not manually measured

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 30, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

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

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

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

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
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		NO _x Analyzer	
Audit Calibrator			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
		Last Calibration Date	<u>March 28, 2016</u>
		Full Scale (ppm)	<u>1</u>

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

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 31, 2016
 Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-342CGA

Company: Maxxam Operator's Name: Limin Li
 Cylinder #: BLM002756T Concentration PPM: 49.9 Tolerance(%) 2 Certified By: Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU 1690
 Last Verification Date: March 31, 2015
 Gas Type: SO2 Conc. 98.57
 Cylinder Number: CAL016720

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 22.5 C
 B.P. 690 mmhg

Reference Analyzer:

Make/Model: Teco 43C Serial/AMU Number: 1623
 Instrument Settings: Zero: 7.9 Span: 1.028 Range: 1.0
 Last Calibration: Date: Mar 31/15 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	0.000	0.000
4976	82.6	0.821	0.01660	60.242	49.5
4993	41.0	0.410	0.00821	121.780	49.9
4977	20.2	0.202	0.00406	246.386	49.8
Average Cylinder Concentration:					49.7

Previous Stated Concentration PPM: 49.9

Percent variance from Stated: 0.4

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: March 31, 2015
 Location: McIntyre Center Edmonton



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2015-338CGA

Company: Maxxam **Operator's Name:** Limin Li
Cylinder #: BLM002508 **Concentration PPM:** 10.2 **Tolerance(%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model: R&R MFC 201
 Serial Number: AMU1690
 Last Verification Date: March 31, 2015
 Gas Type: H2S Conc. 20.43
 Cylinder Number: CAL015106

Flow Measurement Device:

Make/Model: Bios DC2
 Serial Number: AMU 1659
 Temp. °C: 23.0 C
 B.P. 689 mmhg

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980
 Instrument Settings: Zero: 14.5 Span: 1.035 Range: 0.1
 Last Calibration: Date: Mar 31/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0000
5080	38.2	0.0725	0.00752	132.984	9.6
5078	17.9	0.0340	0.00353	283.687	9.6
5066	9.1	0.0170	0.00180	556.703	9.5
Average Cylinder Concentration:					9.6

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 6.0

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: March 31, 2015
 Location: McIntyre Center Edmonton



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Tel: (323) 585-2154 Fax: (714) 542-6689
 PGVPID: F22014

DocNumber: 000068924

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

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

Praxair Order Number: 21137117
 Customer P. O. Number: 35-55963
 Customer Reference Number:

Fill Date: 7/1/2014
 Part Number: NI ME600P2E-AQ
 Lot Number: 109418203
 Cylinder Style & Outlet: AQ CGA 350
 Cylinder Pressure & Volume: 2200 psig 78 cu. ft.

Certified Concentration:

Expiration Date:	7/7/2022	NIST Traceable
Cylinder Number:	LL83638	Analytical Uncertainty:
582 ppm	METHANE	± 1.5 %
203 ppm	PROPANE	± 0.9 %
Balance	NITROGEN	

Certification Information: Certification Date: 7/7/2014 Term: 96 Months Expiration Date: 7/7/2022

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: METHANE

Requested Concentration: 600 ppm
 Certified Concentration: 582 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC139480
 Ref. Std. Conc: 246 ppm
 Ref. Std. Traceable to SRM #: 2751
 SRM Sample #: 212-09-AL
 SRM Cylinder #: SX-20000

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 249.5	C: 589.4	Conc: 581.21
R: 249.5	Z: 0	C: 589	Conc: 580.82
Z: 0	C: 592	R: 249.4	Conc: 583.77
UOM: ppm	Mean Test Assay:		581.93 ppm

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay:		0 ppm

2. Component: PROPANE

Requested Concentration: 200 ppm
 Certified Concentration: 203 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC 163442
 Ref. Std. Conc: 265.8 ppm
 Ref. Std. Traceable to SRM #: vs 2644a
 SRM Sample #: 101-C-45
 SRM Cylinder #: XF003829B

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 273.6	C: 208.4	Conc: 202.43
R: 273.7	Z: 0	C: 208.6	Conc: 202.63
Z: 0	C: 208.5	R: 273.6	Conc: 202.53
UOM: ppm	Mean Test Assay:		202.53 ppm

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay:		0 ppm

Analyzed by:

Jack Fu

Certified by:

Ying Yu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.



Calibration Gas Audit

NO Cylinder Gas

File No. 2015-343CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: BLM002756T **Conc (PPM)** 50.7/50.7 **Tolerance (%)** 2 **Certified By:** Air Liquide

Reference Calibrator and Gas:

Make/Model Teco 146i
Serial Number AMU 1809
Last Verification Date March 31, 2015
Gas Type NO **Conc.** 48.79
Cylinder Number CAL018024

Flow Measurement Device:

Make/Model Bios DC2
Serial Number AMU 1659
Temp. °C 22.5 C
B.P. 690 mmhg

Reference Analyzer:

Make/Model Teco 42i **Serial/AMU Number:** 1868
Instrument Settings **Zero:** 4.2 **Span:** 1.008 **Range:** 1.0
Last Calibration: **Date:** Mar 31/15 **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	0.01660	60.242	50.7	49.5
4976	82.6	0.842	0.822	0.01660	60.242	50.7	49.5
4993	41.0	0.420	0.410	0.00821	121.780	51.1	49.9
4977	20.2	0.208	0.205	0.00406	246.386	51.2	50.5
Average Cylinder Concentration:						51.0	50.0

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.7</u>	<u>50.7</u>
Percent variance from Stated: <u>0.7</u>	<u>1.4</u>

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration Contains 49.9 ppm SO2 in cylinder
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark **Date:** March 31, 2015
Operator Signature: *Al Clark* **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 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

02-03-2017




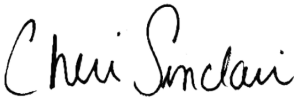
Report Issued Date (dd-mm-yyyy)

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



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-01-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u></u>	Date <u>10-Feb-17</u>
Level 1 Primary Validation	<u></u>	Date <u>24-Feb-17</u>
Level 2 Final Validation	<u></u>	Date <u>02-Mar-17</u>
Level 3 Independent Data Review	<u></u>	Date <u>02-Mar-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 January 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 January 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



MAXXAM ANALYTICS
#1 2080 39 Ave. NE, Calgary, AB
T2E 6P7

maxxam.ca
Toll Free 800-386-7247
Fax 403-219-3673

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

JOB #: 2833-2017-01-31-C

January 2017

Prepared for:

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

Attention: MIKE BISAGA

DATE: **March 3, 2017**

Prepared by: *Kim Wilson*

Kim Wilson, Env. Tech
Project Manager, Customer Service - Air Services

Reviewed by:

Wunmi Adekanmbi

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

SUMMARY

In January 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.

All Parameters: Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.

SO₂: A voltage output calibration was conducted during the routine visit on January 25, two hours of downtime were incurred.

NO₂: The analyzer spanned below the lower acceptance limit, an additional zero/span check was performed on January 30 to assess analyzer performance; and one hour of downtime was incurred.

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.

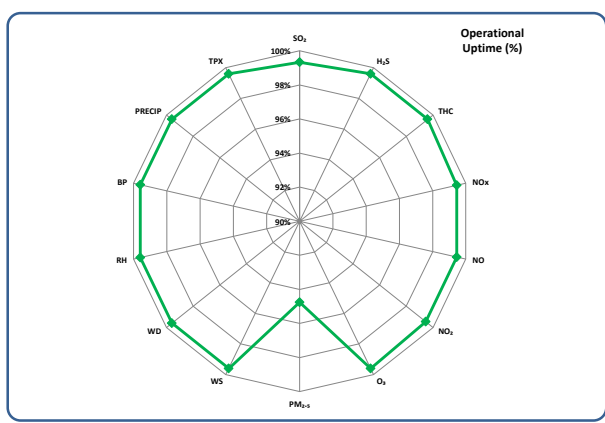
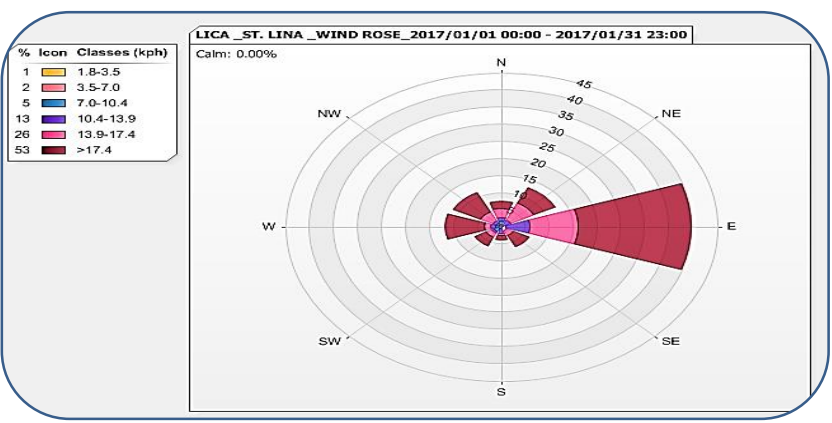
The summary of results is presented on the following pages.

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, 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 403-219-3689 or toll-free at 1-800-386-7247.

January 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	99.3%	4.5	January 13, 24	20, 22	172	0	2.3	January 14	48	0
H ₂ S	ppb	0.0	99.6%	0.1	VAR	VAR	10	0	0.0	ALL	3	0
THC	ppm	2.14	99.6%	3.19	January 19	21	-	-	2.46	January 19	-	-
NO _x	ppb	3.6	99.5%	18.0	January 19	15	-	-	11.4	January 25	-	-
NO	ppb	0.3	99.5%	6.2	January 19	14	-	-	1.0	January 19	-	-
NO ₂	ppb	3.4	99.5%	17.1	January 24	21	159	0	11.1	January 25	-	-
O ₃	ppb	27.9	99.6%	40.4	January 11	14	82	0	36.4	January 15	-	-
PM _{2.5}	µg/m ³	6.3	94.8%	40.5	January 24	20	80	0	17.0	January 25	30	0
WS	kph	5.5	99.6%	32.6	January 11	14	-	-	21.9	January 13	-	-
WD	degree	71 (ENE)	99.6%	-	-	-	-	-	-	-	-	-
RH	%	70	99.6%	89	January 21, 21	0, 4	-	-	82	January 21	-	-
BP	mbar	924	99.6%	939	VAR	VAR	-	-	937	January 2, 3	-	-
PRECIP	mm	0.0	99.6%	0.6	January 10	11	-	-	0.1	January 30	-	-
AmbTPX	°C	-9.8	99.6%	7.7	January 18	14	-	-	3.3	January 29	-	-



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

All Parameters: Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.
SO₂: A voltage output calibration was conducted during the routine visit on January 25, two hours of downtime were incurred.
NO₂: The analyzer spanned below the lower acceptance limit, an additional zero/span check was performed on January 30 to assess analyzer performance; and one hour of downtime was incurred.

Monthly Continuous Data Summary

Lakeland Industry & Community Association St. Lina Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	1-HOUR			24-HOUR		
	1-hr	24-hr	1-hr	24-hr				HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	0.6	4.5	13, 24	20, 22	22.1 18.9	NW E	2.3	14	99.3
H ₂ S (ppb)	10	3	0	0	0.0	0.1	VAR	VAR	VAR	VAR	0.0	ALL	99.6
THC (ppm)	-	-	-	-	2.14	3.19	19	21	18.0	ESE	2.46	19	99.6
NO ₂ (ppb)	159	-	0	-	3.4	17.1	24	21	17.8	E	11.1	25	99.5
NO (ppb)	-	-	-	-	0.3	6.2	19	14	19	WSW	1.0	19	99.5
NO _x (ppb)	-	-	-	-	3.6	18.0	19	15	18.3	WSW	11.4	25	99.5
O ₃ (ppb)	82	-	0	-	27.9	40.4	11	14	32.6	NNW	36.4	15	99.6
PM _{2.5} (µg/m ³)	80	30	0	0	6.3	40.5	24	20	19.4	E	17.0	25	94.8
RELATIVE HUMIDITY (%)	-	-	-	-	70	89	21, 21	0, 4	16.5 21.6	N W	82	21	99.6
BAROMETRIC PRESSURE (millibar)	-	-	-	-	924	939	2, 3	VAR, VAR	VAR VAR	VAR VAR	937	2, 3	99.6
AMBIENT TEMPERATURE (°C)	-	-	-	-	-9.8	7.7	18	14	19.2	ESE	3.3	29	99.6
PRECIPITATION (mm)	-	-	-	-	0.0	0.6	10	11	16.9	S	0.1	30	99.6
VECTOR WS (kph)	-	-	-	-	5.5	32.6	11	14	-	NNW	21.9	13	99.6
VECTOR WD (sec)	-	-	-	-	71 (ENE)	-	-	-	-	-	-	-	99.6

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 January 24. No issues were identified.

SULPHUR DIOXIDE (SO₂)

- A voltage output calibration was performed on January 25, following a successful shut-down calibration, as it was observed that the analyzer output had drifted over time. A successful post-repair calibration was subsequently completed. Two hours of downtime were recorded during this event.
- The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the SO₂ channel, on January 24, during the monthly calibration of the Ozone analyzer.
- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.

HYDROGEN SULPHIDE (H₂S)

- The routine monthly calibration was performed on January 25.
- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.

TOTAL HYDROCARBONS (THC)

- The routine monthly calibration was performed on January 24.
- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.

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

- The routine monthly calibration was performed on January 24.
- The analyzer spanned below the lower acceptance limit on January 28. An additional zero/span check triggered on January 30 suggested that the permeation tube was depleting. This prompted an immediate site visit on January 30, where the permeation tube was replaced. The new permeation tube was allowed time to stabilize and the expected span value was updated on February 6. No data was discarded as analyzer performance was not impacted. One hour of downtime was, however, recorded due to the additional zero/span check.
- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.
- 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)

- The routine monthly calibration was performed on January 24.
- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Two routine audits were performed this month: one was completed on January 13 and the other audit was performed on January 24. Both the FDMS and sample filters were replaced on January 24.
- The TEOM unit malfunctioned after the audit on January 13, normal operations were restored after some hours. Eleven hours of downtime were recorded from January 13 at hour 12:00 to hour 22:00 as a result of this event.
- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.
- 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. Twenty-five 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)

- 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.
- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.
- Fourteen instances of maximum instantaneous data were discarded as the data were considered anomalous spikes.

RELATIVE HUMIDITY (RH)

- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.

BAROMETRIC PRESSURE (BP)

- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.

PRECIPITATION (PRECIP)

- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.

AMBIENT TEMPERATURE (AmbTPX)

- Three hours of downtime were recorded from January 14 at hour 22:00 to January 15 at hour 00:00, due to a power failure.

2.0 Project Personnel

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

3.0 Plant Monthly Required AMD Summary

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

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

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F TEOM Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

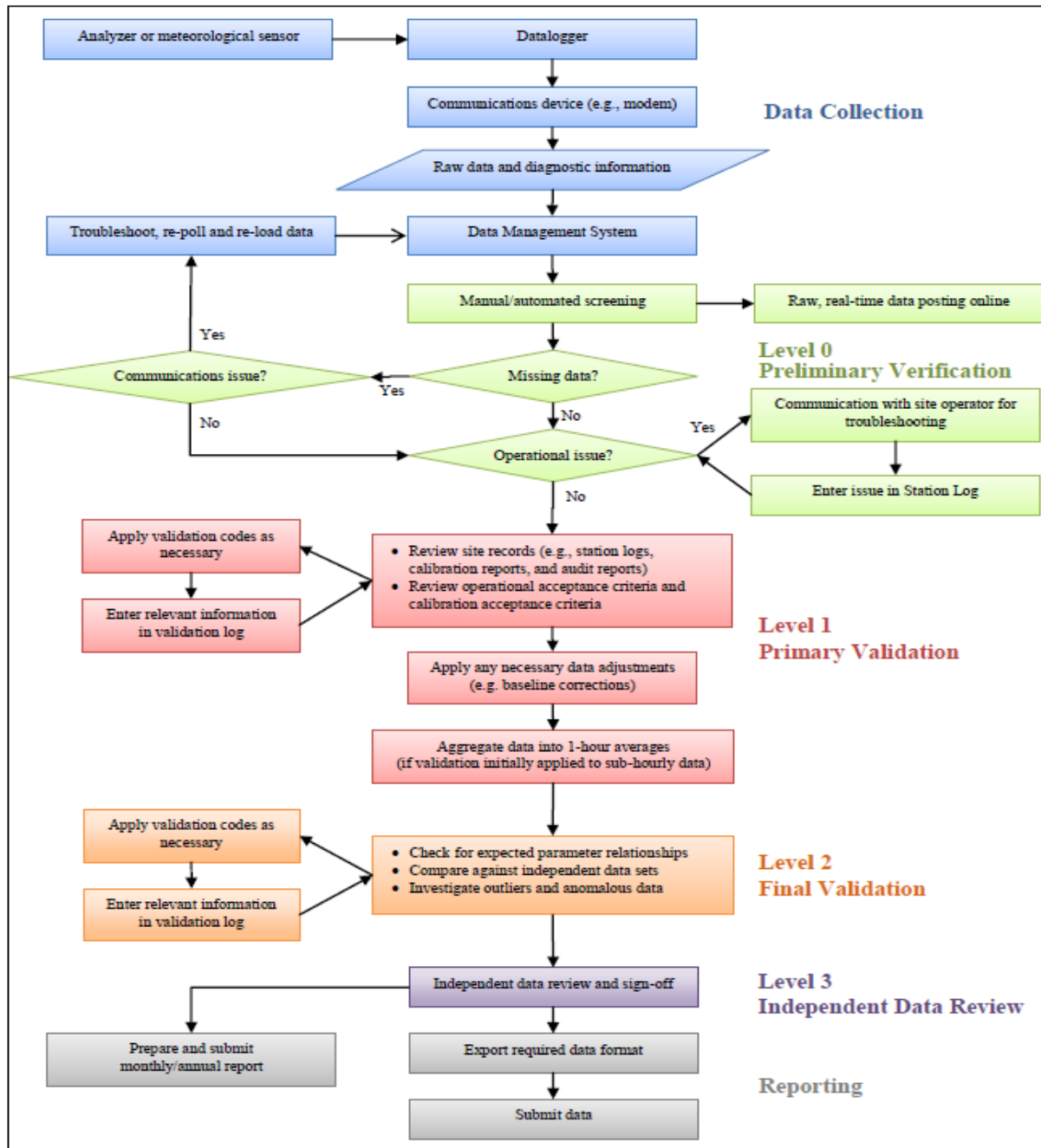
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.0	0.1	0.1	0.1	0.2	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	S	0.0	0.2	0.1	0.1	0.0	0.2	0.1	24	
2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.1	1.0	0.9	0.6	0.6	0.7	0.6	S	1.1	1.2	1.3	1.1	1.2	0.0	1.3	0.5	24
3	1.0	0.9	0.9	0.8	0.8	0.8	0.6	0.3	0.1	0.0	0.2	0.8	1.0	0.6	0.4	0.4	0.3	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.4	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.0	0.1	0.5	0.0	0.5	0.0	24	
5	0.4	0.3	0.2	0.3	0.4	0.4	0.2	0.2	0.1	0.2	0.5	0.6	0.7	0.6	0.5	S	0.4	0.5	0.5	0.4	0.5	0.6	0.6	0.4	0.1	0.7	0.4	24	
6	0.3	0.2	0.2	0.2	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	0.1	0.1	0.1	0.0	0.0	0.3	0.1	24	
7	0.2	0.3	0.3	0.4	0.3	0.2	0.1	0.2	0.3	0.2	0.2	0.3	0.7	S	0.3	0.3	0.1	0.6	0.8	1.1	0.7	0.3	0.2	0.2	0.1	1.1	0.4	24	
8	0.2	0.3	0.3	0.3	0.3	0.1	0.1	0.2	0.2	0.3	0.3	0.2	S	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24
9	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.3	S	0.4	0.7	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.0	0.7	0.3	24	
10	0.1	0.2	0.4	0.3	0.2	0.3	0.3	0.3	0.1	0.2	S	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	0.4	0.1	24	
11	0.0	0.7	0.6	0.9	0.7	1.3	2.1	0.6	0.3	S	0.3	0.6	0.7	0.7	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.5	24	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.3	0.6	0.5	0.5	0.9	1.9	1.3	1.5	1.4	1.5	1.2	0.0	1.9	0.5	24	
13	1.0	0.9	0.9	0.7	0.8	0.6	0.4	S	0.9	0.8	0.6	0.6	0.8	0.7	0.7	0.8	0.7	0.6	1.7	2.9	4.5	3.8	3.5	2.1	0.4	4.5	1.3	24	
14	1.3	0.7	0.6	0.7	1.0	1.7	S	2.2	2.7	1.9	3.0	2.7	2.1	2.5	3.4	3.4	3.4	3.0	3.2	2.6	2.9	3.0	P	P	0.6	3.4	2.3	22	
15	P	2.5	2.1	1.4	0.8	S	0.2	0.3	0.2	0.3	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.8	0.0	2.5	0.5	23	
16	2.6	3.0	3.3	3.5	S	1.4	1.5	1.2	1.3	0.7	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.5	0.5	0.3	0.5	0.5	0.4	0.5	0.3	3.5	1.0	24	
17	0.5	0.4	0.4	S	0.2	0.7	2.2	1.6	1.0	0.6	0.6	0.7	1.0	1.5	1.8	2.1	2.5	1.8	1.0	0.6	0.8	0.4	0.4	0.4	0.2	2.5	1.0	24	
18	0.5	0.4	S	0.1	0.2	0.2	0.2	0.4	0.5	0.6	0.5	0.5	1.0	1.1	0.9	0.9	0.8	1.1	1.3	1.0	0.5	0.3	0.2	0.3	0.1	1.3	0.6	24	
19	0.4	S	0.0	0.0	0.0	0.0	0.0	1.0	0.4	0.0	0.6	0.7	1.0	1.1	0.8	0.7	0.5	0.4	0.4	0.3	0.4	0.3	0.5	0.5	0.0	1.1	0.4	24	
20	S	0.5	0.5	0.2	0.0	0.0	0.0	0.1	0.3	0.5	0.6	0.8	1.6	2.4	1.9	1.1	1.0	1.5	1.4	0.9	0.9	0.8	0.5	S	0.0	2.4	0.8	24	
21	0.4	3.0	3.9	1.5	1.6	2.0	2.8	2.1	0.7	0.8	0.8	1.1	0.4	0.4	0.4	0.3	0.1	0.0	0.2	0.4	0.6	0.5	S	0.1	0.0	3.9	1.0	24	
22	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.3	0.2	0.2	S	0.2	0.3	0.0	0.5	0.1	24	
23	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.1	S	0.1	0.2	0.1	0.1	0.3	0.2	24	
24	0.2	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.6	0.8	Q	Q	2.0	2.3	S	1.9	3.2	4.5	4.2	0.1	4.5	1.1	24	
25	3.8	3.2	3.1	3.4	3.4	3.3	3.0	2.9	2.6	2.8	C	C	C	C	Y	Y	C	C	C	C	0.5	0.6	0.5	0.4	0.4	0.4	3.8	2.3	22
26	0.4	0.4	0.5	0.6	0.7	0.9	1.0	0.9	0.7	0.6	0.5	0.4	0.5	0.4	0.3	0.3	0.3	S	0.2	0.3	0.4	0.4	0.3	0.4	0.2	1.0	0.5	24	
27	0.4	0.3	0.2	0.3	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	S	0.6	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.6	0.1	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	0.8	0.9	1.1	1.2	S	1.0	0.9	1.0	1.1	0.6	0.3	0.2	0.1	0.0	1.2	0.4	24	
29	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	1.4	1.2	0.9	S	0.8	1.1	1.3	1.6	1.9	1.6	1.1	0.7	0.5	0.0	1.9	0.7	24	
30	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.3	0.3	0.1	0.1	S	0.0	0.1	0.1	0.0	0.2	0.1	0.3	0.3	0.3	0.2	0.0	0.5	0.3	24
31	0.3	0.2	0.2	0.2	0.1	0.3	0.7	0.8	0.2	0.3	0.4	0.3	0.1	S	0.1	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.1	0.8	0.3	24	
HOURLY MAX	3.8	3.2	3.9	3.5	3.4	3.3	3.0	2.9	2.7	2.8	3.0	2.7	2.1	2.5	3.4	3.4	3.4	3.0	3.2	2.9	4.5	3.8	4.5	4.2					
HOURLY AVG	0.5	0.7	0.7	0.6	0.4	0.5	0.6	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.7	0.6	0.7	0.7	0.6	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

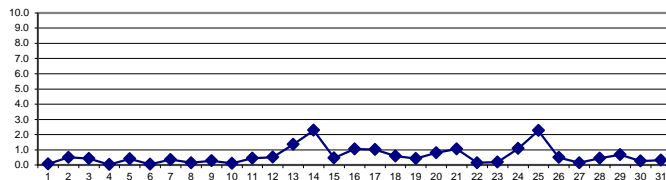
OBJECTIVE LIMIT:

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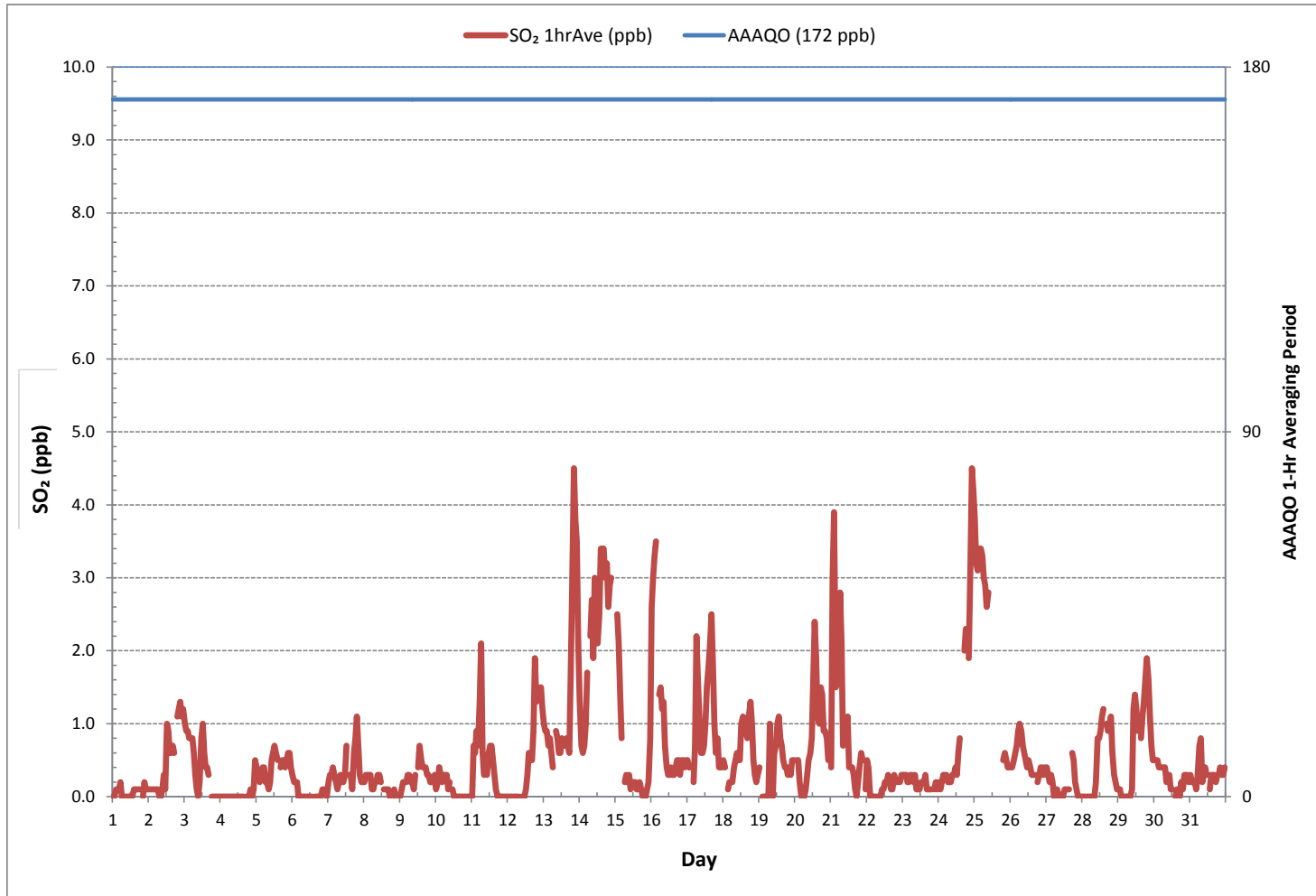
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	558				
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	4.5	ppb	@ HOUR(S)	20 , 22	ON DAY(S) 13 , 24
MAXIMUM 24-HR AVERAGE:	2.3	ppb			ON DAY(S) 14
					VAR-VARIOUS
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	739	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.3	%
STANDARD DEVIATION:	0.8		MONTHLY AVERAGE:	0.6	ppb

24 HR AVERAGES January 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - January 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	2.1	2.4	2.4	2.2	2.3	2.3	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.7	1.5	S	1.6	1.8	1.5	1.5	1.5	2.4	1.9	24
2	1.5	1.4	1.5	1.3	1.4	1.3	1.3	1.3	1.3	1.7	1.3	2.3	2.1	1.8	1.8	1.9	1.7	S	2.3	2.3	2.4	2.4	2.4	2.4	1.3	2.4	1.7	24
3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	1.7	1.4	1.4	1.7	2.3	2.4	1.9	1.9	1.7	1.7	S	1.3	1.5	1.6	1.4	1.5	1.4	1.3	2.4	1.8	24
4	1.5	1.2	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.5	1.6	1.6	1.7	S	1.7	1.7	1.8	1.8	1.7	1.8	2.1	1.2	2.1	1.6	24
5	2.2	2.0	2.0	2.0	2.3	2.2	2.2	2.1	2.1	2.1	2.4	2.4	2.5	2.5	2.4	S	2.4	2.4	2.4	2.3	2.5	2.5	2.4	2.1	2.0	2.5	2.3	24
6	2.1	2.0	2.1	2.1	1.9	1.7	1.8	1.7	1.8	1.8	1.7	1.7	1.9	1.6	S	1.7	1.6	1.4	1.7	1.8	1.9	1.6	1.6	1.8	1.4	2.1	1.8	24
7	1.7	1.9	1.7	1.9	1.6	1.6	1.5	1.6	1.7	1.5	1.7	1.8	2.3	S	1.7	1.7	1.4	2.1	2.1	2.6	2.5	1.7	1.6	1.7	1.4	2.6	1.8	24
8	1.6	1.7	1.9	1.7	1.8	1.7	1.7	1.7	1.8	2.0	1.9	1.8	S	1.9	1.8	1.9	1.9	1.9	1.9	2.1	2.2	2.1	2.1	2.2	1.6	2.2	1.9	24
9	2.3	2.5	2.6	2.5	2.6	2.8	2.9	2.9	2.9	2.7	3.5	S	3.3	3.3	3.3	3.3	3.2	3.0	3.1	3.1	2.9	3.0	3.1	3.2	2.3	3.5	3.0	24
10	3.1	3.1	3.2	3.0	3.2	3.1	3.1	3.1	3.0	3.1	S	2.9	3.0	2.9	2.9	2.8	2.9	3.0	3.0	2.7	2.7	3.1	3.0	3.2	2.7	3.2	3.0	24
11	3.5	4.3	4.2	4.6	4.4	5.4	5.7	4.9	4.1	S	4.1	4.1	4.1	4.1	3.9	3.7	3.5	3.5	3.0	3.0	2.7	2.5	2.5	2.3	2.3	5.7	3.8	24
12	2.3	2.3	2.2	2.1	2.1	2.2	2.0	2.2	S	2.2	2.2	2.2	2.2	2.7	3.0	2.8	2.9	3.3	4.3	3.7	3.8	3.8	3.8	3.7	2.0	4.3	2.8	24
13	3.4	3.1	3.1	2.9	3.2	3.0	2.6	S	3.5	3.0	2.8	2.9	3.0	3.0	3.1	3.0	3.1	3.0	4.6	6.0	7.1	6.0	6.2	4.8	2.6	7.1	3.8	24
14	3.9	3.1	2.9	3.0	3.5	4.3	S	4.7	5.8	4.7	5.5	5.4	4.8	5.6	6.1	6.2	6.3	6.3	6.5	5.6	5.9	6.1	P	P	2.9	6.5	5.1	22
15	P	6.5	5.4	5.2	4.6	S	3.5	3.6	3.5	3.6	3.5	3.4	3.5	3.5	3.3	3.1	3.4	3.3	3.1	3.1	3.2	3.0	3.6	4.0	3.0	6.5	3.8	23
16	6.1	6.1	6.5	7.5	S	4.4	4.6	4.2	4.5	4.2	3.7	3.7	3.8	4.0	4.0	4.2	4.2	4.4	4.3	4.3	4.5	4.7	4.5	4.8	3.7	7.5	4.7	24
17	4.8	4.7	4.8	S	4.7	6.3	6.8	6.6	5.7	5.2	5.3	5.3	5.9	6.7	6.6	7.5	7.4	6.9	5.9	5.3	5.6	5.2	5.0	5.0	4.7	7.5	5.8	24
18	5.2	5.1	S	4.9	5.0	5.0	5.2	5.3	5.3	5.6	5.5	5.5	6.0	6.1	5.7	6.0	5.9	6.1	6.4	6.0	5.5	5.4	5.3	5.3	4.9	6.4	5.5	24
19	5.5	S	5.1	5.1	5.1	5.1	5.1	6.5	6.5	5.1	5.7	5.7	5.9	6.5	6.1	5.9	5.6	5.5	5.4	5.3	5.5	5.5	5.5	5.5	5.1	6.5	5.6	24
20	S	5.4	5.5	5.3	5.2	5.0	4.9	4.9	5.2	5.7	5.5	5.7	7.1	7.3	6.9	6.1	5.8	6.3	6.3	5.8	5.8	5.6	5.4	S	4.9	7.3	5.8	24
21	5.8	8.7	9.5	6.1	6.0	6.5	7.6	6.7	5.2	5.2	5.1	5.4	4.9	4.5	4.4	4.2	4.1	3.8	4.1	4.2	4.3	4.3	S	3.9	3.8	9.5	5.4	24
22	4.1	4.4	3.6	3.5	3.5	3.5	3.4	3.4	3.2	3.4	3.4	3.5	3.5	3.4	3.5	3.4	3.5	3.2	3.4	3.4	3.4	S	3.5	3.5	3.2	4.4	3.5	24
23	3.4	3.5	3.6	3.3	3.4	3.4	3.5	3.5	3.5	3.3	3.4	3.4	3.5	3.3	3.4	3.3	3.2	3.3	3.4	S	3.4	3.4	3.4	3.5	3.2	3.6	3.4	24
24	3.4	3.4	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5	3.4	3.7	4.2	Q	Q	5.2	5.5	S	5.5	6.6	7.1	7.1	3.4	7.1	4.3	24
25	6.5	5.8	5.6	5.9	5.8	5.4	5.4	5.0	4.5	4.8	C	C	C	C	Y	Y	C	C	C	1.9	1.8	1.6	1.8	1.8	1.6	6.5	4.2	22
26	1.7	1.8	1.7	1.9	2.0	2.1	2.0	2.3	1.9	2.0	1.7	1.7	1.7	1.8	1.5	1.5	1.5	S	1.4	1.5	1.6	1.5	1.5	1.7	1.4	2.3	1.7	24
27	1.7	1.5	1.5	1.8	1.5	1.4	1.5	1.4	1.5	1.3	1.4	1.4	1.4	1.5	1.5	1.5	S	2.0	1.9	2.0	1.7	1.7	1.5	1.4	1.3	2.0	1.6	24
28	1.7	1.6	1.8	1.5	1.5	1.6	1.5	1.9	1.8	2.3	2.6	2.4	2.7	2.9	3.1	S	2.9	2.9	3.1	3.0	2.5	2.5	2.3	2.2	1.5	3.1	2.3	24
29	2.1	2.3	1.9	1.9	1.8	2.0	2.0	2.1	2.2	2.2	4.0	3.7	3.5	3.2	S	3.1	3.3	3.7	4.0	4.0	3.9	3.9	2.9	2.8	1.8	4.0	2.9	24
30	2.7	2.7	2.6	2.5	2.5	2.7	2.5	2.5	2.3	2.4	2.4	2.3	2.3	S	2.2	2.1	2.1	2.2	2.1	2.0	2.1	2.2	2.1	2.1	2.0	2.7	2.3	24
31	1.9	1.7	1.6	1.6	1.5	1.6	2.4	2.1	1.4	1.3	1.5	1.4	S	1.2	1.4	1.4	1.1	1.2	1.3	1.2	1.2	1.1	1.1	1.2	1.1	2.4	1.5	24
HOURLY MAX	6.5	8.7	9.5	7.5	6.0	6.5	7.6	6.7	6.5	5.7	5.7	5.7	7.1	7.3	6.9	7.5	7.4	6.9	6.5	6.0	7.1	6.6	7.1	7.1				
HOURLY AVG	3.1	3.3	3.3	3.1	3.1	3.2	3.2	3.2	3.2	3.0	3.1	3.1	3.4	3.4	3.3	3.2	3.3	3.4	3.4	3.3	3.3	3.3	3.1	3.0				

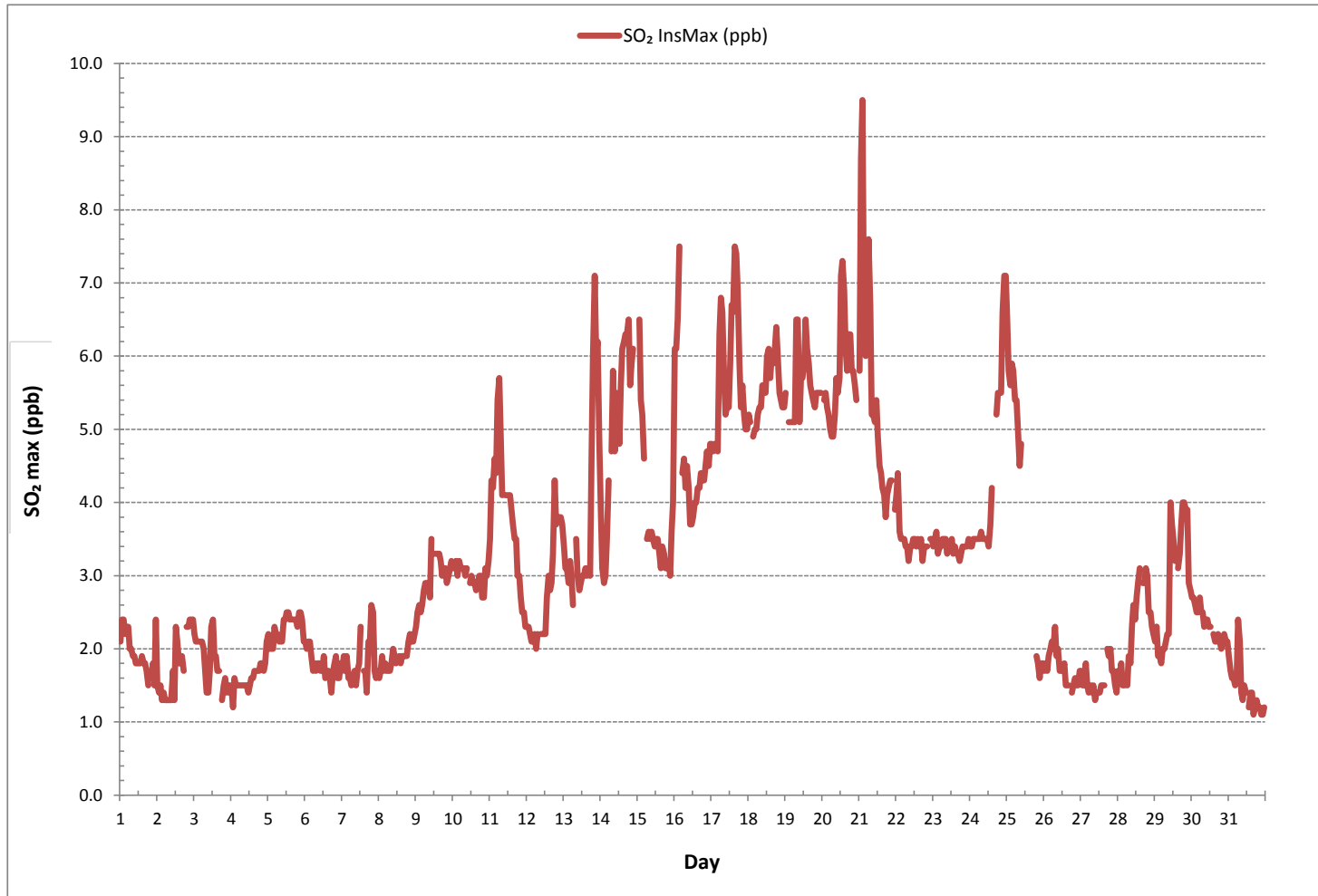
STATUS FLAG CODES

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:	699
MAXIMUM INSTANTANEOUS VALUE:	9.5 ppb @ HOUR(S) 2 ON DAY(S) 21
VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	739 hrs
STANDARD DEVIATION:	1.6

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

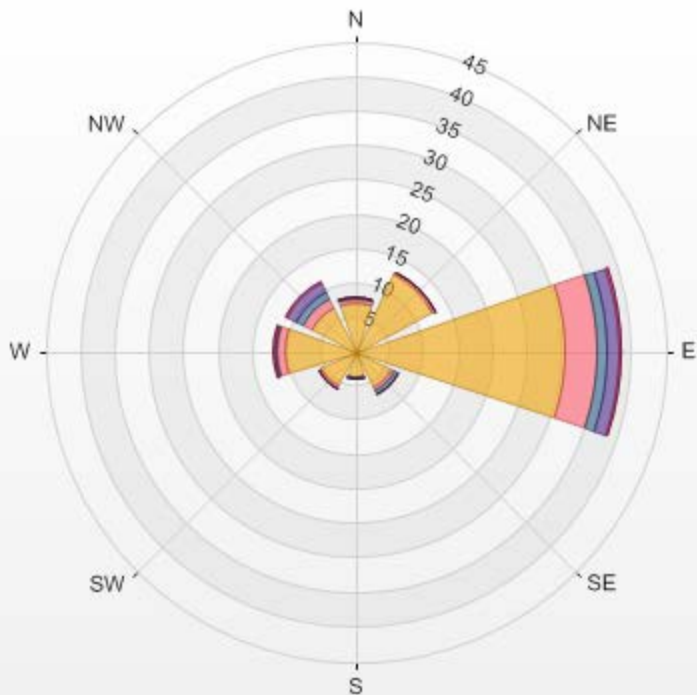


Wind: LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 93.95% Calm Avg: 0.00 [ppb]

Direction	0.0-0.9	0.9-1.8	1.8-2.8	2.8-3.7	3.7-4.6	>4.6	Total
N	7.15	0.57	0.14	0	0	0	7.86
NE	12.59	0.43	0	0	0	0	13.02
E	30.62	4.58	1.29	1.72	0.43	0	38.64
SE	5.72	0.72	0.43	0	0	0	6.87
S	3.72	0.14	0.14	0	0	0	4
SW	5.58	0.43	0	0	0	0	6.01
W	10.3	1.14	0.29	0.14	0.14	0	12.01
NW	7.01	1.43	1.29	1.57	0.29	0	11.59
Summary	82.69	9.44	3.58	3.43	0.86	0	100

% Icon Classes (ppb) 83 0.0-0.9 9 0.9-1.8 4 1.8-2.8 3 2.8-3.7 1 3.7-4.6 0 >4.6

LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 0.00%



SO2[ppb] Calibration: LICA ST. LINA Monthly: 2017/01 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	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22
15	P	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	23
16	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	C	C	C	C	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
26	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	S	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	S	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	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	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	

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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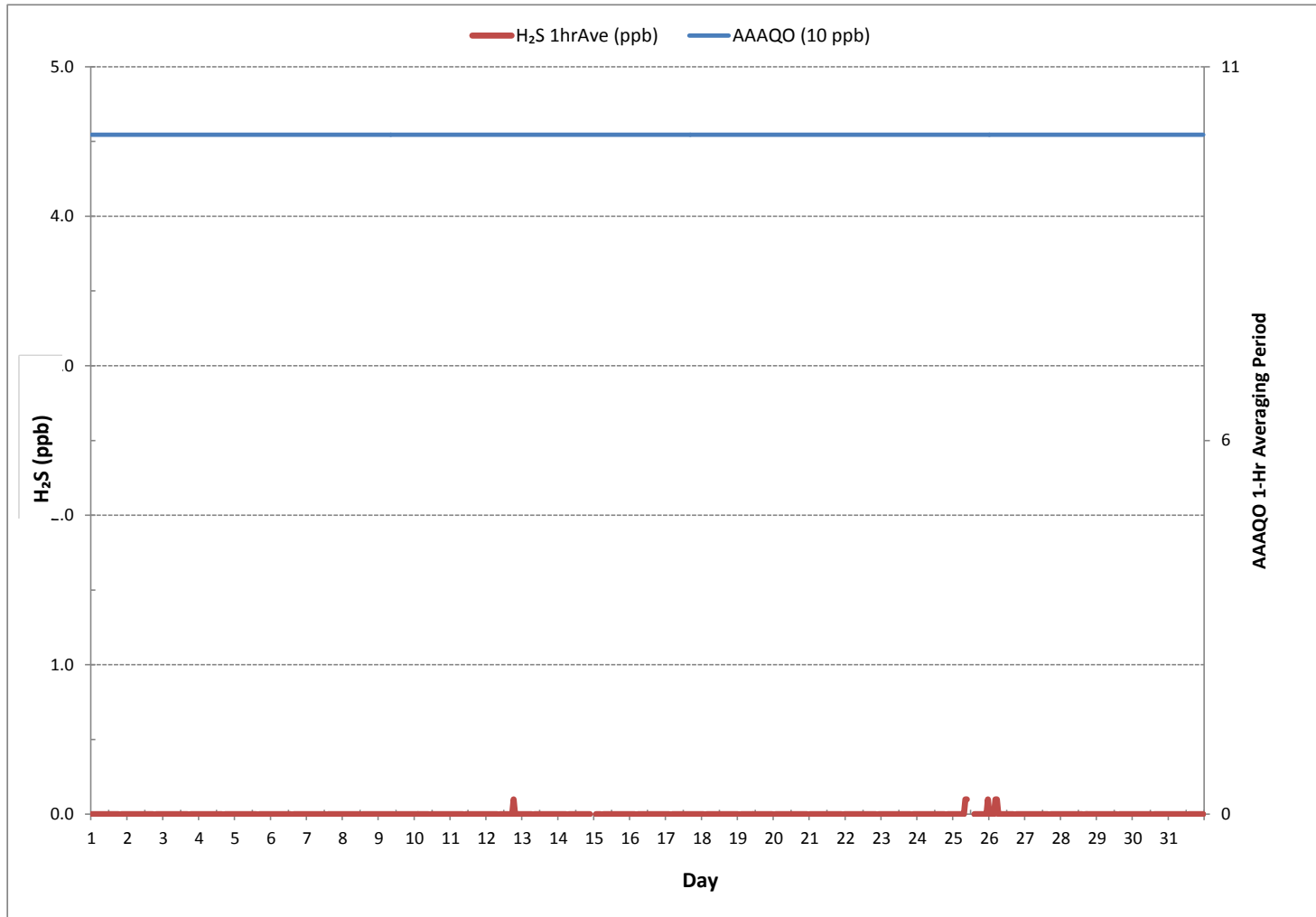
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	6					
MINIMUM 1-HR AVERAGE:	0.0	ppb	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	0.1	ppb	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 24-HR AVERAGE:	0.0	ppb			ON DAY(S)	ALL
					VAR-VARIOUS	
IZS CALIBRATION TIME:	31	hrs		OPERATIONAL TIME:	741	hrs
MONTHLY CALIBRATION TIME:	4	hrs		AMD OPERATION UPTIME:	99.6	%
STANDARD DEVIATION:	0.0			MONTHLY AVERAGE:	0.0	ppb

24 HR AVERAGES January 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - January 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	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	S	0.2	0.2	0.1	0.2	0.1	0.5	0.3	24		
2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	24		
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	S	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.0	0.3	0.1	24
4	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	S	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.3	0.1	0.3	0.1	24
5	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.6	0.4	0.4	S	0.3	0.3	0.4	0.3	0.5	0.4	0.3	0.3	0.3	0.3	0.6	0.4	24	
6	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.3	0.2	0.1	S	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.2	24	
7	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.3	S	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.2	24	
8	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	S	0.2	0.2	0.1	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.0	0.4	0.1	24		
9	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.8	S	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.4	0.8	0.6	24	
10	0.7	0.6	0.8	1.1	1.1	0.6	0.7	0.6	0.7	0.9	S	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.8	0.6	1.1	0.7	24	
11	0.7	0.9	0.9	1.1	1.1	1.2	1.3	1.1	1.1	S	1.1	1.2	1.2	1.2	1.0	1.0	0.7	0.8	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	1.3	0.9	24	
12	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	S	0.3	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.3	0.6	0.4	24	
13	0.6	0.5	0.5	0.5	0.6	0.5	0.5	S	0.5	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.6	0.4	24	
14	0.4	0.4	0.4	0.4	0.5	0.4	S	0.5	0.5	0.6	0.5	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.7	P	P	0.4	0.7	0.6	22		
15	P	0.8	0.5	0.5	0.5	S	0.5	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.8	0.6	23		
16	0.6	0.6	0.6	0.6	S	0.7	0.6	0.8	0.7	0.9	0.8	0.7	0.8	0.9	1.9	1.1	1.0	1.1	1.0	1.0	1.1	1.1	1.2	1.3	0.6	1.9	0.9	24		
17	1.4	1.2	1.2	S	1.3	1.3	1.5	1.4	1.3	1.2	1.3	1.3	1.3	1.4	1.5	1.4	1.4	1.6	1.4	1.4	1.4	1.3	1.3	1.4	1.2	1.6	1.4	24		
18	1.4	1.5	S	1.4	1.5	1.6	1.5	1.6	1.5	1.6	1.6	1.5	1.6	1.5	1.5	1.7	1.6	1.5	1.6	1.6	1.5	1.5	1.5	1.5	1.4	1.7	1.5	24		
19	1.5	S	1.4	1.4	1.4	1.5	1.4	1.4	1.5	1.5	1.5	2.1	1.6	1.5	2.6	2.5	1.7	1.6	1.6	1.7	1.6	1.5	1.9	1.5	1.4	2.6	1.6	24		
20	S	1.4	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.5	1.5	1.3	1.3	1.4	1.2	1.3	1.3	1.2	1.2	1.2	S	1.2	1.5	1.3	24		
21	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.9	1.0	0.9	0.8	0.9	0.8	S	0.7	0.7	1.2	1.0	24		
22	0.7	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.6	0.5	0.6	S	0.6	0.6	0.5	0.8	0.6	24
23	0.5	0.5	0.5	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.5	0.7	0.6	0.5	S	0.5	0.4	0.5	0.4	0.7	0.6	24		
24	0.6	0.5	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.0	0.9	S	0.9	0.9	0.7	0.8	0.5	1.0	0.7	24		
25	0.8	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.8	0.8	C	C	C	C	C	0.6	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.7	0.5	0.8	0.7	24		
26	0.5	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.2	0.1	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.7	0.4	24	
27	0.3	0.2	1.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	S	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	1.1	0.2	24	
28	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	S	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.4	0.1	0.5	0.3	24		
29	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.5	0.5	0.5	0.6	0.6	0.7	0.6	S	0.6	0.6	0.6	0.7	0.7	0.8	0.7	0.7	0.7	0.6	0.3	0.8	0.5	24	
30	0.6	1.5	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.4	S	0.5	0.6	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.3	0.3	1.5	0.6	24		
31	0.3	1.1	0.4	0.2	0.2	0.9	0.0	0.2	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.1	24	
HOURLY MAX	1.5	1.5	1.4	1.4	1.5	1.6	1.5	1.6	1.5	1.6	1.6	2.1	1.6	1.5	2.6	2.5	1.7	1.6	1.6	1.6	1.7	1.6	1.5	1.9	1.5					
HOURLY AVG	0.5	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	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5					

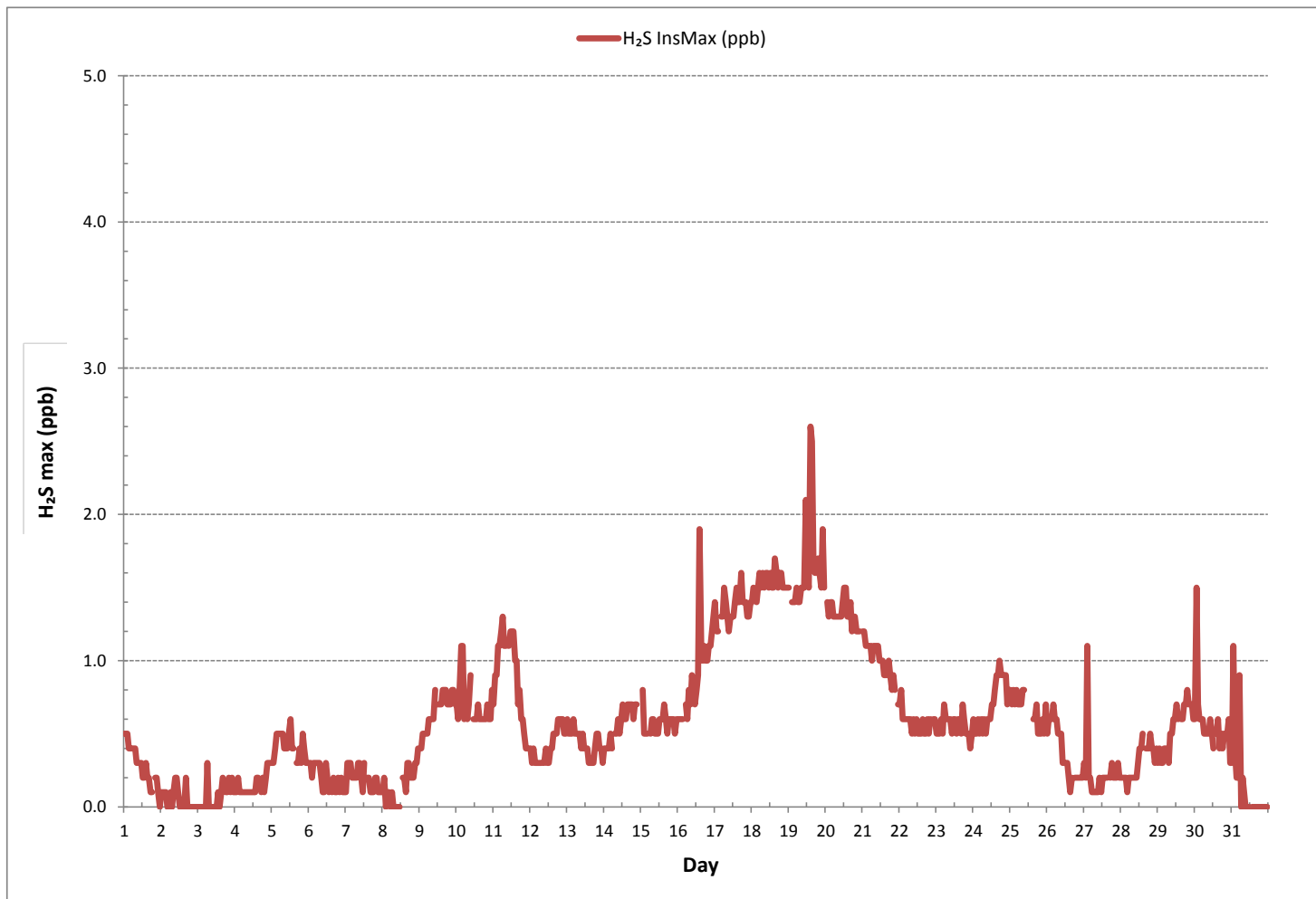
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	657
MAXIMUM INSTANTANEOUS VALUE:	2.6 ppb @ HOUR(S) 14 ON DAY(S) 19
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	741 hrs
STANDARD DEVIATION:	0.4

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

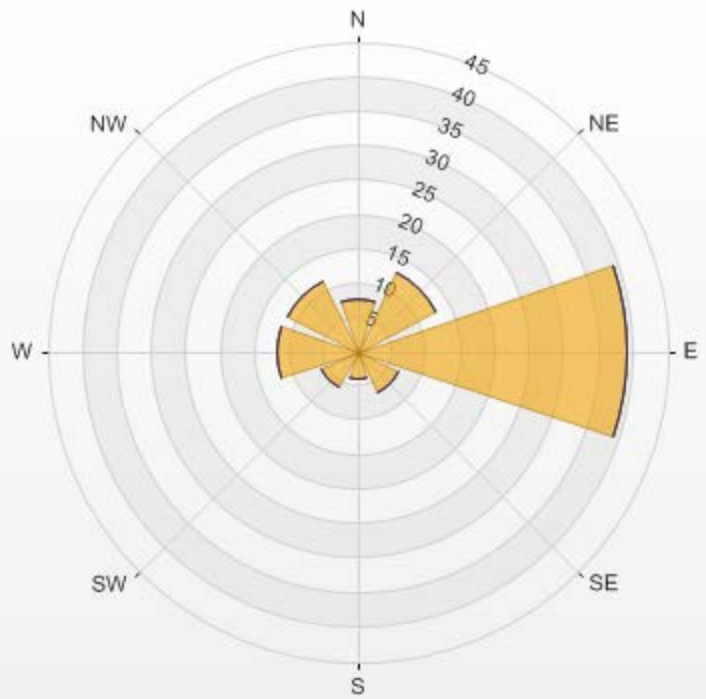


Wind: LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.89% Calm Avg: 0.00 [ppb]

Direction	0.0-0.6	0.6-1.3	1.3-1.9	>1.9	Total
N	7.79	0	0	0	7.79
NE	12.89	0	0	0	12.89
E	39.24	0	0	0	39.24
SE	6.8	0	0	0	6.8
S	3.97	0	0	0	3.97
SW	5.95	0	0	0	5.95
W	11.9	0	0	0	11.9
NW	11.47	0	0	0	11.47
Summary	100	0	0	0	100

% 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] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 0.00%



H2S[ppb] Calibration: LICA ST. LINA Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON

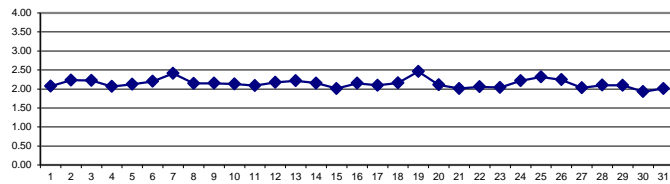
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.05	2.04	2.04	2.04	2.05	2.01	2.08	2.13	2.31	2.32	2.04	2.06	2.07	2.06	2.04	2.04	2.05	2.06	2.05	S	2.04	2.04	2.08	2.04	2.01	2.32	2.08	24	
2	2.09	2.14	2.08	2.08	2.09	2.14	2.16	2.35	2.60	2.55	2.51	2.29	2.15	2.16	2.21	2.34	2.40	2.33	S	2.11	2.11	2.11	2.21	2.11	2.08	2.60	2.23	24	
3	2.19	2.26	2.17	2.17	2.16	2.18	2.36	2.38	2.41	2.41	2.37	2.32	2.26	2.21	2.20	2.22	2.23	S	2.16	2.11	2.09	2.08	2.06	2.05	2.05	2.41	2.22	24	
4	2.05	2.04	2.05	2.04	2.05	2.05	2.05	2.05	2.05	2.06	2.07	2.06	2.05	2.05	2.06	2.06	S	2.07	2.08	2.12	2.10	2.10	2.09	2.06	2.04	2.12	2.06	24	
5	2.10	2.12	2.15	2.15	2.13	2.14	2.14	2.06	2.06	2.06	2.09	2.20	2.11	2.09	2.12	S	2.09	2.10	2.10	2.06	2.12	2.17	2.19	2.24	2.06	2.24	2.12	24	
6	2.09	2.09	2.09	2.09	2.06	2.08	2.09	2.09	2.08	2.10	2.15	2.21	2.21	2.16	S	2.17	2.15	2.15	2.24	2.42	2.42	2.45	2.50	2.50	2.06	2.50	2.20	24	
7	2.38	2.62	2.78	2.72	2.60	2.51	2.57	2.70	2.75	2.73	2.63	2.41	2.29	S	2.22	2.19	2.22	2.23	2.19	2.18	2.12	2.10	2.10	2.09	2.09	2.78	2.41	24	
8	2.11	2.15	2.14	2.13	2.12	2.11	2.14	2.16	2.14	2.16	2.28	2.21	S	2.14	2.14	2.13	2.13	2.14	2.15	2.13	2.14	2.13	2.15	2.13	2.11	2.28	2.15	24	
9	2.19	2.19	2.18	2.18	2.19	2.19	2.20	2.19	2.18	2.20	2.19	S	2.13	2.13	2.18	2.17	2.11	2.09	2.07	2.09	2.09	2.09	2.10	2.09	2.07	2.20	2.15	24	
10	2.08	2.07	2.08	2.08	2.08	2.13	2.08	2.10	2.13	S	2.08	2.08	2.10	2.11	2.14	2.16	2.17	2.17	2.17	2.17	2.18	2.20	2.22	2.22	2.07	2.22	2.13	24	
11	2.22	2.24	2.23	2.20	2.19	2.16	2.13	2.06	2.03	S	1.97	1.95	1.94	1.94	1.95	1.97	2.03	2.07	2.11	2.11	2.14	2.14	2.14	2.15	1.94	2.24	2.09	24	
12	2.15	2.14	2.13	2.13	2.14	2.37	2.17	2.14	S	2.13	2.11	2.09	2.07	2.15	2.32	2.32	2.33	2.22	2.17	2.17	2.16	2.17	2.13	2.09	2.07	2.37	2.17	24	
13	2.10	2.12	2.14	2.17	2.21	2.22	2.24	S	2.24	2.25	2.24	2.25	2.17	2.18	2.19	2.21	2.23	2.25	2.29	2.31	2.27	2.23	2.21	2.22	2.10	2.31	2.21	24	
14	2.24	2.25	2.25	2.23	2.20	2.18	S	2.18	2.18	2.18	2.16	2.16	2.15	2.13	2.05	2.09	2.14	2.14	2.09	2.09	2.08	2.06	P	P	2.05	2.25	2.15	22	
15	P	2.23	2.21	2.17	2.12	S	2.01	2.02	1.99	2.00	1.99	1.95	1.91	1.89	1.88	1.88	1.95	1.97	1.97	1.98	1.99	2.02	2.06	2.06	1.88	2.23	2.01	23	
16	2.13	2.13	2.15	2.13	S	2.15	2.18	2.21	2.23	2.25	2.26	2.20	2.18	2.16	2.16	2.17	2.17	2.16	2.10	2.08	2.07	2.05	2.06	2.06	2.05	2.26	2.15	24	
17	2.08	2.09	2.11	S	2.08	2.08	2.10	2.08	2.03	1.99	2.00	2.07	2.07	2.06	2.13	2.09	2.10	2.09	2.09	2.15	2.20	2.22	2.18	1.99	2.22	2.09	24		
18	2.21	2.37	S	2.17	2.17	2.27	2.51	2.36	2.24	2.21	2.19	2.11	2.04	2.03	2.05	2.06	2.11	2.11	2.08	2.08	2.05	2.04	2.05	2.06	2.03	2.51	2.16	24	
19	2.03	S	2.09	2.14	2.14	2.19	2.18	2.12	2.12	2.22	2.21	2.19	2.10	2.10	2.37	2.58	3.02	3.15	3.06	3.04	3.12	3.19	2.79	2.35	2.03	3.19	2.46	24	
20	S	2.18	2.13	2.04	2.15	2.20	2.21	2.16	2.13	2.11	2.16	2.17	2.15	2.10	2.02	2.08	2.16	2.07	2.08	2.08	2.03	2.00	1.99	S	1.99	2.21	2.11	24	
21	1.95	1.92	1.91	1.94	2.01	1.91	1.89	1.92	1.91	1.96	1.94	1.95	2.10	2.13	2.14	2.08	2.08	2.13	2.11	2.07	2.06	2.07	S	2.03	1.89	2.14	2.01	24	
22	2.07	2.08	2.09	2.07	2.06	2.05	2.06	2.05	2.06	2.06	2.06	2.06	2.06	2.04	2.05	2.04	2.04	2.04	2.04	2.03	2.06	S	2.08	2.02	2.02	2.09	2.06	24	
23	2.01	2.01	2.01	2.02	2.02	2.02	2.03	2.03	2.03	2.04	2.04	2.04	2.03	2.04	2.04	2.03	2.03	2.04	2.04	2.04	S	2.07	2.09	2.11	2.01	2.11	2.04	24	
24	2.10	2.12	2.14	2.16	2.17	2.21	2.23	2.23	2.25	2.26	2.28	2.34	2.40	C	C	C	2.19	2.23	2.20	S	2.21	2.20	2.18	2.18	2.10	2.40	2.21	24	
25	2.19	2.23	2.28	2.31	2.33	2.34	2.34	2.30	2.32	2.30	2.24	2.18	2.16	2.18	2.22	2.33	2.37	2.40	S	2.45	2.41	2.45	2.48	2.52	2.16	2.52	2.32	24	
26	2.55	2.56	2.57	2.56	2.57	2.57	2.53	2.43	2.39	2.33	2.21	2.15	2.10	1.99	1.96	1.99	1.98	S	2.01	2.02	2.04	2.02	2.02	2.01	1.96	2.57	2.24	24	
27	2.03	2.06	2.05	2.03	2.01	2.01	2.03	2.03	2.03	2.03	2.04	2.02	2.01	2.04	2.02	2.02	S	2.03	2.04	2.04	2.03	2.03	2.03	2.04	2.01	2.06	2.03	24	
28	2.04	2.04	2.04	2.04	2.05	2.07	2.09	2.11	2.10	2.11	2.14	2.16	2.09	2.10	2.10	S	2.13	2.15	2.15	2.19	2.14	2.09	2.07	2.09	2.04	2.19	2.10	24	
29	2.08	2.10	2.07	2.07	2.06	2.07	2.10	2.11	2.11	2.13	2.27	2.24	2.13	2.08	S	2.06	2.10	2.13	2.14	2.15	2.13	2.04	1.94	1.93	1.93	2.27	2.10	24	
30	1.93	1.93	1.95	1.95	1.95	1.95	1.94	1.94	1.93	1.94	1.95	1.96	1.97	S	1.90	1.89	1.91	1.91	1.90	1.90	1.89	1.89	1.91	1.94	1.89	1.97	1.93	24	
31	1.97	1.99	2.01	2.02	2.02	2.02	2.04	2.04	2.03	2.03	2.03	2.03	S	2.01	2.01	2.01	2.01	2.01	1.99	1.98	2.00	1.99	1.98	1.99	1.97	2.04	2.01	24	
HOURLY MAX	2.55	2.62	2.78	2.72	2.60	2.57	2.57	2.70	2.75	2.73	2.63	2.41	2.40	2.21	2.37	2.58	3.02	3.15	3.06	3.04	3.12	3.19	2.79	2.52					
HOURLY AVG	2.12	2.15	2.14	2.14	2.14	2.15	2.16	2.16	2.17	2.18	2.16	2.14	2.11	2.09	2.10	2.12	2.16	2.16	2.13	2.15	2.15	2.15	2.14	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

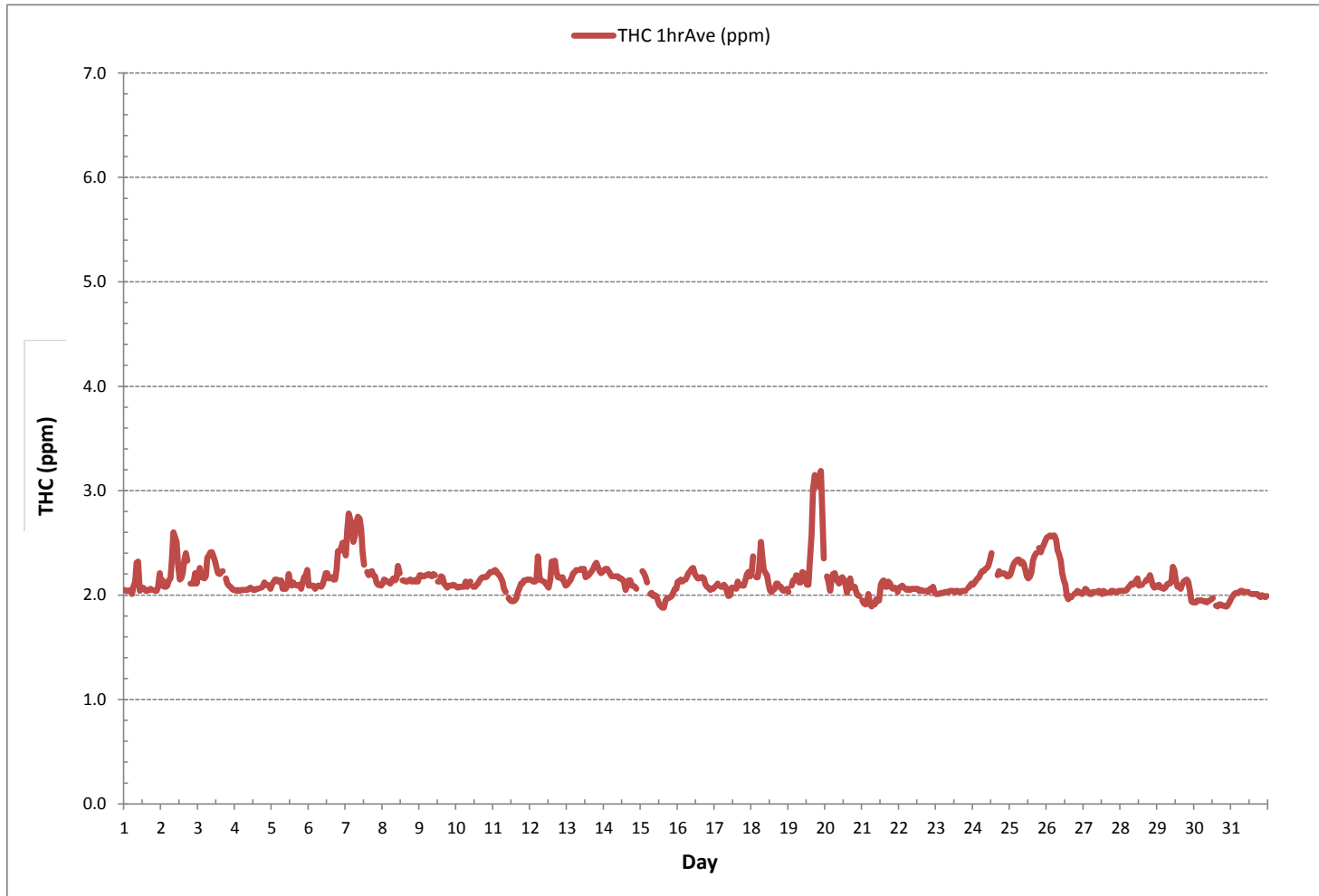
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706				
MINIMUM 1-HR AVERAGE:	1.88 ppm	@ HOUR(S)	14 , 15	ON DAY(S)	15 , 15
MAXIMUM 1-HR AVERAGE:	3.19 ppm	@ HOUR(S)	21	ON DAY(S)	19
MAXIMUM 24-HR AVERAGE:	2.46 ppm			ON DAY(S)	19
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	741 hrs		
MONTHLY CALIBRATION TIME:	3 hrs	AMD OPERATION UPTIME:	99.6 %		
STANDARD DEVIATION:	0.16	MONTHLY AVERAGE:	2.14 ppm		

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - January 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	2.63	2.67	2.50	2.44	2.45	2.35	2.60	3.32	4.40	6.36	2.48	2.67	2.89	2.87	2.38	2.35	2.36	2.38	2.38	S	2.38	2.38	2.53	2.47	2.35	6.36	2.79	24	
2	2.51	2.60	2.44	2.44	2.53	2.54	2.54	2.90	3.04	3.03	3.01	2.82	2.57	2.58	2.66	2.82	2.85	2.84	S	2.54	2.54	2.54	2.81	2.51	2.44	3.04	2.68	24	
3	2.91	2.91	2.57	2.57	2.56	2.57	2.92	2.78	2.78	2.78	2.75	2.70	2.63	2.57	2.54	2.56	2.56	S	2.50	2.47	2.41	2.41	2.39	2.38	2.38	2.92	2.62	24	
4	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.36	2.38	2.38	2.38	2.38	S	2.38	2.39	2.44	2.45	2.41	2.41	2.38	2.36	2.45	2.39	24
5	2.41	2.44	2.47	2.44	2.42	2.44	2.44	2.35	2.35	2.33	2.39	2.51	2.44	2.36	2.41	S	2.38	2.38	2.39	2.38	2.44	2.47	2.49	2.54	2.33	2.54	2.42	24	
6	2.50	2.39	2.39	2.41	2.36	2.39	2.41	2.41	2.38	2.44	2.49	2.54	2.55	2.49	S	2.51	2.49	2.53	2.64	2.87	2.78	2.97	2.94	2.91	2.36	2.97	2.56	24	
7	2.76	3.12	3.13	3.15	3.03	2.85	3.07	3.18	3.12	3.08	3.04	2.81	2.66	S	2.57	2.53	2.57	2.57	2.54	2.51	2.49	2.44	2.44	2.44	2.34	3.18	2.79	24	
8	2.50	2.51	2.49	2.49	2.47	2.45	2.49	2.51	2.49	2.54	2.70	2.58	S	2.48	2.49	2.49	2.45	2.44	2.44	2.41	2.41	2.38	2.41	2.36	2.36	2.70	2.48	24	
9	2.44	2.41	2.39	2.38	2.38	2.38	2.36	2.35	2.32	2.35	2.33	S	2.26	2.29	2.32	2.29	2.27	2.22	2.20	2.22	2.23	2.23	2.23	2.22	2.20	2.44	2.31	24	
10	2.20	2.20	2.20	2.22	2.23	2.22	2.49	2.22	2.23	2.81	S	2.20	2.20	2.20	2.23	2.23	2.26	2.26	2.20	2.23	2.26	2.26	2.26	2.26	2.26	2.20	2.81	2.27	24
11	2.26	2.28	2.29	2.23	2.20	2.17	2.14	2.08	2.04	S	1.99	1.98	1.98	1.99	2.04	2.08	2.14	2.20	2.23	2.26	2.29	2.32	2.32	2.35	1.98	2.35	2.17	24	
12	2.35	2.38	2.36	2.38	2.60	2.78	2.48	2.44	S	2.41	2.39	2.38	2.36	2.54	2.63	2.58	2.61	2.57	2.42	2.42	2.41	2.41	2.38	2.33	2.33	2.78	2.46	24	
13	2.33	2.33	2.36	2.41	2.42	2.44	2.44	S	2.45	2.49	2.49	2.49	2.39	2.39	2.50	2.42	2.45	2.49	2.53	2.54	2.51	2.47	2.44	2.45	2.33	2.54	2.44	24	
14	2.47	2.51	2.50	2.49	2.44	2.44	S	2.41	2.41	2.42	2.39	2.41	2.39	2.38	2.30	2.32	2.35	2.36	2.35	2.33	2.32	2.29	P	P	2.29	2.51	2.39	22	
15	P	2.45	2.44	2.41	2.41	S	2.23	2.23	2.20	2.20	2.18	2.35	2.11	2.17	2.07	2.07	2.11	2.13	2.13	2.12	2.14	2.17	2.18	2.18	2.07	2.45	2.21	23	
16	2.38	2.25	2.26	2.23	S	2.23	2.26	2.26	2.28	2.29	2.29	2.26	2.21	2.17	2.17	2.17	2.17	2.17	2.11	2.08	2.04	2.01	2.01	1.99	1.99	2.38	2.19	24	
17	2.01	2.04	2.04	S	2.01	2.02	2.01	2.01	1.96	1.92	1.98	1.99	2.01	2.01	2.01	2.11	2.04	2.07	2.04	2.07	2.17	2.17	2.20	2.18	1.92	2.20	2.05	24	
18	2.27	2.35	S	2.17	2.14	2.44	2.49	2.44	2.20	2.20	2.17	2.11	2.01	1.98	2.04	2.01	2.08	2.08	2.04	2.04	1.99	1.99	2.04	2.14	1.98	2.49	2.15	24	
19	1.98	S	2.05	2.15	2.17	2.18	2.17	2.11	2.22	2.44	2.26	2.19	2.17	2.35	2.63	2.72	3.31	3.32	3.20	3.12	3.31	3.31	3.19	2.47	1.98	3.32	2.57	24	
20	S	2.28	2.22	2.16	2.30	2.29	2.29	2.25	2.23	2.22	2.29	2.28	2.25	2.25	2.19	2.20	2.33	2.20	2.23	2.22	2.23	2.16	2.14	S	2.14	2.33	2.24	24	
21	2.11	2.07	2.04	2.11	2.20	2.08	2.05	2.18	2.14	2.20	2.17	2.15	2.36	2.38	2.41	2.36	2.35	2.37	2.35	2.35	2.32	2.35	S	2.30	2.04	2.41	2.23	24	
22	2.35	2.36	2.37	2.35	2.35	2.35	2.36	2.35	2.36	2.36	2.36	2.36	2.36	2.38	2.35	2.36	2.37	2.38	2.37	2.38	2.39	S	2.44	2.35	2.35	2.44	2.37	24	
23	2.34	2.34	2.35	2.35	2.32	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.33	2.33	2.35	2.35	2.35	S	2.34	2.35	2.35	2.32	2.35	2.35	24	
24	2.35	2.35	2.35	2.36	2.36	2.38	2.39	2.38	2.38	2.41	2.59	C	C	C	C	C	2.41	2.42	S	2.41	2.41	2.36	2.38	2.35	2.59	2.39	24		
25	2.38	2.44	2.49	2.52	2.54	2.54	2.57	2.52	2.54	2.56	2.45	2.44	2.38	2.42	2.49	2.57	2.63	2.63	S	2.68	2.64	2.69	2.73	2.76	2.38	2.76	2.55	24	
26	2.78	2.78	2.78	2.76	2.79	2.79	2.75	2.66	2.60	2.56	2.41	2.33	2.30	2.20	2.14	2.16	2.14	S	2.18	2.19	2.23	2.20	2.20	2.18	2.14	2.79	2.44	24	
27	2.26	2.26	2.25	2.23	2.22	2.22	2.23	2.25	2.23	2.26	2.26	2.23	2.25	2.26	2.25	2.26	S	2.26	2.26	2.26	2.26	2.23	2.23	2.23	2.22	2.26	2.24	24	
28	2.23	2.22	2.22	2.22	2.22	2.25	2.25	2.26	2.25	2.26	2.29	2.31	2.25	2.26	2.23	S	2.26	2.26	2.26	2.31	2.26	2.20	2.17	2.19	2.17	2.31	2.24	24	
29	2.19	2.19	2.17	2.15	2.14	2.14	2.17	2.17	2.18	2.22	2.38	2.35	2.23	2.17	S	2.14	2.17	2.22	2.23	2.25	2.22	2.19	2.05	2.04	2.04	2.38	2.19	24	
30	2.04	2.04	2.05	2.07	2.08	2.07	2.07	2.07	2.08	2.08	2.11	2.11	S	2.09	2.07	2.11	2.10	2.10	2.10	2.11	2.10	2.10	2.14	2.17	2.04	2.17	2.09	24	
31	2.20	2.25	2.26	2.28	2.29	2.32	2.32	2.35	2.35	2.35	2.35	2.38	S	2.35	2.36	2.37	2.36	2.37	2.37	2.35	2.38	2.36	2.37	2.38	2.20	2.38	2.33	24	
HOURLY MAX	2.91	3.12	3.13	3.15	3.03	2.85	3.07	3.32	4.40	6.36	3.04	2.82	2.89	2.87	2.66	2.82	3.31	3.32	3.20	3.12	3.31	3.31	3.19	2.91					
HOURLY AVG	2.36	2.39	2.36	2.37	2.37	2.37	2.39	2.41	2.43	2.54	2.38	2.38	2.32	2.33	2.33	2.34	2.38	2.38	2.34	2.36	2.37	2.36	2.37	2.34					

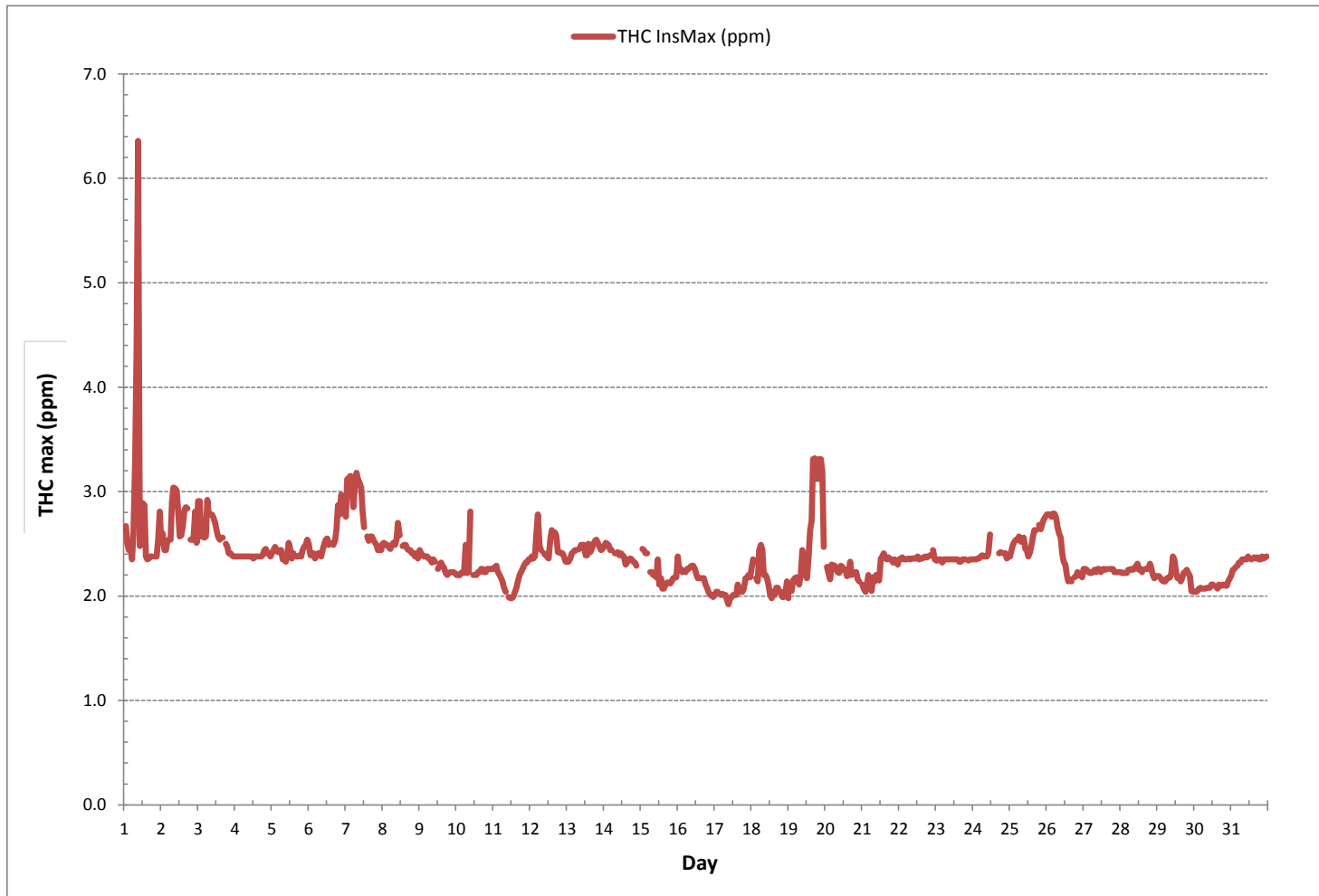
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	704
MAXIMUM INSTANTANEOUS VALUE:	6.36 ppm @ HOUR(S) 9 ON DAY(S) 1
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	741 hrs
STANDARD DEVIATION:	0.29

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

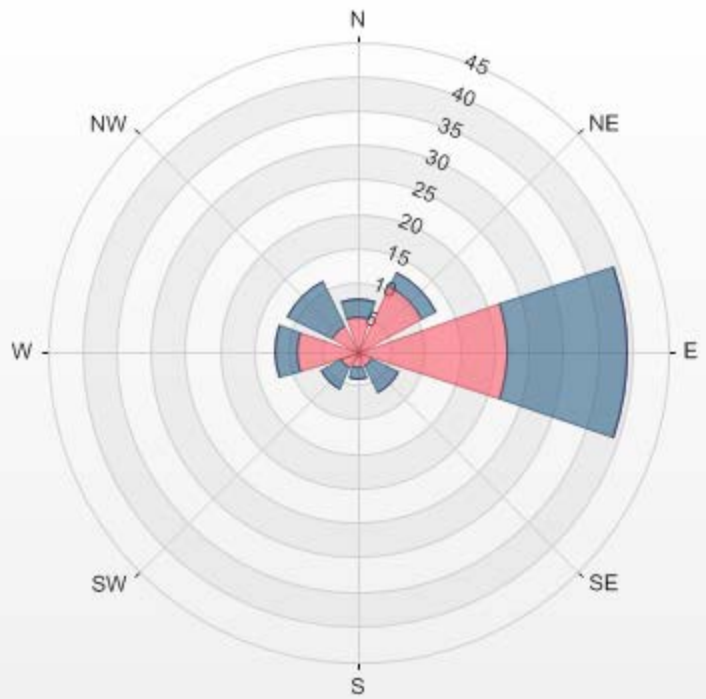


Wind: LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppm]

Direction	0.0-1.1	1.1-2.1	2.1-3.2	>3.2	Total
N	0	5.11	2.7	0	7.81
NE	0	10.5	2.41	0	12.91
E	0	21.84	17.3	0	39.14
SE	0	2.27	4.54	0	6.81
S	0	2.41	1.56	0	3.97
SW	0	2.7	3.26	0	5.96
W	0	8.94	2.98	0	11.92
NW	0	4.11	7.38	0	11.49
Summary	0	57.88	42.13	0	100

% Icon Classes (ppm) 0 0.0-1.1 58 1.1-2.1 42 2.1-3.2 0 >3.2

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 0.00%



OXIDES OF NITROGEN



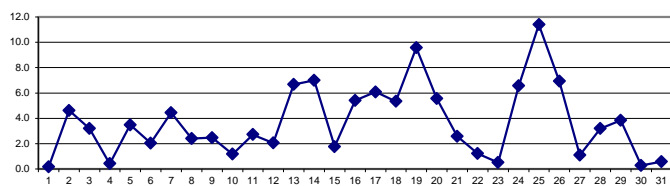
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.2	0.2	0.3	0.2	S	0.5	0.2	0.4	0.4	0.0	0.5	0.2	24	
2	0.3	0.9	0.5	0.4	0.9	2.1	1.9	5.9	13.1	14.0	13.4	7.1	4.2	3.1	3.9	7.4	9.4	7.3	S	3.1	2.3	2.2	1.8	0.9	0.3	14.0	4.6	24	
3	1.7	2.2	1.8	1.9	1.5	1.6	4.3	3.8	3.9	4.5	5.0	6.3	6.8	4.8	4.5	5.4	6.2	S	3.2	1.9	1.4	0.6	0.2	0.0	0.0	6.8	3.2	24	
4	0.1	0.0	0.3	0.4	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.1	0.2	0.2	0.0	0.7	S	0.4	0.7	1.2	1.5	1.1	1.1	1.1	0.0	1.5	0.4	24	
5	1.4	3.0	5.3	6.2	6.2	6.5	6.8	2.3	1.7	1.7	2.8	4.7	4.1	2.8	3.2	S	3.3	2.1	2.1	1.0	1.8	3.3	3.3	4.5	1.0	6.8	3.5	24	
6	1.7	1.1	1.3	1.3	0.5	0.6	0.5	0.4	0.3	0.7	1.6	2.4	2.2	1.2	S	1.4	1.6	1.3	1.9	4.7	4.9	4.9	5.4	5.1	0.3	5.4	2.0	24	
7	4.1	7.1	9.9	8.1	5.9	4.7	5.1	5.2	6.6	6.6	5.9	2.8	2.5	S	2.9	1.7	2.2	3.2	5.2	4.9	2.9	1.5	1.5	1.6	1.5	9.9	4.4	24	
8	2.0	3.6	3.3	2.3	1.8	1.6	1.6	1.4	1.6	1.9	3.4	3.6	S	3.3	3.0	2.3	2.0	2.7	2.2	2.0	2.6	2.2	2.7	2.1	1.4	3.6	2.4	24	
9	2.7	2.9	2.4	2.3	2.3	2.2	2.2	2.7	2.6	2.7	3.1	S	3.4	2.7	4.1	3.5	2.8	1.8	1.4	1.7	1.6	1.9	2.1	1.8	1.4	4.1	2.5	24	
10	1.1	1.7	1.2	1.1	0.9	0.6	0.3	0.6	0.9	3.5	S	1.9	0.6	1.1	1.1	0.8	1.0	1.1	0.8	0.8	0.7	1.4	1.8	1.9	0.3	3.5	1.2	24	
11	2.2	5.1	7.2	10.4	9.4	9.3	8.1	3.4	1.8	S	0.8	0.8	0.5	0.2	0.1	0.4	0.3	0.2	0.6	0.3	0.5	0.3	0.3	0.1	10.4	2.7	24		
12	0.3	0.5	0.5	0.5	0.3	0.6	1.6	1.1	S	0.7	2.0	1.2	0.9	2.7	5.7	4.8	4.5	3.6	3.0	2.6	2.6	2.3	2.4	2.7	0.3	5.7	2.0	24	
13	2.8	2.9	3.3	3.9	5.2	5.7	5.6	S	7.6	7.5	6.7	6.5	4.5	4.9	5.3	5.6	6.3	7.5	11.0	17.0	14.7	8.8	5.8	4.5	2.8	17.0	6.7	24	
14	5.6	5.3	6.3	6.0	5.7	5.5	S	5.7	6.7	7.2	8.6	8.6	7.9	7.9	8.0	8.1	8.2	8.7	7.7	6.5	6.8	5.8	P	P	5.3	8.7	7.0	22	
15	P	6.2	6.2	5.0	3.3	S	1.4	0.9	0.7	0.7	0.9	0.8	0.7	0.8	0.5	0.5	1.1	1.3	1.1	1.5	1.2	1.5	1.4	1.1	0.5	6.2	1.8	23	
16	5.3	7.2	7.4	6.6	S	3.5	3.5	4.3	5.2	6.0	5.9	5.1	4.7	5.1	5.7	7.3	7.2	7.1	6.4	4.6	5.0	4.1	3.5	3.5	3.5	7.4	5.4	24	
17	4.3	4.6	4.7	S	4.4	4.0	5.3	4.4	3.4	2.6	3.6	6.2	5.7	9.3	14.2	9.6	9.8	10.5	6.3	5.4	4.2	6.2	6.3	4.8	2.6	14.2	6.1	24	
18	5.0	6.3	S	5.2	4.6	4.2	6.4	5.6	3.9	3.9	4.0	3.9	4.7	4.4	5.0	8.9	7.7	7.9	7.8	7.3	4.6	4.5	3.9	3.2	3.2	8.9	5.3	24	
19	3.1	S	3.7	4.2	4.2	4.1	4.2	5.6	4.7	4.9	7.2	10.8	7.5	6.1	15.0	18.0	16.2	17.4	15.1	15.0	15.0	16.0	12.9	9.0	3.1	18.0	9.6	24	
20	S	7.3	5.6	3.5	4.4	5.6	5.5	4.1	3.9	4.0	7.0	10.4	12.8	13.9	7.2	6.8	6.3	3.9	2.7	2.3	1.6	1.8	1.6	S	1.6	13.9	5.6	24	
21	1.1	1.1	1.1	1.8	3.3	2.0	1.2	1.0	0.9	3.0	2.1	2.3	2.1	3.5	4.5	4.6	3.8	5.0	4.2	2.6	2.9	3.1	S	2.1	0.9	5.0	2.6	24	
22	2.0	1.7	1.2	1.2	1.0	0.9	0.9	0.9	0.8	0.9	1.0	0.9	0.9	0.9	0.7	1.1	1.3	1.3	1.6	1.7	1.4	S	3.1	0.8	0.7	3.1	1.2	24	
23	0.6	0.3	0.5	0.4	0.5	0.3	0.4	0.5	0.7	0.6	0.5	0.5	0.3	0.8	0.5	0.7	0.4	0.6	0.7	0.8	S	0.6	0.3	0.3	0.3	0.8	0.5	24	
24	0.1	0.2	0.4	0.2	0.5	1.1	0.9	0.9	1.1	2.8	2.0	2.1	3.6	5.4	7.2	12.0	15.2	16.3	16.4	S	16.0	17.1	15.6	13.6	0.1	17.1	6.6	24	
25	12.4	11.1	11.7	12.7	12.9	13.1	12.8	11.0	11.2	9.7	C	C	C	C	C	C	C	14.7	S	9.7	9.2	9.3	9.8	10.9	9.2	14.7	11.4	24	
26	11.7	12.3	12.5	12.8	13.7	15.2	15.6	13.0	11.2	9.2	6.2	4.8	4.2	2.7	1.2	0.5	0.9	S	2.1	2.5	2.0	1.7	1.6	1.5	0.5	15.6	6.9	24	
27	1.3	0.9	0.7	0.3	0.2	0.1	0.1	0.2	0.0	0.2	0.3	0.3	0.6	1.3	1.9	1.8	S	4.2	3.1	2.4	1.6	1.3	1.1	1.1	0.0	4.2	1.1	24	
28	0.9	0.8	0.6	0.5	0.5	0.6	1.3	1.2	1.4	2.0	2.5	4.9	5.5	7.3	8.1	S	6.8	6.7	6.5	7.7	4.3	1.8	0.8	0.8	0.5	8.1	3.2	24	
29	0.8	0.7	0.5	0.4	0.3	0.4	0.6	0.8	0.8	1.9	6.8	10.3	9.0	6.9	S	5.1	6.2	6.8	8.3	9.2	7.4	4.0	0.7	0.2	0.2	10.3	3.8	24	
30	0.2	0.2	0.3	0.4	0.3	0.1	0.1	S1	0.4	0.4	0.5	0.6	0.5	S	0.4	0.4	0.2	0.2	0.2	0.1	0.0	0.3	0.2	0.2	0.0	0.6	0.3	23	
31	0.2	0.0	0.2	0.3	0.2	0.3	1.0	1.2	0.4	0.5	0.6	0.8	S	1.0	0.4	0.4	0.5	0.4	0.7	0.8	0.9	0.9	0.7	0.0	1.2	0.6	0.6	0.3	24
HOURLY MAX	12.4	12.3	12.5	12.8	13.7	15.2	15.6	13.0	13.1	14.0	13.4	10.8	12.8	13.9	15.0	18.0	16.2	17.4	16.4	17.0	16.0	17.1	15.6	13.6					
HOURLY AVG	2.6	3.2	3.4	3.3	3.2	3.2	3.3	3.0	3.3	3.5	3.6	3.8	3.6	3.7	4.1	4.3	4.7	5.0	4.2	4.2	4.1	3.7	3.2	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

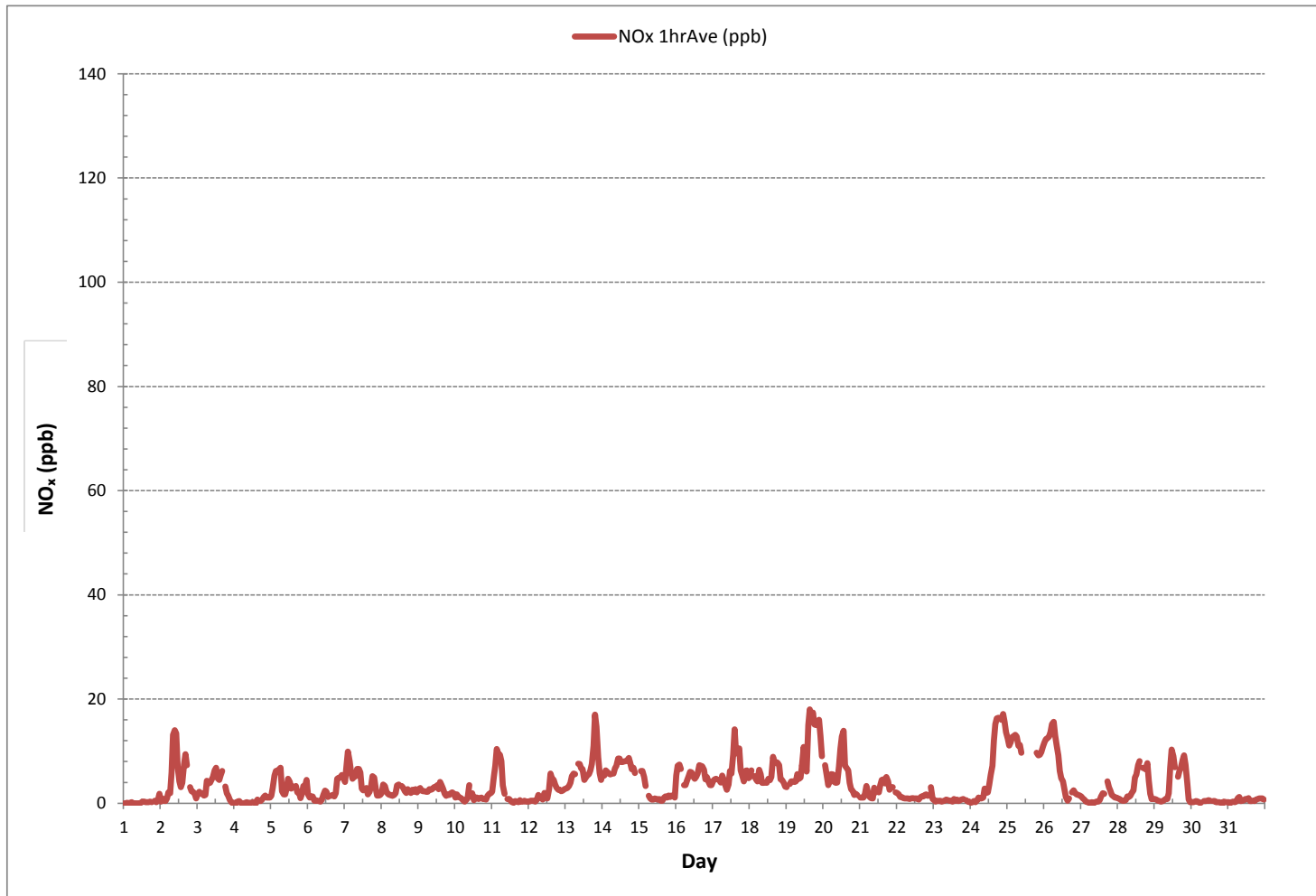
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	18.0 ppb	@ HOUR(S)	15	ON DAY(S) 19
MAXIMUM 24-HR AVERAGE:	11.4 ppb			ON DAY(S) 25
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	740 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	99.5 %	
STANDARD DEVIATION:	3.7	MONTHLY AVERAGE:	3.6 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - January 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	0.6	0.6	0.8	0.3	0.4	0.6	0.4	0.3	0.4	0.4	0.3	0.8	1.2	2.0	1.1	0.6	0.4	1.7	0.7	S	0.9	0.6	1.1	1.1	0.3	2.0	0.8	24
2	1.1	1.5	0.9	0.7	3.2	3.3	2.5	10.5	16.0	16.0	17.1	10.1	4.9	3.7	5.5	9.3	10.2	9.7	S	4.4	3.1	3.2	2.8	1.8	0.7	17.1	6.2	24
3	2.9	2.9	2.6	2.7	2.3	2.4	68.5	4.9	5.0	5.4	18.0	15.0	26.1	14.0	5.7	18.3	7.3	S	5.4	3.1	2.5	2.2	1.2	0.9	0.9	68.5	9.5	24
4	1.0	0.9	1.3	1.3	0.9	1.0	0.6	0.8	0.8	0.5	0.7	0.7	2.6	0.6	1.1	4.4	S	1.0	2.2	20.7	2.2	1.7	1.9	1.7	0.5	20.7	2.2	24
5	2.1	4.3	6.6	7.0	6.9	8.9	9.2	4.4	2.3	2.4	4.7	5.7	5.7	4.1	4.5	S	4.3	3.2	3.7	2.8	4.0	4.1	4.3	6.2	2.1	9.2	4.8	24
6	4.7	1.9	2.0	2.4	1.3	1.3	1.1	1.0	0.9	1.6	2.7	2.9	3.1	1.9	S	1.9	2.1	1.8	3.4	5.5	5.6	5.6	5.9	6.2	0.9	6.2	2.9	24
7	4.9	10.5	10.8	9.4	7.5	5.4	5.7	5.9	8.7	8.8	10.0	3.8	3.2	S	29.5	2.5	3.6	4.5	22.4	5.4	5.5	2.2	1.9	2.1	1.9	29.5	7.6	24
8	3.4	4.1	4.1	3.0	2.2	2.2	2.2	1.9	2.1	2.7	5.3	4.3	S	5.8	4.0	3.4	2.6	39.1	2.7	2.6	4.5	3.2	4.0	2.7	1.9	39.1	4.9	24
9	3.0	3.2	3.0	2.6	2.6	2.6	2.6	13.3	4.5	3.9	44.3	S	23.4	3.6	35.3	6.7	6.6	2.4	3.0	2.2	1.9	2.6	2.5	2.6	1.9	44.3	7.8	24
10	1.6	34.4	1.7	1.6	1.6	1.2	0.7	1.3	1.3	11.9	S	5.2	1.5	2.5	4.8	3.1	12.3	3.1	2.3	1.3	1.3	2.1	2.1	2.6	0.7	34.4	4.4	24
11	3.5	6.8	8.5	11.6	10.7	10.9	26.5	6.8	21.3	S	5.9	15.3	4.1	0.9	0.6	2.0	0.8	0.9	1.9	1.0	0.8	3.2	0.6	0.7	0.6	26.5	6.3	24
12	0.7	0.7	1.0	0.7	0.7	1.2	2.2	1.4	S	0.9	2.8	2.0	1.5	5.4	6.9	5.7	5.4	5.1	3.5	3.3	3.3	3.0	3.0	3.6	0.7	6.9	2.8	24
13	3.6	3.6	4.3	5.1	6.4	6.5	6.4	S	9.1	8.8	8.2	7.8	14.3	12.9	7.2	7.1	8.1	10.0	14.4	20.2	19.6	12.2	8.2	5.8	3.6	20.2	9.1	24
14	71.3	7.2	7.7	7.2	7.4	6.9	S	7.2	8.2	8.7	10.1	11.0	9.9	10.4	9.1	9.1	16.8	10.0	9.5	7.7	7.9	6.8	P	P	6.8	71.3	11.9	22
15	P	7.6	7.2	7.0	5.9	S	2.4	1.8	1.4	1.4	1.7	1.7	1.8	2.6	2.1	1.5	2.1	2.5	2.1	2.6	6.9	12.9	2.8	2.2	1.4	12.9	3.6	23
16	9.1	8.3	8.9	8.9	S	4.9	4.7	7.0	8.9	8.4	7.4	6.2	5.9	6.2	6.7	44.9	38.7	26.6	26.3	6.5	9.8	5.3	4.6	4.6	4.6	44.9	11.7	24
17	5.3	5.5	5.7	S	5.6	5.5	6.5	6.1	5.5	4.0	7.6	16.5	7.4	39.1	67.8	13.8	11.4	73.8	8.9	9.3	6.0	8.1	10.6	6.3	4.0	73.8	14.6	24
18	6.4	7.9	S	6.6	6.0	6.1	7.8	7.6	5.1	5.5	5.3	6.6	30.5	5.6	39.7	71.4	37.9	10.7	36.8	38.1	6.9	5.7	5.5	4.6	4.6	71.4	15.8	24
19	5.1	S	4.9	5.4	5.6	5.6	6.0	9.1	7.0	8.0	9.3	51.3	22.5	8.0	131.7	65.8	20.8	21.1	16.7	16.5	17.6	17.8	17.2	11.2	4.9	131.7	21.1	24
20	S	9.1	8.2	5.6	7.4	7.7	8.7	6.3	5.5	6.0	10.8	13.9	18.7	17.4	10.2	9.5	9.3	6.1	4.6	3.8	3.5	3.4	3.2	S	3.2	18.7	8.1	24
21	3.1	3.0	2.6	4.3	5.0	4.1	2.7	2.4	2.9	4.5	3.7	3.6	3.4	6.5	9.1	9.2	5.2	6.1	5.7	3.9	3.8	3.9	S	3.0	2.4	9.2	4.4	24
22	2.8	2.6	2.0	2.2	2.0	1.7	1.7	1.7	1.7	1.8	1.8	1.6	1.7	2.2	1.5	1.8	2.3	1.8	2.4	2.4	2.4	S	4.9	1.6	1.5	4.9	2.1	24
23	1.1	1.1	1.1	0.9	1.1	1.1	1.1	1.3	1.4	1.3	1.1	1.0	1.1	1.5	1.2	1.5	1.2	1.5	1.3	4.7	S	1.5	1.1	0.8	0.8	4.7	1.3	24
24	0.9	0.7	1.2	1.0	1.3	2.2	1.7	2.2	2.1	7.5	6.3	6.1	7.8	7.9	9.3	14.8	20.4	46.1	25.4	S	40.1	18.2	17.8	14.5	0.7	46.1	11.1	24
25	14.0	12.7	12.9	13.6	13.9	13.9	14.2	11.8	44.1	13.1	C	C	C	C	C	C	C	40.9	S	11.7	9.8	11.6	34.4	31.8	9.8	44.1	19.0	24
26	12.6	12.9	13.4	13.4	34.0	15.9	16.3	14.8	12.5	10.8	7.6	5.5	5.0	20.0	2.2	0.9	15.0	S	2.5	3.7	2.5	2.3	2.3	1.9	0.9	34.0	9.9	24
27	1.8	1.5	1.3	0.7	0.5	0.4	0.6	1.1	0.4	0.9	0.9	0.8	1.2	2.4	14.0	2.3	S	4.8	3.5	2.8	2.1	2.3	1.3	1.3	0.4	14.0	2.1	24
28	1.0	0.9	0.8	0.7	0.5	0.8	2.1	1.1	1.5	9.0	2.9	5.9	6.0	7.9	16.2	S	7.0	6.8	6.5	65.8	5.3	2.5	0.7	0.9	0.5	65.8	6.6	24
29	0.9	0.7	0.5	0.3	0.2	0.2	0.6	0.7	1.3	12.3	15.9	12.1	9.6	9.1	S	5.9	6.7	7.8	10.1	9.8	8.0	6.3	1.7	0.4	0.2	15.9	5.3	24
30	0.4	0.4	0.4	0.5	0.4	0.2	0.4	S1	S1	0.4	0.9	16.1	13.9	S	0.5	0.5	0.6	0.3	1.0	0.0	0.1	0.3	0.0	0.2	0.0	16.1	1.8	22
31	0.2	0.0	0.1	0.2	0.0	0.1	1.3	1.1	0.4	0.4	0.4	0.7	S	3.2	0.7	0.5	0.7	0.2	0.7	0.6	1.3	1.3	0.8	0.7	0.0	3.2	0.7	24
HOURLY MAX	71.3	34.4	13.4	13.6	34.0	15.9	68.5	14.8	44.1	16.0	44.3	51.3	30.5	39.1	131.7	71.4	38.7	73.8	36.8	65.8	40.1	18.2	34.4	31.8				
HOURLY AVG	5.8	5.3	4.2	4.2	4.8	4.2	6.9	4.7	6.3	5.6	7.4	8.1	8.5	7.4	15.3	11.4	9.3	12.1	7.9	9.0	6.3	5.2	5.1	4.3				

