



**Lakeland Industry & Community Association**

# **JANUARY 2019**

## **Monthly Ambient Air Quality Monitoring Report**

**LICA-201901**

**Operation and Maintenance:**

Maxxam Analytics

**Data Validation and Report:**

Maxxam Analytics

March 15, 2019

Pages may be left blank for double-sided printing



Lakeland Industry & Community Association

5107 50 St

Bonnyville, AB, T9N 2J7

Phone #: 780-226-7068

E-mail: [monitoring@lica.ca](mailto:monitoring@lica.ca)

[www.lica.ca](http://www.lica.ca)

**March 15, 2019**

Alberta Environment and Parks (AEP)

11th Floor, Oxbridge Place

9820 106 Street

Edmonton, AB, T5K 2J6

Emailed to: [Air.Reporting@gov.ab.ca](mailto:Air.Reporting@gov.ab.ca)

**RE: LICA –January 2019 Monthly Ambient Air Quality Monitoring Report**

---

Enclosed is the January 2019 Monthly Ambient Air Quality Monitoring Report for the continuous ambient air quality monitoring stations of the Lakeland Industry & Community Association (LICA) regional air quality monitoring network.

The representative of the Person Responsible for this monitoring program is

LICA Airshed

Michael Bisaga, Technical Program Manager

5107 50 Street

Bonnyville, AB, T9N 2J7

Phone #: 780-226-7068

E-mail: [monitoring@lica.ca](mailto:monitoring@lica.ca)

This report has been prepared by Maxxam Analytics, and has been reviewed and submitted by Michael Bisaga & Lily Lin of the LICA Airshed

## NETWORK STATION SUMMARY

### Listing of Continuous Monitoring Stations and Integrated Sampling Stations

Station Name		Cold Lake South	Maskwa	St. Lina	Bonnyville East
Station ID		1174	1248	1250	1608
Coordinates		54.41402, -110.23316	54.604935, -110.452637	54.215961, -111.503304	54.252747, -110.690611
Continuous Monitoring Parameter	SO2	√	√	√	√
	TRS	√			
	H2S		√	√	√
	THC	√	√	√	√
	CH4	√	√	√	√
	NMHC	√	√	√	√
	NOX	√	√	√	√
	NO	√	√	√	√
	NO2	√	√	√	√
	O3	√		√	√
	PM2.5	√		√	√
	TPX	√	√	√	√
	RH	√	√	√	√
	BP		√	√	
	PRECIPTATION		√	√	
	WS	√	√	√	√
WD	√	√	√	√	
STDWD	√	√	√	√	
Integrated Sampling	VOCs	√			
	PAHs	√			
	Partisol	√			
	Passive	√			
	NMHC Canister				√

**List of Contractors who performed the air monitoring activities**

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Prepared By	Electronic Submission Conducted By
Continuous Monitoring Station	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
Intermittent (VOCs/PAHs)	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Maxxam Analytics
Partisol	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Maxxam Analytics
Passive	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
NMHC Canister	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable

**Monitoring Notes during the Month of January 2019**

**Cold Lake South:**

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- THC/CH4/NMHC: On January 25, a shut-down calibration was attempted on the AEP-supplied Thermo 55i, s/n: 1180030034, but the analyzer failed the calibration requirements due to poor sample injections. The analyzer was removed and a LICA-owned Thermo 55i analyzer, s/n: 1180320044, was subsequently installed and calibrated successfully. Data was invalidated back to the point of failed performance, determined as hour 13:00 on January 24. Twenty-eight hours of downtime were recorded due to this event.
- NOX/NO/NO2: Two hours of downtime were recorded on January 8 due to an additional quality check performed to assess a biased high drift in span response.
- O3: Four hours of downtime were recorded on January 29 due to additional quality checks performed to assess a biased low, sudden change in span response.
- The VOCs, PAHs and Partisol samples were processed for analysis by InnoTech and the results will be provided in the 2019, Q1 Integrated Report.
- The passive samples were processed for analysis by Maxxam Analytics and the results will be provided in the 2019, Q1 Integrated Report.

**Maskwa:**

- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.

- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- All Parameters: Fifteen hours of downtime were incurred on January 3, from hours 6:00 - 20:00, as the data polling service was interrupted by a Windows operating system update.
- H2S: Sixteen hours of downtime were recorded across the month due to additional quality checks and corrective actions performed to address drifts in span response.
- Precipitation: Twenty-one hours of downtime were recorded between January 23 and January 24, as the equipment was frozen due to low ambient temperatures. The point in time that the precipitation sensor became frozen could not be determined. As such, data collected at extremely low ambient temperatures should be applied with caution.

**St. Lina Station:**

- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- SO2: Two hours of downtime were recorded on January 29 due to additional quality checks performed to assess a biased low drift in span response.
- H2S: Five hours of downtime were recorded across the month due to additional quality checks performed to address drifts in span and baseline zero response.
- THC/CH4/NMHC: The fuel gas (H2) was depleted on January 6 and was replaced on January 7. Eighteen hours of downtime were recorded due to this issue.

**Bonnyville East Station:**

- All data collected this month were compliant with the requirements outlined in the AMD 2016.
- All parameters met the 90% operational uptime requirement.
- Measured parameters were below Alberta Ambient Air Quality Objectives (AAAQOs) where applicable.
- NMHC Canister System: Three canister events were recorded this month: on January 13 at 8:15 at concentration of 0.35ppm, on January 17 at 5:35 at concentration of 0.45ppm, and on January 22 at 12:55 at concentration of 0.50ppm. The sample results will be provided in the 2019 Q1 integrated sampling report.

### **Revisions to Alberta's Ambient Air Quality Data Warehouse**

No revisions to historical data previously submitted to the Alberta's Ambient Air Quality Data Warehouse were made this month.

### **Deviations from Authorized Monitoring Methods**

At the Maskwa station, nearby trees exceed the height allowed under section 2.3 of the wind speed and wind direction siting criteria in Chapter 3 of the AMD. This non-conformance was documented in the updated station site documents. Further actions are being considered including siting the wind sensor so that it meets AMD Chapter 3 siting requirements, or obtaining written authorization from "The Director" to deviate from AMD Siting requirements.

At the Cold Lake South station, the height of the existing wind sensor tower is shorter than the AMD requirements listed in section 2.3 of the wind speed and wind direction siting criteria in Chapter 3 of the AMD. This non-conformance was documented in the updated station site documents. Further actions are being considered including siting the wind sensor so that it meets AMD Chapter 3 siting requirements, or obtaining written authorization from "The Director" to deviate from AMD Siting requirements.

## Certification

As the LICA Environmental Program Manager and Data & Reporting Specialist, we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also verify all air data that are required by the AMD to be electronically submitted to 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, Partisol samples and passive samples. Electronic submission for the intermittent sample, Partisol sample and passive sample results will be performed during the preparation of the 2019 Q1 integrated sampling report.

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

Respectfully,



Michael Bisaga  
Technical Program Manager  
Lakeland Industry & Community Association  
780-266-7068  
[monitoring@lica.ca](mailto:monitoring@lica.ca)



Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[monitoring@lica.ca](mailto:monitoring@lica.ca)



**JANUARY 1 - 31, 2019**

**MONTHLY AMBIENT AIR QUALITY MONITORING REPORT**

**Project #: 2833-2019-01-23-C**

**LICA-201901**

**Prepared for:**

**Lakeland Industry & Community Association**

**Mike Bisaga**

5107 50 St.

Bonnyville, Alberta T9N 2J7

monitoring@lica.ca

780-266-7068

**Monitoring Station**

**Cold Lake South Continuous**

**Monitoring Station**

**Date of Report Issuance: February 28, 2019**

**Report Preparation By:**

**Bim Adeniji, M.Sc.**

403-219-3677

aadeniji@maxxam.ca

*Bimadeniji*

Project Manager, Customer Service, Air Services

**Reviewed By:**

**Wunmi Adekanmbi, M.Sc., EPT, PMP**

403-219-3661

aadekanmbi@maxxam.ca

*Wunmi Adekanmbi*

Project Team Lead, Customer Service, Air Services



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

LICA-201901

Page 9 of 350

**Lakeland Industry & Community Association**

5107 50 St.  
Bonnyville, Alberta T9N 2J7

Attention: Mike Bisaga

Date: February 27, 2019

**Subject: MONTHLY AMBIENT AIR QUALITY MONITORING REPORT for JANUARY 1 - 31, 2019**

In January 2019, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Cold Lake South Continuous Monitoring Station near Cold Lake South, Alberta. The monitoring program provides continuous measurements of ambient air pollutants and meteorological data to satisfy the reporting requirements of the Alberta airshed.

**Network Parameters for Continuous Monitoring:**

This monthly report, where applicable, was prepared in accordance with Chapter 9 of the Air Monitoring Directive (AMD, 2016). The report summarizes the continuous monitoring results for pollutant and meteorological parameters and presents the hourly statistics, graphs and rose charts for the month. Calibration records are provided in a separate PDF document in order to comply with AMD requirements (Chapter 9, 13.1.7, RC 13-R, AMD 2016). The station is equipped with analyzers to measure SO<sub>2</sub>, TRS, THC, CH<sub>4</sub>, NMHC, NOx, NO, NO<sub>2</sub>, O<sub>3</sub>, and PM<sub>2.5</sub>. The meteorological sensors and equipment capture data for WS, WD, RH, AmbTPX and STDWD.

**Exceedance & Performance Reporting:**

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement, as per the Alberta Air Monitoring Directive (AMD, Chapter 6, DQ 4-C, 2016).

All measured ambient air concentrations were below the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO, November 2018). Comparisons of these concentrations to the corresponding AAAQOs were done in accordance with AMD, Chapter 9, 15.3.2, RC 15-P. Accordingly, the averaging specifications and data completeness criteria, as defined in the Alberta Ambient Air Quality Objective Calculation Guidelines, were applied. (AMD, Chapter 9, Appendix A, 2016).

Specific to the content and purpose of this report, there were no instances where the requirements of the AMD (2016) were contravened.

**Monthly Monitoring Overview:**

In relation to the previous month, there were no changes made to the scope or management of the ambient air monitoring program.

The evaluation of data collected in the month of January did not reveal any errors or omissions that would require resubmission of air data to AEP's airdata warehouse.

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

**THC/CH<sub>4</sub>/NMHC:** On January 25, a shut-down calibration was attempted on the AEP-supplied Thermo 55i, (s/n: 1180030034) but the As-Found high point did not meet Maxxam's internal stability requirement due to poor sample injections. The analyzer was removed and LICA's Thermo 55i analyzer (s/n: 1180320044) was subsequently installed and calibrated successfully. Data was invalidated back to the point of failed performance, determined as hour 13:00 on January 24. Twenty-eight hours of downtime were recorded due to this event.

**NOX/NO/NO<sub>2</sub>:** Two hours of downtime were recorded on January 8, due to an additional quality check performed to assess a biased high drift in span response.

**O<sub>3</sub>:** Four hours of downtime were recorded on January 29, due to additional quality checks performed to assess a biased low, sudden change in span response.

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

**Reviewed by:**



Wunmi Adekanmbi, M.Sc., EPT, PMP  
Project Team Lead, Customer Service, Air Services  
403-219-3677

*I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. Certification of submitted information is specific to the contents of this report and is not intended to represent the onus of the Person Responsible, as outlined in Chapter 9, RC 12-E.*

## TABLE OF CONTENTS

<b>TITLE PAGE</b>	<b>1</b>
<b>COVER LETTER</b>	<b>2</b>
<b>TABLE OF CONTENTS</b>	<b>3</b>
<b>ABBREVIATIONS</b>	<b>4</b>
<b>AAAQO EXCEEDANCE SUMMARY</b>	<b>5</b>
<b>MONTHLY CONTINUOUS DATA SUMMARY</b>	<b>6</b>
<b>OPERATIONAL SUMMARY</b>	<b>7</b>
<b>SUMMARY TABLES, GRAPHS AND ROSES</b>	<b>9</b>
Sulphur Dioxide	10
Total Reduced Sulphur	14
Total Hydrocarbon	18
Methane	22
Non-Methane Hydrocarbon	26
Oxides of Nitrogen	30
Nitric Oxide	34
Nitrogen Dioxide	38
Ozone	42
Particulate Matter <sub>2.5</sub>	46
Wind Speed	50
Wind Direction	53
Standard Deviation Wind Direction	56
Relative Humidity	58
Ambient Temperature	60
<b>MAXIMUM INSTANTANEOUS DATA</b>	<b>62</b>
<b>1.0 Quality Control Activities</b>	<b>82</b>
<b>2.0 Data Verification and Validation</b>	<b>83</b>
<b>Validation Certificate Form</b>	<b>86</b>
<b>End of Report</b>	<b>87</b>

## List of Acronyms

<b>AAAQO</b>	Alberta Ambient Air Quality Objectives and Guidelines Summary
<b>AEP</b>	Alberta Environment and Parks
<b>AMBTPX</b>	Ambient Temperature
<b>AMD</b>	Air Monitoring Directive
<b>CH<sub>4</sub></b>	Methane
<b>DAS</b>	Data acquisition system
<b>hr</b>	Hour
<b>hrs</b>	Hours
<b>IZS</b>	Internal zero-span
<b>kph</b>	Kilometers per hour
<b>NO</b>	Nitric Oxide
<b>NO<sub>2</sub></b>	Nitrogen dioxide
<b>NO<sub>x</sub></b>	Total oxides of nitrogen
<b>O<sub>3</sub></b>	Ozone
<b>NMHC</b>	Non-Methane Hydrocarbon
<b>PM<sub>2.5</sub></b>	Particulate matter less than or equal to 2.5 microns in diameter
<b>ppb</b>	Parts per billion
<b>ppm</b>	Parts per million
<b>QA</b>	Quality Assurance
<b>QC</b>	Quality Control
<b>RH</b>	Relative Humidity
<b>SHARP</b>	Synchronized Hybrid Ambient Real-time Particulate Monitor
<b>SOP</b>	Standard Operating Procedure
<b>SO<sub>2</sub></b>	Sulphur Dioxide
<b>STDWD</b>	Standard Deviation Wind Direction
<b>THC</b>	Total hydrocarbons
<b>TRS</b>	Total Reduced Sulphur
<b>µg/m<sup>3</sup></b>	Microgram per cubic meter
<b>WS</b>	Wind Speed
<b>WD</b>	Wind Direction
<b>°C</b>	Degrees Celsius

## AAAQO Exceedance Summary

### SO<sub>2</sub> 1-Hour Exceedances

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

### SO<sub>2</sub> 24-Hour Exceedances

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

### NO<sub>2</sub> 1-Hour Exceedances

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

### PM<sub>2.5</sub> 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m<sup>3</sup>.

### PM<sub>2.5</sub> 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 29 µg/m<sup>3</sup>.

### O<sub>3</sub> 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.*

**MONTHLY CONTINUOUS DATA SUMMARY**

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
Cold Lake South Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO <sub>2</sub> (ppb)	172	48	0	0	0	4	7	4	12.5	NW	1	7	100.0
TRS (ppb)	-	-	-	-	0	1	1	3	6.7	SE	0	1	100.0
THC (ppm)	-	-	-	-	2.10	3.16	13	5	0.4	SSE	2.64	13	96.2
CH <sub>4</sub> (ppm)	-	-	-	-	2.09	3.04	14	12	7.1	WSW	2.55	13	96.2
NMHC (ppm)	-	-	-	-	0.01	0.18	17	16	2.8	ENE	0.10	13	96.2
NO <sub>2</sub> (ppb)	159	-	0	-	6	29	26	17	1.1	E	17	24	99.7
NO (ppb)	-	-	-	-	1	40	28	14	12.9	N	6	24	99.7
NO <sub>x</sub> (ppb)	-	-	-	-	7	52	24	9	1.0	NNE	23	24	99.7
O <sub>3</sub> (ppb)	82	-	0	-	27.5	43.4	27	21	21.6	NNW	38.6	28	99.5
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	29	0	0	4	23	14	16	5.7	WSW	10	13	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	75	96	14	9	5.5	SW	89	6	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-13.3	5.9	2	14	9.9	WSW	-1.6	2	100.0
VECTOR WS (kph)	-	-	-	-	0.8	25.5	27	17	-	NNW	16.4	27	100.0
VECTOR WD (sec)	-	-	-	-	30 (NNE)	-	-	-	-	-	-	-	100.0

**OPERATIONAL SUMMARY**

Parameter	Equipment	Method & Procedure	Operational Notes
SULPHUR DIOXIDE (SO <sub>2</sub> )	Thermo 43i UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine monthly calibration was performed on January 8, between the hours of 10:00 and 14:00.</li> </ul>
TOTAL REDUCED SULPHUR (TRS)	Thermo 450i UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine monthly calibration was performed on January 8, between the hours of 10:00 and 14:00.</li> </ul>
TOTAL HYDROCARBONS (THC), METHANE (CH <sub>4</sub> ) & NON-METHANE HYDROCARBONS (NMHC)	Thermo 55i FID Analyzer	Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 96.2%, equivalent to 28 hours of downtime.</li> <li>The routine monthly calibration was performed on January 9, between the hours of 10:00 and 13:00.</li> <li>Beginning on January 24, frequent poor sample injections were observed. This prompted a site visit on January 25 where a shut-down calibration was attempted on the AEP-supplied Thermo 55i (s/n: 1180030034). However, the As-Found High point did not meet requirements as there were poor sample injections that impacted the stability criteria. LICA's Thermo 55i analyzer (s/n: 1180320044) which was removed on December 27, was subsequently installed and calibrated successfully. Data was invalidated back to the point of failed performance, determined as hour 13:00 on January 24. Twenty-eight hours of downtime were recorded due to this event.</li> <li>Minute data for the month was reviewed. CH<sub>4</sub> minute concentrations recorded lower than 1.80 ppm, along with the corresponding THC and NMHC values, were excluded and the corresponding hourly averages were re-calculated. The following hourly averages were re-calculated: January 19, hours 01:00 and 07:00; and January 21, hour 06:00.</li> </ul>
OXIDES OF NITROGEN (NO <sub>x</sub> ), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO <sub>2</sub> )	Thermo 42i Chemiluminescent Analyzer	Maxxam AIR SOP-00213: Ambient NO/NO <sub>2</sub> /NO <sub>x</sub> Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 99.7%, equivalent to 2 hours of downtime.</li> <li>The analyzer spanned close to the upper acceptance limit on January 7. A repeat zero-span check was performed on January 8 and the result was much closer to the mean. No further action was required. Two hours of downtime were, however, incurred due to the additional quality check.</li> <li>The routine monthly calibration was performed on January 8, between the hours of 10:00 and 16:00. The expected span value was updated following the scheduled span check at hour 21:00 on the same day. The daily span result for January 9 was outside the upper acceptance limit, probably as the analyzer required a longer stabilization period after calibration. Subsequent daily zero-span checks were within acceptance limits. No action was required.</li> </ul>

**OPERATIONAL SUMMARY**

Parameter	Equipment	Method & Procedure	Operational Notes
OZONE (O <sub>3</sub> )	Thermo 49i Photometric Analyzer	Maxxam AIR SOP-00212: Ambient O <sub>3</sub> Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 99.5%, equivalent to 4 hours of downtime.</li> <li>The routine monthly calibration was performed on January 9, between the hours of 10:00 and 14:00.</li> <li>The analyzer spanned erratically outside the lower acceptance limit on January 29. The results of two repeat zero-span checks performed later in the day exhibited similar response. This prompted an immediate site visit where an as-found response check was successfully completed. Troubleshooting did not reveal a cause for the sudden change in span response. During the site visit on January 29, the zero-span system pump was also disassembled and rebuilt with a new diaphragm. However, the issue was not resolved as the analyzer continued to span at the same level. On February 7, following a successful monthly calibration, the output of the internal Ozone generator (span level) was adjusted to return span concentrations to the required range. The expected span value was subsequently reset and no drifts in span response were observed at the updated span level. As the as-found response check conducted on January 29 and the February monthly calibration met AMD requirements, demonstrating that analyzer performance was not impacted, no data were discarded due to this event. However, four hours of downtime were recorded due to the additional quality checks.</li> </ul>
PARTICULATE MATTER < 2.5 MICRONS (PM <sub>2.5</sub> )	Thermo SHARP 5030 Unit	Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 100%.</li> <li>The routine monthly check was performed on January 25, between the hours of 16:00 and 17:00.</li> </ul>
WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)	Met One Unit	MET One Instruments: Operation Manual Document No. 50.5-9800	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 100%.</li> <li>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.</li> </ul>
RELATIVE HUMIDITY (RH)	Met One Unit	Operation Manual	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 100%.</li> </ul>
AMBIENT TEMPERATURE (AmbTPX)	Met One Unit	Operation Manual	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 100%.</li> </ul>



## ***SUMMARY TABLES, GRAPHS AND ROSES***

**SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)**

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

**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

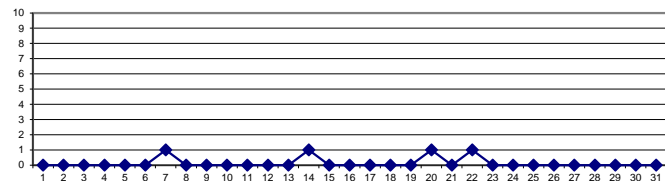
**OBJECTIVE LIMIT:**

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

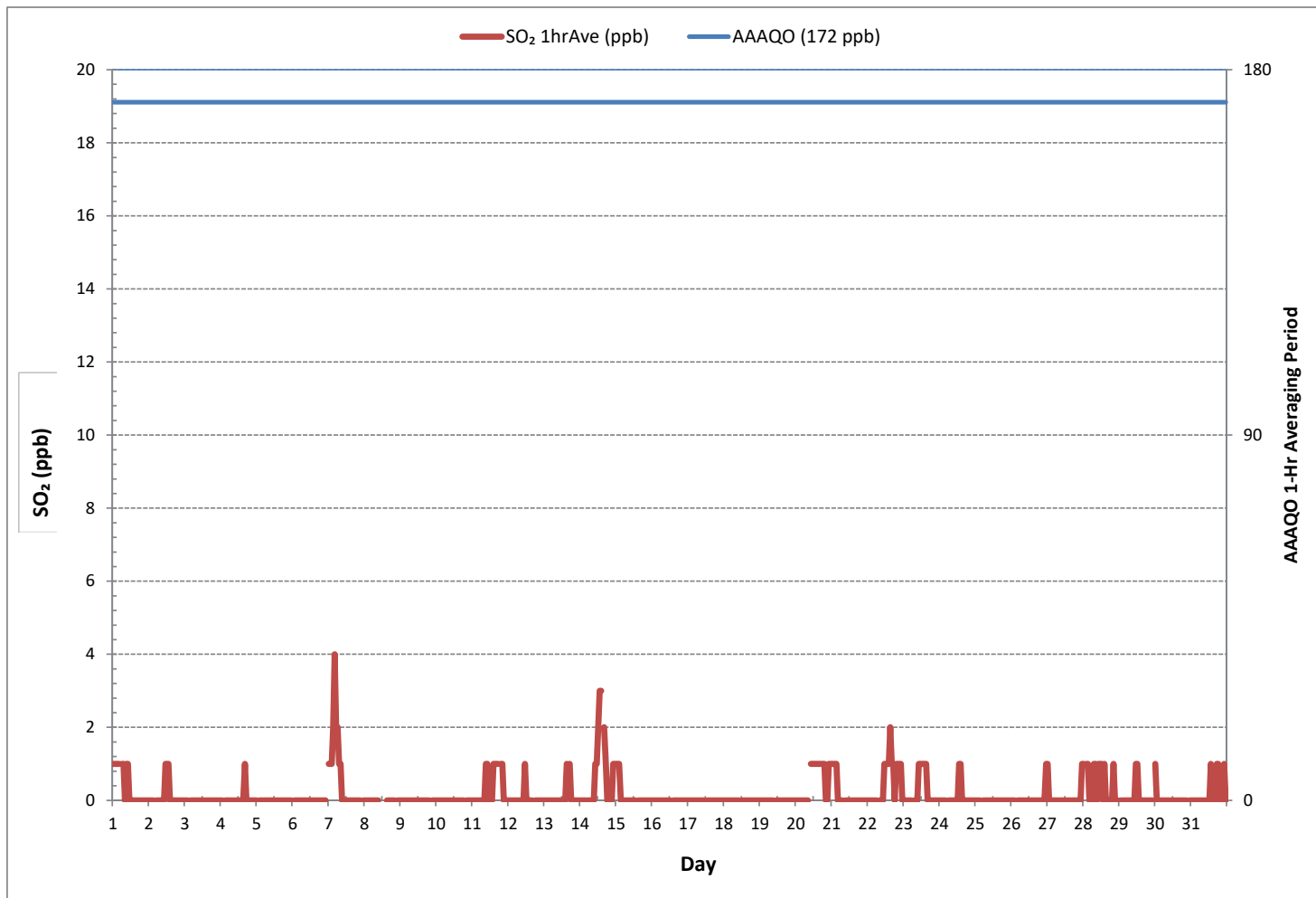
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	100				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	8	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	4 ppb @ HOUR	4	ON DAY	7	
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	7	
IZS CALIBRATION TIME:	33	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

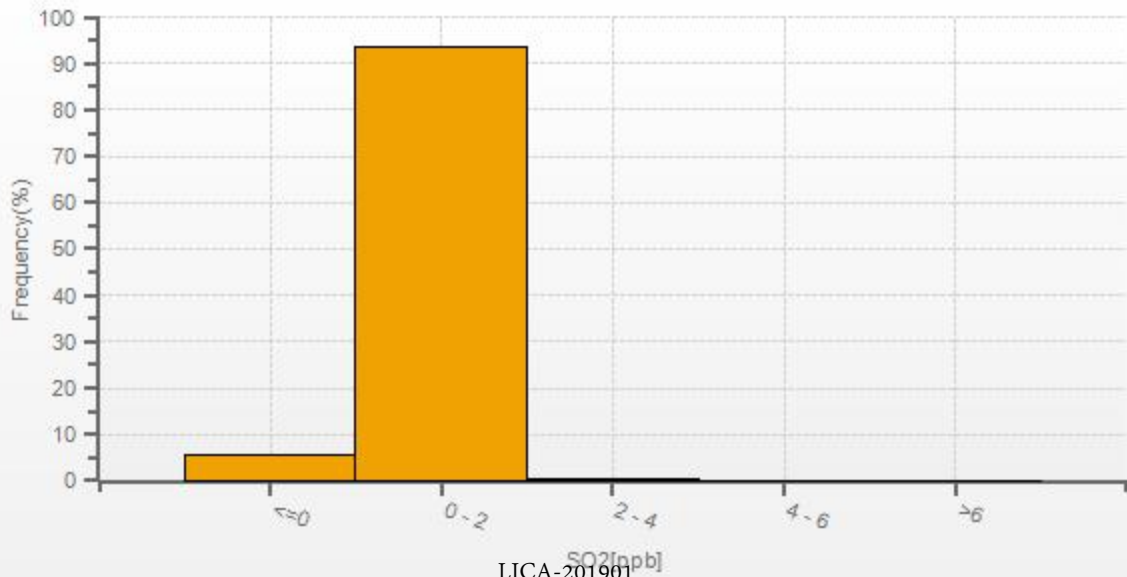
**24 HR AVERAGES January 2019**



SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)



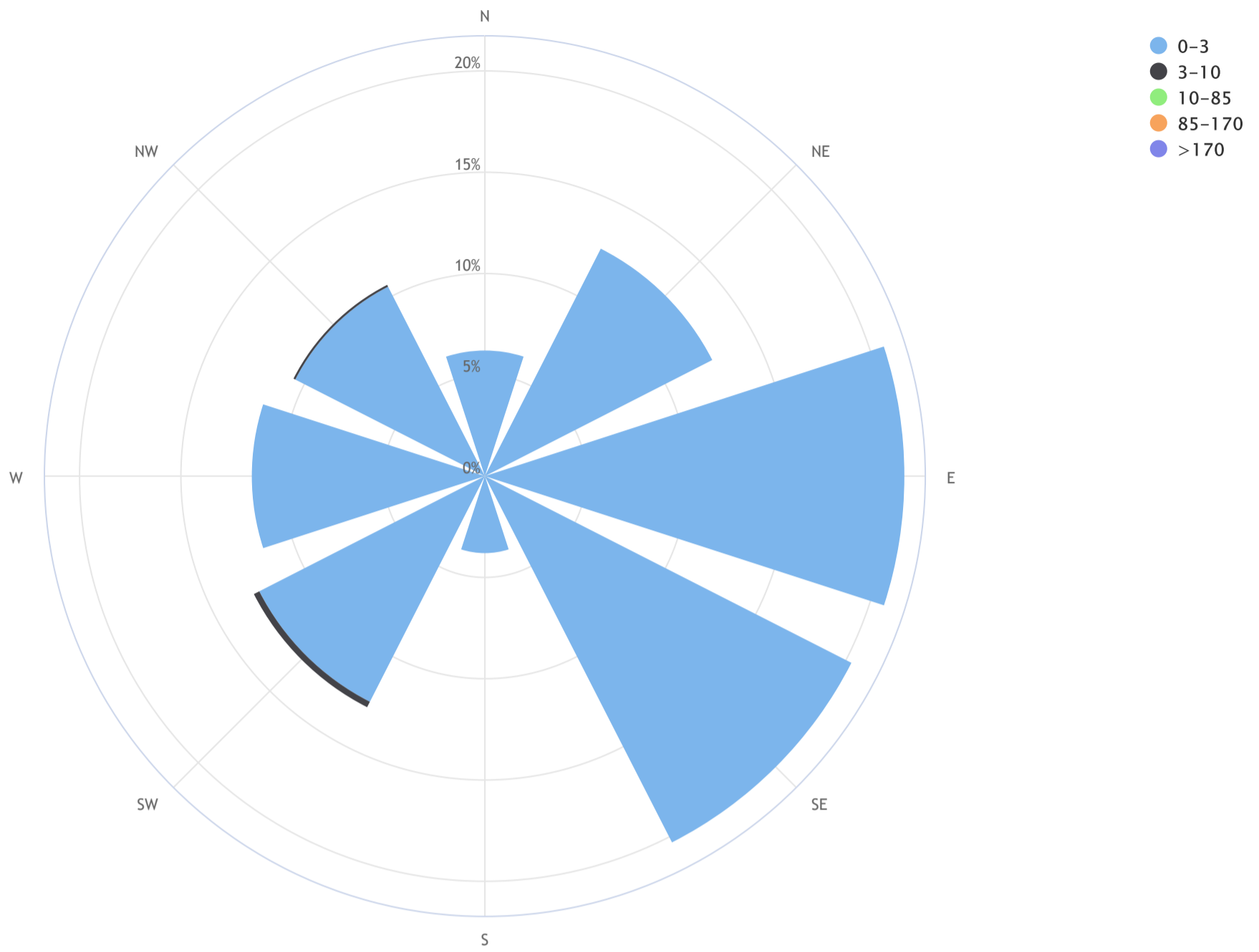
# SO2[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.



LICA-201901

Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_SO<sub>2</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.0\_CALM % = 1.6%



Direction	0-3	3-10	10-85	85-170	>170	TOTAL
N	6.2	0.0	0.0	0.0	0.0	6.2
NE	12.6	0.0	0.0	0.0	0.0	12.6
E	20.7	0.0	0.0	0.0	0.0	20.7
SE	20.3	0.0	0.0	0.0	0.0	20.3
S	3.8	0.0	0.0	0.0	0.0	3.8
SW	12.5	0.3	0.0	0.0	0.0	12.7
W	11.5	0.0	0.0	0.0	0.0	11.5
NW	10.5	0.1	0.0	0.0	0.0	10.6
<b>Summary</b>	<b>98.0</b>	<b>0.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>98.4</b>
<b>CALM</b>	<b>1.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>1.6</b>



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	0	0	1	0	S	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
2	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
3	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	
4	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	24	
5	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	
6	S	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	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24	
8	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	S	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	S	0	0	0	0	0	0	0	0	24	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
11	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	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	1	0	24	
13	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	24	
14	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	24	
15	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	24	
16	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	
17	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	
18	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	
19	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	24	
20	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	
21	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	24	
22	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	24	
23	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	24	
24	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	
25	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	24	
26	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	
27	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	24	
28	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
29	S	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	
30	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	24	
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24	
HOURLY MAX	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0					
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					

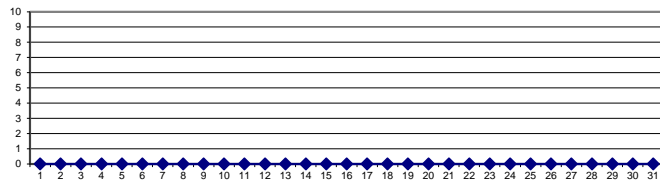
STATUS FLAG CODES

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

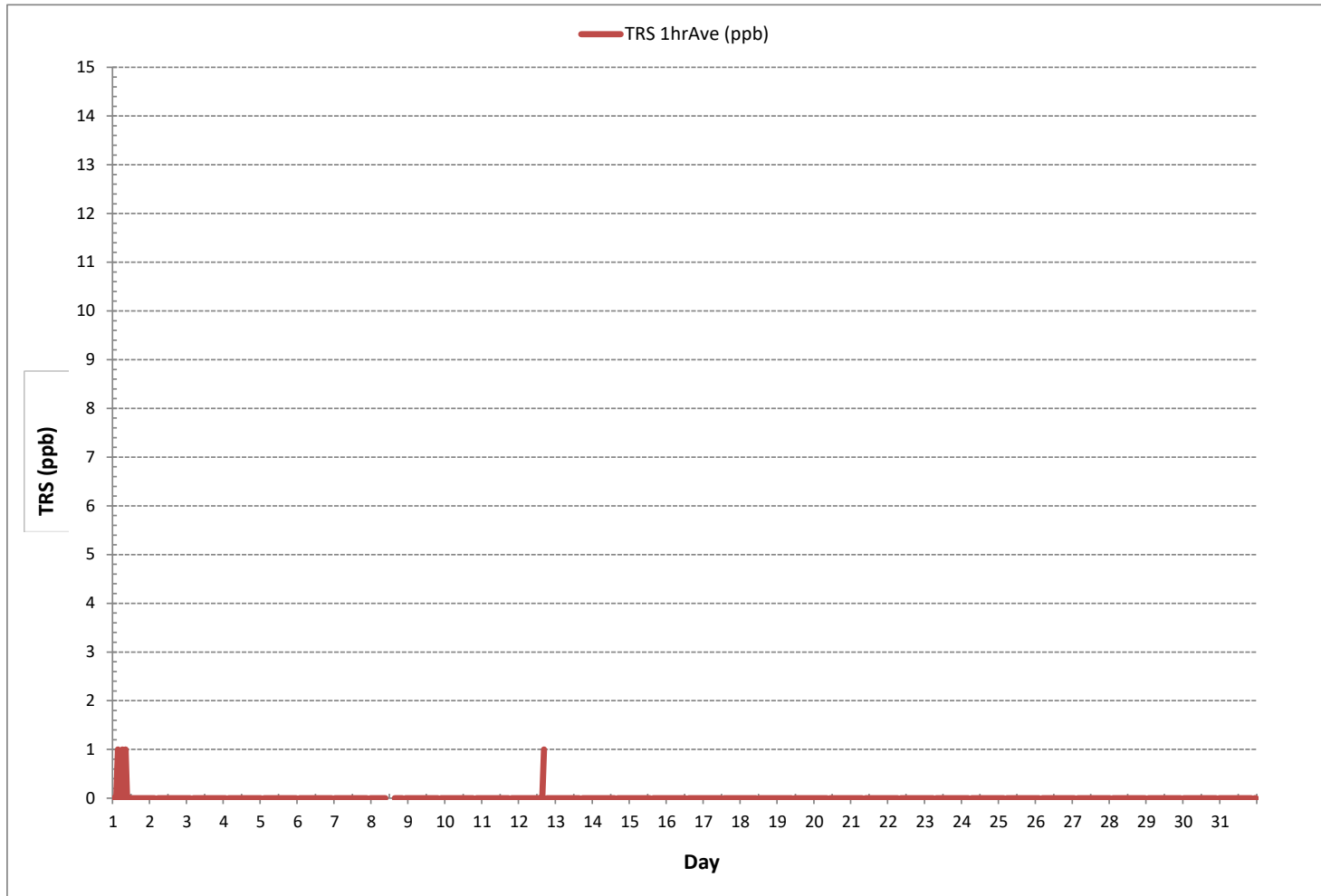
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	4				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	1	ppb @ HOUR	3	ON DAY	1
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY	1
IZS CALIBRATION TIME:	33	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

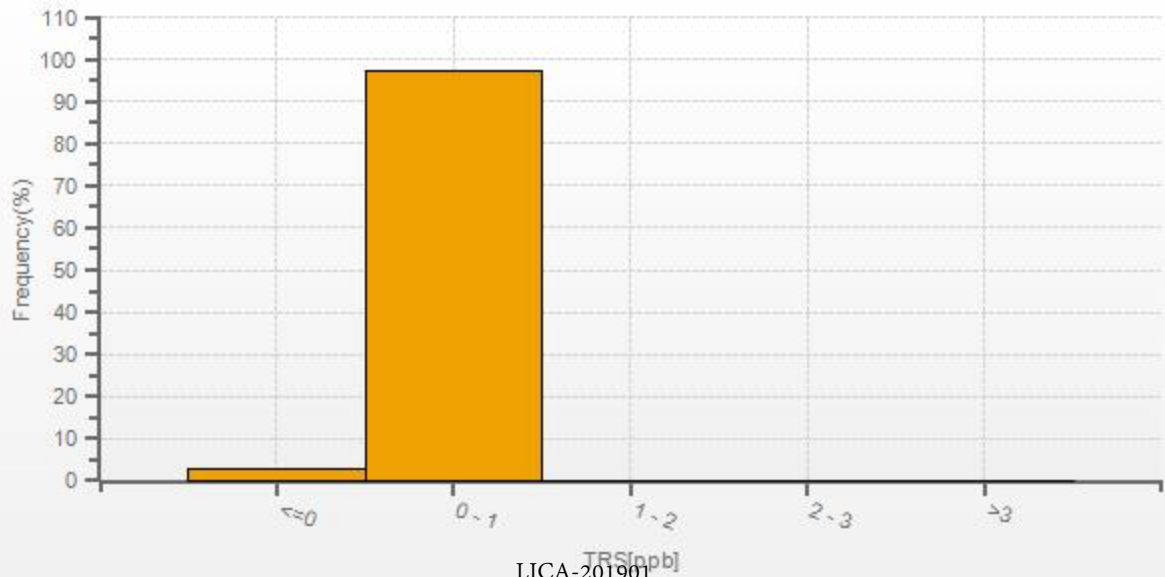
24 HR AVERAGES January 2019



TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



TRS[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.

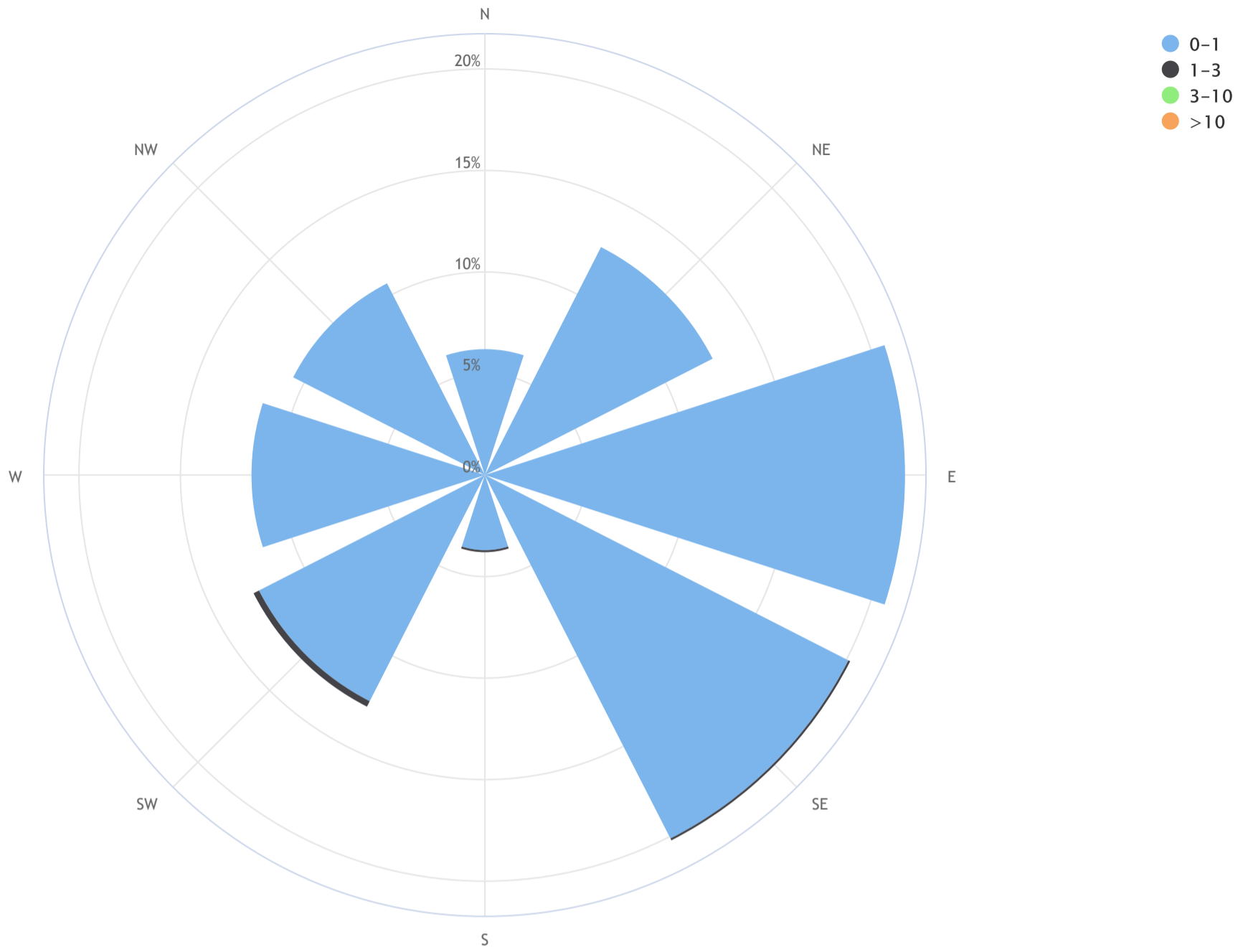


LICA-201901



Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_TRS (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.0\_CALM % = 1.6%



Direction	0-1	1-3	3-10	>10	TOTAL
N	6.2	0.0	0.0	0.0	6.2
NE	12.6	0.0	0.0	0.0	12.6
E	20.7	0.0	0.0	0.0	20.7
SE	20.1	0.1	0.0	0.0	20.3
S	3.7	0.1	0.0	0.0	3.8
SW	12.5	0.3	0.0	0.0	12.7
W	11.5	0.0	0.0	0.0	11.5
NW	10.6	0.0	0.0	0.0	10.6
Summary	97.9	0.6	0.0	0.0	98.4
CALM	1.6	0.0	0.0	0.0	1.6

**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	2.38	2.34	2.32	2.25	2.17	S	2.09	2.11	2.12	2.10	2.05	2.06	2.03	1.91	1.91	1.91	1.91	1.92	1.95	1.98	1.99	1.97	1.96	1.96	1.91	2.38	2.06	24	
2	1.97	1.98	1.98	2.00	S	2.04	2.09	2.09	2.21	2.16	2.12	1.99	1.95	1.95	1.96	1.94	1.96	1.98	1.98	2.01	1.99	2.00	1.98	1.97	1.94	2.21	2.01	24	
3	1.95	1.95	1.95	S	1.95	1.95	1.96	1.98	1.98	1.98	1.99	1.97	1.95	1.96	1.98	1.97	1.99	2.01	2.04	2.04	2.11	2.10	2.08	2.11	1.95	2.11	2.00	24	
4	2.15	2.17	S	2.17	2.19	2.31	2.37	2.52	2.40	2.34	2.18	2.07	1.99	1.97	1.97	1.96	1.96	1.97	1.97	1.96	1.95	1.95	1.96	1.96	1.95	2.52	2.11	24	
5	1.95	S	1.95	1.96	1.96	1.96	1.96	1.96	1.96	1.97	1.96	1.96	1.97	1.98	1.97	1.96	1.97	1.96	1.98	1.96	1.96	1.97	1.99	1.97	1.95	1.99	1.97	24	
6	S	1.95	1.94	1.97	1.95	1.95	1.93	1.93	1.94	1.94	1.93	1.93	1.95	1.96	1.94	2.07	1.95	1.96	1.95	1.94	1.95	1.96	1.95	S	1.93	2.07	1.95	24	
7	1.95	1.94	1.93	1.95	1.99	1.99	1.99	1.98	1.97	1.95	1.95	1.96	1.96	1.96	1.96	1.96	1.96	1.94	1.94	1.95	1.96	1.97	S	1.97	1.93	1.99	1.96	24	
8	1.97	1.98	1.97	1.97	1.96	1.97	1.98	1.98	2.00	2.03	2.06	2.07	2.06	2.05	2.04	2.04	2.08	2.07	2.06	2.06	2.10	S	2.29	2.28	1.96	2.29	2.05	24	
9	2.16	2.09	2.11	2.10	2.09	2.09	2.12	2.12	2.08	2.05	C	C	C	C	2.00	1.99	1.99	1.99	1.98	1.99	S	1.98	1.98	1.99	1.98	2.16	2.05	24	
10	1.97	1.98	1.97	1.97	1.98	1.98	2.00	2.04	2.01	1.98	1.98	1.98	1.99	1.99	1.99	1.98	1.99	2.01	2.02	S	2.06	2.05	2.05	2.06	1.97	2.06	2.00	24	
11	2.08	2.10	2.10	2.14	2.13	2.15	2.20	2.23	2.19	2.29	2.31	2.29	2.23	2.15	2.11	2.11	2.11	2.08	S	2.15	2.11	2.07	2.06	2.06	2.06	2.31	2.15	24	
12	2.06	2.06	2.09	2.10	2.10	2.18	2.31	2.28	2.29	2.42	2.29	2.41	2.38	2.47	2.43	2.38	2.48	S	2.43	2.47	2.49	2.54	2.55	2.85	2.06	2.85	2.35	24	
13	2.94	3.02	3.14	3.04	3.05	3.16	3.16	3.12	3.01	2.94	2.94	2.94	2.79	2.49	2.38	2.33	2.26	S	2.20	2.15	2.10	2.11	2.11	2.17	2.17	2.10	3.16	2.64	24
14	2.20	2.14	2.12	2.12	2.16	2.11	2.16	2.18	2.41	2.49	2.67	2.79	3.15	3.06	2.72	S	2.46	2.30	2.07	2.04	2.00	2.01	2.09	2.07	2.00	3.15	2.33	24	
15	2.06	2.06	2.03	2.02	2.03	2.02	2.02	2.02	2.03	2.02	2.02	2.02	2.02	2.01	S	2.03	2.06	2.04	2.04	2.03	2.03	2.03	2.04	2.02	2.01	2.06	2.03	24	
16	2.02	2.02	2.04	2.05	2.06	2.05	2.05	2.03	2.02	2.03	2.06	2.03	2.04	S	2.02	2.02	2.02	2.02	2.02	2.02	2.01	2.01	2.02	2.02	2.01	2.06	2.03	24	
17	2.02	2.01	2.00	2.00	2.07	2.03	2.04	2.03	2.05	2.06	2.15	2.09	S	2.03	2.01	2.03	2.22	2.14	2.16	2.12	2.14	2.15	2.15	2.19	2.00	2.22	2.08	24	
18	2.18	2.19	2.19	2.19	2.12	2.14	2.19	2.15	2.07	2.01	2.01	S	2.03	2.05	2.05	2.04	2.03	2.02	2.03	2.04	2.05	2.03	2.04	2.06	2.01	2.19	2.08	24	
19	2.08	2.08	2.07	2.07	2.07	2.05	2.05	2.06	2.06	2.05	S	2.03	2.03	2.03	2.02	2.02	2.01	2.00	2.00	2.00	2.01	2.01	2.01	2.00	2.00	2.08	2.04	24	
20	2.00	2.01	2.01	2.03	2.04	2.08	2.06	2.07	2.10	S	2.12	2.14	2.15	2.15	2.12	2.22	2.27	2.30	2.33	2.37	2.39	2.50	2.43	2.45	2.00	2.50	2.19	24	
21	2.49	2.50	2.58	2.60	2.70	2.36	2.15	2.14	S	2.16	2.12	2.08	2.09	2.11	2.12	2.16	2.16	2.13	2.13	2.15	2.16	2.17	2.17	2.22	2.08	2.70	2.25	24	
22	2.24	2.20	2.18	2.16	2.16	2.18	2.16	S	2.23	2.29	2.35	2.37	2.35	2.37	2.36	2.32	2.28	2.30	2.37	2.51	2.56	2.55	2.69	2.32	2.16	2.69	2.33	24	
23	2.06	2.06	2.04	2.02	2.01	2.02	S	2.00	2.04	2.01	2.01	2.00	2.01	2.01	2.01	2.02	2.02	2.03	2.03	2.03	2.06	2.07	2.11	2.16	2.18	2.00	2.18	2.04	24
24	2.20	2.21	2.24	2.24	2.27	S	2.44	2.36	2.50	2.55	2.52	2.55	2.57	X	X	X	X	X	X	X	X	X	X	X	2.20	2.57	2.39	13	
25	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	C1	C1	C1	C1	2.07	2.04	2.07	2.10	2.07	2.07	2.11	2.04	2.11	2.08	7
26	2.14	2.04	2.02	S	2.13	2.11	2.12	2.07	2.09	2.11	2.13	2.13	2.13	2.19	2.24	2.19	2.13	2.36	2.07	1.96	1.96	2.03	1.97	1.96	1.96	2.36	2.10	24	
27	1.94	1.93	S	1.87	1.87	1.87	1.89	1.89	1.91	1.93	1.93	1.94	1.94	1.93	1.93	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.96	1.87	1.96	1.92	24	
28	1.96	S	1.96	1.96	1.96	1.96	1.97	1.95	1.95	1.97	1.94	1.94	1.94	1.94	1.97	1.96	1.95	1.95	1.94	1.97	1.95	1.96	1.97	1.94	1.97	1.96	1.95	24	
29	S	2.00	2.02	2.02	2.06	2.08	2.09	2.13	2.22	2.22	2.01	2.01	2.00	2.00	2.01	2.04	2.03	2.01	2.01	2.05	2.04	2.05	S	2.00	2.22	2.05	24		
30	2.06	2.04	2.03	2.03	2.02	2.01	2.00	2.00	2.00	1.99	2.00	2.02	2.01	1.99	1.99	2.00	2.00	2.00	1.99	2.02	2.02	2.03	S	2.07	1.99	2.07	2.01	24	
31	2.08	2.14	2.13	2.14	2.13	2.13	2.18	2.20	2.16	2.20	2.17	2.14	2.18	2.13	2.10	2.09	2.09	2.09	2.02	2.00	2.00	S	2.00	2.00	2.00	2.00	2.20	2.11	24
HOURLY MAX	2.94	3.02	3.14	3.04	3.05	3.16	3.16	3.12	3.01	2.94	2.94	2.79	3.15	3.06	2.72	2.38	2.48	2.36	2.43	2.51	2.56	2.55	2.69	2.85					
HOURLY AVG	2.12	2.11	2.11	2.11	2.12	2.10	2.13	2.12	2.14	2.15	2.14	2.13	2.13	2.10	2.08	2.06	2.07	2.06	2.06	2.06	2.08	2.08	2.10	2.11					

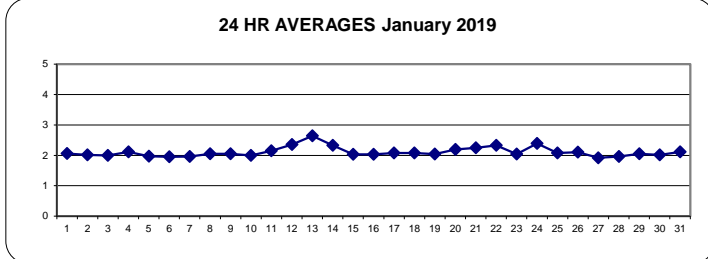
**STATUS FLAG CODES**

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

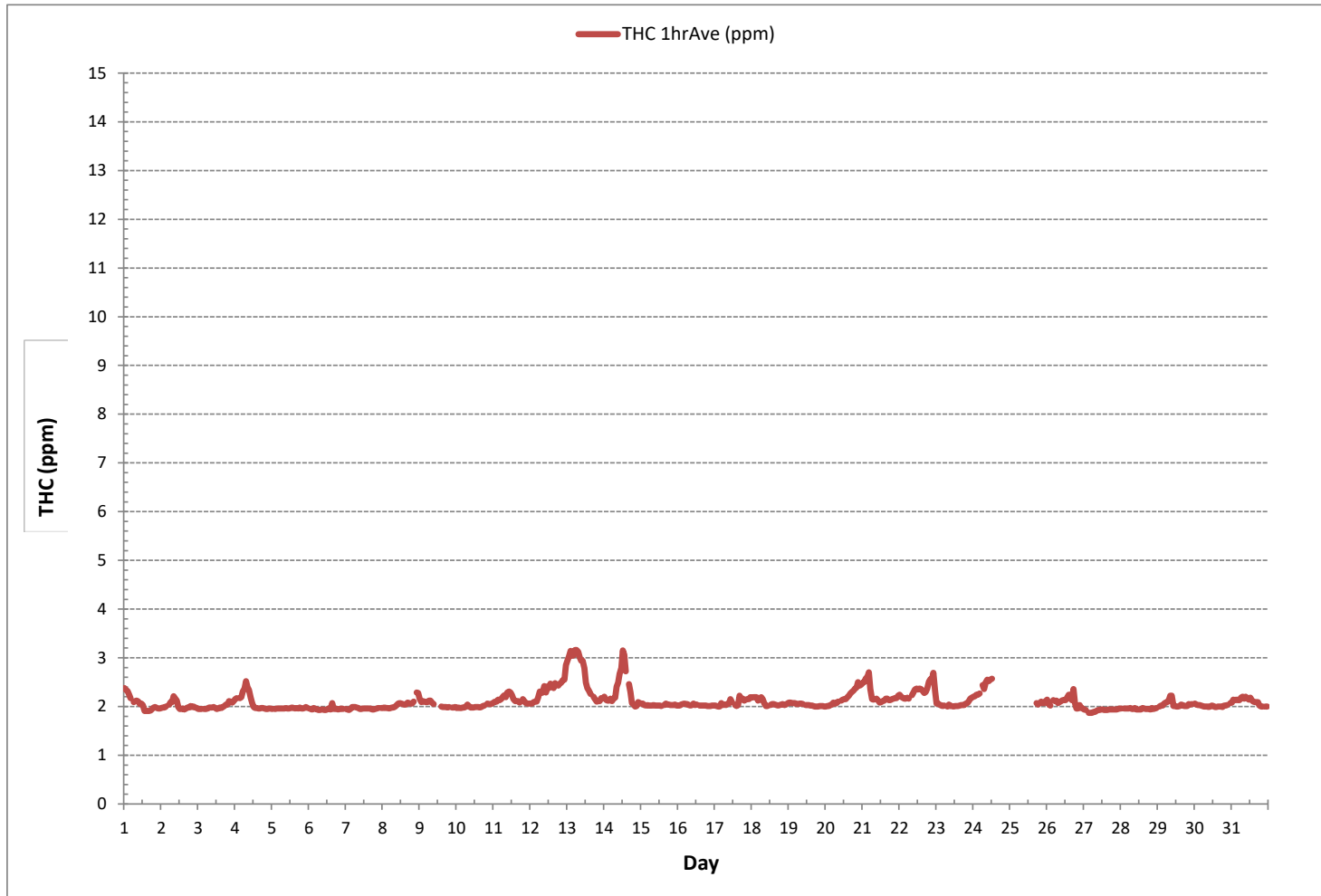
**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	680			
MINIMUM 1-HR AVERAGE:	1.87 ppm	@ HOUR	3	ON DAY 27
MAXIMUM 1-HR AVERAGE:	3.16 ppm	@ HOUR	5	ON DAY 13
MAXIMUM 24-HR AVERAGE:	2.64 ppm			ON DAY 13
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	716 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	96.2 %	
STANDARD DEVIATION:	0.20	MONTHLY AVERAGE:	2.10 ppm	

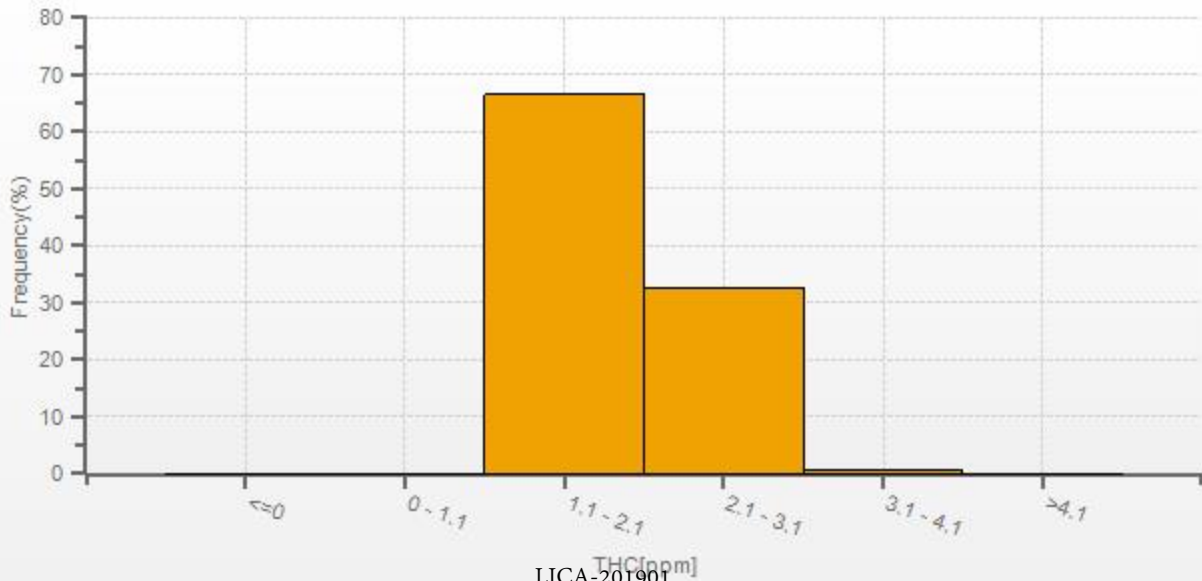
**24 HR AVERAGES January 2019**



TOTAL HYDROCARBONS Hourly Averages (THC ppm)



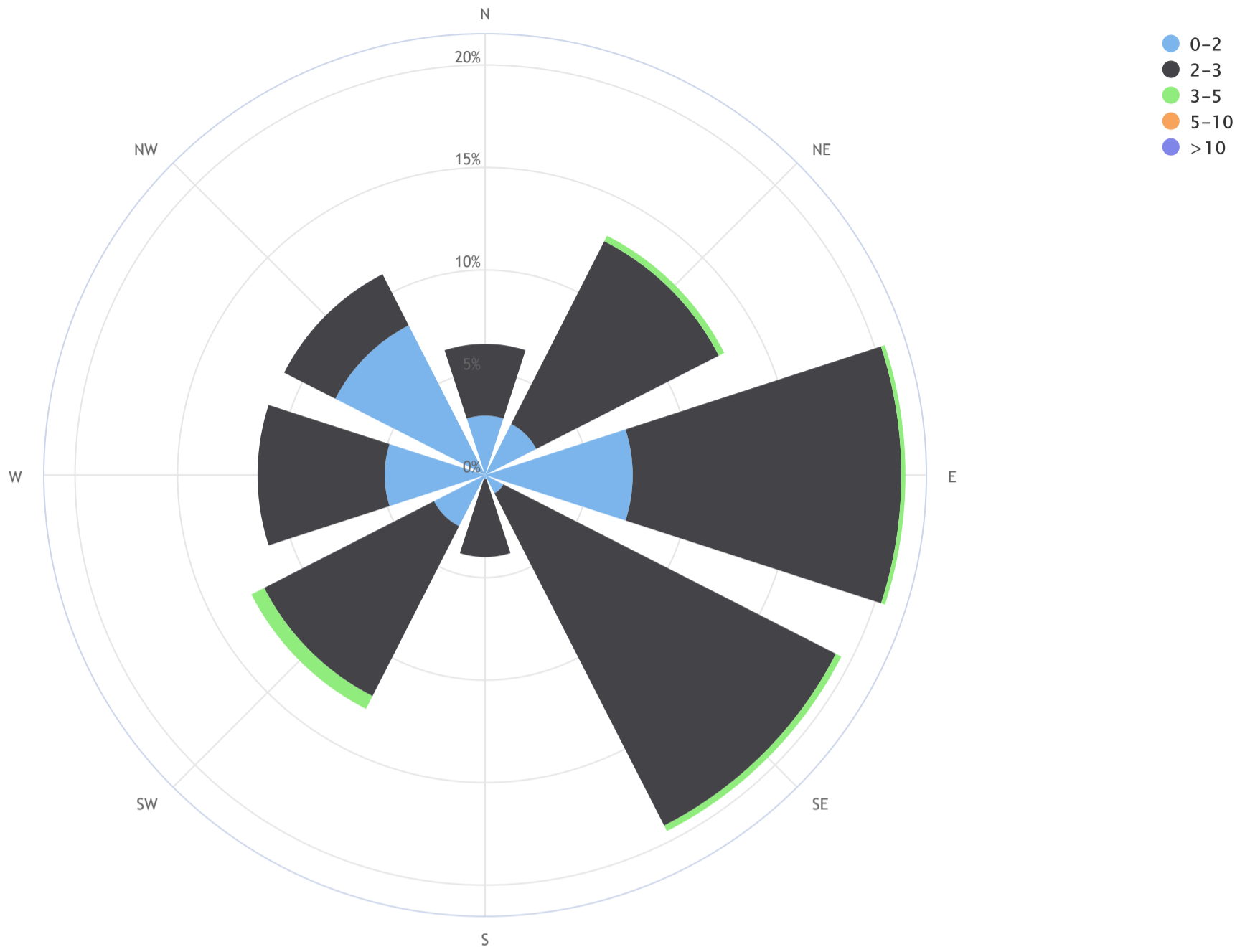
# THC[ppm] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.



LICA-201901

Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_THC (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 2.2\_CALM % = 1.6%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	2.9	3.5	0.0	0.0	0.0	6.5
NE	2.8	10.0	0.3	0.0	0.0	13.1
E	7.2	13.1	0.2	0.0	0.0	20.5
SE	1.0	18.2	0.3	0.0	0.0	19.6
S	0.2	3.8	0.0	0.0	0.0	4.0
SW	2.8	9.3	0.7	0.0	0.0	12.8
W	4.9	6.2	0.0	0.0	0.0	11.0
NW	8.2	2.8	0.0	0.0	0.0	11.0
<b>Summary</b>	<b>30.0</b>	<b>66.9</b>	<b>1.5</b>	<b>0.0</b>	<b>0.0</b>	<b>98.4</b>
<b>CALM</b>	<b>0.0</b>	<b>1.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>1.6</b>

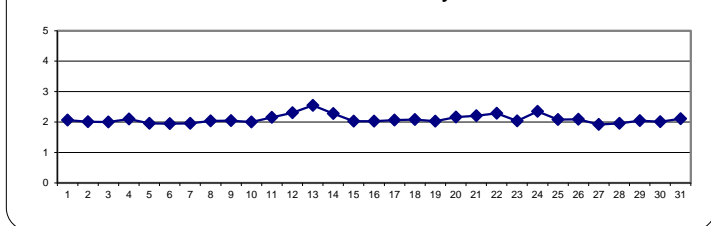
**METHANE Hourly Averages (CH<sub>4</sub> ppm)**

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	2.37	2.33	2.32	2.25	2.17	S	2.09	2.11	2.11	2.09	2.04	2.06	2.02	1.91	1.91	1.91	1.91	1.92	1.95	1.98	1.99	1.97	1.96	1.96	1.91	2.37	2.06	24
2	1.97	1.98	1.98	1.99	S	2.04	2.07	2.08	2.15	2.15	2.11	1.99	1.95	1.95	1.95	1.94	1.95	1.98	1.98	2.00	1.99	2.00	1.98	1.97	1.94	2.15	2.01	24
3	1.95	1.95	1.95	S	1.95	1.95	1.96	1.97	1.98	1.98	1.99	1.96	1.95	1.96	1.98	1.97	1.98	2.01	2.04	2.04	2.10	2.10	2.08	2.11	1.95	2.11	2.00	24
4	2.15	2.17	S	2.17	2.19	2.27	2.35	2.48	2.37	2.32	2.17	2.07	1.99	1.97	1.97	1.96	1.95	1.97	1.97	1.96	1.95	1.95	1.96	1.96	1.95	2.48	2.10	24
5	1.95	S	1.95	1.96	1.96	1.96	1.96	1.96	1.96	1.97	1.96	1.96	1.97	1.97	1.97	1.96	1.97	1.96	1.98	1.96	1.96	1.97	1.99	1.97	1.95	1.99	1.96	24
6	S	1.95	1.94	1.97	1.95	1.95	1.93	1.93	1.94	1.94	1.92	1.93	1.95	1.95	1.94	1.95	1.95	1.95	1.95	1.94	1.95	1.95	1.95	S	1.92	1.97	1.95	24
7	1.95	1.94	1.93	1.95	1.99	1.99	1.99	1.98	1.97	1.95	1.95	1.96	1.96	1.96	1.96	1.96	1.96	1.94	1.94	1.95	1.96	1.97	S	1.97	1.93	1.99	1.96	24
8	1.97	1.98	1.97	1.97	1.96	1.97	1.98	1.98	2.00	2.03	2.06	2.07	2.06	2.05	2.04	2.04	2.05	2.06	2.06	2.05	2.10	S	2.29	2.28	1.96	2.29	2.04	24
9	2.16	2.09	2.11	2.10	2.09	2.09	2.11	2.12	2.07	2.05	C	C	C	C	2.00	1.99	1.99	1.98	1.98	1.99	S	1.98	1.98	1.99	1.98	2.16	2.05	24
10	1.97	1.98	1.97	1.97	1.98	1.98	2.00	2.03	2.00	1.98	1.98	1.98	1.99	1.99	1.99	1.97	1.99	2.01	2.02	S	2.06	2.05	2.05	2.06	1.97	2.06	2.00	24
11	2.08	2.10	2.10	2.14	2.13	2.14	2.20	2.23	2.19	2.29	2.31	2.29	2.23	2.15	2.11	2.11	2.11	2.07	S	2.14	2.10	2.07	2.06	2.06	2.06	2.31	2.15	24
12	2.06	2.06	2.08	2.10	2.10	2.18	2.31	2.28	2.26	2.38	2.28	2.39	2.35	2.39	2.38	2.35	2.36	S	2.39	2.41	2.43	2.46	2.47	2.74	2.06	2.74	2.31	24
13	2.82	2.87	2.97	2.89	2.90	3.00	3.01	2.96	2.86	2.79	2.78	2.64	2.40	2.31	2.27	2.21	S	2.16	2.12	2.09	2.09	2.09	2.15	2.15	2.09	3.01	2.55	24
14	2.18	2.12	2.10	2.10	2.14	2.09	2.14	2.16	2.39	2.46	2.62	2.72	3.04	2.93	2.58	S	2.32	2.21	2.05	2.03	2.00	2.01	2.08	2.06	2.00	3.04	2.28	24
15	2.05	2.05	2.03	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.00	S	2.03	2.06	2.03	2.03	2.03	2.02	2.03	2.04	2.02	2.00	2.06	2.03	24
16	2.02	2.02	2.04	2.05	2.06	2.05	2.05	2.03	2.02	2.03	2.03	2.03	2.03	S	2.02	2.02	2.02	2.02	2.02	2.01	2.01	2.01	2.02	2.02	2.01	2.06	2.03	24
17	2.02	2.01	2.00	2.00	2.02	2.03	2.04	2.03	2.05	2.05	2.13	2.08	S	2.03	2.01	2.00	2.05	2.07	2.12	2.11	2.13	2.14	2.14	2.19	2.00	2.19	2.06	24
18	2.18	2.18	2.19	2.18	2.12	2.12	2.16	2.14	2.07	2.01	2.01	S	2.03	2.05	2.05	2.04	2.03	2.02	2.03	2.04	2.05	2.03	2.04	2.06	2.01	2.19	2.08	24
19	2.07	2.05	2.07	2.07	2.07	2.05	2.05	2.06	2.06	2.05	S	2.03	2.03	2.03	2.02	2.02	2.01	2.00	2.00	2.00	2.01	2.01	2.01	2.00	2.00	2.07	2.03	24
20	2.00	2.01	2.01	2.03	2.04	2.08	2.06	2.07	2.10	S	2.12	2.14	2.15	2.13	2.12	2.19	2.23	2.25	2.28	2.29	2.31	2.40	2.34	2.36	2.00	2.40	2.16	24
21	2.39	2.41	2.47	2.48	2.59	2.30	2.13	2.12	S	2.14	2.11	2.08	2.08	2.10	2.11	2.14	2.14	2.12	2.13	2.14	2.15	2.16	2.16	2.20	2.08	2.59	2.21	24
22	2.22	2.18	2.17	2.15	2.15	2.17	2.15	S	2.20	2.27	2.33	2.34	2.31	2.33	2.31	2.27	2.24	2.25	2.32	2.44	2.49	2.46	2.57	2.27	2.15	2.57	2.29	24
23	2.06	2.06	2.04	2.02	2.01	2.02	S	2.00	2.03	2.01	2.01	2.00	2.01	2.01	2.01	2.02	2.02	2.02	2.03	2.06	2.06	2.11	2.16	2.17	2.00	2.17	2.04	24
24	2.20	2.21	2.24	2.23	2.27	S	2.29	2.31	2.43	2.46	2.48	2.51	2.55	X	X	X	X	X	X	X	X	X	X	X	2.20	2.55	2.35	13
25	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	C1	C1	C1	C1	2.07	2.04	2.07	2.10	2.07	2.07	2.11	2.04	2.11	2.08	7
26	2.14	2.04	2.02	S	2.13	2.11	2.12	2.07	2.09	2.11	2.13	2.13	2.19	2.24	2.19	2.13	2.29	2.07	1.96	1.96	2.00	1.97	1.96	1.96	2.29	2.09	24	
27	1.94	1.93	S	1.87	1.87	1.87	1.89	1.89	1.91	1.93	1.93	1.94	1.94	1.93	1.93	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.95	1.96	1.87	1.96	1.92	24
28	1.96	S	1.96	1.96	1.96	1.96	1.97	1.95	1.95	1.97	1.94	1.94	1.94	1.94	1.97	1.96	1.95	1.95	1.94	1.97	1.95	1.96	1.97	1.94	1.97	1.96	24	
29	S	2.00	2.02	2.02	2.06	2.08	2.09	2.13	2.22	2.22	2.01	2.01	2.00	2.00	2.01	2.04	2.03	2.01	2.01	2.05	2.04	2.05	S	2.00	2.22	2.05	24	
30	2.06	2.04	2.03	2.03	2.02	2.01	2.00	2.00	2.00	1.99	2.00	2.02	2.01	1.99	1.99	2.00	2.00	2.00	1.99	2.02	2.02	2.03	S	2.07	1.99	2.07	2.01	24
31	2.08	2.14	2.13	2.14	2.13	2.13	2.18	2.20	2.16	2.20	2.17	2.14	2.18	2.13	2.10	2.09	2.09	2.09	2.02	2.00	2.00	S	2.00	2.00	2.00	2.20	2.21	24
HOURLY MAX	2.82	2.87	2.97	2.89	2.90	3.00	3.01	2.96	2.86	2.79	2.78	2.72	3.04	2.93	2.58	2.35	2.36	2.29	2.39	2.44	2.49	2.46	2.57	2.74				
HOURLY AVG	2.11	2.10	2.10	2.10	2.10	2.09	2.11	2.11	2.12	2.13	2.13	2.12	2.12	2.09	2.07	2.05	2.05	2.05	2.05	2.05	2.06	2.07	2.09	2.09				

**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

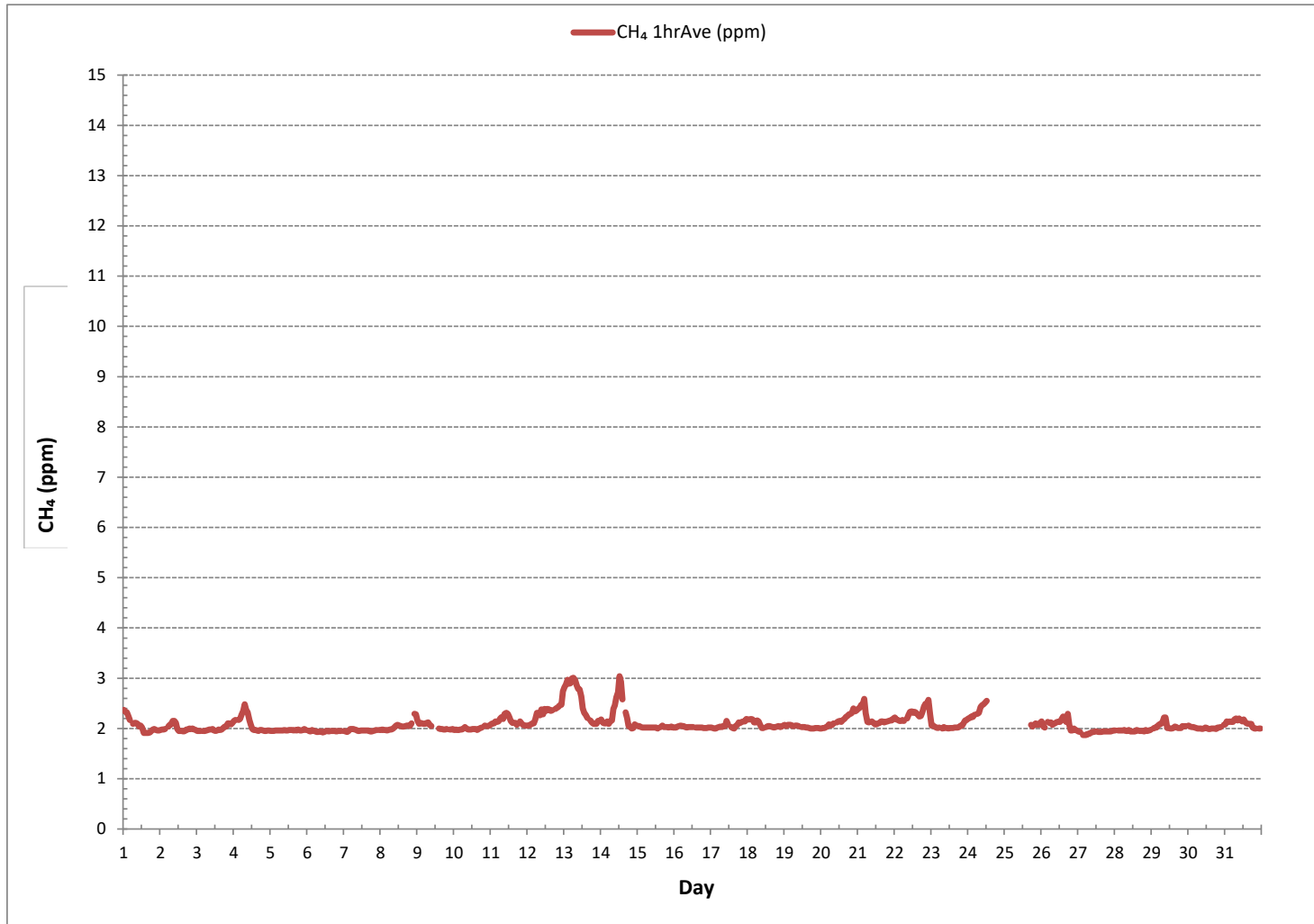
**24 HR AVERAGES January 2019**



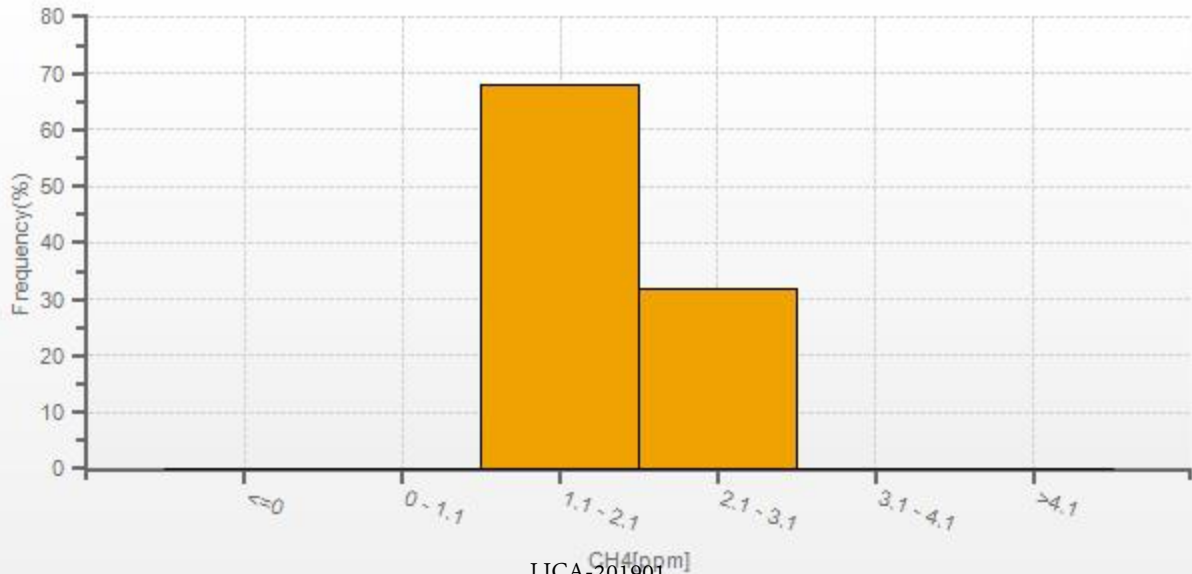
**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	680			
MINIMUM 1-HR AVERAGE:	1.87 ppm	@ HOUR	3	ON DAY 27
MAXIMUM 1-HR AVERAGE:	3.04 ppm	@ HOUR	12	ON DAY 14
MAXIMUM 24-HR AVERAGE:	2.55 ppm			ON DAY 13
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	716 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	96.2 %	
STANDARD DEVIATION:	0.18	MONTHLY AVERAGE:	2.09 ppm	

METHANE Hourly Averages (CH<sub>4</sub> ppm)



CH4[ppm] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.

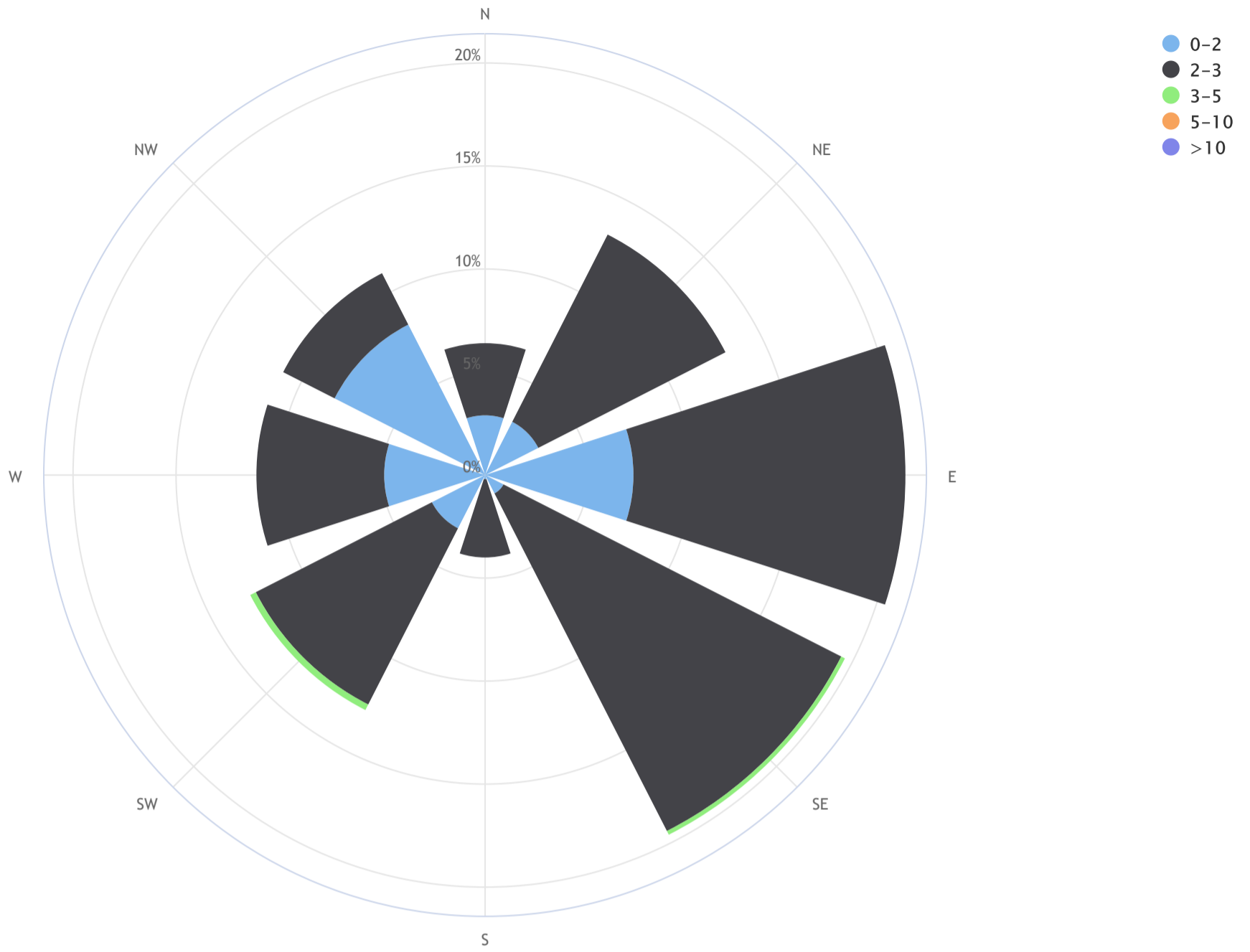


LICA-201901



Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_CH4 (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 2.2\_CALM % = 1.6%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	2.9	3.5	0.0	0.0	0.0	6.5
NE	2.9	10.2	0.0	0.0	0.0	13.1
E	7.2	13.2	0.0	0.0	0.0	20.5
SE	1.0	18.4	0.2	0.0	0.0	19.6
S	0.2	3.8	0.0	0.0	0.0	4.0
SW	2.9	9.6	0.3	0.0	0.0	12.8
W	4.9	6.2	0.0	0.0	0.0	11.0
NW	8.2	2.8	0.0	0.0	0.0	11.0
Summary	30.3	67.7	0.4	0.0	0.0	98.4
CALM	0.0	1.6	0.0	0.0	0.0	1.6



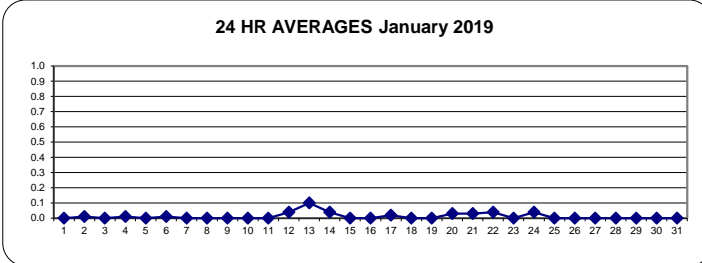
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	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	24	
2	0.00	0.00	0.00	0.00	S	0.00	0.03	0.01	0.06	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
3	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
4	0.00	0.00	S	0.00	0.00	0.04	0.02	0.04	0.03	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
5	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	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
6	S	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	0.13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	S	0.00	0.13	0.01	24	
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	24	
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.01	0.00	S	0.00	0.00	0.00	0.03	0.00	24	
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	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	24	
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	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	24	
11	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	S	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	24	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.01	0.02	0.03	0.08	0.04	0.04	0.12	S	0.04	0.06	0.06	0.08	0.08	0.11	0.00	0.12	0.04	24	
13	0.13	0.14	0.16	0.14	0.15	0.17	0.16	0.16	0.15	0.15	0.16	0.14	0.09	0.07	0.06	0.05	S	0.03	0.03	0.01	0.01	0.02	0.02	0.02	0.01	0.17	0.10	24	
14	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.11	0.13	0.14	S	0.15	0.08	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.15	0.04	24	
15	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	S	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
17	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.03	0.18	0.07	0.04	0.01	0.01	0.00	0.01	0.01	0.01	0.18	0.02	24	
18	0.00	0.01	0.01	0.01	0.00	0.03	0.03	0.01	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	
19	0.02	0.03	0.01	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	0.03	0.00	24	
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.08	0.10	0.09	0.09	0.00	0.10	0.03	24
21	0.09	0.10	0.11	0.11	0.11	0.06	0.02	0.01	S	0.02	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.11	0.03	24
22	0.01	0.01	0.01	0.01	0.01	0.01	0.01	S	0.03	0.02	0.02	0.02	0.04	0.04	0.06	0.05	0.04	0.05	0.05	0.06	0.07	0.09	0.12	0.04	0.01	0.12	0.04	24	
23	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
24	0.00	0.00	0.00	0.00	0.00	S	0.15	0.05	0.07	0.08	0.04	0.04	0.01	X	X	X	X	X	X	X	X	X	X	X	X	0.00	0.15	0.04	13
25	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	C1	C1	C1	C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7	
26	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	0.07	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	24	
27	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
28	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	
29	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	S	0.00	0.00	0.00	24	
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	24	
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24	
HOURLY MAX	0.13	0.14	0.16	0.14	0.15	0.17	0.16	0.16	0.15	0.15	0.16	0.14	0.11	0.13	0.14	0.13	0.18	0.08	0.06	0.08	0.08	0.10	0.12	0.11					
HOURLY AVG	0.01	0.01	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	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01					

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

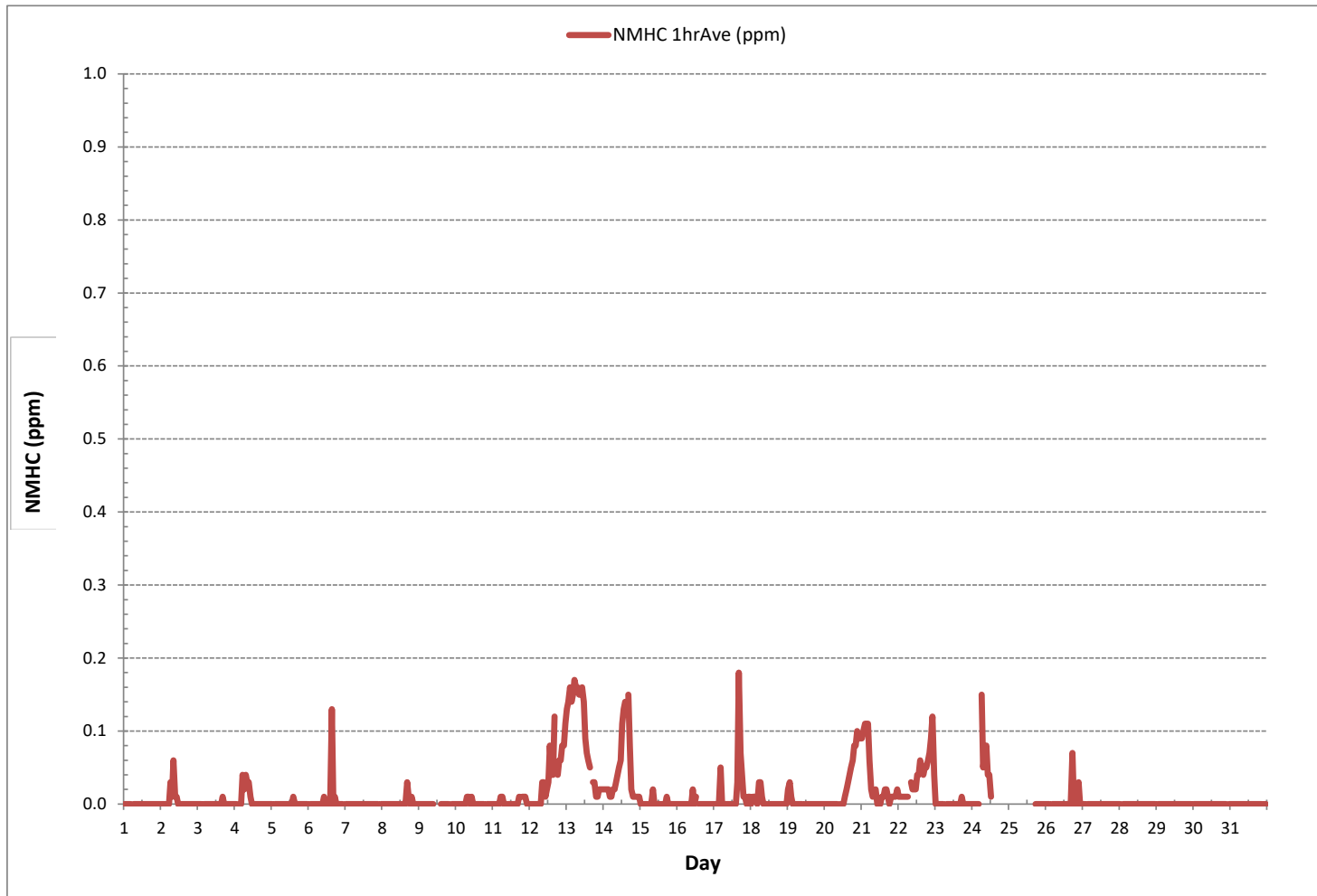
24 HR AVERAGES January 2019



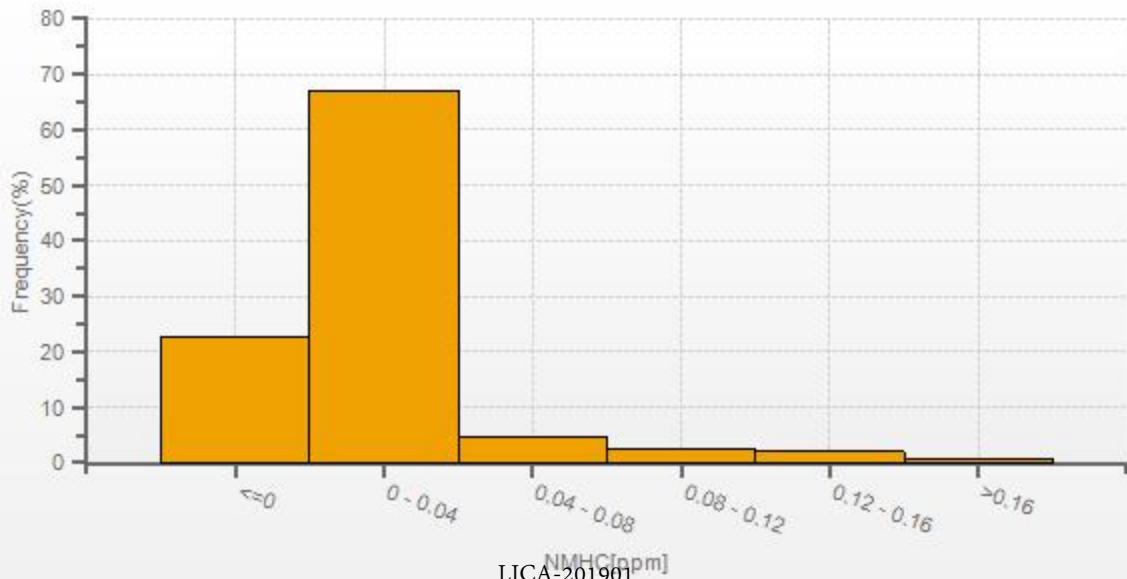
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	174			
MINIMUM 1-HR AVERAGE:	0.00 ppm @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	0.18 ppm @ HOUR	16	ON DAY	17
MAXIMUM 24-HR AVERAGE:	0.10 ppm		ON DAY	13
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	716 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	96.2 %	
STANDARD DEVIATION:	0.03	MONTHLY AVERAGE:	0.01 ppm	

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



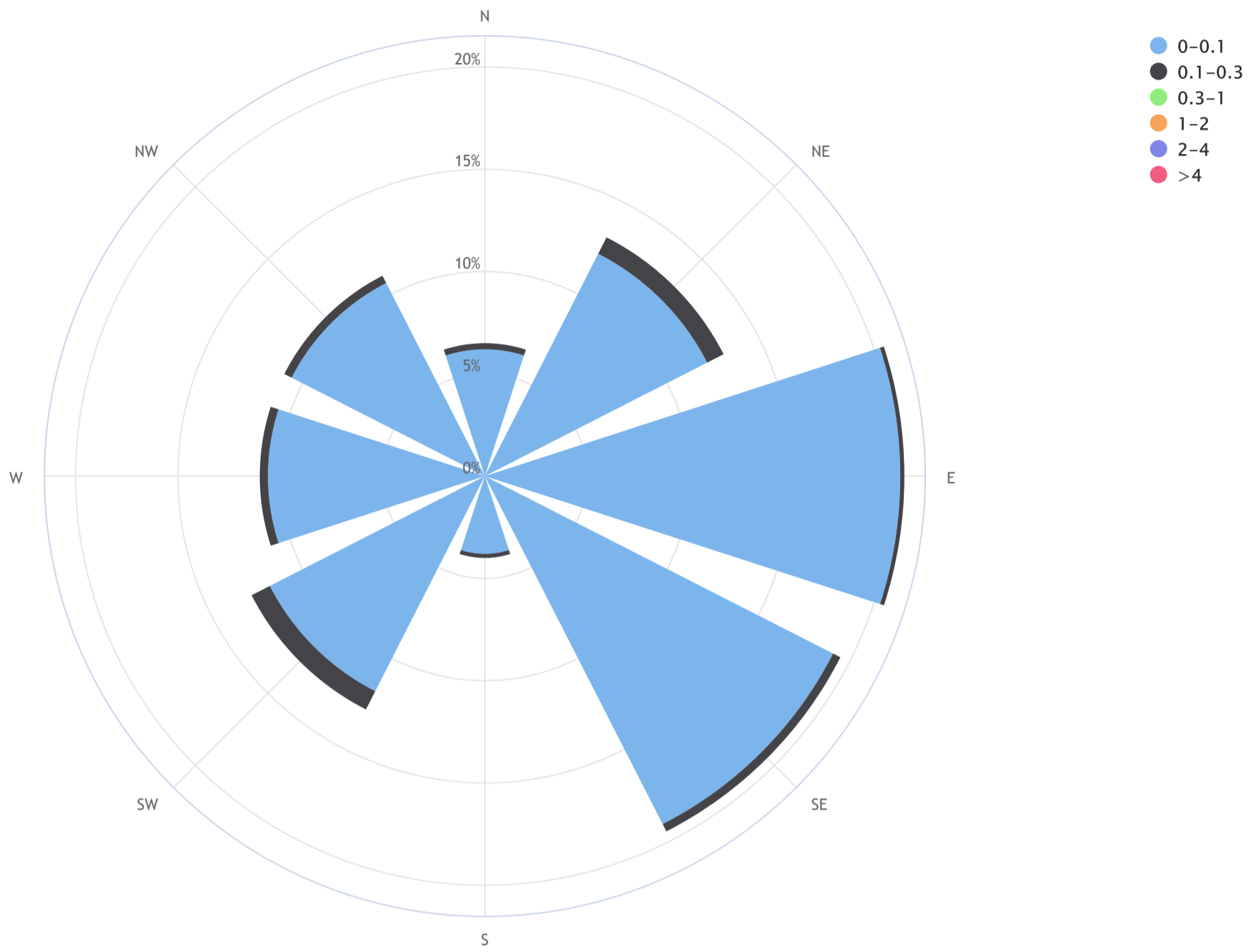
NMHC[ppm] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.



LICA-201901

Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_NMHC (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.0\_CALM % = 1.6%



Direction	0-0.1	0.1-0.3	0.3-1	1-2	2-4	>4	TOTAL
N	6.2	0.3	0.0	0.0	0.0	0.0	6.5
NE	12.2	0.9	0.0	0.0	0.0	0.0	13.1
E	20.3	0.2	0.0	0.0	0.0	0.0	20.4
SE	19.1	0.4	0.0	0.0	0.0	0.0	19.6
S	3.8	0.2	0.0	0.0	0.0	0.0	4.0
SW	11.8	1.0	0.0	0.0	0.0	0.0	12.8
W	10.6	0.4	0.0	0.0	0.0	0.0	11.0
NW	10.6	0.4	0.0	0.0	0.0	0.0	11.0
Summary	94.6	3.8	0.0	0.0	0.0	0.0	98.4
CALM	1.5	0.2	0.0	0.0	0.0	0.0	1.6

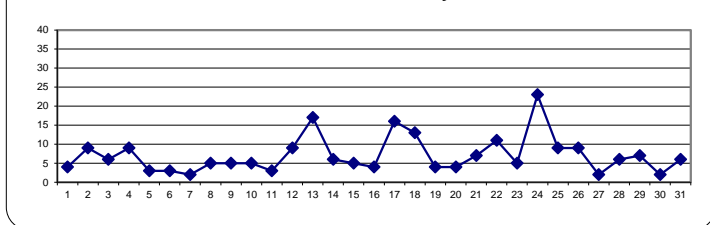
**OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)**

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	5	5	5	5	S	3	3	3	5	6	7	5	2	2	2	2	2	3	5	4	4	4	4	2	7	4	24	
2	4	3	4	4	S	5	13	24	40	27	19	9	7	6	5	6	5	6	5	5	6	5	4	6	3	40	9	24	
3	3	3	5	S	5	3	3	4	5	5	5	5	3	3	4	3	8	6	7	14	13	11	10	7	3	14	6	24	
4	7	10	S	8	10	18	15	25	25	20	16	10	7	4	5	5	4	4	3	3	3	2	3	2	2	25	9	24	
5	2	S	2	2	3	4	4	2	3	3	2	1	2	2	3	3	3	3	2	2	3	3	2	2	2	4	3	24	
6	S	2	2	2	2	2	2	3	3	3	4	4	4	4	4	4	3	3	4	2	1	1	2	S	1	4	3	24	
7	4	6	3	3	7	6	6	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	7	2	24	
8	1	1	1	1	1	1	S1	S1	5	6	C	C	C	C	C	C	C	C	6	6	6	S	12	18	1	18	5	22	
9	13	9	6	4	6	5	10	10	7	6	5	4	5	4	4	4	4	4	3	3	S	3	3	3	3	13	5	24	
10	4	3	3	3	3	7	16	21	14	5	4	4	2	2	3	3	3	3	5	7	S	3	2	1	2	1	21	5	24
11	1	1	1	2	2	5	8	9	5	4	3	3	3	3	3	3	3	3	S	3	3	3	3	3	3	1	9	3	24
12	3	3	2	2	2	4	5	4	12	15	5	8	8	8	9	9	13	S	14	15	12	15	14	16	2	16	9	24	
13	18	23	26	21	21	29	24	30	30	31	33	25	13	10	9	8	S	6	6	4	5	5	4	4	4	33	17	24	
14	4	3	2	2	2	2	2	3	5	4	6	9	14	16	17	S	20	12	5	3	3	3	6	5	2	20	6	24	
15	4	3	2	1	2	3	4	7	8	8	3	2	1	3	S	4	6	10	9	7	5	5	4	2	1	10	5	24	
16	3	5	3	4	3	4	6	10	6	4	3	3	S	3	3	3	4	5	3	2	1	1	2	1	2	10	4	24	
17	4	4	5	2	2	3	4	10	21	32	29	25	S	7	5	9	20	25	31	27	23	25	26	32	2	32	16	24	
18	28	28	27	23	14	17	33	24	17	5	5	S	6	6	5	7	5	6	5	7	8	9	7	8	5	33	13	24	
19	8	7	7	4	5	5	4	4	5	4	S	4	3	4	3	3	4	3	2	3	3	2	2	1	1	8	4	24	
20	1	1	1	1	1	1	1	2	6	S	2	3	3	3	4	4	5	5	7	8	17	8	7	1	17	4	24		
21	8	10	12	11	13	9	6	8	S	13	3	2	2	3	4	6	7	6	5	5	5	5	5	7	2	13	7	24	
22	9	6	5	4	3	3	4	S	5	5	7	8	9	12	14	15	15	16	21	18	18	20	25	11	3	25	11	24	
23	2	2	2	1	2	4	S	2	1	2	2	2	3	3	3	2	2	10	8	8	8	15	14	13	1	15	5	24	
24	12	9	7	12	10	S	26	35	31	52	33	25	19	15	15	16	15	23	23	34	32	34	40	8	7	52	23	24	
25	5	6	5	5	S	5	5	7	13	6	9	12	8	12	13	11	9	8	12	17	19	8	6	5	5	19	9	24	
26	7	4	5	S	4	4	5	5	8	3	4	4	5	18	23	16	15	40	11	4	5	5	4	4	3	40	9	24	
27	5	4	S	2	2	2	2	1	2	2	2	2	2	2	2	1	2	2	1	1	1	1	1	2	1	5	2	24	
28	2	S	3	3	4	2	4	3	9	9	3	3	2	1	43	22	2	3	2	3	5	2	3	3	1	43	6	24	
29	S	5	7	8	8	8	9	15	26	17	4	6	6	4	3	5	6	5	4	4	3	2	3	S	2	26	7	24	
30	2	2	2	2	2	3	2	2	2	2	2	2	3	3	2	3	3	2	3	3	3	3	S	4	2	4	2	24	
31	4	4	4	4	7	4	5	16	12	6	10	6	6	6	6	5	5	5	3	4	3	S	3	3	3	16	6	24	
HOURLY MAX	28	28	27	23	21	29	33	35	40	52	33	25	19	18	43	22	20	40	31	34	32	34	40	32	3				
HOURLY AVG	6	6	5	5	5	6	8	10	11	10	8	7	5	6	7	6	7	8	7	7	7	7	8	6	6	6	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

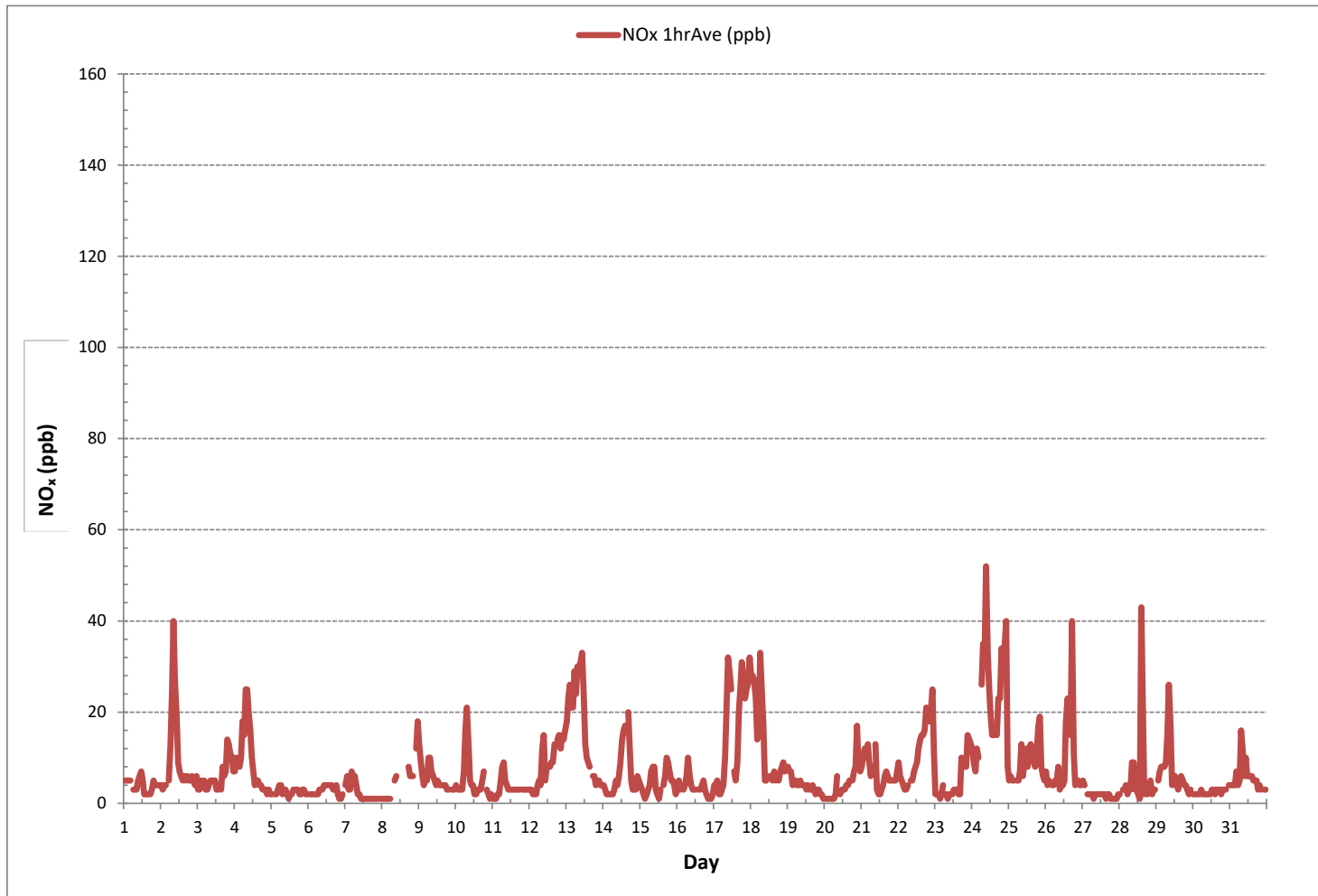
**24 HR AVERAGES January 2019**



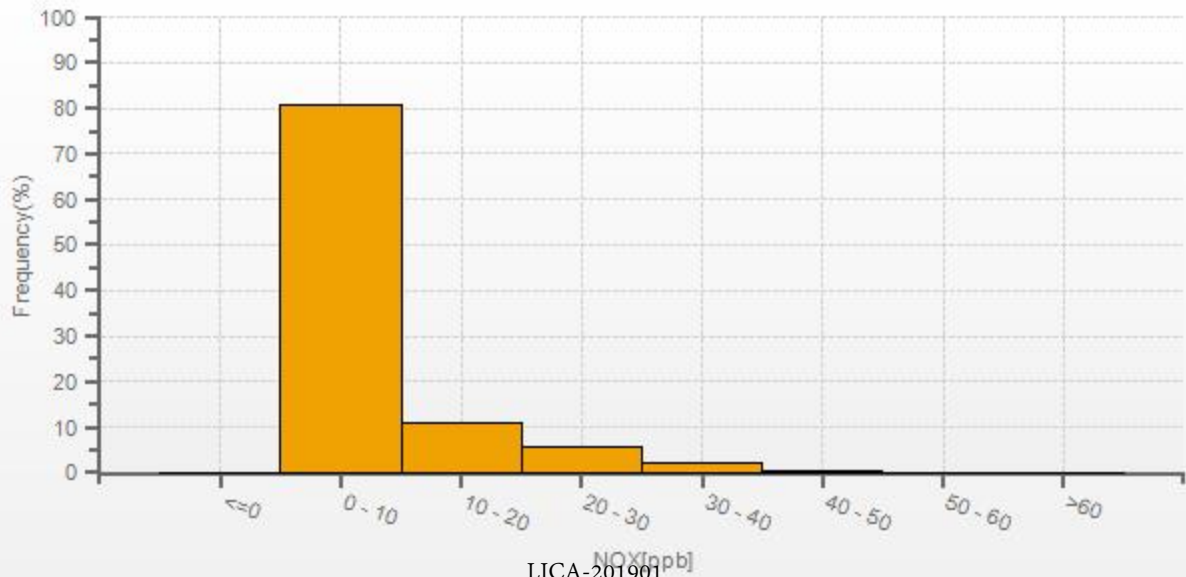
**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	702		
MINIMUM 1-HR AVERAGE:	1 ppb @ HOUR	11	ON DAY 5
MAXIMUM 1-HR AVERAGE:	52 ppb @ HOUR	9	ON DAY 24
MAXIMUM 24-HR AVERAGE:	23 ppb		ON DAY 24
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	742 hrs
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	99.7 %
STANDARD DEVIATION:	7	MONTHLY AVERAGE:	7 ppb

OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)



# NOX[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.

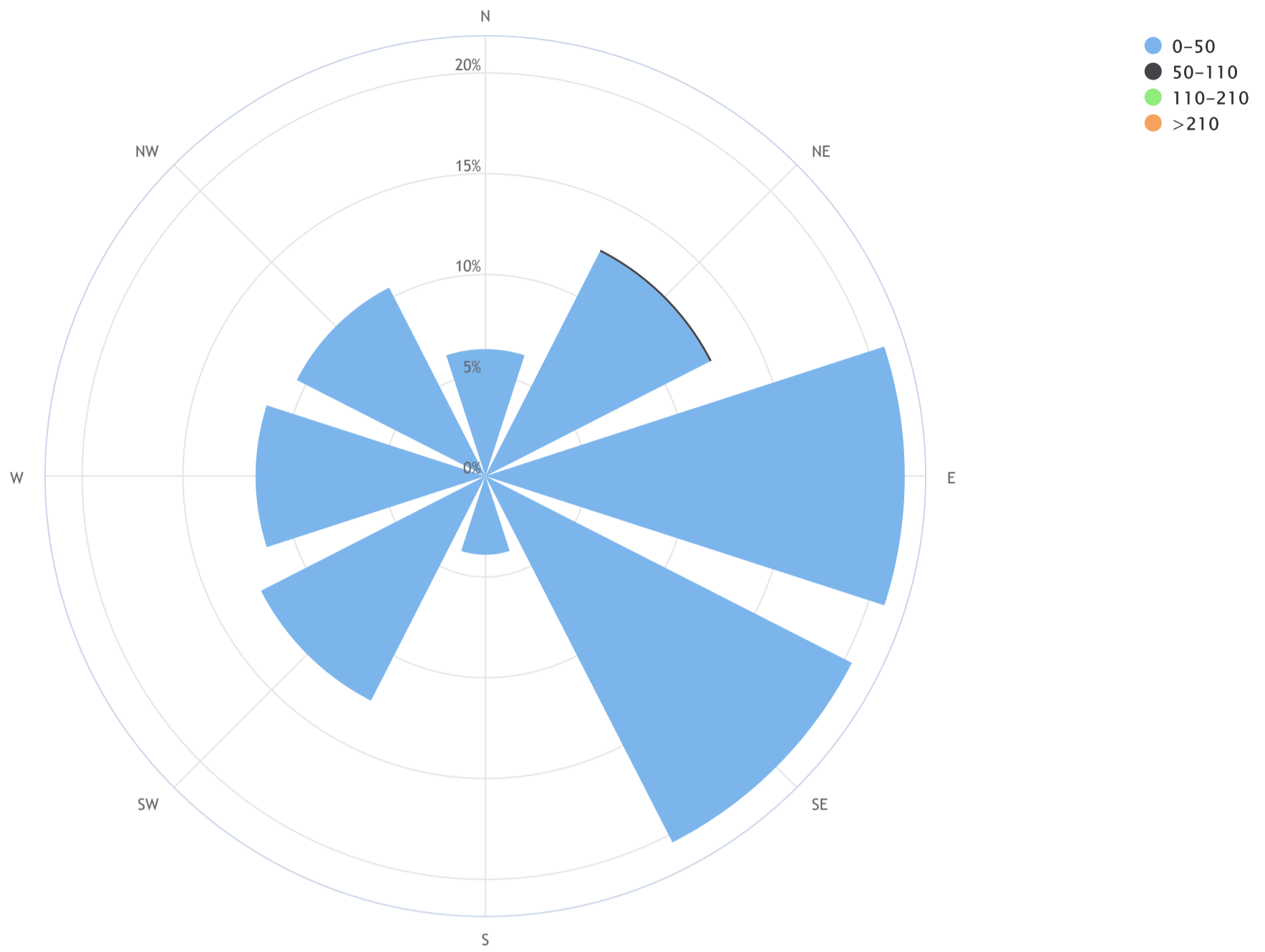


LICA-201901



Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_NO<sub>x</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 14.0\_CALM % = 1.6%



Direction	0-50	50-110	110-210	>210	TOTAL
N	6.3	0.0	0.0	0.0	6.3
NE	12.5	0.1	0.0	0.0	12.7
E	20.8	0.0	0.0	0.0	20.8
SE	20.4	0.0	0.0	0.0	20.4
S	3.9	0.0	0.0	0.0	3.9
SW	12.5	0.0	0.0	0.0	12.5
W	11.4	0.0	0.0	0.0	11.4
NW	10.5	0.0	0.0	0.0	10.5
Summary	98.3	0.1	0.0	0.0	98.5
CALM	1.6	0.0	0.0	0.0	1.6

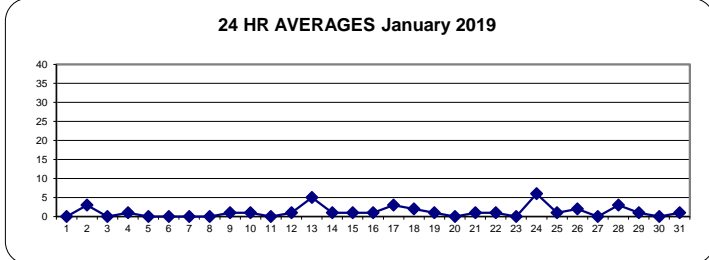
**NITRIC OXIDE Hourly Averages (NO ppb)**

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	S	0	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
2	0	0	0	0	0	S	0	1	10	19	14	9	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	19	3	24	
3	0	0	0	S	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
4	0	0	S	0	0	2	1	3	4	4	4	2	1	1	1	1	0	0	0	0	0	0	1	1	0	0	0	4	1	24		
5	0	S	0	0	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
6	S	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	0	0	0	0	S	0	0	1	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	S	0	0	0	0	0	24		
8	0	0	0	0	0	0	S1	S1	0	1	C	C	C	C	C	C	C	0	0	0	0	0	S	0	1	0	0	1	0	22		
9	1	1	0	0	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	0	S	0	0	0	0	0	0	2	1	24		
10	1	0	0	0	0	1	1	2	2	1	1	1	1	0	0	0	0	0	0	1	S	0	0	0	0	0	0	2	1	24		
11	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24		
12	0	0	0	0	0	0	0	0	2	4	1	3	3	3	2	2	1	S	1	2	1	1	0	0	0	0	0	4	1	24		
13	1	4	7	3	4	11	8	12	11	14	16	11	4	3	2	1	S	1	1	0	1	1	0	0	0	0	0	16	5	24		
14	0	0	0	0	0	0	0	0	0	0	1	2	4	6	5	S	1	0	0	0	0	0	0	0	0	0	0	6	1	24		
15	0	0	0	0	0	1	1	1	1	2	1	1	0	1	S	1	1	1	1	0	1	1	0	0	0	0	0	2	1	24		
16	0	1	0	1	0	1	1	3	1	1	1	1	1	S	1	1	1	1	1	1	0	0	0	1	0	0	0	3	1	24		
17	1	1	1	0	0	0	0	1	4	14	14	12	S	2	2	3	2	4	3	1	2	2	5	0	0	0	0	14	3	24		
18	3	3	3	2	0	2	6	3	2	1	1	S	2	2	1	2	1	1	1	1	1	1	0	0	0	0	0	6	2	24		
19	1	1	1	0	0	1	0	0	1	1	S	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	24		
20	0	0	0	0	0	0	0	0	1	S	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
21	0	0	0	0	0	0	0	0	S	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	1	24		
22	1	0	0	0	0	0	0	S	0	1	2	3	3	4	3	2	1	0	1	0	1	0	0	0	0	0	0	4	1	24		
23	0	0	0	0	0	1	S	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	24		
24	1	0	0	0	1	S	4	11	9	26	14	10	8	6	5	3	1	3	3	7	7	9	14	0	0	0	0	26	6	24		
25	0	0	0	0	S	0	0	0	1	1	3	4	3	5	4	2	1	0	1	2	1	0	0	0	0	0	0	5	1	24		
26	0	0	0	0	S	0	0	0	1	0	0	1	1	2	8	9	4	1	11	1	0	0	0	0	0	0	0	11	2	24		
27	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	24		
28	0	S	0	0	0	0	0	0	1	2	1	1	1	0	40	16	0	0	0	0	0	0	0	0	0	0	0	40	3	24		
29	S	0	0	0	0	0	0	1	6	6	1	2	2	1	1	1	1	1	0	0	0	0	0	S	0	0	0	6	1	24		
30	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	0	1	0	24		
31	0	0	0	0	0	0	0	1	1	1	2	2	2	2	1	1	1	1	0	1	1	S	0	0	0	0	0	2	1	24		
HOURLY MAX	3	4	7	3	4	11	8	12	19	26	16	12	8	8	40	16	3	11	4	7	7	9	14	5								
HOURLY AVG	0	0	0	0	0	1	1	2	2	3	3	2	2	2	3	2	1	1	1	1	1	1	1	0								

**STATUS FLAG CODES**

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

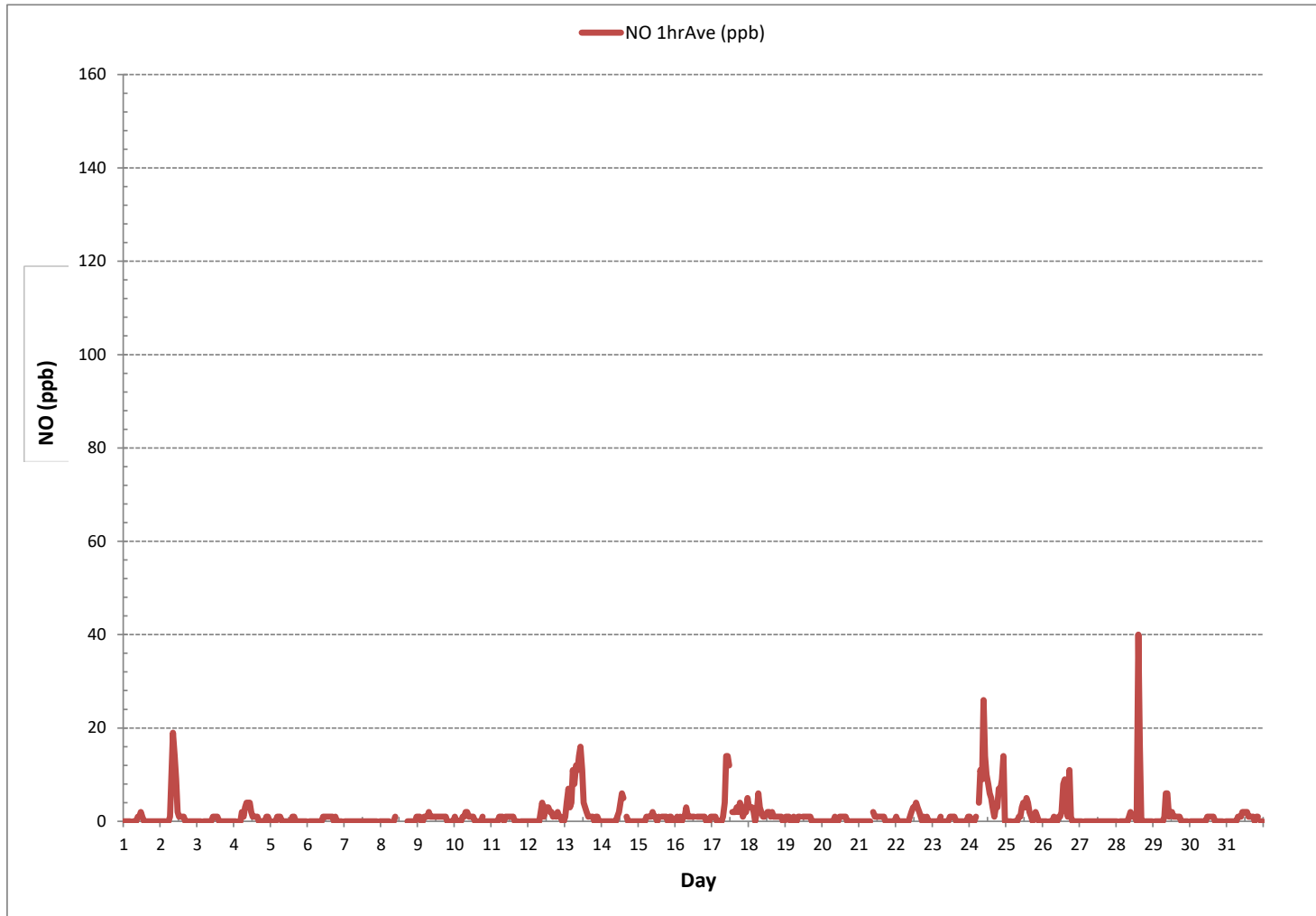
**24 HR AVERAGES January 2019**



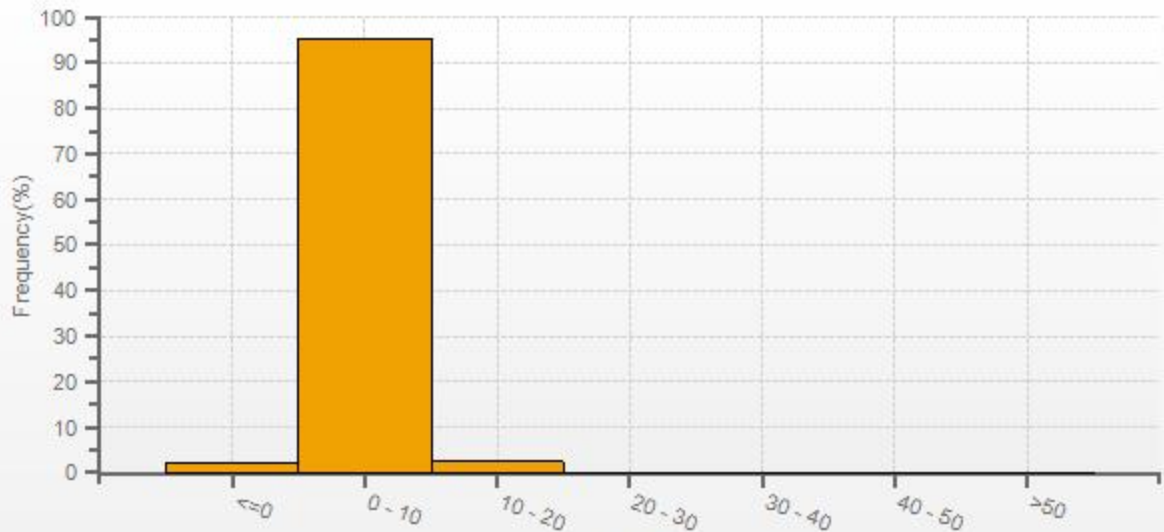
**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	311			
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	40 ppb @ HOUR	14	ON DAY	28
MAXIMUM 24-HR AVERAGE:	6 ppb		ON DAY	24
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	742 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	99.7 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	1 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)



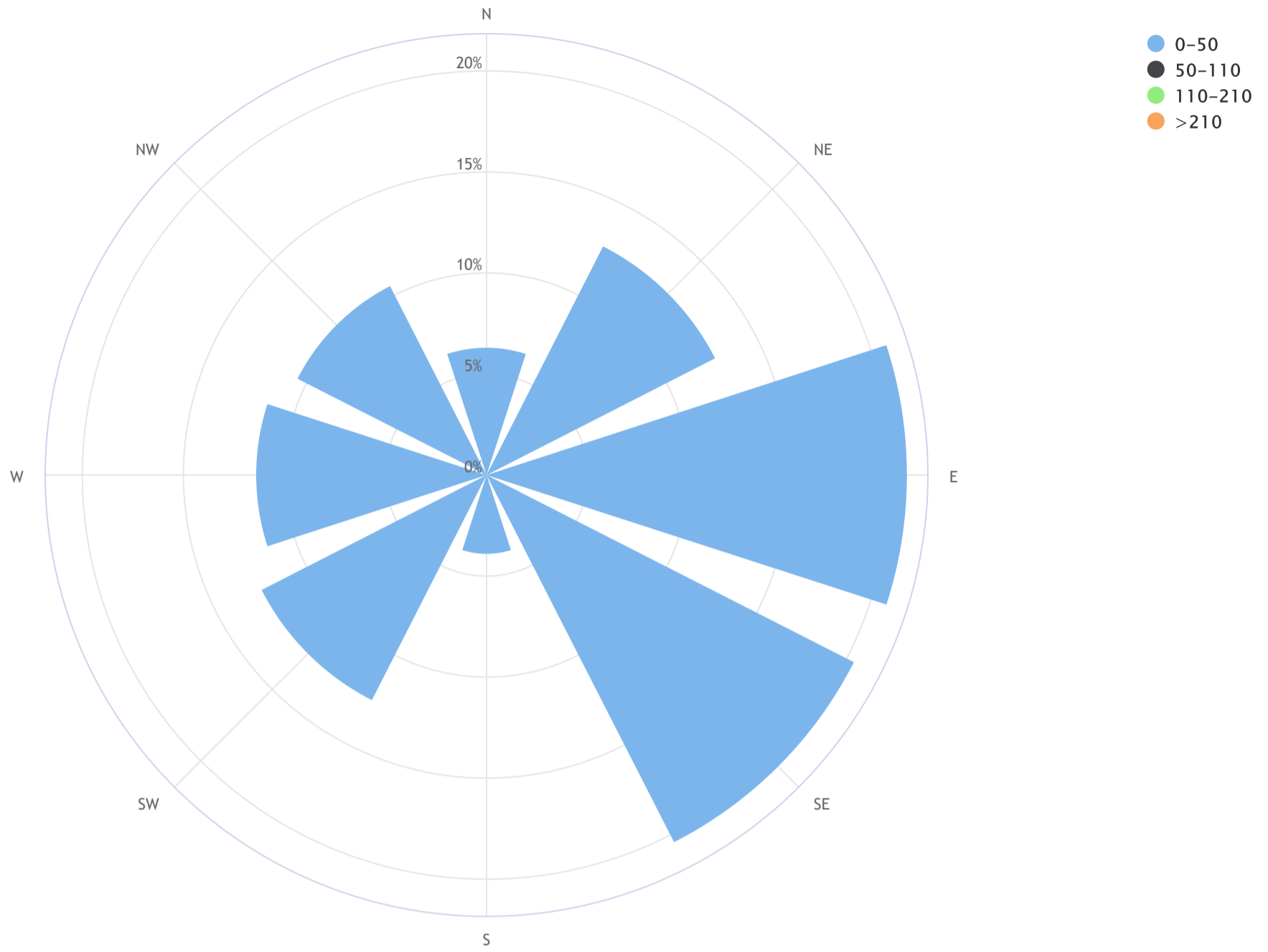
NO[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.