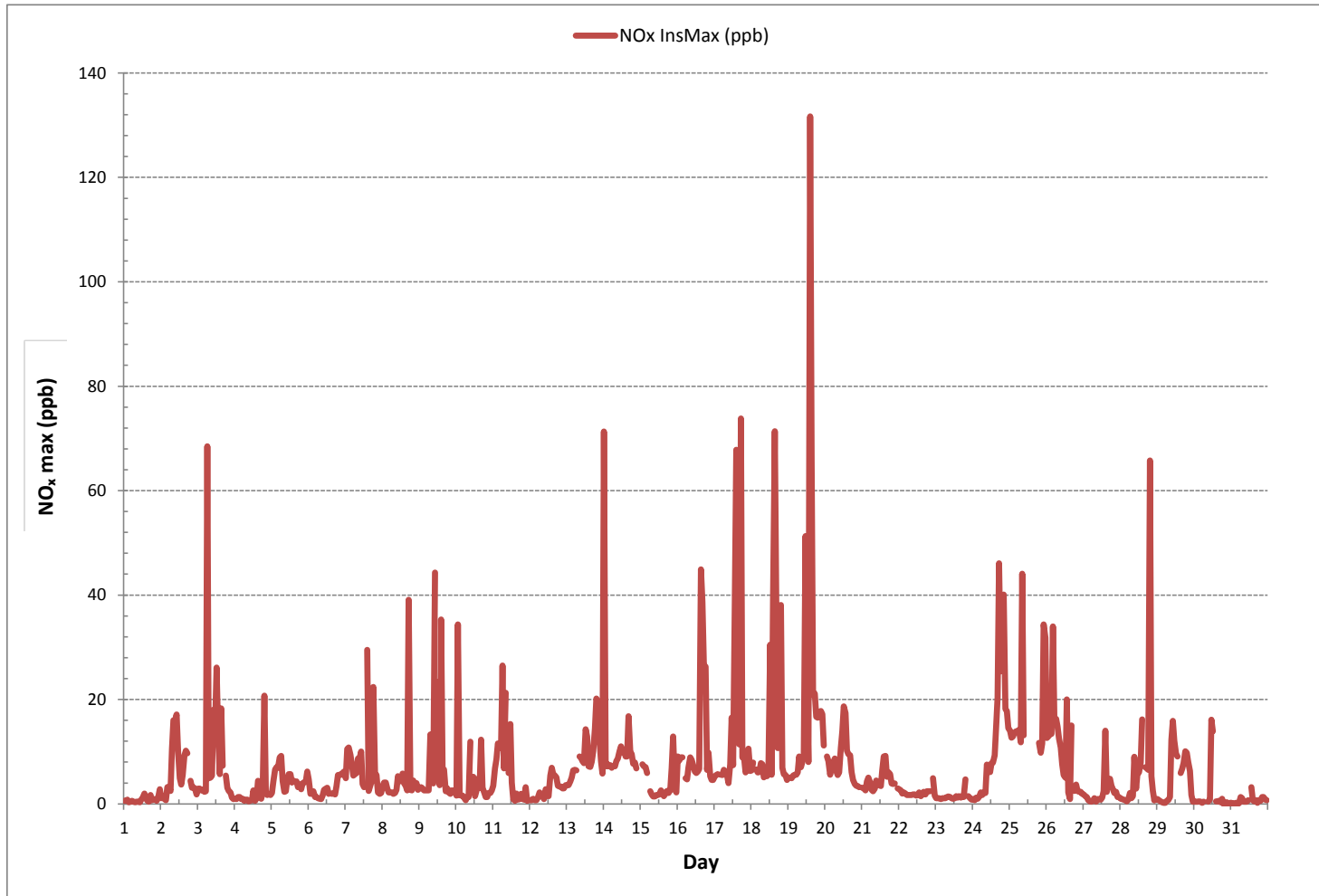
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	696
MAXIMUM INSTANTANEOUS VALUE:	131.7 ppb @ HOUR(S) 14 ON DAY(S) 19
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	739 hrs
STANDARD DEVIATION:	10.9

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

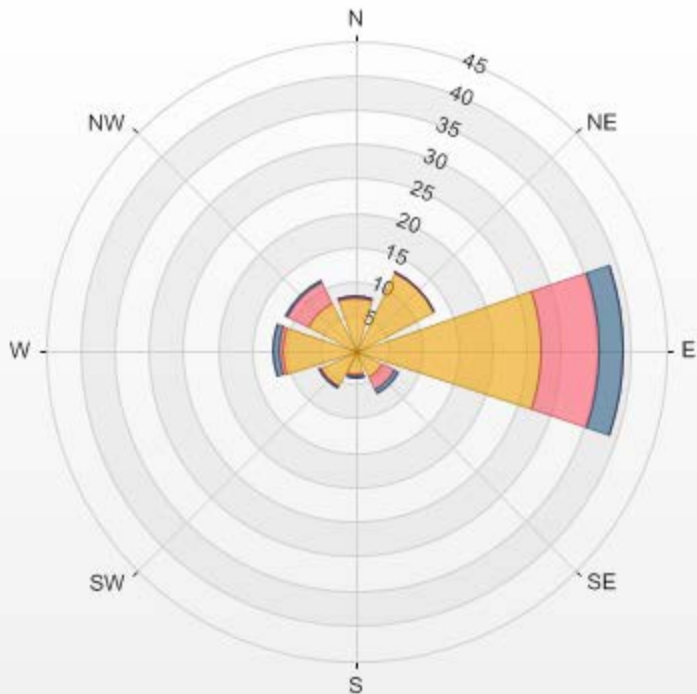


Wind: LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppb]

Direction	0.0-6.0	6.0-12.1	12.1-18.1	>18.1	Total
N	7.56	0.29	0	0	7.85
NE	12.7	0.14	0	0	12.84
E	27.1	8.42	3.42	0	38.94
SE	4.28	2.14	0.43	0	6.85
S	3.57	0.29	0.14	0	4
SW	5.71	0.14	0.14	0	5.99
W	10.7	0.43	0.86	0	11.99
NW	7.56	3.71	0.29	0	11.56
Summary	79.18	15.56	5.28	0	100

% Icon Classes (ppb) 79 0.0-6.0 16 6.0-12.1 5 12.1-18.1 0 >18.1

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 0.00%



NOX[ppb] Calibration: LICA ST. LINA Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

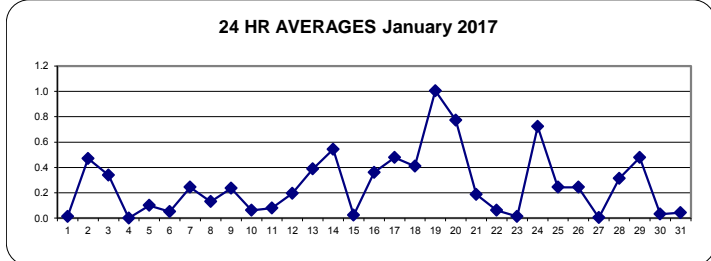
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	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	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	3.7	2.0	1.2	0.7	0.6	0.7	0.0	0.0	S	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	0.6	0.0	0.0	0.4	1.1	1.7	2.0	1.1	0.6	0.3	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	
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	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	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.8	0.3	0.3	S	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.2	S	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	
7	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.3	0.6	1.1	0.5	0.5	S	1.0	0.2	0.0	0.2	0.4	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7	S	0.7	0.5	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	
9	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.2	0.3	0.9	S	1.1	0.7	1.1	0.5	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	
10	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	S	0.3	0.0	0.2	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.3	S	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	S	0.1	0.5	0.3	0.2	0.9	1.6	0.6	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	S	0.2	0.7	1.4	1.8	1.2	1.2	1.1	0.6	0.2	0.0	0.0	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.7	0.0	0.0	0.0	0.0	S	0.2	0.1	0.7	1.5	1.8	1.8	2.0	1.6	0.8	0.1	0.0	0.1	0.0	0.0	0.0	0.0	P	P	0.0	0.0	2.0	0.5	
15	P	0.0	0.0	0.0	0.0	S	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	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0	
16	0.0	0.1	0.0	0.1	S	0.3	0.2	0.4	0.2	0.7	0.9	0.7	0.7	0.6	0.8	1.3	0.5	0.1	0.4	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.6	1.4	1.1	2.0	3.9	0.8	0.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.7	1.2	1.1	2.7	0.5	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	3.8	2.0	0.7	6.2	6.0	1.8	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	S	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.8	3.6	4.3	4.5	1.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	4.5	0.8
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.5	1.1	1.2	0.7	0.0	0.0	0.0	0.0	0.1	0.0	S	0.2	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.0	0.2	0.2	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
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	0.2	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
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.5	1.5	2.2	2.6	3.7	2.6	1.1	1.0	S	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.9	C	C	C	C	C	C	C	0.8	S	0.2	0.1	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0
26	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.3	1.4	1.3	1.1	0.9	0.3	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
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	0.1	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.4	0.9	1.1	1.6	1.8	S	0.4	0.1	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.1	3.3	2.7	1.8	S	0.5	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
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S1	0.1	0.0	0.2	0.2	0.1	S	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
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	S	0.5	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOURLY MAX	0.7	0.2	0.1	0.1	0.1	0.3	0.6	0.4	0.4	1.9	3.7	3.8	4.3	4.5	6.2	6.0	2.6	1.1	1.0	0.5	0.5	0.2	0.2	0.3	0.0	0.0	0.0	0.0	
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.4	0.7	0.9	0.9	0.9	1.0	0.7	0.2	0.1	0.1	0.0	0.1	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

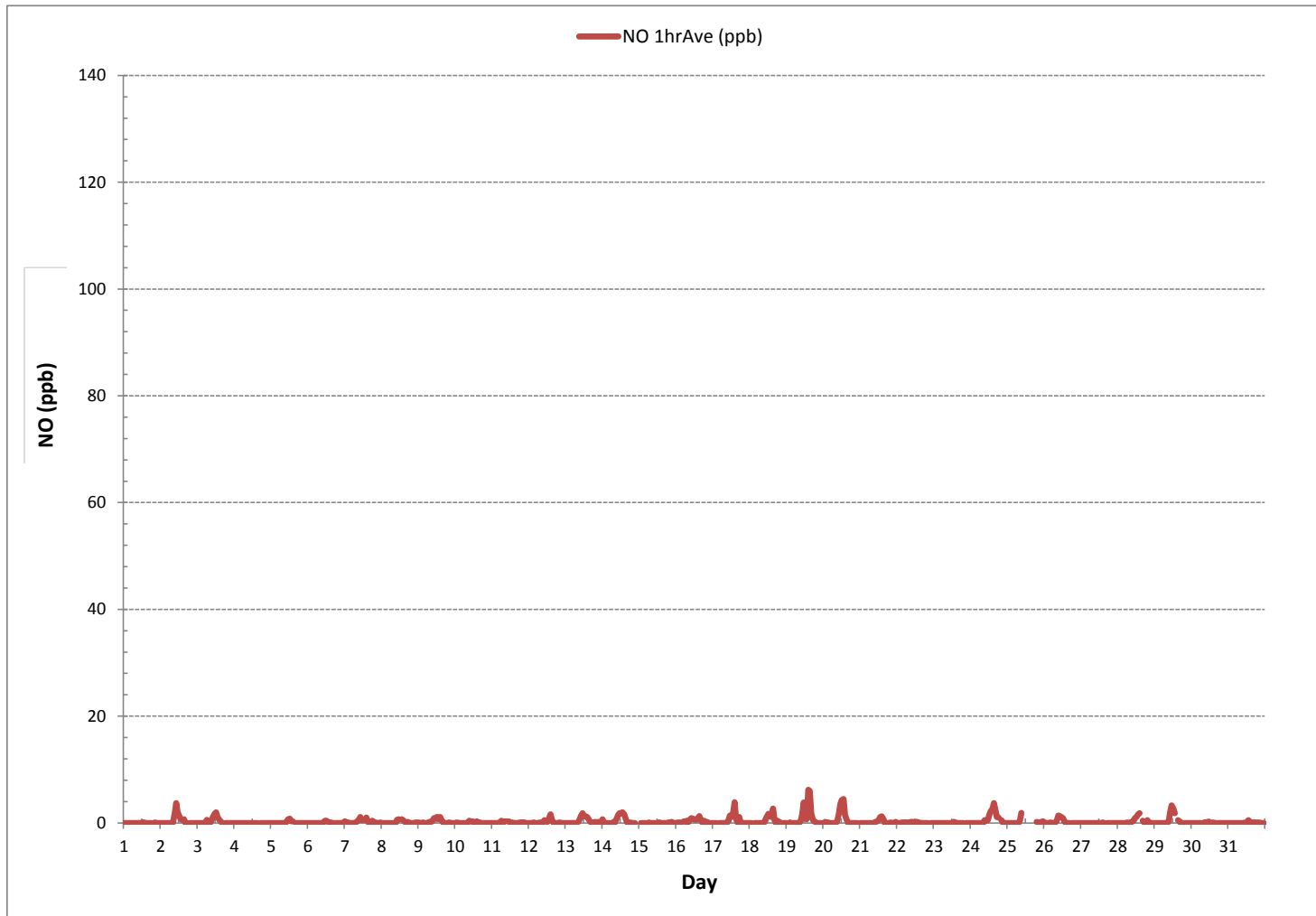
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	250			
MINIMUM 1-HR AVERAGE:	0.0	ppb @ HOUR(S)	VAR	ON DAY(S) ALL
MAXIMUM 1-HR AVERAGE:	6.2	ppb @ HOUR(S)	14	ON DAY(S) 19
MAXIMUM 24-HR AVERAGE:	1.0	ppb		ON DAY(S) 19
				VAR-VARIOUS
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	740
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	99.5
STANDARD DEVIATION:	0.7		MONTHLY AVERAGE:	0.3
				ppb

NITRIC OXIDE Hourly Averages (NO ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.6	0.7	1.4	0.6	0.6	0.4	0.5	0.3	S	0.5	0.4	0.2	0.4	0.2	1.4	0.4	24
2	0.3	0.3	0.5	0.3	0.4	0.3	0.4	0.5	1.4	3.4	5.2	3.4	1.9	1.4	1.4	1.7	1.0	0.5	S	0.5	0.5	0.6	0.5	0.5	0.3	5.2	1.2	24
3	0.5	0.4	0.3	0.5	0.6	0.4	41.2	0.7	0.6	1.1	9.0	6.3	13.1	9.2	1.4	4.9	0.7	S	1.0	0.5	0.5	0.5	0.3	0.1	0.1	41.2	4.1	24
4	0.3	0.3	0.5	0.6	0.4	0.5	0.4	0.3	0.5	0.4	0.5	0.6	1.3	0.5	0.3	1.5	S	0.7	0.7	10.5	0.5	0.3	0.2	0.2	0.2	10.5	1.0	24
5	0.2	0.5	0.5	0.5	0.6	0.6	0.6	0.3	0.4	0.3	1.1	1.6	1.4	1.2	1.1	S	0.7	0.5	0.6	0.4	0.2	0.5	0.4	0.5	0.2	1.6	0.6	24
6	0.5	0.3	0.3	0.6	0.6	0.4	0.3	0.5	0.4	0.6	0.8	1.0	1.0	0.7	S	0.7	0.5	0.3	0.5	0.4	0.5	0.6	0.4	0.5	0.3	1.0	0.5	24
7	0.6	0.6	0.6	0.4	0.2	0.5	0.6	0.6	1.3	1.3	2.6	0.8	1.0	S	16.8	0.6	0.8	0.7	9.6	0.5	0.7	0.3	0.6	0.6	0.2	16.8	1.8	24
8	0.5	0.4	0.5	0.4	0.4	0.3	0.6	0.4	0.5	0.6	1.3	1.3	S	2.0	1.3	0.7	0.3	17.7	0.5	0.2	0.5	0.5	1.3	0.3	0.2	17.7	1.4	24
9	0.6	0.5	0.6	0.6	0.4	0.4	0.5	4.7	1.3	1.2	33.8	S	13.1	1.7	22.5	2.4	2.3	0.4	0.6	0.3	0.6	0.6	0.5	0.6	0.3	33.8	3.9	24
10	0.4	16.9	0.4	0.3	0.4	0.6	0.3	0.4	0.3	3.8	S	2.2	0.5	1.3	3.4	1.1	9.6	1.2	1.1	0.6	0.6	0.3	0.3	0.3	0.3	16.9	2.0	24
11	0.3	0.5	0.6	0.5	0.5	0.9	19.3	0.7	14.6	S	7.8	10.0	2.5	0.7	0.6	0.9	0.4	0.4	0.9	0.4	0.6	2.1	0.4	0.4	0.3	19.3	2.9	24
12	0.4	0.6	0.4	0.4	0.4	0.4	0.4	0.6	S	0.5	1.2	0.8	0.9	1.9	2.4	1.5	0.6	0.6	0.4	0.6	0.6	0.5	0.5	0.6	0.4	2.4	0.7	24
13	0.5	0.6	0.6	0.6	0.4	0.5	0.6	S	1.3	1.5	2.6	2.7	7.1	5.4	2.9	1.2	1.3	0.5	0.6	1.1	0.9	0.8	0.7	0.6	0.4	7.1	1.5	24
14	40.5	0.4	0.6	0.4	0.6	0.6	S	0.7	0.6	1.5	2.1	7.3	2.6	2.9	2.4	1.5	6.8	0.4	0.6	0.6	0.6	0.4	P	P	0.4	40.5	3.5	22
15	P	1.1	0.4	0.9	0.6	S	0.8	0.4	0.4	0.4	0.6	0.6	0.6	0.9	0.7	0.5	0.4	0.5	0.5	0.6	8.3	4.0	0.7	0.2	0.2	8.3	1.1	23
16	0.7	0.5	0.2	0.5	S	0.7	0.6	1.9	1.5	1.8	1.3	1.3	1.0	1.3	1.1	27.0	23.7	10.3	9.8	0.6	2.1	0.6	0.2	0.5	0.2	27.0	3.9	24
17	0.4	0.2	0.4	S	0.7	0.4	0.7	0.7	0.4	0.3	2.6	9.9	1.9	13.6	46.0	2.5	0.9	53.9	2.5	2.8	0.3	0.2	1.6	0.3	0.2	53.9	6.2	24
18	0.3	0.2	S	0.5	0.5	0.4	0.6	0.6	0.6	0.8	1.3	2.6	19.4	1.9	27.2	46.8	15.6	1.5	26.8	21.0	0.6	0.6	0.3	0.6	0.2	46.8	7.4	24
19	0.6	S	0.7	0.6	0.6	0.4	4.9	1.0	0.7	1.1	2.5	26.6	16.6	1.9	104.5	43.5	2.6	1.6	0.8	0.7	0.7	0.7	0.5	0.4	104.5	9.3	24	
20	S	1.1	0.7	1.0	0.5	0.7	1.8	0.9	0.7	1.4	3.6	5.7	6.8	6.5	2.8	2.0	1.2	0.7	0.8	0.6	0.6	0.6	S	0.5	6.8	1.9	24	
21	1.1	0.6	0.8	0.6	0.5	0.6	0.5	0.4	0.5	1.0	1.0	1.2	1.5	2.6	3.4	3.3	0.7	0.7	0.6	0.6	0.8	0.6	S	0.8	0.4	3.4	1.1	24
22	0.6	0.8	0.8	0.7	0.7	0.7	0.9	0.7	0.9	1.0	0.8	0.8	0.9	0.9	0.8	0.9	0.6	0.6	0.6	0.7	0.6	S	0.7	0.8	0.6	1.0	0.8	24
23	0.7	0.9	0.9	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.7	0.9	0.9	1.1	0.9	0.9	0.6	0.8	0.7	2.2	S	0.9	0.5	0.7	0.5	2.2	0.8	24
24	0.6	0.5	0.8	0.6	0.6	0.7	0.6	0.6	0.8	3.2	3.6	3.3	4.6	4.1	3.6	5.9	4.8	30.0	7.7	S	16.2	1.0	1.8	1.0	0.5	30.0	4.2	24
25	0.7	0.7	0.7	1.0	1.0	0.8	1.0	0.8	31.4	7.1	C	C	C	C	C	C	C	21.5	S	2.3	1.3	1.9	19.5	17.0	0.7	31.4	6.8	24
26	1.1	1.0	1.0	1.0	17.4	1.2	0.9	1.3	1.8	2.7	2.4	2.1	2.1	7.4	1.2	0.8	6.6	S	0.9	1.4	0.7	0.7	1.0	0.8	0.7	17.4	2.5	24
27	0.9	0.8	1.1	0.8	0.8	1.1	0.8	1.4	0.7	0.9	1.0	1.0	1.2	1.3	7.7	0.9	S	0.9	1.0	0.7	1.0	1.0	0.8	1.1	0.7	7.7	1.3	24
28	0.8	0.8	0.8	1.0	0.8	0.8	1.6	0.8	0.8	4.0	1.6	2.1	2.0	2.6	6.1	S	1.3	0.9	0.7	39.5	1.0	0.7	0.7	0.7	0.7	39.5	3.1	24
29	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8	1.1	3.5	10.8	5.5	3.9	3.4	S	1.8	1.6	0.7	0.9	1.0	1.0	0.7	0.7	0.7	0.7	10.8	1.9	24
30	0.7	0.7	0.7	0.9	0.7	0.7	0.7	S1	S1	1.1	1.5	13.8	6.7	S	1.0	0.9	1.1	1.1	1.6	0.7	0.7	0.7	0.7	0.7	0.7	13.8	1.8	22
31	0.8	0.5	0.9	0.8	0.7	0.8	0.8	0.8	0.7	1.0	0.8	1.3	S	2.4	1.5	1.1	1.2	1.1	1.1	0.8	1.6	1.3	1.0	0.9	0.5	2.4	1.0	24
HOURLY MAX	40.5	16.9	1.1	1.0	17.4	1.2	41.2	4.7	31.4	7.1	33.8	26.6	19.4	13.6	104.5	46.8	23.7	53.9	26.8	39.5	16.2	4.0	19.5	17.0				
HOURLY AVG	2.0	1.1	0.6	0.6	1.1	0.6	2.8	0.8	2.3	1.6	3.6	4.0	4.2	2.9	9.5	5.6	3.2	5.2	2.6	3.2	1.5	0.8	1.3	1.1				

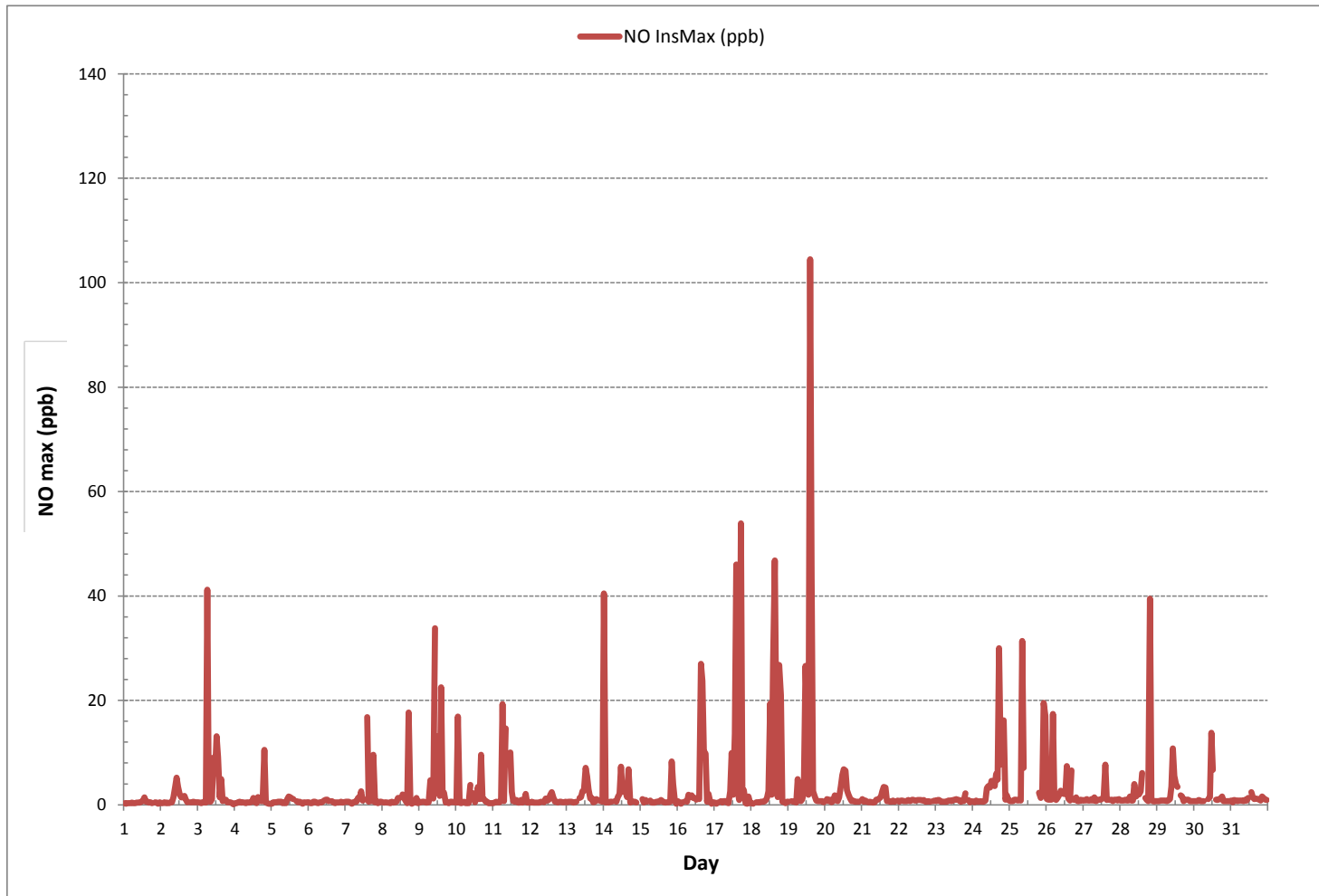
STATUS FLAG CODES

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:	700
MAXIMUM INSTANTANEOUS VALUE:	104.5 ppb @ HOUR(S) 14 ON DAY(S) 19
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	7.1
OPERATIONAL TIME:	739 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppb]

Direction	0.0-2.1	2.1-4.2	4.2-6.3	>6.3	Total
N	7.85	0	0	0	7.85
NE	12.84	0	0	0	12.84
E	37.23	1.43	0.29	0	38.95
SE	6.56	0.29	0	0	6.85
S	3.99	0	0	0	3.99
SW	5.99	0	0	0	5.99
W	11.7	0	0.29	0	11.99
NW	11.55	0	0	0	11.55
Summary	97.71	1.72	0.58	0	100

% Icon Classes (ppb)

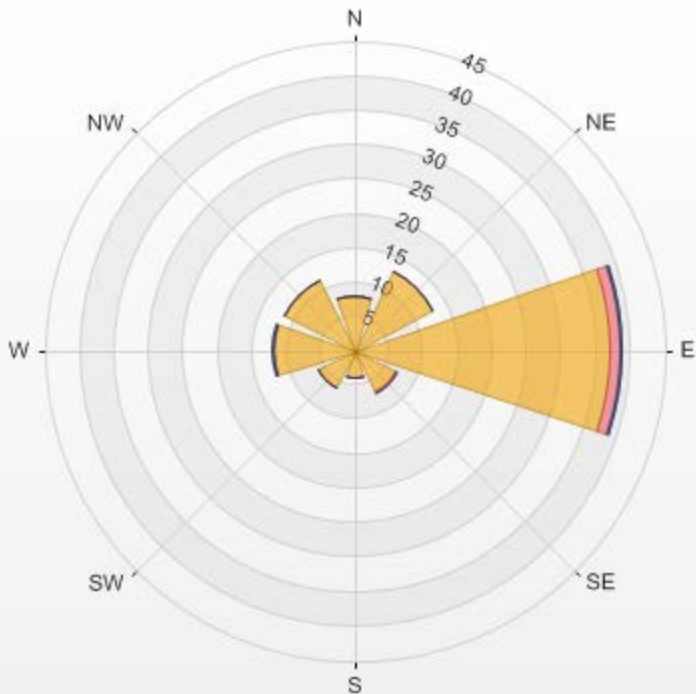
98 0.0-2.1

2 2.1-4.2

1 4.2-6.3

0 >6.3

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 01/01/2017 00:00 - 31/01/2017 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	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	S	0.4	0.2	0.4	0.4	0.0	0.4	0.1	24
2	0.3	0.9	0.5	0.4	0.9	2.1	1.9	5.9	12.9	12.2	9.8	5.0	3.0	2.4	3.3	6.7	9.3	7.3	S	3.1	2.3	2.2	1.8	0.9	0.3	12.9	4.1	24
3	1.7	2.2	1.8	1.9	1.5	1.6	3.6	3.8	3.9	4.0	3.9	4.6	4.9	3.7	3.9	5.1	6.2	S	3.2	1.9	1.4	0.6	0.2	0.0	0.0	6.2	2.9	24
4	0.1	0.0	0.3	0.4	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.1	0.2	0.2	0.0	0.7	S	0.4	0.7	1.2	1.5	1.1	1.1	1.1	0.0	1.5	0.4	24
5	1.4	3.0	5.3	6.2	6.2	6.5	6.8	2.3	1.7	1.7	2.6	4.0	3.3	2.5	2.9	S	3.3	2.1	2.1	1.0	1.8	3.3	3.3	4.5	1.0	6.8	3.4	24
6	1.7	1.1	1.3	1.3	0.5	0.6	0.5	0.4	0.3	0.7	1.5	2.0	1.9	1.0	S	1.3	1.6	1.3	1.9	4.7	4.9	4.9	5.4	5.1	0.3	5.4	2.0	24
7	3.8	7.0	9.8	8.1	5.9	4.7	5.1	5.2	6.3	6.0	4.8	2.3	2.0	S	1.9	1.6	2.2	3.0	4.8	4.8	2.7	1.5	1.4	1.5	1.4	9.8	4.2	24
8	2.0	3.6	3.3	2.3	1.8	1.6	1.6	1.4	1.6	1.9	2.8	2.9	S	2.6	2.5	2.1	2.0	2.5	2.2	2.0	2.6	2.2	2.5	2.1	1.4	3.6	2.3	24
9	2.6	2.8	2.4	2.2	2.3	2.2	2.2	2.5	2.3	2.4	2.2	S	2.3	2.0	3.0	3.0	2.7	1.8	1.4	1.7	1.6	1.9	2.1	1.8	1.4	3.0	2.2	24
10	1.1	1.7	1.2	1.1	0.9	0.6	0.3	0.6	0.9	3.1	S	1.6	0.6	1.0	0.8	0.8	0.9	1.1	0.8	0.8	0.7	1.4	1.8	1.9	0.3	3.1	1.1	24
11	2.2	5.1	7.2	10.4	9.4	9.2	7.8	3.4	1.5	S	0.5	0.6	0.4	0.1	0.1	0.4	0.3	0.2	0.5	0.3	0.3	0.3	0.3	0.3	0.1	10.4	2.6	24
12	0.3	0.5	0.5	0.4	0.3	0.6	1.6	1.0	S	0.6	1.5	0.9	0.7	1.8	4.1	4.2	4.5	3.6	3.0	2.6	2.5	2.3	2.4	2.7	0.3	4.5	1.9	24
13	2.8	2.9	3.3	3.9	5.2	5.7	5.6	S	7.4	6.8	5.3	4.7	3.3	3.7	4.2	5.0	6.1	7.5	11.0	16.8	14.6	8.6	5.7	4.5	2.8	16.8	6.3	24
14	4.9	5.3	6.3	6.0	5.7	5.5	S	5.5	6.6	6.5	7.1	6.8	6.2	5.9	6.5	7.3	8.2	8.7	7.7	6.5	6.8	5.8	P	P	4.9	8.7	6.5	22
15	P	6.2	6.2	5.0	3.2	S	1.3	0.9	0.7	0.7	0.9	0.8	0.7	0.7	0.5	0.5	1.1	1.3	1.1	1.4	1.2	1.3	1.4	1.1	0.5	6.2	1.7	23
16	5.3	7.2	7.4	6.6	S	3.2	3.3	3.9	5.0	5.3	5.0	4.3	4.1	4.4	5.0	6.0	6.8	7.0	6.0	4.6	4.8	4.1	3.5	3.5	3.2	7.4	5.1	24
17	4.3	4.6	4.7	S	4.4	4.0	5.3	4.4	3.4	2.6	3.0	4.8	4.7	7.4	10.3	8.8	9.7	9.5	6.3	5.3	4.2	6.2	6.3	4.8	2.6	10.3	5.6	24
18	5.0	6.3	S	5.2	4.6	4.2	6.4	5.6	3.9	3.9	3.5	2.8	3.0	3.2	3.9	6.1	7.3	7.9	7.4	7.1	4.6	4.5	3.9	3.2	2.8	7.9	4.9	24
19	3.1	S	3.7	4.2	4.2	4.1	4.2	5.6	4.7	4.6	6.0	7.0	5.5	5.4	8.8	12.0	14.4	16.9	14.8	14.9	15.0	15.9	12.9	9.0	3.1	16.9	8.6	24
20	S	7.1	5.6	3.4	4.4	5.6	5.5	4.1	3.9	3.8	5.3	6.8	8.5	9.4	5.8	6.1	6.3	3.9	2.7	2.3	1.6	1.8	1.6	S	1.6	9.4	4.8	24
21	1.1	1.1	1.1	1.8	3.3	2.0	1.2	1.0	0.9	3.0	1.8	2.0	1.6	2.4	3.3	3.8	3.7	5.0	4.2	2.6	2.8	3.1	S	1.9	0.9	5.0	2.4	24
22	2.0	1.7	1.2	1.1	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.9	0.7	0.8	0.6	1.1	1.3	1.3	1.6	1.7	1.4	S	3.1	0.8	0.6	3.1	1.2	24
23	0.6	0.3	0.5	0.4	0.5	0.3	0.4	0.5	0.7	0.6	0.5	0.5	0.3	0.6	0.5	0.7	0.4	0.6	0.7	0.8	S	0.6	0.3	0.3	0.3	0.8	0.5	24
24	0.1	0.2	0.4	0.2	0.5	1.1	0.9	0.9	1.1	2.3	1.6	1.6	2.1	3.2	4.6	8.3	12.6	15.2	15.4	S	15.5	17.1	15.6	13.6	0.1	17.1	5.8	24
25	12.4	11.1	11.7	12.7	12.9	13.1	12.8	11.0	10.7	7.7	C	C	C	C	C	C	C	13.8	S	9.5	9.1	9.3	9.6	10.6	7.7	13.8	11.1	24
26	11.7	12.3	12.5	12.8	13.6	15.2	15.6	12.9	11.0	7.8	4.9	3.7	3.3	2.4	1.2	0.5	0.9	S	2.1	2.5	2.0	1.7	1.6	1.5	0.5	15.6	6.7	24
27	1.3	0.9	0.7	0.3	0.2	0.1	0.1	0.2	0.0	0.2	0.3	0.3	0.6	1.3	1.8	1.8	S	4.2	3.1	2.4	1.6	1.3	1.1	1.1	0.0	4.2	1.1	24
28	0.9	0.8	0.6	0.5	0.5	0.6	1.2	1.2	1.4	1.7	2.1	4.0	4.5	5.7	6.2	S	6.4	6.6	6.5	7.1	4.2	1.8	0.8	0.8	0.5	7.1	2.9	24
29	0.8	0.7	0.5	0.4	0.3	0.4	0.6	0.8	0.8	1.7	4.7	7.0	6.3	5.1	S	4.7	5.9	6.8	8.3	9.2	7.4	4.0	0.7	0.2	0.2	9.2	3.4	24
30	0.2	0.2	0.3	0.4	0.3	0.1	0.1	S1	0.3	0.4	0.2	0.4	0.4	S	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.3	0.2	0.2	0.0	0.4	0.2	23
31	0.2	0.0	0.2	0.3	0.2	0.3	1.0	1.2	0.4	0.5	0.6	0.7	S	0.5	0.3	0.3	0.4	0.4	0.5	0.8	0.8	0.9	0.9	0.7	0.0	1.2	0.5	24
HOURLY MAX	12.4	12.3	12.5	12.8	13.6	15.2	15.6	12.9	12.9	12.2	9.8	7.0	8.5	9.4	10.3	12.0	14.4	16.9	15.4	16.8	15.5	17.1	15.6	13.6				
HOURLY AVG	2.5	3.2	3.4	3.3	3.2	3.2	3.3	3.0	3.2	3.1	2.9	2.9	2.7	2.8	3.1	3.6	4.5	4.8	4.2	4.1	4.0	3.7	3.2	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

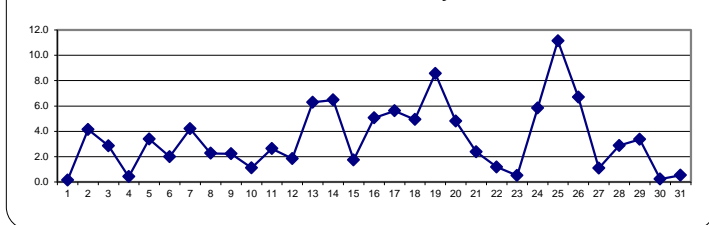
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

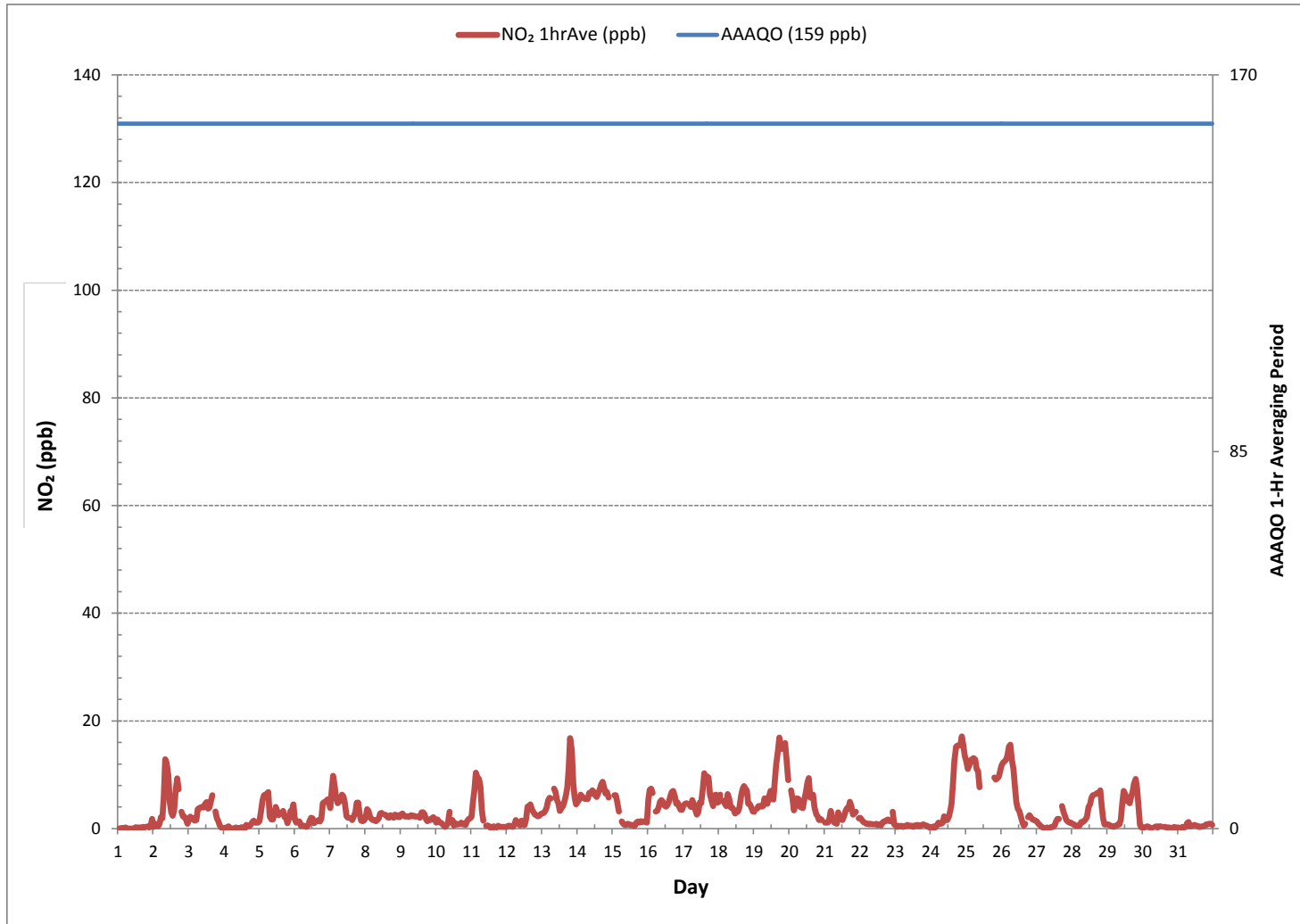
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	684			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	17.1 ppb	@ HOUR(S)	21	ON DAY(S) 24
MAXIMUM 24-HR AVERAGE:	11.1 ppb			ON DAY(S) 25
				VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	740 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	99.5 %	
STANDARD DEVIATION:	3.5	MONTHLY AVERAGE:	3.4 ppb	

24 HR AVERAGES January 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - January 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	0.6	0.9	0.9	0.6	0.6	0.7	0.7	0.7	0.5	0.7	0.7	0.7	1.0	1.1	0.9	0.7	0.7	1.6	0.6	S	0.6	0.8	1.1	1.1	0.5	1.6	0.8	24
2	1.1	1.7	0.8	0.9	3.2	3.4	2.5	10.4	15.0	14.9	12.5	7.2	3.4	2.8	4.5	8.5	10.1	9.9	S	4.2	3.0	3.1	2.9	1.7	0.8	15.0	5.6	24
3	3.0	3.1	2.6	2.9	2.6	2.6	27.5	4.6	5.0	4.7	9.6	9.7	15.2	10.8	5.0	14.3	7.6	S	4.9	3.1	2.5	1.9	1.3	1.1	1.1	27.5	6.3	24
4	1.1	1.1	1.4	1.2	0.9	0.9	0.7	0.9	0.9	0.7	0.9	0.7	1.5	1.0	1.2	3.3	S	0.7	1.9	10.4	2.4	1.9	2.0	1.9	0.7	10.4	1.7	24
5	2.4	4.4	6.8	7.3	7.2	9.2	9.5	4.5	2.8	2.5	3.9	4.8	4.7	3.2	3.9	S	4.1	3.2	3.6	3.0	4.0	4.0	4.1	6.0	2.4	9.5	4.7	24
6	4.7	1.9	2.2	2.0	1.3	1.3	1.2	1.2	0.9	1.5	2.5	2.5	2.3	1.3	S	1.7	2.0	1.8	3.5	6.0	5.8	5.7	5.9	6.0	0.9	6.0	2.8	24
7	4.8	10.5	10.7	9.6	7.8	5.3	5.5	5.8	7.9	7.9	7.9	3.4	2.5	S	14.6	2.2	3.0	4.7	15.0	5.5	5.4	2.2	1.7	1.8	1.7	15.0	6.3	24
8	3.6	4.3	4.1	3.1	2.4	2.3	2.1	2.2	2.6	4.1	3.4	S	4.2	3.0	3.0	2.6	21.0	2.5	2.7	4.2	2.7	3.1	2.8	2.1	21.0	3.8	24	
9	3.2	3.2	2.8	2.8	2.8	2.6	2.6	9.4	3.6	3.1	11.3	S	10.4	2.5	16.8	4.5	4.9	2.4	2.7	2.2	1.9	2.6	2.5	2.5	1.9	16.8	4.5	24
10	1.7	17.4	1.8	1.7	1.5	1.1	1.1	1.4	1.8	9.0	S	3.1	1.1	1.4	1.5	2.1	4.6	2.2	1.6	1.3	1.4	2.4	2.5	3.0	1.1	17.4	2.9	24
11	3.8	7.0	8.9	11.5	10.8	10.4	8.8	7.1	7.2	S	2.3	5.5	3.7	0.6	0.6	1.4	0.8	1.0	1.5	0.9	0.8	1.5	0.9	0.7	0.6	11.5	4.2	24
12	0.9	1.1	1.0	0.8	0.9	1.3	2.3	1.9	S	1.1	2.1	1.8	1.1	3.9	5.1	4.7	5.5	5.3	3.7	3.3	3.2	3.0	3.3	3.7	0.8	5.5	2.7	24
13	3.7	3.7	4.3	5.4	6.6	6.6	6.6	S	8.5	7.6	7.0	5.8	8.9	10.3	5.4	6.6	7.6	10.1	14.3	19.8	19.5	12.5	8.0	5.9	3.7	19.8	8.5	24
14	31.2	7.3	7.7	7.5	7.8	7.2	S	7.0	8.5	7.9	8.7	9.3	7.9	7.9	8.1	9.0	10.1	10.4	9.8	7.8	8.3	7.2	P	P	7.0	31.2	9.4	22
15	P	8.2	7.8	7.6	6.5	S	2.2	2.1	1.8	1.9	1.9	1.7	1.6	2.3	1.9	1.6	2.3	2.5	2.3	2.6	2.9	11.4	2.6	2.6	1.6	11.4	3.6	23
16	9.1	8.5	9.4	9.1	S	4.7	4.6	5.9	7.7	7.5	6.6	5.6	5.3	5.8	6.3	21.7	18.0	17.5	16.5	6.0	8.2	5.3	4.9	5.1	4.6	21.7	8.7	24
17	5.4	5.9	6.1	S	5.3	5.8	6.4	6.0	5.5	4.2	5.5	11.5	6.4	32.5	27.4	11.9	11.5	20.2	8.9	7.3	6.6	8.5	9.7	6.5	4.2	32.5	9.8	24
18	6.6	8.3	S	6.5	6.1	6.4	8.1	7.8	5.1	5.3	4.8	4.9	16.3	4.5	12.3	26.8	22.6	9.5	16.0	18.5	6.7	5.8	4.3	4.3	26.8	9.5	24	
19	5.0	S	4.8	5.4	5.7	5.6	5.5	8.5	7.2	7.3	7.3	29.8	8.0	7.0	32.9	22.5	19.6	20.1	16.7	16.7	17.7	17.7	16.9	11.6	4.8	32.9	13.0	24
20	S	9.1	8.3	5.9	7.8	8.1	7.8	6.1	5.9	5.4	8.0	8.6	12.5	11.4	7.9	8.1	9.0	6.3	4.6	4.2	4.1	3.8	3.5	S	3.5	12.5	7.1	24
21	2.7	3.0	2.7	4.3	5.0	4.1	2.8	2.5	3.0	4.5	3.4	3.0	2.8	4.5	6.4	6.6	5.4	6.1	5.8	4.0	3.8	4.1	S	2.8	2.5	6.6	4.1	24
22	2.8	2.7	2.2	2.1	2.0	1.9	2.0	1.8	2.0	1.8	1.7	1.9	1.7	1.9	1.7	2.2	2.4	2.2	2.7	2.8	2.7	S	4.8	1.4	1.4	4.8	2.2	24
23	1.4	1.1	1.2	1.2	1.2	1.4	1.4	1.5	1.6	1.5	1.2	1.2	1.2	1.4	1.4	1.7	1.7	1.5	1.7	3.0	S	1.4	1.1	1.1	1.1	3.0	1.4	24
24	1.1	1.1	1.3	1.3	1.6	2.1	2.2	2.4	2.3	5.2	3.8	3.4	4.1	4.8	6.4	10.6	16.0	21.1	18.9	S	24.7	18.2	17.3	14.6	1.1	24.7	8.0	24
25	14.1	12.4	13.0	13.6	13.6	13.8	14.0	12.1	20.0	9.2	C	C	C	C	C	C	C	20.6	S	10.2	9.6	10.4	18.0	17.2	9.2	20.6	13.9	24
26	12.5	12.8	13.1	13.3	20.2	15.9	16.1	14.3	12.4	9.4	5.8	4.4	3.5	13.8	1.6	1.0	10.0	S	2.4	3.0	2.4	2.2	2.2	1.9	1.0	20.2	8.4	24
27	1.9	1.5	1.2	0.9	0.6	0.7	0.6	0.6	0.6	0.8	0.6	0.6	1.1	1.7	6.6	2.2	S	4.7	3.5	3.1	1.9	1.7	1.5	1.3	0.6	6.6	1.7	24
28	1.2	0.9	0.9	0.7	0.7	0.9	1.5	1.3	1.6	6.6	2.5	4.7	4.9	5.9	11.0	S	6.6	6.6	6.4	26.7	5.6	2.6	0.8	0.8	0.7	26.7	4.4	24
29	0.8	0.9	0.5	0.4	0.4	0.4	0.9	0.9	1.3	9.6	7.2	7.5	6.6	6.6	S	5.7	6.2	7.8	10.2	9.8	7.8	6.5	1.9	0.5	0.4	10.2	4.4	24
30	0.6	0.5	0.6	0.7	0.6	0.4	0.6	S1	S1	0.6	0.5	9.1	7.8	S	0.4	0.3	0.6	0.0	0.5	0.1	0.0	0.3	0.2	0.0	0.0	9.1	1.2	22
31	0.1	0.0	0.1	0.0	0.0	0.3	1.3	1.2	0.4	0.3	0.4	0.3	S	1.3	0.1	0.1	0.4	0.4	0.7	0.9	0.7	0.9	0.9	0.7	0.0	1.3	0.5	24
HOURLY MAX	31.2	17.4	13.1	13.6	20.2	15.9	27.5	14.3	20.0	14.9	12.5	29.8	16.3	32.5	32.9	26.8	22.6	21.1	18.9	26.7	24.7	18.2	18.0	17.2				
HOURLY AVG	4.5	4.8	4.3	4.3	4.5	4.2	5.0	4.6	4.9	4.8	4.6	5.4	5.3	5.6	7.0	6.6	7.0	7.6	6.3	6.5	5.6	5.1	4.5	3.8				

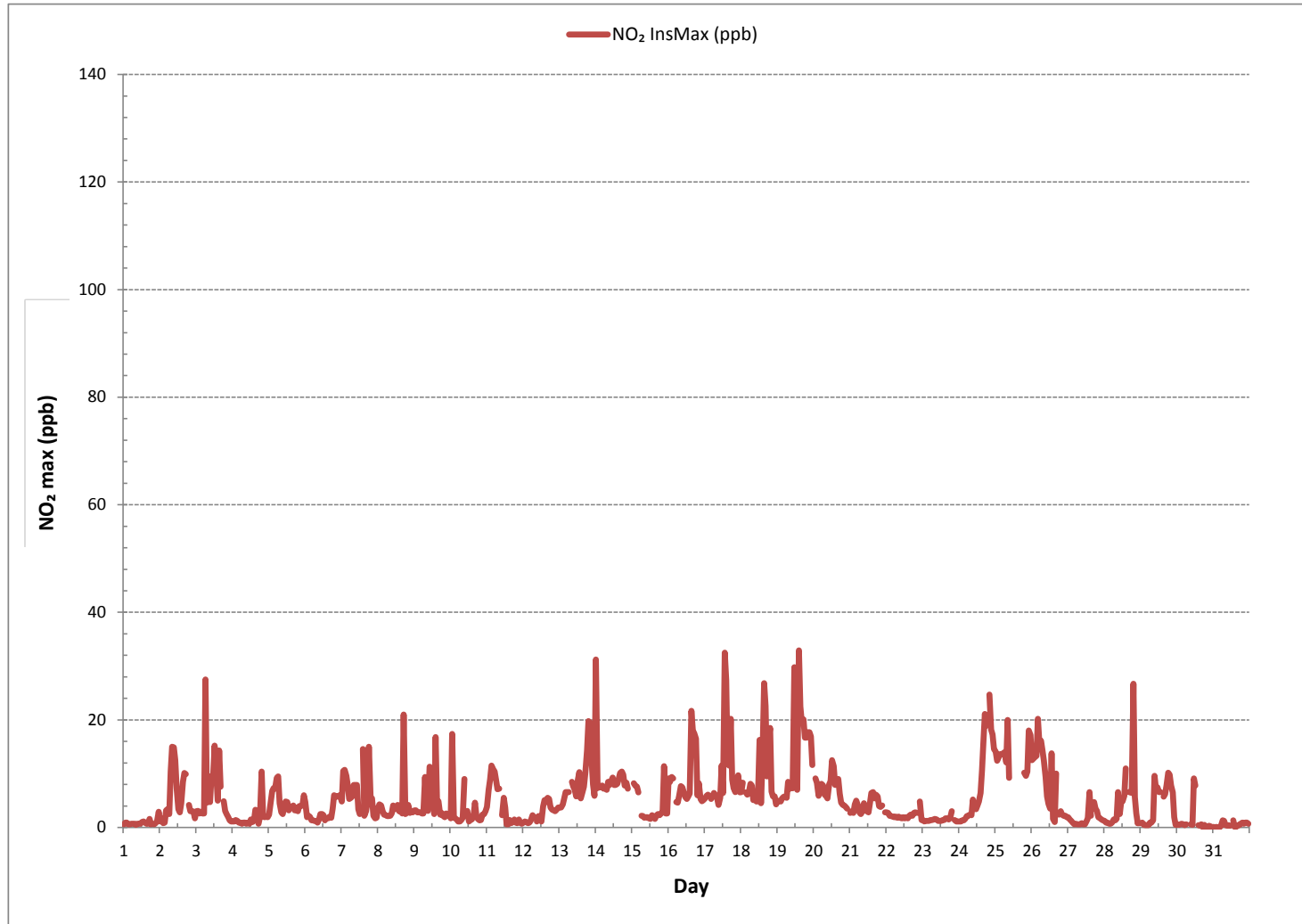
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	694
MAXIMUM INSTANTANEOUS VALUE:	32.9 ppb @ HOUR(S) 14 ON DAY(S) 19
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	739 hrs
STANDARD DEVIATION:	5.3

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

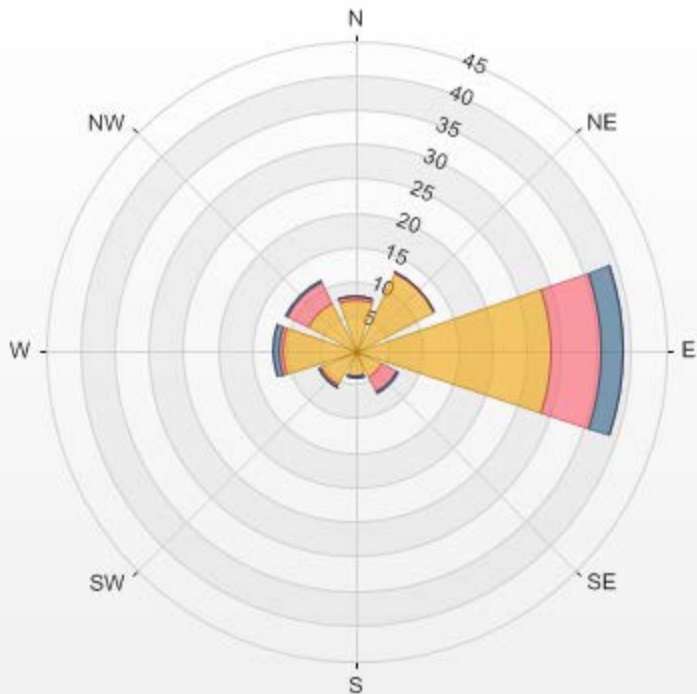


Wind: LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ppb]

Direction	0.0-5.7	5.7-11.5	11.5-17.2	>17.2	Total
N	7.42	0.43	0	0	7.85
NE	12.7	0.14	0	0	12.84
E	28.39	7.28	3.28	0	38.95
SE	4.42	2.14	0.29	0	6.85
S	3.71	0.14	0.14	0	3.99
SW	5.56	0.29	0.14	0	5.99
W	10.7	0.57	0.71	0	11.98
NW	7.56	3.71	0.29	0	11.56
Summary	80.46	14.7	4.85	0	100

% Icon Classes (ppb) 80 0.0-5.7 15 5.7-11.5 5 11.5-17.2 0 >17.2

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 0.00%



NO2[ppb] Calibration: LICA ST. LINA Monthly: 2017/01 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	34.8	34.5	34.2	34.8	34.8	34.7	34.7	34.5	34.2	33.9	33.9	34.3	34.4	34.6	34.3	34.5	34.6	34.5	34.5	S	34.5	34.7	34.3	34.4	33.9	34.8	34.5	24
2	34.1	33.1	34.1	33.7	33.2	31.9	31.7	24.2	16.8	18.0	21.7	27.3	29.7	30.4	29.0	24.5	21.5	23.4	S	30.1	30.6	29.8	30.0	31.0	16.8	34.1	28.3	24
3	30.2	29.3	29.2	28.8	29.3	28.8	25.3	23.1	20.8	19.6	19.3	19.6	21.7	25.0	24.9	24.5	23.6	S	27.5	28.5	28.8	31.5	32.8	33.3	19.3	33.3	26.3	24
4	33.3	33.9	32.1	31.4	32.9	33.5	33.4	33.4	33.6	34.0	34.5	34.6	34.2	33.6	33.3	32.6	S	32.8	32.4	31.3	30.3	30.3	29.8	30.9	29.8	34.6	32.7	24
5	28.3	25.4	22.1	21.2	21.2	20.4	21.0	26.5	26.1	25.7	24.9	24.2	25.2	26.6	26.2	S	27.3	28.9	28.6	29.0	27.4	25.6	25.3	23.5	20.4	29.0	25.2	24
6	28.9	30.0	29.4	29.5	30.2	30.7	31.1	31.6	31.6	31.5	30.1	29.4	29.1	30.6	S	31.4	31.2	31.4	30.4	26.9	26.3	26.8	25.9	26.8	25.9	31.6	29.6	24
7	28.6	22.6	19.6	22.2	25.5	27.2	26.3	25.6	23.3	22.9	24.6	28.3	28.5	S	28.4	27.5	24.8	22.5	20.9	20.9	26.6	28.5	27.7	28.1	19.6	28.6	25.3	24
8	26.5	22.7	23.8	26.7	28.3	28.8	28.7	29.4	30.4	30.2	28.8	28.6	S	29.6	30.4	31.0	30.2	29.6	28.8	28.0	27.9	27.8	27.3	28.6	22.7	31.0	28.4	24
9	28.1	27.2	27.2	27.0	26.6	26.7	26.1	25.2	25.6	25.1	25.3	S	25.6	25.7	24.3	24.2	25.0	27.1	28.8	27.8	27.5	27.0	27.0	28.2	24.2	28.8	26.4	24
10	31.0	32.2	32.7	32.5	32.8	33.3	33.2	33.0	32.2	31.1	S	32.6	33.2	32.8	33.1	32.3	32.1	31.6	31.8	32.1	32.0	30.8	30.1	29.9	29.9	33.3	32.1	24
11	29.4	26.0	23.6	21.3	22.7	23.2	24.7	31.0	33.8	S	37.4	38.4	38.7	39.6	40.4	40.0	37.1	34.8	33.2	32.6	31.8	31.0	30.9	30.8	21.3	40.4	31.8	24
12	30.5	30.2	30.4	30.6	30.5	29.6	27.1	28.4	S	29.8	29.1	30.5	31.6	31.6	29.1	29.2	28.7	30.1	31.2	32.5	32.4	32.3	32.3	32.5	27.1	32.5	30.4	24
13	32.4	32.5	31.9	30.4	28.5	27.0	S	25.2	26.4	29.1	30.3	34.8	34.6	33.9	33.3	32.1	29.9	26.0	20.4	23.3	29.0	32.1	33.2	20.4	34.8	29.7	24	
14	31.9	29.8	27.8	28.2	28.9	28.8	S	28.8	27.2	28.2	29.7	30.0	31.4	33.0	34.6	33.7	33.3	32.3	32.9	33.3	32.4	33.0	P	P	27.2	34.6	30.9	22
15	P	29.1	28.8	30.7	33.5	S	37.3	37.3	37.8	37.4	37.9	38.6	38.6	38.6	38.6	38.5	38.3	38.7	38.5	37.7	36.9	36.4	35.7	35.7	28.8	38.7	36.4	23
16	29.3	26.7	25.8	27.3	S	30.3	30.4	29.3	28.3	29.0	30.4	32.7	33.7	34.7	34.8	34.4	34.0	33.8	34.2	34.6	34.0	34.7	34.6	33.6	25.8	34.8	31.8	24
17	31.7	30.1	29.3	S	28.9	28.7	27.5	28.6	30.4	31.8	29.8	27.5	28.0	26.2	22.8	23.4	22.2	21.6	24.2	24.9	25.7	20.7	19.7	20.5	19.7	31.8	26.3	24
18	19.9	17.4	S	18.8	20.0	20.8	17.5	20.5	23.1	24.1	24.4	24.9	26.2	27.2	27.2	26.1	22.0	20.2	21.8	21.0	24.2	25.1	26.0	27.5	17.4	27.5	22.9	24
19	25.9	S	22.6	20.5	18.9	17.3	17.0	17.0	16.0	14.4	14.6	15.6	20.2	22.8	14.1	11.2	7.6	4.7	5.5	5.5	7.4	6.2	9.4	13.1	4.7	25.9	14.2	24
20	S	14.7	18.6	24.0	18.5	16.2	16.9	20.8	22.1	23.1	18.4	16.8	17.8	20.5	29.3	26.8	24.9	30.9	33.2	32.9	34.6	34.2	35.0	S	14.7	35.0	24.1	24
21	37.1	36.1	35.2	30.9	24.9	32.9	34.8	35.6	35.4	32.1	31.1	29.2	21.0	19.6	20.7	20.0	17.9	14.4	15.7	18.6	18.0	16.8	S	20.0	14.4	37.1	26.0	24
22	20.6	21.9	24.1	26.0	26.3	25.8	24.9	25.3	25.5	25.3	24.1	24.5	24.6	24.6	24.6	23.7	22.9	22.2	21.2	20.6	21.7	S	20.8	23.2	20.6	26.3	23.7	24
23	23.1	23.4	22.8	22.5	22.5	22.5	22.7	22.0	21.3	21.2	21.3	23.5	24.5	23.6	24.2	24.3	25.2	25.1	24.6	25.3	S	25.1	25.1	25.3	21.2	25.3	23.5	24
24	25.6	25.3	25.1	25.4	24.9	24.1	24.4	24.4	24.0	22.8	22.8	21.7	19.3	C	C	C	C	7.1	6.6	S	5.6	4.5	6.0	7.1	4.5	25.6	18.2	24
25	7.5	8.1	7.1	6.3	6.0	5.9	6.0	7.4	8.3	11.4	12.9	13.9	15.0	15.1	14.4	12.4	9.5	7.5	S	13.7	15.1	14.6	13.2	11.3	5.9	15.1	10.5	24
26	9.6	8.5	8.4	8.3	8.2	8.2	9.8	15.0	16.6	20.7	25.6	27.3	28.2	32.0	36.3	36.1	35.7	S	33.1	33.2	33.3	32.8	33.4	34.6	8.2	36.3	23.3	24
27	35.4	35.3	36.2	36.3	36.1	35.5	35.2	35.0	34.7	34.4	34.8	35.7	35.7	35.1	35.4	36.0	S	34.3	35.3	35.3	37.1	37.2	37.2	37.2	34.3	37.2	35.7	24
28	36.9	37.1	37.1	37.3	37.5	36.7	34.9	34.4	34.3	34.2	33.5	31.8	32.3	31.4	31.3	S	28.6	26.4	25.7	25.6	31.8	36.0	38.2	37.6	25.6	38.2	33.5	24
29	37.3	37.2	38.0	38.8	38.8	37.9	36.5	35.9	35.7	34.0	28.2	29.4	33.0	35.0	S	35.7	34.3	32.4	29.4	26.7	27.5	32.0	38.8	38.9	26.7	38.9	34.4	24
30	37.4	36.8	35.9	35.1	35.0	34.9	34.6	33.8	32.8	33.2	33.4	34.5	36.9	S	37.9	38.4	38.3	38.2	38.2	38.4	38.3	38.0	35.4	32.9	32.8	38.4	36.0	24
31	31.1	30.2	29.0	28.7	28.9	28.3	26.5	26.6	28.0	28.4	29.2	30.3	S	31.6	32.4	33.3	32.7	32.1	31.9	31.8	31.9	31.7	32.2	31.2	26.5	33.3	30.3	24
HOURLY MAX	37.4	37.2	38.0	38.8	38.8	37.9	37.3	37.3	37.8	37.4	37.9	38.6	38.7	39.6	40.4	40.0	38.3	38.7	38.5	38.4	38.3	38.0	38.8	38.9				
HOURLY AVG	28.8	27.6	27.4	27.2	27.1	27.0	26.9	27.5	27.2	27.1	27.4	28.2	28.7	29.5	29.5	29.3	27.7	26.8	27.8	27.6	27.8	28.1	28.5	28.3				

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

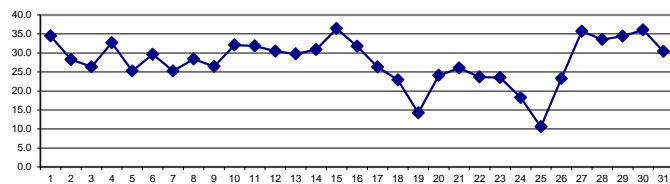
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

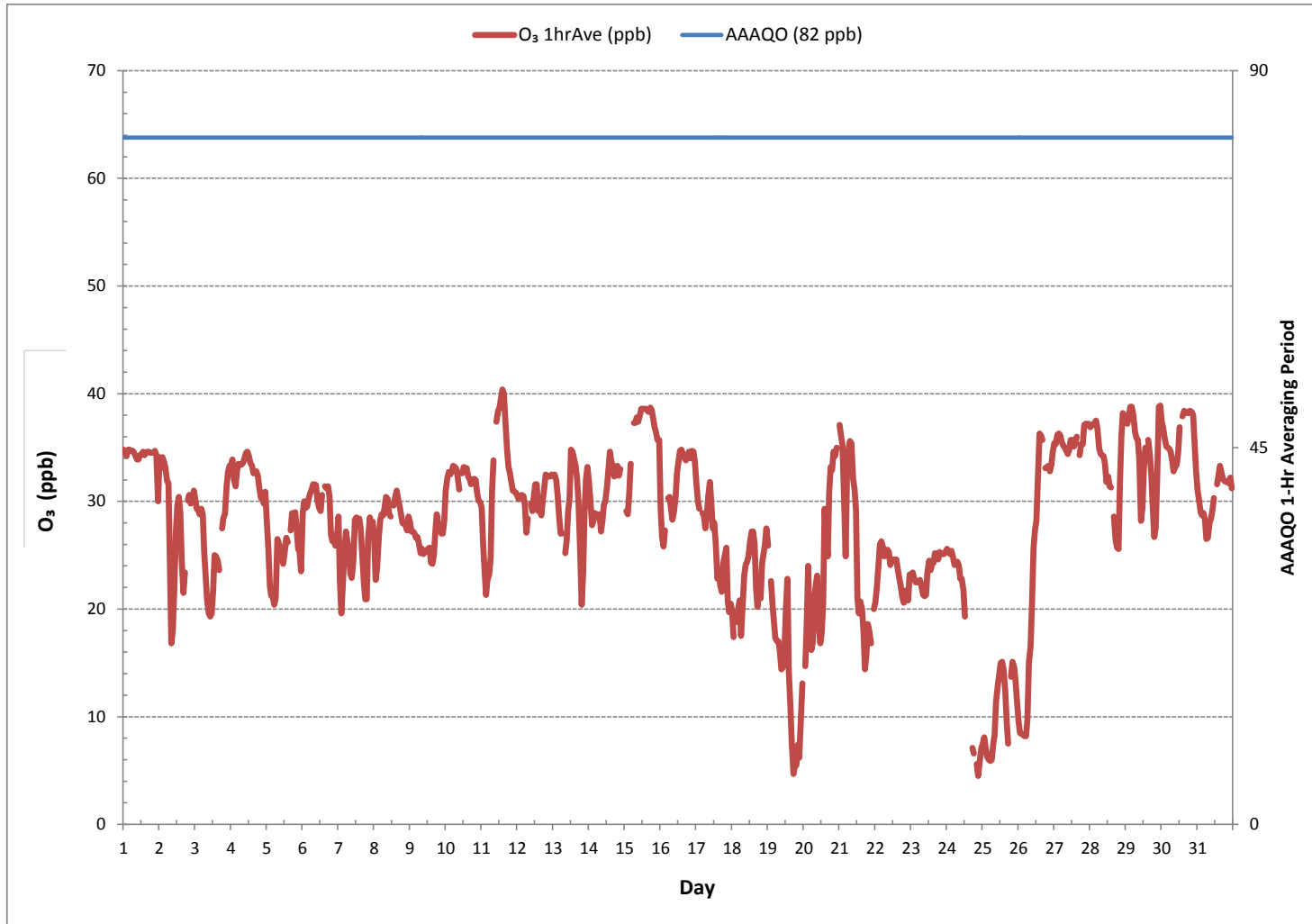
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	705				
MINIMUM 1-HR AVERAGE:	4.5 ppb	@ HOUR(S)	21	ON DAY(S)	24
MAXIMUM 1-HR AVERAGE:	40.4 ppb	@ HOUR(S)	14	ON DAY(S)	11
MAXIMUM 24-HR AVERAGE:	36.4 ppb			ON DAY(S)	15
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	741 hrs		
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.6 %		
STANDARD DEVIATION:	7.3	MONTHLY AVERAGE:	27.9 ppb		

24 HR AVERAGES January 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - January 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	37.0	36.7	36.7	37.0	37.1	37.0	37.0	36.7	36.5	36.3	36.5	36.6	36.8	37.2	36.6	36.7	37.0	37.0	36.9	S	36.9	37.0	36.9	37.0	36.3	37.2	36.8	24
2	36.9	35.6	36.2	35.8	36.0	34.8	34.0	33.6	20.7	22.7	26.5	30.6	31.8	32.5	31.5	29.4	24.0	25.9	S	32.2	32.7	31.8	32.4	32.9	20.7	36.9	31.3	24
3	32.4	31.0	30.9	30.9	31.2	30.9	29.3	26.0	22.8	21.8	21.0	22.1	25.7	27.4	26.8	26.6	25.7	S	29.8	30.2	31.7	34.2	34.7	35.4	21.0	35.4	28.6	24
4	35.6	35.8	35.4	34.0	35.1	35.4	35.3	35.4	36.0	36.3	36.6	36.7	36.6	35.8	35.7	35.4	S	35.0	34.8	34.7	32.6	32.6	32.2	33.3	32.2	36.7	35.1	24
5	30.9	29.4	25.5	23.2	23.2	23.1	26.8	28.9	28.4	27.7	27.0	26.4	27.4	28.5	28.2	S	29.8	31.8	31.8	31.2	30.5	27.6	27.2	26.9	23.1	31.8	27.9	24
6	32.2	32.2	31.6	32.2	32.3	32.9	33.5	33.8	33.9	33.8	32.9	31.7	31.9	33.1	S	33.8	33.6	33.8	33.5	30.3	28.9	29.7	28.4	30.6	28.4	33.9	32.2	24
7	31.4	29.2	22.6	25.7	29.2	29.8	28.5	27.8	26.6	25.0	29.5	30.5	30.6	S	30.8	30.1	27.8	25.9	23.4	23.2	30.9	30.9	29.8	30.3	22.6	31.4	28.2	24
8	30.1	25.2	27.3	29.4	30.5	30.9	30.8	31.8	32.5	32.5	31.4	31.0	S	32.1	33.1	33.2	32.2	31.9	31.2	30.0	30.1	29.8	29.7	30.6	25.2	33.2	30.8	24
9	30.4	29.2	29.1	28.8	28.3	28.5	28.4	27.0	27.3	26.9	27.4	S	27.4	27.6	26.6	26.0	27.7	30.6	30.9	30.0	29.4	29.1	29.2	30.9	26.0	30.9	28.6	24
10	33.5	34.4	34.8	34.5	35.0	35.6	35.3	35.3	34.8	50.0	S	35.1	35.8	35.3	35.6	35.3	34.9	34.2	34.3	34.6	34.3	34.0	32.7	32.4	32.4	50.0	35.3	24
11	32.4	30.3	26.4	24.8	26.0	27.0	28.8	35.4	37.5	S	40.5	41.1	41.3	42.7	45.0	43.9	42.3	38.4	35.8	35.2	34.4	33.4	33.2	33.0	24.8	45.0	35.2	24
12	33.0	32.6	32.7	32.9	32.7	32.5	30.3	31.2	S	31.9	31.8	33.0	34.1	34.3	31.9	31.5	31.9	33.1	33.9	34.6	34.4	34.3	34.6	34.4	30.3	34.6	32.9	24
13	34.4	34.3	34.2	32.9	31.4	29.2	29.1	S	27.6	29.0	31.4	34.6	37.3	37.2	36.0	35.8	34.4	33.2	30.3	25.2	28.3	32.6	34.9	35.4	25.2	37.3	32.6	24
14	34.9	33.9	30.0	30.6	31.7	31.4	S	31.4	30.4	31.5	32.4	32.9	34.3	36.6	37.5	36.2	36.0	35.6	36.0	36.1	35.3	35.8	P	P	30.0	37.5	33.8	22
15	P	32.7	32.4	35.6	40.2	S	40.3	40.4	40.6	40.5	41.1	41.5	41.4	41.3	41.5	41.4	41.3	41.4	41.2	40.7	39.8	39.2	38.6	38.5	32.4	41.5	39.6	23
16	37.5	29.3	28.9	31.0	S	33.2	33.4	32.7	31.3	32.2	34.2	35.6	36.8	37.5	37.6	37.9	37.0	36.6	37.2	37.3	37.1	37.3	37.3	37.0	28.9	37.9	35.0	24
17	35.2	33.4	32.2	S	31.7	31.7	30.6	32.1	33.6	34.4	33.9	30.6	30.6	29.3	28.0	27.0	24.9	24.5	26.9	27.3	28.6	24.4	21.5	22.3	21.5	35.2	29.3	24
18	21.7	20.0	S	20.2	22.3	23.5	19.4	24.2	25.1	26.0	26.2	27.1	28.9	29.3	29.3	29.2	29.1	23.5	24.4	23.9	26.6	27.2	29.5	31.3	19.4	31.3	25.6	24
19	28.6	S	25.7	23.8	22.1	19.1	19.6	19.6	18.9	17.4	16.9	18.3	23.5	25.2	24.4	15.2	14.1	6.7	7.1	8.2	9.3	7.5	13.3	14.8	6.7	28.6	17.4	24
20	S	17.4	22.4	27.3	26.7	18.7	21.0	23.8	25.4	27.1	26.1	19.9	20.2	31.8	34.4	31.7	30.8	35.3	36.3	36.3	40.9	37.9	38.5	S	17.4	40.9	28.6	24
21	41.8	39.7	39.1	37.3	31.4	37.5	37.7	40.6	40.0	34.7	33.5	32.5	26.8	21.8	22.7	22.5	20.6	16.9	18.4	20.1	19.6	18.5	S	21.3	16.9	41.8	29.3	24
22	21.8	23.8	26.1	27.6	27.6	27.2	26.5	27.3	27.2	27.3	25.9	26.1	26.1	26.4	26.3	25.9	25.0	24.4	23.4	23.1	23.9	S	25.1	25.0	21.8	27.6	25.6	24
23	25.0	25.4	24.7	24.3	24.4	24.7	24.9	24.3	23.4	23.4	23.4	26.4	26.9	26.0	26.8	26.8	28.0	27.6	27.2	27.7	S	26.9	26.9	26.9	23.4	28.0	25.7	24
24	27.0	26.6	26.2	26.4	26.0	25.0	25.0	24.9	24.3	23.7	23.0	22.5	C	C	C	C	C	6.8	6.0	S	5.3	3.9	5.7	6.1	3.9	27.0	18.6	24
25	6.6	7.3	6.7	5.6	5.3	5.4	5.9	6.8	8.8	11.2	13.1	13.4	14.8	15.1	14.2	12.7	10.1	7.4	S	14.1	14.7	14.7	13.7	11.9	5.3	15.1	10.4	24
26	10.2	8.8	8.7	8.8	8.8	9.1	13.6	16.2	19.0	25.1	28.0	29.2	29.8	37.1	38.0	37.7	37.6	S	35.1	35.0	35.2	35.0	35.7	36.9	8.7	38.0	25.2	24
27	37.3	37.6	38.1	38.1	38.0	37.7	37.2	37.1	36.9	36.7	37.1	38.3	38.3	37.3	37.7	38.4	S	37.1	37.3	38.5	39.4	39.2	39.3	39.2	36.7	39.4	37.9	24
28	39.1	39.1	39.3	39.7	39.7	39.2	37.2	36.4	36.4	36.2	35.7	34.2	34.6	33.7	33.9	S	33.5	28.4	28.1	30.1	35.6	40.1	40.5	39.7	28.1	40.5	36.1	24
29	39.4	39.1	40.2	40.9	40.8	40.2	38.9	38.7	38.1	36.5	34.2	33.0	36.3	38.9	S	39.2	36.5	36.0	33.4	29.5	30.7	36.6	42.2	41.9	29.5	42.2	37.4	24
30	40.2	39.0	38.9	37.2	37.1	37.2	37.0	36.5	35.3	36.2	35.8	38.3	39.3	S	40.6	40.6	40.5	40.3	40.3	40.3	40.5	40.2	39.8	35.3	35.3	40.6	38.5	24
31	33.5	32.8	31.5	30.8	31.0	30.6	29.3	29.3	30.4	30.3	31.7	32.6	S	34.4	35.4	35.4	34.8	34.2	33.9	34.2	34.3	34.3	34.4	33.2	29.3	35.4	32.7	24
HOURLY MAX	41.8	39.7	40.2	40.9	40.8	40.2	40.3	40.6	40.6	50.0	41.1	41.5	41.4	42.7	45.0	43.9	42.3	41.4	41.2	40.7	40.9	40.2	42.2	41.9				
HOURLY AVG	31.4	30.1	29.8	29.6	29.8	29.3	29.5	30.2	29.7	30.1	30.2	30.7	31.6	32.3	32.4	32.0	30.8	29.4	30.3	30.1	30.4	30.5	31.0	30.5				

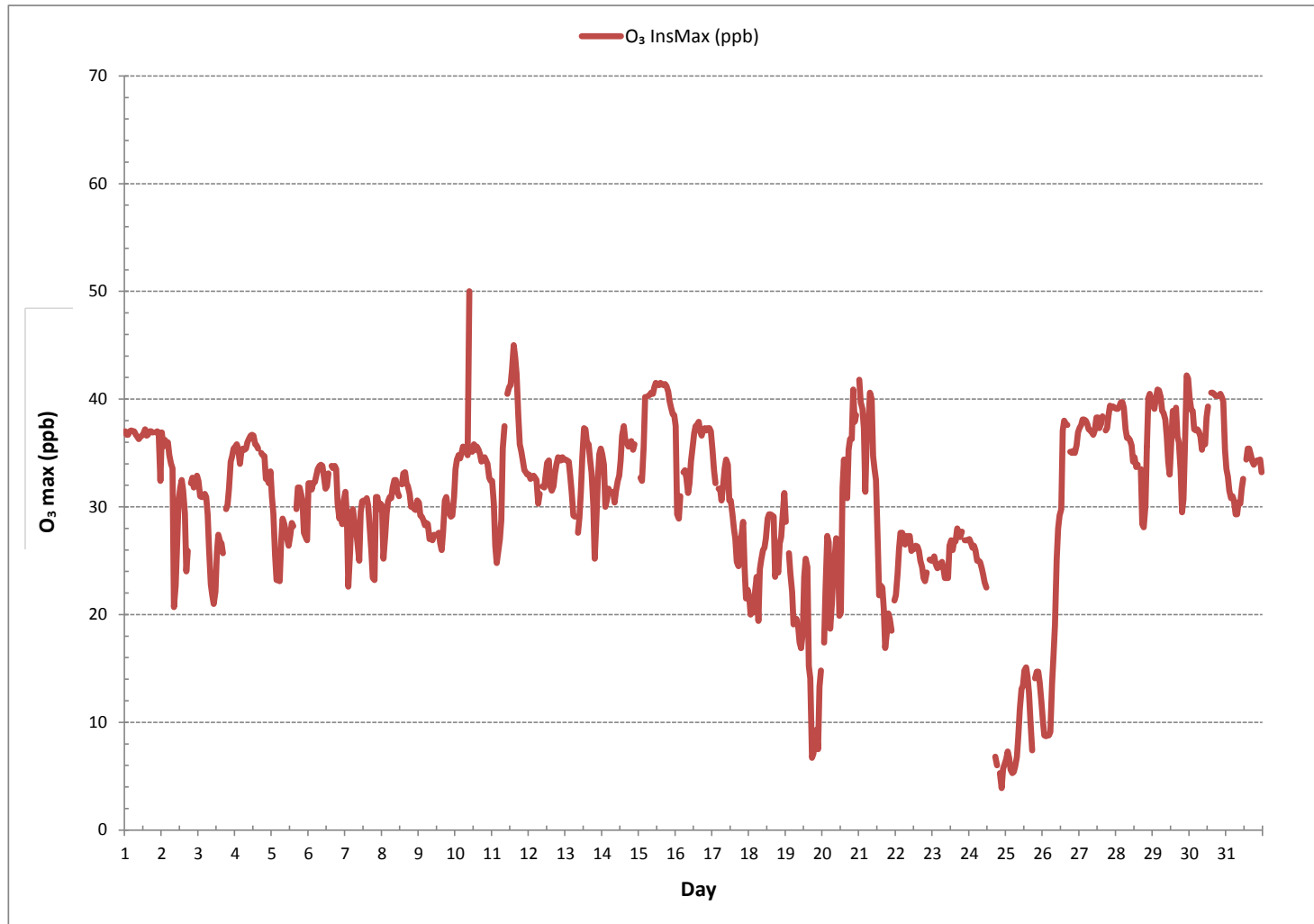
STATUS FLAG CODES

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:	704
MAXIMUM INSTANTANEOUS VALUE:	50.0 ppb @ HOUR(S) 9 ON DAY(S) 10
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	741 hrs
STANDARD DEVIATION:	7.7

OZONE Instantaneous Maximum (O₃ ppb)

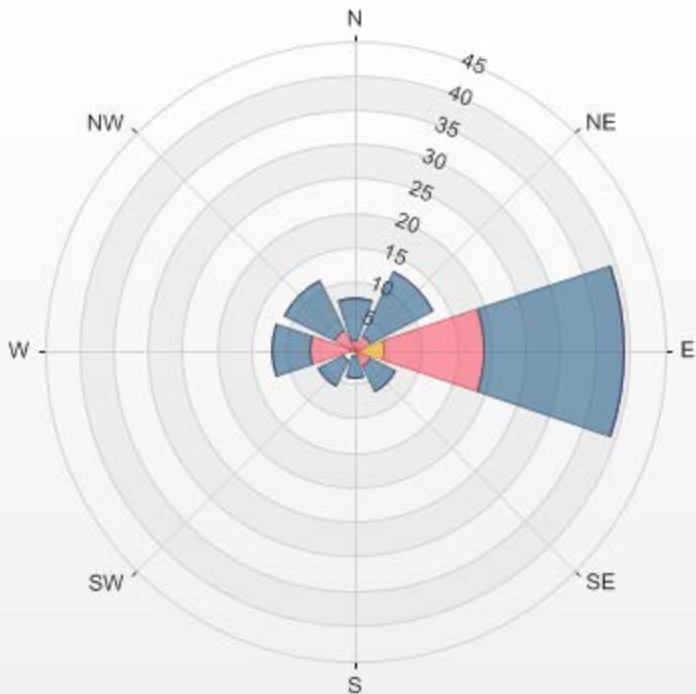


Wind: LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.76% Calm Avg: 0.00 [ppb]

Direction	0.0-13.5	13.5-27.0	27.0-40.5	>40.5	Total
N	0	1.56	6.24	0	7.8
NE	0	2.55	10.35	0	12.9
E	4.4	14.61	20.14	0	39.15
SE	0	2.7	4.11	0	6.81
S	0.14	0.85	2.98	0	3.97
SW	0.14	1.7	4.11	0	5.95
W	0.71	5.82	5.39	0	11.92
NW	0	3.26	8.23	0	11.49
Summary	5.39	33.05	61.55	0	100

% Icon Classes (ppb) 5 0.0-13.5 33 13.5-27.0 62 27.0-40.5 0 >40.5

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 0.00%



O3[ppb] Calibration: LICA ST. LINA Monthly: 2017/01 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	6.9	5.9	1.4	3.9	3.4	0.0	4.9	0.4	0.4	0.4	12.9	0.0	X	1.9	0.0	0.9	0.0	1.4	3.4	0.0	0.9	0.0	1.9	0.0	0.0	0.0	12.9	2.2	23
2	5.0	2.4	1.4	0.4	1.9	3.4	1.9	4.9	7.9	5.9	2.9	0.9	1.9	0.0	5.0	2.4	6.4	5.0	5.4	4.4	4.4	10.9	9.0	4.4	0.0	10.9	4.1	24	
3	4.4	3.9	5.0	2.9	4.4	9.0	6.9	9.4	9.4	7.5	9.9	22.4	20.4	14.5	11.9	12.9	15.9	9.9	6.9	4.0	5.4	1.4	1.9	3.4	1.4	22.4	8.5	24	
4	1.4	0.4	3.4	0.0	2.4	1.4	4.4	3.4	1.4	2.4	0.0	2.9	0.0	3.9	4.4	3.4	0.0	4.0	2.9	5.0	2.4	4.4	9.9	5.0	0.0	9.9	2.9	24	
5	5.9	11.4	24.4	23.4	24.4	25.9	24.4	11.4	7.5	10.9	9.0	2.4	3.4	7.5	3.4	4.9	1.9	6.9	6.4	5.4	2.4	6.4	2.9	1.9	1.9	25.9	9.8	24	
6	4.0	3.4	5.9	1.4	2.9	2.9	1.9	3.4	1.4	1.9	3.4	2.9	2.9	5.9	5.9	0.9	1.9	5.9	4.9	10.4	3.9	7.5	7.5	4.0	0.9	10.4	4.0	24	
7	3.9	5.9	3.9	5.0	5.4	4.4	3.9	7.9	9.4	5.0	5.4	6.4	7.5	6.4	4.4	7.5	5.0	2.4	2.9	3.4	5.4	6.4	6.4	0.4	0.4	9.4	5.2	24	
8	3.9	10.4	8.4	3.9	6.9	7.9	7.5	9.4	6.9	0.9	6.9	2.4	5.0	3.4	6.4	3.9	1.9	6.4	6.4	5.4	9.4	3.4	4.0	3.9	0.9	10.4	5.6	24	
9	6.9	5.0	4.4	6.4	7.9	9.0	5.4	3.9	2.9	5.4	3.4	7.5	5.4	7.5	7.5	7.5	6.9	5.4	5.4	4.9	5.4	6.4	7.9	9.0	2.9	9.0	6.1	24	
10	5.9	9.0	8.4	6.4	6.4	5.4	9.4	4.9	1.4	5.4	9.0	4.4	5.0	4.0	5.9	2.4	4.4	1.9	0.0	5.4	2.4	4.4	1.4	2.4	0.0	9.4	4.8	24	
11	5.9	9.9	10.4	10.4	9.4	6.4	4.4	2.9	2.4	5.9	4.4	5.0	2.9	1.4	6.9	1.9	0.4	3.9	3.9	5.9	3.4	6.4	7.5	1.4	0.4	10.4	5.1	24	
12	9.4	6.4	5.4	9.4	5.9	8.4	6.4	6.4	6.9	3.9	7.9	6.4	9.0	6.9	5.9	8.4	7.5	5.9	2.9	6.9	5.9	9.0	4.0	2.9	2.9	9.4	6.6	24	
13	6.9	4.9	1.9	3.9	10.9	10.4	13.4	11.4	14.0	15.5	C	C	X	X	X	X	X	X	X	X	X	X	X	6.9	1.9	15.5	9.1	13	
14	10.9	9.5	8.5	8.5	9.9	1.9	11.5	15.5	5.9	12.5	7.5	9.5	10.9	7.5	8.0	1.9	1.9	8.5	5.9	5.9	5.9	P	P	1.9	1.9	15.5	7.7	22	
15	P	4.4	5.9	4.4	2.9	6.9	2.9	3.4	2.9	3.9	0.9	0.0	2.9	1.9	2.9	0.0	0.0	2.9	2.4	1.9	3.9	4.4	0.0	0.0	0.0	6.9	2.7	23	
16	5.9	9.0	6.9	7.9	5.4	3.9	5.9	3.9	7.5	3.0	4.4	5.0	0.0	3.4	4.5	1.5	5.0	6.5	5.5	1.5	7.0	3.0	2.0	4.0	0.0	9.0	4.7	24	
17	4.0	6.0	8.0	14.0	6.0	8.5	3.5	3.5	1.5	0.0	1.0	4.5	5.5	4.0	6.5	5.5	2.5	0.5	5.5	3.5	5.0	4.0	5.5	3.5	0.0	14.0	4.7	24	
18	8.5	5.5	6.5	6.0	6.0	7.0	6.0	5.0	7.5	3.5	0.0	7.0	4.0	3.5	3.0	5.5	1.0	5.0	8.0	4.5	1.0	7.0	8.5	4.5	0.0	8.5	5.2	24	
19	4.5	0.0	1.0	5.5	6.0	4.0	8.5	14.0	11.5	10.9	9.5	12.5	10.5	8.0	7.5	10.9	8.5	14.0	0.0	14.5	9.5	16.4	17.4	11.5	0.0	17.4	9.0	24	
20	19.0	10.0	10.9	12.0	8.0	13.5	18.0	13.0	12.5	12.0	18.5	16.4	19.5	18.9	11.5	9.0	13.0	10.0	5.5	5.5	4.5	12.0	14.0	15.0	4.5	19.5	12.6	24	
21	0.0	5.5	2.0	9.5	17.4	10.0	7.5	13.0	6.9	0.9	4.4	3.0	7.5	9.0	12.5	6.5	3.0	3.0	5.5	6.5	6.0	4.5	5.5	6.0	0.0	17.4	6.5	24	
22	7.0	3.5	2.5	7.0	2.5	6.0	6.5	0.0	5.5	0.0	2.5	5.5	0.0	3.5	2.0	X	10.0	X	0.0	6.5	1.0	X	3.5	4.0	0.0	10.0	3.8	21	
23	1.0	3.5	8.0	2.0	8.5	7.5	8.5	2.0	7.5	7.5	3.5	X	X	0.0	0.0	4.0	0.0	9.5	3.5	16.5	X	X	9.5	0.0	16.5	5.1	20		
24	X	2.5	2.5	3.0	0.5	6.0	10.9	0.0	8.0	10.5	17.5	3.5	13.0	21.0	22.9	18.9	C	C	10.4	15.0	40.5	26.5	8.0	16.4	0.0	40.5	12.3	23	
25	14.5	17.4	16.0	18.4	20.5	24.5	29.5	26.5	16.9	16.0	17.5	14.0	15.5	19.4	14.9	16.9	13.4	15.0	11.9	10.9	18.0	10.0	14.5	15.0	10.0	29.5	17.0	24	
26	18.0	27.5	17.4	35.5	13.0	16.4	21.5	19.9	18.9	14.5	12.0	11.5	10.0	1.5	3.5	0.0	1.5	4.0	2.5	7.0	3.5	4.4	4.0	7.5	0.0	35.5	11.5	24	
27	5.9	4.0	9.5	0.5	0.0	0.5	5.4	1.0	0.0	5.9	7.5	0.5	5.5	6.5	X	6.5	10.9	X	9.5	X	1.0	0.0	X	X	0.0	10.9	4.2	19	
28	0.0	3.5	3.5	4.0	X	3.0	7.0	3.5	7.0	0.0	0.0	10.5	4.5	7.5	7.0	5.0	7.5	8.5	3.5	8.5	6.4	5.9	2.5	2.5	0.0	10.5	4.8	23	
29	3.5	9.5	X	0.0	4.5	X	9.5	0.0	5.4	0.0	5.5	5.0	8.0	4.0	5.0	5.5	0.0	5.0	8.0	5.5	8.5	3.5	4.0	3.5	0.0	9.5	4.7	22	
30	2.0	0.5	2.0	0.5	X	X	0.0	3.0	0.0	X	2.0	7.0	0.0	5.0	3.5	4.0	0.0	2.5	4.0	3.5	0.0	4.0	2.5	4.4	0.0	7.0	2.4	21	
31	3.5	1.0	0.0	0.0	1.5	1.5	0.0	5.0	X	4.0	5.5	X	4.0	0.0	0.0	7.5	14.0	0.5	1.5	0.0	1.5	X	X	X	0.0	14.0	2.7	19	
HOURLY MAX	19.0	27.5	24.4	35.5	24.4	25.9	29.5	26.5	18.9	16.0	18.5	22.4	20.4	21.0	22.9	18.9	15.9	15.0	11.9	15.0	40.5	26.5	17.4	16.4					
HOURLY AVG	6.2	6.5	6.5	7.0	7.1	7.4	8.3	6.8	6.6	5.9	6.5	6.4	6.6	6.3	6.3	5.6	5.1	5.1	5.1	5.7	6.4	6.6	6.0	5.5					

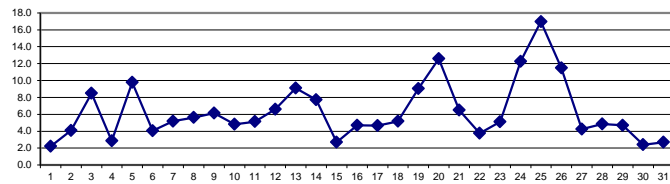
STATUS FLAG CODES

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	80 µg/m ³	24-HR	30 µg/m ³
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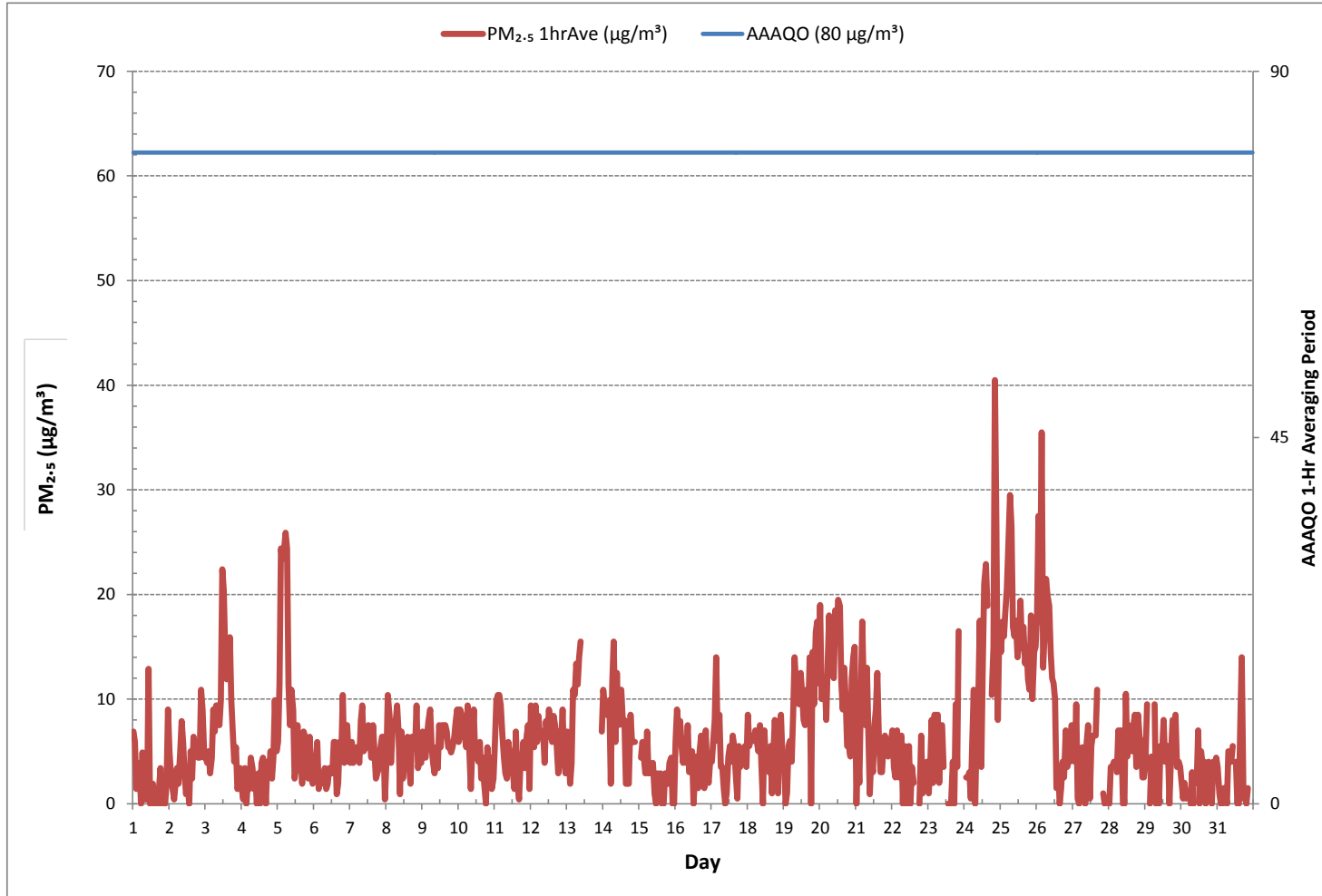
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	646			
MINIMUM 1-HR AVERAGE:	0.0 µg/m ³	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	40.5 µg/m ³	@ HOUR(S)	20	ON DAY(S) 24
MAXIMUM 24-HR AVERAGE:	17.0 µg/m ³			ON DAY(S) 25
				VAR-VARIOUS
MONTHLY CALIBRATION TIME:	4 hrs	OPERATIONAL TIME:	705 hrs	
STANDARD DEVIATION:	5.3	AMD OPERATION UPTIME:	94.8 %	
		MONTHLY AVERAGE:	6.3 µg/m ³	

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

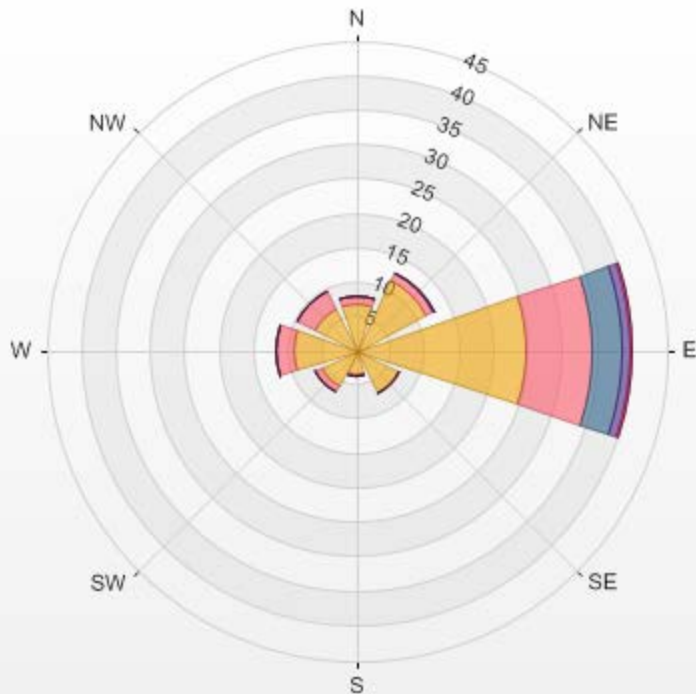


Wind: LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] Monthly: 01/2017 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 94.22% Calm Avg: 0.00 [ug/m3]

Direction	0.0-8.1	8.1-16.2	16.2-24.4	24.4-32.5	32.5-40.6	>40.6	Total
N	6.85	1.14	0	0	0	0	7.99
NE	11.41	1.14	0	0.14	0	0	12.69
E	24.82	9.42	4.42	1.14	0.29	0	40.09
SE	6.85	0.14	0	0	0	0	6.99
S	3.57	0.29	0	0	0	0	3.86
SW	5.71	1	0	0	0	0	6.71
W	9.13	2.57	0.14	0	0	0	11.84
NW	6.85	3	0	0	0	0	9.85
Summary	75.19	18.7	4.56	1.28	0.29	0	100

% Icon Classes (ug/m3(L)) 75 0.0-8.1 19 8.1-16.2 5 16.2-24.4 1 24.4-32.5 0 32.5-40.6 0 >40.6

LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 0.00%



WIND SPEED



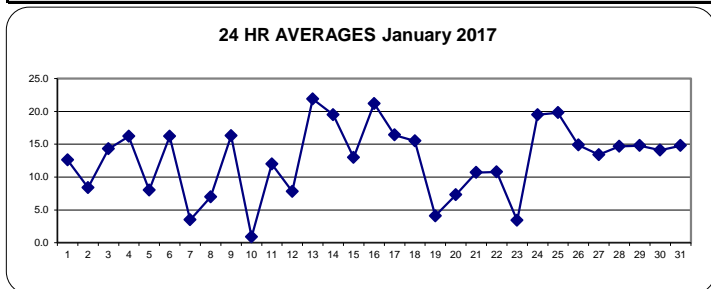
WIND SPEED Hourly Averages (WS kph)

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	14.9	20.6	20.4	20.4	19.5	20.7	17.3	14.2	15.3	16.3	12.8	12.1	12.9	12.9	12.3	11.2	12.7	19.0	20.5	22.2	23.5	25.6	24.3	22.9	11.2	25.6	12.6	24
2	21.0	19.7	19.6	19.8	3.9	9.8	23.5	21.7	21.6	23.0	23.8	19.9	11.9	12.5	22.4	23.5	8.3	15.4	19.6	20.4	20.5	16.8	22.7	19.4	3.9	23.8	8.4	24
3	16.3	20.2	25.7	19.6	22.7	21.7	19.7	19.0	18.4	19.5	18.8	17.1	17.9	17.9	19.0	14.4	15.3	19.2	19.0	17.0	18.3	19.2	18.8	20.5	14.4	25.7	14.3	24
4	19.6	19.5	19.8	18.7	15.8	15.7	12.5	13.6	14.1	14.9	15.0	15.6	17.4	18.7	16.5	16.8	21.7	24.3	23.7	20.6	16.6	18.9	20.3	22.3	12.5	24.3	16.2	24
5	21.0	20.4	20.5	20.8	20.4	24.3	9.9	18.4	19.6	19.4	18.7	19.6	19.5	19.5	19.2	19.2	20.2	17.8	18.1	19.4	18.0	20.1	20.2	18.8	9.9	24.3	8.0	24
6	19.4	20.9	23.0	21.8	21.4	21.7	16.9	17.8	15.6	9.3	8.4	6.0	7.3	10.3	12.9	18.6	21.5	21.4	19.9	17.6	18.0	19.8	19.1	19.1	6.0	23.0	16.2	24
7	18.5	19.9	20.4	8.9	18.1	12.8	17.4	15.0	18.3	20.7	20.0	22.5	19.7	19.1	18.4	18.0	18.6	18.6	18.6	17.6	16.9	19.1	16.7	10.3	8.9	22.5	3.5	24
8	14.2	16.7	14.1	8.9	12.1	18.3	20.8	4.3	21.8	18.8	6.8	16.5	22.6	17.1	15.2	5.7	20.5	17.3	19.7	20.7	20.3	17.2	16.9	20.9	4.3	22.6	7.0	24
9	20.4	20.9	2.7	22.8	19.4	17.1	18.9	21.6	23.7	23.5	23.4	22.4	21.8	19.1	19.3	23.4	21.4	18.6	18.3	18.5	17.8	18.2	18.4	16.5	2.7	23.7	16.3	24
10	17.4	17.5	16.8	19.0	21.7	21.4	14.6	15.8	21.6	25.1	9.3	16.9	10.6	9.9	9.7	14.1	18.7	21.2	20.4	20.5	11.4	19.4	18.6	17.1	9.3	25.1	0.9	24
11	17.7	16.6	16.8	17.4	20.5	21.3	24.5	18.6	21.3	22.1	21.7	24.6	25.4	28.4	32.6	28.8	25.5	25.0	25.5	24.5	20.8	16.7	18.6	18.3	16.6	32.6	12.0	24
12	12.7	9.6	20.2	21.8	16.0	12.9	14.8	12.3	7.8	8.1	9.8	9.2	11.2	11.0	13.5	11.7	9.7	5.2	2.7	3.3	6.6	7.1	10.9	13.9	2.7	21.8	7.8	24
13	16.9	19.4	18.3	20.7	26.3	24.6	24.4	20.8	24.6	23.6	24.5	22.8	25.7	25.9	24.5	22.9	25.1	22.0	20.4	23.8	22.1	19.8	16.6	16.7	16.6	26.3	21.9	24
14	16.4	14.5	14.1	14.4	15.5	16.8	16.6	15.7	16.6	16.7	18.5	19.4	19.7	21.1	24.3	24.7	24.6	25.0	27.5	26.3	26.6	25.6	P	P	14.1	27.5	19.5	22
15	P	14.8	16.4	16.5	15.0	9.5	9.2	11.4	15.2	15.5	11.8	6.6	10.3	11.8	12.0	13.1	12.5	12.3	12.2	13.7	13.6	16.8	18.1	18.0	6.6	18.1	13.0	23
16	19.1	17.8	20.0	20.1	19.9	21.9	22.1	21.6	21.8	21.4	21.2	20.0	21.1	21.9	21.7	21.8	21.9	23.6	23.7	22.1	22.5	22.8	21.7	22.0	17.8	23.7	21.2	24
17	21.1	18.1	20.3	20.4	18.8	15.7	15.7	16.8	14.9	14.4	21.1	22.3	22.3	20.4	22.1	21.8	14.9	22.3	14.4	14.7	11.1	17.2	12.8	13.6	11.1	22.3	16.4	24
18	15.6	16.3	22.7	22.1	17.0	19.5	11.4	14.8	18.1	10.8	17.8	16.9	16.4	17.8	19.2	20.1	21.3	19.9	19.1	22.2	23.1	23.6	18.5	22.6	10.8	23.6	15.5	24
19	8.5	8.6	18.1	16.1	12.7	10.8	15.4	19.4	19.7	6.0	20.1	17.8	20.2	1.8	19.0	18.3	21.7	17.9	10.1	21.0	10.6	18.0	14.8	16.3	1.8	21.7	4.1	24
20	16.1	16.3	14.2	15.6	21.0	19.5	18.4	19.8	21.6	18.0	20.8	21.3	21.1	19.5	22.5	13.9	20.8	10.9	11.4	23.7	22.5	22.9	22.0	16.0	10.9	23.7	7.3	24
21	16.5	17.4	23.9	21.0	21.6	23.3	22.5	20.7	18.8	19.2	20.8	16.6	21.0	20.2	19.6	20.4	20.9	17.9	13.6	12.7	11.6	10.9	12.1	15.5	10.9	23.9	10.7	24
22	12.0	14.5	10.9	10.1	9.8	9.8	10.1	16.7	12.1	14.0	14.8	10.5	15.4	10.1	14.8	14.9	10.3	8.8	9.7	17.5	20.1	20.4	18.6	16.3	8.8	20.4	10.8	24
23	11.0	13.6	18.4	20.0	18.1	7.4	5.1	12.0	13.0	14.8	4.5	9.5	12.7	12.5	7.4	15.2	5.1	18.2	2.6	11.5	14.0	23.5	13.9	25.6	2.6	25.6	3.4	24
24	25.7	25.5	22.7	23.7	23.9	19.7	13.1	17.5	20.1	20.4	20.5	20.4	20.0	19.1	19.0	21.2	19.8	5.5	21.3	21.5	19.4	17.8	18.9	19.0	5.5	25.7	19.5	24
25	20.1	19.1	19.7	21.6	18.2	23.5	22.3	19.3	18.8	17.8	21.2	20.6	19.9	20.7	20.8	20.7	20.6	19.5	19.7	19.6	19.2	19.1	18.4	19.3	17.8	23.5	19.8	24
26	19.2	18.3	18.1	17.5	17.3	14.9	14.5	15.3	15.2	17.4	16.9	17.9	18.0	14.2	14.5	15.0	13.9	11.1	13.1	14.3	17.1	15.3	14.0	12.9	11.1	19.2	14.9	24
27	12.0	16.1	13.6	14.0	13.0	12.1	12.7	14.1	14.8	13.8	17.0	15.5	11.5	12.6	16.2	15.6	12.3	10.0	9.1	14.8	15.2	14.0	13.7	17.3	9.1	17.3	13.4	24
28	15.3	14.4	16.3	16.9	15.4	13.2	13.8	14.8	13.8	13.9	14.4	13.9	16.7	15.9	17.3	17.4	17.6	18.0	17.7	16.1	12.2	14.4	12.8	14.6	12.2	18.0	14.7	24
29	13.3	13.0	11.8	12.7	12.6	15.7	16.0	16.0	17.1	15.8	17.0	17.1	13.6	16.1	15.2	13.0	13.0	15.4	15.8	17.8	22.0	17.2	14.2	16.5	11.8	22.0	14.8	24
30	15.0	16.2	15.1	13.8	13.2	12.4	15.0	15.0	10.8	15.8	14.2	13.6	16.7	14.1	11.5	15.1	14.7	16.2	16.7	15.4	14.3	14.6	20.8	16.7	10.8	20.8	14.1	24
31	19.1	19.8	16.9	15.4	17.9	17.0	14.8	16.9	16.0	15.1	15.8	16.5	17.4	18.2	17.9	18.2	21.1	20.2	22.1	21.2	21.2	22.1	20.3	18.2	14.8	22.1	14.8	24
HOURLY MAX	25.7	25.5	25.7	23.7	26.3	24.6	24.5	21.7	24.6	25.1	24.5	24.6	25.7	28.4	32.6	28.8	25.5	25.0	27.5	26.3	26.6	25.6	24.3	25.6				
HOURLY AVG	6.4	6.6	6.7	7.3	5.6	4.8	3.0	2.6	4.6	5.2	6.5	6.9	8.2	7.3	6.6	6.2	4.9	4.6	4.1	3.6	4.3	5.6	6.4	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

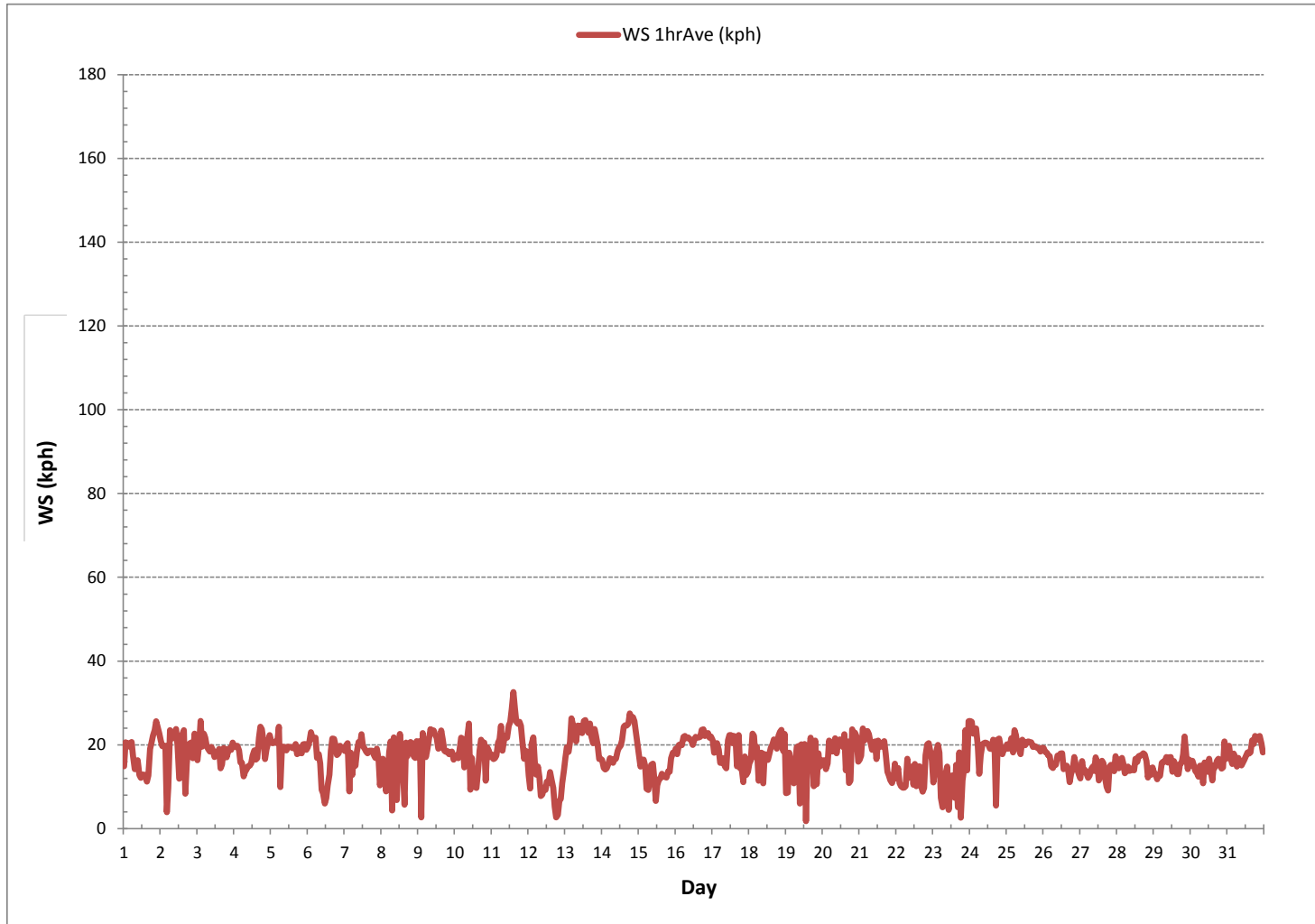
LAST CALIBRATION:	September 12, 2016
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST



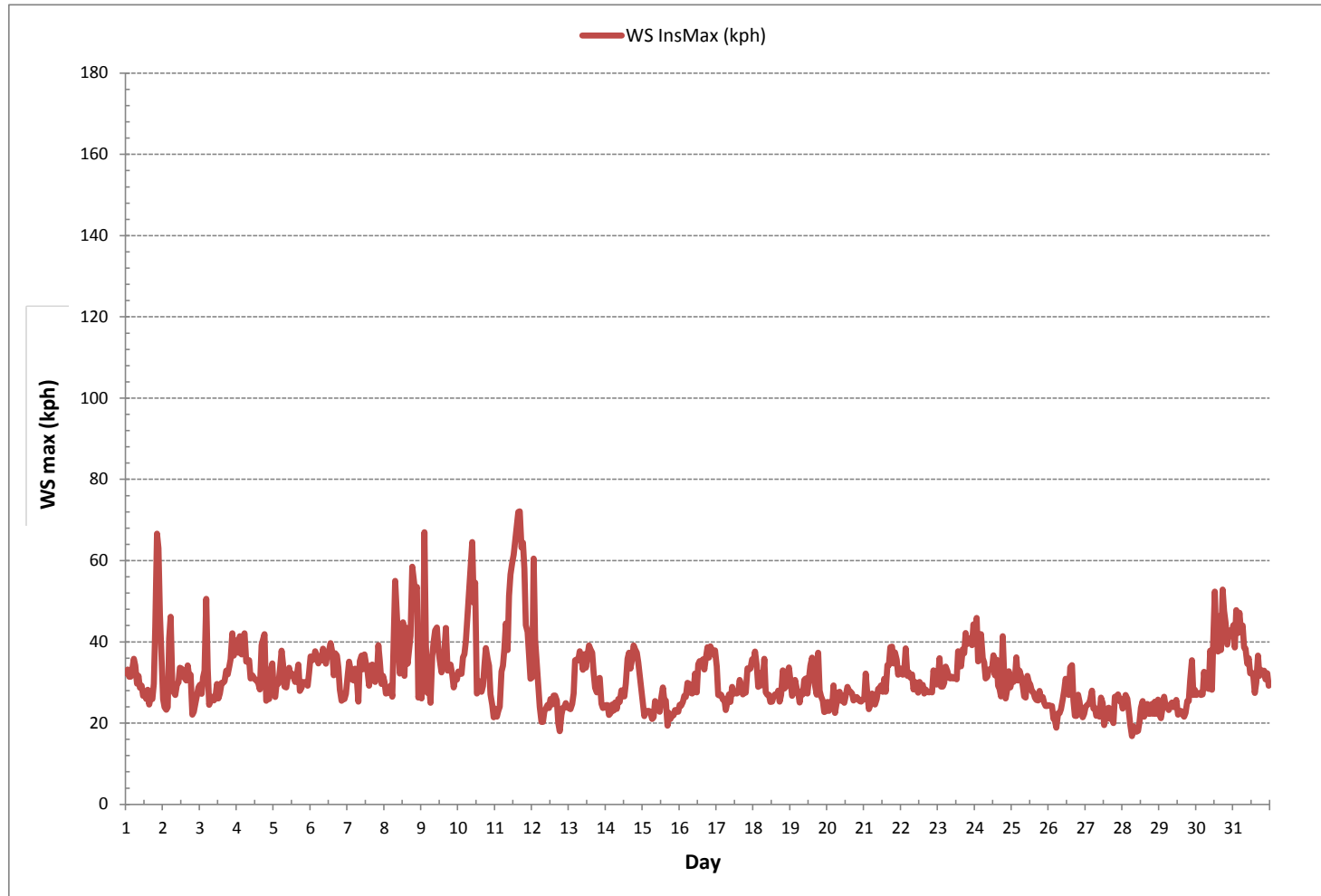
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	741
MINIMUM 1-HR AVERAGE:	1.8 kph @ HOUR(S) 13 ON DAY(S) 19
MAXIMUM 1-HR AVERAGE:	32.6 kph @ HOUR(S) 14 ON DAY(S) 11
MAXIMUM 24-HR AVERAGE:	21.9 kph ON DAY(S) 13
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	741 hrs
AMD OPERATION UPTIME:	99.6 %
STANDARD DEVIATION:	4.5
MONTHLY AVERAGE:	5.5 kph

WIND SPEED Hourly Averages (WS kph)



WIND SPEED Instantaneous Maximum (WS kph)

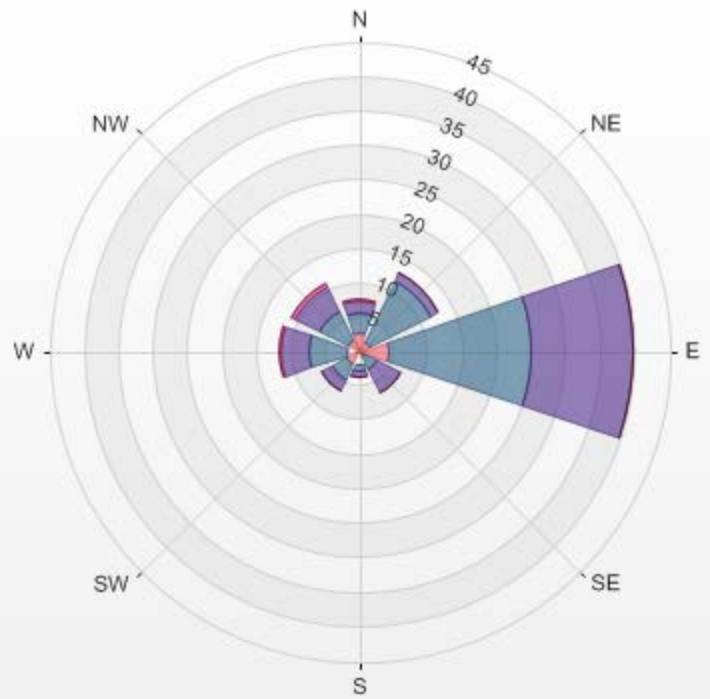


Wind: LICA ST. LINA Monitor: WSP [kph] Monthly: 01/2017 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 0.00% Valid Data: 99.60%

Direction	1.8-6.5	6.5-13.1	13.1-19.6	19.6-26.2	26.2-32.7	>32.7	Total
N	0.54	2.16	2.97	1.62	0.27	0	7.56
NE	0	1.62	9.99	1.21	0	0	12.82
E	0	4.32	20.65	14.84	0	0	39.81
SE	0	0.94	2.02	3.64	0	0	6.6
S	0.27	1.62	1.08	0.94	0	0	3.91
SW	0.4	1.75	2.43	1.75	0	0	6.33
W	0.27	1.75	5.26	4.32	0.13	0	11.73
NW	0.54	1.21	4.72	4.18	0.54	0	11.19
Summary	2.02	15.37	49.12	32.5	0.94	0	100

% Icon Classes (kph) 2 1.8-6.5 15 6.5-13.1 49 13.1-19.6 33 19.6-26.2 1 26.2-32.7 0 >32.7

LICA ST. LINA 01/01/2017 00:00 - 31/01/2017 23:00 Calm: 0.00%



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - January 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	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	S	S	S	S	S	S	E	E	E	E	S	24	
2	E	E	E	E	WSW	SSE	SSE	SSE	SSE	SSE	SE	ESE	SE	SSE	SSE	ENE	NNE	WSW	WSW	WSW	W	N	N	SE	SE	24	
3	N	NNW	NNW	NNW	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ENE	ENE	NE	NE	NE	SE	24	
4	NNE	NE	NE	NE	NNE	NNE	NNE	NNE	NE	NE	NE	NE	NE	ENE	NE	ENE	ENE	E	E	E	E	E	E	E	NE	24	
5	E	E	E	E	E	E	NE	W	W	W	W	W	W	W	W	W	W	WNW	W	W	W	W	W	W	SW	24	
6	W	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	ESE	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	WSW	SW	WSW	24	
7	SW	WSW	WSW	SSW	WSW	ESE	WSW	SW	E	E	E	E	ENE	ENE	ENE	NE	NE	NE	NE	NE	NW	WNW	WNW	NW	SSE	24	
8	NE	ENE	NE	N	WNW	W	W	W	SSE	SW	SSW	E	E	E	NNW	WNW	N	NNW	NNW	N	NNW	NNW	NW	NW	WSW	24	
9	NW	NW	SW	E	E	E	E	E	E	E	E	E	E	E	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ESE	24	
10	ENE	ENE	ENE	ENE	ENE	ENE	NNW	NNW	NNW	E	SSW	S	S	SSW	SSW	SSW	S	SSW	SSW	SSW	WNW	NNW	NW	NW	SSW	24	
11	NW	NW	NW	NW	NW	WNW	NW	WSW	SW	SW	SW	SW	SW	WSW	NNW	N	N	N	NNE	NNE	NNE	NNE	NE	NE	SSW	24	
12	NE	NE	ENE	ENE	ENE	N	NNW	NNW	N	N	N	N	N	NNE	NNE	NNE	NNE	N	NW	WNW	W	WNW	WNW	SSW	24		
13	WNW	NW	NW	NW	NW	NW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	NW	NW	NNW	NNW	NW	24	
14	NNW	NNW	NNW	NNW	NNW	NNW	NW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	WNW	NW	WNW	NW	WNW	WNW	P	P	NW	22	
15	P	ESE	ESE	ESE	E	E	ENE	ENE	E	E	ENE	ENE	ENE	ENE	E	ESE	E	E	E	E	E	E	E	ESE	ESE	E	23
16	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	24
17	ESE	ESE	ESE	ESE	ESE	E	E	ENE	ENE	ENE	E	ESE	ESE	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	S	ESE	SSE	SSE	ESE	24
18	SSW	SE	ESE	ESE	SE	SW	SSW	SSW	ESE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	24
19	S	SSW	ESE	ESE	ESE	SE	E	ENE	W	SW	E	E	E	SSW	WSW	WSW	WSW	W	WSW	WSW	SW	ESE	E	E	SSE	24	
20	ENE	E	ENE	ENE	E	E	E	E	E	E	E	E	E	E	E	E	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	SE	24
21	N	NNW	W	W	W	W	W	WNW	WNW	WNW	WNW	W	ENE	NE	NE	NE	NNE	NNW	NNW	N	N	NNE	NE	SSW	24		
22	NNE	NE	NNE	NNW	N	N	NW	WNW	WNW	WNW	WNW	WNW	W	WNW	W	W	WNW	WNW	WNW	W	W	W	W	W	W	24	
23	W	W	W	W	W	W	WNW	W	W	NNW	WNW	W	ENE	NE	ENE	WNW	W	N	ENE	ENE	E	E	E	E	SSW	24	
24	E	E	E	E	E	E	ESE	E	E	E	E	E	E	E	E	E	SSW	E	E	E	E	E	E	E	E	24	
25	E	E	E	E	E	E	E	E	E	E	E	E	ESE	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	24	
26	ESE	ESE	ESE	ESE	ESE	ENE	E	E	E	E	E	E	E	ENE	NE	NE	NE	E	E	E	E	E	E	E	E	24	
27	E	E	ENE	ENE	ENE	ENE	ENE	ENE	E	E	E	E	ESE	ESE	ESE	ESE	ESE	E	E	ENE	ENE	ENE	ENE	ENE	E	24	
28	ENE	ENE	ENE	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	ENE	ENE	E	24	
29	E	E	ENE	ENE	ENE	E	E	E	E	ESE	ESE	E	ESE	ESE	ESE	ESE	E	E	E	ENE	ENE	ENE	ENE	ENE	E	24	
30	ENE	NE	NE	ENE	ENE	NE	ENE	ENE	ENE	NE	ENE	NE	NNE	NE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NE	NNE	NNE	NE	24	
31	NNE	NE	NNE	NNW	NW	N	N	NW	NNE	NNE	NE	NE	NE	NE	NE	ENE	ENE	E	E	E	E	E	ENE	ENE	E	24	

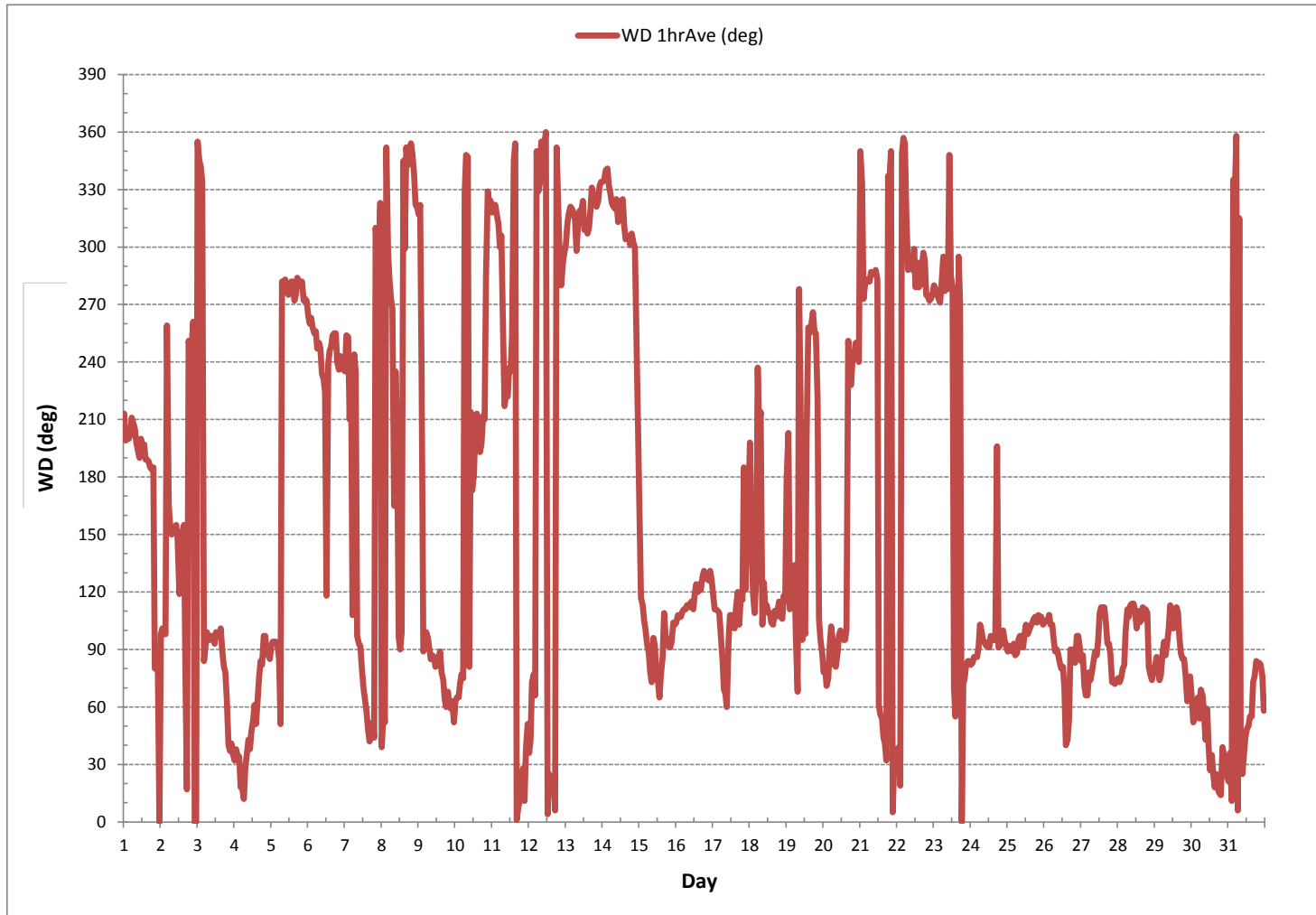
STATUS FLAG CODES

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

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

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	741	hrs
STANDARD DEVIATION:	102		AMD OPERATION UPTIME:	99.6	%
			MONTHLY AVERAGE:	71 (ENE)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - January 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	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	21	27	19	23	23	30	17	19	14	13	19	23	16	15	15	18	10	5	4	15	9	16	9	9	24
2	2	3	2	3	44	63	2	4	3	3	8	37	47	49	22	13	60	36	9	2	2	24	4	2	24
3	3	1	1	41	18	4	11	3	4	5	6	6	6	7	5	9	9	7	7	14	19	19	20	22	24
4	32	28	28	35	52	51	61	56	52	47	48	43	31	23	39	37	20	15	11	3	3	2	3	4	24
5	4	4	3	4	3	7	56	30	17	15	12	10	10	13	12	8	8	12	10	13	11	6	4	7	24
6	11	8	6	9	13	9	41	40	47	56	70	81	71	65	52	29	6	6	7	11	9	9	19	16	24
7	11	7	7	59	26	54	37	44	34	14	5	5	12	14	21	27	26	21	20	32	38	22	37	65	24
8	48	35	49	70	58	27	10	56	24	23	47	45	13	38	33	54	7	6	4	6	6	6	9	5	24
9	6	7	49	5	3	5	3	8	6	9	7	9	6	7	7	5	9	10	11	10	11	12	10	15	24
10	11	10	11	7	5	6	30	5	26	27	49	8	19	27	28	18	9	17	44	45	42	3	4	4	24
11	6	5	6	5	7	10	10	41	30	22	25	35	30	23	32	33	39	35	32	25	29	48	28	14	24
12	53	42	12	18	42	8	6	6	13	18	18	19	16	22	17	20	22	43	71	69	45	40	23	13	24
13	8	3	4	4	15	27	29	47	31	25	24	11	18	15	30	33	9	5	3	6	8	5	6	5	24
14	6	7	5	6	7	7	8	8	9	8	9	8	7	12	18	6	7	9	9	10	9	7	P	P	22
15	P	7	6	5	9	20	22	18	12	6	17	42	27	26	18	12	10	10	11	9	9	4	3	5	23
16	5	5	5	9	19	9	9	8	11	14	20	9	13	14	14	12	11	14	14	22	28	21	32	26	24
17	16	8	7	7	5	6	7	10	11	14	12	11	8	7	13	21	56	10	43	31	60	45	60	60	24
18	51	52	20	8	47	32	63	53	36	43	12	6	5	7	5	4	5	4	5	12	8	10	41	26	24
19	28	46	39	47	55	37	30	12	12	50	5	39	5	18	39	43	4	6	59	6	56	4	5	5	24
20	7	6	9	7	4	2	4	4	2	4	3	3	19	32	13	60	31	57	25	7	2	2	2	47	24
21	38	24	2	2	2	4	8	4	6	8	8	45	12	11	10	17	24	41	58	63	66	65	63	49	24
22	63	52	66	70	71	71	66	39	60	52	48	67	47	68	50	49	67	71	68	38	16	16	34	45	24
23	66	55	30	20	39	80	85	65	58	51	77	71	60	65	78	53	55	43	66	66	55	13	60	18	24
24	6	10	5	5	18	31	55	36	22	17	14	11	31	33	33	5	28	50	26	9	5	7	7	5	24
25	6	5	5	15	9	3	26	20	6	6	7	12	15	7	8	10	14	6	7	7	7	6	6	4	24
26	4	4	4	3	2	3	3	4	4	4	8	8	8	17	23	19	18	16	9	8	6	5	6	11	24
27	19	9	15	14	16	15	13	10	6	7	6	6	13	10	6	7	12	20	21	11	11	13	13	7	24
28	9	10	8	6	6	5	4	4	4	4	4	6	6	7	4	5	5	4	5	6	13	12	14	9	24
29	11	9	16	16	15	7	4	6	5	6	6	6	11	8	9	10	9	5	7	5	5	15	15	9	24
30	15	16	16	18	19	26	21	23	33	21	17	25	23	26	36	31	28	29	28	28	25	27	26	39	24
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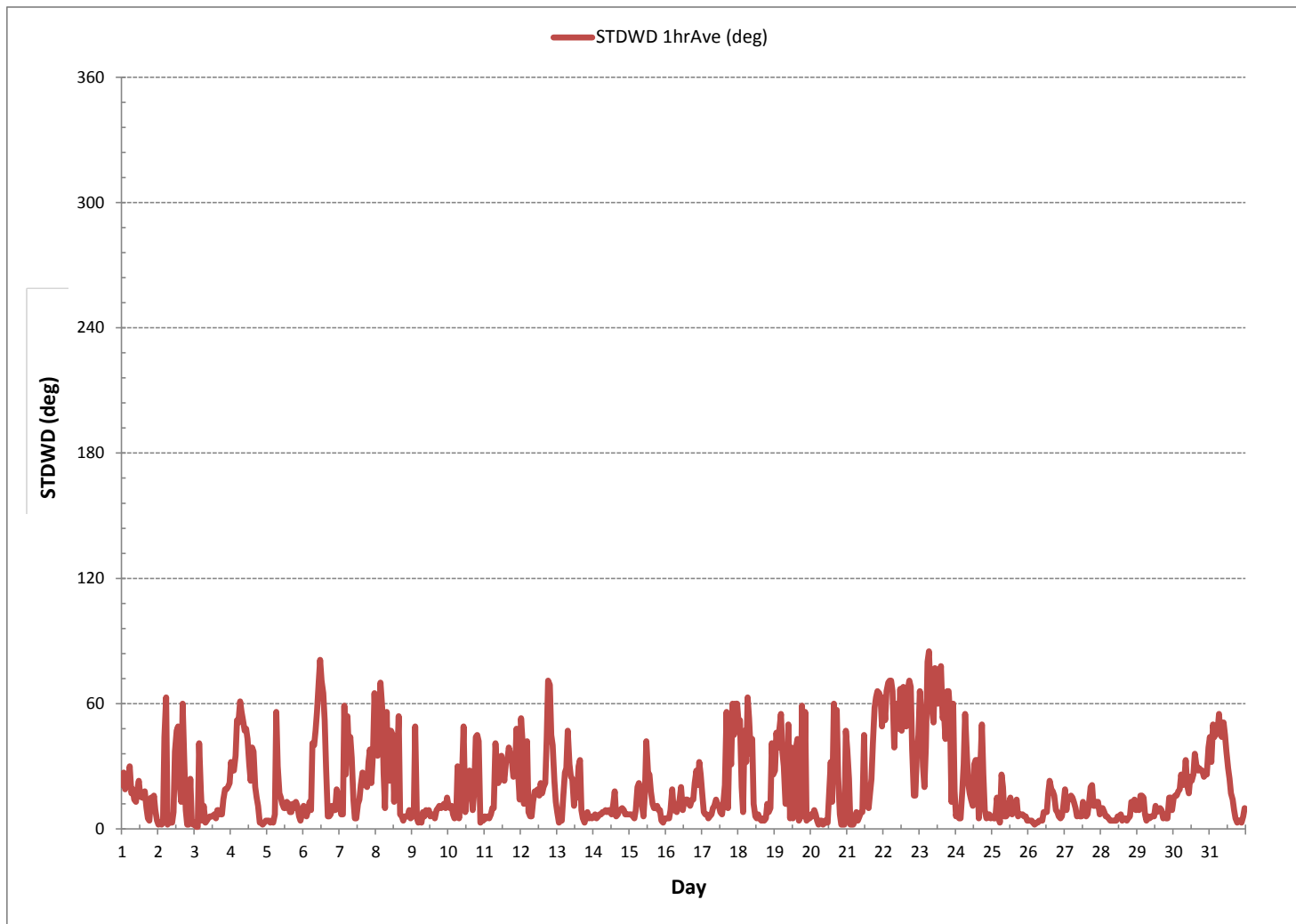
STATUS FLAG CODES

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: September 12, 2016

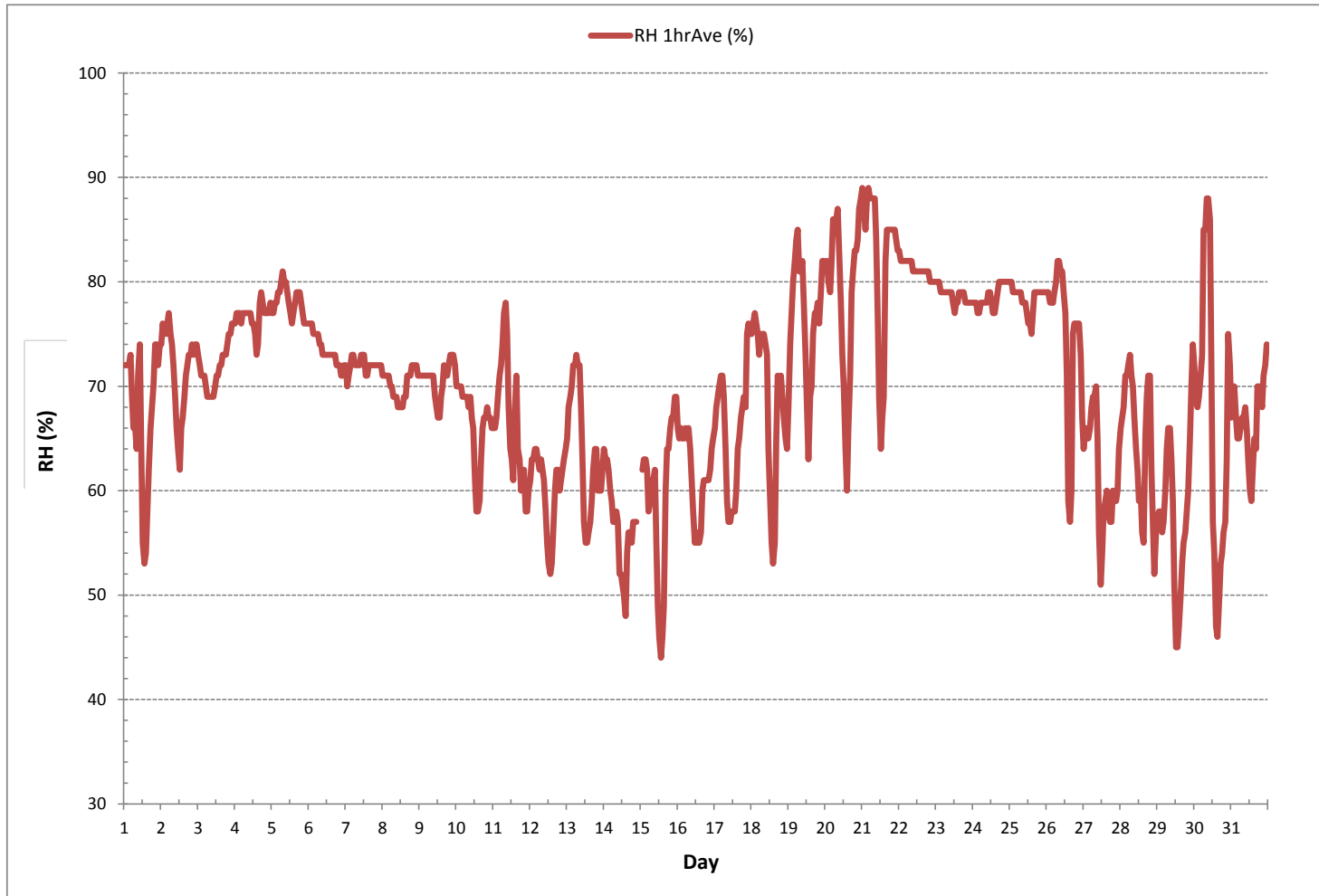
CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 741 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



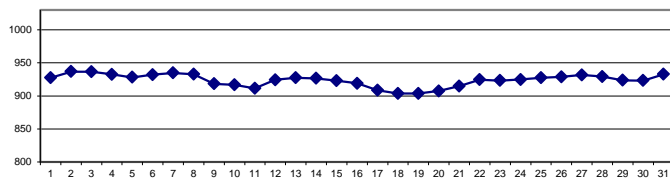
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	923	924	924	924	925	925	925	926	926	927	928	928	928	929	929	929	929	929	930	930	930	931	931	932	923	932	928	24	
2	932	932	933	933	934	934	935	935	936	937	937	938	938	938	938	939	938	939	939	939	939	939	939	939	939	932	939	937	24
3	939	939	939	939	939	939	939	939	938	938	938	938	937	936	936	936	935	934	934	933	933	933	933	933	933	933	939	937	24
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6	929	929	930	930	930	930	930	930	931	931	932	932	932	933	933	933	933	934	934	934	934	934	935	935	935	929	935	932	24
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9	925	924	923	922	922	921	920	919	919	919	918	918	917	917	916	916	915	915	915	916	916	916	916	916	915	925	918	24	
10	916	916	916	916	916	916	915	915	916	916	916	917	917	917	918	918	919	919	918	917	917	916	916	915	915	919	917	24	
11	914	913	912	910	909	907	906	905	905	906	906	905	904	904	906	909	912	915	917	919	921	922	923	924	904	924	911	24	
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15	P	922	921	921	921	921	922	922	922	922	923	923	923	923	923	923	924	924	924	925	925	925	925	925	921	925	923	23	
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17	908	908	908	908	907	907	908	908	909	909	909	910	910	910	910	910	910	909	908	907	907	907	906	906	910	908	24		
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29	928	927	927	927	927	927	927	926	926	926	926	926	925	924	923	923	922	920	919	918	918	918	919	918	918	928	924	24	
30	919	920	920	921	921	922	922	922	922	922	923	924	924	924	924	925	925	925	925	925	925	925	925	926	919	926	923	24	
31	926	927	928	928	929	930	931	931	932	933	934	934	935	935	935	935	935	935	935	934	935	935	935	935	926	935	933	24	
HOURLY MAX	939	939	939	939	939	939	939	939	938	938	938	938	938	938	938	938	939	938	939	939	939	939	939	939	939	939	939	939	
HOURLY AVG	923	923	923	923	923	923	923	923	923	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924	

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

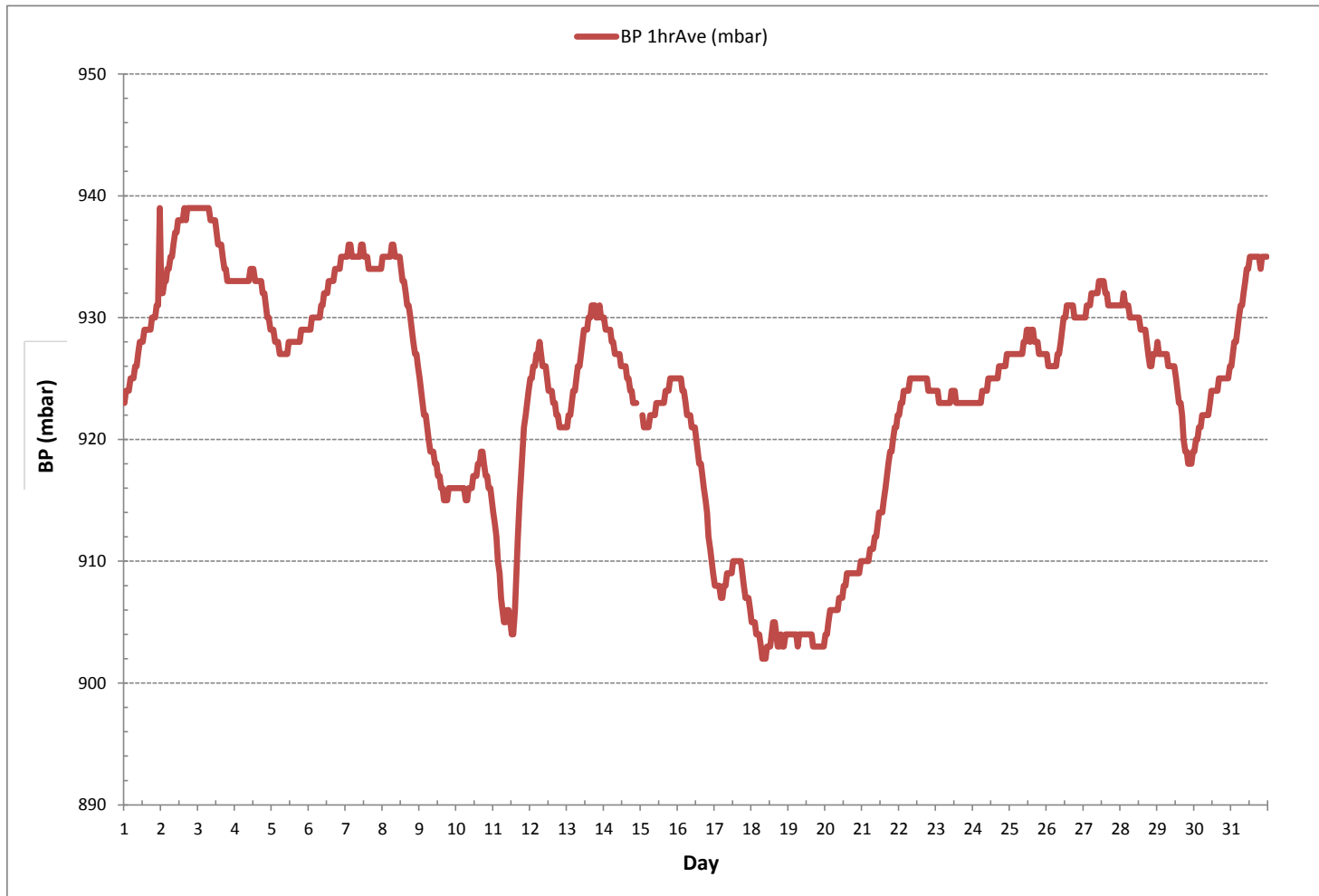
24 HR AVERAGES January 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	902 mbar	@ HOUR(S)	VAR	ON DAY(S)	18
MAXIMUM 1-HR AVERAGE:	939 mbar	@ HOUR(S)	VAR , VAR	ON DAY(S)	2 , 3
MAXIMUM 24-HR AVERAGE:	937 mbar			ON DAY(S)	2, 3
				VAR-VARIOUS	
			OPERATIONAL TIME:		741 hrs
			AMD OPERATION UPTIME:		99.6 %
STANDARD DEVIATION:	9		MONTHLY AVERAGE:		924 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



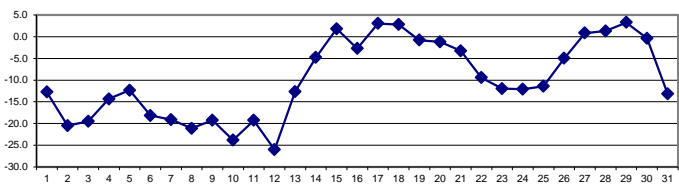
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-10.3	-10.2	-9.9	-9.7	-9.7	-9.7	-10.1	-10.4	-11.8	-11.3	-11.1	-11.1	-9.7	-10.6	-11.7	-13.4	-15.4	-16.5	-16.3	-17.1	-18.0	-17.6	-17.2	-17.3	-18.0	-9.7	-12.8	24	
2	-18.1	-19.4	-18.9	-19.5	-19.9	-19.5	-20.4	-22.3	-23.2	-22.2	-19.0	-17.5	-16.8	-18.8	-19.6	-20.8	-21.8	-22.4	-22.5	-22.1	-21.8	-21.6	-22.0	-22.0	-23.2	-16.8	-20.5	24	
3	-22.3	-22.7	-22.5	-22.1	-21.7	-21.6	-23.3	-23.6	-23.5	-22.8	-21.0	-19.4	-18.1	-17.0	-17.1	-17.3	-17.2	-17.2	-16.8	-16.1	-16.1	-15.7	-15.4	-23.6	-15.4	-19.5	24		
4	-15.0	-14.5	-14.2	-14.5	-14.7	-14.7	-14.6	-14.4	-14.2	-14.0	-13.8	-13.4	-12.8	-12.4	-12.4	-13.1	-14.8	-15.4	-14.7	-15.7	-15.9	-15.8	-15.4	-13.7	-15.9	-12.4	-14.3	24	
5	-14.2	-13.8	-13.2	-12.7	-12.2	-11.8	-10.9	-10.2	-10.6	-10.6	-10.1	-9.8	-9.7	-9.8	-10.2	-11.1	-11.8	-12.3	-13.0	-13.1	-14.4	-16.3	-17.5	-17.1	-17.5	-9.7	-12.4	24	
6	-16.2	-16.0	-16.2	-16.3	-16.6	-16.7	-16.9	-17.3	-18.1	-19.0	-18.4	-17.3	-16.8	-16.7	-17.2	-17.6	-18.3	-19.3	-20.4	-20.3	-20.6	-21.0	-21.4	-21.1	-21.4	-16.0	-18.2	24	
7	-19.9	-21.5	-21.3	-20.1	-19.1	-18.8	-19.7	-20.6	-20.0	-19.2	-17.8	-16.6	-16.1	-15.2	-15.7	-17.5	-19.2	-19.5	-19.7	-20.1	-20.2	-20.5	-20.3	-20.1	-21.5	-15.2	-19.1	24	
8	-20.3	-21.0	-20.8	-20.7	-21.0	-22.0	-23.6	-24.3	-24.5	-23.1	-23.2	-21.9	-20.1	-20.1	-19.9	-20.0	-20.3	-20.1	-19.8	-19.7	-19.7	-19.9	-20.6	-24.5	-19.7	-21.1	24		
9	-20.8	-20.9	-20.8	-20.7	-20.8	-20.8	-20.9	-20.9	-20.7	-20.2	-18.8	-18.0	-17.8	-17.7	-18.0	-17.8	-18.2	-18.2	-18.5	-18.4	-18.4	-18.2	-18.1	-18.4	-20.9	-17.7	-19.3	24	
10	-20.0	-21.5	-22.7	-23.4	-24.2	-24.4	-24.7	-24.8	-24.3	-23.6	-21.0	-20.4	-19.7	-19.8	-21.1	-22.5	-24.2	-25.0	-25.4	-25.9	-26.8	-28.3	-28.9	-28.9	-28.9	-19.7	-23.8	24	
11	-28.8	-27.4	-25.7	-23.8	-22.2	-20.2	-18.0	-14.6	-12.9	-10.4	-9.0	-7.7	-7.4	-7.4	-11.3	-16.8	-20.5	-22.2	-23.5	-24.4	-25.5	-26.8	-27.7	-28.3	-28.8	-7.4	-19.3	24	
12	-28.9	-29.6	-29.9	-30.5	-30.3	-31.1	-32.9	-32.0	-31.3	-29.4	-26.5	-24.1	-22.2	-20.8	-21.1	-22.0	-23.2	-23.7	-23.2	-22.2	-22.1	-22.3	-22.3	-21.8	-32.9	-20.8	-26.0	24	
13	-21.9	-22.0	-21.8	-21.6	-20.2	-18.2	-17.2	-15.7	-15.5	-14.1	-11.8	-9.5	-6.4	-5.9	-6.3	-6.1	-6.9	-8.1	-9.0	-9.4	-8.6	-8.8	-9.1	-10.1	-22.0	-5.9	-12.7	24	
14	-11.0	-11.2	-11.4	-10.5	-9.5	-8.6	-7.8	-7.9	-7.7	-7.4	-5.2	-4.4	-3.0	-0.8	1.6	-0.2	-0.6	-0.4	0.1	-0.1	0.2	0.4	P	P	-11.4	1.6	-4.8	22	
15	P	0.2	-0.1	-0.3	0.0	1.7	1.8	1.4	1.8	1.3	3.6	5.7	6.8	7.3	6.8	5.4	2.6	1.2	0.6	-0.1	-0.7	-1.2	-2.0	-2.3	-2.3	7.3	1.8	23	
16	-2.0	-2.3	-3.0	-3.4	-4.0	-5.1	-5.1	-5.8	-5.6	-5.1	-4.1	-2.5	-1.8	-1.3	-0.8	-0.8	-1.4	-1.6	-1.3	-1.4	-1.5	-1.6	-2.0	-1.8	-5.8	-0.8	-2.7	24	
17	-1.3	-0.6	-0.3	-0.5	-0.3	0.7	2.3	3.8	5.2	6.0	5.6	5.1	5.5	5.9	5.4	4.8	4.7	4.2	4.0	3.7	3.6	1.7	1.3	1.8	-1.3	6.0	3.0	24	
18	1.8	1.1	0.7	0.7	1.1	1.3	0.4	0.6	0.8	1.1	1.6	4.1	6.1	7.5	7.7	7.0	4.0	2.6	2.3	1.7	2.2	3.0	3.4	3.3	0.4	7.7	2.8	24	
19	2.8	1.2	0.0	-1.1	-1.9	-3.3	-3.5	-1.4	-2.1	-3.2	-2.1	-0.8	0.9	2.6	1.5	1.2	0.0	-1.0	-1.2	-1.5	-0.6	-1.6	-1.9	-2.1	-3.5	2.8	-0.8	24	
20	-1.9	-2.7	-2.2	-1.9	-3.6	-5.0	-5.3	-4.6	-4.4	-2.8	-3.2	-1.7	0.2	3.1	5.0	3.1	1.6	0.1	-0.1	-0.1	-0.2	-0.5	-0.9	-1.4	-5.3	5.0	-1.2	24	
21	-1.2	-1.0	-1.0	-2.6	-2.7	-1.9	-2.1	-2.9	-2.9	-1.6	-0.2	2.3	-0.8	-1.5	-1.4	-5.4	-6.4	-6.4	-6.3	-6.4	-6.1	-5.8	-6.4	-7.6	-7.6	2.3	-3.3	24	
22	-8.2	-8.7	-8.9	-9.1	-9.2	-9.1	-9.2	-9.3	-9.6	-9.5	-9.2	-8.7	-8.3	-8.1	-8.2	-8.7	-9.2	-9.7	-9.9	-10.2	-10.7	-11.1	-11.6	-11.6	-11.6	-8.1	-9.4	24	
23	-11.5	-11.6	-11.9	-12.2	-12.3	-12.5	-12.6	-12.4	-11.8	-11.6	-10.7	-9.8	-9.7	-10.1	-10.8	-11.2	-11.8	-12.3	-12.9	-13.3	-13.9	-14.1	-14.0	-14.1	-14.0	-9.7	-12.0	24	
24	-13.8	-13.6	-13.7	-14.0	-14.0	-14.1	-14.1	-14.0	-13.6	-12.8	-11.6	-10.4	-9.4	-9.4	-9.2	-10.2	-11.3	-12.0	-11.9	-11.9	-12.2	-11.7	-11.2	-11.0	-14.1	-9.2	-12.1	24	
25	-11.2	-11.4	-11.8	-12.1	-12.2	-12.4	-12.8	-12.9	-13.2	-12.8	-11.1	-8.8	-8.8	-6.8	-7.0	-8.7	-10.9	-12.3	-12.8	-12.7	-12.5	-12.6	-12.8	-13.3	-13.3	-6.8	-11.4	24	
26	-13.2	-13.3	-13.5	-13.6	-13.6	-12.6	-11.7	-9.8	-9.4	-7.0	-3.6	-1.0	0.8	2.8	4.0	3.9	3.0	-0.6	-1.6	-2.2	-2.3	-2.6	-2.3	-0.5	-13.6	4.0	-5.0	24	
27	0.4	-0.1	-0.1	-0.4	-0.7	-1.7	-2.1	-2.4	-2.8	-1.7	1.3	3.5	3.2	2.3	2.4	2.3	2.3	2.4	2.5	1.8	2.4	2.1	1.8	1.0	-2.8	3.5	0.8	24	
28	0.5	0.5	0.2	-0.4	-0.6	-1.1	-2.2	-2.3	-1.9	-0.8	0.5	1.9	3.3	3.5	4.9	5.3	2.7	1.8	0.9	0.9	2.5	3.2	4.3	3.0	-2.3	5.3	1.3	24	
29	2.5	2.2	2.9	3.6	3.7	2.9	1.4	0.5	0.5	1.0	1.6	4.3	6.8	7.1	6.8	5.7	4.3	3.6	3.2	2.9	2.8	2.8	2.7	2.2	0.5	7.1	3.3	24	
30	2.1	2.4	2.2	2.3	1.9	1.4	0.2	-0.3	-0.9	-0.9	0.1	1.2	1.1	0.9	1.4	0.8	-0.7	-1.6	-2.2	-2.6	-3.0	-3.6	-5.1	-6.3	-6.3	2.4	-0.4	24	
31	-7.5	-8.3	-9.2	-10.2	-11.7	-13.0	-13.6	-14.5	-14.9	-14.9	-14.7	-14.5	-13.7	-13.5	-13.9	-14.4	-14.0	-15.6	-15.5	-14.9	-14.3	-14.0	-13.0	-12.0	-15.6	-7.5	-13.2	24	
HOURLY MAX	2.8	2.4	2.9	3.6	3.7	2.9	2.3	3.8	5.2	6.0	5.6	5.7	6.8	7.5	7.7	7.0	4.7	4.2	4.0	3.7	3.6	3.2	4.3	3.3					
HOURLY AVG	-11.0	-10.9	-10.9	-11.0	-11.0	-11.0	-11.3	-11.1	-11.1	-10.4	-9.2	-7.8	-6.9	-6.5	-6.6	-7.6	-8.8	-9.6	-9.8	-10.0	-10.1	-10.3	-10.8	-10.9					

STATUS FLAG CODES

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

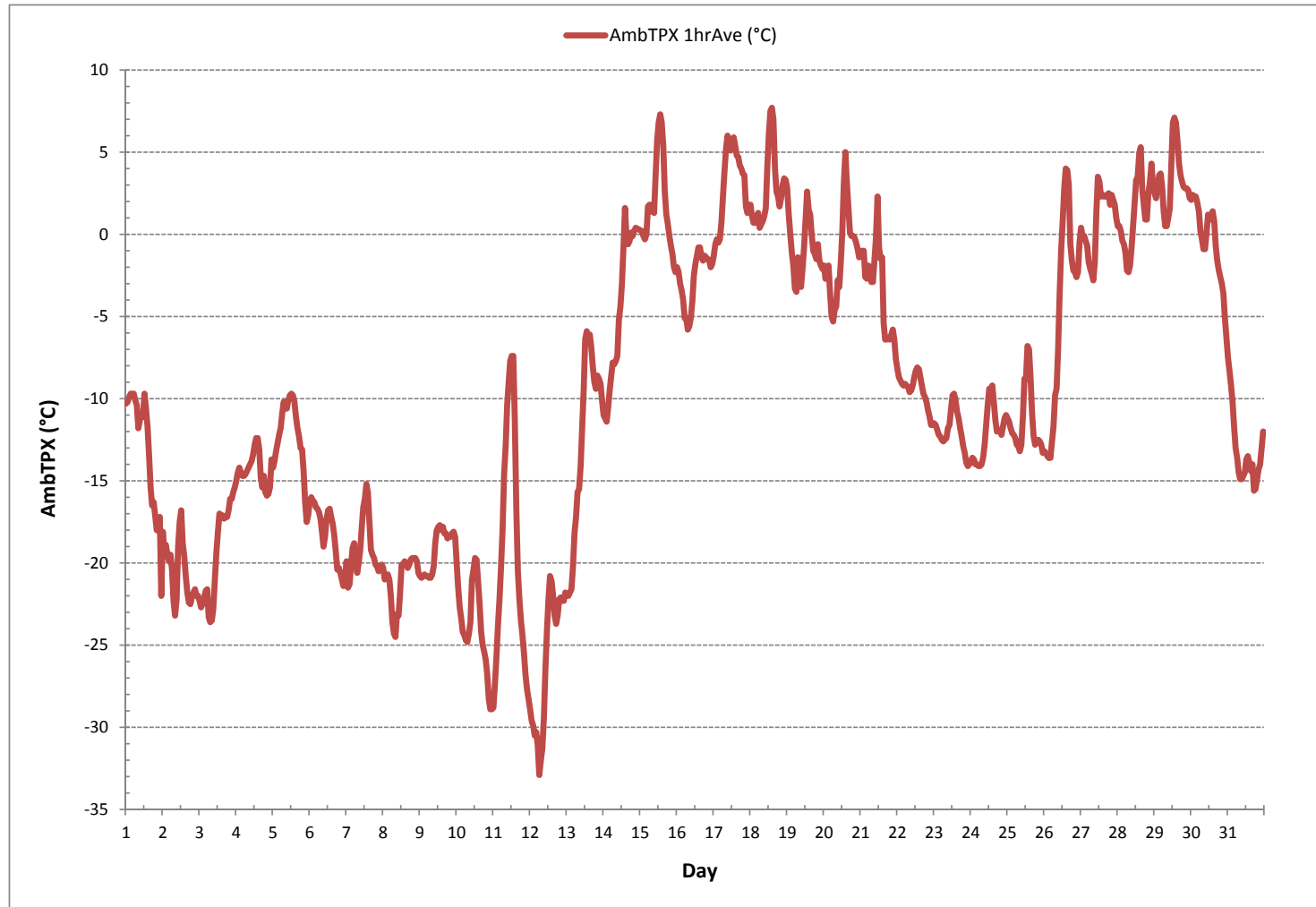
24 HR AVERAGES January 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-32.9 °C	@ HOUR(S)	6	ON DAY(S)	12
MAXIMUM 1-HR AVERAGE:	7.7 °C	@ HOUR(S)	14	ON DAY(S)	18
MAXIMUM 24-HR AVERAGE:	3.3 °C			ON DAY(S)	29
				VAR-VARIOUS	
OPERATIONAL TIME:				741	hrs
AMD OPERATION UPTIME:				99.6	%
STANDARD DEVIATION:	9.4			MONTHLY AVERAGE:	-9.8 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

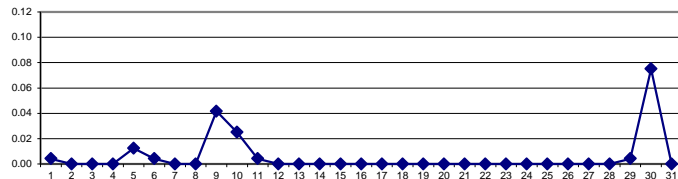
PRECIPITATION Hourly Averages (mm)

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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
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	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	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	24
6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.2	0.2	0.2	0.1	0.1	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	0.0	0.0	0.2	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	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	0.6	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	P	P	0.0	0.0	0.0	22
15	P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23
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	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.4	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.1	24	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.4	0.3	0.6	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2					
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

STATUS FLAG CODES

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

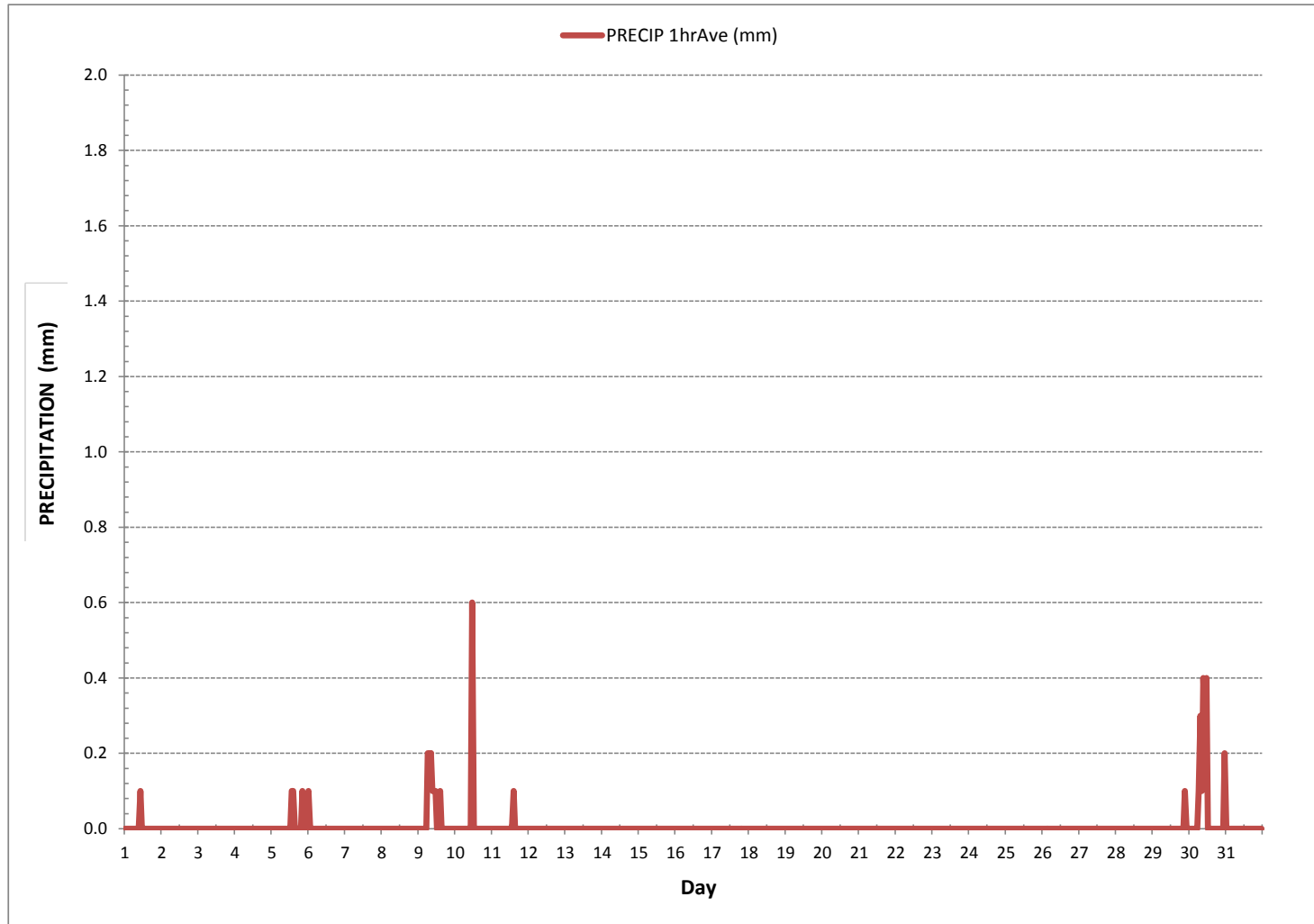
24 HR AVERAGES January 2017



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	0.6	mm	@ HOUR(S)	11	ON DAY(S)	10
MAXIMUM 24-HR AVERAGE:	0.1	mm			ON DAY(S)	30
MONTHLY TOTAL	4.1	mm			VAR-VARIOUS	
OPERATIONAL TIME:						741 hrs
AMD OPERATION UPTIME:						99.6 %
STANDARD DEVIATION:	0.0					MONTHLY AVERAGE: 0.0 mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>January 25, 2017</u>	Barometric Pressure: <u>0.921 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>20</u>
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>A few clouds</u>
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>shut down</u>
Start Time 24 hr. (mst): <u>10:26</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>13:07</u>	Cal Gas Expiry Date: <u>July 18, 2019</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>468</u>	Range ppb: <u>1000</u>	Station SO2 Analyzer Range? <u>ppb</u>
Last Calibration Date: <u>December 21, 2016</u>	As Found C.F.: <u>1.006</u>	
Previous C.F.: <u>0.999</u>	New C.F.: <u>n/a</u>	

Calibrator:	Standard Calibration Points for Ranges	SO₂ Scrubber Check (10 mins.)								
Flow Meter ID's: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190	Start/End Time 24 hr.: _____
Point	ppb									
High	780									
Mid	380									
Low	190									
Make & Model: <u>API 700</u>		Target Concentration (ppb): <u>780</u>								
Serial #: <u>690</u>		Result (ppb): _____								
Cal Gas Cylinder I.D. #: <u>LL104222</u>		Zero Corrected Result (ppb): <u>-2</u>								
Cal Gas Conc. (ppm): <u>50.6</u>		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

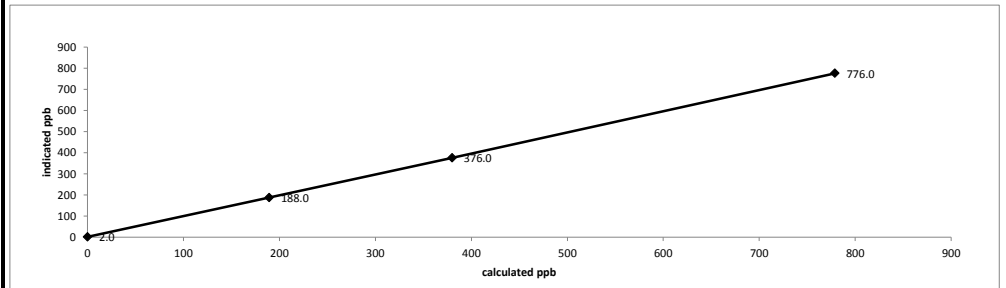
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	5000	0.00	5000	0.0	2.0	n/a
as found high	4919	76.90	4996	778.9	776.0	1.006
mid	4956	37.50	4994	380.0	376.0	1.016
low	4977	18.70	4996	189.4	188.0	1.018
Average C.F. =						1.014

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>1.006</u>	> or = 0.995
b (Intercept as % of full scale) = <u>-0.04%</u>	0.90-1.10
% change in C.F. from last cal = <u>-0.73%</u>	± 3% F.S.
	± 10%

API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
SLOPE: <u>0.991</u>	SLOPE: <u>n/a</u>
OFFSET: <u>117.8</u>	OFFSET: <u>n/a</u>
HVPS: <u>651</u>	HVPS: <u>n/a</u>
RCCELL TEMP: <u>50.0</u>	RCCELL TEMP: <u>n/a</u>
BOX TEMP: <u>28.7</u>	BOX TEMP: <u>n/a</u>
PMT TEMP: <u>7.8</u>	PMT TEMP: <u>n/a</u>
IZS TEMP: <u>50.0</u>	IZS TEMP: <u>n/a</u>
PRES: <u>24.0</u>	PRES: <u>n/a</u>
SAMP FL: <u>619</u>	SAMP FL: <u>n/a</u>
NORM PMT: <u>117.2</u>	NORM PMT: <u>n/a</u>
UV LAMP: <u>3180.0</u>	UV LAMP: <u>n/a</u>
LAMP RATIO: <u>97.5</u>	LAMP RATIO: <u>n/a</u>
STR. LGT: <u>58.4</u>	STR. LGT: <u>n/a</u>
DRK PMT: <u>5.0</u>	DRK PMT: <u>n/a</u>
DRK LMP: <u>6.8</u>	DRK LMP: <u>n/a</u>
Expected Value: <u>410.0</u>	Expected Value: <u>n/a</u>

Comments:

Shutdown calibration completed to calibrate output voltage.



API 100E Sulphur Dioxide Analyzer Calibration

Date: January 25, 2017	Barometric Pressure: 0.921 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: St. Lina	Weather Conditions: A few clouds
Parameter: Sulphur Dioxide	Calibration Purpose: post repair
Start Time 24 hr. (mst): 16:30	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 18:45	Cal Gas Expiry Date: July 18, 2019
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a

Analyzer:	Station SO2 Analyzer Range?
ID# or Serial Number: 468	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:	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 mins.)								
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	Start/End Time 24 hr.:
Point	ppb									
High	780									
Mid	380									
Low	190									
Make & Model: API 700		Target Concentration (ppb): 780								
Serial #: 690		Result (ppb):								
Cal Gas Cylinder I.D. # : LL104222		Zero Corrected Result (ppb): 0								
Cal Gas Conc. (ppm): 50.6		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

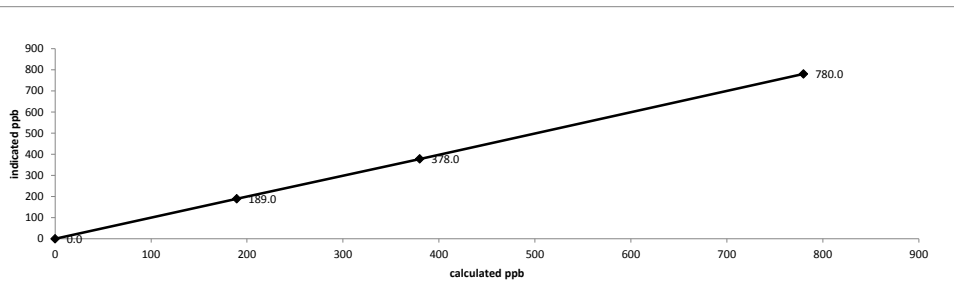
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4919	77.00	4996	779.9	780.0	1.000
mid	4956	37.50	4994	380.0	378.0	1.005
low	4978	18.70	4997	189.4	189.0	1.002
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F. =						1.002

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000	LIMITS
Slope = 1.000	> or = 0.995
b (Intercept as % of full scale) = 0.06%	.95-1.05
% change in C.F. from last cal = n/a	± 3% F.S.
	± 10%

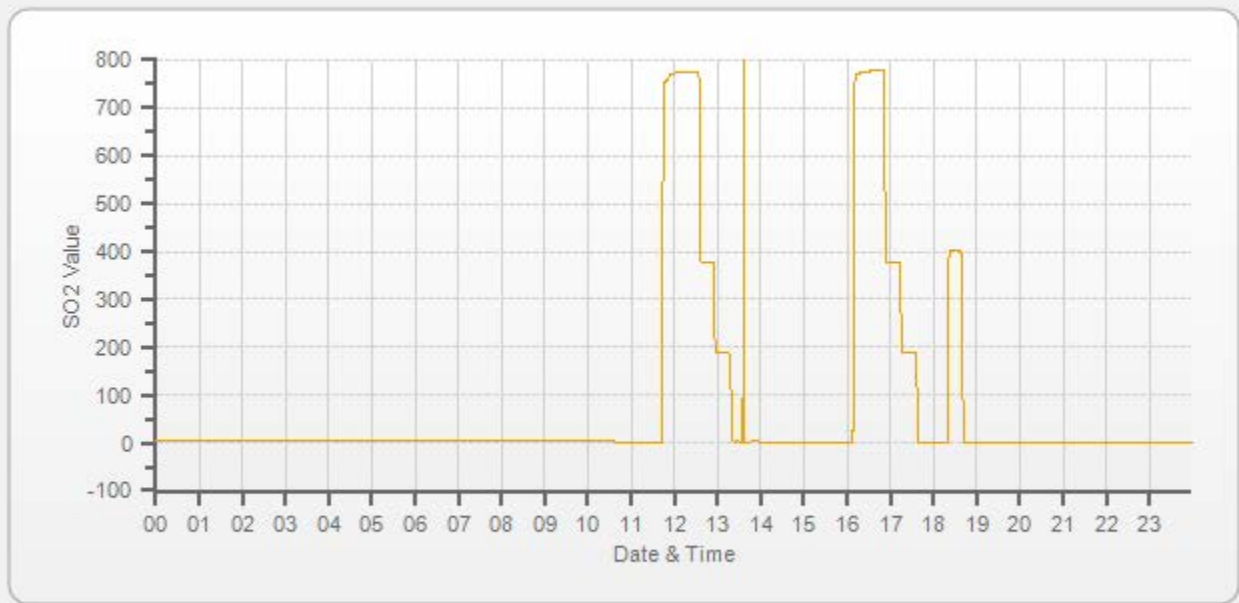
API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
SLOPE: n/a	SLOPE: 0.997
OFFSET: n/a	OFFSET: 117.8
HVPS: n/a	HVPS: 651
RCELL TEMP: n/a	RCELL TEMP: 50.0
BOX TEMP: n/a	BOX TEMP: 30.0
PMT TEMP: n/a	PMT TEMP: 7.9
IZS TEMP: n/a	IZS TEMP: 50.0
PRES: n/a	PRES: 23.9
SAMP FL: n/a	SAMP FL: 617
NORM PMT: n/a	NORM PMT: 117.1
UV LAMP: n/a	UV LAMP: 3180.3
LAMP RATIO: n/a	LAMP RATIO: 97.5
STR. LGT: n/a	STR. LGT: 58.7
DRK PMT: n/a	DRK PMT: 5.8
DRK LMP: n/a	DRK LMP: 6.8
Expected Value: n/a	Expected Value: 400.0

Comments:
The analyzer sample inlet filter was changed.

Post-repair calibration completed after the output voltage calibration was performed to correct ZERO.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: January 25, 2017	Barometric Pressure: 0.921 atm
Company/Airshed: LICA	Station Temperature °C: 20
Location/Station Name: St. Lina	Weather Conditions: A few clouds
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 10:26	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 14:12	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 Station SO2 Analyzer Range?
Last Calibration Date: December 21, 2016	As Found C.F.: 1.006 1000 ppb
Previous C.F.: 0.998	New C.F.: 0.997

Calibrator:	Standard Calibration Points for Ranges	SO₂ Scrubber Check (10 mins.)								
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	Start/End Time 24 hr.: 10:53/11:03
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: SABIO 2010 D		Target Concentration (ppb): 780								
Serial #: 11900613		Result (ppb): 0.5								
Cal Gas Cylinder I.D. #: EY0000654		Zero Corrected Result (ppb): 1								
Cal Gas Conc. (ppm): 10.2		**warning-initial zero must be done for corrected result, corrected result must not be greater than 2 ppb**								

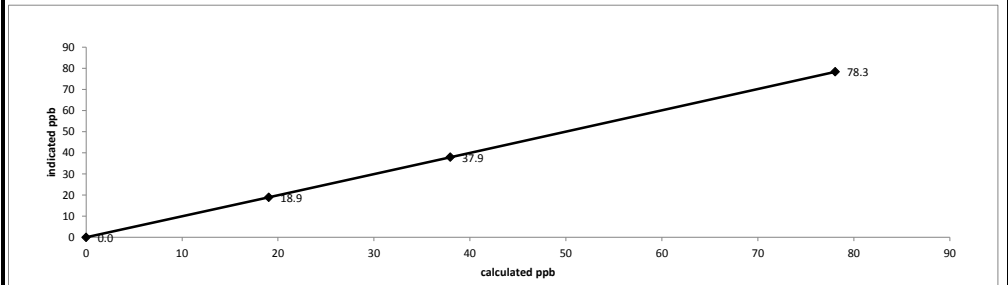
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	(ppb)	(ppb)	
as found zero	7500	0.00	7500	0.0	0.0	n/a
as found high	7442	57.40	7499	78.1	77.6	1.006
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	37.9	1.001
low	7486	14.00	7500	19.0	18.9	1.007
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.002

Linear Regression/Calibration Results:

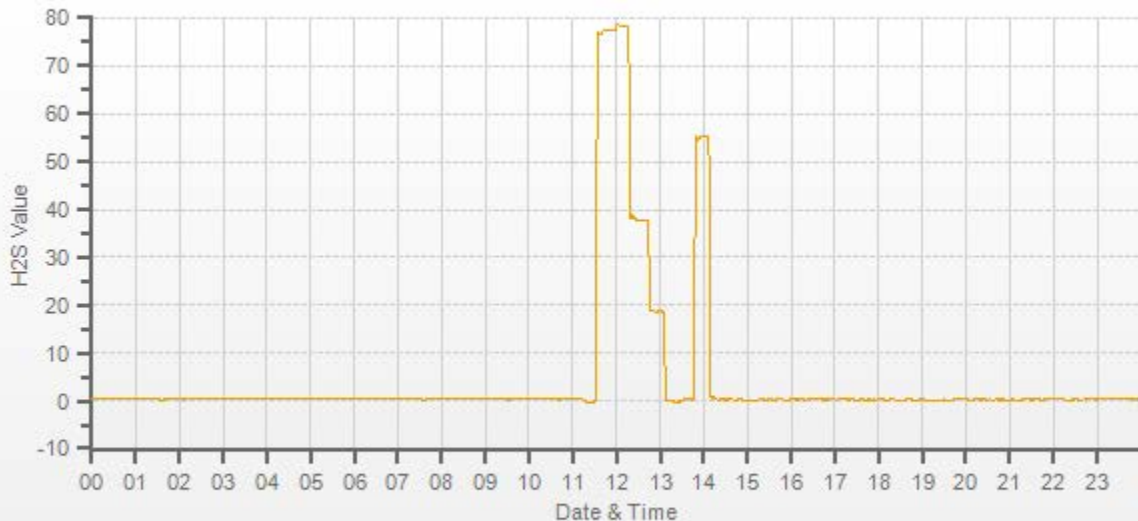
Correlation Coefficient =	1.000	LIMITS
Slope =	0.996	> or = 0.995
b (Intercept as % of full scale)=	0.11%	± 3% F.S.
% change in C.F. from last cal=	-0.81%	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



<p style="text-align: center;">As found:</p> SLOPE: 0.919 OFFSET: 53.1 HVPS: 675 RCCELL TEMP: 50.0 BOX TEMP: 29.9 PMT TEMP: 8.0 IZS TEMP: 48.0 Converter Temp: 315.1 PRES: 20.5 SAMP FL: 567 UV LAMP: 3500.8 LAMP RATIO: 93.7 STR. LGT: 24.4 DRK PMT: 0.3 DRK LMP: 0.6 Expected Value: 56.0	<p style="text-align: center;">As left:</p> SLOPE: 0.933 OFFSET: 53.5 HVPS: 675 RCCELL TEMP: 50.0 BOX TEMP: 32.0 PMT TEMP: 8.0 IZS TEMP: 48.0 Converter Temp: 314.8 PRES: 20.5 SAMP FL: 566 UV LAMP: 3498.1 LAMP RATIO: 93.6 STR. LGT: 25.0 DRK PMT: 0.4 DRK LMP: 0.3 Expected Value: 55.2
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Comments:
The analyzer sample inlet filter was changed.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	January 24, 2017	Barometric Pressure:	0.917 atm
Company/Airshed:	LUCA	Station Temperature °C:	20
Location/Station Name:	St. Lina	Weather Conditions:	Light snow
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly
Start/End Time 24 hr. (mst):	12:49 / 16:02	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:	December 20, 2016	As Found C.F.:	1.008
	Previous Cal High Point C.F.:	1.000	New C.F.:	1.003

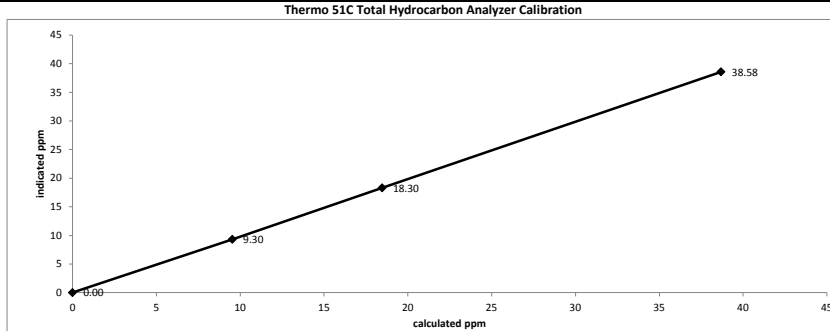
Calibrator:	Flow Meter ID's:	n/a	Standard Calibration Points for a Range of: 50 ppm	
	Make & Model:	API 700		
	Serial #:	690	Point	Target ppm
	Cal Gas Cylinder I.D. #:	LL165372	High	38
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	606.0	212.0	Mid	18
CH ₄ as propane/total CH ₄ equivalents (ppm):	583.0	1189.0	Low	9

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

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	1999	0.00	1999	0.0	0.20	n/a
as found high	1933	65.00	1998	38.68	38.58	1.008
adjusted zero	1999	0.00	1999	0.00	0.00	n/a
adjusted high	1933	65.00	1998	38.68	38.58	1.003
mid	1965	31.00	1996	18.47	18.30	1.009
low	1980	16.00	1996	9.53	9.30	1.025
calibrator zero	1999	0.00	1999	0.0	0.00	n/a
Average C.F. =						1.012

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	1.001	> or = 0.995
b (Intercept as % of full scale) =	0.21%	.95-1.05
% change in C.F. from last cal =	-0.78%	± 3% F.S.
		± 10%



As found:	As left:
H2 cylinder (psi): 800	H2 cylinder (psi): 800
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): 24
Span Cylinder (psi): 1000	Span Cylinder (psi): 1000
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: 47	Zero Air Gen Pressure: 47
measurement alarms: None	measurement alarms: None
service alarms: None	service alarms: None
cnt: 1896	cnt: 1854
rng: 1	rng: 1
try: 1	try: 1
flm: 191.9	flm: 191.7
det: 125.8	det: 125.8
Flame: 191	Flame: 191
Filter: 125	Filter: 125
Base: 1255	Base: 125
Sample psi: 06.90	Sample psi: 06.90
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: 26.87	Expected Value: 27.26

Comments:
 The analyzer sample inlet filter was changed.
 No high point 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.



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: January 25, 2017
Company/Airshed: LICA
Location/Station Name: St. Lina
Start/End Time 24 hr. (mst): 10:26 / 16:29
G.P.T. to be used for Ozone? No
Calibration Method: Gas Dilution & Gas Phase Titration

Barometric Pressure: 0.921 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: 594
Last Calibration Date: December 21, 2016
Range ppb: 1000

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	1.000	1.019	0.999
NO ₂ =	1.006	1.012	1.012
NOx =	1.000	1.019	0.999

Calibrator:

Flow Meter ID's: n/a
Make & Model: API 700
Serial #: 690
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	1.0	n/a	n/a
as found high	4919	76.9	4996	780.4	780.4	766.0	767.0	1.019	1.019
adjusted zero	5000	0.00	5000	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4919	76.90	4996	780.4	780.4	781.0	781.0	0.999	0.999
mid	4956	37.50	4994	380.7	380.7	379.0	380.0	1.005	1.002
low	4977	18.70	4996	189.8	189.8	189.0	189.0	1.004	1.004
calibrator zero	5000	0.00	5000	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.003	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	4919	76.90	4996	0.0	782.0	780.0	-2.0	0.0	-2.0	
as found high NO ₂	4814	76.90	4891	470.0	270.0	774.0	504.0	512.0	506.0	1.012
adjusted high NO ₂	4814	76.90	4891	470.0	270.0	774.0	504.0	512.0	506.0	1.012
gpt mid	4814	76.90	4891	250.0	496.0	776.0	280.0	286.0	282.0	1.014
gpt low	4814	76.90	4891	75.0	679.0	779.0	101.0	103.0	103.0	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	1.010	.95-1.05
b (Intercept as % of full scale)=	-0.08%	-0.06%	-0.08%	± 3% F.S.
% change in C.F. from last cal=	-1.88%	-1.88%	-0.58%	± 10%
NO ₂ converter efficiency			1.01	0.96 to 1.04

As found:

NOx SLOPE: 0.990
 NOx OFFS: 1.2
 NO SLOPE: 1.001
 NO OFFS: 0.8
 SAMP FLW: 484
 OZONE FL: 78
 PMT: 15.7
 NORM PMT: 0.7
 AZERO: 16.4
 HVPS: 767
 RCELL TEMP: 50.0
 BOX TEMP: 31.3
 PMT TEMP: 6.7
 IZS TEMP: 45.0
 MOLY TEMP: 315.1
 RCEL: 5.1
 SAMP: 26.7
 Expected Value NO: 6.7
 Expected Value NO₂: 526.0
 Expected Value NOx: 532.0

As left:

NOx SLOPE: 1.007
 NOx OFFS: 2.2
 NO SLOPE: 1.018
 NO OFFS: 0.3
 SAMP FLW: 484
 OZONE FL: 78
 PMT: 15.8
 NORM PMT: 0.6
 AZERO: 16.6
 HVPS: 767
 RCELL TEMP: 50.0
 BOX TEMP: 31.8
 PMT TEMP: 6.7
 IZS TEMP: 45.3
 MOLY TEMP: 313.9
 RCEL: 5.1
 SAMP: 26.7
 Expected Value NO: 7.3
 Expected Value NO₂: 518.0
 Expected Value NOx: 524.0

Comments:

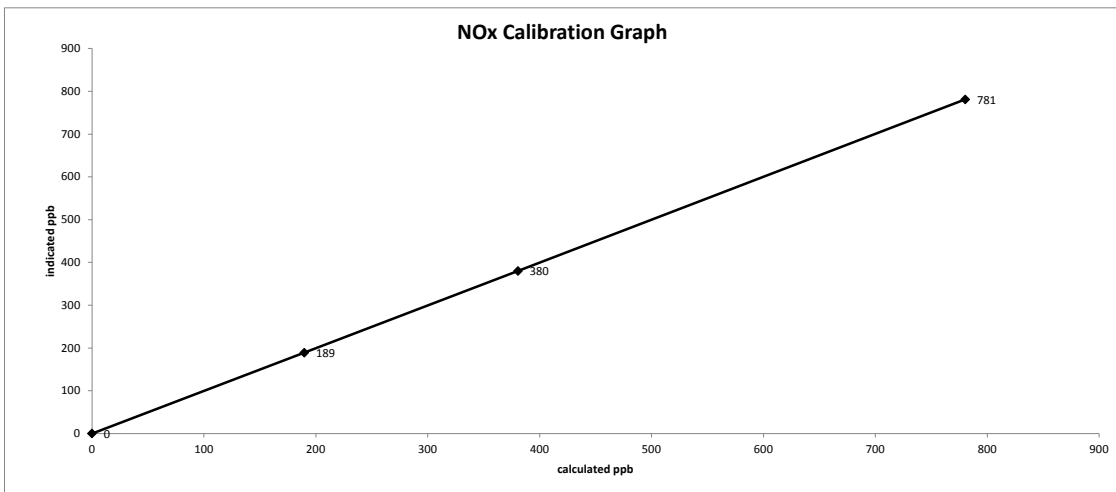
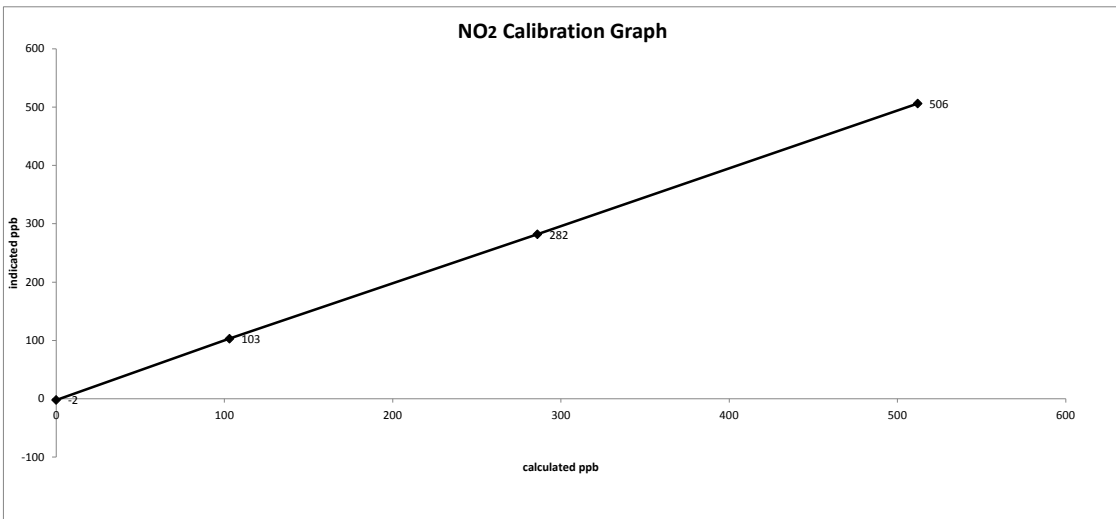
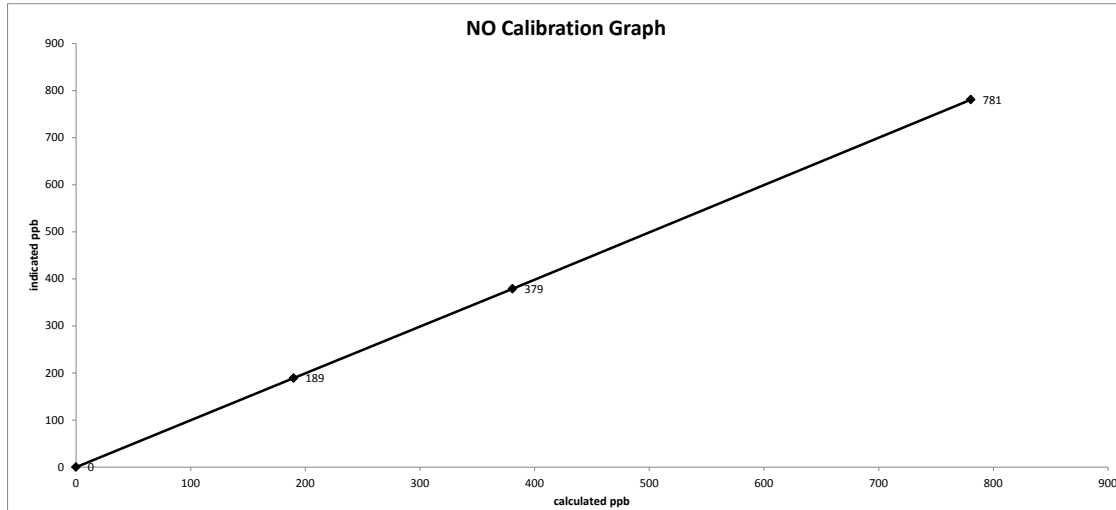
The analyzer sample inlet filter was changed.

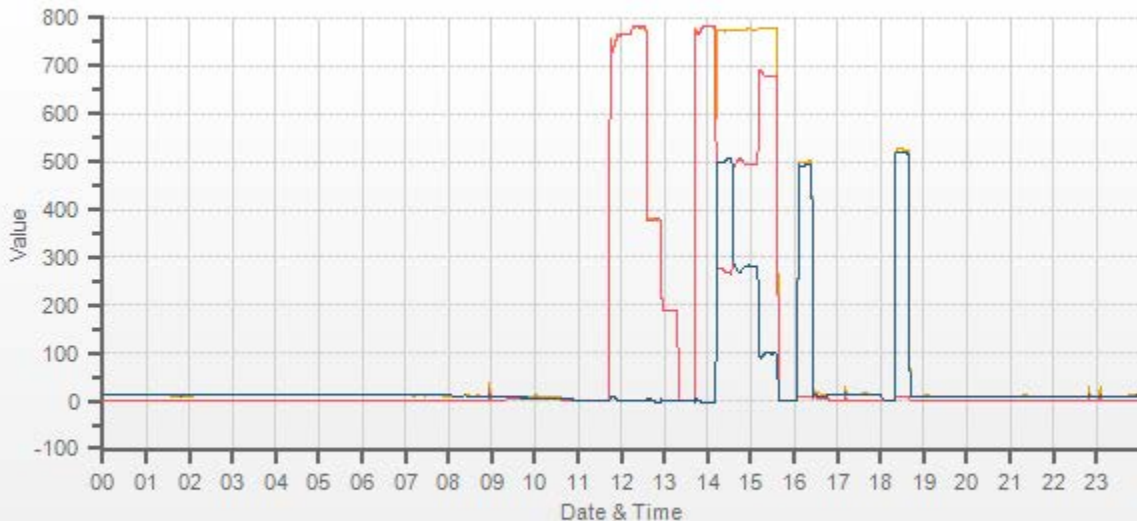
No high point NO₂ adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

Calibration gas audit certificate is included in the report. Concentrations are based on meeting AEP's acceptance criteria and may not match actual.

Date: January 25, 2017
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 10:26 / 16:29
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: January 24, 2017
 Company/Airshed: LICA
 Location/Station Name: St. Lina
 Start/End Time 24 hr. (mst): 12:49 / 16:31
 Ozone Calibration Method: Varying UV Lamp Power
 G.P.T. Date: n/a-done by Varying UV Lamp Power

Barometric Pressure: 0.917 atm
 Station Temperature °C: 20
 Weather Conditions: Light snow
 Calibration Purpose: routine monthly
 Performed By/Reviewer: Alex Yakupov / Trina Whitsitt
 Cal Gas Expiry Date: n/a

Analyzer:
 ID# or Serial Number: 1002240371
 Last Calibration Date: December 20, 2016
 Previous Cal High Point C.F.: 1.000

Ozone Range ppb: 500
 As Found C.F.: 1.000
 New C.F.: 1.000

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

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

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

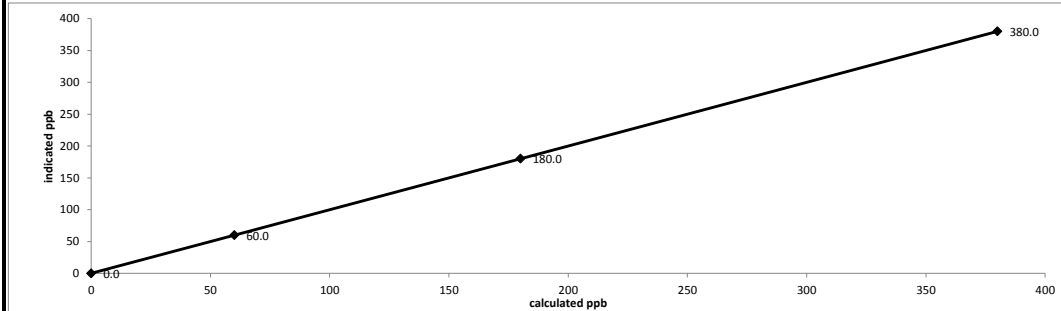
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	380.0	1.000
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	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 = 0.00%

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

Thermo 49i Ozone Analyzer Calibration



As found:

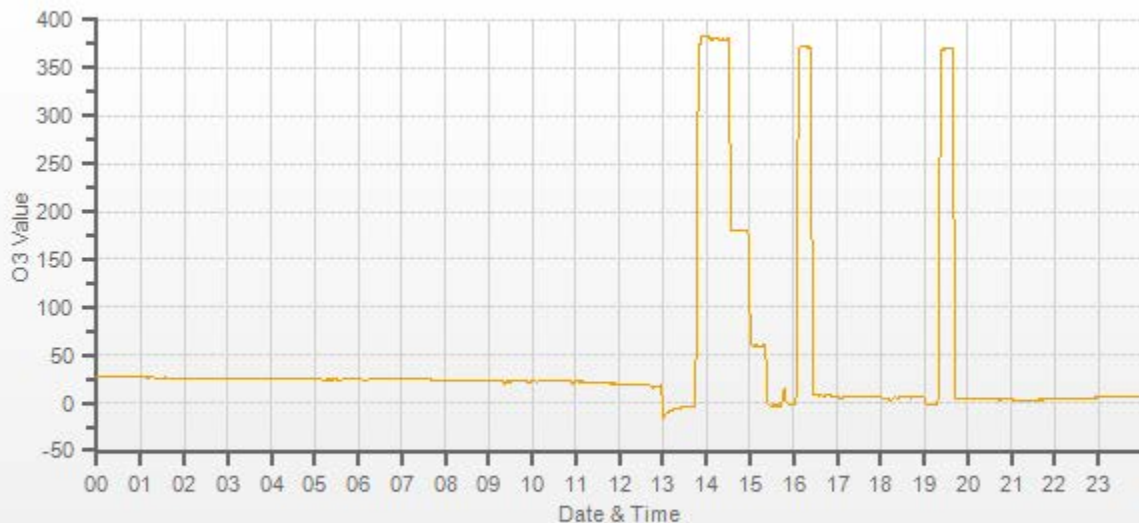
O3 Bkg: 0.8
 O3 Coef: 0.967
 Photo Lamp: 9.4
 O3 Lamp: 7.8
 Bench: 24.7
 Bench Lamp: 53.5
 O3 Lamp: 67.7
 Pressure: 676.4
 Cell A lpm: 0.724
 Cell B lpm: 0.719
 O3 ppb: -6.4
 Cell A ppb: -5.5
 Cell B ppb: -7.3
 Cell A int: 55888
 Expected Value: 375.0

As left:

O3 Bkg: 1.9
 O3 Coef: 0.967
 Photo Lamp: 9.4
 O3 Lamp: 7.8
 Bench: 26.8
 Bench Lamp: 53.6
 O3 Lamp: 67.8
 Pressure: 677.0
 Cell A lpm: 0.725
 Cell B lpm: 0.718
 O3 ppb: -3.2
 Cell A ppb: -5.4
 Cell B ppb: -0.9
 Cell A int: 55876
 Expected Value: 370.0

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

No high point adjustment made. ZERO Air pump was rebuilt.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: January 24, 2017
Company: LICA
Station Name/Location: St. Lina
Previous Audit Date: January 13, 2017
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
Start Time (mst): 16:24
End Time (mst): 17:26
Calibration Purpose: Bi-monthly #2
Weather Conditions: Light snow

1400A Information and Status:

ID# or Serial Number: <u>1405A208301003</u>	As Found Filter Loading %: <u>33.08</u>
Ko Factor: <u>13125</u>	As Left Filter Loading %: <u>21.14</u>
Ambient Temperature °C: <u>-11.75</u>	As Found Noise: <u>0.003</u>
Ambient Pressure atm: <u>0.917</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:

Make: <u>Dwyer</u>	Pressure: <u>Fisher</u>	Temperature: <u>FLUKE</u>
Model: <u>475 Mark III</u>	Model: <u>FB1291</u>	Model: <u>1551A Ex STIK</u>
Serial Number: <u>#3</u>	Serial Number: <u>#05544</u>	Serial Number: <u>4295</u>
Calibration Date: <u>January 1, 2018</u>	Calibration Date: <u>December 5, 2016</u>	Calibration Date: <u>November 15, 2016</u>

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	-0.05	0.00	-0.05
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.86	0.00	-0.86
	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	-0.05	0.00	-0.05
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.86	0.00	-0.86
	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>-11.8</u>	1405F pressure atm: <u>0.917</u>
reference temperature °C: <u>-12.3</u>	reference pressure: <u>0.917</u>
difference °C: <u>-0.5</u>	difference: <u>0.000</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>-12.3</u>	1405F pressure atm: <u>0.917</u>
reference temperature °C: <u>-12.3</u>	reference pressure: <u>0.917</u>
difference °C: <u>0.0</u>	difference: <u>0.000</u>

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm 1405F main flow lpm: <u>3.00</u> reference main flow lpm: <u>3.02</u> difference lpm: <u>0.02</u>	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7% 1400A total/aux flow lpm: <u>16.67</u> reference total/aux flow lpm: <u>17.24</u> difference lpm: <u>0.57</u>
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As left flows (same as above if as found adequate):

main flow tolerance 3.00 lpm +/- 0.20 lpm 1405F main flow lpm: <u>3.00</u> reference main flow lpm: <u>3.00</u> difference lpm: <u>0.00</u>	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7% 1400A total/aux flow lpm: <u>13.67</u> reference total/aux flow lpm: <u>13.66</u> difference lpm: <u>-0.01</u>
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K_o Audit:

Last K_o audit date: December 8, 2016
1405F K_o factor: 13125
Measured K_o factor: 13191.9000
% difference: 0.51

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.

 Flows were calibrated. PM2.5/10 sample inlet was cleaned.



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: January 13, 2017
Company: LICA
Station Name/Location: St. Lina
Previous Audit Date: December 20, 2016
Parameter: PM 2.5

Performed By/Reviewer: Limin Li | Trina Whitsitt
Start Time (mst): 10:30
End Time (mst): 11:30
Calibration Purpose: Bi-monthly #1
Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number: <u>1405A208301003</u>	As Found Filter Loading %: <u>27.98</u>
Ko Factor: <u>13125</u>	As Left Filter Loading %: <u>27.98</u>
Ambient Temperature °C: <u>-12.44</u>	As Found Noise: <u>0.003</u>
Ambient Pressure atm: <u>0.921</u>	As Left Noise: <u>0.000</u>
Main Flow Reading lpm: <u>3.00</u>	Pump Vacuum: <u>0.31</u>
Aux Flow Reading lpm: <u>13.67</u>	Warnings: <u>None</u>

Reference Standards:

Make: <u>Dwyer</u>	Pressure: <u>BRUNTON</u>	Temperature: <u>FLUKE</u>
Model: <u>475 Mark III</u>	ADC-SUMMIT	1551A Ex STIK
Serial Number: <u>#2</u>	5490	4295
Calibration Date: <u>January 15, 2016</u>	December 5, 2016	November 15, 2016

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	-0.05	0.00	-0.05
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.84	-0.01	-0.84
	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	-0.05	0.00	-0.05
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	0.00	-0.84	-0.01	-0.84
	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>-12.4</u>	1405F pressure atm: <u>0.921</u>
reference temperature °C: <u>-12.4</u>	reference pressure: <u>0.924</u>
difference °C: <u>0.0</u>	difference : <u>-0.003</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>-12.4</u>	1405F pressure atm: <u>0.921</u>
reference temperature °C: <u>-12.4</u>	reference pressure: <u>0.924</u>
difference °C: <u>0.0</u>	difference : <u>0.003</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>13.67</u>
reference main flow lpm: <u>3.03</u>	reference total/aux flow lpm: <u>14.27</u>
difference lpm: <u>0.03</u>	difference lpm: <u>0.60</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>3.03</u>	reference total/aux flow lpm: <u>14.27</u>
difference lpm: <u>0.03</u>	difference lpm: <u>0.60</u>

K_o Audit:

Last K_o audit date: December 8, 2016
1405F K_o factor: 13125
Measured K_o factor: 13191.9000
% difference: 0.51

Comments:

No adjustment. Audit only.

WIND SYSTEM

CALIBRATORS



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-164

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>690</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 2, 2015</u>	Temperature (°C)	<u>24</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>700 mmHg</u>
NO/NOX Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4998</u>	Pt. #2 <u>4994</u>	Pt. #3 <u>4996</u>
Gas Flow (sccm)		
Pt. #1 <u>77.5</u>	Pt. #2 <u>37.7</u>	Pt. #3 <u>18.8</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4998	0.0	0.000	0.000	0.001	0.001	0.001	Limit ± 10%	
4998	77.5	0.780	0.780	0.785	-0.002	0.783	1%	0%
4994	37.7	0.380	0.380	0.381	-0.001	0.380	0%	0%
4996	18.8	0.189	0.189	0.189	0.000	0.190	0%	0%
Absolute Average Percent Difference							0%	0%

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)= 1.0063	0.90-1.10	m (Slope)= 1.0024
b (Intercept % of FS)= -0.0486	± 3% F.S.	b (Intercept % of FS)= 0.0457

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4998	0	0.000	0.782	0.000	0.782	NO ₂	% Diff. Limit
4998	0.48	0.512	0.270	0.510	0.779	0%	± 10%
4998	0.24	0.269	0.513	0.269	0.782	0%	± 10%
4998	0.95	0.109	0.673	0.110	0.783	1%	± 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)= 0.9953	0.90-1.10
b (Intercept % of FS)= 0.0789	± 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 O₂ has 49.9ppb SO₂ - Flows not manually measured

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 30, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

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

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

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

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NO _x			
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	NO _x	% 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>			
NO ₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

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

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

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 31, 2016
Location: McIntyre Center Edmonton

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



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 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
Kim Wilson	Project Manager II/ Site Safety Coordinator, 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.