LICA-201901

Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_NO (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 1.9\_CALM % = 1.6%



Direction	0-50	50-110	110-210	>210	TOTAL
N	6.3	0.0	0.0	0.0	6.3
NE	12.7	0.0	0.0	0.0	12.7
E	20.8	0.0	0.0	0.0	20.8
SE	20.4	0.0	0.0	0.0	20.4
S	3.9	0.0	0.0	0.0	3.9
SW	12.5	0.0	0.0	0.0	12.5
W	11.4	0.0	0.0	0.0	11.4
NW	10.5	0.0	0.0	0.0	10.5
Summary	98.5	0.0	0.0	0.0	98.5
CALM	1.6	0.0	0.0	0.0	1.6

**NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> 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	5	5	5	4	S	3	3	3	4	5	5	4	2	2	2	2	3	5	4	3	4	4	2	5	4	2	5	4	24
2	3	3	3	4	S	5	12	14	20	13	10	7	5	5	4	5	5	5	5	4	5	4	4	5	3	20	7	24		
3	3	2	5	S	5	3	3	4	5	5	4	4	3	3	3	3	8	5	7	14	13	11	10	7	2	14	6	24		
4	7	10	S	8	10	16	14	23	21	16	12	8	5	3	4	4	4	3	3	3	3	2	2	1	1	23	8	24		
5	1	S	2	2	2	3	3	2	2	3	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	24	
6	S	2	2	2	2	2	2	2	2	3	4	3	3	3	3	4	3	3	3	2	1	1	2	S	1	4	2	24		
7	4	6	3	3	7	6	6	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	7	2	24		
8	1	1	1	1	1	1	S1	S1	5	5	C	C	C	C	C	C	C	7	6	6	6	S	12	17	1	17	5	22		
9	12	9	5	3	5	5	9	8	6	5	4	3	4	3	3	3	3	3	3	2	S	3	2	2	2	12	5	24		
10	3	3	3	2	2	6	15	20	13	4	3	2	2	1	2	3	2	5	6	S	2	2	1	1	1	20	5	24		
11	1	1	1	2	2	4	7	9	5	4	2	2	2	2	2	3	3	3	S	3	3	3	3	3	3	1	9	3	24	
12	3	2	2	2	2	4	5	4	10	11	4	5	5	5	6	8	12	S	13	14	11	15	13	16	2	16	7	24		
13	17	19	20	18	16	18	16	18	18	17	16	14	9	7	7	6	S	5	5	4	4	4	4	4	4	4	20	11	24	
14	3	3	2	2	2	2	2	3	4	4	5	7	10	10	12	S	19	12	5	3	3	3	6	5	2	19	5	24		
15	4	3	2	1	2	2	3	6	7	6	2	2	1	2	S	3	5	8	8	7	5	4	3	2	1	8	4	24		
16	2	4	3	3	3	3	5	7	5	3	2	2	S	2	2	2	3	4	2	2	1	1	1	1	1	7	3	24		
17	3	4	4	2	2	3	4	9	17	18	15	14	S	4	4	7	17	23	27	25	23	23	23	27	2	27	13	24		
18	25	25	23	21	14	16	26	21	15	4	4	S	5	4	4	5	4	5	5	6	8	8	7	7	4	26	11	24		
19	8	7	6	4	5	4	4	3	4	3	S	3	2	3	2	2	3	2	2	3	2	2	2	1	1	8	3	24		
20	1	1	1	1	1	1	1	2	5	S	2	2	2	3	3	4	5	5	6	8	16	8	7	1	16	4	24			
21	8	10	12	11	12	8	6	8	S	11	3	2	1	2	3	5	6	5	5	4	5	5	4	6	1	12	6	24		
22	8	6	4	3	3	3	4	S	5	4	5	6	6	8	10	13	14	16	20	18	18	20	24	10	3	24	10	24		
23	2	2	1	1	2	3	S	2	1	2	2	1	2	2	2	2	10	8	8	8	15	14	13	1	15	5	24			
24	11	9	7	12	9	S	22	24	22	26	19	15	12	9	10	13	13	20	21	27	26	26	26	8	7	27	17	24		
25	5	5	5	S	5	5	5	6	12	5	6	8	5	7	9	9	8	11	15	18	8	6	5	5	18	8	24			
26	6	4	5	S	3	4	4	5	7	2	3	3	10	14	12	14	29	10	4	5	3	4	2	2	29	7	24			
27	4	4	S	2	2	2	2	1	2	2	1	1	2	1	1	1	2	2	1	1	1	1	1	2	1	4	2	24		
28	2	S	3	3	3	2	4	3	8	8	2	2	1	1	3	6	2	3	2	3	4	2	3	3	1	8	3	24		
29	S	5	7	8	8	8	9	14	20	12	3	4	4	3	3	4	5	5	4	4	3	2	2	S	2	20	6	24		
30	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	3	3	2	3	3	3	3	S	4	1	4	2	24	
31	4	4	4	4	6	3	5	15	11	5	8	5	5	5	5	4	4	4	3	3	3	S	3	2	2	15	5	24		
HOURLY MAX	25	25	23	21	16	18	26	24	22	26	19	15	12	10	14	13	19	29	27	27	26	26	27							
HOURLY AVG	5	6	5	5	5	5	7	8	9	7	5	5	4	4	4	5	6	7	7	7	7	7	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

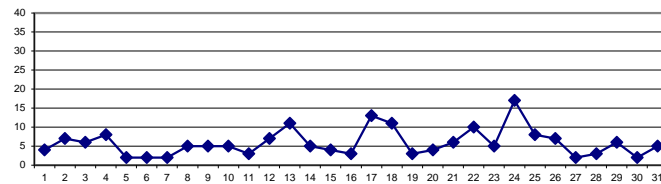
**OBJECTIVE LIMIT:**

**ALBERTA ENVIRONMENT:** 1-HR 159 ppb

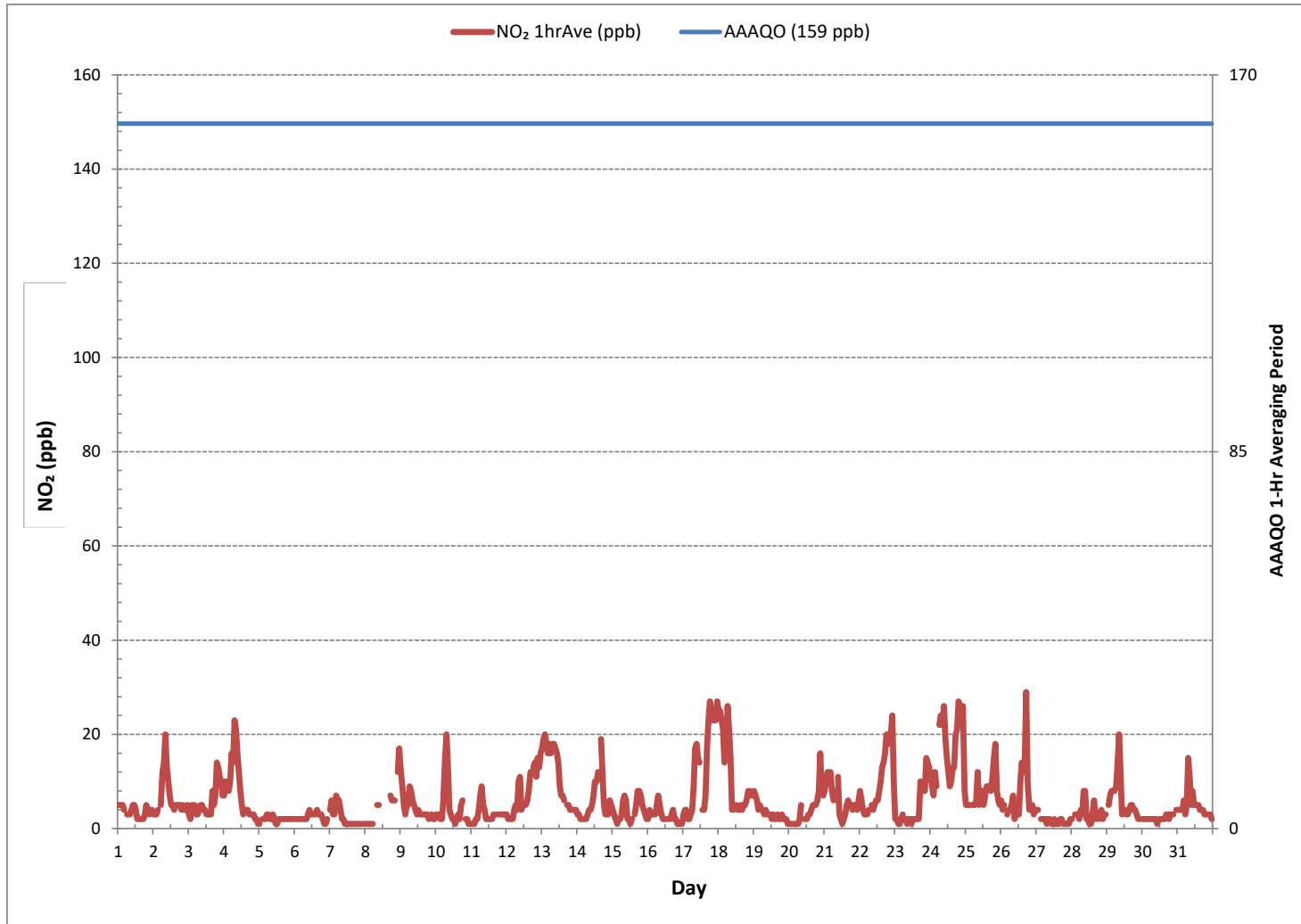
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	702			
MINIMUM 1-HR AVERAGE:	1 ppb	@ HOUR	23	ON DAY 4
MAXIMUM 1-HR AVERAGE:	29 ppb	@ HOUR	17	ON DAY 26
MAXIMUM 24-HR AVERAGE:	17 ppb			ON DAY 24
I2S CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	742 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	99.7 %	
STANDARD DEVIATION:	6	MONTHLY AVERAGE:	6 ppb	

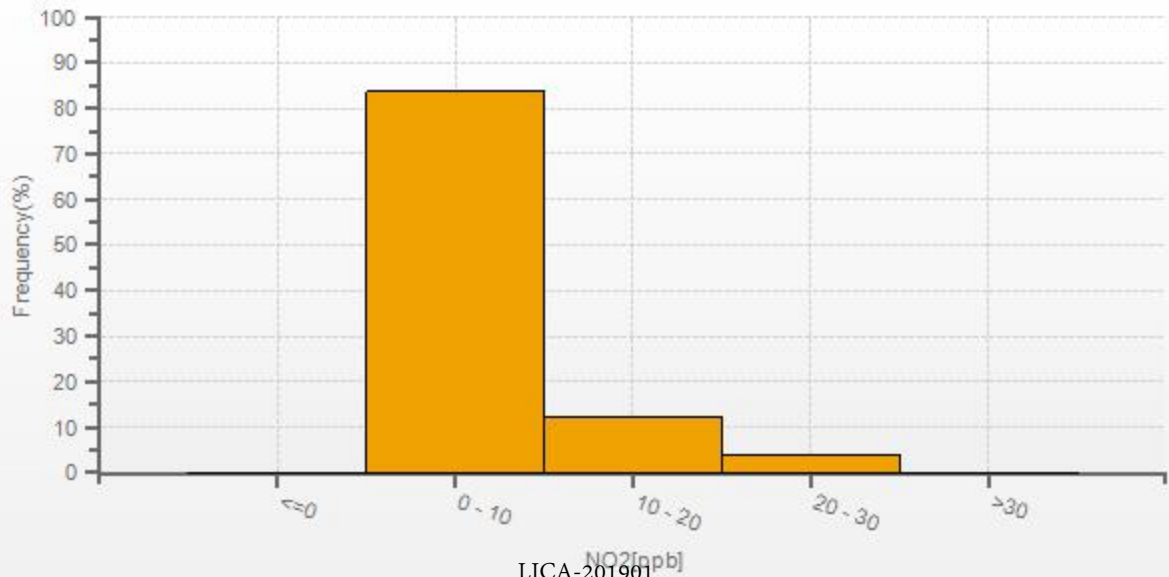
**24 HR AVERAGES January 2019**



NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)



# NO2[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.

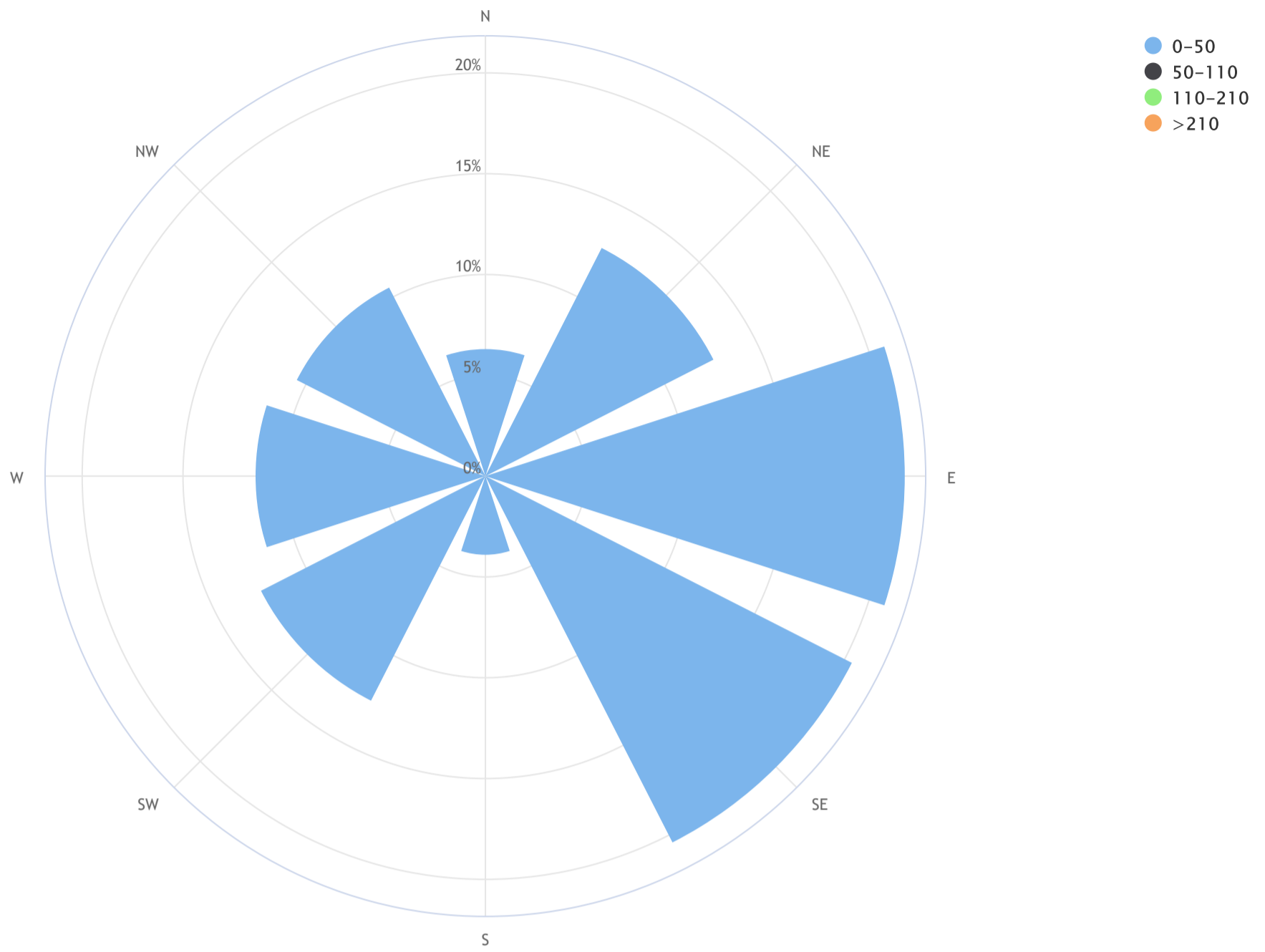


LICA-201901



Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_NO<sub>2</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 12.0\_CALM % = 1.6%



Direction	0-50	50-110	110-210	>210	TOTAL
N	6.3	0.0	0.0	0.0	6.3
NE	12.7	0.0	0.0	0.0	12.7
E	20.8	0.0	0.0	0.0	20.8
SE	20.4	0.0	0.0	0.0	20.4
S	3.9	0.0	0.0	0.0	3.9
SW	12.5	0.0	0.0	0.0	12.5
W	11.4	0.0	0.0	0.0	11.4
NW	10.5	0.0	0.0	0.0	10.5
Summary	98.5	0.0	0.0	0.0	98.5
CALM	1.6	0.0	0.0	0.0	1.6

**OZONE Hourly Averages (O<sub>3</sub> 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	21.1	20.5	20.7	21.2	22.5	S	24.2	23.8	23.6	24.9	28.4	29.3	32.9	37.8	37.6	37.1	36.7	36.3	34.8	32.5	33.9	34.3	33.1	32.9	20.5	37.8	29.6	24
2	30.1	29.9	28.4	20.4	S	20.0	11.5	7.2	0.9	3.1	7.9	27.7	33.0	34.2	35.7	34.7	33.3	32.2	29.5	27.1	30.3	32.9	33.6	31.0	0.9	35.7	25.0	24
3	34.7	33.7	32.9	S	32.9	33.9	33.4	32.5	31.3	31.9	33.2	34.8	36.9	38.0	38.0	38.2	30.5	33.0	32.0	23.7	22.5	22.6	19.5	25.6	19.5	38.2	31.6	24
4	23.3	17.3	S	19.6	11.6	6.7	7.9	4.3	4.0	9.5	15.4	22.5	26.0	30.5	30.3	29.2	30.4	30.7	31.5	34.1	34.4	34.7	34.8	35.9	4.0	35.9	22.8	24
5	36.0	S	36.3	36.4	35.7	34.4	34.6	35.4	35.3	34.9	35.3	36.1	36.5	36.0	34.7	34.1	34.0	33.8	34.2	34.0	33.5	33.1	33.7	34.1	33.1	36.5	34.9	24
6	S	34.3	34.3	34.8	34.8	35.0	34.8	34.3	34.0	33.3	31.8	31.1	30.4	30.5	30.6	29.1	29.6	29.4	28.4	28.2	28.6	28.3	27.2	S	27.2	35.0	31.5	24
7	27.6	25.2	26.7	25.6	21.9	22.8	22.6	25.4	28.3	30.3	33.0	33.2	34.3	33.2	33.2	33.8	34.5	34.9	34.7	35.0	35.2	35.3	S	34.7	21.9	35.3	30.5	24
8	35.2	35.6	36.6	36.9	37.1	37.2	37.0	35.9	32.7	31.8	31.4	32.8	33.4	33.2	33.8	33.4	27.0	27.2	25.0	22.6	22.4	S	14.8	11.0	11.0	37.2	30.6	24
9	20.8	25.9	29.4	31.8	30.2	30.8	27.0	27.6	29.2	30.5	C	C	C	C	C	33.0	33.1	33.8	34.0	34.9	S	34.2	34.2	34.1	20.8	34.9	30.8	24
10	33.8	34.3	34.7	35.6	34.9	31.0	22.0	16.9	24.5	32.8	34.0	34.1	34.8	35.4	34.5	34.3	33.9	30.6	27.7	S	32.4	33.1	33.6	32.9	16.9	35.6	31.8	24
11	32.9	32.7	31.8	30.9	29.4	26.7	24.9	23.8	27.5	29.0	30.9	32.0	32.6	32.5	32.7	32.5	32.3	31.6	S	30.7	30.6	29.8	29.7	29.6	23.8	32.9	30.3	24
12	29.0	28.8	27.8	26.5	25.0	24.5	23.2	20.4	15.9	13.6	23.2	22.5	22.9	22.5	21.4	19.6	14.3	S	11.3	10.2	12.9	9.0	9.3	7.7	7.7	29.0	19.2	24
13	5.3	2.2	0.7	0.7	0.6	0.4	0.4	0.7	0.9	3.9	6.0	9.1	13.5	14.4	15.4	18.5	S	15.4	17.1	18.2	17.3	17.9	19.2	20.9	0.4	20.9	9.5	24
14	21.5	20.9	20.7	20.3	19.5	19.2	18.4	17.3	21.8	24.0	24.6	23.1	19.3	20.4	20.7	S	14.9	20.8	26.7	27.7	29.8	28.1	17.8	20.6	14.9	29.8	21.6	24
15	22.2	23.9	27.4	29.7	30.4	31.5	31.1	28.4	25.7	27.7	32.2	33.2	33.9	32.5	S	32.8	30.6	28.1	27.8	27.0	31.7	31.6	32.6	33.5	22.2	33.9	29.8	24
16	33.0	31.2	31.2	29.7	29.8	29.4	28.0	26.7	28.9	31.2	32.2	33.0	33.1	S	31.3	31.0	30.5	30.4	32.6	32.9	33.2	36.6	35.5	34.3	26.7	36.6	31.6	24
17	32.5	32.9	32.8	32.5	29.1	26.9	24.9	19.6	10.4	10.5	17.8	24.5	S	34.2	35.4	32.7	22.0	13.6	9.3	11.5	7.7	6.2	6.1	4.4	4.4	35.4	20.8	24
18	4.2	2.6	3.5	5.0	12.0	11.2	3.8	8.4	19.1	35.8	35.8	S	34.4	34.1	34.1	33.1	33.9	33.7	34.3	33.2	30.5	29.8	28.0	29.0	2.6	35.8	23.0	24
19	28.5	31.7	31.3	31.1	31.4	34.2	34.4	34.3	33.4	34.3	S	35.7	36.9	36.6	36.5	37.3	37.6	39.1	39.5	38.4	38.3	38.2	38.1	38.8	28.5	39.5	35.5	24
20	38.9	38.7	38.6	38.7	38.2	37.5	37.1	36.5	33.0	S	35.6	35.3	34.7	33.8	33.1	32.3	31.0	29.8	28.4	26.6	22.0	13.0	21.9	24.1	13.0	38.9	32.1	24
21	22.2	19.1	16.9	16.1	13.8	19.0	22.5	20.4	S	14.4	24.5	26.1	26.2	26.0	26.7	24.9	22.5	23.5	23.3	24.0	23.1	22.2	22.4	20.8	13.8	26.7	21.8	24
22	19.0	21.1	22.7	23.5	24.3	24.2	22.8	S	21.8	21.5	21.2	22.4	24.3	25.1	23.8	21.7	19.2	15.7	9.6	10.8	12.3	10.1	4.6	15.7	4.6	25.1	19.0	24
23	23.0	24.4	29.5	32.4	33.1	31.7	S	35.9	36.5	36.0	37.2	38.0	37.8	36.8	36.8	37.1	36.2	26.4	24.0	22.0	21.2	15.3	13.6	13.7	13.6	38.0	29.5	24
24	13.8	15.3	16.1	11.8	13.9	S	3.8	1.1	4.6	6.4	11.8	19.0	19.8	22.0	21.7	19.9	18.1	9.3	6.4	1.8	1.1	0.8	2.2	22.5	0.8	22.5	11.4	24
25	26.5	25.7	25.7	23.3	S	24.4	24.1	22.3	17.8	23.3	22.9	21.5	22.8	21.4	21.8	23.8	24.5	25.6	21.1	14.6	10.1	20.3	25.4	25.8	10.1	26.5	22.4	24
26	24.6	27.9	26.6	S	24.2	23.8	24.2	22.1	20.0	23.6	23.2	23.3	24.7	19.8	17.6	19.1	19.2	2.2	23.6	29.5	28.0	23.6	27.3	30.2	2.2	30.2	22.9	24
27	29.1	30.8	S	35.8	34.5	29.4	33.7	41.3	38.5	36.9	38.1	37.5	37.6	38.8	39.0	39.0	38.7	40.5	42.4	42.3	43.0	43.4	41.4	38.8	29.1	43.4	37.8	24
28	39.0	S	39.1	39.3	38.9	40.1	38.4	39.2	34.1	34.2	39.8	40.8	41.5	42.6	36.4	39.2	41.3	39.8	40.1	39.0	37.7	39.4	35.6	33.2	33.2	42.6	38.6	24
29	S	27.1	25.6	23.6	22.7	22.6	20.1	S1	10.1	S1	35.7	C1	C1	37.0	36.3	35.4	34.6	35.0	36.2	36.9	37.9	38.0	37.8	S	10.1	38.0	30.7	20
30	38.9	39.1	38.9	39.0	38.9	39.0	39.1	39.8	40.2	40.3	40.0	38.8	37.9	38.0	38.4	38.1	37.3	36.7	36.8	36.3	35.8	35.2	S	33.8	33.8	40.3	38.1	24
31	33.1	32.5	32.1	31.6	29.6	31.1	29.6	20.5	23.2	27.3	26.1	30.1	29.0	28.5	27.1	27.8	26.7	26.6	29.7	30.3	30.2	S	28.7	29.5	20.5	33.1	28.7	24
HOURLY MAX	39.0	39.1	39.1	39.3	38.9	40.1	39.1	41.3	40.2	40.3	40.0	40.8	41.5	42.6	39.0	39.2	41.3	40.5	42.4	42.3	43.0	43.4	41.4	38.8				
HOURLY AVG	26.9	26.4	27.6	27.0	26.9	26.8	24.6	24.2	23.6	25.4	27.9	29.6	30.8	31.2	30.8	31.1	29.6	28.2	27.7	27.2	26.9	26.8	25.6	26.9				

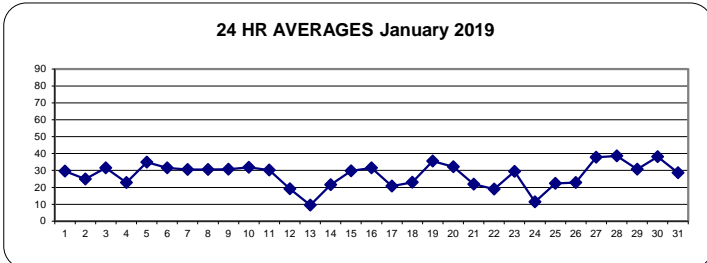
**STATUS FLAG CODES**

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

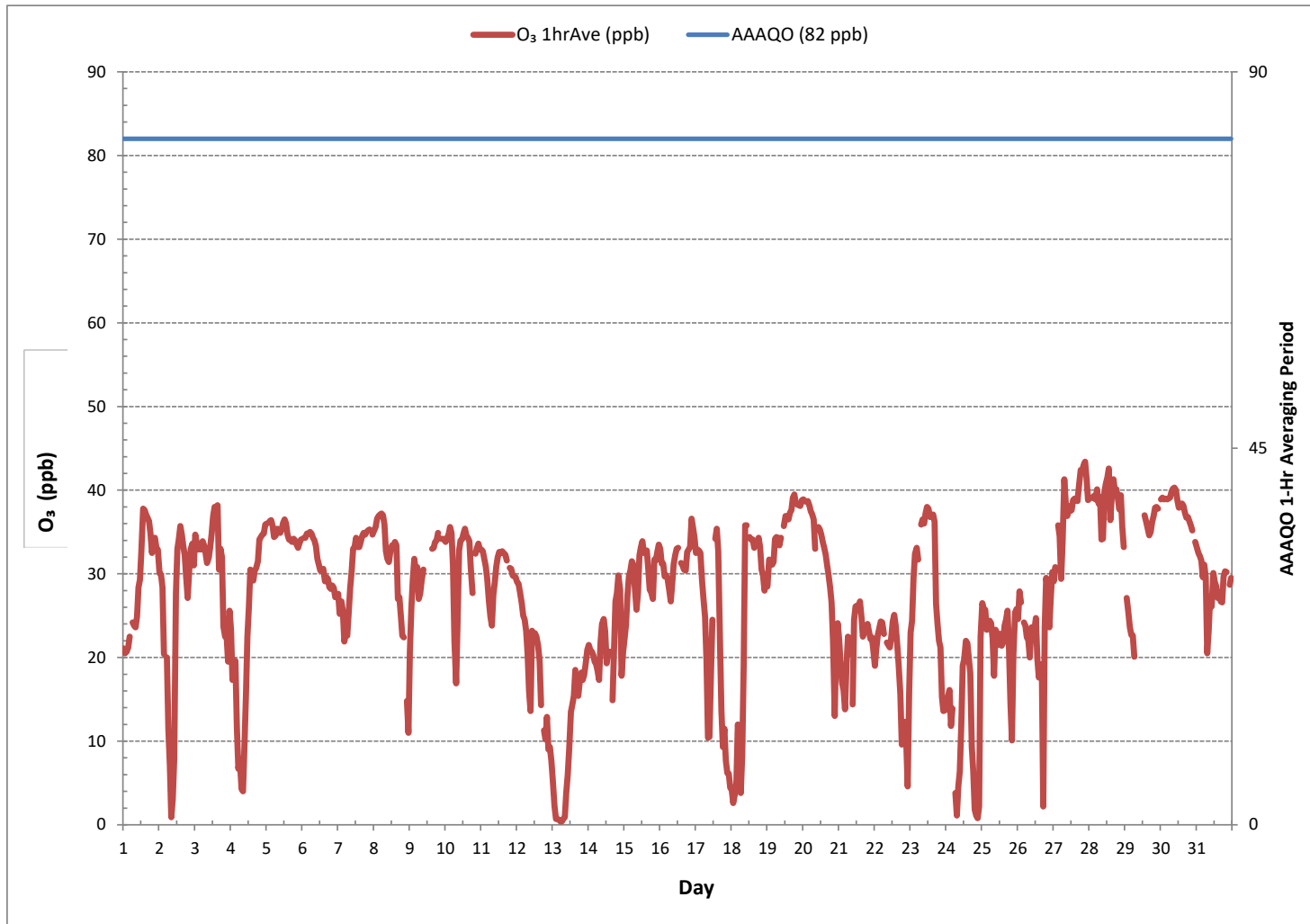
**24 HR AVERAGES January 2019**



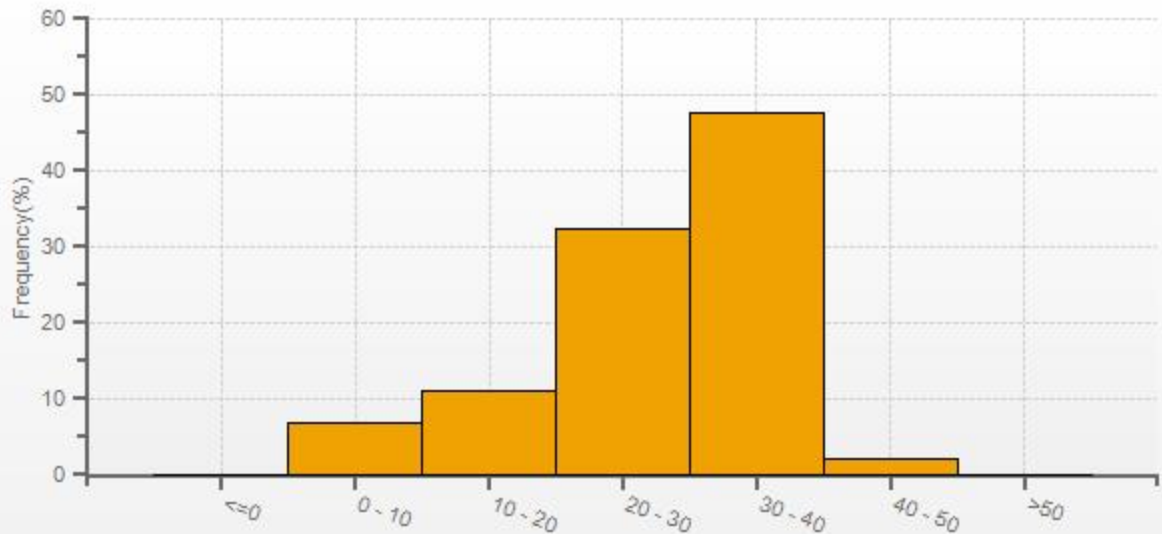
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	702			
MINIMUM 1-HR AVERAGE:	0.4 ppb	@ HOUR	5	ON DAY 13
MAXIMUM 1-HR AVERAGE:	43.4 ppb	@ HOUR	21	ON DAY 27
MAXIMUM 24-HR AVERAGE:	38.6 ppb			ON DAY 28
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	740 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.5 %	
STANDARD DEVIATION:	9.4	MONTHLY AVERAGE:	27.5 ppb	

OZONE Hourly Averages (O<sub>3</sub> ppb)



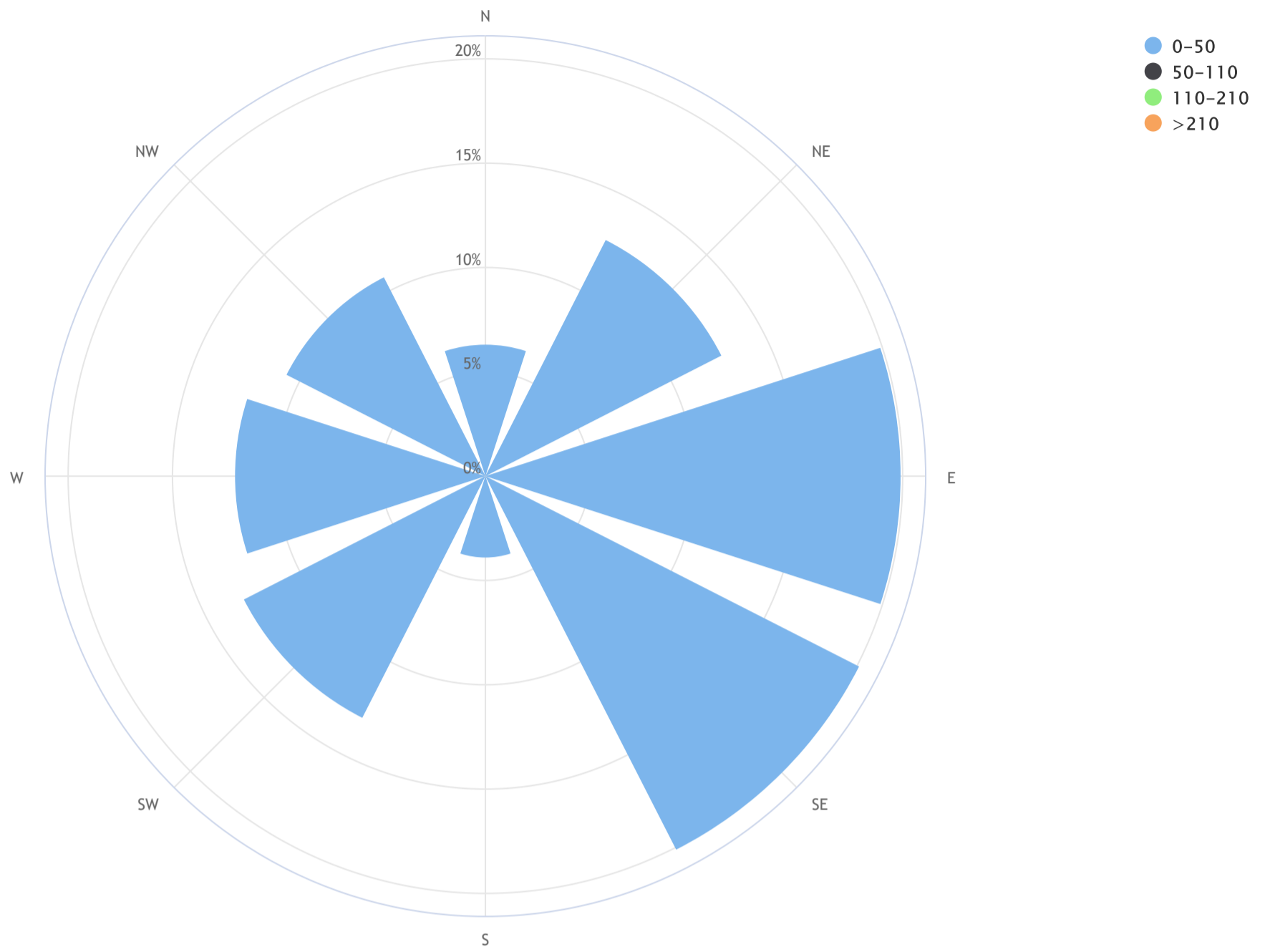
O3[ppb] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.



LICA-201901

Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_O<sub>3</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 14.8\_CALM % = 1.6%



Direction	0-50	50-110	110-210	>210	TOTAL
N	6.3	0.0	0.0	0.0	6.3
NE	12.7	0.0	0.0	0.0	12.7
E	19.9	0.0	0.0	0.0	19.9
SE	20.1	0.0	0.0	0.0	20.1
S	3.9	0.0	0.0	0.0	3.9
SW	13.0	0.0	0.0	0.0	13.0
W	12.0	0.0	0.0	0.0	12.0
NW	10.7	0.0	0.0	0.0	10.7
Summary	98.4	0.0	0.0	0.0	98.4
CALM	1.6	0.0	0.0	0.0	1.6



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)

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	3	4	5	5	5	4	4	4	4	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
2	0	0	0	0	0	0	7	9	3	4	2	1	1	1	1	1	1	1	2	1	1	1	1	0	0	0	9	24	
3	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	2	1	2	3	2	3	3	3	0	3	24	
4	3	5	4	4	4	5	6	9	8	7	6	4	2	2	2	2	2	1	1	1	1	1	1	1	1	1	9	24	
5	1	1	0	0	0	1	1	0	1	1	1	1	1	1	2	2	2	2	2	2	3	3	2	2	0	3	1	24	
6	2	2	2	2	3	3	3	3	4	5	5	5	6	7	7	8	6	6	6	9	9	7	5	3	2	9	5	24	
7	2	2	4	6	4	5	6	5	3	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	6	2	24	
8	0	0	0	0	0	0	0	0	0	2	1	1	1	1	1	1	1	1	1	1	1	4	2	4	0	4	1	24	
9	4	2	1	1	1	1	1	2	2	2	2	2	3	2	2	2	2	3	2	2	2	2	2	2	2	1	4	2	24
10	3	3	2	2	1	2	3	4	3	2	1	2	2	3	3	3	3	5	3	3	3	3	3	4	1	5	3	24	
11	4	4	4	5	5	6	7	7	6	6	5	4	4	3	4	4	5	5	5	6	6	7	6	7	3	7	5	24	
12	8	7	7	6	6	6	7	7	7	7	6	7	6	6	7	8	10	10	11	11	12	12	13	16	6	16	8	24	
13	16	17	16	16	15	15	14	15	15	16	16	15	9	6	7	8	6	4	3	2	2	2	2	1	1	17	10	24	
14	1	1	1	2	2	3	3	4	7	8	7	7	10	14	16	20	23	15	5	3	1	1	3	2	1	23	7	24	
15	3	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	13	13	8	1	13	3	24
16	7	3	2	2	3	3	2	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	7	2	24	
17	1	0	0	0	1	0	0	1	1	2	2	3	1	1	1	1	1	1	3	4	4	5	5	16	0	16	2	24	
18	10	10	7	4	2	4	5	3	4	4	4	4	4	2	4	5	2	2	2	3	3	3	3	3	3	2	10	4	24
19	3	3	5	5	5	8	14	7	5	4	3	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	14	3	24
20	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	4	5	6	7	7	7	7	7	1	7	3	24	
21	8	9	11	10	10	8	8	8	8	7	5	4	4	4	4	7	6	5	4	4	4	5	5	5	4	11	6	24	
22	5	5	5	5	5	6	11	12	13	14	9	7	6	8	8	8	9	11	11	13	12	12	12	8	5	14	9	24	
23	7	6	3	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	3	3	1	7	2	24	
24	3	5	4	5	4	5	4	5	6	11	7	6	5	7	7	8	7	7	8	10	10	11	16	6	3	16	7	24	
25	4	5	5	5	7	6	6	5	6	5	5	6	6	6	5	4	C	C	2	2	3	2	2	2	2	7	5	24	
26	3	2	2	3	4	5	7	7	7	7	6	6	4	6	7	5	5	9	5	3	1	1	1	2	1	9	5	24	
27	2	1	1	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	1	1	1	0	2	1	24	
28	1	1	1	0	0	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	5	1	1	1	0	5	1	24	
29	1	1	1	1	1	1	2	2	4	5	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	5	2	24	
30	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	3	3	3	3	1	3	2	24	
31	4	4	5	5	5	5	6	8	7	6	7	6	7	6	5	4	5	4	3	2	2	2	2	1	1	8	5	24	
HOURLY MAX	16	17	16	16	15	15	14	15	15	16	16	15	10	14	16	20	23	15	11	13	12	13	16	16					
HOURLY AVG	4	3	3	3	3	4	4	4	4	4	4	3	3	3	3	4	4	4	3	3	3	4	4	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

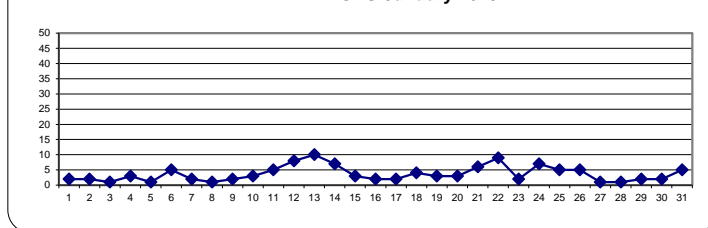
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m <sup>3</sup>	24-HR	29 µg/m <sup>3</sup>
----------------------	------	----------------------	-------	----------------------

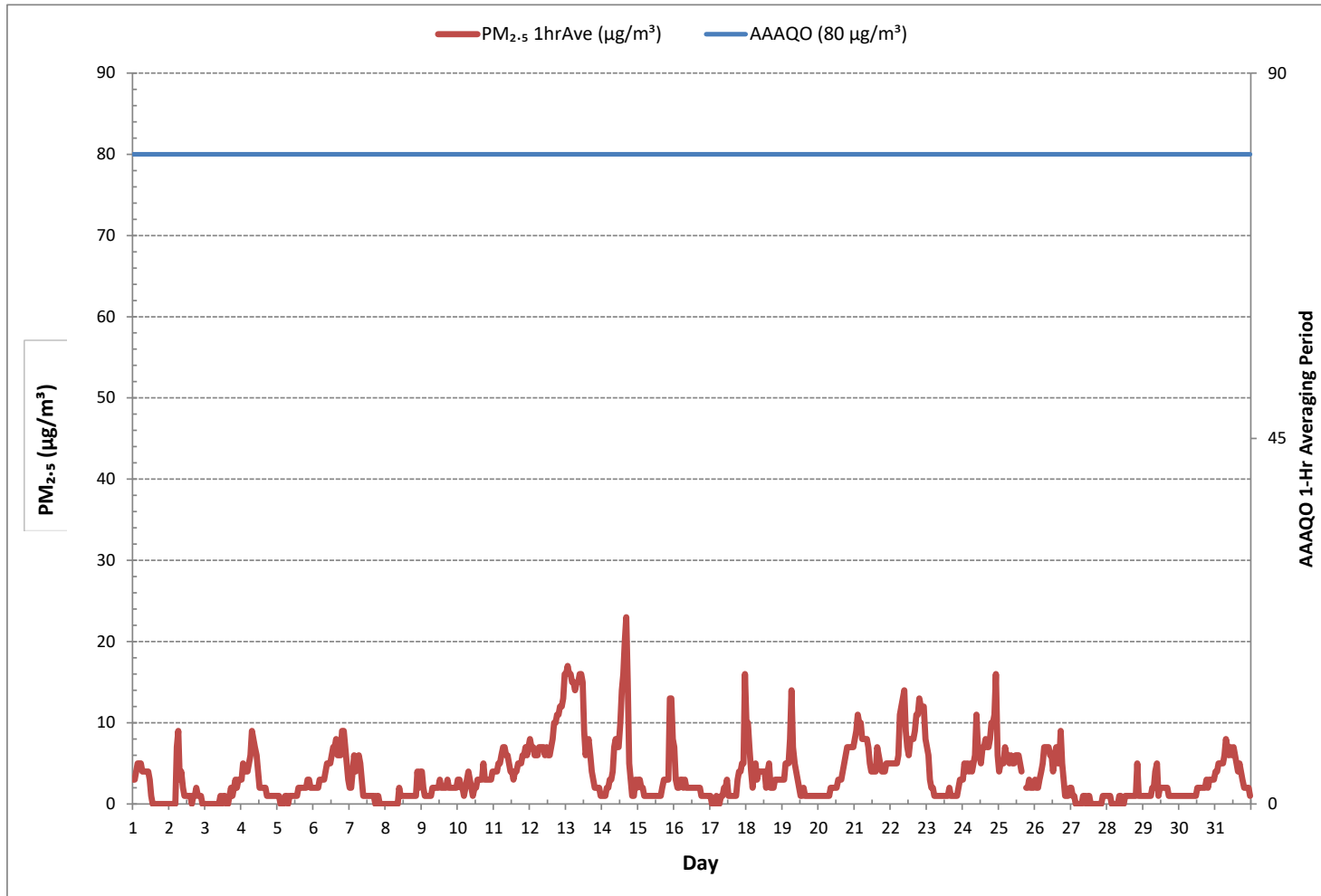
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	666			
MINIMUM 1-HR AVERAGE	0 µg/m <sup>3</sup> @ HOUR	13	ON DAY	1
MAXIMUM 1-HR AVERAGE:	23 µg/m <sup>3</sup> @ HOUR	16	ON DAY	14
MAXIMUM 24-HR AVERAGE:	10 µg/m <sup>3</sup>		ON DAY	13
MONTHLY CALIBRATION TIME:	2 hrs	OPERATIONAL TIME:	744 hrs	
STANDARD DEVIATION:	4	AMD OPERATION UPTIME:	100.0 %	
		MONTHLY AVERAGE:	4 µg/m <sup>3</sup>	

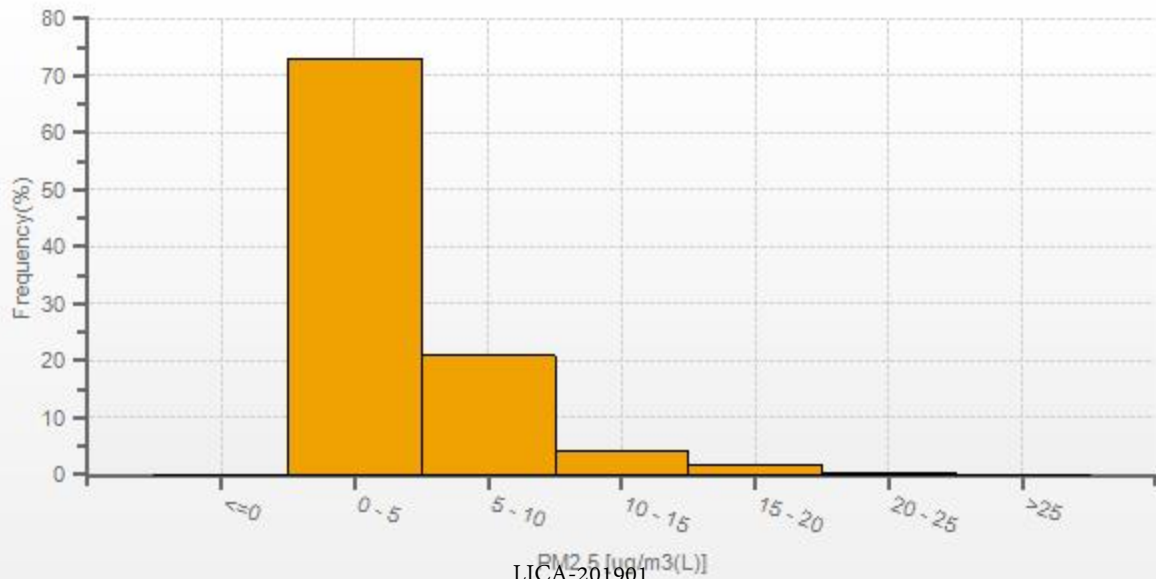
24 HR AVERAGES January 2019



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)



PM2.5 [ug/m3(L)] Histogram: LICA COLD LAKE SOUTH Monthly: 19/01 1 Hr.

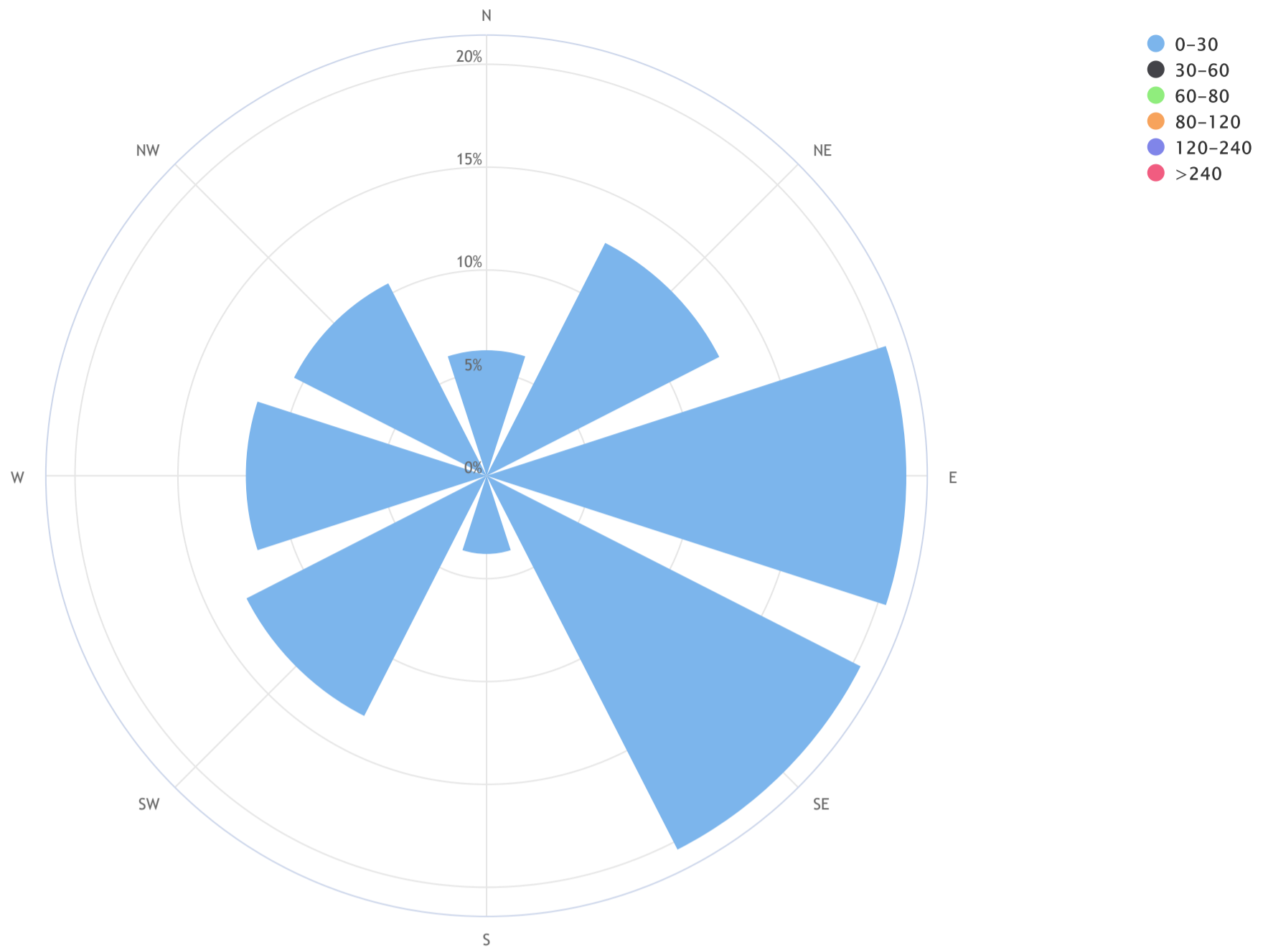


LICA-201901



Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_PM<sub>2.5</sub> (µg/m<sup>3</sup>)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 4.8\_CALM % = 1.5%



Direction	0-30	30-60	60-80	80-120	120-240	>240	TOTAL
N	6.1	0.0	0.0	0.0	0.0	0.0	6.1
NE	12.7	0.0	0.0	0.0	0.0	0.0	12.7
E	20.4	0.0	0.0	0.0	0.0	0.0	20.4
SE	20.4	0.0	0.0	0.0	0.0	0.0	20.4
S	3.8	0.0	0.0	0.0	0.0	0.0	3.8
SW	13.1	0.0	0.0	0.0	0.0	0.0	13.1
W	11.7	0.0	0.0	0.0	0.0	0.0	11.7
NW	10.5	0.0	0.0	0.0	0.0	0.0	10.5
Summary	98.5	0.0	0.0	0.0	0.0	0.0	98.5
CALM	1.5	0.0	0.0	0.0	0.0	0.0	1.5



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	8.4	7.7	8.5	6.7	2.0	5.6	5.9	3.4	2.1	4.1	7.5	11.6	9.3	12.6	11.6	10.6	10.9	9.3	9.6	9.7	8.7	8.6	9.0	7.3	2.0	12.6	5.6	24
2	5.7	5.8	1.9	0.8	0.9	0.1	0.2	0.3	0.5	1.1	1.7	8.1	9.3	9.9	9.9	6.7	6.7	6.2	4.6	4.9	6.4	6.9	7.1	6.3	0.1	9.9	4.5	24
3	8.2	4.9	8.0	7.5	6.8	6.3	7.6	7.1	6.3	6.2	6.1	6.7	5.7	6.6	6.6	5.2	4.5	4.6	4.7	5.1	5.3	4.6	3.4	5.6	3.4	8.2	5.9	24
4	2.3	1.7	3.3	1.2	0.8	1.3	1.0	1.9	2.1	1.5	2.6	3.7	5.9	6.9	5.7	4.4	4.6	5.6	6.4	7.6	7.1	8.7	7.6	6.6	0.8	8.7	3.4	24
5	6.7	5.9	6.3	7.0	6.2	4.9	5.7	5.2	5.2	5.0	6.2	8.0	5.9	6.9	7.7	8.2	8.9	9.7	9.1	9.5	7.0	7.2	6.3	7.7	4.9	9.7	6.4	24
6	8.4	6.6	7.9	7.8	8.5	6.9	7.7	6.7	7.8	7.0	6.0	5.8	7.0	6.8	6.3	4.2	4.8	5.2	5.0	5.2	6.8	7.0	10.1	12.1	4.2	12.1	4.5	24
7	10.6	12.0	8.8	8.3	12.5	10.9	10.6	14.8	14.1	16.6	17.8	14.3	15.9	16.7	14.1	12.8	16.8	12.2	11.7	12.5	15.0	15.8	12.6	11.7	8.3	17.8	13.1	24
8	8.6	9.9	10.9	12.7	11.9	10.6	12.6	5.8	5.7	7.3	9.9	9.4	6.1	7.0	8.0	5.2	4.1	3.8	0.7	0.9	0.9	1.4	0.7	2.1	0.7	12.7	5.2	24
9	2.1	3.4	2.0	4.4	3.8	4.8	4.0	6.3	7.1	6.0	7.7	8.7	7.8	11.2	10.5	9.3	9.6	10.3	10.9	9.4	8.4	8.8	8.5	7.4	2.0	11.2	7.1	24
10	6.2	5.8	5.0	6.4	4.6	4.1	2.6	1.8	3.7	5.6	6.3	3.7	3.2	3.8	1.6	2.8	2.9	0.8	1.4	2.7	2.1	3.9	4.7	4.5	0.8	6.4	3.1	24
11	5.8	5.6	5.3	4.5	2.5	2.8	2.6	4.5	5.9	7.5	9.8	8.3	7.1	7.7	9.5	9.2	10.3	11.6	9.4	11.4	8.9	5.5	5.5	5.6	2.5	11.6	6.9	24
12	4.4	4.7	2.2	1.3	0.6	2.6	1.9	1.0	0.3	0.8	5.1	7.1	6.8	6.4	5.1	3.7	1.4	1.0	1.6	3.2	1.1	0.9	2.6	3.3	0.3	7.1	2.1	24
13	1.1	0.8	1.2	0.8	0.7	0.4	0.8	0.5	0.9	1.2	0.9	2.0	5.2	7.8	4.7	5.1	3.8	5.5	4.5	3.9	3.5	3.8	4.2	3.3	0.4	7.8	2.2	24
14	3.8	3.5	6.0	6.9	4.1	7.7	4.9	2.9	6.0	5.5	6.6	6.4	7.1	8.8	8.8	8.7	5.7	7.0	14.6	12.2	16.0	18.4	16.9	14.0	2.9	18.4	2.7	24
15	14.5	11.6	10.9	8.7	8.1	9.4	6.4	4.1	2.4	5.7	4.8	4.3	4.2	4.6	2.4	4.2	4.1	4.7	2.4	2.5	3.6	3.5	5.1	5.2	2.4	14.5	4.5	24
16	4.3	4.4	3.8	4.3	2.8	4.5	3.6	5.1	4.4	4.3	4.1	3.7	4.4	7.8	7.7	7.7	5.3	6.3	8.4	9.6	9.2	11.1	9.7	8.3	2.8	11.1	5.4	24
17	3.8	3.4	4.1	1.0	0.5	1.0	1.1	0.1	0.3	1.0	0.7	2.5	1.9	4.3	2.1	3.1	2.8	2.9	2.7	2.0	0.4	0.2	0.9	2.0	0.1	4.3	1.4	24
18	0.9	0.8	1.1	0.5	1.4	1.3	1.2	1.0	2.8	5.5	4.0	4.8	3.9	4.1	3.8	4.6	4.4	4.8	4.3	3.9	2.6	2.5	1.0	2.6	0.5	5.5	2.5	24
19	2.1	4.3	3.6	2.1	4.4	7.1	8.8	7.4	7.7	7.0	7.3	8.9	7.4	8.5	10.1	9.7	10.1	10.3	9.3	7.9	8.4	7.9	7.7	10.3	2.1	10.3	7.3	24
20	8.7	7.7	7.7	7.2	5.5	5.4	4.9	4.1	2.4	4.6	6.4	5.8	6.0	3.5	5.1	3.7	2.9	1.6	3.2	1.5	0.1	0.1	0.6	0.4	0.1	8.7	3.7	24
21	1.3	1.7	2.2	1.3	1.5	3.7	3.7	1.8	0.8	2.9	9.6	8.0	7.8	6.0	6.3	7.5	6.9	5.8	5.8	5.7	4.0	3.1	1.0	1.8	0.8	9.6	3.0	24
22	2.8	2.7	2.2	3.9	4.7	5.4	4.2	5.4	4.4	3.5	2.2	3.6	4.6	4.8	2.6	1.9	1.6	0.7	1.6	3.2	3.9	2.1	3.5	8.5	0.7	8.5	1.2	24
23	12.2	11.5	10.7	9.1	10.9	6.4	10.2	9.9	11.6	11.4	14.7	12.5	14.4	14.0	11.9	9.8	5.3	2.1	1.4	1.2	2.8	2.6	1.6	0.4	0.4	14.7	7.0	24
24	0.6	1.4	0.3	0.8	1.2	0.6	0.5	0.6	0.9	1.0	2.0	3.6	3.4	4.3	4.5	4.1	1.7	0.6	0.4	2.0	1.3	0.5	2.4	5.5	0.3	5.5	0.8	24
25	3.5	4.1	6.3	6.1	5.4	3.7	3.7	2.2	2.3	0.6	2.8	4.4	7.5	6.9	6.3	6.1	4.0	2.2	0.3	1.1	1.2	2.2	1.5	1.3	0.3	7.5	1.6	24
26	2.1	2.6	3.0	4.0	4.7	5.8	3.5	3.5	1.1	2.6	2.2	1.3	3.0	1.7	0.9	2.2	0.5	1.1	5.0	2.7	5.0	3.0	4.7	7.4	0.5	7.4	1.2	24
27	6.7	10.2	13.5	14.2	15.8	15.3	14.1	17.6	19.2	24.9	23.0	18.9	17.1	18.6	18.2	21.6	20.7	25.5	24.4	18.9	17.8	21.6	16.4	11.7	6.7	25.5	16.4	24
28	10.1	10.5	7.3	8.8	5.8	5.8	5.7	6.9	3.5	5.4	11.3	13.6	15.0	16.4	12.9	11.1	7.5	4.6	7.6	5.4	5.8	3.0	1.1	1.9	1.1	16.4	7.3	24
29	1.5	1.2	0.7	0.4	1.1	0.4	0.9	0.5	0.5	4.0	5.3	4.7	5.5	5.6	6.4	4.6	5.1	6.7	6.4	5.3	7.1	7.6	7.0	8.7	0.4	8.7	3.6	24
30	10.6	9.5	6.7	8.0	7.8	7.0	8.2	10.0	10.8	10.9	11.9	12.2	12.6	11.3	11.0	10.8	8.4	6.7	3.7	4.4	4.2	3.3	2.6	1.8	1.8	12.6	7.8	24
31	1.4	2.8	2.3	2.3	2.2	2.2	2.4	2.0	3.4	1.0	6.6	6.8	4.7	6.6	6.5	8.2	7.3	8.1	11.2	11.9	10.3	9.6	12.4	12.2	1.0	12.4	5.0	24
HOURLY MAX	14.5	12.0	13.5	14.2	15.8	15.3	14.1	17.6	19.2	24.9	23.0	18.9	17.1	18.6	18.2	21.6	20.7	25.5	24.4	18.9	17.8	21.6	16.9	14.0				

STATUS FLAG CODES

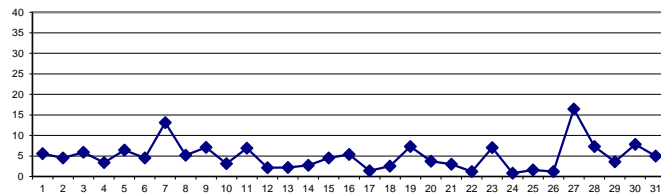
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

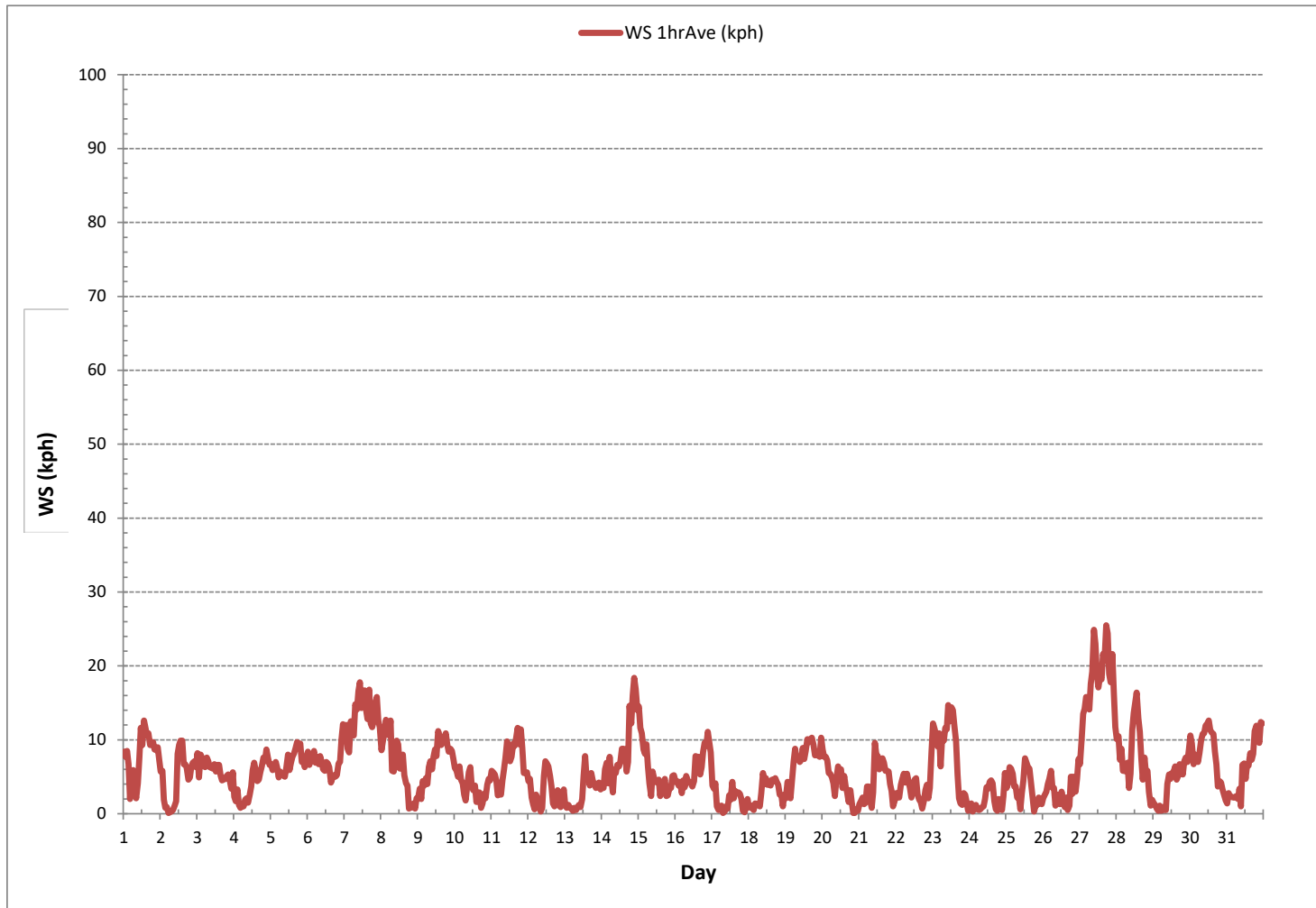
LAST CALIBRATION:	November 9, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR 5 ON DAY 2
MAXIMUM 1-HR AVERAGE:	25.5 kph @ HOUR 17 ON DAY 27
MAXIMUM 24-HR AVERAGE:	16.4 kph ON DAY 27
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.3
MONTHLY AVERAGE:	0.8 kph

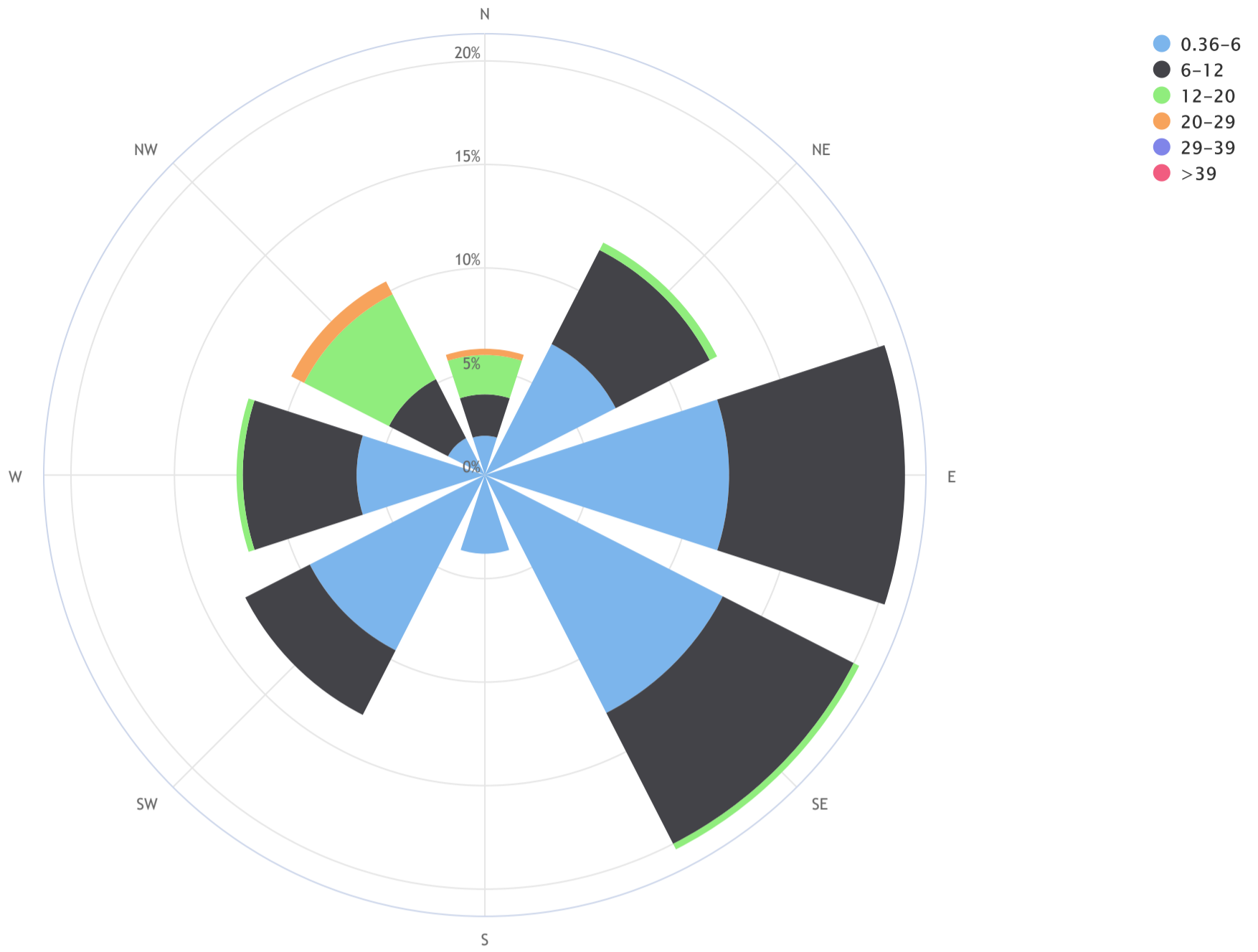
24 HR AVERAGES January 2019





Lakeland Industry & Community Association\_Cold Lake South Continuous Monitoring Station\_19/01

Wind Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.2\_CALM % = 1.5%



Direction	0.36-6	6-12	12-20	20-29	29-39	>39	TOTAL
N	1.9	2.0	1.9	0.3	0.0	0.0	6.1
NE	7.1	5.1	0.4	0.0	0.0	0.0	12.6
E	11.8	8.5	0.0	0.0	0.0	0.0	20.3
SE	12.9	7.1	0.3	0.0	0.0	0.0	20.3
S	3.8	0.0	0.0	0.0	0.0	0.0	3.8
SW	9.5	3.5	0.0	0.0	0.0	0.0	13.0
W	6.2	5.5	0.3	0.0	0.0	0.0	12.0
NW	2.0	3.2	4.6	0.7	0.0	0.0	10.5
<b>Summary</b>	<b>55.2</b>	<b>35.0</b>	<b>7.4</b>	<b>0.9</b>	<b>0.0</b>	<b>0.0</b>	<b>98.5</b>
<b>CALM</b>	<b>1.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>1.5</b>



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

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

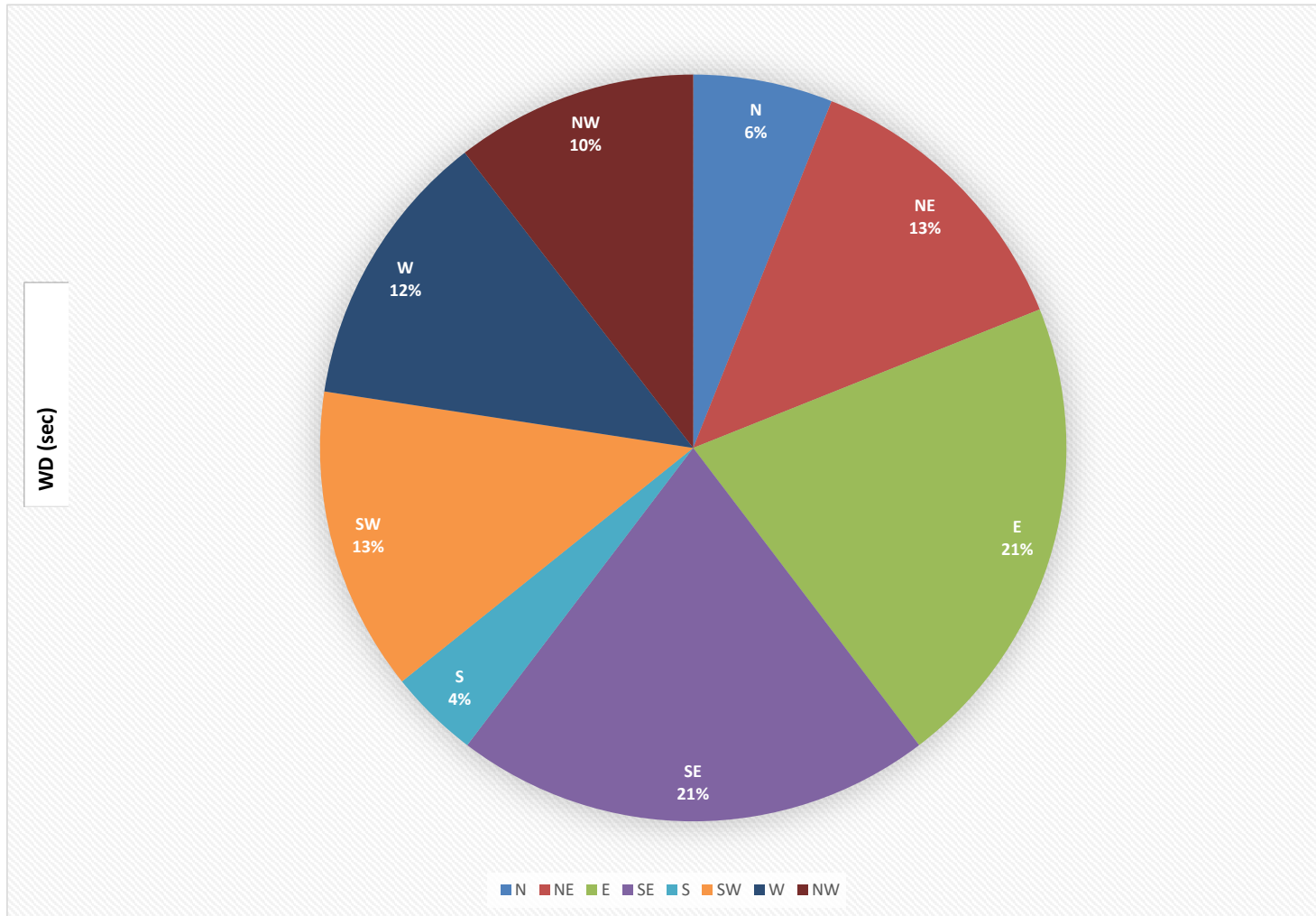
STATUS FLAG CODES

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

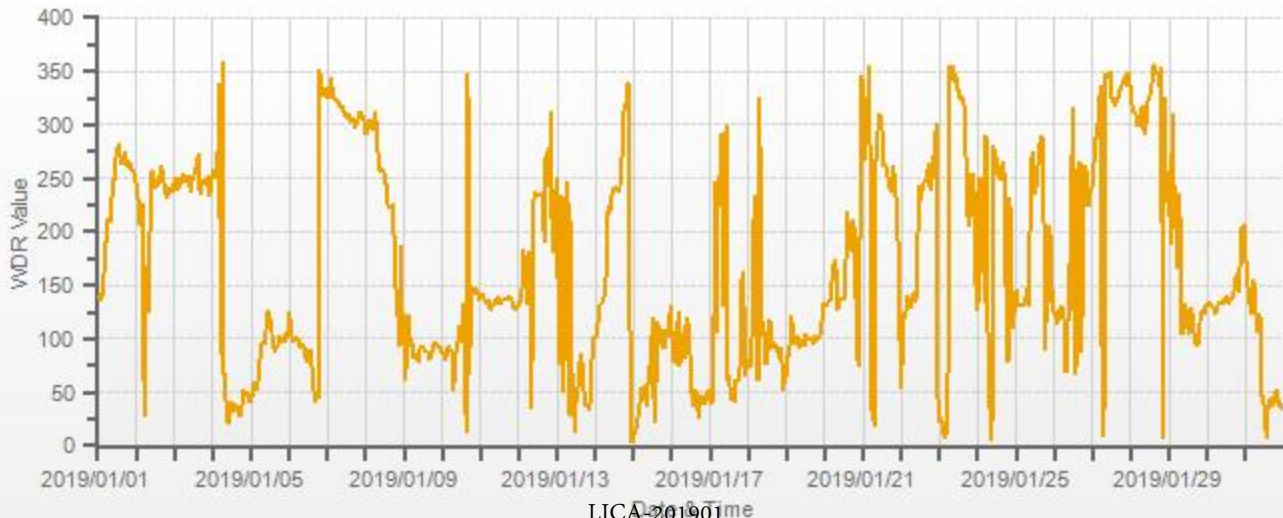
LAST CALIBRATION:	November 9, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	96		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	30	(NNE)

WIND DIRECTION Hourly Averages (WD)



WDR[degwdr]



LICA-201901



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

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	4	7	5	15	50	23	17	20	40	19	6	8	9	8	10	6	6	7	8	4	5	6	4	5	24	
2	8	5	41	54	42	78	75	73	47	44	38	5	6	7	6	7	15	11	17	10	9	5	10	5	24	
3	8	7	6	5	7	9	5	11	6	8	9	6	21	10	12	15	11	8	8	7	6	9	11	18	24	
4	16	27	17	53	46	30	61	20	29	43	16	11	11	9	14	11	12	12	11	6	6	7	7	12	24	
5	10	11	9	8	6	16	11	11	10	11	13	9	13	14	9	11	7	6	9	6	7	8	11	10	24	
6	9	13	6	7	6	8	5	8	6	6	11	12	7	9	11	17	6	8	16	16	8	8	7	5	24	
7	10	7	10	12	9	10	10	7	8	9	7	8	6	8	7	7	5	8	8	7	7	6	5	5	24	
8	12	9	9	9	7	9	6	14	6	6	6	6	11	13	8	9	8	10	62	27	46	28	62	28	24	
9	25	13	37	18	14	9	12	7	7	9	8	6	7	6	6	7	8	7	6	8	7	7	7	6	24	
10	7	7	7	10	11	7	17	30	15	11	11	21	29	20	43	31	12	62	42	16	15	9	12	8	24	
11	8	5	7	8	15	10	11	4	6	5	5	7	8	7	7	5	5	6	6	5	5	8	13	9	24	
12	8	11	36	50	68	20	19	59	75	63	15	8	11	10	11	32	49	58	40	24	60	60	32	18	24	
13	53	57	44	57	57	70	44	62	42	30	52	39	11	5	15	12	26	7	15	14	15	11	16	12	24	
14	11	11	10	6	11	5	18	37	11	10	10	10	6	10	6	6	10	17	7	7	10	11	6	13	24	
15	8	12	8	9	11	5	7	10	17	6	15	22	31	23	45	13	11	8	20	17	14	11	11	14	24	
16	24	11	20	21	17	21	24	11	11	23	26	26	15	16	9	9	17	11	7	8	9	9	5	6	24	
17	9	8	8	52	54	43	46	79	68	38	66	37	43	19	32	23	11	18	14	16	62	74	61	27	24	
18	62	43	32	66	33	38	35	51	31	13	18	24	22	19	21	13	15	15	12	13	23	28	49	15	24	
19	34	8	22	21	16	8	5	13	8	9	8	7	11	7	7	5	5	6	10	6	7	15	7	24		
20	7	8	6	6	12	18	28	29	24	12	8	10	12	37	12	31	24	49	12	41	75	77	50	68	24	
21	27	32	38	42	23	14	23	20	59	15	8	21	12	20	13	7	11	7	8	8	10	16	60	40	24	
22	27	28	26	10	7	7	11	7	7	8	38	21	15	11	27	29	38	49	29	16	12	22	8	15	24	
23	6	7	6	7	5	9	13	8	8	11	9	10	11	10	10	10	11	18	24	36	11	33	40	61	24	
24	61	12	65	48	41	42	68	57	41	50	39	19	28	19	11	13	35	54	63	28	55	67	29	7	24	
25	25	14	6	6	8	15	13	22	31	70	28	12	8	13	11	9	18	25	73	39	55	22	43	30	24	
26	30	26	13	33	12	14	21	17	51	40	22	50	11	36	47	18	59	47	19	42	13	22	16	8	24	
27	8	14	11	11	14	13	6	8	7	8	9	9	9	9	8	8	8	9	6	9	8	10	10	6	24	
28	8	5	8	6	13	9	10	5	26	22	10	9	13	10	13	10	10	10	6	20	15	26	43	12	24	
29	28	40	58	59	48	60	41	63	60	15	11	19	15	19	12	17	12	8	7	14	9	9	9	8	24	
30	6	5	8	6	8	9	6	5	6	6	6	6	6	8	8	6	8	11	21	17	11	25	22	35	24	
31	44	22	23	19	29	26	23	28	16	65	13	16	15	16	10	8	8	9	7	6	7	7	6	6	24	

STATUS FLAG CODES

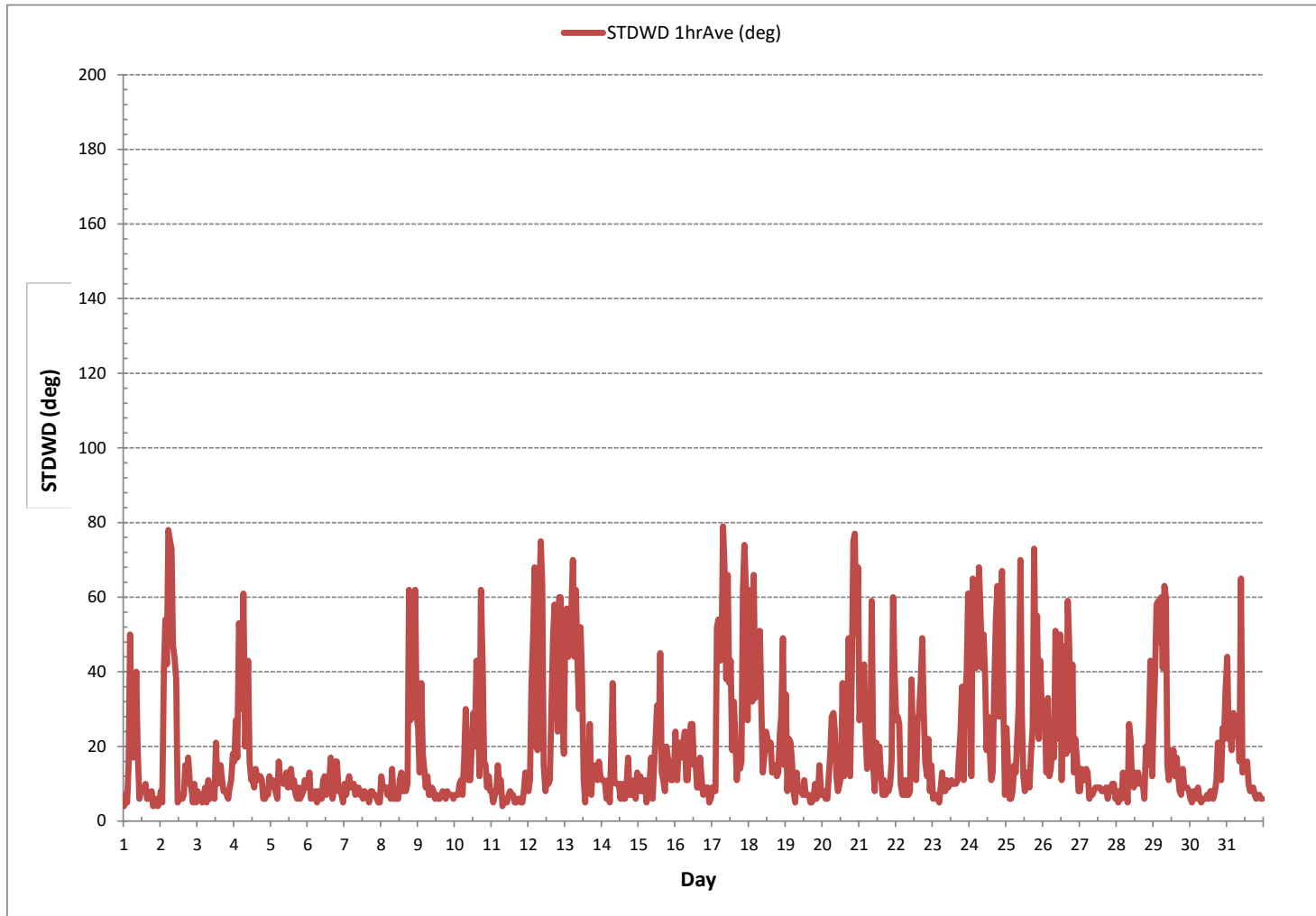
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: November 9, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs



STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)





RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	76	75	75	75	81	83	84	85	86	87	86	82	75	72	71	76	79	79	81	83	83	84	86	87	71	87	80	24
2	91	92	92	91	90	91	92	91	90	89	88	78	69	68	65	67	71	75	80	83	81	78	76	79	65	92	82	24
3	75	76	78	82	83	81	81	78	78	74	70	67	61	55	52	53	64	66	68	74	81	86	87	88	52	88	73	24
4	87	86	86	85	86	86	87	87	88	86	82	78	77	76	77	77	79	81	83	84	85	85	86	85	76	88	83	24
5	84	84	81	81	82	83	84	86	86	89	88	87	81	78	78	79	80	81	83	86	88	89	90	90	78	90	84	24
6	90	91	90	90	89	89	89	89	88	88	87	87	87	87	87	87	88	89	90	91	90	90	90	89	87	91	89	24
7	89	86	85	87	83	81	81	79	78	75	70	71	68	67	66	68	64	65	67	68	68	67	68	70	64	89	74	24
8	71	73	73	71	70	70	68	70	73	72	69	65	61	59	60	61	68	71	74	74	73	75	72	74	59	75	69	24
9	75	73	71	68	67	65	66	68	69	68	65	65	66	67	67	67	68	69	73	75	77	78	79	81	65	81	70	24
10	82	81	81	79	78	79	80	81	80	79	79	78	76	74	73	74	76	78	80	78	77	78	78	79	73	82	78	24
11	79	80	80	81	82	84	84	84	84	81	77	73	69	64	63	65	68	71	73	74	76	77	78	79	63	84	76	24
12	80	81	81	81	82	82	83	84	84	80	74	71	65	61	59	63	70	74	75	75	73	75	74	73	59	84	75	24
13	81	85	86	87	85	85	84	84	85	83	77	76	84	91	92	91	91	94	95	94	93	92	92	90	76	95	87	24
14	90	89	90	90	91	92	92	94	96	94	87	83	77	73	75	78	83	83	80	79	77	79	75	73	76	96	85	24
15	75	72	71	71	72	72	72	74	76	73	67	63	61	62	59	59	63	65	67	71	70	71	71	71	59	76	69	24
16	71	72	73	76	80	79	76	75	74	73	71	68	66	68	68	70	71	69	71	73	71	70	70	70	66	80	72	24
17	73	74	76	75	75	73	72	71	72	67	66	63	53	57	53	58	65	72	76	76	74	72	71	73	53	76	69	24
18	72	71	71	70	69	70	72	72	73	73	73	71	69	68	67	66	65	65	65	67	68	69	72	72	65	73	69	24
19	71	71	72	72	73	72	72	69	66	64	61	61	57	61	68	70	72	73	71	71	72	73	73	73	57	73	69	24
20	73	73	73	73	72	71	71	72	74	71	70	66	64	61	58	58	63	67	71	74	77	78	74	73	58	78	70	24
21	76	77	76	77	79	80	80	81	82	83	73	67	64	60	61	66	67	70	70	68	69	69	72	73	60	83	73	24
22	74	74	74	74	75	79	86	90	91	90	89	84	77	73	69	69	73	80	81	82	89	89	89	86	69	91	81	24
23	80	77	76	75	74	72	70	71	69	66	64	60	57	56	55	54	59	67	72	74	73	73	72	71	54	80	68	24
24	71	70	70	69	69	69	69	70	71	74	73	73	71	69	69	71	72	77	79	79	78	77	78	79	69	79	73	24
25	77	78	78	78	78	79	80	79	78	76	73	71	72	70	75	77	78	80	82	84	86	86	87	89	70	89	79	24
26	90	91	91	90	90	89	86	84	83	83	81	73	71	68	69	74	81	82	85	87	89	93	92	85	68	93	84	24
27	83	75	72	74	85	91	91	84	75	70	70	72	70	69	72	69	70	61	59	65	66	58	61	67	58	91	72	24
28	70	71	69	68	70	72	70	64	62	62	59	50	42	39	41	43	47	52	56	59	60	59	67	70	39	72	59	24
29	71	71	71	71	70	70	69	69	70	68	63	59	54	52	54	61	66	68	69	70	71	71	71	69	52	71	67	24
30	67	67	67	67	68	69	68	65	65	67	70	70	68	70	72	73	71	76	78	77	79	78	77	76	65	79	71	24
31	76	77	78	79	80	81	81	82	82	80	80	79	77	77	78	76	76	77	76	77	76	77	74	69	69	82	78	24
HOURLY MAX	91	92	92	91	91	92	92	94	96	94	87	87	91	92	91	91	94	95	94	93	93	92	90					
HOURLY AVG	78	78	78	78	78	79	79	78	78	77	74	71	68	67	67	68	71	74	75	76	77	77	78	78				

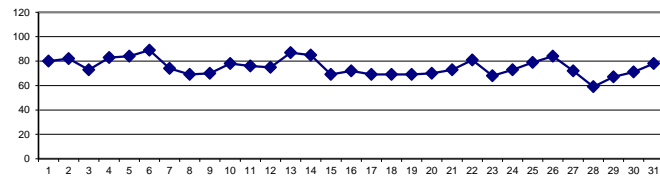
STATUS FLAG CODES

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

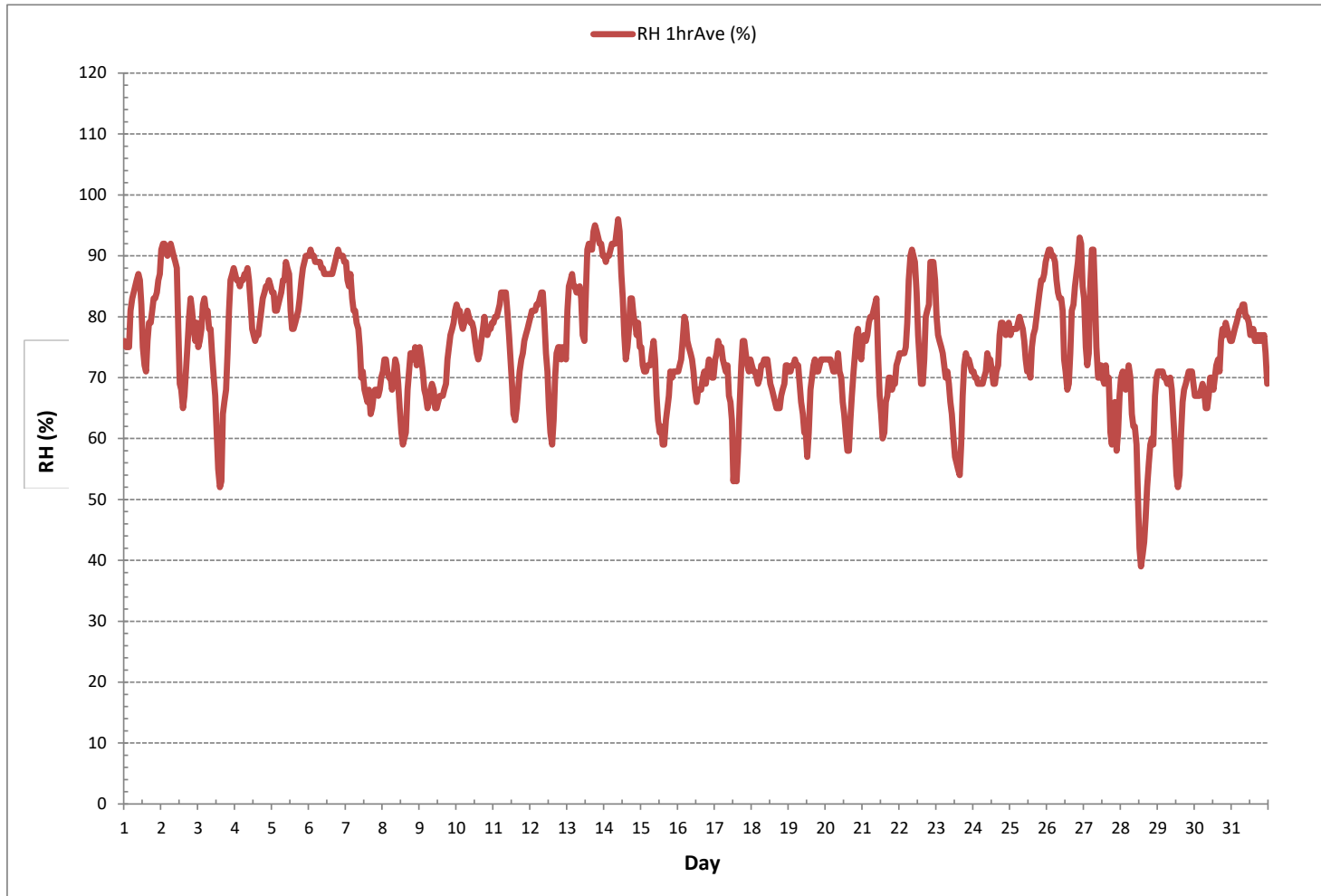
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	39	%	@ HOUR	13	ON DAY	28
MAXIMUM 1-HR AVERAGE:	96	%	@ HOUR	9	ON DAY	14
MAXIMUM 24-HR AVERAGE:	89	%			ON DAY	6
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	9					MONTHLY AVERAGE: 75 %

24 HR AVERAGES January 2019

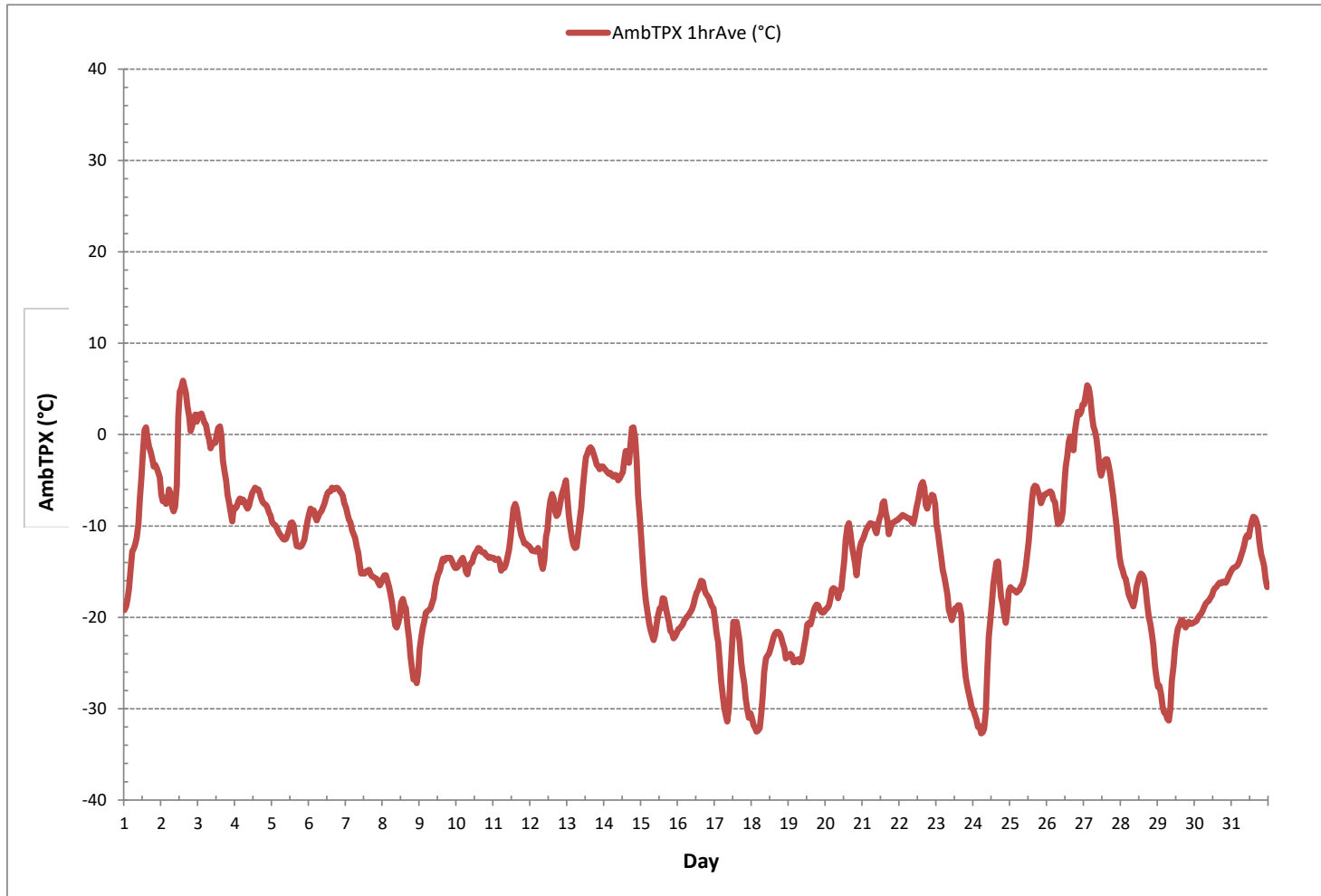


**RELATIVE HUMIDITY Hourly Averages (RH %)**





**AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)**





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)

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

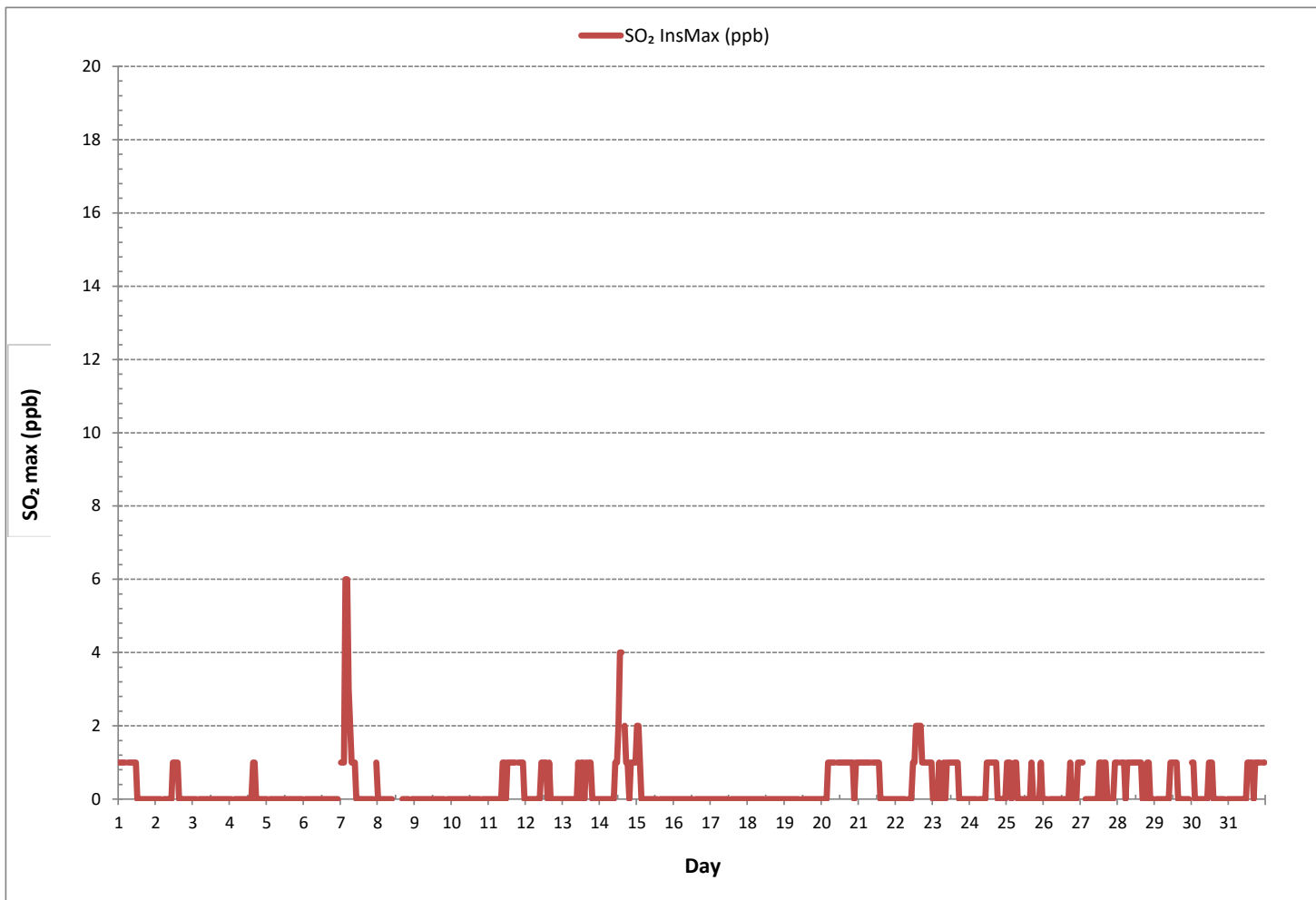
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	181
MAXIMUM INSTANTANEOUS VALUE:	6 ppb @ HOUR 3 ON DAY 7
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

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	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
2	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
3	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
4	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
5	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
6	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	24
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	24
8	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	C	1	1	1	1	1	S	1	1	1	1	1	24
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	24
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	24
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	24
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	24
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	24
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	24
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	24
16	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	24
17	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
18	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
19	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
20	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
21	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
22	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
23	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
24	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
25	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
26	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
27	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
28	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
29	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	24
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	24
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	24
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

STATUS FLAG CODES

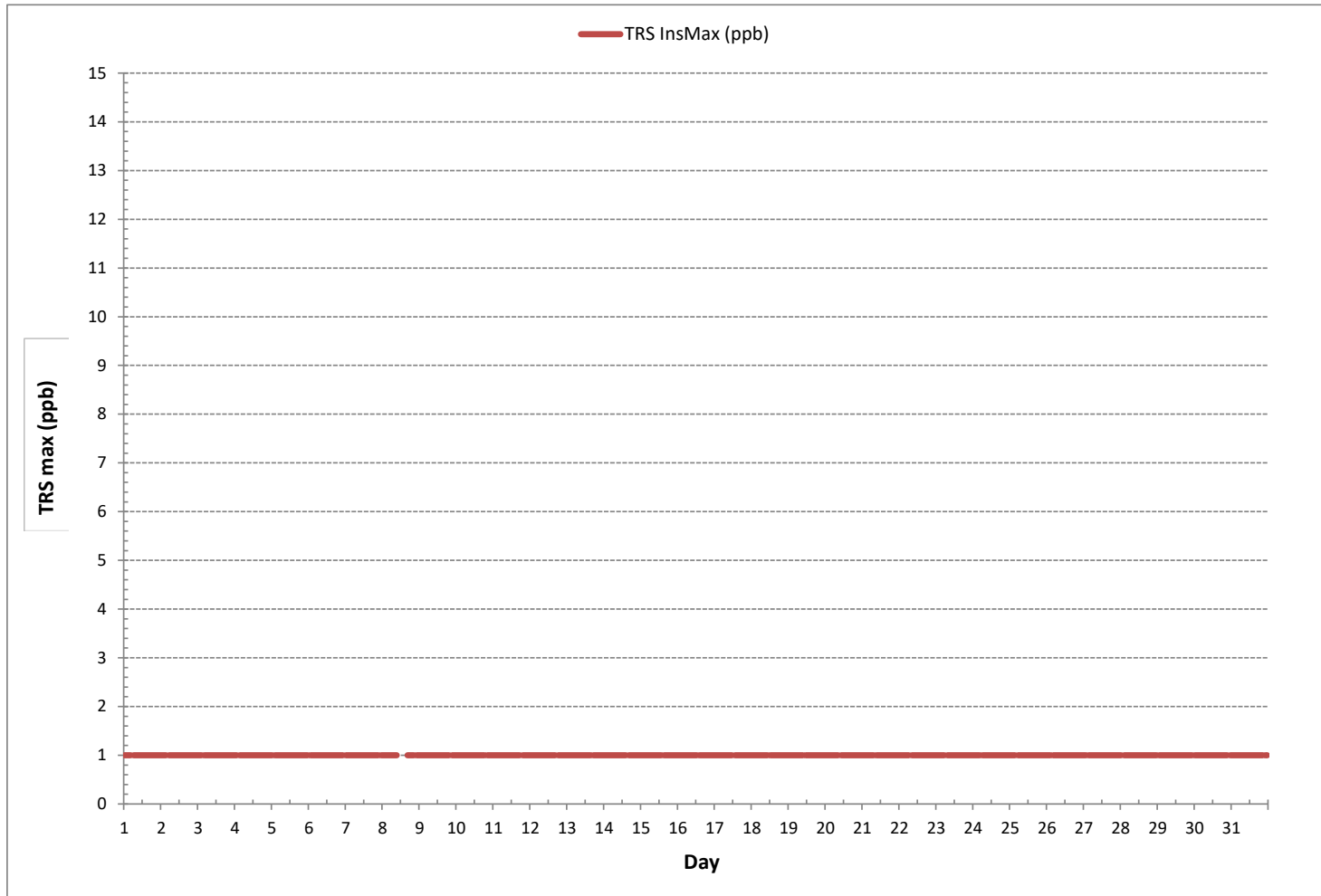
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 0 ON DAY 1
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	744 hrs



TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.51	2.49	2.44	2.36	2.26	S	2.13	2.15	2.17	2.14	2.09	2.08	2.09	1.92	1.94	1.93	1.95	1.93	1.98	2.01	2.01	2.00	1.97	2.00	1.92	1.92	2.51	2.11	24
2	1.99	2.00	2.07	2.10	S	2.10	2.19	2.24	2.47	2.28	2.39	2.20	1.98	2.00	2.01	2.09	1.98	2.01	2.01	2.07	2.04	2.02	2.04	1.99	1.98	1.98	2.47	2.10	24
3	1.98	1.99	1.96	S	1.96	1.97	1.97	1.99	2.08	1.99	2.02	2.02	1.97	2.00	2.01	1.98	2.28	2.05	2.06	2.07	2.15	2.13	2.10	2.16	1.96	2.28	2.04	24	
4	2.18	2.30	S	2.23	2.26	2.59	2.51	2.62	2.55	2.57	2.39	2.16	2.02	1.98	1.98	1.98	2.09	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.97	1.97	2.62	2.18	24
5	1.98	S	1.98	1.98	1.98	1.97	2.27	2.01	1.99	2.02	2.00	1.99	2.06	2.06	2.06	1.99	2.01	1.99	2.07	1.99	2.00	2.01	2.03	2.00	1.97	2.27	2.02	24	
6	S	2.00	1.98	2.01	2.01	1.98	1.96	1.95	1.97	1.98	2.21	1.96	1.98	1.99	1.96	2.87	2.04	2.37	1.97	1.98	1.97	1.97	1.97	S	1.95	2.87	2.05	24	
7	1.97	1.96	1.95	1.99	2.03	2.01	2.01	2.00	2.00	1.98	1.98	1.98	1.97	1.97	2.10	2.01	1.98	1.96	1.98	1.96	1.98	2.00	S	1.99	1.95	2.10	1.99	24	
8	1.98	2.01	1.98	2.01	1.97	2.01	2.02	2.00	2.03	2.14	2.11	2.08	2.16	2.12	2.08	2.07	3.64	2.34	2.13	2.22	2.30	S	2.38	2.37	1.97	3.64	2.18	24	
9	2.27	2.13	2.15	2.15	2.14	2.11	2.16	2.14	2.25	C	C	C	C	C	2.01	2.03	2.21	2.20	1.99	2.03	S	2.02	2.00	2.00	1.99	2.27	2.11	24	
10	2.01	1.99	2.01	1.98	2.00	2.00	2.07	2.09	2.29	2.00	2.22	2.04	2.00	2.01	2.01	2.06	2.00	2.07	2.11	S	2.11	2.06	2.11	2.10	1.98	2.29	2.06	24	
11	2.14	2.16	2.18	2.17	2.18	2.36	2.28	2.40	2.31	2.36	2.36	2.31	2.28	2.21	2.14	2.14	2.14	2.13	S	2.21	2.16	2.11	2.10	2.12	2.10	2.40	2.21	24	
12	2.11	2.09	2.19	2.16	2.15	2.24	2.42	2.34	2.68	10.38	2.40	2.51	2.44	4.81	2.58	2.44	2.74	S	2.50	2.53	2.57	2.58	2.70	3.04	2.09	10.38	2.90	24	
13	3.17	3.18	3.25	3.26	3.24	3.35	3.27	3.18	3.18	3.19	3.04	2.96	2.66	2.50	2.41	2.34	S	2.25	2.23	2.16	2.15	2.16	2.24	2.27	2.15	3.35	2.77	24	
14	2.30	2.21	2.17	2.19	2.22	2.15	2.29	2.28	2.54	2.59	2.76	3.05	3.29	3.18	2.87	S	2.64	2.48	2.16	2.09	2.08	2.13	2.15	2.11	2.08	3.29	2.43	24	
15	2.10	2.10	2.07	2.04	2.06	2.03	2.04	2.05	2.45	2.03	2.05	2.04	2.04	2.03	S	2.11	2.14	2.42	2.08	2.06	2.07	2.05	2.06	2.04	2.03	2.45	2.09	24	
16	2.04	2.04	2.06	2.06	2.07	2.06	2.14	2.07	2.11	2.08	3.33	2.04	2.29	S	2.10	2.03	2.04	2.05	2.02	2.02	2.02	2.02	2.03	2.04	2.02	3.33	2.12	24	
17	2.04	2.03	2.02	2.01	3.51	2.06	2.11	2.06	2.13	2.12	2.22	2.15	S	2.04	2.08	2.65	2.69	2.45	4.37	2.27	2.22	2.23	2.19	2.28	2.01	4.37	2.34	24	
18	2.24	2.25	2.24	2.31	2.23	2.58	2.53	2.27	2.17	2.03	2.05	S	2.06	2.07	2.09	2.07	2.17	2.04	2.05	2.07	2.07	2.05	2.08	2.10	2.03	2.58	2.17	24	
19	2.52	2.48	2.48	2.12	2.11	2.06	2.08	2.07	2.07	2.08	S	2.04	2.05	2.08	2.03	2.04	2.01	2.02	2.02	2.02	2.02	2.06	2.04	2.01	2.01	2.52	2.11	24	
20	2.01	2.02	2.02	2.08	2.10	2.10	2.09	2.10	2.35	S	2.16	2.20	2.20	2.22	2.24	2.30	2.41	2.38	2.41	2.45	2.50	2.58	2.52	2.49	2.01	2.58	2.26	24	
21	2.55	2.55	2.64	2.65	2.78	2.79	2.21	2.20	S	2.25	2.20	2.15	2.12	2.37	2.19	2.58	2.58	2.27	2.18	2.19	2.21	2.22	2.25	2.31	2.12	2.79	2.37	24	
22	2.29	2.25	2.28	2.23	2.24	2.30	2.23	S	2.55	2.47	2.44	2.55	2.57	2.54	2.43	2.40	2.42	2.36	2.47	2.64	2.67	2.73	2.76	2.74	2.23	2.76	2.46	24	
23	2.09	2.08	2.07	2.05	2.03	2.04	S	2.02	2.16	2.04	2.02	2.02	2.02	2.02	2.02	2.04	2.04	2.72	2.09	2.11	2.09	2.17	2.27	2.22	2.02	2.72	2.11	24	
24	2.38	2.24	2.32	2.32	2.39	S	5.78	2.56	2.68	2.79	2.61	2.84	2.69	X	X	X	X	X	X	X	X	X	X	X	2.24	5.78	2.80	13	
25	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	C1	C1	C1	C1	2.13	2.13	2.15	2.16	2.13	2.10	2.17	2.10	2.17	2.14	7	
26	2.27	2.11	2.07	S	2.19	2.21	2.21	2.08	2.15	2.16	2.16	2.16	2.15	2.26	2.28	2.34	2.27	4.15	2.33	2.00	2.03	2.77	2.02	2.02	2.00	4.15	2.28	24	
27	1.96	1.94	S	1.88	1.89	1.89	1.91	1.92	1.92	1.94	1.94	1.95	1.95	1.96	2.04	1.96	1.95	1.96	1.96	1.94	1.95	1.96	1.97	1.97	1.88	2.04	1.94	24	
28	1.97	S	1.98	1.99	1.99	1.99	1.98	1.96	2.04	2.03	1.96	1.96	1.95	1.97	2.09	2.11	1.96	1.97	2.17	1.96	2.03	1.98	1.98	2.00	1.95	2.17	2.00	24	
29	S	2.04	2.07	2.05	2.09	2.10	2.12	2.25	2.41	2.47	2.07	2.07	2.03	2.02	2.03	2.08	2.06	2.03	2.06	2.04	2.07	2.06	2.06	S	2.02	2.47	2.10	24	
30	2.07	2.06	2.05	2.04	2.05	2.03	2.01	2.01	2.01	2.00	2.03	2.04	2.03	2.01	2.02	2.03	2.02	2.02	2.01	2.05	2.03	2.07	S	2.09	2.00	2.09	2.03	24	
31	2.10	2.20	2.16	2.24	2.20	2.22	2.26	2.40	2.19	2.26	2.26	2.20	2.20	2.16	2.11	2.10	2.11	2.11	2.05	2.01	2.01	S	2.02	2.01	2.01	2.40	2.16	24	
HOURLY MAX	3.17	3.18	3.25	3.26	3.51	3.35	5.78	3.18	3.18	10.38	3.33	3.05	3.29	4.81	2.87	2.87	3.64	4.15	4.37	2.64	2.67	2.77	2.76	3.04					
HOURLY AVG	2.19	2.18	2.17	2.17	2.22	2.19	2.32	2.19	2.27	2.51	2.27	2.21	2.19	2.24	2.14	2.17	2.24	2.24	2.19	2.11	2.13	2.15	2.15	2.16					

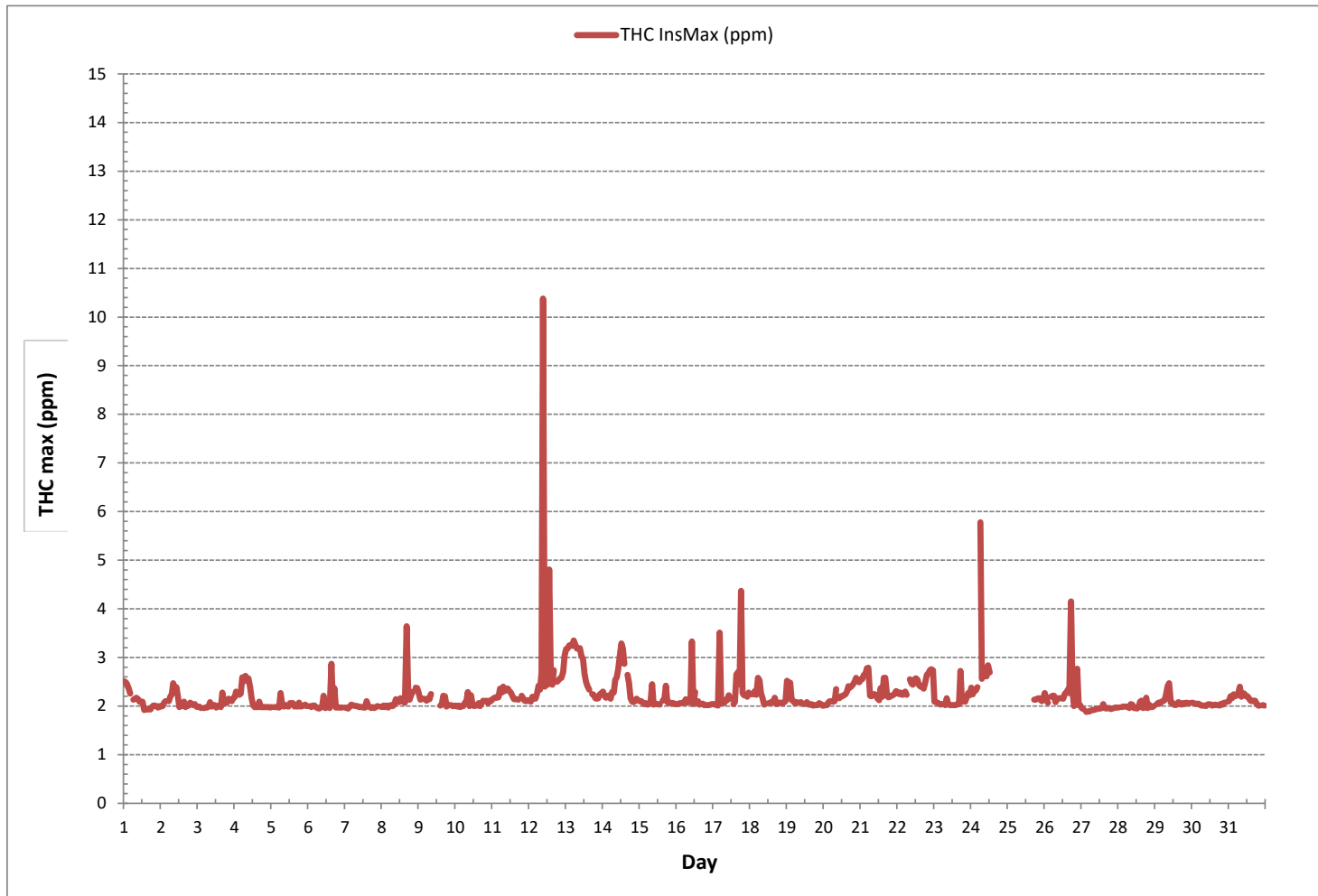
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	679
MAXIMUM INSTANTANEOUS VALUE:	10.38 ppm @ HOUR 9 ON DAY 12
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	716 hrs
STANDARD DEVIATION:	0.46

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

METHANE MAX Instantaneous Maximum (CH<sub>4</sub> ppm)

Table with 26 columns for hourly readings from 0:00 to 23:00, plus columns for DAILY MIN., DAILY MAX., 24-HR AVG., and RDGS. Rows 1-31 show hourly data with status flags (S, C, X, Y, G, P) and values. Rows 32-33 show HOURLY MAX and HOURLY AVG.

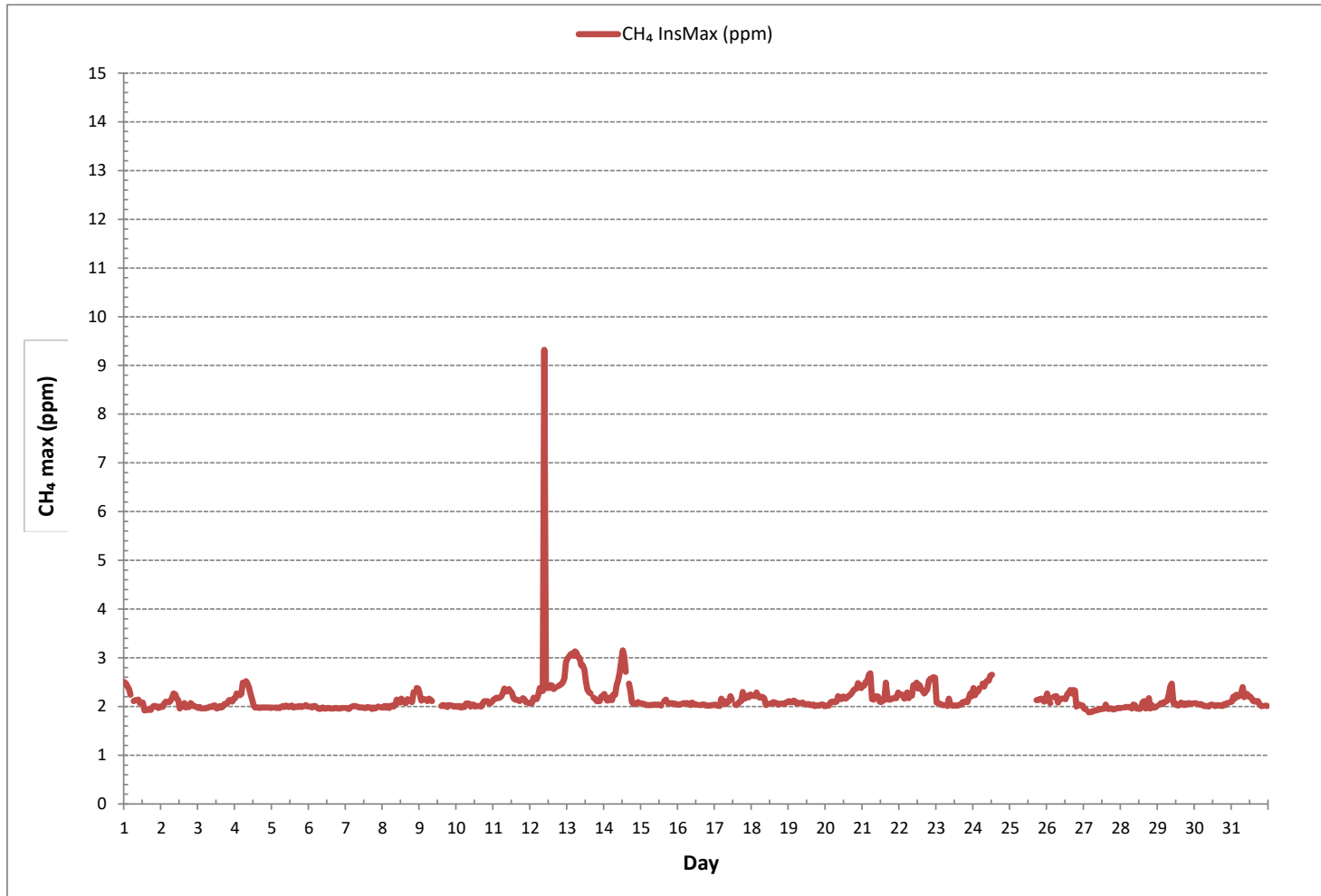
STATUS FLAG CODES

Table mapping status codes to descriptions: C - MONTHLY CALIBRATION, C1 - REPEAT CALIBRATION, Y - MAINTENANCE, S - DAILY ZERO/SPAN CHECK, S1 - REPEAT ZERO/SPAN CHECK, Q - QUALITY ASSURANCE, R - RECOVERY, X - MACHINE MALFUNCTION, G - OUT FOR REPAIR, P - POWER FAILURE.

MONTHLY SUMMARY

Summary table with 2 columns: Label and Value. Includes: NUMBER OF NON-ZERO READINGS: 679; MAXIMUM INSTANTANEOUS VALUE: 9.32 ppm @ HOUR 9 ON DAY 12; IZS CALIBRATION TIME: 32 hrs; MONTHLY CALIBRATION TIME: 5 hrs; STANDARD DEVIATION: 0.34; OPERATIONAL TIME: 716 hrs.

METHANE MAX Instantaneous Maximum (CH<sub>4</sub> ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

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	0.04	0.05	0.05	0.03	0.05	S	0.03	0.04	0.05	0.03	0.04	0.01	0.02	0.00	0.00	0.01	0.01	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.05	0.02	24	
2	0.01	0.00	0.00	0.01	S	0.04	0.11	0.07	0.20	0.07	0.24	0.07	0.02	0.02	0.01	0.03	0.03	0.02	0.03	0.02	0.01	0.02	0.03	0.01	0.00	0.24	0.05	24	
3	0.01	0.01	0.00	S	0.01	0.00	0.00	0.01	0.09	0.01	0.02	0.01	0.01	0.03	0.01	0.00	0.28	0.01	0.01	0.00	0.03	0.05	0.01	0.04	0.00	0.28	0.03	24	
4	0.02	0.03	S	0.03	0.03	0.17	0.09	0.11	0.10	0.20	0.20	0.04	0.01	0.00	0.00	0.00	0.13	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.20	0.05	24	
5	0.00	S	0.01	0.03	0.00	0.00	0.29	0.01	0.00	0.00	0.00	0.00	0.05	0.08	0.09	0.00	0.04	0.00	0.08	0.01	0.00	0.00	0.02	0.01	0.00	0.29	0.03	24	
6	S	0.02	0.01	0.00	0.00	0.02	0.00	0.01	0.00	0.02	0.24	0.01	0.03	0.03	0.02	0.92	0.08	0.40	0.02	0.02	0.02	0.02	0.01	S	0.00	0.92	0.09	24	
7	0.00	0.01	0.01	0.03	0.04	0.01	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.14	0.03	0.01	0.02	0.00	0.01	0.00	0.00	S	0.02	0.00	0.14	0.02	24	
8	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.03	0.00	0.01	0.00	0.01	0.01	1.49	0.23	0.01	0.15	0.00	S	0.02	0.03	0.00	1.49	0.09	24	
9	0.03	0.03	0.01	0.00	0.00	0.01	0.02	0.01	0.17	C	C	C	C	C	C	0.00	0.02	0.20	0.21	0.01	0.00	S	0.01	0.02	0.00	0.21	0.04	24	
10	0.00	0.00	0.03	0.00	0.00	0.01	0.02	0.07	0.25	0.01	0.20	0.02	0.00	0.01	0.00	0.08	0.01	0.02	0.02	S	0.01	0.01	0.06	0.00	0.00	0.25	0.04	24	
11	0.01	0.02	0.01	0.01	0.01	0.21	0.06	0.03	0.01	0.04	0.04	0.02	0.03	0.06	0.02	0.02	0.04	0.05	S	0.06	0.05	0.04	0.03	0.05	0.01	0.21	0.04	24	
12	0.05	0.03	0.03	0.03	0.03	0.05	0.04	0.05	0.40	1.07	0.05	0.09	0.08	2.39	0.19	0.08	0.39	S	0.10	0.10	0.12	0.12	0.12	0.16	0.03	2.39	0.25	24	
13	0.20	0.20	0.22	0.19	0.23	0.22	0.20	0.21	0.20	0.35	0.22	0.22	0.14	0.18	0.12	0.09	S	0.09	0.08	0.06	0.06	0.05	0.06	0.08	0.05	0.35	0.16	24	
14	0.08	0.07	0.07	0.09	0.07	0.05	0.06	0.08	0.10	0.10	0.11	0.13	0.14	0.16	0.18	S	0.20	0.16	0.08	0.06	0.04	0.06	0.06	0.05	0.04	0.20	0.09	24	
15	0.05	0.04	0.03	0.01	0.03	0.01	0.01	0.03	0.41	0.01	0.03	0.01	0.00	0.02	S	0.03	0.02	0.34	0.04	0.02	0.02	0.02	0.01	0.01	0.00	0.41	0.05	24	
16	0.01	0.00	0.01	0.00	0.01	0.01	0.09	0.03	0.08	0.01	1.30	0.00	0.26	S	0.09	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.02	0.00	1.30	0.09	24	
17	0.01	0.01	0.01	0.01	1.35	0.00	0.01	0.01	0.06	0.03	0.02	0.06	S	0.01	0.05	0.59	0.63	0.36	2.07	0.15	0.07	0.04	0.07	0.07	0.00	2.07	0.25	24	
18	0.04	0.05	0.05	0.03	0.04	0.41	0.35	0.12	0.01	0.00	0.01	S	0.01	0.04	0.00	0.03	0.13	0.01	0.00	0.02	0.01	0.01	0.01	0.02	0.00	0.41	0.06	24	
19	0.44	0.41	0.42	0.00	0.01	0.00	0.03	0.00	0.01	0.01	S	0.00	0.01	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.44	0.06	24	
20	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.16	S	0.03	0.02	0.02	0.06	0.06	0.08	0.18	0.11	0.10	0.14	0.18	0.15	0.12	0.12	0.00	0.18	0.07	24	
21	0.14	0.14	0.15	0.16	0.15	0.13	0.08	0.07	S	0.06	0.05	0.06	0.04	0.26	0.06	0.10	0.41	0.12	0.05	0.05	0.05	0.09	0.08	0.04	0.04	0.41	0.11	24	
22	0.06	0.06	0.05	0.08	0.08	0.10	0.07	S	0.34	0.08	0.11	0.07	0.22	0.11	0.11	0.11	0.16	0.09	0.12	0.13	0.13	0.17	0.19	0.16	0.05	0.34	0.12	24	
23	0.02	0.02	0.03	0.02	0.01	0.02	S	0.02	0.01	0.02	0.01	0.02	0.02	0.00	0.01	0.01	0.02	0.63	0.00	0.02	0.03	0.03	0.02	0.05	0.00	0.63	0.05	24	
24	0.02	0.03	0.03	0.03	0.05	S	3.38	0.20	0.19	0.26	0.11	0.28	0.15	X	X	X	X	X	X	X	X	X	X	X	X	0.02	3.38	0.39	13
25	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	C1	C1	C1	C1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7	
26	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	1.82	0.00	0.00	0.00	0.76	0.00	0.00	0.00	1.82	0.11	24	
27	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
28	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	
29	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	S	0.00	0.00	0.00	24	
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	24	
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	24	
HOURLY MAX	0.44	0.41	0.42	0.19	1.35	0.41	3.38	0.21	0.41	1.07	1.30	0.28	0.26	2.39	0.19	0.92	1.49	1.82	2.07	0.15	0.18	0.76	0.19	0.16					
HOURLY AVG	0.05	0.04	0.04	0.03	0.08	0.05	0.17	0.04	0.10	0.09	0.11	0.04	0.05	0.13	0.04	0.08	0.16	0.16	0.10	0.04	0.03	0.06	0.03	0.04					

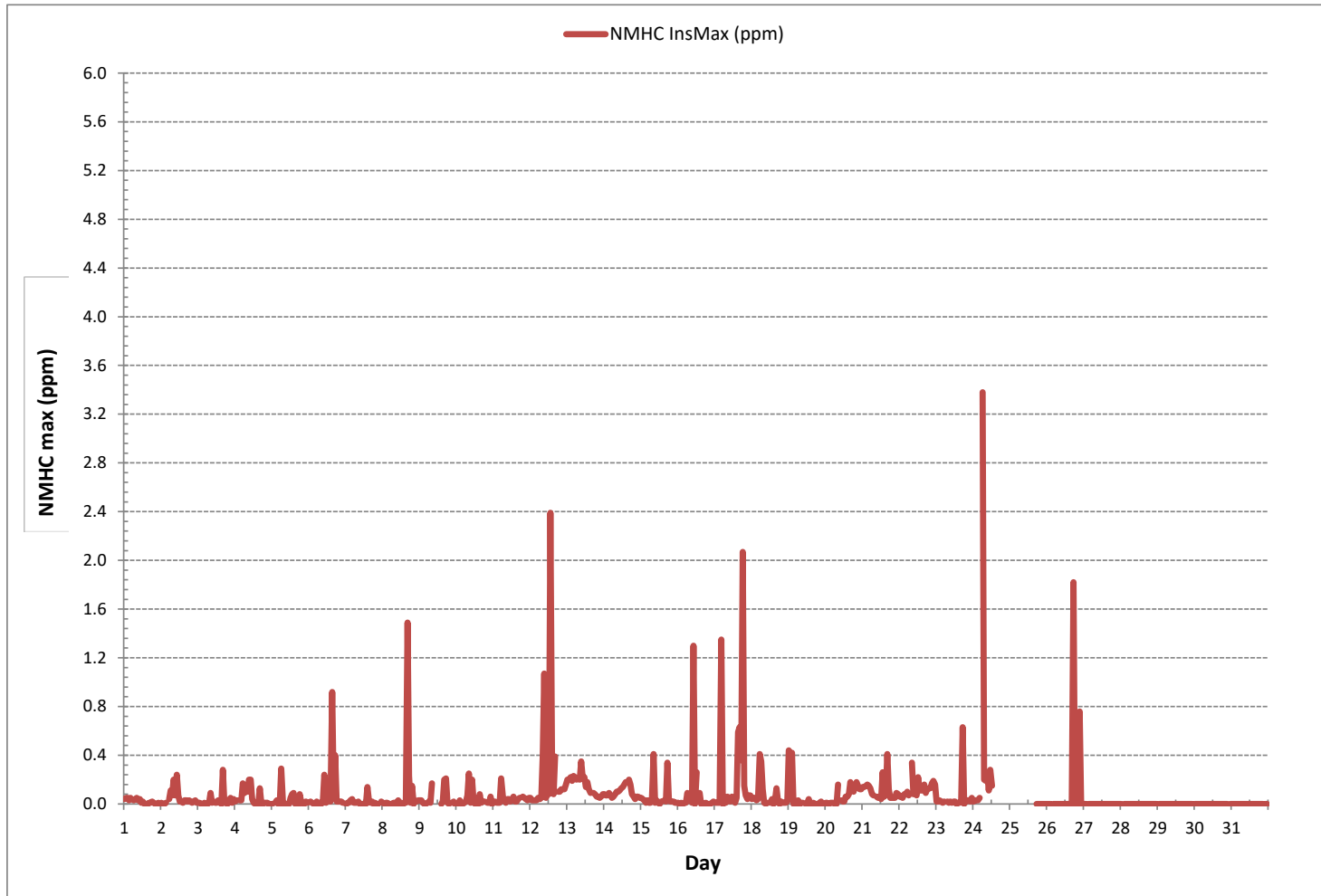
STATUS FLAG CODES

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:	445
MAXIMUM INSTANTANEOUS VALUE:	3.38 ppm @ HOUR 6 ON DAY 24
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	716 hrs
STANDARD DEVIATION:	0.23

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> 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	6	6	9	5	7	S	4	4	5	8	9	10	7	2	3	3	4	3	7	8	6	5	7	5	2	10	6	24			
2	6	3	11	11	S	16	32	69	47	39	30	21	8	7	8	10	7	8	8	8	11	8	7	9	3	69	17	24			
3	6	4	9	S	10	5	5	5	6	9	8	7	5	5	6	7	14	12	13	22	19	20	13	15	4	22	10	24			
4	9	15	S	12	19	31	33	30	31	27	22	22	11	7	10	18	7	7	8	8	6	5	7	4	4	33	15	24			
5	4	S	4	6	7	8	34	4	6	5	5	2	3	5	5	4	6	5	3	8	4	4	4	5	2	34	6	24			
6	S	4	3	4	4	3	4	5	5	7	12	6	6	24	7	7	9	7	12	3	2	2	3	S	2	24	6	24			
7	6	7	6	6	8	7	7	6	5	3	1	1	1	1	1	3	1	1	1	1	1	1	1	S	2	1	8	3	24		
8	2	2	1	1	2	1	S1	S1	7	9	C	C	C	C	C	C	C	C	14	19	16	S	18	27	1	27	9	22			
9	36	13	13	9	9	9	15	14	10	15	7	6	11	11	6	9	11	19	5	5	S	4	5	6	4	36	11	24			
10	10	8	9	6	7	13	34	31	27	8	10	23	10	3	6	7	4	10	20	S	4	4	3	3	3	34	11	24			
11	2	2	2	4	5	16	12	17	11	9	8	4	6	5	5	5	7	4	S	4	4	6	5	5	2	17	6	24			
12	6	4	5	10	5	7	11	8	28	29	9	10	8	9	10	11	21	S	8	11	15	13	12	14	10	6	5	2	18	9	24
13	31	31	33	30	35	33	33	52	34	45	45	37	17	13	14	13	S	12	9	7	10	9	7	8	7	52	24	24			
14	7	5	4	3	4	3	7	5	6	7	7	13	16	22	20	S	26	19	6	4	4	6	7	6	3	26	9	24			
15	4	4	3	2	5	7	9	12	18	18	8	7	3	5	S	8	11	15	13	12	14	10	6	5	2	18	9	24			
16	7	11	7	7	4	8	13	23	8	9	6	6	6	S	21	10	18	12	4	5	3	3	3	5	3	23	9	24			
17	9	8	9	5	6	7	6	25	39	48	38	34	S	10	11	18	33	36	37	36	30	35	35	42	5	48	24	24			
18	33	33	33	31	20	39	47	45	29	9	8	S	13	14	9	11	7	10	11	17	12	15	12	12	7	47	20	24			
19	14	10	14	9	10	9	6	7	7	6	S	6	5	10	6	6	6	9	5	7	5	5	4	2	2	14	7	24			
20	2	3	2	2	3	2	2	4	15	S	3	3	6	5	8	8	7	6	8	15	17	24	16	9	2	24	7	24			
21	10	12	17	15	16	12	9	12	S	20	10	3	3	8	5	9	14	13	8	7	7	6	11	11	3	20	10	24			
22	14	12	12	5	4	4	8	S	7	7	9	12	17	14	16	17	20	23	30	21	21	24	26	26	4	30	15	24			
23	3	3	2	2	3	24	S	3	2	3	3	3	4	4	4	5	23	11	18	11	21	22	21	2	2	24	9	24			
24	25	13	13	18	18	S	45	56	44	79	40	37	23	19	23	20	17	67	53	47	47	48	56	18	13	79	36	24			
25	7	10	7	7	S	8	7	11	27	11	14	19	11	14	17	14	12	11	22	56	28	11	8	7	7	56	15	24			
26	11	7	7	S	6	5	8	9	11	4	6	5	7	24	34	32	29	79	35	5	7	7	6	6	4	79	15	24			
27	8	7	S	2	3	3	3	2	3	3	2	2	2	2	2	2	2	2	1	1	1	1	2	3	1	8	3	24			
28	3	S	4	4	7	4	6	4	25	24	4	3	3	2	147	135	3	5	5	8	11	4	5	5	2	147	18	24			
29	S	8	13	12	11	11	14	31	81	41	5	13	8	7	5	9	8	6	6	6	7	3	4	S	3	81	14	24			
30	3	3	3	3	3	11	4	3	5	3	3	4	4	5	4	14	5	8	4	9	5	4	S	4	3	14	5	24			
31	5	5	6	7	12	5	13	39	22	14	18	22	11	9	11	7	10	9	5	5	5	S	4	4	4	39	11	24			
HOURLY MAX	36	33	33	31	35	39	47	69	81	79	45	37	23	24	147	135	33	79	53	56	47	48	56	42							
HOURLY AVG	10	9	9	8	9	11	15	18	19	17	12	12	8	9	15	15	11	15	13	14	11	11	11	10							

STATUS FLAG CODES

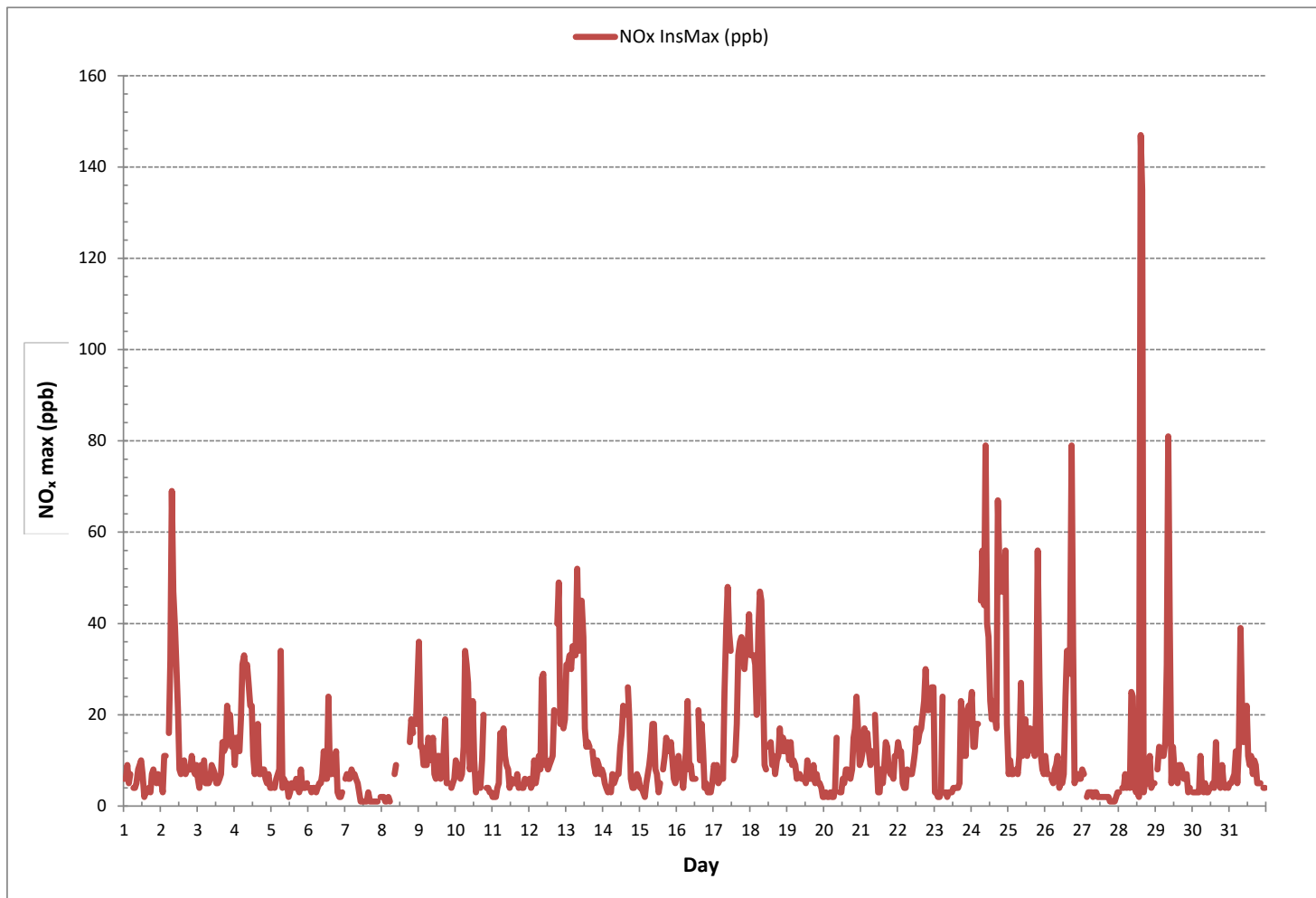
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	701
MAXIMUM INSTANTANEOUS VALUE:	147 ppb @ HOUR 14 ON DAY 28
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	742 hrs
STANDARD DEVIATION:	14



OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

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	1	8	1	1	S	0	0	0	2	4	3	2	1	1	1	1	1	1	1	1	2	1	1	0	8	1	24	
2	1	1	2	2	S	1	9	41	26	20	19	9	2	2	6	2	1	2	1	4	2	1	1	1	1	1	41	7	24
3	1	1	1	S	1	1	2	1	2	2	2	2	2	1	1	1	2	3	3	3	2	3	1	2	1	3	2	24	
4	1	2	S	1	5	10	11	5	8	8	6	7	4	3	9	7	2	2	2	2	3	3	3	1	1	11	5	24	
5	2	S	2	3	3	3	11	1	2	1	1	1	1	2	1	2	2	2	1	1	2	1	1	4	1	11	2	24	
6	S	1	1	1	1	1	1	2	1	2	3	2	2	5	3	2	6	2	5	1	0	0	0	S	0	6	2	24	
7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	S	0	0	1	0	24	
8	1	1	0	0	1	1	S1	S1	1	2	C	C	C	C	C	C	C	C	C	3	5	2	S	1	5	0	5	2	22
9	8	3	3	4	3	2	4	4	3	4	2	3	4	4	3	3	7	8	1	1	S	1	1	2	1	8	3	24	
10	2	3	2	2	3	2	12	7	6	2	5	19	6	2	1	1	1	2	9	S	1	1	1	1	1	19	4	24	
11	1	0	0	1	1	9	3	4	1	3	2	2	8	2	2	2	1	1	S	0	1	2	1	1	1	0	9	2	24
12	2	1	1	4	1	1	2	1	11	15	3	5	3	4	3	3	11	S	15	22	3	3	2	1	1	22	5	24	
13	8	9	13	10	16	14	15	24	15	26	24	20	7	5	6	4	S	4	4	2	3	6	2	3	2	26	10	24	
14	3	1	1	0	1	1	4	1	1	5	2	4	6	9	7	S	4	2	0	0	1	0	1	1	0	9	2	24	
15	0	1	1	1	2	3	4	3	4	6	4	3	1	3	S	3	2	3	2	2	4	6	2	1	0	6	3	24	
16	2	4	2	4	1	2	5	11	3	2	3	2	S	13	4	7	9	2	2	1	1	2	3	1	13	4	24		
17	3	2	3	1	1	1	0	5	13	28	21	18	S	4	4	5	13	7	7	8	3	7	8	13	0	28	8	24	
18	7	6	6	6	2	9	14	13	4	3	2	S	4	4	3	6	2	2	3	6	4	7	3	2	2	14	5	24	
19	4	2	5	1	2	2	2	1	2	1	S	2	2	6	2	3	2	3	1	2	1	1	1	0	0	6	2	24	
20	0	1	1	0	0	0	0	1	5	S	1	2	5	2	4	3	2	0	0	2	1	2	1	1	0	5	2	24	
21	0	1	2	1	1	1	2	2	S	6	2	1	2	3	2	4	4	4	2	3	1	0	2	3	0	6	2	24	
22	4	2	3	1	1	0	1	S	2	2	3	5	9	5	4	3	3	5	2	2	1	1	2	0	9	3	24		
23	1	1	1	1	0	12	S	0	1	1	1	1	1	1	1	1	6	1	3	2	2	3	4	0	12	2	24		
24	5	1	3	2	3	S	18	27	19	45	19	21	10	8	10	6	3	49	33	17	17	21	28	3	1	49	16	24	
25	1	2	1	1	S	1	2	1	10	4	5	8	5	7	6	4	2	2	5	30	3	0	1	1	0	30	4	24	
26	2	1	2	S	1	1	1	3	1	1	2	2	3	16	19	17	4	40	8	1	2	1	1	1	1	40	6	24	
27	2	1	S	0	0	1	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	2	1	24	
28	0	S	0	0	2	1	1	0	4	4	1	1	1	1	111	109	1	1	1	1	2	1	1	1	0	111	11	24	
29	S	0	3	1	2	1	3	8	49	19	2	4	3	4	2	2	2	1	2	1	3	1	1	S	0	49	5	24	
30	0	1	1	1	1	4	1	1	1	3	1	2	2	1	3	6	2	1	2	1	1	0	S	0	0	6	2	24	
31	1	1	1	1	2	0	5	10	3	4	6	7	3	3	3	2	3	4	1	2	2	S	1	1	0	10	3	24	
HOURLY MAX	8	9	13	10	16	14	18	41	49	45	24	21	10	16	111	109	13	49	33	30	17	21	28	13					
HOURLY AVG	2	2	2	2	2	3	5	6	7	7	5	5	3	4	8	7	3	6	4	4	2	3	2	2					

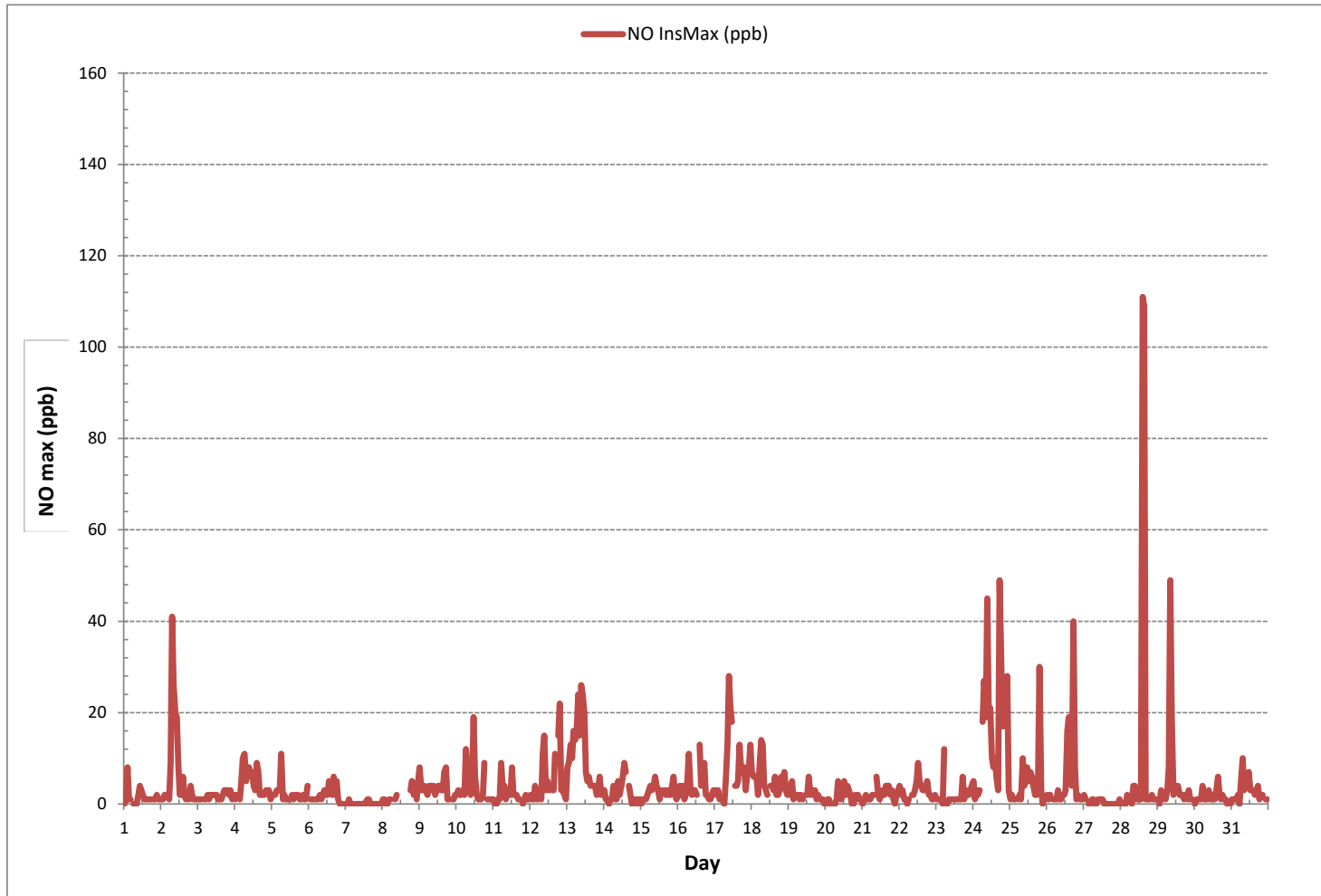
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	626
MAXIMUM INSTANTANEOUS VALUE:	111 ppb @ HOUR 14 ON DAY 28
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	742 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> 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	6	6	6	5	7	S	4	4	4	7	7	7	5	2	2	3	3	3	6	8	5	4	6	5	2	8	5	24	
2	5	3	10	10	S	16	23	29	24	19	13	12	7	6	6	9	6	7	7	7	10	8	6	8	3	29	11	24	
3	5	3	9	S	10	4	4	5	6	8	6	5	4	4	5	7	13	9	10	21	18	17	12	13	3	21	9	24	
4	9	14	S	11	14	21	22	25	25	22	16	16	8	5	6	12	6	6	6	7	5	2	4	3	2	25	12	24	
5	2	S	3	4	4	5	23	4	5	4	3	2	2	4	4	3	4	4	3	8	3	3	3	3	2	23	4	24	
6	S	3	3	3	3	2	3	4	4	5	9	4	5	19	5	6	6	6	7	2	1	2	3	S	1	19	5	24	
7	6	7	5	6	7	7	7	6	4	3	1	1	1	1	1	2	1	1	1	1	1	1	S	2	1	7	3	24	
8	2	1	1	1	1	1	S1	S1	6	7	C	C	C	C	C	C	C	C	12	14	14	S	17	23	1	23	8	22	
9	28	11	10	5	8	7	12	12	8	11	6	5	8	8	4	7	5	11	4	4	S	4	4	4	4	4	28	8	24
10	7	6	7	4	4	11	24	26	23	7	7	7	4	2	4	6	4	8	16	S	3	3	2	2	2	2	26	8	24
11	2	2	2	3	4	9	11	15	10	6	6	3	3	3	3	4	5	4	S	4	3	5	5	4	2	15	5	24	
12	5	3	4	6	4	6	9	7	19	20	7	6	5	6	7	10	18	S	25	27	16	18	15	19	3	27	11	24	
13	23	23	23	21	19	20	18	29	20	19	21	18	10	9	9	9	S	8	7	5	6	7	7	5	5	29	15	24	
14	5	4	3	2	3	3	4	4	6	5	5	9	11	14	13	S	23	19	6	4	4	6	7	5	2	23	7	24	
15	4	4	3	2	3	5	6	8	14	14	5	4	2	3	S	6	10	12	11	10	10	6	5	4	2	14	7	24	
16	5	7	5	5	4	6	8	15	7	8	4	4	4	S	9	6	11	7	3	4	2	2	2	4	2	15	6	24	
17	7	5	6	4	5	6	6	21	28	24	19	18	S	6	8	15	26	29	33	30	28	28	29	30	4	33	18	24	
18	27	28	27	25	19	29	32	32	26	6	7	S	10	10	6	7	6	8	8	10	10	12	10	10	6	32	16	24	
19	10	8	9	8	8	7	5	6	5	5	S	4	4	5	4	3	5	6	4	5	4	4	3	1	1	10	5	24	
20	1	2	2	1	2	2	2	3	11	S	3	3	3	3	5	5	6	6	8	13	15	23	16	9	1	23	6	24	
21	10	12	15	14	15	11	7	11	S	14	7	2	2	5	4	7	9	9	7	5	6	6	8	9	2	15	8	24	
22	11	10	9	4	4	3	8	S	6	6	6	7	8	10	12	15	17	21	26	20	19	23	26	25	3	26	13	24	
23	3	2	2	2	2	16	S	3	2	2	3	2	3	3	3	4	5	18	11	16	11	21	21	18	2	21	7	24	
24	20	12	10	16	15	S	27	30	29	40	22	22	13	11	14	14	16	26	27	29	30	29	30	16	10	40	22	24	
25	6	8	6	6	S	7	7	10	22	8	9	12	6	9	11	11	10	10	18	27	26	11	7	7	6	27	11	24	
26	9	6	6	S	4	5	7	6	10	3	4	4	4	13	18	17	25	39	27	5	6	7	5	5	3	39	10	24	
27	6	6	S	2	2	3	3	1	2	3	2	2	2	2	2	2	2	2	1	1	1	1	2	3	1	6	2	24	
28	3	S	4	3	5	3	5	4	21	20	3	2	2	1	97	80	3	5	5	7	9	3	5	4	1	97	13	24	
29	S	8	9	11	9	10	12	22	32	25	4	9	5	5	4	7	7	5	5	4	3	3	S	3	3	32	9	24	
30	3	3	3	2	2	7	3	4	2	2	3	3	3	3	3	8	4	7	3	8	4	4	S	4	2	8	4	24	
31	5	5	5	6	10	4	9	29	20	10	13	15	8	6	8	6	6	6	4	4	4	S	4	3	3	29	8	24	
HOURLY MAX	28	28	27	25	19	29	32	32	32	40	22	22	13	19	97	80	26	39	33	30	30	29	30	30					
HOURLY AVG	8	7	7	7	7	8	11	13	13	11	8	7	5	6	10	10	9	10	10	10	9	9	9	9					

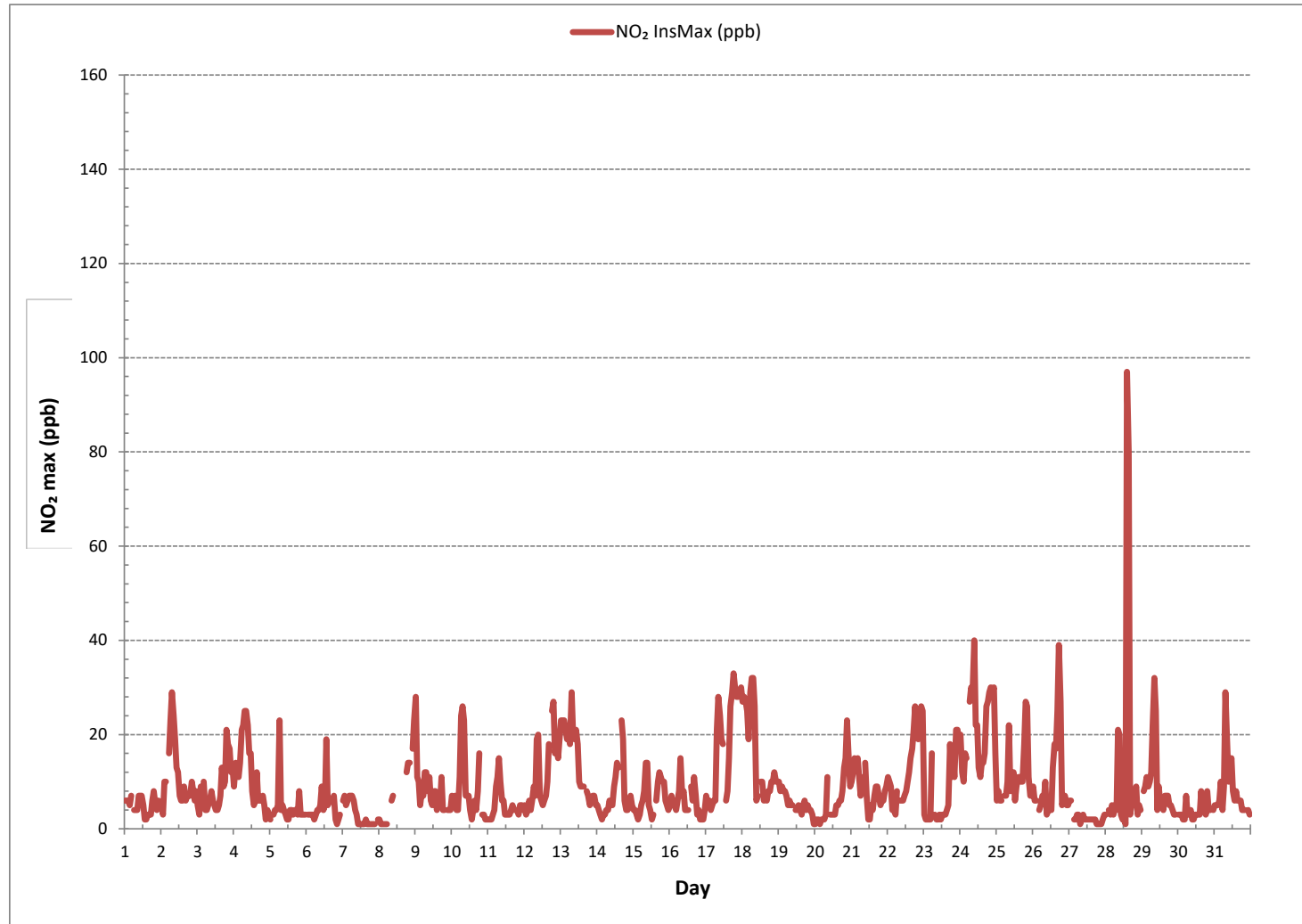
STATUS FLAG CODES

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:	701
MAXIMUM INSTANTANEOUS VALUE:	97 ppb @ HOUR 14 ON DAY 28
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	9
OPERATIONAL TIME:	742 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

OZONE Instantaneous Maximum (O<sub>3</sub> 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	21.6	20.6	21.1	21.5	25.3	S	24.7	24.0	23.9	27.7	28.9	30.3	37.5	37.9	37.9	37.3	36.9	36.5	36.0	34.4	34.5	34.8	34.1	33.8	20.6	37.9	30.5	24	
2	32.2	32.1	32.2	23.7	S	25.1	17.5	14.2	1.4	7.6	15.7	32.8	34.2	34.4	36.4	35.5	35.3	32.9	32.4	31.4	32.2	33.4	34.4	34.2	1.4	36.4	27.9	24	
3	35.6	34.5	35.0	S	34.2	35.0	34.1	33.1	32.2	33.3	33.9	36.1	37.4	38.4	39.4	39.4	34.1	34.6	33.7	30.0	26.0	27.0	23.2	29.2	23.2	39.4	33.4	24	
4	27.5	20.5	S	24.4	18.5	10.4	12.0	8.2	7.9	11.9	18.3	25.9	30.4	31.4	30.9	31.0	32.0	31.3	33.3	34.8	35.0	35.4	35.4	36.7	7.9	36.7	25.4	24	
5	36.8	S	37.2	37.0	36.7	35.8	35.7	36.6	36.1	35.7	36.1	36.5	36.9	36.8	35.8	34.7	34.7	34.4	34.4	34.2	33.8	34.3	34.6	33.8	33.8	37.2	35.6	24	
6	S	34.8	34.9	35.2	35.3	35.3	35.3	35.1	34.5	34.5	32.7	32.0	30.8	31.1	31.4	30.8	30.5	30.1	30.0	28.8	29.3	29.3	28.6	S	28.6	35.3	32.3	24	
7	29.4	26.3	27.2	26.3	22.6	23.0	23.6	26.6	30.2	32.5	33.2	34.1	34.5	33.8	33.5	33.9	35.0	35.1	34.8	35.2	36.1	35.7	S	35.2	22.6	36.1	31.2	24	
8	35.3	36.3	36.8	37.1	37.1	37.5	37.5	36.4	34.4	33.4	32.8	33.5	34.1	34.3	34.0	34.2	32.1	30.9	28.8	26.6	25.0	S	18.2	18.6	18.2	37.5	32.4	24	
9	30.8	28.8	30.9	32.6	32.2	31.9	30.4	29.0	31.0	C	C	C	C	C	C	C	33.9	34.4	34.6	35.4	S	34.9	34.6	34.8	28.8	35.4	32.5	24	
10	34.6	35.3	35.7	36.2	35.5	34.3	27.2	21.2	30.6	35.0	34.8	35.3	35.2	35.8	35.1	34.9	34.3	33.5	30.3	S	33.1	33.7	33.7	33.1	21.2	36.2	33.4	24	
11	33.1	32.9	32.1	31.3	30.5	28.7	27.3	28.0	28.6	29.9	31.7	32.4	32.9	32.8	33.0	32.9	32.6	32.1	S	30.9	30.9	30.6	30.4	29.9	27.3	33.1	31.1	24	
12	29.7	29.5	28.7	28.2	27.0	26.7	24.2	23.0	21.8	19.4	24.7	22.9	23.1	24.0	22.2	20.8	19.4	S	13.7	15.3	15.3	11.1	11.2	8.8	8.8	29.7	21.3	24	
13	6.4	4.6	1.3	1.2	0.8	0.8	0.5	2.7	2.2	5.7	7.0	12.7	14.1	14.9	16.2	20.5	S	15.9	19.0	19.2	18.0	18.3	21.7	21.8	0.5	21.8	10.7	24	
14	22.4	21.9	21.1	20.5	20.0	19.4	19.1	18.6	23.4	24.3	24.8	24.8	20.5	21.3	21.3	S	16.6	26.4	27.5	28.2	31.6	31.7	21.7	21.5	16.6	31.7	23.0	24	
15	22.6	25.7	28.2	30.2	31.4	32.3	32.1	29.8	28.4	31.0	33.4	33.8	34.1	32.9	S	33.9	32.4	30.1	30.3	31.0	33.2	32.9	33.3	34.1	22.6	34.1	31.2	24	
16	34.0	32.1	32.3	30.7	30.8	30.4	29.8	30.0	30.9	32.5	33.9	33.8	33.8	S	33.1	31.7	31.8	34.1	33.7	33.4	36.4	36.9	36.2	35.1	29.8	36.9	32.9	24	
17	34.5	34.0	33.6	33.2	31.4	28.8	26.9	24.9	15.7	15.5	22.2	29.9	S	35.3	36.4	35.1	28.9	19.5	13.6	17.7	9.7	10.6	10.1	10.0	9.7	36.4	24.2	24	
18	8.3	4.9	8.4	8.9	15.6	14.4	6.4	18.1	35.0	38.2	37.5	S	36.3	35.3	35.3	34.6	35.0	36.2	35.9	34.5	31.9	31.1	30.1	31.2	4.9	38.2	26.2	24	
19	31.6	33.2	32.6	33.0	35.1	35.7	35.2	35.2	34.1	34.9	S	36.6	37.5	37.7	37.1	38.0	38.3	39.7	40.0	39.7	38.8	38.6	38.9	39.1	31.6	40.0	36.5	24	
20	39.0	38.9	38.8	38.8	38.4	37.7	37.3	36.9	36.1	S	35.9	35.7	35.1	34.3	33.5	33.2	31.6	30.2	29.6	28.5	25.3	15.4	24.9	25.5	15.4	39.0	33.1	24	
21	23.8	20.7	17.8	17.3	15.2	23.5	23.4	23.0	S	17.3	26.2	26.6	26.5	26.6	27.7	27.0	23.9	24.2	24.0	24.6	23.8	22.9	22.8	21.6	15.2	27.7	23.1	24	
22	21.0	22.6	23.8	24.0	24.8	24.3	23.8	S	22.2	21.9	21.7	24.1	25.4	26.3	24.7	23.1	21.5	18.7	13.2	12.2	12.9	12.6	6.3	22.3	6.3	26.3	20.6	24	
23	23.1	26.0	31.1	33.6	34.2	33.1	S	37.2	36.9	36.6	37.9	38.5	38.7	37.9	37.4	37.8	36.8	32.5	27.1	24.4	24.2	19.3	18.3	16.5	16.5	38.7	31.3	24	
24	19.1	17.3	19.8	17.8	19.7	S	12.2	1.8	8.9	8.5	15.2	22.6	20.9	23.4	22.6	21.0	19.8	14.8	10.4	2.8	3.0	0.9	12.2	26.0	0.9	26.0	14.8	24	
25	27.6	26.2	26.2	25.1	S	25.1	24.8	23.8	23.4	23.8	24.4	24.8	23.8	22.3	22.3	25.0	25.2	27.6	27.4	19.7	17.1	23.2	27.5	27.3	17.1	27.6	24.5	24	
26	26.3	29.1	27.6	S	24.9	24.8	23.7	23.0	24.0	24.2	23.6	24.0	25.1	24.9	19.8	23.6	24.7	11.1	33.9	33.6	29.3	26.9	31.5	31.3	11.1	33.9	25.7	24	
27	29.6	33.2	S	36.2	35.9	31.2	38.4	43.3	42.2	38.2	38.3	38.1	38.2	39.1	39.5	39.6	40.1	41.6	42.9	42.8	43.7	44.1	42.4	40.3	29.6	44.1	39.1	24	
28	40.3	S	40.6	39.8	40.0	40.7	39.6	40.0	39.0	39.5	40.8	40.9	42.3	43.3	43.3	42.5	42.1	40.5	40.7	40.6	40.2	40.4	36.8	35.2	35.2	43.3	40.4	24	
29	S	31.1	31.0	25.8	24.9	24.4	21.3	S1	S1	S1	C1	C1	C1	C1	38.2	37.0	37.2	36.4	36.6	36.9	38.7	38.3	38.5	38.4	S	21.3	38.7	33.4	18
30	39.2	39.4	39.3	39.4	39.1	39.5	39.8	40.7	40.7	40.6	40.5	39.3	38.3	38.4	38.6	38.5	37.5	37.3	37.2	36.8	35.9	35.3	S	34.1	34.1	40.7	38.5	24	
31	33.5	32.8	32.5	32.3	30.6	31.6	30.5	25.6	27.9	28.9	30.8	31.0	29.6	29.4	27.8	28.9	27.7	28.7	30.3	30.7	30.5	S	29.7	30.1	25.6	33.5	30.1	24	
HOURLY MAX	40.3	39.4	40.6	39.8	40.0	40.7	39.8	43.3	42.2	40.6	40.8	40.9	42.3	43.3	43.3	42.5	42.1	41.6	42.9	42.8	43.7	44.1	42.4	40.3					
HOURLY AVG	28.6	27.8	28.9	28.3	28.5	28.3	26.5	26.6	27.0	27.2	29.2	31.0	31.7	32.1	31.8	32.3	31.4	30.4	29.9	29.2	28.5	28.3	27.6	28.7					

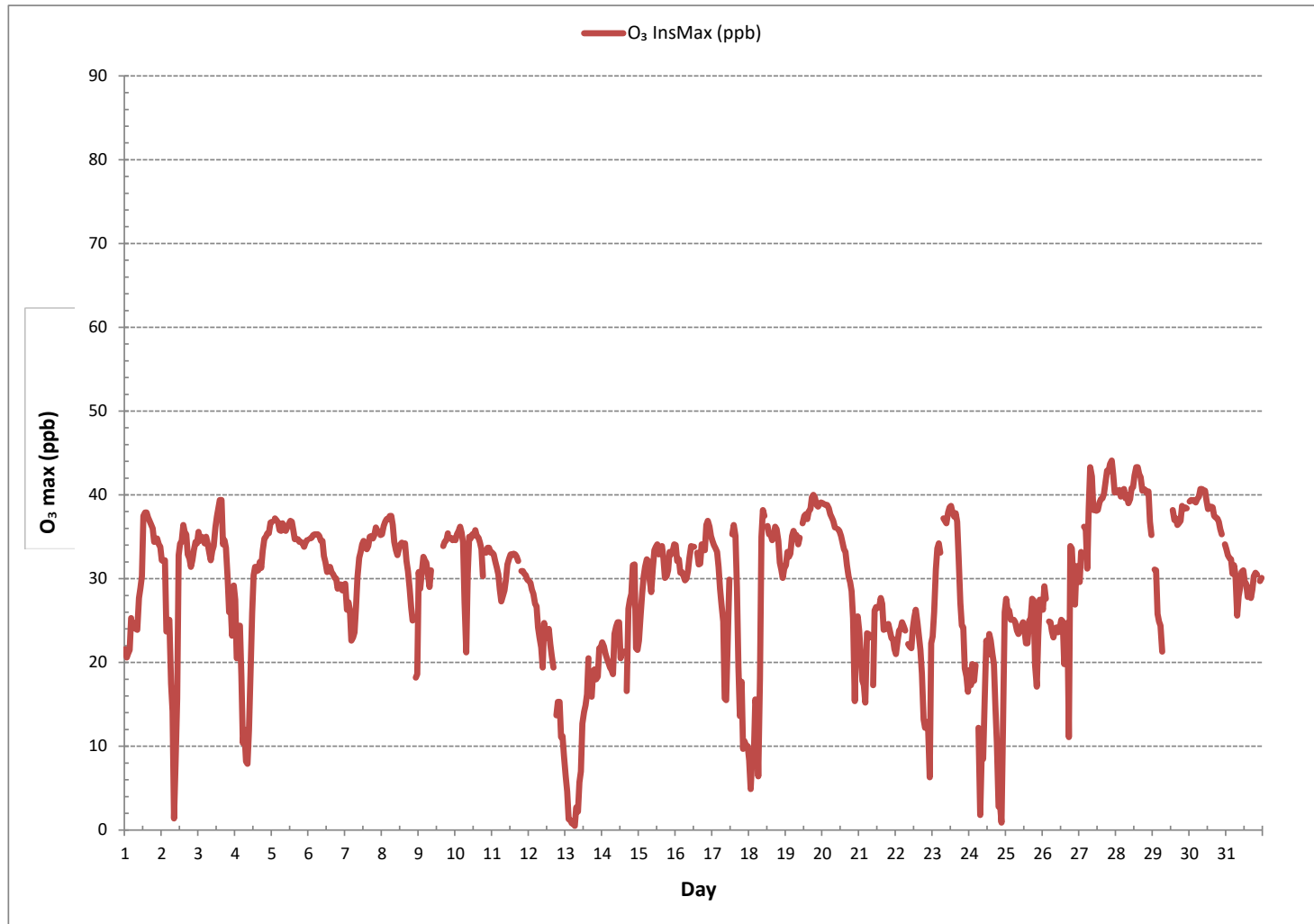
STATUS FLAG CODES

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:	698
MAXIMUM INSTANTANEOUS VALUE:	44.1 ppb @ HOUR 21 ON DAY 27
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	738 hrs
STANDARD DEVIATION:	8.7

OZONE Instantaneous Maximum (O<sub>3</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - January 2019

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	18.0	18.4	18.6	19.4	21.8	30.1	28.1	15.2	14.5	16.2	20.3	45.0	30.1	49.2	44.2	34.7	34.5	33.2	29.3	30.6	30.8	27.4	26.5	19.1	14.5	49.2	27.3	24
2	12.0	14.5	10.8	4.5	7.2	8.0	5.3	3.7	2.8	5.2	13.0	26.5	28.6	28.6	27.1	21.3	23.2	15.7	14.7	14.9	18.1	21.3	22.6	18.0	2.8	28.6	15.3	24
3	21.0	15.7	30.1	20.1	16.4	17.1	21.0	19.0	16.7	17.0	16.2	18.4	19.3	20.8	23.7	16.8	12.7	11.0	13.0	11.4	12.0	11.3	10.8	14.8	10.8	30.1	16.9	24
4	6.0	9.1	10.6	9.8	4.6	5.7	6.4	5.2	5.9	5.9	9.3	12.5	16.4	23.0	24.0	14.3	13.0	19.3	19.9	18.6	20.6	24.0	21.0	22.5	4.6	24.0	13.7	24
5	24.5	19.6	15.7	16.4	15.2	15.9	18.1	15.7	14.9	16.7	20.3	20.6	18.6	21.0	21.5	27.6	21.8	27.2	26.4	28.9	25.7	21.3	20.1	24.2	14.9	28.9	20.7	24
6	24.0	20.1	23.0	23.5	23.7	25.2	24.5	21.5	21.3	19.1	16.7	15.9	20.3	20.3	18.6	12.3	12.7	15.7	13.7	11.5	25.2	14.9	27.1	29.9	11.5	29.9	20.0	24
7	27.6	30.6	28.4	32.5	35.0	28.6	34.0	37.1	33.5	44.5	44.2	33.8	41.1	43.7	37.9	32.8	37.6	34.0	32.1	33.7	44.5	42.5	30.6	28.3	27.6	44.5	35.4	24
8	29.1	31.1	29.1	51.7	33.3	31.6	38.6	24.0	19.1	24.5	29.3	31.7	23.3	20.6	22.5	15.4	11.3	13.2	11.3	9.1	10.6	4.9	7.6	6.2	4.9	51.7	22.0	24
9	7.6	11.3	6.9	14.5	14.9	15.2	11.8	17.4	19.6	16.2	31.1	33.0	27.4	32.6	42.3	26.2	37.2	33.3	36.3	35.0	24.7	27.4	28.1	27.6	6.9	42.3	24.1	24
10	19.1	17.2	17.2	22.0	13.5	10.9	7.4	7.4	13.5	22.3	21.0	11.3	10.4	11.1	6.7	8.1	7.2	5.9	6.9	7.1	8.9	9.8	15.9	12.1	5.9	22.3	12.2	24
11	15.7	14.3	11.5	12.3	11.1	10.6	8.0	11.3	14.2	20.1	26.0	19.8	16.9	17.9	25.0	20.9	27.6	31.7	27.2	26.4	22.0	15.9	16.2	15.2	8.0	31.7	18.2	24
12	14.5	15.0	10.1	10.1	5.5	8.1	6.7	8.1	8.9	8.9	13.2	21.0	17.9	15.7	13.5	11.1	8.6	6.2	5.9	10.6	7.1	8.1	12.5	11.3	5.5	21.0	10.8	24
13	10.8	5.0	4.2	4.8	5.9	10.3	3.7	4.0	4.0	7.1	6.4	11.1	16.7	17.5	13.8	16.5	12.5	14.0	12.8	11.4	10.8	10.1	13.0	11.8	3.7	17.5	9.9	24
14	12.7	14.5	20.1	18.1	11.2	16.2	16.7	10.8	18.1	16.7	17.9	15.9	21.3	23.1	27.6	21.8	19.1	29.8	35.0	31.0	51.0	46.2	47.2	40.6	10.8	51.0	24.3	24
15	45.9	34.1	34.5	27.2	22.0	22.4	21.8	11.6	13.2	13.0	13.1	14.5	13.3	16.7	15.7	12.0	13.5	15.2	9.2	10.6	13.5	11.3	15.0	15.4	9.2	45.9	18.1	24
16	14.0	11.7	10.3	11.5	10.1	12.8	10.1	12.5	13.2	12.5	11.8	14.2	14.0	25.2	20.3	19.6	19.7	35.0	24.5	24.7	27.2	31.1	27.4	23.0	10.1	35.0	18.2	24
17	12.0	10.8	13.7	12.5	9.5	10.1	8.4	8.4	9.1	10.8	8.6	8.9	9.8	12.0	9.1	8.1	9.2	6.5	6.7	4.9	3.0	3.8	5.8	8.6	3.0	13.7	8.8	24
18	10.3	8.6	8.7	5.2	3.8	9.3	4.5	9.8	13.7	22.3	11.5	14.2	12.0	13.0	11.5	13.7	13.2	15.7	12.3	11.6	11.1	10.1	8.9	8.6	3.8	22.3	11.0	24
19	10.6	12.6	13.2	6.5	18.6	22.3	24.0	26.9	23.5	22.1	21.3	27.2	22.3	24.3	32.1	32.8	31.1	31.9	40.8	23.8	31.3	28.9	28.7	28.6	6.5	40.8	24.4	24
20	24.5	20.3	20.3	19.1	18.9	20.6	23.7	19.6	8.9	13.3	18.4	15.7	16.2	15.2	14.7	15.0	15.4	14.0	11.9	10.1	9.6	3.3	3.5	4.6	3.3	24.5	14.9	24
21	3.8	6.3	9.4	10.3	6.4	13.7	10.8	6.7	5.4	14.2	24.5	22.0	26.9	20.6	16.3	17.9	20.3	23.0	22.0	21.6	10.8	9.6	7.4	7.6	3.8	26.9	14.1	24
22	7.9	8.7	9.1	10.1	12.0	12.5	10.6	13.0	10.8	8.1	11.6	12.5	15.0	10.6	11.8	8.2	4.9	4.3	5.9	9.6	11.4	6.9	10.8	30.1	4.3	30.1	10.7	24
23	35.0	37.9	33.0	27.7	39.6	24.0	34.7	31.6	36.0	37.9	41.8	34.0	36.7	32.0	31.3	29.1	14.5	10.3	9.8	10.3	13.5	15.4	11.3	3.6	3.6	41.8	26.3	24
24	10.2	4.2	3.3	8.9	8.9	9.1	3.8	8.9	8.8	4.3	9.1	10.8	18.6	15.2	12.6	17.9	16.9	10.6	4.0	7.6	11.1	5.7	14.0	13.0	3.3	18.6	9.9	24
25	16.2	12.8	14.2	15.2	14.0	10.7	8.0	6.3	8.6	10.8	7.4	13.0	17.9	19.8	17.6	16.4	12.0	8.5	4.2	4.2	12.3	8.7	8.1	4.7	4.2	19.8	11.3	24
26	5.8	9.4	10.3	17.2	13.3	15.9	14.1	11.3	9.8	9.1	6.4	6.2	6.7	11.1	4.0	7.0	4.9	4.2	18.1	9.8	14.7	16.7	19.1	23.2	4.0	23.2	11.2	24
27	21.5	47.1	51.3	43.7	47.3	52.5	47.2	69.4	58.9	<b>81.4</b>	65.5	56.7	48.4	59.7	47.9	63.3	57.2	71.3	68.9	54.7	59.8	64.7	47.2	43.2	21.5	<b>81.4</b>	55.4	24
28	28.9	34.7	19.8	23.0	18.6	18.6	18.1	22.0	12.8	27.9	34.2	30.8	36.7	36.7	36.9	33.9	28.6	21.3	25.2	21.8	25.9	21.8	11.4	4.8	4.8	36.9	24.8	24
29	8.9	9.4	4.2	2.5	6.2	3.3	8.4	3.7	4.5	15.0	14.2	15.0	14.7	15.7	18.6	19.2	15.7	19.6	21.1	18.4	18.9	23.0	19.6	25.0	2.5	25.0	13.5	24
30	26.4	22.4	19.4	22.3	21.5	22.0	21.8	23.3	27.2	31.8	28.9	29.1	33.3	31.1	27.4	26.2	21.0	18.1	16.4	15.9	14.1	15.3	12.8	7.2	7.2	33.3	23.3	24
31	7.9	8.6	9.8	6.2	7.0	8.6	6.7	6.4	9.8	8.9	19.4	20.3	16.4	24.0	22.0	24.7	20.1	32.5	28.4	29.3	30.1	28.9	33.9	35.9	6.2	35.9	18.6	24
HOURLY MAX	45.9	47.1	51.3	51.7	47.3	52.5	47.2	69.4	58.9	81.4	65.5	56.7	48.4	59.7	47.9	63.3	57.2	71.3	68.9	54.7	59.8	64.7	47.2	43.2				

STATUS FLAG CODES

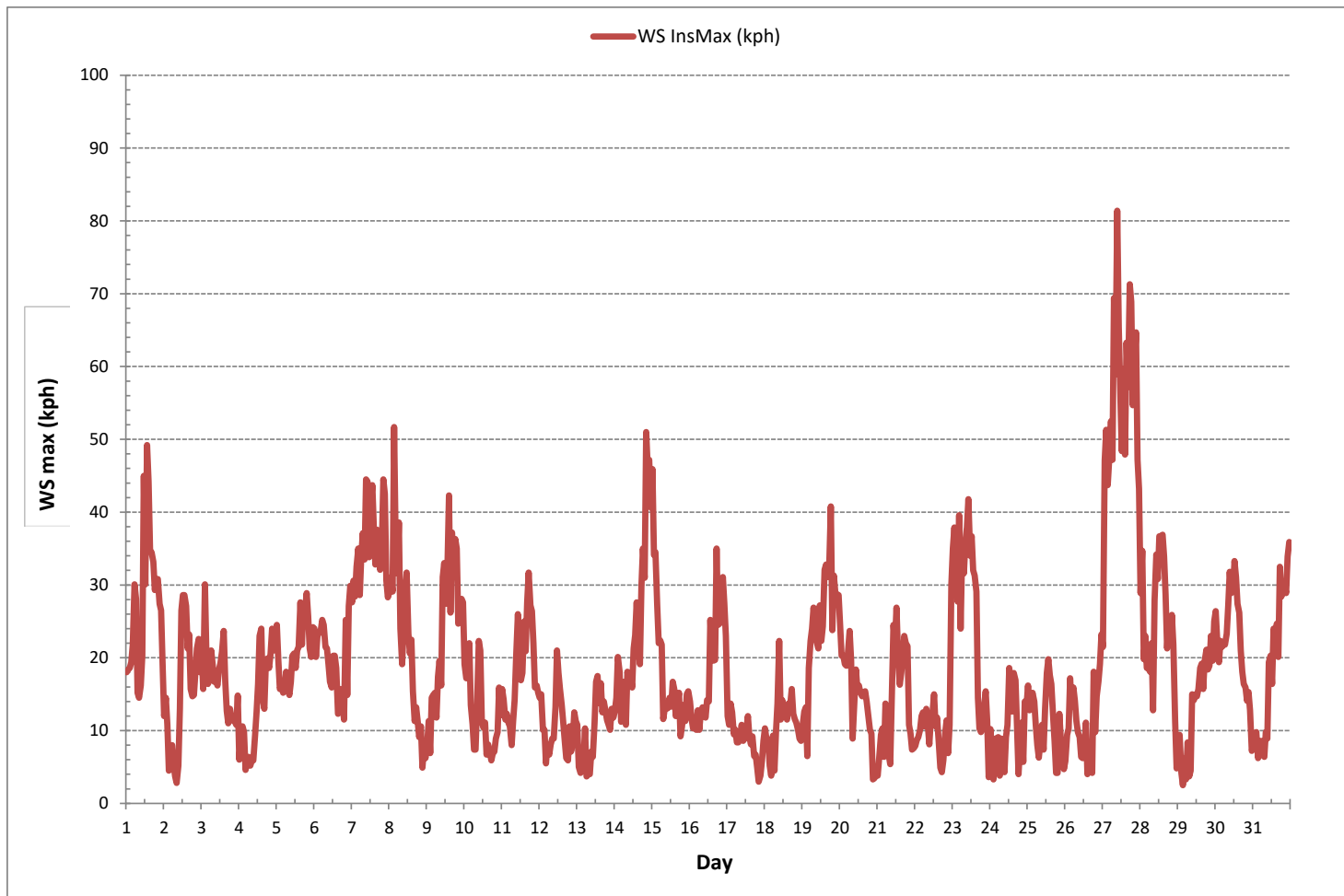
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	81.4	kph	@ HOUR	9	ON DAY	27	
OPERATIONAL TIME:						744	hrs



WIND SPEED Instantaneous Maximum (WS kph)



## 1.0 Quality Control Activities

Quality control procedures are established to govern the performance of the monitoring equipment and to protect operational uptime. Data collected during QC/QA activities are assigned a data validation code to comply with the requirements outlined in Chapter 6, 4.1.1, DQ 4-A (AMD, 2016). Calibrations are deemed successful only if the AMD calibration acceptance limits are met (Chapter 7, 9.0, AMD 2016).

A daily zero-span test procedure is performed for each gaseous parameter by challenging the analyzer with a zero-air source and span gas. Daily review of the data ensures the zero and span check are within the required acceptance limits and do not deviate more than  $\pm 10\%$  from the expected value. The total zero-span cycle is complete within an hour with the zero phase commencing at the beginning of the scheduled hour. This QC activity is conducted in accordance with Chapter 7, 4.0, Cal 4-A (AMD, 2016).

The allowable time for a zero-span check is one hour per calendar day. The time allotted for the zero-span check does not contribute to downtime and is identified with a data validation code of "S". If any additional zero-span response checks are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "S1". The initiation of an additional zero-span check may be warranted during the investigation of operational issues or suspect data.

Each month, a scheduled multipoint calibration is performed on each gas analyzer. Prior to any adjustments, an as-found response test is completed to obtain the zero reading of the analyzer and the response to the highest span concentration. The zero and high point test gases are then re-introduced into the analyzer to establish the zero and high set-points. Once these adjustments are satisfactory, a mid-point and a low-point test concentration is introduced. Additional multi-point calibrations are required if any of the conditions, outlined in Chapter 7, 2.1, Cal 2G (AMD, 2016) exist.

The time allotted for the first multi-point calibration is not considered downtime and is identified with a data validation code of "C". If any additional as-found response checks or multipoint calibrations are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "C1".

A mechanical wind system undergoes annual calibration, as a minimum, while an ultrasonic wind system is factory calibrated every two years (Chapter 6, 6.0, Cal 6-A, AMD 2016). Supplementary to this, a visual inspection of the equipment is performed during each scheduled monthly site visit.

The time allotted for the wind system calibration is not considered downtime and is identified with a data validation code of "C". If function checks or additional calibrations are performed, the time accrued during the QC activity is not considered downtime and is identified with a data validation code of "Q" and "C", respectively. If QC activity goes beyond 10% of the monthly operating time, the time exceeding 10% is considered downtime and is assigned a data validation code of "C1". Data identified with a data validation code of "Q" is in accordance with Chapter 6, 4.1.3 (AMD, 2016) which states QA/QC activities are not included when calculating data completeness.

High volume samplers are calibrated every three months, as a minimum, in accordance with Chapter 7, 7.0, Cal 7-B (AMD, 2016).

Where passive sampling is in practice, quality control samples will be deployed in accordance with Chapter 4, 3.0, 3.1.3. Method blanks, replicate samples and spiked blanks are exposed and handled in the same manner as each passive sample. To comply with the data submission requirements in Chapter 9, 3.1, the replicate and corresponding passive sample concentrations are reportable data values and have not been averaged.

As recommended in Chapter 6, 4.2 (AMD 2016), daily data review is conducted to verify data and avoid significant data losses. Automated flags, originating from the data-logger, and data anomalies are reviewed and may prompt the need to dispatch a technician for investigation and/or corrective action. Additionally, there are several automated alarm scenarios that serve to screen raw data, alert technicians and elicit investigation or corrective action.

Comparisons of the measured ambient concentrations to the corresponding AAAQO are assessed using the significant figures protocol in Chapter 9, 3.1.2. If the measurement is near the set objective, raw data may undergo necessary data adjustments to confirm a true exceedance. Should an exceedance occur, Maxxam will formally notify the client; however, the reporting protocol to AEP is defined by the client and may not involve Maxxam. Exceedance events are acknowledged in the report, based on the information available at the time.

## 2.0 Data Verification and Validation

The data validation procedures, outlined in Chapter 6, 4.0, AMD 2016, are used to accept, reject and qualify data. The data verification and validation process, and the current Data Collection and Management Process Flow Chart have been compiled from sections 4.2 to 4.6 (AMD, 2016) and are shown below.

Baseline adjustments are applied by interpolation between two valid zero checks, as determined by the Data Acquisition System. In the event that zero check results are not reliable, data may be adjusted by applying a constant offset to data collected between two adjacent zero checks. Both adjustment approaches are deemed acceptable by the AMD.

Table 1 (Chapter 6) outlines the quantitative parameter relationships to be considered and dictates that data adjustments are applied equally for NO/NO<sub>2</sub>/NO<sub>x</sub> and CH<sub>4</sub>/NMHC/THC parameters. Below zero adjustments are applied to 1-hour averages, in accordance with Table 2 (Chapter 6), and are done after baseline corrections.

Instantaneous data, where provided, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

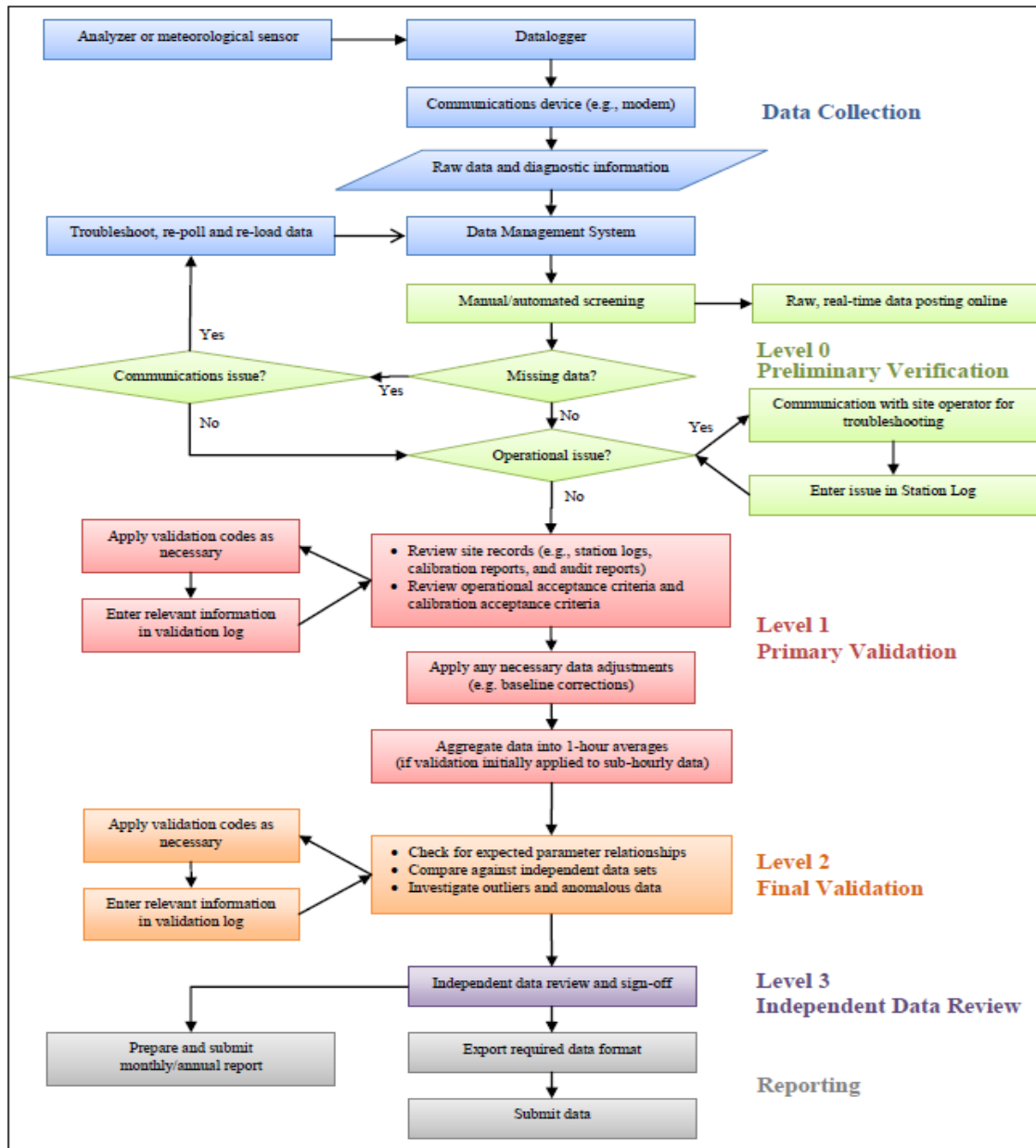
All calculations and reporting of results follow the methods described in the AMD, 2016.

There were no deviations from the prescribed methods.

**AMD Data Verification and Validation Process**

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

<p><b>Level 0 Preliminary Verification</b></p>	<p>Level 0 data are raw data obtained directly from the data acquisition system (DAS). At this level, data undergoes a certain amount of manual or automated screening and flagging. Screening checks include: a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/data-logger 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.</p>
<p><b>Level 1 Primary Validation</b></p>	<p>Primary validation involves more thorough evaluation and documentation of issues identified during data screening, along with appropriate application of data validation codes. Level 1 activities 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.</p>
<p><b>Level 2 Final Validation</b></p>	<p>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. At this level of review, some general knowledge of pollutant and meteorological behavior can be used to determine if data is suspect.</p>
<p><b>Level 3 Independent Data Review</b></p>	<p>Level 3 validation involves a final cursory review of validated data, and is completed by an individual independent of both field operations and primary data validation. At this level, a final independent QA review/endorsement is performed before data is submitted to Alberta Environment and Parks.</p>
<p><b>Post-Final Validation</b></p>	<p>The Post-Final Validation step serves to re-evaluate validated data for errors or omissions discovered and/or suspected after the initial monthly data submittal. This level of validation is performed on an annual basis, when annual reporting is required or requested.</p>



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



## Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2019-01-23-C</u>
<b>Site:</b> <u>Cold Lake South Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

<b>Level 0 Preliminary Verification</b>	<u><i>bimadeniji</i></u>	<b>Date</b> <u>14-Feb-2019</u>
<b>Level 1 Primary Validation</b>	<u><i>bimadeniji</i></u>	<b>Date</b> <u>14-Feb-2019</u>
<b>Level 2 Final Validation</b>	<u><i>bimadeniji</i></u>	<b>Date</b> <u>15-Feb-2019</u>
<b>Level 3 Independent Data Review</b>	<u><i>MSA/mbq</i></u>	<b>Date</b> <u>16-Feb-2019</u>
<b>Post-Final Validation</b>	<u>NA</u>	<b>Date</b> <u>NA</u>

<b>Notes</b>
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.

This page is intentionally blank and marks the conclusion of this report

JANUARY 1 - 31, 2019

MONTHLY AMBIENT AIR QUALITY MONITORING REPORT

Project #: 2833-2019-01-24-C

LICA-201901

Prepared for:

Lakeland Industry & Community Association

5107 50 St.

Bonnyville, Alberta, T9N 2J7

monitoring@lica.ca

780-266-7068

Maskwa Continuous Monitoring Station

Date of Report Issuance: February 28, 2019

Report Preparation By:

Bim Adeniji, M.Sc.

403-219-3677

aadeniji@maxxam.ca



Project Manager, Customer Service, Air Services

Reviewed By:

Wunmi Adekanmbi, M.Sc., Ept, PMP

403-219-3661

aadekanmbi@maxxam.ca



Project Team Lead, Customer Service, Air Services



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

LICA-201901

Page 96 of 350



**Lakeland Industry & Community Association**

Bonnyville, Alberta,  
T9N 2J7

**Attention: Mike Bisaga.**

**Date: February 28, 2019**

**Subject: MONTHLY INDUSTRIAL AIR MONITORING REPORT for JANUARY 1 - 31, 2019**

In January 2019, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Continuous Monitoring Station near Cold Lake, Alberta. The monitoring program provides continuous measurements of ambient air pollutants and meteorological data to satisfy the reporting requirements of the Industrial Operation.

**Station Parameters for Continuous Monitoring:**

This monthly report, where applicable, was prepared in accordance with Chapter 9 of the Air Monitoring Directive (AMD, 2016). The report summarizes the continuous monitoring results for pollutant and meteorological parameters and presents the hourly statistics, graphs and rose charts for the month. Calibration records are provided in a separate PDF document in order to comply with AMD requirements (Chapter 9, 13.1.7, RC 13-R, AMD 2016). The station is equipped with analyzers to measure SO<sub>2</sub>, H<sub>2</sub>S, THC, CH<sub>4</sub>, NMHC, NOx, NO and NO<sub>2</sub>. The meteorological sensors and equipment capture data for WS, WD, RH, BP, PRECIP, AmbTPX and STDWD.

**Exceedance & Performance Reporting:**

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement, as per the Alberta Air Monitoring Directive (AMD, Chapter 6, DQ 4-C, 2016).

All measured ambient air concentrations were below the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO, November 2018). Comparisons of these concentrations to the corresponding AAAQOs were done in accordance with AMD, Chapter 9, 15.3.2, RC 15-P. Accordingly, the averaging specifications and data completeness criteria, as defined in the Alberta Ambient Air Quality Objective Calculation Guidelines, were applied. (AMD, Chapter 9, Appendix A, 2016).

Specific to the content and purpose of this report, there were no instances where the requirements of the AMD (2016) were contravened.

**Monthly Monitoring Overview:**

In relation to the previous month, there were no changes made to the scope or management of the ambient air monitoring program.

The evaluation of data collected in the month of January did not reveal any errors or omissions that would require resubmission of air data to AEP's airdata warehouse.

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

**All Parameters:** Fifteen hours of downtime were incurred on January 3, from hours 6:00 - 20:00, as the data polling service was interrupted by a Windows operating system update.

**H<sub>2</sub>S:** Sixteen hours of downtime were recorded across the month due to additional quality checks and corrective actions performed to address drifts in span response.

**Precipitation:** Twenty-one hours of downtime were recorded between January 23 and January 24, as the equipment was frozen due to low ambient temperatures. The point in time that the precipitation sensor became frozen could not be determined. As such, data collected at extremely low ambient temperatures should be applied with caution.

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

**Reviewed by:**



---

Wunmi Adekanmbi, M.Sc., Ept, PMP  
Project Team Lead, Customer Service, Air Services  
403-219-3661

*I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. Certification of submitted information is specific to the contents of this report and is not intended to represent the onus of the Person Responsible, as outlined in Chapter 9, RC 12-E.*

## TABLE OF CONTENTS

<b>TITLE PAGE</b>	<b>1</b>
<b>COVER LETTER</b>	<b>2</b>
<b>TABLE OF CONTENTS</b>	<b>3</b>
<b>ABBREVIATIONS</b>	<b>4</b>
<b>AAAQO EXCEEDANCE SUMMARY</b>	<b>5</b>
<b>MONTHLY CONTINUOUS DATA SUMMARY</b>	<b>6</b>
<b>OPERATIONAL SUMMARY</b>	<b>7</b>
<b>SUMMARY TABLES, GRAPHS AND ROSES</b>	<b>10</b>
Sulphur Dioxide	11
Hydrogen Sulphide	15
Total Hydrocarbon	19
Methane	22
Non-Methane Hydrocarbon	26
Oxides of Nitrogen	30
Nitric Oxide	34
Nitrogen Dioxide	38
Wind Speed	42
Wind Direction	45
Standard Deviation Wind Direction	48
Relative Humidity	50
Barometric Pressure	52
Ambient Temperature	54
Station Temperature	56
Precipitation	58
<b>MAXIMUM INSTANTANEOUS DATA</b>	<b>60</b>
<b>1.0 Quality Control Activities</b>	<b>76</b>
<b>2.0 Data Verification and Validation</b>	<b>77</b>
<b>Validation Certificate Form</b>	<b>80</b>
<b>End of Report</b>	<b>90</b>

## List of Acronyms

<b>AAAQO</b>	Alberta Ambient Air Quality Objectives and Guidelines Summary
<b>AEP</b>	Alberta Environment and Parks
<b>AMBTPX</b>	Ambient Temperature
<b>AMD</b>	Air Monitoring Directive
<b>BP</b>	Barometric Pressure
<b>CH<sub>4</sub></b>	Methane
<b>DAS</b>	Data acquisition system
<b>hr</b>	Hour
<b>hrs</b>	Hours
<b>H<sub>2</sub>S</b>	Hydrogen Sulphide
<b>IZS</b>	Internal zero-span
<b>kph</b>	Kilometers per hour
<b>NO</b>	Nitric Oxide
<b>NO<sub>2</sub></b>	Nitrogen dioxide
<b>NO<sub>x</sub></b>	Total oxides of nitrogen
<b>NMHC</b>	Non-Methane Hydrocarbon
<b>Precip</b>	Precipitation
<b>ppb</b>	Parts per billion
<b>ppm</b>	Parts per million
<b>QA</b>	Quality Assurance
<b>QC</b>	Quality Control
<b>RH</b>	Relative Humidity
<b>SOP</b>	Standard Operating Procedure
<b>SO<sub>2</sub></b>	Sulphur Dioxide
<b>STDWD</b>	Standard Deviation Wind Direction
<b>THC</b>	Total hydrocarbons
<b>WS</b>	Wind Speed
<b>WD</b>	Wind Direction
<b>°C</b>	Degrees Celsius

## AAAQO Exceedance Summary

### SO<sub>2</sub> 1-Hour Exceedances

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

### SO<sub>2</sub> 24-Hour Exceedances

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

### H<sub>2</sub>S 1-Hour Exceedances

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

### H<sub>2</sub>S 24-Hour Exceedances

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

### NO<sub>2</sub> 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.*

### Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO <sub>2</sub> (ppb)	172	48	0	0	1	11	7	12	8.9	NW	5	7	98.0
H <sub>2</sub> S (ppb)	10	3	0	0	0	1	1	12	10.5	WNW	0	1	95.8
THC (ppm)	-	-	-	-	2.10	2.74	12	19	2.1	SW	2.37	13	98.0
CH <sub>4</sub> (ppm)	-	-	-	-	2.10	2.74	12	19	2.1	SW	2.37	13	98.0
NMHC (ppm)	-	-	-	-	0.00	0.15	19	12	6.6	E	0.01	19	98.0
NO <sub>2</sub> (ppb)	159	-	0	-	5	25	17	7	1.3	WSW	10	12	98.0
NO (ppb)	-	-	-	-	1	9	7	12	8.9	NW	3	7	98.0
NO <sub>x</sub> (ppb)	-	-	-	-	5	31	13	1	1.0	SSW	11	12	98.0
RELATIVE HUMIDITY (%)	-	-	-	-	86	100	2	0	3.1	SW	98	6	98.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	936	952	28	21	1.3	N	950	28	98.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-13.8	3.7	2	15	6.0	W	-1.1	2	98.0
PRECIPITATION (mm)	-	-	-	-	5.1	1.2	27	4	7.2	NNW	2.7	27	95.2
VECTOR WS (kph)	-	-	-	-	0.8	14.3	27	6	-	NNE	9.0	27	98.0
VECTOR WD (sec)	-	-	-	-	26 (NNE)	-	-	-	-	-	-	-	98.0

\* Precipitation: data represents the total (sum) for the indicated time frame

**OPERATIONAL SUMMARY**

Parameter	Equipment	Method & Procedure	Operational Notes
SULPHUR DIOXIDE (SO <sub>2</sub> )	Thermo 43i UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime.</li> <li>On January 3, the polling service was interrupted by a Windows operating system update. Data polling was restored following a manual, onsite reboot of the Envidas Ultimate computer. Data was not collected on January 3, between hours 6:00 and 20:00, due to the update. Fifteen hours of downtime were consequently incurred.</li> <li>The routine monthly calibration was performed on January 4, between the hours of 11:00 and 16:00.</li> </ul>
HYDROGEN SULPHIDE (H <sub>2</sub> S)	Thermo 450i UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 95.8%, equivalent to 31 hours of downtime.</li> <li>On January 3, the polling service was interrupted by a Windows operating system update. Data polling was restored following a manual, onsite reboot of the Envidas Ultimate computer. Data was not collected on January 3, between hours 6:00 and 20:00, due to the update. Fifteen hours of downtime were consequently incurred.</li> <li>The analyzer spanned outside the upper acceptance limit on January 2. The results of subsequent scheduled and repeat span checks, performed between January 2 and January 4, exhibited similar response. This prompted a site visit on January 4 where the routine monthly calibration was successfully completed between hours 11:00 - 17:00. The expected span value was updated following the scheduled zero-span check on January 5. As the monthly calibration met AMD requirements, no data was discarded due to the span drift. Three hours of downtime were, however, recorded due to the additional quality checks.</li> <li>The analyzer exhibited a biased low drift in span response on January 8. An additional zero-span check performed on January 9, at hour 7:00, exceeded the lower acceptance limit. The results of subsequent scheduled span checks were within limits, therefore, no further action was required. One hour of downtime was, however, attributed to the additional quality check.</li> </ul>

**OPERATIONAL SUMMARY**

Parameter	Equipment	Method & Procedure	Operational Notes
HYDROGEN SULPHIDE (H <sub>2</sub> S)	Thermo 450i UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> <li>Span response exhibited a sudden drift towards the lower acceptance limit on January 15. Subsequent scheduled and repeat span check results exhibited similar response with the result exceeding the lower limit from January 17 to January 19. Span response improved beginning on January 20. As a corrective action, on January 23, the SO<sub>2</sub> scrubber beads were renewed, following a successful shut-down calibration. A successful post-repair calibration was subsequently completed. The expected span value was updated immediately after the calibration. Eleven hours of downtime were incurred due to this event.</li> <li>The daily span result drifted close to the upper acceptance limit on January 26. An additional zero-span check conducted at hour 08:00, on January 27 exhibited improved response and subsequent scheduled span check results were closer to the mean. No further action was required. One hour of downtime was, however, recorded due the repeat span check.</li> <li>Further data analysis revealed a correlation between periods of erratic span response and shifts in ambient temperatures. The drift pattern in span response appeared to mirror that of ambient temperature.</li> </ul>
TOTAL HYDROCARBONS (THC), METHANE (CH <sub>4</sub> ) & NON-METHANE HYDROCARBONS (NMHC)	Thermo 55i FID Analyzer	Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime.</li> <li>On January 3, the polling service was interrupted by a Windows operating system update. Data polling was restored following a manual, onsite reboot of the Envidas Ultimate computer. Data was not collected on January 3, between hours 6:00 and 20:00, due to the update. Fifteen hours of downtime were subsequently incurred.</li> <li>The routine monthly calibration was performed on January 4, between the hours of 17:00 and 20:00. The fuel gas (H<sub>2</sub>) cylinder was replaced during this site visit.</li> </ul>
OXIDES OF NITROGEN (NO <sub>x</sub> ), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO <sub>2</sub> )	Thermo 42i Chemiluminescent Analyzer	Maxxam AIR SOP-00213: Ambient NO/NO <sub>2</sub> /NO <sub>x</sub> Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime.</li> <li>On January 3, the polling service was interrupted by a Windows operating system update. Data polling was restored following a manual, onsite reboot of the Envidas Ultimate computer. Data was not collected on January 3, between hours 6:00 and 20:00, due to the update. Fifteen hours of downtime were consequently incurred.</li> <li>The routine monthly calibration was performed on January 4, between the hours of 11:00 and 18:00.</li> </ul>

**OPERATIONAL SUMMARY**

Parameter	Equipment	Method & Procedure	Operational Notes
WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)	RM Young Unit	Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime.</li> <li>On January 3, the polling service was interrupted by a Windows operating system update. Data polling was restored following a manual, onsite reboot of the Envidas Ultimate computer. Data was not collected on January 3, between hours 6:00 and 20:00, due to the update. Fifteen hours of downtime were consequently incurred.</li> <li>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.</li> </ul>
RELATIVE HUMIDITY (RH)	Rotronic Hygroclip Unit	Operation Manual	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime.</li> <li>On January 3, the polling service was interrupted by a Windows operating system update. Data polling was restored following a manual, onsite reboot of the Envidas Ultimate computer. Data was not collected on January 3, between hours 6:00 and 20:00, due to the update. Fifteen hours of downtime were consequently incurred.</li> </ul>
BAROMETRIC PRESSURE (BP)	Met One Unit	Operation Manual	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime.</li> <li>On January 3, the polling service was interrupted by a Windows operating system update. Data polling was restored following a manual, onsite reboot of the Envidas Ultimate computer. Data was not collected on January 3, between hours 6:00 and 20:00, due to the update. Fifteen hours of downtime were consequently incurred.</li> </ul>
PRECIPITATION (PRECIP)	Met One Unit	Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 95.2%, equivalent to 36 hours of downtime.</li> <li>On January 3, the polling service was interrupted by a Windows operating system update. Data polling was restored following a manual, onsite reboot of the Envidas Ultimate computer. Data was not collected on January 3, between hours 6:00 and 20:00, due to the update. Fifteen hours of downtime were consequently incurred.</li> <li>Upon arrival at the station for a precipitation sensor audit on January 23, the equipment was found frozen due to low ambient temperatures, with the discharge holes blocked with ice. The channel was placed offline as the ice could not be removed mechanically immediately without damaging the device. The equipment was defrosted on January 24, using hot water; and a successful audit was subsequently completed. The point in time that the precipitation sensor became frozen could not be determined. As such, data collected at extremely low ambient temperatures should be applied with caution. Data was flagged invalid from the time the channel was placed offline. Twenty-one hours of downtime were recorded between January 3, at hour 13:00 and January 24, at hour 9:00, due to this event.</li> </ul>
AMBIENT TEMPERATURE (AmbTPX)	Rotronic Hygroclip Unit	Operation Manual	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime.</li> <li>On January 3, the polling service was interrupted by a Windows operating system update. Data polling was restored following a manual, onsite reboot of the Envidas Ultimate computer. Data was not collected on January 3, between hours 6:00 and 20:00, due to the update. Fifteen hours of downtime were consequently incurred.</li> </ul>



## ***SUMMARY TABLES, GRAPHS AND ROSES***

**SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> 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	3	S	3	2	2	1	1	1	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
2	0	S	2	1	0	0	1	1	1	1	1	3	3	4	1	0	0	0	0	0	0	1	2	1	1	0	4	1	24
3	S	0	0	0	0	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	0	S	0	0	0	9	
4	2	5	6	1	1	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	S	0	0	6	1	24	
5	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	0	S	2	0	0	2	0	24	
6	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24	
7	0	1	3	5	2	1	2	2	1	3	9	8	11	8	9	10	6	7	11	S	2	2	6	10	0	11	5	24	
8	9	10	7	7	8	7	3	2	9	9	7	1	2	1	0	0	0	0	S	0	0	0	0	0	0	10	4	24	
9	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	1	0	0	0	0	1	0	24	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	S	0	0	0	0	0	1	0	0	1	0	24	
11	1	1	0	1	0	1	0	1	1	1	1	2	2	1	1	S	1	0	1	1	1	1	1	1	1	0	2	1	24
12	1	0	1	1	0	0	0	0	0	0	2	1	1	2	S	1	0	0	1	1	1	1	1	1	1	0	2	1	24
13	0	2	1	0	0	0	0	0	0	0	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	2	0	24
14	0	0	1	0	0	1	1	0	1	1	1	2	S	4	2	1	1	11	7	2	0	1	1	1	0	11	2	24	
15	1	2	1	0	0	0	0	0	0	0	0	S	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0	24
16	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	24
17	0	0	0	0	0	0	0	0	0	S	1	1	0	0	3	1	0	0	0	0	0	0	0	0	0	0	3	0	24
18	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	24
19	0	0	0	0	0	0	0	S	0	1	3	1	2	2	1	3	2	1	1	3	4	4	2	0	0	4	1	24	
20	0	0	0	0	1	0	S	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	0	2	1	24	
21	1	2	1	1	0	S	1	1	1	2	4	4	2	1	1	0	0	0	0	0	1	1	0	0	0	4	1	24	
22	0	1	1	1	S	1	1	1	0	0	1	1	1	1	2	1	1	1	1	2	1	1	0	0	2	1	24		
23	1	0	0	0	S	0	0	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	1	0	24	
24	0	0	S	0	0	0	0	0	0	0	1	3	2	7	1	1	0	1	1	0	0	0	0	1	0	7	1	24	
25	2	S	3	2	1	1	0	0	0	0	0	0	1	3	6	2	1	2	1	0	0	0	0	0	0	6	1	24	
26	S	1	1	1	1	1	0	0	0	0	0	0	1	1	0	1	1	2	2	2	1	0	0	S	0	2	1	24	
27	0	0	0	8	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	8	1	24	
28	0	1	0	2	2	1	1	0	4	3	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	4	1	24	
29	1	0	0	0	1	0	0	0	0	0	2	2	1	1	0	0	1	3	1	2	S	0	1	2	0	3	1	24	
30	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	S	0	0	0	0	0	2	0	24	
31	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	S	0	0	0	0	0	1	0	1	0	24	
HOURLY MAX	9	10	7	8	8	7	3	2	9	9	9	8	11	8	9	10	6	11	11	3	4	4	6	10					
HOURLY AVG	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					

**STATUS FLAG CODES**

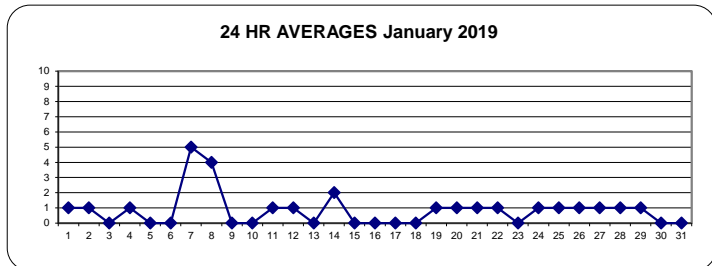
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

**OBJECTIVE LIMIT:**

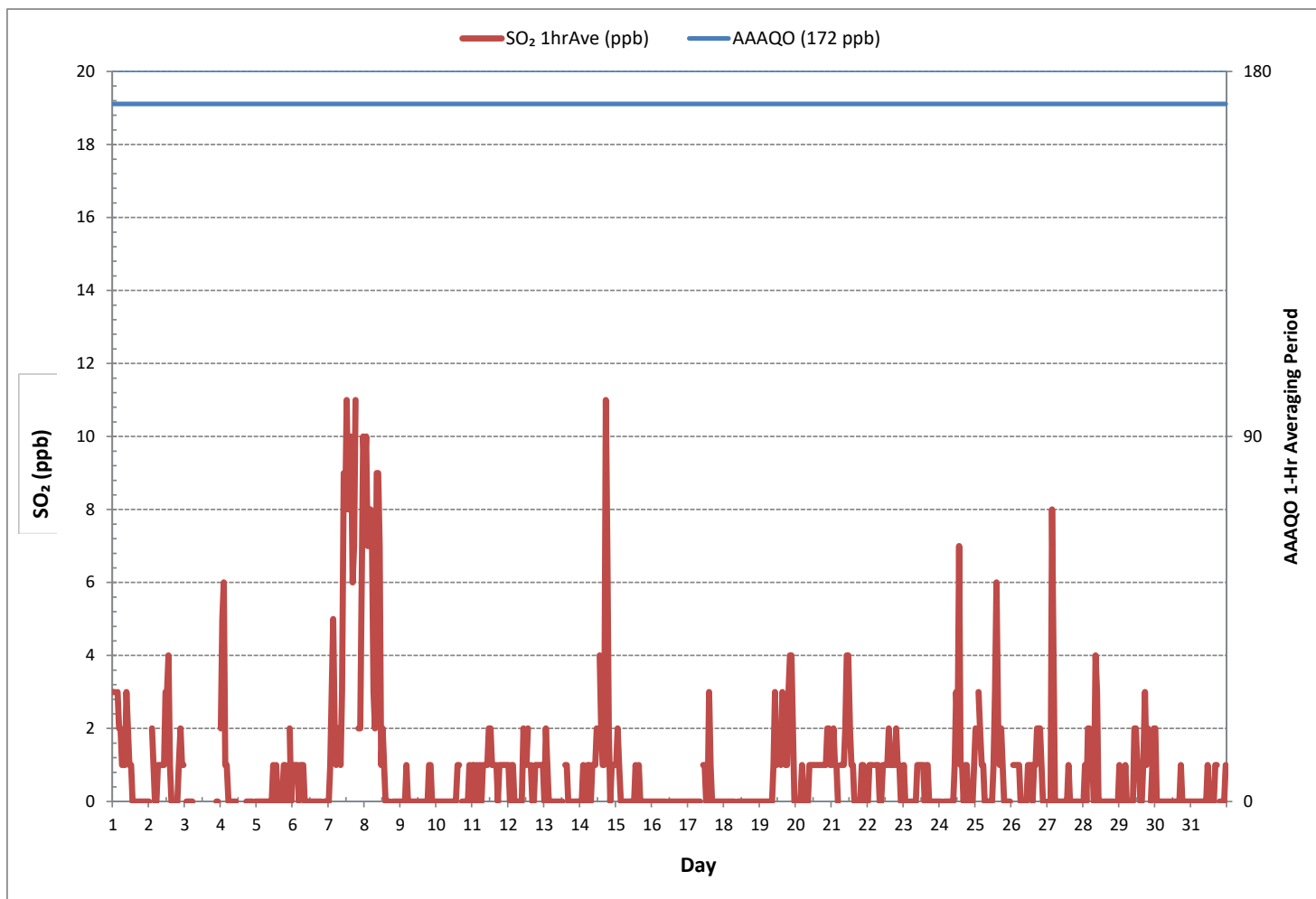
ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
----------------------	------	-----	-----	-------	----	-----

**MONTHLY SUMMARY**

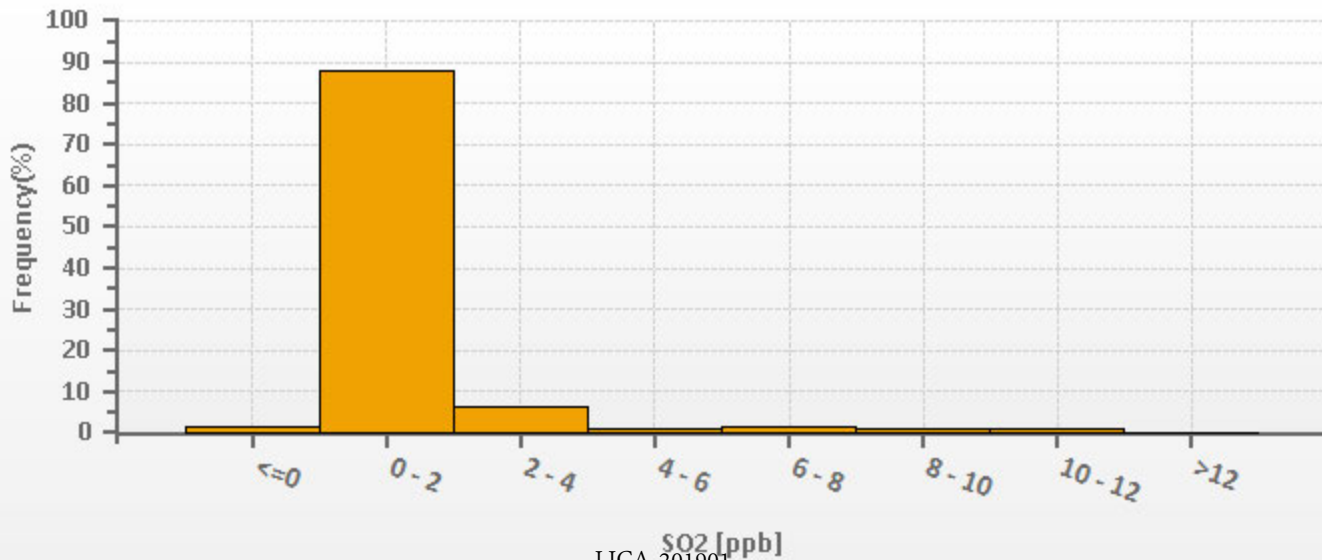
NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	283
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 13 ON DAY 1
MAXIMUM 1-HR AVERAGE:	11 ppb @ HOUR 12 ON DAY 7
MAXIMUM 24-HR AVERAGE:	5 ppb ON DAY 7
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	729 hrs
AMD OPERATION UPTIME:	98.0 %
STANDARD DEVIATION:	2
MONTHLY AVERAGE:	1 ppb



SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)

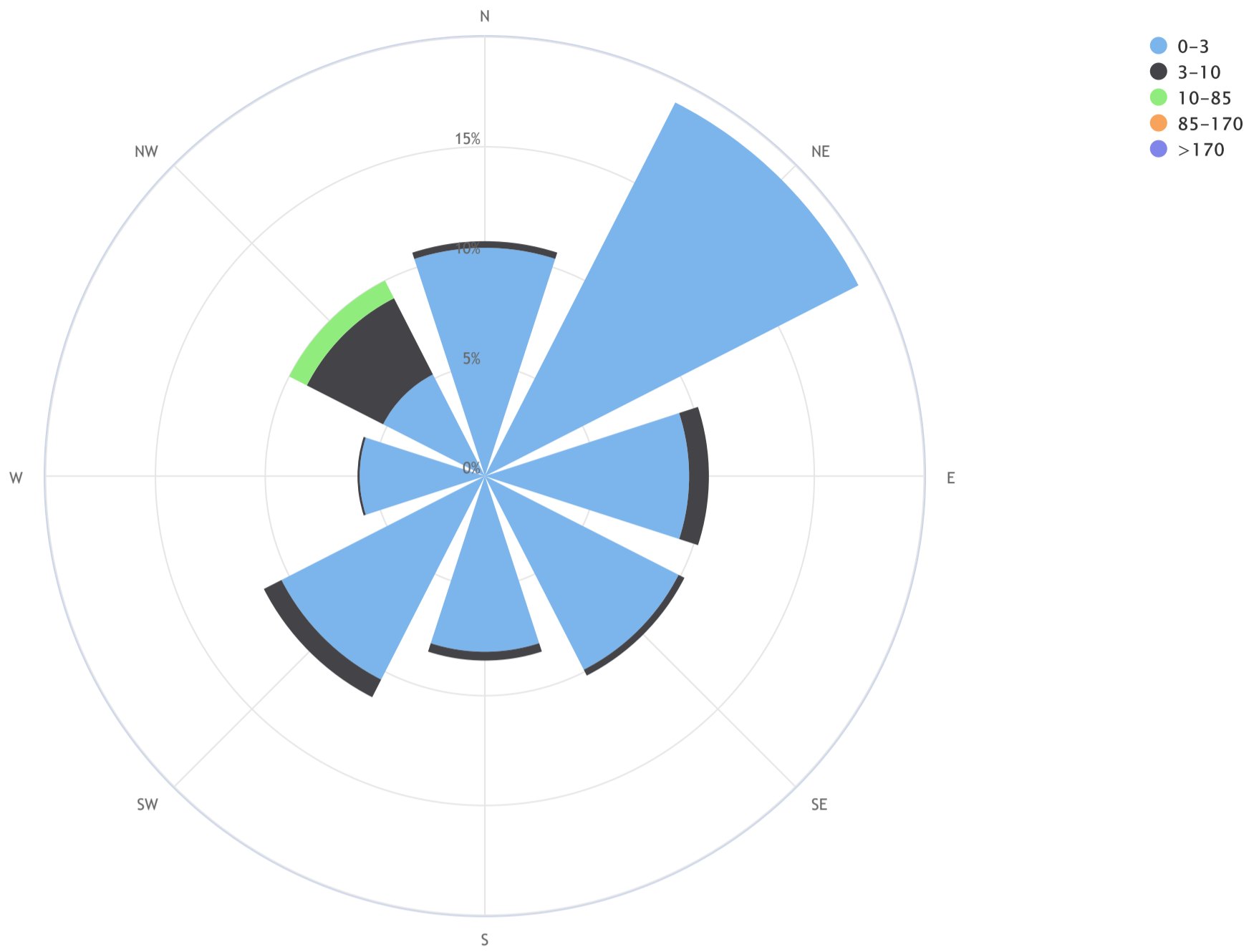


### SO2 [ppb] Histogram: LICA MASKWA Monthly: 19/01 1 Hr.



Lakeland Industry & Community Association\_Maskwa Continuous Monitoring Station\_SO<sub>2</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.4\_CALM % = 14.3%



Direction	0-3	3-10	10-85	85-170	>170	TOTAL
N	10.4	0.3	0.0	0.0	0.0	10.7
NE	19.1	0.0	0.0	0.0	0.0	19.1
E	9.3	0.9	0.0	0.0	0.0	10.2
SE	9.9	0.3	0.0	0.0	0.0	10.2
S	8.0	0.4	0.0	0.0	0.0	8.4
SW	10.4	0.9	0.0	0.0	0.0	11.3
W	5.7	0.1	0.0	0.0	0.0	5.8
NW	5.2	3.9	0.9	0.0	0.0	10.0
<b>Summary</b>	<b>78.0</b>	<b>6.8</b>	<b>0.9</b>	<b>0.0</b>	<b>0.0</b>	<b>85.6</b>
<b>CALM</b>	<b>14.2</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>14.3</b>



HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S 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	S	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	24			
2	0	S	1	1	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	23			
3	S	0	0	0	0	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	0	S	0	0	0	9			
4	0	0	0	0	0	S1	S1	0	0	0	0	C	C	C	C	C	C	C	1	0	0	0	S	0	0	1	0	22				
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	1	0	24			
6	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			
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24			
8	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24			
9	0	0	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	23			
10	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	24			
11	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			
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24			
13	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	1	0	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	24			
15	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			
16	0	0	0	0	0	S1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23			
17	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			
18	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	23			
19	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			
20	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	24			
21	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			
22	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	24			
23	0	0	0	S	0	0	0	0	0	0	0	0	C1	C1	C1	C1	Y	C1	C1	C1	C1	0	0	0	0	0	0	0	15			
24	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	24			
25	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			
26	S	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	24			
27	0	0	0	1	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	23			
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	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	S	0	0	0	0	0	0	24			
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24			
31	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	24			
HOURLY MAX	1	0	1	1	1	0	1	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	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				

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

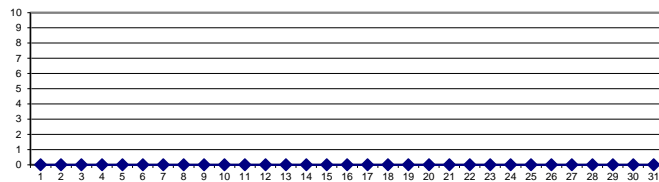
OBJECTIVE LIMIT:

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

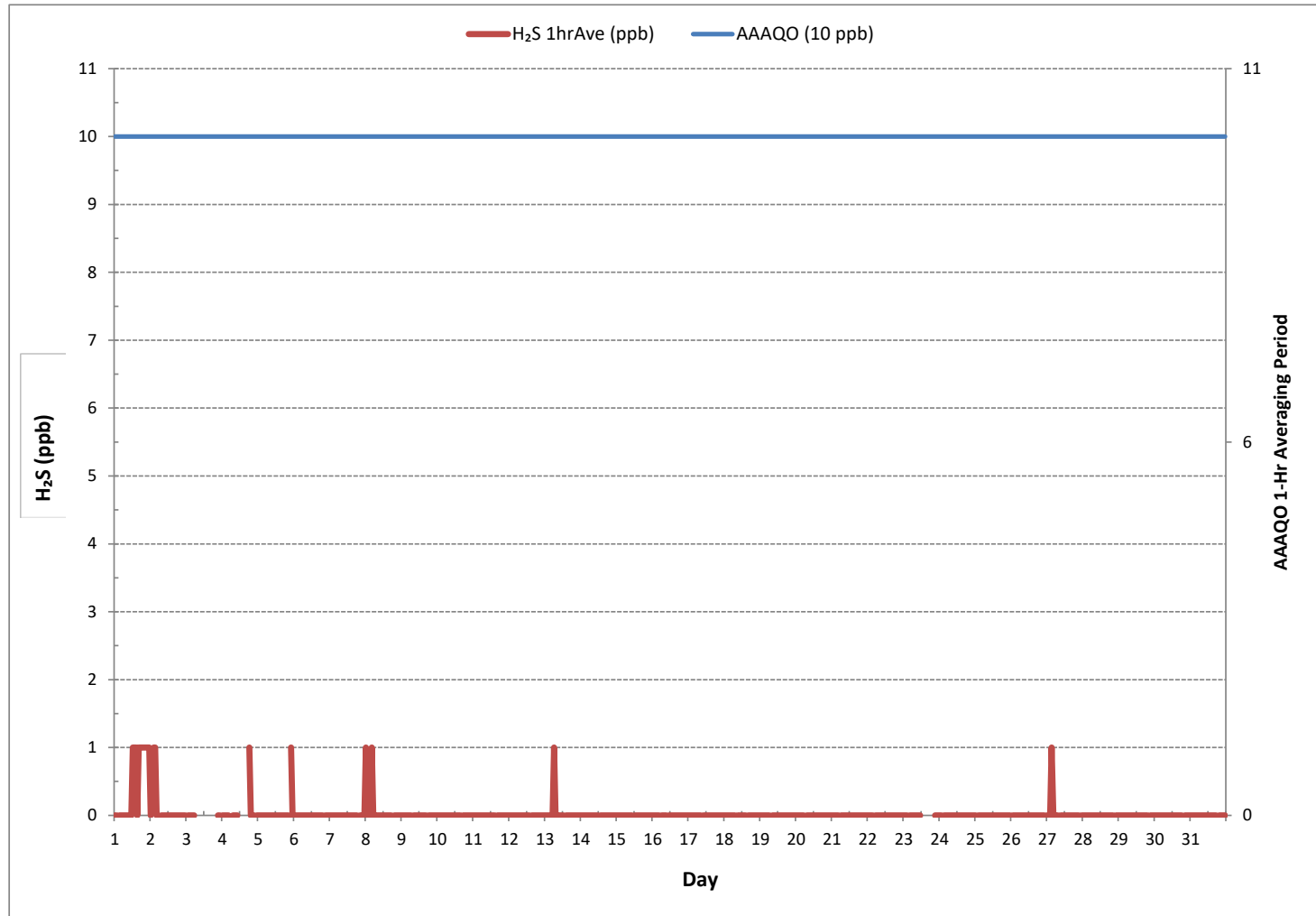
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	19				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR	12	ON DAY	1	
MAXIMUM 24-HR AVERAGE:	0 ppb		ON DAY	1	
I/ZS CALIBRATION TIME:	33	hrs	OPERATIONAL TIME:	713	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	95.8	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

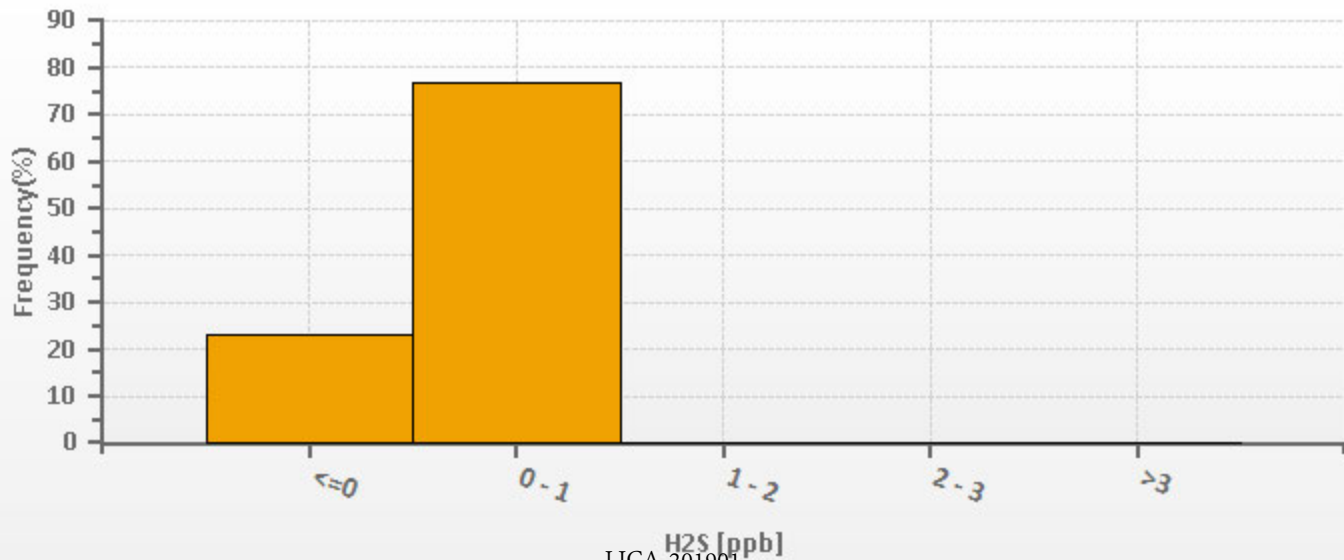
24 HR AVERAGES January 2019



HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S ppb)



## H2S [ppb] Histogram: LICA MASKWA Monthly: 19/01 1 Hr.

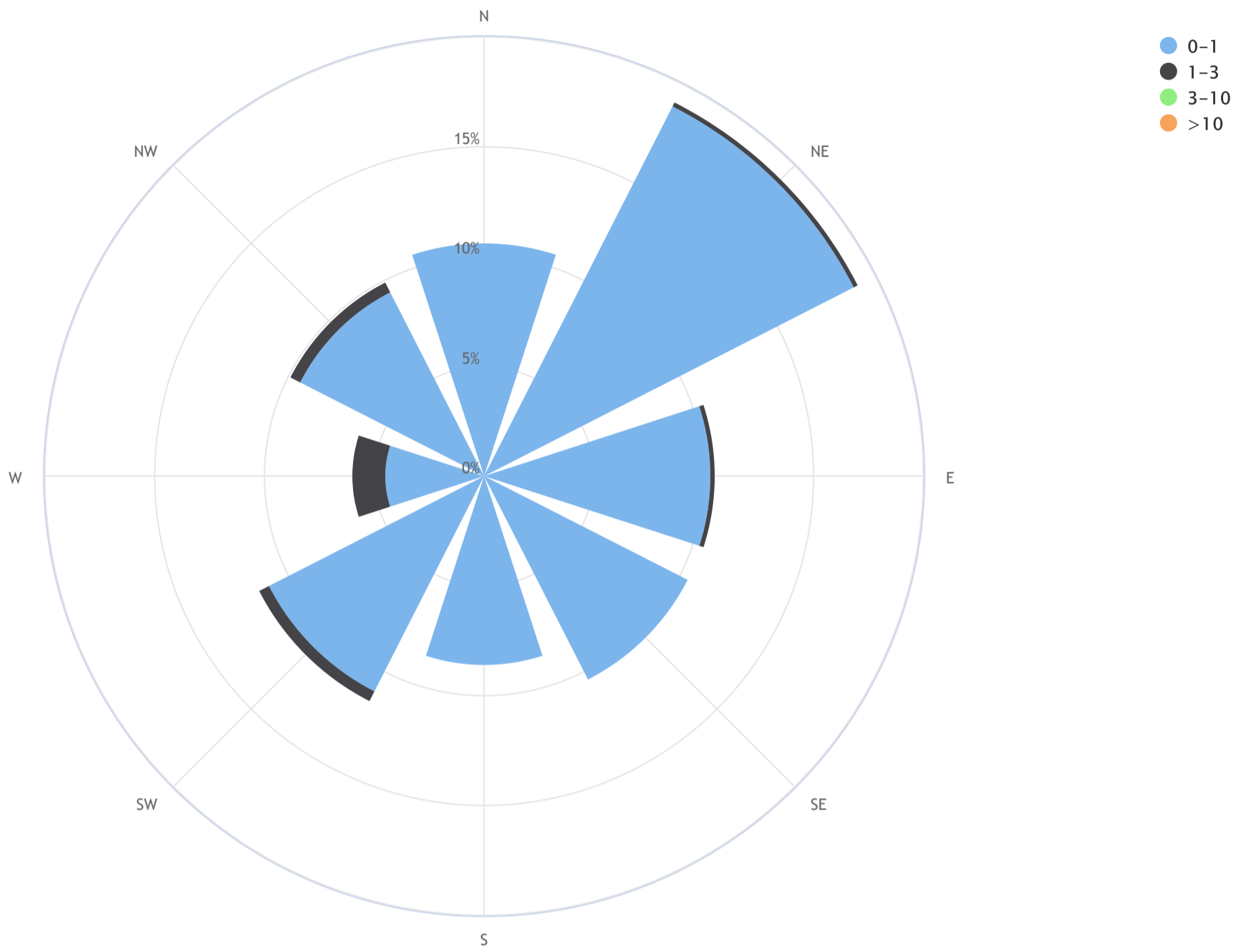


LICA-201901  
Page 112 of 350



Lakeland Industry & Community Association\_Maskwa Continuous Monitoring Station\_H<sub>2</sub>S (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.0\_CALM % = 13.8%



Direction	0-1	1-3	3-10	>10	TOTAL
N	10.6	0.0	0.0	0.0	10.6
NE	18.9	0.2	0.0	0.0	19.0
E	10.3	0.2	0.0	0.0	10.4
SE	10.4	0.0	0.0	0.0	10.4
S	8.6	0.0	0.0	0.0	8.6
SW	11.0	0.5	0.0	0.0	11.5
W	4.5	1.5	0.0	0.0	6.0
NW	9.4	0.5	0.0	0.0	9.8
<b>Summary</b>	<b>83.5</b>	<b>2.7</b>	<b>0.0</b>	<b>0.0</b>	<b>86.2</b>
<b>CALM</b>	<b>13.7</b>	<b>0.2</b>	<b>0.0</b>	<b>0.0</b>	<b>13.8</b>

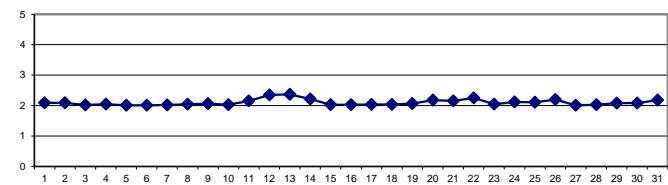
**TOTAL HYDROCARBONS Hourly Averages (THC ppm)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.28	2.26	S	2.25	2.23	2.23	2.21	2.20	2.18	2.21	2.19	2.02	2.00	1.98	1.98	1.97	1.97	1.98	1.98	1.98	1.98	1.98	1.99	2.02	1.97	2.28	2.09	24	
2	2.02	S	2.08	2.11	2.17	2.13	2.12	2.13	2.14	2.14	2.15	2.18	2.21	2.22	2.12	2.01	<b>1.96</b>	1.96	1.96	1.97	2.00	2.05	2.08	2.09	<b>1.96</b>	2.22	2.09	24	
3	S	2.06	2.04	2.01	1.99	1.97	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.02	2.02	S	1.97	2.06	2.02	9	
4	2.03	2.03	2.02	2.01	2.06	2.18	2.21	2.22	2.12	2.07	2.03	2.04	2.00	1.99	1.99	1.99	2.00	C	C	C	C	2.01	S	2.00	1.99	2.22	2.05	24	
5	2.00	2.00	2.00	2.01	2.01	2.01	2.01	2.01	2.00	2.01	2.00	2.02	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.02	2.01	2.00	S	2.03	2.00	2.00	2.03	2.01	24
6	2.02	2.04	2.03	2.10	2.03	2.02	2.01	2.01	2.00	1.99	1.99	2.00	2.00	2.01	2.00	2.00	2.00	2.00	2.00	2.01	S	2.01	2.00	1.99	1.99	2.10	2.01	24	
7	2.00	2.00	2.00	2.02	2.04	2.04	2.02	2.01	2.00	2.01	2.02	2.02	2.03	2.02	2.03	2.01	2.11	2.02	2.01	S	1.99	2.00	2.01	2.02	1.99	2.11	2.02	24	
8	2.04	2.02	2.01	2.01	2.04	2.04	2.00	2.01	2.02	2.04	2.11	2.03	2.02	2.00	2.01	2.00	2.02	2.06	S	2.10	2.10	2.12	2.12	2.14	2.00	2.14	2.05	24	
9	2.14	2.12	2.09	2.10	2.09	2.09	2.09	2.09	2.09	2.07	2.05	2.04	2.03	2.03	2.02	2.02	2.02	S	2.02	2.03	2.02	2.01	2.02	2.02	2.01	2.14	2.06	24	
10	2.02	2.02	2.02	2.01	2.01	2.02	2.01	2.01	2.02	2.02	2.01	2.02	2.02	2.02	2.03	2.03	S	2.02	2.02	2.03	2.05	2.07	2.06	2.06	2.01	2.07	2.03	24	
11	2.08	2.11	2.13	2.14	2.14	2.16	2.19	2.24	2.23	2.23	2.24	2.21	2.19	2.20	2.19	S	2.12	2.08	2.11	2.15	2.12	2.10	2.08	2.09	2.08	2.24	2.15	24	
12	2.09	2.08	2.10	2.12	2.13	2.15	2.18	2.19	2.20	2.21	2.24	2.27	2.27	2.31	S	2.43	2.53	2.63	2.72	<b>2.74</b>	2.70	2.69	2.58	2.57	2.08	<b>2.74</b>	2.35	24	
13	2.68	2.59	2.65	2.70	2.67	2.64	2.66	2.68	2.67	2.69	2.39	2.21	2.19	S	2.20	2.17	2.14	2.10	2.10	2.09	2.08	2.08	2.09	2.08	2.09	2.08	2.70	<b>2.37</b>	24
14	2.09	2.09	2.11	2.12	2.15	2.15	2.15	2.24	2.42	2.52	2.51	2.60	S	2.51	2.44	2.35	2.13	2.09	2.06	2.03	2.01	2.05	2.08	2.07	2.01	2.60	2.22	24	
15	2.06	2.05	2.04	2.03	2.03	2.03	2.02	2.02	2.03	2.02	2.02	S	2.01	2.02	2.02	2.02	2.02	2.02	2.04	2.05	2.03	2.03	2.03	2.03	2.01	2.06	2.03	24	
16	2.03	2.03	2.02	2.02	2.02	2.03	2.03	2.03	2.03	2.04	S	2.04	2.03	2.03	2.03	2.03	2.02	2.02	2.02	2.03	2.02	2.02	2.02	2.02	2.02	2.04	2.03	24	
17	2.03	2.03	2.03	2.02	2.04	2.04	2.05	2.08	2.11	S	2.11	2.05	2.02	2.02	2.04	2.03	2.02	2.02	2.03	2.03	2.04	2.05	2.05	2.04	2.02	2.11	2.04	24	
18	2.05	2.05	2.06	2.06	2.05	2.06	2.07	2.06	S	2.04	2.04	2.04	2.03	2.03	2.02	2.02	2.02	2.02	2.02	2.03	2.03	2.03	2.03	2.04	2.02	2.07	2.04	24	
19	2.03	2.04	2.04	2.04	2.05	2.04	2.04	S	2.03	2.04	2.05	2.03	2.39	2.12	2.05	2.06	2.06	2.04	2.05	2.06	2.08	2.11	2.03	2.03	2.03	2.39	2.06	24	
20	2.03	2.03	2.03	2.04	2.06	2.07	S	2.12	2.12	2.13	2.12	2.13	2.15	2.16	2.19	2.20	2.22	2.23	2.26	2.33	2.36	2.37	2.37	2.37	2.03	2.37	2.18	24	
21	2.39	2.34	2.25	2.21	2.20	S	2.11	2.12	2.12	2.11	2.11	2.12	2.13	2.10	2.10	2.10	2.10	2.10	2.09	2.09	2.13	2.14	2.15	2.15	2.09	2.39	2.15	24	
22	2.17	2.16	2.14	2.16	S	2.15	2.17	2.22	2.26	2.26	2.25	2.25	2.23	2.24	2.23	2.25	2.26	2.30	2.35	2.45	2.45	2.43	2.26	2.13	2.13	2.45	2.25	24	
23	2.10	2.08	2.06	S	2.04	2.04	2.03	2.02	2.03	2.03	2.00	2.03	2.04	2.03	2.03	2.03	2.04	2.04	2.05	2.06	2.06	2.08	2.08	2.06	2.00	2.10	2.05	24	
24	2.08	2.25	S	2.28	2.15	2.15	2.12	2.11	2.12	2.16	2.14	2.14	2.13	2.11	2.07	2.06	2.06	2.08	2.09	2.07	2.10	2.16	2.10	2.09	2.06	2.28	2.12	24	
25	2.13	S	2.13	2.11	2.11	2.13	2.18	2.16	2.15	2.17	2.21	2.21	2.22	2.16	2.09	2.04	2.03	2.03	2.02	2.02	2.05	2.05	2.08	2.02	2.22	2.11	24		
26	S	2.06	2.06	2.07	2.08	2.11	2.15	2.16	2.14	2.15	2.20	2.21	2.20	2.22	2.30	2.34	2.37	2.40	2.40	2.42	2.18	2.07	2.11	S	2.06	2.42	2.20	24	
27	2.10	2.00	1.98	2.01	1.98	1.98	1.98	1.98	2.01	2.01	2.01	2.02	2.01	2.01	2.02	2.01	2.01	2.01	2.01	2.02	2.02	2.01	2.02	S	2.04	1.98	2.10	2.01	24
28	2.03	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.04	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.04	S	2.04	2.06	2.02	2.06	2.03	24	
29	2.07	2.09	2.07	2.06	2.09	2.09	2.13	2.17	2.17	2.18	2.05	2.04	2.03	2.03	2.02	2.03	2.05	2.08	2.06	2.06	S	2.11	2.12	2.11	2.02	2.18	2.08	24	
30	2.12	2.10	2.08	2.08	2.07	2.06	2.06	2.05	2.05	2.05	2.06	2.06	2.06	2.06	2.05	2.05	2.05	2.07	2.08	S	2.10	2.10	2.13	2.16	2.05	2.16	2.08	24	
31	2.19	2.20	2.20	2.21	2.23	2.21	2.22	2.25	2.26	2.24	2.26	2.25	2.24	2.24	2.16	2.17	2.14	2.09	S	2.06	2.08	2.08	2.06	2.06	2.06	2.06	2.26	2.18	24
HOURLY MAX	2.68	2.59	2.65	2.70	2.67	2.64	2.66	2.68	2.67	2.69	2.51	2.60	2.39	2.51	2.44	2.43	2.53	2.63	2.72	2.74	2.70	2.69	2.58	2.57					
HOURLY AVG	2.11	2.10	2.09	2.10	2.10	2.10	2.11	2.12	2.13	2.13	2.12	2.11	2.10	2.10	2.09	2.08	2.09	2.09	2.10	2.11	2.10	2.10	2.10	2.09					

**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

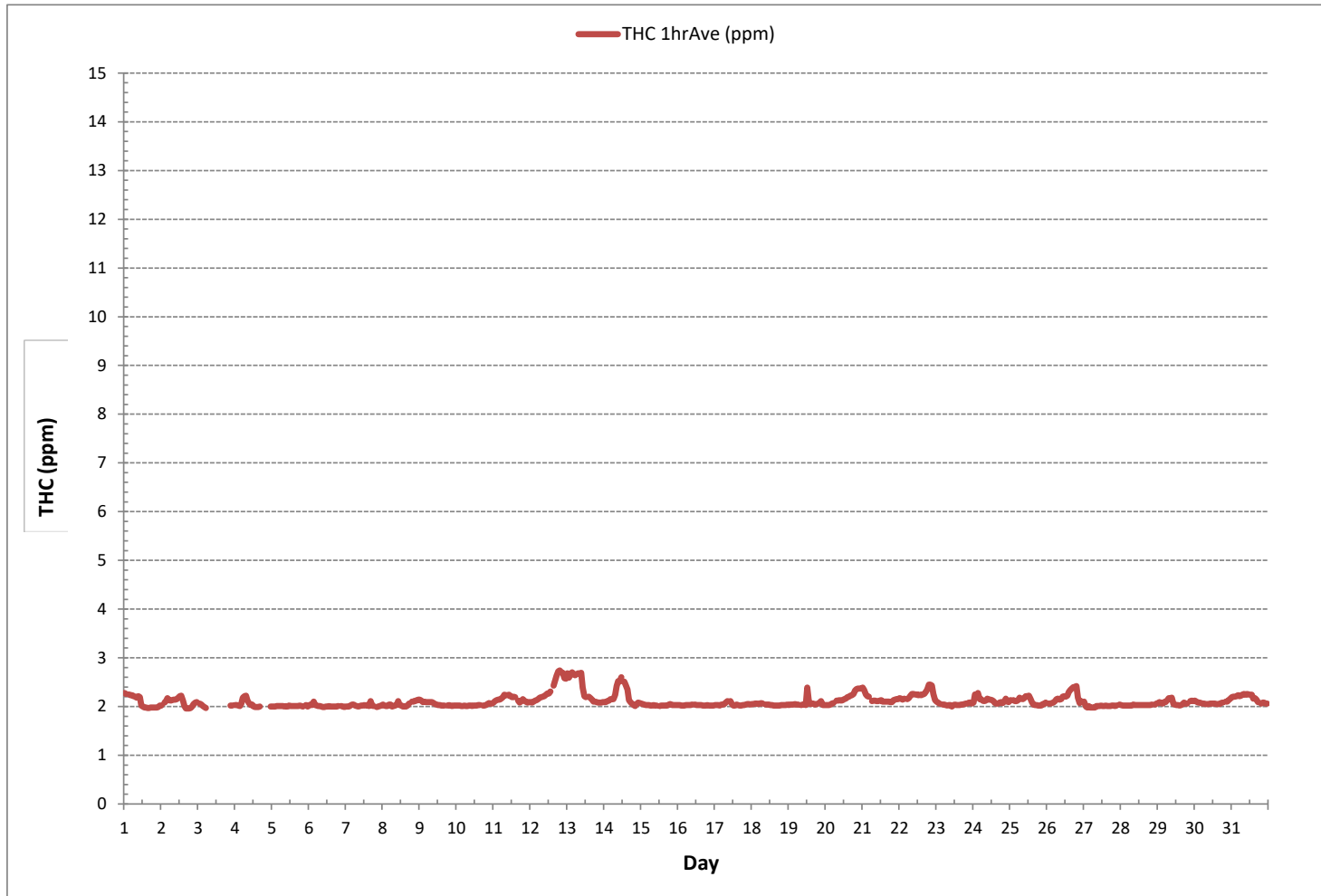
**24 HR AVERAGES January 2019**



**MONTHLY SUMMARY**

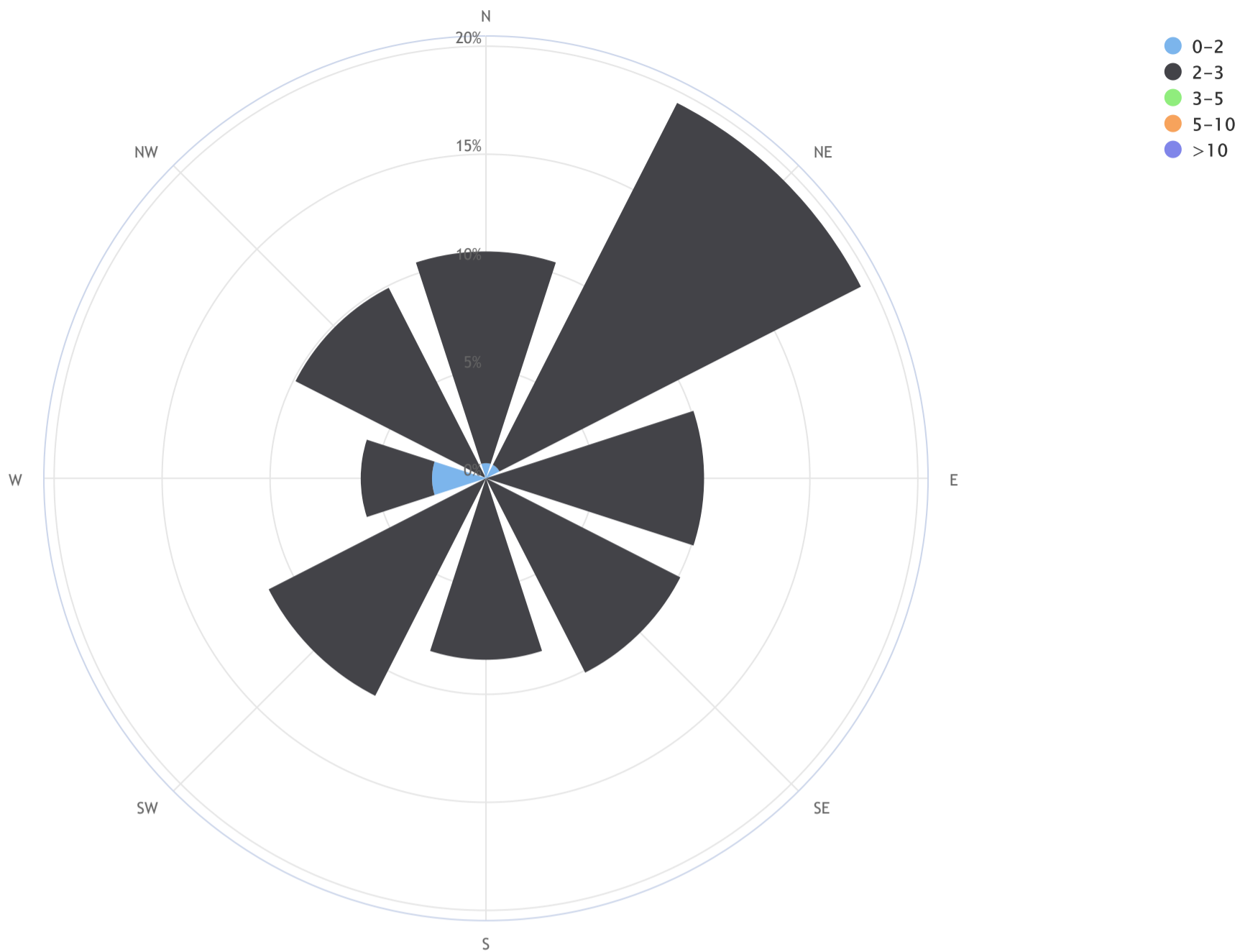
NUMBER OF NON-ZERO READINGS:	692				
MINIMUM 1-HR AVERAGE:	1.96 ppm	@ HOUR	16	ON DAY	2
MAXIMUM 1-HR AVERAGE:	2.74 ppm	@ HOUR	19	ON DAY	12
MAXIMUM 24-HR AVERAGE:	2.37 ppm			ON DAY	13
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	729 hrs		
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	98.0 %		
STANDARD DEVIATION:	0.13	MONTHLY AVERAGE:	2.10 ppm		

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



Lakeland Industry & Community Association\_Maskwa Continuous Monitoring Station\_THC (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 2.2\_CALM % = 14.3%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	0.7	9.8	0.0	0.0	0.0	10.6
NE	0.7	18.8	0.0	0.0	0.0	19.5
E	0.0	10.1	0.0	0.0	0.0	10.1
SE	0.0	10.1	0.0	0.0	0.0	10.1
S	0.0	8.4	0.0	0.0	0.0	8.4
SW	0.0	11.3	0.0	0.0	0.0	11.3
W	2.5	3.3	0.0	0.0	0.0	5.8
NW	0.1	9.8	0.0	0.0	0.0	10.0
Summary	4.0	81.7	0.0	0.0	0.0	85.7
CALM	0.0	14.3	0.0	0.0	0.0	14.3



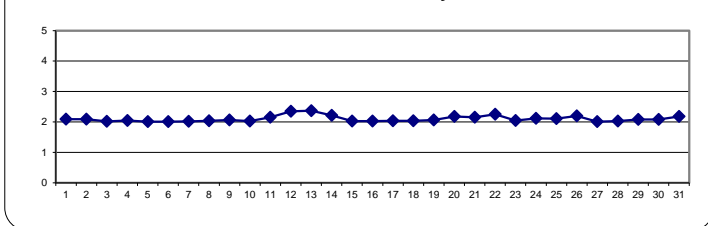
METHANE Hourly Averages (CH<sub>4</sub> ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	2.28	2.26	S	2.25	2.23	2.23	2.21	2.20	2.18	2.21	2.19	2.02	2.00	1.98	1.98	1.97	1.97	1.98	1.98	1.98	1.98	1.98	1.99	2.02	1.97	2.28	2.09	24	
2	2.02	S	2.08	2.11	2.17	2.13	2.12	2.13	2.14	2.14	2.15	2.18	2.21	2.22	2.12	2.01	1.96	1.96	1.97	2.00	2.05	2.08	2.09	1.96	2.22	2.09	24		
3	S	2.06	2.04	2.01	1.99	1.97	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.02	2.02	S	1.97	2.06	2.02	9
4	2.03	2.03	2.02	2.01	2.06	2.18	2.21	2.22	2.12	2.07	2.03	2.04	2.00	1.99	1.99	1.99	2.00	C	C	C	C	2.01	S	2.00	1.99	2.22	2.05	24	
5	2.00	2.00	2.00	2.01	2.01	2.01	2.01	2.01	2.00	2.01	2.00	2.02	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.02	2.01	2.00	S	2.03	2.00	2.00	2.03	2.01	24
6	2.02	2.04	2.03	2.05	2.03	2.02	2.01	2.01	2.00	1.99	1.99	2.00	2.00	2.01	2.00	2.00	2.00	2.00	2.00	2.01	S	2.01	2.00	1.99	1.99	2.05	2.01	24	
7	2.00	2.00	2.00	2.02	2.04	2.04	2.02	2.01	2.00	2.01	2.02	2.02	2.03	2.02	2.03	2.01	2.06	2.02	2.01	S	1.99	2.00	2.01	2.02	1.99	2.06	2.02	24	
8	2.04	2.02	2.01	2.01	2.02	2.02	2.00	2.01	2.02	2.04	2.07	2.03	2.02	2.00	2.01	2.00	2.02	2.06	S	2.10	2.10	2.12	2.12	2.14	2.00	2.14	2.04	24	
9	2.14	2.12	2.09	2.10	2.09	2.09	2.09	2.09	2.09	2.07	2.05	2.04	2.03	2.03	2.02	2.02	2.02	S	2.02	2.03	2.02	2.01	2.02	2.02	2.01	2.14	2.06	24	
10	2.02	2.02	2.02	2.01	2.01	2.02	2.01	2.01	2.02	2.02	2.01	2.02	2.02	2.02	2.03	2.03	S	2.02	2.02	2.03	2.05	2.07	2.06	2.06	2.01	2.07	2.03	24	
11	2.08	2.11	2.13	2.14	2.14	2.16	2.19	2.24	2.23	2.23	2.24	2.21	2.19	2.20	2.19	S	2.12	2.08	2.11	2.15	2.12	2.10	2.08	2.09	2.08	2.24	2.15	24	
12	2.09	2.08	2.10	2.12	2.13	2.15	2.18	2.19	2.20	2.21	2.24	2.27	2.27	2.31	S	2.43	2.53	2.63	2.72	2.74	2.70	2.69	2.58	2.56	2.08	2.74	2.35	24	
13	2.67	2.58	2.65	2.70	2.67	2.63	2.65	2.67	2.66	2.67	2.39	2.21	2.19	S	2.20	2.17	2.14	2.10	2.10	2.09	2.08	2.08	2.08	2.09	2.08	2.70	2.37	24	
14	2.09	2.09	2.11	2.12	2.15	2.15	2.15	2.24	2.42	2.52	2.51	2.60	S	2.51	2.44	2.34	2.13	2.09	2.06	2.03	2.01	2.05	2.08	2.07	2.01	2.60	2.22	24	
15	2.06	2.05	2.04	2.03	2.03	2.03	2.02	2.02	2.03	2.02	2.02	S	2.01	2.02	2.02	2.02	2.02	2.02	2.04	2.05	2.03	2.03	2.03	2.03	2.01	2.06	2.03	24	
16	2.03	2.03	2.02	2.02	2.02	2.03	2.03	2.03	2.03	2.04	S	2.04	2.03	2.03	2.03	2.03	2.02	2.02	2.02	2.03	2.02	2.02	2.02	2.02	2.02	2.04	2.03	24	
17	2.03	2.03	2.03	2.02	2.04	2.04	2.05	2.08	2.11	S	2.11	2.05	2.02	2.02	2.04	2.03	2.02	2.02	2.03	2.03	2.04	2.05	2.05	2.04	2.02	2.11	2.04	24	
18	2.05	2.05	2.06	2.06	2.05	2.06	2.07	2.06	S	2.04	2.04	2.04	2.03	2.03	2.02	2.02	2.02	2.02	2.02	2.03	2.03	2.03	2.03	2.04	2.02	2.07	2.04	24	
19	2.03	2.04	2.04	2.04	2.05	2.04	2.04	S	2.03	2.04	2.05	2.03	2.24	2.10	2.04	2.06	2.06	2.04	2.05	2.06	2.07	2.09	2.03	2.03	2.03	2.24	2.06	24	
20	2.03	2.03	2.03	2.04	2.06	2.07	S	2.12	2.12	2.13	2.12	2.13	2.15	2.16	2.19	2.20	2.22	2.23	2.26	2.33	2.36	2.37	2.37	2.37	2.03	2.37	2.18	24	
21	2.38	2.34	2.25	2.21	2.20	S	2.11	2.12	2.12	2.11	2.11	2.12	2.13	2.10	2.10	2.10	2.10	2.10	2.09	2.09	2.13	2.14	2.15	2.15	2.09	2.38	2.15	24	
22	2.17	2.16	2.14	2.16	S	2.15	2.17	2.22	2.26	2.26	2.25	2.25	2.23	2.24	2.23	2.25	2.26	2.30	2.35	2.45	2.45	2.43	2.26	2.13	2.13	2.45	2.25	24	
23	2.10	2.08	2.06	S	2.04	2.04	2.03	2.02	2.03	2.03	2.00	2.03	2.04	2.03	2.03	2.03	2.04	2.04	2.05	2.06	2.06	2.08	2.08	2.06	2.00	2.10	2.05	24	
24	2.08	2.25	S	2.28	2.15	2.15	2.12	2.11	2.12	2.16	2.14	2.14	2.13	2.11	2.07	2.06	2.06	2.08	2.09	2.07	2.10	2.16	2.10	2.09	2.06	2.28	2.12	24	
25	2.13	S	2.13	2.11	2.11	2.13	2.18	2.16	2.15	2.17	2.20	2.21	2.22	2.16	2.09	2.04	2.03	2.03	2.02	2.02	2.05	2.05	2.08	2.02	2.22	2.11	24		
26	S	2.06	2.06	2.07	2.08	2.11	2.15	2.16	2.14	2.15	2.20	2.21	2.20	2.22	2.30	2.34	2.37	2.40	2.40	2.42	2.18	2.07	2.11	S	2.06	2.42	2.20	24	
27	2.10	2.00	1.98	2.01	1.98	1.98	1.98	1.98	2.01	2.01	2.01	2.02	2.01	2.01	2.02	2.01	2.01	2.01	2.01	2.02	2.02	2.01	2.02	S	2.04	1.98	2.10	2.01	24
28	2.03	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.04	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.04	S	2.04	2.06	2.02	2.06	2.03	24	
29	2.07	2.09	2.07	2.06	2.09	2.09	2.13	2.17	2.17	2.18	2.05	2.04	2.03	2.03	2.02	2.03	2.05	2.08	2.06	2.06	S	2.11	2.12	2.11	2.02	2.18	2.08	24	
30	2.12	2.10	2.08	2.08	2.07	2.06	2.06	2.05	2.05	2.05	2.06	2.06	2.06	2.06	2.05	2.05	2.05	2.07	2.08	S	2.10	2.10	2.13	2.16	2.05	2.16	2.08	24	
31	2.19	2.20	2.20	2.21	2.23	2.21	2.22	2.25	2.26	2.24	2.26	2.25	2.24	2.24	2.16	2.17	2.14	2.09	S	2.06	2.08	2.08	2.06	2.06	2.06	2.06	2.26	2.18	24
HOURLY MAX	2.67	2.58	2.65	2.70	2.67	2.63	2.65	2.67	2.66	2.67	2.51	2.60	2.27	2.51	2.44	2.43	2.53	2.63	2.72	2.74	2.70	2.69	2.58	2.56					
HOURLY AVG	2.11	2.10	2.09	2.10	2.10	2.10	2.11	2.12	2.13	2.13	2.12	2.11	2.10	2.10	2.08	2.08	2.08	2.09	2.10	2.11	2.10	2.10	2.10	2.09					

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

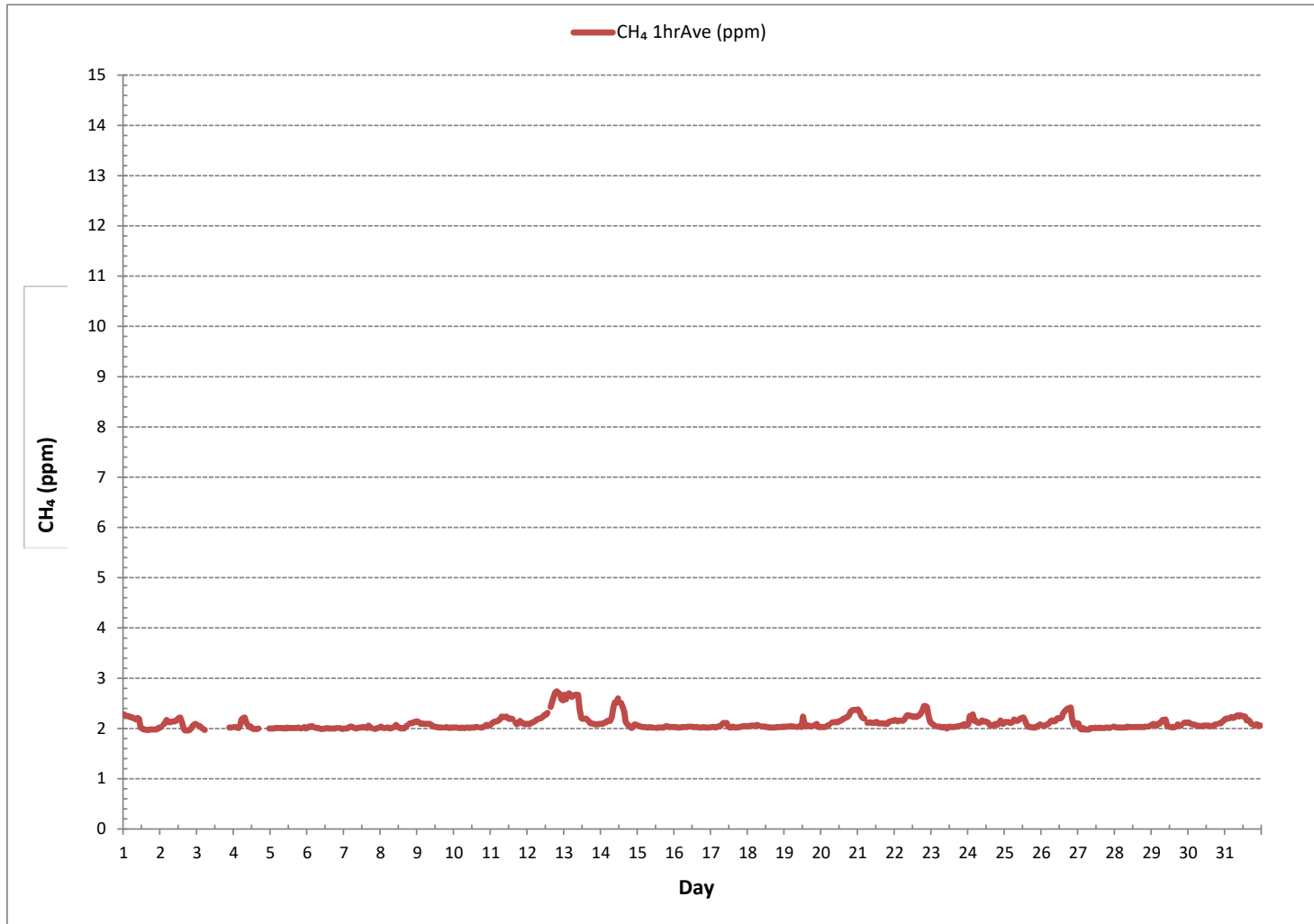
24 HR AVERAGES January 2019



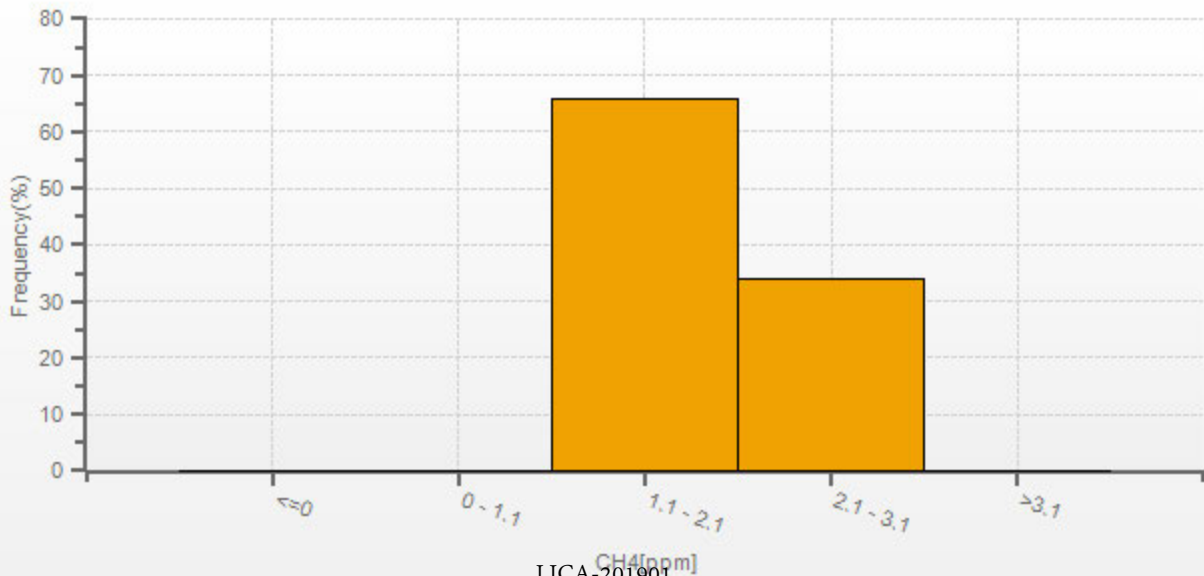
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	692			
MINIMUM 1-HR AVERAGE:	1.96 ppm	@ HOUR	16	ON DAY 2
MAXIMUM 1-HR AVERAGE:	2.74 ppm	@ HOUR	19	ON DAY 12
MAXIMUM 24-HR AVERAGE:	2.37 ppm			ON DAY 13
I2S CALIBRATION TIME:	33 hrs		OPERATIONAL TIME:	729 hrs
MONTHLY CALIBRATION TIME:	4 hrs		AMD OPERATION UPTIME:	98.0 %
STANDARD DEVIATION:	0.13		MONTHLY AVERAGE:	2.10 ppm

METHANE Hourly Averages (CH<sub>4</sub> ppm)



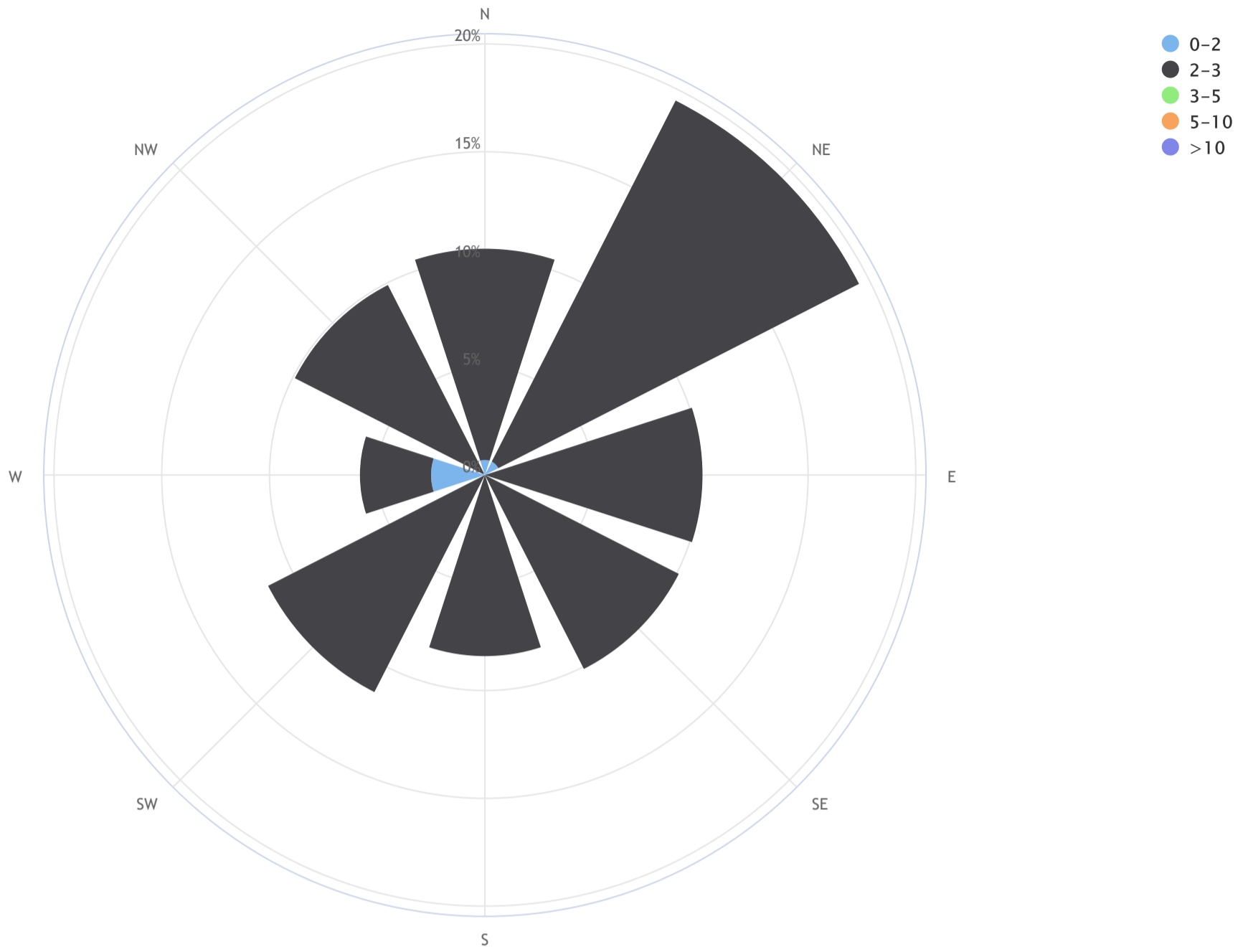
# CH4[ppm] Histogram: LICA MASKWA Monthly: 19/01 1 Hr.