Kim Wilson

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

3-Mar-17

 Report Issued Date (dd-mm-yyyy)

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



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2017-01-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Kim Wilson</u>	Date <u>3-Mar-17</u>
Level 1 Primary Validation	<u>Kim Wilson</u>	Date <u>3-Mar-17</u>
Level 2 Final Validation	<u>Kim Wilson</u>	Date <u>3-Mar-17</u>
Level 3 Independent Data Review	<u>Chris Dunbar</u>	Date <u>3-Mar-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 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 January 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 January 2017 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

NOx/NO2/NO: The API 200E analyzer, S/N: 593, was removed for maintenance, and an API 200A analyzer, S/N: 2166, was installed on January 6.

WS/WD/STDWD: The wind system was re-aligned on January 31 as it was found to be misaligned to magnetic north, rather than true north since its installation in June of 2016. All wind direction data collected between January 1 at hour 0:00, and January 31, at hour 12:00 had a +13° correction applied.

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



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

results for both intermittent samples and VOC canister samples is scheduled to be submitted by the end of January 2018.

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

Respectfully,

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
rebbaca@gmail.com



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Fax 403-219-3673

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

JOB #: 2833-2017-01-35-C

January 2017

Prepared for:

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

Attention: MIKE BISAGA

DATE: **March 8, 2017**

Prepared by: *Kim Wilson*
Kim Wilson, Env.Tech
Project Manager, Customer Service, Air Services

Reviewed by: *Wunmi Adekanmbi*
Wunmi Adekanmbi, M.Sc., EPt.
Project Manager, Customer Service, Air Services

SUMMARY

In January 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.

All Parameters: One hour of downtime was recorded on January 11, at hour 15:00, due to a power failure.

SO₂: Four hours of downtime were recorded on January 20, due to a repeat calibration that was completed to address an observed drift in the analyzer's zero response.

H₂S: An additional span check and repeat calibration were performed on January 18 and January 20 respectively to address a biased high span response. Five hours of downtime were attributed to the additional quality checks.

THC/CH₄/NMHC: Additional span checks were triggered on January 2 and January 10 following a drift in the daily span results. A successful repeat calibration was completed on January 11. Six hours of downtime were recorded due to the additional quality checks.

NO_x/NO₂/NO: In total, twenty hours of downtime were recorded due to maintenance activities this month. Seventeen hours were incurred during unsuccessful calibration attempts on January 4 and January 5. Two hours were attributed to an analyzer replacement event on January 6. The API 200E (S/N: 593) analyzer was removed and replaced with an API 200A (S/N: 2166) analyzer. One hour was incurred due to an additional zero/span check performed on January 31.

The NO_x gas concentration 50.2 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.4 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}: Ten hours of data were recorded this month at concentrations less than -3 µg/m³, rendering the data invalid.

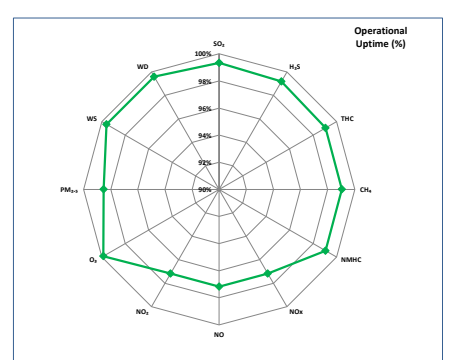
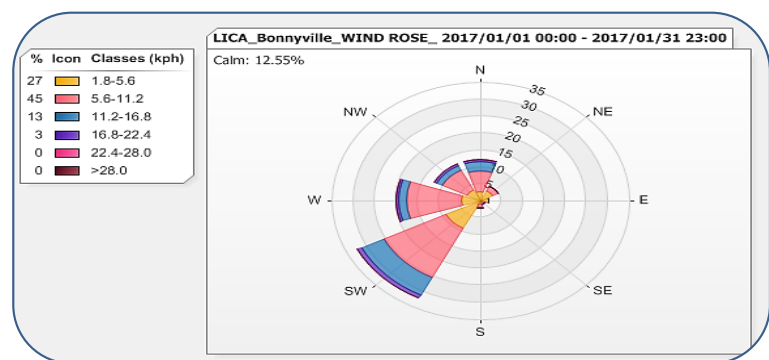
WS/WD/STDWD: The wind system was realigned on January 31 as it was found to be misaligned to magnetic north, rather than true north since its installation in June of 2016. Two hours of downtime were recorded due to this event. All wind direction data collected between January 1 at hour 0:00, and January 31, at hour 12:00 had a +13° correction applied.

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 403-219-3689 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	99.3%	2.0	January 13	20	172	0	0.9	January 14	48	0
H ₂ S	ppb	0.2	99.2%	2.5	January 18	16	10	0	1.0	January 20	3	0
THC	ppm	2.18	99.1%	3.85	January 19	3	-	-	3.27	January 19	-	-
CH ₄	ppm	2.17	99.1%	3.69	January 19	3	-	-	3.16	January 19	-	-
NMHC	ppm	0.01	99.1%	0.40	January 20	15	-	-	0.11	January 19	-	-
NO _x	ppb	12.3	97.2%	113.2	January 19	10	-	-	45.0	January 19	-	-
NO	ppb	4.2	97.2%	85.7	January 19	10	-	-	25.9	January 19	-	-
NO ₂	ppb	8.2	97.2%	33.3	January 17	19	159	0	21.1	January 2	-	-
O ₃	ppb	23.8	99.9%	55.1	January 27	17	82	0	36.4	January 15	-	-
PM _{2.5}	µg/m ³	6.8	98.5%	52.1	January 21	10	80	0	19.2	January 21	30	0
WS	kph	4.2	99.6%	27.9	January 11	14	-	-	13.6	January 14	-	-
WD	degree	269 (W)	99.6%	-	-	-	-	-	-	-	-	-



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

- All Parameters:** One hour of downtime was recorded on January 11, at hour 15:00, due to a power failure.
- SO₂:** Four hours of downtime were recorded on January 20, due to a repeat calibration that was completed to address an observed drift in the analyzer's zero response.
- H₂S:** An additional span check and repeat calibration were performed on January 18 and January 20 respectively to address a biased high span response. Five hours of downtime were attributed to the additional quality checks.
- THC/CH₄/NMHC:** Additional span checks were triggered on January 2 and January 10 following a drift in the daily span results. A successful repeat calibration was completed on January 11. Six hours of downtime were recorded due to the additional quality checks.
- NO_x/NO₂/NO:** Nineteen hours of downtime were due to unsuccessful calibration attempts on January 4 and January 5. Two hours were attributed to an analyzer replacement event on January 6. One hour was incurred due to an additional zero/span check performed on January 31.
- PM_{2.5}:** Ten hours of data were recorded this month at concentrations less than -3 µg/m³, rendering the data invalid.
- WS/WD/STDWD:** The wind system was realigned on January 31 as it was found to be misaligned. Two hours of downtime were recorded due to this event. All wind direction data collected between January 1, at hour 0:00 and January 31, at hour 12:00 had a +13° correction applied.

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	2.0	13	20	11	WSW	0.9	14	99.3
H ₂ S (ppb)	10	3	0	0	0.2	2.5	18	16	0.9	S	1.0	20	99.2
THC (ppm)	-	-	-	-	2.18	3.85	19	3	1.1	NE	3.27	19	99.1
CH ₄ (ppm)	-	-	-	-	2.17	3.69	19	3	1.1	NE	3.16	19	99.1
NMHC (ppm)	-	-	-	-	0.01	0.40	20	15	0.6	NE	0.11	19	99.1
NO ₂ (ppb)	159	-	0	-	8.2	33.3	17	19	3.3	ENE	21.1	2	97.2
NO (ppb)	-	-	-	-	4.2	85.7	19	10	1.9	NNE	25.9	19	97.2
NO _x (ppb)	-	-	-	-	12.3	113.2	19	10	1.9	NNE	45.0	19	97.2
O ₃ (ppb)	82	-	0	-	23.8	55.1	27	17	13.2	WSW	36.4	15	99.9
PM _{2.5} (µg/m ³)	80	30	0	0	6.8	52.1	21	10	0.0	WSW	19.2	21	98.5
VECTOR WS (kph)	-	-	-	-	4.2	27.9	11	14	-	NNW	13.6	14	99.6
VECTOR WD (sec)	-	-	-	-	269 (W)	-	-	-	-	-	-	-	99.6

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
January 1, 2017	641.00	n-Butane
January 7, 2017	1.79	n-Butane
January 13, 2017	2.70	Acetone
January 19, 2017	5.36	n-Butane
January 25, 2017	2.48	n-Butane
January 31, 2017	1.50	Acetone

Note: Higher than historical concentrations were reported on the January 1 sample. Dilutions were applied before analysis.

Polycyclic Aromatic Hydrocarbons (PAHs) Data Summary

Sample Collection Date	Maximum Reading ($\mu\text{g}/\text{puf}$)	Semi-Volatile Organic
January 1, 2017	1.61	Naphthalene
January 7, 2017	1.05	Naphthalene
January 13, 2017	0.52	2-Methylnaphthalene
January 19, 2017	1.06	2-Methylnaphthalene
January 25, 2017	0.80	Naphthalene
January 31, 2017	0.79	2-Methylnaphthalene

Note: NA

Volatile Organics (VOCs) Data Summary - NMHC Canister System

Sample Collection Date	Maximum Reading (ppb)	Volatile Organic Compound
January 6, 2017	1.5	Ethanol
January 9, 2017	1.88	n-Butane
January 10, 2017	1.15	n-Butane
January 12, 2017	10	Isopropyl alcohol
January 13, 2017	1.9	Acetone
January 17, 2017	9.9	Ethanol
January 20, 2017	37	n-Butane

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%).

SULPHUR DIOXIDE (SO₂)

The routine monthly calibration was performed on January 4. A repeat calibration was completed on January 20 to address an observed drift in the analyzer's zero response. Four hours of downtime were recorded due to this event. One hour of downtime was recorded on January 11, at hour 15:00, due to a power failure. Four hours of maximum instantaneous data were invalidated this month due to brief power outages that occurred mostly during operational activities.

HYDROGEN SULPHIDE (H₂S)

The routine monthly calibration was performed on January 4. The analyzer exhibited a biased high span response on January 18. The result of a repeat span check confirmed the drift. A successful repeat calibration was completed on January 20, the expected span value was then updated. Five hours of downtime were incurred due to the additional quality checks.

One hour of downtime was recorded on January 11, at hour 15:00, due to a power failure. Four hours of maximum instantaneous data were invalidated this month due to brief power outages that occurred mostly during operational activities.

TOTAL HYDROCARBONS (THC), METHANE (CH₄) and NON-METHANE HYDROCARBONS (NMHC)

The CH₄ daily span result exceeded the lower acceptance limit on January 1. A repeat span check was triggered on January 2 and the result confirmed the drift. A successful monthly calibration was performed on January 3.

The analyzer spanned close to the lower acceptance limit again on January 10. The result of an additional span check confirmed the drift. A successful repeat calibration was completed on January 11.

No data was invalidated due to these events, however, six hours of downtime were attributed to the additional quality checks.

Channels were placed in "Maintenance" mode for few minutes on January 5, to perform a test on the zero air generator. Two hours of maximum instantaneous data were invalidated due to this event, hourly averages were not impacted.

One hour of downtime was recorded on January 11, at hour 15:00, due to a power failure. Five hours of maximum instantaneous data were invalidated this month due to brief power outages that occurred mostly during operational activities.

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

A routine monthly calibration was attempted on January 4. The NO₂ phase of the calibration demonstrated some instability, and the calibrator was suspected as the problem. On January 5, the GPT (NO₂) portion of the calibration was re-attempted, but the analyzer demonstrated the same result. On January 6, a shutdown calibration was performed on the API 200E (S/N: 593) and model API 200A (S/N: 2166) was installed. An installation calibration was completed afterwards. Both calibration results met the AMD's requirements. Two hours of downtime were recorded during the analyzer replacement event.

In Maxxam's air monitoring laboratory, Maxxam performed a manufacturer's converter test. The test result indicated a weak converter, however, it was operating sufficiently to pass a shut-down calibration within the AMD specifications and the analyzer's operating range. All data produced by the API 200E (S/N: 593) analyzer is considered valid. Seventeen hours of downtime were, however, incurred during the calibration attempts on January 4 and January 5.

The analyzer exhibited a low span drift on January 30. A repeat span check was triggered on January 31 to assess analyzer performance and the result was within acceptance limit; one hour of downtime was incurred.

One hour of downtime was recorded on January 11, at hour 15:00, due to a power failure. This impacted two hours of maximum instantaneous data.

The NO_x gas concentration 50.2 ppm labelled as "Calculated NO_x" on the calibration record is not the actual concentration on the certificate of analysis, which is 50.4 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)

The routine monthly calibration was performed on January 3.

One hour of downtime was recorded on January 11, at hour 15:00, due to a power failure. Five hours of maximum instantaneous data were invalidated this month due to brief power outages that occurred mostly during operational activities. One hour of maximum instantaneous data was invalidated on January 10 at hour 23:00 as the data was considered anomalous.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

Two routine TEOM audits were performed this month: one was completed on January 3 and the other audit was performed on January 26. The sample filter was replaced and a new sample pump was installed on January 3.

Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, *Zero Adjustment Criteria*. Data recorded between 0 and $-3 \mu\text{g}/\text{m}^3$ was corrected to $0 \mu\text{g}/\text{m}^3$. Data recorded below $-3 \mu\text{g}/\text{m}^3$ was invalidated. Ten hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.

One hour of downtime was recorded on January 11, at hour 15:00, due to a power failure.

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

During a station visit on January 31, 2017 it was discovered that the wind system was misaligned to magnetic north, rather than true north since its installation in June of 2016. The wind system was realigned on January 31. Two hours of downtime were recorded due to this event. All wind direction data collected between January 1 at hour 0:00, and January 31 at hour 12:00, had a $+13^\circ$ correction applied.

One hour of downtime was recorded on January 11, at hour 15:00, due to a power failure. Five hours of maximum instantaneous data were invalidated this month due to brief power outages that occurred mostly during operational activities.

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

The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).

The routine quarterly audit for the PUF sampler was completed on January 27. Samples were collected on January 1, 7, 13, 19, 25 and 31. Analytical results are included in this report. VOC values are reported in ppb.

Higher than historical concentrations were reported for the January 1 sample, dilutions were applied before analysis. It was discovered that renovation activities were going on at the AEP building on the sampling date, this might be a factor in the observed elevated concentrations.

PAH SAMPLES

The sampler was programmed to run for 24 hours every 6th day per the NAPS (North American Pollution Surveillance Schedule).

The routine quarterly audit for the PUF sampler was completed on January 27. Samples were collected on January 1, 7, 13, 19, 25 and 31. Analytical results are included in this report. PAH values are reported in ug.

NMHC CANISTER SAMPLES

The canister sampler is programmed to draw in a whole air sample when the 5-minute average concentration of NMHC is above 0.30 ppm. A representative sample of ambient air is collected over a one-hour period when the canister event is triggered.

Seven canister events were recorded this month. The date, time and initial 5-min average concentration measurements are as follows:

- January 6 at 20:20 - 0.34 ppm
- January 9 at 16:05- 0.40 ppm
- January 10 at 16:05- 0.56 ppm
- January 12 at 9:45- 0.31 ppm
- January 13 at 14:30- 0.31 ppm
- January 17 at 18:45- 0.32 ppm
- January 20 at 14:50- 0.31 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. The values for NMHC canister samples are reported in ppb.

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 Raja Ashraf.

3.0 Plant Monthly Required AMD Summary

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

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

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

- Maxxam AIR SOP-00001 - Methane, Non-Methane Hydrocarbon Analyzer Monitoring
- Maxxam AIR SOP-00208: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canister and Xontech
- 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
- Oxides of Nitrogen - API 200E & API 200A Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - R&P 1405F TEOM Unit
- Wind System - RM Young Unit
- Datalogger - ESC 8832
- VOC - XONTECH 910A Gaseous Air Sampler
- PAH - TISCH PUF Plus

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

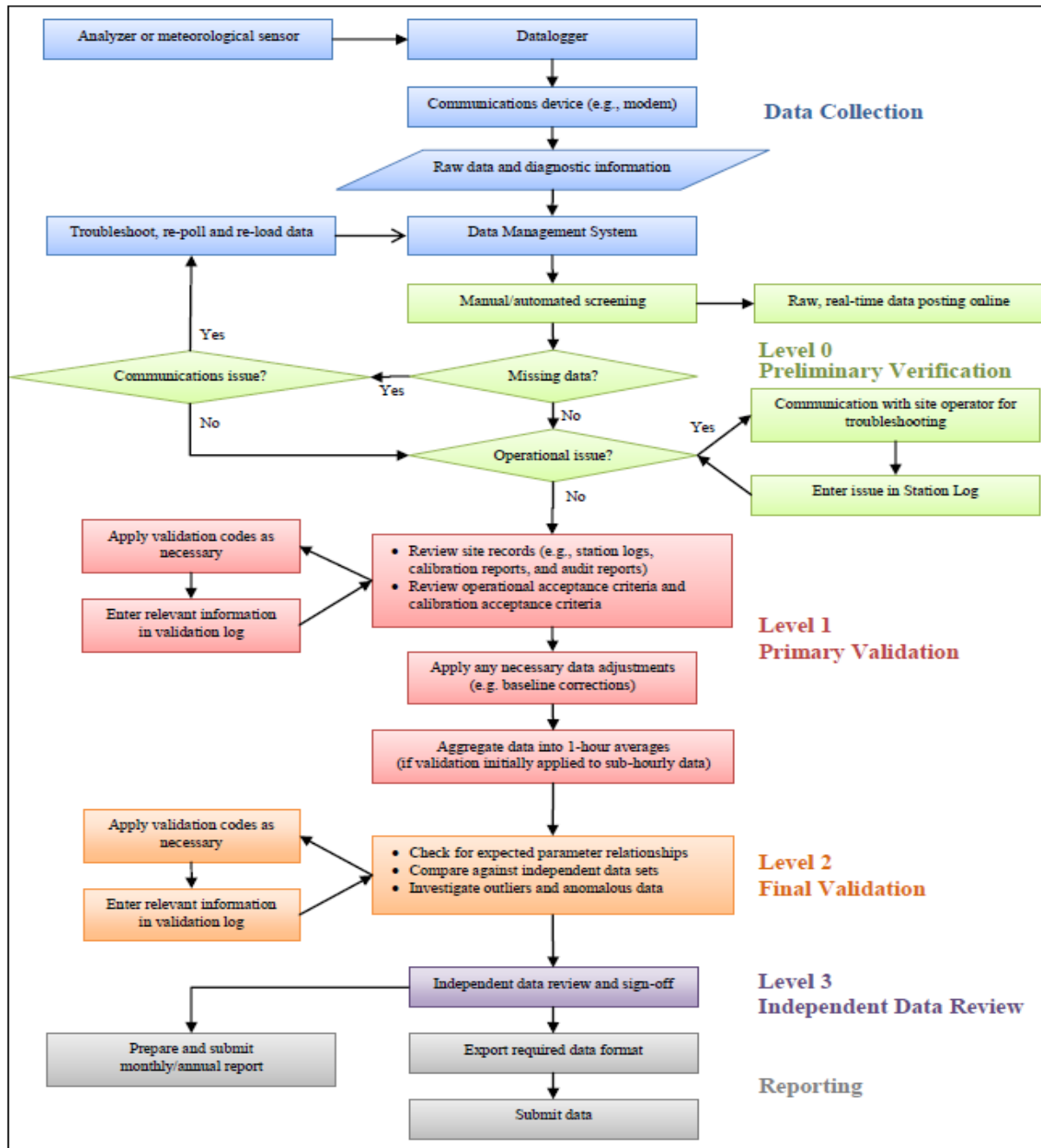
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

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

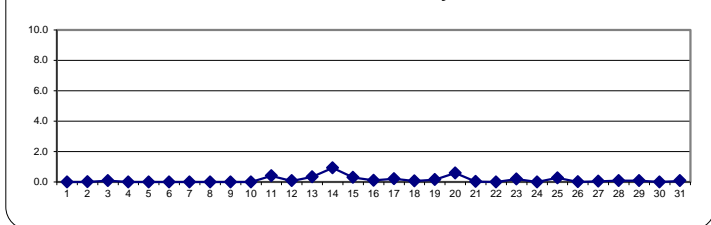
OBJECTIVE LIMIT:

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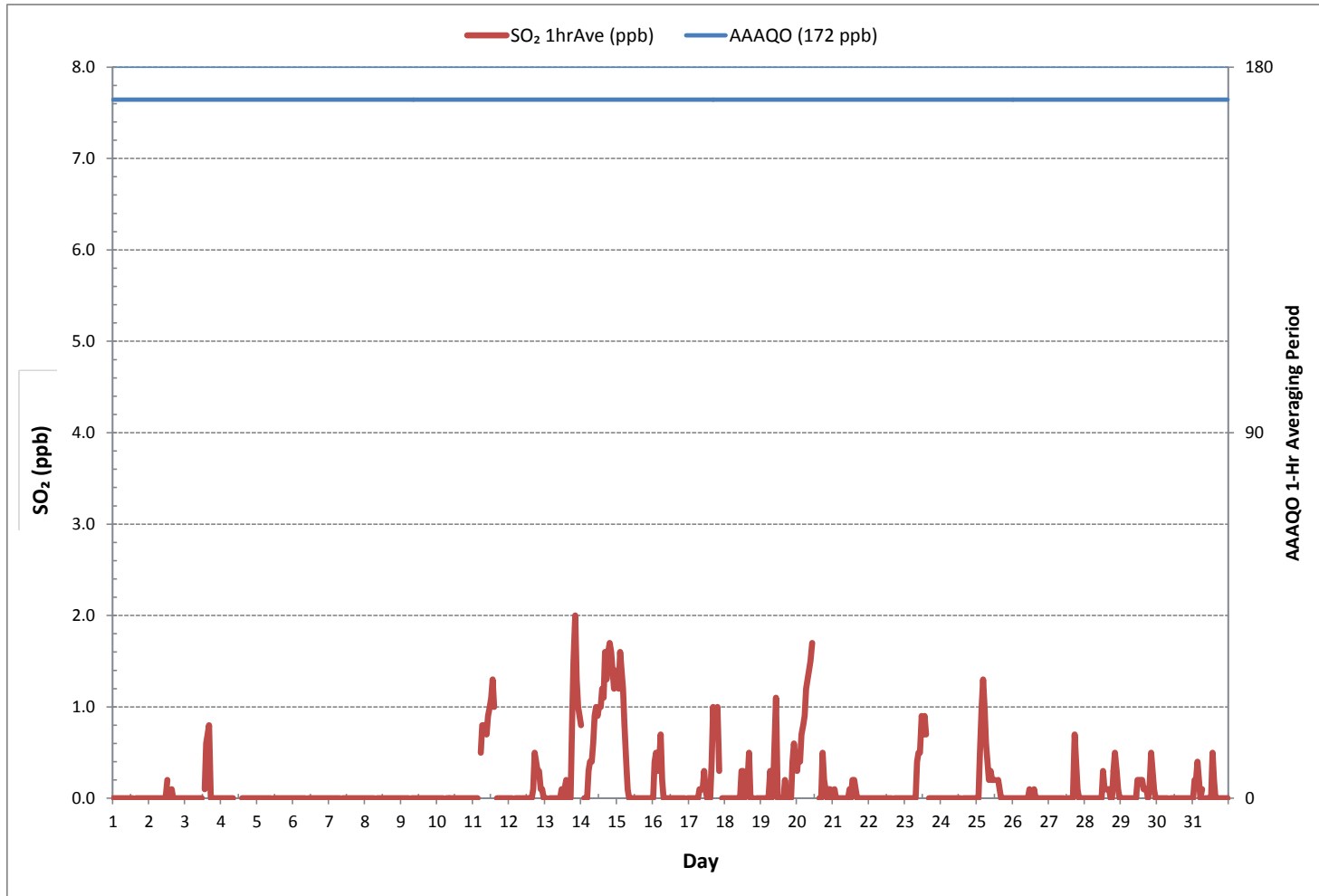
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	162			
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S)	VAR	ON DAY(S)	ALL
MAXIMUM 1-HR AVERAGE:	2.0 ppb @ HOUR(S)	20	ON DAY(S)	13
MAXIMUM 24-HR AVERAGE:	0.9 ppb		ON DAY(S)	14
			VAR-VARIOUS	
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	739 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.3 %	
STANDARD DEVIATION:	0.3	MONTHLY AVERAGE:	0.1 ppb	

24 HR AVERAGES January 2017



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville Continuous Monitoring Station - January 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	1.6	1.4	1.3	1.3	1.5	1.5	1.4	1.3	1.3	1.3	1.1	1.2	1.0	1.0	S	0.8	0.8	0.7	0.9	1.0	0.8	0.7	0.4	0.5	0.4	1.6	1.1	24	
2	0.9	0.9	0.5	0.6	1.2	1.2	0.5	0.4	0.6	0.9	0.2	0.3	0.8	S	0.6	1.0	0.7	1.0	0.7	0.3	0.1	0.0	0.0	0.0	0.0	1.2	0.6	24	
3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	S	0.8	1.2	1.6	1.7	1.0	0.7	0.6	0.6	0.8	0.6	0.6	0.0	1.7	0.5	24	
4	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.8	C	C	C	C	C	1.5	1.7	1.9	1.9	1.7	1.8	1.7	1.9	1.8	1.8	0.6	1.9	1.2	24	
5	2.0	2.0	2.1	1.9	2.3	2.3	2.5	2.5	2.3	2.5	S	2.3	2.4	2.1	2.3	2.4	2.5	2.3	2.3	2.2	2.3	2.4	2.2	2.1	1.9	2.5	2.3	24	
6	2.1	2.2	1.9	1.9	2.0	2.1	1.7	1.9	1.8	S	1.9	1.6	1.9	1.7	1.5	P	2.4	P	1.4	1.4	1.6	1.6	1.3	1.4	1.3	2.4	1.8	22	
7	1.3	1.3	1.1	1.4	1.4	1.3	1.4	2.0	S	1.3	1.5	1.5	1.4	1.5	1.5	1.6	1.4	1.5	1.5	1.9	1.6	1.4	1.5	1.5	1.1	2.0	1.5	24	
8	1.2	1.0	1.1	1.3	1.2	1.3	1.3	S	1.4	1.0	1.3	1.6	1.8	1.8	1.6	1.6	1.5	1.5	1.6	1.7	1.7	1.6	1.8	1.9	1.0	1.9	1.5	24	
9	1.9	1.9	1.8	1.9	2.2	2.2	S	2.1	2.4	2.4	2.6	2.5	3.5	2.7	2.8	3.1	2.9	2.9	2.9	2.9	2.9	2.8	2.7	2.7	1.8	3.5	2.6	24	
10	2.7	2.8	2.7	2.5	2.6	S	2.6	2.5	2.4	2.7	2.7	2.6	2.8	2.6	2.5	2.3	2.9	2.5	2.5	2.5	2.5	2.5	2.4	2.5	2.3	2.9	2.6	24	
11	2.9	2.9	3.2	3.4	S	4.1	4.4	4.1	4.1	3.9	4.1	4.2	4.2	4.2	P	P	2.9	2.7	2.6	2.5	2.2	1.9	1.8	1.9	1.8	4.4	3.2	22	
12	1.8	1.9	1.6	S	1.3	1.3	1.4	1.4	1.5	1.9	2.0	2.0	2.1	2.3	2.1	2.3	2.7	3.2	3.1	2.9	2.8	2.7	2.7	2.5	1.3	3.2	2.2	24	
13	2.5	2.3	S	2.4	2.5	2.4	2.2	2.2	2.1	2.5	2.5	2.5	2.4	2.6	2.6	2.6	2.6	2.5	2.7	3.3	4.1	4.4	3.9	3.5	3.3	2.1	4.4	2.8	24
14	3.2	S	2.4	2.5	2.6	3.0	3.1	3.0	3.8	3.9	3.9	3.9	4.1	4.1	4.1	4.1	4.9	4.5	5.1	4.9	4.9	5.0	4.7	4.8	2.4	5.1	3.9	24	
15	S	4.7	4.8	4.6	4.6	4.3	3.7	3.3	3.1	3.1	3.1	3.1	3.2	2.9	2.9	3.0	3.0	3.7	2.7	2.8	2.8	2.5	2.4	S	2.4	5.7	3.5	24	
16	2.5	3.9	3.9	3.8	3.8	4.3	3.7	3.8	3.5	3.5	3.2	3.2	3.2	3.3	3.7	3.6	3.4	3.3	3.5	3.8	3.8	3.6	S	4.1	2.5	4.3	3.6	24	
17	4.1	4.2	4.1	4.3	4.3	4.4	4.6	4.8	4.6	4.8	5.0	4.7	4.5	4.6	4.7	5.2	5.8	5.6	6.0	6.6	5.2	S	5.1	4.9	4.1	6.6	4.9	24	
18	4.9	4.7	4.7	4.7	4.6	4.7	5.1	5.1	5.0	5.4	5.4	5.8	5.8	5.4	5.7	5.9	7.1	6.4	5.3	5.2	S	5.5	5.2	4.8	4.6	7.1	5.3	24	
19	5.2	5.2	4.8	4.9	4.9	5.2	6.1	5.6	6.2	6.3	7.3	5.8	5.6	5.2	5.0	5.2	6.0	5.5	5.2	S	5.0	5.5	5.7	5.0	4.8	7.3	5.5	24	
20	4.7	4.8	4.5	4.6	4.6	4.4	4.7	4.9	4.5	4.5	4.5	C1	C1	C1	C1	C1	2.0	3.0	2.5	2.7	2.1	3.2	3.0	2.0	2.0	4.9	3.7	19	
21	1.7	1.8	1.7	1.2	1.1	1.2	1.1	1.2	1.1	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.0	S	0.6	0.6	0.3	0.4	0.1	0.0	0.0	1.8	1.0	24	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.8	0.6	1.0	0.7	1.3	1.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	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	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
25	0.0	0.0	0.5	0.8	1.2	0.9	0.4	0.2	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	1.2	0.2	24	
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.2	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	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.3	0.0	0.2	0.5	0.6	0.4	0.3	0.0	0.0	0.0	0.6	0.1	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.6	0.6	0.6	0.7	0.5	1.0	0.6	1.0	1.1	1.0	1.0	0.7	0.0	1.1	0.4	24		
30	0.8	0.6	0.6	0.3	0.2	0.3	0.3	0.3	S	0.0	0.0	0.2	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	0.8	0.2	24
31	0.0	0.2	0.0	0.1	0.0	0.0	0.0	S	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	0.0	0.0	0.0	0.0	0.2	0.0	24
HOURLY MAX	5.2	5.2	4.8	4.9	4.9	5.2	6.1	5.6	6.2	6.3	7.3	5.8	5.8	5.4	5.7	5.9	7.1	6.4	6.0	6.6	5.2	5.5	5.7	5.0					
HOURLY AVG	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.9	1.8	1.9	1.9	1.9	2.0	1.9	1.8	1.8	2.0	2.0	1.8	1.8	1.7	1.7	1.7	1.6					

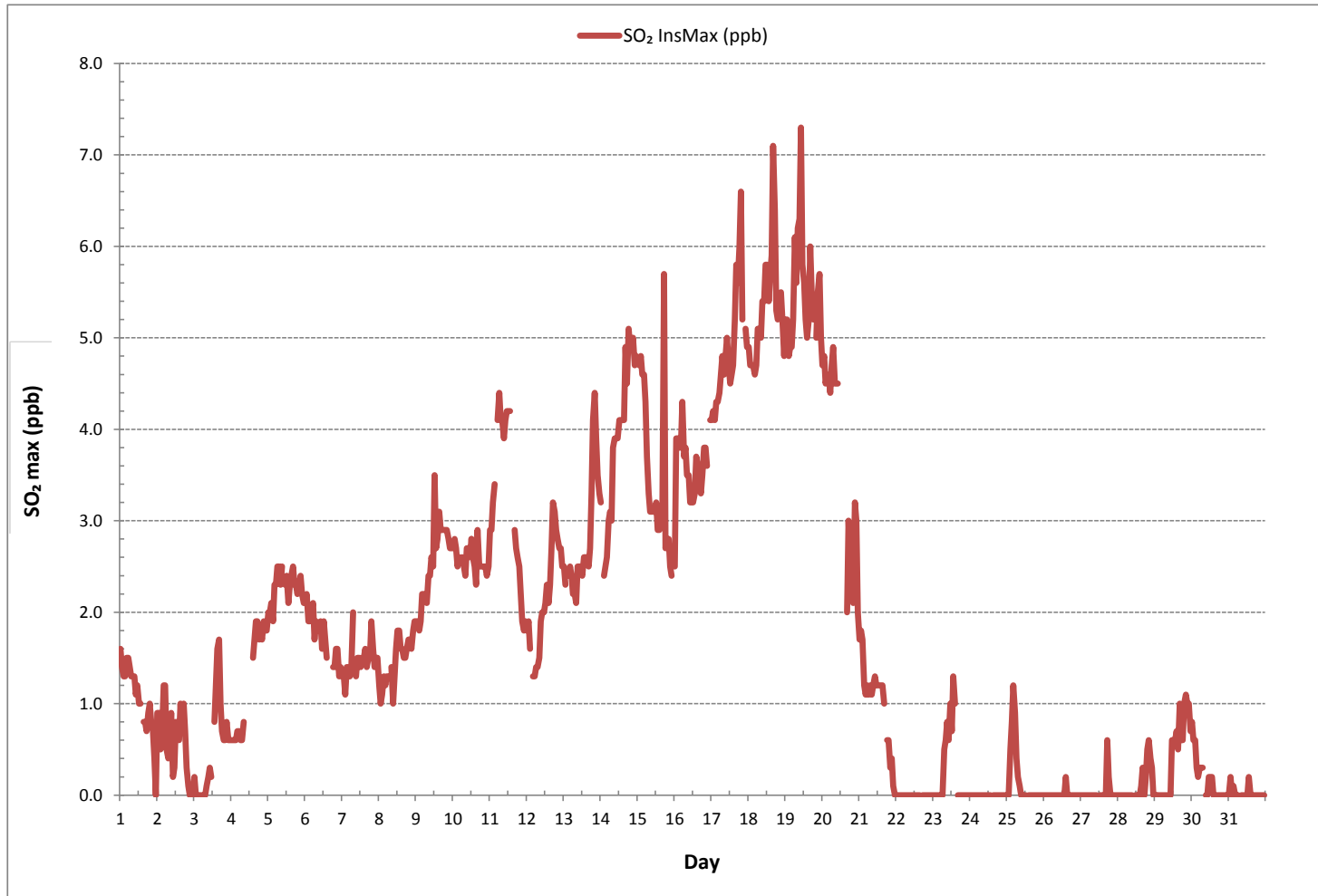
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	511
MAXIMUM INSTANTANEOUS VALUE:	7.3 ppb @ HOUR(S) 10 ON DAY(S) 19
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1.8
OPERATIONAL TIME:	735 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

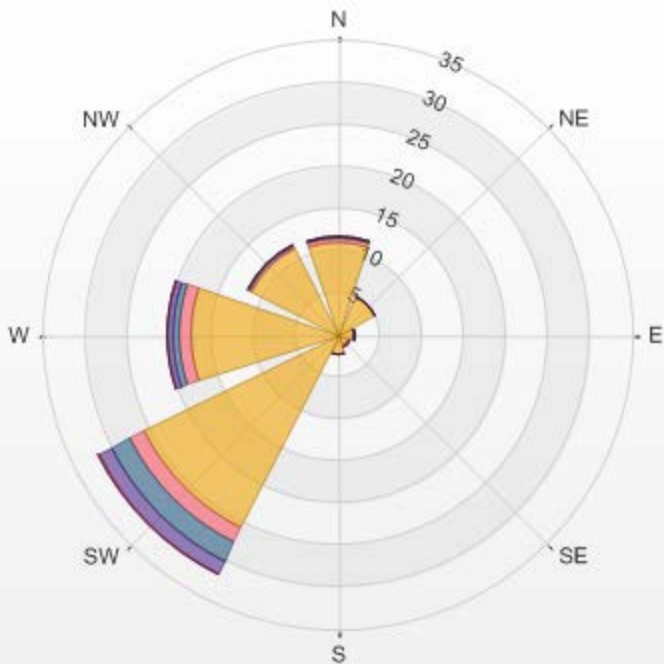


Wind: LICA Bonnyville Poll.: LICA Bonnyville-SO2[ppb] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.82% Valid Data: 94.35% Calm Avg: 0.07 [ppb]

Direction	0.0-0.4	0.4-0.8	0.8-1.3	1.3-1.7	1.7-2.1	>2.1	Total
N	11.11	0.43	0.28	0	0	0	11.82
NE	4.99	0	0	0	0	0	4.99
E	1.99	0	0.14	0	0	0	2.13
SE	1.42	0.28	0	0	0	0	1.7
S	2.28	0	0	0	0	0	2.28
SW	25.64	1.99	2.42	1.71	0.14	0	31.9
W	17.38	1.42	0.85	0.57	0.14	0	20.36
NW	11.54	0.14	0.28	0	0	0	11.96
Summary	76.35	4.26	3.97	2.28	0.28	0	87.14

% Icon	Classes (ppb)	76	 0.0-0.4	4	 0.4-0.8	4	 0.8-1.3	2	 1.3-1.7	0	 1.7-2.1	0	 >2.1
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LICA Bonnyville Poll.: LICA Bonnyville-SO2[ppb] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.82% Calm Poll Avg: 0.07[ppb]



SO2[ppb] Calibration: LICA Bonnyville Monthly: 2017/01 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	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	0.7	1.0	1.0	1.3	1.2	1.7	0.5	0.6	0.6	0.5	1.0	S	0.7	0.9	0.9	0.8	0.6	0.4	0.3	0.3	0.4	0.4	0.0	0.0	1.7	0.7	24	
3	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	S	0.2	0.2	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	0.0	0.0	0.1	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	0.2	0.1	0.2	0.2	0.3	S	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	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	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.3	0.1	0.2	0.2	0.0	0.3	0.1	24	
7	0.3	0.3	0.2	0.2	0.2	0.2	0.5	S	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.2	24	
8	0.0	0.0	0.0	0.0	0.1	0.0	0.1	S	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.2	0.2	0.0	0.1	0.0	0.3	0.1	24		
9	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.1	0.0	0.3	0.0	24		
10	0.1	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.3	0.2	0.1	0.2	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	24	
11	0.0	0.0	0.0	0.0	S	0.1	0.0	0.1	0.2	0.3	0.3	0.2	0.1	0.2	0.3	P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	23	
12	0.0	0.0	0.1	S	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	24	
13	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	24	
14	0.0	S	0.0	0.0	0.1	0.0	0.1	0.1	0.1	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	0.1	0.0	24	
15	S	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	0.2	0.0	0.0	0.0	0.0	0.2	S	0.0	0.2	0.0	24	
16	0.0	0.0	0.2	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.2	0.5	0.7	0.4	0.4	0.4	0.3	0.3	0.4	0.6	0.0	S	0.4	0.0	0.7	0.2	24	
17	0.4	0.6	0.5	0.4	0.8	0.6	0.8	0.1	0.6	0.9	0.3	0.3	0.0	0.0	0.0	0.3	0.5	0.3	0.3	1.8	1.0	S	0.6	0.9	0.0	1.8	0.5	24	
18	0.5	0.1	0.0	0.1	0.2	0.3	0.0	0.2	S1	0.8	0.2	0.2	1.7	0.6	0.8	0.3	2.5	1.1	0.3	0.0	S	1.1	0.5	1.2	0.0	2.5	0.6	23	
19	0.6	0.6	1.2	1.4	0.8	1.2	1.4	1.1	1.0	1.0	1.8	0.5	0.4	0.2	0.1	0.1	0.9	1.2	0.4	S	0.3	1.0	0.6	0.8	0.1	1.8	0.8	24	
20	0.9	0.0	0.0	0.5	0.7	0.6	1.3	1.3	0.7	0.4	0.6	C1	C1	C1	C1	1.1	0.7	1.9	1.7	1.5	1.5	1.6	1.7	1.5	0.0	1.9	1.0	20	
21	0.6	0.6	0.4	0.6	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.1	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	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	0.2	0.0	0.0	0.0	S	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	24	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
24	0.0	0.0	0.0	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	
25	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	0.0	0.1	0.1	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.3	0.0	24	
26	0.1	0.1	0.2	0.1	0.1	0.2	0.0	0.3	0.8	0.0	0.0	0.0	S	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.8	0.1	24	
27	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.3	0.3	0.1	S	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.4	0.2	24	
28	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	S	0.2	0.1	0.3	0.1	0.1	0.3	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.3	0.1	24	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.0	0.3	0.1	24	
30	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.0	S	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.2	0.1	24	
31	0.2	0.2	0.2	0.2	0.1	0.0	S	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	24	
HOURLY MAX	0.9	0.7	1.2	1.4	1.3	1.2	1.7	1.3	1.0	1.0	1.8	0.5	1.7	0.7	0.8	1.1	2.5	1.9	1.7	1.8	1.5	1.6	1.7	1.5					
HOURLY AVG	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	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

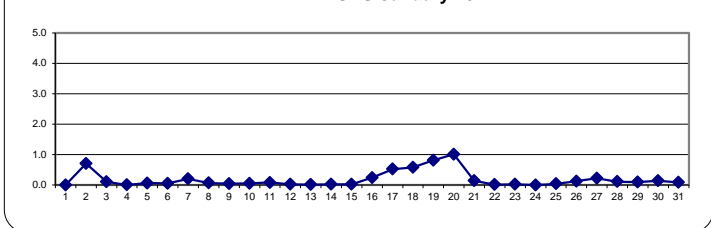
OBJECTIVE LIMIT:

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

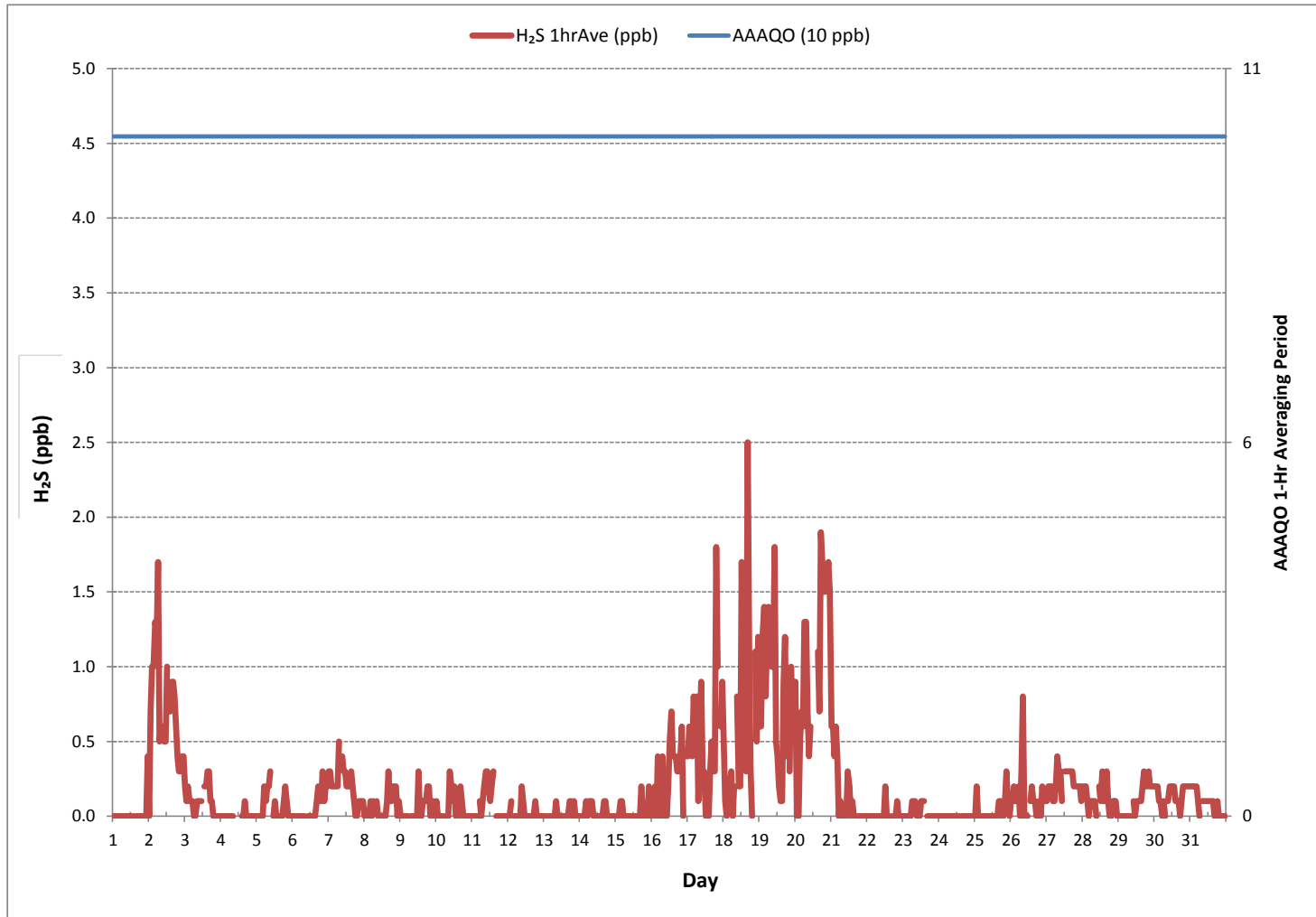
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	351
MINIMUM 1-HR AVERAGE:	0.0 ppb @ HOUR(S) VAR ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	2.5 ppb @ HOUR(S) 16 ON DAY(S) 18
MAXIMUM 24-HR AVERAGE:	1.0 ppb VAR- VARIOUS ON DAY(S) 20
IZS CALIBRATION TIME:	30 hrs OPERATIONAL TIME: 738 hrs
MONTHLY CALIBRATION TIME:	5 hrs AMD OPERATION UPTIME: 99.2 %
STANDARD DEVIATION:	0.3 MONTHLY AVERAGE: 0.2 ppb

24 HR AVERAGES January 2017



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville Continuous Monitoring Station - January 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	0.3	0.2	0.3	0.3	0.4	0.3	0.2	0.3	0.1	0.2	0.2	0.2	0.1	0.3	S	0.1	0.2	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.5	0.2	24
2	0.5	1.1	1.5	1.7	2.2	3.1	3.1	0.7	1.1	1.1	0.6	0.6	1.2	S	0.7	1.2	1.2	1.3	0.8	0.3	0.2	0.4	0.4	0.3	0.2	0.2	3.1	1.1	24
3	0.4	0.0	0.2	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	S	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.3	0.0	0.0	0.4	0.1	24	
4	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.0	0.1	C	C	C	C	C	0.4	0.3	0.6	0.5	0.4	0.3	0.4	0.3	0.5	0.2	0.0	0.6	0.3	24	
5	0.4	0.3	0.3	0.4	0.5	0.6	0.5	0.6	0.6	0.7	S	0.4	0.5	0.4	0.4	0.2	0.5	0.5	0.8	0.7	0.6	0.6	0.5	0.5	0.2	0.8	0.5	24	
6	0.3	0.4	0.4	0.3	0.2	0.5	0.3	0.4	0.3	S	0.3	0.3	0.2	0.4	0.3	P	1.2	P	0.6	0.5	1.3	0.6	0.8	0.6	0.2	1.3	0.5	22	
7	0.8	0.7	0.5	0.5	0.6	0.6	0.5	1.4	S	0.6	0.6	0.8	0.6	0.6	0.4	0.6	0.5	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.3	1.4	0.6	24	
8	0.3	0.2	0.2	0.4	0.3	0.3	0.6	S	0.4	0.2	0.4	0.5	0.5	0.4	0.3	0.6	1.0	0.5	0.6	0.6	0.8	0.7	0.7	0.6	0.2	1.0	0.5	24	
9	0.6	0.5	0.5	0.4	0.4	0.5	S	0.4	0.7	0.6	0.4	0.6	1.8	0.5	0.7	0.6	0.8	0.8	0.9	0.9	0.6	0.5	0.8	0.7	0.4	1.8	0.7	24	
10	0.7	0.5	0.6	0.6	0.7	S	0.9	0.7	0.7	1.0	0.9	1.0	0.9	0.4	0.8	0.7	0.9	0.8	0.6	0.7	0.6	0.7	0.6	0.5	0.4	1.0	0.7	24	
11	0.5	0.5	0.7	0.7	S	0.8	0.8	0.7	1.0	0.9	1.2	1.0	0.9	1.0	P	P	0.7	0.5	0.4	0.6	0.7	0.5	0.5	0.4	0.4	1.2	0.7	22	
12	0.6	0.8	0.7	S	0.3	0.3	0.5	0.6	0.4	1.0	0.9	0.6	0.6	0.5	0.5	0.8	0.6	0.7	0.7	0.4	0.4	0.6	0.5	0.3	1.0	0.6	24		
13	0.5	0.7	S	0.5	0.6	0.5	0.6	1.0	0.7	0.5	0.5	0.4	0.4	0.6	0.6	0.4	0.5	0.6	0.5	0.6	0.5	0.4	0.4	0.4	0.4	1.0	0.5	24	
14	0.6	S	0.5	0.4	0.6	0.4	0.5	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.7	0.7	0.5	0.6	0.6	0.6	0.6	0.6	0.4	0.7	0.6	24	
15	S	0.7	0.6	0.8	0.8	0.8	0.6	0.6	0.4	0.5	0.5	0.6	0.6	0.7	0.4	0.6	0.6	3.5	0.5	0.3	0.4	0.5	2.0	S	0.3	3.5	0.8	24	
16	1.3	0.2	1.1	1.2	1.5	0.5	0.8	1.2	1.1	0.2	0.8	0.8	1.2	1.4	1.1	1.1	1.0	1.1	1.0	1.3	1.1	0.3	S	1.0	0.2	1.5	1.0	24	
17	1.3	1.4	1.1	1.2	1.4	1.5	1.8	1.2	1.7	1.9	1.7	1.4	0.9	0.8	0.9	1.3	2.0	1.8	1.9	3.4	2.5	S	2.3	2.1	0.8	3.4	1.6	24	
18	1.9	2.0	1.2	1.7	1.9	2.1	1.7	2.1	S1	3.3	1.8	2.4	3.9	2.4	2.4	1.9	4.6	4.0	2.4	1.6	S	2.6	2.5	2.8	1.2	4.6	2.4	23	
19	2.1	1.9	3.1	2.9	2.4	2.6	2.9	2.7	3.1	2.9	3.8	2.0	2.0	1.7	1.4	1.6	3.4	3.1	2.1	S	1.9	2.5	2.2	2.8	1.4	3.8	2.5	24	
20	2.8	0.9	1.1	1.3	1.5	1.7	2.2	2.4	1.5	1.3	1.4	C1	C1	C1	C1	C1	1.1	2.8	2.4	2.2	2.1	3.1	3.0	2.7	0.9	3.1	2.0	19	
21	1.3	1.2	1.1	1.5	1.6	0.9	0.9	0.7	0.5	1.0	1.0	1.1	1.1	0.8	1.0	0.6	0.8	S	0.3	0.1	0.2	0.1	0.1	0.0	0.0	1.6	0.8	24	
22	0.0	1.1	0.0	0.1	0.2	0.0	0.1	0.1	0.2	0.1	0.1	0.3	0.5	0.0	0.1	0.0	S	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	1.1	0.1	24	
23	0.1	0.0	0.1	0.0	0.1	0.1	0.3	0.1	0.2	0.2	0.1	0.1	0.2	0.5	0.2	S	0.2	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.5	0.1	24	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	S	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.2	0.0	24	
25	0.2	0.8	0.9	0.2	0.2	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0.2	S	0.4	0.1	0.4	0.7	0.4	0.3	0.4	0.5	0.3	0.2	0.0	0.9	0.3	24	
26	0.4	0.2	0.3	0.2	0.3	0.3	0.1	1.0	1.7	0.0	0.0	0.2	S	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	1.7	0.2	24	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.1	0.1	0.2	0.1	0.1	0.2	1.7	0.0	0.0	0.1	0.1	0.0	0.0	1.7	0.1	24	
29	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	S	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.3	0.3	0.3	0.4	0.2	0.3	0.0	0.4	0.2	24
30	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.0	S	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.3	0.1	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
HOURLY MAX	2.8	2.0	3.1	2.9	2.4	3.1	3.1	2.7	3.1	3.3	3.8	2.4	3.9	2.4	2.4	1.9	4.6	4.0	2.4	3.4	2.5	3.1	3.0	2.8					
HOURLY AVG	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.7	0.6	0.6	0.7	0.6	0.5	0.5	0.8	0.9	0.6	0.6	0.6	0.6	0.7	0.6					

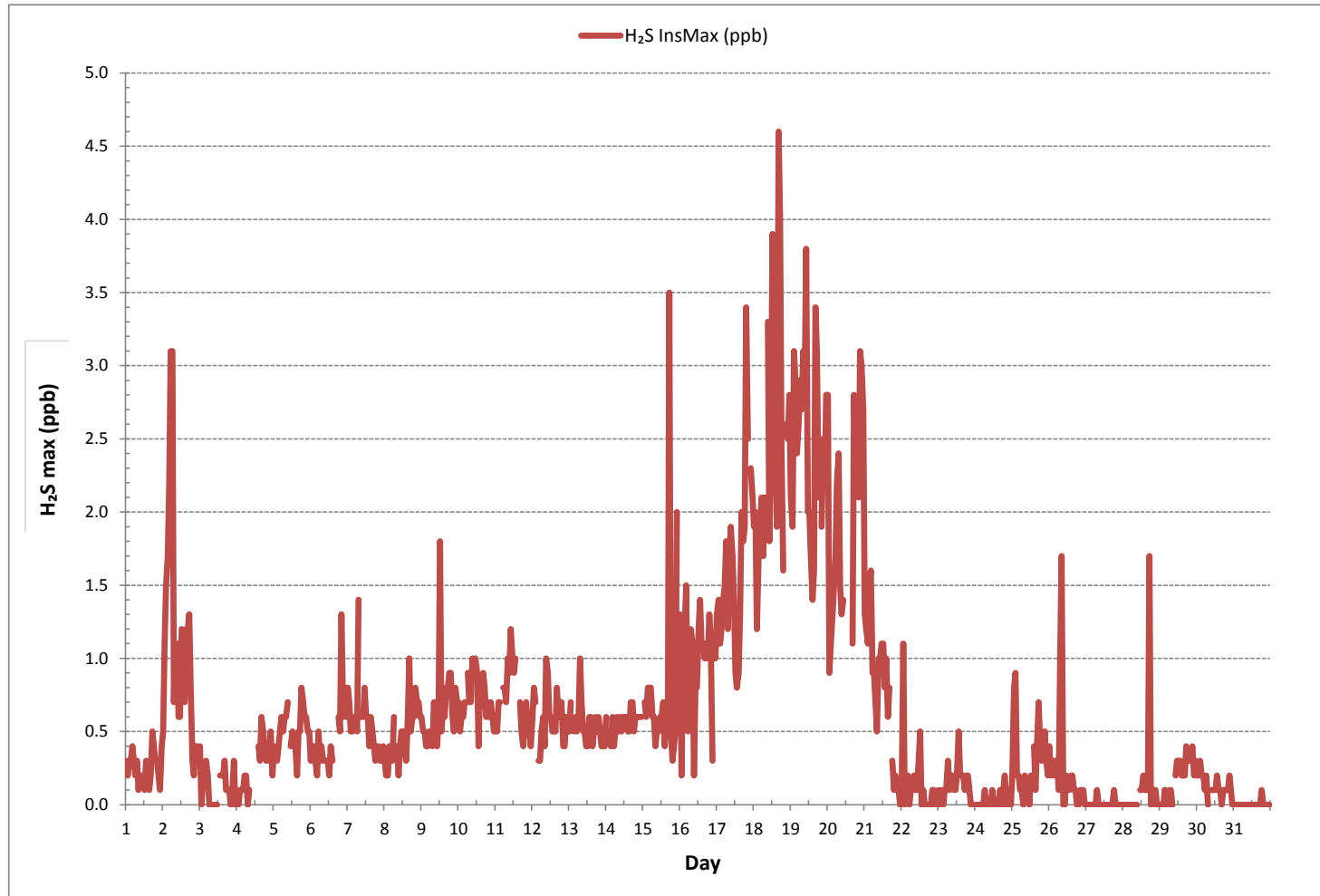
STATUS FLAG CODES

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:	582
MAXIMUM INSTANTANEOUS VALUE:	4.6 ppb @ HOUR(S) 16 ON DAY(S) 18
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	0.7

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

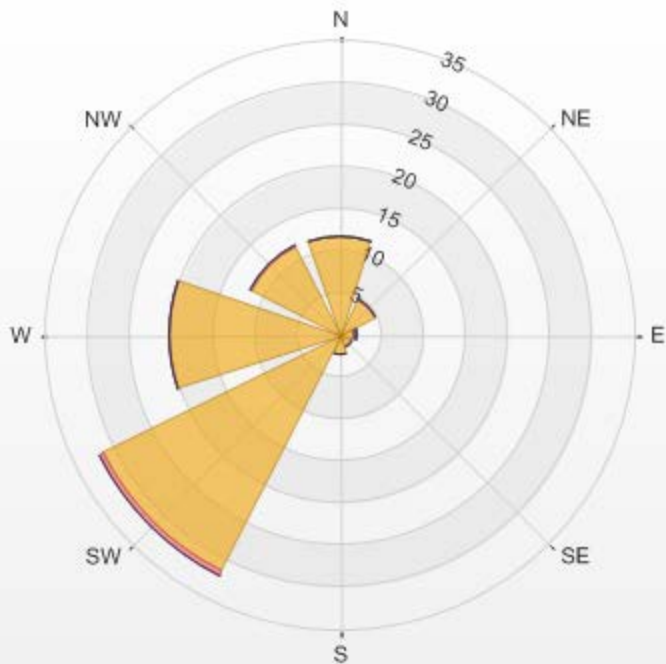


Wind: LICA Bonnyville Poll.: LICA Bonnyville-H2S[ppb] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr
 Calm: 12.84% Valid Data: 94.22% Calm Avg: 0.54 [ppb]

Direction	0.0-0.9	0.9-1.7	1.7-2.6	>2.6	Total
N	11.7	0	0.14	0	11.84
NE	4.71	0.14	0	0	4.85
E	1.71	0.29	0.14	0	2.14
SE	1.57	0.14	0	0	1.71
S	2.28	0	0	0	2.28
SW	31.38	0.57	0	0	31.95
W	20.26	0.14	0	0	20.4
NW	11.7	0.29	0	0	11.99
Summary	85.31	1.57	0.28	0	87.16

% Icon	Classes (ppb)	85	0.0-0.9	2	0.9-1.7	0	1.7-2.6	0	>2.6
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LICA Bonnyville Poll.: LICA Bonnyville-H2S[ppb] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.84% Calm
Poll Avg: 0.54[ppb]



H2S[ppb] Calibration: LICA Bonnyville Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

TOTAL HYDROCARBON

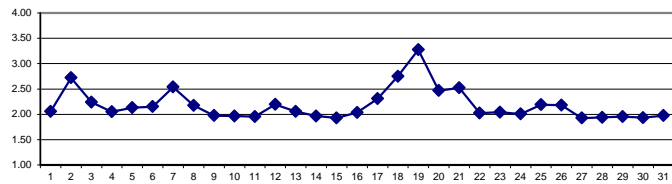
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.99	1.96	1.92	1.94	1.93	1.92	1.94	1.98	2.00	2.04	2.02	2.02	2.06	2.07	S	2.06	2.06	2.22	2.30	2.24	2.20	2.20	2.09	2.10	1.92	2.30	2.05	24	
2	2.39	3.23	3.24	3.29	3.09	3.21	3.06	2.63	2.94	S1	2.69	2.57	2.72	S	2.60	2.53	2.72	2.73	2.59	2.48	2.20	2.31	2.30	2.28	2.20	3.29	2.72	23	
3	2.32	2.29	2.38	2.41	2.58	2.40	2.24	2.17	2.21	2.32	2.39	2.29	S	C	C	C	C	2.11	2.09	2.08	2.07	2.06	2.04	2.04	2.04	2.58	2.24	24	
4	2.02	2.03	2.03	2.05	2.02	2.03	2.03	2.04	2.05	2.11	2.15	S	2.13	2.06	2.03	2.01	2.05	2.03	2.01	2.01	2.03	2.05	2.10	2.09	2.01	2.15	2.05	24	
5	2.05	2.03	2.06	2.04	2.06	2.07	2.14	2.12	2.29	2.43	S	2.03	2.01	2.01	2.01	2.02	2.03	2.20	2.19	2.28	2.18	2.29	2.28	2.20	2.01	2.43	2.13	24	
6	2.18	2.10	2.05	2.07	2.05	2.00	1.99	1.99	1.98	S	2.00	1.99	2.03	2.09	2.16	2.16	2.24	2.24	2.18	2.16	2.28	2.31	2.57	2.70	1.98	2.70	2.15	24	
7	3.06	2.99	2.79	2.71	2.75	2.80	2.75	2.82	S	2.79	2.76	2.57	2.59	2.59	2.41	2.51	2.38	2.20	2.23	2.14	2.08	2.16	2.15	2.14	2.08	3.06	2.54	24	
8	2.09	2.08	2.10	2.12	2.15	2.14	2.27	S	2.25	2.06	2.09	2.07	2.03	2.06	2.03	2.11	2.28	2.20	2.24	2.25	2.30	2.24	2.40	2.40	2.03	2.40	2.17	24	
9	2.20	1.99	1.96	1.94	1.94	1.98	S	1.97	1.97	2.00	1.98	1.97	1.94	1.96	1.95	1.97	2.01	1.94	1.90	1.94	1.96	2.01	1.97	1.97	1.90	2.20	1.97	24	
10	2.00	1.96	2.03	2.06	2.09	S	1.93	1.91	1.96	S1	1.90	1.91	2.09	2.08	1.93	1.89	2.03	1.90	1.89	1.94	1.92	1.92	1.93	1.96	1.89	2.09	1.97	23	
11	1.95	1.94	1.93	1.93	S	1.92	1.90	1.91	1.91	C1	C1	C1	1.89	1.92	P	1.94	1.95	1.97	2.01	2.02	1.99	2.02	2.06	1.89	2.06	1.95	19		
12	2.06	2.17	2.18	S	2.15	2.11	2.18	2.06	2.07	2.22	2.28	2.34	2.30	2.20	2.21	2.23	2.33	2.24	2.29	2.30	2.14	2.12	2.15	2.17	2.06	2.34	2.20	24	
13	2.28	2.23	S	2.21	2.14	2.15	2.14	2.11	2.08	2.07	2.05	2.01	1.98	1.96	1.99	1.97	1.98	1.98	1.99	2.01	2.00	1.98	1.98	2.00	1.96	2.28	2.06	24	
14	2.02	S	1.99	1.97	S	1.98	1.99	1.99	1.99	1.98	1.96	1.96	1.94	1.95	1.97	1.97	1.97	1.98	1.99	1.95	1.95	1.95	1.94	1.93	1.93	2.02	1.97	24	
15	S	1.95	1.96	1.97	1.95	1.94	1.93	1.93	1.91	1.90	1.91	1.91	1.90	1.93	1.90	1.91	1.93	1.93	1.92	1.92	1.93	1.93	1.92	S	1.90	1.97	1.93	24	
16	1.92	1.94	1.95	1.97	1.98	1.97	1.98	1.97	1.98	2.04	2.03	2.03	2.02	2.05	2.05	2.01	2.05	2.01	2.01	2.28	2.33	2.11	S	2.15	1.92	2.33	2.04	24	
17	2.14	2.39	2.17	2.20	2.19	2.22	2.49	2.14	1.99	1.95	1.93	1.93	2.10	2.12	2.07	2.07	2.05	2.23	2.56	3.27	3.05	S	3.20	2.67	1.93	3.27	2.31	24	
18	2.99	2.99	3.25	3.00	2.85	2.89	2.94	2.76	2.82	2.81	2.69	2.91	2.68	2.55	2.72	2.55	3.09	2.51	2.16	2.22	S	2.46	2.64	2.71	2.16	3.25	2.75	24	
19	2.61	3.03	3.23	3.85	3.36	3.62	3.70	3.33	3.42	3.47	3.79	3.26	3.50	3.19	3.04	2.92	3.32	2.86	3.02	S	3.07	3.27	3.21	3.24	2.61	3.85	3.27	24	
20	3.11	2.96	2.57	2.34	2.24	2.13	2.18	2.29	2.12	2.11	2.14	2.16	2.15	2.11	2.28	2.63	2.39	2.72	S	2.77	2.89	2.88	2.70	2.85	2.11	3.11	2.47	24	
21	3.00	3.46	3.00	2.60	2.53	2.64	2.63	2.63	2.60	2.72	2.67	2.61	2.62	2.62	2.61	2.67	2.16	S	2.08	2.03	2.06	2.05	2.01	1.99	1.99	3.46	2.52	24	
22	2.00	1.97	1.96	1.98	1.99	1.99	2.00	1.99	2.03	2.02	2.01	2.01	2.01	2.02	2.01	2.02	S	2.05	2.11	2.05	2.07	2.12	2.08	2.02	1.96	2.12	2.02	24	
23	2.03	2.03	2.03	2.06	2.07	2.09	2.11	2.08	1.99	1.97	1.97	2.05	2.05	2.03	2.05	S	2.10	2.06	2.05	2.05	2.01	1.99	2.05	2.00	1.97	2.11	2.04	24	
24	2.02	1.97	1.94	1.94	1.95	1.95	1.94	1.94	1.94	1.95	1.96	1.95	1.96	1.98	S	1.98	1.98	2.00	1.99	2.01	2.13	2.16	2.33	2.16	1.94	2.33	2.01	24	
25	2.22	2.06	2.04	2.05	2.05	2.05	2.06	2.06	2.06	2.06	2.06	2.07	2.09	S	2.11	2.12	2.13	2.18	2.36	2.49	2.46	2.48	2.52	2.54	2.04	2.54	2.19	24	
26	2.61	2.73	2.68	2.56	2.51	2.44	2.37	2.30	2.18	2.16	2.12	2.03	S	1.94	1.93	1.95	1.96	1.99	1.95	1.94	1.95	1.94	1.95	1.93	1.93	2.73	2.18	24	
27	1.94	1.93	1.93	1.92	1.92	1.92	1.91	1.91	1.91	1.91	1.91	S	1.92	1.92	1.92	1.93	1.93	1.94	1.96	1.94	1.93	1.92	1.93	1.93	1.91	1.96	1.93	24	
28	1.92	1.93	1.92	1.92	1.93	1.93	1.92	1.91	1.91	1.91	S	1.93	1.94	1.95	1.95	1.96	2.00	2.02	1.96	1.94	1.95	1.95	1.95	1.92	1.91	2.02	1.94	24	
29	1.91	1.91	1.91	1.91	1.90	1.90	1.90	1.95	1.97	S	1.97	1.98	1.96	1.95	1.94	1.94	1.95	1.96	1.99	1.98	2.01	2.08	1.96	1.96	1.90	2.08	1.95	24	
30	1.95	1.96	1.95	1.93	1.93	1.94	1.92	1.91	S	1.92	1.91	1.92	1.93	1.94	1.93	1.94	1.94	1.92	1.92	1.92	1.93	1.95	1.97	1.98	1.91	1.98	1.93	24	
31	1.97	1.99	1.97	1.99	1.99	1.99	S	1.99	1.99	1.99	1.99	1.98	1.99	1.98	1.99	1.98	1.96	1.96	1.96	1.95	1.96	1.96	1.96	1.95	1.95	1.99	1.99	1.98	24
HOURLY MAX	3.11	3.46	3.25	3.85	3.36	3.62	3.70	3.33	3.42	3.47	3.79	3.26	3.50	3.19	3.04	2.92	3.32	2.86	3.02	3.27	3.07	3.27	3.21	3.24					
HOURLY AVG	2.23	2.27	2.24	2.23	2.21	2.21	2.22	2.17	2.16	2.19	2.19	2.16	2.17	2.11	2.13	2.14	2.17	2.14	2.13	2.15	2.17	2.16	2.21	2.20					

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

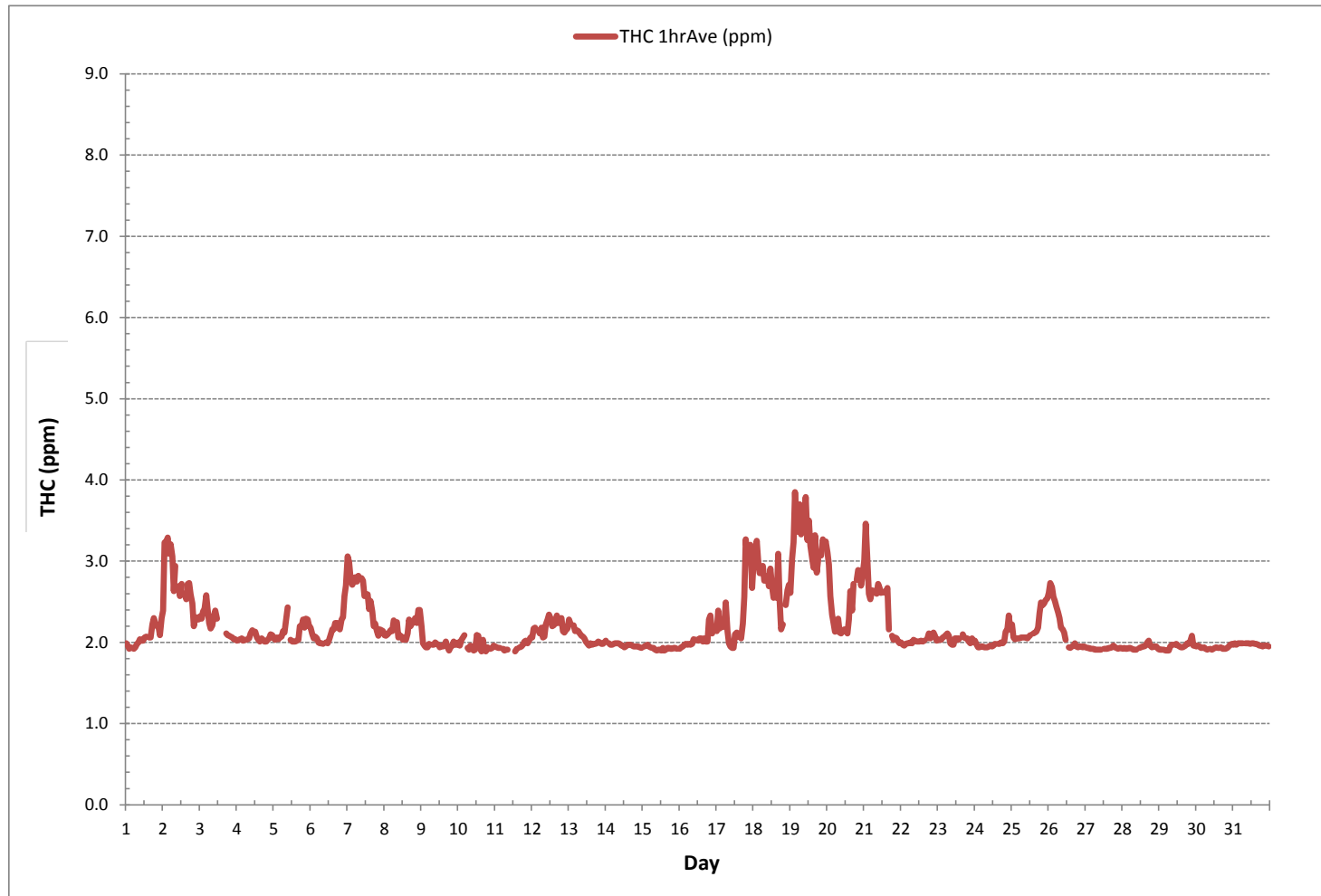
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	701				
MINIMUM 1-HR AVERAGE:	1.89 ppm	@ HOUR(S)	VAR , 13	ON DAY(S)	10 , 11
MAXIMUM 1-HR AVERAGE:	3.85 ppm	@ HOUR(S)	3	ON DAY(S)	19
MAXIMUM 24-HR AVERAGE:	3.27 ppm			ON DAY(S)	19
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	737 hrs		
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.1 %		
STANDARD DEVIATION:	0.35	MONTHLY AVERAGE:	2.18 ppm		

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - January 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	2.01	2.02	1.98	2.00	1.99	2.06	2.02	2.19	2.23	2.44	2.16	2.22	2.33	2.37	S	2.23	2.70	2.88	4.32	2.79	2.37	2.80	2.23	2.15	1.98	4.32	2.37	24	
2	3.22	4.40	3.96	4.23	4.35	4.35	3.59	3.00	S1	S1	2.90	2.76	3.34	S	3.08	2.85	3.89	3.39	3.22	2.77	2.53	2.91	2.61	2.49	2.49	4.40	3.33	22	
3	2.54	2.39	2.58	2.56	2.68	2.63	2.34	2.18	2.25	2.39	2.41	2.37	S	C	C	C	C	3.24	2.09	2.09	2.13	2.12	2.07	2.14	2.07	3.24	2.38	24	
4	2.23	2.10	2.14	2.25	2.05	2.07	2.12	2.08	2.17	P	2.61	S	2.39	2.19	2.14	2.11	2.59	2.05	2.03	2.02	2.08	2.07	2.16	2.10	2.02	2.61	2.17	23	
5	2.08	2.06	2.14	2.05	2.11	2.13	2.37	2.94	2.77	2.59	S	2.06	2.05	2.06	2.08	Y	Y	2.93	2.60	2.92	2.48	2.76	2.69	2.58	2.05	2.94	2.40	22	
6	2.64	2.51	2.33	2.48	2.68	2.15	2.00	2.00	2.20	S	2.02	2.00	2.05	2.14	2.17	P	2.84	P	2.44	2.31	3.47	3.12	3.83	3.01	2.00	3.83	2.49	22	
7	4.22	3.86	3.06	2.80	3.41	3.31	3.51	3.21	S	3.44	2.96	2.64	2.64	2.64	2.54	2.79	2.57	2.36	2.30	2.31	2.33	2.76	2.71	2.39	2.30	4.22	2.90	24	
8	2.81	2.47	2.34	2.30	2.43	2.56	2.63	S	3.01	2.17	2.16	2.29	2.06	2.54	2.06	2.42	3.09	2.77	2.81	2.98	2.46	2.34	2.47	2.51	2.06	3.09	2.51	24	
9	2.33	2.04	2.04	1.99	2.00	2.01	S	2.01	2.01	2.02	2.01	2.01	2.02	2.00	2.21	2.01	3.64	2.01	2.10	2.36	2.15	2.07	2.17	2.17	1.99	3.64	2.15	24	
10	2.17	2.50	2.28	2.51	2.56	S	2.19	1.99	S1	S1	1.98	2.12	2.35	2.41	2.09	2.11	5.97	2.56	1.97	1.96	2.13	1.95	1.95	1.98	1.95	5.97	2.37	22	
11	1.96	1.96	1.96	1.96	S	1.96	1.92	1.94	1.93	C1	C1	C1	C1	1.90	P	P	2.00	2.03	2.07	2.48	2.39	2.15	2.12	2.34	1.90	2.48	2.06	18	
12	2.71	3.38	2.51	S	2.80	2.23	2.31	2.14	2.46	3.18	2.76	2.63	2.60	2.34	2.31	2.38	3.22	2.34	2.54	2.75	2.20	2.14	2.18	2.21	2.14	3.38	2.54	24	
13	2.98	2.35	S	2.26	2.17	2.16	2.17	2.12	2.11	2.08	2.07	2.05	2.01	2.00	3.44	2.03	1.99	2.01	2.01	2.05	2.02	2.04	2.01	2.13	1.99	3.44	2.19	24	
14	2.14	S	2.02	1.99	2.01	2.01	2.00	2.00	2.02	2.03	1.99	1.99	1.96	1.98	1.99	2.00	1.98	2.01	2.01	1.96	1.98	1.97	1.97	1.95	1.95	2.14	2.00	24	
15	S	2.02	2.03	2.03	1.99	1.97	1.94	1.96	1.93	1.91	1.93	1.95	1.92	2.61	1.92	1.92	2.05	1.99	1.95	1.94	1.99	1.97	1.95	S	1.91	2.61	1.99	24	
16	1.94	1.98	1.97	2.07	2.00	2.00	2.00	2.00	2.07	2.07	2.05	2.07	2.09	2.14	2.14	2.04	2.10	2.09	2.08	3.10	3.19	2.26	S	2.24	1.94	3.19	2.16	24	
17	2.73	5.28	2.21	2.50	2.26	2.37	3.17	2.71	2.06	1.96	1.96	1.97	2.18	2.14	2.11	2.54	2.39	3.27	6.50	4.55	4.84	S	4.17	3.26	1.96	6.50	3.01	24	
18	4.16	6.09	7.05	3.82	3.85	3.32	3.40	3.49	3.29	3.52	2.95	3.42	3.01	2.72	3.54	2.79	4.47	3.15	2.36	2.47	S	3.22	3.63	3.20	2.36	7.05	3.61	24	
19	3.52	4.05	3.97	4.98	4.84	6.10	4.84	3.90	4.53	4.22	4.97	3.73	4.79	6.34	3.98	3.16	4.93	3.93	3.75	S	4.38	4.61	4.51	5.67	3.16	6.34	4.51	24	
20	3.30	3.13	2.71	2.41	2.34	2.16	2.58	2.79	2.28	2.20	2.23	2.20	2.21	2.16	3.21	8.33	3.27	2.99	S	3.06	4.26	4.34	3.62	3.97	2.16	8.33	3.12	24	
21	4.08	3.94	3.29	2.79	2.63	2.76	3.09	2.72	2.85	2.99	2.90	2.69	2.72	2.68	2.65	3.06	2.84	S	2.21	2.15	2.24	2.13	2.09	2.10	2.09	4.08	2.77	24	
22	2.10	2.04	2.04	2.08	2.07	2.05	2.07	2.11	2.18	2.11	2.11	2.11	2.10	2.13	2.25	2.16	S	2.32	2.31	2.20	2.27	2.34	2.23	2.19	2.04	2.34	2.16	24	
23	2.14	2.14	2.11	2.17	2.33	2.23	2.45	2.37	2.19	2.07	2.08	2.17	2.23	2.22	2.34	S	2.60	2.22	2.59	2.19	2.17	2.17	2.23	2.05	2.05	2.60	2.24	24	
24	2.10	2.00	1.96	1.96	2.02	1.96	1.97	1.95	1.96	1.98	2.01	1.97	1.99	2.01	S	2.01	2.00	2.06	2.03	2.03	2.28	2.21	2.38	2.34	1.95	2.38	2.05	24	
25	2.28	2.13	2.09	2.06	2.07	2.09	2.10	2.09	2.10	2.13	2.11	2.13	2.15	S	2.11	2.20	2.20	2.36	2.55	2.68	2.63	2.61	2.63	2.70	2.06	2.70	2.27	24	
26	2.85	2.93	2.86	2.67	2.57	2.51	2.48	2.36	2.35	2.24	2.19	2.08	S	1.97	1.95	2.03	1.98	2.03	1.97	1.96	1.98	1.97	1.97	1.96	1.95	2.93	2.25	24	
27	1.96	1.95	1.96	1.96	1.94	1.95	1.92	1.95	1.94	1.94	1.93	S	1.93	1.93	1.94	1.96	1.94	1.96	1.99	1.96	1.97	1.94	1.95	1.95	1.92	1.99	1.95	24	
28	1.93	1.95	1.94	1.94	1.94	1.96	1.93	1.95	1.93	1.93	S	1.94	1.97	1.96	1.98	1.97	2.08	2.74	1.99	1.96	1.99	1.98	2.02	1.97	1.93	2.74	2.00	24	
29	1.92	1.94	1.92	1.94	1.92	1.91	1.94	2.06	2.03	S	2.18	1.99	1.98	1.97	1.96	1.95	1.97	1.98	2.05	2.00	2.15	2.90	1.98	1.97	1.91	2.90	2.03	24	
30	1.97	2.08	1.98	1.96	1.94	1.98	1.95	1.92	S	2.11	1.93	1.96	2.08	2.13	2.27	1.94	2.56	1.94	1.93	1.97	2.01	2.06	2.06	2.08	1.92	2.56	2.04	24	
31	2.04	2.05	2.03	2.09	2.05	2.09	2.12	S	2.05	2.07	2.08	2.07	2.08	2.09	2.09	2.00	2.30	2.20	1.98	1.97	1.99	1.97	1.97	1.97	1.97	1.97	2.30	2.06	24
HOURLY MAX	4.22	6.09	7.05	4.98	4.84	6.10	4.84	3.90	4.53	4.22	4.97	3.73	4.79	6.34	3.98	8.33	5.97	3.93	6.50	4.55	4.84	4.61	4.51	5.67					
HOURLY AVG	2.57	2.72	2.52	2.43	2.47	2.43	2.44	2.35	2.33	2.39	2.34	2.27	2.33	2.35	2.39	2.50	2.79	2.48	2.49	2.40	2.50	2.46	2.49	2.46					

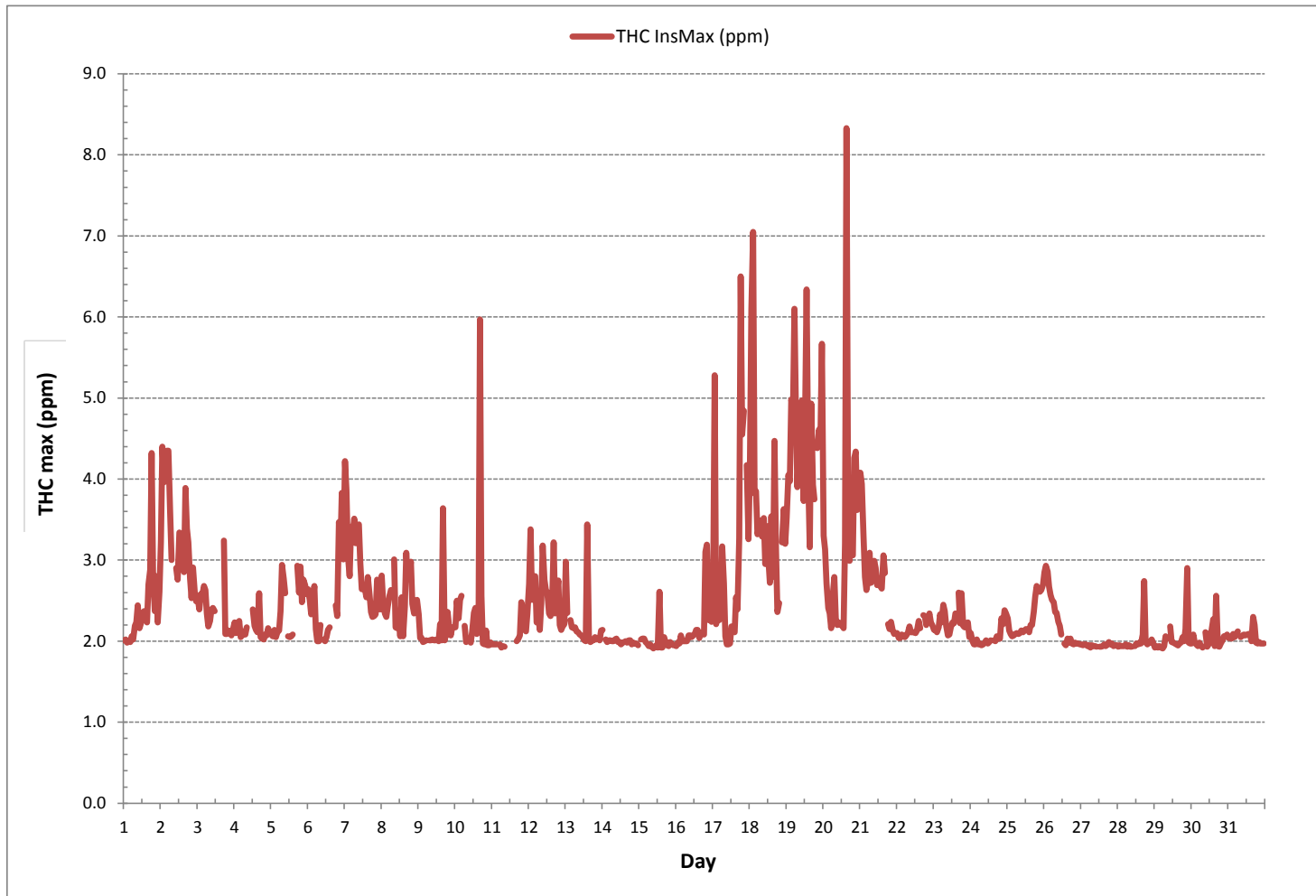
STATUS FLAG CODES

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:	693		
MAXIMUM INSTANTANEOUS VALUE:	8.33 ppm @ HOUR(S) 15 ON DAY(S) 20		
	VAR-VARIOUS		
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	729 hrs
MONTHLY CALIBRATION TIME:	4 hrs		
STANDARD DEVIATION:	0.76		

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

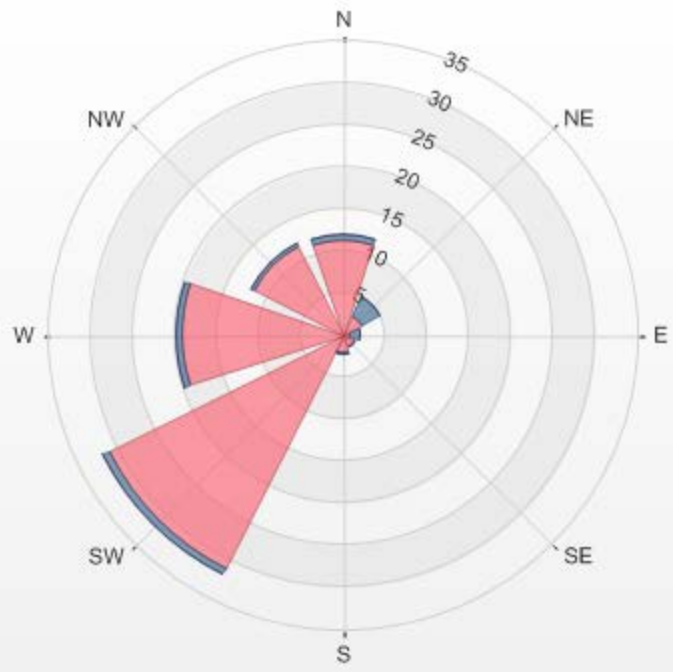


Wind: LICA Bonnyville Poll.: LICA Bonnyville-THC55[ppm] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.73% Valid Data: 93.95% Calm Avg: 2.63 [ppb]

Direction	0.0-1.3	1.3-2.6	2.6-3.9	>3.9	Total
N	0	11.3	0.72	0	12.02
NE	0	2.58	2.43	0	5.01
E	0	0.86	1.29	0	2.15
SE	0	1.57	0.14	0	1.71
S	0	2.15	0.14	0	2.29
SW	0	31.04	0.86	0	31.9
W	0	19.03	0.86	0	19.89
NW	0	11.73	0.57	0	12.3
Summary	0	80.26	7.01	0	87.27

% Icon Classes (ppm) 0 0.0-1.3 80 1.3-2.6 7 2.6-3.9 0 >3.9

LICA Bonnyville Poll.: LICA Bonnyville-THC55[ppm] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.73%
 Calm Poll Avg: 2.63[ppm]



THC55[ppm] Calibration: LICA Bonnyville Monthly: 2017/01 Type: Span



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

METHANE



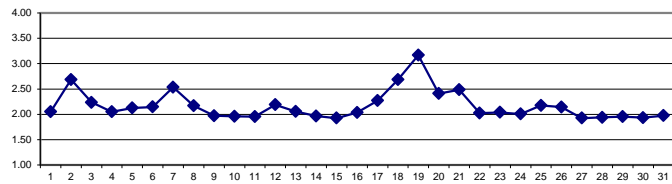
METHANE Hourly Averages (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1.99	1.96	1.92	1.94	1.93	1.92	1.94	1.98	2.00	2.04	2.02	2.02	2.06	2.07	S	2.06	2.06	2.20	2.26	2.23	2.20	2.18	2.09	2.10	1.92	2.26	2.05	24	
2	2.35	3.14	3.22	3.24	3.06	3.16	3.03	2.62	2.77	S1	2.69	2.57	2.70	S	2.53	2.50	2.66	2.65	2.58	2.48	2.20	2.31	2.30	2.27	2.20	3.24	2.68	23	
3	2.32	2.29	2.38	2.41	2.58	2.40	2.24	2.17	2.21	2.32	2.39	2.29	S	C	C	C	C	2.09	2.09	2.08	2.07	2.06	2.04	2.04	2.04	2.58	2.24	24	
4	2.02	2.03	2.03	2.05	2.02	2.03	2.03	2.04	2.05	2.11	2.15	S	2.13	2.06	2.03	2.01	2.02	2.03	2.01	2.01	2.03	2.05	2.10	2.09	2.01	2.15	2.05	24	
5	2.05	2.03	2.06	2.04	2.06	2.07	2.14	2.12	2.29	2.43	S	2.03	2.01	2.01	2.01	2.02	2.03	2.17	2.15	2.27	2.18	2.26	2.25	2.19	2.01	2.43	2.12	24	
6	2.16	2.09	2.05	2.06	2.05	2.00	1.99	1.99	1.98	S	2.00	1.99	2.03	2.09	2.16	2.16	2.23	2.22	2.18	2.16	2.25	2.30	2.53	2.68	1.98	2.68	2.15	24	
7	3.02	2.97	2.79	2.71	2.74	2.80	2.72	2.81	S	2.77	2.75	2.57	2.59	2.59	2.41	2.51	2.38	2.20	2.23	2.14	2.08	2.16	2.15	2.14	2.08	3.02	2.53	24	
8	2.09	2.08	2.10	2.12	2.15	2.14	2.27	S	2.24	2.06	2.09	2.07	2.03	2.06	2.03	2.11	2.25	2.19	2.22	2.24	2.30	2.24	2.40	2.40	2.03	2.40	2.17	24	
9	2.20	1.99	1.96	1.94	1.94	1.98	S	1.97	1.97	2.00	1.98	1.97	1.94	1.96	1.94	1.97	1.95	1.94	1.90	1.93	1.96	2.01	1.97	1.97	1.90	2.20	1.97	24	
10	2.00	1.95	2.03	2.06	2.09	S	1.93	1.91	1.96	S1	1.90	1.91	2.09	2.08	1.93	1.89	1.96	1.89	1.89	1.94	1.91	1.92	1.93	1.96	1.89	2.09	1.96	23	
11	1.95	1.94	1.93	1.93	S	1.92	1.90	1.91	1.91	C1	C1	C1	C1	1.88	1.92	P	1.94	1.95	1.97	2.01	2.02	1.99	2.02	2.06	1.88	2.06	1.95	19	
12	2.06	2.16	2.17	S	2.15	2.11	2.18	2.06	2.05	2.16	2.27	2.34	2.30	2.20	2.21	2.23	2.31	2.24	2.29	2.29	2.14	2.12	2.15	2.17	2.05	2.34	2.19	24	
13	2.27	2.23	S	2.21	2.14	2.15	2.14	2.11	2.08	2.07	2.05	2.01	1.98	1.96	1.97	1.96	1.98	1.98	1.99	2.01	2.00	1.98	1.98	2.00	1.96	2.27	2.05	24	
14	2.02	S	1.99	1.97	1.97	1.98	1.99	1.99	1.99	1.98	1.96	1.96	1.94	1.95	1.97	1.97	1.97	1.96	1.98	1.99	1.95	1.95	1.95	1.94	1.93	1.93	2.02	1.97	24
15	S	1.95	1.96	1.96	1.95	1.94	1.93	1.93	1.91	1.90	1.91	1.91	1.90	1.92	1.90	1.91	1.93	1.93	1.92	1.92	1.93	1.93	1.92	S	1.90	1.96	1.93	24	
16	1.92	1.94	1.95	1.97	1.98	1.97	1.98	1.97	1.98	2.04	2.03	2.03	2.02	2.05	2.05	2.01	2.05	2.01	2.01	2.27	2.32	2.11	S	2.15	1.92	2.32	2.04	24	
17	2.14	2.36	2.17	2.20	2.19	2.22	2.22	2.09	1.99	1.95	1.93	1.93	2.10	2.12	2.07	2.07	2.04	2.21	2.48	3.05	2.94	S	3.05	2.64	1.93	3.05	2.27	24	
18	2.91	2.92	3.15	2.94	2.82	2.86	2.91	2.75	2.79	2.74	2.61	2.75	2.63	2.54	2.64	2.53	2.82	2.49	2.16	2.22	S	2.37	2.55	2.56	2.16	3.15	2.68	24	
19	2.55	2.93	3.17	3.69	3.24	3.45	3.47	3.22	3.28	3.31	3.58	3.22	3.42	3.02	3.01	2.90	3.15	2.78	2.95	S	3.00	3.16	3.11	3.17	2.55	3.69	3.16	24	
20	3.09	2.94	2.57	2.34	2.24	2.13	2.17	2.25	2.12	2.11	2.14	2.16	2.14	2.11	2.21	2.23	2.32	2.55	S	2.63	2.79	2.77	2.63	2.76	2.11	3.09	2.41	24	
21	2.75	3.18	2.92	2.58	2.52	2.62	2.60	2.62	2.59	2.69	2.65	2.60	2.62	2.62	2.61	2.64	2.16	S	2.08	2.03	2.06	2.05	2.01	1.99	1.99	3.18	2.49	24	
22	2.00	1.97	1.96	1.98	1.99	1.99	2.00	1.99	2.03	2.02	2.01	2.01	2.01	2.02	2.01	2.02	S	2.05	2.11	2.05	2.07	2.12	2.07	2.02	1.96	2.12	2.02	24	
23	2.03	2.03	2.03	2.06	2.07	2.09	2.11	2.08	1.99	1.97	1.97	2.05	2.05	2.03	2.05	S	2.10	2.06	2.03	2.04	2.01	1.99	2.05	2.00	1.97	2.11	2.04	24	
24	2.02	1.97	1.94	1.94	1.95	1.95	1.94	1.94	1.94	1.95	1.96	1.95	1.96	1.98	S	1.98	1.98	2.00	1.99	2.01	2.13	2.16	2.33	2.16	1.94	2.33	2.01	24	
25	2.22	2.06	2.04	2.05	2.05	2.05	2.06	2.06	2.06	2.06	2.07	2.09	S	2.11	2.12	2.12	2.17	2.33	2.45	2.43	2.45	2.45	2.46	2.04	2.46	2.17	24		
26	2.52	2.62	2.59	2.48	2.42	2.34	2.27	2.21	2.13	2.12	2.10	2.03	S	1.94	1.93	1.94	1.96	1.99	1.95	1.94	1.95	1.94	1.95	1.93	2.62	2.14	24		
27	1.94	1.93	1.93	1.92	1.92	1.92	1.91	1.91	1.91	1.91	1.91	S	1.92	1.92	1.92	1.93	1.93	1.94	1.96	1.94	1.93	1.92	1.93	1.93	1.91	1.96	1.93	24	
28	1.92	1.93	1.92	1.92	1.93	1.93	1.92	1.91	1.91	1.91	S	1.93	1.94	1.95	1.95	1.96	2.00	2.00	1.96	1.94	1.94	1.95	1.95	1.92	1.91	2.00	1.94	24	
29	1.91	1.91	1.91	1.91	1.90	1.90	1.90	1.95	1.97	S	1.97	1.98	1.96	1.95	1.94	1.94	1.95	1.96	1.98	1.98	2.01	2.08	1.96	1.96	1.90	2.08	1.95	24	
30	1.95	1.96	1.95	1.93	1.93	1.94	1.92	1.91	S	1.91	1.91	1.92	1.93	1.92	1.92	1.93	1.93	1.92	1.92	1.92	1.93	1.95	1.97	1.98	1.91	1.98	1.93	24	
31	1.97	1.99	1.97	1.99	1.99	1.99	S	1.99	1.99	1.99	1.98	1.99	1.99	1.98	1.98	1.96	1.96	1.96	1.96	1.95	1.96	1.96	1.96	1.95	1.95	1.99	1.99	24	
HOURLY MAX	3.09	3.18	3.22	3.69	3.24	3.45	3.47	3.22	3.28	3.31	3.58	3.22	3.42	3.02	3.01	2.90	3.15	2.78	2.95	3.05	3.00	3.16	3.11	3.17					
HOURLY AVG	2.21	2.25	2.23	2.22	2.20	2.20	2.19	2.15	2.14	2.17	2.18	2.15	2.16	2.11	2.12	2.12	2.14	2.12	2.12	2.14	2.16	2.15	2.19	2.19					

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

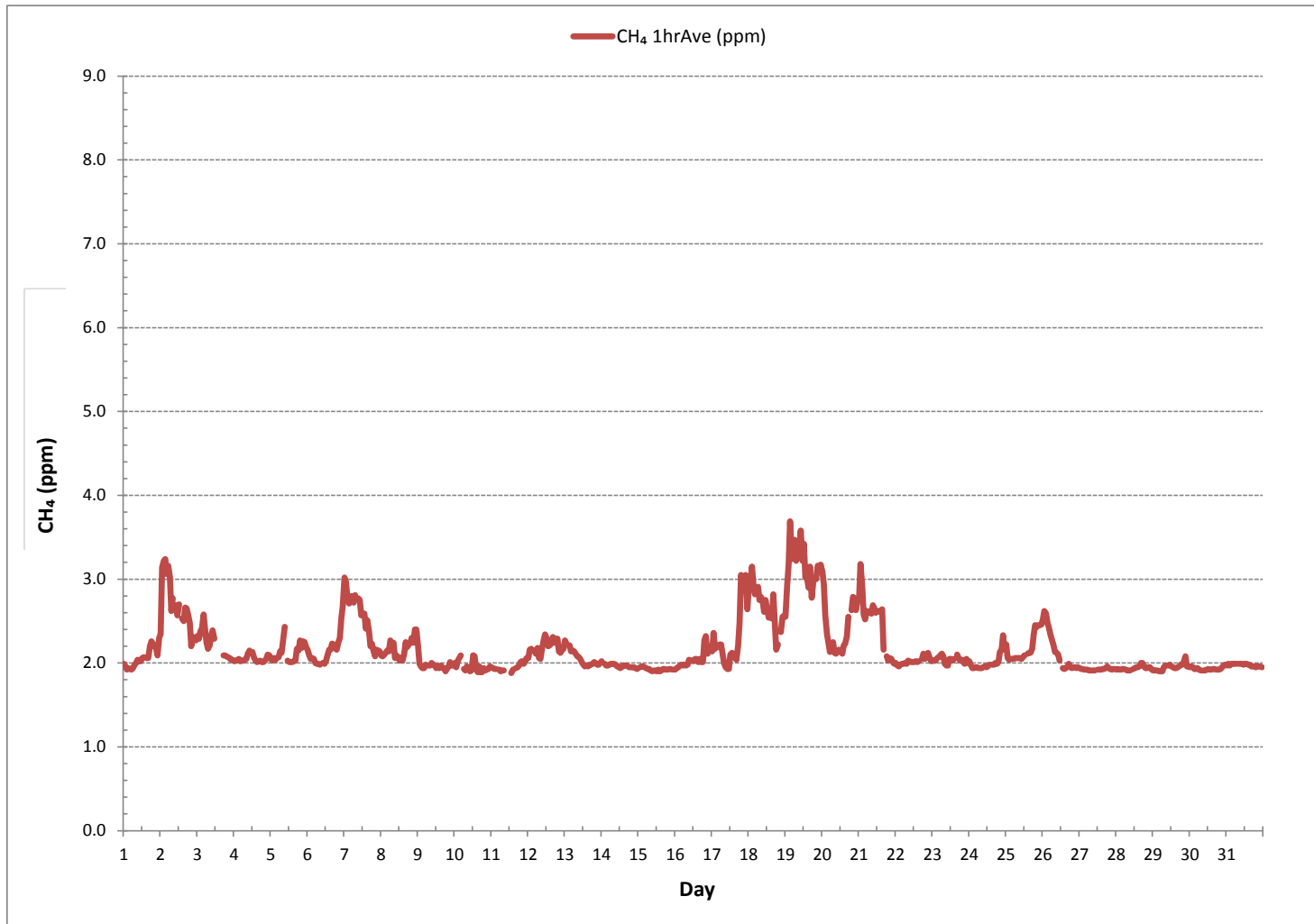
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	701		
MINIMUM 1-HR AVERAGE:	1.88 ppm	@ HOUR(S)	13 ON DAY(S)
MAXIMUM 1-HR AVERAGE:	3.69 ppm	@ HOUR(S)	3 ON DAY(S)
MAXIMUM 24-HR AVERAGE:	3.16 ppm		19 ON DAY(S)
			VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	737 hrs
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.1 %
STANDARD DEVIATION:	0.32	MONTHLY AVERAGE:	2.17 ppm

METHANE Hourly Averages (CH₄ ppm)