LICA-201901

# Lakeland Industry & Community Association\_Maskwa Continuous Monitoring Station\_CH4 (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 2.2\_CALM % = 14.3%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	0.7	9.8	0.0	0.0	0.0	10.6
NE	0.7	18.8	0.0	0.0	0.0	19.5
E	0.0	10.1	0.0	0.0	0.0	10.1
SE	0.0	10.1	0.0	0.0	0.0	10.1
S	0.0	8.4	0.0	0.0	0.0	8.4
SW	0.0	11.3	0.0	0.0	0.0	11.3
W	2.5	3.3	0.0	0.0	0.0	5.8
NW	0.1	9.8	0.0	0.0	0.0	10.0
Summary	4.0	81.7	0.0	0.0	0.0	85.7
CALM	0.0	14.3	0.0	0.0	0.0	14.3



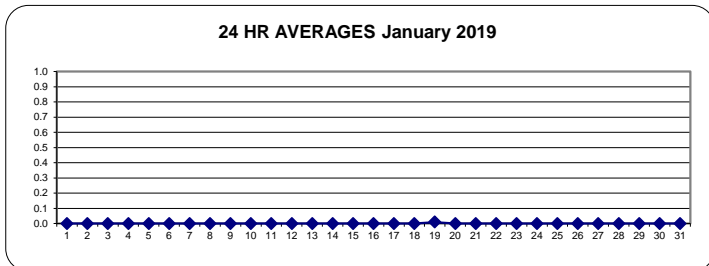


NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	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	24
2	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
3	S	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00	0.00	S	0.00	0.00	0.00	9
4	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	C	C	C	C	0.00	S	0.00	0.00	0.00	0.00	24
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24
6	0.00	0.00	0.00	0.05	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	0.05	0.00	24
7	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	0.05	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	24
8	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.04	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	0.04	0.00	24
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
11	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
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	24
13	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.02	0.01	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	0.02	0.00	24
14	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	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
15	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
16	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	0.00	24
17	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	0.00	0.00	24
18	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	0.00	0.00	0.00	24
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.15	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.15	0.01	24
20	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
21	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
22	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
23	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
24	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
25	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
26	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	S	0.00	0.00	0.00	24
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	24
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	24
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	24
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
HOURLY MAX	0.01	0.00	0.00	0.05	0.02	0.02	0.02	0.01	0.01	0.02	0.04	0.00	0.15	0.02	0.01	0.01	0.05	0.00	0.00	0.00	0.00	0.02	0.00	0.01				
HOURLY AVG	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	0.00	0.00				

STATUS FLAG CODES

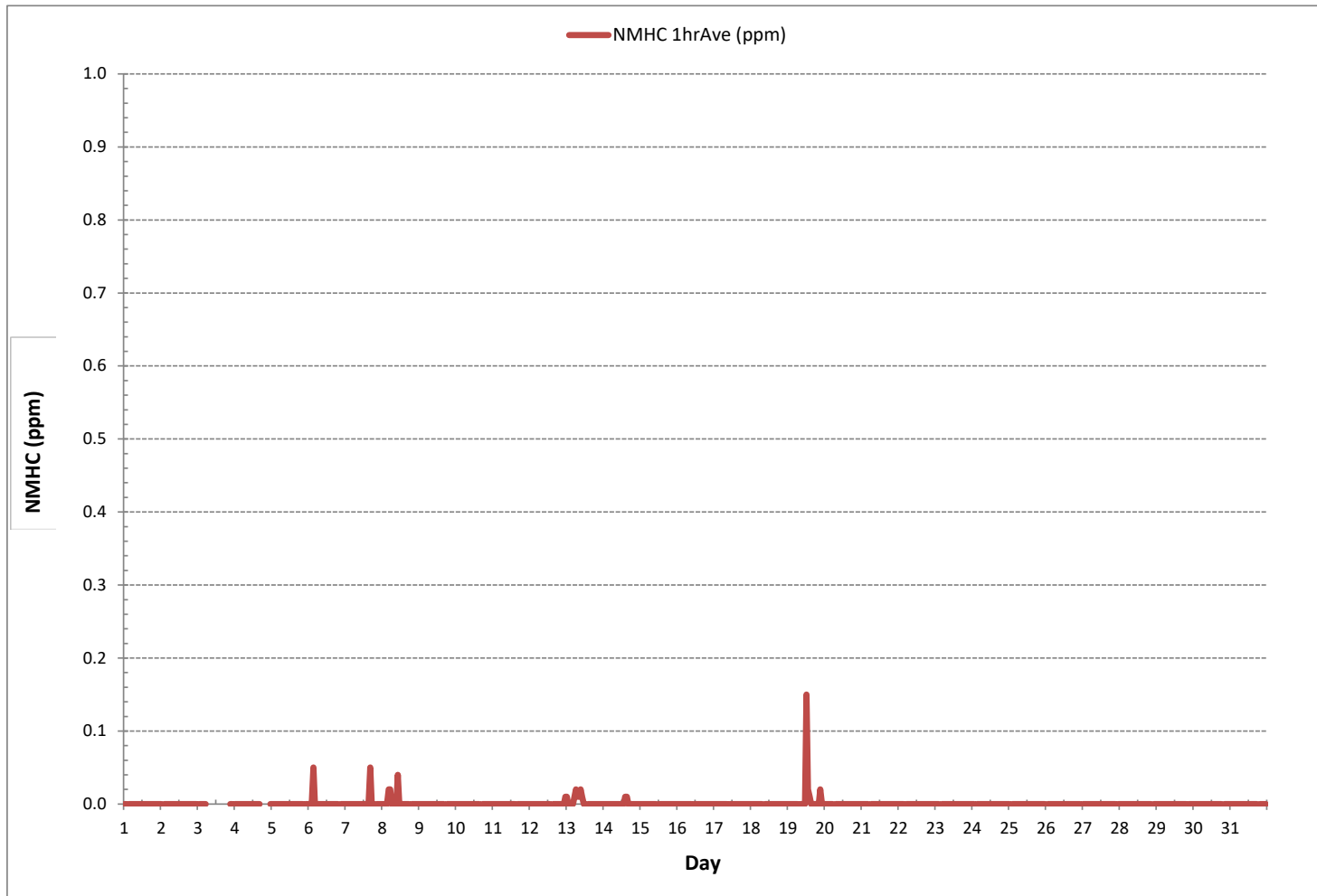
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



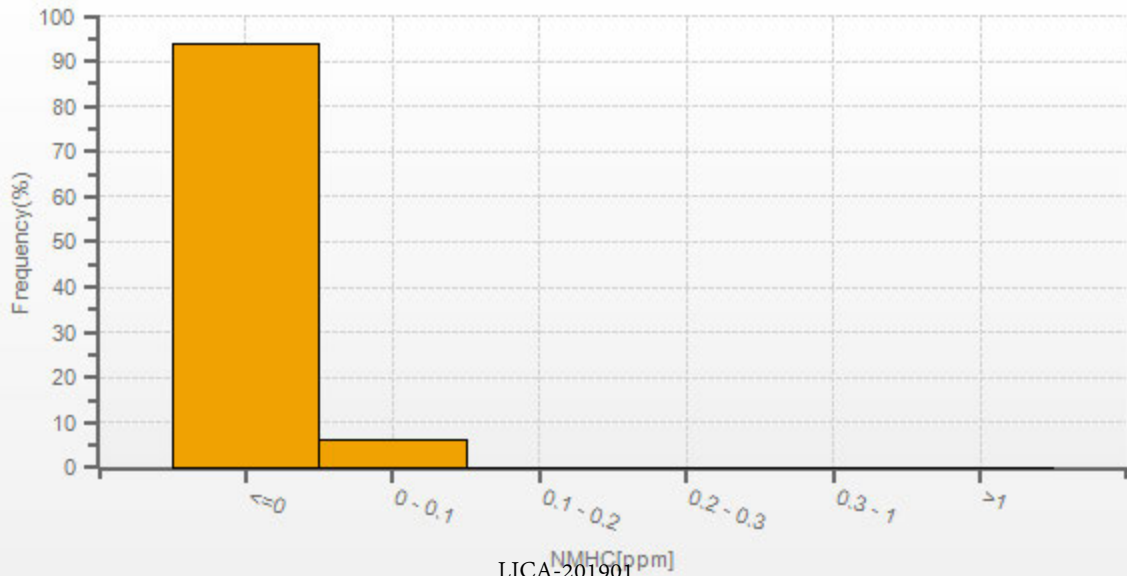
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	19				
MINIMUM 1-HR AVERAGE:	0.00 ppm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	0.15 ppm	@ HOUR	12	ON DAY	19
MAXIMUM 24-HR AVERAGE:	0.01 ppm			ON DAY	19
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	729 hrs		
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	98.0 %		
STANDARD DEVIATION:	0.01	MONTHLY AVERAGE:	0.00 ppm		

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



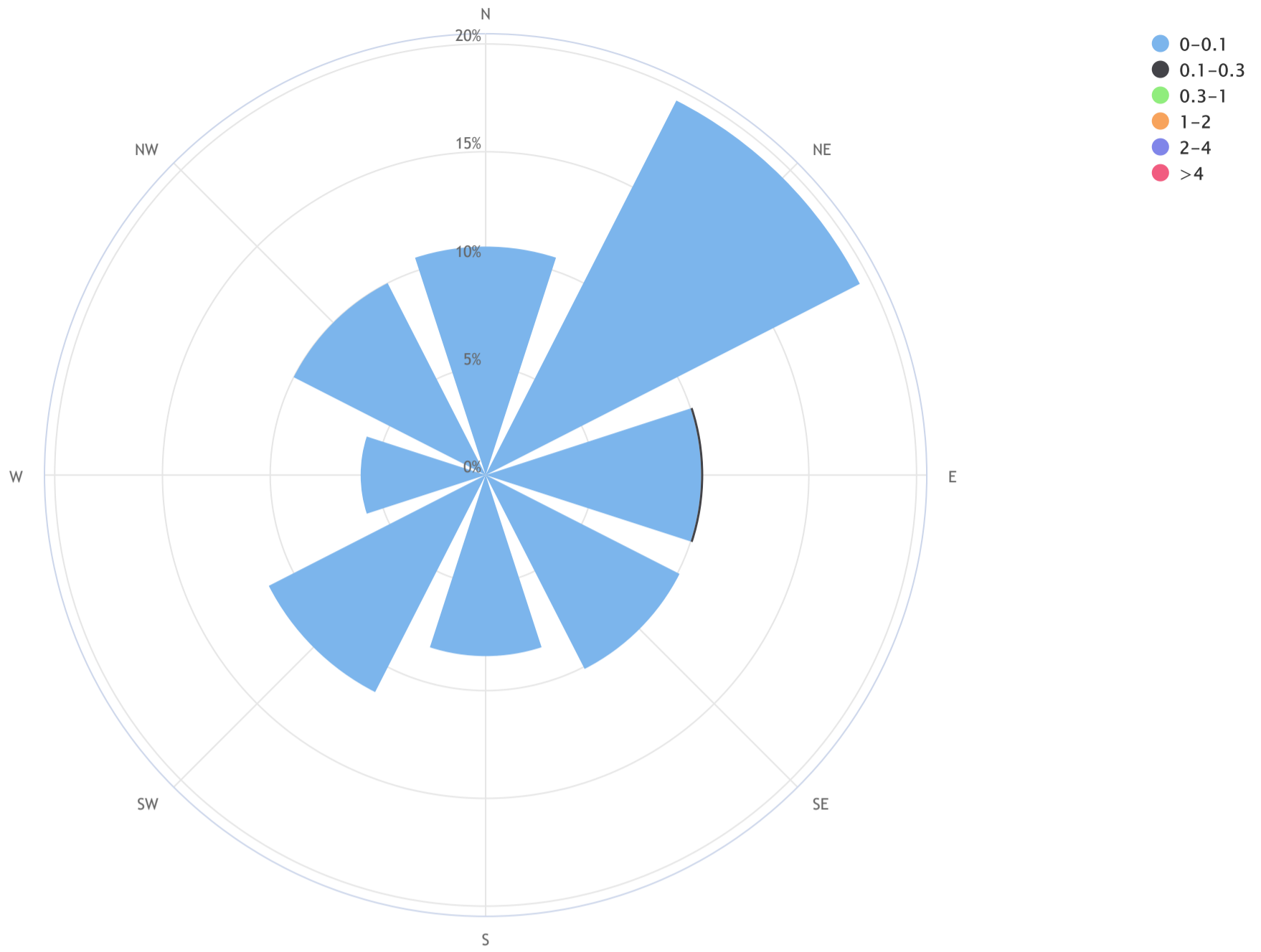
# NMHC[ppm] Histogram: LICA MASKWA Monthly: 19/01 1 Hr.



LICA-201901  
Page 123 of 350

Lakeland Industry & Community Association\_Maskwa Continuous Monitoring Station\_NMHC (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.0\_CALM % = 14.3%



Direction	0-0.1	0.1-0.3	0.3-1	1-2	2-4	>4	TOTAL
N	10.6	0.0	0.0	0.0	0.0	0.0	10.6
NE	19.5	0.0	0.0	0.0	0.0	0.0	19.5
E	10.0	0.1	0.0	0.0	0.0	0.0	10.1
SE	10.1	0.0	0.0	0.0	0.0	0.0	10.1
S	8.4	0.0	0.0	0.0	0.0	0.0	8.4
SW	11.3	0.0	0.0	0.0	0.0	0.0	11.3
W	5.8	0.0	0.0	0.0	0.0	0.0	5.8
NW	10.0	0.0	0.0	0.0	0.0	0.0	10.0
Summary	85.6	0.1	0.0	0.0	0.0	0.0	85.7
CALM	14.3	0.0	0.0	0.0	0.0	0.0	14.3



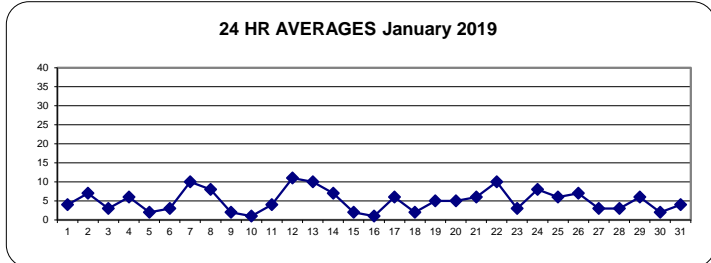
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

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

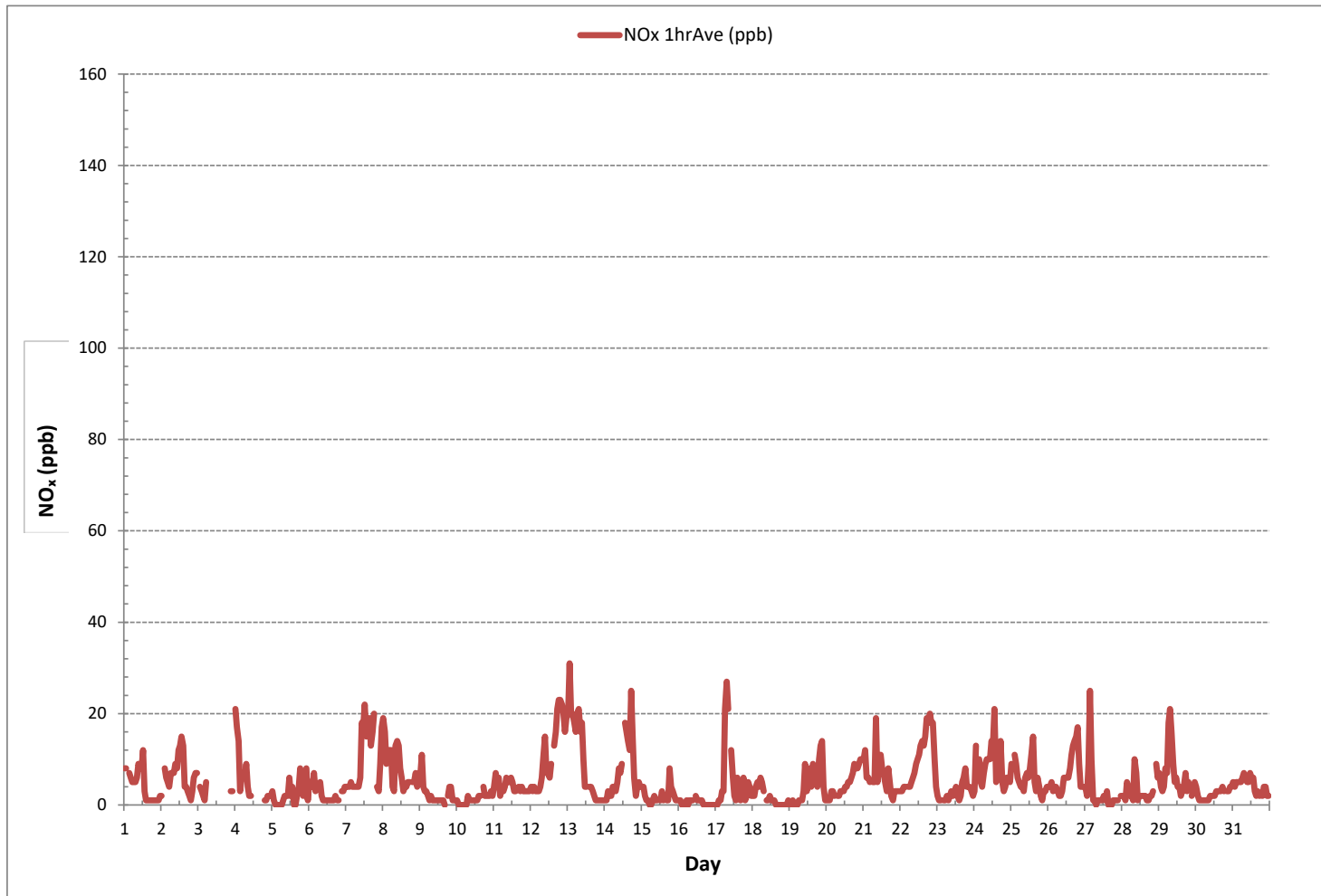
24 HR AVERAGES January 2019



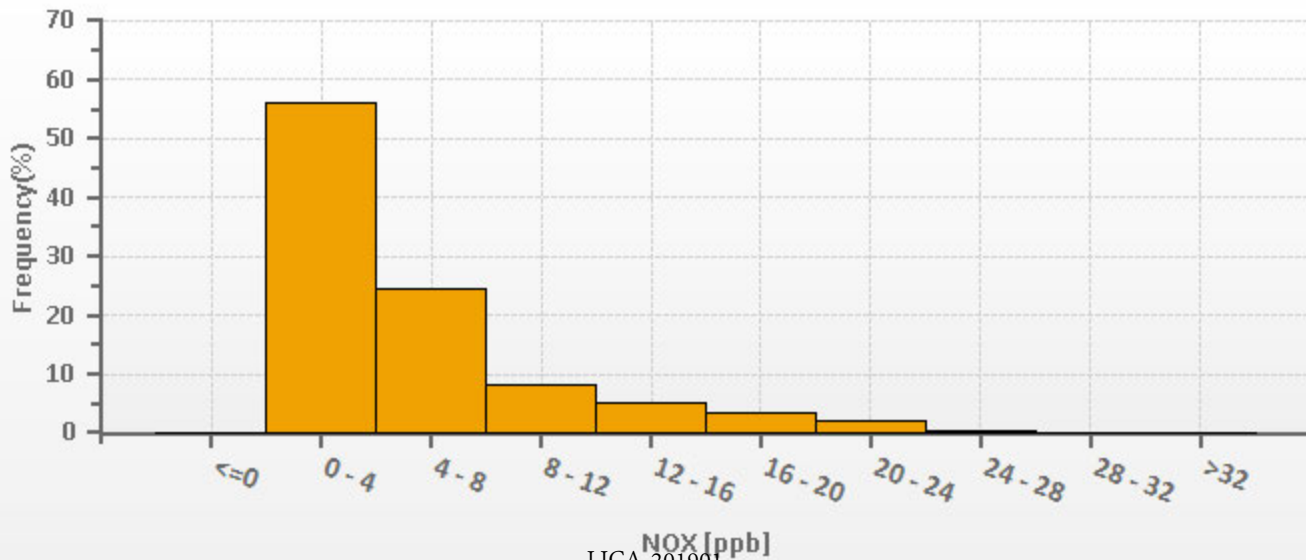
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	641			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	2	ON DAY
MAXIMUM 1-HR AVERAGE:	31	ppb @ HOUR	1	ON DAY
MAXIMUM 24-HR AVERAGE:	11	ppb		ON DAY
IZS CALIBRATION TIME:	33	hrs	OPERATIONAL TIME:	729
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	98.0
STANDARD DEVIATION:	5		MONTHLY AVERAGE:	5
				ppb

OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

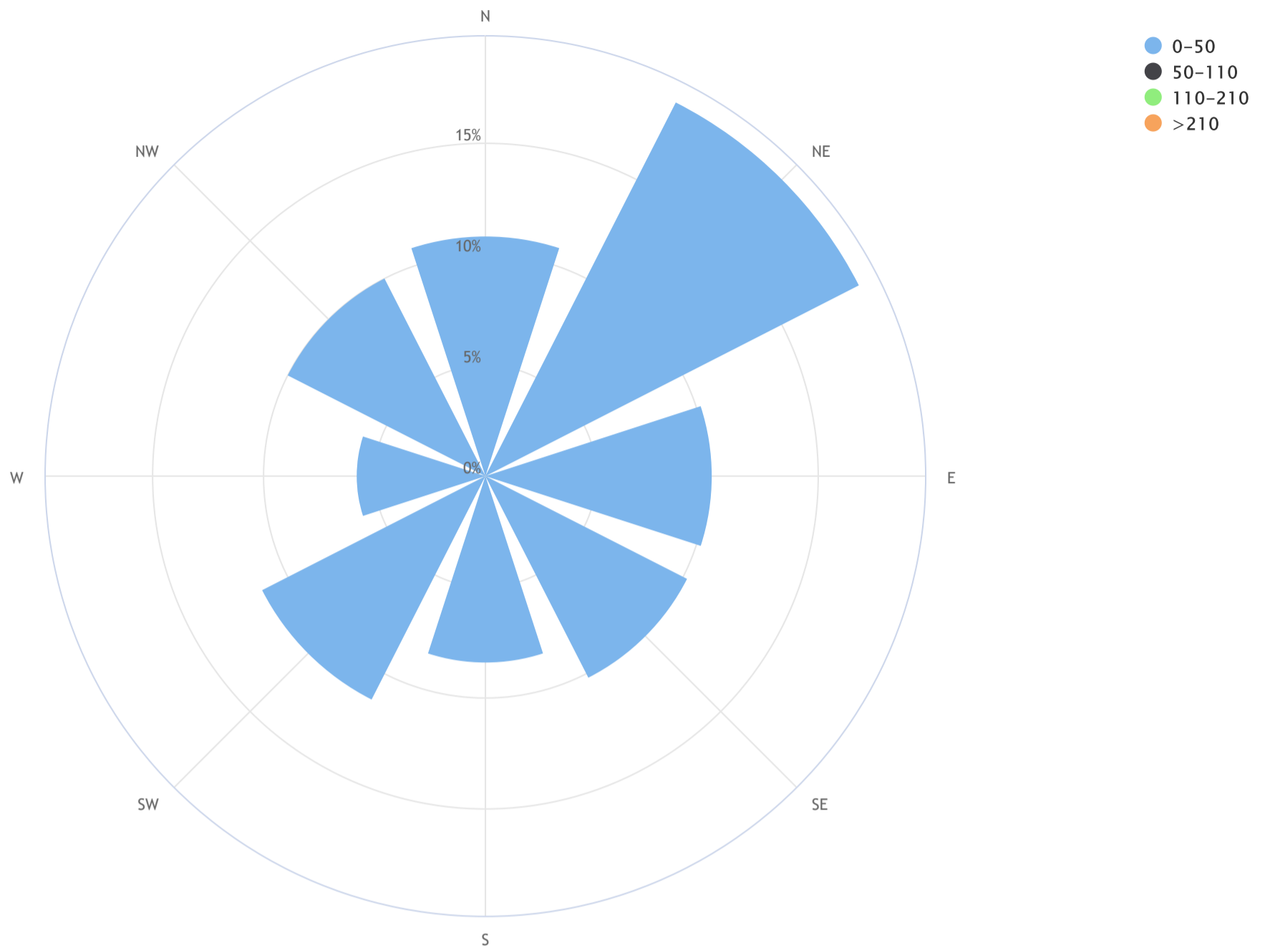


# NOX [ppb] Histogram: LICA MASKWA Monthly: 19/01 1 Hr.



# Lakeland Industry & Community Association\_Maskwa Continuous Monitoring Station\_NO<sub>x</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 7.9\_CALM % = 14.4%



Direction	0-50	50-110	110-210	>210	TOTAL
N	10.8	0.0	0.0	0.0	10.8
NE	18.9	0.0	0.0	0.0	18.9
E	10.2	0.0	0.0	0.0	10.2
SE	10.2	0.0	0.0	0.0	10.2
S	8.4	0.0	0.0	0.0	8.4
SW	11.3	0.0	0.0	0.0	11.3
W	5.8	0.0	0.0	0.0	5.8
NW	10.0	0.0	0.0	0.0	10.0
<b>Summary</b>	<b>85.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>85.6</b>
<b>CALM</b>	<b>14.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>14.4</b>



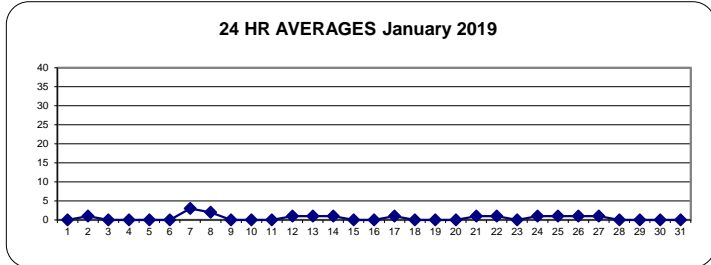
**NITRIC OXIDE Hourly Averages (NO ppb)**

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	S	0	0	0	0	0	0	1	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24																					
2	0	S	0	0	0	0	0	0	0	1	1	2	3	3	4	0	0	1	0	0	0	0	0	0	0	0	4	1	24																					
3	S	0	0	0	0	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	0	S	0	0	0	0	9																					
4	0	1	1	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	0	0	0	S	0	0	1	0	24																						
5	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	S	0	0	1	0	24																						
6	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	24																						
7	0	0	0	0	0	0	1	1	1	2	6	6	9	6	7	6	3	5	6	S	1	1	2	4	0	9	3	0	24																					
8	5	4	2	3	2	3	1	0	3	3	4	2	2	1	1	1	0	0	S	0	0	0	0	0	0	5	2	0	24																					
9	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																					
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	1	0	24																					
11	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24																					
12	0	0	0	0	0	0	0	0	1	3	2	2	2	3	S	2	1	1	1	1	1	1	0	0	0	0	3	1	24																					
13	0	8	1	0	1	0	4	5	2	6	3	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	8	1	24																					
14	0	0	0	0	0	0	0	0	0	1	1	2	S	7	4	2	2	9	4	1	0	0	0	0	0	0	9	1	24																					
15	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
16	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	24																					
17	0	0	0	0	0	0	4	2	2	S	4	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	4	1	24																					
18	0	0	0	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
19	0	0	0	0	0	0	0	S	0	0	1	1	1	1	0	1	1	0	0	1	1	1	0	0	0	0	1	0	24																					
20	0	0	0	0	0	0	S	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
21	0	0	0	0	0	S	0	0	9	1	3	5	3	3	1	1	2	0	0	0	0	0	0	0	0	0	9	1	24																					
22	0	0	0	0	S	0	0	0	0	1	2	3	3	4	3	2	1	1	0	0	0	0	0	0	0	0	4	1	24																					
23	0	0	0	S	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	24																					
24	0	0	S	0	0	0	1	1	1	1	2	4	4	9	1	1	1	3	0	0	0	0	0	0	0	0	9	1	24																					
25	0	S	0	0	0	0	0	0	0	1	1	2	2	3	4	1	0	0	0	0	0	0	0	0	0	0	4	1	24																					
26	S	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	1	0	0	0	1	0	0	S	0	0	2	1	24																					
27	0	0	0	7	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	0	7	1	24																					
28	0	0	0	1	1	0	0	0	2	2	0	0	1	0	0	0	0	0	0	0	0	S	1	0	0	0	2	0	24																					
29	0	0	0	0	0	0	1	1	1	2	1	1	1	1	0	0	0	0	0	0	S	0	0	0	0	0	2	0	24																					
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24																					
31	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	S	0	0	0	0	0	0	1	0	24																					
HOURLY MAX	5	8	2	7	3	3	4	5	9	6	6	6	9	9	7	6	3	9	6	1	1	1	2	4																										
HOURLY AVG	0	0	0	0	0	0	0	0	1	1	1	2	1	2	1	1	0	1	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

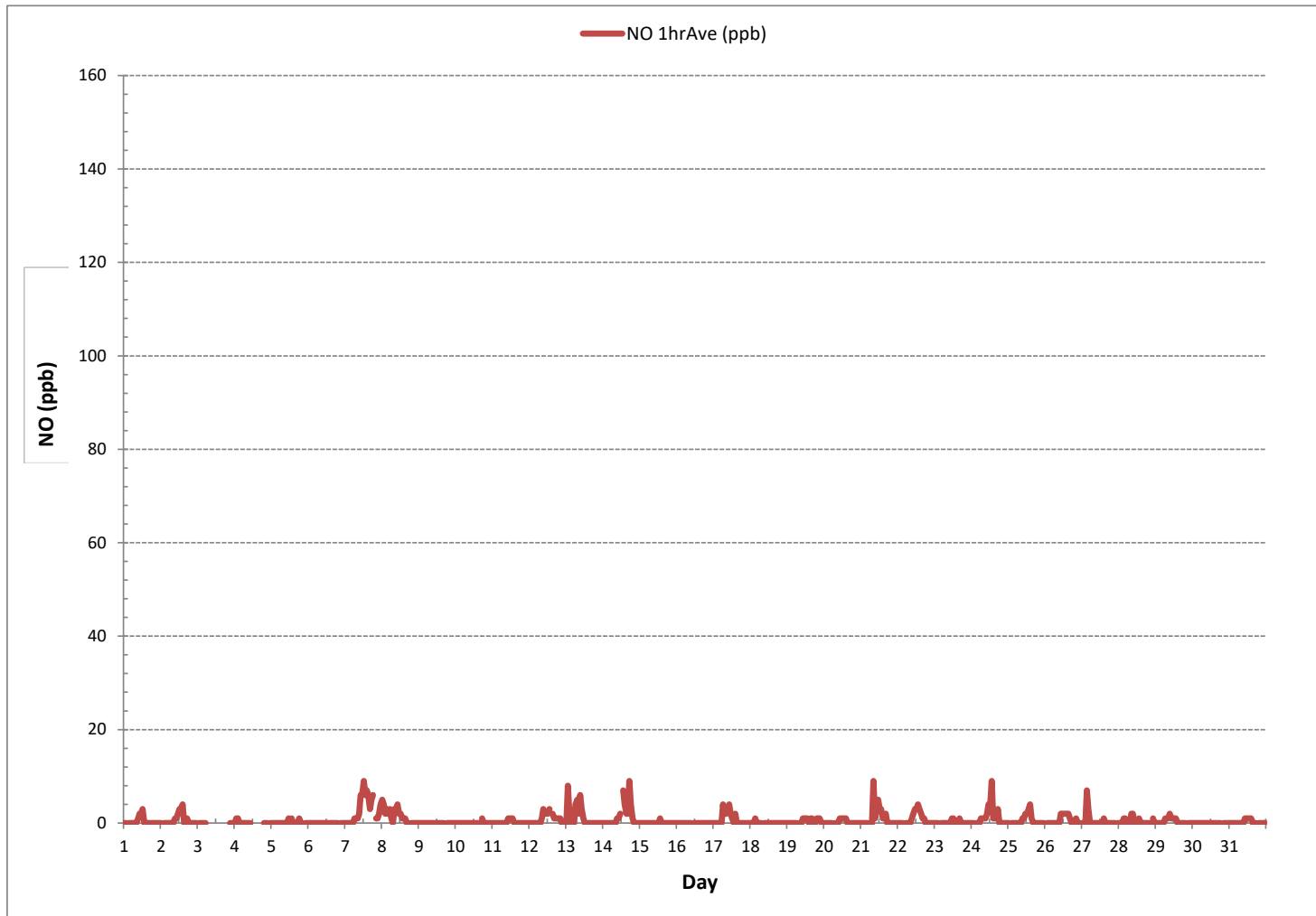
**24 HR AVERAGES January 2019**



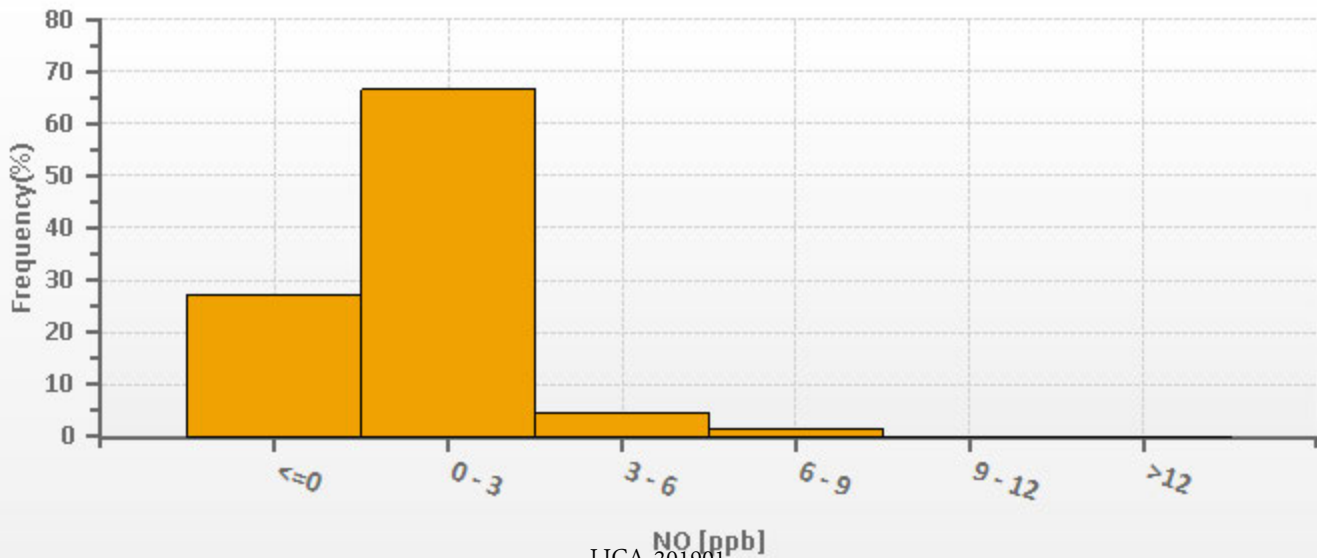
**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	177			
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	9 ppb @ HOUR	12	ON DAY	7
MAXIMUM 24-HR AVERAGE:	3 ppb		ON DAY	7
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	729 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	98.0 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb	

**NITRIC OXIDE Hourly Averages (NO ppb)**

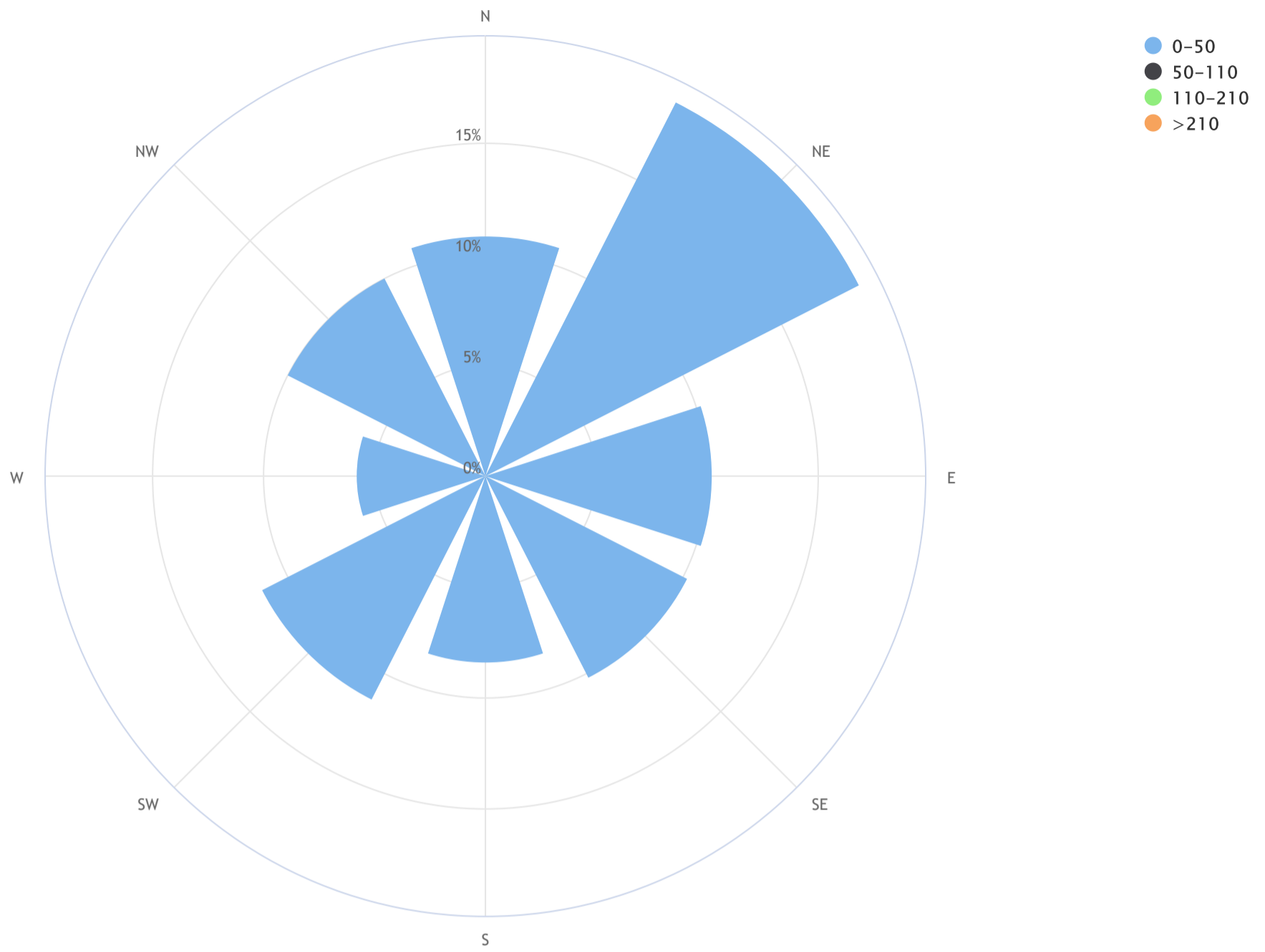


# NO [ppb] Histogram: LICA MASKWA Monthly: 19/01 1 Hr.



# Lakeland Industry & Community Association\_Maskwa Continuous Monitoring Station\_NO (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.6\_CALM % = 14.4%



Direction	0-50	50-110	110-210	>210	TOTAL
N	10.8	0.0	0.0	0.0	10.8
NE	18.9	0.0	0.0	0.0	18.9
E	10.2	0.0	0.0	0.0	10.2
SE	10.2	0.0	0.0	0.0	10.2
S	8.4	0.0	0.0	0.0	8.4
SW	11.3	0.0	0.0	0.0	11.3
W	5.8	0.0	0.0	0.0	5.8
NW	10.0	0.0	0.0	0.0	10.0
<b>Summary</b>	<b>85.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>85.6</b>
<b>CALM</b>	<b>14.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>14.4</b>

**NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)**

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

**STATUS FLAG CODES**

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

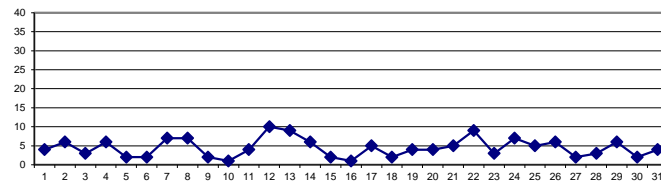
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

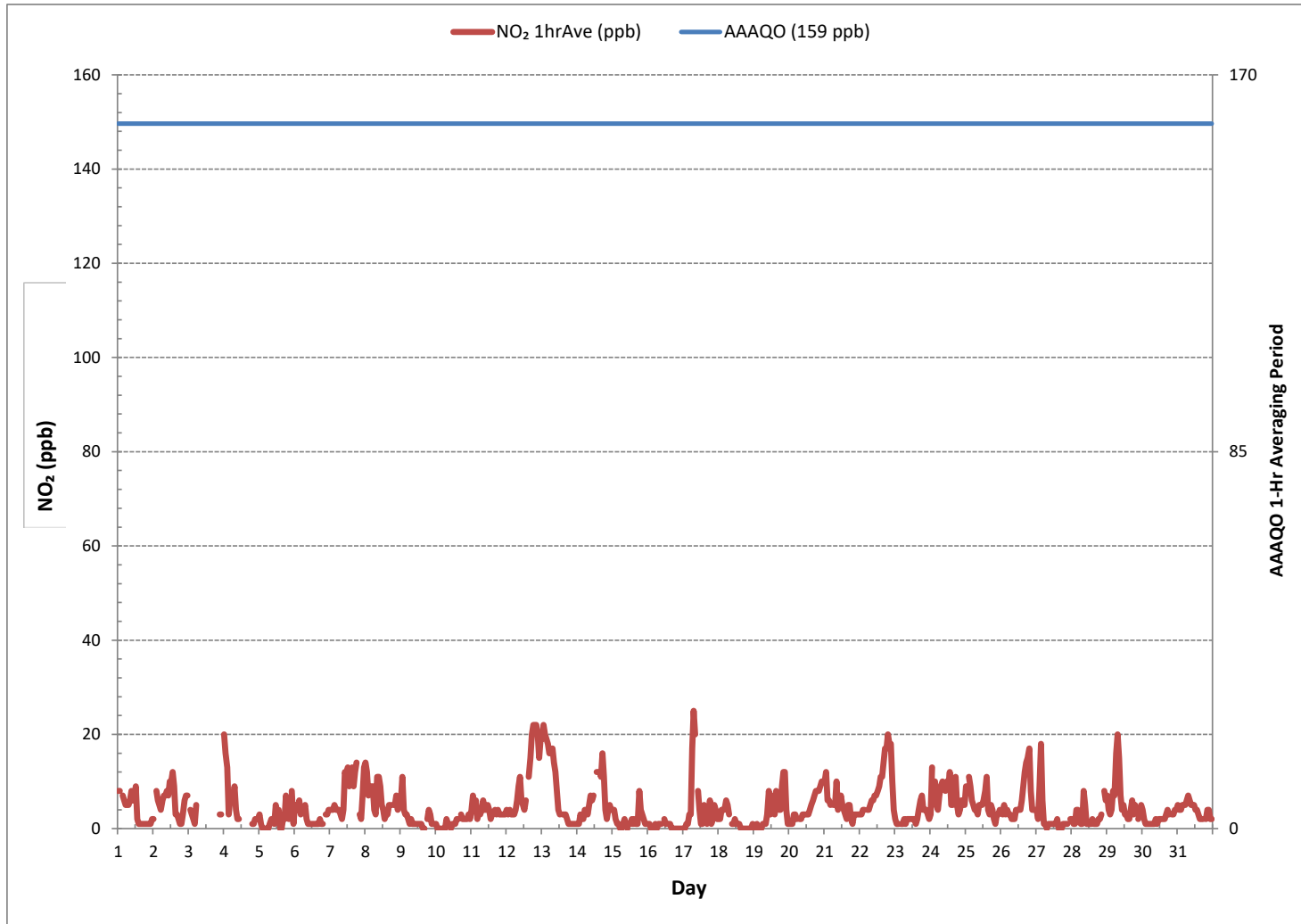
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	638			
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	2 ON DAY 5
MAXIMUM 1-HR AVERAGE:	25	ppb	@ HOUR	7 ON DAY 17
MAXIMUM 24-HR AVERAGE:	10	ppb		ON DAY 12
IZS CALIBRATION TIME:	33	hrs	OPERATIONAL TIME:	729 hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	98.0 %
STANDARD DEVIATION:	4		MONTHLY AVERAGE:	5 ppb

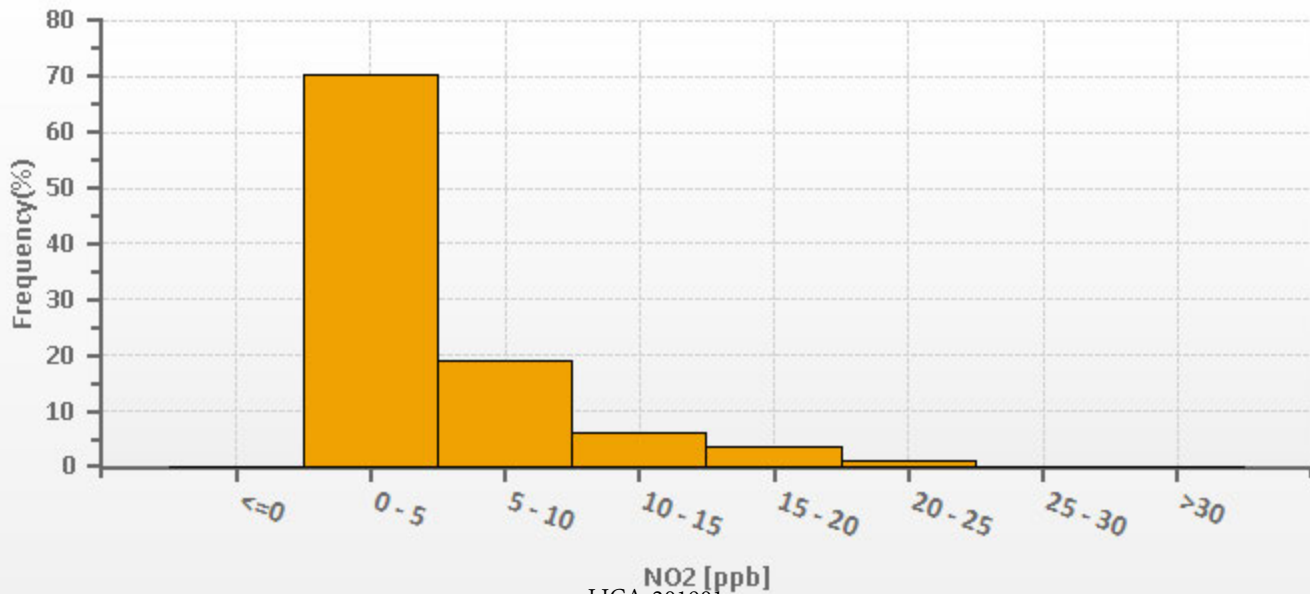
**24 HR AVERAGES January 2019**



NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)



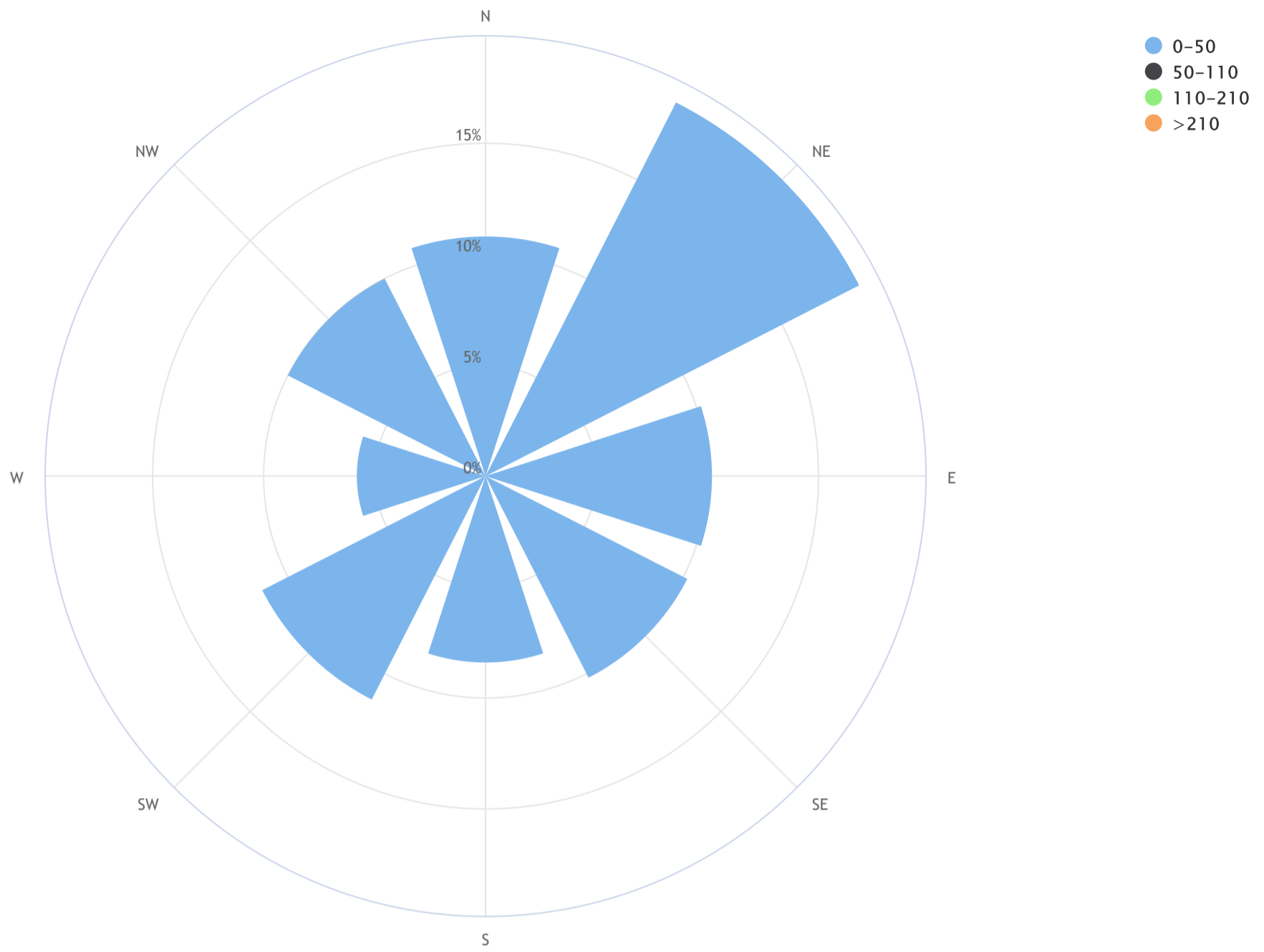
### NO2 [ppb] Histogram: LICA MASKWA Monthly: 19/01 1 Hr.



LICA-201901

# Lakeland Industry & Community Association\_Maskwa Continuous Monitoring Station\_NO<sub>2</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 7.2\_CALM % = 14.4%



Direction	0-50	50-110	110-210	>210	TOTAL
N	10.8	0.0	0.0	0.0	10.8
NE	18.9	0.0	0.0	0.0	18.9
E	10.2	0.0	0.0	0.0	10.2
SE	10.2	0.0	0.0	0.0	10.2
S	8.4	0.0	0.0	0.0	8.4
SW	11.3	0.0	0.0	0.0	11.3
W	5.8	0.0	0.0	0.0	5.8
NW	10.0	0.0	0.0	0.0	10.0
<b>Summary</b>	<b>85.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>85.6</b>
<b>CALM</b>	<b>14.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>14.4</b>





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	4.6	5.8	7.2	5.8	5.4	4.4	5.4	4.9	4.6	6.0	5.0	11.6	10.5	9.9	10.7	9.4	8.5	7.5	6.6	4.3	5.1	5.0	4.1	4.7	4.1	11.6	4.6	24	
2	3.1	4.7	3.2	6.6	7.5	6.8	3.6	4.1	4.3	6.2	6.6	6.0	6.5	5.6	4.4	6.0	6.8	5.1	3.7	3.4	5.2	5.6	4.3	3.6	3.1	7.5	4.7	24	
3	3.4	2.6	3.2	3.5	5.3	5.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.8	3.1	2.4	2.4	5.3	3.4	9	
4	1.1	1.8	1.5	0.5	2.7	1.2	0.3	1.9	2.4	2.6	2.5	3.4	6.5	5.4	5.5	4.7	4.1	4.2	3.8	2.8	2.8	6.7	6.2	4.5	0.3	6.7	2.6	24	
5	6.0	2.4	2.5	3.3	4.4	4.2	4.8	4.1	4.0	4.1	4.2	4.8	4.5	4.5	6.1	6.2	6.3	6.7	7.1	6.0	5.2	5.7	6.3	6.6	2.4	7.1	4.5	24	
6	6.2	5.2	4.4	5.1	5.4	5.1	4.8	5.0	5.1	4.1	4.9	5.1	4.7	4.6	4.8	3.8	3.9	5.3	4.5	2.4	3.4	3.6	6.1	4.5	2.4	6.2	3.8	24	
7	5.4	4.5	5.3	7.0	6.4	6.8	6.4	7.4	7.6	8.0	8.6	8.1	8.9	8.6	7.8	9.0	8.4	8.2	7.8	7.4	7.2	7.5	6.5	6.9	4.5	9.0	7.2	24	
8	7.9	7.9	9.1	8.6	5.1	9.1	6.2	5.1	5.5	4.9	5.5	5.0	4.3	3.0	3.3	2.3	4.7	4.8	1.8	1.2	0.7	0.3	0.0	0.7	0.0	9.1	3.5	24	
9	1.4	2.7	1.2	2.5	3.0	2.8	3.2	4.6	5.5	5.6	5.7	5.8	6.4	6.4	6.8	7.1	7.9	5.4	7.2	7.0	6.2	7.1	6.3	5.1	1.2	7.9	5.0	24	
10	5.3	4.1	3.7	4.7	3.4	3.4	2.0	1.4	1.1	3.3	4.2	3.6	2.7	2.7	1.1	1.6	1.4	1.6	1.4	1.1	0.8	2.8	3.3	2.8	0.8	5.3	2.1	24	
11	2.9	2.2	2.8	3.5	3.8	4.5	4.7	3.8	3.7	4.3	5.2	6.0	5.1	5.2	5.1	3.6	3.7	4.9	6.4	4.3	4.8	4.8	4.2	4.7	2.2	6.4	4.2	24	
12	3.0	1.9	3.4	4.3	1.8	2.8	1.1	1.4	0.3	1.5	2.6	3.6	3.3	3.7	4.9	3.9	3.5	3.4	2.8	2.1	0.5	0.3	2.4	8.1	0.3	8.1	2.5	24	
13	3.6	1.0	1.6	1.2	1.0	2.0	0.4	0.6	0.3	1.2	3.2	3.6	4.6	5.5	4.8	5.5	5.8	5.3	5.9	4.5	3.1	3.5	2.4	3.6	0.3	5.9	2.3	24	
14	3.4	2.2	2.5	2.6	2.4	2.6	3.4	4.8	5.7	6.7	5.7	5.7	4.9	4.4	3.8	4.7	8.3	8.7	8.0	6.2	8.7	11.1	9.1	10.4	2.2	11.1	1.7	24	
15	9.5	11.9	10.6	6.6	8.1	7.3	3.7	1.4	2.0	2.9	4.4	4.7	4.7	4.0	2.6	4.2	2.5	2.9	1.4	2.5	2.3	2.6	1.8	1.3	1.3	11.9	3.9	24	
16	2.0	3.1	3.7	5.1	3.6	5.0	3.9	5.4	4.7	3.2	3.6	5.1	5.0	5.8	7.5	6.4	3.9	5.1	6.1	5.0	4.8	7.7	9.8	7.7	2.0	9.8	5.1	24	
17	4.2	2.8	3.3	0.1	1.4	0.8	0.5	1.3	0.7	1.1	0.7	3.0	3.7	3.3	1.9	1.9	1.5	0.1	2.8	1.4	2.1	2.0	1.8	3.1	0.1	4.2	1.5	24	
18	3.8	2.0	2.5	2.2	0.0	2.1	2.0	2.3	1.9	3.2	3.1	4.2	4.7	4.5	4.5	4.5	3.7	3.4	3.0	3.1	2.6	2.2	2.2	2.9	0.0	4.7	2.9	24	
19	3.6	4.2	4.7	3.0	2.9	3.5	4.1	4.3	5.4	5.1	6.2	6.9	6.6	6.2	7.2	8.1	6.5	7.4	6.6	5.6	6.3	7.0	7.1	5.9	2.9	8.1	5.1	24	
20	4.9	4.9	4.9	4.0	3.8	4.7	5.9	5.0	4.4	5.1	5.5	5.4	5.3	6.5	5.8	5.3	3.7	0.4	5.1	4.2	2.4	2.1	1.6	0.6	0.4	6.5	3.8	24	
21	1.7	2.0	1.5	1.8	1.2	3.7	3.9	1.3	1.4	4.7	4.5	5.2	4.7	4.6	4.6	4.5	2.2	2.3	2.6	2.7	3.4	1.0	1.5	0.3	0.3	5.2	2.0	24	
22	1.4	2.1	1.5	3.0	1.5	2.0	1.2	2.1	3.2	3.1	4.8	3.6	2.2	2.0	3.7	2.9	1.3	3.0	4.7	2.8	2.4	2.2	3.8	6.7	1.2	6.7	1.1	24	
23	12.1	9.5	8.0	10.0	7.4	7.8	7.6	8.5	7.7	6.5	6.8	8.1	7.3	7.3	5.6	5.3	2.4	1.7	1.7	1.7	1.0	2.4	1.8	2.3	1.0	12.1	4.9	24	
24	4.2	6.6	7.4	4.9	5.2	4.2	3.8	3.0	3.7	4.8	3.6	3.2	3.0	4.3	4.5	3.3	1.8	1.9	1.3	0.4	1.6	3.0	0.5	2.1	0.4	7.4	2.4	24	
25	4.1	2.6	2.2	1.8	2.0	0.8	1.2	1.9	1.4	1.4	3.3	3.7	3.8	3.7	5.3	4.7	4.3	3.1	1.9	1.0	1.9	3.2	2.3	1.3	0.8	5.3	0.7	24	
26	1.5	1.4	1.6	1.0	1.2	2.1	1.8	3.8	1.6	0.1	2.7	4.0	5.4	5.8	6.9	6.1	5.4	5.5	3.3	5.6	2.8	5.1	6.2	6.6	0.1	6.9	2.7	24	
27	4.2	7.5	9.5	10.0	7.2	8.8	14.3	13.4	12.0	13.2	13.3	12.1	9.7	9.8	10.7	11.0	10.6	11.6	10.3	9.0	9.1	10.3	7.0	6.2	4.2	14.3	9.0	24	
28	4.5	4.6	5.2	5.3	6.2	6.3	4.6	4.6	4.0	5.7	6.1	7.1	7.4	7.4	7.4	5.8	6.6	5.3	5.0	4.8	3.7	1.3	0.3	1.1	0.3	7.4	4.8	24	
29	0.5	1.1	0.3	0.4	0.6	1.1	0.9	0.7	0.4	0.4	3.8	5.1	4.2	4.7	3.9	4.1	4.3	3.9	3.6	3.7	4.9	4.5	5.0	5.3	0.3	5.3	2.4	24	
30	5.0	4.7	4.6	4.4	4.5	4.4	5.1	6.0	6.0	6.7	7.8	6.4	5.9	6.8	6.3	5.9	4.5	4.4	4.6	5.3	5.3	6.1	3.5	3.0	3.0	7.8	4.7	24	
31	2.4	3.2	2.6	0.9	1.5	2.7	1.3	0.2	2.0	3.0	5.4	3.3	2.7	2.8	7.2	7.1	6.7	5.8	6.9	6.6	5.7	8.0	10.6	13.1	0.2	13.1	3.3	24	
HOURLY MAX	12.1	11.9	10.6	10.0	8.1	9.1	14.3	13.4	12.0	13.2	13.3	12.1	10.5	9.9	10.7	11.0	10.6	11.6	10.3	9.0	9.1	11.1	10.6	13.1					

STATUS FLAG CODES

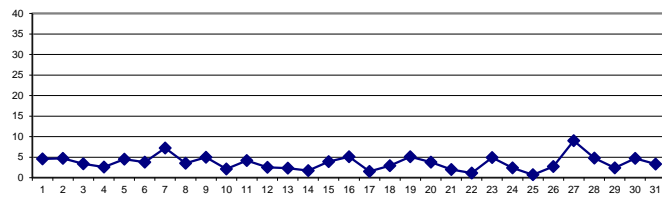
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	September 17, 2018
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

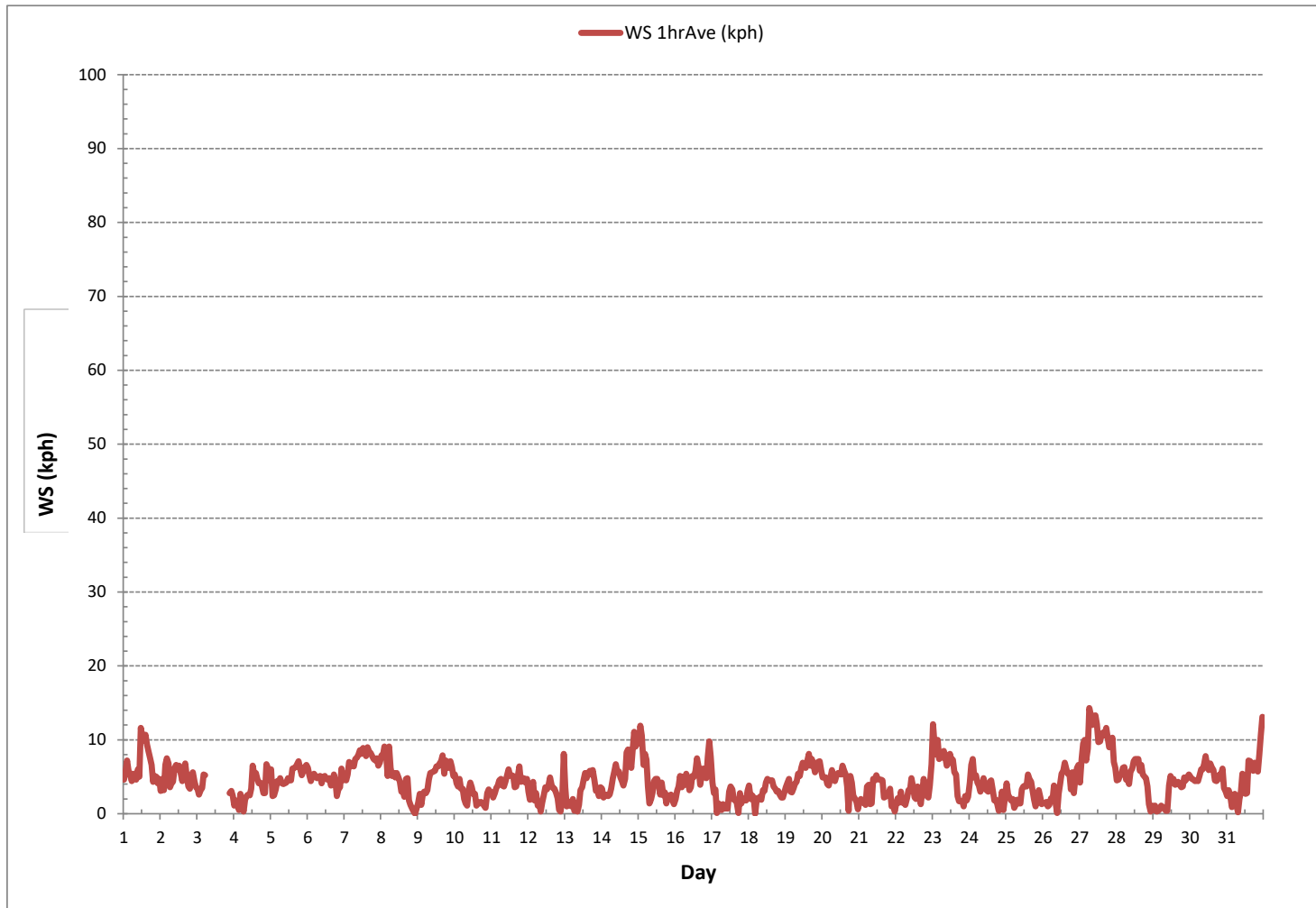
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	727
MINIMUM 1-HR AVERAGE	0.0 kph @ HOUR 22 ON DAY 8
MAXIMUM 1-HR AVERAGE:	14.3 kph @ HOUR 6 ON DAY 27
MAXIMUM 24-HR AVERAGE:	9.0 kph ON DAY 27
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	729 hrs
AMSD OPERATION UPTIME:	98.0 %
STANDARD DEVIATION:	2.5
MONTHLY AVERAGE:	0.8 kph

24 HR AVERAGES January 2019

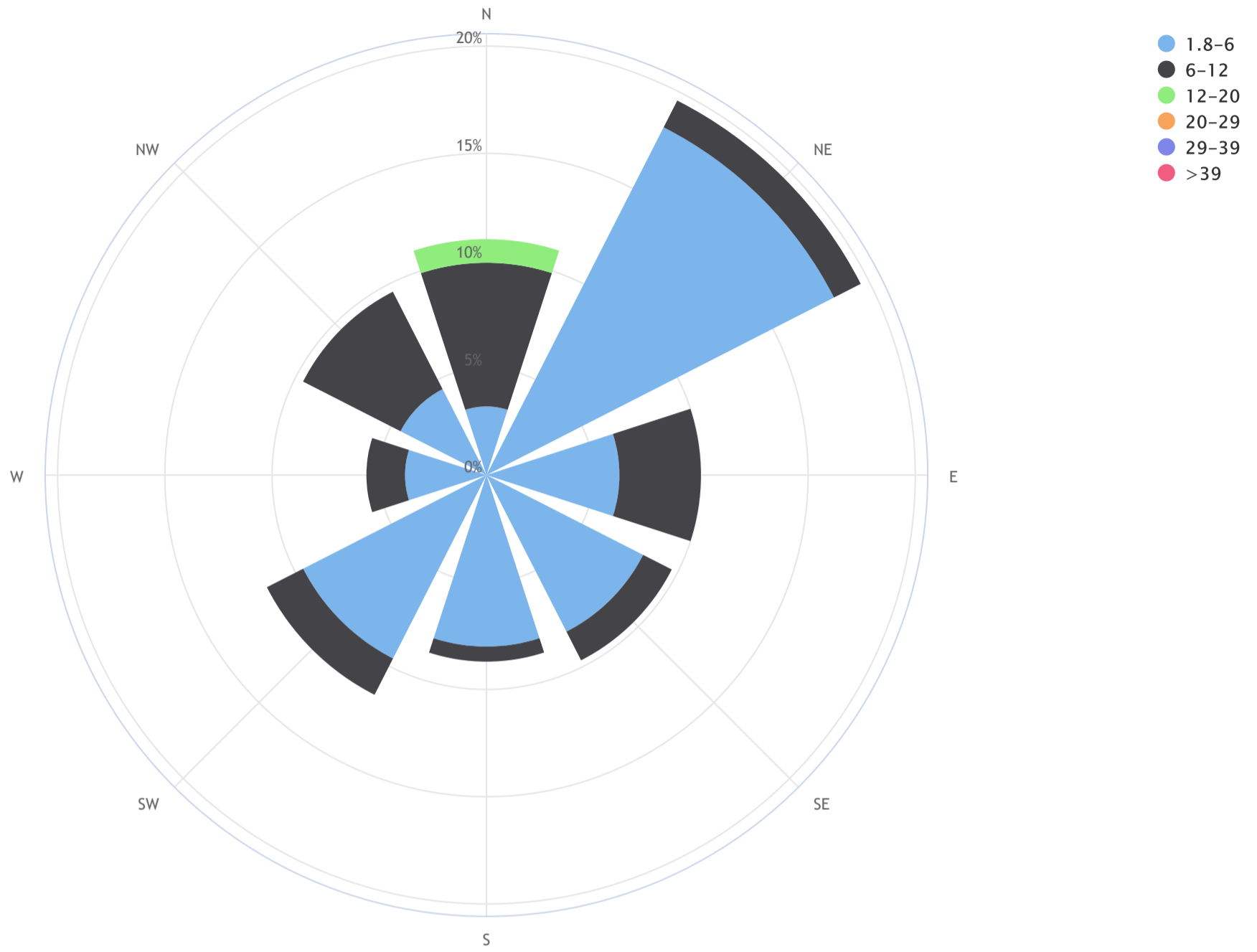


WIND SPEED Hourly Averages (WS kph)



Lakeland Industry & Community Association\_Maskwa Continuous Monitoring Station\_19/01

Wind Rose\_Wind Frequency (Blowing From)\_CALM Avg = 1.0\_CALM % = 14.3%



Direction	1.8-6	6-12	12-20	20-29	29-39	>39	TOTAL
N	3.2	6.7	1.1	0.0	0.0	0.0	11.0
NE	18.2	1.4	0.0	0.0	0.0	0.0	19.6
E	6.2	3.8	0.0	0.0	0.0	0.0	10.0
SE	8.2	1.5	0.0	0.0	0.0	0.0	9.7
S	8.0	0.7	0.0	0.0	0.0	0.0	8.7
SW	9.6	1.9	0.0	0.0	0.0	0.0	11.5
W	3.8	1.8	0.0	0.0	0.0	0.0	5.6
NW	4.5	5.1	0.0	0.0	0.0	0.0	9.6
Summary	61.7	22.9	1.1	0.0	0.0	0.0	85.7
CALM	14.3	0.0	0.0	0.0	0.0	0.0	14.3



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - January 2019

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

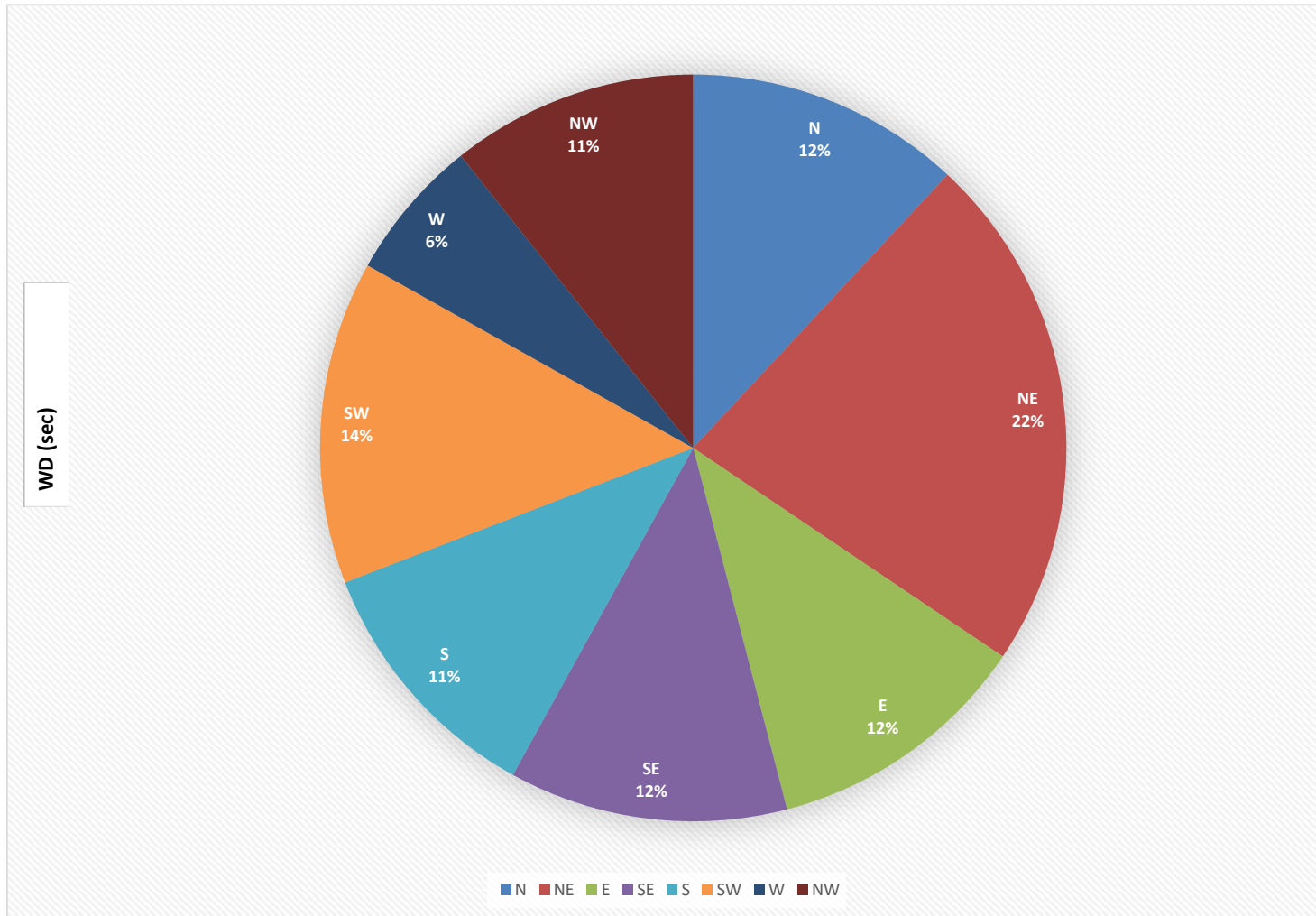
STATUS FLAG CODES

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

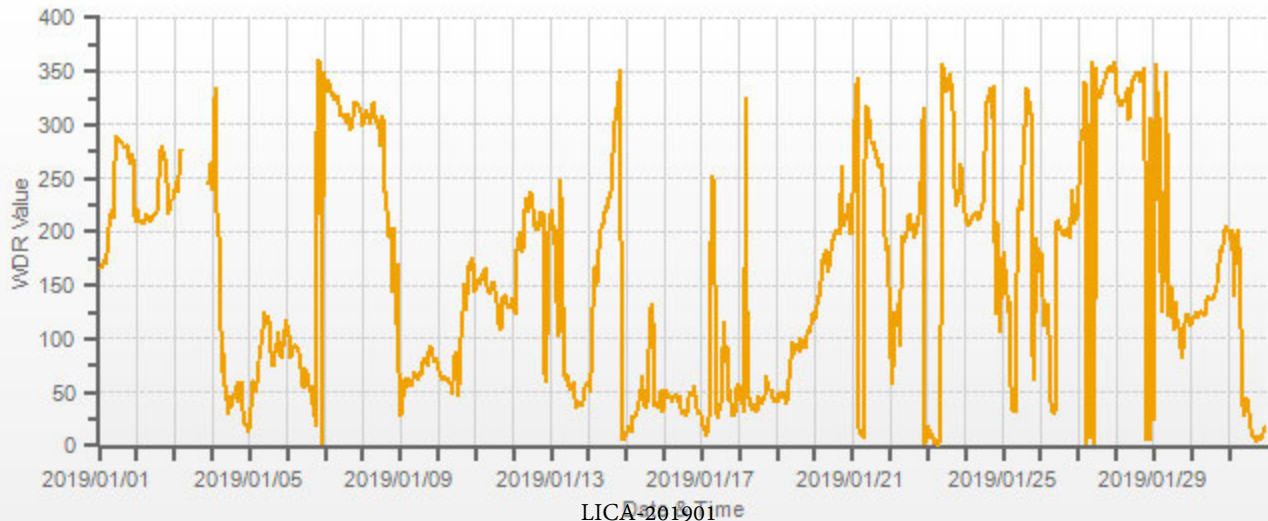
LAST CALIBRATION:	September 17, 2018
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	729	hrs
STANDARD DEVIATION:	105		AMD OPERATION UPTIME:	98.0	%
			MONTHLY AVERAGE:	26	(NNE)

**WIND DIRECTION Hourly Averages (WD)**



— WDR[degwdr]





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - January 2019

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	14	13	9	13	12	13	8	10	13	6	27	5	5	5	6	6	6	7	7	8	10	7	20	9	24	
2	8	7	12	4	5	10	14	8	9	6	7	6	6	7	15	8	6	7	10	12	7	4	12	11	24	
3	16	21	14	19	12	11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	16	11	29	9	
4	32	35	47	59	21	38	62	31	27	32	14	15	8	12	14	11	13	19	24	14	11	6	9	7	24	
5	9	16	27	19	17	15	16	18	16	22	20	17	20	25	14	14	9	11	13	16	12	11	17	13	24	
6	16	17	19	15	13	11	15	14	16	15	10	13	14	14	14	15	16	8	10	13	12	15	9	13	24	
7	13	17	17	14	13	13	14	13	12	12	11	12	10	11	12	12	9	11	12	13	12	10	12	11	24	
8	9	12	11	9	14	12	14	12	11	12	14	13	22	32	27	17	8	6	19	34	43	28	78	29	24	
9	14	13	34	25	25	15	14	11	9	12	13	15	13	15	13	11	10	10	11	12	12	11	10	13	24	
10	9	12	11	10	17	10	17	30	27	14	20	22	31	24	44	21	16	28	32	23	33	15	16	23	24	
11	26	20	13	13	10	9	12	10	11	11	12	13	14	16	14	11	12	12	8	14	9	8	10	13	24	
12	16	27	16	11	41	22	39	45	68	36	22	15	20	14	9	17	13	7	14	10	66	50	25	5	24	
13	22	39	26	34	20	31	50	68	46	22	13	21	18	13	15	12	9	12	8	13	14	12	20	11	24	
14	12	17	19	20	30	15	18	17	8	9	11	10	9	17	13	12	9	13	10	21	14	20	12	9	24	
15	8	7	6	7	6	5	8	13	18	12	19	15	16	21	35	22	12	18	32	12	23	15	22	25	24	
16	18	18	15	14	16	16	15	11	15	22	28	11	15	14	11	10	20	12	12	12	14	9	4	5	24	
17	7	7	5	26	13	50	24	27	38	25	44	27	16	30	37	23	23	73	13	10	14	9	16	11	24	
18	9	13	12	15	79	20	13	18	20	16	15	13	18	16	17	13	11	17	13	12	10	12	10	10	24	
19	9	8	7	9	11	12	10	15	8	12	11	13	13	12	11	13	12	9	11	10	10	11	12	13	24	
20	10	10	13	13	17	16	14	15	13	16	17	17	14	11	8	9	12	63	10	11	13	16	24	57	24	
21	29	25	20	21	14	11	9	13	32	16	16	12	18	17	15	10	18	18	16	25	15	48	38	63	24	
22	41	26	32	12	13	17	26	25	14	19	12	13	17	17	12	20	14	14	9	21	14	24	15	10	24	
23	8	9	8	8	7	7	8	10	8	13	17	14	15	18	18	20	24	16	11	13	16	25	17	12	24	
24	10	4	4	7	5	9	9	14	24	12	13	13	39	17	16	17	22	17	27	58	28	27	59	36	24	
25	13	25	24	33	25	55	25	17	45	28	12	14	11	40	12	22	18	25	30	23	33	14	27	32	24	
26	24	25	22	44	44	19	27	11	15	74	18	10	6	5	5	5	3	5	30	7	18	10	8	8	24	
27	12	8	6	8	20	12	6	9	9	7	12	14	10	10	11	11	13	12	13	16	13	14	13	11	24	
28	15	14	10	12	10	11	11	13	17	14	17	16	14	14	15	16	11	14	11	12	8	15	30	20	24	
29	33	39	30	46	60	25	27	59	42	60	16	15	22	17	21	13	14	13	18	18	12	14	14	15	24	
30	13	15	15	11	12	12	11	11	12	14	9	15	16	15	14	13	15	22	16	15	16	9	13	15	24	
31	13	15	16	53	36	17	44	70	28	17	14	20	31	17	11	11	9	9	9	8	8	9	8	6	24	

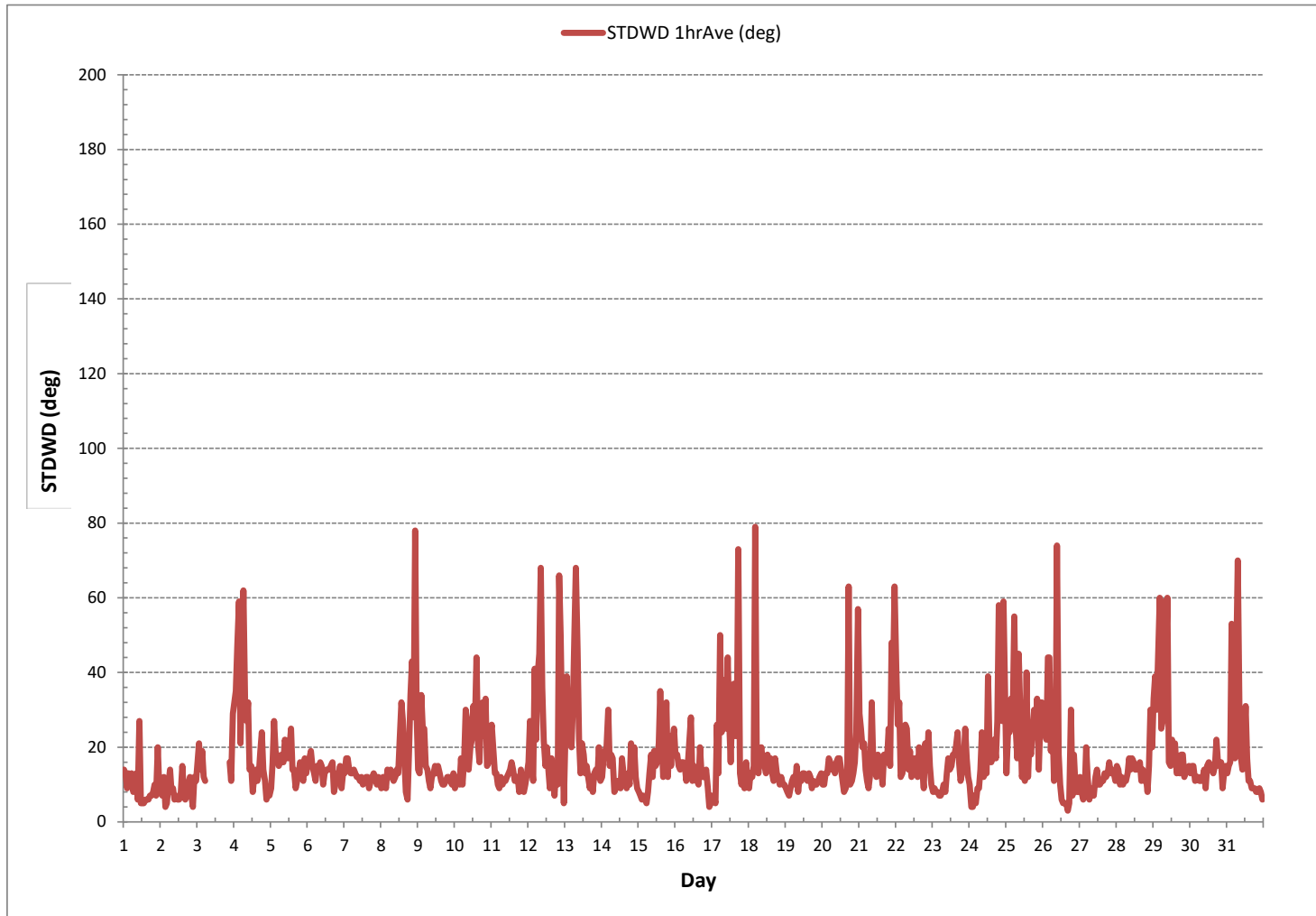
STATUS FLAG CODES

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 17, 2018

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 729 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)







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	88	87	86	87	91	92	93	94	94	95	95	91	89	88	87	90	92	93	94	97	98	97	97	99	86	99	92	24	
2	100	100	100	100	100	100	100	100	100	99	96	91	89	87	85	87	88	91	93	94	96	95	92	92	85	100	95	24	
3	90	91	92	91	85	85	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	82	80	79	79	92	86	9
4	81	77	73	76	80	84	92	93	90	89	86	82	81	81	84	88	90	92	93	95	95	95	94	73	95	86	24		
5	93	93	93	93	94	94	93	93	93	93	98	96	93	91	92	92	95	95	96	97	97	97	98	98	91	98	94	24	
6	98	98	98	98	97	97	97	97	97	97	97	98	98	99	99	100	100	99	99	99	99	99	98	97	97	100	98	24	
7	96	95	95	92	91	91	91	90	87	85	85	84	83	80	81	81	82	82	82	81	80	81	84	86	80	96	86	24	
8	87	87	85	85	86	84	83	83	83	80	78	76	74	71	70	75	81	81	81	79	77	75	74	70	87	80	24		
9	77	81	83	85	85	86	86	84	84	83	78	77	73	74	75	78	80	82	83	86	88	88	88	90	73	90	82	24	
10	91	91	92	92	91	91	92	93	92	92	89	85	83	82	80	81	82	85	89	92	92	91	89	90	80	93	89	24	
11	91	93	93	94	95	95	94	94	94	93	89	84	81	77	75	81	85	84	85	86	88	89	90	91	75	95	88	24	
12	92	94	92	90	90	91	94	94	94	92	84	77	70	66	66	68	78	80	81	84	85	87	90	88	66	94	84	24	
13	85	94	98	99	98	98	98	99	98	98	98	97	100	100	100	100	100	100	99	99	100	100	100	100	85	100	98	24	
14	100	100	100	100	100	100	100	100	100	100	100	100	99	93	94	96	97	97	93	92	91	91	88	86	86	100	96	24	
15	87	85	83	85	84	85	85	84	83	82	80	77	74	70	68	71	76	80	82	82	82	81	82	83	68	87	81	24	
16	83	84	85	85	85	85	85	85	84	82	80	78	76	75	76	79	82	82	85	87	86	82	81	75	87	82	24		
17	84	82	81	78	76	74	73	72	70	71	72	70	64	60	57	63	74	79	78	75	74	73	72	73	57	84	73	24	
18	74	71	70	70	70	70	72	74	76	76	77	78	79	79	79	78	78	77	78	81	80	79	77	78	70	81	76	24	
19	78	77	77	76	76	77	77	78	77	74	68	65	63	65	77	81	84	85	86	87	87	86	86	63	87	78	24		
20	86	87	87	87	87	87	86	87	87	85	82	81	79	74	75	76	79	88	85	82	83	83	82	84	74	88	83	24	
21	87	90	91	92	94	92	89	90	92	87	82	77	76	74	74	76	83	88	82	81	81	82	84	84	74	94	84	24	
22	86	88	88	86	87	90	94	99	100	98	97	97	96	89	84	83	85	89	88	93	98	98	98	83	100	92	24		
23	89	87	86	85	85	83	85	84	82	79	75	69	65	65	62	65	72	81	84	83	83	81	80	79	62	89	79	24	
24	80	82	82	79	80	80	81	82	83	87	89	90	91	89	83	82	85	91	93	94	94	93	92	90	79	94	86	24	
25	90	89	89	90	90	91	90	90	89	89	88	85	83	85	89	90	91	93	94	98	98	97	98	98	83	98	91	24	
26	99	99	99	99	99	98	98	97	97	96	94	90	86	87	88	93	95	95	98	97	100	100	100	100	86	100	96	24	
27	100	95	95	97	100	100	100	95	90	85	85	83	82	83	82	86	79	71	76	77	83	70	74	80	70	100	86	24	
28	86	82	83	82	81	81	79	71	79	83	67	52	44	44	45	49	52	54	59	65	72	75	77	77	44	86	68	24	
29	75	75	74	74	73	72	71	70	71	73	70	58	51	53	58	72	78	82	82	83	83	83	84	51	84	73	24		
30	83	83	84	83	82	80	80	79	79	79	80	78	78	80	81	83	86	92	91	90	89	89	89	90	78	92	84	24	
31	90	92	93	93	92	92	91	91	92	92	92	90	88	87	84	82	83	85	86	87	87	85	78	75	75	93	88	24	
HOURLY MAX	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99	99	100	100	100	100				
HOURLY AVG	88	88	88	88	88	88	88	88	88	87	85	82	80	78	78	81	84	86	86	87	88	87	87	87					

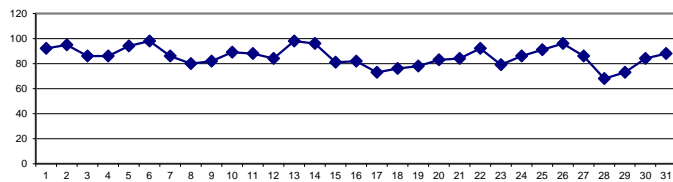
STATUS FLAG CODES

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

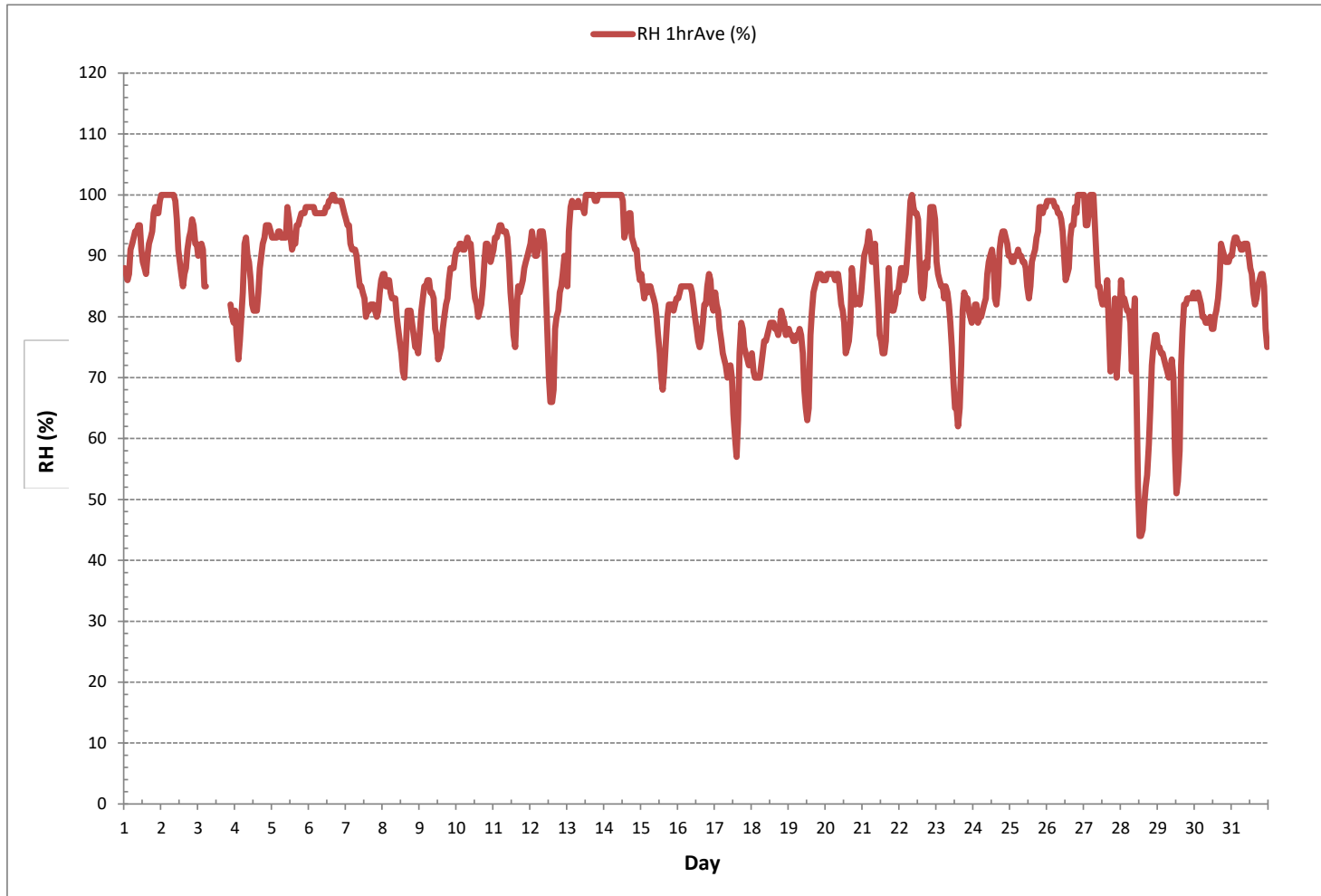
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	44	%	@ HOUR	12	ON DAY	28
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	0	ON DAY	2
MAXIMUM 24-HR AVERAGE:	98	%			ON DAY	6
OPERATIONAL TIME:						729 hrs
AMD OPERATION UPTIME:						98.0 %
STANDARD DEVIATION:	10					MONTHLY AVERAGE: 86 %

24 HR AVERAGES January 2019



**RELATIVE HUMIDITY Hourly Averages (RH %)**





BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	935	933	931	929	927	926	925	925	924	924	923	923	924	924	925	924	924	924	924	925	924	924	924	924	924	923	935	926	24	
2	923	923	923	922	921	920	919	919	918	918	918	918	917	917	917	918	918	918	918	918	918	918	918	917	917	917	917	923	919	24
3	917	917	918	918	918	918	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	922	922	922	917	922	919	9	
4	922	923	923	923	923	923	922	923	923	923	923	924	924	924	924	925	926	926	926	928	928	929	930	930	930	931	922	931	925	24
5	932	932	933	933	934	934	934	935	936	936	936	935	935	935	934	934	933	932	932	931	930	929	928	926	926	936	936	933	24	
6	925	924	922	921	920	918	917	916	916	915	915	914	913	913	913	913	913	913	913	913	913	913	913	914	913	915	916	916	24	
7	915	915	916	917	917	918	919	920	921	922	923	923	924	925	926	927	928	929	930	931	932	934	935	936	915	936	924	24		
8	937	938	940	941	942	944	944	945	946	947	948	948	948	949	949	949	949	949	949	949	949	949	949	949	948	937	949	946	24	
9	947	947	946	946	945	944	944	943	942	943	942	941	940	940	939	939	938	938	937	937	937	937	937	936	936	936	947	941	24	
10	936	936	936	936	936	936	936	936	937	937	937	937	937	938	938	939	939	939	940	940	940	941	941	941	941	936	941	938	24	
11	941	941	942	942	942	941	941	941	941	942	941	941	940	940	940	940	939	939	938	938	937	937	937	936	936	942	940	24		
12	935	935	935	935	935	935	935	935	935	935	936	936	936	937	937	937	938	937	938	938	939	939	940	940	940	935	940	937	24	
13	940	941	941	941	941	941	941	942	942	943	943	944	944	944	944	945	945	945	945	945	945	945	945	944	940	945	943	24		
14	944	944	943	943	942	941	940	939	939	938	937	936	935	935	934	934	934	934	935	935	936	937	938	940	941	934	944	938	24	
15	942	943	944	944	945	945	946	946	946	947	947	946	945	944	944	944	944	944	944	944	944	944	944	943	943	942	947	944	24	
16	943	942	942	942	941	941	941	942	942	942	942	942	942	942	942	942	943	944	944	944	944	945	946	946	947	941	947	943	24	
17	947	947	948	949	949	949	949	949	949	949	949	948	947	946	945	945	945	945	945	946	946	946	946	947	947	945	949	947	24	
18	947	947	947	948	948	948	947	947	947	947	948	947	947	947	947	947	947	947	947	948	947	947	947	948	947	947	948	947	24	
19	947	947	946	946	945	944	944	943	942	942	942	941	940	939	938	938	938	937	937	937	937	937	937	937	937	937	947	941	24	
20	936	936	936	935	935	934	934	933	932	932	931	931	930	929	929	928	928	927	927	927	927	927	927	927	927	927	936	931	24	
21	927	928	928	929	930	930	931	932	932	933	934	935	935	935	936	936	936	936	937	937	937	937	937	937	937	927	937	934	24	
22	937	936	936	935	935	934	933	933	932	932	931	931	930	930	929	929	929	929	929	929	929	929	930	931	929	937	931	24		
23	933	934	935	935	938	939	940	941	943	944	945	946	946	947	947	948	948	948	948	948	948	948	948	947	933	948	944	24		
24	946	946	944	944	942	941	939	937	936	935	934	933	933	933	933	934	935	936	936	936	936	936	936	936	933	946	937	24		
25	936	936	936	935	935	935	934	934	934	934	934	934	934	934	934	934	934	934	933	933	933	932	932	932	932	936	934	24		
26	933	932	932	932	932	932	933	933	933	933	933	933	933	932	932	931	930	929	928	927	925	924	922	922	922	933	931	24		
27	921	920	919	919	920	922	924	927	929	931	933	935	935	936	937	938	939	941	942	944	945	946	947	948	919	948	933	24		
28	948	948	948	948	948	948	949	949	949	949	950	950	949	949	949	949	950	950	951	951	951	951	952	952	948	952	950	24		
29	952	952	952	952	951	951	950	950	949	948	947	946	945	944	944	943	941	941	940	940	939	938	938	937	937	952	946	24		
30	936	936	935	934	933	932	932	931	930	929	929	928	928	927	927	926	927	926	926	925	925	925	924	924	924	924	936	929	24	
31	924	924	924	924	924	924	923	923	923	923	924	924	924	925	926	926	927	928	928	928	929	930	931	932	923	932	926	24		
HOURLY MAX	952	952	952	952	951	951	950	950	949	949	950	950	949	949	949	949	950	950	951	951	951	952	952	952	952	952	952	952	24	
HOURLY AVG	936	936	936	935	935	935	936	936	936	936	936	936	935	935	935	935	935	936	936	936	936	936	936	936	936	936	936	936	24	

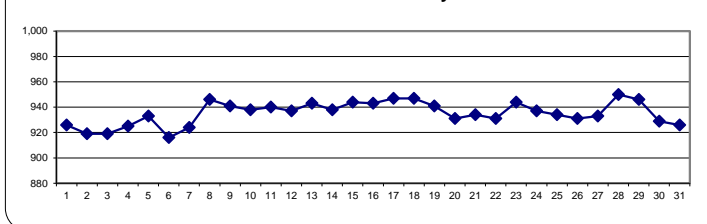
STATUS FLAG CODES

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

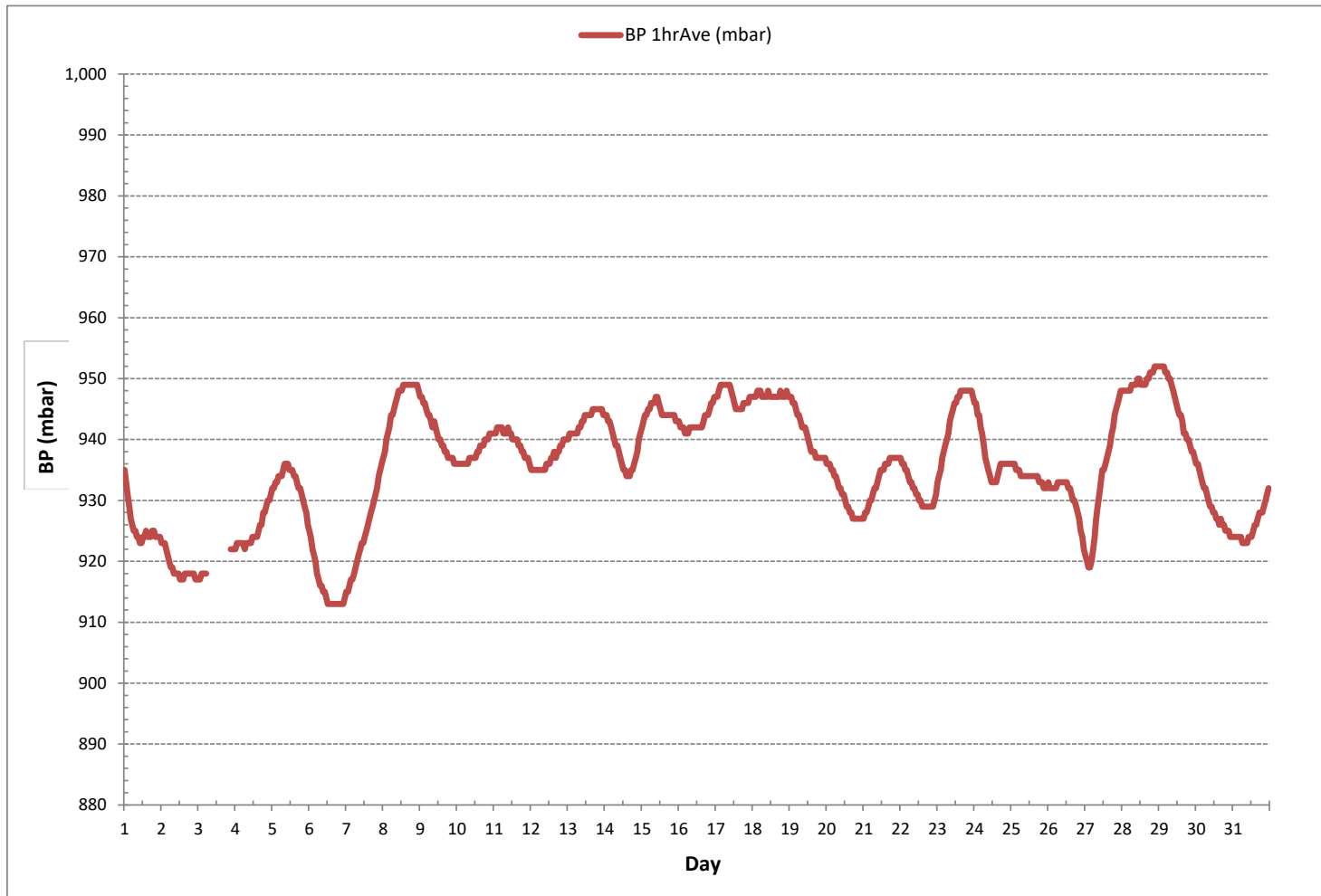
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	913	mbar	@ HOUR	12	ON DAY	6
MAXIMUM 1-HR AVERAGE:	952	mbar	@ HOUR	21	ON DAY	28
MAXIMUM 24-HR AVERAGE:	950	mbar			ON DAY	28
OPERATIONAL TIME:						729 hrs
AMD OPERATION UPTIME:						98.0 %
STANDARD DEVIATION:	9				MONTHLY AVERAGE:	936 mbar

24 HR AVERAGES January 2019



BAROMETRIC PRESSURE Hourly Averages (BP mbar)

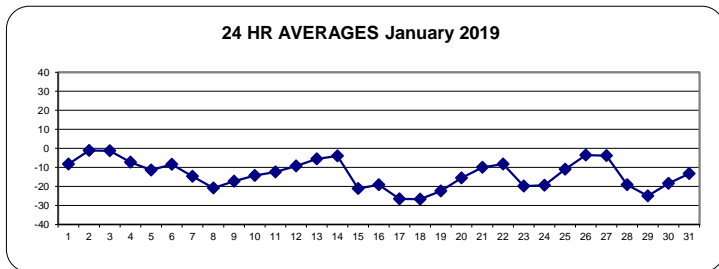


**AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)**

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	-18.3	-17.4	-16.5	-16.0	-15.4	-14.7	-14.0	-13.0	-12.0	-11.4	-9.1	-3.3	-2.1	-1.0	-0.5	-1.1	-2.0	-2.7	-3.1	-4.0	-4.3	-4.2	-4.6	-5.7	-18.3	-0.5	-8.2	24	
2	-6.8	-6.5	-6.2	-4.9	-4.9	-4.5	-4.7	-4.7	-3.6	-2.9	-1.0	0.7	1.6	2.6	3.5	<b>3.7</b>	3.5	2.7	2.0	1.4	0.6	0.7	1.0	0.6	-6.8	<b>3.7</b>	<b>-1.1</b>	24	
3	0.8	1.1	1.1	1.6	1.5	0.8	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	-6.4	-6.3	-6.1	-6.4	1.6	-1.3	9
4	-6.2	-5.4	-4.9	-5.5	-6.1	-7.0	-9.0	-9.3	-8.6	-8.2	-7.4	-6.5	-6.0	-5.6	-5.7	-6.3	-7.1	-7.7	-7.9	-8.5	-9.2	-8.8	-9.4	-9.9	-9.9	-9.9	-9.9	-7.3	24
5	-10.5	-10.9	-10.9	-10.9	-11.3	-11.6	-11.8	-12.0	-12.1	-12.0	-11.8	-11.1	-10.5	-10.4	-11.4	-12.3	-12.7	-12.7	-12.4	-12.3	-11.9	-11.3	-10.3	-9.3	-12.7	-9.3	-12.7	-11.4	24
6	-8.9	-8.9	-9.3	-9.1	-9.7	-9.9	-10.0	-9.6	-9.5	-9.3	-9.0	-8.4	-7.6	-7.3	-7.3	-6.9	-6.8	-7.1	-7.2	-7.2	-7.2	-7.4	-8.0	-8.8	-10.0	-6.8	-8.4	24	
7	-9.4	-10.0	-10.2	-11.1	-11.8	-12.3	-12.9	-13.8	-14.9	-16.1	-16.1	-16.2	-16.0	-15.9	-15.6	-15.8	-16.2	-16.3	-16.4	-16.5	-16.9	-17.2	-17.4	-16.6	-17.4	-9.4	-14.7	24	
8	-15.9	-15.9	-16.5	-17.2	-17.8	-18.5	-19.9	-20.8	-21.4	-21.4	-20.2	-19.1	-18.6	-17.6	-17.3	-18.5	-20.6	-21.9	-23.4	-25.8	-27.0	-28.1	-27.6	-28.3	-28.3	-15.9	-20.8	24	
9	-26.5	-24.2	-22.6	-21.4	-20.3	-20.2	-20.2	-20.0	-19.3	-18.2	-16.9	-15.9	-14.6	-14.2	-13.8	-13.7	-13.8	-13.9	-13.5	-13.7	-13.9	-14.2	-14.5	-14.8	-26.5	-13.5	-17.3	24	
10	-14.9	-14.9	-14.8	-14.6	-14.4	-15.0	-15.8	-16.4	-15.2	-14.7	-14.2	-13.6	-13.3	-13.1	-12.6	-12.6	-13.0	-13.3	-14.3	-15.1	-15.2	-14.5	-14.1	-14.2	-16.4	-12.6	-14.3	24	
11	-14.1	-13.9	-13.8	-13.8	-13.8	-14.2	-14.2	-14.6	-14.5	-13.9	-12.6	-11.7	-10.9	-9.7	-8.7	-9.7	-10.6	-10.6	-11.2	-11.8	-12.5	-12.6	-12.7	-14.6	-8.7	-12.4	24		
12	-13.0	-13.6	-12.6	-12.0	-12.0	-12.3	-13.6	-13.7	-14.3	-13.7	-11.1	-9.1	-6.6	-5.1	-4.7	-5.3	-7.2	-7.7	-7.2	-6.5	-5.7	-5.1	-4.1	-3.9	-14.3	-3.9	-9.2	24	
13	-5.8	-7.6	-8.8	-9.3	-10.3	-9.5	-8.4	-7.3	-6.8	-6.1	-4.1	-2.9	-2.6	-2.7	-2.6	-2.7	-3.2	-3.9	-4.5	-4.8	-5.0	-5.2	-5.2	-5.1	-10.3	-2.6	-5.6	24	
14	-5.2	-5.2	-4.8	-4.6	-4.6	-4.8	-4.8	-4.7	-4.7	-4.7	-4.7	-4.7	-4.7	-2.9	-2.1	-1.8	-0.6	0.2	0.1	-0.5	-2.7	-5.4	-8.4	-10.8	-10.8	0.2	-4.0	24	
15	-13.4	-15.9	-17.7	-19.5	-20.7	-21.7	-22.5	-23.5	-24.1	-23.8	-22.5	-21.4	-20.2	-19.2	-18.4	-18.9	-20.4	-21.7	-22.9	-23.6	-24.4	-24.6	-23.5	-22.2	-24.6	-13.4	-21.1	24	
16	-21.8	-21.6	-21.3	-21.0	-20.9	-20.8	-20.6	-20.3	-20.1	-19.6	-19.0	-18.4	-17.9	-17.2	-16.5	-16.1	-16.6	-17.5	-17.8	-18.0	-18.2	-18.5	-18.9	-20.1	-21.8	-16.1	-19.1	24	
17	-22.2	-24.5	-25.8	-27.1	-28.1	-28.9	-29.9	-30.4	-31.9	-30.7	-26.6	-23.2	-21.2	-20.2	-19.3	-20.4	-22.9	-25.5	-27.1	-28.4	-29.5	-30.1	-30.8	-30.7	-31.9	-19.3	-26.5	24	
18	-30.2	-31.4	<b>-32.1</b>	-32.1	-31.9	-31.8	-30.6	-28.9	-27.7	-27.0	-26.4	-25.3	-24.3	-23.3	-22.5	-22.0	-21.9	-22.1	-22.5	-23.8	-25.0	-25.7	-26.4	-26.3	<b>-32.1</b>	-21.9	-26.7	24	
19	-26.3	-26.7	-27.2	-27.2	-27.3	-27.1	-26.7	-25.6	-23.7	-22.5	-21.1	-20.4	-19.8	-19.6	-19.8	-19.6	-19.8	-19.6	-19.6	-19.4	-19.5	-19.8	-19.7	-19.8	-27.3	-19.4	-22.4	24	
20	-19.6	-19.4	-19.2	-18.8	-18.4	-17.9	-17.6	-17.9	-18.4	-17.6	-16.8	-15.9	-14.6	-13.8	-12.4	-12.2	-12.5	-14.2	-13.9	-13.5	-13.0	-12.1	-11.4	-11.0	-19.6	-11.0	-15.5	24	
21	-10.7	-9.7	-9.2	-9.1	-9.3	-9.7	-10.3	-10.8	-11.1	-11.5	-10.8	-10.3	-9.5	-8.6	-8.4	-8.8	-10.4	-11.4	-10.2	-10.1	-10.1	-10.0	-10.1	-9.8	-11.5	-8.4	-10.0	24	
22	-9.8	-9.7	-9.6	-9.7	-10.1	-9.9	-10.0	-10.0	-10.1	-10.0	-9.6	-8.7	-7.4	-6.4	-5.7	-5.7	-6.3	-7.4	-7.6	-7.5	-7.1	-6.8	-6.9	-7.4	-10.1	-5.7	-8.3	24	
23	-9.8	-12.0	-13.5	-15.1	-16.0	-17.0	-18.2	-19.4	-20.8	-21.5	-21.0	-20.3	-19.9	-19.9	-19.3	-19.5	-20.6	-23.1	-24.4	-24.7	-24.8	-25.4	-25.4	-26.2	-26.2	-9.8	-19.9	24	
24	-25.5	-25.6	-25.5	-26.2	-25.5	-25.7	-25.3	-24.7	-23.7	-21.7	-20.3	-18.9	-16.4	-13.9	-12.7	-11.9	-12.4	-13.9	-14.3	-16.2	-17.3	-16.6	-15.7	-15.4	-26.2	-11.9	-19.4	24	
25	-15.8	-16.1	-15.9	-15.6	-15.8	-15.9	-16.4	-16.4	-16.3	-15.0	-13.6	-11.4	-8.8	-6.5	-5.9	-5.7	-6.1	-6.0	-6.2	-7.2	-7.1	-6.9	-7.0	-7.0	-16.4	-5.7	-11.0	24	
26	-6.8	-6.7	-6.5	-6.3	-6.2	-6.6	-7.1	-9.0	-9.1	-8.5	-6.3	-4.3	-1.5	-0.9	-0.9	-1.4	-1.4	-0.7	-0.6	0.3	0.9	1.4	1.6	1.8	-9.1	1.8	-3.5	24	
27	2.0	3.3	3.5	3.5	2.3	0.8	0.3	-0.9	-2.0	-3.9	-5.1	-5.3	-4.3	-3.6	-3.4	-3.9	-4.8	-5.9	-7.0	-7.9	-9.4	-11.3	-13.2	-14.4	-14.4	3.5	-3.8	24	
28	-15.4	-15.9	-16.6	-16.9	-17.2	-17.6	-18.0	-19.0	-19.6	-18.7	-17.7	-16.9	-16.6	-16.3	-16.2	-16.7	-18.0	-19.4	-20.7	-21.9	-23.8	-25.6	-26.5	-26.8	-26.8	-15.4	-19.1	24	
29	-28.0	-28.3	-28.9	-29.3	-29.6	-30.5	-30.9	-31.2	-30.7	-28.2	-24.7	-23.3	-21.9	-21.3	-21.2	-21.2	-21.2	-21.3	-21.5	-21.8	-21.4	-21.2	-21.4	-21.4	-31.2	-21.2	-25.0	24	
30	-21.3	-21.4	-21.3	-21.0	-20.6	-20.3	-20.0	-19.6	-19.2	-18.7	-18.2	-17.6	-17.2	-17.1	-17.0	-16.9	-16.9	-16.9	-16.7	-16.8	-16.9	-16.8	-16.5	-16.2	-21.4	-16.2	-18.4	24	
31	-15.9	-15.8	-15.5	-15.1	-14.6	-14.2	-13.7	-12.9	-12.5	-12.2	-11.2	-11.2	-9.8	-8.8	-8.0	-9.1	-10.9	-12.3	-13.2	-14.1	-14.6	-15.6	-17.1	-18.2	-18.2	-8.0	-13.2	24	
HOURLY MAX	2.0	3.3	3.5	3.5	2.3	0.8	0.3	-0.9	-2.0	-2.9	-1.0	0.7	1.6	2.6	3.5	3.7	3.5	2.7	2.0	1.4	0.9	1.4	1.6	1.8					
HOURLY AVG	-14.4	-14.5	-14.6	-14.7	-14.9	-15.1	-15.9	-16.0	-15.9	-15.5	-14.3	-13.2	-12.1	-11.3	-10.9	-11.1	-11.8	-12.5	-12.8	-13.3	-13.7	-13.7	-13.9	-14.1					

**STATUS FLAG CODES**

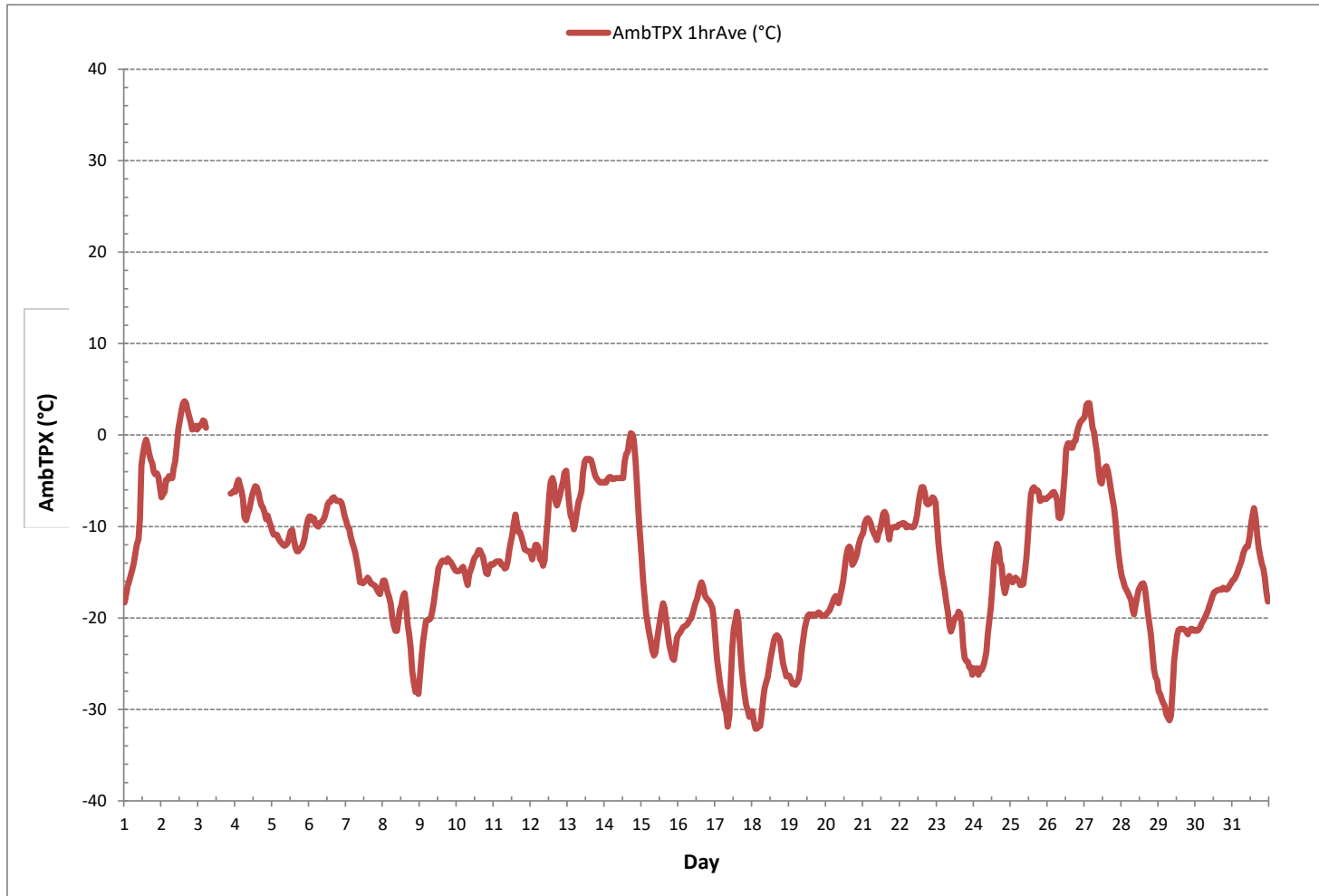
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



**MONTHLY SUMMARY**

MINIMUM 1-HR AVERAGE:	-32.1 °C	@ HOUR	2	ON DAY	18
MAXIMUM 1-HR AVERAGE:	3.7 °C	@ HOUR	15	ON DAY	2
MAXIMUM 24-HR AVERAGE:	-1.1 °C			ON DAY	2
OPERATIONAL TIME:					729 hrs
AMD OPERATION UPTIME:					98.0 %
STANDARD DEVIATION:	7.9			MONTHLY AVERAGE:	-13.8 °C

**AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)**



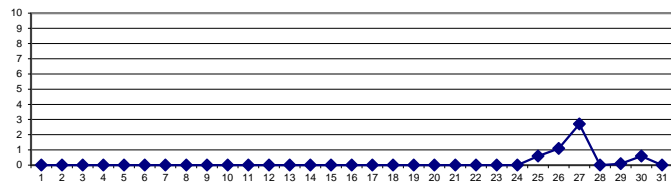
**PRECIPITATION Hourly TOTALS (mm)**

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.	SUM		
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	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	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	13
24	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14
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	0.6	0.0	0.6	24
26	0.7	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.1	24
27	0.1	0.1	0.2	0.7	1.2	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.7	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	24
30	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.6	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	0.7	0.3	0.2	0.7	1.2	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0	24
HOURLY SUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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

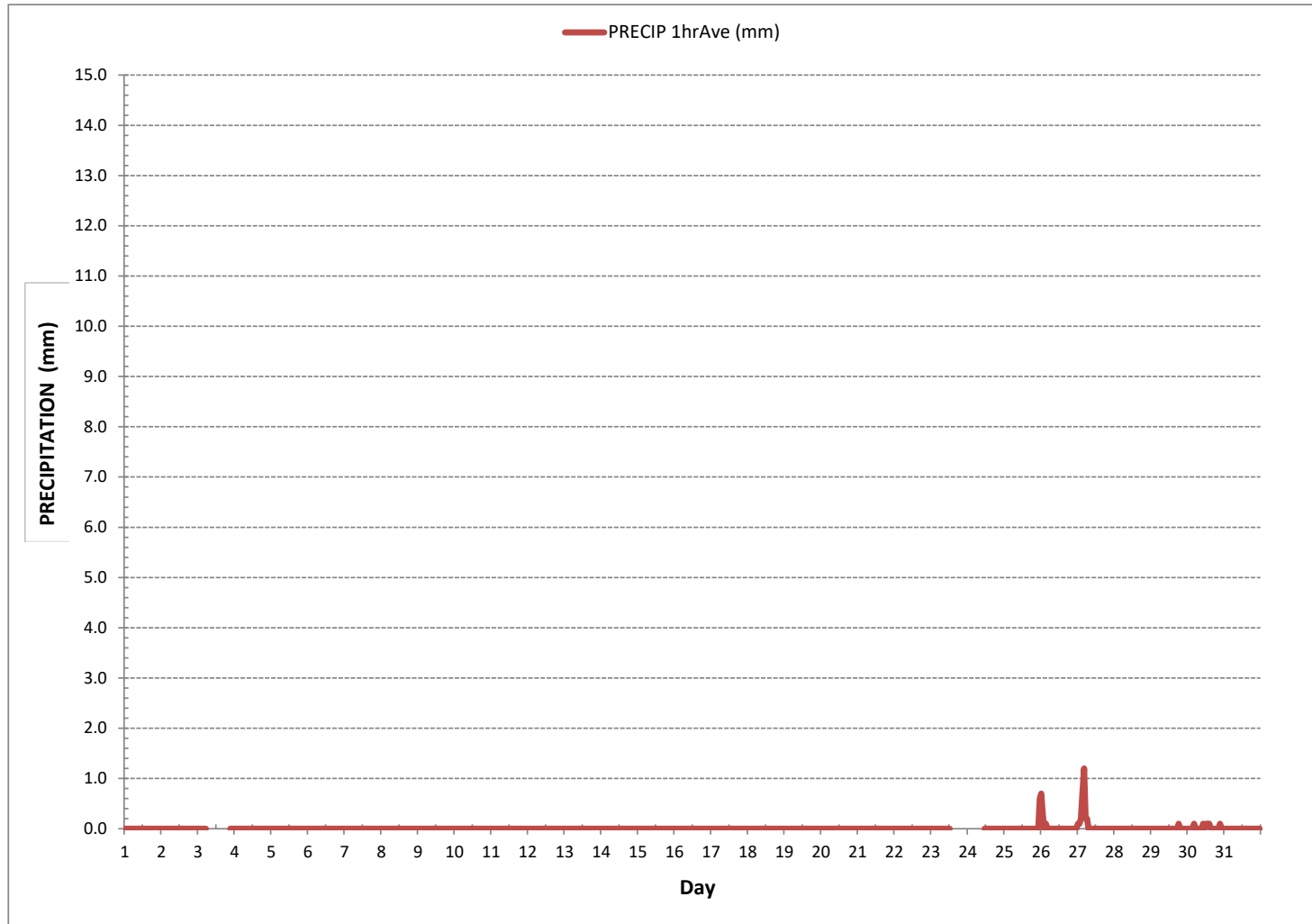
**24 HR TOTALS January 2019**



**MONTHLY SUMMARY**

MINIMUM 1-HR TOTAL:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR TOTAL:	1.2	mm	@ HOUR	4	ON DAY	27
MAXIMUM 24-HR TOTAL:	2.7	mm			ON DAY	27
OPERATIONAL TIME:					708	hrs
AMD OPERATION UPTIME:					95.2	%
STANDARD DEVIATION:	0.1		MONTHLY TOTAL:		5.1	mm

**PRECIPITATION Hourly TOTALS (mm)**







LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - January 2019

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> 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	3	S	4	3	2	1	1	2	4	3	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	4	2	24
2	1	S	3	2	0	1	1	1	2	1	1	5	5	6	2	0	0	0	0	0	2	3	3	2	0	6	2	24	
3	S	0	0	0	0	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	0	S	0	1	0	9
4	4	20	19	2	1	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	S	0	0	20	3	24
5	1	0	0	0	0	0	0	0	0	1	1	2	1	2	0	0	0	1	2	4	1	S	3	1	0	4	1	24	
6	2	2	2	3	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	3	1	24
7	1	1	9	9	3	2	4	9	8	9	13	18	18	14	16	20	14	19	18	S	12	6	14	18	1	20	11	24	
8	15	19	16	18	18	18	16	10	20	18	14	3	10	1	1	0	0	S	0	0	0	0	0	0	0	20	9	24	
9	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	S	1	3	2	0	0	0	0	3	1	24	
10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	S	0	0	0	0	0	0	1	1	0	1	0	24
11	1	2	1	2	0	1	1	2	2	1	2	2	3	1	1	S	1	1	1	1	1	1	1	1	1	0	3	1	24
12	2	1	1	1	1	1	0	1	1	1	3	3	1	2	S	1	1	1	1	1	2	1	1	1	4	0	4	1	24
13	2	4	1	1	0	0	0	1	0	0	1	1	1	S	1	1	1	0	0	0	0	0	0	0	0	0	4	1	24
14	0	0	2	1	1	2	1	0	1	1	1	3	S	5	3	1	11	22	15	18	0	3	1	1	0	22	4	24	
15	2	2	1	0	0	0	0	0	0	0	0	S	1	3	1	3	0	0	1	0	0	0	0	0	0	0	3	1	24
16	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
17	0	0	0	0	0	0	0	0	0	S	2	2	2	0	8	5	0	0	0	0	0	0	0	0	0	0	8	1	24
18	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	24
19	0	0	0	0	0	0	0	S	1	3	6	4	5	4	3	5	4	3	2	5	6	6	6	0	0	6	3	24	
20	0	0	0	1	1	1	S	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	0	2	1	24	
21	1	5	1	1	1	S	2	1	1	6	11	10	5	1	1	0	0	0	0	2	1	2	0	0	11	2	24		
22	0	1	1	1	S	1	1	1	1	1	1	1	1	2	3	2	1	1	1	4	1	2	1	1	0	4	1	24	
23	1	0	0	S	1	0	0	0	0	1	1	1	2	2	0	3	4	1	0	0	0	0	0	0	0	4	1	24	
24	1	1	S	0	0	0	0	1	1	1	4	4	5	16	1	1	0	3	4	0	0	0	1	3	0	16	2	24	
25	6	C	3	3	2	2	0	0	0	0	1	1	2	11	13	13	9	5	4	1	0	0	0	0	0	13	3	24	
26	S	2	3	1	2	1	0	0	0	0	0	1	2	1	1	2	2	2	3	2	1	1	1	S	0	3	1	24	
27	1	0	1	24	23	0	0	0	0	0	0	0	3	2	5	0	0	0	0	1	0	0	S	1	0	24	3	24	
28	1	2	4	14	14	4	4	0	19	24	0	1	1	0	1	1	0	0	1	0	1	S	1	1	0	24	4	24	
29	1	1	1	1	1	1	0	0	0	2	3	5	5	5	1	1	6	7	2	6	S	0	3	4	0	7	2	24	
30	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	S	0	0	0	0	0	4	1	24	
31	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1	0	1	1	S	1	0	0	1	1	0	1	1	24	
HOURLY MAX	15	20	19	24	23	18	16	10	20	24	14	18	18	16	16	20	14	22	18	18	12	6	14	18					
HOURLY AVG	2	2	2	3	3	1	1	1	2	3	2	3	3	3	2	2	2	2	2	2	1	1	1	1					

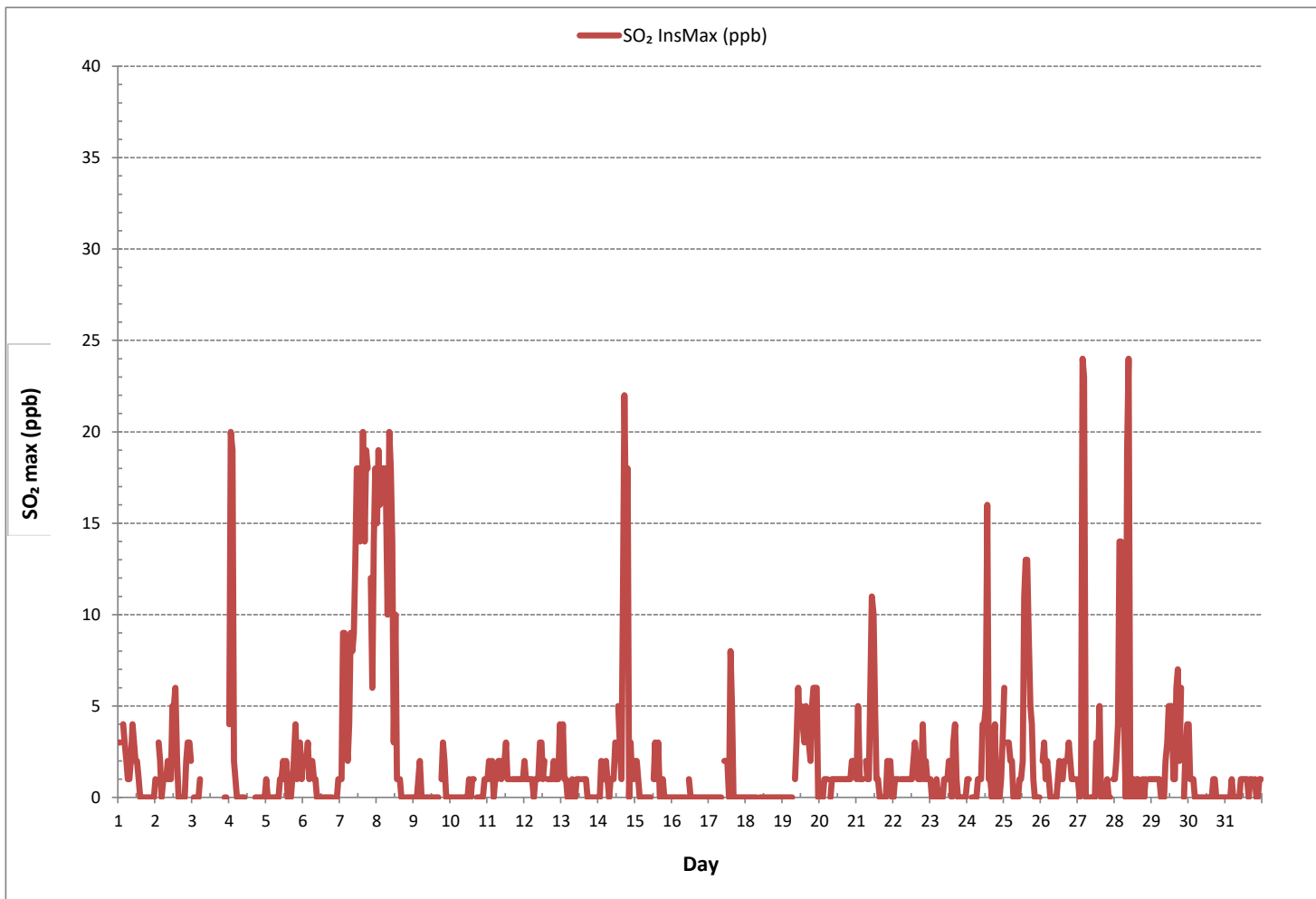
STATUS FLAG CODES

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:	387
MAXIMUM INSTANTANEOUS VALUE:	24 ppb @ HOUR 3 ON DAY 27
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	729 hrs
STANDARD DEVIATION:	4

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
2	1	S	1	1	1	1	S1	S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22	
3	S	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	1	9	
4	1	1	1	1	1	S1	S1	1	1	1	1	C	C	C	C	C	C	C	S	1	1	0	S	1	0	5	22		
5	1	1	1	0	1	1	1	1	1	1	0	0	1	1	1	1	1	0	0	1	0	S	1	1	0	1	24		
6	1	1	0	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	S	1	1	1	0	24		
7	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	S	1	0	1	1	0	2	24		
8	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	0	S	1	1	0	0	1	0	2	24		
9	0	0	0	0	1	0	S1	S1	1	0	1	0	0	0	0	0	0	S	1	0	1	0	1	0	0	1	0	22	
10	0	0	0	1	0	1	0	0	1	0	1	0	1	1	1	1	S	1	0	1	1	1	1	1	0	0	1	24	
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	0	1	0	1	1	1	1	0	1	1	24	
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	24	
13	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
14	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
15	1	1	1	1	1	1	1	1	1	0	1	S	1	0	1	0	1	1	1	0	1	0	1	0	0	1	0	1	24
16	0	0	1	0	0	S1	1	0	0	0	S	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	23
17	1	0	1	0	1	0	1	1	1	S	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	1	24	
18	0	0	1	0	0	0	0	1	S	1	1	0	1	1	0	S1	5	1	0	0	0	1	0	0	0	0	5	23	
19	0	1	0	0	0	0	0	S	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	24	
20	0	0	0	1	0	1	S	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24	
21	1	1	1	1	1	S	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	24	
22	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
23	1	1	1	S	1	1	1	1	0	1	1	1	C1	C1	C1	C1	Y	C1	C1	C1	C1	1	1	1	0	1	1	15	
24	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
25	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
26	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	S	1	2	1	24	
27	2	2	2	2	2	2	2	2	S1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	2	23	
28	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	2	24	
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	24	
30	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	S	0	1	1	1	1	0	1	1	24	
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	24	
HOURLY MAX	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	5	2	5	1	2	2	2	1					
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

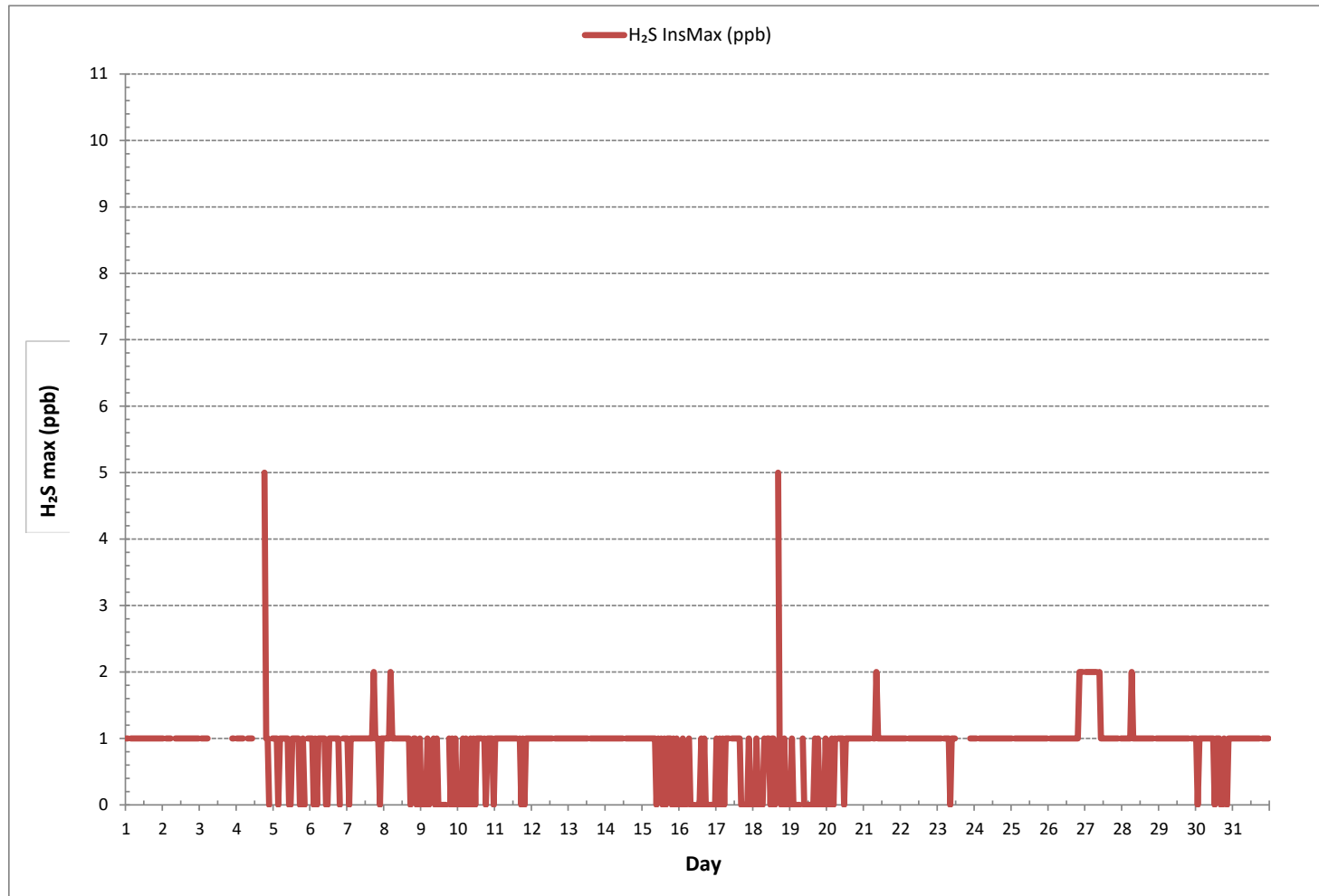
STATUS FLAG CODES

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:	551
MAXIMUM INSTANTANEOUS VALUE:	5 ppb @ HOUR 18 ON DAY 4
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	711 hrs
STANDARD DEVIATION:	0

HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)





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	2.29	2.29	S	2.28	2.25	2.25	2.23	2.25	2.21	2.25	2.25	2.05	2.02	2.00	2.01	1.99	1.99	1.99	1.99	2.00	2.00	2.00	2.01	2.04	1.99	2.29	2.11	24
2	2.05	S	2.10	2.16	2.19	2.16	2.15	2.15	2.16	2.17	2.17	2.22	2.23	2.26	2.21	2.06	1.98	1.98	1.98	1.98	2.04	2.10	2.11	2.13	1.98	2.26	2.12	24
3	S	2.09	2.06	2.04	2.01	1.99	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	S	1.99	2.09	2.04	9
4	2.06	2.05	2.06	2.02	2.16	2.25	2.26	2.26	2.19	2.11	2.06	2.32	2.02	2.01	2.01	2.01	2.02	C	C	C	C	C	S	2.02	2.01	2.32	2.10	24
5	2.03	2.02	2.03	2.03	2.03	2.02	2.03	2.03	2.02	2.03	2.03	2.07	2.02	2.03	2.03	2.02	2.03	2.04	2.07	2.05	2.03	S	2.09	2.02	2.02	2.09	2.03	24
6	2.07	2.07	2.33	2.48	2.10	2.06	2.05	2.04	2.01	2.01	2.01	2.01	2.04	2.02	2.02	2.02	2.02	2.02	2.02	2.03	S	2.04	2.02	2.02	2.01	2.48	2.07	24
7	2.02	2.02	2.02	2.05	2.05	2.06	2.05	2.05	2.04	2.03	2.05	2.05	2.06	2.05	2.06	2.07	2.50	2.05	2.04	S	2.03	2.02	2.04	2.05	2.02	2.50	2.06	24
8	2.07	2.05	2.04	2.04	2.27	2.23	2.03	2.02	2.07	2.20	2.54	2.36	2.07	2.01	2.03	2.05	2.05	2.11	S	2.13	2.12	2.15	2.14	2.17	2.01	2.54	2.13	24
9	2.16	2.15	2.12	2.12	2.14	2.11	2.12	2.11	2.12	2.08	2.10	2.07	2.04	2.06	2.04	2.06	2.03	S	2.05	2.06	2.05	2.03	2.05	2.04	2.03	2.16	2.08	24
10	2.04	2.04	2.05	2.03	2.04	2.04	2.05	2.04	2.04	2.05	2.02	2.04	2.07	2.05	2.08	2.06	S	2.03	2.06	2.05	2.08	2.09	2.10	2.08	2.02	2.10	2.05	24
11	2.12	2.13	2.14	2.17	2.17	2.21	2.21	2.27	2.26	2.26	2.26	2.23	2.21	2.21	2.20	S	2.15	2.10	2.15	2.17	2.18	2.12	2.11	2.10	2.10	2.27	2.18	24
12	2.10	2.09	2.12	2.13	2.14	2.18	2.22	2.22	2.21	2.23	2.26	2.29	2.29	2.39	S	2.49	2.58	2.82	2.76	2.77	2.87	2.88	2.73	2.87	2.09	2.88	2.42	24
13	2.89	2.72	2.70	2.78	2.78	2.77	2.81	2.87	2.81	2.84	2.65	2.25	2.21	S	2.22	2.18	2.17	2.14	2.12	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	24
14	2.10	2.10	2.13	2.16	2.17	2.16	2.17	2.33	2.51	2.55	2.56	2.64	S	2.61	2.58	2.51	2.21	2.13	2.11	2.07	2.03	2.12	2.13	2.08	2.03	2.64	2.27	24
15	2.08	2.07	2.06	2.05	2.04	2.04	2.03	2.05	2.05	2.04	2.04	S	2.03	2.04	2.03	2.03	2.04	2.03	2.07	2.08	2.06	2.04	2.05	2.05	2.03	2.08	2.05	24
16	2.04	2.05	2.04	2.03	2.04	2.04	2.04	2.05	2.04	2.05	S	2.07	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.03	2.04	2.03	2.03	2.07	2.04	24
17	2.04	2.05	2.04	2.05	2.08	2.07	2.08	2.10	2.17	S	2.15	2.09	2.04	2.03	2.08	2.05	2.03	2.05	2.05	2.04	2.06	2.07	2.07	2.06	2.03	2.17	2.07	24
18	2.07	2.08	2.07	2.10	2.07	2.07	2.09	2.08	S	2.05	2.05	2.06	2.05	2.04	2.03	2.04	2.03	2.03	2.03	2.04	2.05	2.06	2.06	2.05	2.03	2.10	2.06	24
19	2.06	2.05	2.05	2.06	2.06	2.06	2.05	S	2.04	2.09	2.08	2.05	3.61	2.35	2.35	2.10	2.10	2.08	2.24	2.10	2.25	2.42	2.06	2.04	2.04	3.61	2.19	24
20	2.05	2.04	2.04	2.06	2.08	2.09	S	2.13	2.14	2.14	2.14	2.14	2.17	2.19	2.22	2.22	2.24	2.25	2.30	2.37	2.38	2.39	2.44	2.45	2.04	2.45	2.20	24
21	2.49	2.42	2.35	2.24	2.23	S	2.13	2.15	2.15	2.14	2.13	2.15	2.16	2.13	2.12	2.12	2.11	2.12	2.11	2.11	2.16	2.16	2.17	2.17	2.11	2.49	2.18	24
22	2.24	2.34	2.15	2.19	S	2.17	2.26	2.26	2.29	2.27	2.27	2.35	2.25	2.26	2.24	2.27	2.28	2.36	2.44	2.47	2.48	2.48	2.36	2.17	2.15	2.48	2.30	24
23	2.14	2.10	2.09	S	2.06	2.05	2.05	2.05	2.05	2.05	2.02	2.05	2.05	2.06	2.05	2.05	2.06	2.05	2.06	2.08	2.10	2.12	2.12	2.08	2.02	2.14	2.07	24
24	2.16	2.41	S	2.32	2.23	2.17	2.15	2.12	2.14	2.18	2.17	2.15	2.16	2.15	2.10	2.08	2.08	2.11	2.11	2.09	2.16	2.36	2.14	2.13	2.08	2.41	2.17	24
25	2.15	S	2.16	2.13	2.12	2.19	2.20	2.18	2.17	2.28	2.31	2.23	2.25	2.24	2.12	2.08	2.04	2.05	2.05	2.03	2.04	2.11	2.07	2.10	2.03	2.31	2.14	24
26	S	2.09	2.08	2.10	2.10	2.14	2.19	2.19	2.16	2.18	2.23	2.24	2.22	2.26	2.37	2.38	2.44	2.43	2.44	2.45	2.39	2.13	2.13	S	2.08	2.45	2.24	24
27	2.12	2.08	2.00	2.04	2.03	2.01	2.01	2.01	2.03	2.03	2.03	2.04	2.02	2.02	2.03	2.03	2.03	2.02	2.04	2.03	2.03	2.04	S	2.06	2.00	2.12	2.03	24
28	2.04	2.04	2.03	2.05	2.05	2.03	2.04	2.04	2.08	2.08	2.04	2.05	2.04	2.05	2.05	2.05	2.05	2.04	2.05	2.05	S	2.07	2.08	2.03	2.08	2.05	2.05	24
29	2.10	2.11	2.09	2.08	2.12	2.12	2.17	2.22	2.21	2.23	2.08	2.06	2.05	2.06	2.03	2.04	2.08	2.10	2.08	2.10	S	2.13	2.15	2.14	2.03	2.23	2.11	24
30	2.14	2.12	2.10	2.09	2.09	2.08	2.07	2.06	2.07	2.07	2.08	2.07	2.07	2.08	2.06	2.07	2.07	2.10	2.11	S	2.11	2.12	2.15	2.19	2.06	2.19	2.09	24
31	2.21	2.22	2.22	2.24	2.25	2.23	2.25	2.27	2.30	2.27	2.28	2.28	2.25	2.26	2.25	2.20	2.18	2.14	S	2.08	2.10	2.10	2.07	2.08	2.07	2.30	2.20	24
HOURLY MAX	2.89	2.72	2.70	2.78	2.78	2.77	2.81	2.87	2.81	2.84	2.65	2.64	3.61	2.61	2.58	2.51	2.58	2.82	2.76	2.77	2.87	2.88	2.73	2.87				
HOURLY AVG	2.14	2.14	2.12	2.14	2.14	2.14	2.14	2.16	2.16	2.17	2.17	2.16	2.16	2.14	2.13	2.12	2.13	2.12	2.13	2.13	2.15	2.16	2.13	2.12				

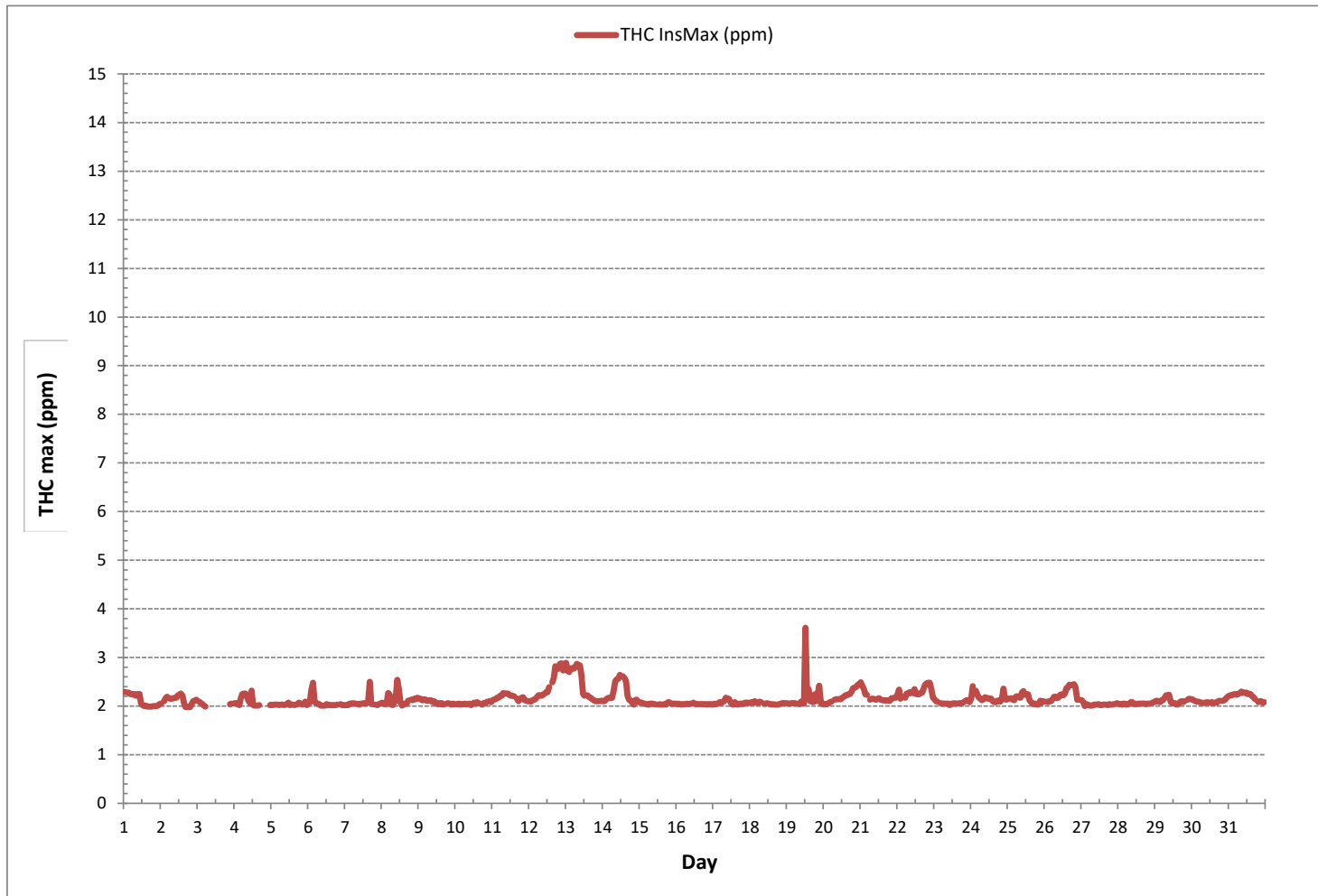
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	691
MAXIMUM INSTANTANEOUS VALUE:	3.61 ppm @ HOUR 12 ON DAY 19
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	729 hrs
STANDARD DEVIATION:	0.17

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





METHANE MAX Instantaneous Maximum (CH<sub>4</sub> 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	2.29	2.29	S	2.28	2.25	2.25	2.23	2.25	2.21	2.25	2.25	2.05	2.02	2.00	2.01	1.99	1.99	1.99	1.99	2.00	2.00	2.00	2.01	2.04	1.99	2.29	2.11	24		
2	2.05	S	2.10	2.16	2.19	2.16	2.15	2.15	2.16	2.17	2.17	2.22	2.23	2.26	2.21	2.06	1.98	1.98	1.98	1.98	2.04	2.10	2.11	2.13	1.98	2.26	2.12	24		
3	S	2.09	2.06	2.04	2.01	1.99	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.04	2.05	S	1.99	2.09	2.04	9
4	2.06	2.05	2.06	2.02	2.16	2.25	2.26	2.26	2.19	2.11	2.06	2.32	2.02	2.01	2.01	2.01	2.02	C	C	C	C	C	S	2.02	2.01	2.32	2.10	24		
5	2.03	2.02	2.03	2.03	2.03	2.02	2.03	2.03	2.02	2.03	2.03	2.07	2.02	2.03	2.03	2.02	2.03	2.04	2.07	2.05	2.03	S	2.09	2.02	2.02	2.09	2.03	24		
6	2.07	2.07	2.11	2.19	2.10	2.06	2.05	2.04	2.01	2.01	2.01	2.01	2.04	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.03	S	2.04	2.02	2.02	2.01	2.19	2.04	24	
7	2.02	2.02	2.02	2.05	2.05	2.06	2.05	2.05	2.04	2.03	2.05	2.05	2.06	2.05	2.06	2.07	2.20	2.05	2.04	S	2.03	2.02	2.04	2.05	2.02	2.20	2.05	24		
8	2.07	2.05	2.04	2.04	2.06	2.06	2.03	2.02	2.07	2.11	2.21	2.20	2.07	2.01	2.03	2.05	2.05	2.11	S	2.13	2.12	2.15	2.14	2.17	2.01	2.21	2.09	24		
9	2.16	2.15	2.12	2.12	2.14	2.11	2.12	2.11	2.12	2.08	2.10	2.07	2.04	2.06	2.04	2.06	2.03	S	2.05	2.06	2.05	2.03	2.05	2.04	2.03	2.16	2.08	24		
10	2.04	2.04	2.05	2.03	2.04	2.04	2.05	2.04	2.04	2.05	2.02	2.04	2.07	2.05	2.08	2.06	S	2.03	2.06	2.05	2.08	2.09	2.10	2.08	2.02	2.10	2.05	24		
11	2.12	2.13	2.14	2.17	2.17	2.21	2.21	2.27	2.26	2.26	2.26	2.23	2.21	2.21	2.20	S	2.15	2.10	2.15	2.17	2.15	2.12	2.11	2.10	2.10	2.27	2.18	24		
12	2.10	2.09	2.12	2.13	2.14	2.18	2.22	2.22	2.21	2.23	2.26	2.29	2.29	2.39	S	2.49	2.58	2.68	2.76	2.77	2.73	2.72	2.68	2.75	2.09	2.77	2.39	24		
13	2.77	2.61	2.70	2.74	2.71	2.68	2.70	2.76	2.71	2.70	2.56	2.25	2.21	S	2.22	2.18	2.17	2.13	2.12	2.10	2.10	2.10	2.10	2.11	2.10	2.77	2.41	24		
14	2.10	2.10	2.13	2.16	2.17	2.16	2.17	2.33	2.51	2.55	2.56	2.64	S	2.57	2.50	2.41	2.21	2.13	2.11	2.07	2.03	2.12	2.13	2.08	2.03	2.64	2.26	24		
15	2.08	2.07	2.06	2.05	2.04	2.04	2.03	2.05	2.05	2.04	2.04	S	2.03	2.04	2.03	2.03	2.04	2.03	2.07	2.08	2.06	2.04	2.05	2.05	2.03	2.08	2.05	24		
16	2.04	2.05	2.04	2.03	2.04	2.04	2.04	2.05	2.04	2.05	S	2.07	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.03	2.04	2.04	2.03	2.03	2.07	2.04	24	
17	2.04	2.05	2.04	2.05	2.08	2.07	2.08	2.10	2.17	S	2.15	2.09	2.04	2.03	2.08	2.05	2.03	2.05	2.03	2.05	2.04	2.06	2.07	2.07	2.06	2.03	2.17	2.07	24	
18	2.07	2.08	2.07	2.10	2.07	2.07	2.09	2.08	S	2.05	2.05	2.06	2.05	2.04	2.03	2.04	2.03	2.03	2.04	2.05	2.06	2.06	2.06	2.05	2.03	2.10	2.07	24		
19	2.06	2.05	2.05	2.06	2.06	2.06	2.05	S	2.04	2.09	2.08	2.05	2.94	2.21	2.20	2.10	2.10	2.08	2.11	2.10	2.16	2.25	2.06	2.04	2.04	2.94	2.13	24		
20	2.05	2.04	2.04	2.06	2.08	2.09	S	2.13	2.14	2.14	2.14	2.14	2.17	2.19	2.22	2.22	2.24	2.25	2.30	2.37	2.38	2.39	2.38	2.39	2.04	2.39	2.20	24		
21	2.40	2.40	2.27	2.24	2.23	S	2.13	2.15	2.15	2.14	2.13	2.15	2.16	2.13	2.12	2.12	2.11	2.12	2.11	2.11	2.16	2.16	2.17	2.17	2.11	2.40	2.17	24		
22	2.24	2.24	2.15	2.19	S	2.17	2.20	2.26	2.29	2.27	2.27	2.27	2.25	2.26	2.24	2.27	2.28	2.36	2.44	2.47	2.48	2.48	2.36	2.17	2.15	2.48	2.29	24		
23	2.14	2.10	2.09	S	2.06	2.05	2.05	2.05	2.05	2.05	2.02	2.05	2.05	2.06	2.05	2.05	2.06	2.05	2.06	2.08	2.10	2.12	2.12	2.08	2.02	2.14	2.07	24		
24	2.16	2.41	S	2.32	2.23	2.17	2.15	2.12	2.14	2.18	2.17	2.15	2.16	2.15	2.10	2.08	2.08	2.11	2.11	2.09	2.16	2.36	2.14	2.13	2.08	2.41	2.17	24		
25	2.15	S	2.16	2.13	2.12	2.19	2.20	2.18	2.17	2.20	2.21	2.23	2.25	2.24	2.12	2.08	2.04	2.05	2.05	2.03	2.04	2.11	2.07	2.10	2.03	2.25	2.13	24		
26	S	2.09	2.08	2.10	2.10	2.14	2.19	2.19	2.16	2.18	2.23	2.24	2.22	2.26	2.37	2.38	2.44	2.43	2.44	2.45	2.39	2.13	2.13	S	2.08	2.45	2.24	24		
27	2.12	2.08	2.00	2.04	2.03	2.01	2.01	2.01	2.03	2.03	2.03	2.04	2.02	2.02	2.03	2.03	2.03	2.02	2.04	2.03	2.03	2.04	S	2.06	2.00	2.12	2.03	24		
28	2.04	2.04	2.03	2.05	2.05	2.03	2.04	2.04	2.08	2.08	2.04	2.05	2.04	2.05	2.05	2.05	2.05	2.05	2.04	2.05	2.05	S	2.07	2.08	2.03	2.08	2.05	24		
29	2.10	2.11	2.09	2.08	2.12	2.12	2.17	2.22	2.21	2.23	2.08	2.06	2.05	2.06	2.03	2.04	2.08	2.10	2.08	2.10	S	2.13	2.15	2.14	2.03	2.23	2.11	24		
30	2.14	2.12	2.10	2.09	2.09	2.08	2.07	2.06	2.07	2.07	2.08	2.07	2.07	2.08	2.06	2.07	2.07	2.10	2.11	S	2.11	2.12	2.15	2.19	2.06	2.19	2.09	24		
31	2.21	2.22	2.22	2.24	2.25	2.23	2.25	2.27	2.30	2.27	2.28	2.28	2.25	2.26	2.25	2.20	2.18	2.14	S	2.08	2.10	2.10	2.07	2.08	2.07	2.30	2.20	24		
HOURLY MAX	2.77	2.61	2.70	2.74	2.71	2.68	2.70	2.76	2.71	2.70	2.56	2.64	2.94	2.57	2.50	2.49	2.58	2.68	2.76	2.77	2.73	2.72	2.68	2.75						
HOURLY AVG	2.14	2.13	2.11	2.13	2.13	2.13	2.14	2.15	2.16	2.16	2.16	2.15	2.14	2.13	2.12	2.11	2.11	2.12	2.13	2.13	2.14	2.15	2.13	2.12						

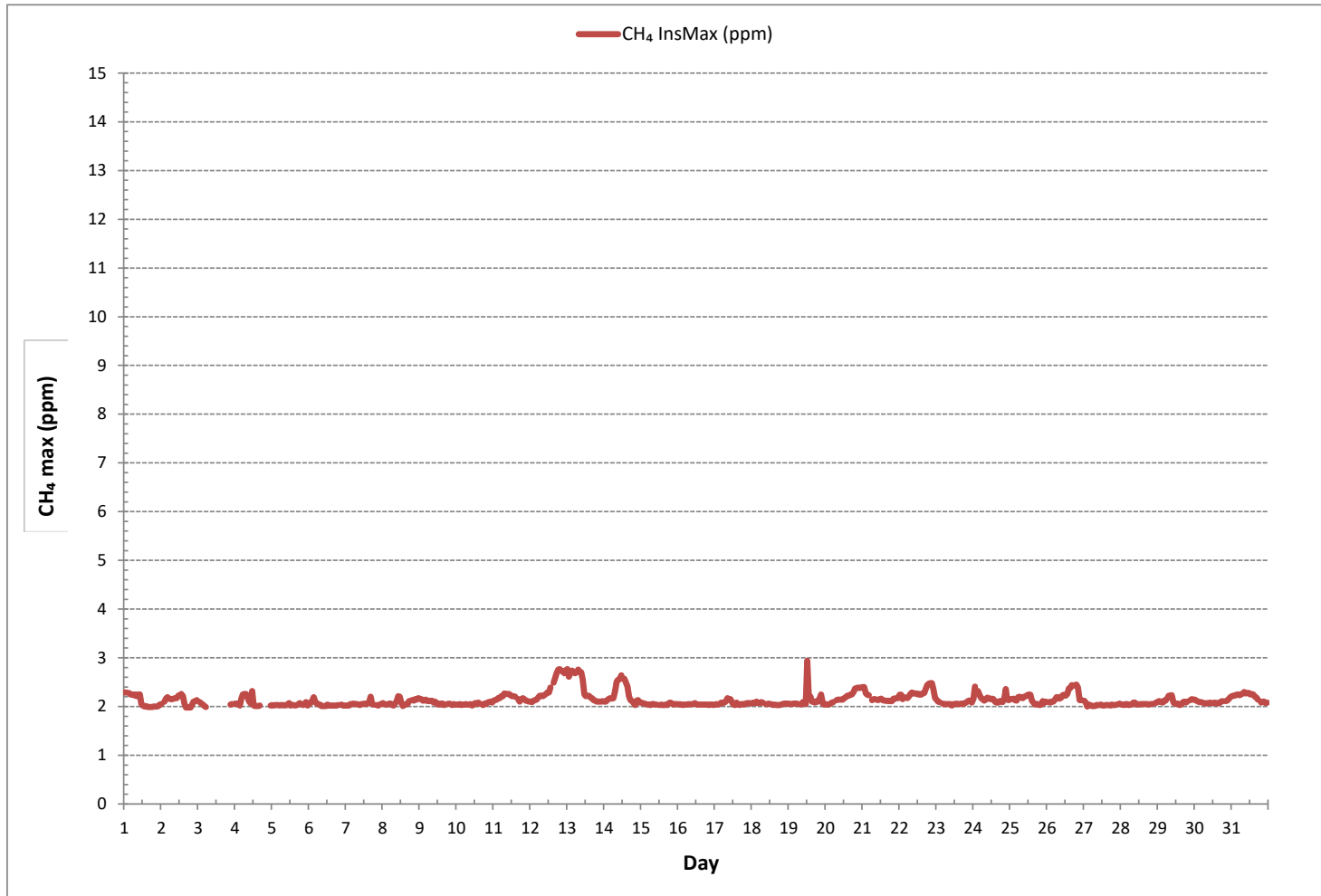
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	691
MAXIMUM INSTANTANEOUS VALUE:	2.94 ppm @ HOUR 12 ON DAY 19
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	729 hrs
STANDARD DEVIATION:	0.14

METHANE MAX Instantaneous Maximum (CH<sub>4</sub> ppm)







LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - January 2019

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	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	24
2	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
3	S	0.00	0.00	0.00	0.00	0.00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.00	0.00	S	0.00	0.00	0.00	9
4	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	C	C	C	C	C	S	0.00	0.00	0.00	0.00	24	
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	24	
6	0.00	0.00	0.22	0.29	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	0.29	0.02	24
7	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	0.31	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.01	24
8	0.00	0.00	0.00	0.00	0.21	0.18	0.00	0.00	0.00	0.10	0.32	0.17	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	0.32	0.04	24
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
11	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	0.06	0.00	0.00	0.00	0.06	0.00	24	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.15	0.00	0.00	0.16	0.17	0.16	0.12	0.00	0.17	0.03	24	
13	0.19	0.13	0.00	0.11	0.12	0.15	0.16	0.16	0.13	0.16	0.12	0.00	0.00	S	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.06	24
14	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	0.09	0.11	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.01	24
15	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
16	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	0.00	24
17	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	0.00	0.00	0.00	24
18	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	0.00	0.00	0.00	24
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.67	0.14	0.16	0.00	0.00	0.00	0.14	0.00	0.09	0.17	0.00	0.00	0.00	0.67	0.06	24
20	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	0.08	0.06	0.00	0.08	0.01	24	
21	0.10	0.08	0.10	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.01	24
22	0.00	0.11	0.00	0.00	S	0.00	0.07	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.01	24
23	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
24	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
25	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.11	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	0.11	0.01	24
26	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	S	0.00	0.00	24
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	24
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	24
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
HOURLY MAX	0.19	0.13	0.22	0.29	0.21	0.18	0.16	0.16	0.13	0.16	0.32	0.17	0.67	0.14	0.16	0.10	0.31	0.15	0.14	0.00	0.16	0.17	0.16	0.12				
HOURLY AVG	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.02	0.01	0.02	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01				

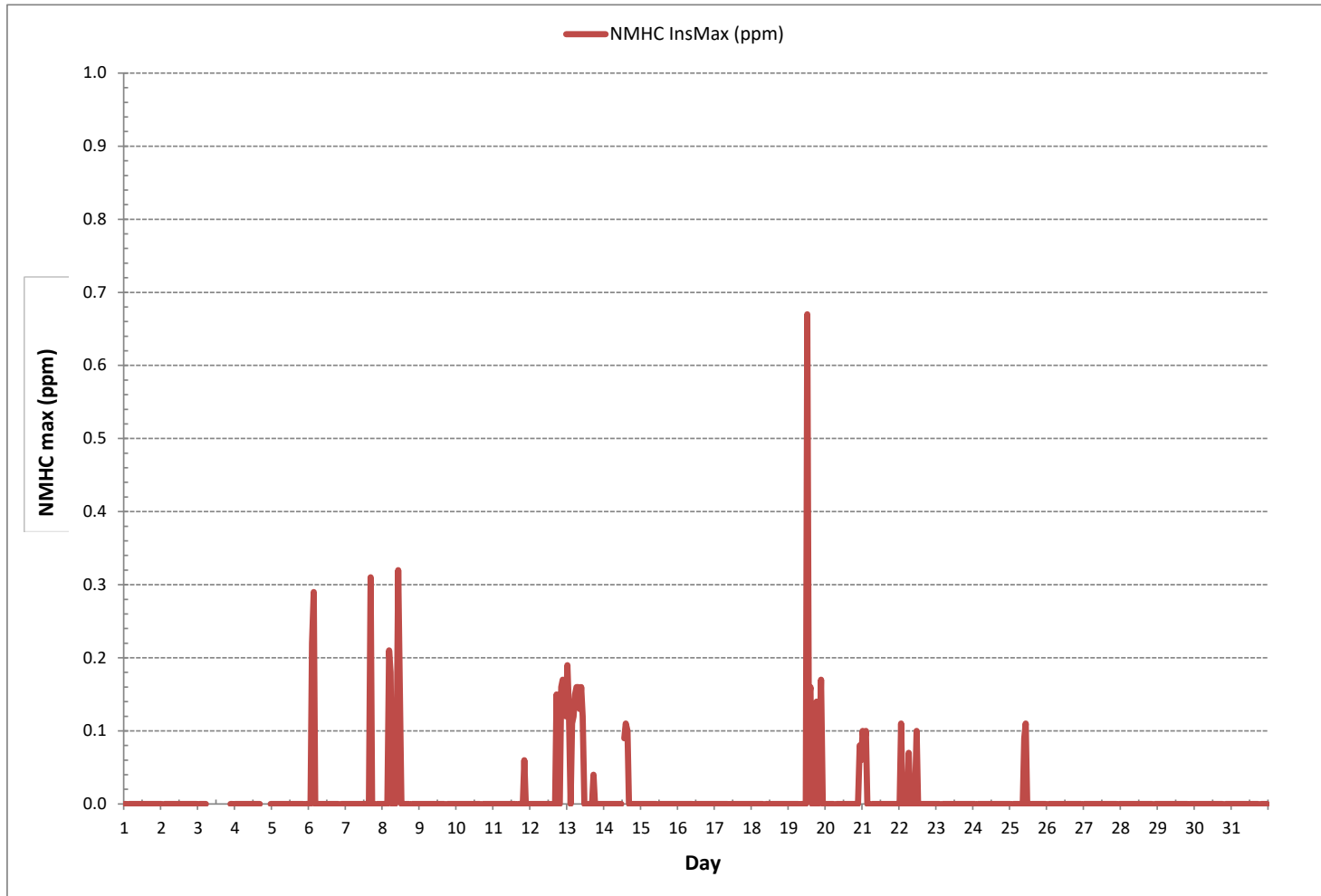
STATUS FLAG CODES

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:	44
MAXIMUM INSTANTANEOUS VALUE:	0.67 ppm @ HOUR 12 ON DAY 19
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	729 hrs
STANDARD DEVIATION:	0.04

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	8	9	S	9	7	6	5	5	7	11	20	16	19	6	2	1	1	1	1	1	1	1	2	2	1	20	6	24	
2	3	S	10	8	6	4	11	19	14	20	14	15	15	20	48	8	22	31	5	1	6	10	11	16	1	48	14	24	
3	S	5	3	7	2	17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	9	S	2	17	7	9	
4	32	35	38	5	7	6	9	13	7	3	5	C	C	C	C	C	C	C	C	1	2	3	S	4	1	38	11	24	
5	4	3	1	1	1	1	1	3	4	6	7	13	6	10	1	1	5	9	14	19	5	S	13	2	1	19	6	24	
6	10	8	10	16	10	9	9	8	6	2	1	1	2	1	1	1	2	3	3	1	S	5	4	6	1	16	5	24	
7	6	7	6	6	6	4	12	21	19	20	29	39	39	28	29	41	33	39	34	S	25	11	26	33	4	41	22	24	
8	48	31	27	32	33	32	25	14	31	28	35	15	21	13	12	14	18	7	S	6	6	8	5	9	5	48	20	24	
9	7	17	11	4	4	2	2	2	1	2	3	1	1	1	1	1	S	8	9	11	2	1	2	1	2	1	17	4	24
10	1	1	1	0	0	0	5	6	2	1	1	3	4	2	4	8	S	21	5	2	2	3	7	5	0	21	4	24	
11	6	8	7	8	3	6	3	8	6	6	6	7	7	4	4	S	8	4	4	4	4	3	3	3	3	3	8	5	24
12	5	4	5	4	4	4	6	9	23	48	10	9	8	10	S	20	19	26	24	24	25	22	19	22	4	48	15	24	
13	22	79	24	22	20	20	38	47	19	26	18	5	4	S	4	5	5	2	2	1	1	1	1	1	1	1	79	16	24
14	1	1	5	4	3	5	5	6	7	14	10	15	S	53	17	20	32	46	31	38	3	8	8	4	1	53	15	24	
15	5	5	3	1	2	1	0	2	4	2	1	S	3	9	4	8	1	2	22	7	7	4	2	1	0	22	4	24	
16	2	1	1	1	1	1	0	2	2	2	S	6	2	4	5	2	2	1	1	0	0	1	0	0	0	6	2	24	
17	0	1	2	1	15	6	49	33	34	S	15	13	6	1	13	10	2	7	17	2	3	7	7	3	0	49	11	24	
18	3	4	6	18	8	10	11	5	S	2	2	3	2	1	1	1	1	1	1	0	1	0	1	1	0	18	4	24	
19	1	1	1	1	1	1	1	S	2	13	15	10	15	14	10	15	14	11	9	15	16	19	14	1	1	19	9	24	
20	1	1	2	4	4	6	S	3	3	4	5	5	5	6	6	5	7	8	13	11	9	11	12	11	1	13	6	24	
21	12	18	7	6	6	S	5	15	139	13	24	22	18	20	10	18	25	18	4	1	4	4	4	3	1	139	17	24	
22	4	4	5	5	S	5	5	6	8	8	10	10	21	14	19	20	25	50	20	23	19	22	14	6	4	50	14	24	
23	4	1	1	S	2	2	2	4	3	4	4	4	6	3	3	7	9	8	14	5	27	7	7	2	1	27	6	24	
24	4	20	S	11	7	11	18	27	27	15	24	51	23	46	7	16	31	68	12	4	5	10	10	10	4	68	20	24	
25	17	S	13	11	8	7	7	4	4	10	10	12	13	24	29	26	18	11	9	3	2	4	4	5	2	29	11	24	
26	S	6	8	4	5	5	16	2	3	7	23	11	9	8	11	14	20	16	17	18	48	5	5	S	2	48	12	24	
27	5	3	17	63	59	2	2	1	2	1	2	2	9	11	12	6	0	1	2	3	2	2	S	4	0	63	9	24	
28	5	5	8	29	28	8	8	13	41	49	2	2	2	5	2	12	4	3	3	2	4	S	26	8	2	49	12	24	
29	9	6	4	5	11	9	27	26	27	13	7	12	12	17	3	3	11	13	5	11	S	2	8	9	2	27	11	24	
30	8	2	2	2	1	2	2	2	2	2	2	2	2	3	3	3	3	5	3	S	3	3	4	4	1	8	3	24	
31	6	4	7	5	5	7	14	13	10	7	7	8	7	7	6	3	4	4	S	3	5	5	3	3	3	3	14	6	24
HOURLY MAX	48	79	38	63	59	32	49	47	139	49	35	51	39	53	48	41	33	68	34	38	48	22	26	33					
HOURLY AVG	8	10	8	10	9	7	10	11	16	12	11	11	10	12	10	10	12	15	10	8	9	7	8	6					

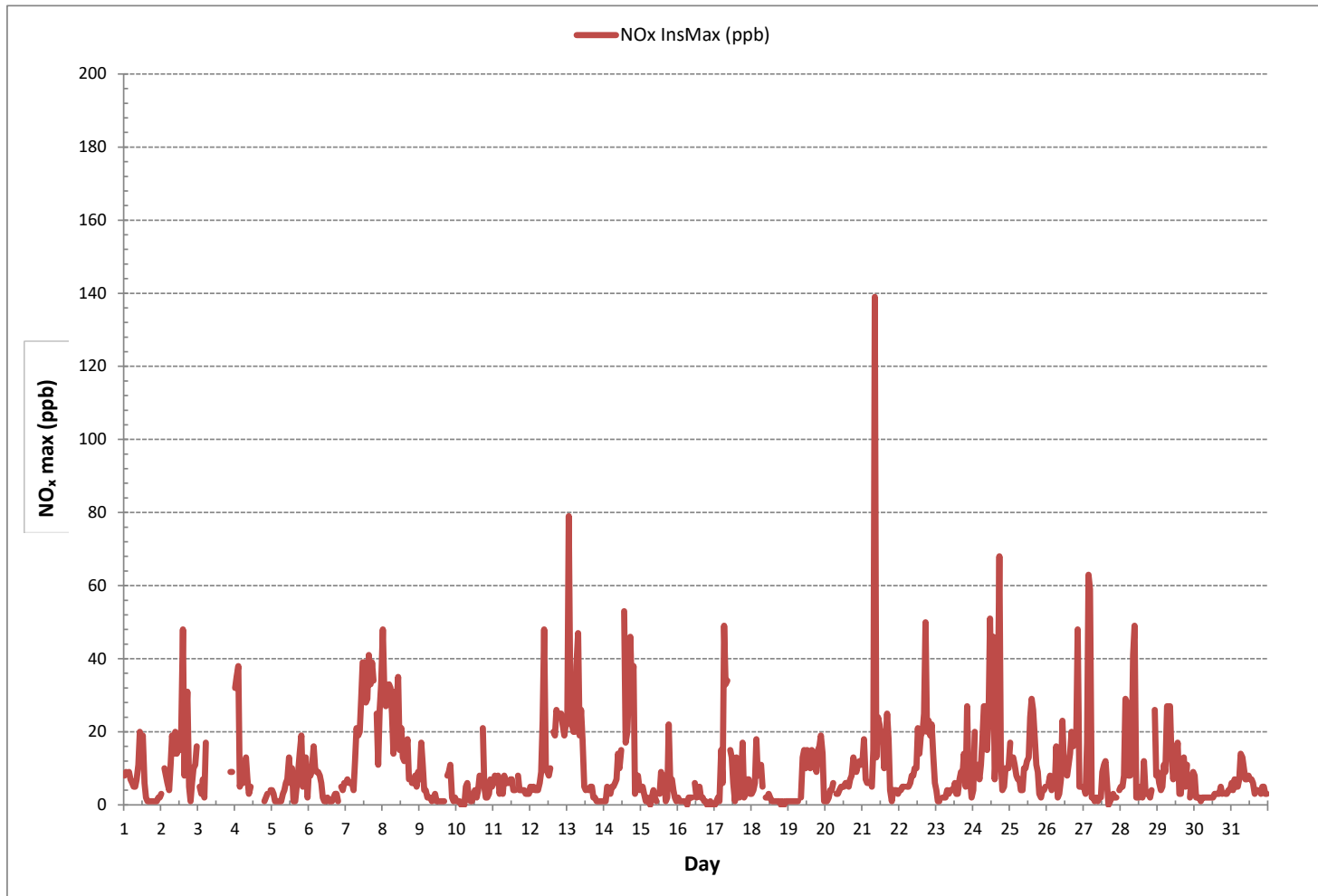
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	675
MAXIMUM INSTANTANEOUS VALUE:	139 ppb @ HOUR 8 ON DAY 21
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	729 hrs
STANDARD DEVIATION:	12

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> 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	S	0	0	0	0	0	0	2	11	4	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1	24	
2	0	S	0	0	0	0	3	6	3	7	4	4	4	5	36	2	5	14	2	0	0	0	0	5	0	0	0	0	36	4	24	
3	S	0	0	2	0	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	0	S	0	0	0	0	2	1	9
4	1	8	7	0	0	0	0	0	0	0	1	C	C	C	C	C	C	C	C	C	0	0	0	S	0	0	0	0	8	1	24	
5	0	0	0	0	0	0	0	0	0	0	1	2	1	2	0	0	1	2	1	3	0	S	1	0	0	0	0	0	3	1	24	
6	1	0	1	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	2	0	24	
7	0	0	0	0	0	0	4	7	6	7	12	17	17	13	12	18	16	14	12	S	7	4	8	10	0	0	0	0	18	8	24	
8	35	10	8	10	10	11	6	3	9	7	15	5	11	5	5	4	6	1	S	0	0	0	0	0	0	0	0	0	35	7	24	
9	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	S	1	1	1	1	0	0	0	0	0	0	1	0	24	
10	0	0	0	0	0	0	1	1	0	0	0	1	1	0	1	2	S	6	1	0	0	0	2	0	0	0	0	0	6	1	24	
11	0	0	0	0	0	0	0	0	0	1	2	2	2	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
12	0	0	0	1	0	0	0	0	7	29	2	3	3	3	S	6	3	5	1	1	2	1	0	1	0	1	0	0	29	3	24	
13	1	53	2	1	1	2	21	26	3	12	6	1	1	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	53	6	24	
14	0	0	0	0	0	0	0	1	0	5	2	7	S	25	5	6	11	21	10	16	0	2	0	0	0	0	0	0	25	5	24	
15	0	0	0	0	0	0	0	0	1	0	0	S	1	3	1	2	0	0	2	0	0	0	0	0	0	0	0	0	3	0	24	
16	0	0	0	0	0	0	0	0	0	S	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
17	0	0	0	0	3	0	24	6	10	S	6	5	2	0	4	2	0	0	1	0	0	0	0	0	0	0	0	0	24	3	24	
18	0	0	0	11	0	0	0	0	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1	24	
19	0	0	0	0	0	0	0	S	0	2	2	2	3	3	2	2	2	1	1	1	1	1	3	1	0	0	0	0	3	1	24	
20	0	0	0	0	0	2	S	0	0	0	1	1	2	2	1	1	0	0	2	1	0	0	0	0	0	0	0	0	2	1	24	
21	0	1	0	0	0	S	0	4	103	4	11	10	12	10	3	11	11	9	0	0	0	0	0	0	0	0	0	0	103	8	24	
22	0	0	0	0	S	0	0	0	2	1	3	3	7	5	6	5	6	25	1	1	0	1	0	0	0	0	0	0	25	3	24	
23	0	0	0	S	0	0	0	1	0	1	1	1	3	1	1	2	4	1	1	0	13	0	0	0	0	0	0	0	13	1	24	
24	0	0	S	0	1	4	6	10	3	5	14	28	8	30	2	7	13	41	1	0	0	0	0	0	0	0	0	0	41	8	24	
25	1	S	0	0	0	0	1	0	0	3	2	6	4	10	11	8	4	1	1	0	0	0	0	0	0	0	0	0	11	2	24	
26	S	0	0	0	0	0	6	0	0	1	15	5	3	3	3	2	4	0	0	0	26	0	0	S	0	0	0	0	26	3	24	
27	0	0	0	31	27	0	0	0	0	0	0	0	3	5	6	1	0	0	0	0	0	0	0	S	0	0	0	0	31	3	24	
28	0	1	1	6	6	1	1	8	13	18	0	1	2	1	7	1	1	0	0	0	S	4	0	0	0	0	0	0	18	3	24	
29	0	0	0	0	0	0	13	11	4	3	1	3	3	5	0	0	0	1	0	1	S	0	0	0	0	0	0	0	13	2	24	
30	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	1	0	24	
31	0	0	1	0	0	1	5	0	0	1	2	2	2	2	2	1	1	0	0	S	0	0	0	0	0	0	0	0	5	1	24	
HOURLY MAX	35	53	8	31	27	11	24	26	103	29	15	28	17	30	36	18	16	41	12	16	26	4	8	10								
HOURLY AVG	1	3	1	2	2	1	3	3	6	4	4	4	4	5	4	3	3	5	1	1	2	0	1	1								

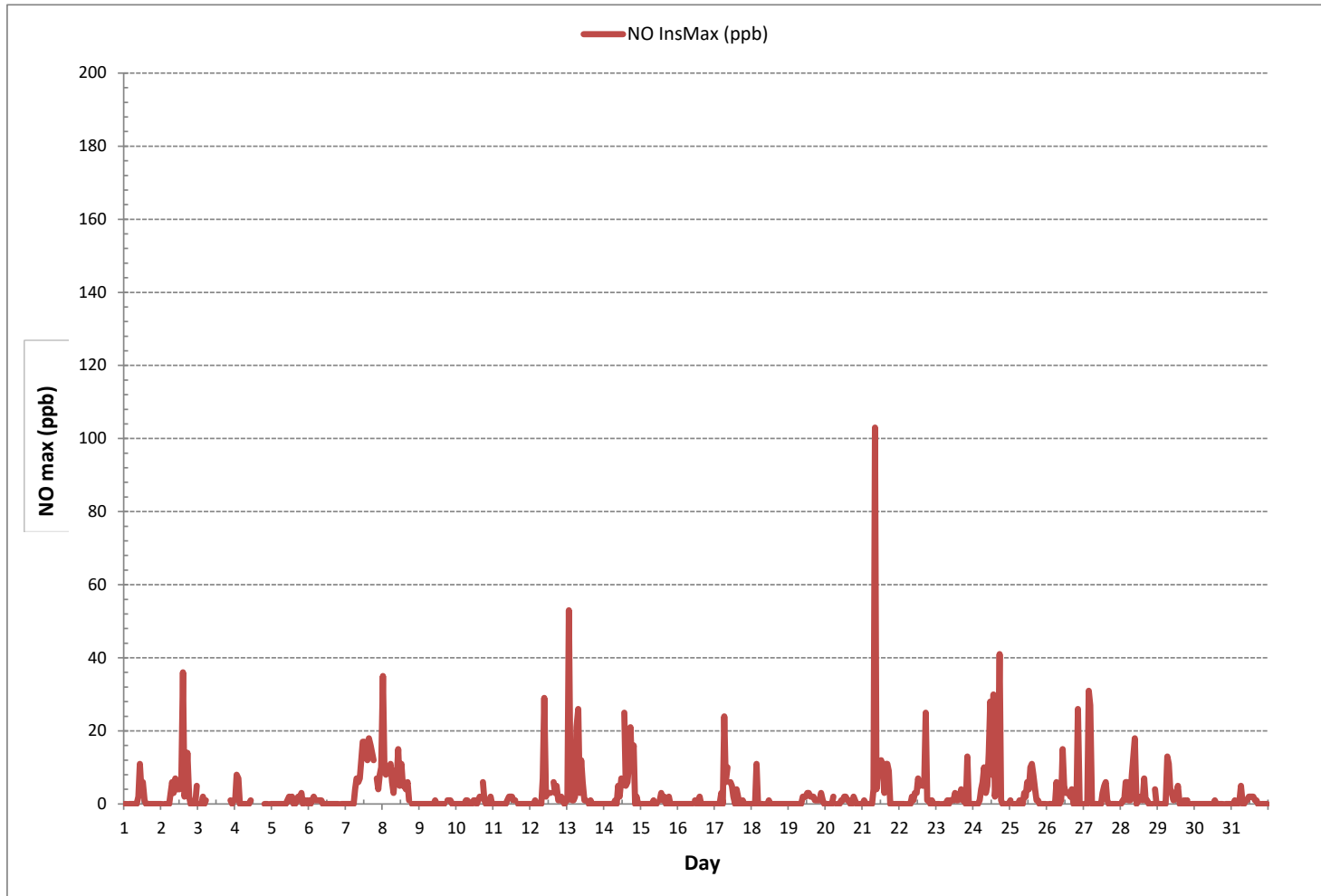
STATUS FLAG CODES

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:	301
MAXIMUM INSTANTANEOUS VALUE:	103 ppb @ HOUR 8 ON DAY 21
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	7
OPERATIONAL TIME:	729 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - January 2019

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	8	9	S	9	7	6	5	5	7	9	11	12	13	5	2	1	1	1	1	1	1	1	2	2	1	13	5	24	
2	3	S	10	8	6	4	10	13	11	14	10	12	12	15	26	6	16	16	4	1	6	10	11	12	1	26	10	24	
3	S	5	3	5	2	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	9	S	2	16	7	9	
4	31	29	31	5	7	6	9	13	7	3	4	C	C	C	C	C	C	C	C	1	2	3	S	4	1	31	10	24	
5	3	3	1	1	1	1	1	3	4	6	6	11	5	9	1	1	4	7	13	17	5	S	12	2	1	17	5	24	
6	9	8	9	14	9	8	8	7	5	2	1	1	2	1	1	1	2	3	3	1	S	5	4	6	1	14	5	24	
7	6	7	6	6	6	4	9	14	13	13	18	22	22	16	17	23	18	25	22	S	17	8	19	23	4	25	14	24	
8	22	21	19	22	24	21	19	12	22	21	20	10	11	8	7	10	12	7	S	6	6	8	5	9	5	24	14	24	
9	7	16	11	4	4	2	2	2	2	2	3	1	1	1	1	1	S	7	8	9	2	1	2	1	16	4	24		
10	1	1	1	1	1	0	4	6	2	1	1	2	3	2	4	6	S	15	5	2	2	3	6	5	0	15	3	24	
11	6	8	7	8	3	6	3	8	6	5	4	6	6	3	3	S	8	4	4	4	4	3	3	4	3	8	5	24	
12	5	4	5	4	4	4	6	9	17	19	7	7	6	7	S	16	17	22	23	23	23	19	21	4	23	13	24		
13	22	27	22	22	20	19	18	21	17	14	12	5	4	S	4	5	5	2	2	1	1	1	1	1	1	1	27	11	24
14	1	1	5	4	3	5	5	5	6	9	8	10	S	29	13	15	22	26	21	23	3	8	8	4	1	29	10	24	
15	5	5	3	1	2	1	1	2	4	2	1	S	2	6	3	7	2	2	20	7	7	4	2	1	1	20	4	24	
16	2	1	1	1	1	2	1	2	2	2	S	5	1	3	3	2	2	1	1	0	0	1	0	0	0	5	1	24	
17	0	1	2	2	13	6	28	28	24	S	11	8	4	1	10	8	2	7	15	2	3	7	7	3	0	28	8	24	
18	3	5	6	8	8	10	11	5	S	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	11	3	24	
19	1	1	1	1	1	1	1	S	2	11	13	8	12	12	8	13	12	10	8	14	15	16	13	1	1	16	7	24	
20	1	1	2	4	4	4	S	3	3	3	4	4	4	4	5	5	7	8	11	10	9	11	12	11	1	12	6	24	
21	12	17	7	6	6	S	5	12	S	10	13	11	8	10	6	7	16	10	4	1	4	4	4	3	1	37	9	24	
22	4	4	5	5	S	5	5	6	7	7	8	8	14	10	13	15	21	25	20	22	19	21	14	6	4	25	11	24	
23	4	1	1	S	2	2	2	3	3	3	3	3	3	3	2	5	8	8	14	6	15	7	7	2	1	15	5	24	
24	4	20	S	11	7	8	12	18	24	11	11	23	15	21	6	9	18	28	11	4	5	9	9	10	4	28	13	24	
25	17	S	13	11	8	7	7	4	4	8	8	6	9	15	19	18	14	9	8	3	2	4	4	5	2	19	9	24	
26	S	6	8	4	5	5	11	2	2	6	8	6	5	5	8	12	17	16	17	18	22	5	5	S	2	22	9	24	
27	5	3	17	32	32	2	1	1	2	1	1	1	6	6	8	5	0	1	2	3	2	2	S	4	0	32	6	24	
28	5	4	7	24	22	7	7	7	27	31	1	2	2	3	2	6	3	2	3	2	4	S	23	8	1	31	9	24	
29	9	6	4	5	11	9	25	25	23	10	6	8	9	12	3	3	10	13	5	11	S	2	8	9	2	25	10	24	
30	8	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	5	3	S	3	3	4	4	2	8	3	24	
31	6	5	6	5	5	7	9	13	10	6	7	6	5	5	4	3	3	3	S	3	5	5	3	3	3	3	13	6	24
HOURLY MAX	31	29	31	32	32	21	28	28	37	31	20	23	22	29	26	23	22	28	23	23	23	22	23	23	23	23	23	23	24
HOURLY AVG	7	8	7	8	8	6	8	9	10	8	7	7	7	8	7	7	9	10	9	7	7	6	7	6					

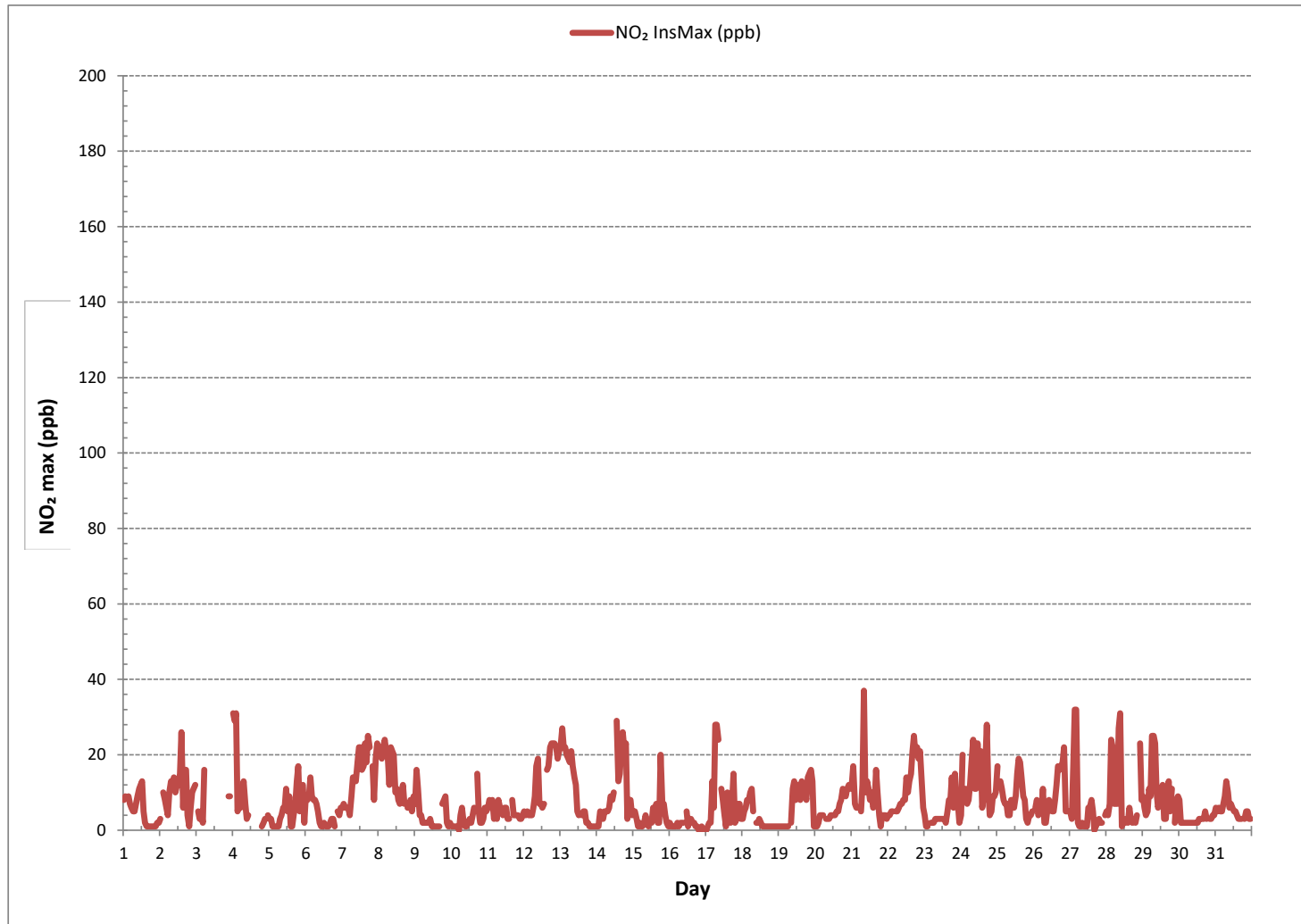
STATUS FLAG CODES

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

NUMBER OF NON-ZERO READINGS:	681
MAXIMUM INSTANTANEOUS VALUE:	37 ppb @ HOUR 8 ON DAY 21
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	729 hrs
STANDARD DEVIATION:	7

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)







LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - January 2019

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	8.0	9.6	14.1	11.6	10.4	7.2	7.1	7.9	8.1	7.9	14.5	16.7	17.6	13.3	17.4	16.0	13.6	11.8	11.1	7.3	8.8	9.4	8.8	5.4	5.4	17.6	11.0	24	
2	4.3	5.9	4.2	6.6	8.2	7.8	5.9	6.7	6.3	7.1	9.2	8.0	7.8	9.7	9.9	10.6	11.6	8.8	6.6	7.1	7.0	7.4	7.1	6.6	4.2	11.6	7.5	24	
3	7.0	7.0	5.8	7.8	9.6	9.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	4.8	5.6	6.0	4.8	9.6	7.0	9
4	2.9	5.2	5.2	2.7	3.5	3.1	1.6	3.8	3.4	3.2	3.5	4.3	9.4	6.9	7.0	6.4	5.7	6.1	5.1	3.7	3.7	7.8	8.0	5.7	1.6	9.4	4.9	24	
5	7.3	3.5	5.3	5.4	6.1	5.8	7.0	7.2	6.3	7.6	7.5	7.5	7.1	7.8	8.8	8.8	8.2	10.6	11.0	10.0	7.4	7.5	11.5	10.3	3.5	11.5	7.7	24	
6	9.8	8.9	8.0	7.8	8.0	7.3	8.5	8.1	8.0	5.8	6.4	6.4	7.4	6.7	7.0	6.2	5.9	5.8	5.4	3.8	6.1	10.8	8.8	8.6	3.8	10.8	7.3	24	
7	11.9	8.5	12.2	16.1	14.4	15.2	12.9	14.9	17.8	16.6	17.1	16.2	16.5	16.8	15.1	16.6	11.9	15.1	14.1	18.9	19.4	13.6	14.3	15.0	8.5	19.4	15.0	24	
8	13.2	16.3	20.4	18.4	11.6	19.4	13.0	9.5	10.5	9.8	9.1	7.6	8.4	5.3	7.0	5.0	5.7	5.7	4.3	2.0	2.8	1.2	1.4	1.6	1.2	20.4	8.7	24	
9	2.3	3.4	2.3	6.4	4.3	4.2	4.4	6.6	7.5	7.4	7.9	8.7	9.4	10.1	10.0	11.6	12.5	9.0	12.0	11.2	10.4	10.9	10.1	8.1	2.3	12.5	8.0	24	
10	7.0	7.0	5.6	6.6	6.6	4.4	3.4	3.3	2.8	4.8	6.9	5.1	4.4	4.2	2.8	2.7	2.3	2.7	3.0	2.4	1.7	5.6	5.3	4.5	1.7	7.0	4.4	24	
11	4.3	3.7	6.2	5.2	5.9	8.6	8.3	7.0	6.5	6.8	9.4	9.5	8.8	9.1	8.4	6.0	5.4	9.7	8.9	7.2	8.5	6.8	6.5	7.6	3.7	9.7	7.3	24	
12	5.5	3.3	7.0	6.6	4.4	4.7	3.3	4.2	2.0	5.3	4.9	7.1	4.9	4.8	6.2	5.8	6.3	5.4	4.5	3.5	3.7	3.4	4.8	9.6	2.0	9.6	5.0	24	
13	7.8	2.8	2.6	2.7	1.9	3.0	1.5	3.2	1.3	4.0	5.2	5.3	6.3	8.0	6.3	7.3	6.9	6.6	6.3	5.7	3.7	5.1	3.8	5.1	1.3	8.0	4.7	24	
14	5.0	4.5	5.0	4.2	4.0	4.5	6.7	7.0	7.1	10.8	9.3	7.9	7.2	7.8	6.8	9.2	14.3	16.9	15.9	18.2	15.5	17.8	15.7	13.1	4.0	18.2	9.8	24	
15	14.3	12.9	13.0	9.2	8.6	7.5	6.3	2.8	3.7	4.3	6.2	5.6	5.6	5.2	5.4	6.1	4.6	4.7	2.8	3.5	2.6	3.8	3.5	2.9	2.6	14.3	6.0	24	
16	3.2	4.3	4.6	7.4	4.2	6.4	5.4	6.7	7.0	5.3	6.0	5.8	7.4	7.5	8.5	7.3	7.0	8.3	8.9	8.5	6.1	9.1	10.4	9.5	3.2	10.4	6.9	24	
17	4.8	3.6	4.5	2.2	2.5	2.8	1.6	2.1	2.5	2.5	2.8	5.0	6.6	5.2	4.1	2.6	2.3	1.8	3.6	2.7	2.8	2.4	4.4	4.9	1.6	6.6	3.3	24	
18	4.7	3.3	3.5	3.5	1.7	2.9	2.7	3.7	3.5	3.8	3.7	5.0	5.5	5.4	5.7	5.1	5.4	6.1	4.4	3.9	3.7	3.7	3.2	3.8	1.7	6.1	4.1	24	
19	5.3	5.0	6.2	4.0	4.7	4.7	4.6	7.7	8.2	8.1	9.3	13.2	10.6	10.8	11.7	12.8	11.8	12.8	12.5	9.6	10.8	10.6	10.8	10.6	4.0	13.2	9.0	24	
20	8.3	8.0	6.6	6.8	6.7	7.2	8.4	7.1	7.5	7.6	8.6	7.5	7.2	11.1	6.7	6.8	5.1	3.3	8.2	8.2	3.7	4.2	3.8	2.6	2.6	11.1	6.7	24	
21	3.3	4.1	3.4	3.6	1.9	5.6	4.8	3.4	6.5	8.5	8.9	7.1	8.7	7.1	7.5	7.9	5.6	5.2	5.7	5.8	4.4	3.6	4.4	2.3	1.9	8.9	5.4	24	
22	2.9	3.2	2.7	4.0	2.7	4.4	2.3	4.2	4.6	5.1	4.9	5.0	3.9	3.0	4.0	3.9	2.5	4.1	7.3	5.6	4.7	4.7	6.4	13.3	2.3	13.3	4.6	24	
23	14.6	11.5	12.9	17.5	11.8	12.1	13.3	13.5	13.1	12.1	11.9	15.0	16.0	13.2	11.3	13.1	9.0	3.3	3.2	3.3	2.4	4.2	4.1	3.0	2.4	17.5	10.2	24	
24	6.7	6.4	8.3	7.2	6.1	6.0	5.4	5.2	5.9	6.6	5.7	5.0	7.4	9.4	8.9	6.3	4.8	4.4	3.1	1.9	2.4	3.7	2.3	5.4	1.9	9.4	5.6	24	
25	5.5	4.5	3.2	5.2	3.1	2.5	2.4	2.4	3.6	3.7	4.4	4.8	4.6	11.0	8.9	9.0	11.4	6.2	5.5	2.0	3.2	3.7	4.3	2.6	2.0	11.4	4.9	24	
26	4.0	3.2	2.7	3.7	3.0	3.3	3.4	4.1	2.2	2.4	4.3	5.4	6.0	6.0	7.0	6.3	5.4	5.9	4.7	5.7	5.0	8.3	7.7	7.7	2.2	8.3	4.9	24	
27	8.9	15.8	19.4	17.2	14.0	13.7	19.0	23.4	20.4	25.1	28.8	22.5	21.6	18.4	23.1	23.3	21.4	22.3	18.7	18.6	17.4	19.9	19.5	13.0	8.9	28.8	19.4	24	
28	11.1	9.9	11.9	12.4	10.5	12.7	9.8	9.8	8.4	12.3	11.9	17.8	14.1	13.9	13.7	11.6	12.3	12.8	8.4	7.2	6.9	3.1	2.0	2.4	2.0	17.8	10.3	24	
29	2.1	2.4	2.0	1.5	2.1	2.0	2.0	2.1	1.3	5.3	6.8	5.7	7.1	6.2	5.9	5.2	5.8	7.3	5.7	7.1	8.0	8.8	10.4	9.1	1.3	10.4	5.1	24	
30	10.3	9.9	8.2	8.1	7.9	8.4	8.6	8.1	9.3	10.7	11.5	12.5	9.7	10.6	11.3	9.4	7.1	7.1	7.8	8.7	7.6	7.5	5.7	4.8	4.8	12.5	8.8	24	
31	3.1	4.6	4.6	2.5	2.9	4.2	2.9	2.0	4.1	5.2	6.8	4.6	5.6	3.7	10.3	9.0	8.9	10.1	9.0	9.1	8.2	11.1	15.3	16.3	2.0	16.3	6.8	24	
HOURLY MAX	14.6	16.3	20.4	18.4	14.4	19.4	19.0	23.4	20.4	25.1	28.8	22.5	21.6	18.4	23.1	23.3	21.4	22.3	18.7	18.9	19.4	19.9	19.5	16.3					

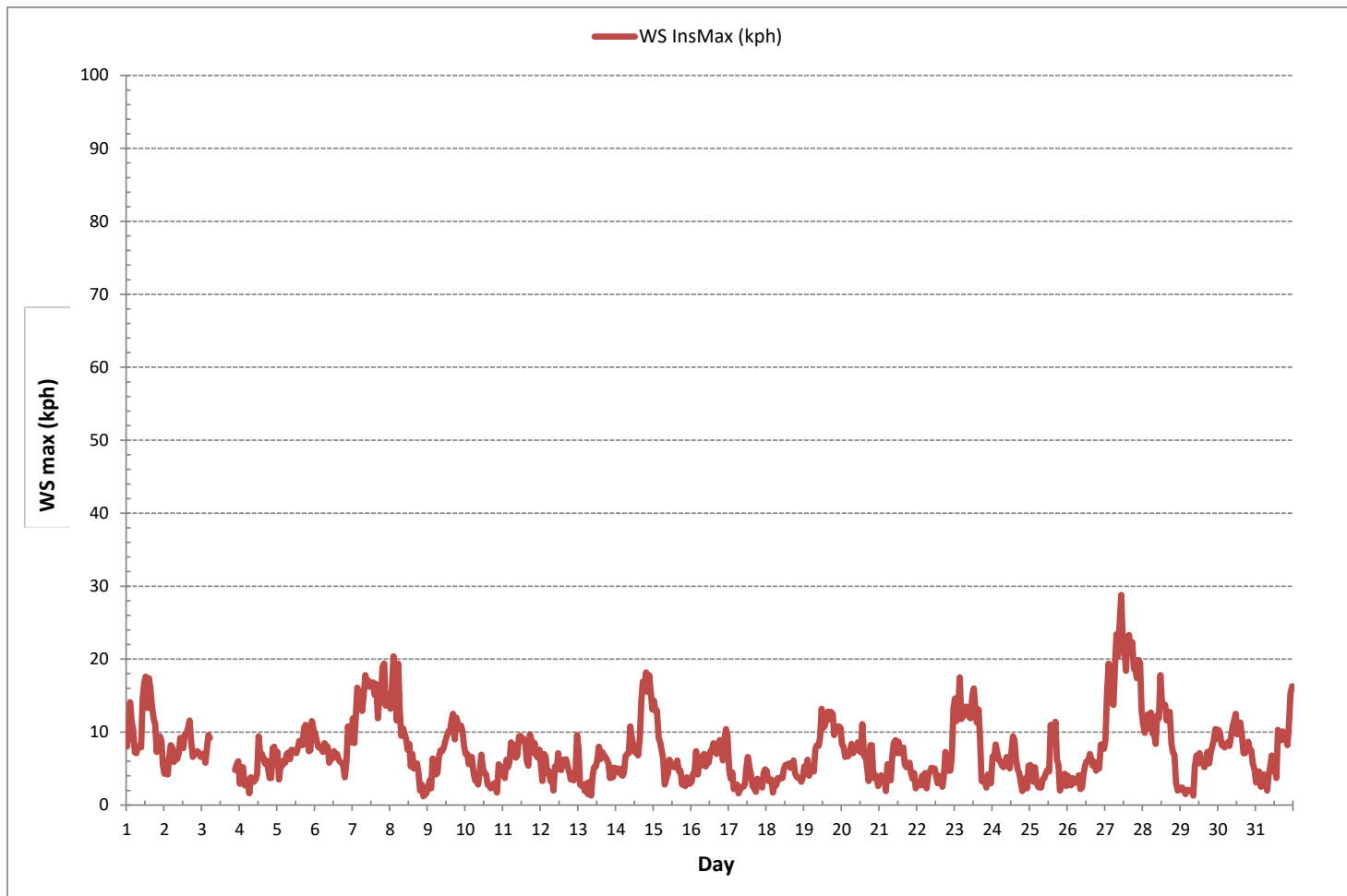
STATUS FLAG CODES

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

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	28.8	kph	@ HOUR	10	ON DAY	27	
OPERATIONAL TIME:						729	hrs

WIND SPEED Instantaneous Maximum (WS kph)



## 1.0 Quality Control Activities

Quality control procedures are established to govern the performance of the monitoring equipment and to protect operational uptime. Data collected during QC/QA activities are assigned a data validation code to comply with the requirements outlined in Chapter 6, 4.1.1, DQ 4-A (AMD, 2016). Calibrations are deemed successful only if the AMD calibration acceptance limits are met (Chapter 7, 9.0, AMD 2016).

A daily zero-span test procedure is performed for each gaseous parameter by challenging the analyzer with a zero-air source and span gas. Daily review of the data ensures the zero and span check are within the required acceptance limits and do not deviate more than  $\pm 10\%$  from the expected value. The total zero-span cycle is complete within an hour with the zero phase commencing at the beginning of the scheduled hour. This QC activity is conducted in accordance with Chapter 7, 4.0, Cal 4-A (AMD, 2016).

The allowable time for a zero-span check is one hour per calendar day. The time allotted for the zero-span check does not contribute to downtime and is identified with a data validation code of "S". If any additional zero-span response checks are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "S1". The initiation of an additional zero-span check may be warranted during the investigation of operational issues or suspect data.

Each month, a scheduled multipoint calibration is performed on each gas analyzer. Prior to any adjustments, an as-found response test is completed to obtain the zero reading of the analyzer and the response to the highest span concentration. The zero and high point test gases are then re-introduced into the analyzer to establish the zero and high set-points. Once these adjustments are satisfactory, a mid-point and a low-point test concentration is introduced. Additional multi-point calibrations are required if any of the conditions, outlined in Chapter 7, 2.1, Cal 2G (AMD, 2016) exist.

The time allotted for the first multi-point calibration is not considered downtime and is identified with a data validation code of "C". If any additional as-found response checks or multipoint calibrations are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "C1".

A mechanical wind system undergoes annual calibration, as a minimum, while an ultrasonic wind system is factory calibrated every two years (Chapter 6, 6.0, Cal 6-A, AMD 2016). Supplementary to this, a visual inspection of the equipment is performed during each scheduled monthly site visit.

The time allotted for the wind system calibration is not considered downtime and is identified with a data validation code of "C". If function checks or additional calibrations are performed, the time accrued during the QC activity is not considered downtime and is identified with a data validation code of "Q" and "C", respectively. If QC activity goes beyond 10% of the monthly operating time, the time exceeding 10% is considered downtime and is assigned a data validation code of "C1". Data identified with a data validation code of "Q" is in accordance with Chapter 6, 4.1.3 (AMD, 2016) which states QA/QC activities are not included when calculating data completeness.

High volume samplers are calibrated every three months, as a minimum, in accordance with Chapter 7, 7.0, Cal 7-B (AMD, 2016).

Where passive sampling is in practice, quality control samples will be deployed in accordance with Chapter 4, 3.0, 3.1.3. Method blanks, replicate samples and spiked blanks are exposed and handled in the same manner as each passive sample. To comply with the data submission requirements in Chapter 9, 3.1, the replicate and corresponding passive sample concentrations are reportable data values and have not been averaged.

As recommended in Chapter 6, 4.2 (AMD 2016), daily data review is conducted to verify data and avoid significant data losses. Automated flags, originating from the data-logger, and data anomalies are reviewed and may prompt the need to dispatch a technician for investigation and/or corrective action. Additionally, there are several automated alarm scenarios that serve to screen raw data, alert technicians and elicit investigation or corrective action.

Comparisons of the measured ambient concentrations to the corresponding AAAQO are assessed using the significant figures protocol in Chapter 9, 3.1.2. If the measurement is near the set objective, raw data may undergo necessary data adjustments to confirm a true exceedance. Should an exceedance occur, Maxxam will formally notify the client; however, the reporting protocol to AEP is defined by the client and may not involve Maxxam. Exceedance events are acknowledged in the report, based on the information available at the time.

## 2.0 Data Verification and Validation

The data validation procedures, outlined in Chapter 6, 4.0, AMD 2016, are used to accept, reject and qualify data. The data verification and validation process, and the current Data Collection and Management Process Flow Chart have been compiled from sections 4.2 to 4.6 (AMD, 2016) and are shown below.

Baseline adjustments are applied by interpolation between two valid zero checks, as determined by the Data Acquisition System. In the event that zero check results are not reliable, data may be adjusted by applying a constant offset to data collected between two adjacent zero checks. Both adjustment approaches are deemed acceptable by the AMD.

Table 1 (Chapter 6) outlines the quantitative parameter relationships to be considered and dictates that data adjustments are applied equally for NO/NO<sub>2</sub>/NO<sub>x</sub> and CH<sub>4</sub>/NMHC/THC parameters. Below zero adjustments are applied to 1-hour averages, in accordance with Table 2 (Chapter 6), and are done after baseline corrections.

Instantaneous data, where provided, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

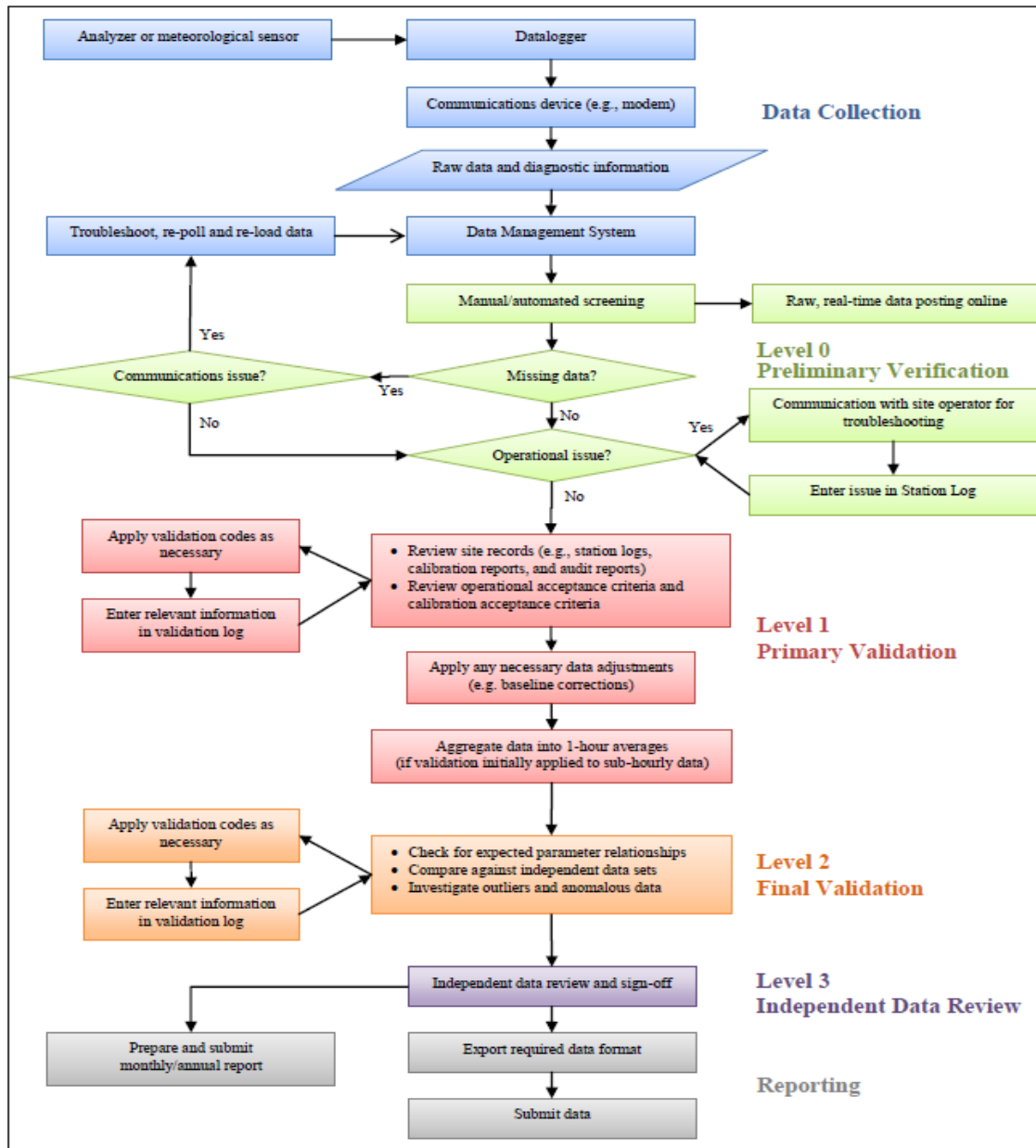
All calculations and reporting of results follow the methods described in the AMD, 2016.

There were no deviations from the prescribed methods.

**AMD Data Verification and Validation Process**

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

<p><b>Level 0 Preliminary Verification</b></p>	<p>Level 0 data are raw data obtained directly from the data acquisition system (DAS). At this level, data undergoes a certain amount of manual or automated screening and flagging. Screening checks include: a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/data-logger 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.</p>
<p><b>Level 1 Primary Validation</b></p>	<p>Primary validation involves more thorough evaluation and documentation of issues identified during data screening, along with appropriate application of data validation codes. Level 1 activities 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.</p>
<p><b>Level 2 Final Validation</b></p>	<p>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. At this level of review, some general knowledge of pollutant and meteorological behavior can be used to determine if data is suspect.</p>
<p><b>Level 3 Independent Data Review</b></p>	<p>Level 3 validation involves a final cursory review of validated data, and is completed by an individual independent of both field operations and primary data validation. At this level, a final independent QA review/endorsement is performed before data is submitted to Alberta Environment and Parks.</p>
<p><b>Post-Final Validation</b></p>	<p>The Post-Final Validation step serves to re-evaluate validated data for errors or omissions discovered and/or suspected after the initial monthly data submittal. This level of validation is performed on an annual basis, when annual reporting is required or requested.</p>



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



### Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2019-01-24-C</u>
<b>Site:</b> <u>Maskwa Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

Level 0 Preliminary Verification *bimadeniji* Date 08 - Feb- 2019

Level 1 Primary Validation *bimadeniji* Date 08 - Feb- 2019

Level 2 Final Validation *bimadeniji* Date 12 - Feb - 2019

Level 3 Independent Data Review *msalmbg* Date 28- Feb - 2019

Post-Final Validation NA Date NA

<b>Notes</b>
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.

This page is intentionally blank and marks the conclusion of this report



JANUARY 1 - 31, 2019

MONTHLY AMBIENT AIR QUALITY MONITORING REPORT

Project #: 2833-2019-01-25-C

LICA-201901

Prepared for:

Lakeland Industry & Community Association

Mike Bisaga

5107 50 St.

Bonnyville, Alberta T9N 2J7

monitoring@lica.ca

780-266-7068

Monitoring Station

St. Lina Continuous Monitoring Station

Date of Report Issuance: February 28, 2019

Report Preparation By:

Bim Adeniji, M.Sc.

403-219-3677

aadeniji@maxxam.ca



Project Manager, Customer Service, Air Services

Reviewed By:

Wunmi Adekanmbi, M.Sc., EPT, PMP

403-219-3661

aadekanmbi@maxxam.ca



Project Team Lead, Customer Service, Air Services



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

LICA-201901

Page 177 of 350

**Lakeland Industry & Community Association**

5107 50 St.  
Bonnyville, Alberta T9N 2J7

**Attention: Mike Bisaga**

**Date: February 27, 2019**

**Subject: MONTHLY AMBIENT AIR QUALITY MONITORING REPORT for JANUARY 1 - 31, 2019**

In January 2019, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Continuous Monitoring Station near St. Lina, Alberta. The monitoring program provides continuous measurements of ambient air pollutants and meteorological data to satisfy the reporting requirements of the Alberta airshed.

**Network Parameters for Continuous Monitoring:**

This monthly report, where applicable, was prepared in accordance with Chapter 9 of the Air Monitoring Directive (AMD, 2016). The report summarizes the continuous monitoring results for pollutant and meteorological parameters and presents the hourly statistics, graphs and rose charts for the month. Calibration records are provided in a separate PDF document in order to comply with AMD requirements (Chapter 9, 13.1.7, RC 13-R, AMD 2016). The station is equipped with analyzers to measure SO<sub>2</sub>, H<sub>2</sub>S, THC, CH<sub>4</sub>, NMHC, NO<sub>x</sub>, NO, NO<sub>2</sub> and O<sub>3</sub>. The meteorological sensors and equipment capture data for WS, WD, RH, BP, PRECIP, AmbTPX and STDWD.

**Exceedance & Performance Reporting:**

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement, as per the Alberta Air Monitoring Directive (AMD, Chapter 6, DQ 4-C, 2016).

All measured ambient air concentrations were below the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO, November 2018). Comparisons of these concentrations to the corresponding AAAQOs were done in accordance with AMD, Chapter 9, 15.3.2, RC 15-P. Accordingly, the averaging specifications and data completeness criteria, as defined in the Alberta Ambient Air Quality Objective Calculation Guidelines, were applied. (AMD, Chapter 9, Appendix A, 2016).

Specific to the content and purpose of this report, there were no instances where the requirements of the AMD (2016) were contravened.

**Monthly Monitoring Overview:**

In relation to the previous month, there were no changes made to the scope or management of the ambient air monitoring program.

The evaluation of data collected in the month of January did not reveal any errors or omissions that would require resubmission of air data to AEP's airdata warehouse.

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

**SO<sub>2</sub>:** Two hours of downtime were recorded on January 29 due to additional quality checks performed to assess a biased low drift in span response.

**H<sub>2</sub>S:** Five hours of downtime were recorded across the month due to additional quality checks performed to address drifts in span and baseline zero response.

**THC/CH<sub>4</sub>/NMHC:** The fuel gas (H<sub>2</sub>) was depleted on January 6 and was replaced on January 7. Eighteen hours of downtime were recorded due to this issue.

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

**Reviewed by:**



Wunmi Adekanmbi, M.Sc., EPT, PMP  
Project Team Lead, Customer Service, Air Services  
403-219-3677

*I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. Certification of submitted information is specific to the contents of this report and is not intended to represent the onus of the Person Responsible, as outlined in Chapter 9, RC 12-E.*

## TABLE OF CONTENTS

<b>TITLE PAGE</b>	<b>1</b>
<b>COVER LETTER</b>	<b>2</b>
<b>TABLE OF CONTENTS</b>	<b>3</b>
<b>ABBREVIATIONS</b>	<b>4</b>
<b>AAAQO EXCEEDANCE SUMMARY</b>	<b>5</b>
<b>MONTHLY CONTINUOUS DATA SUMMARY</b>	<b>6</b>
<b>OPERATIONAL SUMMARY</b>	<b>7</b>
<b>SUMMARY TABLES, GRAPHS AND ROSES</b>	<b>9</b>
Sulphur Dioxide	10
Hydrogen Sulphide	14
Total Hydrocarbon	18
Methane	22
Non-Methane Hydrocarbon	26
Oxides of Nitrogen	30
Nitric Oxide	34
Nitrogen Dioxide	38
Ozone	42
Particulate Matter <sub>2.5</sub>	46
Wind Speed	50
Wind Direction	53
Standard Deviation Wind Direction	56
Relative Humidity	58
Barometric Pressure	60
Ambient Temperature	62
Precipitation	64
<b>MAXIMUM INSTANTANEOUS DATA</b>	<b>66</b>
<b>1.0 Quality Control Activities</b>	<b>86</b>
<b>2.0 Data Verification and Validation</b>	<b>87</b>
<b>Validation Certificate Form</b>	<b>90</b>
<b>End of Report</b>	<b>91</b>

## List of Acronyms

<b>AAAQO</b>	Alberta Ambient Air Quality Objectives and Guidelines Summary
<b>AEP</b>	Alberta Environment and Parks
<b>AMBTPX</b>	Ambient Temperature
<b>AMD</b>	Air Monitoring Directive
<b>BP</b>	Barometric Pressure
<b>CH<sub>4</sub></b>	Methane
<b>DAS</b>	Data acquisition system
<b>hr</b>	Hour
<b>hrs</b>	Hours
<b>H<sub>2</sub>S</b>	Hydrogen Sulphide
<b>IZS</b>	Internal zero-span
<b>kph</b>	Kilometers per hour
<b>NO</b>	Nitric Oxide
<b>NO<sub>2</sub></b>	Nitrogen dioxide
<b>NO<sub>x</sub></b>	Total oxides of nitrogen
<b>O<sub>3</sub></b>	Ozone
<b>NMHC</b>	Non-Methane Hydrocarbon
<b>PM<sub>2.5</sub></b>	Particulate matter less than or equal to 2.5 microns in diameter
<b>Precip</b>	Precipitation
<b>ppb</b>	Parts per billion
<b>ppm</b>	Parts per million
<b>QA</b>	Quality Assurance
<b>QC</b>	Quality Control
<b>RH</b>	Relative Humidity
<b>SHARP</b>	Synchronized Hybrid Ambient Real-time Particulate Monitor
<b>SOP</b>	Standard Operating Procedure
<b>SO<sub>2</sub></b>	Sulphur Dioxide
<b>STDWD</b>	Standard Deviation Wind Direction
<b>THC</b>	Total hydrocarbons
<b>µg/m<sup>3</sup></b>	Microgram per cubic meter
<b>WS</b>	Wind Speed
<b>WD</b>	Wind Direction
<b>°C</b>	Degrees Celsius

## AAAQO Exceedance Summary

### SO<sub>2</sub> 1-Hour Exceedances

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

### SO<sub>2</sub> 24-Hour Exceedances

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

### H<sub>2</sub>S 1-Hour Exceedances

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

### H<sub>2</sub>S 24-Hour Exceedances

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

### NO<sub>2</sub> 1-Hour Exceedances

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

### PM<sub>2.5</sub> 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m<sup>3</sup>.

### PM<sub>2.5</sub> 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 29 µg/m<sup>3</sup>.

### O<sub>3</sub> 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.*

**MONTHLY CONTINUOUS DATA SUMMARY**

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
St. Lina Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO <sub>2</sub> (ppb)	172	48	0	0	0	3	2	8	14.8	SW	1	2	99.7
H <sub>2</sub> S (ppb)	10	3	0	0	0	1	12	23	9.7	SSW	0	1	99.3
THC (ppm)	-	-	-	-	2.09	2.91	25	15	13.1	WNW	2.36	14	97.6
CH <sub>4</sub> (ppm)	-	-	-	-	2.09	2.89	25	15	13.1	WNW	2.36	14	97.6
NMHC (ppm)	-	-	-	-	0.00	0.04	29	15	12.3	SE	0.00	1	97.6
NO <sub>2</sub> (ppb)	159	-	0	-	3	19	14	16	11.9	W	10	13	100.0
NO (ppb)	-	-	-	-	0	9	14	13	14.7	WSW	2	14	100.0
NO <sub>x</sub> (ppb)	-	-	-	-	4	23	14	13	14.7	WSW	11	13	100.0
O <sub>3</sub> (ppb)	82	-	0	-	31.8	44.3	27	23	17.6	NNW	42.6	28	100.0
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	29	0	0	5	27	14	12	15.5	SW	14	13	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	83	100	1	22	9.9	WSW	98	6	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	924	939	28	8	14.3	NNW	939	28	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-11.5	7.2	2	13	25.9	W	1.9	2	100.0
PRECIPITATION (mm)	-	-	-	-	13.1	1.1	27	6	23.0	N	2.7	19	100.0
VECTOR WS (kph)	-	-	-	-	0.3	33.4	27	15	-	NNW	22.2	27	100.0
VECTOR WD (sec)	-	-	-	-	265 (W)	-	-	-	-	-	-	-	100.0

\* Precipitation: data represents the total (sum) for the indicated time frame

**OPERATIONAL SUMMARY**

Parameter	Equipment	Method & Procedure	Operational Notes
SULPHUR DIOXIDE (SO <sub>2</sub> )	Thermo 43i TLE UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 99.7%, equivalent to 2 hours of downtime.</li> <li>The routine monthly calibration was performed on January 21, between the hours of 13:00 and 17:00.</li> <li>The analyzer spanned outside the lower acceptance limit on January 29. Additional zero-span checks conducted at hours 07:00 and 11:00 drifted further outside limit, indicating the depletion of the permeation tube. The permeation tube was replaced on February 12, during the monthly calibration. As the monthly calibration met AMD requirements, no data was discarded due to this issue. Two hours of downtime were, however, recorded on January 29 due to the additional quality checks.</li> </ul>
HYDROGEN SULPHIDE (H <sub>2</sub> S)	Thermo 450i UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.</li> <li>The analyzer exhibited a sudden drift towards the lower acceptance limit on January 9. An additional zero-span check was performed later that day at hour 07:00 and the result was closer to the mean. No further action was required. One hour of downtime was, however, incurred due to the additional quality check.</li> <li>An additional zero-span check was performed on January 15, at hour 8:00, to assess a positive baseline zero drift but the result displayed a similar response. Subsequent scheduled zero results exhibited no further drift. One hour of downtime was attributed to the repeat check.</li> <li>The daily span result exceeded the lower acceptance limit on January 17. A repeat zero-span check performed on January 18, at hour 07:00, exhibited similar results. This prompted an immediate site visit where the SO<sub>2</sub> scrubber beads were renewed, following a successful shut-down calibration. A successful post-repair calibration was subsequently completed. As the shut-down and post-repair calibrations met AMD requirements, no data was discarded due to the span drift. One hour of downtime was, however, recorded due to the additional quality check.</li> <li>On January 27, the analyzer exhibited a biased high drift in zero response and also spanned outside the upper acceptance limit. An additional zero-span check was triggered at hour 20:00 and the results exhibited no further zero or span drifts. No further action was required. Two hours of downtime were, however, incurred due to the additional quality check.</li> <li>Further data analysis revealed a correlation between periods of erratic span response and shifts in ambient temperatures across the month. The drift pattern in span response appeared to mirror that of ambient temperature.</li> </ul>

**OPERATIONAL SUMMARY**

Parameter	Equipment	Method & Procedure	Operational Notes
TOTAL HYDROCARBONS (THC), METHANE (CH <sub>4</sub> ) & NON-METHANE HYDROCARBONS (NMHC)	Thermo 55i FID Analyzer	Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 97.6%, equivalent to 18 hours of downtime.</li> <li>The analyzer flamed out on January 6, as the fuel gas (H<sub>2</sub>) was depleted. The gas cylinder was replaced on January 7 and a zero-span check was performed afterwards as a quality check. Eighteen hours of downtime were recorded between January 6 and January 7 due to this event.</li> <li>The analyzer recorded anomalously low minute concentrations on January 7 at 13.29 – 13.30. These data points were excluded and the corresponding hourly averages were re-calculated.</li> <li>The routine monthly calibration was performed on January 21, between the hours of 13:00 and 17:00.</li> </ul>
OXIDES OF NITROGEN (NO <sub>x</sub> ), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO <sub>2</sub> )	Thermo 42i Chemiluminescent Analyzer	Maxxam AIR SOP-00213: Ambient NO/NO <sub>2</sub> /NO <sub>x</sub> Monitoring	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine monthly calibration was performed on January 21, between the hours of 13:00 and 19:00.</li> </ul>
OZONE (O <sub>3</sub> )	Thermo 49i Photometric Analyzer	Maxxam AIR SOP-00212: Ambient O <sub>3</sub> Monitoring	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine monthly calibration was performed on January 18, between the hours of 11:00 and 17:00.</li> </ul>
PARTICULATE MATTER < 2.5 MICRONS (PM <sub>2.5</sub> )	Thermo SHARP 5030i Unit	Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine monthly check was performed on January 29, at hour 16:00.</li> </ul>
WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)	Met One Unit	MET One Instruments: Operation Manual Document No. 50.5-9800	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>Two instances of maximum instantaneous data were invalidated on January 17, at hour 8:00 and January 29, at hour 01:00, as the spike in wind speed was deemed anomalous. Minute data review did not support the validity of the elevated measurement.</li> <li>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 and is measured in degrees from true north.</li> </ul>
RELATIVE HUMIDITY (RH)	Campbell Scientific Unit	Operating Manual	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> </ul>
BAROMETRIC PRESSURE (BP)	Met One Unit	Operating Manual	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> </ul>
PRECIPITATION (PRECIP)	Met One Unit	Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>A precipitation sensor check was performed on January 29.</li> </ul>
AMBIENT TEMPERATURE (AmbTPX)	Campbell Scientific Unit	Operating Manual	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> </ul>



***SUMMARY TABLES, GRAPHS AND ROSES***

**SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> 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	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
2	0	0	0	2	2	2	2	1	3	S	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	24		
3	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
4	0	0	0	0	0	0	0	0	S	0	0	0	1	1	1	0	0	0	0	0	0	0	1	2	1	0	0	2	0	24		
5	0	0	0	0	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
6	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	24		
7	0	0	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
8	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	24		
9	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		
10	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	24		
11	S	0	0	0	0	0	0	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	S	0	2	1	24			
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	S	1	0	1	1	0	24			
13	1	1	1	1	0	1	0	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	S	0	0	0	1	1	1	24		
14	0	0	0	0	0	0	1	1	1	2	2	3	3	2	1	1	0	0	0	0	0	S	0	0	0	0	0	3	1	24		
15	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24		
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0	0	0	0	0	0	1	0	24		
17	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24		
18	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24		
19	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
20	0	0	1	1	0	0	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	0	1	1	1	24		
21	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	24		
22	0	0	0	0	1	1	1	1	1	1	1	1	S	2	2	3	2	1	1	1	0	0	0	0	0	0	0	3	1	24		
23	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
24	0	0	0	0	0	0	0	0	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
25	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	24		
26	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0	2	0	24		
27	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
28	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
29	0	0	0	0	0	S	0	S1	0	0	0	S1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	0	22			
30	1	1	1	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	0	24		
31	0	0	0	S	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	24			
HOURLY MAX	1	1	1	2	2	2	2	1	3	2	2	3	3	2	2	3	2	1	1	1	1	2	2	1	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						

**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

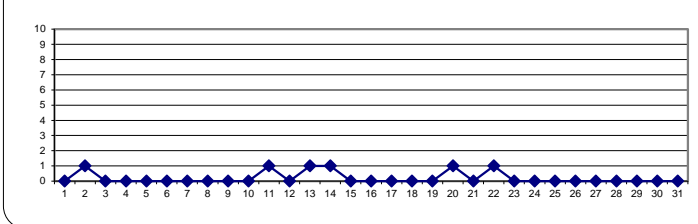
**OBJECTIVE LIMIT:**

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

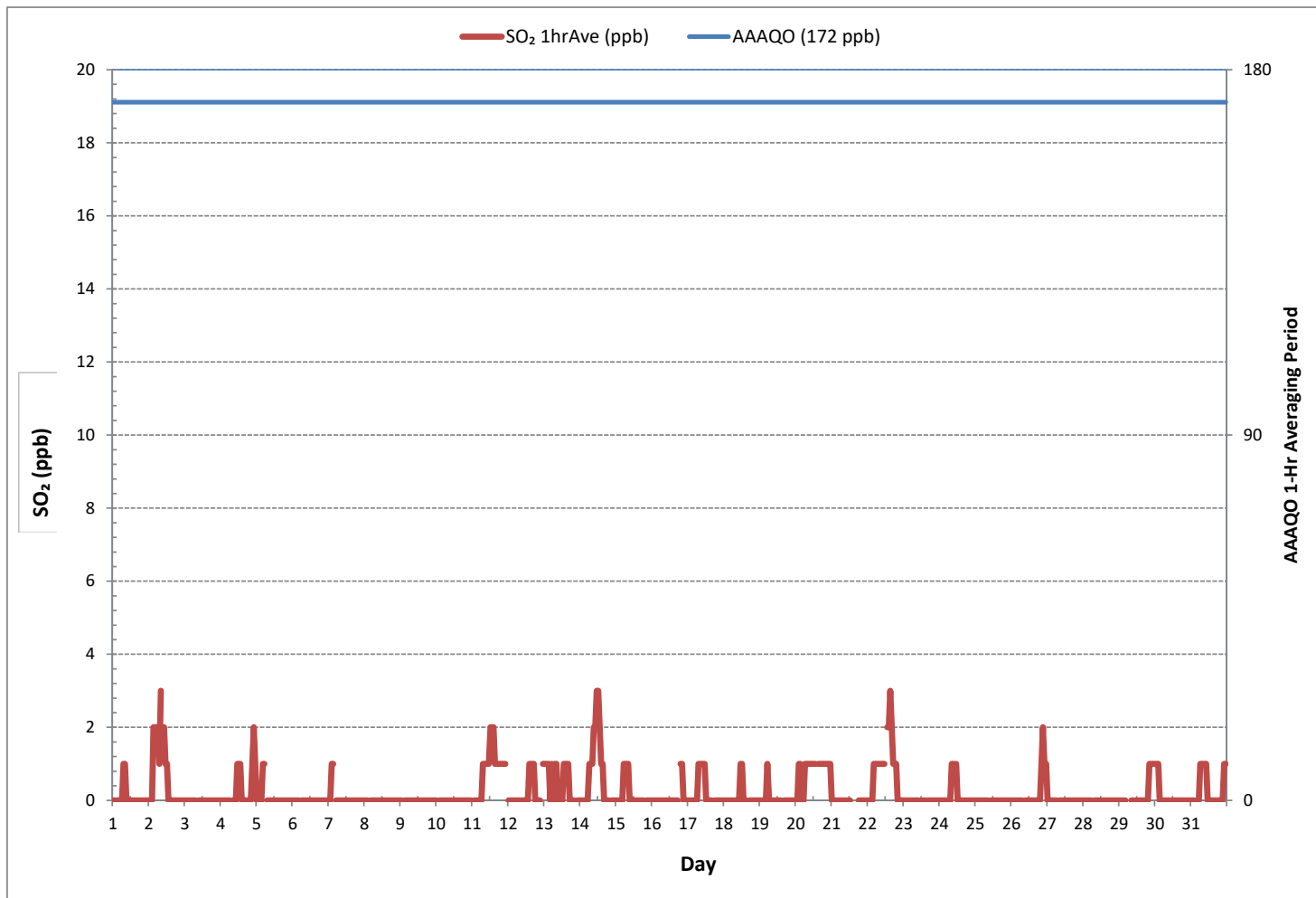
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	132		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1		
MAXIMUM 1-HR AVERAGE:	3 ppb @ HOUR ON DAY 2		
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 2		
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	742 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.7 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb

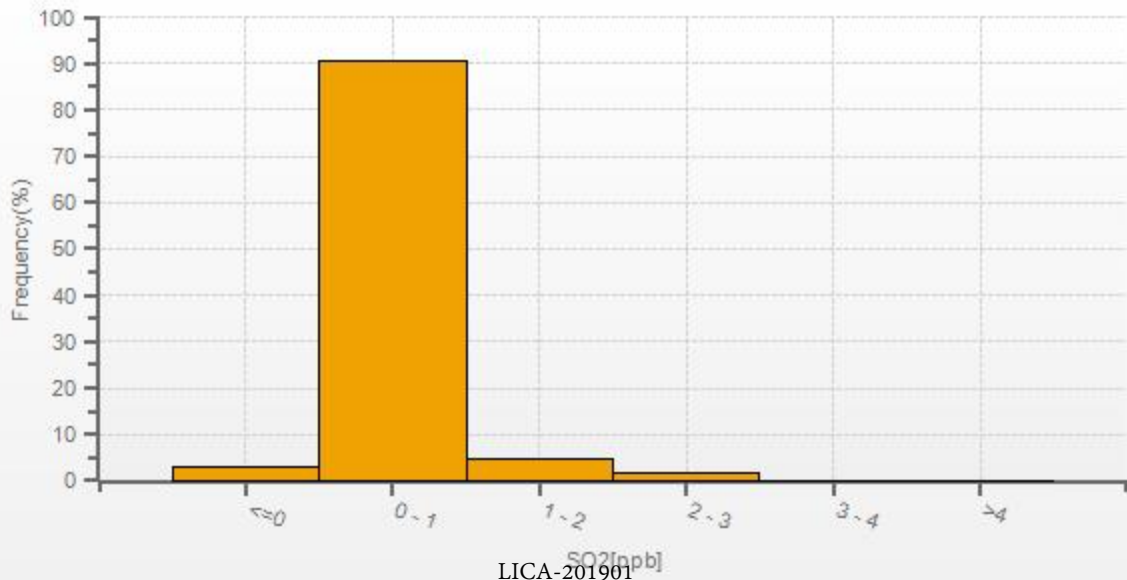
**24 HR AVERAGES January 2019**



SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)

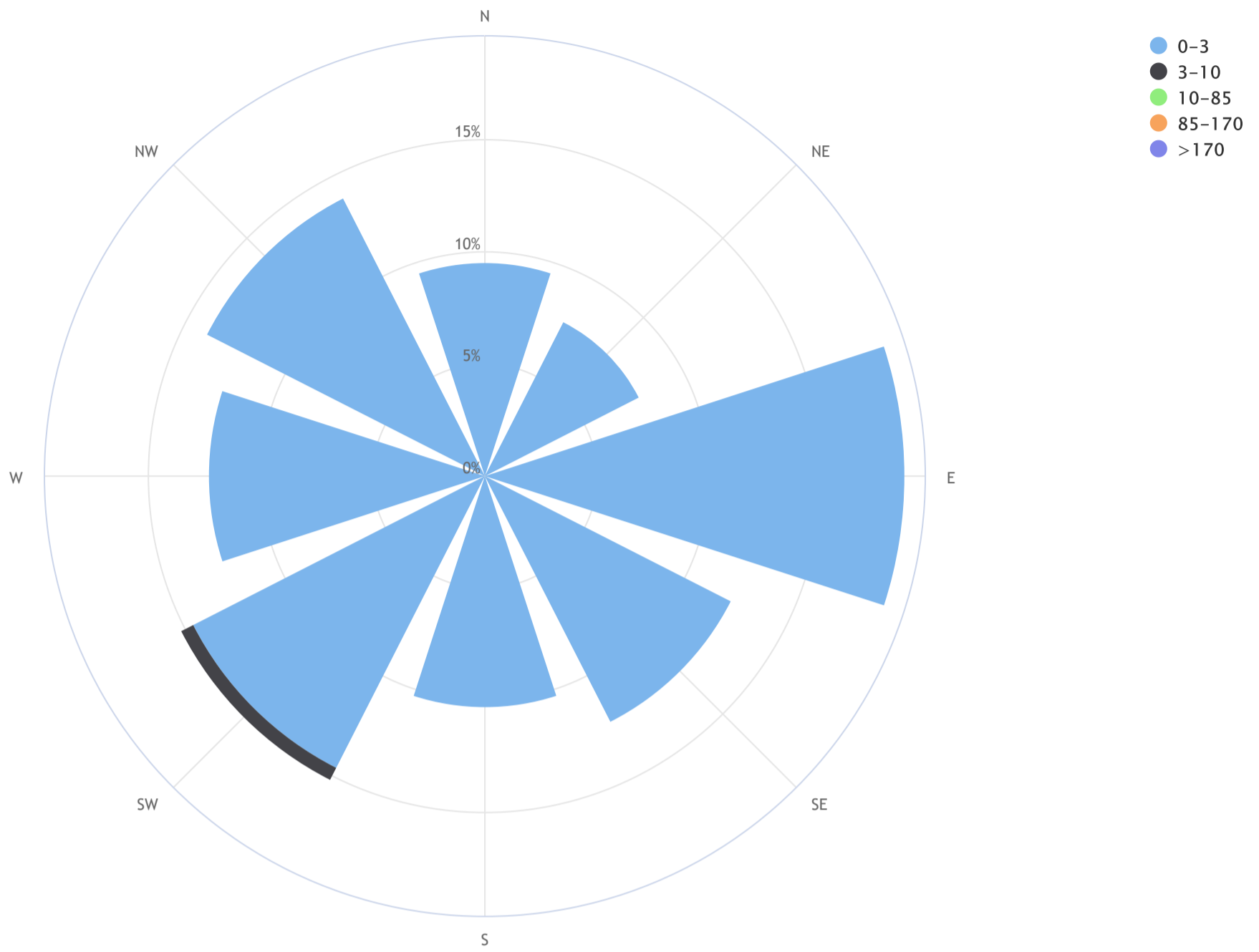


### SO2[ppb] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.



Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_SO<sub>2</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 1.0\_CALM % = 0.1%



Direction	0-3	3-10	10-85	85-170	>170	TOTAL
N	9.5	0.0	0.0	0.0	0.0	9.5
NE	7.7	0.0	0.0	0.0	0.0	7.7
E	18.7	0.0	0.0	0.0	0.0	18.7
SE	12.3	0.0	0.0	0.0	0.0	12.3
S	10.3	0.0	0.0	0.0	0.0	10.3
SW	14.6	0.6	0.0	0.0	0.0	15.2
W	12.3	0.0	0.0	0.0	0.0	12.3
NW	13.9	0.0	0.0	0.0	0.0	13.9
<b>Summary</b>	<b>99.3</b>	<b>0.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>99.9</b>
<b>CALM</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>



HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S 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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
2	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
3	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
4	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	24
5	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	24
6	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
7	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	24
8	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
9	0	S	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
10	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
11	S	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
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	1	1	0	24
13	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	1	0	24
14	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
15	0	0	0	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	0	0	0	0	0	0	0	0	0	24
18	0	0	0	0	0	0	S1	0	0	0	C	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	23
19	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
20	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	24
21	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	24
22	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	24
23	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	24
24	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
25	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	24
26	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
27	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	S1	S1	0	0	0	0	0	0	22
28	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	24
29	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	S	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1				
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

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

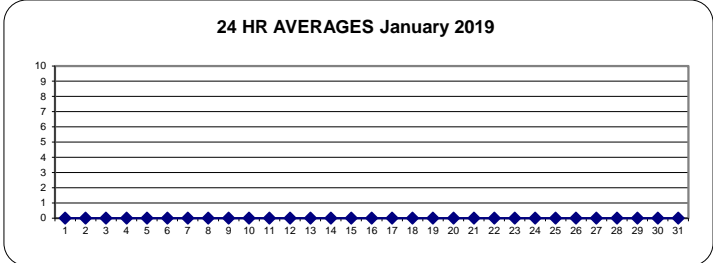
OBJECTIVE LIMIT:

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

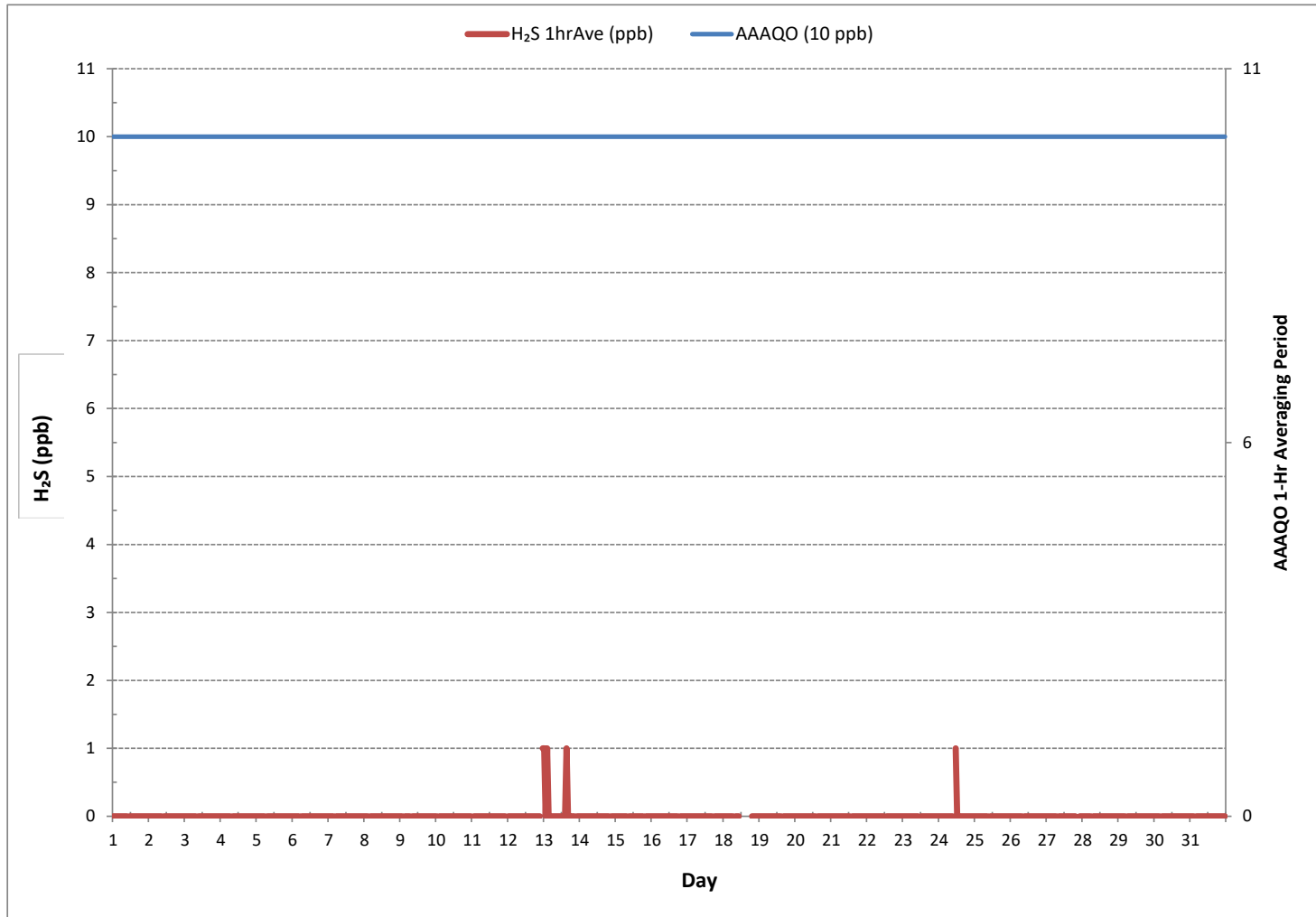
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	5
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR 23 ON DAY 12
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	739 hrs
AMD OPERATION UPTIME:	99.3 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