METHANE MAX Instantaneous Maximum (CH₄ ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	2.01	2.02	1.98	2.00	1.99	2.07	2.02	2.19	2.23	2.41	2.17	2.22	2.33	2.37	S	2.23	2.62	2.62	4.05	2.70	2.37	2.74	2.25	2.15	1.98	4.05	2.34	24
2	2.67	4.14	3.85	4.01	4.20	4.20	3.48	3.01	S1	S1	2.81	2.76	3.20	S	2.93	2.74	3.65	2.97	2.82	2.76	2.53	2.83	2.57	2.48	2.48	4.20	3.17	22
3	2.54	2.39	2.58	2.56	2.68	2.63	2.34	2.19	2.25	2.40	2.41	2.38	S	C	C	C	C	2.13	2.10	2.09	2.14	2.13	2.07	2.15	2.07	2.68	2.32	24
4	2.22	2.11	2.15	2.22	2.05	2.07	2.13	2.09	2.17	P	2.61	S	2.39	2.20	2.15	2.12	2.17	2.05	2.03	2.02	2.09	2.08	2.16	2.10	2.02	2.61	2.15	23
5	2.09	2.06	2.15	2.05	2.12	2.13	2.37	2.83	2.69	2.59	S	2.06	2.05	2.06	2.09	Y	Y	2.78	2.50	2.81	2.44	2.64	2.58	2.50	2.05	2.83	2.36	22
6	2.56	2.45	2.30	2.42	2.57	2.15	2.00	2.00	1.99	S	2.02	2.00	2.05	2.14	2.18	P	2.75	P	2.44	2.32	2.83	2.98	3.59	2.92	1.99	3.59	2.41	22
7	4.00	3.68	3.07	2.81	3.27	3.23	3.11	3.13	S	3.29	2.87	2.64	2.64	2.64	2.54	2.79	2.57	2.36	2.31	2.31	2.29	2.70	2.62	2.39	2.29	4.00	2.84	24
8	2.70	2.47	2.31	2.27	2.39	2.48	2.58	S	2.89	2.18	2.17	2.26	2.06	2.47	2.06	2.37	2.94	2.67	2.30	2.88	2.46	2.35	2.47	2.52	2.06	2.94	2.45	24
9	2.34	2.04	2.04	1.98	2.00	2.01	S	2.01	2.01	2.02	2.01	2.01	2.02	2.00	2.00	2.01	2.10	2.01	2.00	2.09	2.16	2.07	2.17	2.17	1.98	2.34	2.06	24
10	2.18	2.43	2.29	2.46	2.48	S	2.20	1.99	S1	S1	1.98	2.12	2.35	2.41	2.10	2.11	2.17	1.99	1.96	1.96	1.99	1.94	1.95	1.98	1.94	2.48	2.14	22
11	1.96	1.96	1.96	1.95	S	1.96	1.92	1.94	1.92	C1	C1	C1	C1	1.90	P	P	2.01	2.03	2.07	2.44	2.39	2.15	2.13	2.34	1.90	2.44	2.06	18
12	2.60	3.21	2.44	S	2.69	2.22	2.32	2.15	2.42	2.50	2.55	2.49	2.60	2.34	2.32	2.39	2.36	2.34	2.50	2.51	2.21	2.14	2.18	2.21	2.14	3.21	2.42	24
13	2.86	2.36	S	2.26	2.17	2.17	2.18	2.13	2.11	2.08	2.08	2.05	2.00	2.00	1.98	1.98	1.99	2.01	2.01	2.04	2.02	2.01	2.01	2.14	1.98	2.86	2.11	24
14	2.15	S	2.02	1.99	2.01	2.01	2.00	2.00	2.03	2.03	1.99	2.00	1.95	1.97	1.98	2.00	1.98	1.96	1.98	1.96	1.98	1.96	1.96	1.95	1.95	2.15	1.99	24
15	S	1.95	1.98	1.98	1.98	1.96	1.94	1.95	1.92	1.92	1.92	1.95	1.91	1.96	1.92	1.92	2.05	1.99	1.94	1.93	1.99	1.96	1.94	S	1.91	2.05	1.95	24
16	1.94	1.98	1.96	2.08	2.00	2.00	2.00	2.00	2.01	2.08	2.06	2.07	2.10	2.15	2.15	2.05	2.11	2.05	2.08	2.94	3.05	2.27	S	2.24	1.94	3.05	2.15	24
17	2.66	4.81	2.22	2.44	2.26	2.37	2.34	2.14	2.06	1.96	1.96	1.97	2.18	2.15	2.11	2.44	2.32	3.11	5.85	4.04	4.51	S	3.88	3.10	1.96	5.85	3.82	24
18	3.90	5.59	6.48	3.60	3.68	3.20	3.29	3.36	3.06	3.34	2.76	3.12	2.77	2.66	3.27	2.63	3.96	2.88	2.37	2.46	S	2.98	3.42	2.93	2.37	6.48	3.38	24
19	3.28	3.80	3.76	4.62	4.48	5.63	4.51	3.65	4.25	3.94	4.58	3.54	4.49	3.34	3.75	3.07	4.44	3.74	3.56	S	4.12	4.32	4.23	5.27	3.07	5.63	4.10	24
20	3.20	3.02	2.72	2.38	2.31	2.17	2.48	2.62	2.25	2.14	2.17	2.20	2.21	2.14	2.21	3.48	2.63	2.78	S	2.84	3.84	3.87	3.37	3.67	2.14	3.87	2.76	24
21	3.11	3.64	3.16	2.72	2.56	2.67	2.66	2.65	2.65	2.91	2.79	2.66	2.63	2.64	2.64	2.91	2.75	S	2.22	2.15	2.23	2.14	2.10	2.11	2.10	3.64	2.64	24
22	2.11	2.04	2.04	2.09	2.07	2.06	2.07	2.11	2.18	2.11	2.11	2.12	2.11	2.13	2.25	2.17	S	2.32	2.31	2.21	2.27	2.28	2.23	2.20	2.04	2.32	2.16	24
23	2.15	2.15	2.12	2.17	2.33	2.22	2.39	2.32	2.19	2.07	2.08	2.18	2.22	2.21	2.29	S	2.53	2.22	2.34	2.20	2.17	2.18	2.23	2.05	2.05	2.53	2.22	24
24	2.10	2.00	1.96	1.96	2.02	1.96	1.96	1.95	1.96	1.98	2.01	1.97	1.99	2.01	S	2.01	2.00	2.06	2.03	2.03	2.28	2.22	2.38	2.34	1.95	2.38	2.05	24
25	2.27	2.13	2.09	2.06	2.07	2.10	2.08	2.07	2.10	2.09	2.06	2.11	2.11	S	2.12	2.13	2.14	2.29	2.46	2.54	2.54	2.52	2.54	2.56	2.06	2.56	2.23	24
26	2.73	2.83	2.76	2.56	2.47	2.39	2.36	2.25	2.20	2.15	2.12	2.08	S	1.97	1.95	1.95	1.97	2.03	1.97	1.96	1.98	1.97	1.97	1.96	1.95	2.83	2.20	24
27	1.96	1.95	1.95	1.96	1.94	1.94	1.92	1.94	1.93	1.94	1.92	S	1.92	1.93	1.94	1.96	1.94	1.96	1.99	1.96	1.96	1.93	1.95	1.95	1.92	1.99	1.95	24
28	1.93	1.95	1.94	1.93	1.94	1.96	1.92	1.95	1.92	1.93	S	1.93	1.96	1.95	1.98	1.96	2.09	2.13	1.98	1.96	1.99	1.98	2.02	1.96	1.92	2.13	1.97	24
29	1.92	1.93	1.92	1.93	1.91	1.92	1.93	2.06	2.03	S	2.02	1.99	1.98	1.96	1.95	1.96	1.98	2.05	2.00	2.15	2.77	1.99	1.96	1.91	1.91	2.77	2.01	24
30	1.96	2.08	1.97	1.95	1.94	1.98	1.94	1.92	S	1.93	1.92	1.96	2.00	1.93	1.94	1.93	1.97	1.94	1.92	1.96	2.01	2.06	2.07	2.08	1.92	2.08	1.97	24
31	2.04	2.05	2.03	2.10	2.05	2.10	2.13	S	2.05	2.07	2.08	2.07	2.08	2.09	2.08	2.00	2.00	1.98	1.98	1.96	1.99	1.97	1.97	1.97	1.96	2.13	2.04	24
HOURLY MAX	4.00	5.59	6.48	4.62	4.48	5.63	4.51	3.65	4.25	3.94	4.58	3.54	4.49	3.34	3.75	3.48	4.44	3.74	5.85	4.04	4.51	4.32	4.23	5.27				
HOURLY AVG	2.47	2.64	2.47	2.38	2.42	2.40	2.35	2.30	2.28	2.32	2.29	2.25	2.30	2.20	2.28	2.28	2.43	2.32	2.40	2.33	2.43	2.40	2.43	2.41				

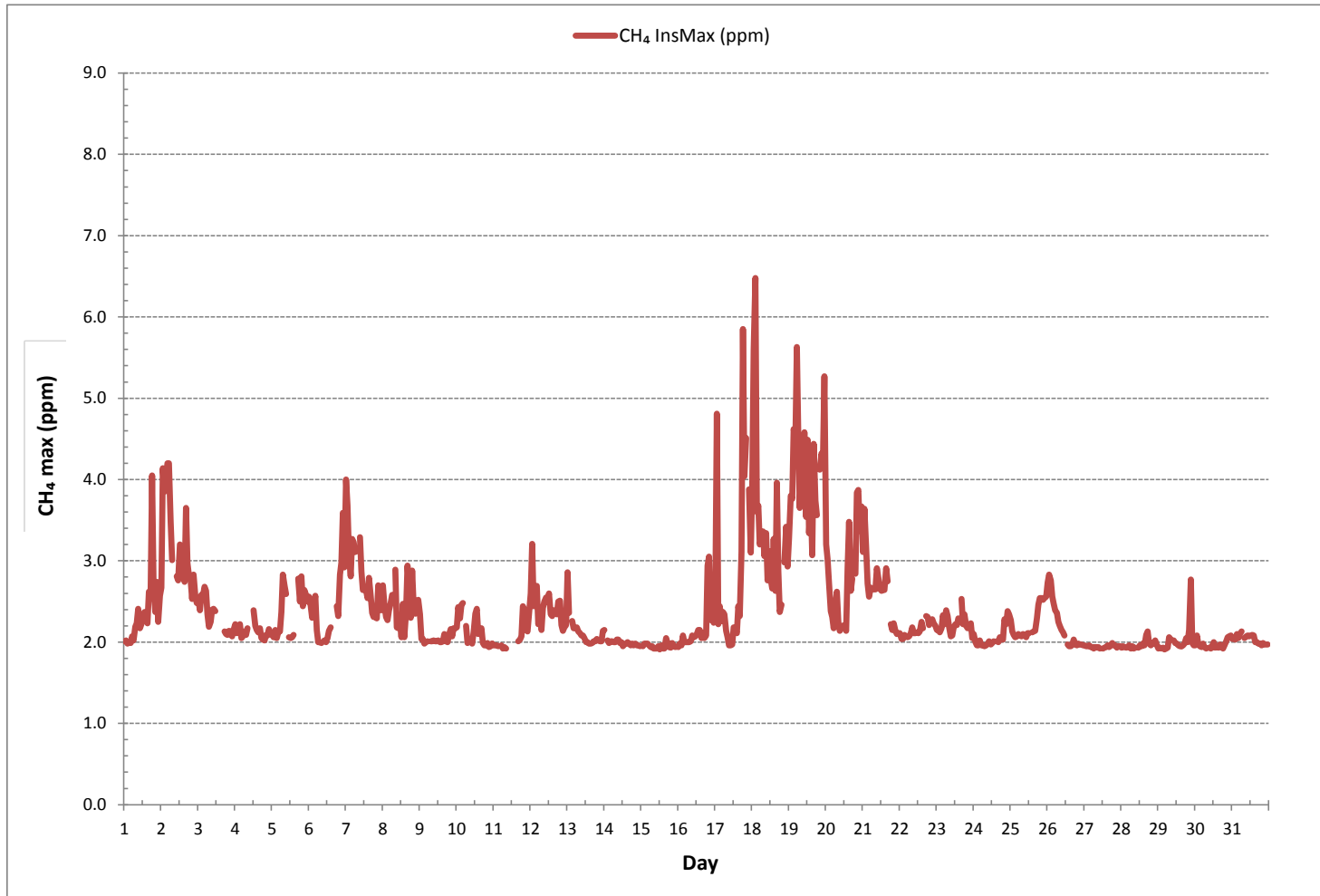
STATUS FLAG CODES

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:	693
MAXIMUM INSTANTANEOUS VALUE:	6.48 ppm @ HOUR(S) 2 ON DAY(S) 18
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	729 hrs
STANDARD DEVIATION:	0.61

METHANE MAX Instantaneous Maximum (CH₄ ppm)

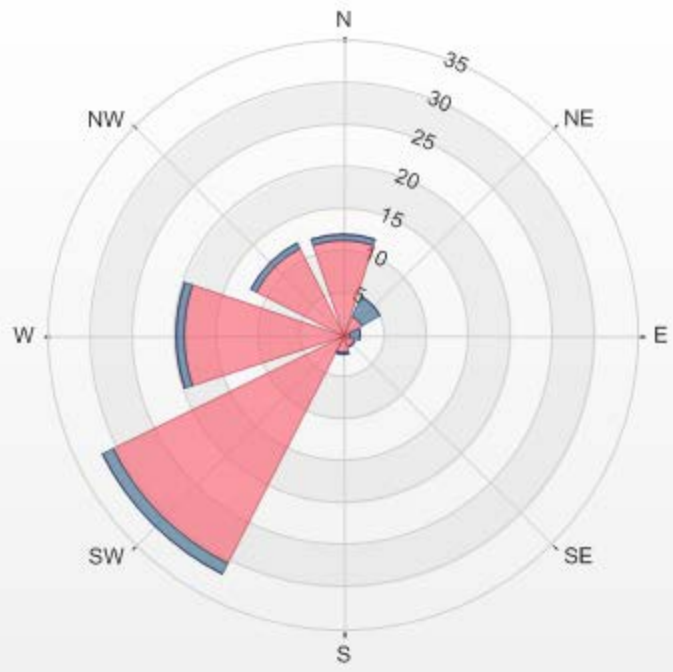


Wind: LICA Bonnyville Poll.: LICA Bonnyville-CH4[ppm] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.73% Valid Data: 93.95% Calm Avg: 2.58 [ppb]

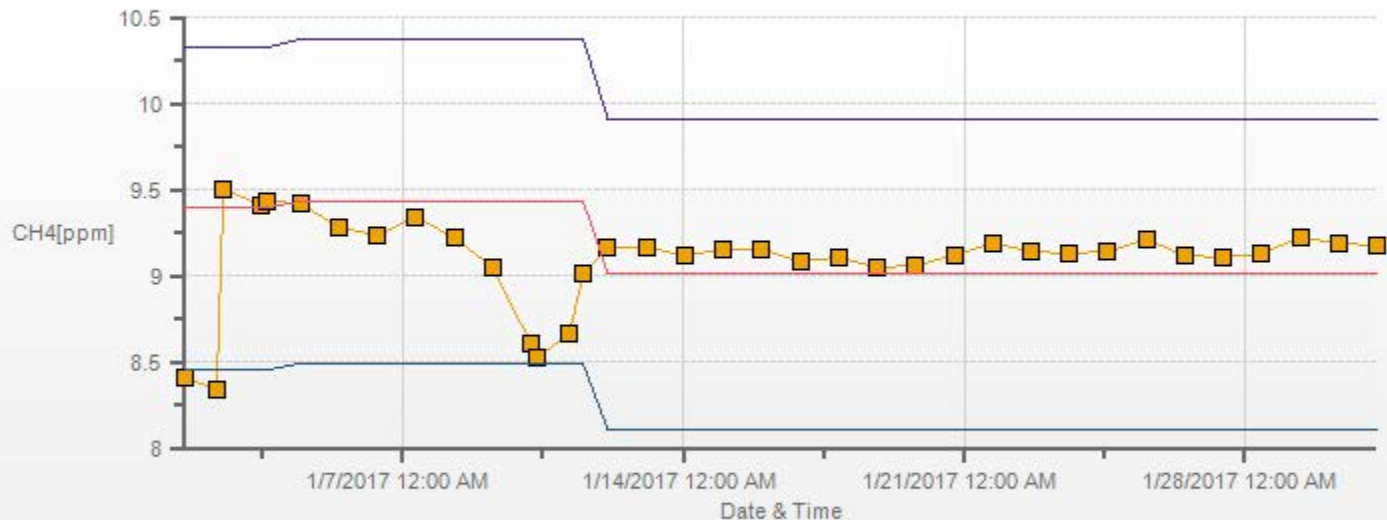
Direction	0.0-1.2	1.2-2.5	2.5-3.7	>3.7	Total
N	0	11.3	0.72	0	12.02
NE	0	2.58	2.43	0	5.01
E	0	0.86	1.29	0	2.15
SE	0	1.57	0.14	0	1.71
S	0	2.15	0.14	0	2.29
SW	0	30.47	1.43	0	31.9
W	0	18.88	1	0	19.88
NW	0	11.59	0.72	0	12.31
Summary	0	79.4	7.87	0	87.27

% Icon Classes (ppm) 0 0.0-1.2 79 1.2-2.5 8 2.5-3.7 0 >3.7

LICA Bonnyville Poll.: LICA Bonnyville-CH4[ppm] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.73% Calm Poll Avg: 2.58[ppm]



CH4[ppm] Calibration: LICA Bonnyville Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

NON-METHANE HYDROCARBON



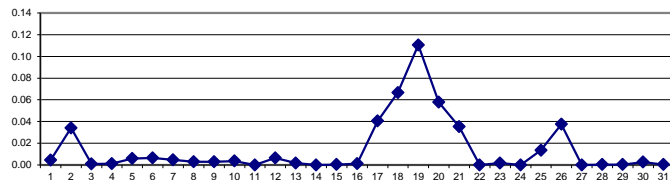
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.02	0.04	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.04	0.00	24
2	0.03	0.09	0.02	0.04	0.03	0.04	0.02	0.01	0.17	S1	0.00	0.00	0.02	S	0.07	0.04	0.07	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.03	23
3	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	C	C	C	C	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	24	
4	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	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	24	
5	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	0.02	0.03	0.01	0.00	0.03	0.03	0.02	0.00	0.03	0.01	24
6	0.02	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	0.02	0.00	0.00	0.04	0.01	0.04	0.02	0.00	0.04	0.01	24	
7	0.03	0.01	0.00	0.00	0.01	0.00	0.03	0.01	S	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	0.00	0.00	0.00	0.03	0.00	24	
8	0.00	0.00	0.00	0.00	0.00	0.00	0.01	S	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	24	
9	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	0.06	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.06	0.00	24	
10	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	S1	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	23	
11	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	C1	C1	C1	C1	0.00	0.00	P	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19	
12	0.00	0.01	0.01	S	0.01	0.00	0.00	0.00	0.01	0.06	0.01	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.06	0.01	24	
13	0.01	0.00	S	0.00	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	0.00	0.00	0.00	0.03	0.00	24	
14	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	0.00	0.00	24	
15	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.01	0.00	24	
16	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	0.02	0.01	0.00	S	0.00	0.02	0.00	0.00	24	
17	0.00	0.03	0.00	0.00	0.00	0.00	0.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.22	0.10	S	0.15	0.03	0.26	0.04	24		
18	0.08	0.07	0.10	0.05	0.02	0.04	0.03	0.01	0.03	0.07	0.07	0.16	0.06	0.01	0.08	0.03	0.27	0.02	0.00	0.00	S	0.09	0.09	0.15	0.00	0.27	0.07	24	
19	0.06	0.10	0.05	0.17	0.12	0.17	0.22	0.12	0.14	0.15	0.21	0.05	0.08	0.16	0.04	0.02	0.17	0.08	0.07	S	0.07	0.11	0.10	0.08	0.22	0.11	0.11	24	
20	0.02	0.02	0.00	0.00	0.00	0.00	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.08	0.40	0.08	0.17	S	0.14	0.10	0.11	0.07	0.09	0.00	0.40	0.06	24		
21	0.25	0.28	0.08	0.02	0.01	0.02	0.03	0.01	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.03	0.01	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.04	24	
22	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	0.00	24	
23	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	0.01	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.02	0.00	24	
24	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	24	
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.01	0.01	0.03	0.04	0.03	0.04	0.07	0.08	0.00	0.08	0.01	24	
26	0.09	0.10	0.10	0.08	0.09	0.10	0.10	0.09	0.05	0.04	0.02	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	0.10	0.04	24	
27	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	0.00	0.00	24	
28	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24	
29	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	0.01	0.00	0.00	0.00	0.01	0.00	24	
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.01	0.00	0.00	0.00	0.03	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	24	
31	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
HOURLY MAX	0.25	0.28	0.10	0.17	0.12	0.17	0.26	0.12	0.17	0.15	0.21	0.16	0.08	0.16	0.08	0.40	0.27	0.17	0.07	0.22	0.10	0.11	0.15	0.15					
HOURLY AVG	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.02	0.01	0.02	0.01	0.01	0.02	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

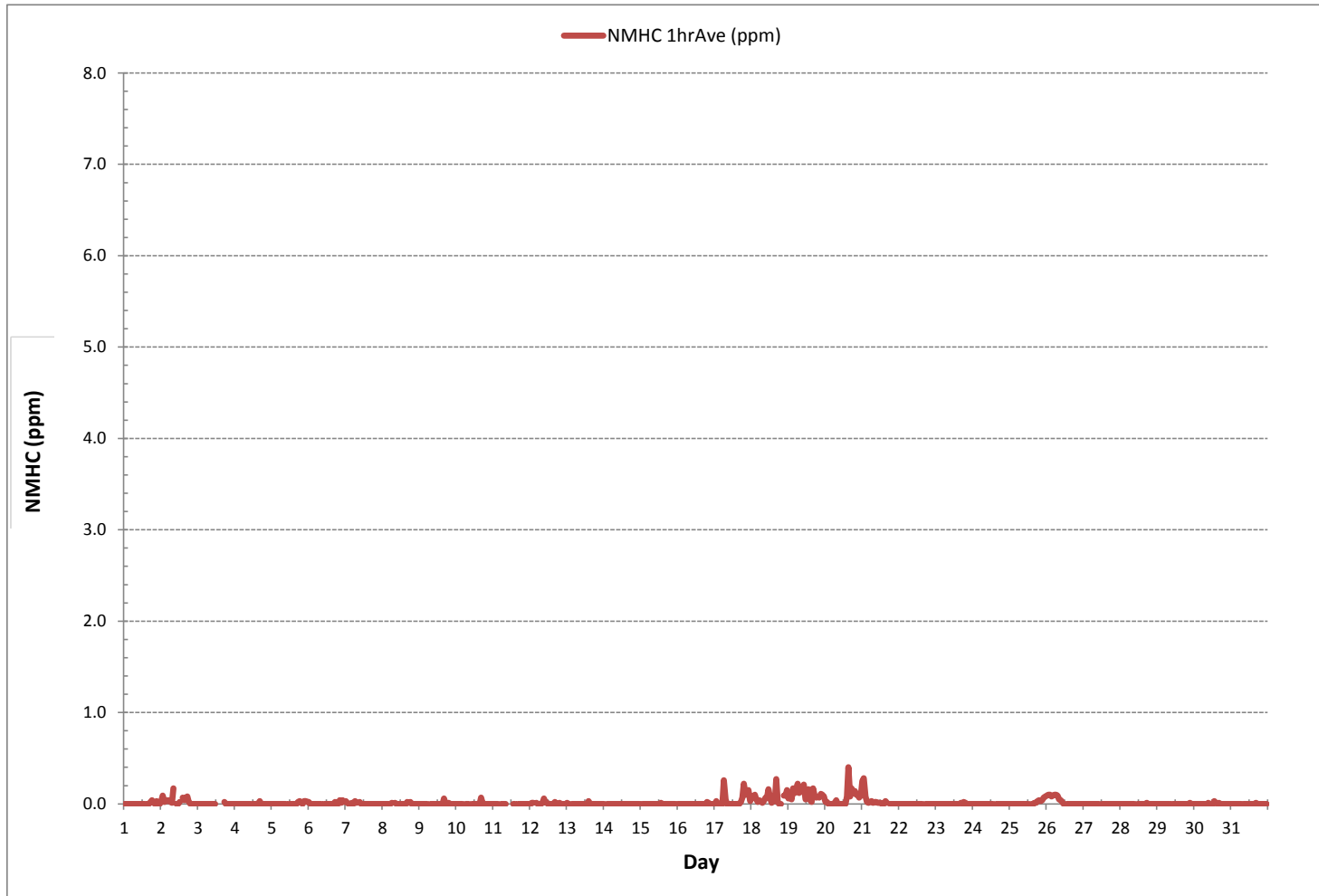
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	172				
MINIMUM 1-HR AVERAGE:	0.00 ppm	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	0.40 ppm	@ HOUR(S)	15	ON DAY(S)	20
MAXIMUM 24-HR AVERAGE:	0.11 ppm			ON DAY(S)	19
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	737 hrs		
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.1 %		
STANDARD DEVIATION:	0.04	MONTHLY AVERAGE:	0.01 ppm		

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville Continuous Monitoring Station - January 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	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.03	S	0.00	0.09	0.59	0.32	0.09	0.00	0.40	0.00	0.00	0.00	0.00	0.59	0.07	24
2	0.75	0.29	0.14	0.22	0.23	0.16	0.14	0.15	S1	S1	0.11	0.09	0.17	S	0.21	0.17	0.24	0.65	0.52	0.00	0.00	0.09	0.07	0.00	0.00	0.00	0.75	0.21	22
3	0.00	0.00	0.08	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	S	C	C	C	C	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.07	24
4	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	P	0.22	S	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.04	23
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.09	0.06	S	0.00	0.00	0.00	0.00	Y	Y	0.15	0.32	0.11	0.06	0.12	0.12	0.09	0.00	0.32	0.06	22	
6	0.09	0.07	0.04	0.05	0.11	0.00	0.00	0.00	0.23	S	0.00	0.00	0.00	0.00	0.00	P	0.11	P	0.00	0.00	1.23	0.14	0.23	0.11	0.00	1.32	0.11	22	
7	0.22	0.17	0.06	0.00	0.14	0.08	0.54	0.10	S	0.15	0.11	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.04	0.08	0.10	0.00	0.00	0.54	0.08	24	
8	0.11	0.00	0.04	0.03	0.05	0.08	0.09	S	0.14	0.00	0.00	0.04	0.00	0.07	0.00	0.07	0.15	0.13	0.52	0.11	0.00	0.00	0.00	0.00	0.00	0.52	0.07	24	
9	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	0.24	0.00	1.93	0.00	0.12	0.32	0.00	0.00	0.00	0.00	0.00	1.93	0.11	24	
10	0.00	0.07	0.00	0.06	0.07	S	0.00	0.00	S1	S1	0.00	0.00	0.00	0.00	0.00	0.00	3.82	0.57	0.22	0.00	0.16	0.00	0.00	0.00	0.00	3.82	0.24	22	
11	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	C1	C1	C1	C1	0.00	P	P	0.07	0.00	0.00	0.05	0.03	0.00	0.00	0.05	0.00	0.07	0.01	18	
12	0.12	0.16	0.09	S	0.11	0.00	0.00	0.00	0.17	0.93	0.37	0.33	0.00	0.00	0.00	0.00	0.95	0.00	0.05	0.42	0.00	0.00	0.00	0.00	0.00	0.95	0.16	24	
13	0.13	0.00	S	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.47	0.06	0.00	0.00	0.02	0.05	0.01	0.07	0.00	0.00	0.00	1.47	0.08	24	
14	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.00	0.00	0.02	0.02	0.00	0.00	0.06	0.01	24	
15	S	0.08	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.65	0.04	24
16	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	0.00	0.00	0.00	0.10	0.00	0.16	0.14	0.00	S	0.00	0.00	0.00	0.16	0.02	24	
17	0.07	0.47	0.00	0.05	0.00	0.00	0.94	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.07	0.18	0.67	0.62	0.34	S	0.29	0.16	0.00	0.94	0.20	24		
18	0.27	0.51	0.59	0.22	0.16	0.15	0.12	0.14	0.37	0.22	0.26	0.33	0.24	0.17	0.29	0.26	1.17	0.34	0.07	0.04	S	0.39	0.24	0.44	0.04	1.17	0.30	24	
19	0.24	0.25	0.21	0.35	0.35	0.48	0.72	0.25	0.35	0.28	0.40	0.19	0.31	3.01	0.22	0.12	0.49	0.47	0.22	S	0.27	0.30	0.27	0.41	0.12	3.01	0.44	24	
20	0.13	0.13	0.06	0.05	0.06	0.02	0.12	0.16	0.05	0.07	0.07	0.04	0.12	0.05	0.38	6.08	0.90	0.32	S	0.32	0.41	0.47	0.24	0.29	0.02	6.08	0.46	24	
21	1.42	1.23	0.18	0.14	0.11	0.12	0.45	0.08	0.22	0.12	0.15	0.09	0.10	0.07	0.06	0.15	0.11	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	0.21	24	
22	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	0.04	0.04	0.02	0.05	0.06	0.04	0.00	0.00	0.06	0.01	24	
23	0.00	0.00	0.00	0.00	0.00	0.04	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.05	S	0.24	0.00	0.55	0.16	0.00	0.00	0.03	0.00	0.00	0.55	0.05	24	
24	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
25	0.04	0.00	0.00	0.00	0.00	0.04	0.05	0.04	0.05	0.07	0.06	0.07	0.07	S	0.00	0.09	0.09	0.10	0.11	0.20	0.11	0.12	0.12	0.16	0.00	0.20	0.07	24	
26	0.15	0.15	0.14	0.14	0.13	0.16	0.20	0.15	0.17	0.12	0.10	0.03	S	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.07	24
27	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	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24	
28	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	0.63	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.63	0.03	24	
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.14	0.00	0.00	0.00	0.24	0.02	24	
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.21	0.00	0.00	0.16	0.23	0.33	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.07	24
31	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.31	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.03	24	
HOURLY MAX	1.42	1.23	0.59	0.35	0.35	0.48	0.94	0.62	0.37	0.93	0.40	0.33	0.31	3.01	1.47	6.08	3.82	1.13	0.67	0.62	1.23	0.47	0.29	0.44					
HOURLY AVG	0.12	0.12	0.06	0.05	0.05	0.05	0.11	0.06	0.07	0.09	0.08	0.04	0.04	0.16	0.13	0.28	0.42	0.20	0.13	0.09	0.10	0.08	0.06	0.06					

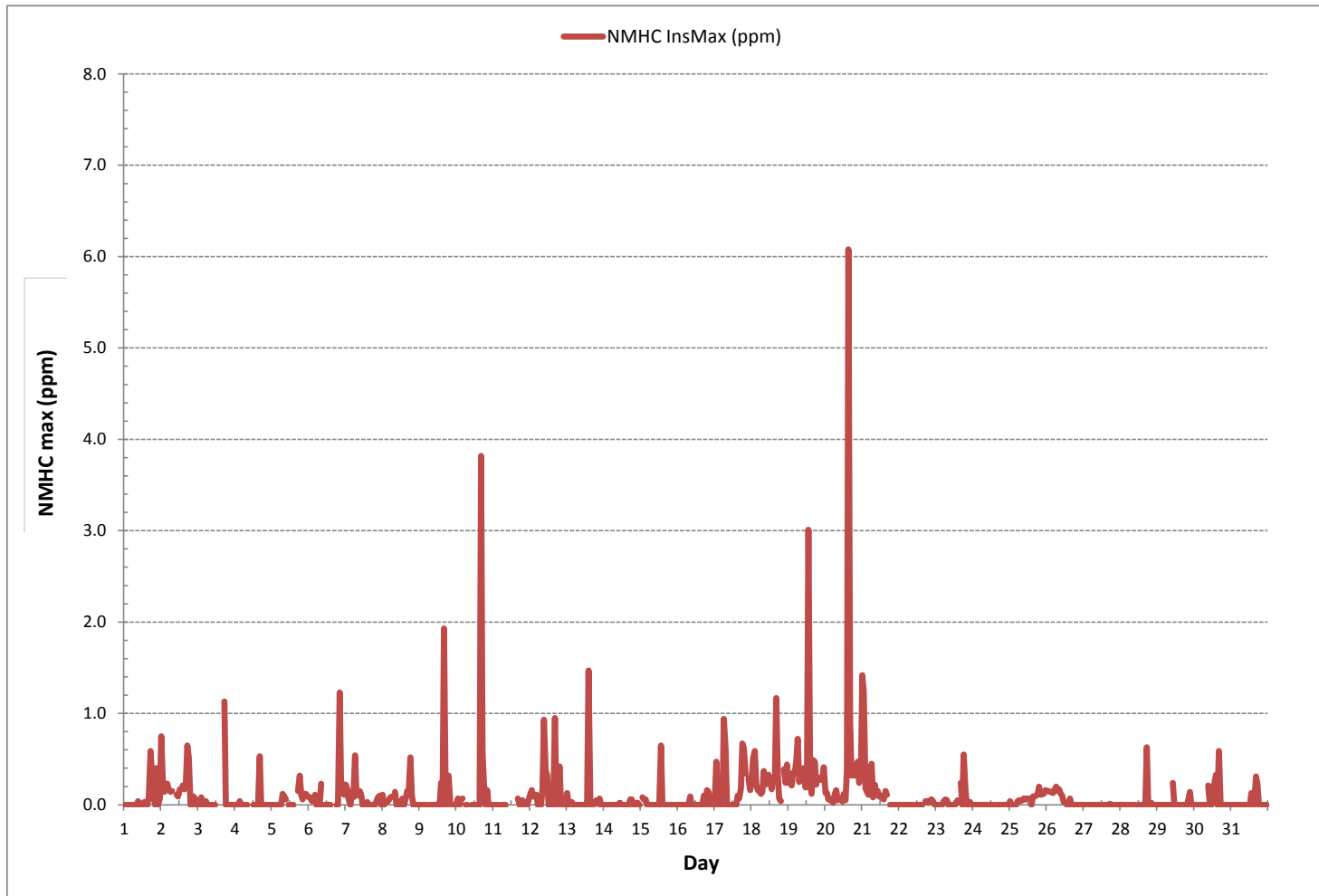
STATUS FLAG CODES

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:	286
MAXIMUM INSTANTANEOUS VALUE:	6.08 ppm @ HOUR(S) 15 ON DAY(S) 20
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	729 hrs
STANDARD DEVIATION:	0.35

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

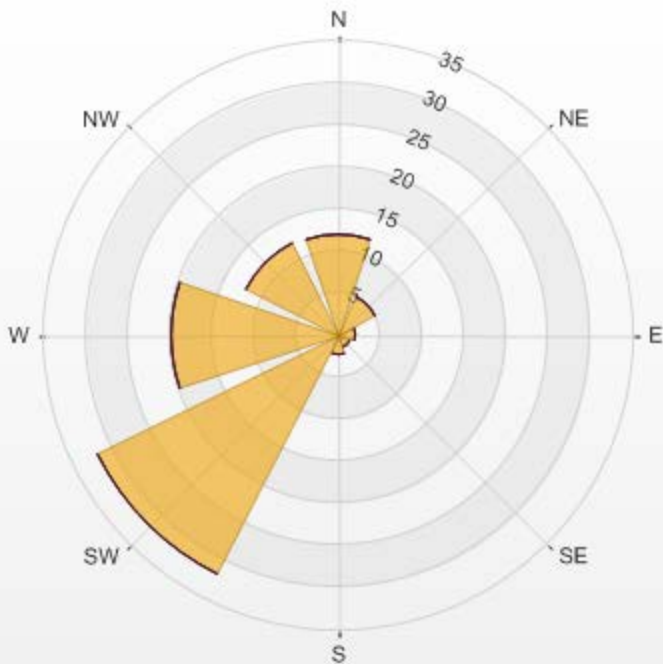


Wind: LICA Bonnyville Poll.: LICA Bonnyville-NMHC[ppm] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.73% Valid Data: 93.95% Calm Avg: 0.06 [ppb]

Direction	0.0-0.4	0.4-0.8	0.8-1.2	1.2-1.6	1.6-2.0	>2.0	Total
N	12.02	0	0	0	0	0	12.02
NE	5.01	0	0	0	0	0	5.01
E	2.15	0	0	0	0	0	2.15
SE	1.72	0	0	0	0	0	1.72
S	2.29	0	0	0	0	0	2.29
SW	31.9	0	0	0	0	0	31.9
W	19.89	0	0	0	0	0	19.89
NW	12.3	0	0	0	0	0	12.3
Summary	87.28	0	0	0	0	0	87.28

% Icon Classes (ppm) 87 0.0-0.4 0 0.4-0.8 0 0.8-1.2 0 1.2-1.6 0 1.6-2.0 0 >2.0

LICA Bonnyville Poll.: LICA Bonnyville-NMHC[ppm] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.73% Calm Poll
Avg: 0.06[ppm]



OXIDES OF NITROGEN



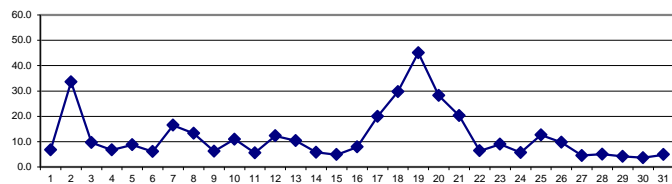
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	2.9	2.6	2.5	2.7	2.4	2.3	3.4	3.8	4.4	5.4	4.1	3.8	4.0	5.5	S	7.7	9.4	23.4	13.0	15.5	12.2	11.7	7.6	5.6	2.3	23.4	6.8	24	
2	20.5	35.0	19.5	21.4	17.5	36.4	25.3	30.3	47.1	47.0	32.5	32.0	54.3	S	43.7	62.0	56.4	51.2	37.0	24.6	15.2	18.4	25.4	18.8	15.2	62.0	33.5	24	
3	12.8	9.9	16.7	11.5	14.3	12.1	8.8	8.1	9.8	8.8	9.9	8.3	S	9.3	9.5	11.3	11.9	9.2	8.4	7.5	8.2	6.0	5.7	4.3	4.3	16.7	9.7	24	
4	3.1	3.9	4.0	4.2	4.5	4.7	5.4	7.6	8.7	Y	Y	Y	Y	Y	Y	S	19.0	15.3	9.8	4.7	6.4	3.7	7.2	2.6	2.6	19.0	6.8	18	
5	2.3	2.5	4.1	2.8	5.7	5.4	14.9	13.2	17.4	22.6	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	9.7	4.9	2.3	22.6	8.8	13
6	4.8	5.0	3.9	4.1	4.2	3.3	1.7	1.8	3.7	C	C	C	C	C	C	Y	Y	C	C	C	C	C	C	28.6	1.7	28.6	6.1	22	
7	26.6	29.7	15.2	15.4	18.6	16.6	19.6	S	32.6	28.5	18.1	20.5	9.8	10.2	11.9	16.8	16.7	9.9	9.6	8.5	9.4	11.3	13.1	10.8	8.5	32.6	16.5	24	
8	6.3	6.0	6.5	6.0	6.9	7.0	14.6	S	23.4	10.1	8.6	14.5	20.2	12.0	8.7	16.6	25.5	20.4	22.4	21.5	17.5	8.6	9.3	13.7	6.0	25.5	13.3	24	
9	5.2	1.2	2.9	0.7	0.9	1.2	S	3.4	6.8	4.7	3.2	2.9	14.3	3.2	4.3	6.2	16.1	10.1	12.5	10.6	9.9	8.2	7.6	6.0	0.7	16.1	6.2	24	
10	7.2	9.8	6.9	6.4	8.1	S	12.3	4.9	11.1	31.4	19.9	11.7	16.1	14.1	8.8	10.1	29.0	18.5	10.8	4.5	6.8	2.6	0.9	0.6	0.6	31.4	11.0	24	
11	0.9	1.6	3.3	4.6	S	7.0	5.1	5.3	7.6	7.5	7.2	5.1	4.5	3.8	4.4	P	3.9	3.9	4.0	6.6	7.5	6.1	12.8	9.0	0.9	12.8	5.5	23	
12	18.0	24.7	18.1	S	6.7	6.2	9.4	9.8	12.3	21.5	20.1	18.6	19.1	10.9	8.5	12.1	14.0	11.8	13.6	10.5	5.7	4.2	2.7	3.9	2.7	24.7	12.3	24	
13	7.2	5.4	S	6.7	6.5	7.1	11.0	17.0	15.0	11.8	11.3	10.5	9.1	8.0	10.1	10.7	10.3	14.3	13.1	16.6	17.1	9.8	4.8	4.5	4.5	17.1	10.3	24	
14	6.6	S	4.7	3.9	4.0	4.8	5.1	4.8	5.8	6.6	6.8	6.7	7.9	6.4	7.0	6.6	7.6	6.3	6.5	5.9	6.2	5.3	4.4	3.8	3.8	7.9	5.8	24	
15	S	5.9	6.0	6.0	4.5	5.8	4.1	3.4	2.5	2.2	2.5	2.7	2.7	4.6	3.7	5.8	3.0	26.9	4.1	3.4	3.2	1.7	2.8	S	1.7	26.9	4.9	24	
16	2.4	4.2	4.9	4.7	5.7	3.9	4.1	5.4	6.4	5.7	5.9	5.8	8.9	10.6	9.1	10.7	11.1	7.0	9.5	22.9	16.6	8.3	S	7.2	2.4	22.9	7.9	24	
17	5.2	7.0	5.5	4.8	6.3	8.3	33.2	18.3	13.9	7.3	7.5	6.6	11.4	11.4	10.8	20.3	19.6	21.7	44.2	78.2	41.1	S	46.6	30.3	4.8	78.2	20.0	24	
18	24.3	20.4	21.4	18.8	15.0	22.6	27.3	25.5	35.7	44.2	34.9	54.4	41.0	19.7	37.5	43.1	71.7	24.4	15.1	11.5	S	29.4	27.7	16.8	11.5	71.7	29.7	24	
19	22.0	26.4	16.3	36.9	33.5	49.1	80.8	55.3	67.7	95.3	113.2	42.7	39.1	29.4	23.6	25.8	52.5	38.9	41.5	S	39.9	42.2	38.3	25.6	16.3	113.2	45.0	24	
20	15.8	15.1	10.5	8.4	8.0	7.9	13.1	32.5	18.9	12.6	18.2	19.0	18.8	14.4	21.4	57.2	42.3	76.7	S	60.3	37.9	43.3	48.3	47.6	7.9	76.7	28.2	24	
21	45.5	47.1	36.9	22.9	18.6	19.0	18.8	19.5	19.6	27.0	24.6	25.4	20.1	20.5	22.5	24.4	12.2	S	10.3	6.8	6.9	6.0	5.5	5.3	5.3	47.1	20.2	24	
22	5.4	3.6	3.3	3.8	4.9	5.5	5.1	5.7	6.4	6.3	5.5	6.3	5.4	5.1	5.1	S	15.0	11.0	9.6	8.5	9.0	9.9	8.9	6.8	3.3	11.0	6.4	24	
23	6.5	5.6	6.3	6.9	7.7	9.8	10.3	13.3	11.3	8.5	7.4	11.7	10.9	17.6	12.5	S	15.0	10.2	9.2	7.4	7.1	3.2	4.4	4.0	3.2	17.6	9.0	24	
24	4.2	2.1	1.3	2.0	3.3	1.3	2.1	3.3	4.0	2.4	4.9	9.5	6.3	7.5	S	8.9	6.0	6.7	5.3	5.0	10.0	9.2	15.9	9.8	1.3	15.9	5.7	24	
25	10.9	9.1	10.5	13.3	11.9	11.1	10.3	8.4	8.6	7.9	7.5	7.5	9.9	S	12.6	12.7	16.2	17.2	17.2	21.5	18.7	18.7	13.0	16.7	7.5	21.5	12.7	24	
26	15.6	14.2	16.5	12.0	13.3	12.0	13.3	14.2	14.1	12.7	10.8	12.9	S	8.9	8.8	9.0	7.8	6.1	4.0	3.3	4.7	4.0	3.3	2.4	2.4	16.5	9.7	24	
27	2.1	1.9	2.1	2.0	2.7	2.7	2.4	3.9	7.4	5.7	6.6	S	7.0	4.3	3.9	6.7	4.4	8.3	10.0	6.3	4.2	3.4	3.3	2.8	1.9	10.0	4.5	24	
28	2.9	3.5	2.6	2.1	3.1	2.6	2.3	2.1	1.8	2.5	S	6.6	6.2	7.4	5.9	8.2	12.2	8.2	6.4	7.0	7.5	6.4	5.9	2.7	1.8	12.2	5.0	24	
29	1.6	1.6	2.2	1.6	1.8	1.9	3.1	0.9	2.0	S	6.4	7.2	6.2	5.4	4.9	4.5	4.4	7.1	6.2	5.4	7.3	7.9	3.7	3.3	0.9	7.9	4.2	24	
30	3.0	3.0	3.1	2.3	3.4	4.8	4.0	4.3	S	5.1	4.4	5.9	4.3	3.0	2.9	3.2	3.2	6.5	4.4	2.6	1.7	2.3	3.4	3.9	1.7	6.5	3.7	24	
31	3.2	4.1	3.6	4.0	3.5	5.4	6.1	S	S1	7.2	9.8	5.4	5.8	5.1	5.1	4.2	3.6	9.2	8.7	2.8	1.4	1.9	3.4	4.0	1.4	9.8	4.9	23	
HOURLY MAX	45.5	47.1	36.9	36.9	33.5	49.1	80.8	55.3	67.7	95.3	113.2	54.4	54.3	29.4	43.7	62.0	71.7	76.7	44.2	78.2	41.1	43.3	48.3	47.6					
HOURLY AVG	9.8	10.4	8.7	8.1	8.2	9.6	12.6	11.6	14.7	16.4	15.3	13.5	14.0	9.9	11.8	15.8	18.0	17.2	13.1	13.9	12.1	10.5	11.9	10.2					

STATUS FLAG CODES

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

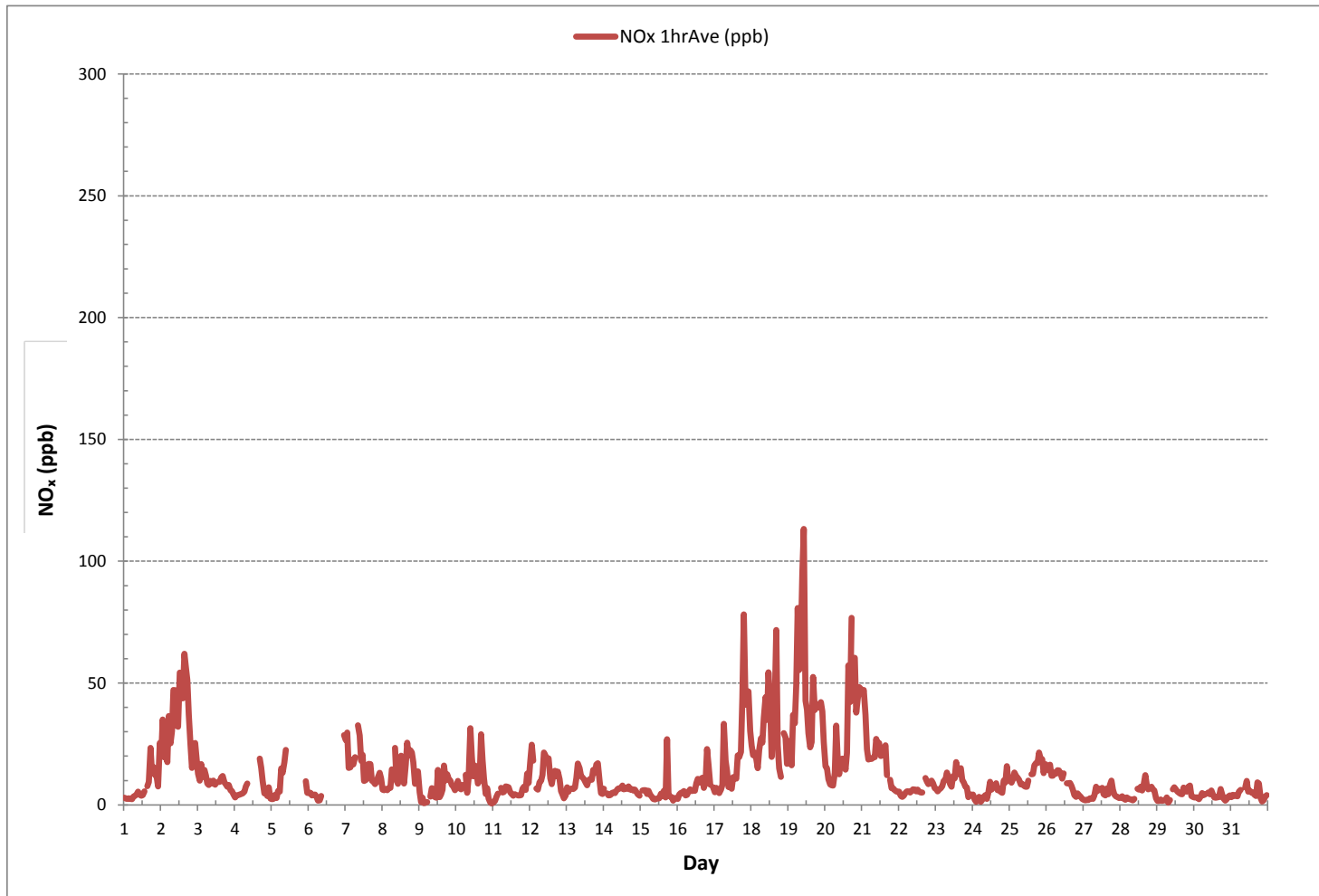
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	680				
MINIMUM 1-HR AVERAGE:	0.6 ppb	@ HOUR(S)	23	ON DAY(S)	10
MAXIMUM 1-HR AVERAGE:	113.2 ppb	@ HOUR(S)	10	ON DAY(S)	19
MAXIMUM 24-HR AVERAGE:	45.0 ppb			ON DAY(S)	19
				VAR-VARIOUS	
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	723 hrs		
MONTHLY CALIBRATION TIME:	12 hrs	AMD OPERATION UPTIME:	97.2 %		
STANDARD DEVIATION:	13.1	MONTHLY AVERAGE:	12.3 ppb		

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville Continuous Monitoring Station - January 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	5.1	3.8	3.9	3.8	3.3	3.5	5.9	9.4	8.3	7.9	5.4	5.4	5.7	8.6	S	12.6	12.1	37.0	46.0	45.2	78.0	20.9	16.9	9.2	3.3	78.0	15.6	24	
2	63.8	45.3	35.7	42.1	81.5	96.0	65.9	60.7	74.1	129.2	57.6	37.1	82.7	S	52.6	106.2	84.1	163.7	54.7	64.9	20.2	43.3	35.0	21.6	20.2	163.7	66.0	24	
3	18.5	13.0	32.4	14.0	31.7	29.0	13.9	11.9	35.2	26.0	30.4	15.9	S	25.1	12.8	16.3	16.0	24.1	10.0	12.3	12.3	8.3	9.9	6.7	6.7	35.2	18.5	24	
4	6.0	8.1	6.8	7.7	8.2	7.9	11.1	13.3	13.1	Y	Y	Y	Y	Y	Y	S	67.1	23.8	18.7	9.9	43.9	6.2	61.8	5.6	5.6	67.1	18.8	18	
5	8.1	5.6	15.3	4.4	17.9	10.4	23.8	29.4	23.6	29.3	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	6.8	4.4	29.4	15.9	12
6	6.4	6.7	6.5	6.6	7.1	29.3	2.9	13.2	20.6	C	C	C	C	C	C	Y	Y	C	C	C	C	C	C	C	42.9	2.9	42.9	14.2	22
7	40.6	38.2	20.0	17.6	24.2	42.3	27.7	S	S	37.1	47.6	67.0	15.3	14.8	16.5	24.2	31.2	19.4	28.8	13.0	13.0	14.2	20.0	22.9	13.0	67.0	27.1	24	
8	17.6	8.9	8.9	8.3	9.4	10.1	21.8	S	55.8	15.9	75.8	25.9	39.4	17.1	32.3	27.0	38.8	42.3	30.0	24.1	58.7	20.0	11.9	22.9	8.3	75.8	27.1	24	
9	16.5	2.4	5.4	3.6	2.4	13.0	S	6.5	34.7	10.6	17.1	5.4	109.7	18.8	18.8	11.8	33.5	14.2	18.8	17.1	13.6	20.6	10.7	10.7	2.4	109.7	18.1	24	
10	11.8	19.4	11.2	8.9	15.3	S	89.9	34.1	42.3	42.3	66.4	44.0	37.0	19.4	28.3	16.5	45.8	27.0	20.0	24.1	44.1	7.0	3.6	1.9	1.9	89.9	28.7	24	
11	2.4	4.2	7.1	7.1	S	9.4	22.4	17.1	11.2	10.1	8.9	8.3	8.9	8.9	P	P	6.5	5.4	5.9	9.5	10.7	10.7	20.0	13.6	2.4	22.4	9.9	22	
12	34.1	50.0	24.7	S	8.3	8.3	62.3	54.0	51.1	50.6	41.1	22.4	44.7	31.7	24.7	47.1	40.0	37.0	42.9	29.4	24.7	33.5	2.4	25.9	2.4	62.3	34.4	24	
13	11.8	7.1	S	7.1	10.0	21.2	31.1	64.6	50.6	27.7	26.5	30.6	30.6	11.8	59.9	39.4	30.6	25.9	18.2	19.4	32.3	31.1	9.4	16.5	7.1	64.6	26.7	24	
14	15.9	S	7.1	5.4	10.7	28.9	15.9	6.0	23.5	7.7	17.6	8.9	38.8	11.8	14.2	11.8	18.2	8.9	21.2	8.3	24.7	6.5	13.6	4.8	4.8	38.8	14.4	24	
15	S	7.1	6.5	7.1	6.0	27.0	7.6	31.1	3.0	3.0	3.6	3.0	3.6	5.9	15.9	24.7	5.9	247.1	10.1	4.2	8.9	3.0	22.4	S	3.0	247.1	20.8	24	
16	3.6	5.4	6.0	4.8	9.4	17.6	11.8	27.7	28.3	8.3	17.1	7.1	24.1	21.2	23.5	37.0	18.8	16.5	60.5	52.9	27.7	23.6	S	9.4	3.6	60.5	20.1	24	
17	15.9	13.0	8.9	5.3	11.2	18.8	49.4	69.3	57.0	26.5	28.3	42.3	37.0	35.8	32.3	72.8	72.2	57.6	133.3	157.3	85.8	S	64.6	57.0	5.3	157.3	50.1	24	
18	41.7	26.5	26.5	29.4	27.0	43.5	38.8	35.3	65.2	63.4	58.8	122.7	82.2	49.4	88.7	143.2	169.7	94.6	78.1	15.4	S	54.6	39.4	24.1	15.4	169.7	61.7	24	
19	31.7	55.8	23.5	69.9	48.8	68.7	113.3	76.3	140.3	131.5	155.6	72.8	69.9	40.6	28.8	31.7	123.9	73.9	62.8	S	48.8	65.8	61.7	38.8	23.5	155.6	71.1	24	
20	19.4	18.8	13.6	11.8	10.7	40.0	65.8	84.0	65.2	24.7	43.5	56.4	38.8	51.7	68.1	191.4	65.8	105.7	S	97.4	77.5	231.3	132.1	66.4	10.7	231.3	68.7	24	
21	115.7	56.4	46.5	31.2	35.3	21.8	24.1	21.8	24.7	44.6	39.4	41.2	37.7	43.5	38.8	35.8	22.9	S	15.3	9.5	9.5	9.4	8.2	7.7	7.7	115.7	32.2	24	
22	7.7	6.4	5.4	5.4	6.5	7.7	7.7	7.6	7.6	9.5	8.3	7.7	22.9	7.6	6.5	7.1	S	13.6	13.6	12.4	11.2	11.8	12.4	8.9	5.4	22.9	9.4	24	
23	8.3	7.7	7.7	9.4	10.1	11.8	13.6	18.2	16.5	14.8	10.7	25.9	18.2	62.3	15.9	S	38.2	16.5	24.1	20.6	11.9	4.2	6.0	6.5	4.2	62.3	16.5	24	
24	6.4	3.6	3.6	4.8	8.3	8.2	26.5	36.4	31.1	14.8	36.4	48.8	34.1	34.7	S	32.9	27.6	62.8	25.9	30.6	40.5	27.0	21.2	14.2	3.6	62.8	25.2	24	
25	12.5	10.7	14.2	15.3	22.9	13.0	13.6	21.2	24.1	29.4	22.4	31.2	27.7	S	62.3	40.0	90.4	92.8	70.5	29.4	25.9	37.6	16.5	30.0	10.7	92.8	32.8	24	
26	32.3	22.4	22.9	14.2	50.6	15.9	38.3	35.8	40.5	56.4	14.2	57.0	S	12.5	12.4	11.8	43.5	42.3	21.8	6.0	47.6	9.4	51.1	3.6	3.6	57.0	28.8	24	
27	3.0	3.0	3.0	3.0	4.8	4.2	5.4	7.1	38.8	15.9	9.5	S	38.2	6.5	7.1	48.2	13.6	10.1	36.4	10.7	4.8	3.6	3.6	3.6	3.0	48.2	12.4	24	
28	3.0	3.6	3.0	3.0	3.6	4.2	3.0	2.4	1.8	11.8	S	28.3	21.8	17.0	7.1	52.3	30.6	11.8	50.6	10.6	27.6	8.9	9.5	10.6	1.8	52.3	14.2	24	
29	2.4	1.9	4.2	1.8	1.8	2.4	34.1	0.7	2.4	S	14.2	15.9	7.7	18.8	16.5	11.8	7.1	24.7	30.6	7.7	10.7	10.7	4.8	4.8	0.7	34.1	10.3	24	
30	5.4	5.4	4.2	3.0	7.1	7.7	4.8	6.0	S	6.5	8.3	9.5	7.1	4.2	4.2	4.8	4.2	35.3	36.4	4.2	4.8	5.4	5.4	6.0	3.0	36.4	8.3	24	
31	4.2	6.0	4.8	5.4	4.8	7.1	7.7	S	S1	11.2	16.5	11.2	17.7	8.9	8.2	8.2	11.8	14.2	78.7	21.2	3.6	3.0	4.8	6.0	3.0	78.7	12.1	23	
HOURLY MAX	115.7	56.4	46.5	69.9	81.5	96.0	113.3	84.0	140.3	131.5	155.6	122.7	109.7	62.3	88.7	191.4	169.7	247.1	133.3	157.3	85.8	231.3	132.1	66.4					
HOURLY AVG	19.1	15.5	13.0	12.0	16.6	21.0	28.7	28.6	35.4	31.0	32.6	31.6	34.7	22.6	27.9	41.0	41.8	48.2	38.0	27.4	29.4	26.1	24.2	17.0					

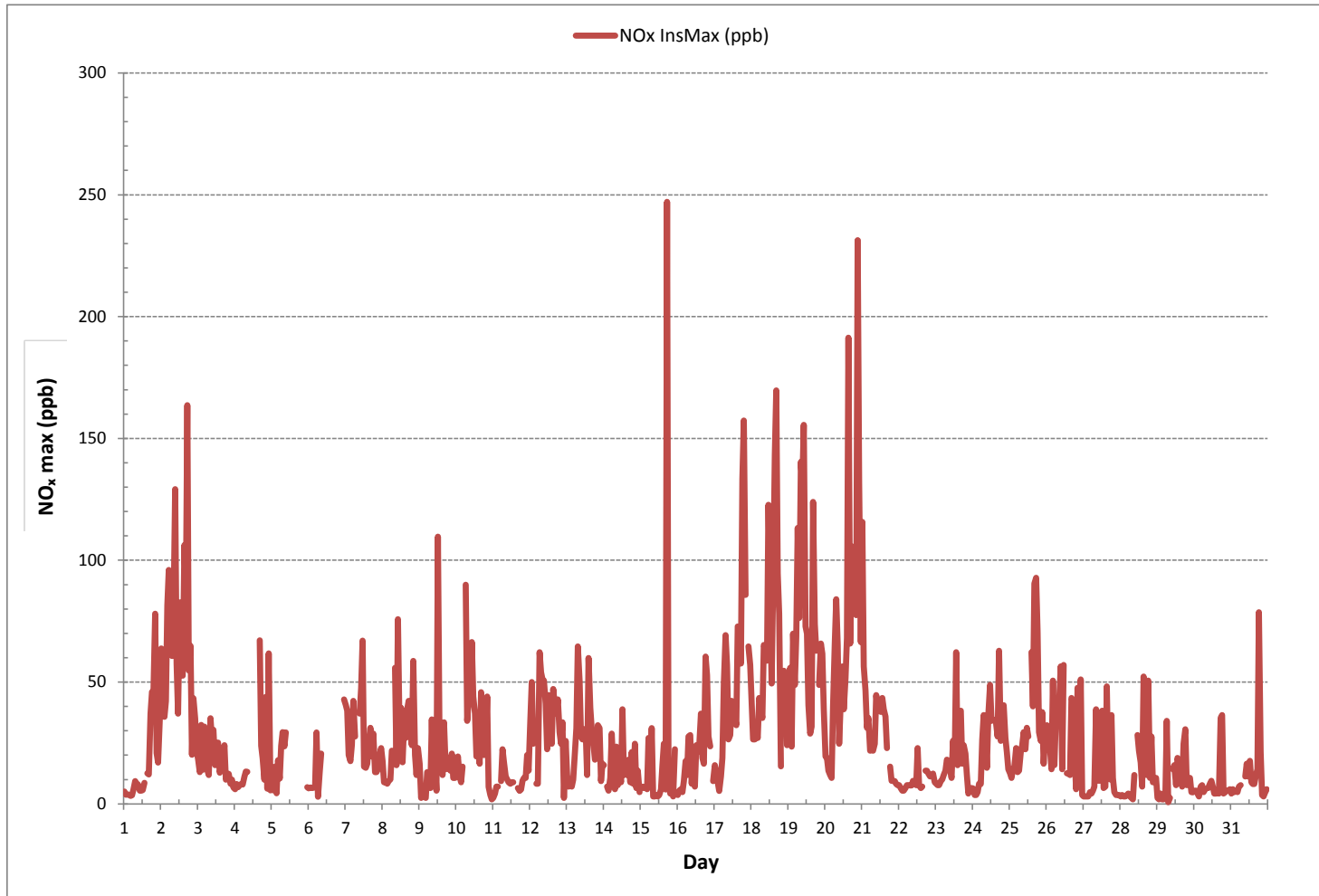
STATUS FLAG CODES

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:	677
MAXIMUM INSTANTANEOUS VALUE:	247.1 ppb @ HOUR(S) 17 ON DAY(S) 15
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	12 hrs
OPERATIONAL TIME:	721 hrs
STANDARD DEVIATION:	29.6

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



Wind: LICA Bonnyville Poll.: LICA Bonnyville-NOX[ppb] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.39% Valid Data: 91.13% Calm Avg: 30.78 [ppb]

Direction	0.0-37.8	37.8-75.5	75.5-113.3	>113.3	Total
N	11.21	0.29	0.15	0	11.65
NE	3.1	0.59	0	0	3.69
E	1.92	0.15	0.15	0	2.22
SE	1.62	0.15	0	0	1.77
S	2.36	0	0	0	2.36
SW	32.74	0	0	0	32.74
W	21.09	0	0	0	21.09
NW	11.8	0.15	0.15	0	12.1
Summary	85.84	1.33	0.45	0	87.62

% Icon Classes (ppb)

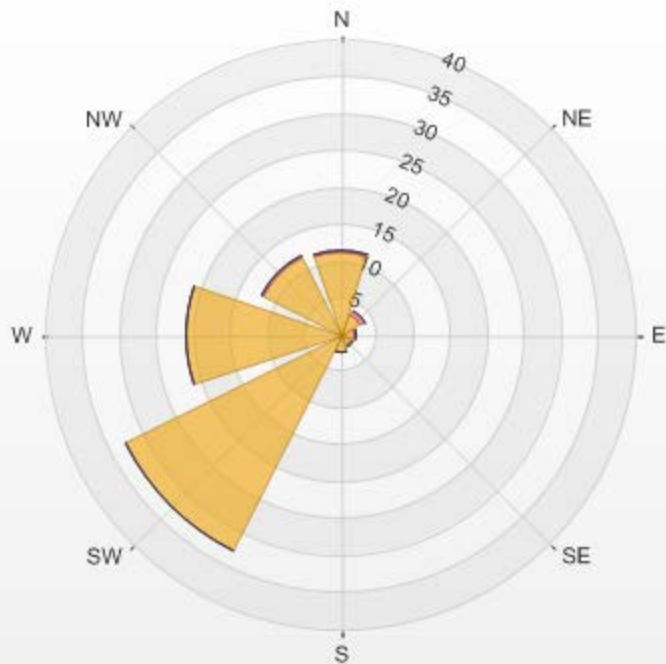
86  0.0-37.8

1  37.8-75.5

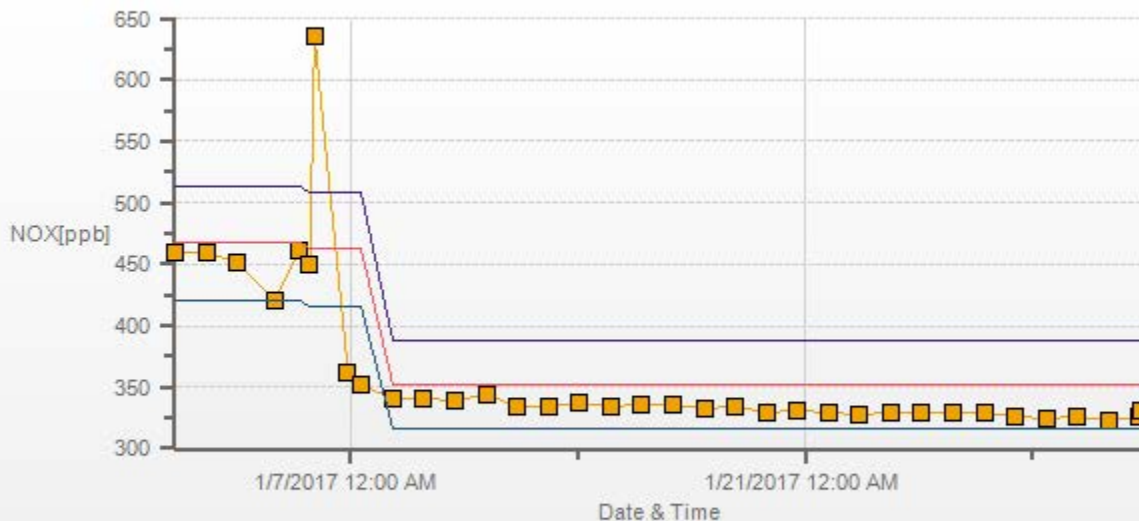
0  75.5-113.3

0  >113.3

LICA Bonnyville Poll.: LICA Bonnyville-NOX[ppb] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.39% Calm Poll
Avg: 30.78[ppb]



NOX[ppb] Calibration: LICA Bonnyville Monthly: 2017/01 Type: Span



Span Meas Span Ref Span Low Span High

NITRIC OXIDES

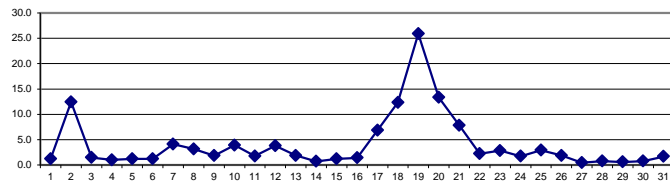
NITRIC OXIDE Hourly Averages (NO ppb)

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	0.3	0.1	0.3	0.1	0.1	0.0	0.5	1.0	1.2	1.5	1.5	1.6	1.5	2.0	S	2.3	2.4	3.0	1.7	2.9	2.4	1.2	0.2	0.2	0.0	3.0	1.2	24	
2	3.5	9.6	3.2	4.7	7.8	16.5	5.8	6.5	18.7	25.4	15.9	17.2	33.0	S	21.2	31.4	24.1	20.5	10.4	2.9	1.2	2.7	3.3	0.9	0.9	33.0	12.5	24	
3	0.4	0.3	1.8	0.3	1.5	0.8	1.1	1.1	1.5	2.7	3.8	3.1	S	3.4	3.0	2.4	1.6	0.8	0.6	0.4	0.9	1.0	1.0	0.7	0.3	3.8	1.5	24	
4	0.8	0.8	0.7	0.9	0.8	0.7	0.7	1.2	0.8	Y	Y	Y	Y	Y	Y	S	6.0	1.6	0.2	0.2	1.1	0.0	1.0	0.0	0.0	6.0	1.0	18	
5	0.0	0.0	0.0	0.0	0.0	1.4	2.0	3.2	5.6	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1.8	0.9	0.0	5.6	1.2	13
6	0.8	1.0	0.7	0.6	0.8	0.6	0.3	0.2	1.2	C	C	C	C	C	C	Y	Y	C	C	C	C	C	C	C	6.2	0.2	6.2	1.2	22
7	5.3	6.7	1.8	2.2	2.6	1.3	3.0	S	8.5	8.2	5.7	9.1	3.6	3.5	3.7	4.9	4.7	2.6	2.7	2.5	3.0	3.3	3.5	2.7	1.3	9.1	4.1	24	
8	2.1	1.8	1.9	1.8	1.9	2.1	3.3	S	3.9	2.3	4.3	6.8	9.4	4.9	3.0	4.4	4.5	3.2	3.3	3.7	2.0	0.7	0.4	0.8	0.4	9.4	3.2	24	
9	0.3	0.3	0.7	0.1	0.2	0.4	S	0.7	2.2	1.3	1.3	1.5	9.3	1.6	1.8	1.7	4.3	1.8	3.0	1.9	2.1	2.3	2.2	2.0	0.1	9.3	1.9	24	
10	2.0	2.3	2.1	1.9	1.8	S	2.9	1.3	3.1	9.6	8.5	5.7	8.0	7.1	4.2	3.9	12.9	4.0	1.9	1.7	3.4	0.9	0.4	0.3	0.3	12.9	3.9	24	
11	0.2	0.4	0.3	0.3	S	0.4	0.6	0.7	1.3	1.5	2.0	1.8	1.7	1.3	2.4	P	2.2	2.1	2.0	3.0	2.9	2.8	6.1	3.3	0.2	6.1	1.8	23	
12	3.4	6.0	3.0	S	0.3	0.6	2.0	2.6	3.7	7.6	9.1	9.3	10.1	5.4	4.0	4.9	3.7	3.5	3.5	2.0	1.1	0.9	0.3	0.6	0.3	10.1	3.8	24	
13	0.6	0.0	S	0.0	0.5	0.5	1.8	3.1	4.1	2.9	4.1	4.3	3.8	2.8	3.1	3.0	1.4	2.5	0.8	0.7	1.9	0.9	0.1	0.3	0.0	4.3	1.9	24	
14	0.1	S	0.1	0.1	0.1	0.4	0.3	0.1	0.3	0.9	1.5	1.7	2.5	1.6	1.7	1.1	0.9	0.7	0.6	0.5	0.9	0.3	0.5	0.1	0.1	2.5	0.7	24	
15	S	0.2	0.0	0.2	0.2	1.1	0.7	0.6	0.4	0.4	0.6	0.6	0.6	1.0	1.0	1.1	0.4	16.1	0.6	0.2	0.7	0.0	0.6	S	0.0	16.1	1.2	24	
16	0.3	0.1	0.2	0.2	0.1	0.4	0.5	1.1	1.8	0.9	1.7	1.6	2.5	3.0	2.5	3.4	1.3	0.9	2.6	3.7	2.0	1.3	S	0.6	0.1	3.7	1.4	24	
17	0.3	0.3	0.1	0.1	0.4	0.6	4.3	2.7	4.3	2.0	2.4	2.9	4.5	4.9	3.5	8.1	5.3	3.4	20.4	44.9	14.5	S	19.1	9.2	0.1	44.9	6.9	24	
18	5.1	2.8	3.9	2.6	2.3	5.4	8.3	7.3	15.8	24.3	19.3	36.7	26.4	9.5	18.7	22.6	46.0	7.9	2.8	1.0	S	7.5	5.6	1.3	1.0	46.0	12.3	24	
19	3.4	6.4	2.1	13.7	12.2	25.9	54.4	32.9	44.6	69.3	85.7	25.7	23.4	15.5	11.1	12.2	33.6	20.7	22.8	S	21.3	24.5	21.9	12.0	2.1	85.7	25.9	24	
20	4.6	1.6	0.8	0.7	0.8	1.2	2.7	11.0	6.1	3.9	8.1	10.3	9.1	6.5	9.7	34.6	17.0	46.3	S	35.8	18.0	23.4	28.6	26.1	0.7	46.3	13.3	24	
21	23.5	26.0	17.6	5.6	1.6	1.4	1.5	1.7	4.2	13.4	13.4	15.1	10.6	10.1	9.9	8.8	3.5	S	3.1	2.0	1.8	1.8	1.9	1.7	1.4	26.0	7.8	24	
22	1.6	1.5	1.4	1.4	1.7	2.0	2.0	2.0	2.0	2.5	2.8	2.5	3.2	2.7	2.6	2.2	S	3.0	2.7	2.4	2.5	2.3	2.5	1.9	1.4	3.2	2.2	24	
23	1.8	1.8	1.7	2.0	2.0	2.4	2.4	2.9	3.3	2.6	2.6	5.3	5.1	9.7	4.7	S	4.5	2.5	2.1	1.8	1.8	0.5	1.0	0.9	0.5	9.7	2.8	24	
24	0.8	0.3	0.2	0.6	0.8	0.6	1.1	2.0	1.6	1.0	2.5	5.5	3.9	3.9	S	3.6	2.4	2.5	1.7	0.8	1.7	0.7	1.4	0.5	0.2	5.5	1.7	24	
25	0.6	0.7	0.5	1.0	0.5	0.9	1.1	1.0	1.7	3.0	3.4	3.7	6.1	S	6.7	6.1	6.8	6.3	4.0	4.8	3.3	3.0	0.5	2.1	0.5	6.8	2.9	24	
26	2.4	0.6	2.3	0.4	0.7	0.5	1.5	2.5	3.5	4.1	4.1	5.5	S	2.7	2.3	1.9	2.3	1.9	0.9	0.4	1.1	0.6	0.8	0.2	0.2	5.5	1.9	24	
27	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.9	0.9	1.5	S	1.6	0.7	1.0	2.1	0.7	0.1	1.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	2.1	0.5	24
28	0.2	0.2	0.1	0.2	0.3	0.2	0.3	0.5	0.2	0.6	S	1.7	1.4	1.9	1.3	2.3	1.9	0.7	0.7	0.6	0.9	0.6	0.9	0.1	0.1	2.3	0.8	24	
29	0.0	0.0	0.3	0.1	0.0	0.0	0.7	0.0	0.1	S	1.6	2.3	1.7	1.5	1.1	0.9	0.3	1.1	0.9	0.3	0.4	0.5	0.1	0.2	0.0	2.3	0.6	24	
30	0.4	0.4	0.5	0.2	0.5	0.5	0.4	0.6	S	1.0	1.0	1.7	1.4	0.9	1.0	0.6	0.7	2.0	1.7	0.4	0.2	0.6	0.6	1.0	0.2	2.0	0.8	24	
31	1.0	0.9	1.0	1.1	0.8	1.4	1.6	S	S1	3.1	4.7	2.8	3.2	2.8	2.6	1.7	1.2	1.5	2.6	0.9	0.5	0.6	0.6	0.5	0.5	4.7	1.7	23	
HOURLY MAX	23.5	26.0	17.6	13.7	12.2	25.9	54.4	32.9	44.6	69.3	85.7	36.7	33.0	15.5	21.2	34.6	46.0	46.3	22.8	44.9	21.3	24.5	28.6	26.1					
HOURLY AVG	2.2	2.4	1.6	1.4	1.4	2.3	3.6	3.2	5.0	7.2	7.9	6.9	7.2	4.3	4.9	6.6	7.0	5.8	3.6	4.4	3.4	3.0	3.7	2.6					

STATUS FLAG CODES

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

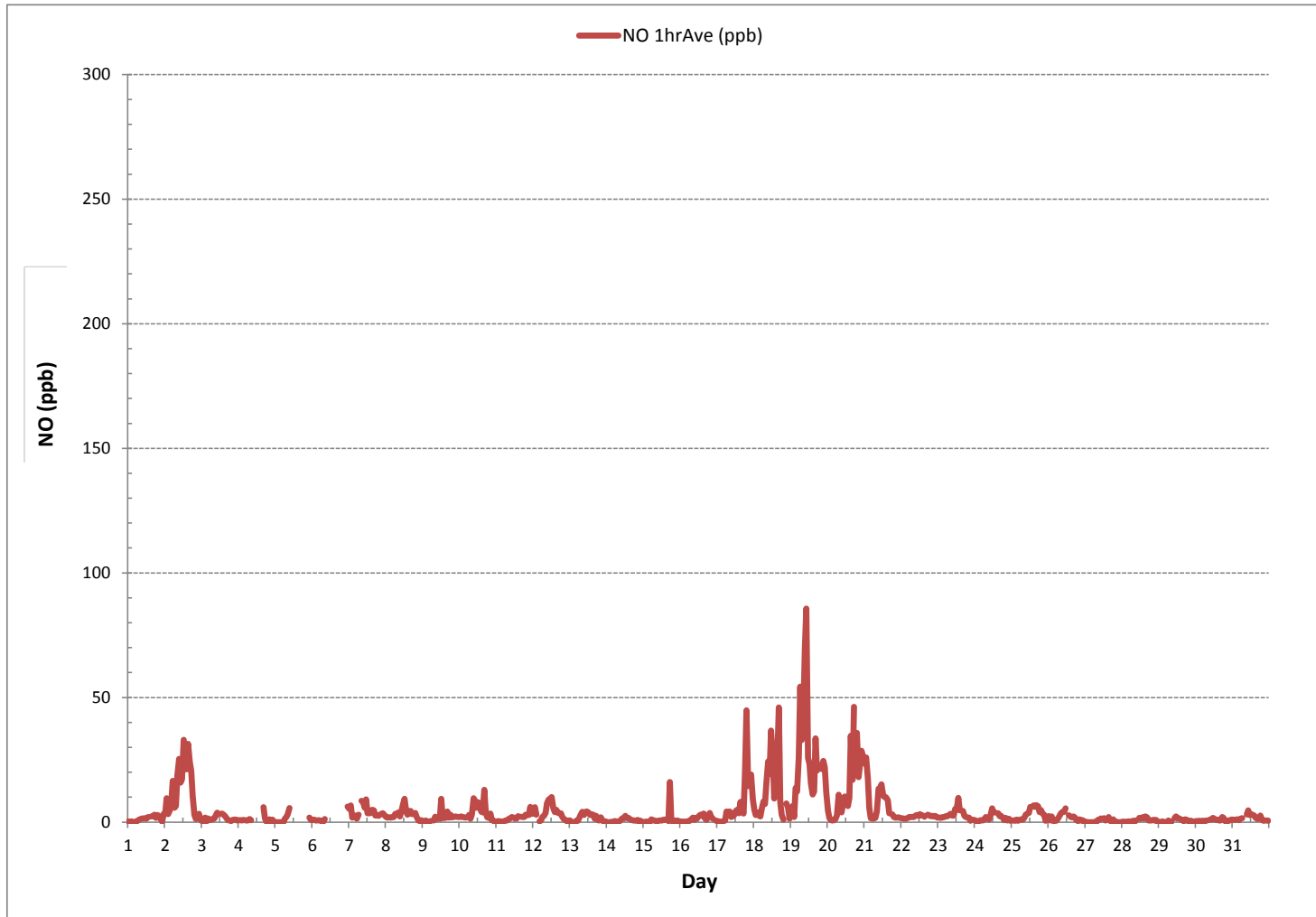
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	653			
MINIMUM 1-HR AVERAGE:	0.0 ppb	@ HOUR(S)	VAR	ON DAY(S) VAR
MAXIMUM 1-HR AVERAGE:	85.7 ppb	@ HOUR(S)	10	ON DAY(S) 19
MAXIMUM 24-HR AVERAGE:	25.9 ppb			ON DAY(S) 19
				VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	723 hrs	
MONTHLY CALIBRATION TIME:	12 hrs	AMD OPERATION UPTIME:	97.2 %	
STANDARD DEVIATION:	8.0	MONTHLY AVERAGE:	4.2 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - January 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	1.5	0.8	1.0	1.0	0.8	0.8	1.4	3.9	2.4	3.2	2.4	2.9	2.5	4.7	S	4.4	4.4	6.1	24.1	10.2	38.7	5.4	2.2	1.9	0.8	38.7	5.5	24	
2	29.0	15.7	10.3	14.2	54.1	67.6	33.8	31.3	40.4	96.6	38.5	20.1	55.3	S	26.0	62.4	47.6	132.7	27.0	27.3	3.6	12.5	8.2	2.4	2.4	132.7	37.2	24	
3	1.1	1.0	9.4	0.7	7.3	5.6	3.9	3.2	15.2	19.5	25.4	8.1	S	9.8	5.2	4.3	4.4	8.9	1.4	1.6	2.5	2.4	3.0	2.4	0.7	25.4	6.4	24	
4	2.7	2.9	2.5	2.9	2.7	2.6	3.9	3.7	3.4	Y	Y	Y	Y	Y	Y	S	32.8	5.6	2.2	3.5	20.0	1.8	38.6	1.5	1.5	38.6	7.8	18	
5	0.7	0.6	1.2	1.0	1.9	2.4	8.0	8.9	5.8	10.7	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2.2	0.6	10.7	3.9	12
6	2.4	2.9	2.1	1.9	2.3	13.1	2.1	5.0	12.7	C	C	C	C	C	C	Y	Y	C	C	C	C	C	C	C	13.7	1.9	13.7	5.8	22
7	16.7	10.2	3.8	3.2	3.8	17.8	7.2	S	S	13.2	20.2	51.8	6.1	4.9	5.5	8.4	12.5	7.2	12.5	3.8	4.9	4.3	6.6	9.6	3.2	51.8	10.6	24	
8	4.3	3.2	2.6	3.2	3.2	3.2	5.5	S	23.7	4.3	55.3	12.0	25.4	7.2	16.7	9.0	12.0	17.8	11.3	4.9	26.6	2.6	0.8	7.8	0.8	55.3	11.4	24	
9	6.6	0.8	1.4	0.8	0.8	11.4	S	2.0	19.0	3.2	10.2	3.2	87.6	10.2	9.6	3.7	18.4	3.2	6.1	4.3	4.3	5.5	3.8	3.8	0.8	87.6	9.6	24	
10	4.3	4.9	4.9	3.2	3.2	S	56.6	26.6	23.1	19.6	36.6	19.6	27.8	10.2	14.3	6.6	26.0	6.1	13.7	14.3	37.8	2.6	1.4	0.8	0.8	56.6	15.8	24	
11	0.8	1.4	0.8	0.8	S	1.4	12.0	7.2	2.6	2.0	3.2	2.6	3.2	3.2	P	P	3.7	3.2	3.2	4.3	4.3	5.5	9.6	6.1	0.8	12.0	3.9	22	
12	7.8	13.7	4.3	S	0.8	2.0	22.5	39.0	34.8	29.0	26.6	12.0	24.9	21.3	17.8	29.0	13.7	16.7	23.7	8.4	13.7	9.0	0.8	9.0	0.8	39.0	16.5	24	
13	1.4	0.8	S	0.8	3.2	8.4	19.6	36.6	34.8	14.3	16.1	20.2	20.2	4.3	27.2	21.4	14.9	9.6	2.6	2.0	13.7	9.6	1.4	7.2	0.8	36.6	12.6	24	
14	0.8	S	0.8	0.8	0.8	9.6	8.4	0.8	10.2	1.4	7.8	2.6	23.7	2.6	5.6	4.3	6.1	2.0	5.5	1.4	12.5	0.8	9.0	0.8	0.8	23.7	5.1	24	
15	S	0.8	0.8	0.8	0.8	11.4	2.6	21.4	0.8	0.8	1.4	1.4	1.4	1.4	8.4	15.5	2.0	167.3	3.2	0.8	4.3	0.8	7.2	S	0.8	167.3	11.6	24	
16	0.8	0.8	1.4	0.8	0.8	10.2	7.8	13.2	14.3	2.6	11.4	2.6	13.7	10.2	11.4	19.0	9.6	2.6	35.4	23.7	6.0	9.0	S	1.4	0.8	35.4	9.1	24	
17	6.6	0.8	0.8	0.8	0.8	2.6	11.4	31.3	35.4	21.4	17.8	28.4	14.3	17.2	20.7	51.8	39.0	29.0	102.3	115.8	47.8	S	33.7	31.3	0.8	115.8	28.7	24	
18	20.1	7.2	6.6	7.2	9.0	16.1	16.1	13.1	41.3	41.8	49.5	98.1	65.3	32.5	56.0	81.2	132.2	70.0	52.4	2.6	S	21.9	11.4	3.7	2.6	132.2	37.2	24	
19	7.8	38.4	5.0	36.6	23.1	42.4	83.5	48.4	126.3	98.1	124.6	48.9	52.4	23.1	13.7	15.5	99.3	48.9	36.0	S	29.0	46.6	41.8	21.9	5.0	126.3	48.3	24	
20	7.2	4.3	2.0	2.6	1.4	22.5	28.4	44.8	45.4	10.8	27.2	36.6	28.4	34.8	44.2	142.1	33.1	69.4	S	67.1	51.8	188.4	111.0	41.8	1.4	188.4	45.4	24	
21	79.4	33.7	24.9	11.4	18.4	2.6	3.7	3.2	8.4	26.6	24.9	24.9	19.0	27.2	19.0	20.7	6.6	S	4.3	3.2	3.2	2.6	2.6	2.6	2.6	79.4	16.2	24	
22	2.6	2.6	2.6	2.6	2.6	3.2	3.2	3.2	3.2	3.2	3.8	3.8	4.3	15.5	3.7	3.2	3.2	S	4.3	4.3	5.0	3.8	3.7	4.3	3.2	2.6	15.5	4.0	24
23	3.2	3.7	2.6	3.8	3.2	3.8	3.8	4.3	6.6	4.9	4.9	13.1	12.0	49.5	6.1	S	20.7	6.1	15.5	9.0	3.7	1.4	2.0	2.6	1.4	49.5	8.1	24	
24	2.0	0.8	0.8	1.4	3.2	7.8	18.4	30.1	15.5	7.2	27.2	26.6	21.3	21.9	S	21.9	20.7	52.4	20.2	16.7	20.7	17.3	3.8	2.0	0.8	52.4	15.6	24	
25	2.0	1.4	2.6	2.6	10.2	2.0	3.2	14.9	13.7	24.9	18.9	17.8	19.6	S	44.2	24.3	76.5	82.9	47.2	10.8	7.8	16.7	2.0	7.2	1.4	82.9	19.7	24	
26	13.2	3.7	6.1	1.4	19.6	1.4	26.0	23.1	18.4	34.8	5.5	28.4	S	4.3	3.2	3.8	25.4	31.9	13.1	2.0	30.1	3.2	31.3	0.8	0.8	34.8	14.4	24	
27	0.8	0.8	0.8	0.8	0.8	0.8	2.0	2.0	14.9	6.1	3.8	S	24.3	2.6	3.2	28.4	6.1	1.4	29.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	29.6	5.8	24
28	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	3.2	S	10.8	11.4	7.2	3.2	24.9	18.4	2.6	31.9	2.6	16.1	3.2	3.2	9.6	0.8	31.9	6.8	24	
29	0.8	0.8	2.0	0.8	0.8	0.8	26.0	0.8	0.8	S	4.9	12.5	3.2	13.7	13.7	6.0	2.0	13.7	19.6	1.4	2.0	2.0	0.8	1.4	0.8	26.0	5.7	24	
30	1.4	2.0	1.4	0.8	1.4	1.4	0.8	1.4	S	1.4	2.6	3.2	2.6	2.0	1.4	1.4	2.0	20.2	21.3	1.4	2.0	2.6	2.0	2.6	0.8	21.3	3.4	24	
31	2.0	2.0	2.0	2.6	2.0	2.6	3.2	S	S1	5.0	7.8	5.5	11.4	4.9	3.8	3.2	2.0	2.6	43.0	8.4	1.4	1.4	1.4	1.4	1.4	1.4	43.0	5.4	23
HOURLY MAX	79.4	38.4	24.9	36.6	54.1	67.6	83.5	48.4	126.3	98.1	124.6	98.1	87.6	49.5	56.0	142.1	132.2	167.3	102.3	115.8	51.8	188.4	111.0	41.8					
HOURLY AVG	7.7	5.5	3.6	3.7	6.1	9.3	14.2	15.2	20.5	18.2	21.4	19.2	22.8	12.9	15.3	23.7	24.7	29.4	21.9	12.8	14.8	13.7	12.3	6.8					

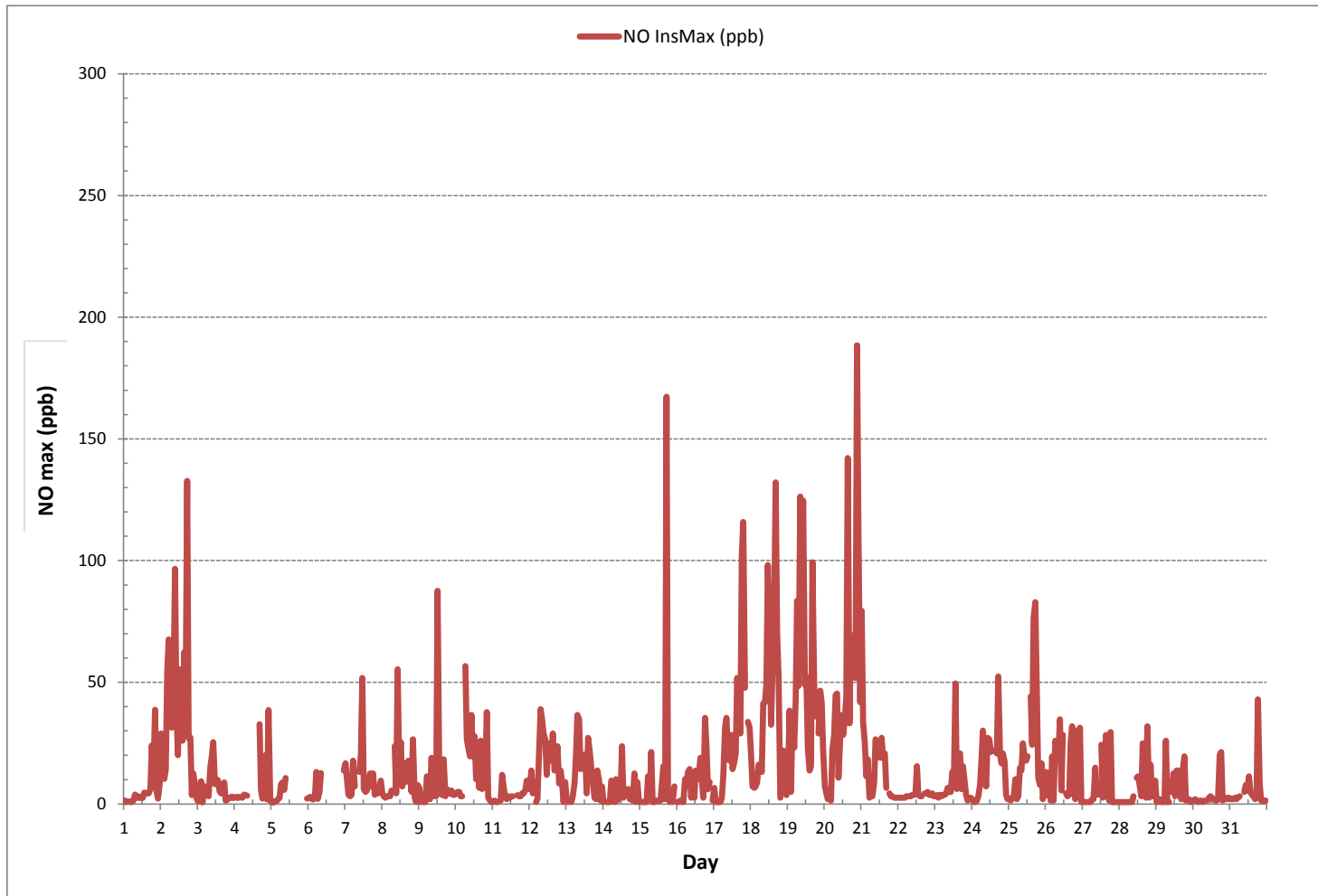
STATUS FLAG CODES

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:	677
MAXIMUM INSTANTANEOUS VALUE:	188.4 ppb @ HOUR(S) 21 ON DAY(S) 20
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	12 hrs
STANDARD DEVIATION:	22.2
OPERATIONAL TIME:	721 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)

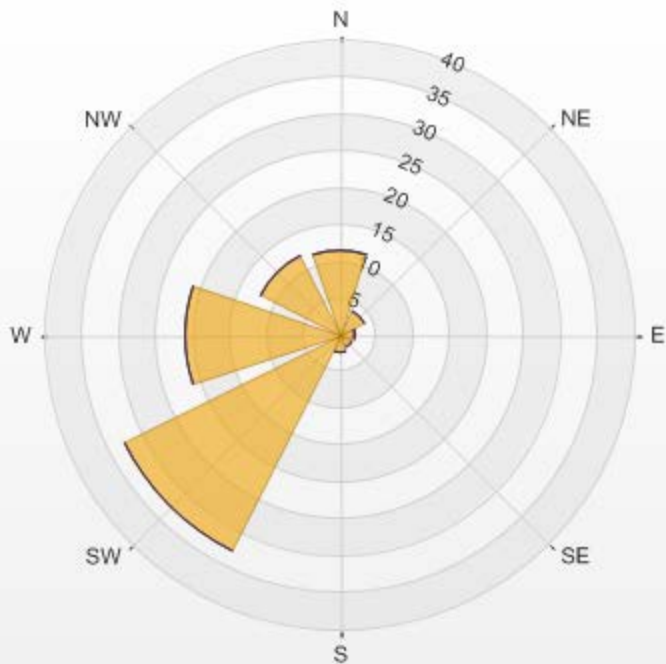


Wind: LICA Bonnyville Poll.: LICA Bonnyville-NO[ppb] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.39% Valid Data: 91.13% Calm Avg: 13.94 [ppb]

Direction	0.0-28.6	28.6-57.2	57.2-85.8	>85.8	Total
N	11.5	0	0.15	0	11.65
NE	3.69	0	0	0	3.69
E	1.92	0.29	0	0	2.21
SE	1.77	0	0	0	1.77
S	2.36	0	0	0	2.36
SW	32.74	0	0	0	32.74
W	21.09	0	0	0	21.09
NW	11.95	0.15	0	0	12.1
Summary	87.02	0.44	0.15	0	87.61

% Icon Classes (ppb) 87 0.0-28.6 0 28.6-57.2 0 57.2-85.8 0 >85.8

LICA Bonnyville Poll.: LICA Bonnyville-NO[ppb] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.39% Calm
Poll Avg: 13.94[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	2.6	2.6	2.2	2.6	2.3	2.2	2.9	2.8	3.2	3.9	2.6	2.2	2.5	3.5	S	5.4	7.0	20.4	11.3	12.6	9.8	10.5	7.4	5.5	2.2	20.4	5.6	24	
2	17.0	25.4	16.3	16.7	9.7	19.9	19.6	23.8	28.4	21.7	16.6	14.8	21.3	S	22.5	30.6	32.2	30.8	26.6	21.6	14.0	15.7	22.2	17.9	9.7	32.2	21.1	24	
3	12.4	9.6	14.9	11.2	12.8	11.3	7.7	7.0	8.3	6.0	6.1	5.2	S	5.9	6.6	8.8	10.3	8.4	7.8	7.1	7.3	5.0	4.7	3.5	3.5	14.9	8.2	24	
4	2.3	3.1	3.3	3.3	3.8	4.0	4.7	6.4	7.8	Y	Y	Y	Y	Y	Y	S	13.1	13.7	9.6	4.5	5.4	3.7	6.2	2.6	2.3	13.7	5.7	18	
5	2.3	2.5	4.1	2.8	5.7	5.4	13.5	11.2	14.2	17.0	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	7.9	4.0	2.3	17.0	7.6	13
6	4.0	4.0	3.2	3.5	3.5	2.7	1.4	1.6	2.4	C	C	C	C	C	C	Y	Y	C	C	C	C	C	C	22.4	1.4	22.4	4.9	22	
7	21.2	23.1	13.4	13.2	16.0	15.3	16.6	S	24.1	20.3	12.3	11.4	6.2	6.7	8.1	11.8	12.0	7.3	6.9	6.0	6.4	8.0	9.6	8.2	6.0	24.1	12.4	24	
8	4.1	4.2	4.6	4.2	5.0	4.9	11.2	S	19.5	7.8	4.3	7.7	10.8	7.1	5.7	12.2	21.1	17.2	19.1	17.7	15.5	7.9	8.9	12.9	4.1	21.1	10.2	24	
9	5.0	0.9	2.2	0.6	0.7	0.8	S	2.7	4.6	3.4	1.9	1.4	5.0	1.6	2.5	4.5	11.8	8.2	9.6	8.7	7.8	5.8	5.4	4.0	0.6	11.8	4.3	24	
10	5.2	7.5	4.9	4.5	6.4	S	9.4	3.6	8.0	21.8	11.4	6.0	8.0	7.1	4.6	6.1	16.1	14.6	8.9	2.8	3.4	1.7	0.5	0.4	0.4	21.8	7.1	24	
11	0.7	1.2	3.0	4.3	S	6.6	4.5	4.6	6.2	6.0	5.2	3.3	2.7	2.5	2.0	P	1.7	1.7	2.0	3.7	4.6	3.2	6.7	5.7	0.7	6.7	3.7	23	
12	14.6	18.7	15.1	S	6.4	5.6	7.4	7.1	8.6	13.8	11.0	9.2	9.0	5.5	4.5	7.2	10.3	8.3	10.1	8.5	4.6	3.3	2.4	3.4	2.4	18.7	8.5	24	
13	6.6	5.4	S	6.6	6.0	6.7	9.2	13.9	10.9	9.0	7.3	6.2	5.3	5.3	7.0	7.7	8.9	11.8	12.3	15.9	15.2	8.9	4.7	4.3	4.3	15.9	8.5	24	
14	6.5	S	4.7	3.8	4.0	4.4	4.8	4.6	5.5	5.7	5.3	5.0	5.4	4.8	5.3	5.5	6.7	5.6	6.0	5.3	5.2	4.9	3.9	3.7	3.7	6.7	5.1	24	
15	S	5.7	5.9	5.7	4.3	4.7	3.3	2.8	2.1	1.8	1.9	2.0	2.1	3.5	2.8	4.7	2.6	10.8	3.5	3.2	2.5	1.6	2.1	S	1.6	10.8	3.6	24	
16	2.1	4.1	4.7	4.5	5.6	3.5	3.6	4.3	4.6	4.9	4.3	4.2	6.4	7.7	6.6	7.3	9.9	6.1	6.9	19.2	14.6	7.0	S	6.6	2.1	19.2	6.5	24	
17	4.9	6.7	5.4	4.7	5.9	7.7	28.9	15.6	9.6	5.3	5.1	3.7	6.9	6.5	7.3	12.2	14.3	18.3	23.9	33.3	26.5	S	27.5	21.1	3.7	33.3	13.1	24	
18	19.2	17.6	17.6	16.2	12.7	17.2	18.9	18.1	19.8	19.9	15.6	17.7	14.6	10.1	18.8	20.5	25.7	16.5	12.2	10.5	S	21.9	22.2	15.6	10.1	25.7	17.4	24	
19	18.6	19.9	14.2	23.2	21.3	23.2	26.5	22.4	23.1	26.0	27.5	16.9	15.8	13.9	12.5	13.6	18.9	18.2	18.8	S	18.6	17.7	16.4	13.6	12.5	27.5	19.2	24	
20	11.3	13.4	9.7	7.6	7.2	6.7	10.4	21.5	12.8	8.7	10.1	8.7	9.7	7.9	11.7	22.6	25.4	30.5	S	24.5	19.9	19.9	19.6	21.5	6.7	30.5	14.8	24	
21	22.0	21.1	19.3	17.3	17.0	17.6	17.3	17.8	15.5	13.6	11.2	10.3	9.5	10.4	12.6	15.6	8.7	S	7.2	4.8	5.0	4.2	3.6	3.6	3.6	22.0	12.4	24	
22	3.8	2.1	1.9	2.4	3.2	3.5	3.5	3.2	3.7	3.9	3.5	3.0	3.1	2.7	2.5	2.9	S	8.0	6.9	6.1	6.5	7.6	6.4	4.9	1.9	8.0	4.1	24	
23	4.7	3.8	4.5	4.9	5.7	7.4	7.9	10.4	8.0	5.9	4.8	6.4	5.8	7.9	7.7	S	10.6	7.7	7.0	5.6	5.3	2.7	3.5	3.1	2.7	10.6	6.1	24	
24	3.4	1.8	1.1	1.4	2.5	0.7	1.0	1.3	2.4	1.4	2.4	4.1	2.4	3.6	S	5.3	3.6	4.2	3.7	4.2	8.2	8.5	14.5	9.3	0.7	14.5	4.0	24	
25	10.3	8.4	10.0	12.3	11.4	10.2	9.2	7.4	6.9	4.9	4.1	3.7	3.9	S	5.9	6.6	9.4	10.9	13.1	16.7	15.4	15.7	12.5	14.6	3.7	16.7	9.7	24	
26	13.2	13.5	14.3	11.6	11.4	12.8	11.3	11.7	10.6	6.7	7.3	S	6.2	6.4	7.1	5.4	4.3	3.2	2.8	3.6	3.4	2.5	2.2	2.2	2.2	14.3	7.8	24	
27	1.9	1.9	2.1	1.9	2.7	2.7	2.3	3.8	6.5	4.8	5.1	S	5.4	3.6	2.9	4.6	3.7	8.2	8.8	6.2	4.0	3.4	3.2	2.8	1.9	8.8	4.0	24	
28	2.7	3.3	2.4	2.0	2.8	2.5	2.0	1.6	1.9	S	5.0	4.7	5.5	4.6	5.9	10.3	7.5	5.6	6.5	6.5	5.8	5.1	2.6	1.6	1.6	10.3	4.3	24	
29	1.6	1.6	1.9	1.5	1.7	1.9	2.4	0.9	1.8	S	4.8	4.9	4.5	3.9	3.8	3.6	4.1	6.0	5.3	5.0	7.0	7.4	3.6	3.1	0.9	7.4	3.6	24	
30	2.6	2.7	2.6	2.0	2.9	4.3	3.6	3.7	S	4.2	3.4	4.2	3.0	2.0	1.9	2.6	2.5	4.5	2.7	2.2	1.6	1.7	2.9	3.0	1.6	4.5	2.9	24	
31	2.2	3.2	2.6	3.0	2.7	3.9	4.5	S	S1	4.1	5.0	2.6	2.6	2.3	2.5	2.5	2.4	7.8	6.1	1.9	0.9	1.4	2.8	3.4	0.9	7.8	3.2	23	
HOURLY MAX	22.0	25.4	19.3	23.2	21.3	23.2	28.9	23.8	28.4	26.0	27.5	17.7	21.3	13.9	22.5	30.6	32.2	30.8	26.6	33.3	26.5	21.9	27.5	22.4					
HOURLY AVG	7.6	8.0	7.1	6.7	6.8	7.3	9.0	8.4	9.7	9.2	7.4	6.6	6.8	5.7	6.9	9.1	11.0	11.3	9.5	9.5	8.8	7.4	8.2	7.7					

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

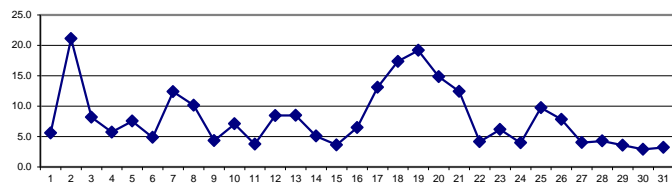
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

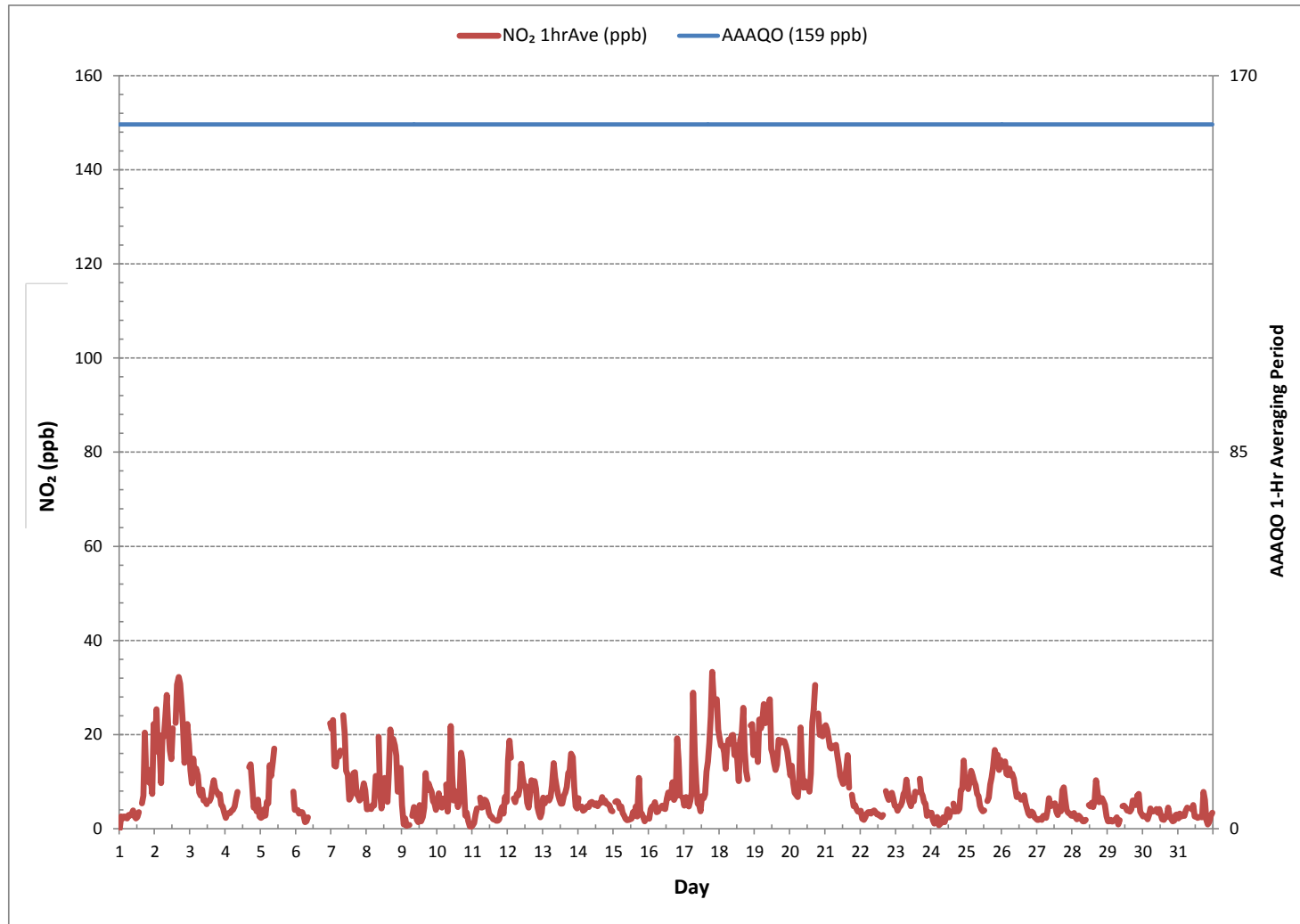
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	680					
MINIMUM 1-HR AVERAGE:	0.4	ppb	@ HOUR(S)	23	ON DAY(S)	10
MAXIMUM 1-HR AVERAGE:	33.3	ppb	@ HOUR(S)	19	ON DAY(S)	17
MAXIMUM 24-HR AVERAGE:	21.1	ppb			ON DAY(S)	2
					VAR-VARIOUS	
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	723	hrs	
MONTHLY CALIBRATION TIME:	12	hrs	AMD OPERATION UPTIME:	97.2	%	
STANDARD DEVIATION:	6.4		MONTHLY AVERAGE:	8.2	ppb	