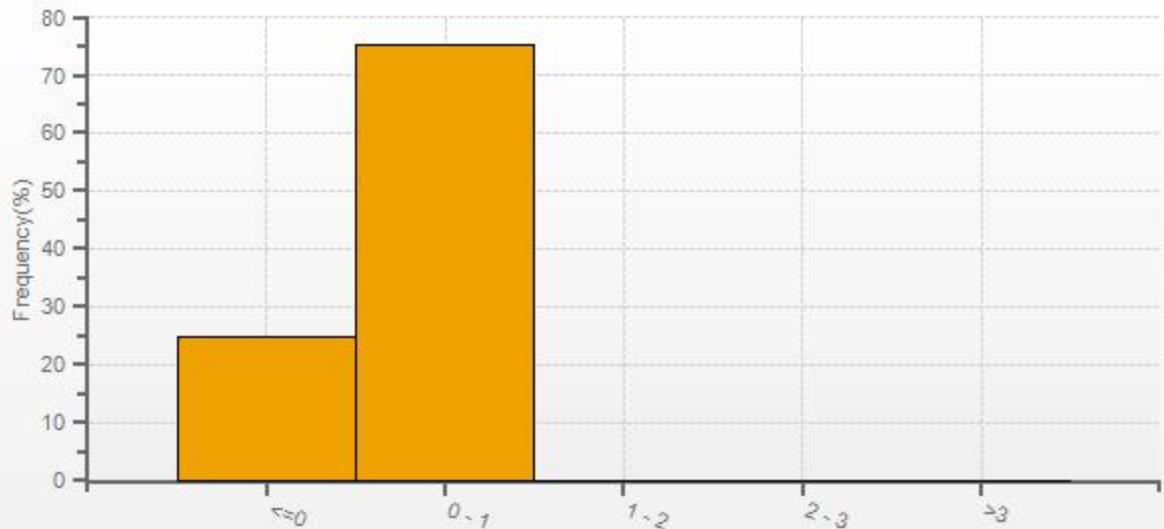
24 HR AVERAGES January 2019



HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S ppb)



## H2S[ppb] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.

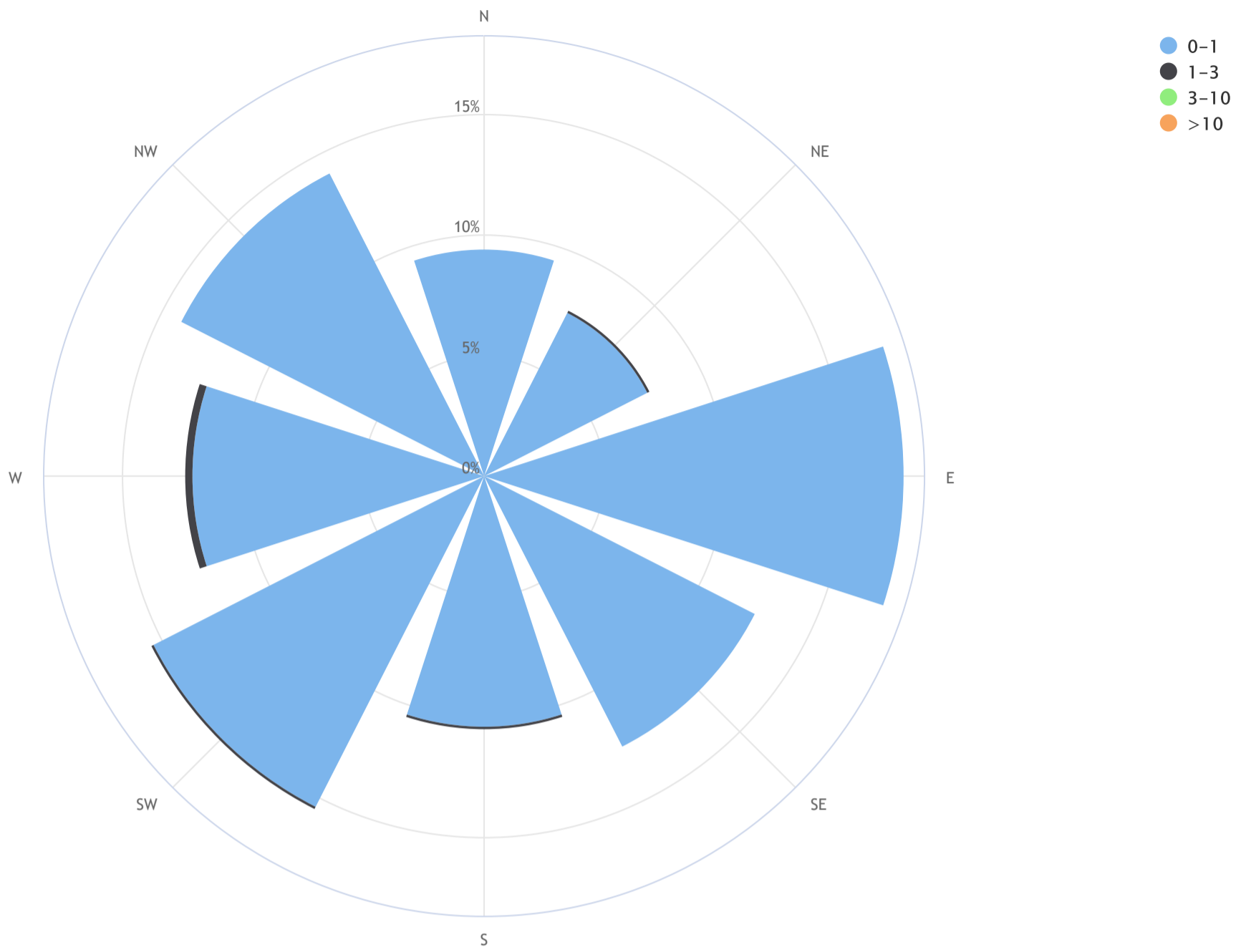


LICA-201901



Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_H2S (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.0\_CALM % = 0.1%



Direction	0-1	1-3	3-10	>10	TOTAL
N	9.4	0.0	0.0	0.0	9.4
NE	7.6	0.1	0.0	0.0	7.7
E	17.4	0.0	0.0	0.0	17.4
SE	12.6	0.0	0.0	0.0	12.6
S	10.4	0.1	0.0	0.0	10.6
SW	15.4	0.1	0.0	0.0	15.6
W	12.1	0.3	0.0	0.0	12.4
NW	14.1	0.0	0.0	0.0	14.1
<b>Summary</b>	<b>99.1</b>	<b>0.7</b>	<b>0.0</b>	<b>0.0</b>	<b>99.9</b>
<b>CALM</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>

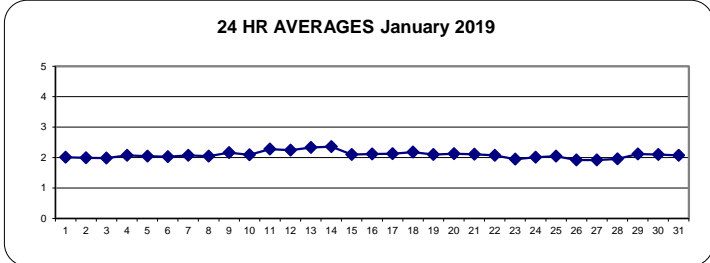
**TOTAL HYDROCARBONS Hourly Averages (THC ppm)**

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	2.04	2.06	2.08	2.09	2.08	2.07	2.08	2.07	2.06	2.02	S	1.96	1.96	1.96	1.96	1.97	1.96	1.96	1.96	1.96	1.96	1.96	1.95	1.98	1.95	2.09	2.01	24	
2	2.00	2.00	2.00	2.01	2.02	2.00	2.00	2.01	2.02	S	2.02	2.00	1.98	1.96	1.97	1.98	1.97	1.97	1.98	1.97	1.97	1.98	1.97	1.99	1.96	1.96	2.02	1.99	24
3	1.97	1.96	1.95	1.95	1.95	1.95	1.94	1.94	S	1.95	1.97	1.96	1.97	2.06	1.97	1.97	1.98	1.99	1.99	2.00	2.00	2.01	2.00	1.99	1.94	2.06	1.98	24	
4	2.00	2.03	2.00	1.99	2.06	1.98	1.96	S	2.06	2.10	2.11	2.06	2.16	2.19	2.12	2.17	2.17	2.13	2.04	1.99	2.08	2.11	2.07	2.01	1.96	2.19	2.07	24	
5	2.01	2.03	2.06	2.03	2.06	2.08	S	2.01	2.10	2.07	2.05	2.03	2.02	2.08	2.08	2.09	2.10	2.09	2.07	2.06	2.04	2.03	2.04	2.02	2.01	2.10	2.05	24	
6	2.00	2.00	2.00	2.01	2.00	S	2.01	2.00	1.99	1.99	2.02	2.03	2.04	2.09	2.04	2.11	2.09	X	X	X	X	X	X	X	1.99	2.11	2.03	17	
7	X	X	X	X	X	X	X	X	X	X	X	S	S	2.08	2.09	2.07	2.07	2.08	2.05	2.06	2.07	2.08	2.07	2.04	2.04	2.09	2.07	13	
8	2.06	2.09	2.08	S	2.02	2.07	2.10	2.04	2.04	2.02	2.02	2.12	2.05	2.04	2.03	2.03	2.03	2.05	2.05	2.05	2.08	2.05	2.06	2.08	2.02	2.12	2.05	24	
9	2.07	2.22	S	2.29	2.22	2.32	2.33	2.33	2.25	2.21	2.22	2.22	2.14	2.10	2.10	2.07	2.07	2.05	2.09	2.09	2.06	2.06	2.04	2.06	2.04	2.33	2.16	24	
10	2.06	S	2.05	2.05	2.04	2.04	2.04	2.06	2.05	2.10	2.11	2.08	2.07	2.05	2.04	2.04	2.25	2.04	2.05	2.12	2.20	2.16	2.16	2.20	2.04	2.25	2.09	24	
11	S	2.21	2.27	2.30	2.26	2.24	2.28	2.27	2.27	2.22	2.16	2.16	2.15	2.16	2.20	2.29	2.33	2.37	2.40	2.43	2.44	2.37	2.34	S	2.15	2.44	2.28	24	
12	2.25	2.21	2.19	2.19	2.19	2.21	2.24	2.24	2.24	2.25	2.26	2.26	2.25	2.25	2.26	2.29	2.32	2.31	2.19	2.01	2.06	2.38	S	2.37	2.01	2.38	2.24	24	
13	2.36	2.34	2.34	2.20	2.19	2.28	2.18	2.20	2.20	2.18	2.35	2.20	2.31	2.37	2.41	2.54	2.62	2.53	2.40	2.36	2.29	S	2.39	2.34	2.18	2.62	2.33	24	
14	2.43	2.53	2.54	2.57	2.54	2.64	2.72	2.65	2.61	2.51	2.45	2.39	2.38	2.35	2.32	2.32	2.28	2.17	2.03	2.00	S	1.98	1.99	1.99	1.98	2.72	2.36	24	
15	2.00	2.01	2.02	2.03	2.06	2.10	2.06	2.10	2.13	2.13	2.07	2.05	2.09	2.10	2.15	2.17	2.14	2.12	2.11	S	2.15	2.18	2.18	2.16	2.00	2.18	2.10	24	
16	2.24	2.19	2.19	2.13	2.13	2.11	2.11	2.13	2.12	2.10	2.12	2.05	2.05	2.07	2.10	2.08	2.08	S	2.09	2.14	2.22	2.12	2.03	2.03	2.04	2.12	2.12	24	
17	2.04	2.04	2.06	2.11	2.12	2.11	2.12	2.11	2.13	2.14	2.11	2.09	2.05	2.13	2.12	2.11	2.08	S	2.18	2.21	2.18	2.26	2.25	2.19	2.04	2.26	2.13	24	
18	2.25	2.18	2.17	2.18	2.17	2.13	2.14	2.17	2.17	2.19	2.19	2.20	2.19	2.21	2.19	2.16	S	2.18	2.19	2.15	2.17	2.16	2.17	2.22	2.13	2.25	2.18	24	
19	2.21	2.17	2.17	2.18	2.23	2.22	2.18	2.15	2.16	2.09	2.06	2.03	2.03	2.02	2.02	S	2.01	2.02	2.04	2.05	2.06	2.08	2.08	2.09	2.01	2.23	2.10	24	
20	2.08	2.07	2.08	2.08	2.08	2.08	2.08	2.06	2.06	2.07	2.09	2.11	2.14	2.15	S	2.17	2.19	2.19	2.21	2.19	2.21	2.21	2.21	2.19	2.06	2.21	2.13	24	
21	2.13	2.15	2.14	2.17	2.16	2.11	2.10	2.13	2.12	2.12	2.11	2.13	2.13	C	C	C	C	C	2.07	2.06	2.07	2.13	2.08	2.03	2.03	2.17	2.11	24	
22	2.04	2.04	2.05	2.07	2.08	2.11	2.11	2.09	2.09	2.09	2.10	2.12	S	2.11	2.09	2.09	2.07	2.06	2.08	2.06	2.08	2.06	2.01	1.98	1.98	2.12	2.07	24	
23	2.00	2.02	1.99	1.97	1.94	1.94	1.96	1.94	1.93	1.93	1.93	S	1.93	1.93	1.94	1.95	1.96	1.93	1.95	1.95	1.94	1.95	1.98	1.97	1.93	2.02	1.95	24	
24	2.01	2.02	2.04	2.05	2.04	2.05	2.05	2.06	2.08	2.09	S	2.07	2.03	2.00	1.97	1.96	1.95	1.95	1.96	1.95	1.95	1.95	1.95	1.96	1.95	2.09	2.01	24	
25	2.02	1.98	1.99	2.03	2.01	1.98	1.97	1.98	1.98	S	1.96	1.96	1.95	1.94	1.95	2.91	2.76	1.91	1.92	1.95	1.98	2.02	2.05	2.00	1.91	2.91	2.05	24	
26	1.97	1.96	1.94	1.93	1.92	1.91	1.90	1.90	S	1.90	1.90	1.90	1.90	1.91	1.90	1.91	1.91	1.90	1.90	1.91	1.93	1.94	1.95	1.96	1.90	1.97	1.92	24	
27	1.93	1.91	1.91	1.90	1.89	1.90	1.90	S	1.91	1.93	1.94	1.94	1.93	1.93	1.93	1.92	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.89	1.94	1.92	24	
28	1.94	1.93	1.93	2.14	2.03	2.07	S	1.96	1.97	1.93	1.92	1.92	1.93	1.93	1.94	1.94	1.95	1.95	1.94	1.95	1.95	1.95	1.95	1.96	1.92	2.14	1.96	24	
29	1.96	1.96	1.97	2.15	2.19	S	2.01	2.03	2.02	2.00	2.03	2.05	2.20	2.22	2.10	2.12	2.16	2.19	2.21	2.24	2.29	2.23	2.21	2.25	1.96	2.29	2.12	24	
30	2.20	2.20	2.19	2.18	S	2.19	2.18	2.12	2.04	2.02	2.05	2.07	2.09	2.09	2.08	2.07	2.09	2.12	2.11	2.05	2.02	2.03	2.05	2.05	2.02	2.20	2.10	24	
31	2.07	2.08	2.09	S	2.12	2.12	2.13	2.16	2.12	2.11	2.10	2.04	2.11	2.15	2.08	2.02	2.02	2.02	2.02	2.01	2.01	2.00	2.00	2.01	2.00	2.16	2.07	24	
HOURLY MAX	2.43	2.53	2.54	2.57	2.54	2.64	2.72	2.65	2.61	2.51	2.45	2.39	2.38	2.37	2.41	2.91	2.76	2.53	2.40	2.43	2.44	2.38	2.39	2.37					
HOURLY AVG	2.08	2.09	2.09	2.11	2.10	2.11	2.10	2.10	2.10	2.09	2.09	2.08	2.08	2.09	2.07	2.12	2.12	2.08	2.07	2.06	2.08	2.08	2.08	2.07					

**STATUS FLAG CODES**

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

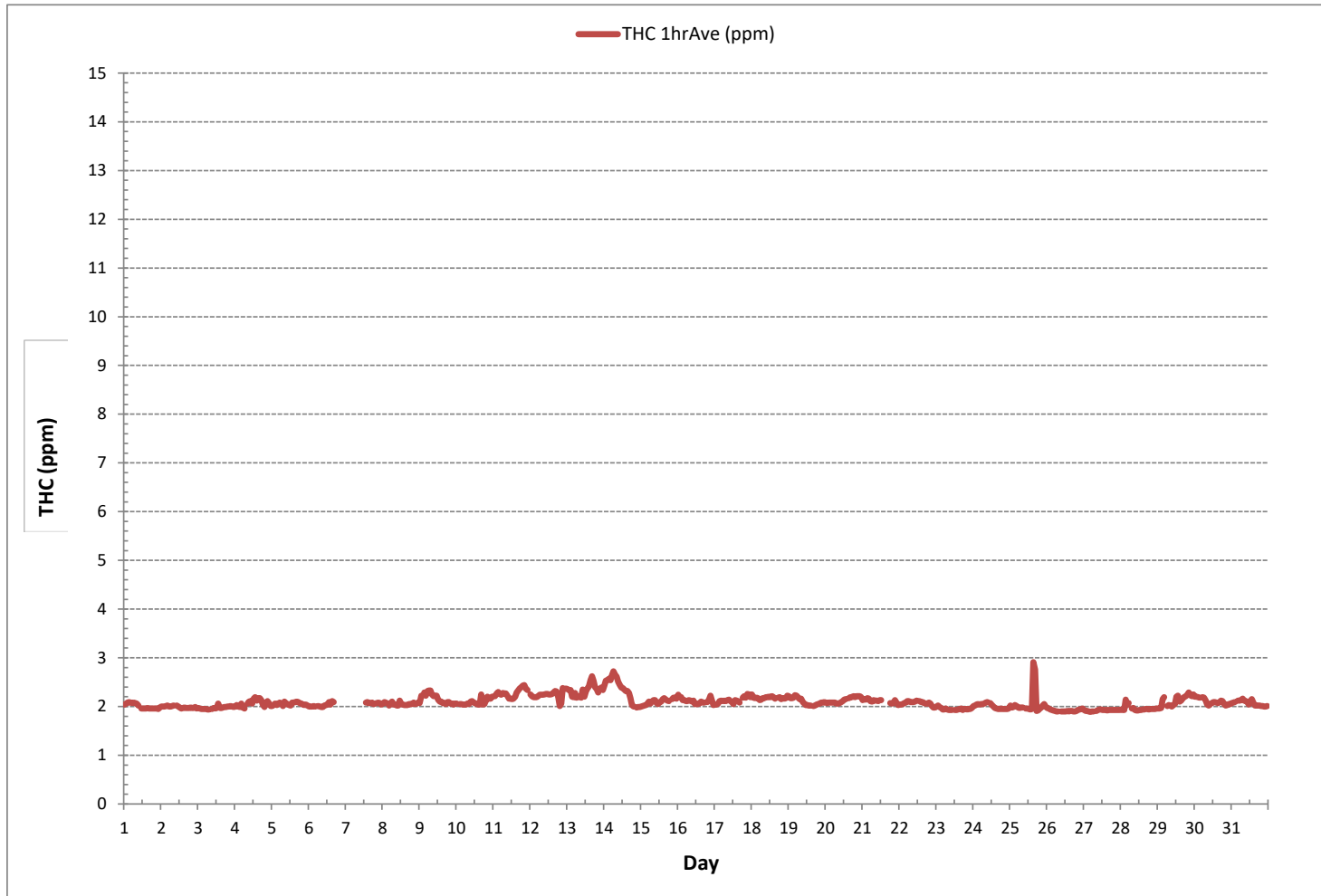
**24 HR AVERAGES January 2019**



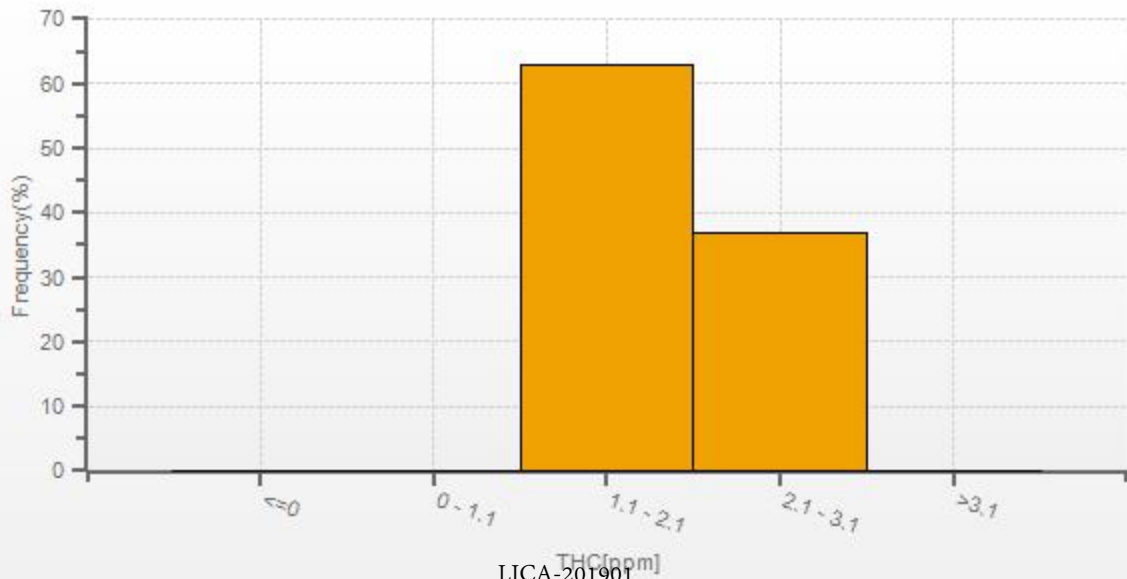
**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	689			
MINIMUM 1-HR AVERAGE:	1.89 ppm	@ HOUR	4	ON DAY 27
MAXIMUM 1-HR AVERAGE:	2.91 ppm	@ HOUR	15	ON DAY 25
MAXIMUM 24-HR AVERAGE:	2.36 ppm			ON DAY 14
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	726 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	97.6 %	
STANDARD DEVIATION:	0.14	MONTHLY AVERAGE:	2.09 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)

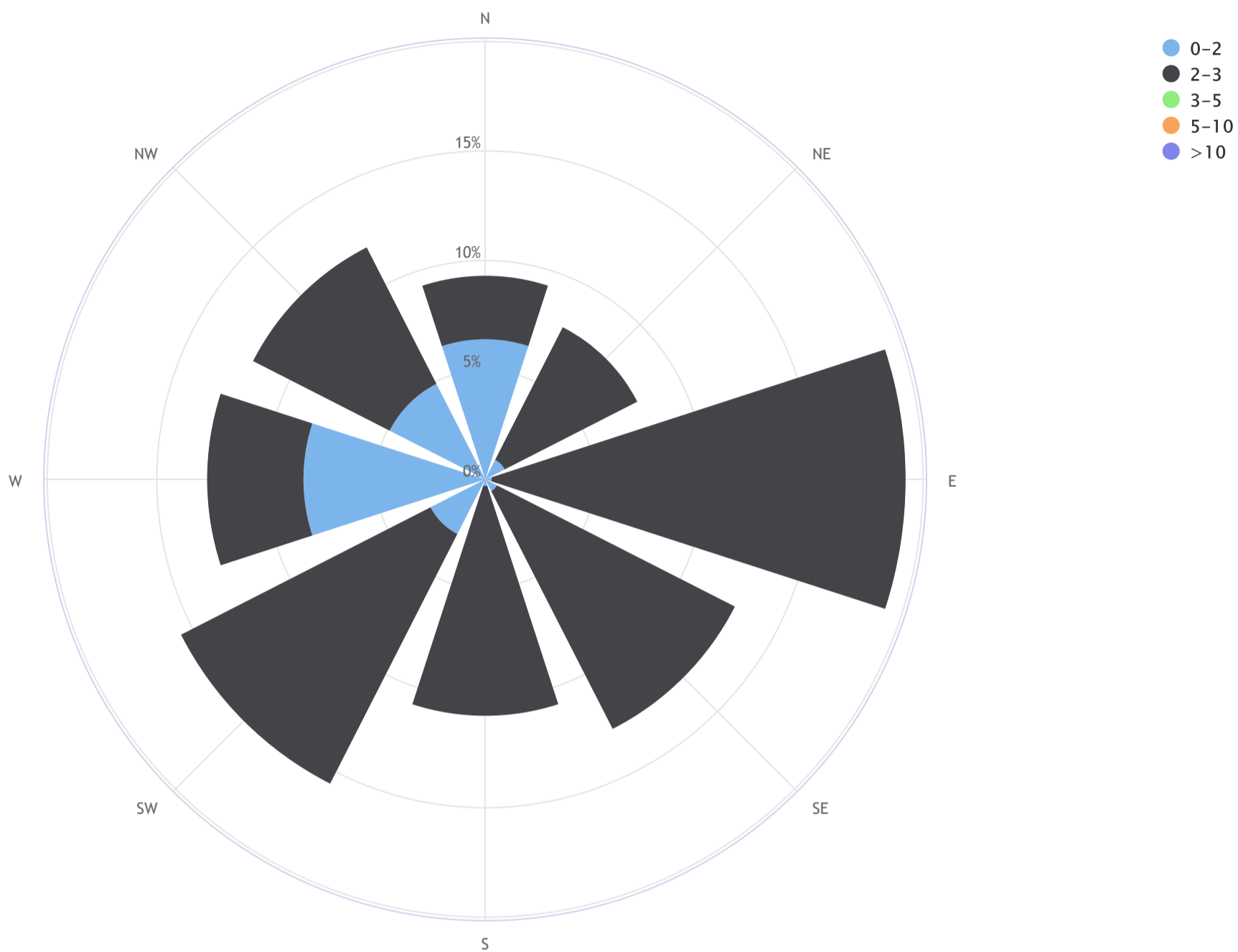


# THC[ppm] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.



Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_THC (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 2.2\_CALM % = 0.1%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	6.4	2.9	0.0	0.0	0.0	9.3
NE	1.0	6.8	0.0	0.0	0.0	7.8
E	0.3	18.9	0.0	0.0	0.0	19.2
SE	0.6	12.2	0.0	0.0	0.0	12.8
S	0.3	10.5	0.0	0.0	0.0	10.7
SW	2.8	12.8	0.0	0.0	0.0	15.5
W	8.3	4.4	0.0	0.0	0.0	12.6
NW	4.9	7.0	0.0	0.0	0.0	11.9
Summary	24.5	75.3	0.0	0.0	0.0	99.9
CALM	0.0	0.2	0.0	0.0	0.0	0.2



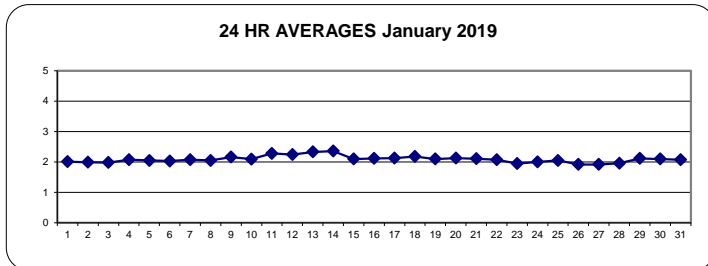
METHANE Hourly Averages (CH<sub>4</sub> ppm)

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	2.04	2.06	2.08	2.09	2.08	2.07	2.08	2.07	2.06	2.02	S	1.96	1.96	1.96	1.96	1.97	1.96	1.96	1.96	1.96	1.96	1.96	1.95	1.98	1.95	2.09	2.01	24
2	2.00	2.00	2.00	2.01	2.02	2.00	2.00	2.01	2.02	S	2.02	2.00	1.98	1.96	1.97	1.98	1.97	1.97	1.97	1.98	1.97	1.99	1.99	1.96	1.96	2.02	1.99	24
3	1.97	1.96	1.95	1.95	1.95	1.95	1.94	1.94	S	1.95	1.97	1.96	1.97	2.06	1.97	1.97	1.98	1.99	1.99	2.00	2.00	2.01	2.00	1.99	1.94	2.06	1.98	24
4	2.00	2.03	2.00	1.99	2.06	1.98	1.96	S	2.06	2.10	2.11	2.06	2.16	2.19	2.12	2.17	2.17	2.13	2.04	1.99	2.08	2.11	2.06	2.01	1.96	2.19	2.07	24
5	2.01	2.03	2.06	2.03	2.06	2.08	S	2.01	2.10	2.07	2.05	2.03	2.02	2.08	2.08	2.09	2.10	2.09	2.07	2.06	2.04	2.03	2.04	2.02	2.01	2.10	2.05	24
6	2.00	2.00	2.00	2.01	2.00	S	2.01	2.00	1.99	1.99	2.02	2.03	2.04	2.09	2.04	2.11	2.09	X	X	X	X	X	X	X	1.99	2.11	2.03	17
7	X	X	X	X	X	X	X	X	X	X	X	S	S	2.08	2.09	2.07	2.07	2.08	2.05	2.06	2.07	2.08	2.07	2.04	2.04	2.09	2.07	13
8	2.06	2.09	2.08	S	2.02	2.07	2.10	2.04	2.04	2.02	2.02	2.12	2.05	2.04	2.03	2.03	2.03	2.05	2.05	2.05	2.08	2.05	2.06	2.08	2.02	2.12	2.05	24
9	2.07	2.22	S	2.29	2.22	2.32	2.33	2.33	2.25	2.21	2.22	2.22	2.14	2.10	2.10	2.07	2.07	2.05	2.09	2.09	2.06	2.06	2.04	2.06	2.04	2.33	2.16	24
10	2.06	S	2.05	2.05	2.04	2.04	2.04	2.06	2.05	2.10	2.11	2.08	2.07	2.05	2.04	2.04	2.25	2.04	2.05	2.12	2.20	2.16	2.16	2.20	2.04	2.25	2.09	24
11	S	2.21	2.27	2.30	2.26	2.24	2.28	2.27	2.27	2.22	2.16	2.16	2.15	2.16	2.20	2.29	2.33	2.37	2.40	2.43	2.41	2.36	2.34	S	2.15	2.43	2.28	24
12	2.25	2.21	2.19	2.19	2.19	2.21	2.24	2.24	2.24	2.25	2.26	2.26	2.25	2.25	2.26	2.29	2.32	2.31	2.19	2.01	2.06	2.38	S	2.37	2.01	2.38	2.24	24
13	2.36	2.34	2.34	2.20	2.19	2.28	2.18	2.20	2.20	2.18	2.35	2.20	2.31	2.27	2.41	2.54	2.62	2.53	2.40	2.36	2.29	S	2.39	2.34	2.18	2.62	2.33	24
14	2.43	2.53	2.54	2.57	2.54	2.64	2.72	2.65	2.61	2.51	2.45	2.39	2.38	2.35	2.32	2.28	2.17	2.03	2.00	S	1.98	1.99	1.99	1.98	2.72	2.36	24	
15	2.00	2.01	2.02	2.03	2.06	2.10	2.06	2.10	2.13	2.13	2.07	2.05	2.09	2.10	2.15	2.17	2.14	2.12	2.11	S	2.15	2.18	2.18	2.16	2.00	2.18	2.10	24
16	2.24	2.19	2.19	2.13	2.13	2.11	2.11	2.13	2.12	2.10	2.12	2.05	2.05	2.07	2.10	2.08	2.08	S	2.09	2.14	2.22	2.12	2.03	2.03	2.24	2.12	24	
17	2.04	2.04	2.06	2.11	2.12	2.11	2.12	2.11	2.13	2.14	2.11	2.09	2.05	2.13	2.12	2.11	2.08	S	2.18	2.21	2.18	2.26	2.25	2.19	2.04	2.26	2.13	24
18	2.25	2.18	2.17	2.18	2.17	2.13	2.14	2.17	2.17	2.19	2.19	2.20	2.19	2.21	2.19	2.16	S	2.18	2.19	2.15	2.17	2.16	2.17	2.22	2.13	2.25	2.18	24
19	2.21	2.17	2.17	2.18	2.23	2.22	2.18	2.15	2.16	2.09	2.06	2.03	2.03	2.02	2.02	S	2.01	2.02	2.04	2.05	2.06	2.08	2.08	2.09	2.01	2.23	2.10	24
20	2.08	2.07	2.08	2.08	2.08	2.08	2.06	2.06	2.07	2.09	2.11	2.14	2.15	S	2.17	2.19	2.19	2.21	2.19	2.21	2.21	2.21	2.21	2.19	2.06	2.21	2.13	24
21	2.13	2.15	2.14	2.17	2.16	2.11	2.10	2.13	2.12	2.12	2.11	2.13	2.13	C	C	C	C	C	2.07	2.06	2.07	2.13	2.08	2.03	2.03	2.17	2.11	24
22	2.04	2.04	2.05	2.07	2.08	2.11	2.11	2.09	2.09	2.09	2.10	2.12	S	2.11	2.09	2.09	2.07	2.06	2.08	2.06	2.01	1.97	1.98	1.97	2.12	2.07	24	
23	1.99	2.02	1.98	1.97	1.94	1.94	1.96	1.94	1.93	1.93	1.93	S	1.93	1.93	1.93	1.95	1.95	1.93	1.95	1.95	1.94	1.94	1.95	1.97	1.93	2.02	1.95	24
24	2.01	2.01	2.04	2.04	2.04	2.05	2.05	2.06	2.08	2.09	S	2.07	2.03	2.00	1.97	1.96	1.95	1.95	1.96	1.95	1.95	1.95	1.96	1.95	1.95	2.09	2.00	24
25	2.02	1.98	1.99	2.03	2.01	1.98	1.97	1.98	1.98	S	1.96	1.96	1.95	1.94	1.95	2.89	2.75	1.91	1.92	1.95	1.98	2.02	2.05	2.00	1.91	2.89	2.05	24
26	1.97	1.96	1.94	1.93	1.92	1.91	1.90	1.90	S	1.90	1.90	1.90	1.90	1.91	1.90	1.91	1.91	1.90	1.90	1.91	1.93	1.94	1.95	1.96	1.90	1.97	1.92	24
27	1.93	1.91	1.91	1.90	1.89	1.90	S	1.91	1.93	1.94	1.94	1.93	1.93	1.93	1.93	1.92	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.89	1.94	1.92	24
28	1.94	1.93	1.93	2.14	2.03	2.07	S	1.96	1.97	1.93	1.92	1.92	1.93	1.93	1.94	1.94	1.95	1.95	1.94	1.95	1.95	1.95	1.95	1.96	1.92	2.14	1.96	24
29	1.96	1.96	1.97	2.15	2.19	S	2.01	2.03	2.02	2.00	2.02	2.05	2.20	2.22	2.10	2.08	2.16	2.19	2.24	2.29	2.23	2.21	2.25	1.96	2.29	2.12	24	
30	2.20	2.20	2.19	2.18	S	2.19	2.18	2.12	2.04	2.02	2.05	2.07	2.09	2.09	2.08	2.07	2.09	2.12	2.11	2.05	2.02	2.03	2.05	2.05	2.02	2.20	2.10	24
31	2.07	2.08	2.09	S	2.12	2.12	2.13	2.16	2.12	2.11	2.10	2.04	2.11	2.15	2.08	2.02	2.02	2.02	2.02	2.01	2.01	2.00	2.00	2.01	2.00	2.16	2.07	24
HOURLY MAX	2.43	2.53	2.54	2.57	2.54	2.64	2.72	2.65	2.61	2.51	2.45	2.39	2.38	2.37	2.41	2.89	2.75	2.53	2.40	2.43	2.41	2.38	2.39	2.37				
HOURLY AVG	2.08	2.09	2.09	2.11	2.10	2.11	2.10	2.10	2.10	2.09	2.09	2.08	2.08	2.09	2.07	2.12	2.12	2.08	2.07	2.06	2.08	2.08	2.08	2.07				

STATUS FLAG CODES

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

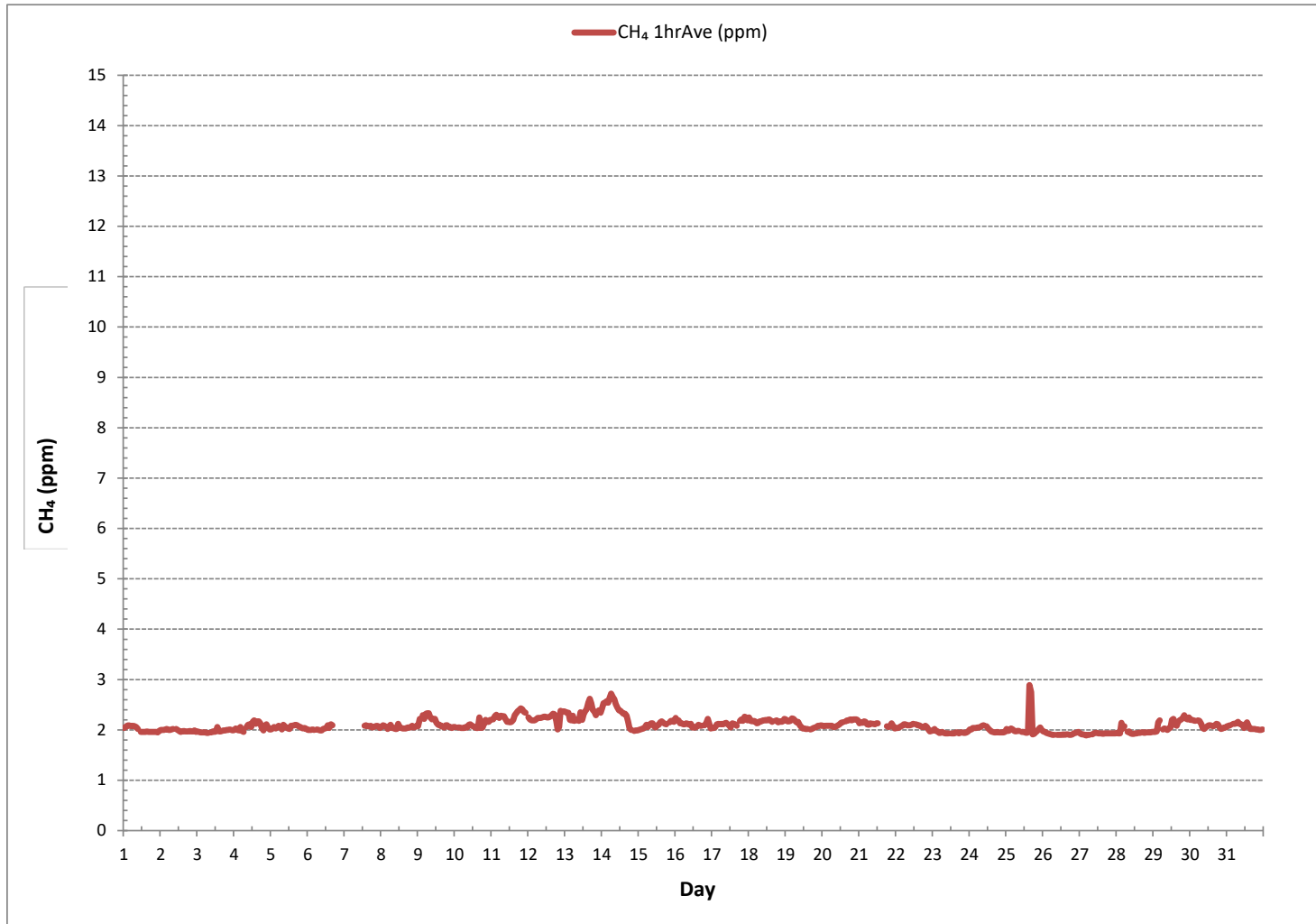
24 HR AVERAGES January 2019



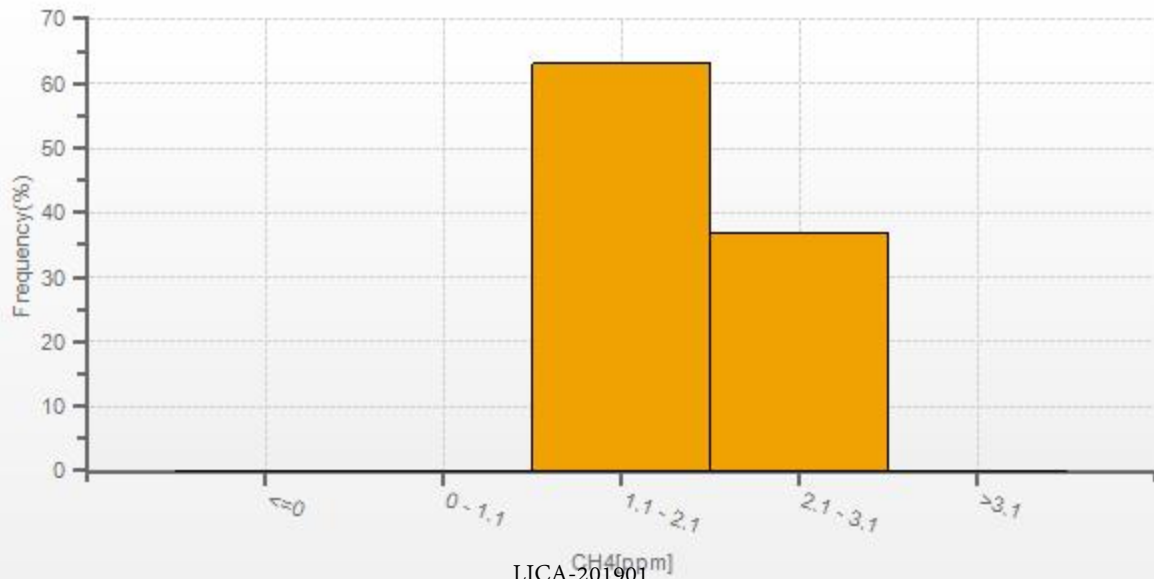
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	689			
MINIMUM 1-HR AVERAGE:	1.89 ppm	@ HOUR	4	ON DAY 27
MAXIMUM 1-HR AVERAGE:	2.89 ppm	@ HOUR	15	ON DAY 25
MAXIMUM 24-HR AVERAGE:	2.36 ppm			ON DAY 14
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	726 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	97.6 %	
STANDARD DEVIATION:	0.14	MONTHLY AVERAGE:	2.09 ppm	

**METHANE Hourly Averages (CH<sub>4</sub> ppm)**



# CH4[ppm] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.

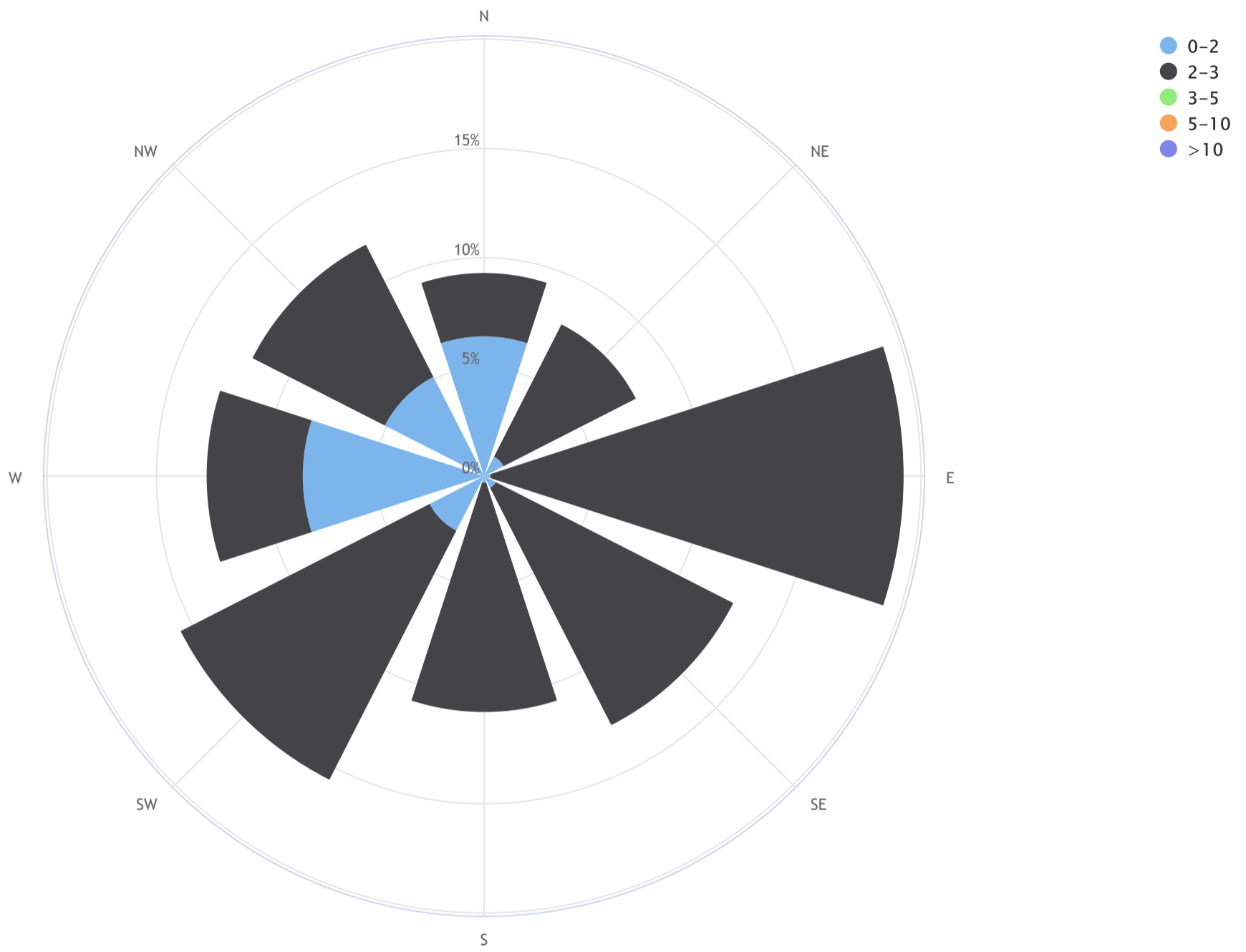


LICA-201901



Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_CH4 (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 2.2\_CALM % = 0.1%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	6.4	2.9	0.0	0.0	0.0	9.3
NE	1.0	6.8	0.0	0.0	0.0	7.8
E	0.3	18.9	0.0	0.0	0.0	19.2
SE	0.6	12.2	0.0	0.0	0.0	12.8
S	0.3	10.5	0.0	0.0	0.0	10.7
SW	2.8	12.8	0.0	0.0	0.0	15.5
W	8.3	4.4	0.0	0.0	0.0	12.6
NW	5.1	6.8	0.0	0.0	0.0	11.9
<b>Summary</b>	<b>24.7</b>	<b>75.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>99.9</b>
<b>CALM</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.2</b>



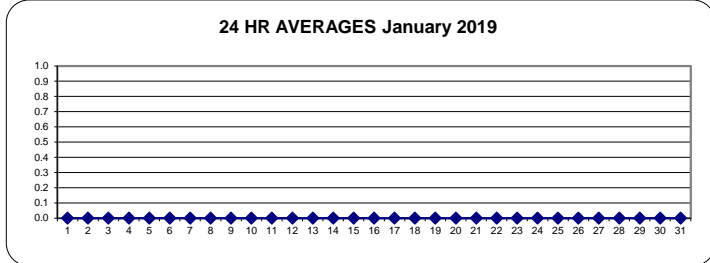
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	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	24
2	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	0.00	24
3	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	0.00	0.00	24
4	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	0.00	0.00	0.00	24
5	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	0.00	0.00	0.00	24
6	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	X	X	X	X	X	X	X	0.00	0.00	0.00	17
7	X	X	X	X	X	X	X	X	X	X	X	S	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	13
8	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
9	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
10	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
11	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	0.02	0.01	0.00	S	0.00	0.02	0.00	24
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	24
13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	24
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	24
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
19	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	0.00	24
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
21	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	C	C	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	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	24
23	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
24	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	0.00	24
25	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	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	24
26	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	0.00	0.00	0.00	24
27	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	0.00	0.00	0.00	0.00	24
28	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
29	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	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	24
30	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
31	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
HOURLY MAX	0.01	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	0.04	0.01	0.00	0.00	0.00	0.02	0.01	0.00	0.00				
HOURLY AVG	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				

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

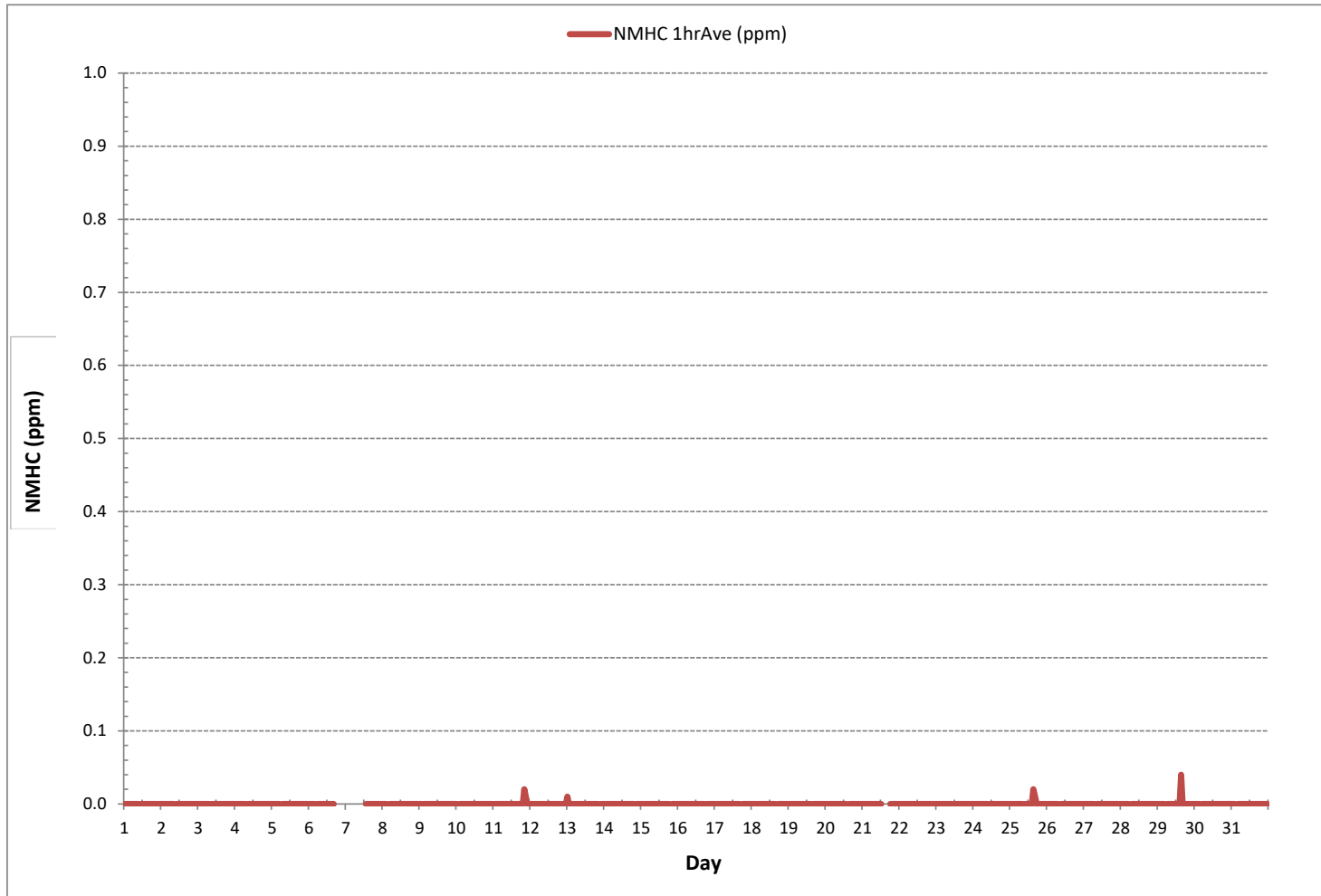
24 HR AVERAGES January 2019



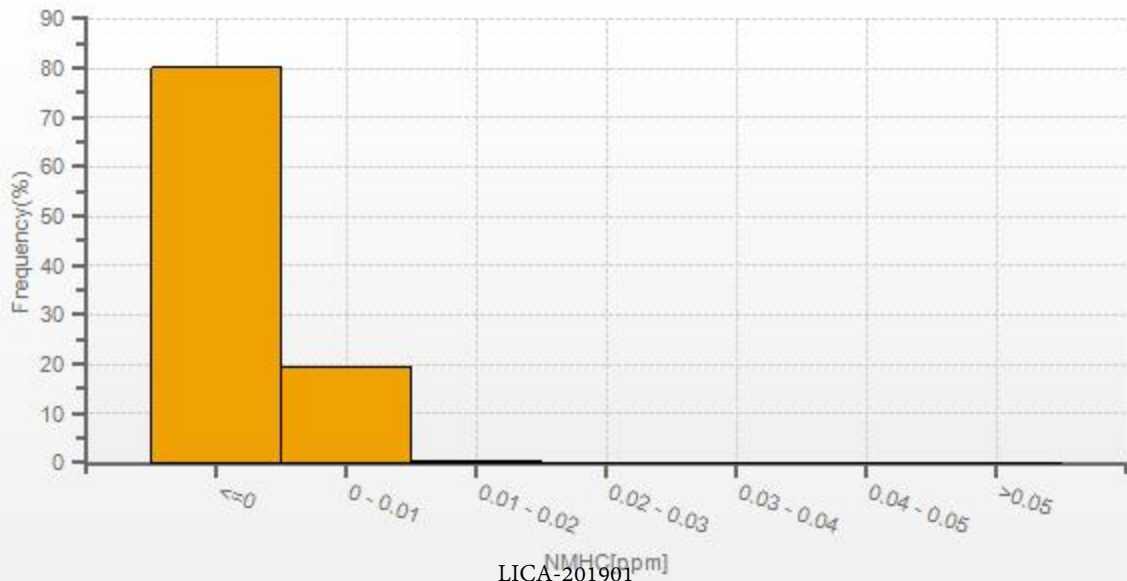
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	6				
MINIMUM 1-HR AVERAGE:	0.00	ppm @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	0.04	ppm @ HOUR	15	ON DAY	29
MAXIMUM 24-HR AVERAGE:	0.00	ppm		ON DAY	1
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	726	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	97.6	%
STANDARD DEVIATION:	0.00		MONTHLY AVERAGE:	0.00	ppm

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

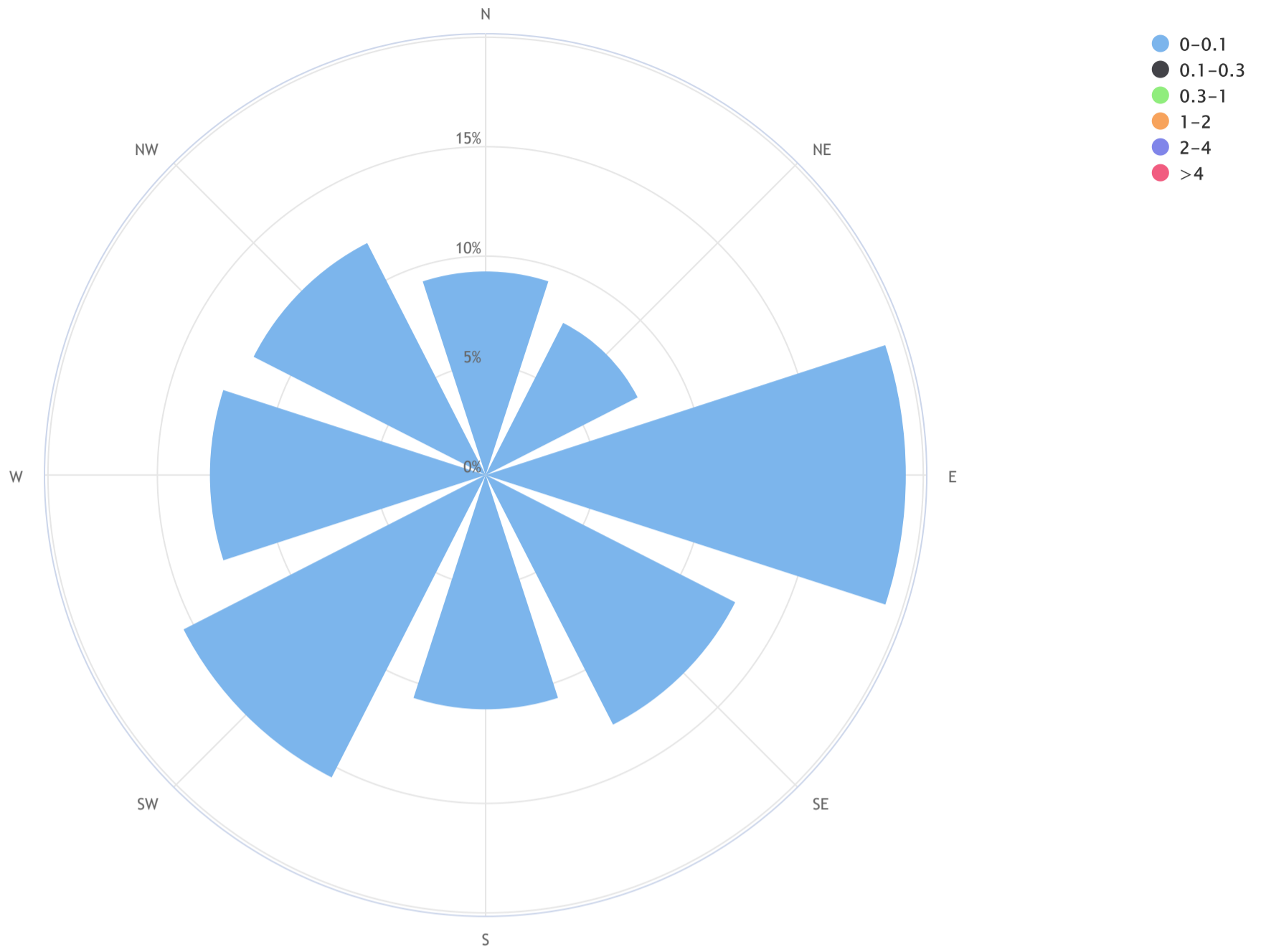


# NMHC[ppm] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.



Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_NMHC (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.0\_CALM % = 0.1%



Direction	0-0.1	0.1-0.3	0.3-1	1-2	2-4	>4	TOTAL
N	9.3	0.0	0.0	0.0	0.0	0.0	9.3
NE	7.8	0.0	0.0	0.0	0.0	0.0	7.8
E	19.2	0.0	0.0	0.0	0.0	0.0	19.2
SE	12.8	0.0	0.0	0.0	0.0	0.0	12.8
S	10.7	0.0	0.0	0.0	0.0	0.0	10.7
SW	15.5	0.0	0.0	0.0	0.0	0.0	15.5
W	12.6	0.0	0.0	0.0	0.0	0.0	12.6
NW	11.9	0.0	0.0	0.0	0.0	0.0	11.9
Summary	99.9	0.0	0.0	0.0	0.0	0.0	99.9
CALM	0.2	0.0	0.0	0.0	0.0	0.0	0.2



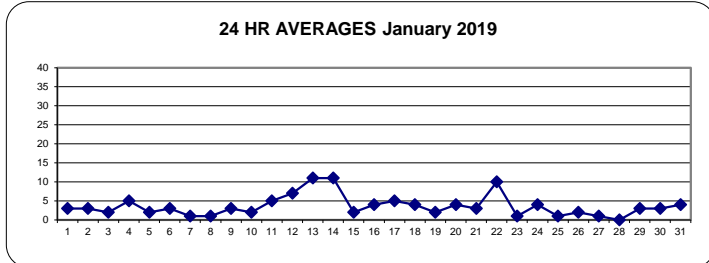
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

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	3	4	4	4	4	4	5	5	4	S	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	5	3	24
2	1	2	2	3	4	5	5	4	7	S	8	5	4	3	3	4	3	2	2	2	2	2	4	2	1	8	3	24	
3	2	1	1	1	1	1	1	1	S	2	2	2	1	1	1	1	2	2	3	3	2	2	2	2	1	3	2	24	
4	2	2	2	2	2	1	1	S	2	4	4	6	8	9	6	9	11	7	4	3	6	7	6	3	1	11	5	24	
5	2	4	4	4	4	4	S	1	1	1	1	1	2	3	3	3	3	2	2	2	2	2	2	2	1	4	2	24	
6	2	2	2	2	2	S	2	2	2	2	2	3	3	3	3	7	7	4	3	3	2	2	1	1	1	7	3	24	
7	1	1	2	3	S	1	1	1	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	0	3	1	24	
8	1	0	0	S	1	1	1	1	1	1	1	1	1	1	1	2	3	2	2	2	1	2	1	2	0	3	1	24	
9	2	3	S	5	4	4	4	4	3	3	3	3	3	2	2	2	2	2	1	2	1	1	1	1	1	5	3	24	
10	1	S	1	1	1	1	1	1	1	2	1	1	1	1	1	2	2	2	2	2	2	2	3	3	1	3	2	24	
11	S	3	4	4	3	3	4	4	4	4	3	4	4	5	5	6	6	6	7	7	6	5	5	S	3	7	5	24	
12	4	4	3	4	4	4	4	4	4	4	5	5	5	6	7	9	11	13	14	10	4	5	13	S	14	3	14	7	24
13	15	16	16	11	10	12	7	9	8	7	9	7	11	15	14	17	20	17	11	8	7	S	5	5	5	5	20	11	24
14	5	7	7	10	9	9	9	9	9	17	18	19	22	23	23	23	20	12	4	3	S	2	2	1	1	23	11	24	
15	1	1	1	1	2	3	3	2	3	4	2	1	2	2	2	2	3	3	3	S	3	3	3	4	1	4	2	24	
16	4	4	3	2	3	3	2	3	4	3	2	2	2	2	3	4	4	S	6	8	11	7	3	2	11	4	24		
17	2	2	3	5	6	6	7	9	9	6	4	2	2	2	3	12	5	S	5	5	4	5	5	2	12	5	24		
18	6	7	5	5	4	3	3	3	3	3	3	4	4	4	4	S	4	4	4	4	3	3	3	3	3	7	4	24	
19	2	3	2	2	3	2	2	2	2	2	1	1	1	1	S	1	1	1	1	1	1	2	2	1	3	2	24		
20	2	2	2	2	1	2	2	2	2	3	3	4	5	S	6	7	8	8	7	7	7	9	9	1	9	4	24		
21	7	6	4	5	4	3	3	2	1	1	1	1	1	C	C	C	C	C	C	C	C	3	2	2	1	7	3	24	
22	2	3	4	6	8	11	12	10	8	9	11	12	S	13	16	19	19	16	15	14	11	6	3	3	2	19	10	24	
23	2	3	1	1	1	1	3	2	1	1	1	S	1	1	1	0	0	0	1	1	1	1	1	0	3	1	24		
24	2	1	2	4	7	6	6	6	7	7	S	10	7	4	3	2	2	1	1	1	1	1	1	1	1	10	4	24	
25	1	1	1	1	1	1	1	1	1	S	2	2	2	2	1	1	1	1	2	1	2	3	2	2	1	3	1	24	
26	2	2	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	2	6	6	6	1	6	2	24	
27	3	2	1	1	1	1	1	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	24	
28	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	24	
29	1	1	1	1	2	S	2	2	3	2	3	3	5	5	3	3	4	5	6	6	6	5	5	1	6	3	24		
30	4	4	4	4	S	4	3	3	2	2	2	3	4	4	4	4	4	4	4	3	3	3	3	3	2	4	3	24	
31	3	3	3	S	4	5	6	7	7	8	8	6	5	5	3	2	2	2	2	3	4	4	4	6	2	8	4	24	
HOURLY MAX	15	16	16	11	10	12	12	10	9	17	18	19	22	23	23	23	20	17	15	14	11	13	9	14					
HOURLY AVG	3	3	3	3	3	4	3	4	3	4	4	4	4	4	4	5	5	4	4	3	3	4	3	3					

STATUS FLAG CODES

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

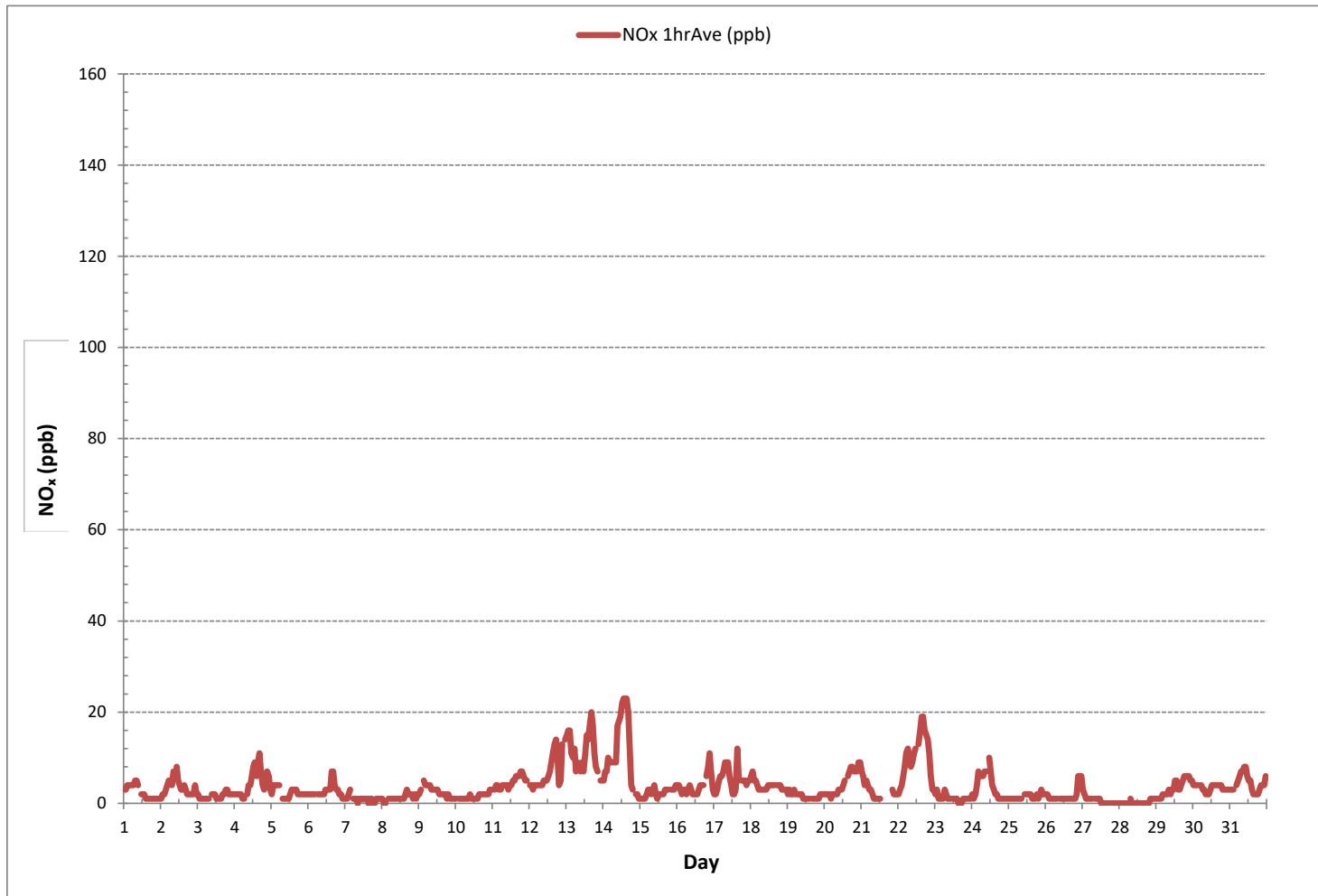
24 HR AVERAGES January 2019



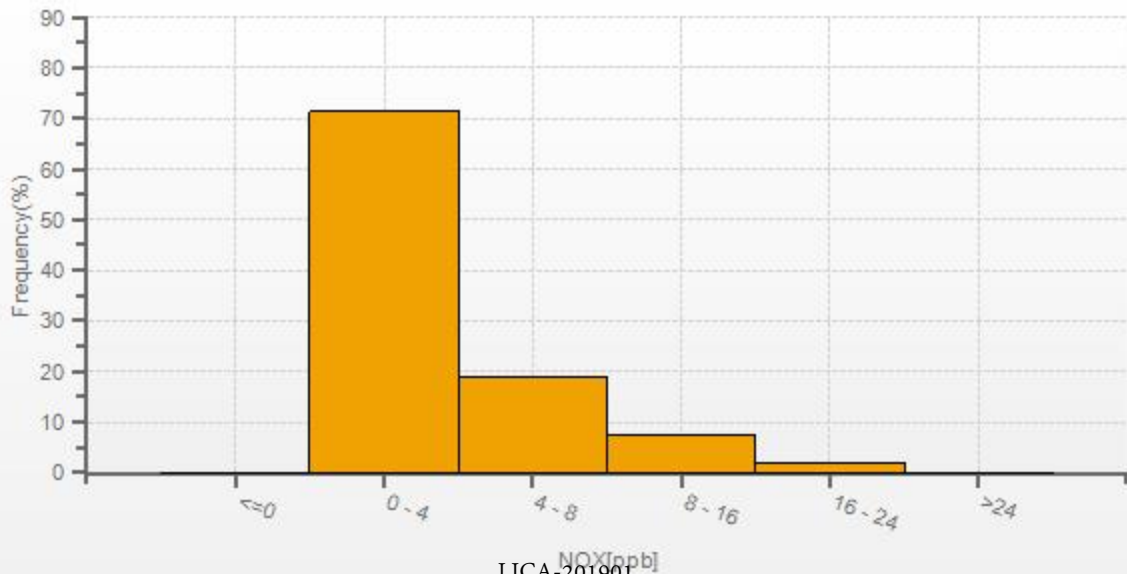
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	667			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	8	ON DAY
MAXIMUM 1-HR AVERAGE:	23	ppb @ HOUR	13	ON DAY
MAXIMUM 24-HR AVERAGE:	11	ppb		ON DAY
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	744
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0
STANDARD DEVIATION:	4		MONTHLY AVERAGE:	4
				ppb

**OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)**



# NOX[ppb] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.

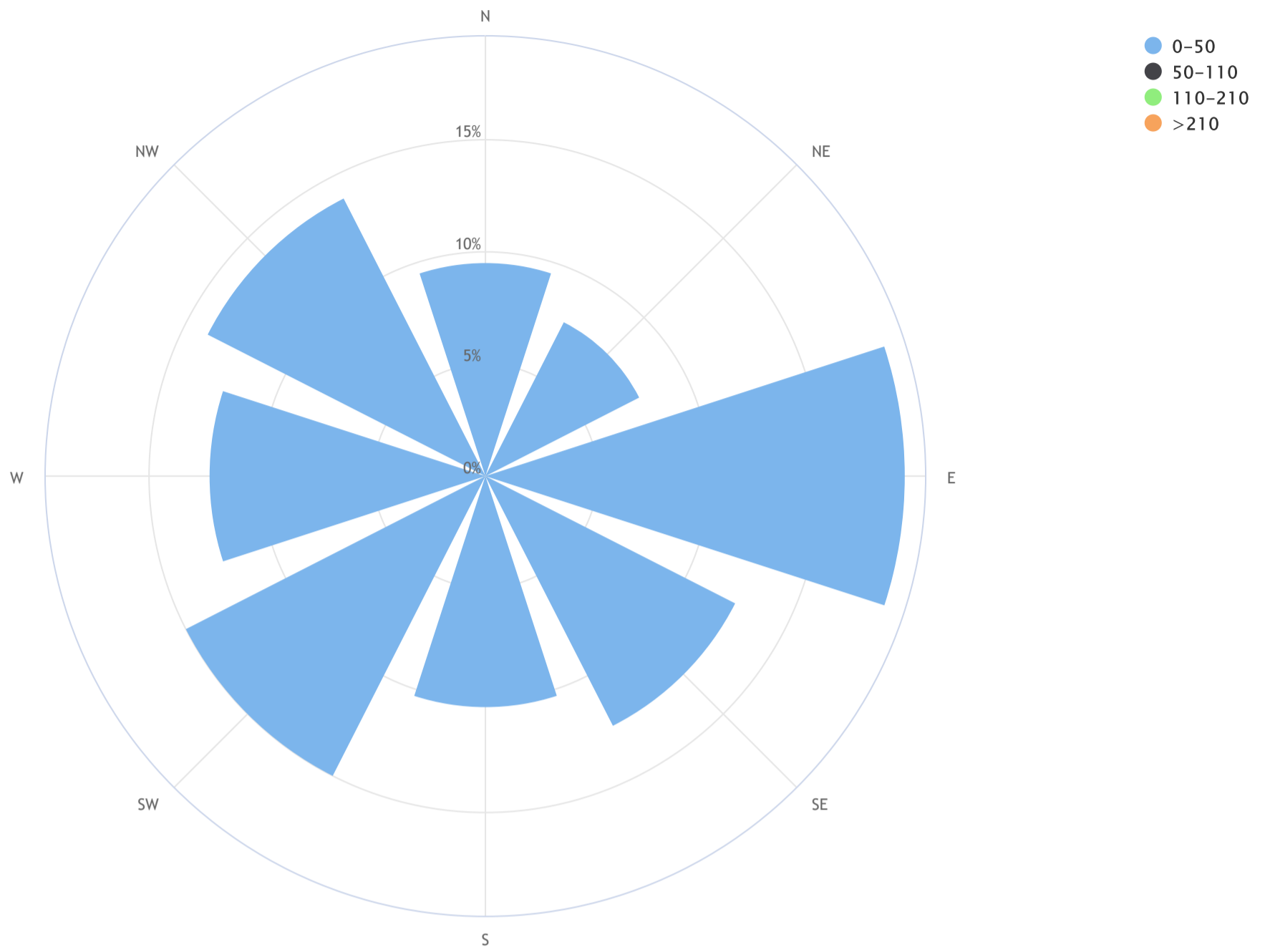


LICA-201901  
Page 208 of 350



Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_NO<sub>x</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 9.0\_CALM % = 0.1%



Direction	0-50	50-110	110-210	>210	TOTAL
N	9.5	0.0	0.0	0.0	9.5
NE	7.7	0.0	0.0	0.0	7.7
E	18.7	0.0	0.0	0.0	18.7
SE	12.5	0.0	0.0	0.0	12.5
S	10.3	0.0	0.0	0.0	10.3
SW	15.0	0.0	0.0	0.0	15.0
W	12.3	0.0	0.0	0.0	12.3
NW	13.9	0.0	0.0	0.0	13.9
Summary	99.9	0.0	0.0	0.0	99.9
CALM	0.1	0.0	0.0	0.0	0.1

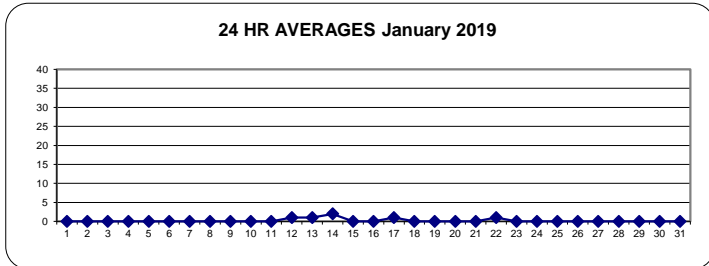
**NITRIC OXIDE Hourly Averages (NO ppb)**

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	S	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	S	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
3	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
4	0	0	0	0	0	0	0	0	S	0	0	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
5	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	24	
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
7	0	0	0	0	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	24	
8	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	
9	0	0	S	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
10	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	
11	S	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24	
12	0	0	0	0	0	0	0	0	0	1	1	1	2	2	2	2	1	0	0	0	0	0	0	S	0	0	0	0	2	1	24	
13	0	0	0	0	0	0	0	0	0	0	1	1	3	4	3	3	2	0	0	0	0	0	S	0	0	0	0	0	4	1	24	
14	0	0	0	0	0	0	0	0	0	0	3	5	7	8	9	7	5	1	0	0	0	0	S	0	0	0	0	0	9	2	24	
15	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	1	0	24	
16	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	24	
17	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	6	0	0	S	0	0	0	0	0	0	0	0	0	6	1	24	
18	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
20	0	0	0	0	0	0	0	0	0	0	1	1	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	24	
22	0	0	0	0	0	0	0	0	0	1	2	3	S	4	4	4	1	0	0	0	0	0	0	0	0	0	0	0	4	1	24	
23	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
24	0	0	0	0	0	0	0	0	0	1	S	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24	
25	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	24	
26	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	24	
27	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	24	
28	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	24	
29	0	0	0	0	0	S	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
30	0	0	0	0	S	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
31	0	0	0	S	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
HOURLY MAX	0	0	0	0	0	0	0	0	0	3	5	7	8	9	7	6	2	0	0	0	0	0	0	2	0	0	0					
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	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

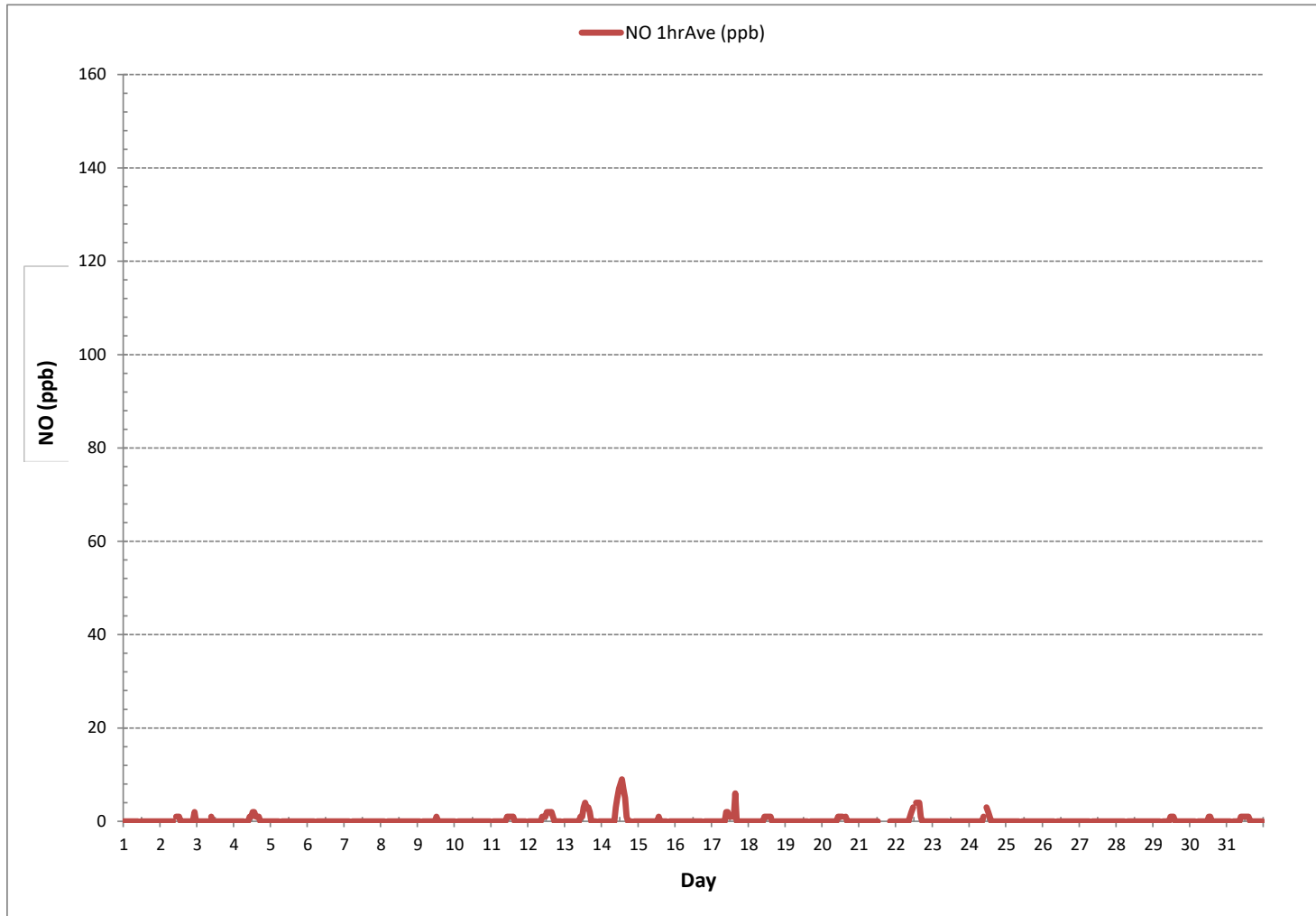
**24 HR AVERAGES January 2019**



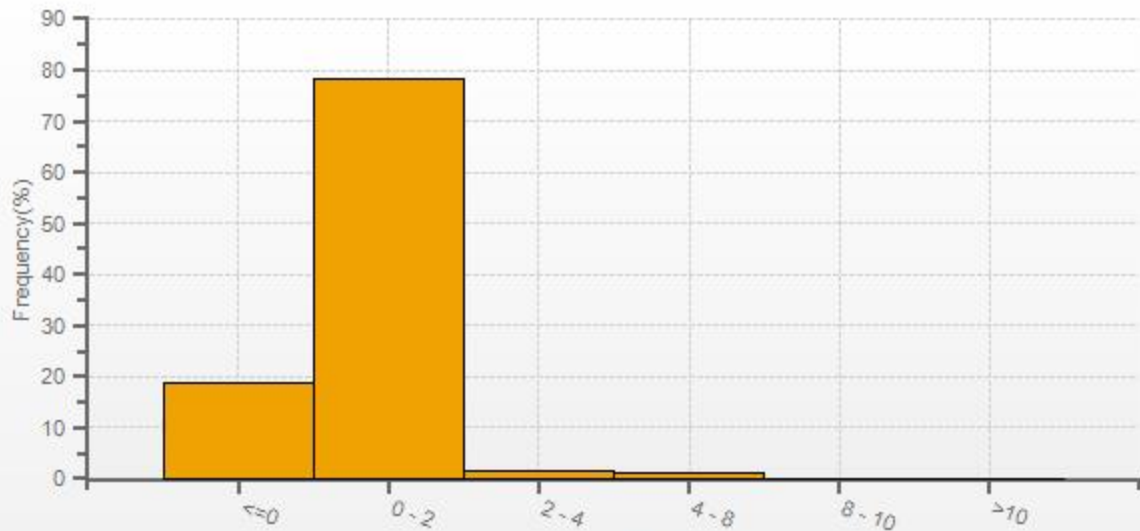
**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	81			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	9	ppb @ HOUR	13	ON DAY 14
MAXIMUM 24-HR AVERAGE:	2	ppb		ON DAY 14
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	0 ppb

**NITRIC OXIDE Hourly Averages (NO ppb)**



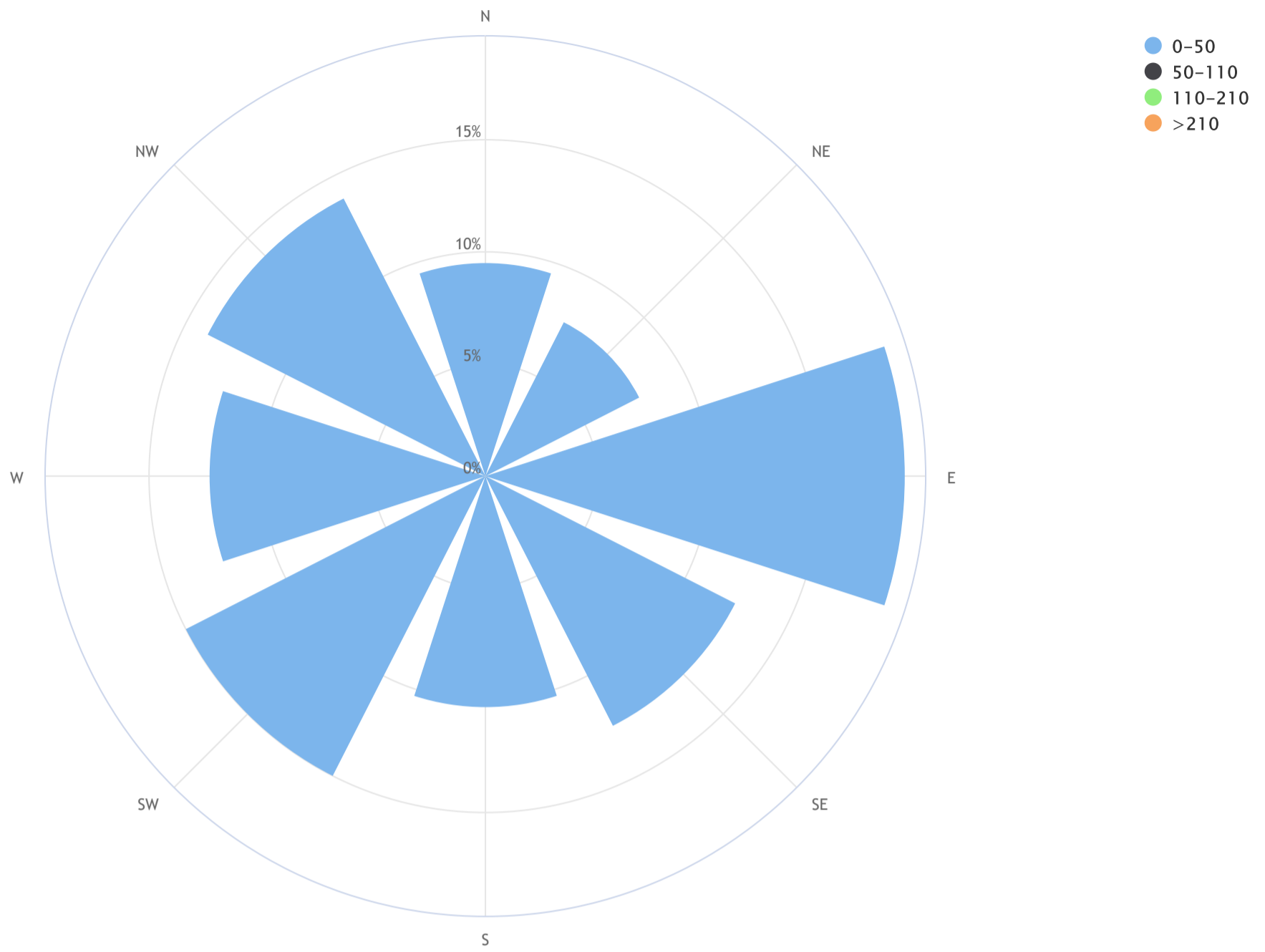
NO[ppb] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.



LICA-201901  
Page 212 of 350

Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_NO (ppb)\_19/01

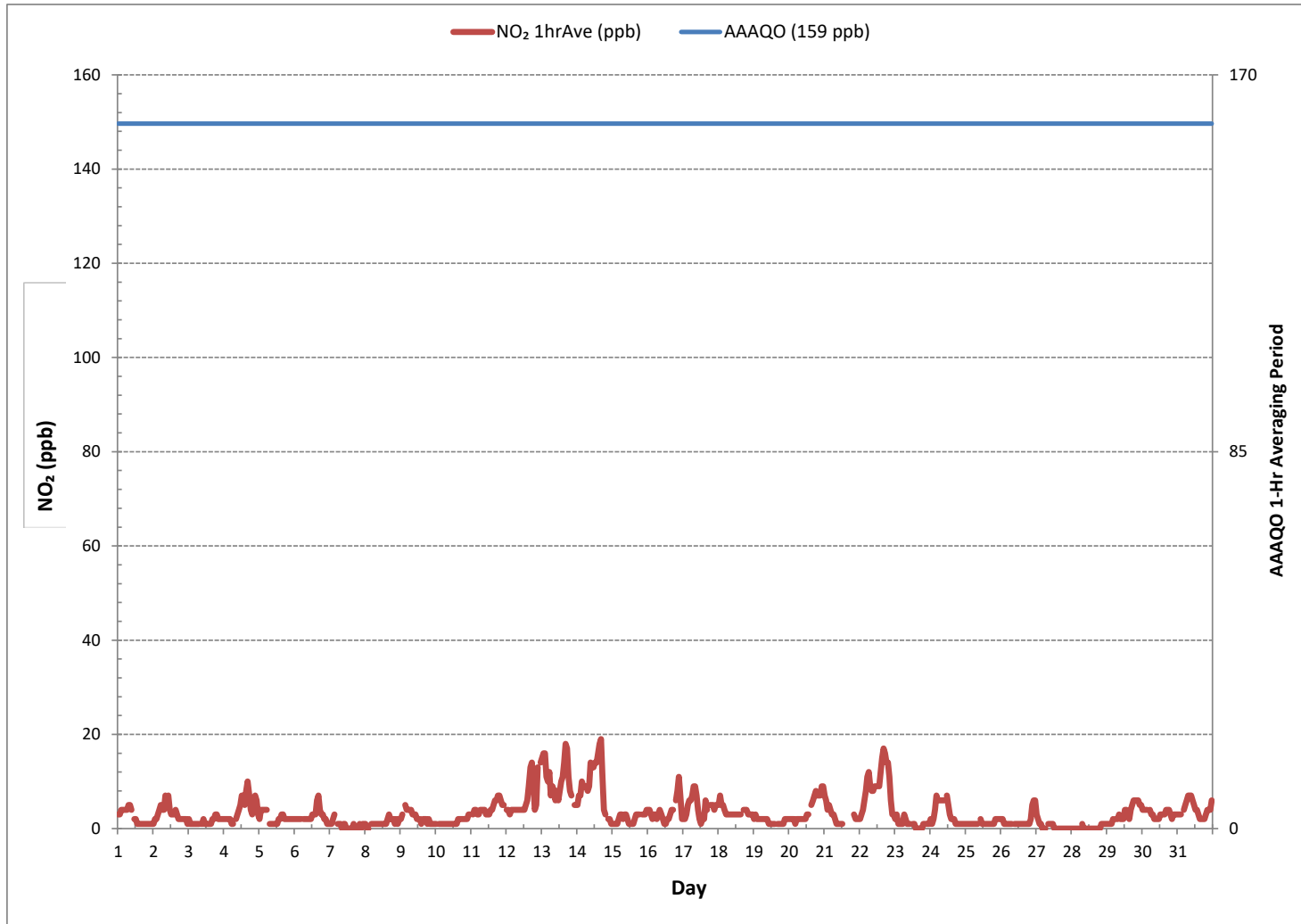
Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.0\_CALM % = 0.1%



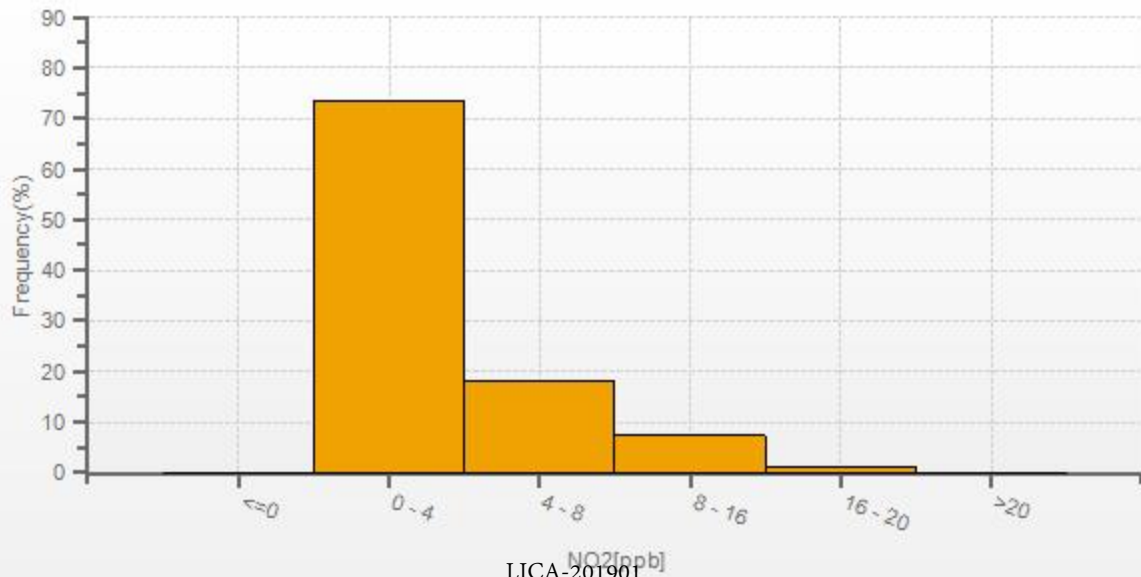
Direction	0-50	50-110	110-210	>210	TOTAL
N	9.5	0.0	0.0	0.0	9.5
NE	7.7	0.0	0.0	0.0	7.7
E	18.7	0.0	0.0	0.0	18.7
SE	12.5	0.0	0.0	0.0	12.5
S	10.3	0.0	0.0	0.0	10.3
SW	15.0	0.0	0.0	0.0	15.0
W	12.3	0.0	0.0	0.0	12.3
NW	13.9	0.0	0.0	0.0	13.9
Summary	99.9	0.0	0.0	0.0	99.9
CALM	0.1	0.0	0.0	0.0	0.1



NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)



# NO2[ppb] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.

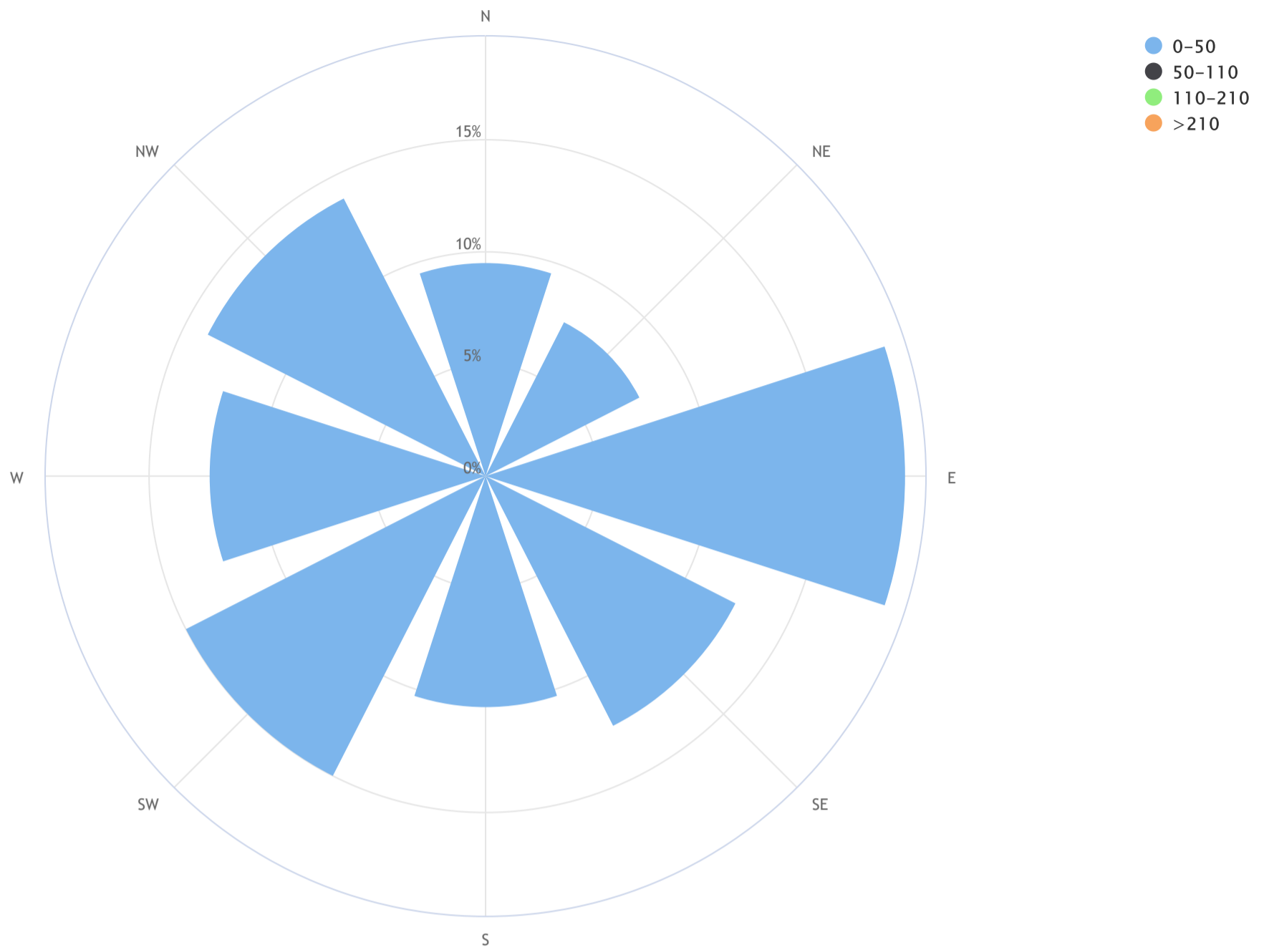


LICA-201901  
Page 216 of 350



Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_NO<sub>2</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 9.0\_CALM % = 0.1%



Direction	0-50	50-110	110-210	>210	TOTAL
N	9.5	0.0	0.0	0.0	9.5
NE	7.7	0.0	0.0	0.0	7.7
E	18.7	0.0	0.0	0.0	18.7
SE	12.5	0.0	0.0	0.0	12.5
S	10.3	0.0	0.0	0.0	10.3
SW	15.0	0.0	0.0	0.0	15.0
W	12.3	0.0	0.0	0.0	12.3
NW	13.9	0.0	0.0	0.0	13.9
Summary	99.9	0.0	0.0	0.0	99.9
CALM	0.1	0.0	0.0	0.0	0.1



OZONE Hourly Averages (O<sub>3</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	31.1	29.4	26.7	25.5	26.3	27.0	26.8	27.2	28.8	32.2	S	39.6	39.6	39.4	39.5	39.5	39.5	38.1	37.2	37.4	37.0	36.2	35.0	34.4	25.5	39.6	33.6	24	
2	33.8	33.2	32.1	30.3	28.3	27.7	28.7	30.1	28.6	S	31.8	35.0	37.4	39.4	38.7	37.5	37.7	37.7	37.4	37.1	36.5	36.1	35.2	36.5	27.7	39.4	34.2	24	
3	36.9	37.7	39.0	38.4	38.1	38.2	38.5	37.9	S	36.8	35.7	37.9	40.0	41.3	41.4	39.7	37.9	35.8	34.3	33.3	33.3	33.2	33.2	33.1	33.1	41.4	37.0	24	
4	33.6	34.1	33.9	32.0	32.1	35.5	37.0	S	35.1	33.5	33.1	31.1	28.9	29.3	32.0	28.5	26.2	29.2	30.4	31.3	26.6	23.3	25.8	30.8	23.3	37.0	31.0	24	
5	32.5	28.1	28.4	29.3	29.6	29.9	S	35.6	35.0	34.8	35.2	34.8	33.3	31.9	32.5	32.2	32.5	33.5	34.6	34.3	34.4	35.1	34.7	33.6	28.1	35.6	32.9	24	
6	33.1	33.1	32.9	32.3	32.6	S	33.0	33.1	33.0	32.0	29.6	28.2	27.2	27.6	29.4	25.9	24.6	27.0	27.3	27.1	28.5	29.3	29.3	28.9	24.6	33.1	29.8	24	
7	29.3	29.0	26.9	22.7	S	26.3	31.9	31.4	32.3	30.4	30.3	31.6	33.0	34.4	34.9	34.4	34.1	34.5	35.4	36.3	36.2	36.4	36.4	35.5	22.7	36.4	32.3	24	
8	35.5	36.0	36.4	S	36.7	37.4	37.1	36.4	36.2	36.2	36.4	36.2	37.1	37.1	37.2	35.7	34.0	34.6	34.6	34.8	36.2	35.8	37.0	35.2	34.0	37.4	36.1	24	
9	34.0	32.2	S	31.1	32.2	31.7	33.1	34.1	34.2	33.5	33.8	34.7	34.9	35.4	35.0	33.9	33.7	34.0	34.0	33.5	33.9	33.9	34.2	35.1	31.1	35.4	33.7	24	
10	34.9	S	34.2	34.1	34.0	34.0	34.5	34.6	34.5	34.5	34.9	35.2	35.2	35.3	35.2	34.7	33.8	34.2	34.0	34.1	34.0	33.1	30.8	30.6	30.6	35.3	34.1	24	
11	S	30.2	28.9	29.0	29.7	29.8	28.9	29.0	29.2	29.4	30.4	30.5	30.2	29.8	29.2	28.3	27.6	27.3	26.8	26.5	27.2	26.8	26.1	S	26.1	30.5	28.7	24	
12	25.5	25.9	25.9	25.2	24.3	24.2	23.8	23.5	23.2	22.7	22.4	22.3	22.0	21.7	20.8	18.3	15.0	14.3	24.7	36.6	33.4	11.6	S	12.6	11.6	36.6	22.6	24	
13	13.2	13.3	12.4	23.0	22.8	16.3	25.3	20.7	21.3	24.7	19.9	23.3	21.5	19.7	17.6	12.4	7.1	8.0	11.9	14.1	14.8	S	17.2	17.1	7.1	25.3	17.3	24	
14	15.8	13.6	12.5	10.5	15.3	16.3	16.9	17.2	16.9	14.4	16.5	18.7	19.3	21.2	21.1	19.3	18.3	25.2	32.3	31.2	S	33.7	32.8	32.0	10.5	33.7	20.5	24	
15	30.0	29.4	25.7	25.1	23.7	22.6	26.1	27.2	27.0	27.4	30.6	32.0	31.9	31.7	31.4	30.9	30.1	29.6	29.8	S	29.6	29.3	28.4	27.5	22.6	32.0	28.6	24	
16	26.9	27.1	28.6	30.1	29.8	29.6	29.6	28.0	27.0	28.1	29.5	30.0	29.9	29.6	29.8	29.5	30.2	30.6	S	27.5	25.2	22.4	26.7	30.3	22.4	30.6	28.5	24	
17	31.4	31.8	30.6	28.3	28.3	27.3	25.8	24.0	23.3	25.1	28.9	32.9	36.3	36.4	34.4	32.6	32.0	S	31.8	32.0	32.6	32.8	31.0	30.8	23.3	36.4	30.5	24	
18	30.7	29.4	31.7	32.0	33.0	32.9	33.3	33.3	33.0	33.0	34.1	C	C	C	C	C	C	C	C	32.7	32.3	32.5	32.8	33.3	33.4	29.4	34.1	32.6	24
19	33.0	33.8	33.0	33.4	33.5	34.3	34.6	36.1	36.1	38.6	40.7	41.9	42.0	42.0	42.1	S	42.2	41.8	41.1	40.4	40.0	39.4	39.0	38.5	33.0	42.2	38.2	24	
20	38.3	37.9	37.6	37.6	37.2	36.6	36.4	35.7	34.4	33.7	32.9	31.4	30.2	S	28.3	26.9	26.2	25.8	26.4	26.0	25.0	24.8	25.7	24.8	24.8	38.3	31.8	24	
21	29.1	29.0	28.0	25.2	25.1	24.3	23.9	24.6	25.0	25.2	26.2	26.6	26.6	S	27.1	27.2	25.7	25.9	25.5	25.3	25.6	27.1	27.1	27.8	23.9	29.1	26.2	24	
22	27.3	26.3	24.9	22.6	21.5	18.4	18.8	21.3	23.3	24.3	24.4	24.3	S	25.4	24.7	23.0	21.7	23.3	23.9	22.8	26.1	31.0	32.2	29.3	18.4	32.2	24.4	24	
23	25.8	19.8	25.2	28.9	34.7	35.9	29.3	34.2	35.7	37.7	37.5	S	37.4	37.5	37.9	38.5	38.3	37.9	37.6	37.6	38.0	37.9	38.0	37.3	19.8	38.5	34.7	24	
24	35.2	35.6	34.2	31.0	26.3	27.0	27.2	26.0	25.1	25.0	S	25.8	29.2	32.1	34.4	34.4	35.3	34.4	34.8	35.7	35.7	34.7	34.4	33.9	25.0	35.7	31.6	24	
25	33.6	33.2	32.8	33.0	33.7	33.6	33.7	34.2	33.8	S	34.7	35.1	35.9	37.4	38.6	41.4	42.2	41.7	40.9	37.3	35.6	34.3	34.4	35.1	32.8	42.2	35.9	24	
26	36.7	36.9	37.4	37.3	37.2	38.1	38.5	38.4	S	38.3	38.4	38.5	39.3	39.4	38.2	36.8	36.3	37.3	38.2	35.7	33.9	28.7	28.3	29.1	28.3	39.4	36.4	24	
27	33.7	36.8	38.3	38.9	38.3	38.3	34.7	S	40.8	39.0	38.1	39.1	39.9	39.5	41.1	41.0	40.7	40.3	41.2	42.6	43.1	44.2	44.1	44.3	33.7	44.3	39.9	24	
28	43.8	43.1	43.5	43.3	42.6	42.8	S	42.6	42.3	41.9	41.8	41.8	42.1	42.4	42.3	42.2	42.9	43.2	43.0	42.8	42.2	42.3	42.0	41.9	41.8	43.8	42.6	24	
29	41.6	41.8	41.5	40.0	38.6	S	39.6	38.1	37.6	39.1	39.6	39.2	38.0	37.6	39.5	40.5	37.9	37.2	35.8	35.2	34.3	34.5	34.8	34.2	34.2	41.8	38.1	24	
30	34.8	34.7	34.7	34.7	S	35.5	35.8	36.7	38.2	38.5	38.7	38.4	37.5	36.9	36.8	36.6	35.9	35.1	34.9	35.3	35.6	35.2	34.4	33.8	33.8	38.7	36.0	24	
31	33.0	32.3	31.6	S	29.5	27.5	25.7	23.9	24.2	25.1	26.6	29.2	27.3	26.1	27.5	28.9	28.3	29.4	28.1	26.5	25.4	25.4	25.6	22.9	22.9	33.0	27.4	24	
HOURLY MAX	43.8	43.1	43.5	43.3	42.6	42.8	39.6	42.6	42.3	41.9	41.8	41.9	42.1	42.4	42.3	42.2	42.9	43.2	43.0	42.8	43.1	44.2	44.1	44.3					
HOURLY AVG	31.8	31.2	31.0	30.5	30.9	30.3	30.6	30.9	30.9	31.6	32.2	32.6	33.3	33.4	33.5	32.1	31.6	32.0	32.7	32.8	32.4	32.1	32.2	31.7					

STATUS FLAG CODES

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

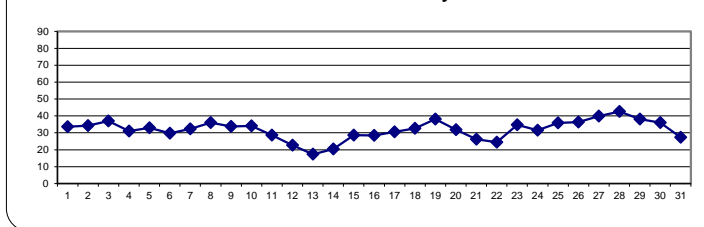
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

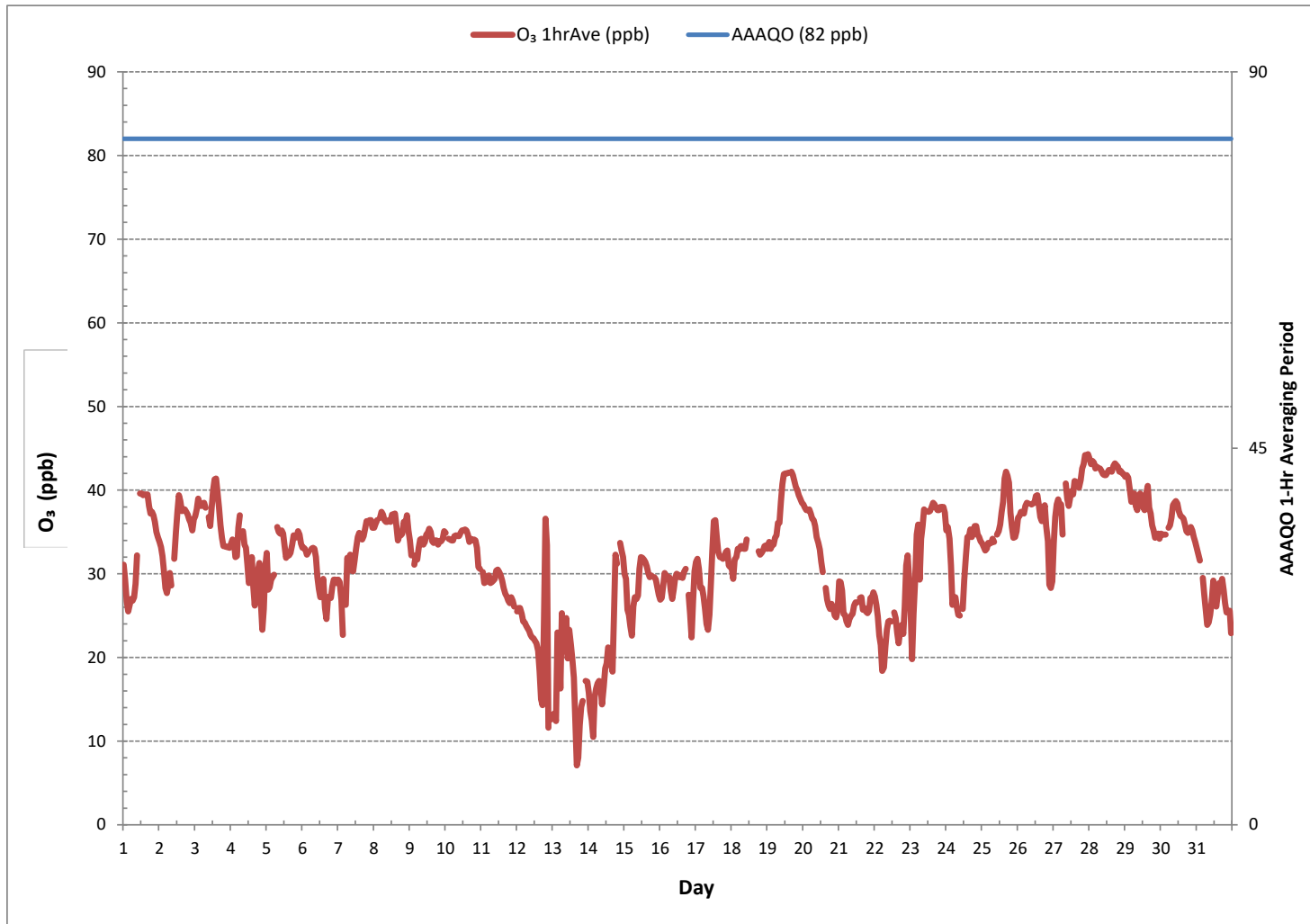
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	706			
MINIMUM 1-HR AVERAGE:	7.1	ppb	@ HOUR	16 ON DAY 13
MAXIMUM 1-HR AVERAGE:	44.3	ppb	@ HOUR	23 ON DAY 27
MAXIMUM 24-HR AVERAGE:	42.6	ppb		ON DAY 28
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	6.5		MONTHLY AVERAGE:	31.8 ppb

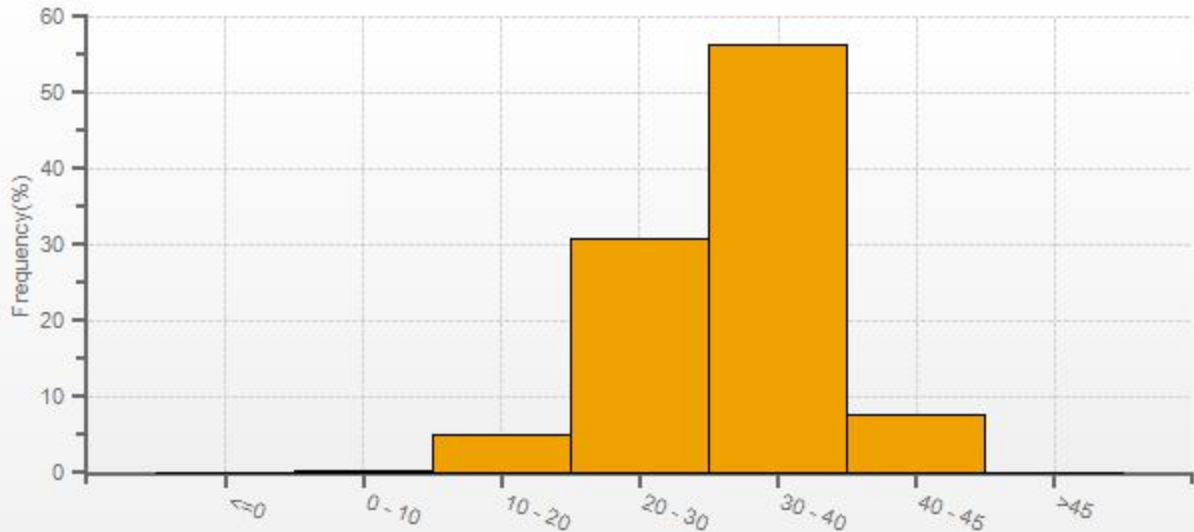
24 HR AVERAGES January 2019



OZONE Hourly Averages (O<sub>3</sub> ppb)



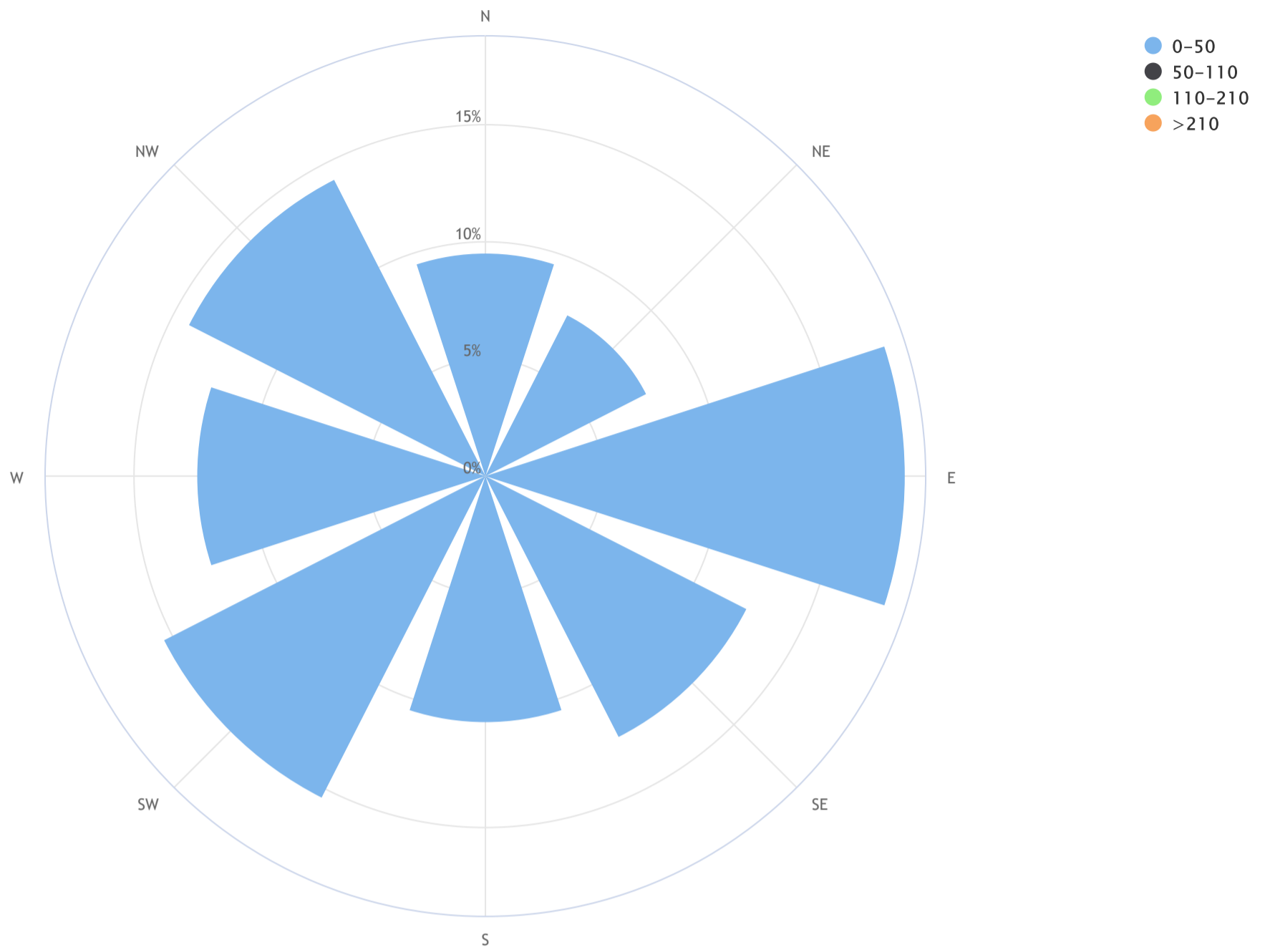
O3[ppb] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.



LICA-201901

# Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_O<sub>3</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 20.7\_CALM % = 0.1%



Direction	0-50	50-110	110-210	>210	TOTAL
N	9.5	0.0	0.0	0.0	9.5
NE	7.7	0.0	0.0	0.0	7.7
E	17.9	0.0	0.0	0.0	17.9
SE	12.5	0.0	0.0	0.0	12.5
S	10.5	0.0	0.0	0.0	10.5
SW	15.4	0.0	0.0	0.0	15.4
W	12.3	0.0	0.0	0.0	12.3
NW	14.2	0.0	0.0	0.0	14.2
<b>Summary</b>	<b>99.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>99.9</b>
<b>CALM</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)

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

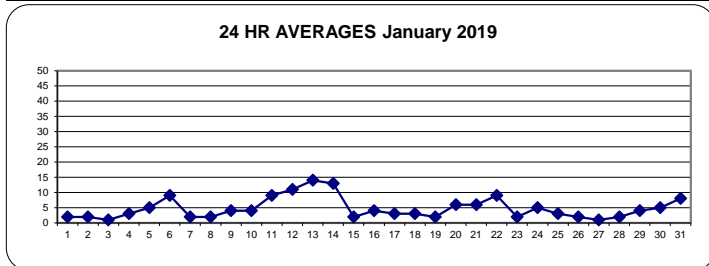
STATUS FLAG CODES

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 <sup>3</sup>	24-HR	29 µg/m <sup>3</sup>
----------------------	------	----------------------	-------	----------------------

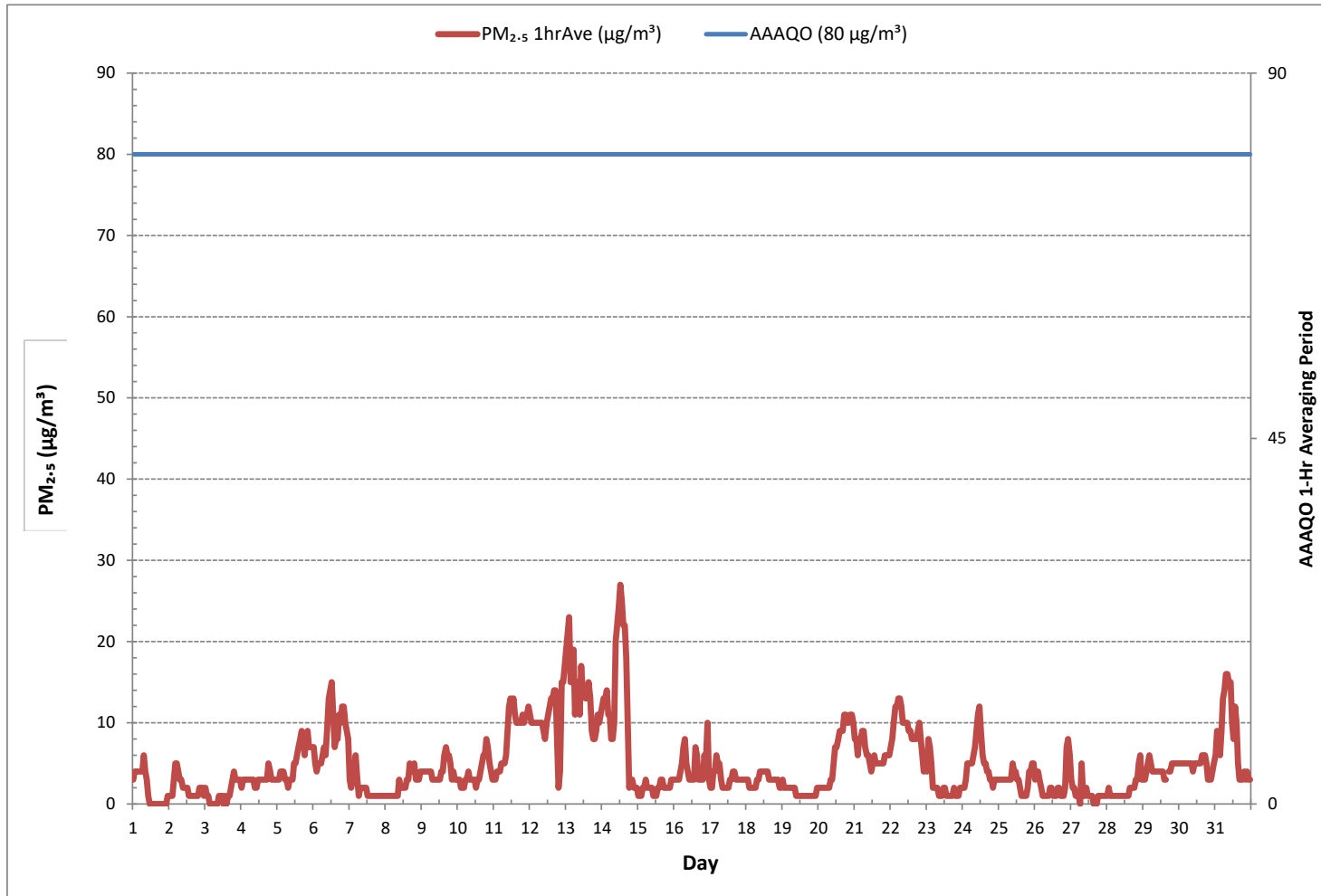
24 HR AVERAGES January 2019



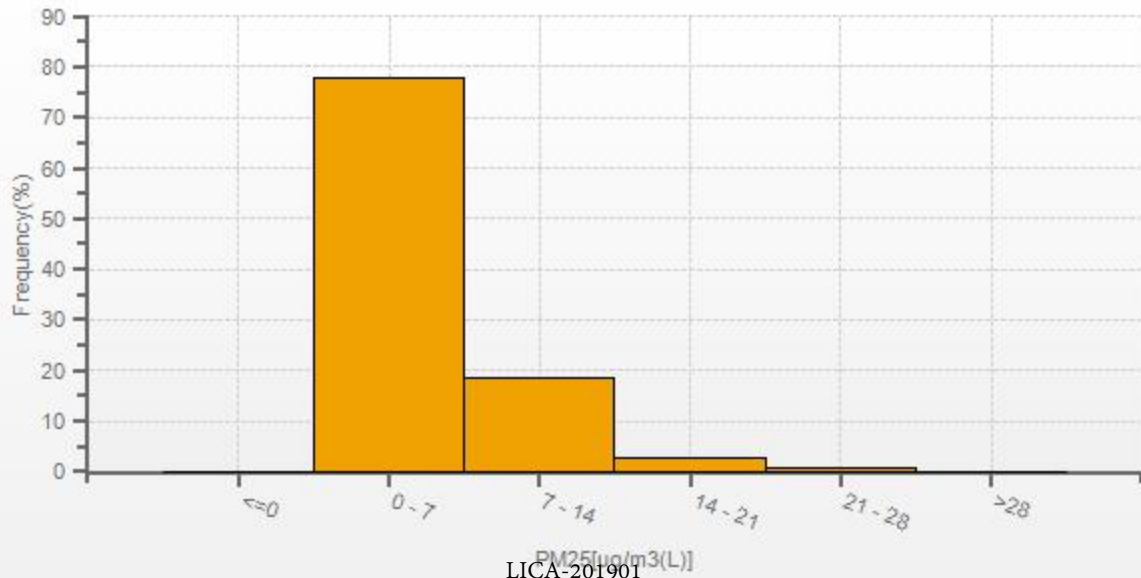
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	719			
MINIMUM 1-HR AVERAGE:	0 µg/m <sup>3</sup> @ HOUR	11	ON DAY	1
MAXIMUM 1-HR AVERAGE:	27 µg/m <sup>3</sup> @ HOUR	12	ON DAY	14
MAXIMUM 24-HR AVERAGE:	14 µg/m <sup>3</sup>		ON DAY	13
MONTHLY CALIBRATION TIME:	1 hrs	OPERATIONAL TIME:	744 hrs	
STANDARD DEVIATION:	4	AMD OPERATION UPTIME:	100.0 %	
		MONTHLY AVERAGE:	5 µg/m <sup>3</sup>	

PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)



PM25[ug/m3(L)] Histogram: LICA ST. LINA Monthly: 19/01 1 Hr.