24 HR AVERAGES January 2017



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville Continuous Monitoring Station - January 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	4.1	3.7	3.8	3.9	3.2	3.4	4.9	5.9	6.6	5.6	3.9	3.3	3.8	5.7	S	9.2	9.9	31.4	32.7	35.4	40.9	19.7	15.2	8.1	3.2	40.9	11.5	24	
2	35.8	30.0	25.7	28.4	30.0	34.0	36.8	37.3	33.7	38.4	27.7	17.1	29.0	S	26.9	44.3	40.6	43.4	31.3	39.9	18.3	31.2	28.4	21.0	17.1	44.3	31.7	24	
3	18.1	13.1	23.1	13.7	24.9	23.7	10.7	9.2	21.7	10.8	17.5	11.4	S	20.5	8.5	12.5	12.3	15.7	9.5	11.5	10.4	6.4	7.7	5.2	5.2	24.9	13.8	24	
4	4.1	5.5	5.1	5.5	6.4	6.4	7.8	10.1	10.1	Y	Y	Y	Y	Y	Y	S	36.9	18.9	17.2	7.1	23.7	5.2	27.4	4.7	4.1	36.9	11.9	18	
5	7.8	5.6	14.4	4.3	16.7	9.4	20.2	21.1	18.1	19.0	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	5.8	4.3	21.1	12.9	12
6	5.2	5.8	5.6	5.6	5.6	16.6	2.5	8.4	10.7	C	C	C	C	C	C	Y	Y	C	C	C	C	C	C	C	30.0	2.5	30.0	9.6	22
7	30.6	28.3	16.6	14.8	20.6	24.8	20.1	S	S	24.2	27.7	25.3	9.6	9.6	10.7	16.0	21.8	12.5	18.9	8.9	8.3	10.7	14.2	17.1	8.3	30.6	17.8	24	
8	13.6	6.0	6.0	5.4	6.5	7.2	17.1	S	35.3	11.9	23.0	13.6	21.8	9.5	17.7	19.4	28.8	24.2	24.2	20.0	33.5	17.7	11.3	17.7	5.4	35.3	17.0	24	
9	12.5	1.9	4.3	2.5	1.3	6.0	S	4.9	15.9	7.7	10.1	3.7	22.9	10.1	10.1	8.9	20.0	11.9	12.5	13.0	9.5	15.4	7.2	6.5	1.3	22.9	9.5	24	
10	7.7	14.2	6.6	6.0	11.9	S	34.7	17.6	19.5	27.7	29.4	24.7	15.4	9.5	13.6	10.1	22.4	22.4	15.4	10.7	13.6	4.2	1.9	1.3	1.3	34.7	14.8	24	
11	1.3	3.1	6.5	6.0	S	8.3	10.7	9.5	8.3	7.7	6.5	5.4	5.4	5.4	P	P	3.1	2.5	3.1	6.0	6.5	6.0	10.7	7.2	1.3	10.7	6.2	22	
12	25.9	35.8	21.2	S	7.2	7.2	40.0	21.2	25.9	23.0	14.2	10.7	20.1	15.9	14.8	18.8	28.8	20.6	21.8	24.1	11.9	25.3	2.5	17.1	2.5	40.0	19.7	24	
13	10.1	6.5	S	6.6	7.1	12.5	18.2	32.9	23.6	18.9	14.2	14.8	13.6	7.2	34.1	28.8	17.6	16.5	15.4	17.7	22.4	21.8	8.3	13.0	6.5	34.1	16.6	24	
14	14.8	S	6.5	4.3	10.1	19.4	10.7	5.4	14.8	7.2	14.8	6.5	18.2	9.5	10.1	8.3	11.9	7.1	15.4	6.5	13.6	5.4	8.3	4.3	4.3	19.4	10.1	24	
15	S	6.5	6.0	6.5	4.9	15.9	5.4	10.7	2.5	2.5	2.5	1.9	2.5	4.2	8.3	11.3	4.9	136.6	7.2	3.7	4.9	1.9	17.6	S	1.9	136.6	12.2	24	
16	2.5	4.3	4.9	4.2	8.9	9.5	5.4	15.4	18.9	6.0	10.7	4.9	16.5	14.2	16.6	23.5	14.2	13.6	26.5	38.8	24.1	16.5	S	8.3	2.5	38.8	13.4	24	
17	9.5	11.9	8.3	4.3	10.7	15.9	39.4	40.6	25.9	13.6	10.7	18.9	30.0	28.8	12.5	35.3	36.4	32.3	59.9	54.6	53.4	S	31.2	32.3	4.3	59.9	26.8	24	
18	25.3	20.1	20.1	21.8	17.7	29.4	23.6	23.0	27.1	25.3	21.2	32.9	21.2	19.4	32.9	65.1	42.9	28.8	28.8	13.6	S	32.9	28.8	20.0	13.6	65.1	27.0	24	
19	24.2	33.5	18.2	35.3	25.9	33.5	31.7	28.3	38.8	39.4	32.9	24.1	20.0	17.7	14.8	15.9	27.1	24.7	28.3	S	21.2	24.1	24.8	17.1	14.8	39.4	26.2	24	
20	13.6	14.8	11.9	9.5	8.9	20.0	37.6	41.1	27.1	15.9	18.3	21.2	21.2	20.0	26.5	55.7	32.9	40.0	S	31.7	25.3	42.9	32.3	24.8	8.9	55.7	25.8	24	
21	36.4	23.0	21.8	20.0	22.4	19.5	20.6	19.5	18.9	17.7	16.0	18.9	18.9	19.4	21.2	19.5	16.6	S	11.3	7.2	7.1	6.5	6.0	5.4	5.4	36.4	17.1	24	
22	5.4	4.2	3.1	3.7	4.3	4.9	4.9	4.9	4.9	5.4	4.9	3.7	9.5	3.7	3.7	3.7	S	9.5	9.5	8.3	7.2	8.3	7.7	6.5	3.1	9.5	5.7	24	
23	6.0	4.9	5.5	6.0	7.2	8.3	9.5	13.6	9.5	11.3	5.4	14.8	6.5	20.0	9.5	S	21.8	11.3	10.1	13.6	8.3	3.1	4.3	4.3	3.1	21.8	9.3	24	
24	4.3	2.5	3.1	3.1	5.4	4.2	13.0	11.3	16.0	7.2	14.2	24.7	13.0	14.8	S	15.9	7.1	10.7	7.7	15.4	20.0	14.2	17.7	13.0	2.5	24.7	11.2	24	
25	10.7	8.9	11.9	13.0	14.2	10.7	11.3	13.6	13.6	9.5	8.3	15.4	8.9	S	22.4	17.1	27.7	22.9	25.9	18.9	18.2	23.0	14.8	22.4	8.3	27.7	15.8	24	
26	20.1	18.8	18.2	13.0	35.8	14.8	21.2	19.4	25.3	27.1	8.9	28.9	S	8.3	8.9	8.9	17.7	20.6	8.9	4.2	18.2	6.6	20.6	2.5	2.5	35.8	16.4	24	
27	2.5	2.5	1.9	1.9	4.2	3.1	3.7	6.6	25.9	9.5	5.4	S	14.2	4.9	4.2	22.4	8.9	8.9	21.8	9.5	3.7	3.1	3.1	2.5	1.9	25.9	7.6	24	
28	2.5	3.1	2.5	1.9	2.5	3.1	1.9	1.3	0.7	8.9	S	17.6	12.5	9.5	4.3	30.0	16.5	8.9	18.8	7.7	14.2	6.5	6.0	4.2	0.7	30.0	8.0	24	
29	1.3	1.3	2.5	1.3	1.3	1.3	12.5	0.2	1.9	S	8.9	4.9	4.9	6.5	6.5	6.6	5.4	14.2	11.3	6.0	8.9	8.9	4.3	4.2	0.2	14.2	5.4	24	
30	4.2	3.7	2.5	1.9	6.0	6.0	4.3	4.9	S	5.4	6.0	6.5	4.2	2.5	2.5	3.1	2.5	19.4	18.2	3.1	2.5	2.5	3.7	3.7	1.9	19.4	5.2	24	
31	2.5	3.7	2.5	3.1	2.5	4.9	4.9	S	S1	6.5	8.3	6.5	9.5	4.9	4.3	4.9	10.1	11.9	35.8	12.5	1.9	1.9	3.7	4.9	1.9	35.8	6.9	23	
HOURLY MAX	36.4	35.8	25.7	35.3	35.8	34.0	40.0	41.1	38.8	39.4	32.9	32.9	30.0	28.8	34.1	65.1	42.9	136.6	59.9	54.6	53.4	42.9	32.3	32.3					
HOURLY AVG	12.1	10.9	9.7	8.6	11.1	12.8	16.2	15.6	17.9	14.8	13.8	14.2	14.4	11.6	13.8	19.8	19.5	22.9	19.6	16.1	16.1	13.3	13.2	11.2					

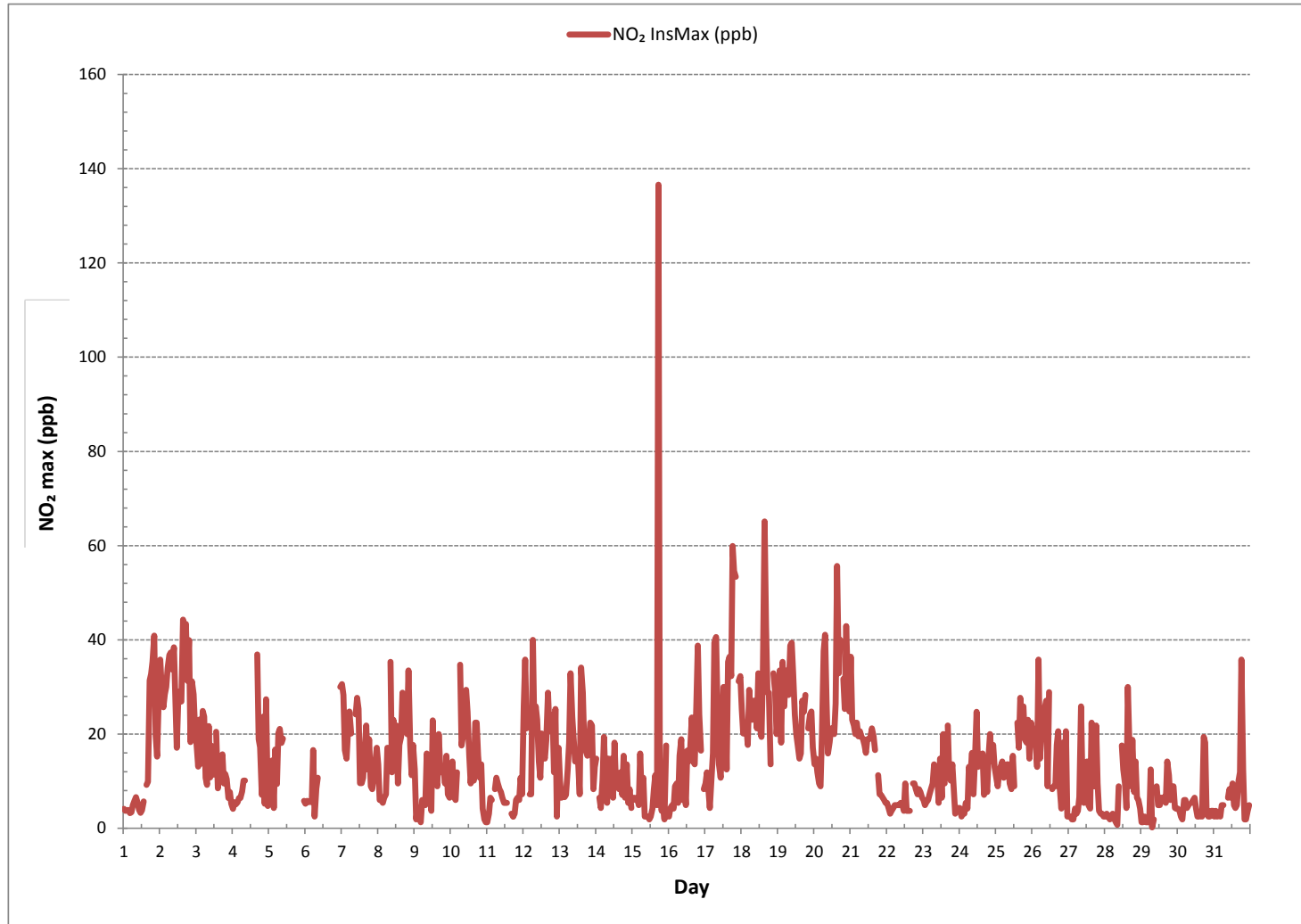
STATUS FLAG CODES

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:	677
MAXIMUM INSTANTANEOUS VALUE:	136.6 ppb @ HOUR(S) 17 ON DAY(S) 15
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	12 hrs
OPERATIONAL TIME:	721 hrs
STANDARD DEVIATION:	11.6

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

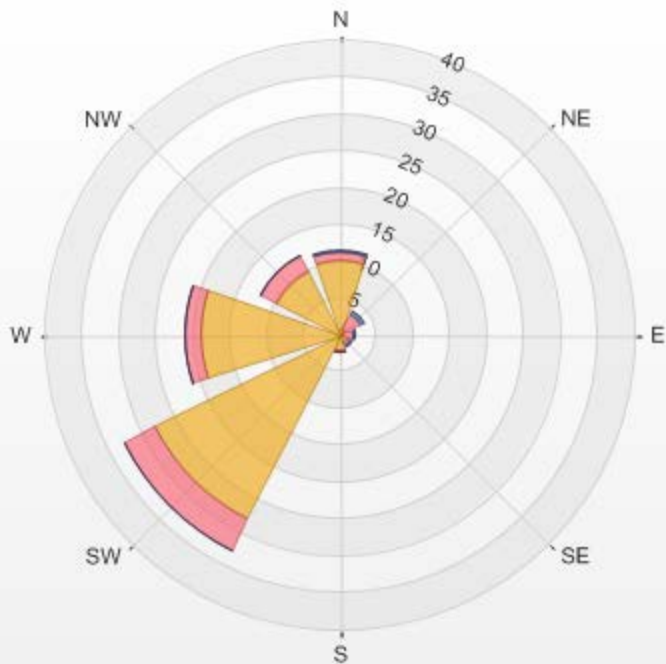


Wind: LICA Bonnyville Poll.: LICA Bonnyville-NO2[ppb] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.39% Valid Data: 91.13% Calm Avg: 16.83 [ppb]

Direction	0.0-11.1	11.1-22.3	22.3-33.4	>33.4	Total
N	10.18	1.18	0.29	0	11.65
NE	0.88	2.36	0.44	0	3.68
E	0.59	1.18	0.44	0	2.21
SE	1.47	0.15	0.15	0	1.77
S	2.06	0.29	0	0	2.35
SW	28.02	4.72	0	0	32.74
W	18.73	2.21	0.15	0	21.09
NW	9.73	2.21	0.15	0	12.09
Summary	71.66	14.3	1.62	0	87.58

% Icon	Classes (ppb)	72	 0.0-11.1	14	 11.1-22.3	2	 22.3-33.4	0	 >33.4
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LICA Bonnyville Poll.: LICA Bonnyville-NO2[ppb] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.39% Calm
Poll Avg: 16.83[ppb]



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	33.9	34.2	34.6	34.4	34.8	35.1	34.5	34.4	34.0	33.5	34.6	34.8	34.2	33.3	S	31.9	30.3	17.3	21.7	20.2	22.2	21.8	24.3	25.6	17.3	35.1	30.2	24	
2	13.6	4.1	8.1	7.7	11.3	4.9	5.5	6.3	2.4	5.4	12.6	15.4	12.1	S	12.3	5.8	2.0	1.2	1.2	5.0	15.2	13.3	7.2	8.0	1.2	15.4	7.9	24	
3	13.0	14.4	9.0	11.3	11.5	15.7	21.5	21.9	20.5	21.4	20.8	23.1	S	C	C	C	C	23.5	23.6	25.0	26.7	27.3	28.9	31.8	9.0	31.8	20.6	24	
4	34.0	33.5	33.3	32.3	32.4	33.0	32.2	30.6	29.0	24.7	25.5	S	24.5	25.8	28.6	28.9	25.8	25.9	17.9	16.1	14.9	19.4	28.5	26.9	29.8	24.7	34.0	29.9	24
5	29.6	29.5	27.9	28.5	25.0	24.7	17.5	19.0	16.1	13.0	S	24.5	25.8	28.6	28.9	25.8	25.9	17.9	16.1	14.9	19.4	28.5	26.9	29.8	24.7	34.0	29.9	24	
6	30.1	30.3	30.7	30.4	30.5	31.3	32.5	33.1	32.8	S	31.8	32.7	31.7	29.7	28.9	24.8	15.1	16.1	16.3	21.5	19.5	19.9	14.5	9.2	9.2	33.1	25.8	24	
7	8.2	9.4	16.6	17.8	15.3	11.8	12.0	4.2	S	10.5	17.6	18.5	24.1	23.5	23.8	19.6	19.3	23.7	23.0	20.9	21.5	20.4	19.3	21.0	4.2	24.1	17.5	24	
8	25.9	25.6	26.0	27.3	27.3	28.3	21.9	S	13.9	21.7	25.5	24.7	22.9	25.7	26.7	20.4	12.6	16.3	14.3	14.6	16.0	21.1	19.9	15.9	12.6	28.3	21.5	24	
9	26.0	31.6	30.9	32.1	31.1	29.9	S	28.7	26.1	26.7	27.9	28.3	26.6	27.7	26.7	24.4	18.8	21.9	22.2	21.7	22.4	25.0	25.0	27.4	18.8	32.1	26.5	24	
10	27.0	25.3	28.5	29.4	28.5	S	25.9	28.9	24.0	14.6	22.5	26.8	25.9	28.0	30.4	29.4	20.2	21.7	25.7	29.5	29.9	31.6	32.8	32.4	14.6	32.8	26.9	24	
11	32.3	32.1	29.8	28.5	S	27.7	29.8	30.0	28.9	31.2	34.1	37.0	37.6	38.6	38.6	P	37.5	34.0	32.5	30.2	29.4	30.4	28.1	27.9	27.7	38.6	32.1	23	
12	21.0	18.4	19.1	S	23.9	23.4	22.8	23.7	23.3	20.8	22.2	23.8	24.9	29.5	29.8	28.4	26.4	26.8	24.4	25.8	30.5	33.1	33.2	32.0	18.4	33.2	25.5	24	
13	29.1	28.6	S	28.9	28.8	27.2	24.6	20.8	22.3	24.7	27.5	30.3	32.9	34.3	33.4	32.8	31.0	27.3	26.9	22.8	23.6	29.9	33.8	33.9	20.8	34.3	28.5	24	
14	31.0	S	34.1	35.0	34.6	33.7	32.9	32.8	32.0	32.7	34.6	35.4	35.9	36.9	36.3	36.2	36.1	36.9	36.1	36.9	36.6	36.6	37.1	36.7	31.0	37.1	35.1	24	
15	S	34.3	32.6	31.8	33.9	34.3	35.7	36.9	38.1	38.5	38.0	38.5	39.4	38.6	38.4	35.5	36.1	34.3	36.7	37.6	37.1	37.3	36.6	S	31.8	39.4	36.4	24	
16	37.2	32.7	31.2	30.8	30.3	33.2	32.8	32.9	33.0	33.0	34.5	35.7	35.1	34.3	35.1	35.6	33.1	37.1	36.1	23.5	26.7	34.4	S	33.3	23.5	37.2	33.1	24	
17	33.4	31.4	31.4	31.0	28.4	27.0	8.8	18.5	24.2	28.3	29.5	31.0	27.6	27.8	25.8	22.6	21.6	15.5	9.0	2.8	3.9	S	2.5	7.0	2.5	33.4	21.3	24	
18	6.2	6.5	5.7	5.7	7.7	6.7	4.6	5.0	2.6	3.5	5.8	6.1	10.2	16.8	9.7	8.4	2.6	10.4	17.5	18.5	S	10.6	6.9	6.2	2.6	18.5	8.0	24	
19	9.5	5.8	6.8	1.5	1.2	0.7	0.9	0.7	1.0	1.7	2.1	5.4	6.0	7.1	6.7	5.4	1.6	1.5	1.5	S	1.0	1.0	0.8	0.6	0.6	9.5	3.1	24	
20	0.5	3.0	8.7	11.5	12.8	15.9	13.6	5.5	11.0	15.8	13.5	15.4	18.7	20.6	15.3	7.0	3.7	1.7	S	1.5	1.8	1.0	0.9	0.7	0.5	20.6	8.7	24	
21	0.9	0.7	0.6	0.5	0.8	1.2	1.7	1.4	3.2	6.2	9.5	12.9	16.3	16.8	15.9	13.5	15.0	S	15.4	17.5	16.8	19.0	20.7	21.4	0.5	21.4	9.9	24	
22	21.5	26.0	26.1	24.4	23.3	22.8	22.7	23.2	22.6	22.6	22.5	23.6	23.7	23.9	23.8	23.4	S	18.2	19.8	19.4	20.1	19.6	18.4	19.2	20.7	18.4	26.1	22.3	24
23	22.1	23.5	22.5	22.0	21.0	19.2	18.3	15.8	19.1	21.0	21.7	19.9	19.5	18.6	18.6	S	18.2	22.1	21.6	22.5	23.6	25.9	24.9	24.9	15.8	25.9	21.2	24	
24	24.0	25.2	26.5	26.0	24.9	26.4	26.5	26.0	25.0	25.3	24.9	24.1	24.2	22.3	S	21.3	22.5	20.6	21.3	20.7	16.0	14.0	6.3	11.2	6.3	26.5	22.0	24	
25	9.3	10.7	8.5	6.6	6.8	7.4	8.2	9.7	10.6	12.7	13.8	14.6	14.1	S	13.5	12.1	8.7	6.1	4.5	2.2	3.4	4.5	10.1	8.0	2.2	14.6	9.0	24	
26	7.4	6.1	6.8	9.9	10.7	9.4	11.9	13.4	17.1	19.5	22.5	24.8	S	31.3	31.7	32.0	32.3	28.3	30.2	32.1	32.4	33.1	33.9	34.7	6.1	34.7	22.2	24	
27	35.5	35.9	36.3	36.2	35.4	34.9	34.9	33.7	31.7	32.8	33.0	S	35.3	36.2	36.6	34.4	36.3	55.1	30.5	33.1	35.4	36.2	36.6	36.6	30.5	55.1	35.8	24	
28	36.5	36.3	36.8	36.5	35.3	34.8	36.6	37.1	36.6	36.4	S	34.0	34.5	32.4	32.2	30.5	26.2	27.1	28.3	30.0	29.7	28.9	30.3	34.6	26.2	37.1	33.1	24	
29	37.1	36.9	36.8	36.8	37.2	37.0	36.9	36.1	34.3	33.4	S	32.5	32.5	35.8	36.9	37.3	37.7	37.3	33.6	30.6	31.0	30.1	30.3	35.1	35.0	30.1	37.7	34.8	24
30	35.6	34.8	34.1	34.4	33.3	31.7	32.5	32.3	S	31.7	33.9	34.1	36.1	37.9	38.5	38.5	38.6	37.5	38.4	38.1	38.8	38.1	33.9	31.7	31.7	38.8	35.4	24	
31	31.7	28.1	28.8	27.7	27.8	26.9	26.5	S	26.1	29.0	29.3	31.9	32.0	31.8	32.6	32.0	31.9	27.5	28.0	31.4	31.9	32.4	31.7	32.0	26.1	32.6	30.0	24	
HOURLY MAX	37.2	36.9	36.8	37.2	37.0	36.9	36.6	37.1	38.1	38.5	38.0	38.5	39.4	38.6	38.6	38.5	38.6	55.1	38.4	38.1	38.8	38.1	37.1	36.7					
HOURLY AVG	23.4	23.2	23.6	23.9	23.5	23.2	22.2	22.1	22.1	22.0	24.3	25.5	26.6	28.6	27.2	25.0	23.0	22.9	22.7	22.7	23.0	24.1	22.9	23.4					

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

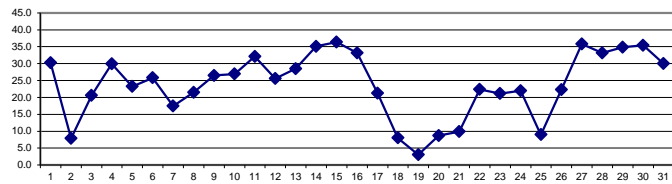
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

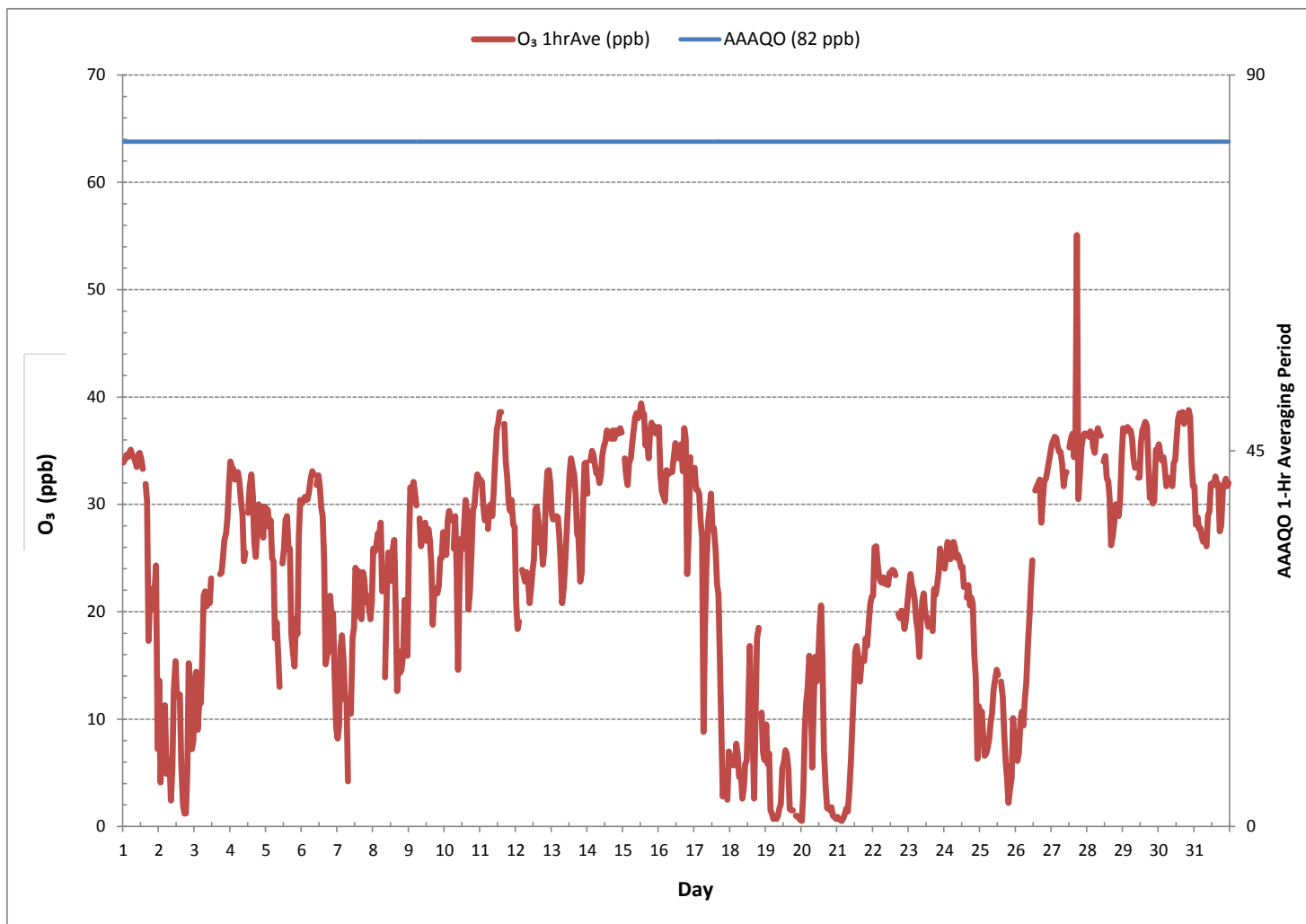
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	707				
MINIMUM 1-HR AVERAGE:	0.5 ppb	@ HOUR(S)	0 , 3	ON DAY(S)	20 , 21
MAXIMUM 1-HR AVERAGE:	55.1 ppb	@ HOUR(S)	17	ON DAY(S)	27
MAXIMUM 24-HR AVERAGE:	36.4 ppb			ON DAY(S)	15
				VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	743 hrs		
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.9 %		
STANDARD DEVIATION:	10.7	MONTHLY AVERAGE:	23.8 ppb		

24 HR AVERAGES January 2017



OZONE Hourly Averages (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 Bonnyville Continuous Monitoring Station - January 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	34.7	35.5	35.4	35.3	35.5	36.1	35.9	35.9	35.4	35.8	35.7	35.7	35.1	34.4	S	34.4	32.0	28.0	28.4	29.4	28.2	27.5	28.0	26.6	26.6	36.1	33.0	24
2	25.5	11.1	12.9	17.9	16.8	17.3	12.4	12.0	4.9	10.1	14.2	17.3	16.8	S	17.5	8.8	4.0	4.3	5.1	17.8	18.8	19.1	8.8	10.0	4.0	25.5	13.2	24
3	16.0	15.9	12.7	13.5	14.5	18.8	24.1	24.0	23.3	22.5	22.2	25.7	S	C	C	C	C	25.7	25.6	26.6	28.7	28.2	31.8	34.7	12.7	34.7	22.9	24
4	34.9	34.6	34.4	34.0	34.4	35.3	34.1	32.9	30.9	P	30.3	S	31.0	34.3	35.1	34.3	32.8	30.3	32.5	32.0	31.5	29.9	31.0	31.0	29.9	35.3	32.8	23
5	31.0	31.0	30.4	29.6	28.1	25.8	23.1	20.8	21.0	14.1	S	26.9	28.8	30.6	31.2	29.1	28.7	22.8	23.7	21.6	23.1	23.8	29.6	31.5	14.1	31.5	26.4	24
6	31.2	32.1	32.0	31.7	32.1	33.1	33.1	33.8	34.1	S	32.9	33.4	33.2	31.6	30.6	P	23.7	P	21.3	26.4	26.7	24.6	22.3	17.3	17.3	34.1	29.4	22
7	14.5	14.9	18.5	19.4	18.8	14.0	15.9	7.6	S	13.7	21.0	22.1	25.6	24.9	26.7	24.1	23.1	25.3	24.4	24.1	22.9	22.5	21.9	24.0	7.6	26.7	20.4	24
8	27.7	26.7	27.5	29.0	29.0	30.7	26.1	S	21.6	26.0	28.1	28.4	25.1	29.0	29.3	28.2	17.5	20.2	19.7	17.5	22.6	23.5	22.3	22.3	17.5	30.7	25.1	24
9	31.3	32.9	32.3	32.9	32.0	30.7	S	29.7	29.1	28.2	28.8	29.0	28.7	28.4	29.3	26.6	24.6	26.3	26.7	23.8	24.6	26.6	27.5	28.5	23.8	32.9	28.6	24
10	28.5	30.4	30.2	31.0	31.6	S	32.2	30.3	29.1	20.8	26.3	29.1	28.0	32.5	32.3	32.6	29.6	25.8	30.4	31.7	31.8	33.2	33.7	X	20.8	33.7	30.1	23
11	33.1	33.4	31.5	29.9	S	28.8	30.4	30.6	30.9	33.4	36.8	39.8	39.5	40.3	P	P	40.2	35.7	34.0	32.2	32.0	32.2	30.0	29.6	28.8	40.3	33.5	22
12	28.5	26.0	23.1	S	25.8	25.3	27.2	27.5	28.0	28.5	23.7	25.6	29.4	31.2	31.0	30.9	30.0	29.0	27.0	27.2	33.7	33.7	33.8	32.8	23.1	33.8	28.6	24
13	32.3	31.0	S	29.4	29.3	28.5	27.0	26.4	24.7	26.3	29.6	32.9	34.9	35.6	35.2	34.9	33.4	30.2	28.7	25.3	27.7	31.9	35.9	35.7	24.7	35.9	30.7	24
14	33.4	S	35.0	35.7	35.4	34.6	33.4	33.5	32.8	34.3	35.1	37.7	37.8	38.0	37.1	36.9	37.2	37.4	37.2	37.7	37.8	37.8	38.0	38.0	32.8	38.0	36.2	24
15	S	35.4	33.7	32.6	34.9	35.7	37.4	38.1	38.7	39.5	38.7	39.8	40.3	41.1	39.6	38.3	38.6	39.3	38.4	39.0	38.8	38.6	37.8	S	32.6	41.1	37.9	24
16	38.0	36.8	32.3	31.8	32.5	34.3	33.7	34.1	34.9	34.9	36.1	37.2	38.0	38.6	38.1	37.9	38.4	39.5	39.2	36.2	34.0	36.9	S	35.7	31.8	39.5	36.0	24
17	35.3	34.6	32.6	32.0	31.3	29.6	21.3	27.0	28.8	30.0	31.5	33.1	30.0	29.3	28.5	27.5	29.5	20.2	21.9	9.3	9.9	S	8.1	12.6	8.1	35.3	25.8	24
18	12.7	11.4	10.9	9.0	12.1	9.4	10.0	7.5	4.9	7.8	8.4	8.1	16.2	20.2	17.1	13.1	5.5	21.6	22.3	23.4	S	22.3	12.1	8.5	4.9	23.4	12.8	24
19	15.9	14.7	10.1	3.7	3.0	1.2	1.4	0.9	2.1	2.1	2.9	7.0	7.2	8.7	8.4	7.2	3.3	3.9	2.3	S	2.0	1.8	1.4	1.1	0.9	15.9	4.9	24
20	0.6	6.7	11.1	11.8	14.7	17.1	17.4	13.4	15.4	18.9	16.0	17.3	22.8	22.6	21.0	17.4	5.2	3.0	S	2.9	4.8	1.7	2.0	1.1	0.6	22.8	11.5	24
21	1.2	1.1	0.7	0.7	1.7	1.7	2.3	1.7	6.3	7.2	11.4	15.7	17.3	17.7	17.5	16.2	16.7	S	17.7	19.1	18.9	20.2	23.8	22.9	0.7	23.8	11.3	24
22	24.5	27.8	28.0	25.6	24.5	23.8	23.7	24.4	24.3	23.8	23.5	24.8	24.5	24.6	24.4	24.4	S	22.9	21.4	22.2	20.7	19.9	20.5	21.8	19.9	28.0	23.7	24
23	24.1	24.3	24.0	23.7	23.1	20.5	19.9	18.8	21.1	22.8	23.1	21.6	20.7	20.5	20.4	S	19.8	25.1	25.3	25.4	26.6	27.0	26.7	26.6	18.8	27.0	23.1	24
24	25.6	26.9	27.7	27.3	26.9	27.2	27.5	27.5	26.6	26.3	26.3	25.8	25.6	24.4	S	23.8	24.4	22.5	22.6	22.5	20.7	16.7	9.7	12.6	9.7	27.7	23.8	24
25	11.2	12.0	11.8	7.6	7.6	8.2	9.9	10.8	12.0	13.8	15.1	15.4	15.3	S	14.4	13.5	12.4	8.7	8.8	3.7	5.2	8.1	12.1	10.6	3.7	15.4	10.8	24
26	9.9	7.9	9.9	11.4	11.5	10.9	14.1	15.1	19.1	21.1	24.9	29.1	S	33.5	33.2	34.1	35.2	32.0	32.5	33.4	33.8	34.1	36.1	35.5	7.9	36.1	24.3	24
27	36.2	36.6	36.8	36.8	36.8	36.3	36.1	35.4	34.4	34.4	34.7	S	36.5	37.7	37.8	37.2	37.5	36.2	31.9	35.0	36.3	37.1	37.2	37.4	31.9	37.8	36.2	24
28	37.5	37.1	37.5	37.2	36.1	35.9	37.6	37.6	37.2	37.1	S	35.4	35.3	34.4	33.8	32.5	31.5	29.6	29.7	31.5	31.3	29.9	33.1	37.8	29.6	37.8	34.6	24
29	37.9	37.6	37.8	38.0	37.5	37.8	37.8	36.6	34.7	S	35.7	33.8	37.2	37.7	38.4	38.8	39.1	35.9	34.4	32.8	31.7	33.8	36.3	36.6	31.7	39.1	36.4	24
30	36.8	35.4	35.0	35.1	34.7	32.8	34.3	34.3	S	33.1	36.5	36.5	38.4	38.8	39.4	40.0	40.2	39.3	39.6	39.3	39.5	39.0	38.1	33.4	32.8	40.2	36.9	24
31	33.2	31.3	30.0	29.1	28.8	28.4	27.8	S	28.4	31.8	31.5	34.6	33.2	33.2	33.9	33.8	33.8	31.3	31.8	33.2	33.2	33.8	33.5	32.9	27.8	34.6	31.8	24
HOURLY MAX	38.0	37.6	37.8	38.0	37.5	37.8	37.8	38.1	38.7	39.5	38.7	39.8	40.3	41.1	39.6	40.0	40.2	39.5	39.6	39.3	39.5	39.0	38.1	38.0				
HOURLY AVG	26.1	25.8	25.5	25.4	25.4	25.0	24.9	24.4	24.6	24.2	26.2	27.5	28.7	30.5	28.9	28.0	26.5	25.9	26.2	26.1	25.9	26.5	25.4	25.1				

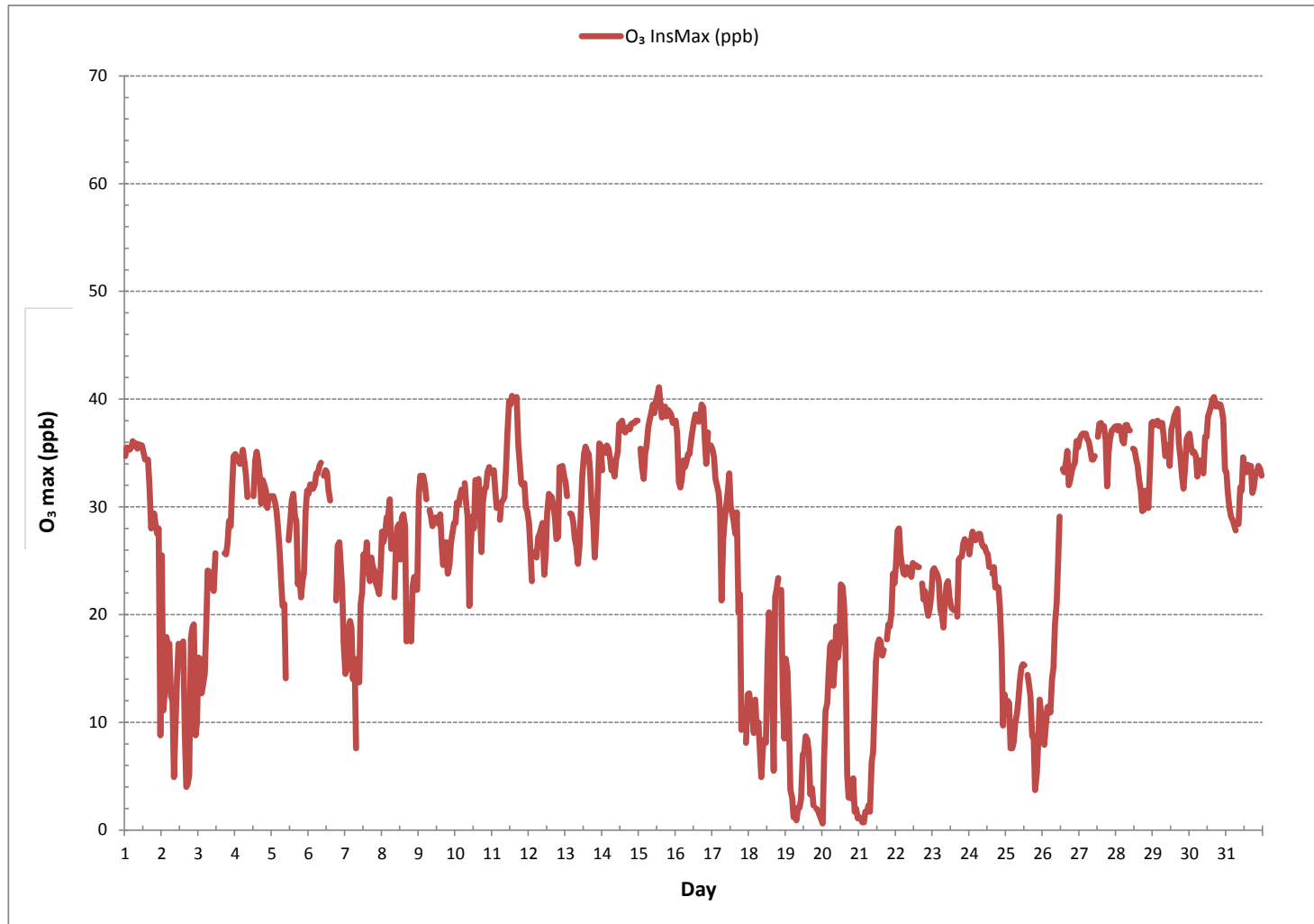
STATUS FLAG CODES

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:	702
MAXIMUM INSTANTANEOUS VALUE:	41.1 ppb @ HOUR(S) 13 ON DAY(S) 15
VAR-VARIOUS	
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
STANDARD DEVIATION:	10.1
OPERATIONAL TIME:	738 hrs

OZONE Instantaneous Maximum (O₃ ppb)

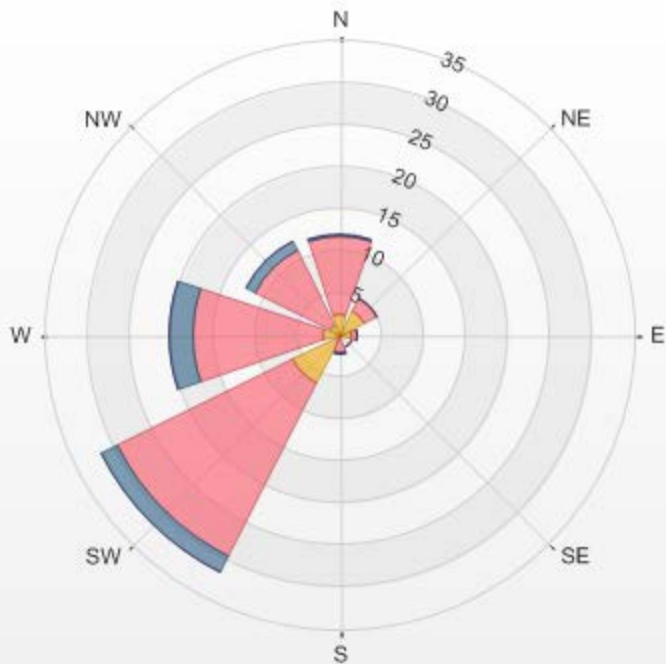


Wind: LICA Bonnyville Poll.: LICA Bonnyville-O3[ppb] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.77% Valid Data: 94.76% Calm Avg: 10.87 [ppb]

Direction	0.0-18.4	18.4-36.8	36.8-55.2	>55.2	Total
N	2.41	9.36	0.14	0	11.91
NE	3.26	1.7	0	0	4.96
E	1.42	0.71	0	0	2.13
SE	0.14	1.56	0	0	1.7
S	0.28	1.84	0.14	0	2.26
SW	6.38	23.12	2.13	0	31.63
W	1.99	15.46	2.84	0	20.29
NW	1.28	10.07	0.99	0	12.34
Summary	17.16	63.82	6.24	0	87.22

% Icon Classes (ppb) 17 0.0-18.4 64 18.4-36.8 6 36.8-55.2 0 >55.2

LICA Bonnyville Poll.: LICA Bonnyville-03[ppb] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.77% Calm
Poll Avg: 10.87[ppb]



O3[ppb] Calibration: LICA Bonnyville Monthly: 2017/01 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	2.2	0.0	0.0	6.2	0.7	3.7	1.7	0.0	0.0	0.0	0.0	0.0	6.2	0.0	0.0	3.2	0.0	6.7	2.7	4.2	2.7	3.7	7.2	6.2	0.0	7.2	2.4	24
2	1.2	8.2	4.7	5.2	2.7	6.2	12.2	10.7	10.2	10.7	9.2	11.2	17.7	33.7	14.2	13.2	19.2	17.7	16.7	15.7	13.2	11.2	8.2	8.7	1.2	33.7	11.7	24
3	6.7	7.7	9.2	9.2	14.2	3.7	5.2	3.7	8.2	10.1	6.2	7.2	13.2	21.1	21.1	C	C	20.7	15.7	16.1	9.2	10.6	9.7	0.0	0.0	21.1	10.4	24
4	0.2	0.7	4.7	8.7	8.7	16.1	11.7	1.6	1.6	0.0	0.0	8.7	4.7	3.7	1.1	4.1	X	0.7	3.7	5.6	0.0	5.2	8.2	X	0.0	16.1	4.5	22
5	4.2	2.2	1.7	10.6	13.1	10.1	14.2	16.7	17.1	11.2	7.7	2.2	0.2	2.7	3.2	5.7	3.2	0.0	8.2	10.6	3.7	5.1	3.2	3.2	0.0	17.1	6.7	24
6	0.0	2.2	4.7	0.1	0.7	7.2	6.2	3.2	5.1	0.0	0.0	0.0	0.0	7.7	8.2	1.7	5.6	0.1	4.7	6.6	8.2	11.7	2.2	6.2	0.0	11.7	3.8	24
7	9.2	8.7	2.7	6.7	5.6	3.7	5.1	8.7	10.1	7.7	4.2	11.7	9.2	2.7	2.7	12.7	5.6	5.1	X	0.1	3.2	2.2	2.7	1.6	0.1	12.7	5.7	23
8	2.2	2.2	6.2	0.1	2.2	2.6	0.0	5.1	8.2	8.2	5.6	6.2	9.2	10.1	4.2	4.7	8.2	9.7	7.7	5.1	3.2	3.2	4.1	6.2	0.0	10.1	5.2	24
9	3.2	0.7	0.0	3.7	2.7	3.2	8.2	X	0.0	3.2	1.6	13.1	4.7	10.1	5.6	12.7	2.2	10.1	14.7	2.2	3.2	3.2	1.1	4.1	0.0	14.7	4.9	23
10	1.1	1.6	0.0	0.0	3.7	0.7	1.6	X	0.1	8.7	8.7	5.6	5.6	4.1	0.0	0.0	2.7	1.1	5.6	0.0	0.0	5.1	3.7	6.7	0.0	8.7	2.9	23
11	0.0	1.6	7.7	8.2	8.7	5.6	3.1	6.7	4.7	3.2	0.0	6.7	6.2	4.7	1.2	P	14.6	6.2	7.7	6.6	7.7	5.6	6.7	4.1	0.0	14.6	5.5	23
12	8.7	7.2	11.7	3.2	3.7	3.2	9.7	6.2	4.2	X	8.7	10.1	5.7	5.7	6.7	11.2	6.7	6.2	7.7	6.2	7.2	6.2	0.0	4.1	0.0	11.7	6.5	23
13	7.2	4.7	5.1	8.7	5.1	12.1	17.7	28.2	12.7	11.2	X	12.7	5.6	9.2	9.2	1.6	8.7	9.7	15.7	14.2	9.7	3.2	2.7	5.1	1.6	28.2	9.6	23
14	0.0	0.0	0.0	6.6	3.7	2.6	9.7	9.2	8.7	3.7	9.2	0.7	3.7	3.7	4.7	0.7	4.7	3.2	5.6	3.7	4.7	6.7	3.7	5.1	0.0	9.7	4.3	24
15	5.1	3.7	8.7	8.2	3.2	1.1	5.1	2.2	0.0	0.0	2.2	1.1	5.6	6.7	6.7	2.7	2.7	8.7	1.1	4.1	3.7	1.1	0.0	0.7	0.0	8.7	3.5	24
16	0.2	9.7	0.0	6.6	8.2	6.7	4.7	3.2	4.7	4.7	0.7	5.6	X	1.1	3.7	3.2	1.6	5.1	5.1	5.1	1.1	1.6	5.1	2.2	0.0	9.7	3.9	23
17	4.7	5.6	1.6	3.2	6.2	1.1	1.6	0.0	0.0	1.6	4.1	4.7	4.7	0.0	0.7	1.7	0.2	3.7	5.2	11.2	5.6	9.2	7.7	4.2	0.0	11.2	3.7	24
18	4.7	13.2	8.2	7.2	8.2	7.2	4.7	5.6	4.2	12.1	7.7	14.1	9.6	8.7	12.1	5.2	15.7	7.7	2.2	10.6	9.2	9.6	10.6	14.2	2.2	15.7	8.9	24
19	13.7	11.7	14.2	9.6	15.2	8.2	14.7	16.1	18.6	20.7	20.7	17.1	13.7	14.2	14.1	5.1	11.7	15.7	17.1	18.2	8.7	20.2	15.2	11.2	5.1	20.7	14.4	24
20	15.7	17.7	18.6	15.7	19.2	22.1	10.1	16.7	17.7	15.2	14.7	10.6	9.6	18.2	13.2	12.1	20.2	23.1	21.7	25.7	26.7	35.6	30.7	26.7	9.6	35.6	19.1	24
21	19.2	19.2	21.1	13.1	12.1	14.6	24.7	25.7	26.2	41.1	52.1	40.1	39.1	31.2	26.7	20.7	8.2	1.6	4.7	3.7	10.1	2.6	2.2	0.0	0.0	52.1	19.2	24
22	0.1	1.1	2.2	6.6	1.1	2.2	1.6	1.1	6.2	0.1	0.1	6.2	0.0	3.1	X	0.7	0.0	0.0	1.6	2.2	1.6	0.0	0.0	1.1	0.0	6.6	1.7	23
23	3.7	3.1	1.1	0.0	0.0	2.6	0.0	0.7	6.7	2.7	0.0	3.2	0.1	7.2	2.2	2.2	1.6	0.7	0.0	2.7	0.0	10.6	6.2	9.7	0.0	10.6	2.8	24
24	X	0.0	10.6	13.7	11.2	7.7	5.6	4.7	9.7	8.7	0.0	4.7	2.6	4.2	5.6	4.7	3.7	10.1	3.7	9.2	5.6	7.7	17.7	17.7	0.0	17.7	7.4	23
25	17.1	16.1	25.1	16.7	15.2	12.7	15.2	18.6	10.6	12.7	13.7	10.6	19.2	15.7	14.7	19.2	17.1	20.2	14.2	13.2	17.7	12.7	14.7	15.2	10.6	25.1	15.8	24
26	21.7	20.2	21.7	25.7	21.7	23.1	22.6	23.6	23.1	15.7	16.6	9.2	4.7	C	C	4.2	4.7	7.2	6.7	3.7	5.1	10.6	10.1	8.2	3.7	25.7	14.1	24
27	2.2	6.6	2.2	1.6	0.0	4.2	0.7	2.2	1.6	3.7	1.6	0.1	0.0	0.0	0.2	3.7	0.0	3.7	6.2	0.0	3.2	1.6	4.7	6.2	0.0	6.6	2.3	24
28	0.7	3.2	1.6	2.7	2.7	1.2	0.0	3.7	2.2	2.2	0.1	6.7	8.7	3.2	3.7	0.2	7.2	3.7	4.7	8.7	0.1	3.7	0.7	6.2	0.0	8.7	3.2	24
29	0.0	2.7	2.7	0.0	0.0	3.2	0.2	0.0	0.0	1.6	0.0	5.7	9.2	1.7	5.2	2.2	3.7	1.2	6.2	3.2	7.7	3.7	3.7	2.2	0.0	9.2	2.8	24
30	0.0	3.2	0.0	0.7	1.2	3.2	0.0	3.2	2.2	2.7	0.0	0.0	0.0	0.0	1.7	0.0	0.2	0.0	2.7	3.2	0.0	0.0	0.0	1.6	0.0	3.2	1.1	24
31	3.7	4.1	0.0	1.1	0.1	3.7	1.6	7.2	2.6	0.0	1.1	4.2	2.2	1.1	0.0	3.2	1.7	2.6	6.2	1.6	12.7	4.7	1.1	4.2	0.0	12.7	2.9	24
HOURLY MAX	21.7	20.2	25.1	25.7	21.7	23.1	24.7	28.2	26.2	41.1	52.1	40.1	39.1	33.7	26.7	20.7	20.2	23.1	21.7	25.7	26.7	35.6	30.7	26.7				
HOURLY AVG	5.3	6.1	6.4	6.8	6.5	6.6	7.1	8.1	7.3	7.4	6.6	7.7	7.4	7.9	6.6	5.6	6.3	6.8	7.5	7.2	6.3	7.0	6.3	6.4				

STATUS FLAG CODES

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

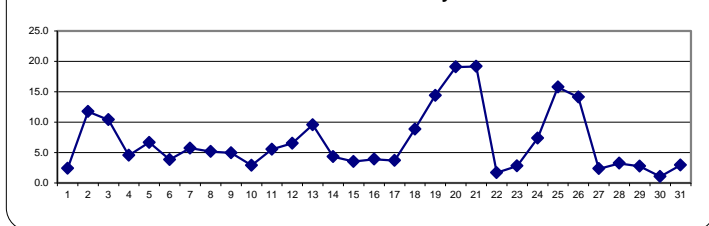
OBJECTIVE LIMIT:

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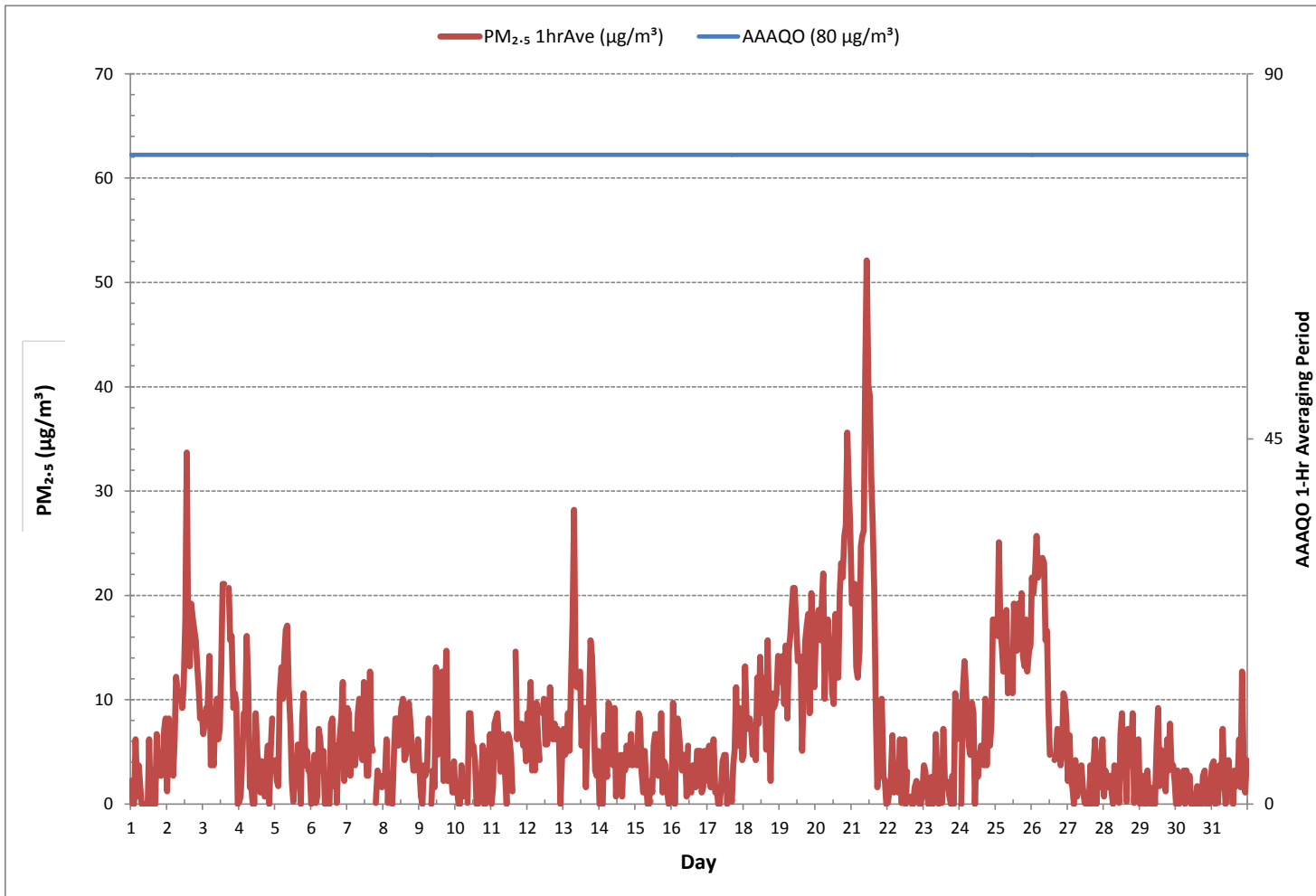
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	646					
MINIMUM 1-HR AVERAGE:	0.0	µg/m ³	@ HOUR(S)	VAR	ON DAY(S)	VAR
MAXIMUM 1-HR AVERAGE:	52.1	µg/m ³	@ HOUR(S)	10	ON DAY(S)	21
MAXIMUM 24-HR AVERAGE:	19.2	µg/m ³			ON DAY(S)	21
					VAR-VARIOUS	
MONTHLY CALIBRATION TIME:	4	hrs	OPERATIONAL TIME:	733 hrs		
STANDARD DEVIATION:	6.8		AMD OPERATION UPTIME:	98.5 %		
			MONTHLY AVERAGE:	6.8 µg/m ³		

24 HR AVERAGES January 2017









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

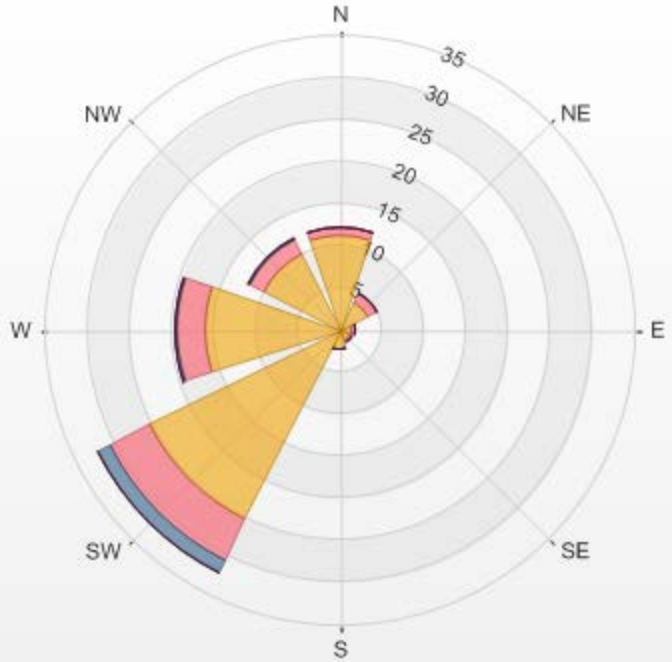


Wind: LICA Bonnyville Poll.: LICA Bonnyville-PM25[ug/m3(L)] Monthly: 2017/01 Type: PollutionRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.65% Valid Data: 97.72% Calm Avg: 13.01 [ppb]

Direction	0.0-10.4	10.4-20.9	20.9-31.3	31.3-41.8	41.8-52.2	>52.2	Total
N	11.28	0.96	0	0	0	0	12.24
NE	3.71	1.24	0	0	0	0	4.95
E	1.38	0.55	0	0	0	0	1.93
SE	1.51	0.14	0	0	0	0	1.65
S	2.48	0	0	0	0	0	2.48
SW	25.17	5.36	1.65	0	0	0	32.18
W	15.96	3.3	0.41	0	0	0	19.67
NW	10.04	1.93	0.14	0.14	0	0	12.25
Summary	71.53	13.48	2.2	0.14	0	0	87.35

% Icon	Classes (ug/m3(L))	72		0.0-10.4	13		10.4-20.9	2		20.9-31.3	0		31.3-41.8	0		41.8-52.2	0		>52.2
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LICA Bonnyville Poll.: LICA Bonnyville-PM25[ug/m3(L)] 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.65% Calm Poll Avg: 13.01[ug/m3(L)]



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

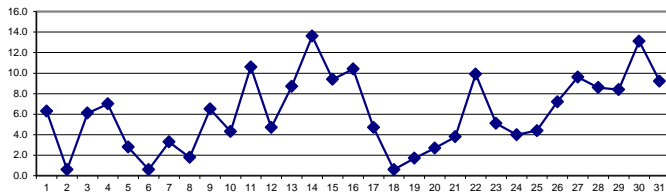
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	10.3	9.3	8.2	8.7	9.9	10.5	13.5	10.1	9.4	10.0	11.8	11.8	9.0	6.6	7.3	7.8	6.8	3.2	2.1	1.8	2.9	0.1	2.1	0.9	0.1	13.5	6.3	24	
2	0.6	3.1	0.2	0.3	1.6	1.3	0.9	1.9	1.4	0.5	0.1	0.2	0.5	2.9	1.2	0.5	0.7	0.3	0.5	0.8	2.4	2.0	0.9	2.1	0.1	3.1	0.6	24	
3	1.0	0.8	1.0	1.6	0.3	3.4	3.2	5.1	5.2	7.9	9.7	9.1	9.2	10.5	9.6	10.4	9.3	8.8	7.7	8.8	10.3	11.6	11.4	0.3	11.6	6.1	24		
4	12.9	10.2	9.4	10.5	11.4	12.3	12.2	10.0	7.9	6.1	7.5	6.9	5.9	8.2	9.4	7.1	6.3	5.6	4.8	3.4	5.2	4.9	3.5	4.3	3.4	12.9	7.0	24	
5	5.3	3.8	7.2	7.8	5.4	2.8	1.4	2.8	5.2	6.6	9.0	9.5	10.2	9.7	8.0	5.8	5.7	2.5	3.3	3.9	4.1	4.1	5.6	7.0	1.4	10.2	2.8	24	
6	5.3	4.6	4.7	4.4	5.2	4.8	2.1	2.4	2.2	3.5	5.9	5.3	3.2	2.3	2.4	0.7	2.2	2.3	3.5	0.3	0.6	0.6	1.3	1.5	0.3	5.9	0.6	24	
7	1.1	4.4	2.5	4.6	2.1	1.2	1.4	1.6	3.6	1.3	2.4	3.4	6.3	5.7	6.0	7.1	7.8	9.8	7.9	12.2	9.5	7.7	4.4	4.4	1.1	12.2	3.3	24	
8	8.5	8.7	8.0	8.8	8.5	10.3	6.3	1.5	2.2	1.9	0.3	0.9	1.0	1.7	0.2	2.3	1.5	2.5	0.6	2.3	1.5	6.3	12.2	11.8	0.2	12.2	1.8	24	
9	13.4	10.7	4.7	6.4	6.6	10.4	7.4	5.5	4.5	5.9	6.5	6.8	6.9	9.9	8.1	6.9	5.0	6.5	8.4	6.6	7.7	10.2	9.4	8.8	4.5	13.4	6.5	24	
10	6.1	5.6	7.1	7.3	4.1	3.7	0.8	0.8	2.4	2.5	2.1	1.8	6.6	7.8	8.3	9.1	7.4	8.0	6.3	5.6	7.0	8.4	7.7	10.4	0.8	10.4	4.3	24	
11	9.0	7.5	9.3	13.5	17.8	21.1	20.2	16.2	13.0	11.2	11.5	12.5	18.2	22.2	27.9	P	26.6	22.1	19.2	14.1	8.8	10.7	8.9	6.4	6.4	27.9	10.6	23	
12	4.0	4.5	2.8	1.1	0.9	0.7	2.6	4.7	2.8	4.3	4.8	3.8	2.9	11.7	12.5	9.8	9.5	10.3	7.8	9.4	10.7	15.9	14.0	4.4	0.7	15.9	4.7	24	
13	1.3	3.0	9.7	9.2	9.4	8.2	7.9	6.5	8.3	10.2	10.6	9.7	10.1	10.6	9.3	10.7	8.4	11.5	11.8	11.0	8.9	9.0	8.6	1.3	11.8	8.7	24		
14	9.1	14.0	14.7	14.1	15.4	13.5	15.7	17.5	15.1	16.2	15.8	13.3	10.3	13.6	12.0	14.0	12.2	13.2	14.1	13.8	14.3	11.5	11.7	15.1	9.1	17.5	13.6	24	
15	15.8	13.4	12.0	10.0	11.8	10.0	10.9	10.7	9.9	10.9	10.1	10.3	10.3	7.4	10.7	5.7	5.9	7.8	6.9	8.8	8.1	7.3	8.0	8.4	5.7	15.8	9.4	24	
16	7.7	11.2	8.7	9.3	8.5	10.2	13.1	11.9	11.8	12.5	12.4	13.2	19.1	18.6	16.3	14.1	16.8	13.3	8.7	1.7	2.2	8.1	5.6	7.7	1.7	19.1	10.4	24	
17	5.5	7.5	9.6	8.8	5.9	4.7	5.0	6.3	8.2	7.5	7.7	7.2	10.7	9.9	7.1	6.1	3.0	3.9	0.3	3.3	3.4	2.3	1.5	6.4	0.3	10.7	4.7	24	
18	3.1	2.7	3.1	2.0	2.9	5.2	5.0	6.2	2.4	2.9	0.1	1.2	1.0	2.1	0.9	0.2	0.9	5.1	5.7	7.5	3.1	1.7	6.4	1.3	0.1	7.5	0.6	24	
19	4.2	4.2	1.9	1.1	1.9	1.0	3.2	2.9	1.4	0.2	1.9	2.9	3.1	2.5	4.1	4.4	1.1	2.3	5.7	2.1	1.1	0.9	0.3	0.4	0.2	5.7	1.7	24	
20	3.7	7.1	7.0	8.0	7.0	7.2	2.0	3.3	5.0	6.1	4.7	3.3	3.2	2.4	0.1	0.6	2.2	1.5	0.6	0.9	0.4	0.3	0.3	2.6	0.1	8.0	2.7	24	
21	1.7	1.4	3.3	3.5	3.9	3.2	1.8	0.0	0.0	0.8	0.0	0.0	0.1	0.3	0.2	2.5	11.3	13.9	9.2	10.2	10.3	10.5	11.4	12.1	0.0	13.9	3.8	24	
22	12.0	12.2	12.1	10.7	10.4	10.8	11.3	10.9	10.1	9.6	10.8	10.8	10.2	10.8	11.1	10.4	8.4	7.7	8.2	8.5	8.3	8.4	7.6	7.0	7.0	12.2	9.9	24	
23	7.5	8.2	8.2	7.6	7.7	6.5	6.2	5.1	5.6	4.4	3.6	4.5	5.2	4.8	4.3	5.3	6.2	5.3	3.7	4.9	4.4	2.3	1.9	3.3	1.9	8.2	5.1	24	
24	4.4	5.4	5.5	5.1	4.9	4.7	4.6	3.8	3.8	3.3	5.3	4.0	5.3	3.4	2.1	2.3	4.1	3.9	3.9	4.5	4.7	5.9	4.9	3.4	2.1	5.9	4.0	24	
25	3.6	3.0	6.3	5.4	6.7	5.0	4.6	5.2	5.8	5.9	3.9	6.2	5.4	2.7	1.8	1.5	1.7	3.5	9.3	4.0	5.2	4.6	5.9	3.4	1.5	9.3	4.4	24	
26	2.5	4.4	4.8	6.5	6.3	4.6	5.7	6.6	7.8	6.4	8.7	6.5	10.2	9.8	11.3	9.1	5.9	5.6	9.7	10.7	9.6	9.8	9.1	9.8	2.5	11.3	7.2	24	
27	9.3	10.5	10.1	9.3	9.4	9.5	9.1	10.4	8.1	8.9	8.4	9.0	9.2	10.4	10.5	7.1	12.8	13.2	10.2	10.3	11.5	10.0	8.7	8.0	7.1	13.2	9.6	24	
28	9.1	7.6	9.5	8.8	7.1	6.2	10.9	11.3	9.8	10.3	10.7	9.5	11.3	7.0	7.4	9.1	6.3	5.8	7.9	9.4	8.6	8.6	6.9	9.5	5.8	11.3	8.6	24	
29	9.1	10.2	12.3	11.4	10.3	9.3	8.3	7.2	7.0	7.2	12.2	12.6	10.2	8.4	9.4	10.1	9.0	4.4	4.3	7.3	5.4	5.8	8.1	7.9	4.3	12.6	8.4	24	
30	7.0	9.5	8.6	11.2	10.7	7.8	9.4	10.2	9.7	14.0	14.8	13.5	18.8	18.9	18.6	18.4	19.7	16.7	20.2	15.0	16.9	13.7	11.4	13.2	7.0	20.2	13.1	24	
31	13.3	15.8	18.2	16.1	15.7	15.4	15.9	15.2	13.8	12.8	12.8	11.0	10.1	9.1	Y	Y	8.8	9.9	6.6	4.8	6.7	5.9	8.4	5.9	5.9	4.8	18.2	9.2	22
HOURLY MAX	15.8	15.8	18.2	16.1	17.8	21.1	20.2	17.5	15.1	16.2	15.8	13.5	19.1	22.2	27.9	18.4	26.6	22.1	20.2	15.0	16.9	15.9	14.0	15.1					
HOURLY AVG	3.9	4.1	4.3	4.2	4.2	4.4	4.6	4.4	4.1	4.2	4.3	4.3	5.0	5.0	4.4	4.1	4.3	4.1	4.1	4.1	4.1	4.1	4.2	3.6	3.5				

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

LAST CALIBRATION: January 26, 2016
DECLINATION: MAGNETIC DECLINATION 19 DEGREE EAST

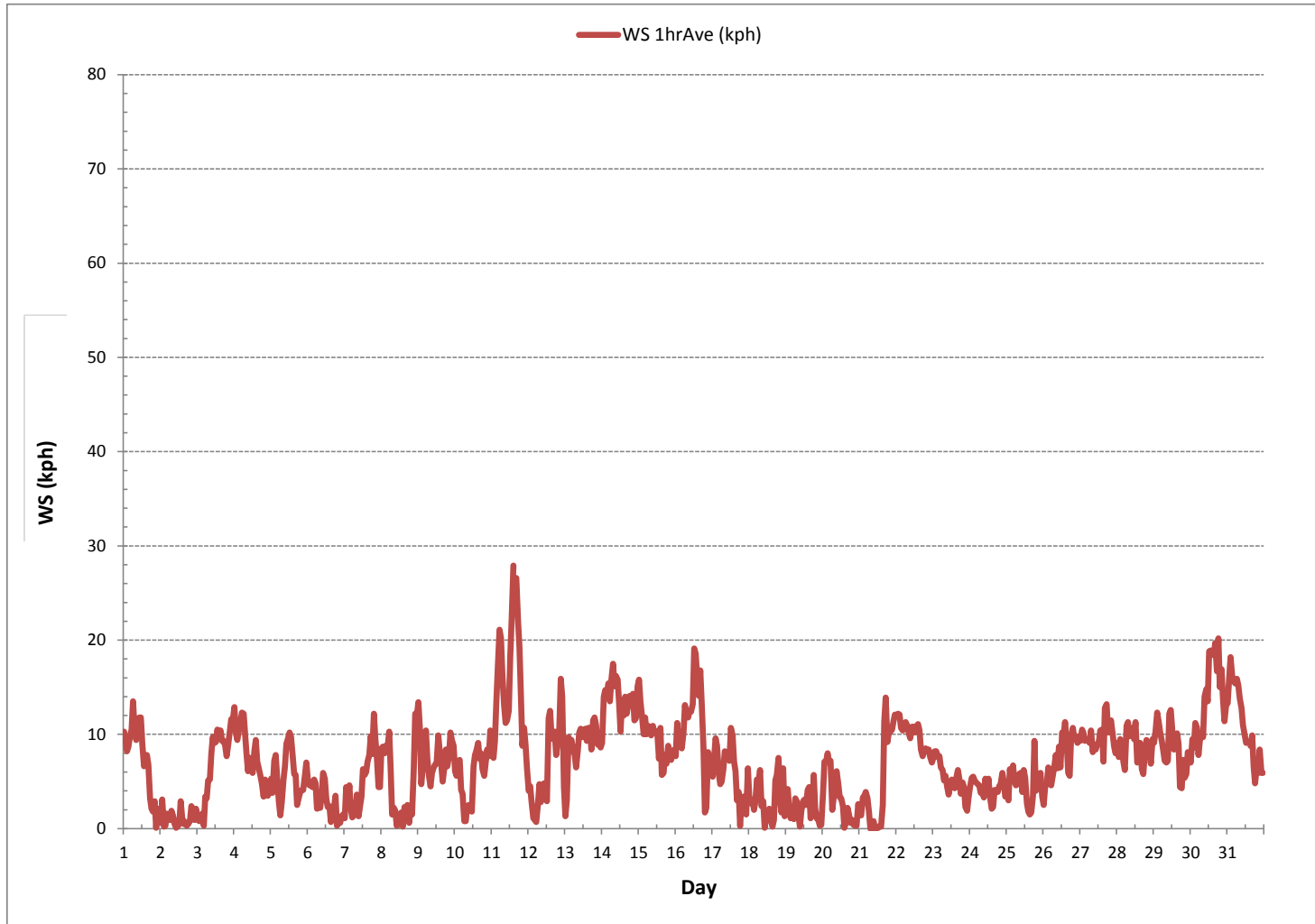
24 HR AVERAGES January 2017



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	737
MINIMUM 1-HR AVERAGE:	0.0 kph @ HOUR(S) VAR ON DAY(S) 21
MAXIMUM 1-HR AVERAGE:	27.9 kph @ HOUR(S) 14 ON DAY(S) 11
MAXIMUM 24-HR AVERAGE:	13.6 kph ON DAY(S) 14
	VAR-VARIOUS
MONTHLY CALIBRATION TIME:	0 hrs OPERATIONAL TIME: 741 hrs
	AMD OPERATION UPTIME: 99.6 %
STANDARD DEVIATION:	4.5 MONTHLY AVERAGE: 4.2 kph

WIND SPEED Hourly Averages (WS kph)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - January 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	23.1	23.8	18.5	21.9	26.3	34.5	30.9	26.6	25.8	30.3	30.5	24.9	18.7	14.5	15.0	19.7	17.0	8.1	5.7	10.3	7.5	3.0	6.4	6.1	3.0	34.5	18.7	24	
2	4.6	8.1	5.7	4.4	8.7	6.9	7.6	7.1	4.0	5.0	3.2	3.4	4.2	5.3	4.8	5.7	5.6	2.6	4.3	5.4	6.2	9.1	8.7	6.1	2.6	9.1	5.7	24	
3	4.8	3.9	4.6	5.5	3.0	7.2	8.4	9.2	9.6	12.8	15.0	16.6	18.4	21.5	20.0	20.4	18.1	16.8	18.4	17.5	22.0	22.9	24.2	28.2	3.0	28.2	14.5	24	
4	31.8	27.8	22.0	24.8	24.7	24.3	23.5	22.9	17.4	P	15.2	14.6	14.0	18.5	21.8	17.9	17.2	13.2	10.0	9.6	9.1	7.8	7.8	7.8	7.8	7.8	31.8	17.6	23
5	8.6	9.5	13.1	13.2	8.2	9.6	4.7	6.8	9.6	16.7	21.3	23.3	24.8	21.4	18.3	15.4	14.5	8.6	6.6	9.5	9.0	9.6	12.5	17.7	4.7	24.8	13.0	24	
6	11.6	14.5	13.9	14.6	13.2	13.4	11.3	10.0	10.3	11.3	13.3	13.3	11.1	7.8	6.4	P	8.8	P	10.2	10.1	3.3	4.4	5.6	6.2	3.3	14.6	10.2	22	
7	6.8	10.6	8.6	11.4	8.4	5.7	8.3	7.9	7.5	5.9	6.8	6.6	13.5	12.6	13.5	15.7	16.7	20.0	15.3	27.0	22.8	15.7	10.4	8.7	5.7	27.0	11.9	24	
8	20.4	19.2	15.8	17.9	17.7	20.9	12.8	5.6	6.2	5.7	4.1	5.8	4.9	8.3	2.6	9.1	6.4	9.1	4.5	6.8	8.0	18.3	21.1	17.7	2.6	21.1	11.2	24	
9	18.4	18.6	13.2	11.4	12.4	15.0	13.7	11.2	10.0	12.2	10.7	12.8	13.4	17.5	17.4	15.6	12.8	18.7	18.5	15.9	20.5	21.4	21.6	21.6	10.0	21.6	15.6	24	
10	14.8	15.9	16.8	15.8	9.6	7.9	5.1	5.8	7.5	8.1	7.5	8.9	12.4	17.6	19.0	21.9	18.8	18.2	16.2	13.4	12.0	16.5	15.5	14.2	5.1	21.9	13.3	24	
11	14.2	15.3	20.6	25.8	28.5	33.6	37.0	32.5	30.7	26.2	26.9	34.7	51.2	70.3	P	P	60.0	49.3	47.2	38.2	30.8	30.9	19.9	13.3	13.3	70.3	33.5	22	
12	9.4	9.8	6.6	5.8	5.2	2.8	9.3	7.8	7.4	11.3	11.7	8.9	18.9	22.8	22.8	19.1	18.7	20.5	16.0	18.3	27.1	26.5	29.0	10.8	2.8	29.0	14.4	24	
13	5.5	10.5	15.3	16.3	15.5	13.1	12.9	11.7	13.7	14.9	15.3	18.2	19.5	21.8	19.5	22.1	19.4	18.3	21.4	21.7	21.1	16.6	14.3	16.4	5.5	22.1	16.5	24	
14	12.7	19.7	21.2	21.6	20.6	16.7	24.1	24.4	22.1	22.2	24.0	22.6	19.1	27.4	24.0	21.7	22.5	22.5	25.9	28.3	26.0	23.8	19.3	30.3	12.7	30.3	22.6	24	
15	29.7	31.8	31.6	18.2	22.6	17.9	19.0	19.4	21.1	23.5	19.4	23.8	23.7	20.1	27.8	15.4	14.3	18.7	15.3	16.0	15.8	13.1	15.3	15.0	13.1	31.8	20.4	24	
16	13.3	17.0	16.3	14.1	13.3	17.4	19.2	17.0	19.0	18.7	18.9	22.9	25.7	30.0	25.9	22.2	27.3	24.1	21.6	8.0	13.4	16.4	17.0	15.0	8.0	30.0	18.9	24	
17	15.4	17.6	15.4	16.3	11.0	9.5	11.2	11.4	14.1	13.0	13.2	12.5	18.0	16.5	9.9	11.9	13.0	8.0	4.3	8.5	9.0	8.7	8.7	12.5	4.3	18.0	12.1	24	
18	12.1	9.8	10.8	9.6	11.1	11.0	10.6	11.0	9.1	12.8	7.1	6.2	5.5	8.3	4.6	3.7	7.2	11.0	9.5	14.1	7.2	8.6	13.5	10.1	3.7	14.1	9.4	24	
19	12.5	12.2	13.2	13.3	10.3	5.8	7.9	10.4	9.9	4.3	7.8	8.4	7.8	8.9	10.3	10.0	5.9	9.7	12.4	20.5	10.7	6.5	3.2	2.7	2.7	20.5	9.4	24	
20	10.3	14.2	11.5	12.9	11.3	14.1	11.1	7.5	9.0	10.7	8.1	7.6	8.1	7.0	2.1	6.4	7.5	6.3	4.4	5.5	4.4	3.9	4.0	6.0	2.1	14.2	8.1	24	
21	5.8	5.3	5.4	6.7	6.0	5.7	5.8	0.0	0.0	5.5	0.0	0.0	3.7	4.0	3.5	11.9	25.9	26.0	20.0	23.9	22.1	20.5	25.9	25.4	0.0	26.0	10.8	24	
22	23.7	27.6	32.0	24.2	22.5	23.6	23.1	21.6	20.9	19.8	19.4	21.5	20.7	20.4	19.9	18.8	15.9	16.4	15.7	17.2	16.4	19.0	14.3	13.5	13.5	32.0	20.3	24	
23	15.7	15.2	16.3	14.9	14.2	12.3	13.1	10.0	13.8	10.4	10.1	10.1	12.2	10.0	9.1	11.2	11.1	15.8	11.8	10.8	10.8	7.1	7.8	9.5	7.1	16.3	11.8	24	
24	10.7	11.9	14.6	13.3	15.5	11.1	11.0	11.2	8.4	8.3	9.1	7.9	9.5	7.6	5.6	6.0	7.8	7.2	7.1	7.5	8.4	9.1	11.2	7.5	5.6	15.5	9.5	24	
25	10.6	7.9	13.3	12.2	12.3	12.2	11.7	10.2	10.3	9.7	7.8	10.5	10.0	6.3	6.8	6.0	5.7	7.1	17.2	10.9	9.3	9.8	10.9	6.6	5.7	17.2	9.8	24	
26	5.3	6.3	9.1	10.3	8.4	7.5	9.9	13.6	15.5	13.2	16.7	22.0	29.6	26.4	24.2	23.7	19.1	9.8	20.2	20.8	23.4	17.7	17.2	19.6	5.3	29.6	16.2	24	
27	18.3	20.2	20.8	18.7	18.9	18.2	18.5	19.8	18.6	17.2	20.3	20.5	22.5	20.5	21.5	16.2	29.5	30.2	20.8	20.6	22.5	19.9	18.4	15.9	15.9	30.2	20.4	24	
28	16.8	13.6	18.9	17.5	14.6	12.4	20.8	20.0	19.3	18.5	22.1	18.9	26.6	12.8	13.2	14.7	11.5	10.4	12.8	17.8	19.3	13.5	12.8	21.3	10.4	26.6	16.7	24	
29	15.2	18.0	20.5	20.1	17.4	16.8	12.9	11.2	10.2	13.9	34.2	22.5	22.2	16.3	19.5	19.2	19.4	8.5	8.7	12.4	13.9	20.3	20.6	18.1	8.5	34.2	17.2	24	
30	15.8	21.5	24.4	26.6	25.6	21.1	26.1	26.0	22.7	36.5	37.1	32.5	44.1	46.3	54.1	44.7	53.3	47.5	49.2	36.2	39.5	36.3	38.9	39.4	15.8	54.1	35.2	24	
31	30.6	35.7	47.5	36.3	36.2	34.5	36.2	28.3	30.6	26.6	20.9	21.3	20.0	Y	Y	24.3	23.8	18.3	10.8	11.2	15.7	15.8	15.8	13.4	10.8	47.5	25.2	22	
HOURLY MAX	31.8	35.7	47.5	36.3	36.2	34.5	37.0	32.5	30.7	36.5	37.1	34.7	51.2	70.3	54.1	44.7	60.0	49.3	49.2	38.2	39.5	36.3	38.9	39.4					
HOURLY AVG	14.5	15.9	16.7	16.0	15.3	14.9	15.4	14.1	14.0	14.8	15.4	15.6	17.9	18.3	16.0	16.2	17.9	16.7	15.5	15.9	15.7	15.2	15.2	14.7					

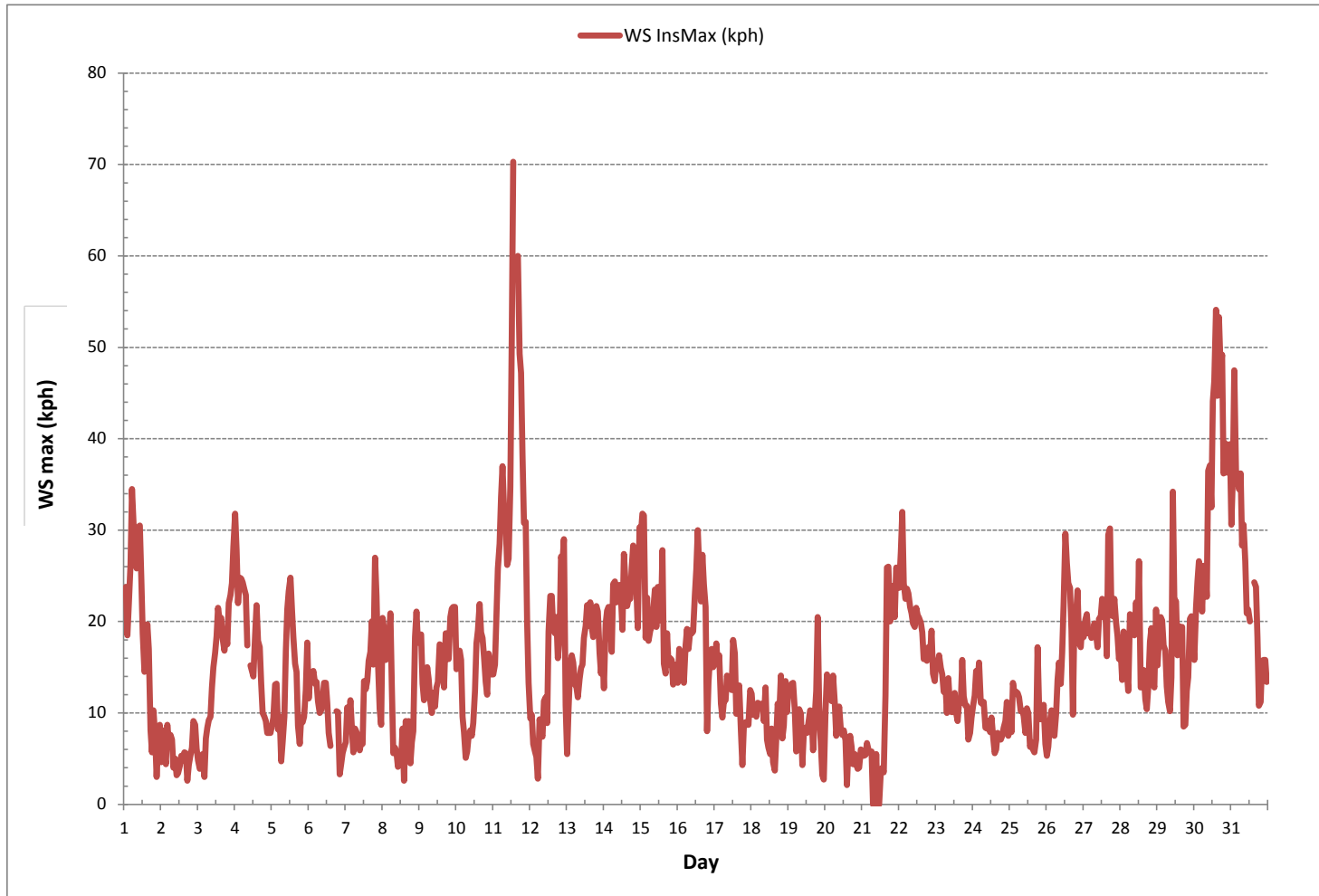
STATUS FLAG CODES

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

MONTHLY SUMMARY




MAXIMUM INSTANTANEOUS VALUE:	70.3	kph	@ HOUR(S)	13	ON DAY(S)	11
					VAR-VARIOUS	
OPERATIONAL TIME:					737	hrs

WIND SPEED Instantaneous Maximum (WS kph)

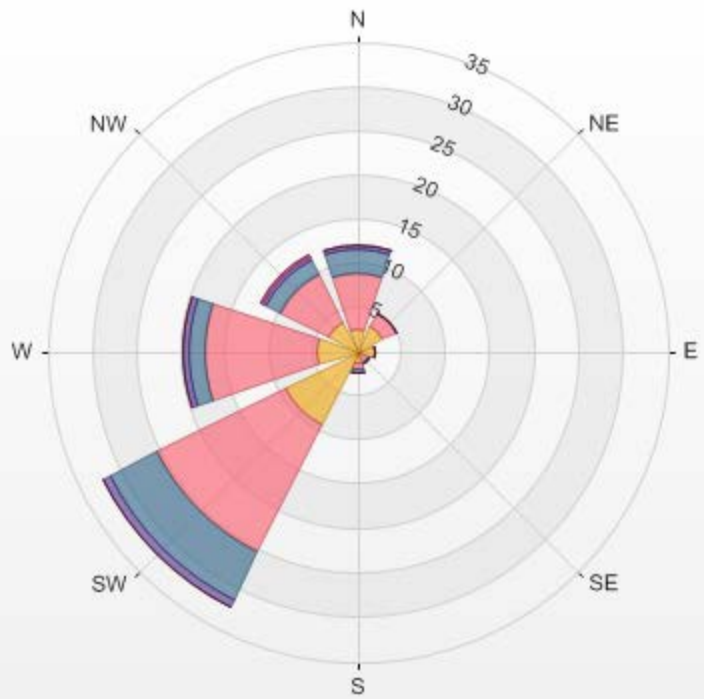


Wind: LICA Bonnyville Monitor: WSP [kph] Monthly: 2017/01 Type: WindRose Direction: Blowing From (Wind Frequency) Based On 1 Hr.
 Calm: 12.55% Valid Data: 99.60% Calm Avg: 0.00 [ppb]

Direction	1.8-5.6	5.6-11.2	11.2-16.8	16.8-22.4	22.4-28.0	>28.0	Total
N	2.56	6.34	2.7	0.4	0.13	0	12.13
NE	3.24	1.62	0	0	0	0	4.86
E	2.02	0	0	0	0	0	2.02
SE	0.54	0.81	0.27	0	0	0	1.62
S	1.35	0.67	0.4	0	0	0	2.42
SW	9.18	16.19	5.94	0.94	0	0	32.25
W	4.59	12.69	1.89	0.67	0	0	19.84
NW	3.64	6.21	1.75	0.54	0.13	0	12.27
Summary	27.12	44.53	12.95	2.55	0.26	0	87.41

% Icon	Classes (kph)	27		1.8-5.6	45		5.6-11.2	13		11.2-16.8	3		16.8-22.4	0		22.4-28.0	0		>28.0
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LICA Bonnyville 2017/01/01 00:00 - 2017/01/31 23:00 Calm: 12.55% Calm Wind Avg Speed: 0.84(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - January 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	W	WNW	WNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	WNW	W	SSW	W	W	W	NW	24	
2	NNW	NNE	WNW	N	NNW	N	NNE	NNE	NNW	WSW	WSW	W	WNW	NW	W	NW	SW	W	WNW	SSW	SW	NW	WNW	S	NW	24	
3	WSW	WNW	WNW	W	NW	WSW	SW	WSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	WNW	NW	WNW	NW	WSW	WSW	24	
4	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	NW	WNW	WNW	W	WSW	WSW	WSW	WSW	WSW	NW	24	
5	SSW	SW	SW	SW	SW	WSW	NNW	NNW	NNW	NNE	NE	NE	NE	NE	NE	NE	NE	NNE	N	NNE	NNE	NE	NE	NE	NNE	24	
6	NE	NE	NE	NE	ENE	SE	SSW	SW	S	SSW	SSW	SW	SW	SW	WSW	W	NE	ENE	NE	E	N	WSW	NNE	NE	ESE	24	
7	NE	ENE	E	E	NE	WSW	NNE	NW	NNE	NNE	S	WSW	WSW	W	WNW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	NW	24	
8	NNW	NNW	N	N	N	N	NNW	NW	WSW	W	N	S	SSE	NW	NNE	NNE	ENE	ENE	ENE	S	SW	SSW	SSW	SSW	NNW	24	
9	SW	SW	W	SW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WNW	W	WNW	W	WNW	WNW	WNW	NW	WSW	24	
10	NW	NW	NNW	N	N	NNW	NW	WSW	WSW	WNW	W	WNW	NNW	NNW	NNW	NW	NW	WNW	W	WSW	WSW	WSW	WSW	SW	WNW	24	
11	SW	WSW	SW	SW	SW	SW	SW	WSW	WSW	W	W	W	NNW	P	NNW	NNW	NNW	NNW	NNW	NNW	NW	NW	NNW	NW	WNW	23	
12	NW	NW	NW	WNW	SSW	WSW	SW	SSW	SE	ESE	E	E	ESE	ESE	SE	SE	SE	ESE	ESE	SSE	S	SSE	SSE	SSE	SE	24	
13	SW	SSW	SSW	SSW	SW	SW	SW	WSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	24	
14	SW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SSW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	WSW	SW	SW	SW	24	
15	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	24
16	WSW	SW	SW	SW	SSW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SW	SSW	SSW	SSW	SSW	WSW	SE	SSE	S	SE	SSW	24
17	S	SSW	S	SSW	SSW	SW	W	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SW	SW	WSW	ENE	SSE	SW	NW	NE	SW	24	
18	NE	NE	NE	NE	E	E	NE	NE	NNE	NNW	W	SSW	W	NW	WSW	S	WSW	SW	WSW	SW	WNW	NNE	SSE	NNE	NNE	24	
19	E	NE	E	NE	NW	WNW	NW	ENE	NE	SSW	NNE	NE	N	NNE	NE	NNE	N	NE	ENE	NNW	NE	W	NW	NW	NE	24	
20	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SSW	WSW	WSW	WSW	WSW	WSW	W	NW	NE	NE	NNE	NNW	NNE	NNW	NNW	NNW	NNW	NNW	WSW	24
21	NW	WNW	SW	WSW	SW	WSW	W	W	W	WSW	WSW	SSW	WSW	SW	NNW	N	NNW	NNW	NNW	N	NNW	NNW	NNW	NNW	NNW	NNW	24
22	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	NNW	NNW	NNW	NNW	NNW	N	N	NNW	NNW	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24
23	NNW	NNW	NNW	NNW	N	N	N	N	N	N	NNW	NW	NNW	NNW	NNW	NNW	NNW	NW	NW	NNW	NNW	WNW	NW	WNW	NNW	24	
24	WNW	WSW	WSW	W	W	WSW	WSW	SW	SW	SSW	SW	SW	SW	SSW	SW	SSW	SW	SSW	SW	SSW	WSW	SW	SW	SW	WSW	SW	24
25	SW	W	WSW	W	SW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	WSW	W	WSW	SW	SSW	SW	SW	SW	SW	WSW	SW	24	
26	SW	SW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	WNW	W	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24
27	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	WSW	WSW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24
28	WSW	WSW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24
29	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	WSW	W	WNW	W	W	WSW	24
30	W	WNW	WNW	W	WNW	WNW	W	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NNW	NNW	WNW	24
31	NNW	N	N	N	N	NNW	N	N	N	N	N	NNW	NNW	Y	Y	W	W	W	WSW	SW	WSW	WSW	W	W	NNW	22	

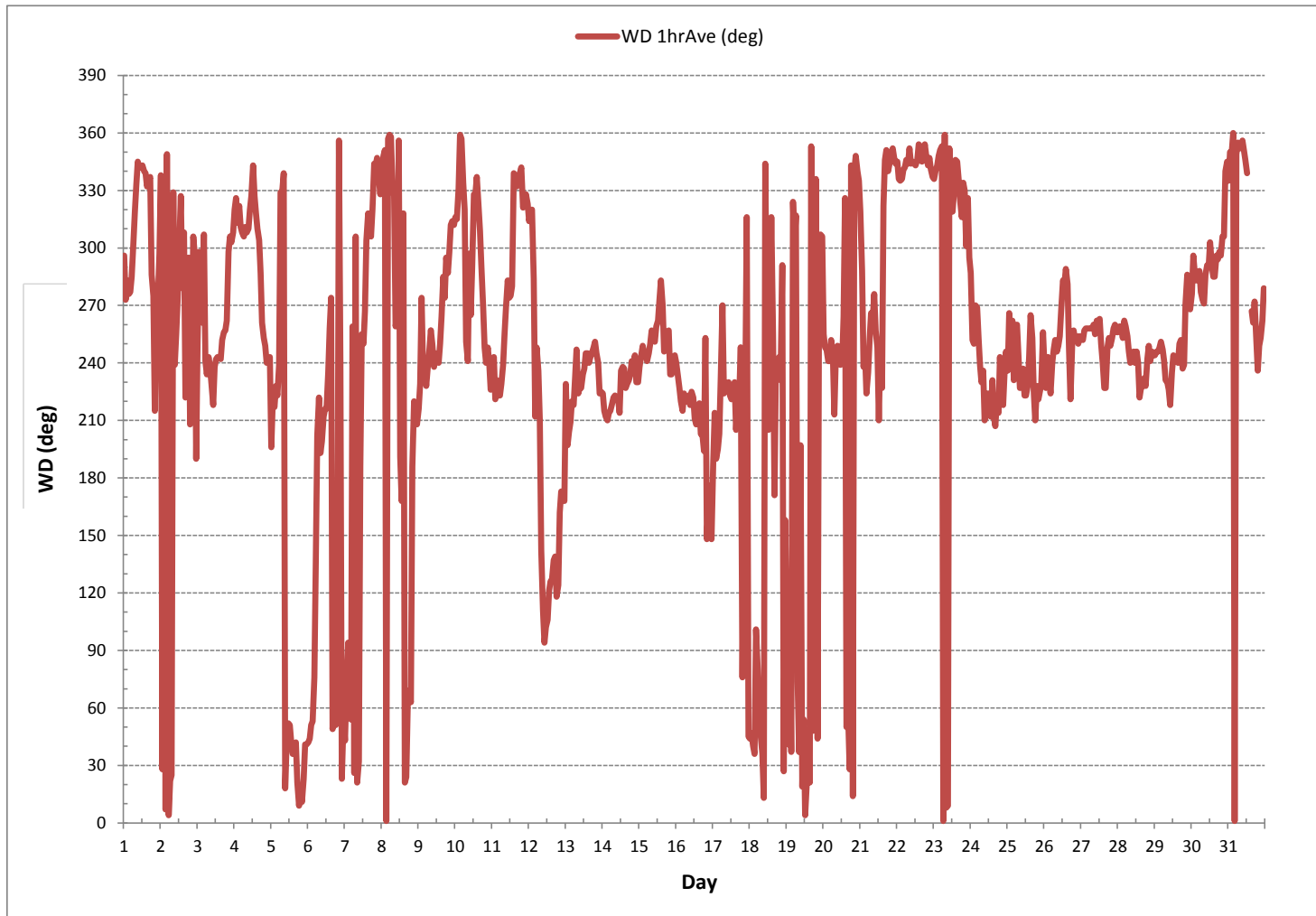
STATUS FLAG CODES

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:	741	hrs
STANDARD DEVIATION:	85		AMD OPERATION UPTIME:	99.6	%
			MONTHLY AVERAGE:	269	(W)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Bonnyville Continuous Monitoring Station - January 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	16	17	17	16	19	18	15	14	14	13	14	13	13	14	13	11	10	16	22	33	27	13	17	10	24	
2	27	13	31	11	8	32	17	18	8	16	14	18	22	9	15	17	12	10	13	16	20	12	23	12	24	
3	13	8	13	13	17	13	20	13	14	10	9	17	15	15	14	13	13	14	15	15	14	13	13	12	24	
4	16	14	14	14	14	13	12	13	12	12	13	13	13	14	16	14	13	16	15	13	11	7	15	12	24	
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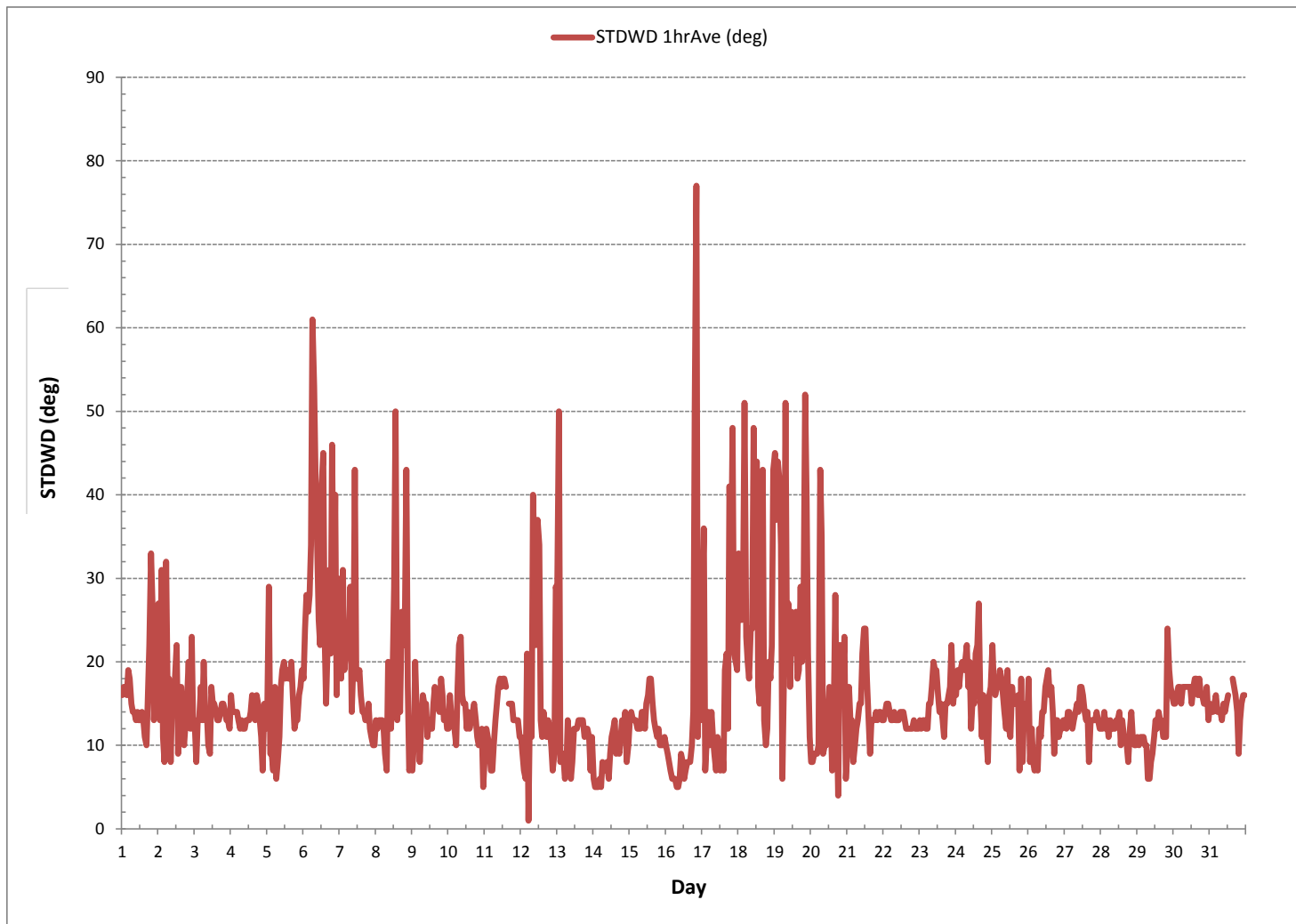
STATUS FLAG CODES

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: 741 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



APPENDIX II
NON-CONTINUOUS MONITORING DATA RESULTS

VOC RESULTS

Maxxam Analytics

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

Client: LICA Sampler S/N: 6200
 Location: Bonnyville - AER Canister ID: H3298
 Station ID: LICA 37 Installation Date/Time (mst): Dec 27, 2016 @ 12:19
 Sample ID: LICA/VOC/Bonnyville/Jan 01, 2017 Removal Date/Time (mst): Jan 04, 2017 @ 11:09

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 01, 2017</u>	<u>00:00</u>	<u>00:00 Jan 02, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>- 27.6</u>	<u>+ 18.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Oct 07, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Sep 28, 2016 (due every 6 months)

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

Comments: Date of last audit - Oct 07, 2016
The canister is not equipped with a pressure gauge.

Deployment Technician Signature: Alex Yakupov
 Collection Technician Signature: Alex Yakupov Date: Jan 04, 2017

Sample ID: 17010017-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Jan 01, 2017



Volatile Organics Data Results

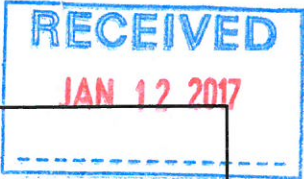
Date: January 1, 2017
Canister ID: H3298

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	0.09
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.04
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.06
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.09
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	1.37
2,3,4-Trimethylpentane	0.05
2,3-Dimethylbutane	5.83
2,3-Dimethylpentane	1.83
2,4-Dimethylpentane	1.94
2-Methylheptane	1.89
2-Methylhexane	8.14
2-Methylpentane	26.80
3-Methylheptane	1.27
3-Methylhexane	7.56
3-Methylpentane	20.40
Acetone	16.80
Acrolein	< 0.3
Benzene	5.36
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.15
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.69
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.03
cis-2-Pentene	< 0.02
Cyclohexane	18.30
Cyclopentane	7.76
Dibromochloromethane	0.02
Ethanol	1.10
Ethyl acetate	< 0.4
Ethylbenzene	0.21
Freon-11	0.40
Freon-113	0.06

Volatile Organics Data Results

Date: January 1, 2017
Canister ID: H3298

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.03
Freon-12	0.84
Hexachloro-1,3-butadiene	< 0.50
Isobutane	287.00
Isopentane	146.00
Isoprene	< 0.01
Isopropyl alcohol	< 0.4
Isopropylbenzene	0.02
m,p-Xylene	1.48
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	16.10
Methylcyclopentane	17.50
Methylene chloride	< 0.3
n-Butane	641.00
n-Decane	0.09
n-Dodecane	< 0.4
n-Heptane	14.20
n-Hexane	34.60
n-Nonane	0.83
n-Octane	3.41
n-Pentane	140.00
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.02
o-Xylene	0.32
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	5.87
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.03
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02



Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Jan 07, 2017

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: 2447
 Station ID: LICA 37 Installation Date/Time (mst): Jan 04, 2017 @ 11:09
 Sample ID: LICA/VOC/Bonnyville/Jan 07, 2017 Removal Date/Time (mst): Jan 09, 2017 @ 18:00

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 07, 2017</u>	<u>00:00</u>	<u>00:00 Jan 08, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.1</u>	<u>+18.5</u>

Flow Settings		
Flow Reading (sccm)	Pot Set Point	Pump Set (psi)
<u>10.0</u>	<u>4.94</u>	<u>26</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = - @ - mst
 Final leak check deployment vacuum (in. Hg) = - @ - mst
 Total leak rate = - psi over - minutes
 Timer reset to zero prior to sampling? YES (yes/no)
 Date of last flow calibration: Oct 07, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Sep 28, 2016 (due every 6 months)

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

Comments: Date of last audit - Oct 07, 2016
The canister is not equipped with a pressure gauge.

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: LIMIN LI Date: Jan 09, 2017

Volatile Organics Data Results

Date: January 7, 2017
Canister ID: 2447

PARAMETERS	CONCENTRATION (PPB)
1,1,1-Trichloroethane	< 0.02
1,1,2,2-Tetrachloroethane	< 0.02
1,1,2-Trichloroethane	< 0.02
1,1-Dichloroethane	< 0.02
1,1-Dichloroethylene	< 0.04
1,2,3-Trimethylbenzene	< 0.05
1,2,4-Trichlorobenzene	< 0.8
1,2,4-Trimethylbenzene	0.12
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
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	0.03
2,2,4-Trimethylpentane	0.05
2,2-Dimethylbutane	0.06
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.08
2,3-Dimethylpentane	0.09
2,4-Dimethylpentane	0.03
2-Methylheptane	0.04
2-Methylhexane	0.09
2-Methylpentane	0.17
3-Methylheptane	0.03
3-Methylhexane	0.08
3-Methylpentane	0.11
Acetone	1.10
Acrolein	< 0.3
Benzene	0.22
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.05
Carbon tetrachloride	0.10
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.62
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.04
cis-2-Pentene	0.02
Cyclohexane	0.19
Cyclopentane	0.08
Dibromochloromethane	< 0.01
Ethanol	1.50
Ethyl acetate	< 0.4
Ethylbenzene	0.05
Freon-11	0.26
Freon-113	0.09

Volatile Organics Data Results

Date: January 7, 2017
Canister ID: 2447

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.60
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.98
Isopentane	0.84
Isoprene	0.02
Isopropyl alcohol	< 0.4
Isopropylbenzene	0.01
m,p-Xylene	0.12
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	0.31
Methylcyclopentane	0.22
Methylene chloride	< 0.3
n-Butane	1.79
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.09
n-Hexane	0.17
n-Nonane	0.02
n-Octane	0.04
n-Pentane	0.50
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.02
o-Xylene	0.05
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.16
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.02
trans-2-Pentene	0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

Maxxam Analytics

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

Client: LICA
 Location: Bonnyville - AER
 Station ID: LICA 3F
 Sample ID: LICA/VOC/Bonnyville/Jan 13, 2017

Sampler S/N: ~~6200~~ 6200
 Canister ID: ~~1720~~ 2440
 Installation Date/Time (mst): Jan 09, 2017 @ 18:29
 Removal Date/Time (mst): Jan 17, 2017 @ 18:51

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 13, 2017</u>	<u>00:00</u>	<u>Jan 14, 2017 @ 00:00</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.8</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> <u>28</u>

Deployment/Collection and Maintenance Checklist

Initial leak check deployment vacuum (in. Hg) = _____ @ _____ mst
 Final leak check deployment vacuum (in. Hg) = _____ @ _____ mst
 Total leak rate = _____ psi over _____ minutes
 Timer reset to zero prior to sampling? Yes (yes/no)
 Date of last flow calibration: Oct 07, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Sept 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: Aimin Li Date: Jan 09, 2017

Collection Technician Signature: Alex Yakupov Date: Jan 17, 2017



Sample ID: 17010130-002

Customer ID: LICA

Cust Samp ID: LICA/VOC/Bonnyville/ Jan 13, 2017

Volatile Organics Data Results

Date: January 13, 2017
Canister ID: 2440

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	0.12
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	0.05
2-Methylpentane	0.13
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.07
Acetone	2.70
Acrolein	0.30
Benzene	0.19
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.18
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.02
Chloromethane	0.60
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	1.60
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.32
Freon-113	0.10

Volatile Organics Data Results

Date: January 13, 2017
Canister ID: 2440

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.64
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.14
Isopentane	0.71
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	0.07
Methylcyclopentane	0.07
Methylene chloride	< 0.3
n-Butane	1.93
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
n-Hexane	0.13
n-Nonane	< 0.01
n-Octane	< 0.02
n-Pentane	0.40
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	0.12
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.03
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	0.70
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: 2652
 Station ID: LICA 37 Installation Date/Time (mst): Jan 17, 2017 @ 12:51
 Sample ID: LICA/VOC/Bonnyville/Jan 19, 2017 Removal Date/Time (mst): Jan 20, 2017 @ 12:08

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 19, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Jan 20, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.4</u>	<u>+17.9</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: Oct 07, 2016 (due every 3 months)
 Last date of sample line & fitting replacement: Sep 28, 2016 (due every 6 months)

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

Comments: Date of last audit - Oct 07, 2016

Deployment Technician Signature: Alex Yakupov

Collection Technician Signature: Alex Yakupov Date: Jan 20, 2017

Sample ID: 17010190-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Jan 19, 2017



Volatile Organics Data Results

Date: January 19, 2017
Canister ID: 2652

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	0.07
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.03
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.04
1,3-Butadiene	0.08
1,3-Dichlorobenzene	< 0.3
1,4-Dichlorobenzene	< 0.4
1,4-Dioxane	< 0.4
1-Butene	0.21
1-Hexene	< 0.02
1-Pentene	0.03
2,2,4-Trimethylpentane	0.11
2,2-Dimethylbutane	0.06
2,3,4-Trimethylpentane	0.03
2,3-Dimethylbutane	0.14
2,3-Dimethylpentane	0.17
2,4-Dimethylpentane	0.07
2-Methylheptane	0.06
2-Methylhexane	0.16
2-Methylpentane	0.29
3-Methylheptane	0.04
3-Methylhexane	0.15
3-Methylpentane	0.21
Acetone	2.10
Acrolein	< 0.3
Benzene	0.32
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.52
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	0.07
cis-2-Pentene	< 0.02
Cyclohexane	0.28
Cyclopentane	0.13
Dibromochloromethane	< 0.01
Ethanol	3.40
Ethyl acetate	< 0.4
Ethylbenzene	0.07
Freon-11	0.33
Freon-113	0.10

Volatile Organics Data Results

Date: January 19, 2017
Canister ID: 2652

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.72
Hexachloro-1,3-butadiene	< 0.50
Isobutane	3.09
Isopentane	1.66
Isoprene	0.02
Isopropyl alcohol	< 0.4
Isopropylbenzene	< 0.01
m,p-Xylene	0.25
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	0.43
Methylcyclopentane	0.35
Methylene chloride	< 0.3
n-Butane	5.36
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.15
n-Hexane	0.32
n-Nonane	0.03
n-Octane	0.06
n-Pentane	0.80
n-Propylbenzene	< 0.05
n-Undecane	< 0.5
Naphthalene	< 0.5
o-Ethyltoluene	0.03
o-Xylene	0.08
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	0.20
Tetrahydrofuran	< 0.4
Toluene	0.49
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	0.08
trans-2-Pentene	0.04
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: 1531
 Station ID: LICA 37 Installation Date/Time (mst): Jan 20, 2017 @ 12:08
 Sample ID: LICA/VOC/Bonnyville/Jan 25, 2017 Removal Date/Time (mst): Jan 27, 2017 @ 14:03

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 25, 2017</u>	<u>00:00</u>	<u>00:00 Jan 26, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.4</u>	<u>+19.5</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) = -27.4 @ Jan 20, 2017/12:08 mst
 Final leak check deployment vacuum (in. Hg) = -27.4 @ Jan 20, 2017/16:08 mst
 Total leak rate = 0.0 psi over 240 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 leak check performed on Jan 20, 2017

Deployment Technician Signature: Alex Yakupov

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

Sample ID: 17010213-001

Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Jan 25, 2017



Volatile Organics Data Results

Date: January 25, 2017
Canister ID: 1531

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	0.06
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	0.04
2,4-Dimethylpentane	0.02
2-Methylheptane	0.02
2-Methylhexane	0.04
2-Methylpentane	0.12
3-Methylheptane	< 0.02
3-Methylhexane	0.05
3-Methylpentane	0.09
Acetone	1.10
Acrolein	< 0.3
Benzene	0.19
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	0.03
Chloromethane	0.51
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.04
cis-2-Butene	< 0.02
cis-2-Pentene	< 0.02
Cyclohexane	0.05
Cyclopentane	0.04
Dibromochloromethane	< 0.01
Ethanol	1.10
Ethyl acetate	< 0.4
Ethylbenzene	0.02
Freon-11	0.39
Freon-113	0.12

Volatile Organics Data Results

Date: January 25, 2017
Canister ID: 1531

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.03
Freon-12	0.83
Hexachloro-1,3-butadiene	< 0.50
Isobutane	1.30
Isopentane	0.76
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	0.07
Methylcyclopentane	0.08
Methylene chloride	< 0.3
n-Butane	2.48
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.05
n-Hexane	0.17
n-Nonane	< 0.01
n-Octane	0.03
n-Pentane	0.60
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	0.14
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: 2405
 Station ID: LICA 37 Installation Date/Time (mst): Jan 27, 2017 @ 14:42
 Sample ID: LICA/VOC/Bonnyville/Jan 31, 2017 Removal Date/Time (mst): Feb 01, 2017 @ 14:54

Date and Time Information

Sample Date:	Start Time (mst)	End Time (mst)	Elapsed Time (hours)
<u>Jan 31, 2017</u>	<u>00:00</u>	<u>00:00</u> <u>Feb 01, 2017</u>	<u>24.0</u>

Canister Pressure/Vacuum	
Initial Vacuum (in. Hg)	Final Pressure (psi)
<u>-27.0</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 01, 2017



Sample ID: 17020031-001
 Customer ID: LICA
 Cust Samp ID: LICA/VOC/Bonnyville/Jan 31, 2017

Volatile Organics Data Results

Date: January 31, 2017
Canister ID: 2405

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	0.07
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.02
2,2-Dimethylbutane	< 0.01
2,3,4-Trimethylpentane	< 0.01
2,3-Dimethylbutane	< 0.02
2,3-Dimethylpentane	0.02
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.01
2-Methylhexane	0.03
2-Methylpentane	0.04
3-Methylheptane	< 0.02
3-Methylhexane	0.03
3-Methylpentane	0.03
Acetone	1.50
Acrolein	< 0.3
Benzene	0.10
Benzyl chloride	< 0.4
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.02
Carbon tetrachloride	0.13
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.56
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	0.37
Freon-113	0.11

Volatile Organics Data Results

Date: January 31, 2017
Canister ID: 2405

PARAMETERS	CONCENTRATION (PPB)
Freon-114	0.02
Freon-12	0.79
Hexachloro-1,3-butadiene	< 0.50
Isobutane	0.36
Isopentane	0.22
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	0.60
n-Decane	< 0.06
n-Dodecane	< 0.4
n-Heptane	0.04
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	< 0.01
p-Diethylbenzene	< 0.04
p-Ethyltoluene	< 0.07
Styrene	< 0.04
Tetrachloroethylene	< 0.04
Tetrahydrofuran	< 0.4
Toluene	0.05
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.04
trans-2-Butene	< 0.01
trans-2-Pentene	< 0.02
Trichloroethylene	< 0.04
Vinyl acetate	< 0.4
Vinyl chloride	< 0.02

PAH RESULTS

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 1, 2017
PUF S/N: 9801

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.70
2-Methylnaphthalene	1.41
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.06
Acenaphthylene	0.06
Acridine	< 0.01
Anthracene	0.03
Benzo(a)anthracene	0.01
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	< 0.01
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	0.04
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.07
Fluorene	0.10
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	1.61
Perylene	< 0.01
Phenanthrene	0.24
Pyrene	0.06
Retene	0.13

Sample ID: 17010086-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Jan 07, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>A 13-02</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139 / 100 - 1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Jan 04, 2017 / 12:08</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Jan 7, 2017</u>		

Sample Data Collection Information

Sample Date:	<u>Jan 07, 2017</u>	Average Pressure (mmHg)	<u>713</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>22.9</u>
End Time (mst):	<u>00:00 Jan 08, 2017</u>	Average Temperature (°C)	<u>-19.6</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.16</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	<input type="radio"/> YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Oct 07, 2016</u>	
Other observations?	<u>no</u>	

Deployed By:	<u>Alex Yakupov</u>	
Collected By:	<u>LSMIN LJ</u>	Date: <u>Jan 09, 2017</u>

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 7, 2017
PUF S/N: A13-02

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.55
2-Methylnaphthalene	0.94
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.08
Acenaphthylene	0.11
Acridine	< 0.01
Anthracene	0.03
Benzo(a)anthracene	0.01
Benzo(a)pyrene	0.01
Benzo(b,j,k)fluoranthene	0.06
Benzo(c)phenanthrene	0.02
Benzo(e)pyrene	0.02
Benzo(ghi)perylene	0.02
Chrysene	0.04
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.01
Fluoranthene	0.10
Fluorene	0.13
Indeno(1,2,3-cd)pyrene	0.01
Naphthalene	1.05
Perylene	< 0.01
Phenanthrene	0.35
Pyrene	0.08
Retene	0.16

Sample ID: 17010130-003

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/ Jan 13, 2017

RECEIVED
JAN 18 2017

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE 07</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139/100 - 1015</u>
Station ID:	<u>LICA 3F</u>	Installation Date/Time:	<u>Jan 09, 2017</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Jan 13, 2017</u>	Removal Date/Time:	<u>Jan 17, 2017 / 12:37</u>

Sample Data Collection Information

Sample Date:	<u>Sample Jan 13, 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>Jan 14, 2017 @ 00:00</u>	Average Temperature (°C)	<u>-13.9°</u>
Elapsed Time (Hours):	<u>24.0</u>	Volume (V _{std} m ³)	<u>330.19</u>

Sample Recovery Checklist

(circle one)

Flow Rate 230 slpm +/- 0.2 slpm ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Oct 07, 2016</u>	
Other observations?	<u>n/a</u>	

Deployed By:	ALEX <u>Timur Li</u>	<u>Jan 09, 2017</u>
Collected By:	Timur Li	Jan 09, 2017

Alex Yakupov Date: Jan 17, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

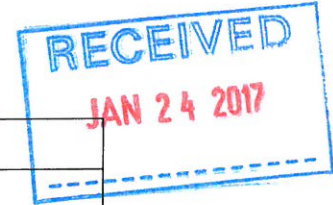
Date: January 13, 2017
PUF S/N: TE-07

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.30
2-Methylnaphthalene	0.52
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.11
Acenaphthylene	0.03
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	< 0.01
Benzo(a)pyrene	0.02
Benzo(b,j,k)fluoranthene	0.05
Benzo(c)phenanthrene	0.02
Benzo(e)pyrene	0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.04
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	0.01
Fluoranthene	0.10
Fluorene	0.19
Indeno(1,2,3-cd)pyrene	0.01
Naphthalene	0.47
Perylene	< 0.01
Phenanthrene	0.40
Pyrene	0.06
Retene	0.15

Sample ID: 17010190-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Jan 19, 2017



TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-04</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139 / 100-1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Jan 17, 2017 / 12:37</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Jan 19, 2017</u>	Removal Date/Time:	<u>Jan 20, 2017 / 11:58</u>

Sample Data Collection Information

Sample Date:	<u>Jan 19, 2017</u>	Average Pressure (mmHg)	<u>686</u>
Start Time (mst):	<u>00:00</u>	Average Flow (Q _{std})	<u>229</u>
End Time (mst):	<u>00:00 Jan 20, 2017</u>	Average Temperature (°C)	<u>-4.6°</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	NO
Average temperature appears correct?	<input checked="" type="radio"/> YES	NO
Average pressure appears correct?	<input checked="" type="radio"/> YES	NO
Any error messages? (if yes list below)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	NO
Date of last calibration/audit:	<u>Oct 07, 2016</u>	
Other observations?	<u>n/a</u>	

Deployed By: Alex Yakupov

Collected By: Alex Yakupov

Date: Jan 20, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 19, 2017
PUF S/N: TE-04

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.62
2-Methylnaphthalene	1.06
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.23
Acenaphthylene	0.89
Acridine	< 0.01
Anthracene	0.11
Benzo(a)anthracene	0.04
Benzo(a)pyrene	0.04
Benzo(b,j,k)fluoranthene	0.10
Benzo(c)phenanthrene	0.03
Benzo(e)pyrene	0.04
Benzo(ghi)perylene	< 0.01
Chrysene	0.05
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.20
Fluorene	0.40
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.84
Perylene	< 0.01
Phenanthrene	0.77
Pyrene	0.20
Retene	0.20

Sample ID: 17010213-002

Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Jan 25, 2017

TISCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>TE-02</u>	
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139 / 100-1015</u>	
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Jan 20, 2017 / 11:58</u>	
Field Sample ID:	<u>LICA/PUF/Bonnyville/Jan 25, 2017</u>		Removal Date/Time:	<u>Jan 27, 2017 / 13:04</u>

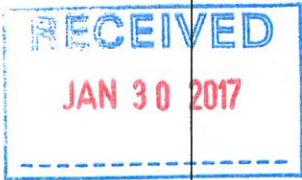
Sample Data Collection Information

Sample Date:	<u>Jan 25, 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 Jan 26, 2017</u>	Average Temperature (°C)	<u>-11.3°</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)	YES	<input checked="" type="radio"/> NO
Sample duration 24 hours?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Date of last calibration/audit:	<u>Oct 07, 2016</u>	
Other observations?	<u>n/a</u>	



Deployed By: Alex Yakupov

Collected By: Alex Yakupov Date: Jan 27, 2017

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 25 , 2017
PUF S/N: TE-02

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.46
2-Methylnaphthalene	0.77
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.11
Acenaphthylene	0.15
Acridine	< 0.01
Anthracene	0.02
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.02
Benzo(e)pyrene	< 0.01
Benzo(ghi)perylene	< 0.01
Chrysene	0.02
Dibenzo(a,h)pyrene	< 0.01
Dibenzo(a,i)pyrene	< 0.01
Dibenzo(a,l)pyrene	< 0.01
Dibenzo(ah)anthracene	< 0.01
Fluoranthene	0.09
Fluorene	0.21
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.80
Perylene	< 0.01
Phenanthrene	0.36
Pyrene	0.07
Retene	0.08

Sample ID: 17020031-002

AI Customer ID: LICA

Cust Samp ID: LICA/PUF/Bonnyville/Jan 31, 2017

SCH PUF PLUS Sample Collection Data Sheet

Client:	<u>LICA</u>	Puf+ S/N:	<u>9801</u>
Location:	<u>Bonnyville - AER</u>	Motor S/N:	<u>1139 / 100 - 1015</u>
Station ID:	<u>LICA 37</u>	Installation Date/Time:	<u>Jan 27, 2017 / 14:06</u>
Field Sample ID:	<u>LICA/PUF/Bonnyville/Jan 31, 2017</u>	Removal Date/Time:	<u>Feb 01, 2017 / 14:39</u>

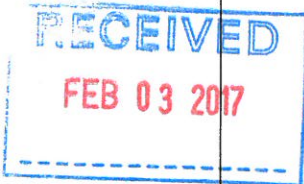
Sample Data Collection Information

Sample Date:	<u>Jan 31, 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 01, 2017</u>	Average Temperature (°C)	<u>-13.1°</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: Jan 27, 2017

Feb 01, 2017 (A.Y.)

Polycyclic Aromatic Hydrocarbons (PAHs) Data Results

Date: January 31, 2017
PUF S/N: 9801

PARAMETERS	CONCENTRATION (µg/puf)
1-Methylnaphthalene	0.5
2-Methylnaphthalene	0.79
3-Methylcholanthrene	< 0.01
7,12-Dimethylbenz(a)anthracene	< 0.01
Acenaphthene	0.08
Acenaphthylene	0.07
Acridine	< 0.01
Anthracene	< 0.01
Benzo(a)anthracene	0.02
Benzo(a)pyrene	< 0.01
Benzo(b,j,k)fluoranthene	0.04
Benzo(c)phenanthrene	0.02
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	0.05
Fluorene	0.09
Indeno(1,2,3-cd)pyrene	< 0.01
Naphthalene	0.63
Perylene	< 0.01
Phenanthrene	0.18
Pyrene	0.04
Retene	0.05

NMHC CANISTER RESULTS

Sample ID: 17010044-001

Customer ID: LICA
Cust Samp ID: LICA/NMHC-
VOC/Bonnyville

AIR FCD-01320/2

Maxxam

VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC-VOC/Bonnyville/

Sampler S/N: n/a
Canister ID: 17132
Canister Installation Date/Time: January 04, 2017 / 11:49
Canister Removal Date/Time: January 07, 2017 / 11:00

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours) <i>MINUTES</i>
<u>January 6, 2017</u>	<u>20:20</u>	<u>20:25</u> n/a	<u>5</u> n/a

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
n/a	n/a	n/a

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
<u>-27.9</u>	<u>-4</u>

Canister valve open prior to sampling? YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments:

NMHC canister

5 MINUTES DATA 0:34^(100m) at 20:20 P.M.

Technician Signature: _____

Alex Yakupov

Date: _____

Removed by Raja Akid. Jan 7, 2017.

Volatile Organics Data Results (NMHC Canister System)

Date: January 6, 2017
Canister ID: 17132

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	< 0.04
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	< 0.01
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	< 0.02
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.11
1-Hexene	< 0.02
1-Pentene	< 0.01
2,2,4-Trimethylpentane	0.04
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.01
2,3-Dimethylbutane	0.04
2,3-Dimethylpentane	0.04
2,4-Dimethylpentane	0.01
2-Methylheptane	0.02
2-Methylhexane	0.05
2-Methylpentane	0.08
3-Methylheptane	< 0.02
3-Methylhexane	0.04
3-Methylpentane	0.06
Acetone	1.1
Acrolein	< 0.4
Benzene	0.32
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.12
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.52
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.04
cis-2-Pentene	< 0.02
Cyclohexane	0.05
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	1.5
Ethyl acetate	< 0.5
Ethylbenzene	0.03
Freon-11	0.33
Freon-113	0.1

Volatile Organics Data Results (NMHC Canister System)

Date: January 6, 2017
Canister ID: 17132

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.67
Hexachloro-1,3-butadiene	< 0.61
Isobutane	0.75
Isopentane	0.39
Isoprene	< 0.01
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.1
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.61
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.1
Methylcyclopentane	0.08
Methylene chloride	< 0.4
n-Butane	1.08
n-Decane	< 0.07
n-Dodecane	< 0.5
n-Heptane	0.04
n-Hexane	0.07
n-Nonane	< 0.01
n-Octane	0.03
n-Pentane	0.2
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	0.1
Tetrahydrofuran	< 0.5
Toluene	0.19
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: 17010086-005

Customer ID: LICA

Cust Samp ID: LICA/NMHC/VOC/Bonnyville



Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: BONNYVILLE - AER. Canister ID: 55624
 Station ID: LICA - 37 Canister Installation Date/Time: January 7, 2017 11:01
 Field Sample ID: 55624, LICA/NMHC/VOC Canister Removal Date/Time: Jan 09, 2017 @ 19:14
R.A. BONNYVILLE

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 09, 2017</u>	<u>16:20</u>	<u>17:20</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>-27.7</u>	<u>-2</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments:

NMHC canister

Canister triggered @ 16:20 on Jan 09, 2017.

NMHC 5 m Average 0.40 ppm @ 16:15 pm

Technician Signature:

Installed by Raja and Removed by Steven Li

Date:

Jan 09, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: January 9, 2017
Canister ID: S5624

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	0.1
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.05
1,3-Butadiene	< 0.03
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.35
1-Hexene	< 0.03
1-Pentene	0.03
2,2,4-Trimethylpentane	0.18
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.07
2,3-Dimethylbutane	0.05
2,3-Dimethylpentane	0.17
2,4-Dimethylpentane	0.05
2-Methylheptane	0.04
2-Methylhexane	0.17
2-Methylpentane	0.17
3-Methylheptane	0.04
3-Methylhexane	0.17
3-Methylpentane	0.1
Acetone	1.2
Acrolein	< 0.4
Benzene	0.42
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.01
Carbon tetrachloride	0.11
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.48
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.09
cis-2-Pentene	0.03
Cyclohexane	0.06
Cyclopentane	0.03
Dibromochloromethane	< 0.01
Ethanol	1.6
Ethyl acetate	< 0.5
Ethylbenzene	0.13
Freon-11	0.3
Freon-113	0.1

Volatile Organics Data Results (NMHC Canister System)

Date: January 9, 2017
Canister ID: S5624

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.03
Freon-12	0.59
Hexachloro-1,3-butadiene	< 0.66
Isobutane	0.75
Isopentane	0.71
Isoprene	0.03
Isopropyl alcohol	< 0.5
Isopropylbenzene	0.02
m,p-Xylene	0.35
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	0.11
Methylcyclopentane	0.12
Methylene chloride	< 0.4
n-Butane	1.88
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.19
n-Hexane	0.15
n-Nonane	0.03
n-Octane	0.05
n-Pentane	0.4
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	0.04
o-Xylene	0.16
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	0.08
Tetrahydrofuran	< 0.5
Toluene	0.58
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.03
trans-2-Pentene	0.04
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.03

Sample ID: 17010086-006

Customer ID: LICA

Cust Samp ID: LICA/NMHC/VOC/Bonnyville



Maxxam

VOC Sample Collection Data Sheet

Client: LICA
 Location: Bonnyville - ACR
 Station ID: LICA - 37
 Field Sample ID: LICA/NMHC/VOC/Bonnyville

Sampler S/N: n/a
 Canister ID: 17120
 Canister Installation Date/Time: Jan 09, 2017 @ 19:30
 Canister Removal Date/Time: Jan 11, 2017 @ 11:25

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
Jan 10, 2017	16:10	17:10 n/a	1 n/a

Flow Settings		
Meter Reading (sccm)	Pot Set Pt.	Pump Pressure Setting (psig)
n/a	n/a	n/a

Canister Information	
Initial Canister Vacuum (inHg)	Final Canister Vacuum (inHg)
-27.8	-3

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments:

NMHC canister

Technician Signature:

in by LICA 1/9
out by LICA 1/11

Date:

Jan 11, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: January 10, 2017
Canister ID: 17120

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	< 0.04
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	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.18
1-Hexene	< 0.03
1-Pentene	0.02
2,2,4-Trimethylpentane	0.07
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.02
2,3-Dimethylbutane	0.03
2,3-Dimethylpentane	0.07
2,4-Dimethylpentane	0.03
2-Methylheptane	0.02
2-Methylhexane	0.06
2-Methylpentane	0.09
3-Methylheptane	< 0.03
3-Methylhexane	0.06
3-Methylpentane	0.06
Acetone	0.9
Acrolein	< 0.4
Benzene	0.53
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.1
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	< 0.03
Chloromethane	0.5
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.04
cis-2-Pentene	< 0.03
Cyclohexane	0.03
Cyclopentane	0.01
Dibromochloromethane	< 0.01
Ethanol	1.1
Ethyl acetate	< 0.5
Ethylbenzene	0.05
Freon-11	0.29
Freon-113	0.09

Volatile Organics Data Results (NMHC Canister System)

Date: January 10, 2017
Canister ID: 17120

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.03
Freon-12	0.58
Hexachloro-1,3-butadiene	< 0.66
Isobutane	0.53
Isopentane	0.39
Isoprene	0.02
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.13
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	0.04
Methylcyclopentane	0.06
Methylene chloride	< 0.4
n-Butane	1.15
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.05
n-Hexane	0.07
n-Nonane	< 0.01
n-Octane	< 0.03
n-Pentane	0.2
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	0.02
o-Xylene	0.06
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	0.2
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.03
trans-2-Pentene	< 0.03
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.03

Sample ID: 17010105-001

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC/VOC/Bonnyville
e

Maxxam



VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA - 37
Field Sample ID: LICA/NMHC/VOC/Bonnyville

Sampler S/N: n/a
Canister ID: 1837
Canister Installation Date/Time: Jan 11, 2017 @ 11:40
Canister Removal Date/Time: Jan 13, 2017 @ 08:50

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 12, 2017</u>	<u>09:50</u>	<u>Jan 12, 2017 10:50</u> n/a	<u>1</u> n/a

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>n/a</u>	<u>n/a</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Technician Signature: in by henric li
out by henric li

Date: Jan 13, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: January 12, 2017
Canister ID: 1837

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	0.07
1,2,4-Trichlorobenzene	< 0.9
1,2,4-Trimethylbenzene	0.23
1,2-Dibromoethane	< 0.02
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.08
1,3-Butadiene	< 0.02
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.47
1-Hexene	< 0.02
1-Pentene	0.07
2,2,4-Trimethylpentane	0.21
2,2-Dimethylbutane	0.05
2,3,4-Trimethylpentane	0.06
2,3-Dimethylbutane	0.1
2,3-Dimethylpentane	0.29
2,4-Dimethylpentane	0.09
2-Methylheptane	0.1
2-Methylhexane	0.35
2-Methylpentane	0.41
3-Methylheptane	0.08
3-Methylhexane	0.32
3-Methylpentane	0.24
Acetone	1.7
Acrolein	< 0.4
Benzene	0.38
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.01
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.03
Chloromethane	0.58
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.12
cis-2-Pentene	0.05
Cyclohexane	0.11
Cyclopentane	0.06
Dibromochloromethane	< 0.01
Ethanol	4.4
Ethyl acetate	< 0.5
Ethylbenzene	0.17
Freon-11	0.3
Freon-113	0.09

Volatile Organics Data Results (NMHC Canister System)

Date: January 12, 2017
Canister ID: 1837

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.6
Hexachloro-1,3-butadiene	< 0.59
Isobutane	1.3
Isopentane	1.56
Isoprene	0.04
Isopropyl alcohol	10
Isopropylbenzene	0.02
m,p-Xylene	0.62
m-Diethylbenzene	< 0.05
m-Ethyltoluene	0.13
Methyl butyl ketone	< 0.59
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.08
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.27
Methylcyclopentane	0.32
Methylene chloride	< 0.4
n-Butane	3.85
n-Decane	< 0.07
n-Dodecane	< 0.5
n-Heptane	0.21
n-Hexane	0.33
n-Nonane	0.04
n-Octane	0.1
n-Pentane	0.6
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	< 0.6
o-Ethyltoluene	0.06
o-Xylene	0.26
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.08
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	0.74
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.1
trans-2-Pentene	0.09
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.02

Sample ID: 17010130-001

Customer ID: LICA

Cust Samp ID: LICA/NMHC/VOC/Bonnyville
e/ Jan 13, 2017

Maxxam



VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville - AER Canister ID: 55661
 Station ID: LICA - 3I Canister Installation Date/Time: Jan 13, 2017 @ 09:10
 Field Sample ID: LICA/NMHC/VOC/Bonnyville Canister Removal Date/Time: Jan 17, 2017 / 13:17
Jan 13, 2017

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 13, 2017</u>	<u>14:35</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>-27.3</u>	<u>-1.0</u>

Canister valve open prior to sampling?: YES / NO

Canister valve closed prior to disconnection?: YES / NO

Comments: NMHC canister

Results also to Cheri Sinclair as per email.
JMP

Technician Signature:

Sample in: LEMIA HI
Sample out:
Alex Yakupov

Date: Jan 17, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: January 13, 2017
Canister ID: S5661

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	< 0.06
1,2,4-Trichlorobenzene	< 1.0
1,2,4-Trimethylbenzene	< 0.06
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	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.08
1-Hexene	< 0.03
1-Pentene	< 0.01
2,2,4-Trimethylpentane	< 0.01
2,2-Dimethylbutane	0.02
2,3,4-Trimethylpentane	0.01
2,3-Dimethylbutane	< 0.03
2,3-Dimethylpentane	< 0.03
2,4-Dimethylpentane	< 0.01
2-Methylheptane	0.01
2-Methylhexane	0.03
2-Methylpentane	0.1
3-Methylheptane	< 0.03
3-Methylhexane	0.03
3-Methylpentane	0.07
Acetone	1.9
Acrolein	< 0.4
Benzene	0.15
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	0.01
Carbon tetrachloride	0.12
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	0.03
Chloromethane	0.57
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	< 0.03
cis-2-Pentene	< 0.03
Cyclohexane	0.03
Cyclopentane	0.02
Dibromochloromethane	< 0.01
Ethanol	1
Ethyl acetate	< 0.5
Ethylbenzene	0.02
Freon-11	0.31
Freon-113	0.1

Volatile Organics Data Results (NMHC Canister System)

Date: January 13, 2017
Canister ID: S5661

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.03
Freon-12	0.62
Hexachloro-1,3-butadiene	< 0.64
Isobutane	0.72
Isopentane	0.46
Isoprene	< 0.01
Isopropyl alcohol	< 0.5
Isopropylbenzene	0.02
m,p-Xylene	0.05
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.64
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.04
Methylcyclopentane	0.06
Methylene chloride	< 0.4
n-Butane	1.38
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.04
n-Hexane	0.13
n-Nonane	< 0.01
n-Octane	< 0.03
n-Pentane	0.3
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	< 0.6
o-Ethyltoluene	< 0.01
o-Xylene	0.02
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	< 0.05
Tetrahydrofuran	< 0.5
Toluene	0.13
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: 17010190-003

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/Jan 17,
2017

Maxxam

VOC Sample Collection Data Sheet

Client: LICA Sampler S/N: n/a
 Location: Bonnyville AER Canister ID: 1530
 Station ID: LICA 37 Canister Installation Date/Time: January 17, 2017 / 13:17
 Field Sample ID: LICA/NMHC VOC/Bonnyville/Jan 17, 2017 Canister Removal Date/Time: January 20, 2017 / 12:38

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 17, 2017</u>	<u>18:45</u>	<u>n/a</u>	<u>n/a</u>

Flow Settings		
Meter Reading (scm)	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>-27.3</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: Jan 20, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: January 17, 2017
Canister ID: 1530

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	0.26
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	0.14
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	0.52
1-Hexene	0.04
1-Pentene	0.06
2,2,4-Trimethylpentane	0.23
2,2-Dimethylbutane	0.03
2,3,4-Trimethylpentane	0.06
2,3-Dimethylbutane	0.11
2,3-Dimethylpentane	0.28
2,4-Dimethylpentane	0.09
2-Methylheptane	0.07
2-Methylhexane	0.3
2-Methylpentane	0.37
3-Methylheptane	0.05
3-Methylhexane	0.29
3-Methylpentane	0.3
Acetone	3.3
Acrolein	< 0.4
Benzene	0.64
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.02
Bromoform	< 0.02
Bromomethane	< 0.01
Carbon disulfide	0.14
Carbon tetrachloride	0.11
Chlorobenzene	< 0.02
Chloroethane	< 0.02
Chloroform	0.05
Chloromethane	0.48
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.14
cis-2-Pentene	0.07
Cyclohexane	0.11
Cyclopentane	0.06
Dibromochloromethane	< 0.01
Ethanol	9.9
Ethyl acetate	< 0.5
Ethylbenzene	0.13
Freon-11	0.31
Freon-113	0.09

Volatile Organics Data Results (NMHC Canister System)

Date: January 17, 2017
Canister ID: 1530

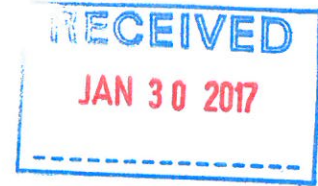
PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.02
Freon-12	0.66
Hexachloro-1,3-butadiene	< 0.62
Isobutane	3.82
Isopentane	2.34
Isoprene	0.05
Isopropyl alcohol	0.6
Isopropylbenzene	< 0.01
m,p-Xylene	0.49
m-Diethylbenzene	< 0.05
m-Ethyltoluene	< 0.10
Methyl butyl ketone	< 0.62
Methyl ethyl ketone	< 0.4
Methyl isobutyl ketone	< 0.5
Methyl methacrylate	< 0.09
Methyl tert butyl ether	< 0.04
Methylcyclohexane	0.16
Methylcyclopentane	0.36
Methylene chloride	0.5
n-Butane	8.91
n-Decane	< 0.07
n-Dodecane	< 0.5
n-Heptane	0.18
n-Hexane	0.62
n-Nonane	0.05
n-Octane	0.07
n-Pentane	0.9
n-Propylbenzene	< 0.06
n-Undecane	< 0.6
Naphthalene	< 0.6
o-Ethyltoluene	0.04
o-Xylene	0.17
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	0.06
Tetrachloroethylene	1.6
Tetrahydrofuran	< 0.5
Toluene	1.02
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	0.12
trans-2-Pentene	0.11
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.02

Sample ID: 17010213-003

AIR FCD-01320/2

Customer ID: LICA
Cust Samp ID: LICA/NMHC
VOC/Bonnyville/Jan 20,
2017

Maxxam



VOC Sample Collection Data Sheet

Client: LICA
Location: Bonnyville - AER
Station ID: LICA 37
Field Sample ID: LICA/NMHC VOC/Bonnyville/
Jan 20, 2017

Sampler S/N: n/a
Canister ID: 35669
Canister Installation Date/Time: January 20, 2017 / 12:41
Canister Removal Date/Time: January 26, 2017 / 14:25

Date and Time Information			
Sample Date	Start Time (MST)	End Time (MST)	Elapsed Time (Hours)
<u>Jan 20, 2017</u>	<u>14:55</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>-27.3</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: January 26, 2017

Volatile Organics Data Results (NMHC Canister System)

Date: January 20, 2017
Canister ID: S5669

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	0.11
1,2-Dibromoethane	< 0.03
1,2-Dichlorobenzene	< 0.04
1,2-Dichloroethane	0.02
1,2-Dichloropropane	< 0.01
1,3,5-Trimethylbenzene	0.05
1,3-Butadiene	0.12
1,3-Dichlorobenzene	< 0.4
1,4-Dichlorobenzene	< 0.5
1,4-Dioxane	< 0.5
1-Butene	1.75
1-Hexene	0.07
1-Pentene	0.17
2,2,4-Trimethylpentane	0.23
2,2-Dimethylbutane	0.04
2,3,4-Trimethylpentane	0.06
2,3-Dimethylbutane	0.23
2,3-Dimethylpentane	0.33
2,4-Dimethylpentane	0.14
2-Methylheptane	0.05
2-Methylhexane	0.26
2-Methylpentane	0.57
3-Methylheptane	0.03
3-Methylhexane	0.26
3-Methylpentane	0.39
Acetone	9.7
Acrolein	< 0.4
Benzene	0.5
Benzyl chloride	< 0.5
Bromodichloromethane	< 0.03
Bromoform	< 0.03
Bromomethane	< 0.01
Carbon disulfide	< 0.01
Carbon tetrachloride	0.13
Chlorobenzene	< 0.03
Chloroethane	< 0.03
Chloroform	0.03
Chloromethane	0.49
cis-1,2-Dichloroethene	< 0.01
cis-1,3-Dichloropropene	< 0.05
cis-2-Butene	0.93
cis-2-Pentene	0.13
Cyclohexane	0.07
Cyclopentane	0.07
Dibromochloromethane	< 0.01
Ethanol	5.9
Ethyl acetate	< 0.5
Ethylbenzene	0.1
Freon-11	0.37
Freon-113	0.11

Volatile Organics Data Results (NMHC Canister System)

Date: January 20, 2017
Canister ID: 55669

PARAMETERS	CONCENTRATION (PPB)
Freon-114	< 0.03
Freon-12	0.76
Hexachloro-1,3-butadiene	< 0.66
Isobutane	17.5
Isopentane	8.66
Isoprene	0.04
Isopropyl alcohol	< 0.5
Isopropylbenzene	< 0.01
m,p-Xylene	0.33
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	0.12
Methylcyclopentane	0.29
Methylene chloride	< 0.4
n-Butane	37
n-Decane	< 0.08
n-Dodecane	< 0.5
n-Heptane	0.23
n-Hexane	0.33
n-Nonane	0.01
n-Octane	0.05
n-Pentane	1.5
n-Propylbenzene	< 0.07
n-Undecane	< 0.7
Naphthalene	< 0.7
o-Ethyltoluene	0.03
o-Xylene	0.12
p-Diethylbenzene	< 0.05
p-Ethyltoluene	< 0.09
Styrene	< 0.05
Tetrachloroethylene	0.42
Tetrahydrofuran	< 0.5
Toluene	0.63
trans-1,2-Dichloroethylene	< 0.01
trans-1,3-Dichloropropylene	< 0.05
trans-2-Butene	1.07
trans-2-Pentene	0.27
Trichloroethylene	< 0.05
Vinyl acetate	< 0.5
Vinyl chloride	< 0.03

APPENDIX III
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: January 4, 2017	Barometric Pressure: 0.942 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: A few clouds
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 9:38	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 13:54	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	Station SO2 Analyzer Range? ppb
Last Calibration Date: December 23, 2016	As Found C.F.: 1.007	
Previous C.F.: 1.000	New C.F.: 1.000	

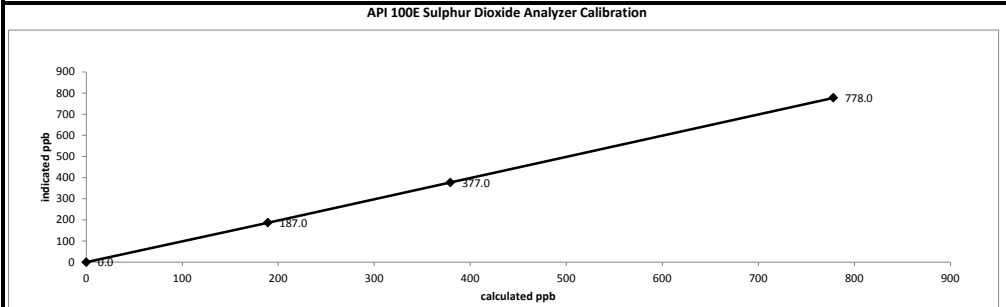
Calibrator:	Standard Calibration Points for Ranges								
Flow Meter ID's: n/a	<table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								
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	773.0	1.007
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	4966	37.50	5004	379.2	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

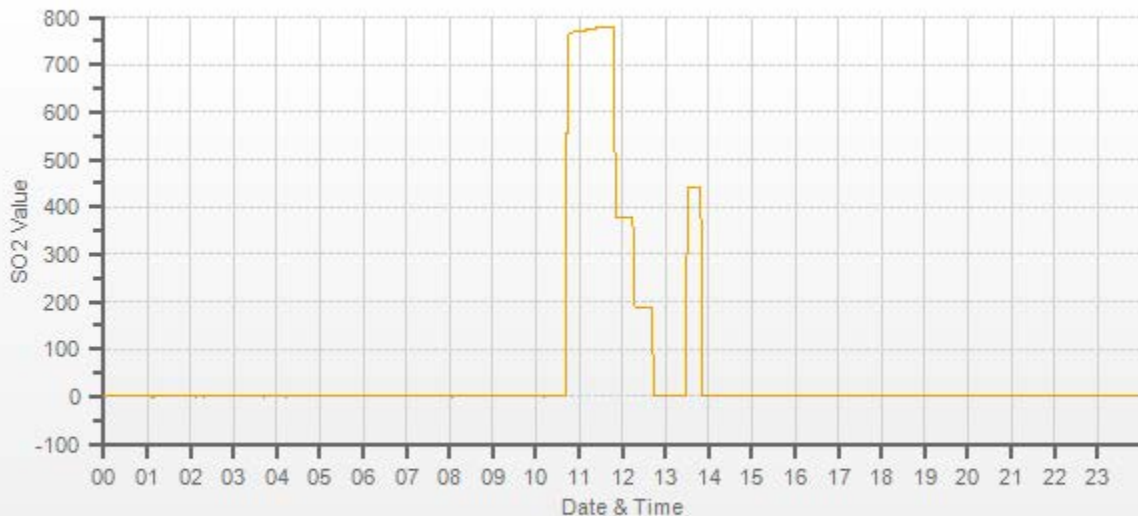
Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.13%</u>	.95-1.05
% change in C.F. from last cal = <u>-0.66%</u>	± 3% F.S.
	± 10%



<p style="text-align: center; font-weight: bold; font-size: small;">As found:</p> <p>SLOPE: <u>0.968</u></p> <p>OFFSET: <u>125.2</u></p> <p>HVPS: <u>524</u></p> <p>RCCELL TEMP: <u>50.0</u></p> <p>BOX TEMP: <u>33.1</u></p> <p>PMT TEMP: <u>8.1</u></p> <p>IZS TEMP: <u>50.0</u></p> <p>PRES: <u>25.8</u></p> <p>SAMP FL: <u>541</u></p> <p>NORM PMT: <u>123.3</u></p> <p>UV LAMP: <u>2737.0</u></p> <p>LAMP RATIO: <u>98.5</u></p> <p>STR. LGT: <u>60.6</u></p> <p>DRK PMT: <u>16.0</u></p> <p>DRK LMP: <u>2.7</u></p> <p>Expected Value: <u>442.8</u></p>	<p style="text-align: center; font-weight: bold; font-size: small;">As left:</p> <p>SLOPE: <u>0.971</u></p> <p>OFFSET: <u>123.3</u></p> <p>HVPS: <u>524</u></p> <p>RCCELL TEMP: <u>50.0</u></p> <p>BOX TEMP: <u>33.2</u></p> <p>PMT TEMP: <u>8.1</u></p> <p>IZS TEMP: <u>50.0</u></p> <p>PRES: <u>25.8</u></p> <p>SAMP FL: <u>541</u></p> <p>NORM PMT: <u>123.1</u></p> <p>UV LAMP: <u>2737.4</u></p> <p>LAMP RATIO: <u>98.4</u></p> <p>STR. LGT: <u>59.9</u></p> <p>DRK PMT: <u>15.9</u></p> <p>DRK LMP: <u>2.7</u></p> <p>Expected Value: <u>439.0</u></p>
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Comments:
The analyzer sample inlet filter was changed.



— SO2[ppb]



API 100E Sulphur Dioxide Analyzer Calibration

Date: January 20, 2017	Barometric Pressure: 0.916 atm
Company/Airshed: LICA	Station Temperature °C: 24
Location/Station Name: Bonnyville - AER	Weather Conditions: Mix of sun and clouds
Parameter: Sulphur Dioxide	Calibration Purpose: repeat
Start Time 24 hr. (mst): 11:22	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 15:06	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	Station SO2 Analyzer Range?
Last Calibration Date: January 4, 2017	As Found C.F.: 0.986	ppb
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="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								
Make & Model: API 700									
Serial #: 690									
Cal Gas Cylinder I.D. #: LL104222									
Cal Gas Conc. (ppm): 50.6									

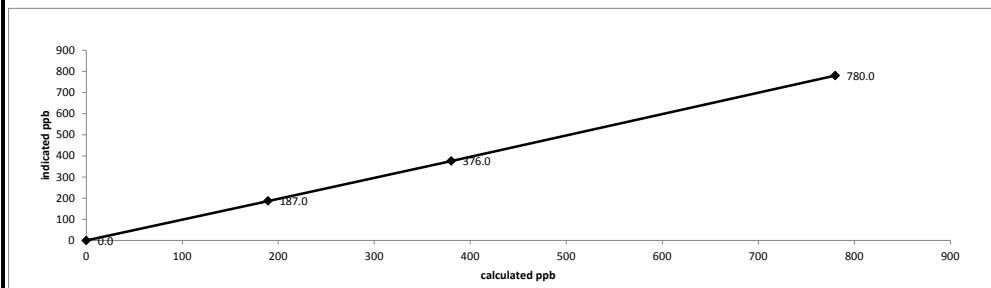
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	2.8	n/a
as found high	4918	77.00	4995	780.0	794.0	0.986
adjusted zero	5000	0.00	5000	0.0	0.0	n/a
adjusted high	4918	77.00	4995	780.0	780.0	1.000
mid	4954	37.50	4992	380.1	376.0	1.011
low	4977	18.70	4996	189.4	187.0	1.013
calibrator zero	5000	0.00	5000	0.0	0.0	n/a
Average C.F.=						1.008

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>0.18%</u>	± 3% F.S.
% change in C.F. from last cal = <u>1.41%</u>	± 10%

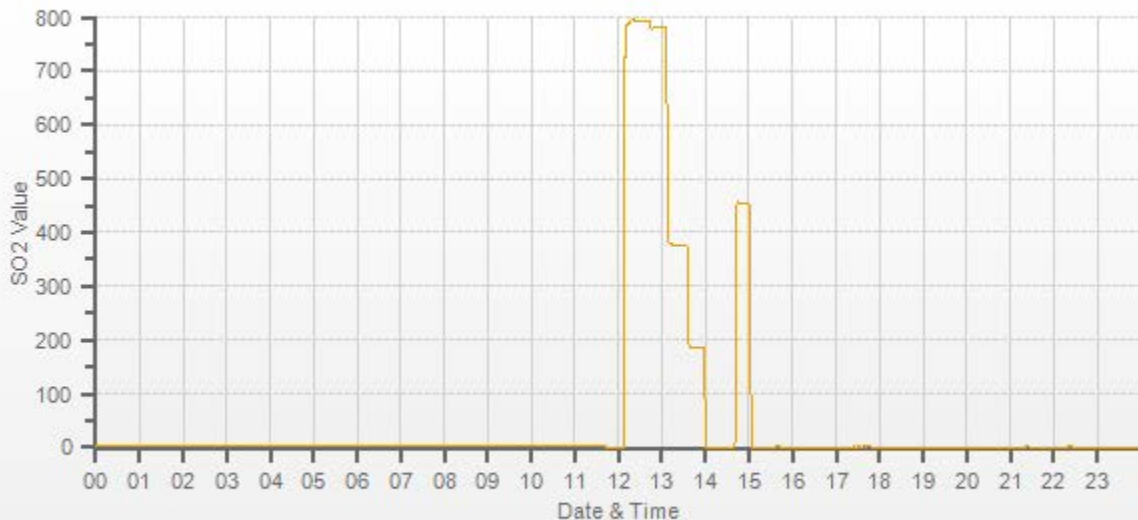
API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
SLOPE: <u>0.972</u>	SLOPE: <u>0.956</u>
OFFSET: <u>124.2</u>	OFFSET: <u>130.4</u>
HVPS: <u>524</u>	HVPS: <u>524</u>
RCELL TEMP: <u>50.0</u>	RCELL TEMP: <u>50.0</u>
BOX TEMP: <u>32.5</u>	BOX TEMP: <u>33.3</u>
PMT TEMP: <u>8.1</u>	PMT TEMP: <u>8.1</u>
IZS TEMP: <u>50.0</u>	IZS TEMP: <u>50.0</u>
PRES: <u>24.8</u>	PRES: <u>24.8</u>
SAMP FL: <u>529</u>	SAMP FL: <u>529</u>
NORM PMT: <u>129.3</u>	NORM PMT: <u>130.3</u>
UV LAMP: <u>2724.4</u>	UV LAMP: <u>2721.2</u>
LAMP RATIO: <u>98.0</u>	LAMP RATIO: <u>97.9</u>
STR. LGT: <u>60.4</u>	STR. LGT: <u>62.3</u>
DRK PMT: <u>15.3</u>	DRK PMT: <u>15.8</u>
DRK LMP: <u>2.7</u>	DRK LMP: <u>2.7</u>
Expected Value: <u>439.0</u>	Expected Value: <u>452.0</u>

Comments:

Repeat calibration required to correct a ZERO drift.



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: January 4, 2017	Barometric Pressure: 0.942 atm
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville - AER	Weather Conditions: A few clouds
Parameter: Hydrogen Sulphide	Calibration Purpose: routine monthly
Start Time 24 hr. (mst): 9:38	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
End Time 24 hr. (mst): 13:54	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	Station SO ₂ Analyzer Range?
Last Calibration Date: December 16, 2016	As Found C.F.: 1.005	1000 ppb
Previous C.F.: 0.998	New C.F.: 1.000	

Calibrator:	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)								
Flow Meter ID's: n/a	<table border="1" style="display: inline-table;"><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.: 10:38/10:48
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										

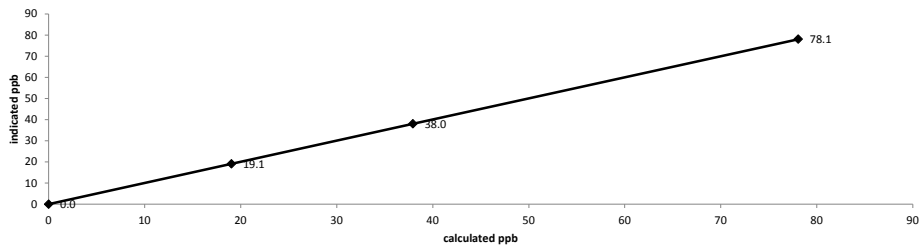
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	77.7	1.005
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	38.0	0.999
low	7486	14.00	7500	19.0	19.1	0.997
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 = 1.000	.95-1.05
b (Intercept as % of full scale) = -0.03%	± 3% F.S.
% change in C.F. from last cal = -0.68%	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration

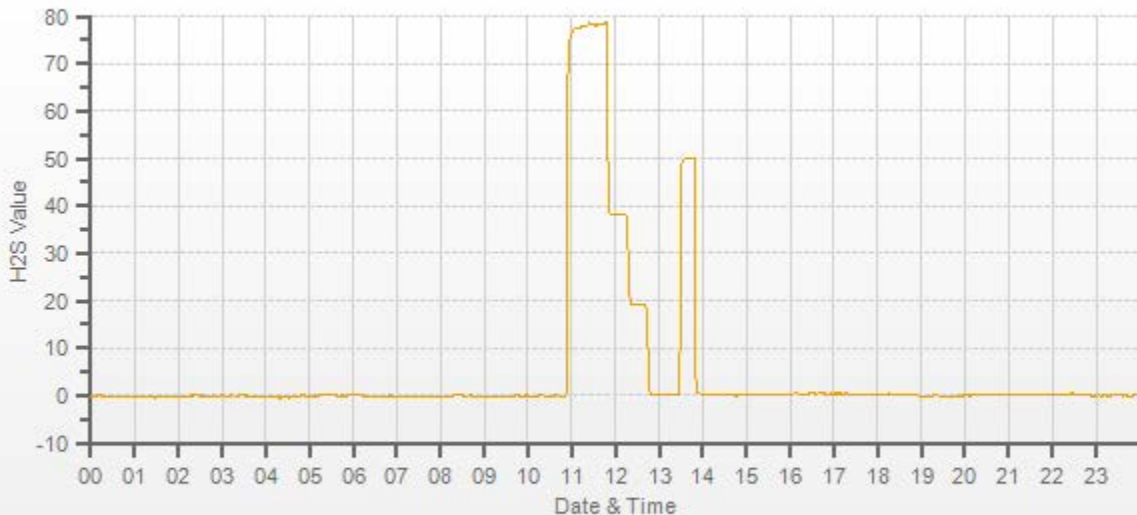


<p style="text-align: center;">As found:</p> <p>SLOPE: 0.957</p> <p>OFFSET: 31.3</p> <p>HVPS: 530</p> <p>RCELL TEMP: 50.0</p> <p>BOX TEMP: 35.3</p> <p>PMT TEMP: 8.4</p> <p>IZS TEMP: 45.0</p> <p>Converter Temp: 314.4</p> <p>PRES: 21.2</p> <p>SAMP FL: 549</p> <p>UV LAMP: 3506.2</p> <p>LAMP RATIO: 92.4</p> <p>STR. LGT: 15.0</p> <p>DRK PMT: 37.2</p> <p>DRK LMP: -1.9</p> <p>Expected Value: 49.9</p>	<p style="text-align: center;">As left:</p> <p>SLOPE: 0.959</p> <p>OFFSET: 30.8</p> <p>HVPS: 530</p> <p>RCELL TEMP: 50.0</p> <p>BOX TEMP: 35.4</p> <p>PMT TEMP: 8.4</p> <p>IZS TEMP: 45.0</p> <p>Converter Temp: 314.9</p> <p>PRES: 21.2</p> <p>SAMP FL: 549</p> <p>UV LAMP: 3503.5</p> <p>LAMP RATIO: 92.3</p> <p>STR. LGT: 14.8</p> <p>DRK PMT: 35.3</p> <p>DRK LMP: -1.8</p> <p>Expected Value: 49.9</p>
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Comments:

The analyzer sample inlet filter was changed.

The EV has not changed after the calibration.



— H2S[ppb]



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>January 20, 2017</u>	Barometric Pressure: <u>0.916 atm</u>
Company/Airshed: <u>LICA</u>	Station Temperature °C: <u>24</u>
Location/Station Name: <u>Bonnyville - AER</u>	Weather Conditions: <u>Mix of sun and clouds</u>
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>repeat</u>
Start Time 24 hr. (mst): <u>11:22</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Trina Whitsitt</u>
End Time 24 hr. (mst): <u>15:13</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>

Analyzer:		
ID# or Serial Number: <u>510</u>	Range ppb: <u>100</u>	Station SO ₂ Analyzer Range? <u>1000 ppb</u>
Last Calibration Date: <u>January 4, 2017</u>	As Found C.F.: <u>0.964</u>	
Previous C.F.: <u>1.000</u>	New C.F.: <u>0.998</u>	

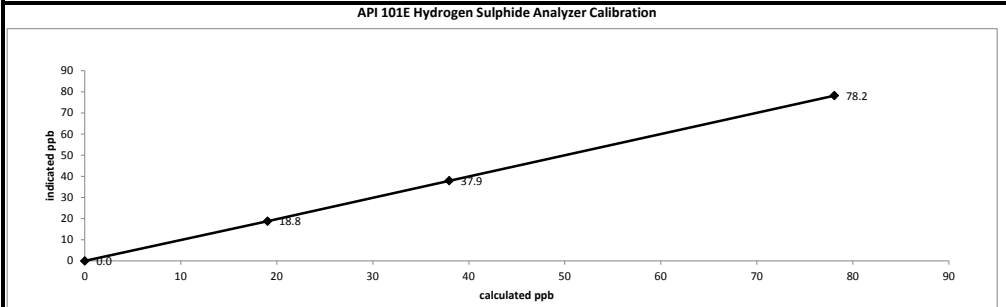
Calibrator:	Standard Calibration Points for Ranges	SO ₂ Scrubber Check (10 mins.)								
Flow Meter ID's: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: <u>780</u>
Point	ppb									
High	78									
Mid	38									
Low	19									
Make & Model: <u>SABIO 2010 D</u>		Target Concentration (ppb): <u>780</u>								
Serial #: <u>11900613</u>		Result (ppb): <u>0</u>								
Cal Gas Cylinder I.D. #: <u>EY0000654</u>		Zero Corrected Result (ppb): <u>0</u>								
Cal Gas Conc. (ppm): <u>10.2</u>										

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	81.0	0.964
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	37.9	1.001
low	7486	14.00	7500	19.0	18.8	1.013
calibrator zero	7500	0.00	7500	0.0	0.0	n/a
Average C.F.=						1.004

Linear Regression/Calibration Results:

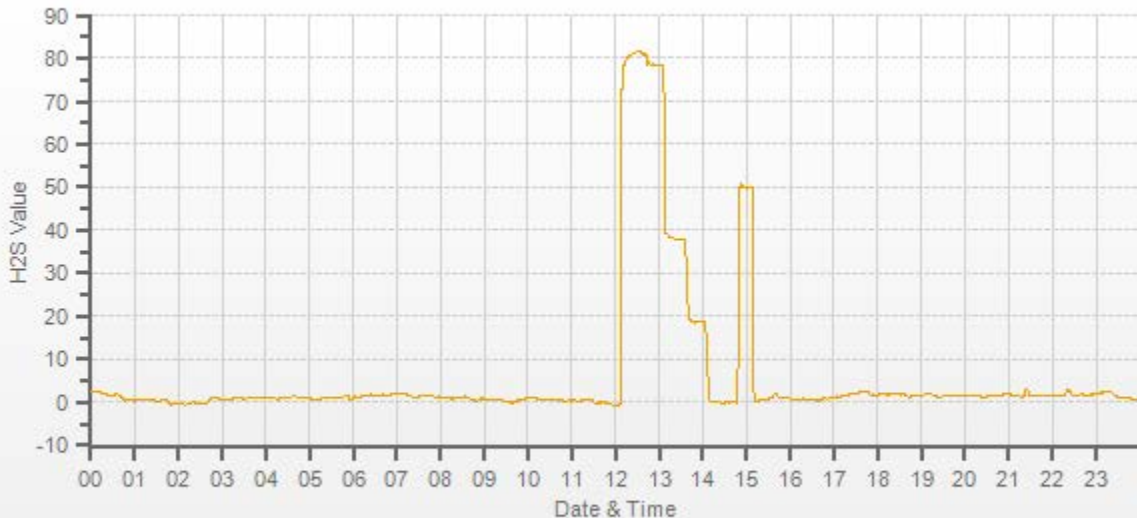
Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.997</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.13%</u>	.95-1.05
% change in C.F. from last cal = <u>3.62%</u>	± 3% F.S.
	± 10%



<p style="text-align: center;">As found:</p> SLOPE: <u>0.959</u> OFFSET: <u>30.8</u> HVPS: <u>530</u> RCCELL TEMP: <u>50.0</u> BOX TEMP: <u>35.1</u> PMT TEMP: <u>8.4</u> IZS TEMP: <u>45.0</u> Converter Temp: <u>314.4</u> PRES: <u>20.3</u> SAMP FL: <u>531</u> UV LAMP: <u>3486.1</u> LAMP RATIO: <u>91.8</u> STR. LGT: <u>14.8</u> DRK PMT: <u>37.2</u> DRK LMP: <u>-1.8</u> Expected Value: <u>49.9</u>	<p style="text-align: center;">As left:</p> SLOPE: <u>0.918</u> OFFSET: <u>32.0</u> HVPS: <u>530</u> RCCELL TEMP: <u>50.0</u> BOX TEMP: <u>35.6</u> PMT TEMP: <u>8.4</u> IZS TEMP: <u>45.0</u> Converter Temp: <u>314.6</u> PRES: <u>20.3</u> SAMP FL: <u>532</u> UV LAMP: <u>3477.3</u> LAMP RATIO: <u>91.6</u> STR. LGT: <u>14.7</u> DRK PMT: <u>36.3</u> DRK LMP: <u>-1.8</u> Expected Value: <u>50.0</u>
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Comments:

"Repeat" calibration completed to correct the EV.



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	January 3, 2017	Barometric Pressure:	0.948 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):	12:50 / 16:23	Performed By/Reviewer:	Alex Yakupov Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 25, 2023

Analyzer:		Correction Factors:			
ID# or Serial Number:	1236656107	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1.093	CH ₄ =	1.000	1.008	1.000
Last Calibration Date:	December 15, 2016	NMHC =	1.000	0.989	1.000
Range ppm:	20 CH ₄ /20 NMHC/40 THC	THC =	1.000	0.998	1.000

Calibrator:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
Flow Meter ID's:	n/a	Point	CH ₄	NMHC	THC
Make & Model:	API 700	High	13.00	13.00	26.00
Serial #:	627	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. #:	LL165372	Low	3.00	3.00	6.00
CH ₄ Cylinder Conc. =	606.0 212.0	=C ₂ H ₆ Cylinder Conc.			
CH ₄ as C ₂ H ₆ =	583.0 1189.0	=total CH ₄ equivalent			

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

Point	Calibrator Flow Rates (cc/min)			Calculated CH ₄ (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH ₄ (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH ₄	NMHC	THC
as found zero	2000	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2000	46.00	2046	13.62	13.11	26.73	13.51	13.26	26.78	1.008	0.989	0.998
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	13.63	13.11	26.73	1.000	1.000	1.000
mid	2000	24.00	2024	7.19	6.91	14.10	7.15	6.90	14.04	1.005	1.002	1.004
low	2000	11.00	2011	3.31	3.19	6.50	3.29	3.19	6.49	1.008	1.000	1.002
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. =		
										1.004	1.000	1.002

Linear Regression/Calibration Results:

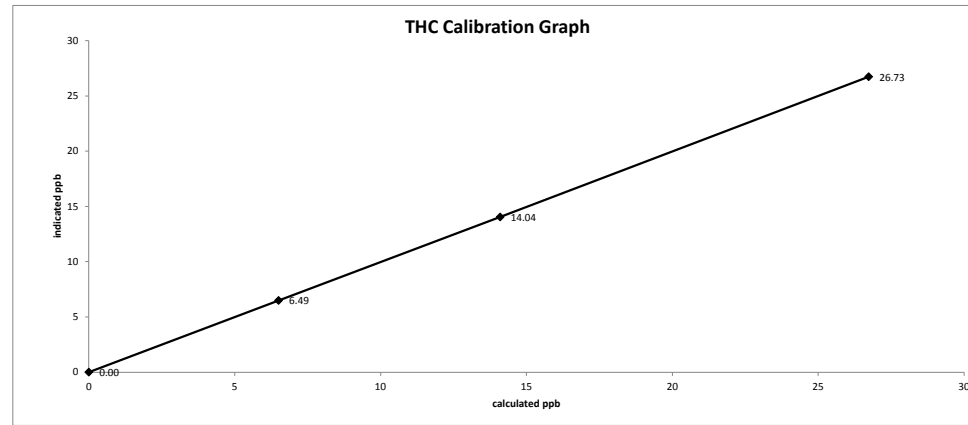
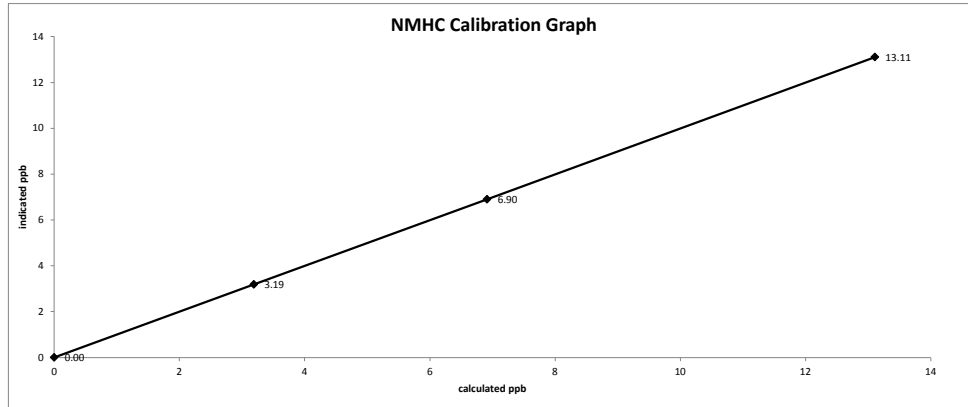
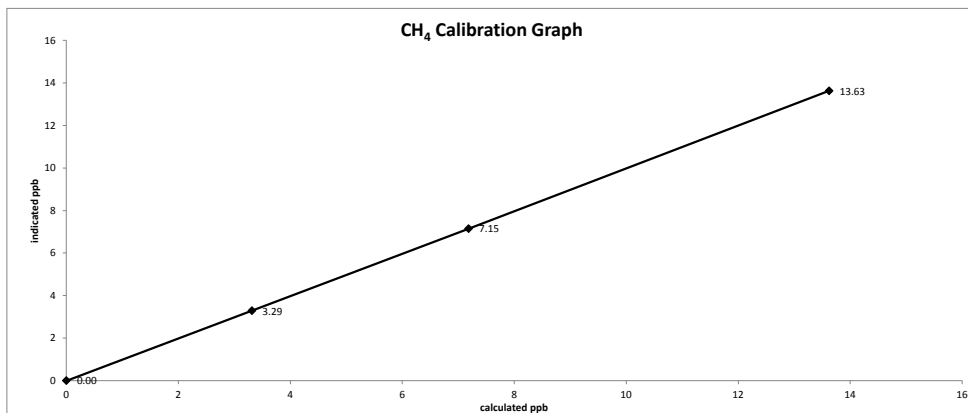
	CH ₄	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.001	1.000	1.000	.95-1.05
b (Intercept as % of full scale) =	-0.09%	-0.01%	-0.04%	± 3% F.S.
% change in C.F. from last cal =	-0.85%	1.15%	0.18%	± 10%

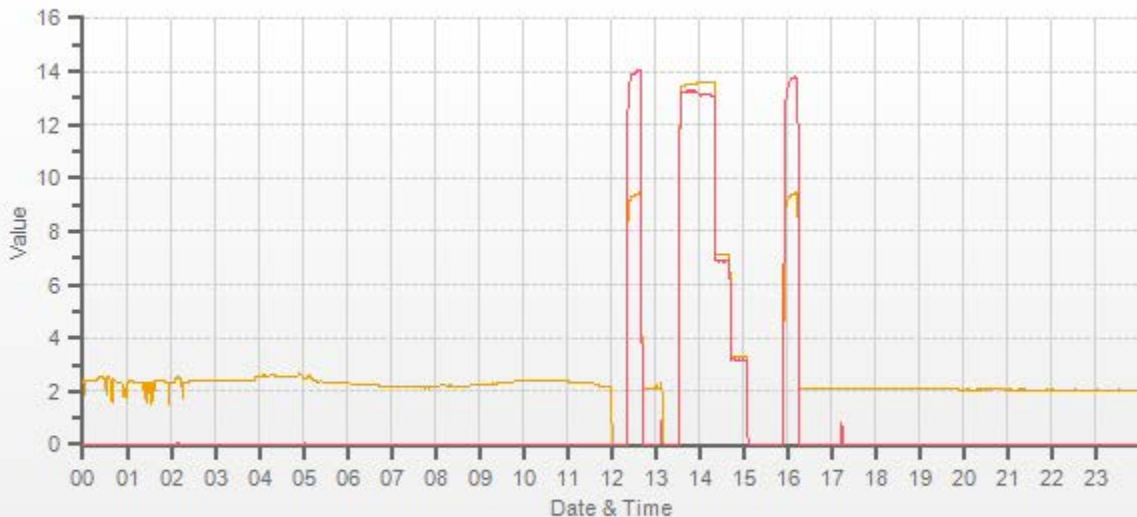
Interface Board Voltages:		Bias Supply:	-293.0	Calibration History cnt'd:		NM Peak Area:	88089
Temperatures:		Detector Oven:	175.0	Crucial Settings:		Methane Start:	n/a
		Filter:	175.0			Methane End:	n/a
		Column Oven:	75.0			Backflush:	n/a
		Internal:	33.1			NMHV Start:	n/a
Cylinder Pressures/reg.:		Carrier:	1800 50	Run History>1:		NMHC End:	n/a
		Fuel:	1400 60			Date:	Jan 03, 2017
		Span Gas:	1900 22			Time:	13:15
		Zero Air Generator:	47			CH ₄ PK HT:	0
						CH ₄ RT:	8.0
Internal Pressures:		Carrier:	31.1			CH ₄ Baseline:	2484
		Fuel:	40.3			CH ₄ LOD:	60
		Air:	32.4			CH ₄ SD:	20
FID Status:		Status:	LIT			CH ₄ CONC:	0.00
		Counts:	28918			NM PK HT:	0
		Flame:	375.8			NM Peak Area:	0
		Det Base:	175.1			NM CONC:	0.00
Flame and Power Stats:		Last Power On:	August 3, 2016			NM Base Start:	2460
		Flameouts:	2			NM Base End:	2471
		Det Oven at Start:	169.0			NM LOD:	5
		Col Oven at Start:	74.5			NM Start IDX:	63
Calibration History:		Time:	Dec 15, 2016 / 14:26			NM End IDX:	50
		Type:	SPAN			NM Max Slope:	8.5e-01
		Status:	GOOD			NM Min Slope:	-8.0e-01
		Check/Adjust:	ADJUST			NM PT Count:	0
		CH ₄ Span Conc:	13.62	Expected Values:		Previous CH ₄ :	9.39
		CH ₄ SP Ratio:	0.0000713			Previous NMHC:	13.6
		CH ₄ RT:	12.4			Previous THC:	23.02
		CH ₄ PK IDX:	22			New CH ₄ :	9.43
		CH ₄ PK HT:	19089			New NMHC:	13.77
		NM Span Conc:	13.11			New THC:	23.22
		NM SP Ratio:	0.000149				

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: January 3, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 12:50 / 16:23
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution





CH4[ppm] NMHC[ppm]



Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	January 11, 2017	Barometric Pressure:	27.44 inHg
Company/Airshed:	LICA	Station Temperature °C:	22
Location/Station Name:	Bonnyville - AER	Weather Conditions:	Mainly sunny
Parameter:	CH ₄ / NMHC / THC	Calibration Purpose:	repeat
Start/End Time 24 hr. (mst):	09:00 / 13:00	Performed By/Reviewer:	Limin Li Trina Whitsitt
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	January 7, 2022

Analyzer:		Correction Factors:			
ID# or Serial Number:	1236656107	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1.093	CH ₄ =	1.000	1.019	0.999
Last Calibration Date:	January 3, 2017	NMHC =	1.000	1.037	0.998
Range ppm:	20 CH ₄ /20 NMHC/40 THC	THC =	1.000	1.027	0.999

Calibrator:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
Flow Meter ID's:	n/a	Point	CH ₄	NMHC	THC
Make & Model:	API 700	High	13.00	13.00	26.00
Serial #:	690	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. #:	LL83638	Low	3.00	3.00	6.00
CH ₄ Cylinder Conc. =	582.0 203.0	=C ₂ H ₆ Cylinder Conc.			
CH ₄ as C ₂ H ₆ =	558.3 1140.3	=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	1996	0.00	1996	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	1996	46.00	2042	13.11	12.58	25.69	12.87	12.13	25.00	1.019	1.037	1.027
adjusted zero	1996	0.00	1996	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	1996	46.00	2042	13.11	12.58	25.69	13.12	12.60	25.72	0.999	0.998	0.999
mid	1996	24.00	2020	6.91	6.63	13.55	6.91	6.59	13.50	1.001	1.006	1.004
low	1996	11.00	2007	3.19	3.06	6.25	3.21	3.06	6.27	0.994	1.000	0.997
calibrator zero	1996	0.00	1996	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
										Average C.F. =		
										0.998	1.001	1.000

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	1.000	1.000	LIMITS	> or = 0.995
Slope =	1.000	1.001	1.001		.95-1.05
b (Intercept as % of full scale) =	0.03%	-0.06%	-0.02%		± 3% F.S.
% change in C.F. from last cal =	-1.87%	-3.67%	-2.75%		± 10%

Interface Board Voltages:	Bias Supply:	-292.6	Calibration History cnt'd:	NM Peak Area:	89197
Temperatures:	Detector Oven:	175.0	Crucial Settings:	Methane Start:	8
	Filter:	175.1		Methane End:	16
	Column Oven:	75.0		Backflush:	18
	Internal:	31.2		NMHV Start:	24.5
Cylinder Pressures/reg.:	Carrier:	1350 50	Run History>1:	NMHC End:	56
	Fuel:	1300 60		Date:	Jan 11, 2017
	Span Gas:	2100 22		Time:	08:48
	Zero Air Generator:	55		CH ₄ PK HT:	2648
Internal Pressures:	Carrier:	31.1		CH ₄ RT:	13.2
	Fuel:	40.3		CH ₄ Baseline:	2418
	Air:	32.3		CH ₄ LOD:	54
FID Status:	Status:	LIT		CH ₄ SD:	18
	Counts:	27374		CH ₄ CONC:	1.9
	Flame:	370.8		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:	2		NM Base Start:	2329
	Det Oven at Start:	169.0		NM Base End:	2338
	Col Oven at Start:	74.5		NM LOD:	11
Calibration History:	Time:	Jan 03, 2017 / 13:55		NM Start IDX:	17
	Type:	SPAN		NM End IDX:	80
	Status:	GOOD		NM Max Slope:	6.3e-01
	Check/Adjust:	ADJUST		NM Min Slope:	-5.0e-01
	CH ₄ Span Conc:	13.62	Expected Values:	NM PT Count:	0
	CH ₄ SP Ratio:	0.0000718		Previous CH ₄ :	9.39
	CH ₄ RT:	13		Previous NMHC:	13.6
	CH ₄ PK IDX:	25		Previous THC:	23.02
	CH ₄ PK HT:	18972		New CH ₄ :	9.01
	NM Span Conc:	13.11		New NMHC:	13.93
	NM SP Ratio:	0.000147		New THC:	22.97

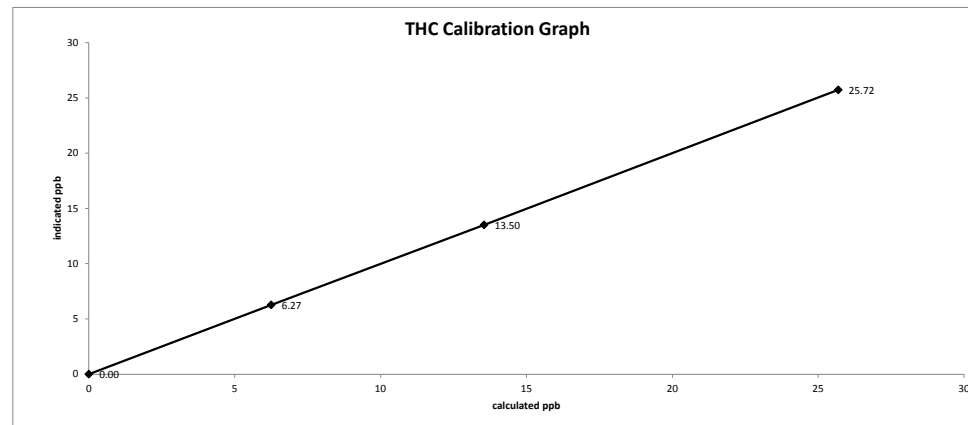
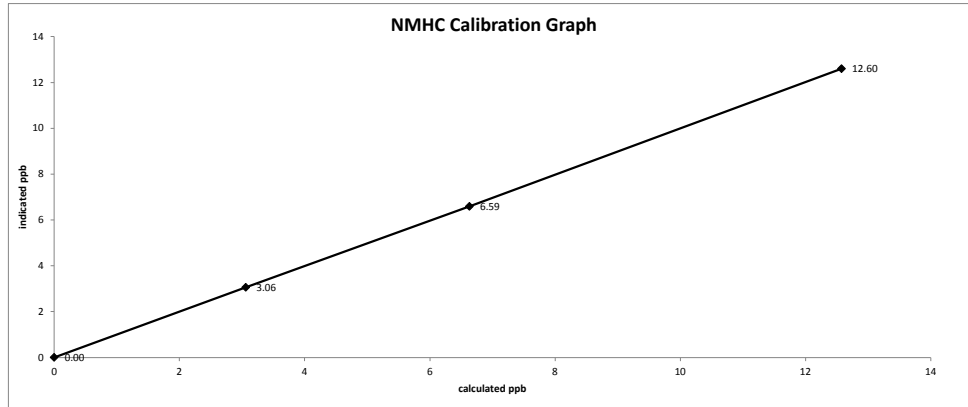
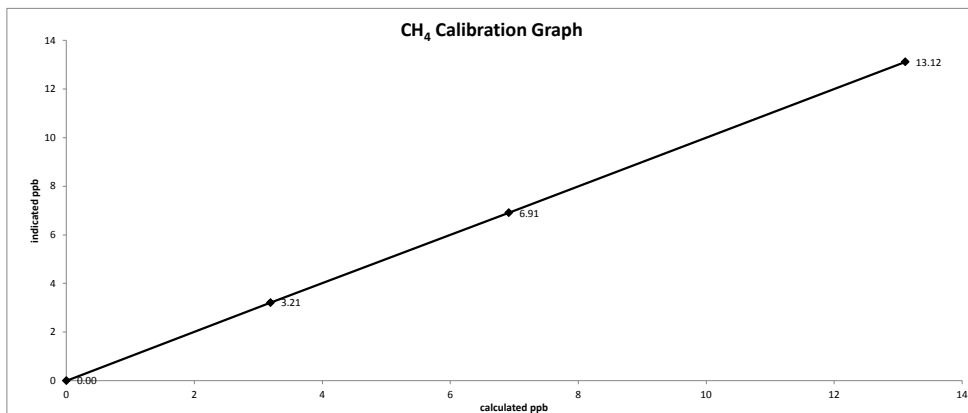
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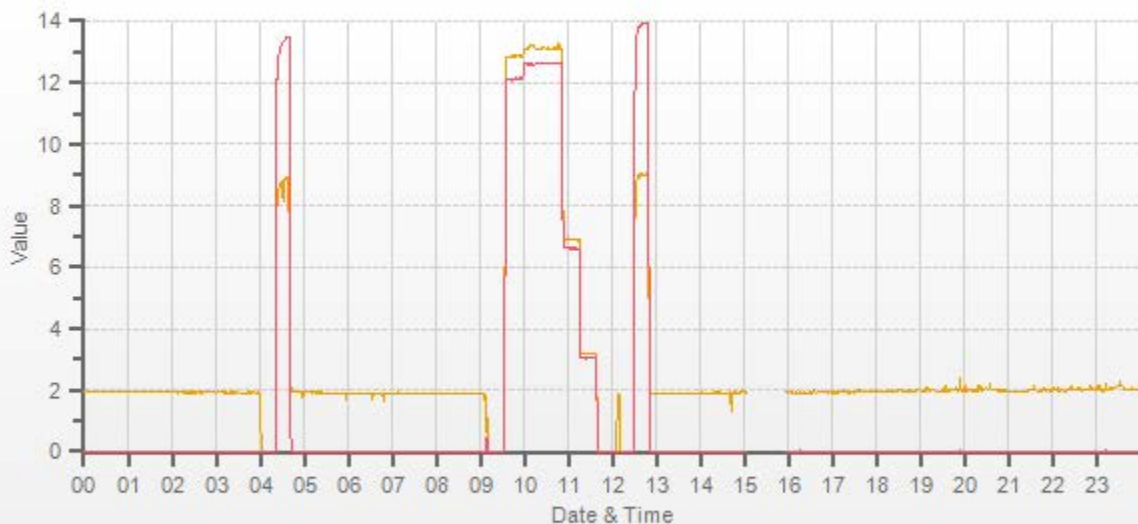
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

Adjust zero air supply from 47psi to 55psi on Jan 10, 2017 @ 20:30pm.

Date: January 11, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville - AER

Start/End Time 24 hr. (mst): 09:00 / 13:00
Calibration Purpose: repeat
Calibration Method: Gas Dilution





— CH4[ppm] — NMHC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: January 6, 2017	Barometric Pressure: 28.20 inHg
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville-AER	Weather Conditions: Mainly cloudy with light snow
Start/End Time 24 hr. (mst): 9:45-14:07	Calibration Purpose: shut down
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Raja Abid Trina Whatsitt
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: May 23, 2019

Analyzer: ID# or Serial Number: 593 Last Calibration Date: January 4, 2017 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.018</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.032</td> <td>1.019</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.014</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.018	n/a	NO ₂ =	1.032	1.019	n/a	NOx =	1.000	1.014	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.018	n/a														
NO ₂ =	1.032	1.019	n/a														
NOx =	1.000	1.014	n/a														

Calibrator: Flow Meter ID's: n/a Make & Model: EnviroNics 6100 Serial #: 5212 Cal Gas Cylinder I.D. #: LL 19513 NO/NOx Gas Conc. (ppm): 50.2 50.2	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Point	Diluent	Cal Gas	Total Flow	Calculated NO (ppb)	Calculated NOx (ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	NO C.F.	NOx C.F.
as found zero	4997	0.0	4997	0	0	1.0	1.5	n/a	n/a
as found high	4936	60.7	4997	609.7	609.7	600.0	603.0	1.018	1.014
mid	4965	30.84	4996	309.9	309.9	305.0	305.0	1.019	1.021
low	4982	14.91	4997	149.8	149.8	157.0	157.0	0.960	0.963
Average C.F.=								0.999	0.999

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

Point	Diluent	Cal Gas	Total Flow	Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	Indicated NO ₂ (ppb)	NO drop (ppb)	NO ₂ gain (ppb)	NO ₂ C.F.
NOx reference	4936	60.72	4997	0.0	620.0	621.0	1.0	1.0	1.0	n/a
as found high NO2	4936	60.70	4997	380.0	241.0	613.0	373.0	379.0	372.0	1.019
gpt mid	4936	60.72	4997	200.0	420.1	617.2	197.7	199.9	196.7	1.016
gpt low	4936	60.70	4997	75.0	540.2	617.4	78.0	79.8	77.0	1.036
Average NO₂ C.F.=										1.024

Linear Regression/Calibration Results:

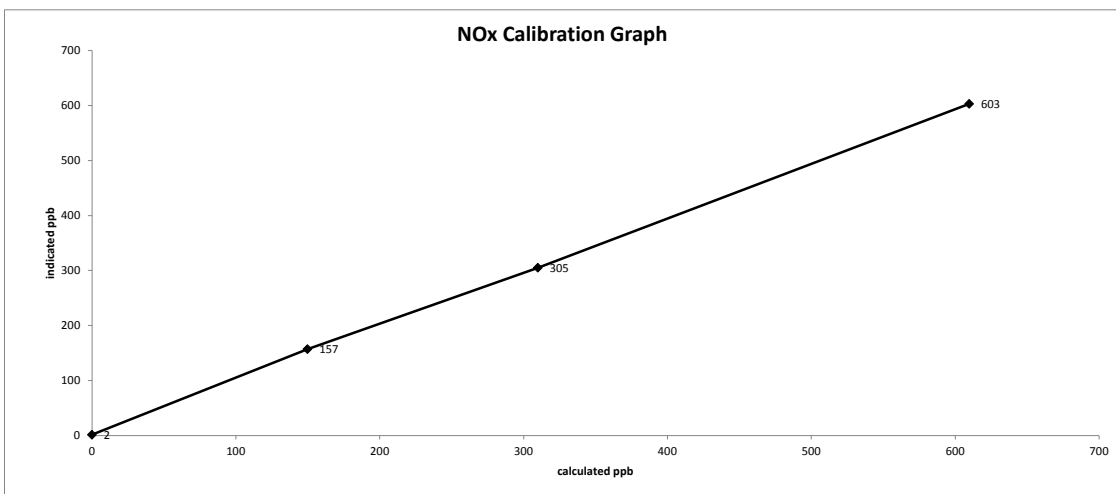
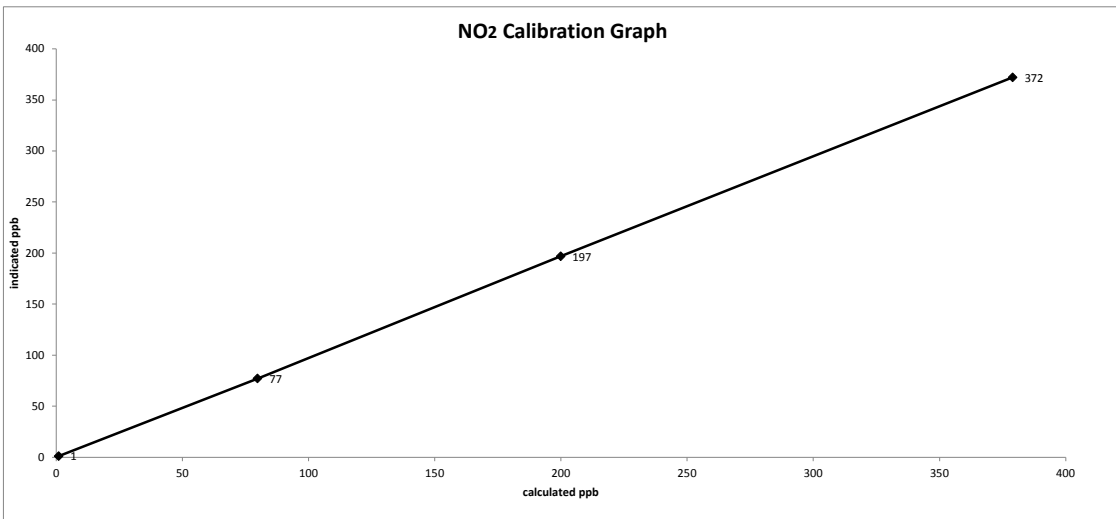
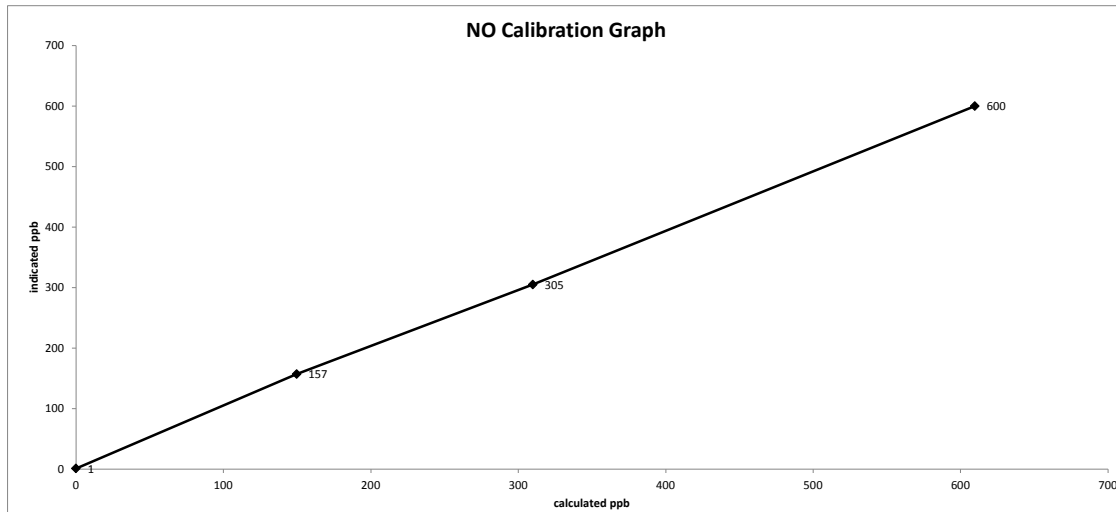
	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.023	1.018	1.017	0.90-1.10
b (Intercept as % of full scale)=	0.45%	0.42%	-0.05%	± 3% F.S.
% change in C.F. from last cal=	-1.79%	1.28%	-1.37%	± 10%
NO2 converter efficiency			0.70	0.96 to 1.04

As found: NOx SLOPE: 1.097 NOx OFFS: 0.1 NO SLOPE: 1.096 NO OFFS: -1.4 SAMP FLW: 477 OZONE FL: 63 PMT: 10.3 NORM PMT: -1.3 AZERO: 8.5 HVPS: 658 RCELL TEMP: 50.0 BOX TEMP: 32.5 PMT TEMP: 6.7 IZS TEMP: 50.2 MOLY TEMP: 316 RCEL: 5.3 SAMP: 27.4 Expected Value NO: n/a Expected Value NO2: n/a Expected Value NOx: n/a	As left: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a PMT: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Expected Value NO: n/a Expected Value NO2: n/a Expected Value NOx: n/a
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Comments:

Date: January 6, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville-AER

Start/End Time 24 hr. (mst): 9:45-14:07
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration





API 200A NO-NO2-NOx Analyzer Calibration

Date: January 6, 2017	Barometric Pressure: 28.20 inHg
Company/Airshed: LICA	Station Temperature °C: 22
Location/Station Name: Bonnyville-AER	Weather Conditions: Mainly cloudy with light snow
Start/End Time 24 hr. (mst): 17:45-22:38	Calibration Purpose: installation
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Raja Abid Trina Whitsitt
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: May 23, 2019

Analyzer:	Correction Factors:												
ID# or Serial Number: 2166	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">Previous C.F.:</th> <th style="width: 33%;">As Found C.F.:</th> <th style="width: 33%;">New C.F.:</th> </tr> <tr> <td>NO = n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NO₂ = n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NOx = n/a</td> <td>n/a</td> <td>1.000</td> </tr> </table>	Previous C.F.:	As Found C.F.:	New C.F.:	NO = n/a	n/a	1.000	NO ₂ = n/a	n/a	1.000	NOx = n/a	n/a	1.000
Previous C.F.:	As Found C.F.:	New C.F.:											
NO = n/a	n/a	1.000											
NO ₂ = n/a	n/a	1.000											
NOx = n/a	n/a	1.000											
Last Calibration Date: n/a													
Range ppb: 1000													

Calibrator:	Standard Calibration Points for a Range of: 1000 ppb																								
Flow Meter ID's: n/a																									
Make & Model: EnviroNics 6100																									
Serial #: 5212																									
Cal Gas Cylinder I.D. #: LL 19513																									
NO/NOx Gas Conc. (ppm): 50.2 50.2																									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (ppb)</th> <th>Cc Ozone ?</th> </tr> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </table>	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?																						
High	780	500	n/a																						
Mid	380	275	n/a																						
Low	190	100	n/a																						
Extra Point #1	n/a	n/a	n/a																						
Extra Point #2	n/a	n/a	n/a																						

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
adjusted zero	4932	0.0	4932	0	0	0.0	0.0	n/a	n/a
adjusted high	4919	77.6	4997	779.9	779.9	780.0	780.0	1.000	1.000
mid	4958	37.80	4996	379.8	379.8	375.0	376.0	1.013	1.010
low	4978	18.90	4997	189.9	189.9	186.0	186.0	1.021	1.021
calibrator zero	4997	0.00	4997	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F.=								1.011	1.010

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	4919	77.64	4997	0.0	778.0	778.0	0.0	0.0	0.0	
adjusted high NO2	4919	77.64	4997	500.0	282.0	778.0	496.0	496.0	496.0	1.000
gpt mid	4919	77.64	4997	275.0	501.0	778.0	277.0	277.0	277.0	1.000
gpt low	4919	77.64	4997	100.0	678.5	779.0	100.0	99.5	100.0	0.995
Average NO₂ C.F.=										0.998

Linear Regression/Calibration Results:

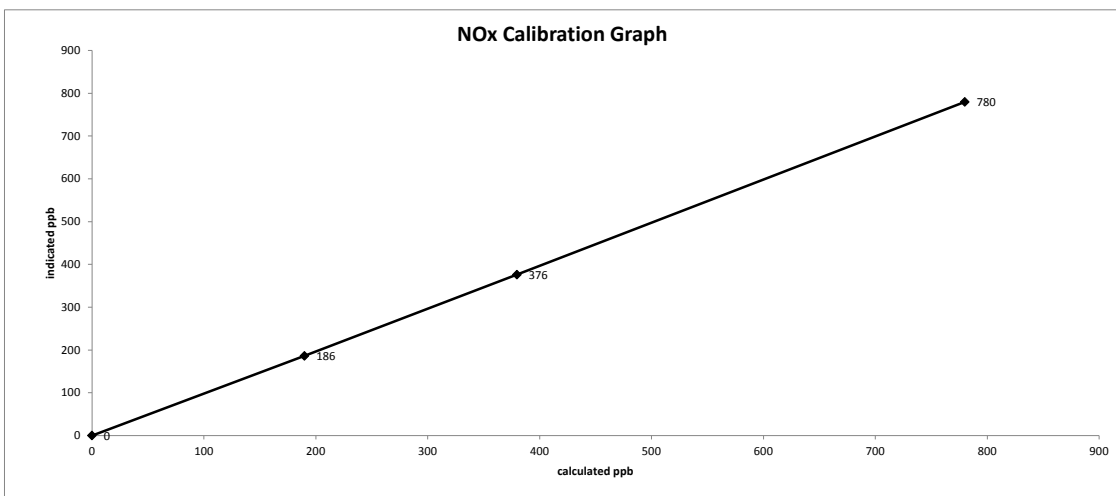
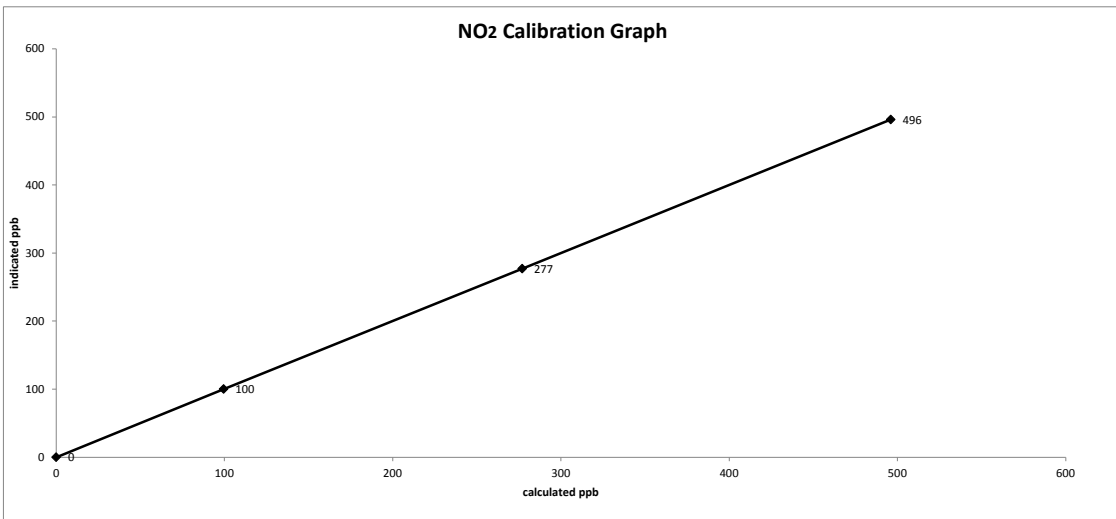
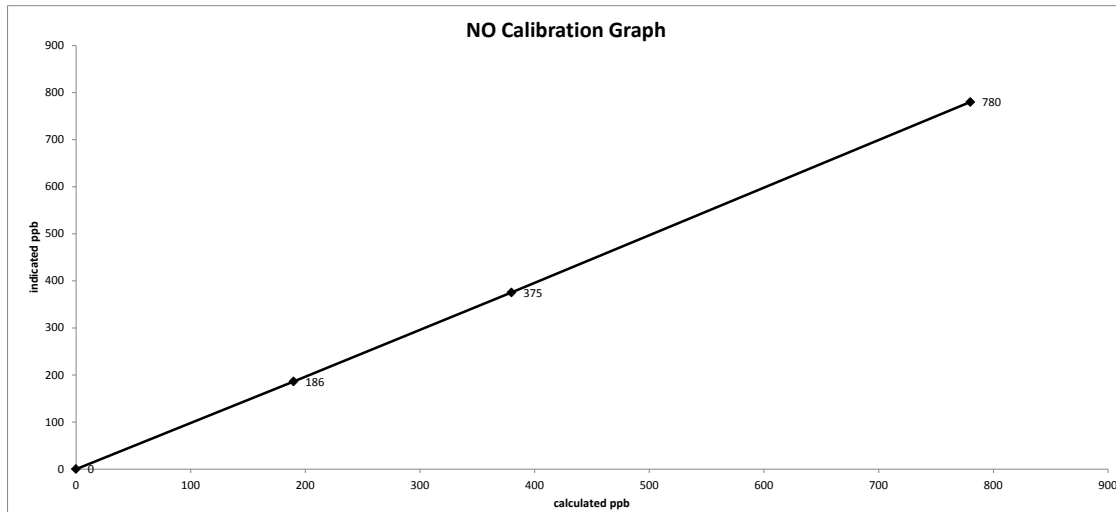
	NO	NOx	NO ₂	
Correlation Coefficient =	1.000	1.000	1.000	LIMITS
Slope =	0.999	0.999	1.000	> or = 0.995
b (Intercept as % of full scale)=	-0.26%	-0.24%	0.02%	.95-1.05
% change in C.F. from last cal=	n/a	n/a	n/a	± 3% F.S.
NO ₂ converter efficiency	 	 	0.98	± 10%
				0.96 to 1.04

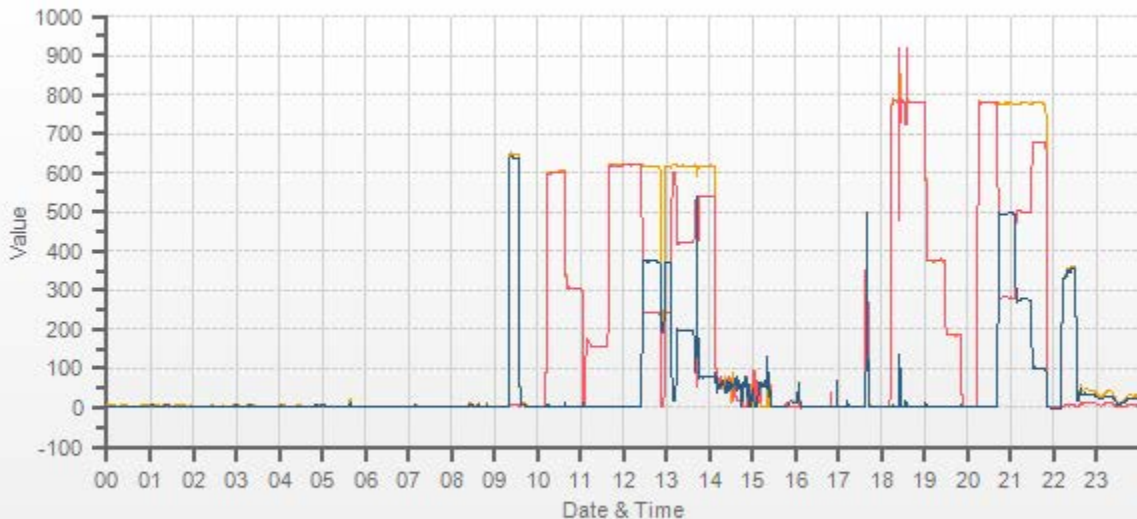
<p style="text-align: center;">As found:</p> NOx SLOPE: 0.975 NOx OFFS: 1.3 NO SLOPE: 0.966 NO OFFS: -1.7 SAMP FLW: 481 OZONE FL: 78 NORM PMT: -2.9 AZERO: 24.8 HVPS: 695 DCPS: 2620 RCELL: 50.6 BOX TEMP: 28.1 IZS TEMP: 45 MOLY TEMP: 315.8 RCEL: 7.0 SAMP: 26.1 Expected Value NO: 6.2 Expected Value NO ₂ : 456.0 Expected Value NOx: 462.0	<p style="text-align: center;">As left:</p> NOx SLOPE: 0.821 NOx OFFS: 1.5 NO SLOPE: 0.814 NO OFFS: -1.8 SAMP FLW: 481 OZONE FL: 79 NORM PMT: 12.5 AZERO: 23.2 HVPS: 695 DCPS: 2626 RCELL: 50.7 BOX TEMP: 27.9 IZS TEMP: 45.3 MOLY TEMP: 314.5 RCEL: 6.9 SAMP: 26.0 Expected Value NO: 4.5 Expected Value NO ₂ : 347.5 Expected Value NOx: 352.1
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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: January 6, 2017
Company/Airshed: LICA
Location/Station Name: Bonnyville-AER

Start/End Time 24 hr. (mst): 17:45-22:38
Calibration Purpose: installation
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: January 3, 2017
 Company/Airshed: LICA
 Location/Station Name: Bonnyville - AER
 Start/End Time 24 hr. (mst): 12:50 / 16:18
 Ozone Calibration Method: Varying UV Lamp Power
 G.P.T. Date: n/a-done by Varying UV Lamp Power

Barometric Pressure: 0.948 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: 1002240372
 Last Calibration Date: December 15, 2016
 Previous Cal High Point C.F.: 1.000

Ozone Range ppb: 500
 As Found C.F.: 0.992
 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

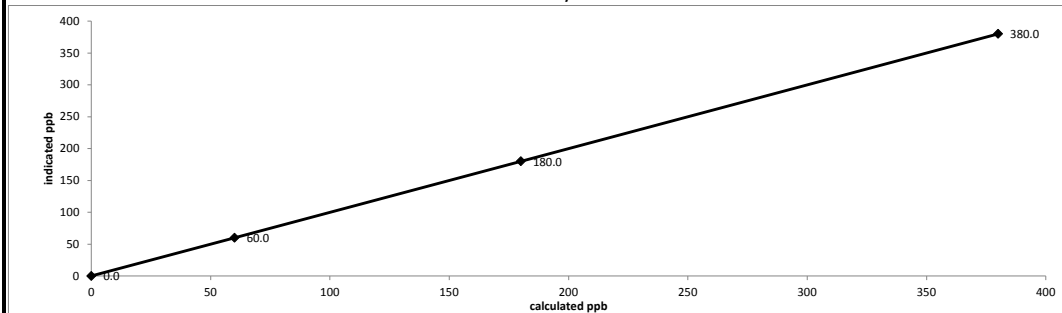
Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	383.0	0.992
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 = 0.78%

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

Thermo 49i Ozone Analyzer Calibration

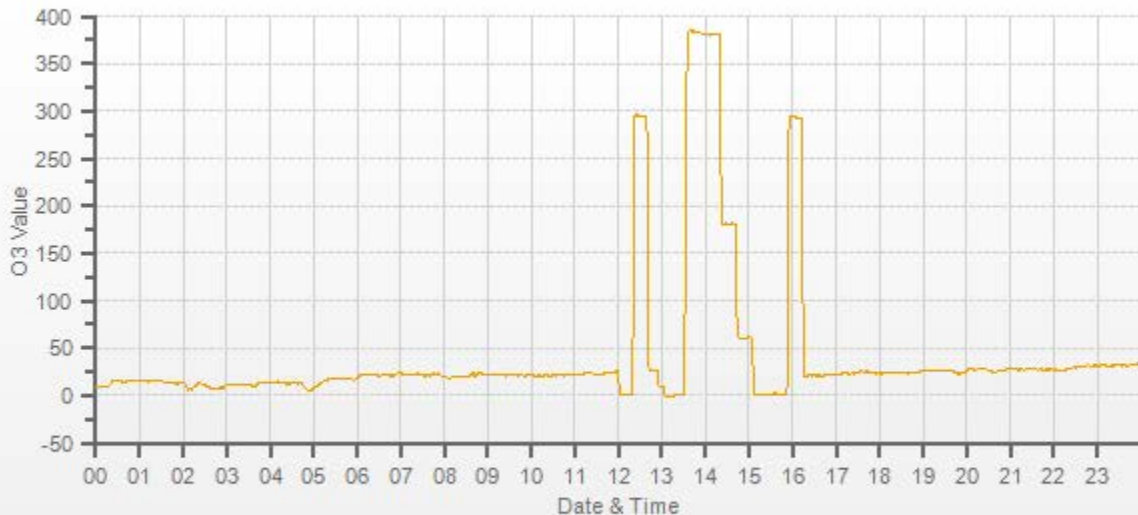


As found:
 O3 Bkg: -0.1
 O3 Coef: 0.990
 Photo Lamp: 14.2
 O3 Lamp: 5.8
 Bench: 30.0
 Bench Lamp: 54.1
 O3 Lamp: 68.1
 Pressure: 711.9
 Cell A lpm: 0.749
 Cell B lpm: 0.760
 O3 ppb: -0.7
 Cell A ppb: -1.1
 Cell B ppb: -0.3
 Cell A int: 81237
 Expected Value: 293.0

As left:
 O3 Bkg: -0.1
 O3 Coef: 0.984
 Photo Lamp: 14.2
 O3 Lamp: 5.8
 Bench: 30.4
 Bench Lamp: 54.1
 O3 Lamp: 68.1
 Pressure: 710.4
 Cell A lpm: 0.748
 Cell B lpm: 0.759
 O3 ppb: 0.1
 Cell A ppb: 1.4
 Cell B ppb: -1.2
 Cell A int: 81207
 Expected Value: 293.0

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

No ZERO adjustment made. The EV has not changed after the calibration.