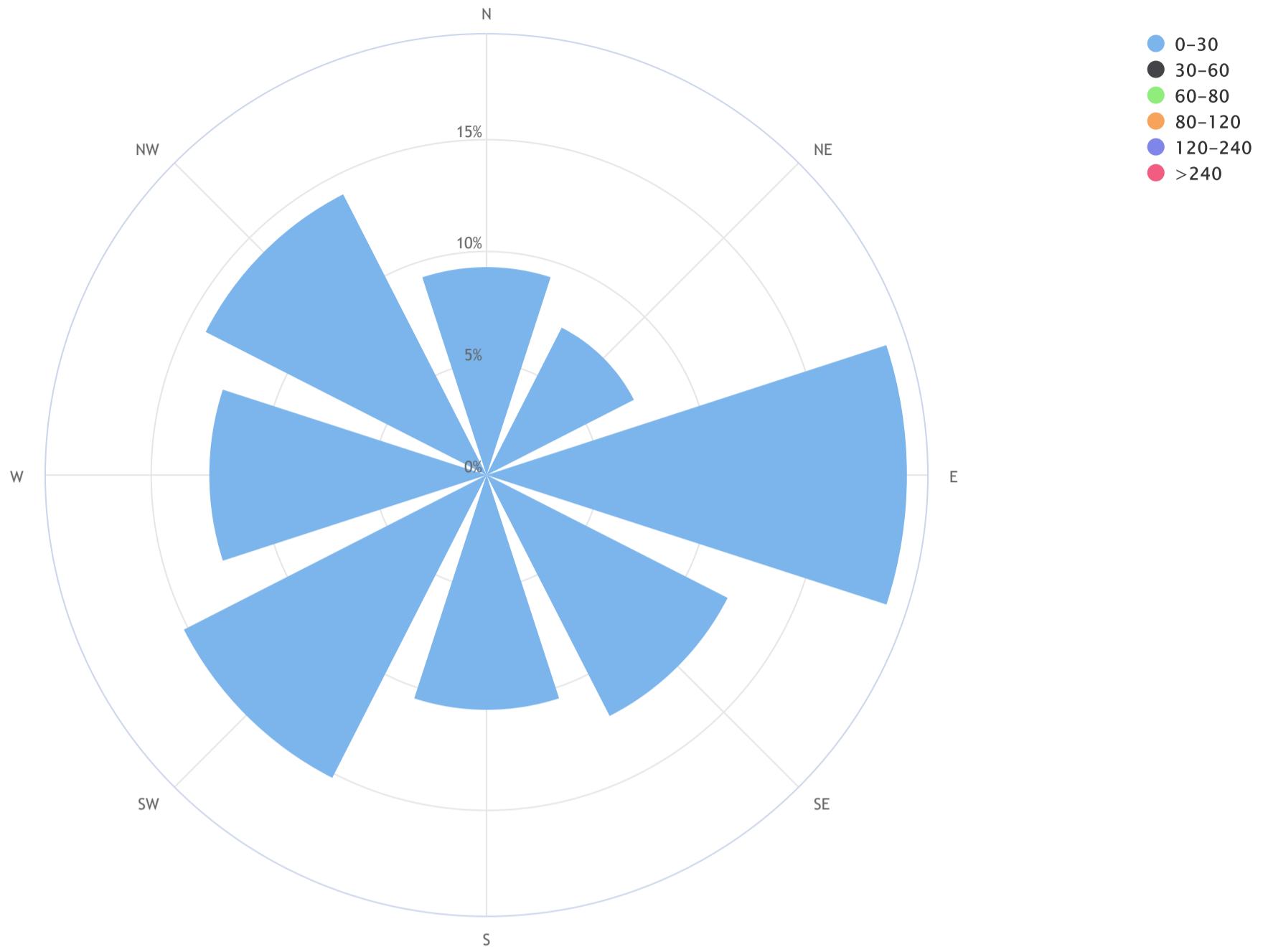


LICA-201901



Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_PM2.5 (µg/m³)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_CALM Avg = 15.0\_CALM % = 0.1%



Direction	0-30	30-60	60-80	80-120	120-240	>240	TOTAL
N	9.3	0.0	0.0	0.0	0.0	0.0	9.3
NE	7.4	0.0	0.0	0.0	0.0	0.0	7.4
E	18.8	0.0	0.0	0.0	0.0	0.0	18.8
SE	12.1	0.0	0.0	0.0	0.0	0.0	12.1
S	10.5	0.0	0.0	0.0	0.0	0.0	10.5
SW	15.2	0.0	0.0	0.0	0.0	0.0	15.2
W	12.4	0.0	0.0	0.0	0.0	0.0	12.4
NW	14.1	0.0	0.0	0.0	0.0	0.0	14.1
Summary	99.9	0.0	0.0	0.0	0.0	0.0	99.9
CALM	0.1	0.0	0.0	0.0	0.0	0.0	0.1



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	18.5	20.8	20.6	21.6	20.3	17.2	17.7	18.8	20.9	17.0	20.1	24.5	20.9	16.6	14.0	12.0	13.6	12.9	12.1	13.4	9.7	11.1	9.9	9.7	9.7	24.5	12.8	24
2	9.6	10.6	11.6	12.1	13.3	13.8	13.2	11.6	14.8	15.7	17.3	22.5	24.2	25.9	20.6	19.3	14.5	11.3	10.0	8.9	9.7	8.6	10.6	13.1	8.6	25.9	13.6	24
3	16.1	18.3	20.0	18.0	13.7	12.2	10.7	10.9	9.4	9.3	8.4	11.6	11.9	11.7	8.7	10.8	10.1	8.8	8.8	7.5	5.3	7.3	6.1	6.6	5.3	20.0	10.5	24
4	8.0	8.0	4.0	3.5	3.8	9.3	8.2	7.6	9.2	9.9	8.4	8.0	7.4	8.0	8.0	4.4	4.4	6.4	8.1	7.9	9.7	10.7	10.2	3.5	10.7	5.4	24	
5	9.2	9.2	8.1	7.5	8.8	9.1	11.9	9.3	9.0	9.8	12.0	9.4	8.3	11.5	9.6	13.3	14.6	14.7	16.3	16.6	17.6	17.6	18.3	18.6	7.5	18.6	11.3	24
6	19.7	19.3	19.3	20.2	19.3	18.7	15.5	15.3	12.5	14.6	12.1	13.4	8.6	5.8	7.9	8.3	7.2	6.4	10.3	12.1	13.4	12.5	14.2	14.3	5.8	20.2	6.5	24
7	15.1	16.2	18.2	17.6	14.4	19.0	19.9	18.1	16.6	21.5	22.2	20.7	22.2	20.4	21.1	19.9	19.6	22.5	22.4	22.1	18.3	17.1	16.7	18.8	14.4	22.5	19.1	24
8	19.5	18.8	18.9	16.9	16.0	16.2	13.8	13.0	13.3	12.9	12.8	9.3	9.3	7.3	4.5	6.9	9.2	10.5	11.0	13.0	13.3	13.5	13.6	12.8	4.5	19.5	7.1	24
9	12.1	8.2	11.1	12.0	13.7	15.7	17.1	17.4	14.8	13.8	13.0	16.8	15.1	14.1	14.4	14.1	12.9	16.1	14.9	11.3	11.3	12.3	10.5	10.9	8.2	17.4	13.0	24
10	10.5	12.8	12.6	10.7	11.1	9.9	9.7	8.0	8.2	8.6	6.8	5.2	3.2	2.1	2.5	4.0	5.2	6.1	7.6	6.6	8.7	10.4	8.5	10.3	2.1	12.8	6.1	24
11	12.5	11.7	10.1	10.9	11.7	12.3	11.7	13.0	12.6	17.4	16.2	18.0	18.2	16.0	15.3	18.2	16.1	15.0	20.7	18.5	21.5	16.0	15.8	13.0	10.1	21.5	14.9	24
12	15.1	9.1	10.6	9.8	9.7	8.9	8.4	6.8	10.5	12.3	9.8	8.0	8.3	8.4	11.0	11.5	9.9	8.7	9.8	13.1	9.8	5.6	3.1	9.7	3.1	15.1	7.3	24
13	10.3	8.5	7.3	7.2	4.7	1.1	6.4	<b>0.3</b>	5.8	7.9	3.3	10.8	9.3	6.4	7.9	9.5	10.6	8.9	7.4	7.7	8.1	9.2	8.1	3.8	<b>0.3</b>	10.8	4.2	24
14	5.8	6.0	7.5	6.7	8.5	9.3	10.1	12.4	14.1	15.8	14.0	15.2	15.5	14.7	13.1	13.8	11.9	9.8	18.7	22.5	18.8	20.7	20.6	18.6	5.8	22.5	6.9	24
15	17.1	16.1	12.8	10.7	11.9	13.6	10.8	9.3	10.0	9.7	10.5	10.1	8.3	8.8	8.0	7.7	8.3	9.5	10.9	10.4	9.0	9.6	9.0	8.2	7.7	17.1	9.0	24
16	8.2	8.2	7.4	10.1	9.8	9.3	10.5	10.3	10.4	10.9	9.4	7.8	7.4	8.8	9.7	10.0	9.4	7.3	5.3	6.2	10.2	10.7	10.3	10.2	5.3	10.9	8.9	24
17	10.2	6.2	9.4	11.2	10.7	11.7	13.2	11.8	10.7	9.0	10.3	10.4	8.8	9.3	8.2	9.0	11.4	13.6	12.4	15.2	16.6	15.0	14.2	14.6	6.2	16.6	10.8	24
18	14.3	13.0	11.0	14.8	14.0	12.2	10.0	9.7	12.7	14.2	14.7	13.0	12.7	13.3	11.3	14.5	14.1	12.4	11.0	10.9	12.3	14.0	12.6	10.5	9.7	14.8	12.5	24
19	11.2	15.4	12.5	12.6	16.7	16.7	17.4	18.8	17.5	15.6	23.4	23.9	24.0	24.6	22.4	23.0	21.2	20.9	15.0	15.6	15.8	14.5	15.3	14.4	11.2	24.6	17.0	24
20	12.8	13.4	13.8	14.1	14.1	14.6	15.1	17.4	15.1	16.3	17.5	16.0	12.8	15.2	13.1	10.3	9.4	10.8	11.9	10.1	10.4	10.5	11.4	10.8	9.4	17.5	11.9	24
21	10.2	8.9	7.8	6.5	6.5	10.6	8.7	9.8	8.3	9.5	9.6	9.3	8.3	10.9	7.9	6.8	6.2	8.6	4.1	5.4	5.7	6.1	6.4	9.6	4.1	10.9	4.9	24
22	11.1	9.6	9.7	10.0	8.4	8.9	9.8	9.5	9.7	7.6	7.8	8.4	8.7	8.2	10.7	12.1	12.5	7.5	9.3	11.7	10.0	13.1	15.1	16.4	7.5	16.4	7.9	24
23	19.1	18.7	19.1	14.7	16.0	15.5	16.0	19.2	16.0	15.4	16.4	16.5	15.6	14.4	12.5	10.5	8.8	7.3	9.4	11.9	11.0	10.8	10.3	7.8	7.3	19.2	11.3	24
24	10.0	10.3	11.0	12.3	13.2	13.7	14.0	12.9	13.5	17.0	16.4	17.4	13.7	13.1	14.6	17.8	18.1	14.5	11.7	9.4	5.4	2.9	2.2	1.7	1.7	18.1	5.9	24
25	4.4	4.7	4.4	6.4	6.7	6.1	8.8	5.9	10.6	11.5	13.1	10.9	8.9	10.2	9.9	13.1	11.5	6.0	2.7	2.2	4.0	5.2	7.3	8.6	2.2	13.1	4.4	24
26	8.9	8.2	10.0	10.2	13.5	15.6	14.3	13.5	13.5	14.2	14.5	15.3	12.2	10.9	9.4	9.0	10.6	17.1	14.4	11.3	10.1	11.2	10.9	15.7	8.2	17.1	11.4	24
27	15.8	17.2	18.4	27.1	24.7	30.2	23.0	24.2	24.6	28.0	20.8	24.2	26.4	25.4	31.0	<b>33.4</b>	32.7	31.3	27.3	25.7	23.0	21.8	17.9	17.6	15.8	<b>33.4</b>	<b>22.2</b>	24
28	14.3	8.8	10.4	8.1	10.1	12.3	14.3	12.9	14.3	12.1	14.1	13.7	16.3	18.3	14.8	14.6	14.2	13.8	9.6	9.0	8.5	10.7	8.2	8.1	8.1	18.3	11.5	24
29	6.7	5.3	6.8	6.4	6.4	6.8	9.2	8.3	9.6	8.8	9.3	11.3	11.8	11.6	12.7	12.3	11.6	10.2	10.5	10.4	12.0	13.4	12.6	13.6	5.3	13.6	9.0	24
30	12.8	12.4	13.0	11.5	10.2	8.6	10.5	10.7	11.3	11.7	12.7	13.0	12.2	14.6	12.5	12.2	9.4	5.7	8.7	8.7	12.1	12.5	9.2	11.7	5.7	14.6	9.4	24
31	9.9	8.5	7.2	8.6	8.7	8.7	8.5	9.6	9.6	9.0	8.8	9.7	11.2	12.0	10.2	10.8	11.7	14.9	12.9	12.8	13.4	13.9	16.1	16.3	7.2	16.3	3.6	24
HOURLY MAX	19.7	20.8	20.6	27.1	24.7	30.2	23.0	24.2	24.6	28.0	23.4	24.5	26.4	25.9	31.0	33.4	32.7	31.3	27.3	25.7	23.0	21.8	20.6	18.8				

STATUS FLAG CODES

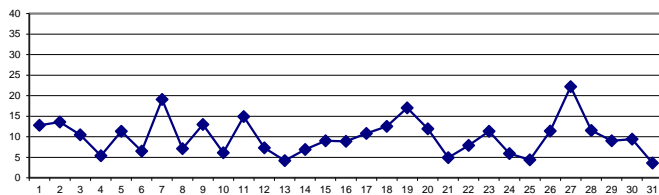
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	May 25, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

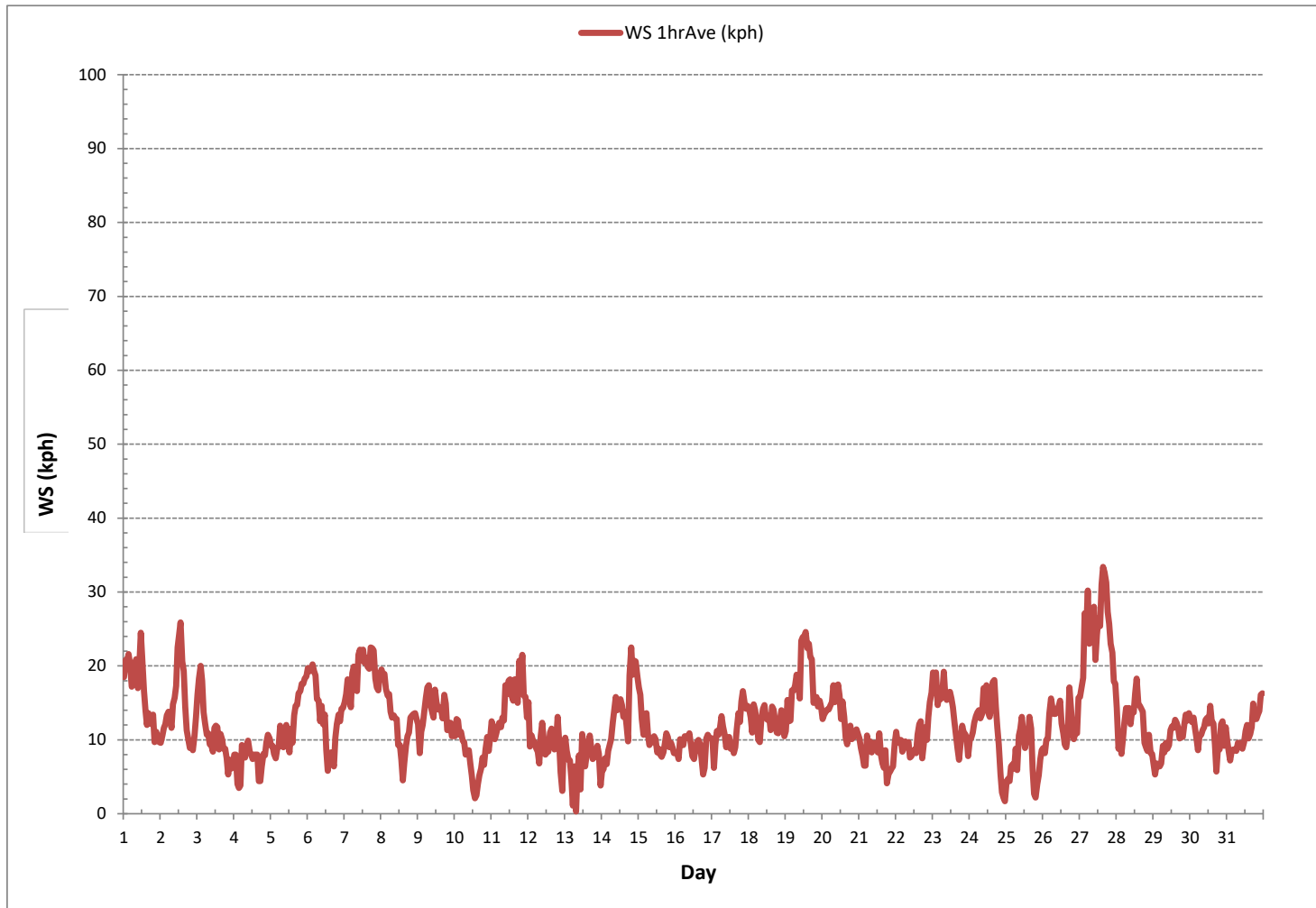
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE	0.3 kph @ HOUR 7 ON DAY 13
MAXIMUM 1-HR AVERAGE:	33.4 kph @ HOUR 15 ON DAY 27
MAXIMUM 24-HR AVERAGE:	22.2 kph ON DAY 27
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.9
MONTHLY AVERAGE:	0.3 kph

24 HR AVERAGES January 2019

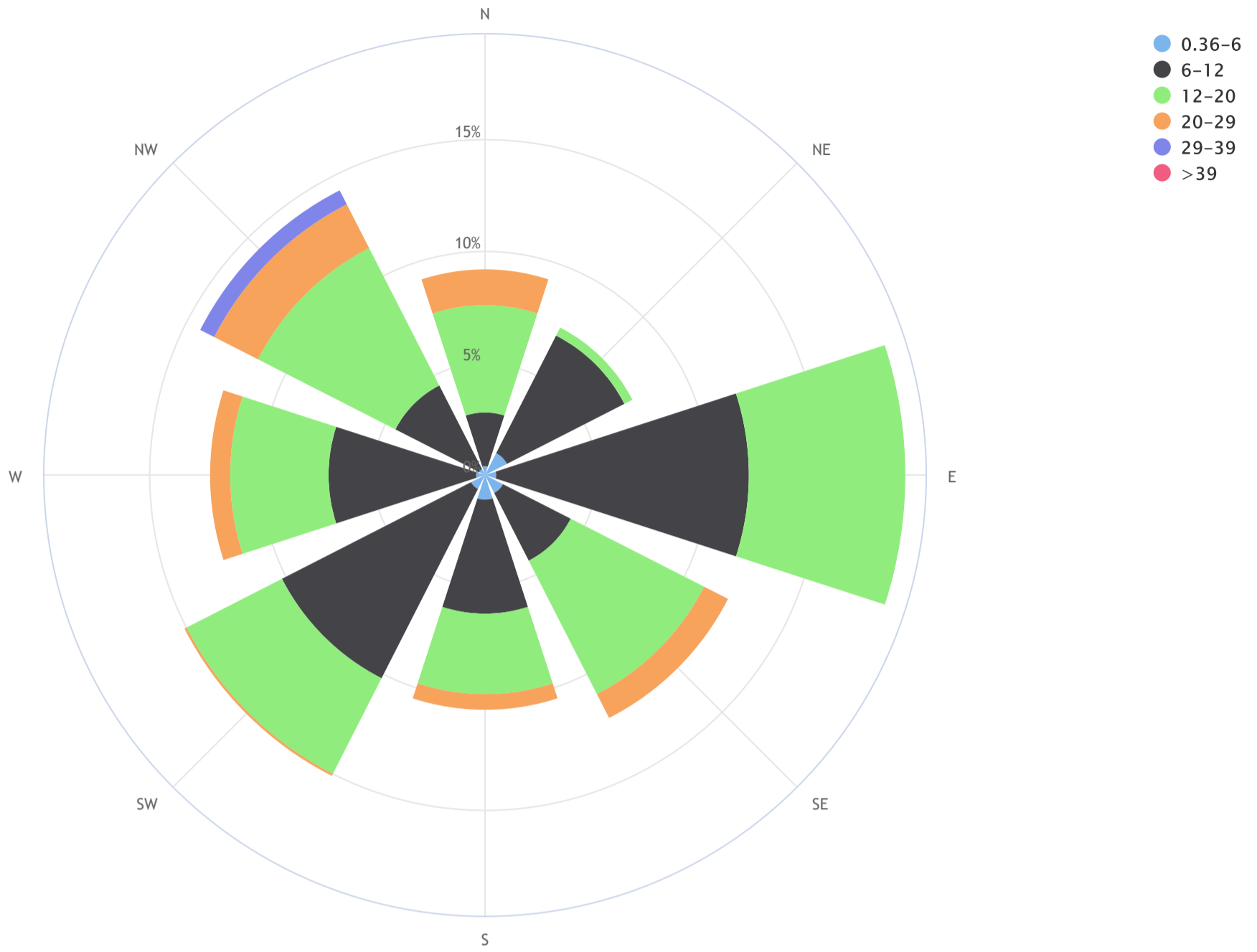


WIND SPEED Hourly Averages (WS kph)



Lakeland Industry & Community Association\_St. Lina Continuous Monitoring Station\_19/01

Wind Rose\_Wind Frequency (Blowing From)\_CALM Avg = 0.3\_CALM % = 0.1%



Direction	0.36-6	6-12	12-20	20-29	29-39	>39	TOTAL
N	0.4	2.4	4.8	1.6	0.0	0.0	9.3
NE	1.1	5.9	0.4	0.0	0.0	0.0	7.4
E	0.5	11.3	7.0	0.0	0.0	0.0	18.8
SE	0.9	3.4	6.7	1.2	0.0	0.0	12.2
S	1.1	5.1	3.6	0.7	0.0	0.0	10.5
SW	0.7	9.5	4.8	0.1	0.0	0.0	15.2
W	0.4	6.6	4.4	0.9	0.0	0.0	12.4
NW	0.3	4.2	6.9	2.2	0.7	0.0	14.1
Summary	5.4	48.4	38.7	6.7	0.7	0.0	99.9
CALM	0.1	0.0	0.0	0.0	0.0	0.0	0.1



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - January 2019

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

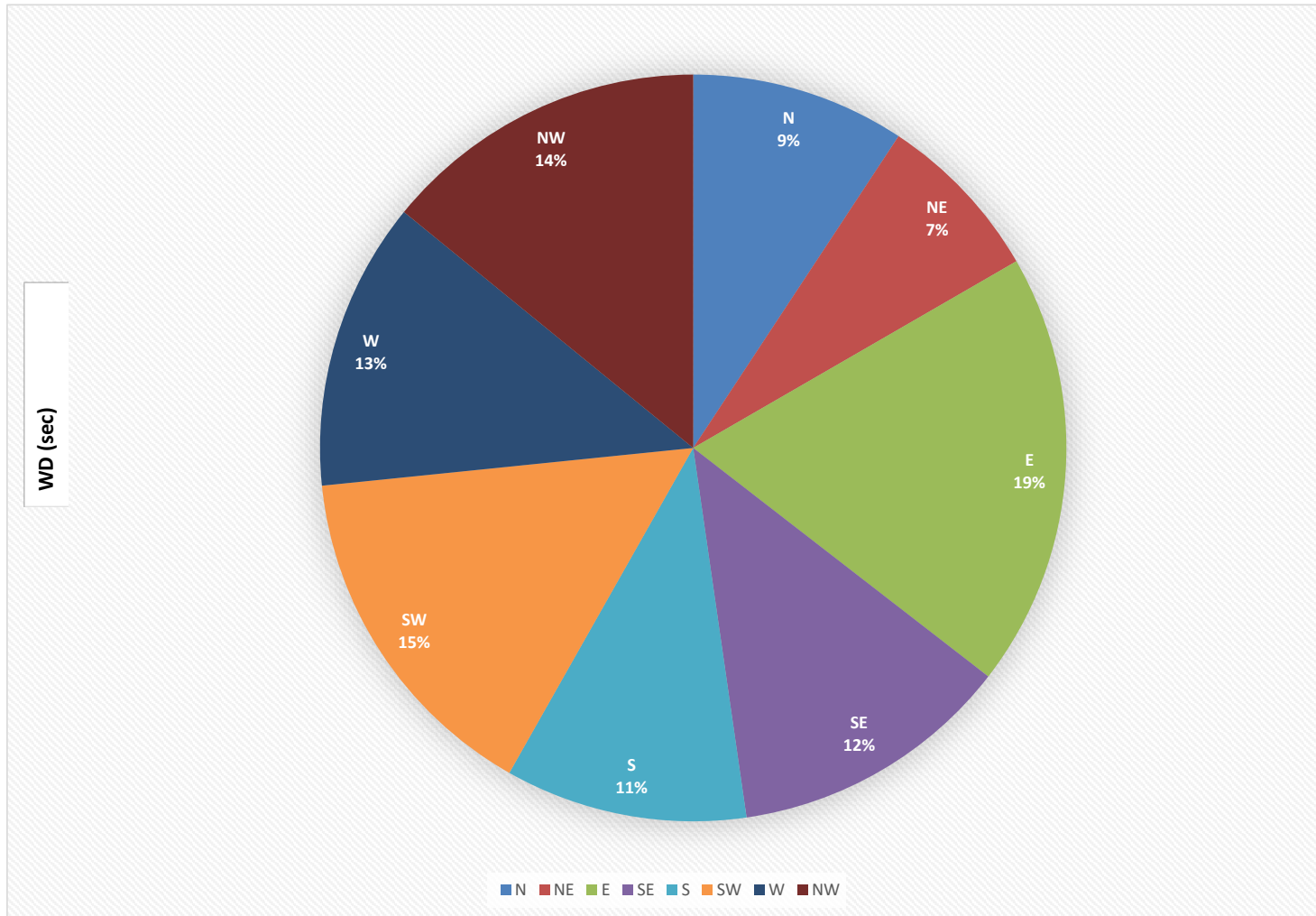
STATUS FLAG CODES

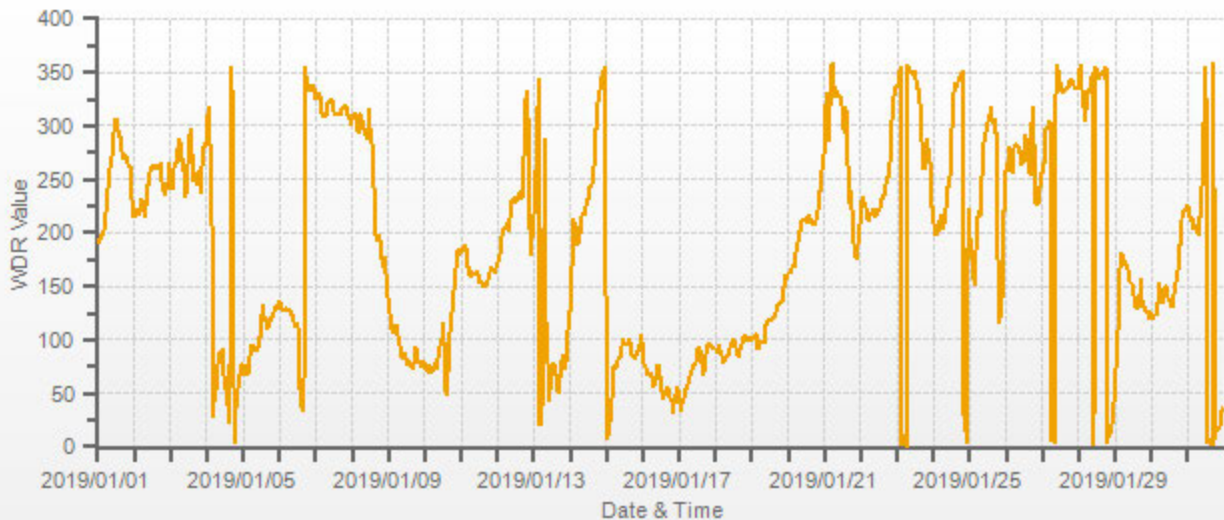
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	May 25, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	99		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	265	(W)

**WIND DIRECTION Hourly Averages (WD)**





LICA-201901

— WDR[degwdr]



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - January 2019

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	5	4	7	4	6	4	9	6	4	3	9	5	7	5	7	9	4	3	3	3	5	6	9	14	24	
2	9	6	4	5	8	6	5	10	11	9	10	3	3	3	5	3	3	6	11	12	11	10	19	6	24	
3	5	7	7	5	4	10	9	7	4	8	13	7	13	10	16	13	3	8	2	6	26	12	14	12	24	
4	7	8	34	30	43	3	14	11	9	7	8	9	7	8	8	9	25	13	14	7	8	6	4	6	24	
5	8	10	10	12	13	8	8	11	5	6	7	9	8	6	8	5	6	8	5	5	4	5	5	5	24	
6	6	7	6	5	5	5	7	5	5	6	8	6	7	26	9	7	5	27	5	4	5	5	5	6	24	
7	6	7	6	5	10	6	6	8	5	5	5	6	6	6	6	6	7	5	6	4	5	5	6	7	24	
8	7	5	6	7	5	5	6	6	6	4	7	12	16	20	24	8	7	5	6	6	5	4	8	8	24	
9	10	10	7	5	4	4	6	3	8	5	6	6	8	5	6	4	5	5	5	6	4	3	4	4	24	
10	5	5	6	6	4	8	8	6	6	10	9	13	24	31	20	9	6	5	4	6	10	9	18	10	24	
11	5	5	9	4	9	4	5	6	6	5	4	3	6	5	5	4	4	3	3	4	3	5	8	7	24	
12	6	12	5	6	7	8	27	27	7	9	6	9	9	7	3	2	11	25	11	6	31	52	61	5	24	
13	8	22	14	8	24	58	21	77	28	24	49	3	11	14	7	6	6	8	5	8	6	8	8	22	24	
14	14	21	15	13	14	9	5	7	4	5	4	10	4	5	6	9	7	12	6	4	6	7	8	13	24	
15	7	7	7	12	9	8	5	9	5	5	10	5	7	6	7	8	7	5	5	5	7	5	7	8	24	
16	14	6	8	6	7	5	5	6	5	5	7	6	12	9	14	9	10	11	11	9	9	5	9	6	24	
17	6	9	3	4	3	3	2	2	9	6	7	8	10	7	10	8	3	5	8	5	5	3	3	2	24	
18	3	6	6	6	5	7	5	7	6	4	3	4	5	5	7	6	5	8	6	6	3	3	4	4	24	
19	5	8	7	9	4	4	4	4	3	8	7	8	5	5	5	5	5	5	7	6	7	7	7	4	24	
20	6	6	5	6	6	8	9	5	6	5	4	8	5	5	4	5	3	2	4	9	5	8	10	5	24	
21	5	20	10	16	21	8	6	7	6	5	6	6	14	11	14	25	9	8	16	12	11	12	9	9	24	
22	4	6	12	8	6	9	6	4	4	12	4	6	7	8	8	2	5	11	4	4	7	10	6	6	24	
23	7	4	6	5	5	7	5	4	5	6	8	9	7	8	7	10	13	13	8	7	4	5	4	21	24	
24	8	7	9	8	4	4	3	6	7	8	3	5	9	10	7	5	5	6	14	14	25	27	46	40	24	
25	34	20	23	9	14	13	3	7	18	6	4	7	9	7	7	6	8	8	24	43	30	15	15	16	24	
26	4	9	8	15	3	5	4	3	3	4	8	4	11	7	15	8	8	9	19	8	5	4	8	4	24	
27	5	3	10	7	6	5	24	4	7	7	7	5	7	5	5	5	4	4	4	4	4	5	4	3	24	
28	6	18	5	12	5	7	5	6	10	10	7	6	7	6	7	6	5	4	6	6	9	6	8	9	24	
29	7	15	20	14	11	10	7	10	8	7	11	10	10	12	7	6	10	8	7	7	5	5	9	4	24	
30	4	5	5	5	7	13	13	6	6	5	8	10	8	6	6	8	10	12	7	12	7	6	5	3	24	
31	5	7	13	8	11	8	7	6	4	10	17	12	12	9	11	13	6	5	7	5	5	5	6	6	24	

STATUS FLAG CODES

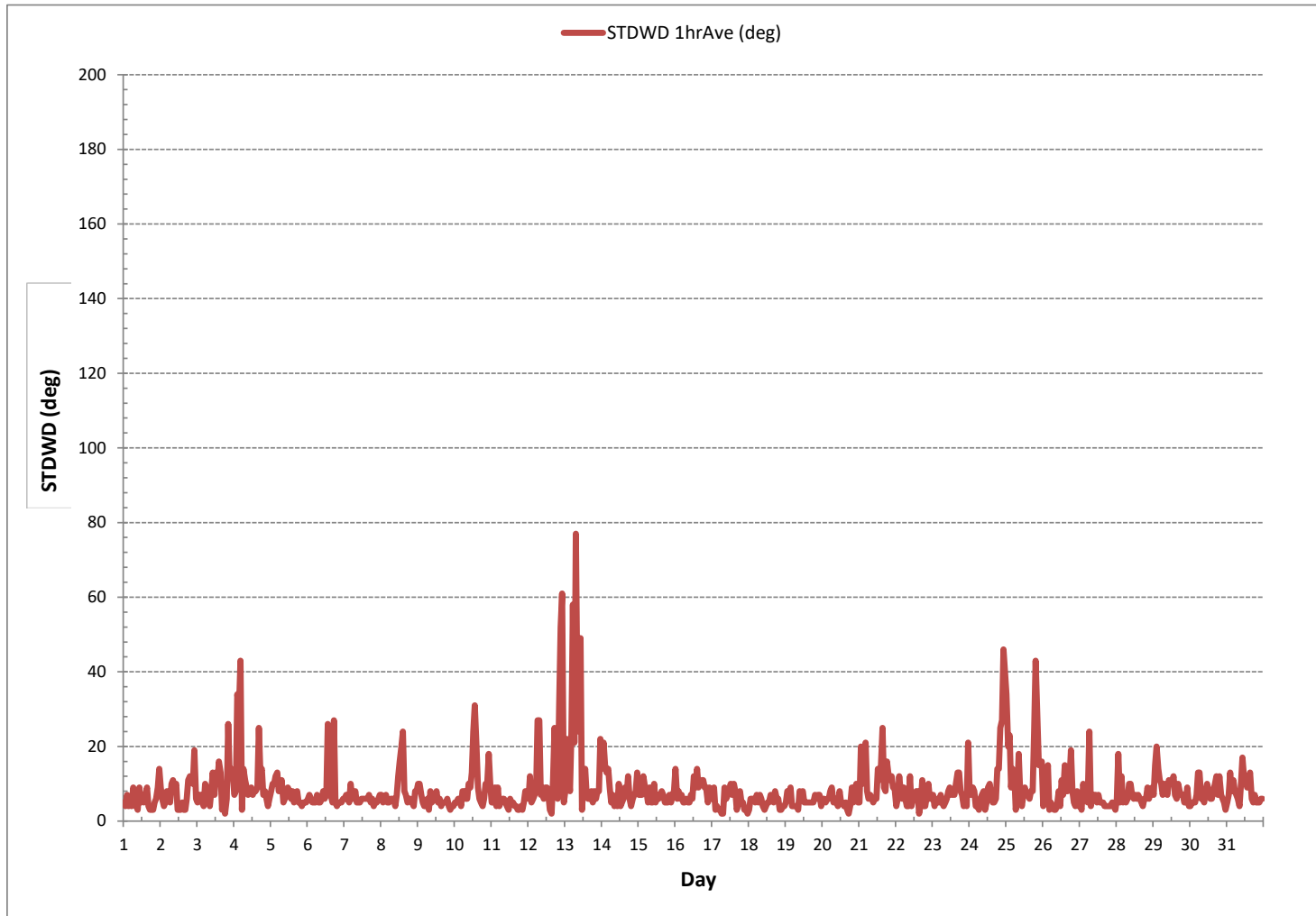
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs



STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)





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	81	80	80	89	92	93	94	96	96	93	85	72	72	75	76	76	79	86	89	88	94	98	100	100	72	100	87	24					
2	100	100	99	98	94	90	89	87	84	77	72	65	61	60	64	68	72	75	78	80	81	80	83	79	60	100	81	24					
3	82	88	82	79	78	78	76	78	80	79	79	68	54	45	47	57	65	73	78	81	84	84	84	87	45	88	74	24					
4	81	78	79	85	83	71	67	67	69	70	71	71	72	78	82	75	75	75	76	79	83	88	90	93	67	93	77	24					
5	96	97	97	97	97	97	97	97	96	95	95	94	95	96	96	97	97	97	97	98	98	98	97	97	97	94	98	97	24				
6	97	97	97	97	97	97	97	98	98	98	99	99	99	98	97	97	97	97	98	98	98	97	97	97	97	97	99	98	24				
7	97	96	95	94	93	92	90	89	87	83	80	75	74	71	70	70	73	73	74	75	80	80	81	81	70	97	82	24					
8	80	80	81	81	80	78	79	81	81	79	75	71	66	64	60	61	69	73	75	77	75	75	71	68	60	81	74	24					
9	68	73	72	72	70	71	73	76	78	78	75	74	73	69	70	74	79	82	83	86	87	90	91	91	68	91	77	24					
10	91	91	91	90	91	91	90	90	90	90	87	85	82	82	83	85	89	92	92	93	92	93	93	92	82	93	89	24					
11	92	91	91	91	91	90	90	90	90	88	86	82	76	74	76	79	83	84	85	86	86	87	88	89	74	92	86	24					
12	90	90	89	89	88	89	89	90	90	86	82	72	67	63	62	64	67	69	69	64	66	76	76	79	62	90	78	24					
13	78	80	80	83	86	84	88	88	88	90	86	86	79	78	79	84	88	93	96	98	99	98	99	100	78	100	88	24					
14	99	97	100	100	100	100	100	99	98	97	96	96	96	95	88	79	80	84	86	86	87	82	84	87	79	100	92	24					
15	88	86	87	86	87	87	85	85	86	84	78	73	71	74	80	85	85	84	81	81	81	80	83	86	71	88	83	24					
16	87	86	86	85	86	87	86	86	87	87	85	83	82	84	85	84	83	82	83	83	84	86	86	82	87	85	24						
17	86	86	85	83	82	81	79	78	77	75	76	76	73	64	62	62	68	72	73	74	72	72	75	76	62	86	75	24					
18	75	75	75	75	75	76	76	75	76	76	73	72	71	73	74	75	75	76	77	79	80	80	77	77	71	80	76	24					
19	79	75	78	78	76	75	74	70	71	62	74	82	83	84	85	85	84	85	86	85	83	82	82	84	62	86	79	24					
20	85	84	84	85	86	86	87	88	88	86	82	76	73	68	67	66	72	77	79	80	80	81	79	79	66	88	80	24					
21	81	86	92	93	96	98	97	92	88	87	80	75	73	70	67	69	71	74	75	76	77	78	82	86	67	98	82	24					
22	93	99	99	98	97	96	96	95	95	94	94	94	94	94	89	78	76	83	85	85	87	93	95	95	76	99	92	24					
23	94	92	88	89	87	84	86	83	81	76	73	74	71	69	70	70	71	78	83	84	82	82	81	81	69	94	80	24					
24	83	83	84	83	82	82	83	82	83	86	89	91	92	93	92	95	95	96	96	96	95	94	94	93	82	96	89	24					
25	94	95	95	95	95	95	96	95	96	94	93	91	85	82	78	79	82	84	86	87	89	90	92	93	78	96	90	24					
26	93	98	99	100	99	92	89	88	87	82	79	72	67	68	73	76	79	76	77	83	88	89	86	78	67	100	84	24					
27	72	69	64	83	86	82	97	98	96	83	84	78	75	78	72	68	67	69	74	69	69	65	71	73	64	98	77	24					
28	78	87	79	81	89	84	84	84	84	82	79	70	64	52	51	50	48	47	49	52	56	62	66	70	47	89	69	24					
29	72	71	71	74	75	74	69	72	69	66	61	58	56	60	60	56	62	66	70	74	76	78	81	84	56	84	69	24					
30	85	86	86	87	87	85	84	84	87	86	83	81	82	82	84	88	90	91	91	91	91	91	91	92	81	92	87	24					
31	92	95	95	94	94	95	95	97	98	97	93	88	90	94	89	86	88	86	90	91	91	90	87	88	86	98	92	24					
HOURLY MAX	100	100	100	100	100	100	100	99	98	98	99	99	99	99	98	97	97	98	98	98	99	98	100	100									
HOURLY AVG	86	87	86	88	88	87	87	86	86	84	82	79	76	75	75	75	78	80	82	83	84	84	85	86									

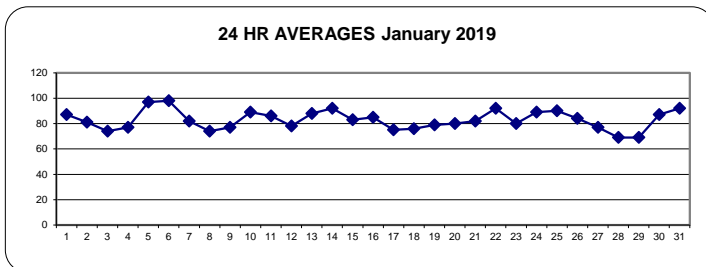
STATUS FLAG CODES

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

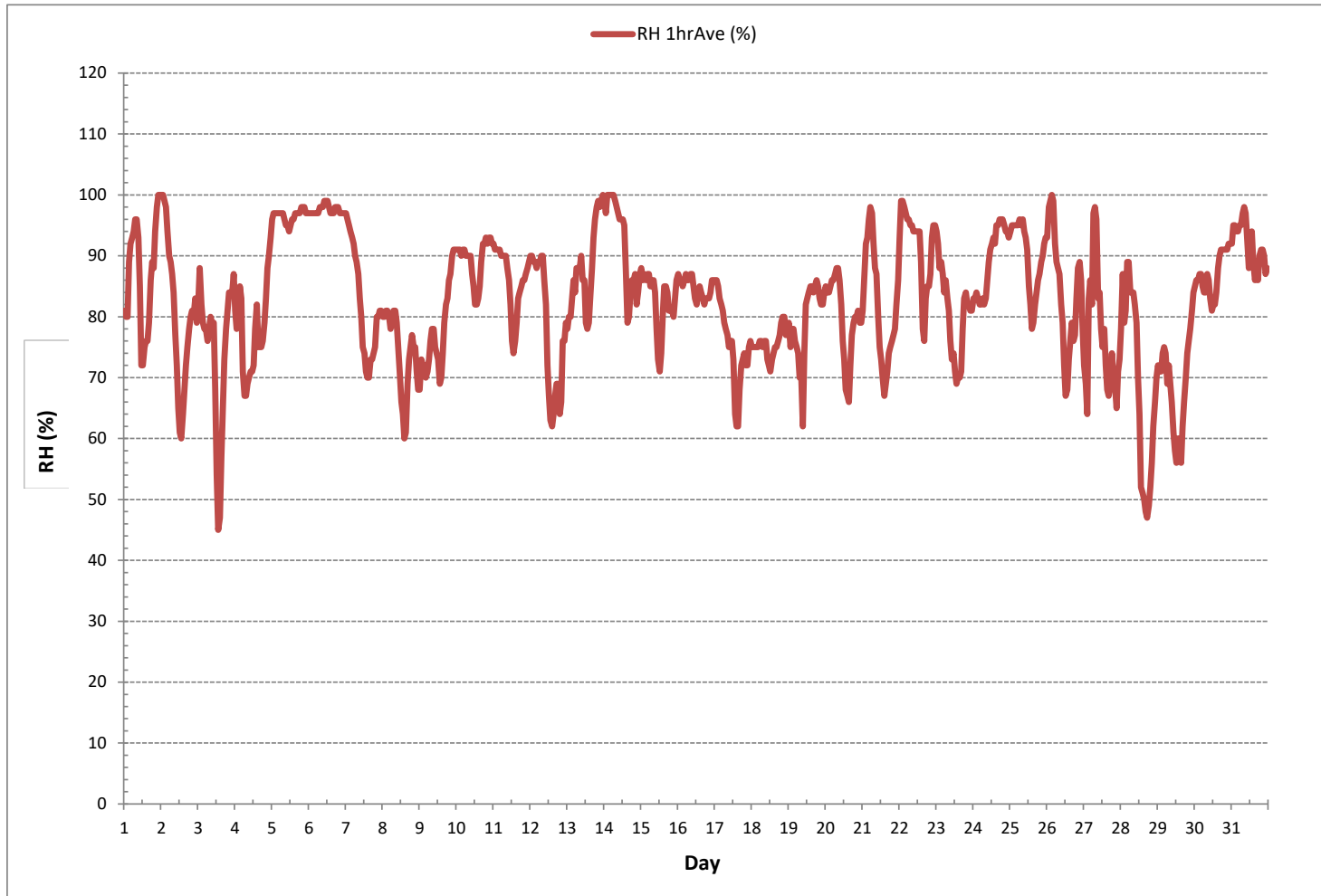
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	45	%	@ HOUR	13	ON DAY	3
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	22	ON DAY	1
MAXIMUM 24-HR AVERAGE:	98	%			ON DAY	6
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	10					MONTHLY AVERAGE: 83 %

24 HR AVERAGES January 2019



**RELATIVE HUMIDITY Hourly Averages (RH %)**





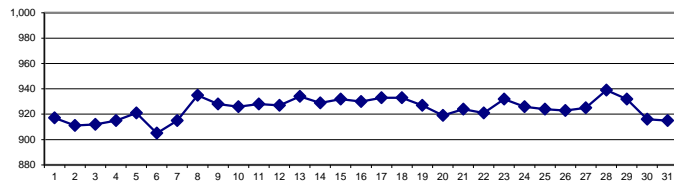
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	922	921	919	917	916	916	915	915	915	916	916	917	917	918	918	918	917	917	917	917	916	916	915	915	915	915	922	917	24
2	915	914	914	913	913	912	911	911	911	911	911	911	911	911	911	911	911	911	911	911	910	910	910	910	910	910	910	915	24
3	910	910	910	911	911	911	911	911	911	912	912	913	912	913	913	913	913	913	913	913	913	913	913	913	913	910	913	912	24
4	914	914	914	914	913	913	913	913	913	913	913	914	914	914	915	916	916	917	918	918	919	919	920	920	920	913	920	915	24
5	921	922	922	922	923	923	923	924	924	924	924	924	924	923	922	922	921	921	920	919	918	917	915	914	914	924	921	24	
6	913	911	910	909	908	906	905	905	904	904	903	903	903	902	902	903	903	903	903	903	903	904	904	905	902	913	905	24	
7	905	906	907	907	908	909	909	910	911	912	913	914	914	915	916	917	918	919	920	921	923	924	925	927	905	927	915	24	
8	928	929	930	931	932	933	934	935	935	936	937	937	937	938	938	937	937	936	936	936	935	935	934	928	938	935	24		
9	933	933	933	932	932	931	930	929	929	929	929	928	927	927	926	926	925	925	925	925	925	924	924	924	924	924	933	928	24
10	924	924	924	924	924	924	924	925	925	925	926	926	926	927	927	928	928	928	928	929	929	929	930	929	924	930	926	24	
11	929	929	930	930	929	929	929	929	929	929	929	928	928	928	927	927	926	925	925	925	925	924	924	924	924	924	930	928	24
12	923	923	924	923	924	924	923	924	924	925	925	926	927	927	928	928	928	928	929	929	930	931	931	931	931	923	931	927	24
13	931	931	932	932	932	932	932	932	933	933	934	934	934	934	934	935	935	935	935	935	935	935	935	935	935	931	935	934	24
14	934	934	934	933	932	931	930	929	928	928	927	927	926	926	926	926	927	927	928	929	929	930	930	931	926	934	929	24	
15	931	931	932	933	933	933	933	933	933	934	934	934	933	932	932	932	932	931	931	930	930	930	930	930	930	930	934	932	24
16	929	929	929	929	929	929	928	929	929	930	930	930	930	930	930	931	931	932	932	933	933	934	934	928	934	930	24		
17	934	934	935	935	935	935	935	934	934	934	934	934	933	933	932	932	931	931	931	931	931	931	931	932	931	935	933	24	
18	932	932	932	932	932	932	932	932	933	933	933	934	934	934	934	934	934	934	934	934	934	934	933	933	933	932	934	933	24
19	933	932	932	931	930	930	929	927	927	928	927	926	925	924	923	923	923	924	924	924	924	924	924	924	923	933	927	24	
20	924	923	923	923	922	922	921	920	920	919	919	919	919	918	918	917	917	917	917	916	916	916	917	917	916	924	919	24	
21	918	918	919	919	920	920	921	922	922	923	924	925	925	925	926	927	927	927	927	927	927	927	927	927	926	918	927	924	24
22	926	926	925	924	924	923	922	922	921	921	921	920	920	919	919	919	919	920	919	919	920	921	921	922	919	926	921	24	
23	923	924	925	926	927	928	929	930	932	933	934	935	936	936	936	937	937	937	936	936	936	936	936	935	923	937	932	24	
24	934	933	932	931	929	928	926	925	923	923	923	922	923	923	924	925	925	926	926	926	926	926	925	925	922	934	926	24	
25	925	925	924	924	924	924	923	923	923	924	924	925	925	925	926	925	926	925	924	924	923	923	922	923	922	926	924	24	
26	923	923	923	923	923	924	924	925	925	925	925	925	925	925	925	924	924	923	922	921	919	918	916	915	915	925	923	24	
27	914	914	913	913	913	914	916	919	921	923	925	926	928	928	929	930	932	933	934	935	936	937	937	938	913	938	925	24	
28	938	938	938	938	938	938	938	938	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	938	939	939	24	
29	939	939	938	938	937	937	936	935	935	934	934	933	932	931	930	929	928	928	927	926	925	925	924	923	923	939	932	24	
30	922	922	921	920	919	919	918	918	917	917	916	916	915	914	914	914	914	915	914	914	914	913	913	913	913	913	922	916	24
31	913	913	913	913	913	913	913	913	912	913	914	914	915	916	916	917	917	917	917	918	918	919	919	919	912	919	915	24	
HOURLY MAX	939	939	938	938	938	938	938	938	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	939	
HOURLY AVG	925	924	924	924	924	924	924	924	924	924	924	924	924	924	924	925	925	925	925	925	925	925	924	925					

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

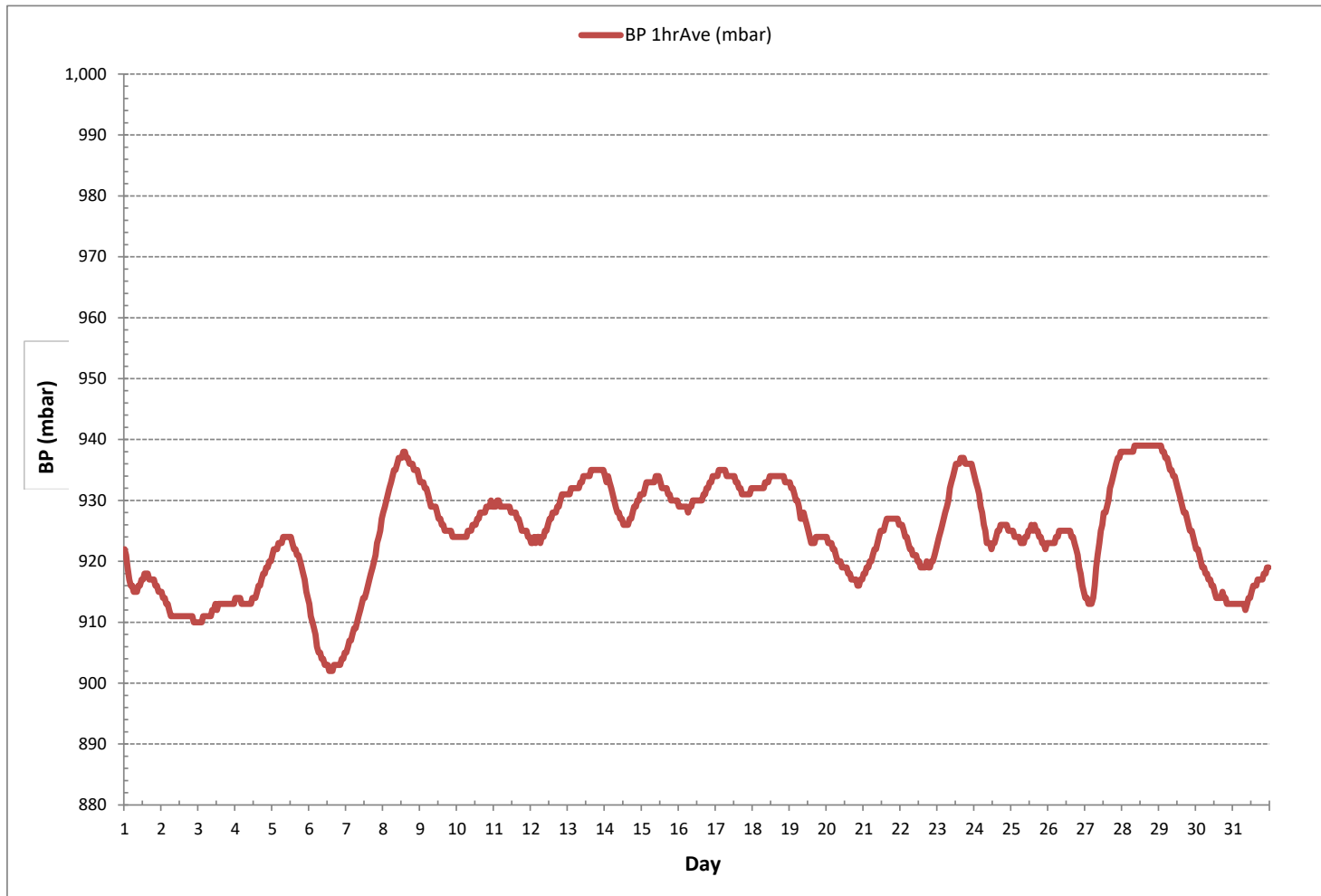
24 HR AVERAGES January 2019



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	902 mbar	@ HOUR	13	ON DAY	6
MAXIMUM 1-HR AVERAGE:	939 mbar	@ HOUR	8	ON DAY	28
MAXIMUM 24-HR AVERAGE:	939 mbar			ON DAY	28
OPERATIONAL TIME:					744 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	9			MONTHLY AVERAGE:	924 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)





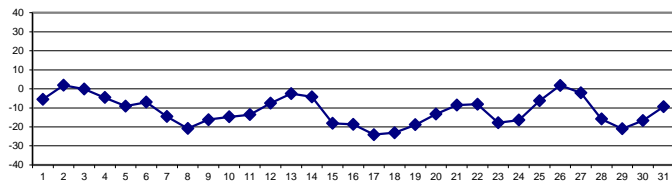
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	-13.7	-13.5	-13.3	-13.0	-12.2	-11.2	-10.4	-8.0	-6.7	-5.3	-2.6	0.5	0.7	-0.1	-0.4	-0.5	-1.4	-2.2	-2.4	-2.5	-3.3	-3.9	-4.6	-5.1	-13.7	0.7	-5.6	24	
2	-4.9	-4.2	-3.3	-2.5	-1.4	-0.5	-0.3	0.2	1.0	3.0	4.2	5.7	6.8	7.2	6.3	5.5	4.7	4.0	3.3	2.9	2.4	2.3	1.5	2.5	-4.9	7.2	1.9	24	
3	2.5	2.1	3.0	2.6	2.1	1.7	1.2	0.3	-0.4	-0.8	-1.0	0.3	1.5	2.0	1.3	0.0	-0.7	-1.5	-1.9	-2.4	-3.0	-3.1	-3.3	-3.8	-3.8	3.0	-0.1	24	
4	-3.0	-3.0	-3.4	-4.0	-3.9	-3.7	-3.7	-3.8	-4.1	-4.2	-4.3	-4.2	-4.3	-4.6	-4.7	-4.7	-4.9	-4.8	-5.0	-5.3	-5.7	-6.4	-7.3	-8.4	-8.4	-3.0	-4.6	24	
5	-9.0	-9.2	-9.5	-9.8	-10.2	-10.4	-11.0	-11.7	-11.5	-11.1	-10.9	-10.7	-9.6	-8.2	-8.0	-8.0	-8.1	-7.7	-7.5	-7.4	-7.3	-7.2	-7.3	-7.4	-11.7	-7.2	-9.1	24	
6	-8.0	-8.2	-8.0	-8.1	-7.8	-7.5	-7.4	-7.2	-6.8	-6.3	-5.8	-5.3	-5.2	-5.5	-7.0	-7.3	-7.2	-7.0	-7.0	-7.1	-7.2	-7.4	-7.4	-7.3	-8.2	-5.2	-7.0	24	
7	-7.7	-8.6	-9.7	-10.5	-11.0	-12.9	-14.4	-14.8	-15.2	-15.2	-15.6	-15.8	-15.8	-15.8	-15.9	-16.3	-16.2	-16.5	-16.7	-17.1	-17.3	-17.3	-17.3	-17.5	-17.5	-7.7	-14.6	24	
8	-18.3	-19.0	-19.6	-20.7	-21.1	-21.3	-21.9	-22.6	-23.0	-22.7	-21.9	-21.0	-19.7	-19.1	-18.2	-18.8	-20.8	-22.1	-22.6	-22.9	-22.2	-22.5	-20.6	-18.8	-23.0	-18.2	-20.9	24	
9	-18.0	-18.2	-17.6	-17.8	-17.3	-17.3	-17.1	-16.7	-16.9	-17.3	-17.0	-16.4	-15.7	-15.3	-15.4	-15.9	-16.1	-15.9	-15.2	-14.7	-14.5	-14.6	-14.5	-14.4	-18.2	-14.4	-16.2	24	
10	-14.5	-14.9	-15.3	-15.2	-15.3	-15.3	-15.1	-15.0	-14.9	-14.5	-14.0	-13.5	-13.3	-13.0	-13.3	-14.2	-14.7	-14.8	-14.9	-15.1	-15.5	-16.0	-16.3	-16.3	-16.3	-13.0	-14.7	24	
11	-16.4	-16.6	-16.9	-16.9	-16.5	-15.7	-15.8	-15.7	-14.9	-13.4	-12.0	-10.4	-9.4	-9.8	-11.0	-11.8	-12.2	-12.4	-12.2	-12.2	-12.4	-12.5	-12.5	-16.9	-9.4	-13.6	24		
12	-12.7	-12.5	-12.1	-11.6	-11.2	-11.7	-12.0	-12.4	-12.5	-11.9	-11.2	-8.7	-7.2	-5.5	-4.7	-4.8	-5.0	-4.9	-0.1	4.0	2.9	-5.3	-3.9	-4.6	-12.7	4.0	-7.5	24	
13	-3.9	-3.4	-3.6	-1.8	-2.7	-3.6	-2.0	-3.0	-2.9	-2.3	-2.7	-1.7	-1.0	-0.8	-1.0	-2.1	-2.7	-2.7	-2.7	-2.8	-3.1	-3.1	-3.1	-3.1	-3.9	-0.8	-2.5	24	
14	-3.0	-3.3	-4.0	-4.4	-5.2	-6.2	-7.3	-8.0	-8.0	-8.8	-8.0	-6.9	-5.9	-3.8	-2.3	-1.7	-1.6	-0.5	1.1	0.7	-0.2	-1.5	-3.6	-6.6	-9.0	1.1	-4.2	24	
15	-9.0	-10.7	-11.6	-12.3	-13.5	-15.8	-18.2	-19.3	-20.6	-21.0	-20.8	-20.4	-19.6	-19.6	-20.2	-20.4	-20.4	-20.3	-20.1	-20.0	-19.8	-19.8	-19.9	-19.9	-21.0	-9.0	-18.1	24	
16	-19.8	-20.0	-20.3	-20.3	-20.2	-20.2	-20.2	-20.0	-19.6	-19.1	-18.5	-18.1	-18.0	-17.7	-17.7	-17.6	-17.5	-17.2	-17.0	-16.9	-16.9	-17.4	-18.4	-20.3	-16.9	-18.7	24		
17	-19.9	-21.2	-22.4	-23.7	-24.6	-25.4	-26.1	-26.6	-27.0	-26.1	-24.3	-22.9	-22.1	-21.8	-22.3	-23.9	-24.6	-25.0	-24.9	-24.6	-25.0	-25.8	-26.0	-27.0	-19.9	-24.1	24		
18	-25.7	-25.9	-25.5	-25.4	-25.5	-25.5	-25.3	-24.8	-24.8	-24.6	-23.5	-22.6	-21.8	-21.5	-21.1	-21.2	-21.2	-21.2	-21.3	-21.3	-21.3	-21.5	-21.3	-21.1	-25.9	-21.1	-23.1	24	
19	-21.5	-21.4	-21.4	-21.0	-20.9	-20.8	-20.6	-20.0	-20.1	-18.5	-18.0	-18.0	-18.1	-18.0	-17.6	-17.2	-16.9	-17.2	-17.6	-17.9	-18.0	-17.8	-17.8	-17.9	-21.5	-16.9	-18.9	24	
20	-17.8	-17.7	-17.7	-17.6	-17.6	-17.3	-17.3	-17.4	-16.9	-16.2	-15.1	-13.2	-11.5	-9.7	-8.5	-7.9	-9.2	-10.4	-10.5	-10.8	-10.9	-10.6	-8.9	-6.8	-17.8	-6.8	-13.2	24	
21	-5.4	-5.9	-6.2	-7.4	-7.3	-7.9	-8.7	-9.7	-10.8	-11.1	-11.0	-10.6	-10.0	-9.2	-8.4	-8.7	-8.9	-9.4	-8.9	-8.8	-8.4	-7.9	-8.1	-8.1	-11.1	-5.4	-8.6	24	
22	-8.9	-9.5	-10.1	-10.9	-10.9	-11.2	-11.4	-11.7	-12.0	-11.5	-10.9	-9.7	-8.4	-7.9	-6.8	-5.6	-5.0	-4.9	-5.0	-4.8	-4.3	-4.0	-4.1	-5.4	-12.0	-4.0	-8.1	24	
23	-7.2	-9.4	-12.0	-13.3	-14.0	-14.8	-16.1	-17.8	-18.9	-20.3	-20.4	-20.2	-19.9	-19.5	-18.9	-18.6	-18.2	-19.3	-20.3	-20.5	-20.9	-21.8	-22.2	-23.0	-23.0	-7.2	-17.8	24	
24	-24.4	-24.6	-25.2	-25.8	-25.7	-25.1	-24.2	-24.0	-23.1	-21.0	-18.0	-14.3	-10.7	-8.6	-7.5	-8.5	-9.1	-9.8	-9.9	-10.2	-10.7	-11.2	-11.5	-11.4	-25.8	-7.5	-16.4	24	
25	-11.3	-11.1	-10.8	-10.3	-9.9	-9.9	-10.2	-10.1	-10.5	-8.9	-7.6	-6.3	-4.6	-3.1	-1.8	-1.3	-1.6	-1.6	-1.8	-2.8	-3.6	-4.1	-4.5	-4.2	-11.3	-1.3	-6.3	24	
26	-2.7	-2.4	-1.6	-1.3	-1.0	0.2	0.3	0.1	-0.1	0.6	1.2	2.7	4.4	5.1	4.3	3.9	3.5	5.1	5.1	3.7	2.9	2.8	3.0	3.9	-2.7	5.1	1.8	24	
27	4.3	4.6	5.5	4.3	3.8	3.8	1.0	-0.2	-1.0	-2.4	-2.9	-2.5	-3.0	-2.7	-2.5	-2.8	-3.9	-4.7	-5.5	-6.4	-7.6	-8.7	-9.9	-10.8	-10.8	5.5	-2.1	24	
28	-11.7	-12.9	-13.8	-14.7	-14.9	-15.2	-14.9	-14.9	-14.9	-15.0	-15.1	-14.3	-14.1	-14.0	-14.0	-14.3	-15.4	-16.8	-17.9	-19.0	-20.1	-20.9	-21.4	-22.2	-22.2	-11.7	-15.9	24	
29	-22.6	-22.8	-23.3	-23.6	-23.3	-23.3	-22.9	-23.0	-22.5	-21.6	-20.5	-19.7	-19.4	-19.6	-19.5	-18.8	-19.4	-19.6	-19.5	-19.8	-20.0	-19.8	-19.8	-20.1	-23.6	-18.8	-21.0	24	
30	-20.3	-20.3	-20.2	-20.0	-19.6	-18.8	-18.2	-17.8	-17.5	-17.0	-16.2	-15.7	-16.0	-16.1	-16.2	-16.2	-16.1	-16.0	-15.5	-14.6	-14.2	-13.6	-12.9	-12.3	-20.3	-12.3	-16.7	24	
31	-11.9	-11.8	-11.5	-11.1	-10.4	-8.8	-8.0	-7.8	-7.5	-6.6	-5.5	-3.3	-5.0	-7.1	-6.8	-7.0	-7.7	-9.3	-11.0	-11.9	-12.5	-13.5	-14.5	-15.5	-15.5	-3.3	-9.4	24	
HOURLY MAX	4.3	4.6	5.5	4.3	3.8	3.8	1.2	0.3	1.0	3.0	4.2	5.7	6.8	7.2	6.3	5.5	4.7	5.1	5.1	4.0	2.9	2.8	3.0	3.9					
HOURLY AVG	-11.8	-12.1	-12.3	-12.5	-12.6	-12.6	-12.9	-13.0	-13.1	-12.7	-12.0	-11.0	-10.2	-9.8	-9.6	-9.8	-10.2	-10.5	-10.5	-10.6	-10.9	-11.4	-11.5	-11.7					

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

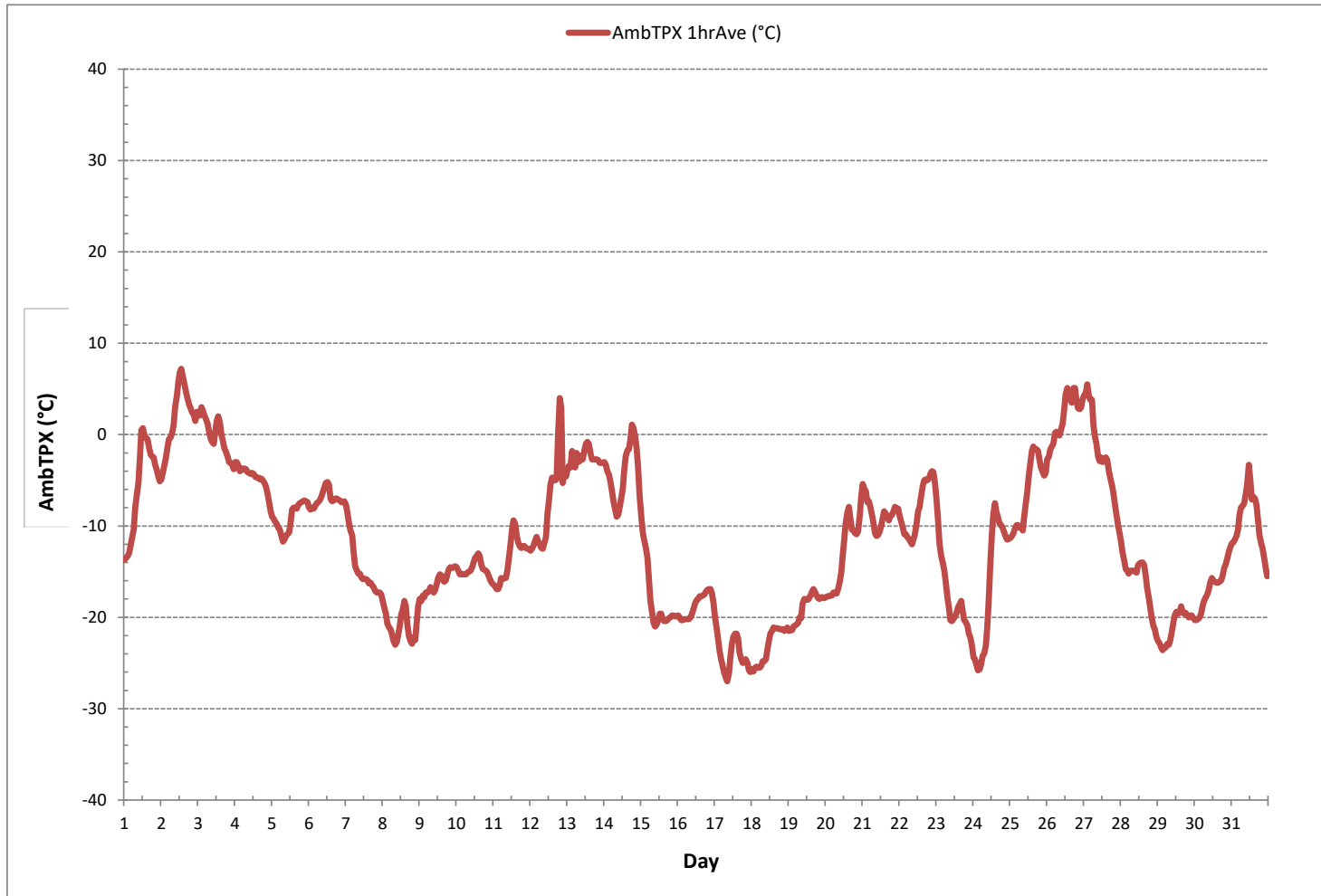
24 HR AVERAGES January 2019



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-27.0 °C	@ HOUR	8	ON DAY	17
MAXIMUM 1-HR AVERAGE:	7.2 °C	@ HOUR	13	ON DAY	2
MAXIMUM 24-HR AVERAGE:	1.9 °C			ON DAY	2
OPERATIONAL TIME:				744	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	7.9			MONTHLY AVERAGE:	-11.5 °C

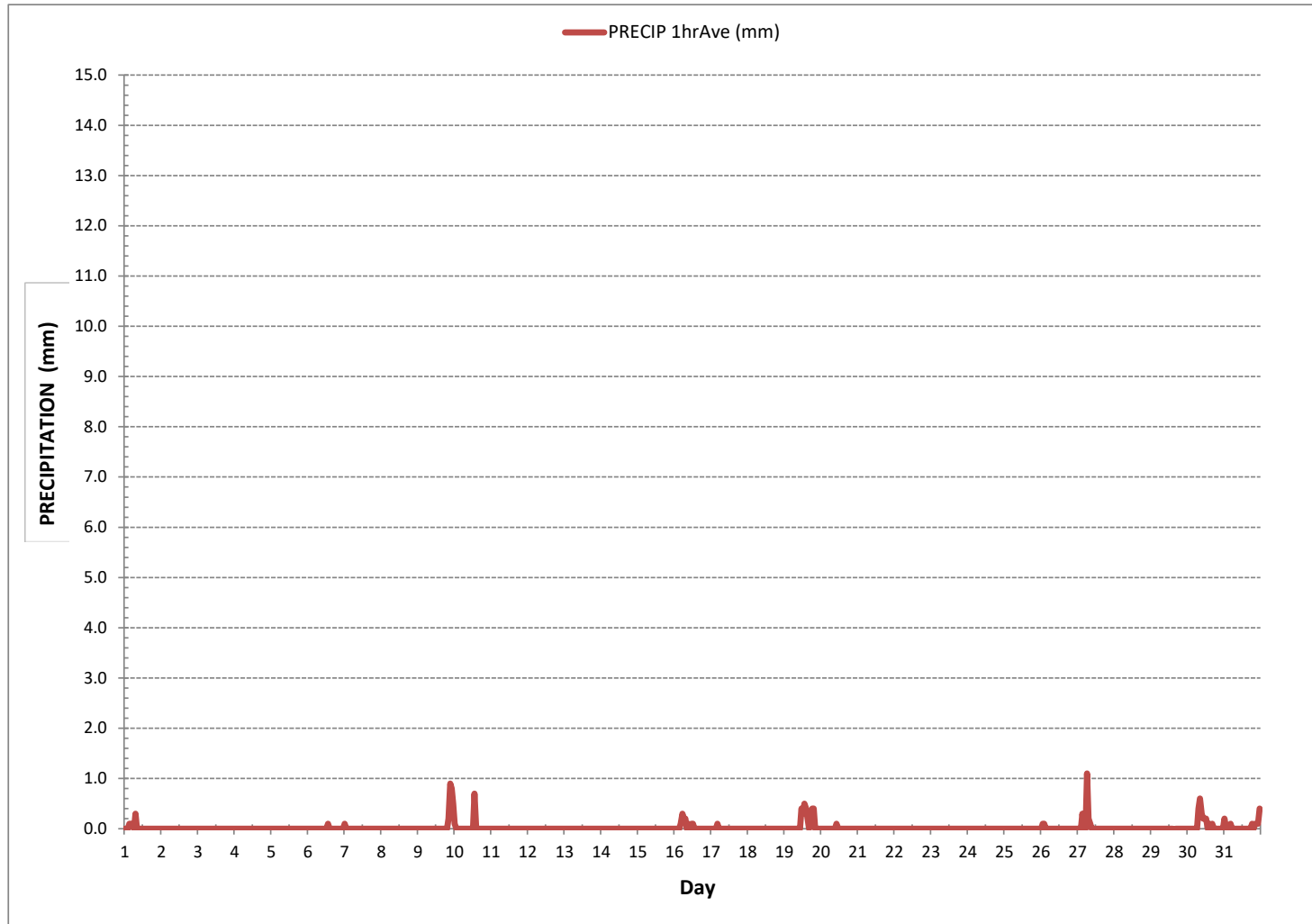
**AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)**







**PRECIPITATION Hourly TOTALS (mm)**





SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59						
DAY 1	0	0	1	1	0	0	0	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
2	0	0	1	2	3	2	2	1	4	S	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	24	
3	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
4	0	0	0	0	0	0	0	S	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	2	1	0	2	0	24	
5	0	1	0	0	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
6	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	
7	0	0	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
8	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	
9	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	24	
10	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	
11	S	0	0	0	0	1	1	1	1	1	1	2	2	3	2	1	1	1	1	1	1	1	1	1	S	0	3	1	24	
12	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	S	1	0	1	0	24	
13	1	1	1	1	1	1	1	1	1	0	0	0	1	2	1	1	1	1	0	0	0	0	S	0	0	0	2	1	24	
14	0	0	0	0	0	1	1	1	1	3	3	3	3	3	1	1	0	0	0	0	0	S	0	0	0	0	3	1	24	
15	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0	0	0	0	1	0	24	
17	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	1	0	S	0	0	0	0	0	0	0	0	1	0	24	
18	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24	
19	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	S	0	0	0	1	0	0	0	0	0	0	1	0	24	
20	0	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	0	1	1	24	
21	1	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	1	0	24	
22	0	0	0	0	1	1	1	1	1	2	1	2	S	2	3	3	3	2	1	1	1	1	0	0	0	0	3	1	24	
23	0	0	0	0	0	0	0	0	0	0	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
24	0	0	0	1	0	0	0	1	1	1	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
25	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	24	
26	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	0	2	0	24
27	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	24
28	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
29	0	0	0	0	0	S	0	S1	S1	0	0	S1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	21	
30	1	1	1	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	24	
31	0	0	0	S	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	24	
HOURLY MAX	1	1	1	2	3	2	2	1	4	3	3	3	3	3	3	3	3	2	1	1	2	2	2	2	1					
HOURLY AVG	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0					

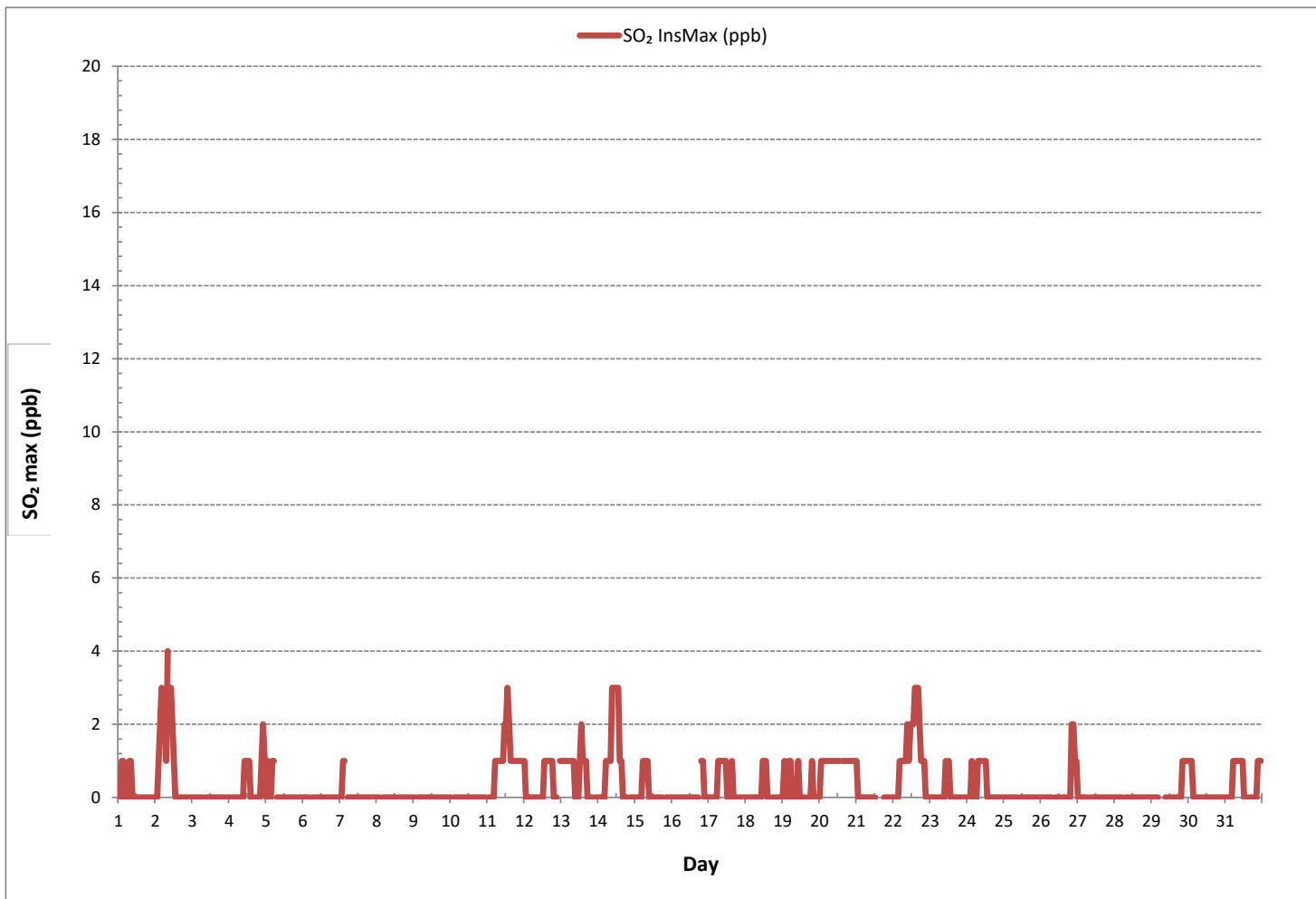
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	166
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 8 ON DAY 2
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	741 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - January 2019

HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	2	1	2	2	2	2	2	2	1	2	1	24
2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	24
3	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	24
4	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	24
5	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	24
6	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	24
7	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	2	2	24
8	2	2	2	S	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	22
9	1	1	S	1	1	1	S1	S1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	22
10	1	S	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	2	1	24
11	S	2	1	2	2	2	2	2	1	1	2	2	1	2	1	2	2	2	2	2	2	2	2	S	1	2	2	2	24
12	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	24
13	3	2	2	2	2	3	2	2	3	2	2	3	2	3	3	3	3	3	3	3	3	3	S	3	3	2	3	3	24
14	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	S	3	3	3	2	3	3	3	24
15	3	3	3	2	2	3	2	S1	S1	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	3	2	22
16	2	2	2	2	2	2	2	2	2	1	2	1	2	1	1	2	1	2	S	2	2	2	2	1	1	1	2	2	24
17	2	2	1	2	1	2	1	2	1	2	1	1	1	1	2	2	2	S	1	1	1	1	1	1	1	1	2	1	24
18	1	1	1	1	1	1	1	S1	2	1	1	C	C	C	C	C	C	C	C	1	1	1	1	1	1	1	2	1	23
19	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	0	1	0	24
20	1	0	0	0	0	0	0	1	0	0	1	0	1	1	S	1	1	1	1	1	1	1	1	1	1	0	1	1	24
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	24
22	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	2	1	1	2	1	1	1	2	2	1	2	1	24
23	1	1	1	2	1	1	1	1	2	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
24	1	1	1	1	1	1	1	1	1	1	1	S	1	0	1	0	0	1	1	1	1	1	1	1	1	0	1	1	24
25	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	24
26	1	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	24
27	2	3	2	2	2	3	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	S1	S1	2	2	2	3	2	22
28	1	2	2	1	1	2	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
29	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
30	1	1	1	1	S	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
31	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	2	1	2	24
HOURLY MAX	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
HOURLY AVG	2	2	2	2	1	2	1	2	1	1	1	1	1	1	2	1	2	2	2	2	2	1	1	2	2	1	2	1	24

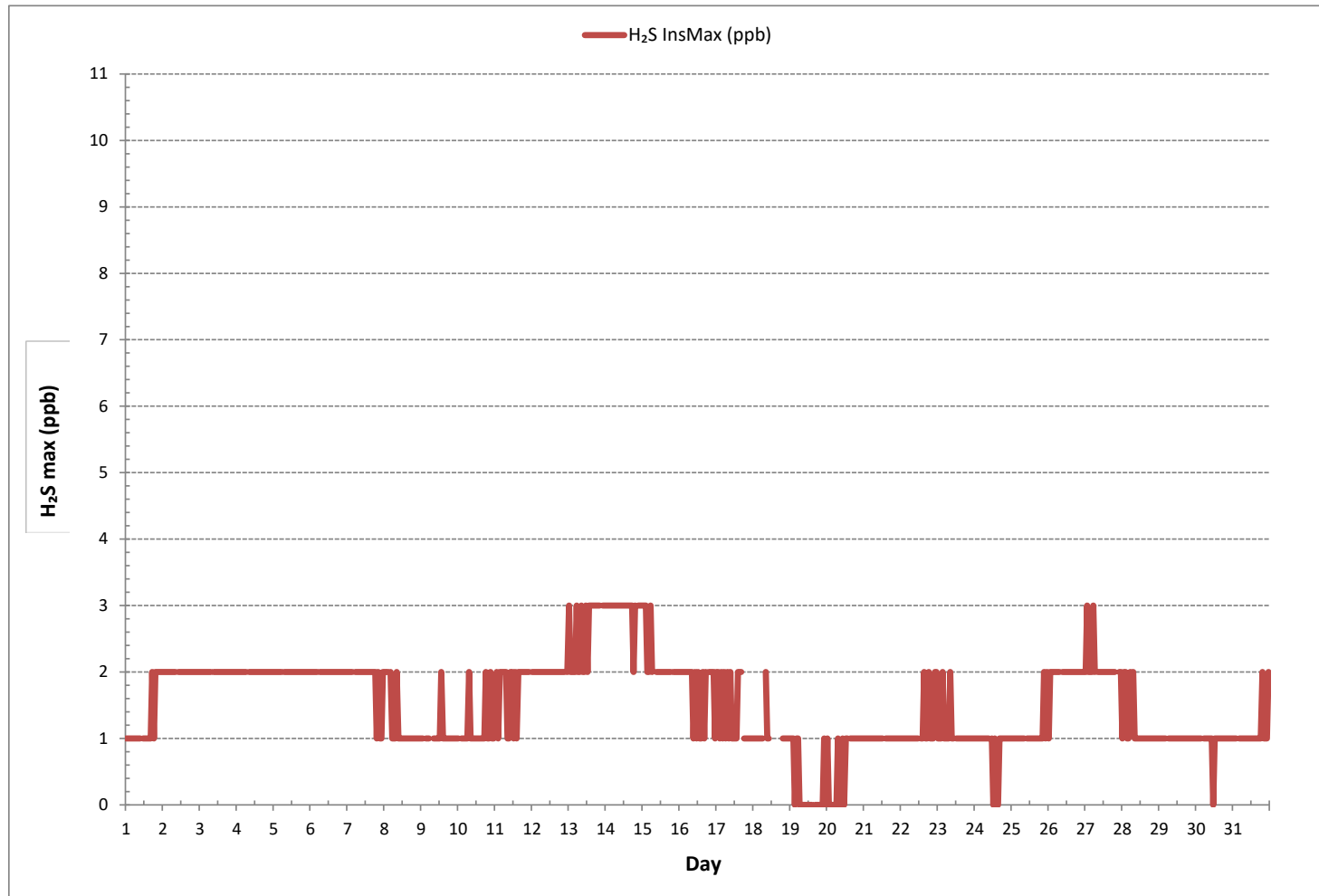
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	668
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 0 ON DAY 13
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	737 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)





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	2.06	2.09	2.10	2.11	2.10	2.08	2.10	2.08	2.07	2.04	S	2.05	1.98	2.02	2.10	2.07	1.97	1.97	1.97	1.98	2.00	1.98	1.97	1.99	1.97	2.11	2.04	24	
2	2.01	2.01	2.02	2.06	2.04	2.02	2.02	2.03	2.04	S	2.03	2.01	2.01	1.97	1.98	1.99	1.99	1.98	1.98	1.99	1.99	1.99	2.01	1.99	1.97	2.06	2.01	24	
3	1.99	2.02	1.97	1.97	1.97	1.97	1.96	1.96	S	1.97	1.99	1.98	2.29	2.79	2.10	1.99	2.00	2.03	2.01	2.01	2.05	2.19	2.03	2.01	1.96	2.79	2.05	24	
4	2.22	2.23	2.11	2.02	2.74	2.05	2.09	S	2.40	2.41	2.41	2.26	2.21	2.24	2.17	2.19	2.44	2.47	2.22	2.00	2.16	2.15	2.09	2.13	2.00	2.74	2.24	24	
5	2.14	2.10	2.31	2.25	2.46	2.37	S	2.26	2.53	2.31	2.60	2.19	2.04	2.09	2.18	2.10	2.35	2.21	2.10	2.08	2.08	2.06	2.05	2.05	2.04	2.60	2.21	24	
6	2.01	2.02	2.01	2.03	2.01	S	2.03	2.03	2.00	2.11	2.13	2.15	2.25	2.59	2.08	2.13	2.11	X	X	X	X	X	X	X	2.00	2.59	2.11	17	
7	X	X	X	X	X	X	X	X	X	X	X	S	S	2.36	2.34	2.29	2.28	2.39	2.16	2.28	2.27	2.49	2.35	2.26	2.16	2.49	2.32	13	
8	2.18	2.45	2.40	S	2.16	2.31	2.64	2.42	2.33	2.17	2.08	2.45	2.23	2.23	2.28	2.05	2.06	2.08	2.07	2.07	2.11	2.10	2.09	2.11	2.05	2.64	2.22	24	
9	2.11	3.09	S	2.86	2.27	2.37	2.51	2.54	2.51	2.38	2.58	2.49	2.29	2.28	2.29	2.22	2.30	2.20	2.29	2.49	2.24	2.22	2.10	2.30	2.10	3.09	2.39	24	
10	2.32	S	2.38	2.24	2.08	2.11	2.11	2.37	2.30	2.32	2.56	2.57	2.64	2.18	2.13	2.15	3.24	2.06	2.07	2.22	2.29	2.21	2.19	2.26	2.06	3.24	2.30	24	
11	S	2.23	2.29	2.32	2.29	2.27	2.30	2.30	2.29	2.28	2.18	2.18	2.18	2.18	2.24	2.36	2.36	2.40	2.42	2.47	2.51	2.47	2.36	S	2.18	2.51	2.31	24	
12	2.28	2.23	2.20	2.20	2.22	2.23	2.41	2.35	2.26	2.26	2.28	2.29	2.27	2.27	2.28	2.31	2.67	2.34	2.29	2.08	2.34	2.48	S	2.48	2.08	2.67	2.31	24	
13	2.67	2.43	2.39	2.37	2.39	2.44	3.36	2.30	2.25	2.58	2.75	2.27	2.62	2.62	2.53	2.62	2.66	2.59	2.61	2.63	2.63	S	2.67	2.89	2.25	3.36	2.58	24	
14	4.50	2.59	2.60	2.61	2.62	2.74	2.76	2.67	2.67	2.57	2.56	2.51	2.45	2.52	2.35	2.37	2.36	2.32	2.13	2.07	S	1.99	2.01	2.00	1.99	4.50	2.52	24	
15	2.01	2.02	2.04	2.04	2.09	2.21	2.22	2.28	2.61	2.61	2.21	2.17	2.41	2.59	2.69	2.49	2.52	2.37	2.31	S	2.41	2.46	2.41	2.34	2.01	2.69	2.33	24	
16	2.60	2.40	2.51	2.34	2.42	2.16	2.15	2.15	2.17	2.36	2.11	2.13	2.06	2.10	2.11	2.20	2.20	S	2.12	2.18	2.28	2.27	2.06	2.06	2.60	2.60	2.23	24	
17	2.06	2.06	2.10	2.22	2.13	2.14	2.13	2.13	2.29	2.19	2.38	2.26	2.29	2.62	2.57	2.52	2.10	S	2.76	2.54	2.48	2.57	2.63	2.50	2.06	2.76	2.33	24	
18	2.65	2.41	2.77	2.38	2.46	2.25	2.39	2.33	2.50	2.45	2.35	2.43	2.42	2.45	2.36	2.46	S	2.41	2.67	2.39	2.54	2.34	2.66	2.72	2.25	2.77	2.47	24	
19	2.58	2.33	2.59	2.37	2.57	2.40	2.40	2.34	2.36	2.31	2.22	2.08	2.03	2.06	2.04	S	2.02	2.04	2.06	2.07	2.07	2.10	2.10	2.13	2.02	2.59	2.23	24	
20	2.10	2.10	2.10	2.09	2.10	2.09	2.10	2.08	2.07	2.10	2.11	2.13	2.16	2.17	S	2.19	2.20	2.21	2.23	2.21	2.23	2.23	2.23	2.21	2.07	2.23	2.15	24	
21	2.17	2.35	2.59	2.48	2.47	2.12	2.19	2.38	2.46	2.32	2.38	2.33	2.34	C	C	C	C	C	C	2.66	2.07	2.10	2.16	2.14	2.05	2.05	2.66	2.30	24
22	2.07	2.07	2.09	2.09	2.10	2.14	2.13	2.11	2.10	2.12	2.14	2.14	S	2.13	2.13	2.11	2.11	2.08	2.09	2.11	2.11	2.07	2.00	2.02	2.00	2.14	2.10	24	
23	2.04	2.06	2.02	2.01	1.97	1.97	1.99	1.99	1.96	1.95	1.96	S	1.96	1.99	2.04	2.07	2.15	1.97	1.98	1.98	1.95	1.98	1.97	2.01	1.95	2.15	2.00	24	
24	2.03	2.07	2.08	2.07	2.06	2.06	2.07	2.08	2.09	2.10	S	2.10	2.07	2.03	1.98	1.98	1.97	1.98	1.97	1.98	1.97	2.02	2.01	2.42	1.97	2.42	2.05	24	
25	2.28	2.03	2.02	2.08	2.04	2.04	2.00	2.03	2.00	S	1.99	1.98	1.97	1.98	2.17	14.62	8.08	1.96	2.26	2.22	2.04	2.46	2.14	2.04	1.96	14.62	2.89	24	
26	2.01	1.98	1.97	1.97	1.95	1.92	1.91	1.91	S	1.92	1.91	1.94	1.93	2.13	1.91	1.94	1.95	1.94	1.99	1.93	1.96	1.96	1.97	1.97	1.91	2.13	1.95	24	
27	1.97	2.00	2.02	2.02	1.97	2.02	1.91	S	1.94	1.96	1.99	1.98	1.96	1.96	1.95	1.94	1.94	1.97	1.99	2.04	1.95	2.09	1.96	2.05	1.91	2.09	1.98	24	
28	2.02	1.97	1.99	3.24	2.74	2.75	S	2.24	2.69	1.97	1.95	1.93	1.94	1.94	1.95	1.95	2.05	1.95	1.96	1.97	1.96	1.97	1.97	1.97	1.93	3.24	2.13	24	
29	1.97	2.00	2.01	2.40	2.33	S	2.04	2.05	2.04	2.03	2.08	2.12	2.24	2.24	2.17	4.40	2.19	2.20	2.24	2.27	2.30	2.29	2.25	2.27	1.97	4.40	2.27	24	
30	2.23	2.21	2.20	2.19	S	2.21	2.22	2.17	2.09	2.05	2.06	2.11	2.11	2.11	2.10	2.10	2.12	2.14	2.18	2.08	2.04	2.05	2.06	2.07	2.04	2.23	2.13	24	
31	2.09	2.10	2.11	S	2.14	2.14	2.16	2.19	2.15	2.13	2.12	2.10	2.17	2.18	2.13	2.04	2.03	2.05	2.04	2.02	2.01	2.02	2.02	2.03	2.01	2.19	2.09	24	
HOURLY MAX	4.50	3.09	2.77	3.24	2.74	2.75	3.36	2.67	2.69	2.61	2.75	2.57	2.64	2.79	2.69	14.62	8.08	2.59	2.76	2.63	2.63	2.57	2.67	2.89					
HOURLY AVG	2.25	2.19	2.21	2.25	2.24	2.20	2.23	2.21	2.26	2.21	2.23	2.18	2.19	2.23	2.18	2.68	2.43	2.16	2.20	2.15	2.17	2.19	2.16	2.18					

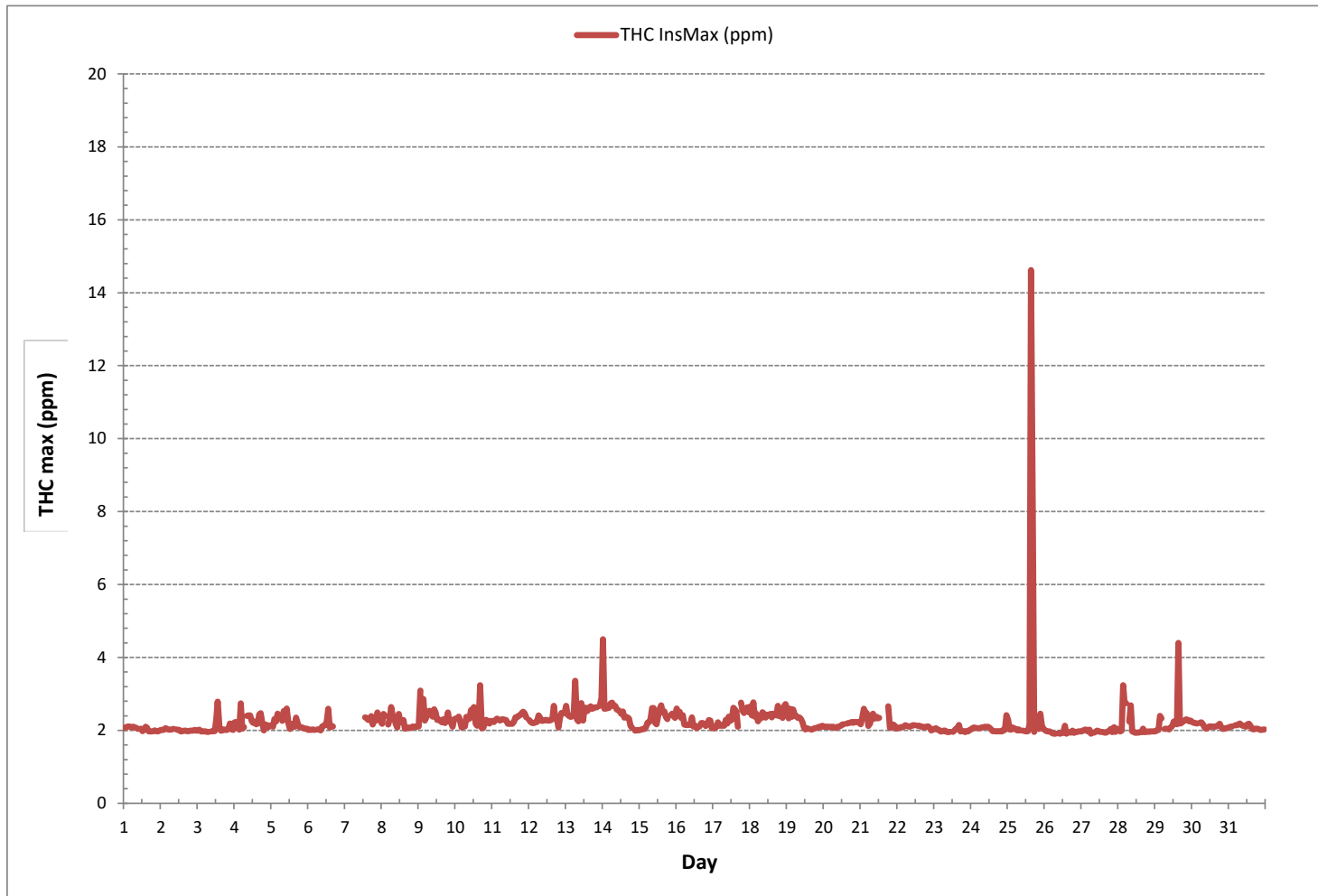
STATUS FLAG CODES

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:	689
MAXIMUM INSTANTANEOUS VALUE:	14.62 ppm @ HOUR 15 ON DAY 25
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	726 hrs
STANDARD DEVIATION:	0.58

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - January 2019

METHANE MAX Instantaneous Maximum (CH<sub>4</sub> 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	2.09	2.10	2.11	2.10	2.08	2.10	2.08	2.07	2.04	S	2.05	1.98	2.02	2.10	2.07	1.97	1.97	1.97	1.98	2.00	1.98	1.97	1.99	1.97	2.11	2.04	24
2	2.01	2.01	2.02	2.02	2.03	2.02	2.02	2.03	2.04	S	2.03	2.01	2.00	1.97	1.98	1.99	1.99	1.98	1.98	1.99	1.99	1.99	2.01	1.99	1.97	2.04	2.00	24
3	1.99	1.99	1.97	1.97	1.97	1.97	1.96	1.96	S	1.97	1.99	1.98	2.29	2.79	2.10	1.99	2.00	2.03	2.01	2.01	2.05	2.19	2.03	2.01	1.96	2.79	2.05	24
4	2.22	2.23	2.11	2.02	2.74	2.05	2.09	S	2.40	2.41	2.41	2.26	2.21	2.24	2.17	2.19	2.44	2.47	2.22	2.00	2.16	2.15	2.09	2.13	2.00	2.74	2.24	24
5	2.14	2.10	2.31	2.25	2.46	2.37	S	2.26	2.53	2.31	2.60	2.19	2.04	2.09	2.18	2.10	2.35	2.21	2.10	2.08	2.08	2.06	2.05	2.05	2.04	2.60	2.21	24
6	2.01	2.02	2.01	2.03	2.01	S	2.03	2.03	2.00	2.11	2.13	2.15	2.25	2.59	2.08	2.13	2.11	X	X	X	X	X	X	X	2.00	2.59	2.11	17
7	X	X	X	X	X	X	X	X	X	X	X	S	S	2.36	2.34	2.29	2.28	2.39	2.16	2.28	2.27	2.49	2.35	2.26	2.16	2.49	2.32	13
8	2.18	2.45	2.40	S	2.16	2.31	2.64	2.42	2.33	2.17	2.08	2.45	2.23	2.23	2.28	2.05	2.06	2.08	2.07	2.07	2.11	2.10	2.09	2.11	2.05	2.64	2.22	24
9	2.11	3.09	S	2.86	2.27	2.37	2.51	2.54	2.51	2.38	2.58	2.49	2.29	2.28	2.29	2.22	2.30	2.20	2.29	2.49	2.24	2.22	2.10	2.30	2.10	3.09	2.39	24
10	2.32	S	2.38	2.24	2.08	2.11	2.11	2.37	2.30	2.32	2.56	2.57	2.64	2.18	2.13	2.15	3.24	2.06	2.07	2.22	2.29	2.21	2.19	2.23	2.06	3.24	2.30	24
11	S	2.23	2.29	2.32	2.29	2.27	2.30	2.30	2.29	2.28	2.18	2.18	2.18	2.18	2.24	2.36	2.36	2.40	2.42	2.47	2.45	2.40	2.36	S	2.18	2.47	2.31	24
12	2.28	2.23	2.20	2.20	2.22	2.23	2.41	2.35	2.26	2.26	2.28	2.29	2.27	2.27	2.28	2.31	2.67	2.34	2.28	2.08	2.34	2.48	S	2.40	2.08	2.67	2.30	24
13	2.41	2.43	2.39	2.37	2.39	2.37	3.36	2.30	2.25	2.58	2.75	2.27	2.62	2.62	2.53	2.62	2.66	2.59	2.61	2.63	2.63	S	2.67	2.89	2.25	3.36	2.56	24
14	4.50	2.59	2.60	2.61	2.62	2.74	2.76	2.67	2.67	2.57	2.56	2.43	2.39	2.38	2.35	2.37	2.31	2.32	2.13	2.07	S	1.99	2.01	2.00	1.99	4.50	2.51	24
15	2.01	2.02	2.04	2.04	2.09	2.21	2.22	2.28	2.61	2.61	2.21	2.17	2.41	2.59	2.69	2.49	2.52	2.37	2.31	S	2.41	2.46	2.41	2.34	2.01	2.69	2.33	24
16	2.60	2.40	2.51	2.34	2.42	2.16	2.15	2.15	2.15	2.17	2.36	2.11	2.13	2.06	2.10	2.11	2.20	2.20	S	2.12	2.18	2.28	2.27	2.07	2.06	2.60	2.23	24
17	2.06	2.06	2.10	2.22	2.13	2.14	2.13	2.13	2.29	2.19	2.38	2.26	2.29	2.62	2.57	2.52	2.10	S	2.76	2.54	2.48	2.57	2.63	2.50	2.06	2.76	2.33	24
18	2.65	2.41	2.77	2.38	2.46	2.25	2.39	2.33	2.50	2.45	2.35	2.43	2.42	2.45	2.35	2.46	S	2.41	2.67	2.39	2.54	2.34	2.66	2.72	2.25	2.77	2.47	24
19	2.58	2.33	2.59	2.37	2.57	2.40	2.40	2.34	2.36	2.31	2.22	2.08	2.03	2.06	2.04	S	2.02	2.04	2.06	2.07	2.07	2.10	2.10	2.13	2.02	2.59	2.23	24
20	2.10	2.10	2.10	2.09	2.10	2.09	2.10	2.08	2.07	2.10	2.11	2.13	2.16	2.17	S	2.19	2.20	2.21	2.23	2.23	2.23	2.23	2.21	2.07	2.23	2.15	2.24	24
21	2.17	2.35	2.59	2.48	2.47	2.12	2.19	2.38	2.46	2.32	2.38	2.33	2.34	C	C	C	C	C	2.66	2.07	2.10	2.16	2.14	2.05	2.05	2.66	2.30	24
22	2.07	2.07	2.09	2.09	2.10	2.14	2.13	2.11	2.10	2.12	2.14	2.14	S	2.13	2.13	2.10	2.11	2.08	2.09	2.11	2.11	2.07	2.00	2.02	2.00	2.14	2.10	24
23	2.04	2.06	2.02	2.01	1.97	1.97	1.99	1.99	1.96	1.95	1.96	S	1.96	1.99	2.04	2.07	2.15	1.97	1.98	1.98	1.95	1.98	1.97	2.01	1.95	2.15	2.00	24
24	2.03	2.07	2.08	2.07	2.06	2.06	2.07	2.08	2.09	2.10	S	2.10	2.07	2.03	1.98	1.98	1.97	1.98	1.97	1.98	1.96	2.02	2.01	2.42	1.96	2.42	2.05	24
25	2.28	2.03	2.02	2.08	2.04	2.04	2.00	2.03	2.00	S	1.99	1.98	1.97	1.98	2.17	14.10	7.86	1.96	2.26	2.22	2.04	2.46	2.14	2.04	1.96	14.10	2.86	24
26	2.01	1.98	1.97	1.94	1.95	1.92	1.91	1.91	S	1.92	1.91	1.94	1.93	2.13	1.91	1.94	1.95	1.94	1.99	1.93	1.96	1.96	1.97	1.97	1.91	2.13	1.95	24
27	1.97	2.02	2.02	2.02	1.97	2.02	1.91	S	1.94	1.96	1.99	1.98	1.96	1.96	1.95	1.94	1.94	1.97	1.99	2.04	1.95	2.09	1.96	2.05	1.91	2.09	1.98	24
28	2.02	1.97	1.99	3.24	2.74	2.75	S	2.24	2.69	1.97	1.95	1.93	1.94	1.94	1.95	1.95	2.05	1.95	1.96	1.97	1.96	1.97	1.97	1.97	1.93	3.24	2.13	24
29	1.97	2.00	2.01	2.40	2.33	S	2.03	2.05	2.04	2.03	2.08	2.12	2.24	2.24	2.17	2.09	2.19	2.20	2.24	2.27	2.30	2.29	2.25	2.27	1.97	2.40	2.17	24
30	2.23	2.21	2.20	2.19	S	2.21	2.22	2.17	2.09	2.05	2.06	2.11	2.11	2.11	2.10	2.10	2.12	2.14	2.18	2.08	2.04	2.05	2.06	2.07	2.04	2.23	2.13	24
31	2.09	2.10	2.11	S	2.14	2.14	2.16	2.19	2.15	2.13	2.12	2.10	2.17	2.18	2.12	2.04	2.03	2.05	2.05	2.04	2.02	2.01	2.02	2.03	2.01	2.19	2.09	24
HOURLY MAX	4.50	3.09	2.77	3.24	2.74	2.75	3.36	2.67	2.69	2.61	2.75	2.57	2.64	2.79	2.69	14.10	7.86	2.59	2.76	2.63	2.63	2.57	2.67	2.89				
HOURLY AVG	2.25	2.19	2.21	2.25	2.24	2.20	2.22	2.21	2.26	2.21	2.23	2.18	2.19	2.23	2.18	2.58	2.42	2.16	2.20	2.15	2.17	2.18	2.16	2.18				

STATUS FLAG CODES

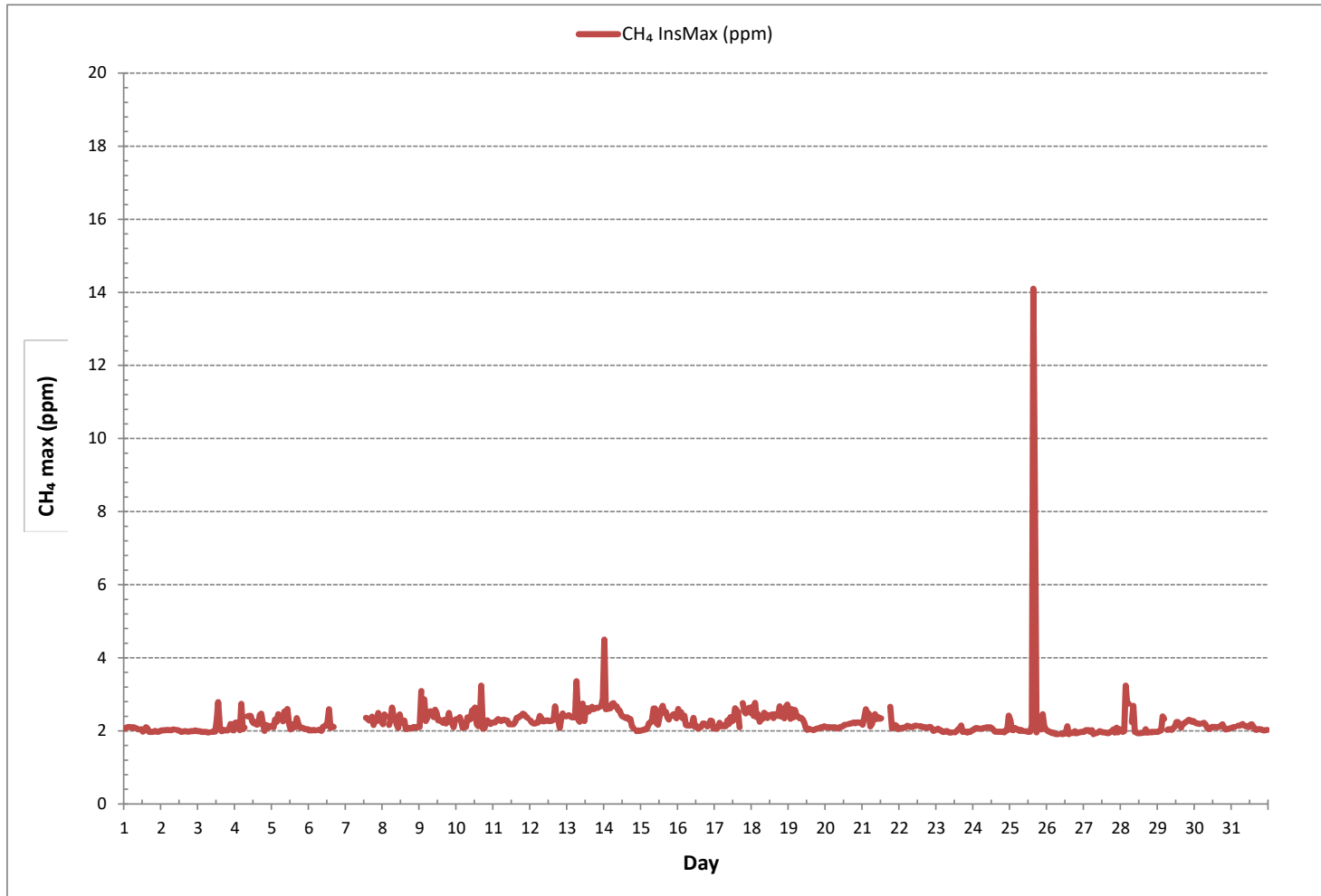
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	689
MAXIMUM INSTANTANEOUS VALUE:	14.10 ppm @ HOUR 15 ON DAY 25
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	726 hrs
STANDARD DEVIATION:	0.55



METHANE MAX Instantaneous Maximum (CH<sub>4</sub> ppm)





NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	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	0.02	0.00	24
2	0.00	0.01	0.01	0.05	0.03	0.00	0.00	0.01	0.01	S	0.01	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.01	24
3	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	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	0.01	0.00	0.05	0.00	24
4	0.00	0.00	0.00	0.00	0.00	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	0.01	0.00	0.00	0.01	0.00	0.00	0.02	0.00	24
5	0.00	0.00	0.00	0.00	0.00	0.00	S	0.07	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	0.07	0.00	24
6	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	X	X	X	X	X	X	X	0.00	0.01	0.00	17
7	X	X	X	X	X	X	X	X	X	X	X	S	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	13
8	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.01	24
9	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
10	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	0.06	0.00	0.06	0.00	24
11	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	0.09	0.08	0.00	S	0.00	0.09	0.01	24
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.06	S	0.09	0.00	0.09	0.01	24
13	0.30	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.07	0.00	0.01	0.00	0.00	0.01	0.16	0.01	S	0.00	0.00	0.00	0.30	0.03	24
14	0.05	0.02	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.11	0.07	0.15	0.00	0.00	0.09	0.00	0.00	0.00	S	0.00	0.02	0.00	0.00	0.15	0.02	24
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
17	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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
18	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	0.04	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	24
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
20	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
21	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	24
22	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	S	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
23	0.00	0.00	0.00	0.00	0.00	0.00	0.03	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	0.03	0.00	24
24	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	0.01	0.00	0.00	0.00	0.00	0.01	0.00	24
25	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	0.52	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.03	24
26	0.00	0.00	0.00	0.03	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	24
27	0.00	0.00	0.00	0.00	0.00	0.00	S	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	0.00	0.00	0.00	0.00	0.01	0.00	24
28	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
29	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	2.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.32	0.10	24
30	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
31	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	0.00	0.00	0.01	0.00	24
HOURLY MAX	0.30	0.05	0.01	0.05	0.03	0.17	0.06	0.07	0.01	0.01	0.01	0.11	0.12	0.15	0.04	2.32	0.23	0.00	0.01	0.16	0.09	0.08	0.02	0.09				
HOURLY AVG	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.10	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01				

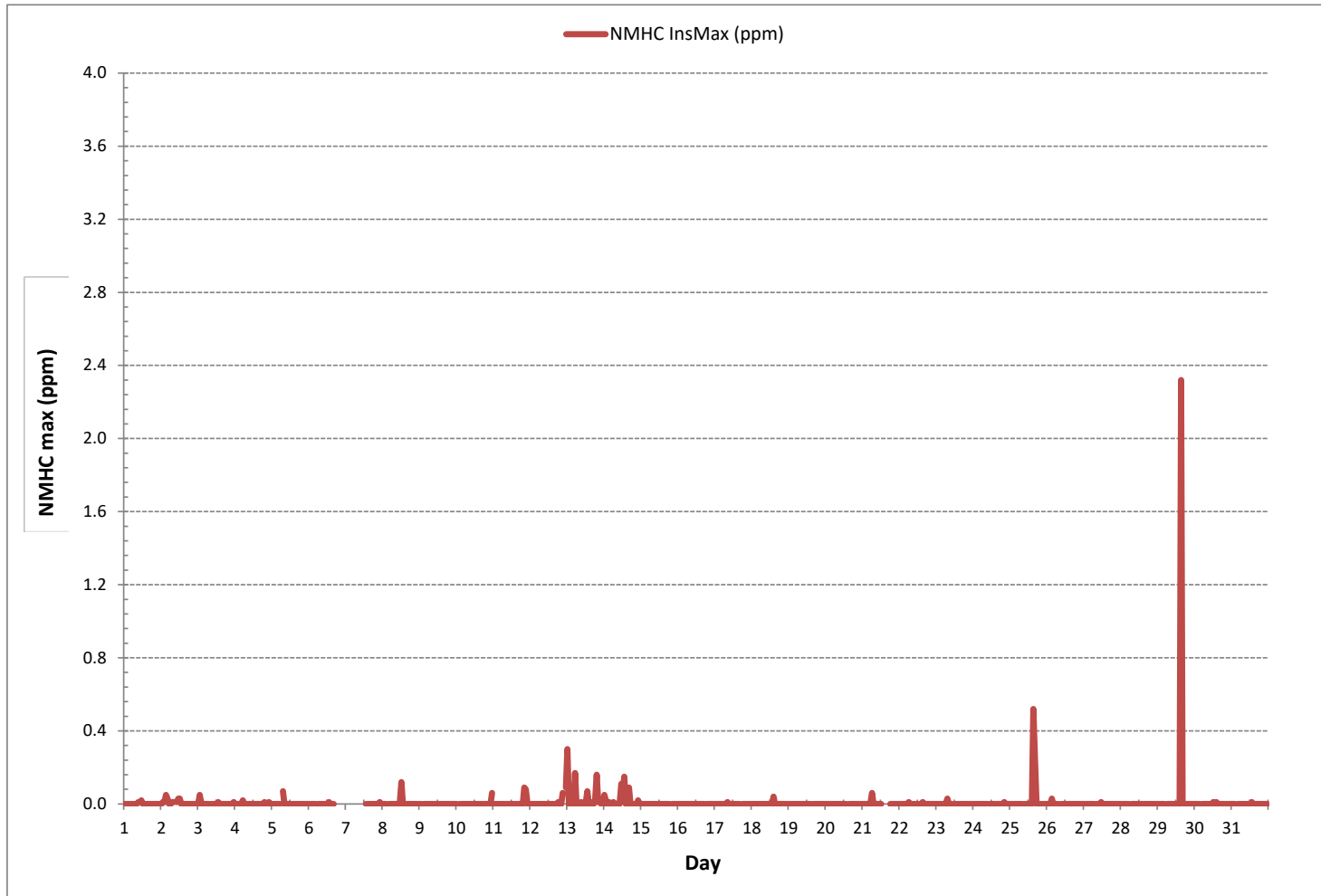
STATUS FLAG CODES

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:	60
MAXIMUM INSTANTANEOUS VALUE:	2.32 ppm @ HOUR 15 ON DAY 29
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	726 hrs
STANDARD DEVIATION:	0.09

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - January 2019

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	3	4	5	4	4	4	5	6	6	5	S	3	2	3	2	3	2	2	2	1	1	1	1	2	1	6	3	24		
2	2	2	2	4	5	5	5	5	14	S	9	7	5	6	4	4	5	4	4	3	2	2	41	4	2	41	6	24		
3	2	2	1	1	1	1	1	2	S	23	4	14	1	1	4	6	2	2	4	3	3	2	2	2	2	1	23	4	24	
4	2	2	2	2	3	1	1	S	3	4	6	7	9	10	8	9	23	9	6	3	9	9	7	6	1	23	6	24		
5	2	5	4	4	4	5	S	1	1	1	1	1	2	3	3	3	3	2	2	2	2	2	2	2	1	5	3	24		
6	2	2	2	2	2	S	2	2	2	2	3	3	3	3	5	8	7	6	3	8	3	2	2	2	2	8	3	24		
7	1	1	3	4	S	3	1	1	1	1	3	1	1	1	3	5	1	1	2	1	1	1	2	1	1	1	5	2	24	
8	1	1	1	S	1	1	1	1	1	5	1	3	2	2	5	7	21	4	5	2	2	2	2	2	1	21	3	24		
9	3	4	S	6	4	5	4	4	4	4	4	3	3	3	2	2	3	2	2	2	1	2	1	1	1	6	3	24		
10	2	S	1	1	1	1	1	1	1	2	2	1	1	1	1	2	3	2	3	2	2	3	5	4	1	5	2	24		
11	S	4	4	4	4	4	4	4	4	5	4	4	5	6	6	7	6	7	7	7	7	6	5	S	4	7	5	24		
12	5	4	4	4	4	4	4	4	4	5	11	6	7	22	30	20	13	18	16	14	5	11	25	S	15	4	30	11	24	
13	16	17	17	16	15	15	11	12	10	8	11	10	14	16	16	20	21	19	14	10	7	S	6	5	5	21	13	24		
14	6	7	9	11	11	10	10	11	11	21	23	31	24	24	27	30	29	18	5	4	S	3	2	2	2	31	14	24		
15	1	1	1	1	3	5	4	3	3	4	3	2	2	2	2	2	3	3	3	S	3	4	4	4	1	5	3	24		
16	4	4	4	3	3	3	3	4	5	3	3	2	2	3	3	5	5	5	S	7	9	14	14	3	2	14	5	24		
17	3	4	5	6	6	6	9	10	10	10	9	5	3	3	4	131	6	S	6	6	6	5	6	6	3	131	11	24		
18	7	7	6	5	5	4	3	3	4	4	4	5	4	5	5	4	S	4	4	4	4	4	3	3	3	7	4	24		
19	3	3	3	3	3	3	2	2	2	2	2	1	1	1	1	S	1	1	1	1	2	2	2	2	1	3	2	24		
20	2	2	2	2	2	2	2	2	2	4	3	5	10	9	S	6	7	18	8	8	7	8	10	9	2	18	6	24		
21	8	6	5	5	4	3	3	5	2	3	2	4	4	C	C	C	C	C	C	C	C	C	7	2	2	3	2	8	4	24
22	3	4	5	7	10	13	13	13	10	20	12	14	S	18	19	26	29	18	20	16	15	9	3	3	3	29	13	24		
23	3	5	3	1	1	2	4	3	2	5	1	S	3	1	2	1	2	3	2	8	1	1	1	2	1	8	2	24		
24	2	2	3	7	8	7	6	9	8	10	S	12	9	6	4	3	3	2	2	2	1	1	1	1	1	12	5	24		
25	1	1	2	2	1	1	1	9	2	S	3	3	6	5	11	2	1	3	6	2	3	3	3	3	1	11	3	24		
26	2	2	2	1	1	1	1	1	S	4	3	1	2	7	4	4	1	2	1	1	1	4	6	8	7	1	8	3	24	
27	5	2	3	1	1	1	1	S	2	2	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	5	1	24		
28	0	0	0	0	0	0	S	5	0	1	0	1	0	1	1	1	1	0	1	1	2	1	2	1	0	5	1	24		
29	1	1	1	2	2	S	2	2	3	3	4	4	5	5	4	3	5	5	6	6	6	6	5	5	1	6	4	24		
30	5	4	4	4	S	4	3	3	2	2	2	3	4	4	4	4	4	4	4	4	3	3	3	3	2	5	4	24		
31	3	3	3	S	4	6	8	13	9	18	12	10	6	6	4	4	2	2	3	3	5	5	4	6	2	18	6	24		
HOURLY MAX	16	17	17	16	15	15	13	13	14	23	23	31	24	30	27	131	29	19	20	16	15	25	41	15						
HOURLY AVG	3	4	4	4	4	4	4	5	4	7	5	6	5	6	6	11	7	6	5	4	4	4	5	4						

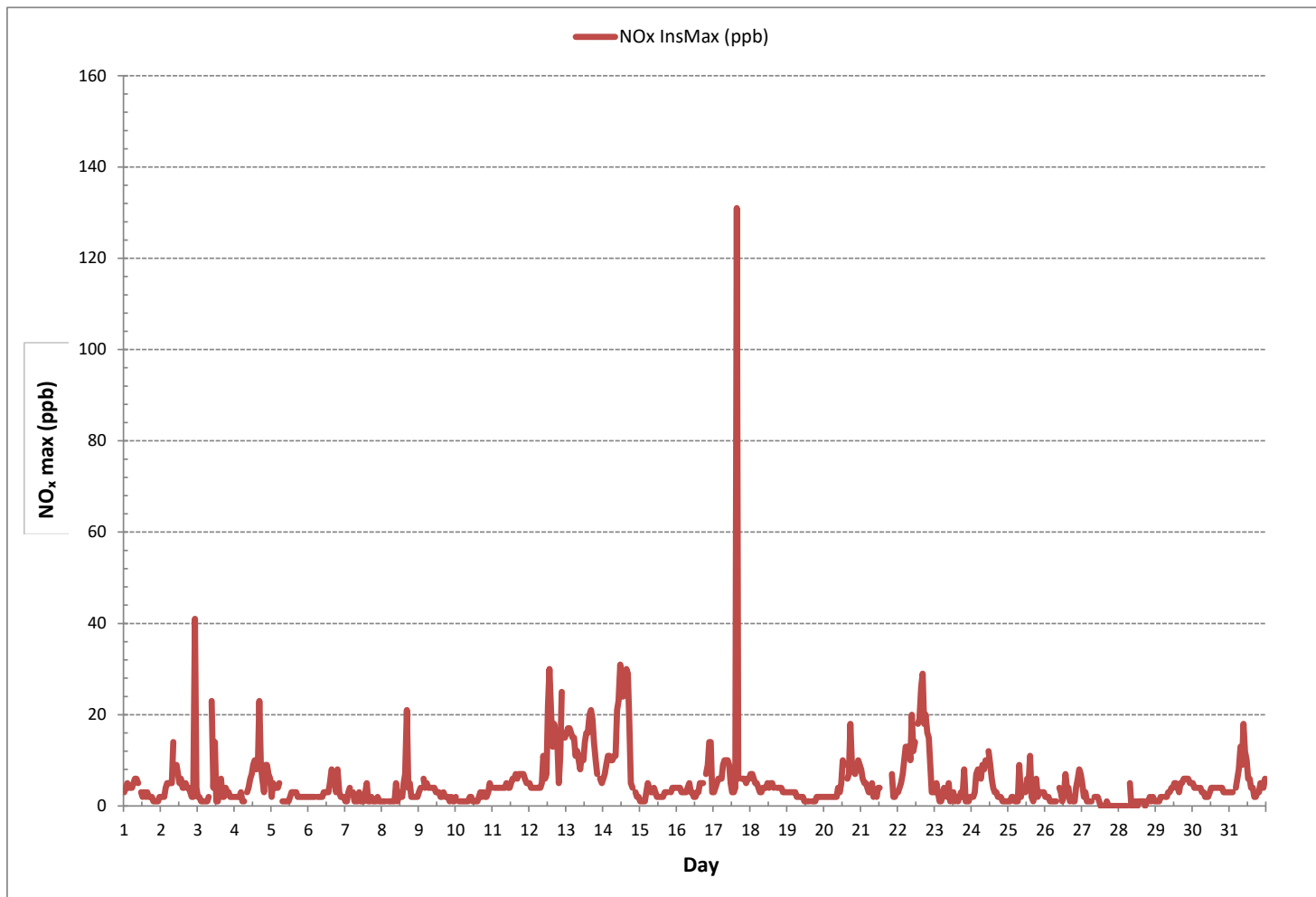
STATUS FLAG CODES

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:	685
MAXIMUM INSTANTANEOUS VALUE:	131 ppb @ HOUR 15 ON DAY 17
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	7

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> 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	1	0	0	0	0	0	0	0	0	S	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	24	
2	0	0	0	0	0	0	0	0	0	5	S	1	1	1	1	0	0	0	2	1	0	0	0	40	1	0	40	2	24			
3	0	0	0	0	0	0	0	1	S	13	0	6	0	0	2	3	0	0	1	0	0	0	0	0	0	0	0	13	1	24		
4	0	0	0	0	0	0	0	S	0	0	1	1	2	2	1	1	5	0	0	0	0	0	0	0	0	0	0	5	1	24		
5	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	24		
7	0	0	0	0	S	0	0	0	0	0	3	0	0	0	3	2	0	0	0	0	0	0	1	0	0	0	0	3	0	24		
8	0	0	0	S	0	0	0	1	0	2	0	1	1	1	1	2	7	1	1	0	0	0	0	0	0	0	0	7	1	24		
9	0	0	S	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
10	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	1	0	24			
11	S	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	S	0	1	0	24			
12	0	0	0	0	0	0	0	0	0	8	2	2	12	18	8	4	2	0	0	0	0	0	9	S	0	0	18	3	24			
13	0	0	0	0	0	0	0	0	0	1	2	2	4	5	4	4	3	0	0	0	0	0	S	0	0	0	5	1	24			
14	0	0	0	0	0	0	0	1	1	5	8	14	9	9	9	9	5	1	0	0	S	0	0	0	0	0	14	3	24			
15	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	S	0	0	0	0	0	1	0	24			
16	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24			
17	0	0	0	0	0	0	0	0	1	2	2	2	1	1	1	81	0	S	0	0	0	0	0	0	0	0	0	81	4	24		
18	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	1	0	24			
19	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	24		
20	0	0	0	0	0	0	0	0	0	1	1	2	5	5	S	1	1	6	0	0	0	0	0	0	0	0	0	6	1	24		
21	0	0	0	0	0	0	0	2	0	1	0	3	2	C	C	C	C	C	C	C	C	1	0	0	0	0	0	3	1	24		
22	0	0	0	0	0	0	0	2	1	7	3	4	S	6	5	10	11	1	4	0	1	0	0	0	0	0	11	2	24			
23	0	0	0	0	0	0	0	1	0	2	0	S	1	0	1	1	1	2	1	5	0	0	0	0	0	0	0	5	1	24		
24	0	0	0	0	0	0	0	2	1	5	S	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	6	1	24			
25	0	0	0	0	0	0	0	3	1	S	1	1	5	4	5	1	0	1	1	0	0	0	0	0	0	0	5	1	24			
26	0	0	0	0	0	0	0	0	S	1	0	1	1	4	1	2	0	0	0	0	0	1	2	0	0	0	4	1	24			
27	0	0	1	0	0	0	0	S	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24			
28	0	0	0	0	0	0	S	2	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0	24			
29	0	0	0	0	0	S	0	0	0	0	1	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0	24			
30	0	0	0	0	S	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24			
31	0	0	0	S	0	0	0	3	1	6	5	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	6	1	24			
HOURLY MAX	0	0	1	0	0	0	0	3	5	13	8	14	12	18	9	81	11	6	4	5	1	9	40	1								
HOURLY AVG	0	0	0	0	0	0	0	1	0	2	1	2	2	2	2	4	1	0	0	0	0	0	1	0								

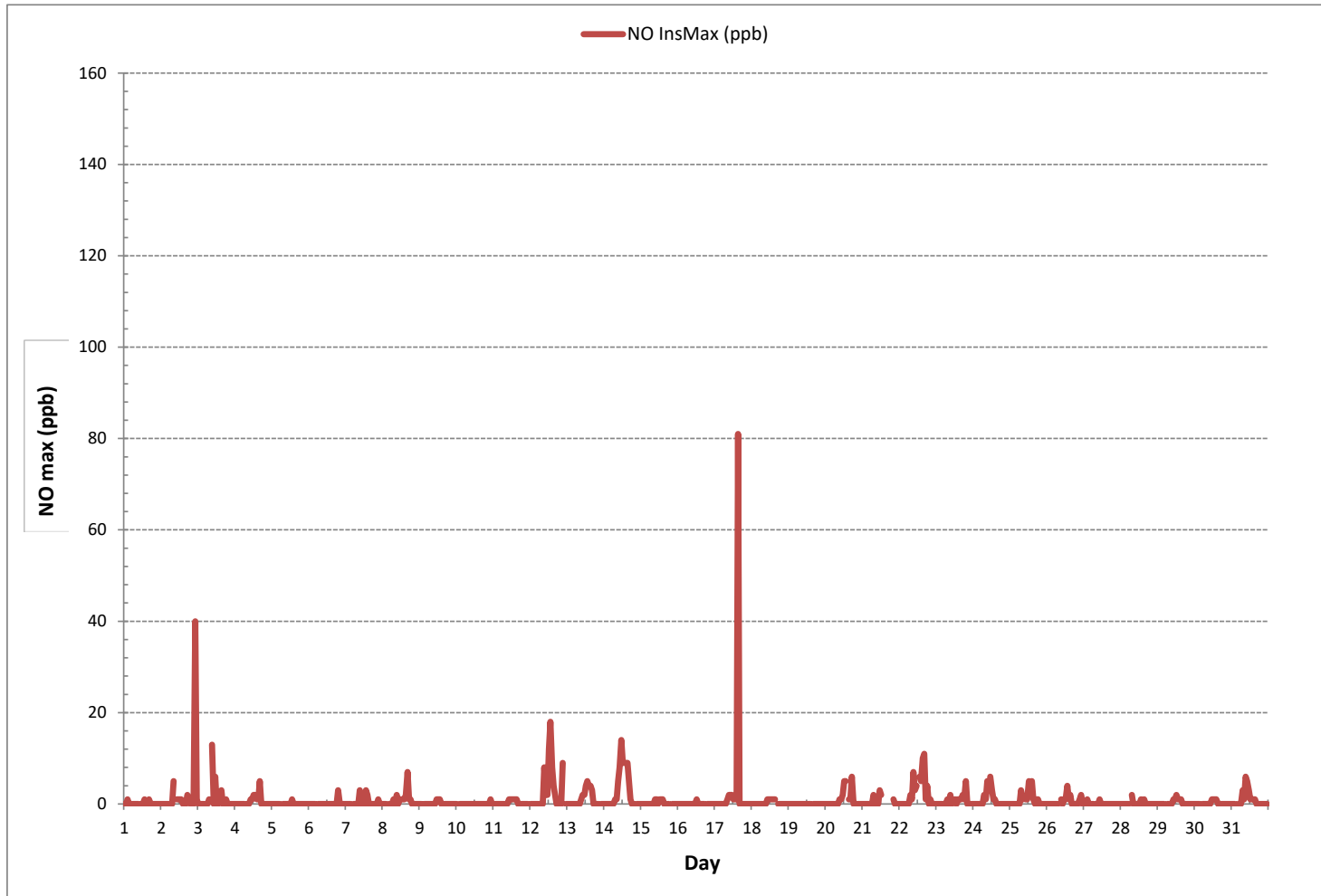
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	182
MAXIMUM INSTANTANEOUS VALUE:	81 ppb @ HOUR 15 ON DAY 17
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	744 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> 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	3	4	4	4	4	5	6	6	5	S	3	2	2	2	2	2	2	2	2	2	1	2	2	1	6	3	24	
2	2	2	2	4	5	6	5	5	11	S	8	6	4	5	4	4	5	3	3	3	3	2	8	3	2	11	4	24	
3	2	2	1	1	1	1	1	2	S	10	3	8	1	1	2	4	2	2	3	3	3	3	2	2	2	1	10	3	24
4	2	2	2	2	3	1	1	S	3	4	5	6	8	8	7	9	18	9	6	4	9	9	7	6	1	18	6	24	
5	2	5	5	4	4	5	S	1	1	1	1	1	2	3	3	3	3	3	2	2	2	2	2	2	1	5	3	24	
6	2	2	2	2	2	S	2	2	2	2	3	3	3	3	5	7	7	6	3	5	3	2	2	2	2	7	3	24	
7	1	1	3	4	S	3	1	1	1	1	1	1	1	1	3	1	1	2	1	1	1	1	1	1	1	4	1	24	
8	1	1	1	S	1	1	1	1	1	4	1	2	1	2	4	5	14	4	4	2	2	2	2	3	1	14	3	24	
9	3	4	S	6	4	5	4	4	4	4	3	3	2	2	2	2	3	2	2	2	2	2	2	2	2	6	3	24	
10	2	S	1	1	1	1	1	1	1	2	2	1	1	1	1	2	3	2	3	2	2	3	4	4	1	4	2	24	
11	S	4	4	4	4	4	5	4	4	5	4	4	4	4	5	6	6	7	7	7	7	7	6	5	S	4	7	24	
12	5	4	4	4	4	4	4	4	5	6	4	5	10	12	13	11	16	16	14	5	11	15	S	15	4	16	8	24	
13	16	17	17	16	15	15	11	12	10	8	9	8	10	11	13	17	20	19	14	10	7	S	6	5	5	20	13	24	
14	6	7	9	11	11	10	10	10	11	17	15	17	15	16	19	22	25	18	5	4	S	3	2	2	2	25	11	24	
15	1	1	1	1	3	5	4	3	3	4	3	1	2	2	2	2	3	3	3	S	3	4	4	4	1	5	3	24	
16	4	4	4	3	3	3	3	4	5	3	2	2	2	2	3	4	5	5	S	7	10	14	14	3	2	14	5	24	
17	3	4	5	6	6	7	9	10	10	8	6	3	2	2	3	82	6	S	6	6	6	6	5	6	6	82	9	24	
18	7	8	6	5	5	4	3	3	4	3	4	3	4	4	4	S	4	5	4	4	3	3	3	3	3	8	4	24	
19	3	3	3	3	3	3	3	2	2	2	2	1	1	1	1	S	1	1	1	2	2	2	2	2	1	3	2	24	
20	2	2	2	2	2	2	2	2	3	3	3	5	5	S	6	7	13	8	8	7	8	10	10	2	13	5	24		
21	8	7	5	5	4	3	3	2	2	2	2	2	2	C	C	C	C	C	C	C	C	6	2	2	3	2	8	4	24
22	3	4	5	7	10	13	13	11	9	14	9	10	S	12	14	17	22	17	17	15	15	9	3	3	3	22	11	24	
23	3	5	3	1	1	2	4	2	2	3	1	S	2	1	1	1	1	1	1	2	1	1	1	2	1	5	2	24	
24	2	2	3	7	8	7	7	7	7	S	8	7	5	3	2	2	2	2	2	2	1	1	1	1	1	8	4	24	
25	1	1	2	2	1	1	1	5	2	S	2	2	4	2	7	2	1	3	6	2	3	3	2	2	1	7	2	24	
26	2	2	1	1	1	1	1	1	S	2	2	1	2	3	3	2	1	1	1	1	1	4	6	7	7	1	7	2	24
27	5	2	2	1	1	1	1	S	2	1	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	5	1	24	
28	0	0	0	0	0	0	S	2	0	1	0	0	0	0	1	0	1	0	1	1	2	1	2	1	0	2	1	24	
29	1	1	1	2	2	S	2	2	3	3	3	3	4	4	3	3	5	5	6	6	6	6	5	5	1	6	4	24	
30	5	4	4	4	S	4	3	3	2	2	2	3	4	4	4	4	4	4	4	4	3	3	3	3	2	5	3	24	
31	3	3	3	S	4	5	8	10	8	12	8	7	5	5	4	3	2	2	3	3	5	5	4	6	2	12	5	24	
HOURLY MAX	16	17	17	16	15	15	13	12	11	17	15	17	15	16	19	82	25	19	17	15	15	15	14	15					
HOURLY AVG	3	4	4	4	4	4	4	4	4	5	4	4	4	4	5	8	6	5	5	4	4	4	4	4					