— O3[ppb]

PARTICULATE MATTER



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: January 3, 2017
 Company: LICA
 Station Name/Location: Bonnyville - AER
 Previous Audit Date: December 22, 2016
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whitsitt
 Start Time (mst): 15:42
 End Time (mst): 16:32
 Calibration Purpose: Bi-monthly #1
 Weather Conditions: A few clouds

1400A Information and Status:

ID# or Serial Number: 1405A207691003 As Found Filter Loading %: 28.79
 Ko Factor: 15635 As Left Filter Loading %: 21.81
 Ambient Temperature °C: -15.54 As Found Noise: 0.004
 Ambient Pressure atm: 0.944 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:	<u>Dwyer</u>	<u>BRUNTON</u>	<u>FLUKE</u>
Model:	<u>475 Mark III</u>	<u>BIO</u>	<u>1551A Ex STIK</u>
Serial Number:	<u>#2</u>	<u>BPO 14</u>	<u>4295</u>
Calibration Date:	<u>January 15, 2016</u>	<u>July 7, 2016</u>	<u>November 15, 2016</u>

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: <u>-15.5</u>	1405F pressure atm: <u>0.944</u>
reference temperature °C: <u>-16.6</u>	reference pressure: <u>0.946</u>
difference °C: <u>-1.0</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>-16.6</u>	1405F pressure atm: <u>0.946</u>
reference temperature °C: <u>-16.6</u>	reference pressure: <u>0.946</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>3.01</u>	reference total/aux flow lpm: <u>16.81</u>
difference lpm: <u>0.01</u>	difference lpm: <u>0.14</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>3.01</u>	reference total/aux flow lpm: <u>16.81</u>
difference lpm: <u>0.01</u>	difference lpm: <u>0.14</u>

K_o Audit:

Last K_o audit date: November 24, 2016
 1405F K_o factor: 15635
 Measured K_o factor: 15790.8000
 % difference: 1.00

Comments:

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



R & P 1405F TEOM PM 2.5 Analyzer Calibration

Date: January 26, 2017
Company: LICA
Station Name/Location: Bonnyville - AER
Previous Audit Date: January 3, 2017
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Trina Whatsitt
Start Time (mst): 13:15
End Time (mst): 14:33
Calibration Purpose: Bi-monthly #2
Weather Conditions: Mainly sunny

1400A Information and Status:

ID# or Serial Number: <u>1405A207691003</u>	As Found Filter Loading %: <u>31.94</u>
Ko Factor: <u>15635</u>	As Left Filter Loading %: <u>30.37</u>
Ambient Temperature °C: <u>3.21</u>	As Found Noise: <u>0.005</u>
Ambient Pressure atm: <u>0.936</u>	As Left Noise: <u>0.000</u>
Main Flow Reading lpm: <u>3.00</u>	Pump Vacuum: <u>0.31</u>
Aux Flow Reading lpm: <u>13.67</u>	Warnings: <u>None</u>

Reference Standards:

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

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	0.12	0.00	0.12
	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	0.12	0.00	0.12
	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: <u>3.2</u>	1405F pressure atm: <u>0.936</u>
reference temperature °C: <u>4.5</u>	reference pressure: <u>0.935</u>
difference °C: <u>1.2</u>	difference: <u>0.001</u>

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

tolerance +/- 2.0°C	tolerance +/- 0.01 atm
1405F temperature °C: <u>4.5</u>	1405F pressure atm: <u>0.935</u>
reference temperature °C: <u>4.5</u>	reference pressure: <u>0.935</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>3.03</u>	reference total/aux flow lpm: <u>17.12</u>
difference lpm: <u>0.03</u>	difference lpm: <u>0.45</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>3.03</u>	reference total/aux flow lpm: <u>17.12</u>
difference lpm: <u>0.03</u>	difference lpm: <u>0.45</u>

K_o Audit:

Last K_o audit date: November 24, 2016
1405F K_o factor: 15635
Measured K_o factor: 15790.8000
% difference: 1.00

Comments:

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

WIND SYSTEM



Meteorological Sensor Audit

Station Information

Company:	<u>LICA</u>	Performed By:	<u>Limin Li</u>
Location:	<u>Bonnyville (in Calgary shop)</u>	Reason:	<u>Annual maintenance</u>
Audit Date:	<u>26-Jan-16</u>	Start Time (mst):	<u>11:00</u>
Previous Audit Date:	<u>NA</u>	End Time (mst):	<u>15:00</u>

Wind Speed

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>200KPH</u>

Wind Speed Audit Data

RPM	Wind Speed Actual	Indicated WS - CW	Indicated WS-CCW	Correction Factor
0	0.0	0.032	0.032	-
1000	17.6	17.66	17.64	1.00
2000	35.28	35.3	35.29	1.00
3000	52.92	52.99	52.99	1.00
4000	70.56	70.66	70.65	1.00
5000	88.2	88.35	88.33	1.00
6000	105.84	106	106	1.00
7000	123.48	123.7	123.7	1.00
8000	141.12	141.4	141.3	1.00
9000	158.76	159.1	159.1	1.00
10000	176.4	176.7	176.7	1.00
Average Correction Factor:				1.00

Wind Direction

Sensor make:	<u>R. M. Young</u>	Sensor height:	<u>n/a</u>
Sensor model:	<u>5103VK</u>	Serial Number:	<u>56589</u>
Calibrator:	<u>Young 18802</u>	Variable speed motor:	<u>CA 03309</u>
Voltage range:	<u>0-1</u>	Output signal range:	<u>0-360DEG</u>

Wind Direction Audit Data

Wind Direction	Indicated	Correction Factor
0	0.5	NA
45	44.9	1.00
90	92.0	0.98
135	136.5	0.99
180	180.6	1.00
225	224.4	1.00
270	270.3	1.00
315	312.2	1.01
359	355.0	1.01
Average Correction Factor:		1.00

Remarks: Annual maintenance. Changed 05163PG, 05124VG bearings. 05131D, 05133B & 05135D

Audit Performed by: Limin Li

VOC SAMPLER

Maxxam Analytics

XONTECK FLOW RATE VERIFICATION/CALIBRATION

Client: <u>LICA</u>	Date: <u>January 27, 2017</u>	
Location: <u>Cold Lake South</u>	Last Cal. Date: <u>October 7, 2016</u>	
Station ID: <u>LICA 37</u>	Start Time 24 hr. (mst): <u>14:19</u>	
Sampler s/n: <u>6200</u>	End Time 24 hr. (mst): <u>14:47</u>	
Purpose: <u>Routine Quarterly</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Trina Whatsitt</u>
Pressure Standard:		
Make/Model: <u>Fisher Scientific/FB61291</u>	Flow Standard:	
S/N or ID#: <u>ID# 05544</u>	<u>Dwyer/Series 475 Mark III</u>	
Certification Date: <u>December 5, 2016</u>	<u>#3</u>	
	<u>January 1, 2017</u>	

The desired flow rate can be calculated using the equation provided by USEPA Method T0-14 Section 9.1.3.1.

$$F = \frac{(P \times V)}{(T \times 60)} = \frac{1.62 \times 6000}{24 \times 60} = \boxed{6.73 \text{ cc/min}}$$

= target flow rate

where;

F= flow rate in cc/min
P= final canister in atmosphere absolute
V= volume of canister in c.c.
T= sampling period in hours
bp= barometric pressure in atmospheres

enter:

bp 0.935 atm
P= 1.61546 (atm)+.68046
V= 6000 cubic centimetres
T= 24 hours

XONTECK QUARTERLY FLOW VERIFICATION/CALIBRATION

FLOW RATE VERIFICATION

Volumetric Flow rate =	10.00	(cc/min)		As found pot setting =	4.94
Target Flow Rate (cc/min) =	6.73				

FLOW RATE CALIBRATION

Volumetric Flow rate =	10.00	(cc/min)		Adjusted pot setting =	4.94
Target Flow Rate (cc/min) =	6.73				

XONTECK MAINTENANCE

	Item:		Most Recent Date Completed:
1. Replace sample line and fittings from sampler to canister every 6 months.			<u>January 20, 2017</u>
2. Purge line from manifold--> sampler with zero air every 6 months.			<u>October 7, 2016</u>
3. Sample system cleaning every 2 years.			<u>March 21, 2015</u>
4. Perform 12 hour leak check procedure every 6 months.			<u>January 20, 2017</u>

COMMENTS:

Flow rate formula works with the positive initial pressure. The sampling is done from vacuum of about -28 in Hg. The current pump setting creates an adequate flow rate to fill up the sample canister to the pressure required for analysis.

PAH SAMPLER



TISCH PUF PLUS SAMPLER AUDIT

Date: January 27, 2017	PUF PLUS Serial #: 100-1015
Company/Airshed: LICA/Bonnyville	Performed By/Reviewer: Alex Yakupov Trina Whitsitt
Location/Station Name: Bonnyville-AER/LICA 37	Weather Conditions: Mainly sunny
Reference Standards:	Flow: _____ Pressure: _____ Temperature: _____
Make: Dwyer	Fisher Scientific
Model: Series 475 Mark III	FLUKE
Serial Number: #3	FB61291 1551A Ex STIK
Calibration Date: January 1, 2017	ID# 05544 ID# 4295
	December 5, 2016 November 15, 2016

TISCH PUF PLUS PRESSURE AND TEMPERATURE AUDIT

AS FOUND Reference Barometric Pressure (mmHg):	711.06	AS FOUND Reference Temperature (°C):	2.6
AS FOUND PUF PLUS Barometric Pressure (mmHg):	707	AS FOUND PUF PLUS Temperature (°C):	3.0
% Difference (+/- 2% max.):	0.57%	% Difference (+/- 2 °C max.):	-0.4
IF THE PRESSURE DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED		**IF THE TEMPERATURE DEVIATES BY MORE THAN +/- 2 °C A FLOW CALIBRATION IS REQUIRED**	

TISCH PUF PLUS FLOW AUDIT

Flow Audit Calculations:

Calibrated Orifice Certification Date:	October 20, 2016
Enter Barometric Pressure from refrence (inHg)	27.99
Barometric Pressure (mmHg)	711.1
Enter Ambient Temperature from reference °C	2.6
Enter "m" variable from calibrated orifice	6.08663
Enter "b" variable from calibrated orifice	-0.04218
Enter Δp in. H ₂ O	1.84
Standardized Flow lpm=	231.03
Flow Set Point lpm=	230.00
% Difference (+/- 2% max.)=	-0.45%
IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED	

TISCH PUF PLUS PRESSURE CALIBRATION

Reference Barometric Pressure AFTER CALIBRATION (mmHg):	n/a
PUF Barometric Pressure AFTER CALIBRATION (mmHg):	n/a
% Difference:	#VALUE! Max 2.0%

Calibration Point (mmHg):	Δp (in. H ₂ O) required for target barometric pressure:	As Found barometric pressure (mmHg):	As Left barometric pressure (mmHg):	% Difference vs. Calibration Target:
751.06	1.57	n/a	n/a	n/a
731.06	0.79	n/a	n/a	n/a
711.06	0.00	n/a	n/a	n/a
691.06	-0.79	n/a	n/a	n/a
671.06	-1.57	n/a	n/a	n/a
% Difference (+/- 2% max.)=				n/a

TISCH PUF PLUS TEMPERATURE CALIBRATION

Temperature Calibrator Certification Date:	n/a
Reference Temperature AFTER CALIBRATION (°C):	n/a
TISCH PUF PLUS Temperature AFTER CALIBRATION (°C):	n/a
Difference (°C):	#VALUE! Max 2.0 °C

Calibration Point (°C):	As Found (°C)	As Left (°C)	+/- Difference (°C)
20	n/a	n/a	n/a
-20	n/a	n/a	n/a
40	n/a	n/a	n/a
0	n/a	n/a	n/a
-30	n/a	n/a	n/a
% Difference (+/- 2 °C max.)			n/a

TISCH PUF PLUS FLOW CALIBRATION

Flow Calibration Calculations:

Calibrated Orifice Certification Date:	n/a
Enter Barometric Pressure from refrence (inHg)	n/a
Barometric Pressure (mmHg)	n/a
Enter Ambient Temperature from reference °C	n/a
Enter "m" variable from calibrated orifice	n/a
Enter "b" variable from calibrated orifice	n/a
Enter Δp in. H ₂ O	n/a
Standardized Flow lpm=	#VALUE!
Flow Set Point lpm=	230.00
% Difference (+/- 2% max.)=	#VALUE!
IF THE FLOW DEVIATES BY MORE THAN +/- 2% A FLOW CALIBRATION IS REQUIRED	

R, A1 and A0 Factors:

	As Found/As Left Pressure:	As Found/As Left Temperature:	As Found/As Left Flow:
A0	15312.7500	-11845.5546	-0.2483
A1	22.5779	0.2990	17.6252
R	0.0000	0.0000	0.0000

Notes:
 Audit started: 13:10 (SMT), audit finished: 13:51 (SMT)

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. 2015-164

Company <u>Maxxam</u>		Operator: <u>Chris Wesson</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>NA</u>
Serial Number	<u>690</u>	Serial Number	<u>NA</u>
Last Verification Date	<u>April 2, 2015</u>	Temperature (°C)	<u>24</u>
NO Cylinder S/N	<u>LL119317</u>	Barometric Pressure	<u>700 mmHg</u>
NO/NOX Concentration	<u>50.3ppm/50.3ppm</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4998</u>	Pt. #2 <u>4994</u>	Pt. #3 <u>4996</u>
Gas Flow (sccm)		
Pt. #1 <u>77.5</u>	Pt. #2 <u>37.7</u>	Pt. #3 <u>18.8</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4998	0.0	0.000	0.000	0.001	0.001	0.001	Limit ± 10%	
4998	77.5	0.780	0.780	0.785	-0.002	0.783	1%	0%
4994	37.7	0.380	0.380	0.381	-0.001	0.380	0%	0%
4996	18.8	0.189	0.189	0.189	0.000	0.190	0%	0%
Absolute Average Percent Difference							0%	0%

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)=	1.0063	0.90-1.10		m (Slope)=	1.0024
b (Intercept % of FS)=	-0.0486	± 3% F.S.		b (Intercept % of FS)=	0.0457

Flow	O ₂ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4998	0	0.000	0.782	0.000	0.782	NO ₂	% Diff. Limit
4998	0.48	0.512	0.270	0.510	0.779	0%	± 10%
4998	0.24	0.269	0.513	0.269	0.782	0%	± 10%
4998	0.95	0.109	0.673	0.110	0.783	1%	± 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)=	0.9953	0.90-1.10	
b (Intercept % of FS)=	0.0789	± 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 O₂ has 49.9ppb SO₂ - Flows not manually measured

Auditor: Shea Beaton
 Operator Signature: [Signature]

Date: March 30, 2016
 Location: McIntyre Center Edmonton



Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2015-165

Company Maxxam Operator: Chris Wesson

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

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

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

LINEAR REGRESSION ANALYSIS				<i>y=mx+b (where x=calculated concentration, y=indicated concentration)</i>			
NO		LIMITS		NO _x			
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	NO _x	% 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>			
NO ₂		LIMITS					
Correlation=	1.0000	≥ 0.995					
m (Slope)=	0.9992	0.90-1.10					
b (Intercept % of FS)=	0.0171	± 3% F.S.					

AENV Standards		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

Company <u>Maxxam</u>		Operator: <u>Mike</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Envionics 6100</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>5212</u>	Serial Number	<u>Hi148944 Lo 152019</u>
Last Verification Date	<u>February 3, 2016</u>	Temperature (°C)	<u>24.6</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>701.4mmHg</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>4919</u>	Pt. #2 <u>4934</u>	Pt. #3 <u>4960</u>
Gas Flow (sccm)		
Pt. #1 <u>79.2</u>	Pt. #2 <u>38.3</u>	Pt. #3 <u>19.1</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4987	0.0	0.0000	0.0000	0.0000	0.0002	0.0002	Limit ± 10%	
4998	79.2	0.7765	0.7765	0.7801	-0.0003	0.7798	0%	0%
4977	38.3	0.3775	0.3775	0.3790	0.0000	0.3790	0%	0%
4979	19.1	0.1880	0.1880	0.1888	-0.0001	0.1887	0%	0%
Absolute Average Percent Difference							0%	0%

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)= 1.0046	0.90-1.10	m (Slope)= 1.0041
b (Intercept % of FS)= -0.0080	± 3% F.S.	b (Intercept % of FS)= 0.0057

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
4998	0.000	0.0000	0.7799	-0.0008	0.7790	NO ₂	% Diff. Limit
4998	0.500	0.4949	0.2850	0.4909	0.7776	-1%	± 10%
4998	0.275	0.2765	0.5034	0.2742	0.7776	-1%	± 10%
4998	0.100	0.1003	0.6796	0.0989	0.7786	-1%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂	LIMITS	
Correlation= 1.0000	≥ 0.995	
m (Slope)= 0.9936	0.90-1.10	
b (Intercept % of FS)= -0.0733	± 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>February 13, 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: February 14, 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	0.000	0.000	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

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	0.00752	132.895	10.2
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 Date: October 19, 2016

Operator Signature: *Al Clark* 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



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Tel: (323) 585-2154 Fax: (714) 542-6689
 PGVPID: F22014

DocNumber: 000068924

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

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

Praxair Order Number: 21137117
 Customer P. O. Number: 35-55963
 Customer Reference Number:

Fill Date: 7/1/2014
 Part Number: NI ME600P2E-AQ
 Lot Number: 109418203
 Cylinder Style & Outlet: AQ CGA 350
 Cylinder Pressure & Volume: 2200 psig 78 cu. ft.

Certified Concentration:

Expiration Date:	7/7/2022	NIST Traceable
Cylinder Number:	LL83638	Analytical Uncertainty:
582 ppm	METHANE	± 1.5 %
203 ppm	PROPANE	± 0.9 %
Balance	NITROGEN	

Certification Information: Certification Date: 7/7/2014 Term: 96 Months Expiration Date: 7/7/2022

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: METHANE

Requested Concentration: 600 ppm
 Certified Concentration: 582 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC139480
 Ref. Std. Conc: 246 ppm
 Ref. Std. Traceable to SRM #: 2751
 SRM Sample #: 212-09-AL
 SRM Cylinder #: SX-20000

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 249.5	C: 589.4	Conc: 581.21
R: 249.5	Z: 0	C: 589	Conc: 580.82
Z: 0	C: 592	R: 249.4	Conc: 583.77
UOM: ppm	Mean Test Assay:		581.93 ppm

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay:		0 ppm

2. Component: PROPANE

Requested Concentration: 200 ppm
 Certified Concentration: 203 ppm
 Instrument Used: MKS Multigas 2031 FTIR
 Analytical Method: Fourier Transform Infrared
 Last Multipoint Calibration: 6/24/2014

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC 163442
 Ref. Std. Conc: 265.8 ppm
 Ref. Std. Traceable to SRM #: vs 2644a
 SRM Sample #: 101-C-45
 SRM Cylinder #: XF003829B

First Analysis Data:		Date: 7/7/2014	
Z: 0	R: 273.6	C: 208.4	Conc: 202.43
R: 273.7	Z: 0	C: 208.6	Conc: 202.63
Z: 0	C: 208.5	R: 273.6	Conc: 202.53
UOM: ppm	Mean Test Assay:		202.53 ppm

Second Analysis Data:		Date:	
Z: 0	R: 0	C: 0	Conc: 0
R: 0	Z: 0	C: 0	Conc: 0
Z: 0	C: 0	R: 0	Conc: 0
UOM: ppm	Mean Test Assay:		0 ppm

Analyzed by:

Jack Fu

Certified by:

Ying Yu

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.



Calibration Gas Audit

NO Cylinder Gas

File No. 2016-087CGA

Company: Maxxam **Operator's name:** Chris Wesson
Cylinder #: LL119513 **Conc (PPM)** 50.2/50.4 **Tolerance (%)** 1 **Certified By:** Praxair

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>June 17, 2016</u>			Temp.°C	<u>23.0 C</u>
Gas Type	<u>NO</u>	Conc.	<u>48.79</u>	B.P.	<u>700 mmhg</u>
Cylinder Number	<u>CAL018188</u>				

Reference Analyzer:

Make/Model	<u>Teco 42i</u>	Serial/AMU Number:	<u>1868</u>
Instrument Settings	Zero: <u>4.3</u>	Span:	<u>1.046</u> Range: <u>1.0</u>
Last Calibration:	Date: <u>June 17/16</u>	C.F.	<u>1.000</u> Done By: <u>Al Clark</u>

Calibrator Flows (scm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4976	82.3	0.826	0.819	0.01654	60.462	49.9	49.5
4985	40.8	0.411	0.406	0.00818	122.181	50.2	49.6
4965	20.2	0.204	0.202	0.00407	245.792	50.1	49.7
Average Cylinder Concentration:						50.1	49.6

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>50.2</u>	<u>50.4</u>
Percent variance from Stated: <u>0.2</u>	<u>1.6</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: June 17, 2016
 Operator Signature: _____ Location: McIntyre Center Edmonton

APPENDIX IV
ANALYTICAL RESULTS

VOCS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 07, 2017	2447	Ambient Air	07-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	19-Jan-17
17010086-001	1,2,4-Trimethylbenzene	I	0.12	ppbv	0.03	AC-058	19-Jan-17
17010086-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-001	1,2-Dichloropropane	I	0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-001	1,3,5-Trimethylbenzene	I	0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Jan-17
17010086-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-001	1-Butene	I	0.11	ppbv	0.02	AC-058	19-Jan-17
17010086-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	1-Pentene	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-001	2,2,4-Trimethylpentane	I	0.05	ppbv	0.01	AC-058	19-Jan-17
17010086-001	2,2-Dimethylbutane	I	0.06	ppbv	0.01	AC-058	19-Jan-17
17010086-001	2,3,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-001	2,3-Dimethylbutane	I	0.08	ppbv	0.02	AC-058	19-Jan-17
17010086-001	2,3-Dimethylpentane	I	0.09	ppbv	0.02	AC-058	19-Jan-17

Report certified by:	Krista Gegolick, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Wednesday, February 08, 2017	Inquiries:	(780) 632 8455
		E-mail:	EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 07, 2017	2447	Ambient Air	07-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-001	2,4-Dimethylpentane	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-001	2-Methylheptane	I	0.04	ppbv	0.01	AC-058	19-Jan-17
17010086-001	2-Methylhexane	I	0.09	ppbv	0.01	AC-058	19-Jan-17
17010086-001	2-Methylpentane	I	0.17	ppbv	0.01	AC-058	19-Jan-17
17010086-001	3-Methylheptane	I	0.03	ppbv	0.02	AC-058	19-Jan-17
17010086-001	3-Methylhexane	I	0.08	ppbv	0.02	AC-058	19-Jan-17
17010086-001	3-Methylpentane	I	0.11	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Acetone		1.1	ppbv	0.4	AC-058	19-Jan-17
17010086-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Jan-17
17010086-001	Benzene	I	0.22	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Carbon disulfide	I	0.05	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Chloroform	I	0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Chloromethane		0.62	ppbv	0.02	AC-058	19-Jan-17
17010086-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-001	cis-2-Butene	I	0.04	ppbv	0.02	AC-058	19-Jan-17
17010086-001	cis-2-Pentene	I	0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Cyclohexane	I	0.19	ppbv	0.02	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 07, 2017	2447	Ambient Air	07-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-001	Cyclopentane	I	0.08	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Ethanol		1.5	ppbv	0.3	AC-058	19-Jan-17
17010086-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-001	Ethylbenzene	I	0.05	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Freon-11	I	0.26	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Freon-113	I	0.09	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Freon-114	I	0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Freon-12		0.60	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	19-Jan-17
17010086-001	Isobutane		0.98	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Isopentane		0.84	ppbv	0.03	AC-058	19-Jan-17
17010086-001	Isoprene	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-001	Isopropylbenzene	I	0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-001	m,p-Xylene	I	0.12	ppbv	0.03	AC-058	19-Jan-17
17010086-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	19-Jan-17
17010086-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	19-Jan-17
17010086-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Jan-17
17010086-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Jan-17
17010086-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-001	Methylcyclohexane		0.31	ppbv	0.01	AC-058	19-Jan-17
17010086-001	Methylcyclopentane	I	0.22	ppbv	0.02	AC-058	19-Jan-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
LICA/VOC/Bonnyville/Jan 07, 2017	2447	Ambient Air	07-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	19-Jan-17
17010086-001	n-Butane		1.79	ppbv	0.03	AC-058	19-Jan-17
17010086-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Jan-17
17010086-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-001	n-Heptane	I	0.09	ppbv	0.01	AC-058	19-Jan-17
17010086-001	n-Hexane	I	0.17	ppbv	0.01	AC-058	19-Jan-17
17010086-001	n-Octane	I	0.04	ppbv	0.02	AC-058	19-Jan-17
17010086-001	n-Pentane		0.5	ppbv	0.1	AC-058	19-Jan-17
17010086-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-001	n-Nonane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-001	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-001	o-Xylene	I	0.05	ppbv	0.01	AC-058	19-Jan-17
17010086-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Jan-17
17010086-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-001	Toluene	I	0.16	ppbv	0.01	AC-058	19-Jan-17
17010086-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-001	trans-2-Butene	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-001	trans-2-Pentene	I	0.02	ppbv	0.02	AC-058	19-Jan-17
17010086-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 07, 2017	2447	Ambient Air	07-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010086-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	19-Jan-17
17010086-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	19-Jan-17

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

Date: Wednesday, February 08, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/ Jan 13, 2017	2440	Ambient Air	13-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010130-002	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010130-002	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010130-002	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	20-Jan-17
17010130-002	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010130-002	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-002	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-002	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jan-17
17010130-002	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-002	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-002	1-Butene		0.12	ppbv	0.02	AC-058	20-Jan-17
17010130-002	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	1-Pentene		0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-002	2,2-Dimethylbutane		0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	2,3-Dimethylbutane		0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	2,3-Dimethylpentane		0.02	ppbv	0.02	AC-058	20-Jan-17

Report certified by: Graham Knox, Team Lead

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

Date: Tuesday, February 07, 2017

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
.ICA/VOC/Bonnyville/ Jan 13, 2017	2440	Ambient Air	13-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010130-002	2,4-Dimethylpentane		0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	2-Methylheptane		0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	2-Methylhexane		0.05	ppbv	0.01	AC-058	20-Jan-17
17010130-002	2-Methylpentane		0.13	ppbv	0.01	AC-058	20-Jan-17
17010130-002	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	3-Methylhexane		0.03	ppbv	0.02	AC-058	20-Jan-17
17010130-002	3-Methylpentane		0.07	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Acetone		2.7	ppbv	0.4	AC-058	20-Jan-17
17010130-002	Acrolein		0.3	ppbv	0.3	AC-058	20-Jan-17
17010130-002	Benzene		0.19	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-002	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Carbon disulfide	I	0.18	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Chloroform	I	0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Chloromethane		0.60	ppbv	0.02	AC-058	20-Jan-17
17010130-002	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010130-002	cis-2-Butene		0.03	ppbv	0.02	AC-058	20-Jan-17
17010130-002	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Cyclohexane		0.03	ppbv	0.02	AC-058	20-Jan-17

Report certified by: Graham Knox, Team Lead

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

Date: Tuesday, February 07, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/ Jan 13, 2017	2440	Ambient Air	13-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010130-002	Cyclopentane		0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Ethanol		1.6	ppbv	0.3	AC-058	20-Jan-17
17010130-002	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-002	Ethylbenzene		0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Freon-11		0.32	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Freon-113	I	0.10	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Freon-114	I	0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Freon-12		0.64	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	20-Jan-17
17010130-002	Isobutane		1.14	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Isopentane		0.71	ppbv	0.03	AC-058	20-Jan-17
17010130-002	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-002	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	m,p-Xylene		0.05	ppbv	0.03	AC-058	20-Jan-17
17010130-002	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010130-002	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	20-Jan-17
17010130-002	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	20-Jan-17
17010130-002	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jan-17
17010130-002	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-002	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	20-Jan-17
17010130-002	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-002	Methylcyclohexane		0.07	ppbv	0.01	AC-058	20-Jan-17
17010130-002	Methylcyclopentane		0.07	ppbv	0.02	AC-058	20-Jan-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
.ICA/VOC/Bonnyville/ Jan 13, 2017	2440	Ambient Air	13-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010130-002	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	20-Jan-17
17010130-002	n-Butane		1.93	ppbv	0.03	AC-058	20-Jan-17
17010130-002	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	20-Jan-17
17010130-002	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-002	n-Heptane		0.04	ppbv	0.01	AC-058	20-Jan-17
17010130-002	n-Hexane		0.13	ppbv	0.01	AC-058	20-Jan-17
17010130-002	n-Octane	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	n-Pentane		0.4	ppbv	0.1	AC-058	20-Jan-17
17010130-002	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010130-002	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010130-002	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010130-002	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	o-Xylene		0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-002	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010130-002	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	20-Jan-17
17010130-002	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010130-002	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010130-002	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-002	Toluene		0.12	ppbv	0.01	AC-058	20-Jan-17
17010130-002	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-002	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010130-002	trans-2-Butene		0.03	ppbv	0.01	AC-058	20-Jan-17
17010130-002	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	20-Jan-17
17010130-002	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17

Report certified by: Graham Knox, Team Lead

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/ Jan 13, 2017	2440	Ambient Air	13-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010130-002	Vinyl acetate		0.7 ppbv	0.4	AC-058	20-Jan-17
17010130-002	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	20-Jan-17

Report certified by: Graham Knox, Team Lead

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

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 19, 2017	2652	Ambient Air	19-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010190-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Feb-17
17010190-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Feb-17
17010190-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	01-Feb-17
17010190-001	1,2,4-Trimethylbenzene		0.07	ppbv	0.05	AC-058	01-Feb-17
17010190-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Feb-17
17010190-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	01-Feb-17
17010190-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Feb-17
17010190-001	1,3,5-Trimethylbenzene		0.04	ppbv	0.02	AC-058	01-Feb-17
17010190-001	1,3-Butadiene	I	0.08	ppbv	0.02	AC-058	01-Feb-17
17010190-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Feb-17
17010190-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Feb-17
17010190-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Feb-17
17010190-001	1-Butene		0.21	ppbv	0.02	AC-058	01-Feb-17
17010190-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	1-Pentene		0.03	ppbv	0.01	AC-058	01-Feb-17
17010190-001	2,2,4-Trimethylpentane		0.11	ppbv	0.01	AC-058	01-Feb-17
17010190-001	2,2-Dimethylbutane		0.06	ppbv	0.01	AC-058	01-Feb-17
17010190-001	2,3,4-Trimethylpentane		0.03	ppbv	0.01	AC-058	01-Feb-17
17010190-001	2,3-Dimethylbutane		0.14	ppbv	0.02	AC-058	01-Feb-17
17010190-001	2,3-Dimethylpentane		0.17	ppbv	0.02	AC-058	01-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 19, 2017	2652	Ambient Air	19-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010190-001	2,4-Dimethylpentane		0.07	ppbv	0.01	AC-058	01-Feb-17
17010190-001	2-Methylheptane		0.06	ppbv	0.01	AC-058	01-Feb-17
17010190-001	2-Methylhexane		0.16	ppbv	0.01	AC-058	01-Feb-17
17010190-001	2-Methylpentane		0.29	ppbv	0.01	AC-058	01-Feb-17
17010190-001	3-Methylheptane		0.04	ppbv	0.02	AC-058	01-Feb-17
17010190-001	3-Methylhexane		0.15	ppbv	0.02	AC-058	01-Feb-17
17010190-001	3-Methylpentane		0.21	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Acetone		2.1	ppbv	0.4	AC-058	01-Feb-17
17010190-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Feb-17
17010190-001	Benzene		0.32	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Feb-17
17010190-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Chloroform	I	0.03	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Chloromethane		0.52	ppbv	0.02	AC-058	01-Feb-17
17010190-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Feb-17
17010190-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Feb-17
17010190-001	cis-2-Butene		0.07	ppbv	0.02	AC-058	01-Feb-17
17010190-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Cyclohexane		0.28	ppbv	0.02	AC-058	01-Feb-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 19, 2017	2652	Ambient Air	19-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010190-001	Cyclopentane		0.13	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Ethanol		3.4	ppbv	0.3	AC-058	01-Feb-17
17010190-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Feb-17
17010190-001	Ethylbenzene		0.07	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Freon-11		0.33	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Freon-113	I	0.10	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Freon-114	I	0.02	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Freon-12		0.72	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	01-Feb-17
17010190-001	Isobutane		3.09	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Isopentane		1.66	ppbv	0.03	AC-058	01-Feb-17
17010190-001	Isoprene		0.02	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Feb-17
17010190-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Feb-17
17010190-001	m,p-Xylene		0.25	ppbv	0.03	AC-058	01-Feb-17
17010190-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Feb-17
17010190-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	01-Feb-17
17010190-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	01-Feb-17
17010190-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Feb-17
17010190-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Feb-17
17010190-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Feb-17
17010190-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	01-Feb-17
17010190-001	Methylcyclohexane		0.43	ppbv	0.01	AC-058	01-Feb-17
17010190-001	Methylcyclopentane		0.35	ppbv	0.02	AC-058	01-Feb-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 19, 2017	2652	Ambient Air	19-Jan-17 0:00
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REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010190-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	01-Feb-17
17010190-001	n-Butane		5.36	ppbv	0.03	AC-058	01-Feb-17
17010190-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	01-Feb-17
17010190-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Feb-17
17010190-001	n-Heptane		0.15	ppbv	0.01	AC-058	01-Feb-17
17010190-001	n-Hexane		0.32	ppbv	0.01	AC-058	01-Feb-17
17010190-001	n-Octane		0.06	ppbv	0.02	AC-058	01-Feb-17
17010190-001	n-Pentane		0.8	ppbv	0.1	AC-058	01-Feb-17
17010190-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	01-Feb-17
17010190-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	01-Feb-17
17010190-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	01-Feb-17
17010190-001	n-Nonane		0.03	ppbv	0.01	AC-058	01-Feb-17
17010190-001	o-Ethyltoluene	I	0.03	ppbv	0.01	AC-058	01-Feb-17
17010190-001	o-Xylene		0.08	ppbv	0.01	AC-058	01-Feb-17
17010190-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Feb-17
17010190-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	01-Feb-17
17010190-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Feb-17
17010190-001	Tetrachloroethylene	I	0.20	ppbv	0.04	AC-058	01-Feb-17
17010190-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	01-Feb-17
17010190-001	Toluene		0.49	ppbv	0.01	AC-058	01-Feb-17
17010190-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	01-Feb-17
17010190-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Feb-17
17010190-001	trans-2-Butene		0.08	ppbv	0.01	AC-058	01-Feb-17
17010190-001	trans-2-Pentene		0.04	ppbv	0.02	AC-058	01-Feb-17
17010190-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	01-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 19, 2017	2652	Ambient Air	19-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010190-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	01-Feb-17
17010190-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	01-Feb-17

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

Date: Wednesday, February 22, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 25, 2017	1531	Ambient Air	25-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010213-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Feb-17
17010213-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	02-Feb-17
17010213-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Feb-17
17010213-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Feb-17
17010213-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	02-Feb-17
17010213-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Feb-17
17010213-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010213-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010213-001	1-Butene		0.06	ppbv	0.02	AC-058	02-Feb-17
17010213-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	02-Feb-17
17010213-001	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	02-Feb-17
17010213-001	2,3,4-Trimethylpentane		0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	2,3-Dimethylbutane		0.03	ppbv	0.02	AC-058	02-Feb-17
17010213-001	2,3-Dimethylpentane		0.04	ppbv	0.02	AC-058	02-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 25, 2017	1531	Ambient Air	25-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-001	2,4-Dimethylpentane		0.02	ppbv	0.01	AC-058	02-Feb-17
17010213-001	2-Methylheptane		0.02	ppbv	0.01	AC-058	02-Feb-17
17010213-001	2-Methylhexane		0.04	ppbv	0.01	AC-058	02-Feb-17
17010213-001	2-Methylpentane		0.12	ppbv	0.01	AC-058	02-Feb-17
17010213-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	3-Methylhexane		0.05	ppbv	0.02	AC-058	02-Feb-17
17010213-001	3-Methylpentane		0.09	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Acetone		1.1	ppbv	0.4	AC-058	02-Feb-17
17010213-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Feb-17
17010213-001	Benzene		0.19	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010213-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Carbon disulfide	I	0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Chloroform	I	0.03	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Chloromethane		0.51	ppbv	0.02	AC-058	02-Feb-17
17010213-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010213-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Cyclohexane		0.05	ppbv	0.02	AC-058	02-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

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LICA/VOC/Bonnyville/Jan 25, 2017	1531	Ambient Air	25-Jan-17	0:00
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			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-001	Cyclopentane		0.04	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Ethanol		1.1	ppbv	0.3	AC-058	02-Feb-17
17010213-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010213-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Freon-11		0.39	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Freon-113	I	0.12	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Freon-114	I	0.03	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Freon-12		0.83	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Feb-17
17010213-001	Isobutane		1.30	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Isopentane		0.76	ppbv	0.03	AC-058	02-Feb-17
17010213-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010213-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	m,p-Xylene		0.04	ppbv	0.03	AC-058	02-Feb-17
17010213-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010213-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	02-Feb-17
17010213-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	02-Feb-17
17010213-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Feb-17
17010213-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010213-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Feb-17
17010213-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	02-Feb-17
17010213-001	Methylcyclohexane		0.07	ppbv	0.01	AC-058	02-Feb-17
17010213-001	Methylcyclopentane		0.08	ppbv	0.02	AC-058	02-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 25, 2017	1531	Ambient Air	25-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	02-Feb-17
17010213-001	n-Butane		2.48	ppbv	0.03	AC-058	02-Feb-17
17010213-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Feb-17
17010213-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010213-001	n-Heptane		0.05	ppbv	0.01	AC-058	02-Feb-17
17010213-001	n-Hexane		0.17	ppbv	0.01	AC-058	02-Feb-17
17010213-001	n-Octane		0.03	ppbv	0.02	AC-058	02-Feb-17
17010213-001	n-Pentane		0.6	ppbv	0.1	AC-058	02-Feb-17
17010213-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Feb-17
17010213-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Feb-17
17010213-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Feb-17
17010213-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	o-Xylene		0.02	ppbv	0.01	AC-058	02-Feb-17
17010213-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010213-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Feb-17
17010213-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010213-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010213-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010213-001	Toluene		0.14	ppbv	0.01	AC-058	02-Feb-17
17010213-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010213-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010213-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010213-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 25, 2017	1531	Ambient Air	25-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-001	Vinyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010213-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 31, 2017	2405	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	17020031	REPORT CREATED:	22-Feb-17	REPORT REVISED: 02-Mar-17
		VERSION:	Version 02	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020031-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020031-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Feb-17
17020031-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	15-Feb-17
17020031-001	1,2,4-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Feb-17
17020031-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Feb-17
17020031-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	15-Feb-17
17020031-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Feb-17
17020031-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020031-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020031-001	1-Butene		0.07	ppbv	0.02	AC-058	15-Feb-17
17020031-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	2,2,4-Trimethylpentane		0.02	ppbv	0.01	AC-058	15-Feb-17
17020031-001	2,2-Dimethylbutane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	2,3,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	2,3-Dimethylbutane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	2,3-Dimethylpentane		0.02	ppbv	0.02	AC-058	15-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: March-02-17

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 31, 2017	2405	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	17020031	REPORT CREATED:	22-Feb-17	REPORT REVISED: 02-Mar-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020031-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	2-Methylheptane		0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	2-Methylhexane		0.03	ppbv	0.01	AC-058	15-Feb-17
17020031-001	2-Methylpentane		0.04	ppbv	0.01	AC-058	15-Feb-17
17020031-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	3-Methylhexane		0.03	ppbv	0.02	AC-058	15-Feb-17
17020031-001	3-Methylpentane		0.03	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Acetone		1.5	ppbv	0.4	AC-058	15-Feb-17
17020031-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Feb-17
17020031-001	Benzene		0.10	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020031-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Chloroform	I	0.03	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Chloromethane		0.56	ppbv	0.02	AC-058	15-Feb-17
17020031-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020031-001	cis-2-Butene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Cyclohexane	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17

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

Date: March-02-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 31, 2017	2405	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	17020031	REPORT CREATED:	22-Feb-17	REPORT REVISED: 02-Mar-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020031-001	Cyclopentane		0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Ethanol		0.7	ppbv	0.3	AC-058	15-Feb-17
17020031-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020031-001	Ethylbenzene		0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Freon-11		0.37	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Freon-113	I	0.11	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Freon-114	I	0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Freon-12		0.79	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	15-Feb-17
17020031-001	Isobutane		0.36	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Isopentane		0.22	ppbv	0.03	AC-058	15-Feb-17
17020031-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020031-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	m,p-Xylene	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Feb-17
17020031-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020031-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	15-Feb-17
17020031-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	15-Feb-17
17020031-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Feb-17
17020031-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020031-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Feb-17
17020031-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	15-Feb-17
17020031-001	Methylcyclohexane		0.03	ppbv	0.01	AC-058	15-Feb-17
17020031-001	Methylcyclopentane		0.03	ppbv	0.02	AC-058	15-Feb-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 31, 2017	2405	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	17020031	REPORT CREATED:	22-Feb-17	REPORT REVISED: 02-Mar-17
		VERSION:	Version 02	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020031-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	15-Feb-17
17020031-001	n-Butane		0.60	ppbv	0.03	AC-058	15-Feb-17
17020031-001	n-Decane	K, T, U	< 0.06	ppbv	0.06	AC-058	15-Feb-17
17020031-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020031-001	n-Heptane		0.04	ppbv	0.01	AC-058	15-Feb-17
17020031-001	n-Hexane		0.04	ppbv	0.01	AC-058	15-Feb-17
17020031-001	n-Octane		0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	n-Pentane		0.2	ppbv	0.1	AC-058	15-Feb-17
17020031-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	15-Feb-17
17020031-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	15-Feb-17
17020031-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	15-Feb-17
17020031-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	o-Xylene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020031-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	15-Feb-17
17020031-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020031-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020031-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	15-Feb-17
17020031-001	Toluene		0.05	ppbv	0.01	AC-058	15-Feb-17
17020031-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17
17020031-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	15-Feb-17
17020031-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	15-Feb-17
17020031-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	15-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/VOC/Bonnyville/Jan 31, 2017	2405	Ambient Air	31-Jan-17	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	17020031	REPORT CREATED:	22-Feb-17	REPORT REVISED: 02-Mar-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17020031-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	15-Feb-17
17020031-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	15-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: March-02-17

Inquiries: (780) 632 8455

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PAHS SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Jan 01, 2017	9801	Air Filter	01-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010017-002	1-Methylnaphthalene		0.70	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	2-Methylnaphthalene		1.41	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Acenaphthene		0.06	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Acenaphthylene		0.06	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Anthracene		0.03	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Benzo(a)anthracene		0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Benzo(b,j,k)fluoranthene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Benzo(c)phenanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Benzo(ghi)perylene		0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Chrysene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Dibenzo(a,i)pyrene		0.04	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Fluoranthene		0.07	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Fluorene		0.10	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Naphthalene		1.61	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Phenanthrene		0.24	ug/Filter	0.01	NA-017	17-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Jan 01, 2017	9801	Air Filter	01-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010017-002	Pyrene		0.06 ug/Filter	0.01	NA-017	17-Jan-17
17010017-002	Retene		0.13 ug/Filter	0.01	NA-017	17-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Jan 07, 2017	A13-02	Air Filter	07-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-002	1-Methylnaphthalene		0.55	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	2-Methylnaphthalene		0.94	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Acenaphthene		0.08	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Acenaphthylene		0.11	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Acridine	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Anthracene		0.03	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Benzo(a)anthracene		0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Benzo(a)pyrene		0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Benzo(b,j,k)fluoranthene		0.06	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Benzo(c)phenanthrene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Benzo(e)pyrene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Benzo(ghi)perylene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Chrysene		0.04	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Dibenzo(ah)anthracene		0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Fluoranthene		0.10	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Fluorene		0.13	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Indeno(1,2,3-cd)pyrene		0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Naphthalene		1.05	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Perylene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Phenanthrene		0.35	ug/PUF	0.01	NA-017	28-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Jan 07, 2017	A13-02	Air Filter	07-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010086-002	Pyrene		0.08 ug/PUF	0.01	NA-017	28-Jan-17
17010086-002	Retene		0.16 ug/PUF	0.01	NA-017	28-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/ Jan 13, 2017	TE07	Air Filter	13-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010130-003	1-Methylnaphthalene		0.30	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	2-Methylnaphthalene		0.52	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	3-Methylcholanthrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Acenaphthene		0.11	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Acenaphthylene		0.03	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Acridine	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Anthracene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Benzo(a)anthracene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Benzo(a)pyrene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Benzo(b,j,k)fluoranthene		0.05	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Benzo(c)phenanthrene		0.02	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Benzo(e)pyrene		0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Benzo(ghi)perylene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Chrysene		0.04	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Dibenzo(ah)anthracene		0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Fluoranthene		0.10	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Fluorene		0.19	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Indeno(1,2,3-cd)pyrene		0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Naphthalene		0.47	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Perylene	K, T, U	< 0.01	ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Phenanthrene		0.40	ug/PUF	0.01	NA-017	28-Jan-17

Report certified by: Graham Knox, Team Lead

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

Date: Tuesday, February 07, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/ Jan 13, 2017	TE07	Air Filter	13-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010130-003	Pyrene		0.06 ug/PUF	0.01	NA-017	28-Jan-17
17010130-003	Retene		0.15 ug/PUF	0.01	NA-017	28-Jan-17

Report certified by: Graham Knox, Team Lead

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

Date: Tuesday, February 07, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Jan 19, 2017	TE04	Air Filter	19-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010190-002	1-Methylnaphthalene		0.62	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	2-Methylnaphthalene		1.06	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Acenaphthene		0.23	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Acenaphthylene		0.89	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Anthracene		0.11	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Benzo(a)anthracene		0.04	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Benzo(a)pyrene		0.04	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Benzo(b,j,k)fluoranthene		0.10	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Benzo(c)phenanthrene		0.03	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Benzo(e)pyrene		0.04	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Chrysene		0.05	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Fluoranthene		0.20	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Fluorene		0.40	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Naphthalene		0.84	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Phenanthrene		0.77	ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/PUF/Bonnyville/Jan 19, 2017	TE04	Air Filter	19-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010190-002	Pyrene		0.20 ug/Filter	0.01	NA-017	08-Feb-17
17010190-002	Retene		0.20 ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Jan 25, 2017	TE02	Air Filter	25-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-002	1-Methylnaphthalene		0.46	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	2-Methylnaphthalene		0.77	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Acenaphthene		0.11	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Acenaphthylene		0.15	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Anthracene		0.02	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Benzo(a)anthracene		0.02	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Benzo(b,j,k)fluoranthene		0.04	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Benzo(c)phenanthrene		0.02	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Chrysene		0.02	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Fluoranthene		0.09	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Fluorene		0.21	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Naphthalene		0.80	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Phenanthrene		0.36	ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Jan 25, 2017	TE02	Air Filter	25-Jan-17	0:00
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-002	Pyrene		0.07	ug/Filter	0.01	NA-017	08-Feb-17
17010213-002	Retene		0.08	ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8	CLIENT SAMPLE ID ..ICA/PUF/Bonnyville/Jan 31, 2017	CANISTER ID 9801	Matrix Air Filter	Priority Normal
	DESCRIPTION: Bonnyville- AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	780 812 2182	DATE SAMPLED: 31-Jan-17	0:00	DATE RECEIVED: 03-Feb-17
		REPORT CREATED: 22-Feb-17		REPORT NUMBER: 17020031
		REPORT REVISED: 02-Mar-17		VERSION: Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020031-002	1-Methylnaphthalene		0.50	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	2-Methylnaphthalene		0.79	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	3-Methylcholanthrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	7,12-Dimethylbenz(a)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Acenaphthene		0.08	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Acenaphthylene		0.07	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Acridine	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Benzo(a)anthracene		0.02	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Benzo(a)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Benzo(b,j,k)fluoranthene		0.04	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Benzo(c)phenanthrene		0.02	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Benzo(e)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Benzo(ghi)perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Chrysene		0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Dibenzo(a,h)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Dibenzo(a,i)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Dibenzo(a,l)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator

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

Date: March-02-17

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/PUF/Bonnyville/Jan 31, 2017	9801	Air Filter	31-Jan-17	0:00
DESCRIPTION:	Bonnyville- AER			
REPORT NUMBER:	17020031	REPORT CREATED:	22-Feb-17	REPORT REVISED: 02-Mar-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17020031-002	Dibenzo(ah)anthracene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Fluoranthene		0.05	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Fluorene		0.09	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Indeno(1,2,3-cd)pyrene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Naphthalene		0.63	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Perylene	K, T, U	< 0.01	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Phenanthrene		0.18	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Pyrene		0.04	ug/Filter	0.01	NA-017	08-Feb-17
17020031-002	Retene		0.05	ug/Filter	0.01	NA-017	08-Feb-17

Report certified by: Colleen McGerrigle, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: March-02-17 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

NMHC CANISTER SAMPLES

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 01, 2017	H3298	Ambient Air	01-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010017-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	1,1-Dichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-001	1,2,3-Trimethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Jan-17
17010017-001	1,2,4-Trichlorobenzene	K, T, U	< 0.8	ppbv	0.8	AC-058	10-Jan-17
17010017-001	1,2,4-Trimethylbenzene	I	0.09	ppbv	0.03	AC-058	10-Jan-17
17010017-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	1,2-Dichlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Jan-17
17010017-001	1,2-Dichloroethane	I	0.04	ppbv	0.01	AC-058	10-Jan-17
17010017-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-001	1,3,5-Trimethylbenzene	I	0.06	ppbv	0.02	AC-058	10-Jan-17
17010017-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	1,3-Dichlorobenzene	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Jan-17
17010017-001	1,4-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-001	1,4-Dioxane	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-001	1-Butene	I	0.09	ppbv	0.02	AC-058	10-Jan-17
17010017-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-001	2,2-Dimethylbutane		1.37	ppbv	0.01	AC-058	10-Jan-17
17010017-001	2,3,4-Trimethylpentane	I	0.05	ppbv	0.01	AC-058	10-Jan-17
17010017-001	2,3-Dimethylbutane		5.83	ppbv	0.02	AC-058	10-Jan-17
17010017-001	2,3-Dimethylpentane		1.83	ppbv	0.02	AC-058	10-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 01, 2017	H3298	Ambient Air	01-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010017-001	2,4-Dimethylpentane		1.94	ppbv	0.01	AC-058	10-Jan-17
17010017-001	2-Methylheptane		1.89	ppbv	0.01	AC-058	10-Jan-17
17010017-001	2-Methylhexane		8.14	ppbv	0.01	AC-058	10-Jan-17
17010017-001	2-Methylpentane		26.8	ppbv	0.10	AC-058	19-Jan-17
17010017-001	3-Methylheptane		1.27	ppbv	0.02	AC-058	10-Jan-17
17010017-001	3-Methylhexane		7.56	ppbv	0.02	AC-058	10-Jan-17
17010017-001	3-Methylpentane		20.4	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Acetone		16.8	ppbv	0.4	AC-058	10-Jan-17
17010017-001	Acrolein	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Jan-17
17010017-001	Benzene		5.36	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Benzyl chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Carbon disulfide	I	0.02	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Carbon tetrachloride	I	0.15	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Chloroform	I	0.03	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Chloromethane		0.69	ppbv	0.02	AC-058	10-Jan-17
17010017-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-001	cis-1,3-Dichloropropene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-001	cis-2-Butene	I	0.03	ppbv	0.02	AC-058	10-Jan-17
17010017-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Cyclohexane		18.3	ppbv	0.02	AC-058	10-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 01, 2017	H3298	Ambient Air	01-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010017-001	Cyclopentane		7.76	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Dibromochloromethane	I	0.02	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Ethanol		1.1	ppbv	0.3	AC-058	10-Jan-17
17010017-001	Ethyl acetate	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-001	Ethylbenzene	I	0.21	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Freon-11		0.40	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Freon-113	I	0.06	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Freon-114	I	0.03	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Freon-12		0.84	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Hexachloro-1,3-butadiene	K, T, U	< 0.50	ppbv	0.50	AC-058	10-Jan-17
17010017-001	Isobutane		287	ppbv	2.64	AC-058	19-Jan-17
17010017-001	Isopentane		146	ppbv	0.30	AC-058	19-Jan-17
17010017-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Isopropyl alcohol	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-001	Isopropylbenzene	I	0.02	ppbv	0.01	AC-058	10-Jan-17
17010017-001	m,p-Xylene		1.48	ppbv	0.03	AC-058	10-Jan-17
17010017-001	m-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-001	m-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	10-Jan-17
17010017-001	Methyl butyl ketone	K, T, U	< 0.50	ppbv	0.50	AC-058	10-Jan-17
17010017-001	Methyl ethyl ketone	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Jan-17
17010017-001	Methyl isobutyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-001	Methyl methacrylate	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Jan-17
17010017-001	Methyl tert butyl ether	K, T, U	< 0.03	ppbv	0.03	AC-058	10-Jan-17
17010017-001	Methylcyclohexane		16.1	ppbv	0.01	AC-058	10-Jan-17
17010017-001	Methylcyclopentane		17.5	ppbv	0.02	AC-058	10-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 01, 2017	H3298	Ambient Air	01-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010017-001	Methylene chloride	K, T, U	< 0.3	ppbv	0.3	AC-058	10-Jan-17
17010017-001	n-Butane		641	ppbv	3.96	AC-058	19-Jan-17
17010017-001	n-Decane	I	0.09	ppbv	0.06	AC-058	10-Jan-17
17010017-001	n-Dodecane	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-001	n-Heptane		14.2	ppbv	0.01	AC-058	10-Jan-17
17010017-001	n-Hexane		34.6	ppbv	0.10	AC-058	19-Jan-17
17010017-001	n-Octane		3.41	ppbv	0.02	AC-058	10-Jan-17
17010017-001	n-Pentane		140	ppbv	1.0	AC-058	19-Jan-17
17010017-001	n-Propylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	10-Jan-17
17010017-001	n-Undecane	K, T, U	< 0.5	ppbv	0.5	AC-058	10-Jan-17
17010017-001	Naphthalene	K, T, U	< 0.5	ppbv	0.5	AC-058	10-Jan-17
17010017-001	n-Nonane		0.83	ppbv	0.01	AC-058	10-Jan-17
17010017-001	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	10-Jan-17
17010017-001	o-Xylene		0.32	ppbv	0.01	AC-058	10-Jan-17
17010017-001	p-Diethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-001	p-Ethyltoluene	K, T, U	< 0.07	ppbv	0.07	AC-058	10-Jan-17
17010017-001	Styrene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-001	Tetrachloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-001	Tetrahydrofuran	K, T, U	< 0.4	ppbv	0.4	AC-058	10-Jan-17
17010017-001	Toluene		5.87	ppbv	0.01	AC-058	10-Jan-17
17010017-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	10-Jan-17
17010017-001	trans-1,3-Dichloropropylene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17
17010017-001	trans-2-Butene	I	0.03	ppbv	0.01	AC-058	10-Jan-17
17010017-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	10-Jan-17
17010017-001	Trichloroethylene	K, T, U	< 0.04	ppbv	0.04	AC-058	10-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LICA/VOC/Bonnyville/Jan 01, 2017	H3298	Ambient Air	01-Jan-17 0:00
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010017	REPORT CREATED:	25-Jan-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010017-001	Vinyl acetate	K, T, U	< 0.4 ppbv	0.4	AC-058	10-Jan-17
17010017-001	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	10-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: January-25-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca



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

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Adewunmi Adekanmbi Lakeland Industry and Community Assn 4000, 19 St NE Calgary AB T2E 6P8 INVOICE: Arianna Cook 780 812 2182 PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	<table border="0"> <tr> <td>CLIENT SAMPLE ID</td> <td>LICA/NMHC-VOC/Bonnyville</td> <td>CANISTER ID</td> <td>17132</td> <td>Matrix</td> <td>Ambient Air</td> <td>Priority</td> <td>Normal</td> </tr> <tr> <td>DESCRIPTION:</td> <td colspan="7">Bonnyville - AER</td> </tr> <tr> <td>DATE SAMPLED:</td> <td>06-Jan-17</td> <td>20:20</td> <td>DATE RECEIVED:</td> <td colspan="4">10-Jan-17</td> </tr> <tr> <td>REPORT CREATED:</td> <td colspan="2">30-Jan-17</td> <td>REPORT NUMBER:</td> <td colspan="4">17010044</td> </tr> <tr> <td></td> <td></td> <td></td> <td>VERSION:</td> <td colspan="4">Version 01</td> </tr> </table>	CLIENT SAMPLE ID	LICA/NMHC-VOC/Bonnyville	CANISTER ID	17132	Matrix	Ambient Air	Priority	Normal	DESCRIPTION:	Bonnyville - AER							DATE SAMPLED:	06-Jan-17	20:20	DATE RECEIVED:	10-Jan-17				REPORT CREATED:	30-Jan-17		REPORT NUMBER:	17010044							VERSION:	Version 01			
CLIENT SAMPLE ID	LICA/NMHC-VOC/Bonnyville	CANISTER ID	17132	Matrix	Ambient Air	Priority	Normal																																		
DESCRIPTION:	Bonnyville - AER																																								
DATE SAMPLED:	06-Jan-17	20:20	DATE RECEIVED:	10-Jan-17																																					
REPORT CREATED:	30-Jan-17		REPORT NUMBER:	17010044																																					
			VERSION:	Version 01																																					

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010044-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-17
17010044-001	1,2,3-Trimethylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	18-Jan-17
17010044-001	1,2,4-Trichlorobenzene	K, T, U	< 1.0	ppbv	1.0	AC-058	18-Jan-17
17010044-001	1,2,4-Trimethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Jan-17
17010044-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Jan-17
17010044-001	1,2-Dichloroethane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	1,3,5-Trimethylbenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Jan-17
17010044-001	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-17
17010044-001	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-17
17010044-001	1-Butene	I	0.11	ppbv	0.02	AC-058	18-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator **On behalf of:** PJ Pretorius, Manager, Analysis and Testing Services
Date: Monday, January 30, 2017 **Inquiries:** (780) 632 8455 **E-mail:** EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC-VOC/Bonnyville	17132	Ambient Air	06-Jan-17	20:20
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010044	REPORT CREATED:	30-Jan-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010044-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	2,2,4-Trimethylpentane	I	0.04	ppbv	0.01	AC-058	18-Jan-17
17010044-001	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	18-Jan-17
17010044-001	2,3,4-Trimethylpentane	I	0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	2,3-Dimethylbutane	I	0.04	ppbv	0.02	AC-058	18-Jan-17
17010044-001	2,3-Dimethylpentane	I	0.04	ppbv	0.02	AC-058	18-Jan-17
17010044-001	2,4-Dimethylpentane	I	0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	2-Methylheptane	I	0.02	ppbv	0.01	AC-058	18-Jan-17
17010044-001	2-Methylhexane	I	0.05	ppbv	0.01	AC-058	18-Jan-17
17010044-001	2-Methylpentane	I	0.08	ppbv	0.01	AC-058	18-Jan-17
17010044-001	3-Methylheptane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	3-Methylhexane	I	0.04	ppbv	0.02	AC-058	18-Jan-17
17010044-001	3-Methylpentane	I	0.06	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Acetone		1.1	ppbv	0.5	AC-058	18-Jan-17
17010044-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Jan-17
17010044-001	Benzene	I	0.32	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-17
17010044-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, January 30, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC-VOC/Bonnyville	17132	Ambient Air	06-Jan-17	20:20
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010044	REPORT CREATED:	30-Jan-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010044-001	Chloroform	I	0.03	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Chloromethane		0.52	ppbv	0.02	AC-058	18-Jan-17
17010044-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-17
17010044-001	cis-2-Butene	I	0.04	ppbv	0.02	AC-058	18-Jan-17
17010044-001	cis-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Cyclohexane	I	0.05	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Cyclopentane	I	0.02	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Ethanol		1.5	ppbv	0.4	AC-058	18-Jan-17
17010044-001	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-17
17010044-001	Ethylbenzene	I	0.03	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Freon-11	I	0.33	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Freon-113	I	0.10	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Freon-12		0.67	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Hexachloro-1,3-butadiene	K, T, U	< 0.61	ppbv	0.61	AC-058	18-Jan-17
17010044-001	Isobutane		0.75	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Isopentane		0.39	ppbv	0.04	AC-058	18-Jan-17
17010044-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-17
17010044-001	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	m,p-Xylene	I	0.10	ppbv	0.04	AC-058	18-Jan-17
17010044-001	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-17
17010044-001	m-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	18-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: Monday, January 30, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC-VOC/Bonnyville	17132	Ambient Air	06-Jan-17	20:20
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010044	REPORT CREATED:	30-Jan-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010044-001	Methyl butyl ketone	K, T, U	< 0.61	ppbv	0.61	AC-058	18-Jan-17
17010044-001	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Jan-17
17010044-001	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-17
17010044-001	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	18-Jan-17
17010044-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	18-Jan-17
17010044-001	Methylcyclohexane	I	0.10	ppbv	0.01	AC-058	18-Jan-17
17010044-001	Methylcyclopentane	I	0.08	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	18-Jan-17
17010044-001	n-Butane		1.08	ppbv	0.04	AC-058	18-Jan-17
17010044-001	n-Decane	K, T, U	< 0.07	ppbv	0.07	AC-058	18-Jan-17
17010044-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-17
17010044-001	n-Heptane	I	0.04	ppbv	0.01	AC-058	18-Jan-17
17010044-001	n-Hexane	I	0.07	ppbv	0.01	AC-058	18-Jan-17
17010044-001	n-Octane	I	0.03	ppbv	0.02	AC-058	18-Jan-17
17010044-001	n-Pentane	I	0.2	ppbv	0.1	AC-058	18-Jan-17
17010044-001	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	18-Jan-17
17010044-001	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	18-Jan-17
17010044-001	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	18-Jan-17
17010044-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	o-Ethyltoluene	I	0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	o-Xylene	I	0.04	ppbv	0.01	AC-058	18-Jan-17
17010044-001	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-17
17010044-001	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	18-Jan-17
17010044-001	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-17
17010044-001	Tetrachloroethylene	I	0.10	ppbv	0.05	AC-058	18-Jan-17

Report certified by:	Rebecca Holgate, Account Coordinator	On behalf of:	PJ Pretorius, Manager, Analysis and Testing Services
Date:	Monday, January 30, 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/NMHC-VOC/Bonnyville	17132	Ambient Air	06-Jan-17	20:20
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010044	REPORT CREATED:	30-Jan-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010044-001	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-17
17010044-001	Toluene	I	0.19	ppbv	0.01	AC-058	18-Jan-17
17010044-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-17
17010044-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	18-Jan-17
17010044-001	trans-2-Pentene	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17
17010044-001	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	18-Jan-17
17010044-001	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	18-Jan-17
17010044-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	18-Jan-17

Report certified by: Rebecca Holgate, Account Coordinator	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Monday, January 30, 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 LICA/NMHC/VOC/Bonnyville	CANISTER ID S5624	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 09-Jan-17	16:20	DATE RECEIVED: 12-Jan-17	
	REPORT CREATED: 08-Feb-17		REPORT NUMBER: 17010086	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-005	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-006	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-005	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Jan-17
17010086-006	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Jan-17
17010086-005	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	19-Jan-17
17010086-006	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	19-Jan-17
17010086-006	1,2,4-Trimethylbenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-005	1,2,4-Trimethylbenzene	I	0.10	ppbv	0.04	AC-058	19-Jan-17
17010086-006	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

Inquiries: (780) 632 8455

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	17120	Ambient Air	10-Jan-17	16:10
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-006	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-005	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-006	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-005	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-006	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	1,3,5-Trimethylbenzene	I	0.05	ppbv	0.03	AC-058	19-Jan-17
17010086-006	1,3,5-Trimethylbenzene	I	0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	1,3-Butadiene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-005	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-006	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-006	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	1-Butene	I	0.35	ppbv	0.03	AC-058	19-Jan-17
17010086-006	1-Butene	I	0.18	ppbv	0.03	AC-058	19-Jan-17
17010086-006	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	1-Pentene	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-006	1-Pentene	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-005	2,2,4-Trimethylpentane	I	0.18	ppbv	0.01	AC-058	19-Jan-17
17010086-006	2,2,4-Trimethylpentane	I	0.07	ppbv	0.01	AC-058	19-Jan-17
17010086-005	2,2-Dimethylbutane	I	0.03	ppbv	0.01	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	17120	Ambient Air	10-Jan-17	16:10
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-006	2,2-Dimethylbutane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-005	2,3,4-Trimethylpentane	I	0.07	ppbv	0.01	AC-058	19-Jan-17
17010086-006	2,3,4-Trimethylpentane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-005	2,3-Dimethylbutane	I	0.05	ppbv	0.03	AC-058	19-Jan-17
17010086-006	2,3-Dimethylbutane	I	0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	2,3-Dimethylpentane	I	0.07	ppbv	0.03	AC-058	19-Jan-17
17010086-005	2,3-Dimethylpentane	I	0.17	ppbv	0.03	AC-058	19-Jan-17
17010086-006	2,4-Dimethylpentane	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-005	2,4-Dimethylpentane	I	0.05	ppbv	0.01	AC-058	19-Jan-17
17010086-005	2-Methylheptane	I	0.04	ppbv	0.01	AC-058	19-Jan-17
17010086-006	2-Methylheptane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-006	2-Methylhexane	I	0.06	ppbv	0.01	AC-058	19-Jan-17
17010086-005	2-Methylhexane	I	0.17	ppbv	0.01	AC-058	19-Jan-17
17010086-006	2-Methylpentane	I	0.09	ppbv	0.01	AC-058	19-Jan-17
17010086-005	2-Methylpentane	I	0.17	ppbv	0.01	AC-058	19-Jan-17
17010086-005	3-Methylheptane	I	0.04	ppbv	0.03	AC-058	19-Jan-17
17010086-006	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	3-Methylhexane	I	0.06	ppbv	0.03	AC-058	19-Jan-17
17010086-005	3-Methylhexane	I	0.17	ppbv	0.03	AC-058	19-Jan-17
17010086-006	3-Methylpentane	I	0.06	ppbv	0.01	AC-058	19-Jan-17
17010086-005	3-Methylpentane	I	0.10	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Acetone		0.9	ppbv	0.5	AC-058	19-Jan-17
17010086-005	Acetone		1.2	ppbv	0.5	AC-058	19-Jan-17
17010086-005	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-006	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator	On behalf of: PJ Pretorius, Manager, Analysis and Testing Services
Date: Wednesday, February 08, 2017	Inquiries: (780) 632 8455 E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	17120	Ambient Air	10-Jan-17	16:10
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-006	Benzene		0.53	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Benzene		0.42	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-006	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Carbon disulfide	I	0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Carbon tetrachloride	I	0.10	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Chloroform	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Chloromethane		0.50	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Chloromethane		0.48	ppbv	0.03	AC-058	19-Jan-17
17010086-006	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-006	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	S5624	Ambient Air	09-Jan-17	16:20
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-005	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-006	cis-2-Butene	I	0.04	ppbv	0.03	AC-058	19-Jan-17
17010086-005	cis-2-Butene	I	0.09	ppbv	0.03	AC-058	19-Jan-17
17010086-006	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	cis-2-Pentene	I	0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Cyclohexane	I	0.06	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Cyclohexane	I	0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Cyclopentane	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Cyclopentane	I	0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Ethanol		1.1	ppbv	0.4	AC-058	19-Jan-17
17010086-005	Ethanol		1.6	ppbv	0.4	AC-058	19-Jan-17
17010086-006	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	Ethylbenzene	I	0.13	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Ethylbenzene	I	0.05	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Freon-11	I	0.29	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Freon-11	I	0.30	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Freon-113	I	0.10	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Freon-113	I	0.09	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Freon-12		0.59	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Freon-12		0.58	ppbv	0.03	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	S5624	Ambient Air	09-Jan-17	16:20
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-005	Hexachloro-1,3-butadiene	K, T, U	< 0.66	ppbv	0.66	AC-058	19-Jan-17
17010086-006	Hexachloro-1,3-butadiene	K, T, U	< 0.66	ppbv	0.66	AC-058	19-Jan-17
17010086-006	Isobutane		0.53	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Isobutane		0.75	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Isopentane	I	0.39	ppbv	0.04	AC-058	19-Jan-17
17010086-005	Isopentane		0.71	ppbv	0.04	AC-058	19-Jan-17
17010086-006	Isoprene	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Isoprene	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-006	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-006	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Isopropylbenzene	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-005	m,p-Xylene	I	0.35	ppbv	0.04	AC-058	19-Jan-17
17010086-006	m,p-Xylene	I	0.13	ppbv	0.04	AC-058	19-Jan-17
17010086-006	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-005	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-005	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	19-Jan-17
17010086-006	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	19-Jan-17
17010086-005	Methyl butyl ketone	K, T, U	< 0.66	ppbv	0.66	AC-058	19-Jan-17
17010086-006	Methyl butyl ketone	K, T, U	< 0.66	ppbv	0.66	AC-058	19-Jan-17
17010086-005	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-006	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-005	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-006	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	19-Jan-17

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

Date: Wednesday, February 08, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	17120	Ambient Air	10-Jan-17	16:10
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-006	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	19-Jan-17
17010086-006	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-005	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010086-006	Methylcyclohexane	I	0.04	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Methylcyclohexane	I	0.11	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Methylcyclopentane	I	0.12	ppbv	0.03	AC-058	19-Jan-17
17010086-006	Methylcyclopentane	I	0.06	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-006	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010086-005	n-Butane		1.88	ppbv	0.04	AC-058	19-Jan-17
17010086-006	n-Butane		1.15	ppbv	0.04	AC-058	19-Jan-17
17010086-005	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	19-Jan-17
17010086-006	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	19-Jan-17
17010086-005	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-006	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-006	n-Heptane	I	0.05	ppbv	0.01	AC-058	19-Jan-17
17010086-005	n-Heptane	I	0.19	ppbv	0.01	AC-058	19-Jan-17
17010086-006	n-Hexane	I	0.07	ppbv	0.01	AC-058	19-Jan-17
17010086-005	n-Hexane	I	0.15	ppbv	0.01	AC-058	19-Jan-17
17010086-006	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	n-Octane	I	0.05	ppbv	0.03	AC-058	19-Jan-17
17010086-005	n-Pentane		0.4	ppbv	0.1	AC-058	19-Jan-17
17010086-006	n-Pentane	I	0.2	ppbv	0.1	AC-058	19-Jan-17
17010086-005	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Jan-17
17010086-006	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Jan-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	S5624	Ambient Air	09-Jan-17	16:20
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-005	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	19-Jan-17
17010086-006	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	19-Jan-17
17010086-005	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	19-Jan-17
17010086-006	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	19-Jan-17
17010086-005	n-Nonane	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-006	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	o-Ethyltoluene	I	0.04	ppbv	0.01	AC-058	19-Jan-17
17010086-006	o-Ethyltoluene	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010086-005	o-Xylene	I	0.16	ppbv	0.01	AC-058	19-Jan-17
17010086-006	o-Xylene	I	0.06	ppbv	0.01	AC-058	19-Jan-17
17010086-005	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-006	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-005	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	19-Jan-17
17010086-006	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	19-Jan-17
17010086-005	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-006	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-005	Tetrachloroethylene	I	0.08	ppbv	0.05	AC-058	19-Jan-17
17010086-006	Tetrachloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-006	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-006	Toluene	I	0.20	ppbv	0.01	AC-058	19-Jan-17
17010086-005	Toluene		0.58	ppbv	0.01	AC-058	19-Jan-17
17010086-006	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-005	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010086-006	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	S5624	Ambient Air	09-Jan-17	16:20
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010086	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010086-005	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-006	trans-2-Butene	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-005	trans-2-Butene	I	0.03	ppbv	0.01	AC-058	19-Jan-17
17010086-006	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	trans-2-Pentene	I	0.04	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-006	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010086-006	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-005	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010086-006	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17
17010086-005	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

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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 LICA/NMHC/VOC/Bonnyville	CANISTER ID 1837	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 12-Jan-17	9:50	DATE RECEIVED: 16-Jan-17	
	REPORT CREATED: 08-Feb-17		REPORT NUMBER: 17010105	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010105-001	1,1,1-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	1,1,2-Trichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	1,1-Dichloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010105-001	1,2,3-Trimethylbenzene	I	0.07	ppbv	0.06	AC-058	19-Jan-17
17010105-001	1,2,4-Trichlorobenzene	K, T, U	< 0.9	ppbv	0.9	AC-058	19-Jan-17
17010105-001	1,2,4-Trimethylbenzene		0.23	ppbv	0.06	AC-058	19-Jan-17
17010105-001	1,2-Dibromoethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010105-001	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	19-Jan-17
17010105-001	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010105-001	1,3,5-Trimethylbenzene		0.08	ppbv	0.02	AC-058	19-Jan-17
17010105-001	1,3-Butadiene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010105-001	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010105-001	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010105-001	1-Butene		0.47	ppbv	0.02	AC-058	19-Jan-17

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

Date: Wednesday, February 08, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	1837	Ambient Air	12-Jan-17	9:50
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010105	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010105-001	1-Hexene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	1-Pentene		0.07	ppbv	0.01	AC-058	19-Jan-17
17010105-001	2,2,4-Trimethylpentane		0.21	ppbv	0.01	AC-058	19-Jan-17
17010105-001	2,2-Dimethylbutane		0.05	ppbv	0.01	AC-058	19-Jan-17
17010105-001	2,3,4-Trimethylpentane		0.06	ppbv	0.01	AC-058	19-Jan-17
17010105-001	2,3-Dimethylbutane		0.10	ppbv	0.02	AC-058	19-Jan-17
17010105-001	2,3-Dimethylpentane		0.29	ppbv	0.02	AC-058	19-Jan-17
17010105-001	2,4-Dimethylpentane		0.09	ppbv	0.01	AC-058	19-Jan-17
17010105-001	2-Methylheptane		0.10	ppbv	0.01	AC-058	19-Jan-17
17010105-001	2-Methylhexane		0.35	ppbv	0.01	AC-058	19-Jan-17
17010105-001	2-Methylpentane		0.41	ppbv	0.01	AC-058	19-Jan-17
17010105-001	3-Methylheptane		0.08	ppbv	0.02	AC-058	19-Jan-17
17010105-001	3-Methylhexane		0.32	ppbv	0.02	AC-058	19-Jan-17
17010105-001	3-Methylpentane		0.24	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Acetone		1.7	ppbv	0.5	AC-058	19-Jan-17
17010105-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010105-001	Benzene		0.38	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010105-001	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Carbon disulfide	I	0.01	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	1837	Ambient Air	12-Jan-17	9:50
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010105	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010105-001	Chloroform	I	0.03	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Chloromethane		0.58	ppbv	0.02	AC-058	19-Jan-17
17010105-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010105-001	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010105-001	cis-2-Butene		0.12	ppbv	0.02	AC-058	19-Jan-17
17010105-001	cis-2-Pentene		0.05	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Cyclohexane		0.11	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Cyclopentane		0.06	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Ethanol		4.4	ppbv	0.4	AC-058	19-Jan-17
17010105-001	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010105-001	Ethylbenzene		0.17	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Freon-11	I	0.30	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Freon-113	I	0.09	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Freon-12		0.60	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Hexachloro-1,3-butadiene	K, T, U	< 0.59	ppbv	0.59	AC-058	19-Jan-17
17010105-001	Isobutane		1.30	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Isopentane		1.56	ppbv	0.04	AC-058	19-Jan-17
17010105-001	Isoprene		0.04	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Isopropyl alcohol		10.0	ppbv	0.5	AC-058	19-Jan-17
17010105-001	Isopropylbenzene		0.02	ppbv	0.01	AC-058	19-Jan-17
17010105-001	m,p-Xylene		0.62	ppbv	0.04	AC-058	19-Jan-17
17010105-001	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010105-001	m-Ethyltoluene	I	0.13	ppbv	0.09	AC-058	19-Jan-17

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E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	1837	Ambient Air	12-Jan-17	9:50
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010105	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010105-001	Methyl butyl ketone	K, T, U	< 0.59	ppbv	0.59	AC-058	19-Jan-17
17010105-001	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010105-001	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010105-001	Methyl methacrylate	K, T, U	< 0.08	ppbv	0.08	AC-058	19-Jan-17
17010105-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	19-Jan-17
17010105-001	Methylcyclohexane		0.27	ppbv	0.01	AC-058	19-Jan-17
17010105-001	Methylcyclopentane		0.32	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	19-Jan-17
17010105-001	n-Butane		3.85	ppbv	0.04	AC-058	19-Jan-17
17010105-001	n-Decane	K, T, U	< 0.07	ppbv	0.07	AC-058	19-Jan-17
17010105-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010105-001	n-Heptane		0.21	ppbv	0.01	AC-058	19-Jan-17
17010105-001	n-Hexane		0.33	ppbv	0.01	AC-058	19-Jan-17
17010105-001	n-Octane		0.10	ppbv	0.02	AC-058	19-Jan-17
17010105-001	n-Pentane		0.6	ppbv	0.1	AC-058	19-Jan-17
17010105-001	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	19-Jan-17
17010105-001	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	19-Jan-17
17010105-001	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	19-Jan-17
17010105-001	n-Nonane		0.04	ppbv	0.01	AC-058	19-Jan-17
17010105-001	o-Ethyltoluene	I	0.06	ppbv	0.01	AC-058	19-Jan-17
17010105-001	o-Xylene		0.26	ppbv	0.01	AC-058	19-Jan-17
17010105-001	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010105-001	p-Ethyltoluene	K, T, U	< 0.08	ppbv	0.08	AC-058	19-Jan-17
17010105-001	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010105-001	Tetrachloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
LICA/NMHC/VOC/Bonnyville	1837	Ambient Air	12-Jan-17	9:50
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010105	REPORT CREATED:	08-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010105-001	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010105-001	Toluene		0.74	ppbv	0.01	AC-058	19-Jan-17
17010105-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	19-Jan-17
17010105-001	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010105-001	trans-2-Butene		0.10	ppbv	0.01	AC-058	19-Jan-17
17010105-001	trans-2-Pentene		0.09	ppbv	0.02	AC-058	19-Jan-17
17010105-001	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	19-Jan-17
17010105-001	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	19-Jan-17
17010105-001	Vinyl chloride	K, T, U	< 0.02	ppbv	0.02	AC-058	19-Jan-17

Report certified by: Krista Gegolick, Account Coordinator

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

Date: Wednesday, February 08, 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/ Jan 13, :	CANISTER ID S5661	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 13-Jan-17	14:35	DATE RECEIVED: 18-Jan-17	
	REPORT CREATED: 07-Feb-17		REPORT NUMBER: 17010130	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010130-001	1,1,1-Trichloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	20-Jan-17
17010130-001	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	20-Jan-17
17010130-001	1,1,2-Trichloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	20-Jan-17
17010130-001	1,1-Dichloroethane	K, T, U	< 0.03 ppbv	0.03	AC-058	20-Jan-17
17010130-001	1,1-Dichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	20-Jan-17
17010130-001	1,2,3-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	20-Jan-17
17010130-001	1,2,4-Trichlorobenzene	K, T, U	< 1.0 ppbv	1.0	AC-058	20-Jan-17
17010130-001	1,2,4-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	20-Jan-17
17010130-001	1,2-Dibromoethane	K, T, U	< 0.03 ppbv	0.03	AC-058	20-Jan-17
17010130-001	1,2-Dichlorobenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	20-Jan-17
17010130-001	1,2-Dichloroethane	I	0.02 ppbv	0.01	AC-058	20-Jan-17
17010130-001	1,2-Dichloropropane	K, T, U	< 0.01 ppbv	0.01	AC-058	20-Jan-17
17010130-001	1,3,5-Trimethylbenzene	K, T, U	< 0.03 ppbv	0.03	AC-058	20-Jan-17
17010130-001	1,3-Butadiene	K, T, U	< 0.03 ppbv	0.03	AC-058	20-Jan-17
17010130-001	1,3-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	20-Jan-17
17010130-001	1,4-Dichlorobenzene	K, T, U	< 0.5 ppbv	0.5	AC-058	20-Jan-17
17010130-001	1,4-Dioxane	K, T, U	< 0.5 ppbv	0.5	AC-058	20-Jan-17
17010130-001	1-Butene		0.08 ppbv	0.03	AC-058	20-Jan-17

Report certified by: Graham Knox, Team Lead

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

Date: Tuesday, February 07, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC/VOC/Bonnyville/ Jan 13, 2	S5661	Ambient Air	13-Jan-17 14:35
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010130-001	1-Hexene	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	1-Pentene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	2,2,4-Trimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	2,2-Dimethylbutane		0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-001	2,3,4-Trimethylpentane		0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	2,3-Dimethylbutane	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	2,3-Dimethylpentane	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	2,4-Dimethylpentane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	2-Methylheptane		0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	2-Methylhexane		0.03	ppbv	0.01	AC-058	20-Jan-17
17010130-001	2-Methylpentane		0.10	ppbv	0.01	AC-058	20-Jan-17
17010130-001	3-Methylheptane	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	3-Methylhexane		0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	3-Methylpentane		0.07	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Acetone		1.9	ppbv	0.5	AC-058	20-Jan-17
17010130-001	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-001	Benzene		0.15	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010130-001	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Carbon disulfide	I	0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Carbon tetrachloride	I	0.12	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17

Report certified by: Graham Knox, Team Lead

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

Date: Tuesday, February 07, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC/VOC/Bonnyville/ Jan 13, 2	S5661	Ambient Air	13-Jan-17	14:35
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010130-001	Chloroform	I	0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Chloromethane		0.57	ppbv	0.03	AC-058	20-Jan-17
17010130-001	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010130-001	cis-2-Butene	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	cis-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Cyclohexane		0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Cyclopentane		0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Ethanol		1.0	ppbv	0.4	AC-058	20-Jan-17
17010130-001	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010130-001	Ethylbenzene		0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Freon-11	I	0.31	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Freon-113	I	0.10	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Freon-12		0.62	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Hexachloro-1,3-butadiene	K, T, U	< 0.64	ppbv	0.64	AC-058	20-Jan-17
17010130-001	Isobutane		0.72	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Isopentane		0.46	ppbv	0.04	AC-058	20-Jan-17
17010130-001	Isoprene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010130-001	Isopropylbenzene		0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-001	m,p-Xylene		0.05	ppbv	0.04	AC-058	20-Jan-17
17010130-001	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010130-001	m-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	20-Jan-17

Report certified by: Graham Knox, Team Lead

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

Date: Tuesday, February 07, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
/NMHC/VOC/Bonnyville/ Jan 13, 2	S5661	Ambient Air	13-Jan-17 14:35
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010130-001	Methyl butyl ketone	K, T, U	< 0.64	ppbv	0.64	AC-058	20-Jan-17
17010130-001	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-001	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010130-001	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	20-Jan-17
17010130-001	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	20-Jan-17
17010130-001	Methylcyclohexane		0.04	ppbv	0.01	AC-058	20-Jan-17
17010130-001	Methylcyclopentane		0.06	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	20-Jan-17
17010130-001	n-Butane		1.38	ppbv	0.04	AC-058	20-Jan-17
17010130-001	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	20-Jan-17
17010130-001	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010130-001	n-Heptane		0.04	ppbv	0.01	AC-058	20-Jan-17
17010130-001	n-Hexane		0.13	ppbv	0.01	AC-058	20-Jan-17
17010130-001	n-Octane	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	n-Pentane		0.3	ppbv	0.1	AC-058	20-Jan-17
17010130-001	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	20-Jan-17
17010130-001	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	20-Jan-17
17010130-001	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	20-Jan-17
17010130-001	n-Nonane	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	o-Ethyltoluene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	o-Xylene		0.02	ppbv	0.01	AC-058	20-Jan-17
17010130-001	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010130-001	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	20-Jan-17
17010130-001	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010130-001	Tetrachloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17

Report certified by: Graham Knox, Team Lead

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

Date: Tuesday, February 07, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
/NMHC/VOC/Bonnyville/ Jan 13, 2	S5661	Ambient Air	13-Jan-17	14:35
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010130	REPORT CREATED:	07-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010130-001	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010130-001	Toluene		0.13	ppbv	0.01	AC-058	20-Jan-17
17010130-001	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010130-001	trans-2-Butene	K, T, U	< 0.01	ppbv	0.01	AC-058	20-Jan-17
17010130-001	trans-2-Pentene	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17
17010130-001	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	20-Jan-17
17010130-001	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	20-Jan-17
17010130-001	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	20-Jan-17

Report certified by: Graham Knox, Team Lead

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

Date: Tuesday, February 07, 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/Jan 17, 2	CANISTER ID 1530	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 17-Jan-17	18:45	DATE RECEIVED: 24-Jan-17	
	REPORT CREATED: 22-Feb-17		REPORT NUMBER: 17010190	
			VERSION: Version 01	

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010190-003	1,1,1-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Feb-17
17010190-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Feb-17
17010190-003	1,1,2-Trichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Feb-17
17010190-003	1,1-Dichloroethane	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Feb-17
17010190-003	1,1-Dichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Feb-17
17010190-003	1,2,3-Trimethylbenzene	K, T, U	< 0.06 ppbv	0.06	AC-058	02-Feb-17
17010190-003	1,2,4-Trichlorobenzene	K, T, U	< 1.0 ppbv	1.0	AC-058	02-Feb-17
17010190-003	1,2,4-Trimethylbenzene		0.26 ppbv	0.06	AC-058	02-Feb-17
17010190-003	1,2-Dibromoethane	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Feb-17
17010190-003	1,2-Dichlorobenzene	K, T, U	< 0.04 ppbv	0.04	AC-058	02-Feb-17
17010190-003	1,2-Dichloroethane	I	0.03 ppbv	0.01	AC-058	02-Feb-17
17010190-003	1,2-Dichloropropane	I	0.01 ppbv	0.01	AC-058	02-Feb-17
17010190-003	1,3,5-Trimethylbenzene		0.06 ppbv	0.02	AC-058	02-Feb-17
17010190-003	1,3-Butadiene	I	0.14 ppbv	0.02	AC-058	02-Feb-17
17010190-003	1,3-Dichlorobenzene	K, T, U	< 0.4 ppbv	0.4	AC-058	02-Feb-17
17010190-003	1,4-Dichlorobenzene	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Feb-17
17010190-003	1,4-Dioxane	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Feb-17
17010190-003	1-Butene		0.52 ppbv	0.02	AC-058	02-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
√NMHC VOC/Bonnyville/Jan 17, 2	1530	Ambient Air	17-Jan-17	18:45
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17	VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010190-003	1-Hexene	I	0.04	ppbv	0.02	AC-058	02-Feb-17
17010190-003	1-Pentene		0.06	ppbv	0.01	AC-058	02-Feb-17
17010190-003	2,2,4-Trimethylpentane		0.23	ppbv	0.01	AC-058	02-Feb-17
17010190-003	2,2-Dimethylbutane		0.03	ppbv	0.01	AC-058	02-Feb-17
17010190-003	2,3,4-Trimethylpentane		0.06	ppbv	0.01	AC-058	02-Feb-17
17010190-003	2,3-Dimethylbutane		0.11	ppbv	0.02	AC-058	02-Feb-17
17010190-003	2,3-Dimethylpentane		0.28	ppbv	0.02	AC-058	02-Feb-17
17010190-003	2,4-Dimethylpentane		0.09	ppbv	0.01	AC-058	02-Feb-17
17010190-003	2-Methylheptane		0.07	ppbv	0.01	AC-058	02-Feb-17
17010190-003	2-Methylhexane		0.30	ppbv	0.01	AC-058	02-Feb-17
17010190-003	2-Methylpentane		0.37	ppbv	0.01	AC-058	02-Feb-17
17010190-003	3-Methylheptane		0.05	ppbv	0.02	AC-058	02-Feb-17
17010190-003	3-Methylhexane		0.29	ppbv	0.02	AC-058	02-Feb-17
17010190-003	3-Methylpentane		0.30	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Acetone		3.3	ppbv	0.5	AC-058	02-Feb-17
17010190-003	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010190-003	Benzene		0.64	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Feb-17
17010190-003	Bromodichloromethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Bromoform	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Carbon disulfide	I	0.14	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Carbon tetrachloride	I	0.11	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Chlorobenzene	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Chloroethane	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√NMHC VOC/Bonnyville/Jan 17, 2	1530	Ambient Air	17-Jan-17 18:45
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010190-003	Chloroform	I	0.05	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Chloromethane		0.48	ppbv	0.02	AC-058	02-Feb-17
17010190-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010190-003	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Feb-17
17010190-003	cis-2-Butene		0.14	ppbv	0.02	AC-058	02-Feb-17
17010190-003	cis-2-Pentene		0.07	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Cyclohexane		0.11	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Cyclopentane		0.06	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Ethanol		9.9	ppbv	0.4	AC-058	02-Feb-17
17010190-003	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Feb-17
17010190-003	Ethylbenzene		0.13	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Freon-11	I	0.31	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Freon-113	I	0.09	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Freon-114	K, T, U	< 0.02	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Freon-12		0.66	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Hexachloro-1,3-butadiene	K, T, U	< 0.62	ppbv	0.62	AC-058	02-Feb-17
17010190-003	Isobutane		3.82	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Isopentane		2.34	ppbv	0.04	AC-058	02-Feb-17
17010190-003	Isoprene		0.05	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Isopropyl alcohol		0.6	ppbv	0.5	AC-058	02-Feb-17
17010190-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	02-Feb-17
17010190-003	m,p-Xylene		0.49	ppbv	0.04	AC-058	02-Feb-17
17010190-003	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Feb-17
17010190-003	m-Ethyltoluene	K, T, U	< 0.10	ppbv	0.10	AC-058	02-Feb-17

Report certified by: Graham Knox, Team Lead

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Date: Wednesday, February 22, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√/NMHC VOC/Bonnyville/Jan 17, 2	1530	Ambient Air	17-Jan-17 18:45
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010190-003	Methyl butyl ketone	K, T, U	< 0.62	ppbv	0.62	AC-058	02-Feb-17
17010190-003	Methyl ethyl ketone	K, T, U	< 0.4	ppbv	0.4	AC-058	02-Feb-17
17010190-003	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Feb-17
17010190-003	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	02-Feb-17
17010190-003	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	02-Feb-17
17010190-003	Methylcyclohexane		0.16	ppbv	0.01	AC-058	02-Feb-17
17010190-003	Methylcyclopentane		0.36	ppbv	0.02	AC-058	02-Feb-17
17010190-003	Methylene chloride		0.5	ppbv	0.4	AC-058	02-Feb-17
17010190-003	n-Butane		8.91	ppbv	0.04	AC-058	02-Feb-17
17010190-003	n-Decane	K, T, U	< 0.07	ppbv	0.07	AC-058	02-Feb-17
17010190-003	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	02-Feb-17
17010190-003	n-Heptane		0.18	ppbv	0.01	AC-058	02-Feb-17
17010190-003	n-Hexane		0.62	ppbv	0.01	AC-058	02-Feb-17
17010190-003	n-Octane		0.07	ppbv	0.02	AC-058	02-Feb-17
17010190-003	n-Pentane		0.9	ppbv	0.1	AC-058	02-Feb-17
17010190-003	n-Propylbenzene	K, T, U	< 0.06	ppbv	0.06	AC-058	02-Feb-17
17010190-003	n-Undecane	K, T, U	< 0.6	ppbv	0.6	AC-058	02-Feb-17
17010190-003	Naphthalene	K, T, U	< 0.6	ppbv	0.6	AC-058	02-Feb-17
17010190-003	n-Nonane		0.05	ppbv	0.01	AC-058	02-Feb-17
17010190-003	o-Ethyltoluene	I	0.04	ppbv	0.01	AC-058	02-Feb-17
17010190-003	o-Xylene		0.17	ppbv	0.01	AC-058	02-Feb-17
17010190-003	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	02-Feb-17
17010190-003	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	02-Feb-17
17010190-003	Styrene	I	0.06	ppbv	0.05	AC-058	02-Feb-17
17010190-003	Tetrachloroethylene		1.60	ppbv	0.05	AC-058	02-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

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CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
√/NMHC VOC/Bonnyville/Jan 17, 2	1530	Ambient Air	17-Jan-17 18:45
DESCRIPTION:	Bonnyville - AER		
REPORT NUMBER:	17010190	REPORT CREATED:	22-Feb-17
			VERSION: Version 01

Lab ID	Parameter	Qualifier	Result Units	RDL	Method	Analysis Date
17010190-003	Tetrahydrofuran	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Feb-17
17010190-003	Toluene		1.02 ppbv	0.01	AC-058	02-Feb-17
17010190-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01 ppbv	0.01	AC-058	02-Feb-17
17010190-003	trans-1,3-Dichloropropylene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Feb-17
17010190-003	trans-2-Butene		0.12 ppbv	0.01	AC-058	02-Feb-17
17010190-003	trans-2-Pentene		0.11 ppbv	0.02	AC-058	02-Feb-17
17010190-003	Trichloroethylene	K, T, U	< 0.05 ppbv	0.05	AC-058	02-Feb-17
17010190-003	Vinyl acetate	K, T, U	< 0.5 ppbv	0.5	AC-058	02-Feb-17
17010190-003	Vinyl chloride	K, T, U	< 0.02 ppbv	0.02	AC-058	02-Feb-17

Report certified by: Graham Knox, Team Lead

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

Date: Wednesday, February 22, 2017

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E-mail: EAS.Results@innotechalberta.ca



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

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/Jan 20, 2	CANISTER ID S5669	Matrix Ambient Air	Priority Normal
	DESCRIPTION: Bonnyville - AER			
INVOICE: Arianna Cook PO Box 8237 5107W-50 St Bonnyville AB T9N 2J5	DATE SAMPLED: 20-Jan-17	14:55	DATE RECEIVED: 30-Jan-17	
	REPORT CREATED: 21-Feb-17		REPORT NUMBER: 17010213	
	REPORT REVISED: 22-Feb-17		VERSION: Version 02	

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-003	1,1,1-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	1,1,2,2-Tetrachloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	1,1,2-Trichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	1,1-Dichloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	1,1-Dichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010213-003	1,2,3-Trimethylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Feb-17
17010213-003	1,2,4-Trichlorobenzene	K, T, U	< 1.1	ppbv	1.1	AC-058	03-Feb-17
17010213-003	1,2,4-Trimethylbenzene		0.11	ppbv	0.07	AC-058	03-Feb-17
17010213-003	1,2-Dibromoethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	1,2-Dichlorobenzene	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17
17010213-003	1,2-Dichloroethane	I	0.02	ppbv	0.01	AC-058	03-Feb-17
17010213-003	1,2-Dichloropropane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010213-003	1,3,5-Trimethylbenzene		0.05	ppbv	0.03	AC-058	03-Feb-17
17010213-003	1,3-Butadiene	I	0.12	ppbv	0.03	AC-058	03-Feb-17
17010213-003	1,3-Dichlorobenzene	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010213-003	1,4-Dichlorobenzene	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010213-003	1,4-Dioxane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010213-003	1-Butene		1.75	ppbv	0.03	AC-058	03-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
\NMHC VOC/Bonnyville/Jan 20, 2	S5669	Ambient Air	20-Jan-17	14:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-003	1-Hexene	I	0.07	ppbv	0.03	AC-058	03-Feb-17
17010213-003	1-Pentene		0.17	ppbv	0.01	AC-058	03-Feb-17
17010213-003	2,2,4-Trimethylpentane		0.23	ppbv	0.01	AC-058	03-Feb-17
17010213-003	2,2-Dimethylbutane		0.04	ppbv	0.01	AC-058	03-Feb-17
17010213-003	2,3,4-Trimethylpentane		0.06	ppbv	0.01	AC-058	03-Feb-17
17010213-003	2,3-Dimethylbutane		0.23	ppbv	0.03	AC-058	03-Feb-17
17010213-003	2,3-Dimethylpentane		0.33	ppbv	0.03	AC-058	03-Feb-17
17010213-003	2,4-Dimethylpentane		0.14	ppbv	0.01	AC-058	03-Feb-17
17010213-003	2-Methylheptane		0.05	ppbv	0.01	AC-058	03-Feb-17
17010213-003	2-Methylhexane		0.26	ppbv	0.01	AC-058	03-Feb-17
17010213-003	2-Methylpentane		0.57	ppbv	0.01	AC-058	03-Feb-17
17010213-003	3-Methylheptane		0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	3-Methylhexane		0.26	ppbv	0.03	AC-058	03-Feb-17
17010213-003	3-Methylpentane		0.39	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Acetone		9.7	ppbv	0.5	AC-058	03-Feb-17
17010213-003	Acrolein	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010213-003	Benzene		0.50	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Benzyl chloride	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010213-003	Bromodichloromethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Bromoform	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Bromomethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Carbon disulfide	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Carbon tetrachloride	I	0.13	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Chlorobenzene	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Chloroethane	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-003	Chloroform	I	0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Chloromethane		0.49	ppbv	0.03	AC-058	03-Feb-17
17010213-003	cis-1,2-Dichloroethene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010213-003	cis-1,3-Dichloropropene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010213-003	cis-2-Butene		0.93	ppbv	0.03	AC-058	03-Feb-17
17010213-003	cis-2-Pentene		0.13	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Cyclohexane		0.07	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Cyclopentane		0.07	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Dibromochloromethane	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Ethanol		5.9	ppbv	0.4	AC-058	03-Feb-17
17010213-003	Ethyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010213-003	Ethylbenzene		0.10	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Freon-11	I	0.37	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Freon-113	I	0.11	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Freon-114	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Freon-12		0.76	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Hexachloro-1,3-butadiene	K, T, U	< 0.66	ppbv	0.66	AC-058	03-Feb-17
17010213-003	Isobutane		17.5	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Isopentane		8.66	ppbv	0.04	AC-058	03-Feb-17
17010213-003	Isoprene		0.04	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Isopropyl alcohol	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010213-003	Isopropylbenzene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010213-003	m,p-Xylene		0.33	ppbv	0.04	AC-058	03-Feb-17
17010213-003	m-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010213-003	m-Ethyltoluene	K, T, U	< 0.11	ppbv	0.11	AC-058	03-Feb-17

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DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-003	Methyl butyl ketone	K, T, U	< 0.66	ppbv	0.66	AC-058	03-Feb-17
17010213-003	Methyl ethyl ketone		0.4	ppbv	0.4	AC-058	03-Feb-17
17010213-003	Methyl isobutyl ketone	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010213-003	Methyl methacrylate	K, T, U	< 0.09	ppbv	0.09	AC-058	03-Feb-17
17010213-003	Methyl tert butyl ether	K, T, U	< 0.04	ppbv	0.04	AC-058	03-Feb-17
17010213-003	Methylcyclohexane		0.12	ppbv	0.01	AC-058	03-Feb-17
17010213-003	Methylcyclopentane		0.29	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Methylene chloride	K, T, U	< 0.4	ppbv	0.4	AC-058	03-Feb-17
17010213-003	n-Butane		37.0	ppbv	0.12	AC-058	03-Feb-17
17010213-003	n-Decane	K, T, U	< 0.08	ppbv	0.08	AC-058	03-Feb-17
17010213-003	n-Dodecane	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010213-003	n-Heptane		0.23	ppbv	0.01	AC-058	03-Feb-17
17010213-003	n-Hexane		0.33	ppbv	0.01	AC-058	03-Feb-17
17010213-003	n-Octane		0.05	ppbv	0.03	AC-058	03-Feb-17
17010213-003	n-Pentane		1.5	ppbv	0.1	AC-058	03-Feb-17
17010213-003	n-Propylbenzene	K, T, U	< 0.07	ppbv	0.07	AC-058	03-Feb-17
17010213-003	n-Undecane	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Feb-17
17010213-003	Naphthalene	K, T, U	< 0.7	ppbv	0.7	AC-058	03-Feb-17
17010213-003	n-Nonane		0.01	ppbv	0.01	AC-058	03-Feb-17
17010213-003	o-Ethyltoluene	I	0.03	ppbv	0.01	AC-058	03-Feb-17
17010213-003	o-Xylene		0.12	ppbv	0.01	AC-058	03-Feb-17
17010213-003	p-Diethylbenzene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010213-003	p-Ethyltoluene	K, T, U	< 0.09	ppbv	0.09	AC-058	03-Feb-17
17010213-003	Styrene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010213-003	Tetrachloroethylene		0.42	ppbv	0.05	AC-058	03-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

Inquiries: (780) 632 8455

E-mail: EAS.Results@innotechalberta.ca

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED	
\NMHC VOC/Bonnyville/Jan 20, 2	S5669	Ambient Air	20-Jan-17	14:55
DESCRIPTION:	Bonnyville - AER			
REPORT NUMBER:	17010213	REPORT CREATED:	21-Feb-17	REPORT REVISED: 22-Feb-17
			VERSION:	Version 02

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
17010213-003	Tetrahydrofuran	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010213-003	Toluene		0.63	ppbv	0.01	AC-058	03-Feb-17
17010213-003	trans-1,2-Dichloroethylene	K, T, U	< 0.01	ppbv	0.01	AC-058	03-Feb-17
17010213-003	trans-1,3-Dichloropropylene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010213-003	trans-2-Butene		1.07	ppbv	0.01	AC-058	03-Feb-17
17010213-003	trans-2-Pentene		0.27	ppbv	0.03	AC-058	03-Feb-17
17010213-003	Trichloroethylene	K, T, U	< 0.05	ppbv	0.05	AC-058	03-Feb-17
17010213-003	Vinyl acetate	K, T, U	< 0.5	ppbv	0.5	AC-058	03-Feb-17
17010213-003	Vinyl chloride	K, T, U	< 0.03	ppbv	0.03	AC-058	03-Feb-17

Report certified by: Rebecca Holgate, Account Coordinator

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

Date: February-22-17

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APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	Bonnyville Continuous Monitoring Station
Name of the Representative of the Person Responsible (Last, First, Middle)	Position / Title of the Representative of the Person Responsible
Kim Wilson	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.

Kim Wilson

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

08-Mar-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>0-2017-01-0-C</u>
Site: <u>Bonnyville Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	 _____	Date <u>27-Feb-2017</u>
Level 1 Primary Validation	<u>Kim Wilson</u> _____	Date <u>08-Mar-2017</u>
Level 2 Final Validation	<u>Kim Wilson</u> _____	Date <u>08-Mar-2017</u>
Level 3 Independent Data Review	 _____	Date <u>08-Mar-2017</u>
Post-Final Validation	NA _____	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.