STATUS FLAG CODES

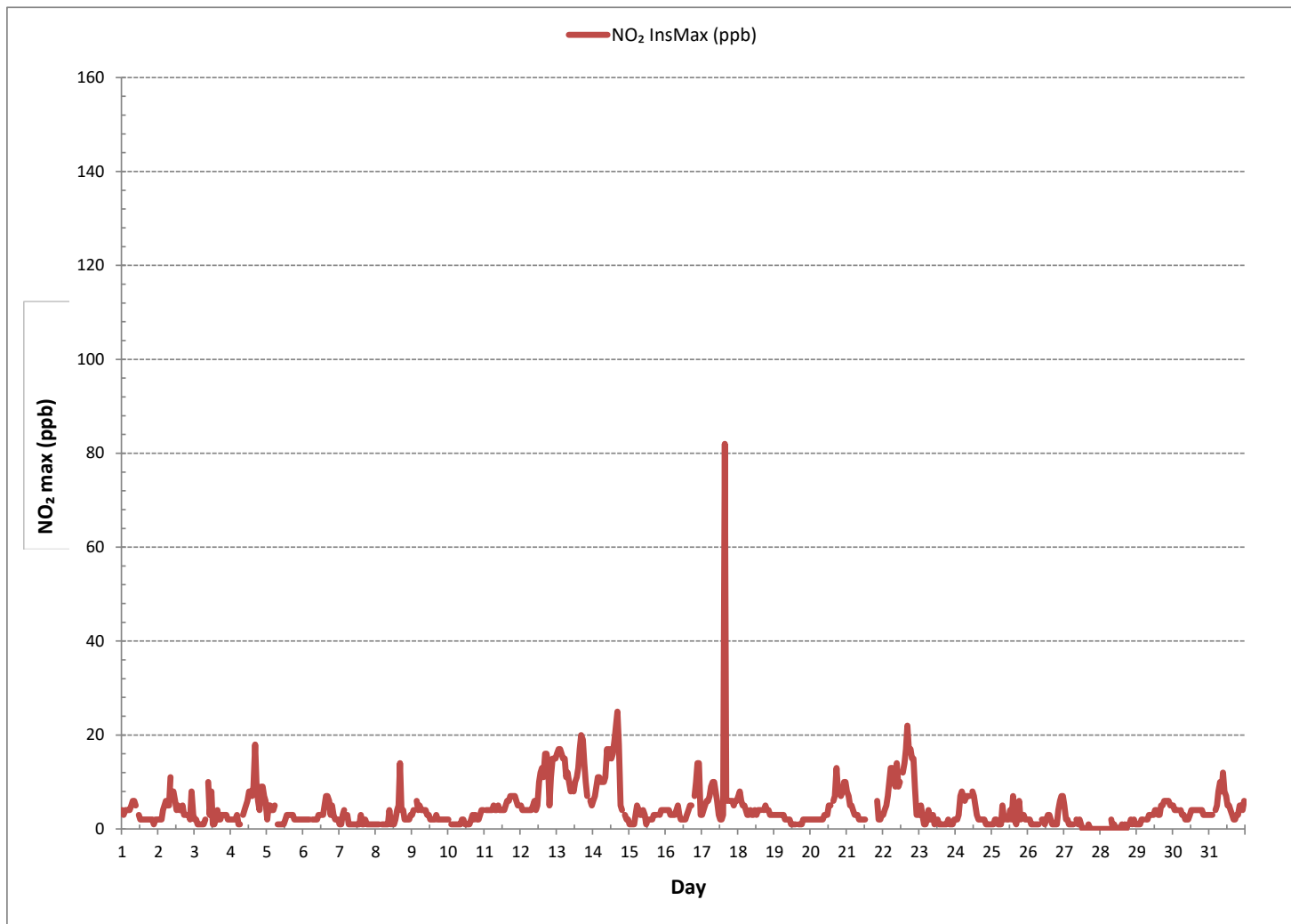
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	82 ppb @ HOUR 15 ON DAY 17
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	744 hrs



NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - January 2019

OZONE Instantaneous Maximum (O<sub>3</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY 1	32.2	31.3	28.8	26.6	27.5	28.0	27.7	28.3	30.9	34.9	S	40.6	40.5	40.3	40.3	40.4	40.5	39.9	38.2	38.3	38.2	37.5	36.3	35.4	26.6	40.6	34.9	24				
2	35.1	34.4	33.2	31.6	29.7	28.8	30.8	31.6	30.8	S	34.3	36.9	39.9	40.6	40.3	39.1	39.0	38.9	38.7	38.2	37.5	37.4	37.0	38.0	28.8	40.6	35.7	24				
3	38.3	39.4	40.1	39.5	39.1	39.5	39.7	39.0	S	38.3	37.9	40.3	41.7	42.5	42.5	42.3	40.1	37.7	35.8	34.5	34.7	34.6	34.5	34.5	34.5	34.5	42.5	38.5	24			
4	34.6	35.7	35.7	34.2	35.4	37.6	38.1	S	37.2	34.9	34.9	32.7	30.7	31.8	34.2	30.8	28.9	31.3	32.4	32.6	31.5	26.1	27.7	33.7	26.1	38.1	33.2	24				
5	33.8	32.6	29.9	30.9	30.7	34.4	S	36.8	36.2	35.8	36.6	36.2	34.9	33.2	33.7	33.7	33.9	35.1	35.7	35.6	35.8	36.2	35.8	35.2	29.9	36.8	34.5	24				
6	34.1	34.1	34.0	33.5	33.7	S	34.0	34.2	34.0	33.6	31.5	29.3	28.7	30.6	30.6	28.6	25.8	28.6	28.6	28.4	30.2	30.3	30.4	30.2	25.8	34.2	31.2	24				
7	30.4	30.3	29.3	25.4	S	32.3	33.5	33.4	33.9	31.6	31.4	33.6	34.6	35.7	36.0	35.4	35.2	35.6	37.1	37.3	37.2	37.3	37.3	37.2	25.4	37.3	34.0	24				
8	36.6	37.0	37.3	S	38.1	38.4	38.1	37.7	37.2	37.2	37.3	37.5	38.1	38.2	38.4	38.1	36.3	35.9	35.8	36.1	37.7	37.2	38.0	37.4	35.8	38.4	37.4	24				
9	35.4	34.4	S	32.8	33.6	32.9	34.9	36.5	36.8	34.7	35.1	35.9	36.1	36.4	36.3	35.3	34.7	35.3	35.1	34.6	35.1	35.0	35.4	36.4	32.8	36.8	35.1	24				
10	36.4	S	35.3	35.2	35.0	35.0	35.6	35.7	35.6	35.6	36.0	36.3	36.2	36.3	36.3	36.2	35.0	35.3	35.4	35.3	35.1	34.6	32.7	31.8	31.8	36.4	35.3	24				
11	S	31.5	30.3	30.1	30.9	30.9	30.4	30.1	30.2	31.0	31.6	31.6	31.4	31.1	30.2	29.9	28.7	28.5	27.9	27.6	28.2	27.9	27.3	S	27.3	31.6	29.9	24				
12	26.7	26.8	26.9	26.3	25.2	25.2	24.7	24.5	24.3	23.9	23.4	23.4	22.9	22.7	22.4	20.5	17.4	20.2	33.5	40.7	41.4	15.8	S	18.2	15.8	41.4	25.1	24				
13	18.2	18.6	18.3	36.1	28.1	27.7	31.1	28.2	25.8	26.1	26.1	26.3	23.7	21.6	20.0	16.4	9.5	10.4	14.1	15.8	15.9	S	18.6	18.5	9.5	36.1	21.5	24				
14	17.6	15.3	14.2	12.1	19.9	18.0	18.6	18.6	18.1	17.2	18.3	20.7	20.9	23.0	22.6	21.9	20.7	32.6	33.5	32.8	S	35.2	34.4	34.8	12.1	35.2	22.6	24				
15	31.5	31.2	28.3	26.3	24.9	28.3	28.3	28.3	29.8	32.2	33.3	33.1	32.7	32.6	32.0	31.5	31.0	31.2	S	30.8	30.6	29.7	28.9	24.9	33.3	30.1	24					
16	28.2	28.3	30.9	31.2	31.1	31.1	30.7	30.1	28.8	29.6	31.0	31.1	31.0	30.8	31.3	31.0	32.2	32.3	S	36.9	26.8	26.9	31.6	31.5	26.8	36.9	30.6	24				
17	32.9	32.9	32.5	29.8	29.3	28.8	27.6	25.4	25.4	27.3	32.2	36.5	37.8	37.7	36.3	34.3	33.7	S	33.3	33.6	34.4	34.5	33.4	32.1	25.4	37.8	32.2	24				
18	32.7	31.9	33.5	33.8	34.6	34.6	34.7	34.5	34.2	34.4	35.5	C	C	C	C	C	C	C	C	C	C	C	C	33.6	33.7	33.9	34.5	34.6	31.9	35.5	34.0	24
19	34.3	35.0	34.3	34.9	35.1	35.4	36.3	37.6	37.7	41.7	42.4	43.0	43.1	43.2	43.3	S	43.4	43.1	42.5	41.9	41.3	40.7	40.1	39.5	34.3	43.4	39.6	24				
20	39.4	39.0	38.7	38.7	38.6	38.5	37.6	37.5	37.0	35.8	34.9	34.3	33.1	31.7	S	29.8	28.4	27.4	26.8	27.5	27.0	26.4	25.8	27.8	25.8	39.4	33.1	24				
21	31.0	30.3	29.8	27.7	26.2	25.9	25.0	25.9	26.0	26.4	27.3	27.5	27.7	S	28.2	28.2	27.7	27.4	27.4	26.5	27.5	28.4	28.6	29.3	25.0	31.0	27.6	24				
22	28.6	27.8	26.6	24.2	23.3	20.3	21.1	23.2	25.0	26.1	25.7	25.6	S	26.6	26.5	24.5	23.5	24.7	25.5	25.0	29.5	35.1	33.5	32.8	20.3	35.1	26.3	24				
23	30.4	22.8	27.3	32.5	37.2	38.0	34.2	35.8	37.5	39.2	39.2	S	38.6	38.5	39.5	39.6	39.4	39.0	38.6	38.8	39.0	38.9	38.9	38.7	22.8	39.6	36.6	24				
24	36.3	36.7	36.2	33.9	28.4	28.1	28.5	27.3	26.4	26.1	S	28.0	31.3	34.3	35.7	35.6	36.6	35.9	36.2	36.9	36.9	35.9	35.6	35.2	26.1	36.9	33.1	24				
25	34.8	34.1	33.8	34.3	34.7	34.5	34.9	35.4	35.1	S	35.8	36.6	37.4	38.7	41.1	42.8	43.1	42.7	42.6	42.0	37.2	35.5	35.5	37.5	33.8	43.1	37.4	24				
26	37.8	38.0	38.9	38.8	38.4	39.4	39.5	39.5	S	39.3	39.3	39.9	40.6	40.7	39.9	38.4	37.4	39.4	39.6	38.6	36.1	31.5	29.4	32.3	29.4	40.7	37.9	24				
27	36.9	37.9	40.0	40.3	39.5	39.5	39.0	S	42.7	40.6	40.2	40.9	41.1	41.2	42.4	42.2	41.8	41.6	43.4	44.1	44.5	45.4	45.3	45.4	36.9	45.4	41.5	24				
28	44.8	44.2	44.5	44.3	43.7	43.9	S	43.7	43.2	42.9	42.8	42.7	43.0	43.6	43.6	43.6	48.0	44.2	44.2	43.8	43.5	43.6	43.6	42.9	42.7	48.0	43.8	24				
29	42.8	42.9	42.8	42.1	40.2	S	41.0	39.4	39.0	40.6	40.9	40.8	39.8	39.1	41.1	41.7	40.2	38.5	38.0	36.4	35.4	35.9	36.0	35.3	35.3	42.9	39.6	24				
30	36.1	35.8	35.9	35.7	S	36.6	36.9	38.1	39.6	39.6	39.9	39.8	38.9	38.0	38.0	37.8	37.3	36.3	36.2	36.6	36.8	36.4	35.6	35.1	35.1	39.9	37.3	24				
31	34.3	33.7	32.9	S	31.2	29.3	27.8	25.5	25.7	26.9	29.0	31.4	29.6	27.4	31.2	31.0	29.5	31.4	30.4	28.0	26.8	27.3	27.4	25.5	25.5	34.3	29.3	24				
HOURLY MAX	44.8	44.2	44.5	44.3	43.7	43.9	41.0	43.7	43.2	42.9	42.8	43.0	43.1	43.6	43.6	43.6	48.0	44.2	44.2	44.1	44.5	45.4	45.3	45.4								
HOURLY AVG	33.4	32.8	32.7	32.5	32.6	32.3	32.4	32.5	32.5	33.1	33.9	34.2	34.7	34.8	35.0	33.8	33.3	33.8	34.4	34.6	34.2	33.7	33.7	33.5								

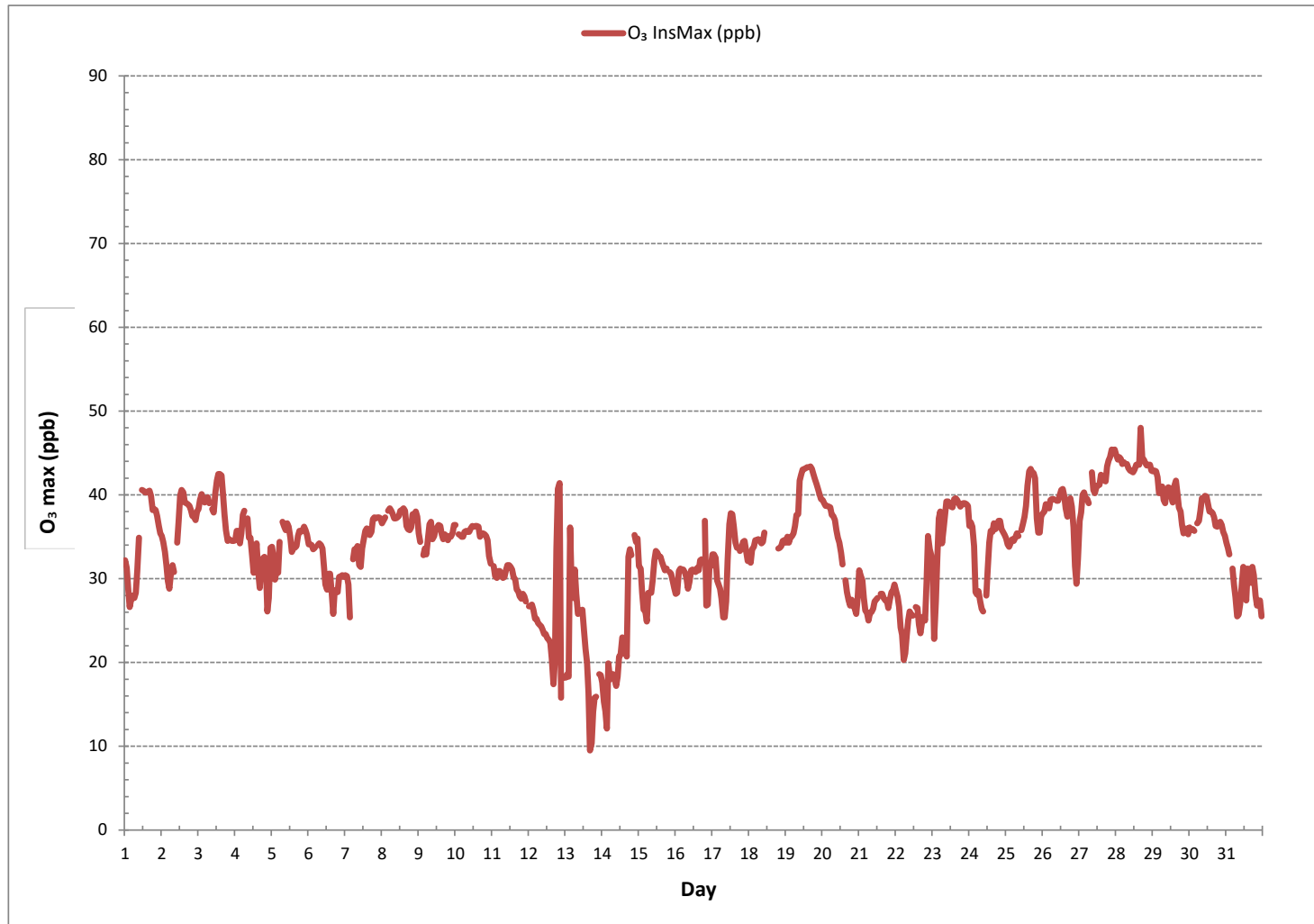
STATUS FLAG CODES

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:	705
MAXIMUM INSTANTANEOUS VALUE:	48.0 ppb @ HOUR 16 ON DAY 28
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	6.2

OZONE Instantaneous Maximum (O<sub>3</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - January 2019

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	36.4	39.5	40.6	39.3	41.2	31.2	32.7	36.0	34.4	34.2	51.3	60.7	50.2	40.6	31.6	26.1	23.9	27.0	22.4	26.5	15.2	15.6	15.6	17.8	15.2	60.7	32.9	24	
2	17.6	16.9	16.5	21.1	29.8	22.2	23.5	27.6	26.1	52.4	45.6	48.4	56.3	53.9	43.8	48.9	23.5	18.9	14.8	13.0	14.3	13.0	21.7	25.0	13.0	56.3	28.9	24	
3	26.3	31.1	48.2	35.7	28.9	29.8	24.6	19.7	16.7	16.2	15.2	21.0	22.8	25.0	20.0	16.0	15.6	12.8	12.3	13.8	12.1	15.4	13.4	12.5	12.1	48.2	21.1	24	
4	14.3	15.2	12.3	13.2	13.6	14.5	15.2	17.8	19.1	20.7	21.9	14.9	16.7	16.1	18.7	20.2	14.1	11.6	16.0	15.2	16.3	19.3	21.9	23.0	11.6	23.0	16.7	24	
5	22.6	23.9	22.8	18.2	22.4	26.1	28.1	25.2	24.8	25.7	28.6	23.0	17.4	21.9	21.7	24.9	31.2	29.6	34.4	35.1	36.2	39.3	38.9	43.0	17.4	43.0	27.7	24	
6	39.5	39.2	48.2	40.3	43.8	42.1	36.2	34.2	27.4	29.4	26.6	32.7	24.3	14.7	19.6	19.4	15.4	17.8	26.5	34.2	31.0	29.4	35.5	33.6	14.7	48.2	30.9	24	
7	33.8	42.3	40.8	39.7	34.0	48.0	47.1	45.6	41.9	50.2	54.4	43.0	47.6	49.3	49.5	46.7	55.7	51.6	48.0	46.9	44.7	35.5	39.7	39.0	33.8	55.7	44.8	24	
8	44.7	40.4	41.9	34.0	34.0	36.0	32.7	25.2	25.9	25.3	28.3	20.6	24.1	20.6	41.2	15.8	21.5	22.0	22.6	25.5	26.1	26.8	28.8	26.1	15.8	44.7	28.8	24	
9	24.6	17.1	24.1	24.8	25.5	29.6	39.7	38.2	30.7	31.6	35.1	39.5	35.4	32.0	30.1	32.5	28.2	32.5	31.4	26.4	27.0	29.0	26.3	25.2	17.1	39.7	29.9	24	
10	25.0	30.3	28.1	21.7	25.2	23.7	24.1	20.2	21.9	20.9	18.7	29.6	14.1	11.7	18.2	43.2	56.6	12.3	13.0	11.0	18.5	22.4	21.9	24.1	11.0	56.6	23.2	24	
11	25.9	22.8	23.2	24.1	25.5	30.3	25.0	30.1	30.1	34.7	33.1	34.5	35.3	32.9	29.2	33.4	35.7	33.4	38.8	36.8	43.8	36.8	38.4	29.8	22.8	43.8	31.8	24	
12	33.8	22.0	25.2	20.0	18.9	19.8	21.9	15.2	20.0	18.7	16.9	13.6	12.1	12.3	15.2	14.3	14.3	16.3	18.0	19.5	20.0	16.7	12.7	13.0	12.1	33.8	17.9	24	
13	14.5	11.6	9.7	17.3	16.3	6.6	13.0	13.0	11.5	11.9	12.3	18.5	19.1	12.3	15.6	19.1	20.0	18.7	14.7	16.5	14.1	15.2	16.3	12.5	6.6	20.0	14.6	24	
14	13.0	12.5	15.8	13.0	17.8	20.6	21.9	21.9	23.9	26.7	23.0	23.9	21.5	21.5	20.2	21.9	21.7	26.5	53.9	46.9	44.3	49.3	49.3	46.0	12.5	53.9	27.4	24	
15	40.8	39.3	30.7	27.9	24.8	30.3	25.2	23.3	25.2	24.8	26.8	21.9	20.9	19.8	23.3	21.9	20.9	22.4	24.8	24.8	22.8	23.3	22.9	20.6	19.8	40.8	25.4	24	
16	21.3	21.3	19.1	21.5	22.2	21.1	20.2	19.1	20.6	22.2	24.0	19.1	18.2	18.2	21.3	20.6	20.4	16.9	12.5	14.5	24.1	22.0	24.8	21.1	12.5	24.8	20.3	24	
17	21.5	13.6	17.0	20.4	18.3	19.1	22.4	18.5	X	21.3	27.0	25.3	22.6	25.5	20.6	20.7	23.5	24.6	26.1	31.8	36.0	28.5	31.6	29.9	13.6	36.0	23.7	23	
18	31.0	31.0	27.4	34.3	29.2	33.2	24.8	23.3	28.5	33.2	31.8	28.1	26.1	27.6	27.4	35.8	32.5	33.6	26.1	24.4	25.7	28.5	24.8	23.5	23.3	35.8	28.8	24	
19	26.3	40.2	26.1	32.5	32.9	41.5	36.2	44.1	38.4	41.7	64.4	60.1	51.1	50.9	49.5	48.9	46.7	48.0	33.1	35.8	30.3	31.0	40.4	33.4	26.1	64.4	41.0	24	
20	30.0	34.2	29.0	31.1	30.9	31.8	35.3	34.5	31.0	29.1	29.6	27.8	22.6	23.7	20.9	17.1	16.0	16.7	19.1	17.1	13.0	13.7	15.2	18.7	13.0	35.3	24.5	24	
21	16.0	19.5	20.6	14.9	25.2	27.0	23.9	22.8	20.2	22.6	23.7	20.8	20.0	24.6	17.4	14.7	14.7	16.3	13.4	13.2	15.9	19.1	17.4	18.2	13.2	27.0	19.3	24	
22	16.9	13.0	14.4	12.7	11.2	13.2	12.7	12.7	13.0	10.1	13.0	13.4	14.3	13.9	16.7	18.3	23.1	11.9	14.7	21.9	17.8	45.4	38.1	39.3	10.1	45.4	18.0	24	
23	45.8	48.3	48.2	35.5	50.0	43.0	34.9	45.8	38.8	42.6	44.3	42.8	37.3	36.9	30.9	25.2	22.6	16.7	19.8	23.3	21.7	21.3	19.1	11.5	11.5	50.0	33.6	24	
24	15.0	18.0	20.2	23.9	23.1	24.2	25.5	22.2	27.4	24.6	25.0	28.5	29.4	27.0	44.1	43.5	45.8	42.3	30.7	25.2	43.9	16.9	18.7	16.0	15.0	45.8	27.5	24	
25	13.0	19.1	14.9	15.4	18.2	15.2	12.3	10.3	18.7	23.3	26.3	25.0	20.2	21.3	21.3	33.8	28.5	14.9	12.4	18.9	13.2	13.6	14.1	12.3	10.3	33.8	18.2	24	
26	13.6	13.6	20.0	18.0	20.8	31.4	29.0	22.8	23.5	30.0	23.5	33.8	25.7	28.7	22.1	15.4	16.9	43.2	46.0	18.9	17.1	19.3	18.4	40.3	13.6	46.0	24.7	24	
27	34.0	42.3	66.4	79.9	59.8	70.7	57.6	72.8	66.4	78.4	57.6	67.7	70.1	66.8	74.3	77.3	97.5	70.8	75.4	90.5	65.1	54.8	36.2	35.3	34.0	97.5	65.3	24	
28	38.6	23.7	22.2	21.5	23.5	25.9	32.0	32.3	36.7	32.0	36.4	31.4	38.2	42.5	41.7	36.6	36.0	33.6	25.5	19.3	22.6	23.1	18.7	13.0	13.0	42.5	29.4	24	
29	12.8	X	20.4	50.7	18.0	17.4	20.4	20.4	22.8	23.1	27.2	25.2	26.8	22.0	26.1	27.0	20.9	26.9	20.6	19.5	23.9	23.7	26.6	26.1	12.8	50.7	23.9	23	
30	27.9	23.1	26.3	23.3	20.2	22.6	22.4	22.6	23.9	26.3	28.5	26.8	24.6	27.9	25.5	26.8	23.5	18.5	23.9	21.9	21.3	19.5	16.3	20.6	16.3	28.5	23.5	24	
31	16.0	14.5	15.2	14.5	17.1	15.8	15.9	19.1	15.2	13.8	15.2	19.5	29.0	32.9	32.5	26.5	29.6	36.0	34.2	30.3	32.7	32.9	40.2	35.1	13.8	40.2	24.3	24	
HOURLY MAX	45.8	48.3	66.4	79.9	59.8	70.7	57.6	72.8	66.4	78.4	64.4	67.7	70.1	66.8	74.3	77.3	97.5	70.8	75.4	90.5	65.1	54.8	49.3	46.0					

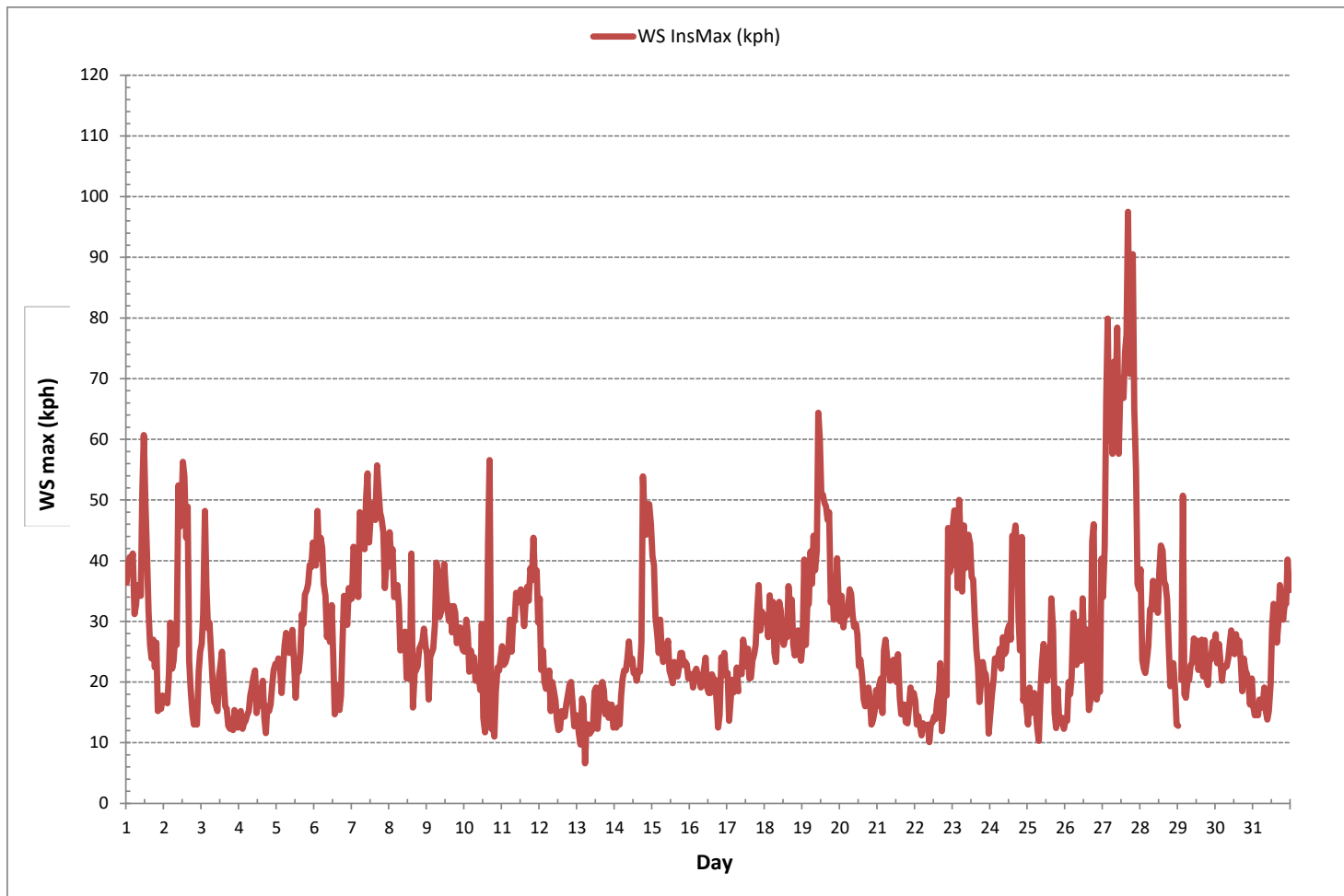
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	97.5	kph	@ HOUR	16	ON DAY	27
OPERATIONAL TIME:					742	hrs

WIND SPEED Instantaneous Maximum (WS kph)



## 1.0 Quality Control Activities

Quality control procedures are established to govern the performance of the monitoring equipment and to protect operational uptime. Data collected during QC/QA activities are assigned a data validation code to comply with the requirements outlined in Chapter 6, 4.1.1, DQ 4-A (AMD, 2016). Calibrations are deemed successful only if the AMD calibration acceptance limits are met (Chapter 7, 9.0, AMD 2016).

A daily zero-span test procedure is performed for each gaseous parameter by challenging the analyzer with a zero-air source and span gas. Daily review of the data ensures the zero and span check are within the required acceptance limits and do not deviate more than  $\pm 10\%$  from the expected value. The total zero-span cycle is complete within an hour with the zero phase commencing at the beginning of the scheduled hour. This QC activity is conducted in accordance with Chapter 7, 4.0, Cal 4-A (AMD, 2016).

The allowable time for a zero-span check is one hour per calendar day. The time allotted for the zero-span check does not contribute to downtime and is identified with a data validation code of "S". If any additional zero-span response checks are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "S1". The initiation of an additional zero-span check may be warranted during the investigation of operational issues or suspect data.

Each month, a scheduled multipoint calibration is performed on each gas analyzer. Prior to any adjustments, an as-found response test is completed to obtain the zero reading of the analyzer and the response to the highest span concentration. The zero and high point test gases are then re-introduced into the analyzer to establish the zero and high set-points. Once these adjustments are satisfactory, a mid-point and a low-point test concentration is introduced. Additional multi-point calibrations are required if any of the conditions, outlined in Chapter 7, 2.1, Cal 2G (AMD, 2016) exist.

The time allotted for the first multi-point calibration is not considered downtime and is identified with a data validation code of "C". If any additional as-found response checks or multipoint calibrations are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "C1".

A mechanical wind system undergoes annual calibration, as a minimum, while an ultrasonic wind system is factory calibrated every two years (Chapter 6, 6.0, Cal 6-A, AMD 2016). Supplementary to this, a visual inspection of the equipment is performed during each scheduled monthly site visit.

The time allotted for the wind system calibration is not considered downtime and is identified with a data validation code of "C". If function checks or additional calibrations are performed, the time accrued during the QC activity is not considered downtime and is identified with a data validation code of "Q" and "C", respectively. If QC activity goes beyond 10% of the monthly operating time, the time exceeding 10% is considered downtime and is assigned a data validation code of "C1". Data identified with a data validation code of "Q" is in accordance with Chapter 6, 4.1.3 (AMD, 2016) which states QA/QC activities are not included when calculating data completeness.

High volume samplers are calibrated every three months, as a minimum, in accordance with Chapter 7, 7.0, Cal 7-B (AMD, 2016).

Where passive sampling is in practice, quality control samples will be deployed in accordance with Chapter 4, 3.0, 3.1.3. Method blanks, replicate samples and spiked blanks are exposed and handled in the same manner as each passive sample. To comply with the data submission requirements in Chapter 9, 3.1, the replicate and corresponding passive sample concentrations are reportable data values and have not been averaged.

As recommended in Chapter 6, 4.2 (AMD 2016), daily data review is conducted to verify data and avoid significant data losses. Automated flags, originating from the data-logger, and data anomalies are reviewed and may prompt the need to dispatch a technician for investigation and/or corrective action. Additionally, there are several automated alarm scenarios that serve to screen raw data, alert technicians and elicit investigation or corrective action.

Comparisons of the measured ambient concentrations to the corresponding AAAQO are assessed using the significant figures protocol in Chapter 9, 3.1.2. If the measurement is near the set objective, raw data may undergo necessary data adjustments to confirm a true exceedance. Should an exceedance occur, Maxxam will formally notify the client; however, the reporting protocol to AEP is defined by the client and may not involve Maxxam. Exceedance events are acknowledged in the report, based on the information available at the time.

## 2.0 Data Verification and Validation

The data validation procedures, outlined in Chapter 6, 4.0, AMD 2016, are used to accept, reject and qualify data. The data verification and validation process, and the current Data Collection and Management Process Flow Chart have been compiled from sections 4.2 to 4.6 (AMD, 2016) and are shown below.

Baseline adjustments are applied by interpolation between two valid zero checks, as determined by the Data Acquisition System. In the event that zero check results are not reliable, data may be adjusted by applying a constant offset to data collected between two adjacent zero checks. Both adjustment approaches are deemed acceptable by the AMD.

Table 1 (Chapter 6) outlines the quantitative parameter relationships to be considered and dictates that data adjustments are applied equally for NO/NO<sub>2</sub>/NO<sub>x</sub> and CH<sub>4</sub>/NMHC/THC parameters. Below zero adjustments are applied to 1-hour averages, in accordance with Table 2 (Chapter 6), and are done after baseline corrections.

Instantaneous data, where provided, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

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

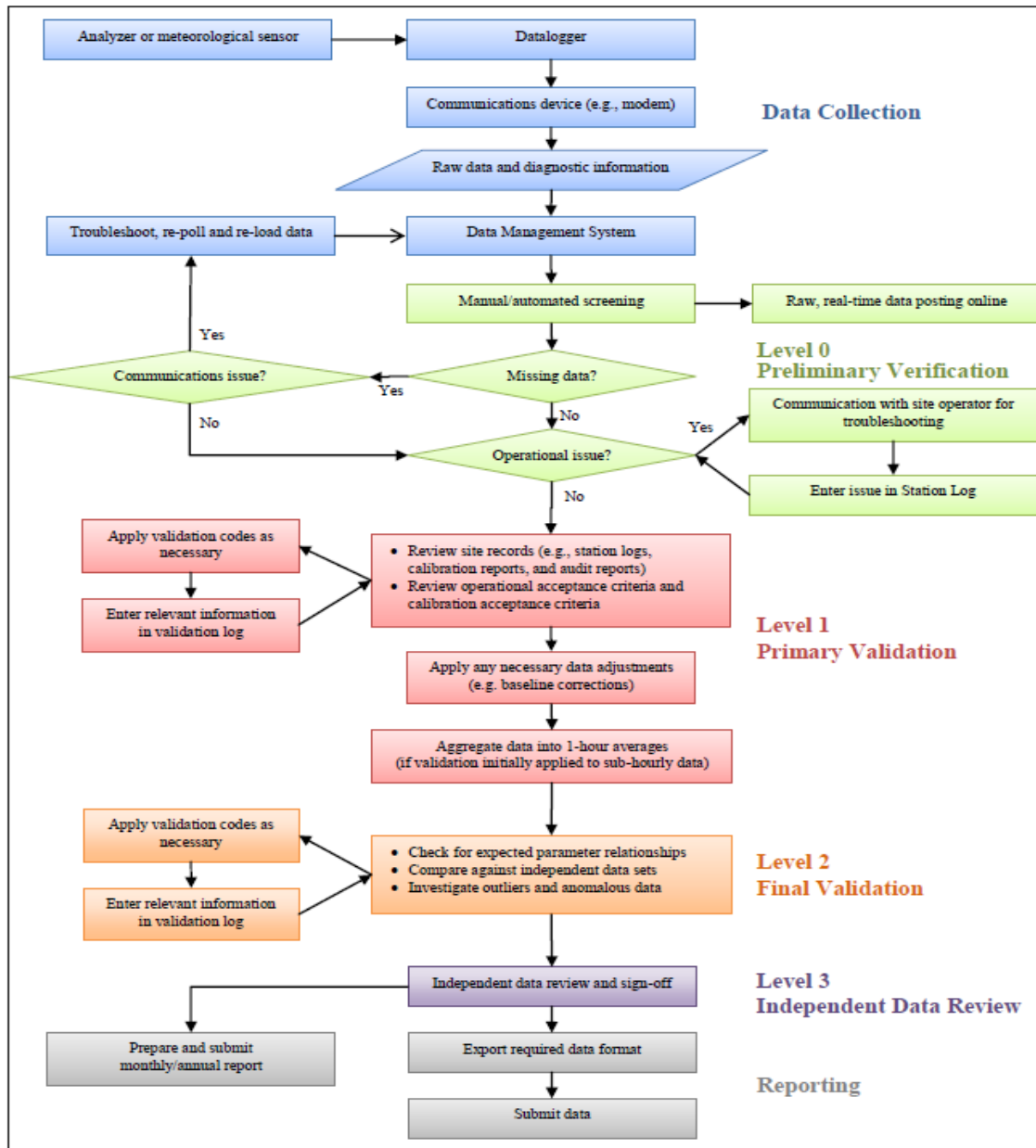
There were no deviations from the prescribed methods.

**AMD Data Verification and Validation Process**

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

<b>Level 0 Preliminary Verification</b>	<p>Level 0 data are raw data obtained directly from the data acquisition system (DAS). At this level, data undergoes a certain amount of manual or automated screening and flagging. Screening checks include: a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/data-logger 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.</p>
<b>Level 1 Primary Validation</b>	<p>Primary validation involves more thorough evaluation and documentation of issues identified during data screening, along with appropriate application of data validation codes. Level 1 activities 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.</p>
<b>Level 2 Final Validation</b>	<p>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. At this level of review, some general knowledge of pollutant and meteorological behavior can be used to determine if data is suspect.</p>
<b>Level 3 Independent Data Review</b>	<p>Level 3 validation involves a final cursory review of validated data, and is completed by an individual independent of both field operations and primary data validation. At this level, a final independent QA review/endorsement is performed before data is submitted to Alberta Environment and Parks.</p>
<b>Post-Final Validation</b>	<p>The Post-Final Validation step serves to re-evaluate validated data for errors or omissions discovered and/or suspected after the initial monthly data submittal. This level of validation is performed on an annual basis, when annual reporting is required or requested.</p>





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



### Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2019-01-25-C</u>
<b>Site:</b> <u>St. Lina Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u><i>bimadeniji</i></u>	Date <u>04- Feb - 2019</u>
Level 1 Primary Validation	<u><i>bimadeniji</i></u>	Date <u>04- Feb - 2019</u>
Level 2 Final Validation	<u><i>bimadeniji</i></u>	Date <u>06- Feb - 2019</u>
Level 3 Independent Data Review	<u><i>cradamba</i></u>	Date <u>15- Feb - 2019</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

<b>Notes</b>
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.

This page is intentionally blank and marks the conclusion of this report

**JANUARY 1 - 31, 2019**

**MONTHLY AMBIENT AIR QUALITY MONITORING REPORT**

**Project #: 2833-2019-01-39-C**

**LICA-201901**

**Prepared for:**

**Lakeland Industry & Community Association**

**Mike Bisaga**

5107 50 St.

Bonnyville, Alberta T9N 2J7

monitoring@lica.ca

780-266-7068

**Monitoring Station**

**Bonnyville East Continuous Monitoring  
Station**

**Date of Report Issuance: February 28, 2019**

**Report Preparation By:**

**Bim Adeniji, M.Sc.**

403-219-3677

aadeniji@maxxam.ca

*Bimadeniji*

Project Manager, Customer Service, Air Services

**Reviewed By:**

**Wunmi Adekanmbi, M.Sc., EPT, PMP**

403-219-3661

aadekanmbi@maxxam.ca

*Wunmi Adekanmbi*

Project Team Lead, Customer Service, Air Services



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

LICA-201901

Page 268 of 350

**Lakeland Industry & Community Association**

5107 50 St.  
Bonnyville, Alberta T9N 2J7

**Attention: Mike Bisaga**

**Date: March 08, 2019**

**Subject: MONTHLY AMBIENT AIR QUALITY MONITORING REPORT for JANUARY 1 - 31, 2019**

In January 2019, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Bonnyville East Continuous Monitoring Station near Bonnyville, Alberta. The monitoring program provides continuous measurements of ambient air pollutants and meteorological data to satisfy the reporting requirements of the Alberta airshed.

**Network Parameters for Continuous Monitoring:**

This monthly report, where applicable, was prepared in accordance with Chapter 9 of the Air Monitoring Directive (AMD, 2016). The report summarizes the continuous monitoring results for pollutant and meteorological parameters and presents the hourly statistics, graphs and rose charts for the month. Calibration records are provided in a separate PDF document in order to comply with AMD requirements (Chapter 9, 13.1.7, RC 13-R, AMD 2016). The station is equipped with analyzers to measure SO<sub>2</sub>, H<sub>2</sub>S, THC, CH<sub>4</sub>, NMHC, NO<sub>x</sub>, NO, NO<sub>2</sub>, O<sub>3</sub> and PM<sub>2.5</sub>. The meteorological sensors and equipment capture data for WS, WSmax, WD and STDWD.

**Exceedance & Performance Reporting:**

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement, as per the Alberta Air Monitoring Directive (AMD, Chapter 6, DQ 4-C, 2016).

All measured ambient air concentrations were below the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO, November, 2018). Comparisons of these concentrations to the corresponding AAAQOs were done in accordance with AMD, Chapter 9, 15.3.2, RC 15-P. Accordingly, the averaging specifications and data completeness criteria, as defined in the Alberta Ambient Air Quality Objective Calculation Guidelines, were applied. (AMD, Chapter 9, Appendix A, 2016).

Specific to the content and purpose of this report, there were no instances where the requirements of the AMD (2016) were contravened.

**Monthly Monitoring Overview:**

In relation to the previous month, there were no changes made to the scope or management of the ambient air monitoring program.

The evaluation of data collected in the month of January did not reveal any errors or omissions that would require resubmission of air data to AEP's airdata warehouse.

**H<sub>2</sub>S:** Fourteen hours of downtime were recorded across the month due to additional quality checks and corrective actions performed to address drifts in span response.

**Canister System:** Three canister events were recorded this month. The samples were processed for analysis by InnoTech and the results will be provided in the 2019, Q1 Integrated Report.

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

**Reviewed by:**



Wunmi Adekanmbi, M.Sc., EPT, PMP  
Project Team Lead, Customer Service, Air Services  
403-219-3661

*I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. Certification of submitted information is specific to the contents of this report and is not intended to represent the onus of the Person Responsible, as outlined in Chapter 9, RC 12-E.*

## TABLE OF CONTENTS

<b>TITLE PAGE</b>	<b>1</b>
<b>COVER LETTER</b>	<b>2</b>
<b>TABLE OF CONTENTS</b>	<b>3</b>
<b>ABBREVIATIONS</b>	<b>4</b>
<b>AAAQO EXCEEDANCE SUMMARY</b>	<b>5</b>
<b>MONTHLY CONTINUOUS DATA SUMMARY</b>	<b>6</b>
<b>OPERATIONAL SUMMARY</b>	<b>7</b>
<b>SUMMARY TABLES, GRAPHS AND ROSES</b>	<b>9</b>
Sulphur Dioxide	10
Hydrogen Sulphide	14
Total Hydrocarbon	18
Methane	22
Non-Methane Hydrocarbon	26
Oxides of Nitrogen	30
Nitric Oxide	34
Nitrogen Dioxide	38
Ozone	42
Particulate Matter <sub>2.5</sub>	46
Wind Speed	50
Wind Direction	53
Standard Deviation Wind Direction	56
<b>MAXIMUM INSTANTANEOUS DATA</b>	<b>58</b>
<b>1.0 Quality Control Activities</b>	<b>78</b>
<b>2.0 Data Verification and Validation</b>	<b>79</b>
<b>Validation Certificate Form</b>	<b>82</b>
<b>End of Report</b>	<b>83</b>

## List of Acronyms

<b>AAAQO</b>	Alberta Ambient Air Quality Objectives and Guidelines Summary
<b>AEP</b>	Alberta Environment and Parks
<b>AMD</b>	Air Monitoring Directive
<b>CH<sub>4</sub></b>	Methane
<b>DAS</b>	Data acquisition system
<b>hr</b>	Hour
<b>hrs</b>	Hours
<b>H<sub>2</sub>S</b>	Hydrogen Sulphide
<b>IZS</b>	Internal zero-span
<b>kph</b>	Kilometers per hour
<b>NO</b>	Nitric Oxide
<b>NO<sub>2</sub></b>	Nitrogen dioxide
<b>NO<sub>x</sub></b>	Total oxides of nitrogen
<b>O<sub>3</sub></b>	Ozone
<b>NMHC</b>	Non-Methane Hydrocarbon
<b>PM<sub>2.5</sub></b>	Particulate matter less than or equal to 2.5 microns in diameter
<b>ppb</b>	Parts per billion
<b>ppm</b>	Parts per million
<b>QA</b>	Quality Assurance
<b>QC</b>	Quality Control
<b>SHARP</b>	Synchronized Hybrid Ambient Real-time Particulate Monitor
<b>SOP</b>	Standard Operating Procedure
<b>SO<sub>2</sub></b>	Sulphur Dioxide
<b>STDWD</b>	Standard Deviation Wind Direction
<b>THC</b>	Total hydrocarbons
<b>µg/m<sup>3</sup></b>	Microgram per cubic meter
<b>WS</b>	Wind Speed
<b>WD</b>	Wind Direction
<b>°C</b>	Degrees Celsius

## AAAQO Exceedance Summary

### SO<sub>2</sub> 1-Hour Exceedances

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

### SO<sub>2</sub> 24-Hour Exceedances

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

### H<sub>2</sub>S 1-Hour Exceedances

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

### H<sub>2</sub>S 24-Hour Exceedances

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

### NO<sub>2</sub> 1-Hour Exceedances

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

### PM<sub>2.5</sub> 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQG of 80 µg/m<sup>3</sup>.

### PM<sub>2.5</sub> 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 29 µg/m<sup>3</sup>.

### O<sub>3</sub> 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*



## Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
Bonnyville East Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO <sub>2</sub> (ppb)	172	48	0	0	0	5	7	3	24.3	NW	1	1	100.0
H <sub>2</sub> S (ppb)	10	3	0	0	0	4	22	3	5.1	SSE	1	13	98.1
THC (ppm)	-	-	-	-	2.24	15.22	22	13	4.7	SE	4.11	22	100.0
CH <sub>4</sub> (ppm)	-	-	-	-	2.23	14.41	22	13	4.7	SE	3.99	22	100.0
NMHC (ppm)	-	-	-	-	0.01	0.81	22	13	4.7	SE	0.12	22	100.0
NO <sub>2</sub> (ppb)	159	-	0	-	5	28	22	17	5.6	WSW	14	22	100.0
NO (ppb)	-	-	-	-	1	16	15	13	10.4	NE	3	13	100.0
NO <sub>x</sub> (ppb)	-	-	-	-	5	33	22	16	2.9	ENE	17	22	100.0
O <sub>3</sub> (ppb)	82	-	0	-	29.8	44.0	27	21	29.7	NNW	39.0	28	100.0
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	29	0	0	5	23	14	15	16.1	WSW	14	13	100.0
VECTOR WS (kph)	-	-	-	-	0.8	40.4	29	3	-	WNW	25.7	27	100.0
VECTOR WD (sec)	-	-	-	-	33 (NNE)	-	-	-	-	-	-	-	100.0

## OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
SULPHUR DIOXIDE (SO <sub>2</sub> )	Thermo 431-TLE UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine monthly calibration was performed on January 10, between the hours of 11:00 and 16:00.</li> </ul>
HYDROGEN SULPHIDE (H <sub>2</sub> S)	Thermo 450i UV Fluorescent Analyzer	Maxxam AIR SOP-00209: Ambient Sulphur Monitoring	<ul style="list-style-type: none"> <li>Operational time for the monitoring period was 98.1%, equivalent to 14 hours of downtime.</li> <li>The analyzer spanned outside the upper acceptance limit on January 2. The result of subsequent scheduled and repeat span checks, performed between January 2 and January 4, exhibited similar response. This prompted a site visit on January 4 where the routine monthly calibration was successfully completed between hours 07:00 - 11:00. The expected span value was updated following the scheduled zero-span check on January 5, and was adjusted again on January 6 to reflect a more representative reference concentration. As the monthly calibration met AMD requirements, no data was discarded due to the span drift. Three hours of downtime were, however, recorded due to the additional quality checks.</li> <li>The analyzer spanned towards the lower acceptance limit on January 8. The result of a repeat zero-span check conducted later in the day showed similar response. On January 9, the results of the daily and repeat span check exceeded the lower limit. This prompted a site visit on January 10 where the SO<sub>2</sub> scrubber beads were renewed, following a successful shut-down calibration. A successful post-repair calibration was subsequently completed. The expected span value was updated immediately after the calibration. As the shut-down and post-repair calibrations met AMD requirements, no data was discarded due to the span drift. Nine hours of downtime were, however, recorded due to the additional quality checks and corrective actions performed.</li> <li>Additional zero-span checks were triggered on January 15 and January 27 to assess biased high drifts in span response; and the results were closer to the mean. No further action was required. Two hours of downtime were, however, incurred due to the additional quality checks.</li> <li>Further data analysis revealed a correlation between periods of erratic span response and shifts in ambient temperatures recorded across the LICA network. The drift pattern in span response appeared to mirror that of ambient temperature.</li> </ul>

## OPERATIONAL SUMMARY

Parameter	Equipment	Method & Procedure	Operational Notes
TOTAL HYDROCARBONS (THC), METHANE (CH <sub>4</sub> ) & NON-METHANE HYDROCARBONS (NMHC)	Thermo 55i FID Analyzer	<p><b>Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring</b></p> <p><b>Maxxam AIR SOP-00225: The Collection of VOCs in Ambient Air Using Canisters and Xontech</b></p>	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine monthly calibration was performed on January 11, between the hours of 10:00 and 14:00.</li> <li>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.</li> <li>Three canister events were recorded this month. The date, time and initial 5-min average concentration measurements are as follows: January 13, at 8:15 - 0.35ppm January 17, at 5:35 - 0.45ppm January 22, at 12:55 - 0.50ppm The samples were processed for analysis by InnoTech and the results will be provided in the 2019, Q1 Integrated Report.</li> </ul>
OXIDES OF NITROGEN (NO <sub>x</sub> ), NITRIC OXIDE (NO) & NITROGEN DIOXIDE (NO <sub>2</sub> )	Thermo 42i Chemiluminescent Analyzer	<b>Maxxam AIR SOP-00213: Ambient NO/NO<sub>2</sub>/NO<sub>x</sub> Monitoring</b>	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine monthly calibration was performed on January 10, between the hours of 11:00 and 18:00.</li> </ul>
OZONE (O <sub>3</sub> )	Thermo 49i Photometric Analyzer	<b>Maxxam AIR SOP-00212: Ambient O<sub>3</sub> Monitoring</b>	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine monthly calibration was performed on January 11, between the hours of 10:00 and 15:00.</li> </ul>
PARTICULATE MATTER < 2.5 MICRONS (PM <sub>2.5</sub> )	Thermo SHARP 5030i Unit	<b>Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP</b>	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>The routine quarterly calibration was performed on January 24, between the hours of 15:00 and 17:00.</li> </ul>
WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)	RM Young Unit	<b>Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration</b>	<ul style="list-style-type: none"> <li>Operational time was 100% and there were no performance issues identified.</li> <li>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.</li> </ul>

***SUMMARY TABLES, GRAPHS AND ROSES***

**SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)**

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

**STATUS FLAG CODES**

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

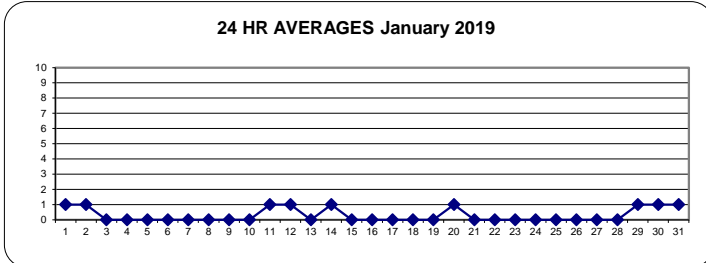
**OBJECTIVE LIMIT:**

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

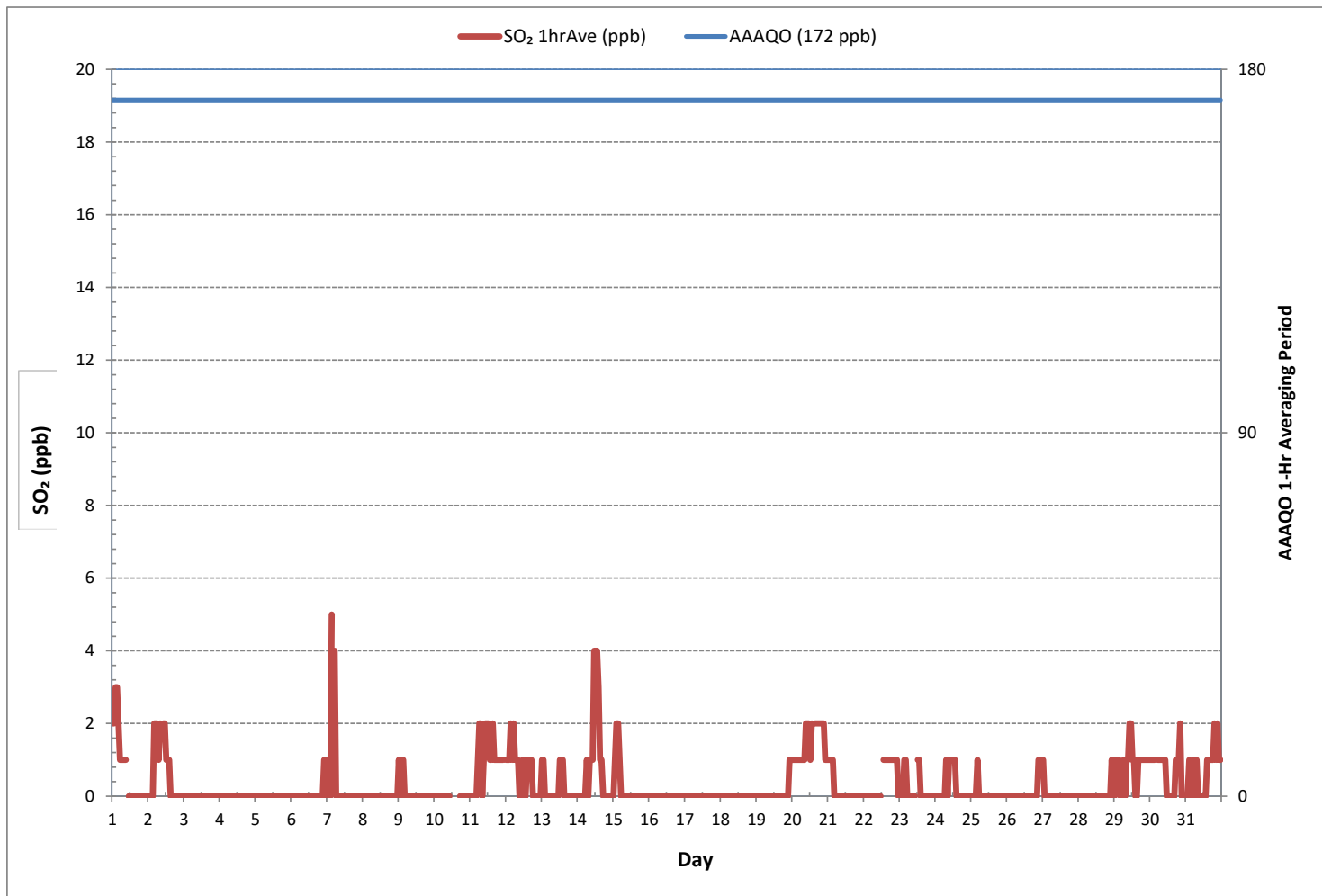
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	175		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 11 ON DAY 1		
MAXIMUM 1-HR AVERAGE:	5 ppb @ HOUR 3 ON DAY 7		
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 1		
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb

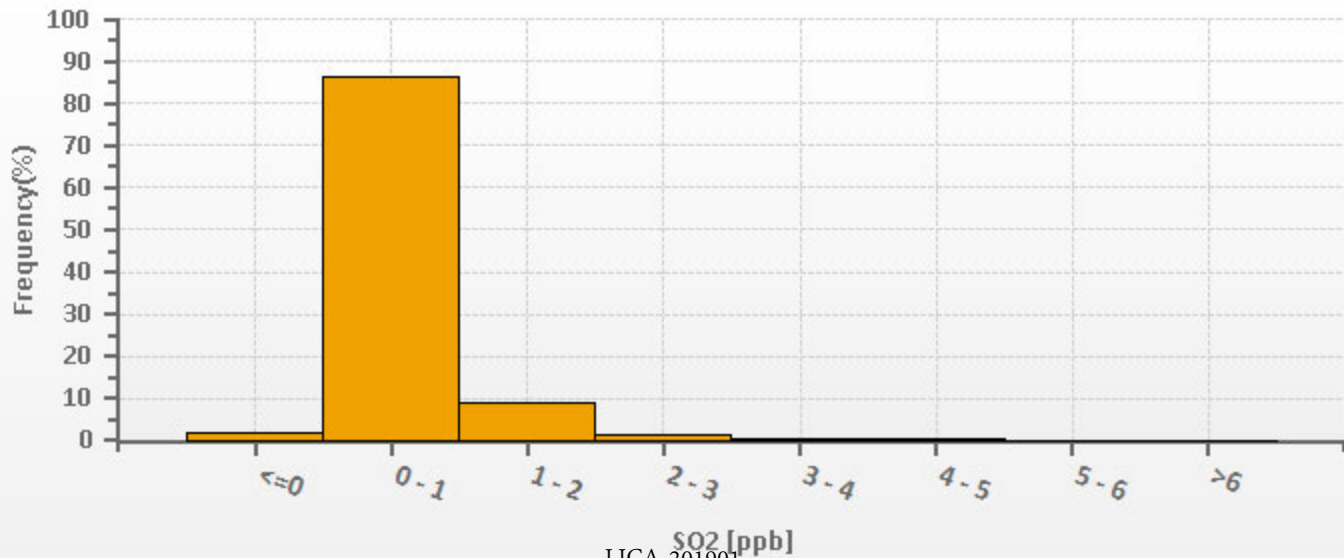
**24 HR AVERAGES January 2019**



SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)

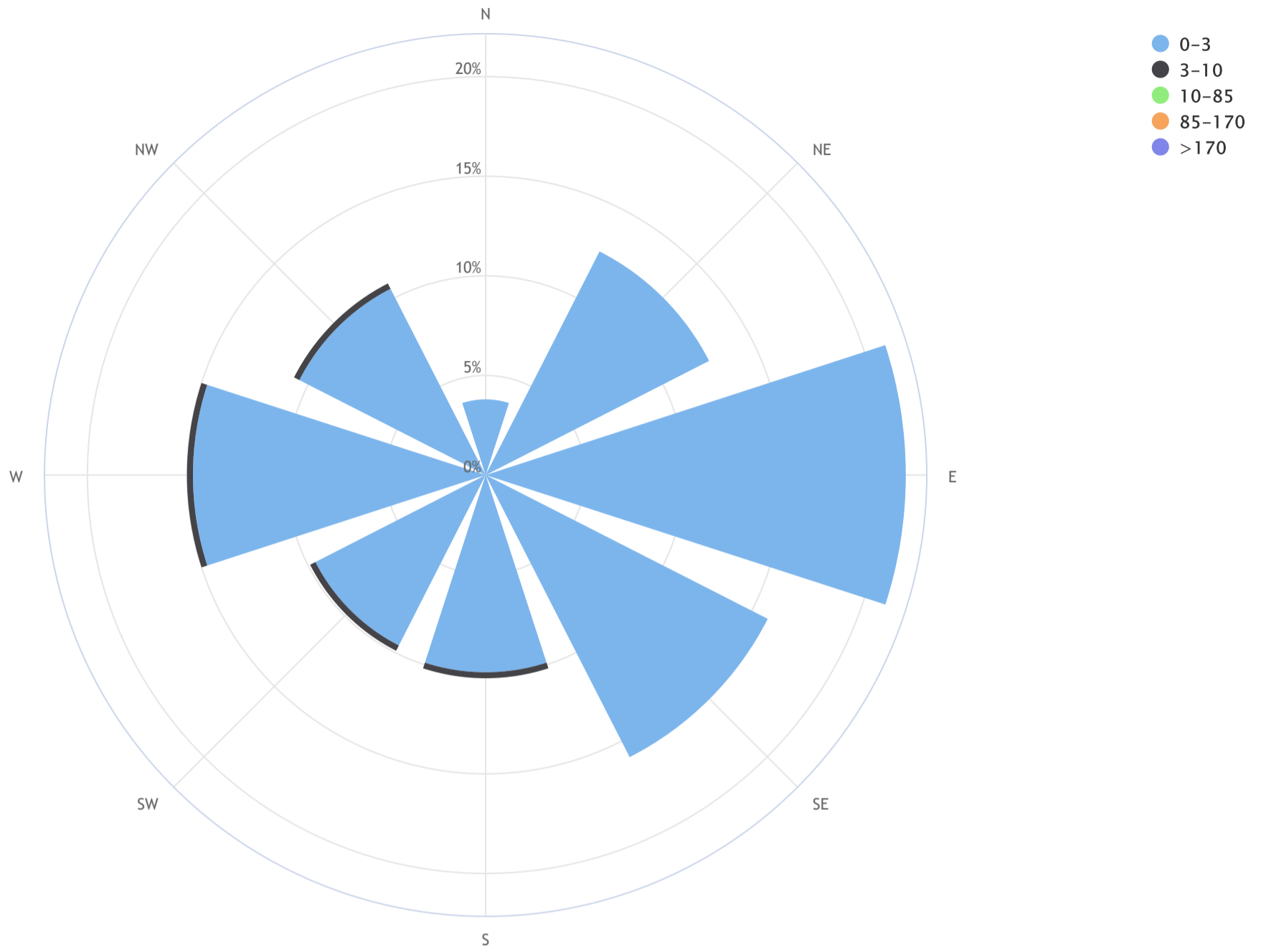


### SO2 [ppb] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_SO2 (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 0.4, CALM % = 0.7%



Direction	0-3	3-10	10-85	85-170	>170	TOTAL
N	3.8	0.0	0.0	0.0	0.0	3.8
NE	12.6	0.0	0.0	0.0	0.0	12.6
E	21.1	0.0	0.0	0.0	0.0	21.1
SE	15.9	0.0	0.0	0.0	0.0	15.9
S	9.9	0.3	0.0	0.0	0.0	10.2
SW	9.6	0.3	0.0	0.0	0.0	9.9
W	14.7	0.3	0.0	0.0	0.0	15.0
NW	10.5	0.3	0.0	0.0	0.0	10.8
Summary	98.2	1.1	0.0	0.0	0.0	99.3
CALM	0.7	0.0	0.0	0.0	0.0	0.7





HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S 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	S	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	S	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	
3	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	1	1	2	1	1	0	0	2	0	24	
4	1	1	1	0	2	S1	S1	C	C	C	C	C	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	22	
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	24	
6	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	1	0	24	
7	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	24	
8	0	0	0	S	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	
9	0	0	S	0	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	
10	0	S	0	0	0	0	0	0	0	0	0	0	C1	C1	C1	C1	C1	C1	0	0	0	0	0	0	0	0	0	0	0	0	17	
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	S	1	0	0	0	1	0	24	
13	0	0	0	1	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	3	1	24	
14	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24	
15	0	0	0	0	0	0	0	0	S1	0	0	0	0	0	0	0	0	0	0	1	S	0	1	0	0	0	0	0	1	0	23	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	1	1	1	0	0	0	1	0	24
18	1	1	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	1	0	24	
19	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	24	
20	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	1	0	0	1	0	0	0	0	0	1	0	24	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	24	
22	0	0	0	4	2	4	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	4	1	24	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
24	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	24	
25	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	24	
26	0	0	0	0	0	0	0	0	0	S	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
27	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S1	0	0	0	0	0	0	23	
28	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	24	
29	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	1	0	24	
30	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	24	
31	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	1	1	1	4	2	4	1	3	1	1	2	1	0	1	1	1	1	1	1	1	1	1	1	2	1	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					

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

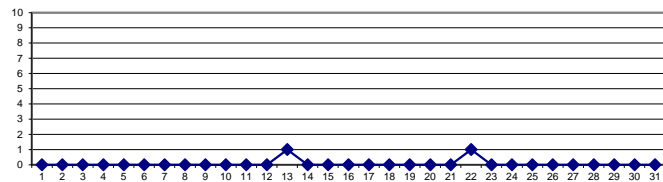
OBJECTIVE LIMIT:

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

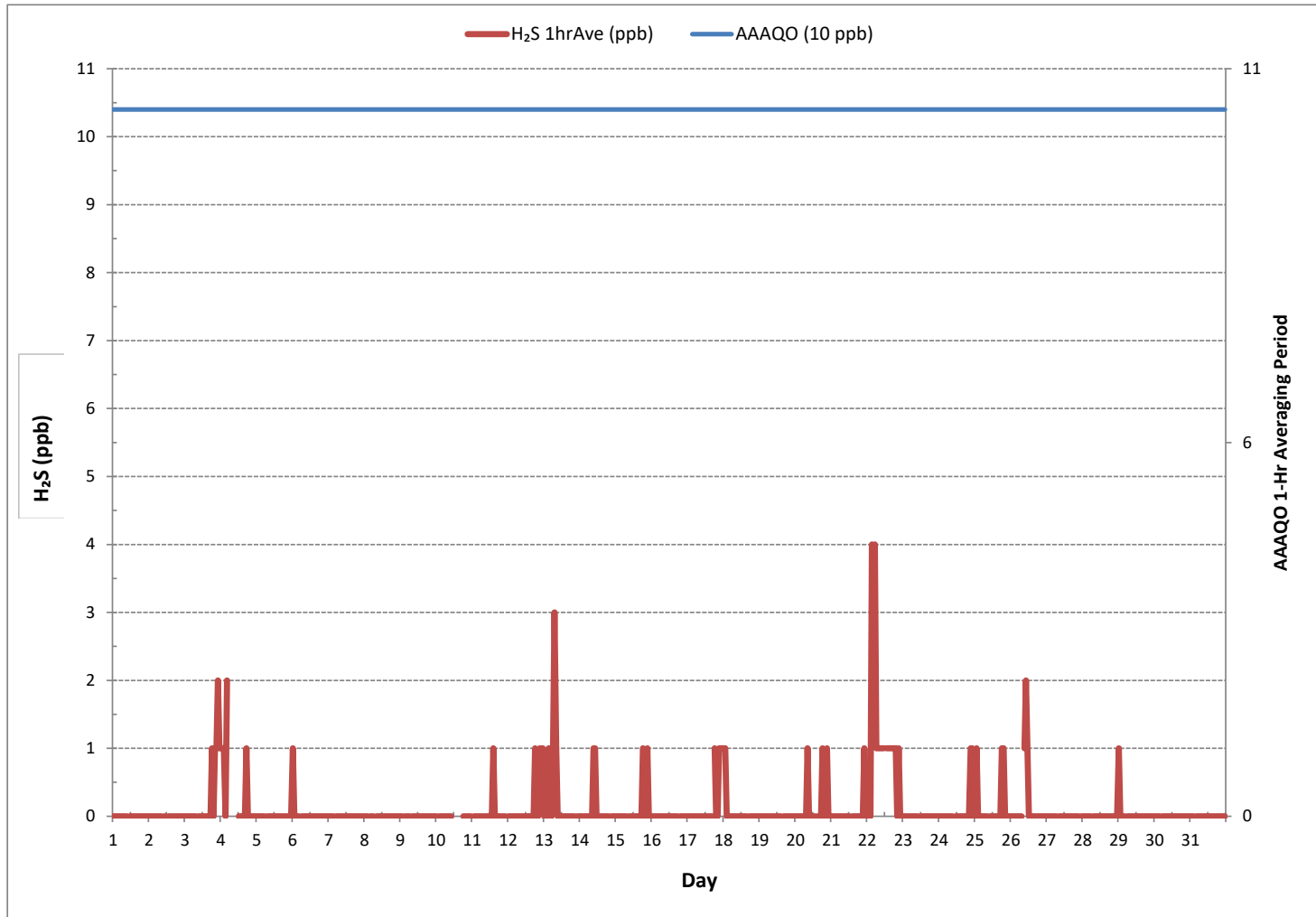
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	59				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	4 ppb @ HOUR	3	ON DAY	22	
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	13	
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	730	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	98.1	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

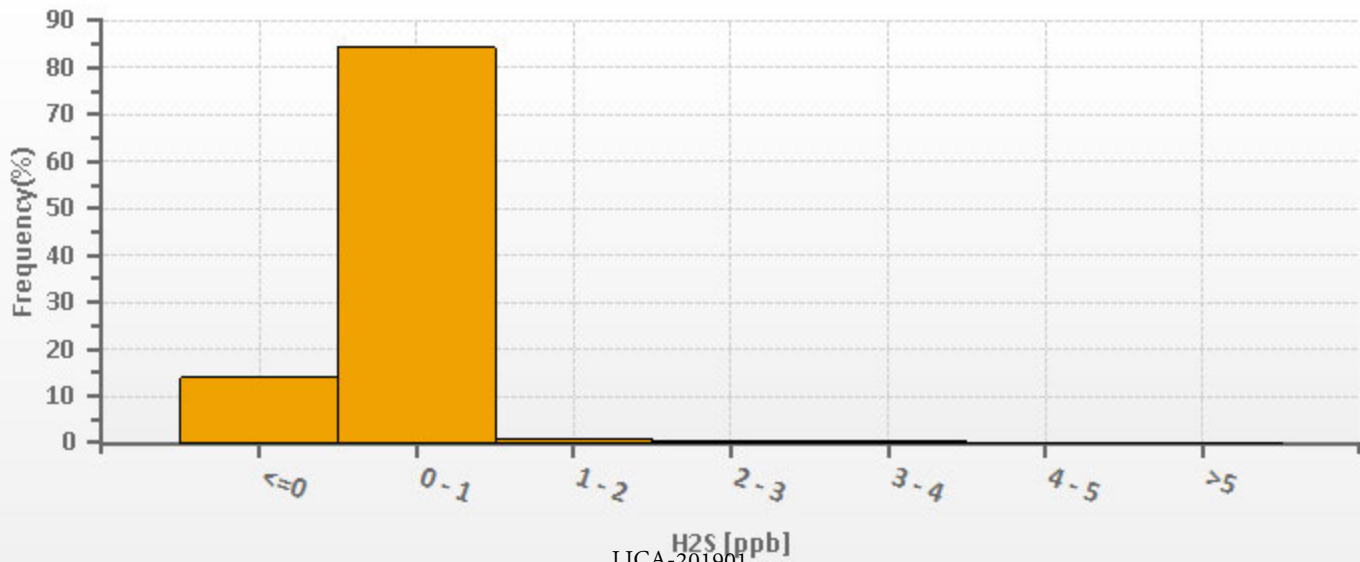
24 HR AVERAGES January 2019



HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S ppb)

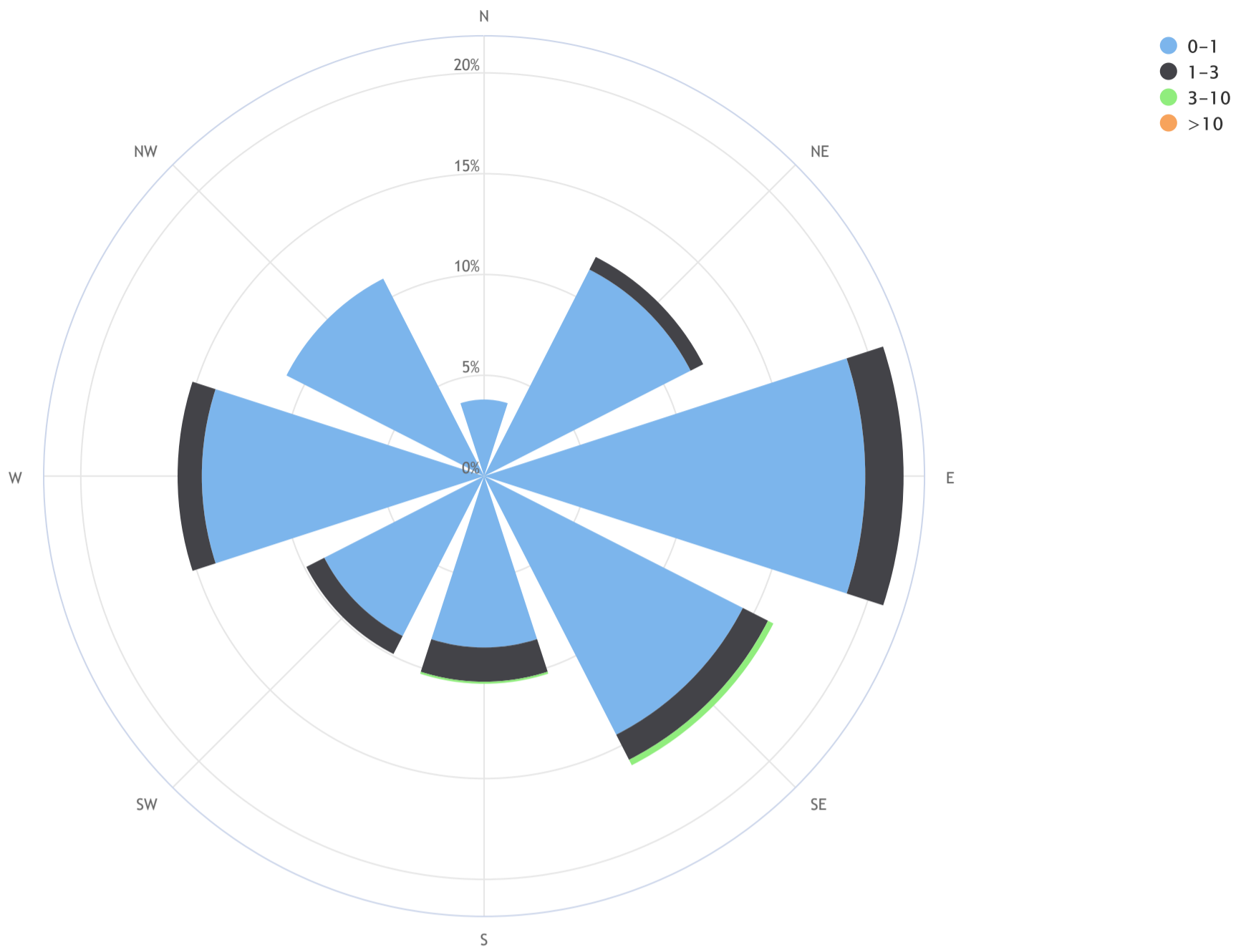


### H2S [ppb] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_H2S (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 0.2, CALM % = 0.7%



Direction	0-1	1-3	3-10	>10	TOTAL
N	3.8	0.0	0.0	0.0	3.8
NE	11.5	0.7	0.0	0.0	12.3
E	18.9	1.9	0.0	0.0	20.8
SE	14.4	1.4	0.3	0.0	16.1
S	8.5	1.7	0.1	0.0	10.4
SW	8.9	1.0	0.0	0.0	9.9
W	14.0	1.2	0.0	0.0	15.1
NW	11.0	0.0	0.0	0.0	11.0
Summary	90.9	7.9	0.4	0.0	99.3
CALM	0.6	0.1	0.0	0.0	0.7



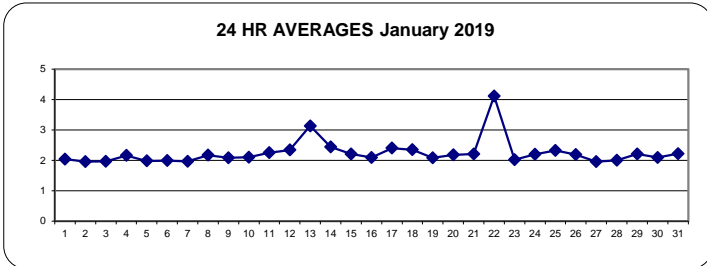
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.29	2.24	2.17	2.17	2.16	2.15	2.11	2.07	2.05	2.03	S	1.96	1.94	1.94	1.93	1.93	1.93	1.96	1.95	1.95	1.95	1.97	1.99	1.98	1.93	2.29	2.04	24
2	1.97	1.98	1.97	1.99	1.99	1.99	1.98	1.98	1.99	S	1.96	1.96	1.96	1.95	1.93	1.93	1.95	1.97	1.96	1.95	1.95	1.95	1.95	1.97	1.93	1.99	1.96	24
3	1.94	1.94	1.93	1.93	1.93	1.93	1.93	1.93	S	1.95	1.93	1.94	1.94	1.94	1.94	1.96	1.97	2.01	2.00	2.02	2.03	2.04	2.08	2.11	1.93	2.11	1.97	24
4	2.06	2.04	2.02	2.00	2.03	2.14	2.23	S	2.42	2.81	2.31	3.20	2.30	2.12	2.05	2.04	2.00	2.00	2.01	2.02	2.01	1.97	1.97	1.96	1.96	3.20	2.16	24
5	1.97	1.97	1.96	1.98	1.98	1.97	S	1.97	1.98	2.00	1.99	1.99	1.99	2.04	1.99	1.98	2.00	1.98	2.00	1.99	1.98	2.00	1.96	1.96	1.96	2.04	1.98	24
6	1.97	1.97	2.00	2.01	1.98	S	1.97	1.98	1.99	1.98	1.99	1.99	1.99	1.99	1.98	1.99	1.99	1.98	1.99	2.03	2.04	2.04	1.98	1.96	1.96	2.04	1.99	24
7	1.97	1.98	1.98	1.97	S	2.00	2.00	1.98	1.97	1.97	1.97	1.96	1.97	1.96	1.96	1.97	1.97	1.98	1.96	1.96	1.96	1.97	1.98	1.98	1.96	2.00	1.97	24
8	1.98	1.96	1.97	S	1.98	1.98	1.99	2.00	2.00	1.99	1.98	1.98	1.97	1.98	1.98	2.00	2.02	2.00	2.00	2.03	2.04	2.29	3.10	2.99	3.60	2.17	24	
9	2.34	2.24	S	2.14	2.17	2.18	2.16	2.15	2.14	2.11	2.08	2.05	2.04	2.02	2.00	1.99	1.99	1.99	1.99	2.01	2.00	1.99	2.00	2.00	1.99	2.34	2.08	24
10	1.99	S	1.99	1.99	2.01	2.00	1.99	1.99	2.00	2.00	1.98	2.00	2.02	2.00	2.19	2.08	2.54	2.26	2.22	2.21	2.36	2.24	2.15	1.98	2.54	2.10	24	
11	S	2.25	2.35	2.39	2.37	2.32	2.19	2.16	2.12	2.12	C	C	C	C	C	2.21	2.26	2.29	2.33	2.26	2.20	2.18	S	2.12	2.39	2.25	24	
12	2.18	2.18	2.19	2.18	2.18	2.20	2.22	2.27	2.26	2.30	2.30	2.30	2.36	2.37	2.37	2.39	2.45	2.49	2.45	2.48	2.58	2.61	S	2.59	2.18	2.61	2.34	24
13	2.53	2.53	2.62	3.19	3.04	2.80	3.30	3.78	4.20	3.07	4.17	7.04	3.49	3.13	2.73	2.73	2.61	3.07	2.42	2.34	2.29	S	2.52	2.51	2.29	7.04	3.13	24
14	2.21	2.21	2.26	2.32	2.36	2.63	2.58	2.65	2.70	2.87	3.08	3.00	3.02	2.52	2.42	2.41	2.40	2.36	2.05	2.04	S	2.02	2.02	2.02	2.02	3.08	2.44	24
15	2.06	2.08	2.08	2.06	2.06	2.05	2.46	2.07	2.16	2.13	2.12	2.06	2.04	2.18	2.30	2.34	2.07	2.41	2.27	S	2.71	2.66	2.29	2.20	2.04	2.71	2.21	24
16	2.15	2.10	2.11	2.11	2.11	2.09	2.08	2.09	2.09	2.06	2.09	2.08	2.11	2.07	2.05	2.05	2.17	2.08	S	2.11	2.05	2.03	2.04	2.08	2.03	2.17	2.09	24
17	2.05	2.30	2.05	2.21	2.11	2.20	2.18	2.27	2.30	2.29	2.58	2.53	2.40	2.26	2.18	2.17	2.16	S	2.45	2.39	2.39	2.72	3.28	3.78	2.05	3.78	2.40	24
18	3.96	3.53	2.99	2.48	2.61	2.49	2.21	2.12	2.16	2.15	2.12	2.10	2.10	2.11	2.08	2.08	S	2.10	2.11	2.10	2.11	2.11	2.11	2.15	2.08	3.96	2.35	24
19	2.16	2.16	2.13	2.15	2.11	2.12	2.10	2.09	2.09	2.09	2.08	2.08	2.08	2.06	2.06	S	2.02	2.03	2.03	2.02	2.04	2.02	2.01	2.03	2.01	2.16	2.08	24
20	2.04	2.05	2.06	2.07	2.08	2.07	2.07	2.09	2.12	2.12	2.12	2.12	2.11	2.13	S	2.19	2.23	2.27	2.30	2.33	2.36	2.39	2.38	2.42	2.04	2.42	2.18	24
21	2.43	2.46	2.37	2.53	2.44	2.19	2.34	2.21	2.12	2.10	2.09	2.10	2.11	S	2.07	2.08	2.07	2.10	2.12	2.08	2.07	2.08	2.15	2.47	2.07	2.53	2.21	24
22	2.37	2.35	2.44	2.54	2.54	2.52	2.56	3.47	4.01	2.69	2.38	2.52	S	15.22	7.00	7.05	8.06	5.58	5.06	4.28	2.67	2.45	2.37	2.43	2.35	15.22	4.11	24
23	2.11	2.04	2.03	2.02	2.00	2.00	2.00	1.99	2.00	2.01	2.00	S	1.99	1.97	1.97	1.96	1.98	2.01	2.05	2.07	2.07	2.13	2.08	2.05	1.96	2.13	2.02	24
24	2.06	2.05	2.04	2.05	2.11	2.10	2.11	2.20	2.30	2.21	S	2.18	2.11	2.17	2.27	2.09	2.02	2.05	2.07	2.07	2.09	2.10	3.03	3.06	2.02	3.06	2.20	24
25	3.14	3.25	2.90	2.44	2.21	2.27	2.27	2.23	2.25	S	2.26	2.26	2.26	2.14	2.08	2.07	2.07	2.10	2.07	2.05	2.20	2.60	2.15	2.16	2.05	3.25	2.32	24
26	2.29	2.30	2.34	2.42	2.60	2.46	2.56	2.41	S	2.45	2.49	2.27	2.00	1.96	1.97	1.98	1.97	1.99	1.97	1.95	1.95	1.99	2.00	1.95	2.00	2.60	2.19	24
27	1.99	1.98	1.94	1.93	1.93	1.94	1.95	S	1.97	1.98	1.97	1.98	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.95	1.95	1.95	1.96	1.97	1.93	1.99	1.96	24
28	1.98	1.98	1.98	1.99	2.00	2.02	S	2.07	2.06	2.03	1.97	1.94	1.93	1.94	1.93	1.94	1.96	1.99	2.01	2.02	2.07	2.10	2.04	2.07	1.93	2.10	2.00	24
29	2.10	2.05	2.11	2.09	2.13	S	2.17	2.40	2.59	2.41	2.14	2.10	2.19	2.25	2.19	2.11	2.08	2.14	2.25	2.37	2.41	2.29	2.21	2.18	2.05	2.59	2.21	24
30	2.16	2.15	2.13	2.12	S	2.11	2.11	2.11	2.08	2.08	2.08	2.09	2.08	2.05	2.04	2.04	2.05	2.08	2.09	2.09	2.10	2.09	2.11	2.10	2.04	2.16	2.09	24
31	2.11	2.14	2.17	S	2.25	2.52	2.50	2.47	2.50	2.41	2.36	2.32	2.27	2.28	2.26	2.18	2.16	2.12	2.05	2.01	2.01	2.01	2.01	2.00	2.00	2.52	2.22	24
HOURLY MAX	3.96	3.53	2.99	3.19	3.04	2.80	3.30	3.78	4.20	3.07	4.17	7.04	3.49	15.22	7.00	7.05	8.06	5.58	5.06	4.28	2.71	3.10	3.28	3.78				
HOURLY AVG	2.22	2.22	2.18	2.19	2.19	2.19	2.22	2.25	2.30	2.22	2.24	2.35	2.16	2.58	2.27	2.27	2.29	2.25	2.21	2.17	2.16	2.20	2.20	2.26				

STATUS FLAG CODES

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

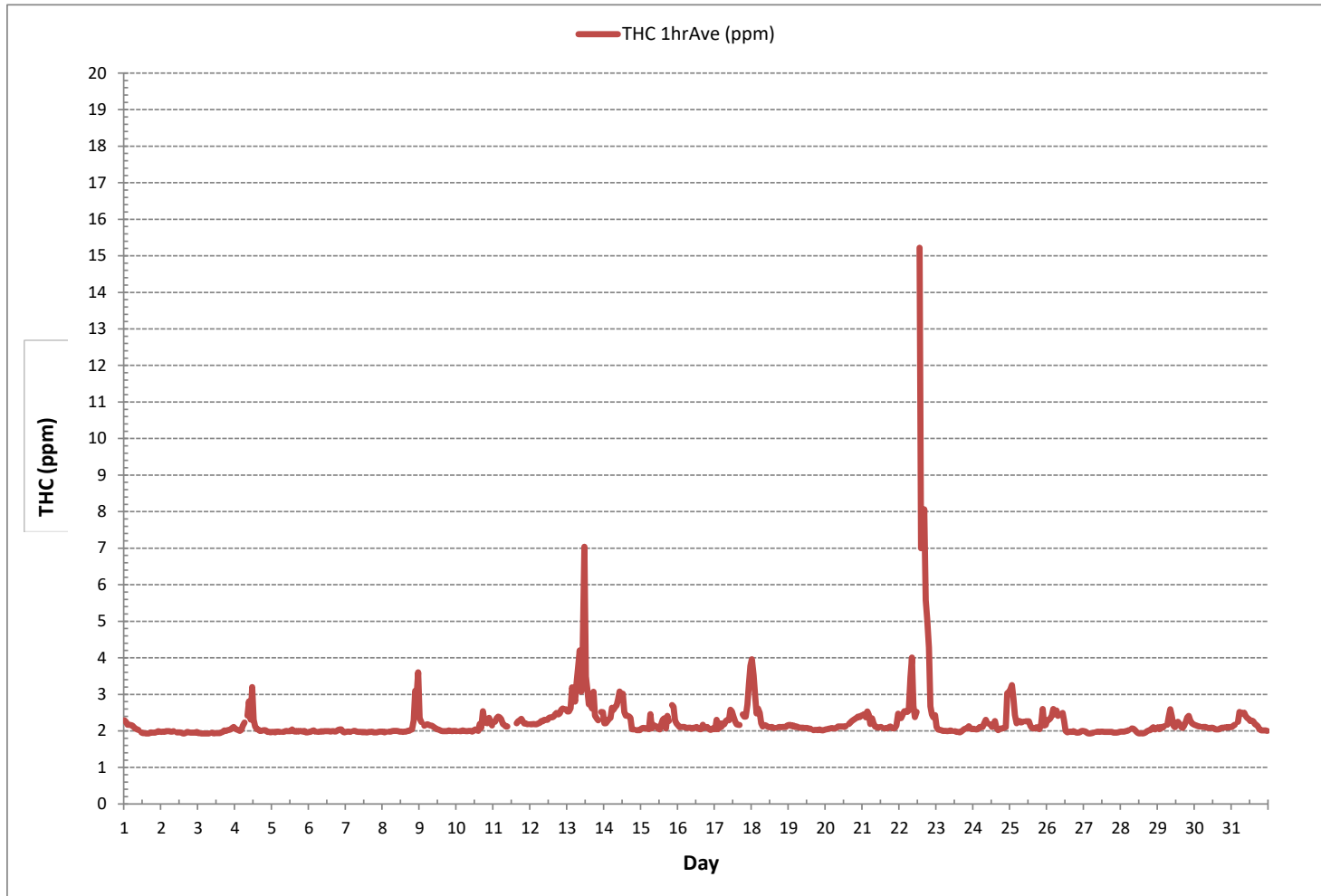
24 HR AVERAGES January 2019



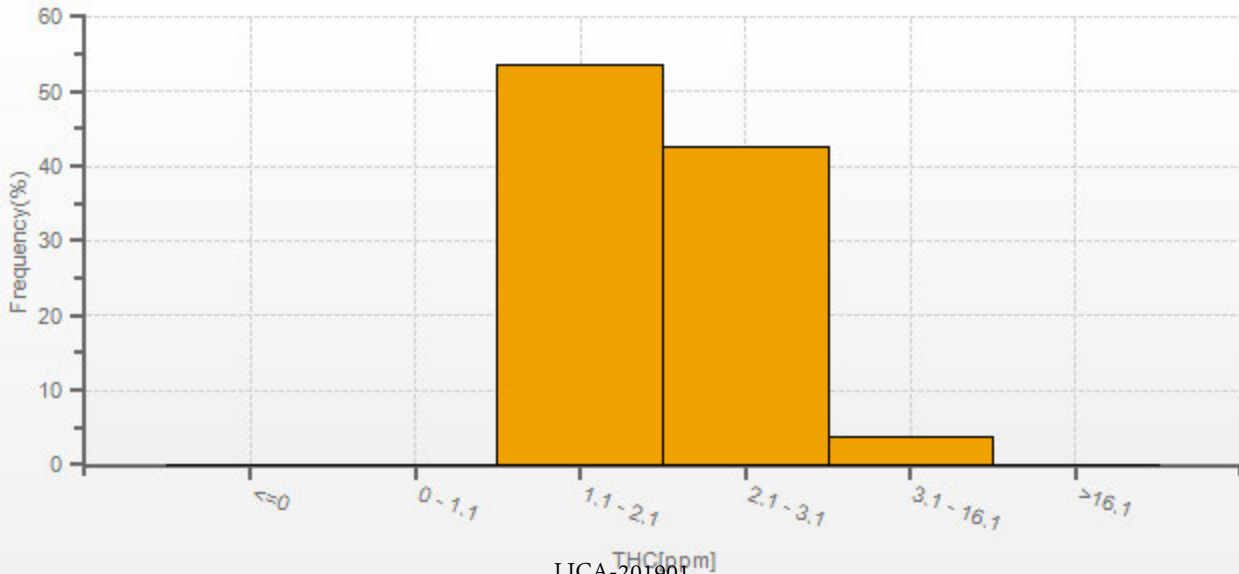
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	707			
MINIMUM 1-HR AVERAGE:	1.93 ppm	@ HOUR	14	ON DAY 1
MAXIMUM 1-HR AVERAGE:	15.22 ppm	@ HOUR	13	ON DAY 22
MAXIMUM 24-HR AVERAGE:	4.11 ppm			ON DAY 22
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.72	MONTHLY AVERAGE:	2.24 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



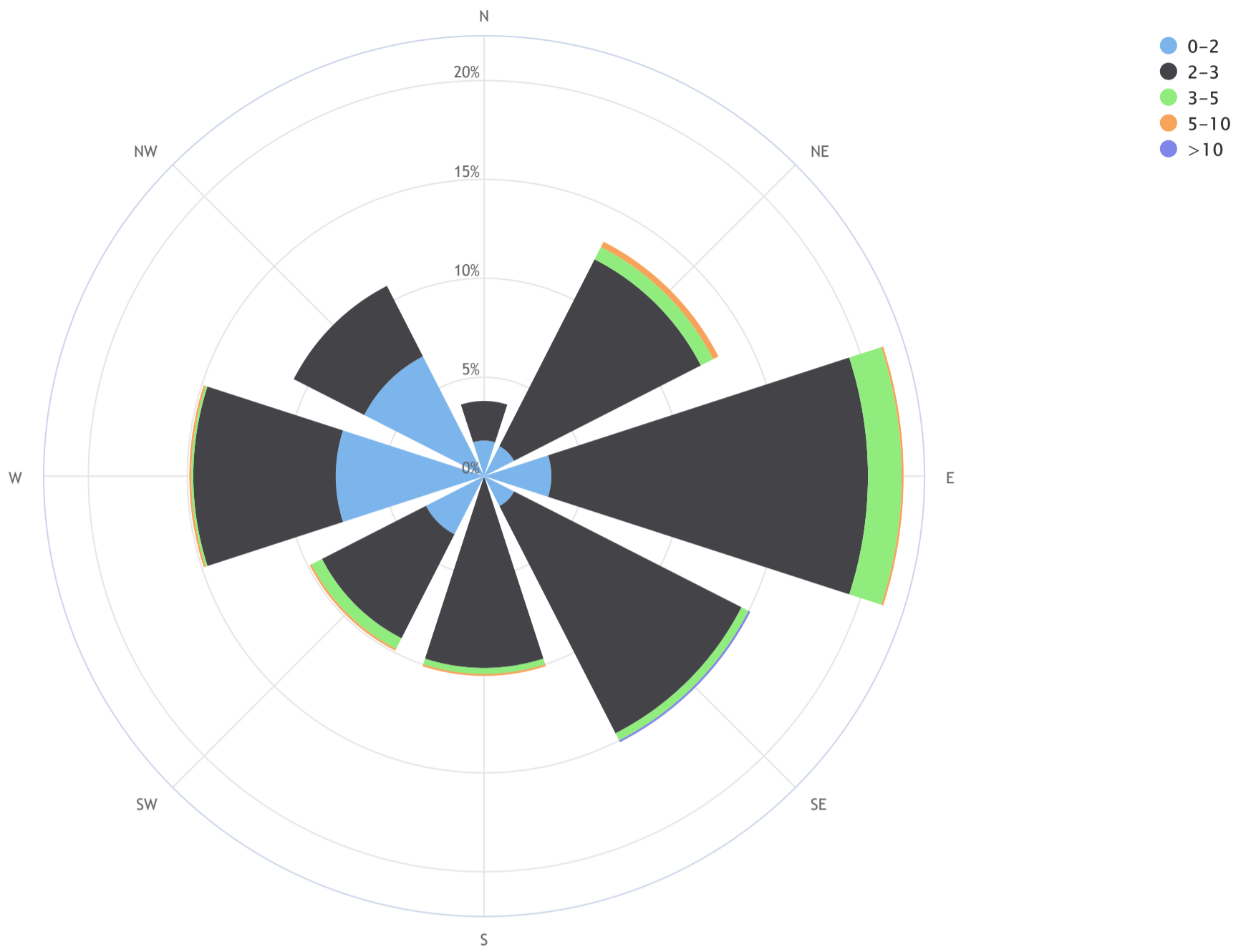
### THC[ppm] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



LICA-201901  
Page 287 of 350

Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_THC (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 2.3, CALM % = 0.7%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	1.8	2.0	0.0	0.0	0.0	3.8
NE	1.7	10.6	0.7	0.3	0.0	13.3
E	3.4	16.0	1.7	0.1	0.0	21.2
SE	1.7	12.9	0.4	0.0	0.1	15.1
S	0.1	9.6	0.3	0.1	0.0	10.2
SW	3.3	5.9	0.6	0.1	0.0	9.9
W	7.5	7.2	0.1	0.1	0.0	15.0
NW	6.8	4.0	0.0	0.0	0.0	10.8
<b>Summary</b>	<b>26.3</b>	<b>68.2</b>	<b>3.8</b>	<b>0.8</b>	<b>0.1</b>	<b>99.3</b>
<b>CALM</b>	<b>0.0</b>	<b>0.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.7</b>





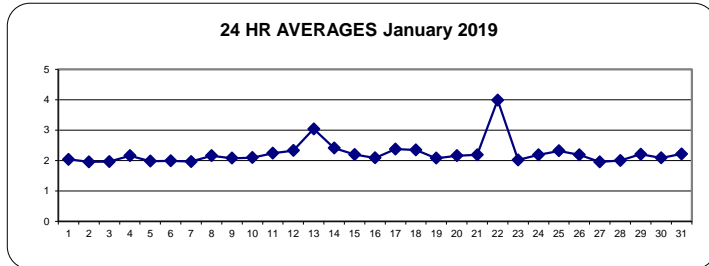
METHANE Hourly Averages (CH<sub>4</sub> ppm)

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	2.29	2.23	2.17	2.17	2.16	2.15	2.11	2.07	2.05	2.03	S	1.96	1.94	1.94	1.93	1.93	1.93	1.96	1.95	1.95	1.95	1.97	1.99	1.98	1.93	2.29	2.04	24	
2	1.97	1.98	1.97	1.99	1.99	1.99	1.98	1.98	1.99	S	1.96	1.96	1.96	1.95	1.93	1.93	1.95	1.97	1.96	1.95	1.95	1.95	1.95	1.97	1.93	1.99	1.96	24	
3	1.94	1.94	1.93	1.93	1.93	1.93	1.93	1.93	S	1.95	1.93	1.94	1.94	1.94	1.94	1.96	1.97	2.01	2.00	2.02	2.03	2.04	2.08	2.11	1.93	2.11	1.97	24	
4	2.06	2.04	2.02	2.00	2.03	2.14	2.23	S	2.42	2.80	2.31	3.19	2.30	2.12	2.05	2.04	2.00	2.00	2.01	2.02	2.01	1.97	1.97	1.96	1.96	3.19	2.16	24	
5	1.97	1.97	1.96	1.98	1.98	1.97	S	1.97	1.98	2.00	1.99	1.99	1.99	2.04	1.99	1.98	2.00	1.98	2.00	1.99	1.98	2.00	1.96	1.96	1.96	2.04	1.98	24	
6	1.97	1.97	2.00	2.01	1.98	S	1.97	1.98	1.99	1.98	1.99	1.99	1.99	1.99	1.98	1.99	1.99	1.98	1.99	2.03	2.04	2.04	1.98	1.96	1.96	2.04	1.99	24	
7	1.97	1.98	1.98	1.97	S	2.00	2.00	1.98	1.97	1.97	1.97	1.96	1.97	1.96	1.96	1.97	1.97	1.98	1.96	1.96	1.96	1.97	1.98	1.98	1.96	2.00	1.97	24	
8	1.98	1.96	1.97	S	1.98	1.98	1.99	2.00	2.00	2.00	1.99	1.98	1.98	1.97	1.98	1.98	2.00	2.00	2.03	2.04	2.29	3.10	2.98	3.56	1.96	3.56	2.16	24	
9	2.34	2.24	S	2.14	2.17	2.18	2.16	2.15	2.14	2.11	2.08	2.05	2.04	2.02	2.00	1.99	1.99	1.99	1.99	2.01	2.00	1.99	2.00	2.00	1.99	2.34	2.08	24	
10	1.99	S	1.99	1.99	2.01	2.00	1.99	1.99	2.00	2.00	1.98	2.00	2.04	2.02	2.00	2.19	2.08	2.54	2.26	2.22	2.21	2.36	2.24	2.15	1.98	2.54	2.10	24	
11	S	2.25	2.35	2.38	2.37	2.32	2.19	2.16	2.12	C	C	C	C	C	C	2.21	2.25	2.27	2.29	2.25	2.20	2.19	2.18	S	2.12	2.38	2.24	24	
12	2.18	2.18	2.19	2.18	2.18	2.20	2.22	2.27	2.25	2.30	2.30	2.30	2.35	2.37	2.35	2.37	2.41	2.46	2.43	2.47	2.57	2.59	S	2.51	2.18	2.59	2.33	24	
13	2.47	2.45	2.55	3.10	2.93	2.69	3.15	3.60	3.99	2.98	4.02	6.66	3.33	3.00	2.66	2.66	2.58	2.99	2.40	2.33	2.29	S	2.49	2.49	2.29	6.66	3.04	24	
14	2.21	2.21	2.26	2.31	2.36	2.62	2.57	2.65	2.69	2.86	3.06	2.89	2.91	2.43	2.30	2.30	2.29	2.26	2.05	2.04	S	2.02	2.02	2.02	2.02	3.06	2.41	24	
15	2.06	2.08	2.08	2.06	2.06	2.05	2.45	2.07	2.16	2.13	2.12	2.06	2.04	2.18	2.30	2.28	2.06	2.39	2.27	S	2.68	2.64	2.29	2.20	2.04	2.68	2.20	24	
16	2.15	2.10	2.11	2.11	2.11	2.09	2.08	2.09	2.09	2.06	2.09	2.08	2.11	2.07	2.05	2.05	2.17	2.08	S	2.11	2.05	2.03	2.04	2.08	2.03	2.17	2.09	24	
17	2.05	2.26	2.05	2.10	2.11	2.13	2.18	2.27	2.30	2.29	2.57	2.53	2.33	2.25	2.18	2.14	2.15	S	2.45	2.39	2.39	2.69	3.27	3.75	2.05	3.75	2.38	24	
18	3.92	3.51	2.98	2.45	2.61	2.49	2.21	2.12	2.16	2.15	2.12	2.10	2.10	2.11	2.08	2.08	S	2.10	2.11	2.10	2.11	2.11	2.11	2.15	2.08	3.92	2.35	24	
19	2.16	2.16	2.13	2.15	2.11	2.12	2.10	2.09	2.09	2.09	2.08	2.08	2.08	2.06	2.06	S	2.02	2.03	2.03	2.02	2.04	2.02	2.01	2.03	2.01	2.16	2.08	24	
20	2.04	2.05	2.06	2.07	2.08	2.07	2.07	2.09	2.12	2.12	2.12	2.12	2.11	2.13	S	2.18	2.21	2.24	2.27	2.26	2.28	2.31	2.30	2.34	2.04	2.34	2.16	24	
21	2.35	2.37	2.31	2.47	2.42	2.19	2.32	2.20	2.09	2.10	2.09	2.10	2.11	S	2.07	2.08	2.07	2.10	2.12	2.08	2.07	2.08	2.15	2.47	2.07	2.47	2.19	24	
22	2.37	2.35	2.40	2.52	2.54	2.52	2.56	3.42	3.92	2.67	2.38	2.51	S	14.41	6.70	6.72	7.64	5.33	4.84	4.12	2.62	2.40	2.35	2.43	2.35	14.41	3.99	24	
23	2.11	2.04	2.03	2.02	2.00	2.00	2.00	1.99	2.00	2.01	2.00	S	1.99	1.97	1.97	1.96	1.98	2.01	2.05	2.07	2.07	2.13	2.08	2.05	1.96	2.13	2.02	24	
24	2.06	2.05	2.04	2.05	2.11	2.10	2.11	2.20	2.30	2.21	S	2.18	2.11	2.16	2.27	2.09	2.02	2.05	2.07	2.07	2.09	2.10	2.99	3.02	2.02	3.02	2.19	24	
25	3.09	3.22	2.88	2.44	2.21	2.27	2.27	2.23	2.25	S	2.25	2.26	2.26	2.14	2.08	2.06	2.06	2.10	2.07	2.05	2.20	2.59	2.15	2.16	2.05	3.22	2.32	24	
26	2.29	2.30	2.34	2.42	2.60	2.46	2.56	2.41	S	2.44	2.48	2.27	2.00	1.96	1.97	1.98	1.97	1.99	1.97	1.95	1.95	1.99	2.00	1.95	2.00	1.95	2.60	2.19	24
27	1.99	1.98	1.94	1.93	1.93	1.94	1.95	S	1.97	1.98	1.97	1.98	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.95	1.95	1.95	1.96	1.97	1.93	1.99	1.96	24	
28	1.98	1.98	1.98	1.99	2.00	2.02	S	2.07	2.06	2.03	1.97	1.94	1.93	1.93	1.93	1.94	1.96	1.99	2.01	2.02	2.07	2.10	2.04	2.07	1.93	2.10	2.00	24	
29	2.10	2.05	2.11	2.09	2.13	S	2.17	2.40	2.59	2.41	2.14	2.10	2.19	2.25	2.19	2.11	2.08	2.14	2.25	2.37	2.41	2.29	2.21	2.18	2.05	2.59	2.21	24	
30	2.16	2.15	2.13	2.12	S	2.11	2.11	2.11	2.08	2.08	2.08	2.09	2.08	2.05	2.04	2.04	2.05	2.08	2.09	2.09	2.10	2.09	2.11	2.10	2.04	2.16	2.09	24	
31	2.11	2.14	2.17	S	2.25	2.51	2.50	2.47	2.50	2.41	2.36	2.27	2.28	2.26	2.18	2.16	2.12	2.05	2.01	2.01	2.01	2.01	2.01	2.00	2.00	2.51	2.22	24	
HOURLY MAX	3.92	3.51	2.98	3.10	2.93	2.69	3.15	3.60	3.99	2.98	4.02	6.66	3.33	14.41	6.70	6.72	7.64	5.33	4.84	4.12	2.68	3.10	3.27	3.75					
HOURLY AVG	2.21	2.21	2.17	2.18	2.18	2.18	2.21	2.24	2.29	2.22	2.23	2.33	2.15	2.54	2.25	2.25	2.27	2.24	2.20	2.16	2.15	2.19	2.20	2.26					

STATUS FLAG CODES

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

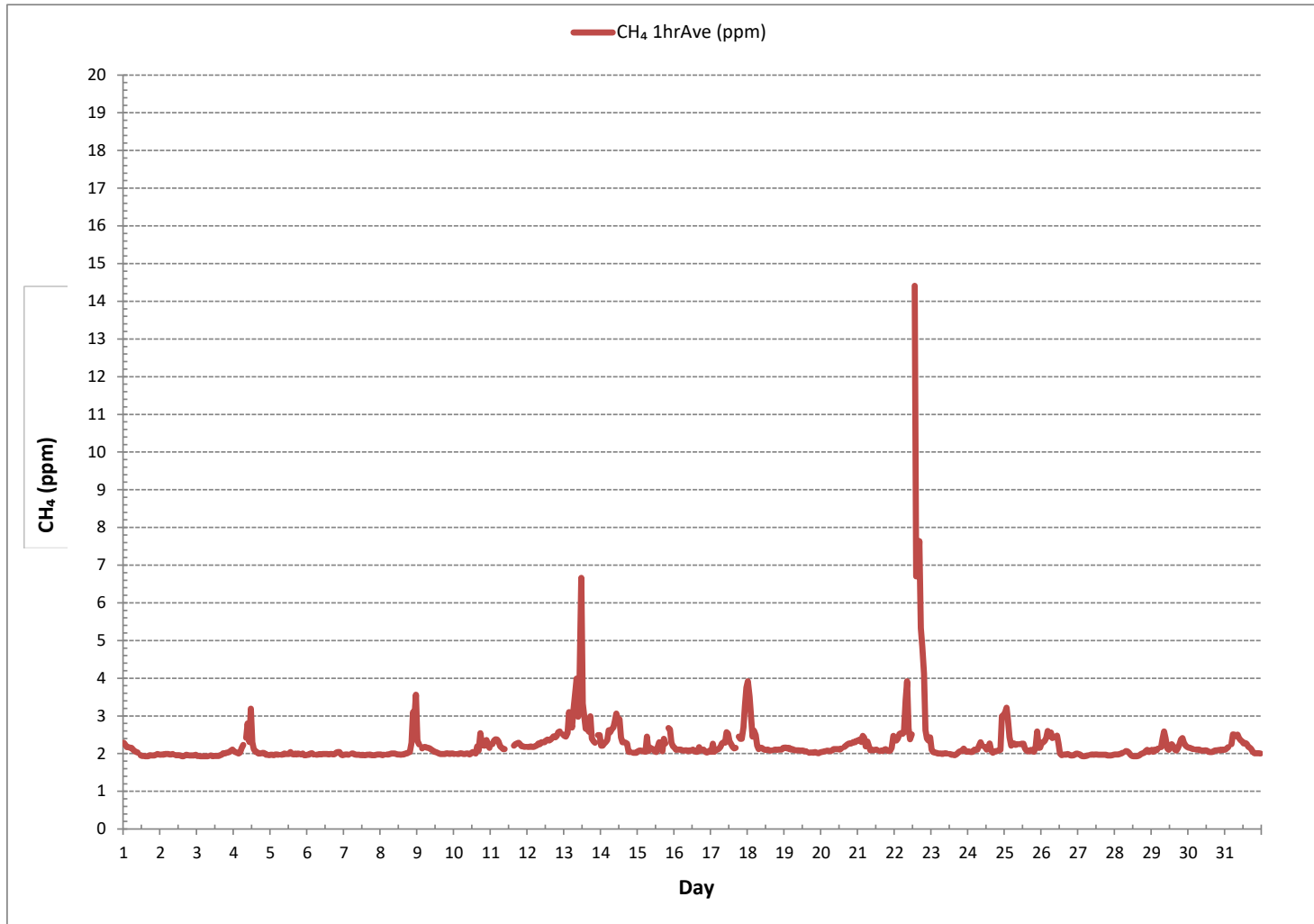
24 HR AVERAGES January 2019



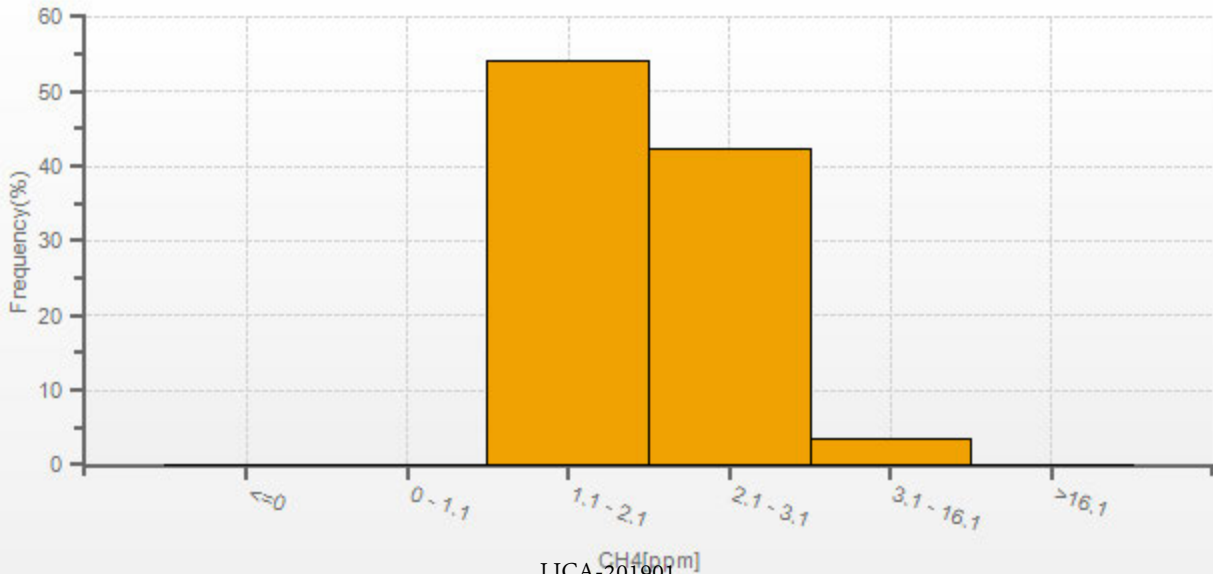
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	707			
MINIMUM 1-HR AVERAGE:	1.93 ppm	@ HOUR	14	ON DAY 1
MAXIMUM 1-HR AVERAGE:	14.41 ppm	@ HOUR	13	ON DAY 22
MAXIMUM 24-HR AVERAGE:	3.99 ppm			ON DAY 22
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.67	MONTHLY AVERAGE:	2.23 ppm	

METHANE Hourly Averages (CH<sub>4</sub> ppm)



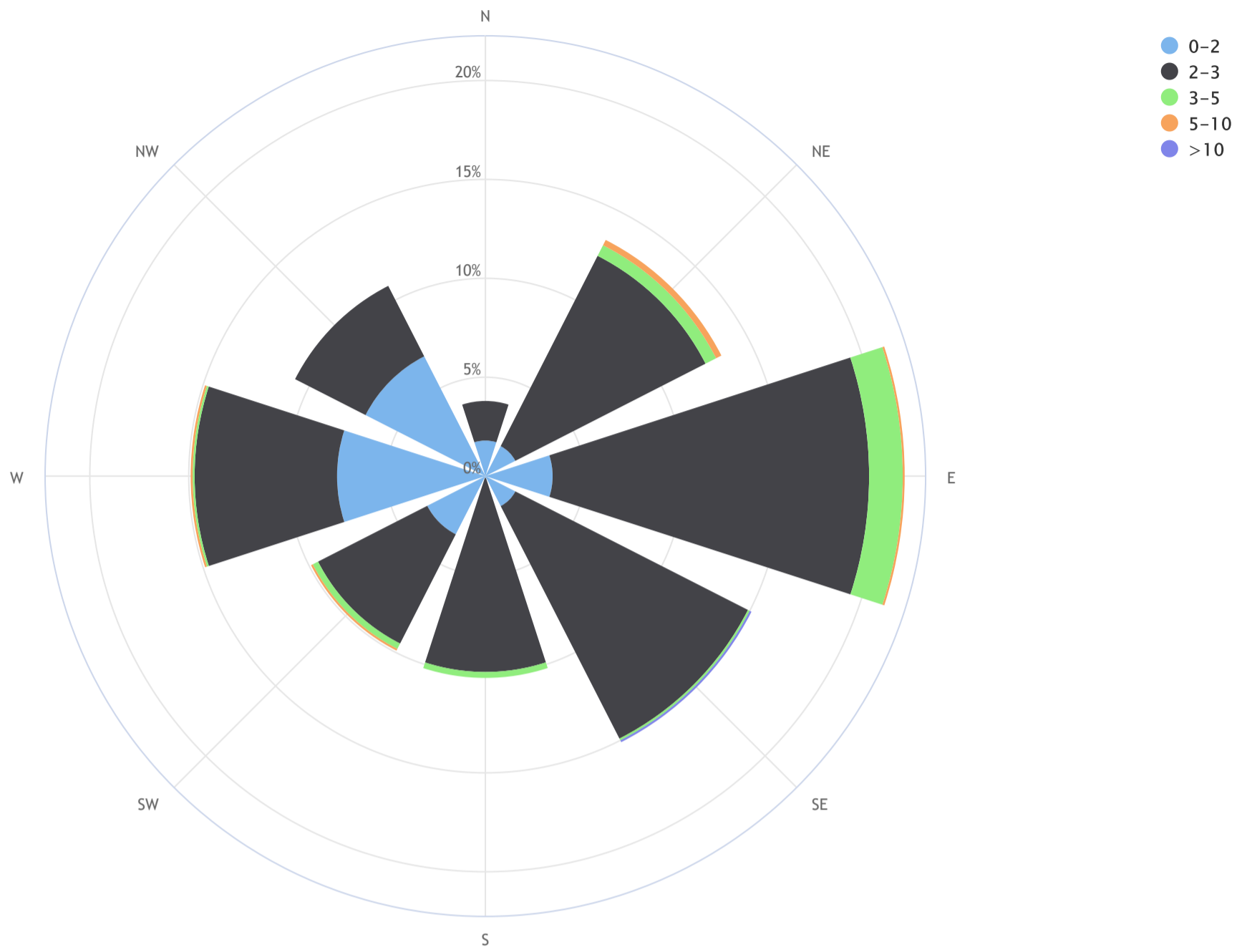
CH4[ppm] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



LICA-201901

Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_CH4 (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 2.3, CALM % = 0.7%



Direction	0-2	2-3	3-5	5-10	>10	TOTAL
N	1.8	2.0	0.0	0.0	0.0	3.8
NE	1.7	10.8	0.6	0.3	0.0	13.3
E	3.4	16.0	1.7	0.1	0.0	21.2
SE	1.7	13.2	0.1	0.0	0.1	15.1
S	0.1	9.8	0.3	0.0	0.0	10.2
SW	3.3	6.2	0.3	0.1	0.0	9.9
W	7.5	7.2	0.1	0.1	0.0	15.0
NW	6.8	4.0	0.0	0.0	0.0	10.8
Summary	26.3	69.0	3.1	0.7	0.1	99.3
CALM	0.0	0.7	0.0	0.0	0.0	0.7



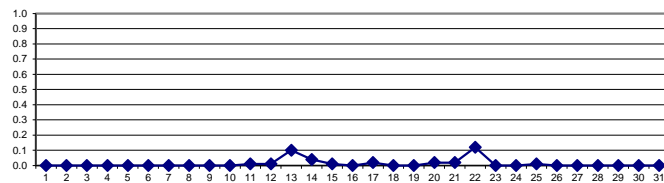
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	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	24
2	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	0.00	0.00	24
3	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	0.00	0.00	0.00	24
4	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	0.00	0.00	0.00	0.00	24
5	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	0.00	0.00	0.00	0.00	24
6	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
7	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
8	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
9	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
10	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	0.00	24
11	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	C	0.00	0.00	0.00	0.02	0.04	0.02	0.01	0.00	0.00	S	0.00	0.04	0.01	24
12	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	0.02	0.02	0.04	0.04	0.03	0.00	0.01	0.02	S	0.08	0.00	0.08	0.01	24	
13	0.06	0.08	0.07	0.09	0.11	0.10	0.15	0.18	0.21	0.09	0.14	0.38	0.15	0.13	0.07	0.07	0.03	0.08	0.01	0.01	0.00	S	0.03	0.03	0.00	0.38	0.10	24	
14	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.02	0.11	0.11	0.10	0.12	0.12	0.12	0.09	0.00	0.00	S	0.00	0.00	0.00	0.00	0.12	0.04	24	
15	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.01	0.02	0.00	S	0.02	0.02	0.00	0.00	0.00	0.06	0.01	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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
17	0.00	0.04	0.00	0.11	0.00	0.07	0.00	0.00	0.00	0.00	0.01	0.00	0.07	0.00	0.00	0.03	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.02	24
18	0.04	0.02	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	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	24
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
20	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	0.02	0.04	0.03	0.07	0.07	0.08	0.08	0.08	0.00	0.00	0.08	0.02	24
21	0.08	0.09	0.06	0.06	0.02	0.00	0.01	0.00	0.02	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	0.09	0.02	24
22	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.05	0.10	0.01	0.00	0.00	S	0.81	0.30	0.33	0.42	0.25	0.16	0.05	0.05	0.03	0.00	0.00	0.00	0.81	0.12	24	
23	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	
24	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	0.04	0.04	0.00	0.04	0.00	24	
25	0.05	0.03	0.02	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	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.05	0.01	24	
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	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	0.01	0.00	24	
27	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	0.00	0.00	0.00	0.00	24	
28	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
29	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
30	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
31	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
HOURLY MAX	0.08	0.09	0.07	0.11	0.11	0.10	0.15	0.18	0.21	0.09	0.14	0.38	0.15	0.81	0.30	0.33	0.42	0.25	0.21	0.16	0.07	0.07	0.08	0.08					
HOURLY AVG	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.02	0.01	0.04	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01					

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

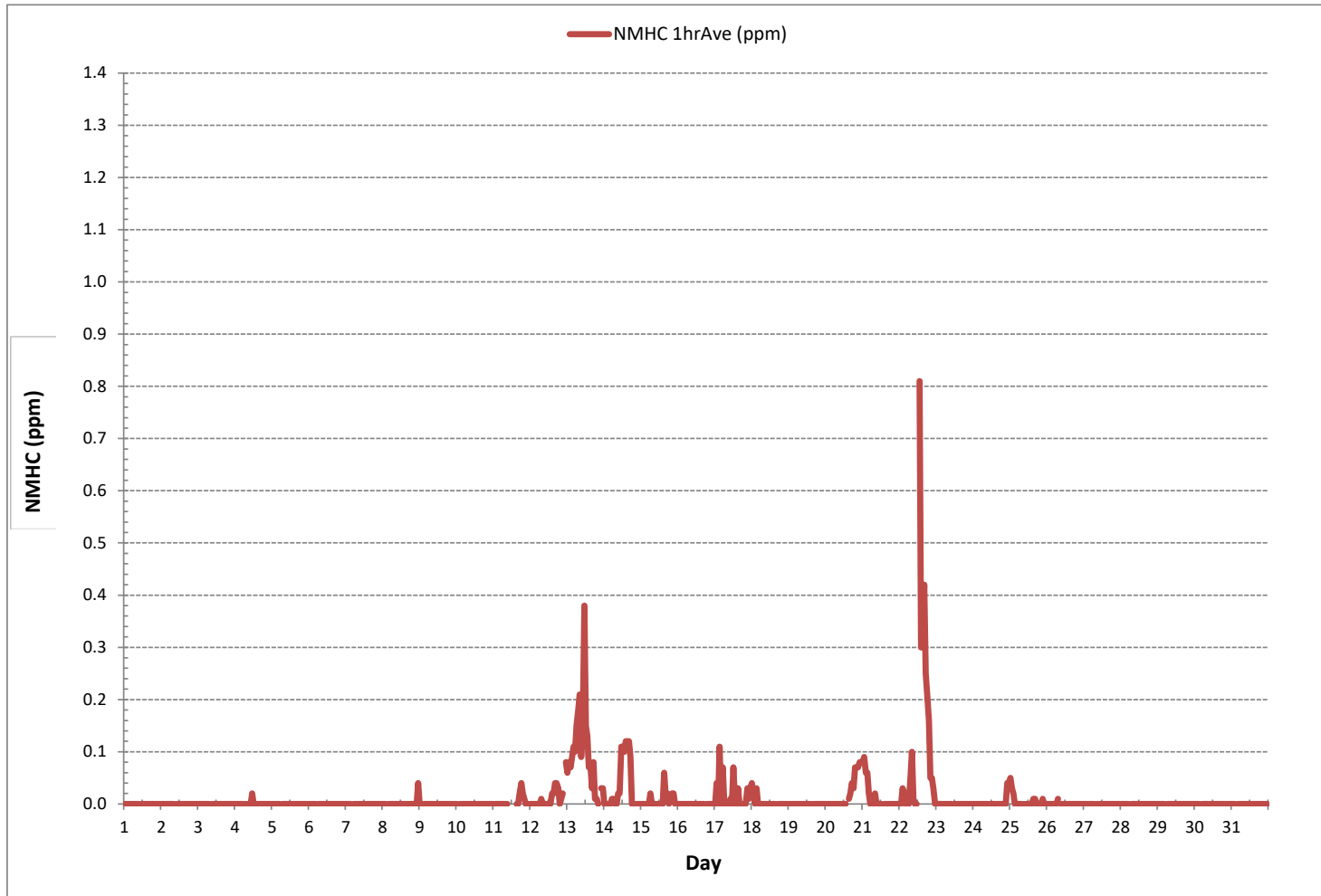
24 HR AVERAGES January 2019



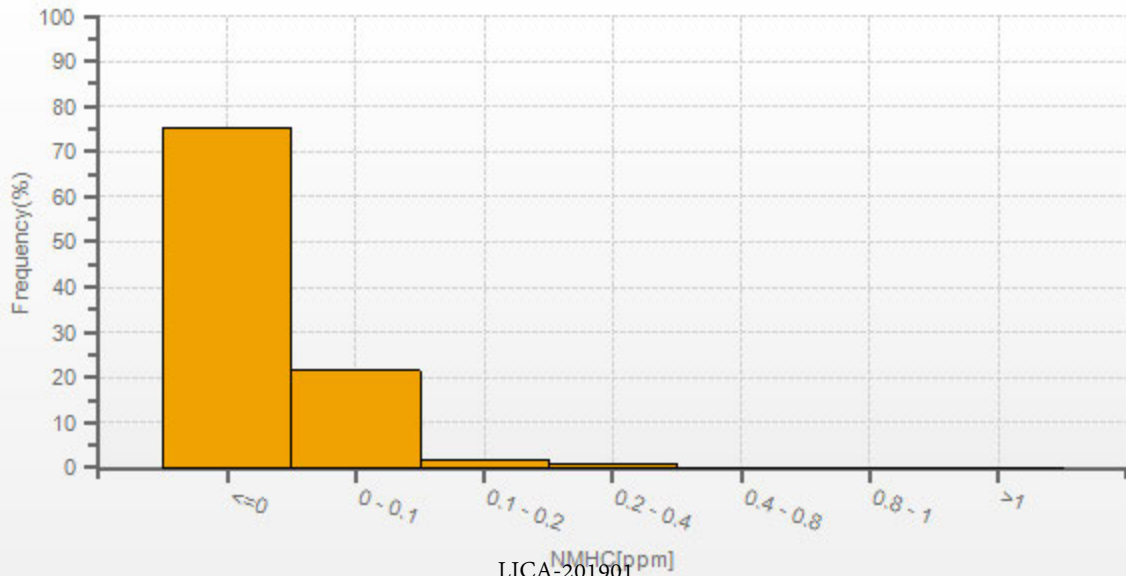
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	106			
MINIMUM 1-HR AVERAGE:	0.00 ppm	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	0.81 ppm	@ HOUR	13	ON DAY 22
MAXIMUM 24-HR AVERAGE:	0.12 ppm			ON DAY 22
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.05	MONTHLY AVERAGE:	0.01 ppm	

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



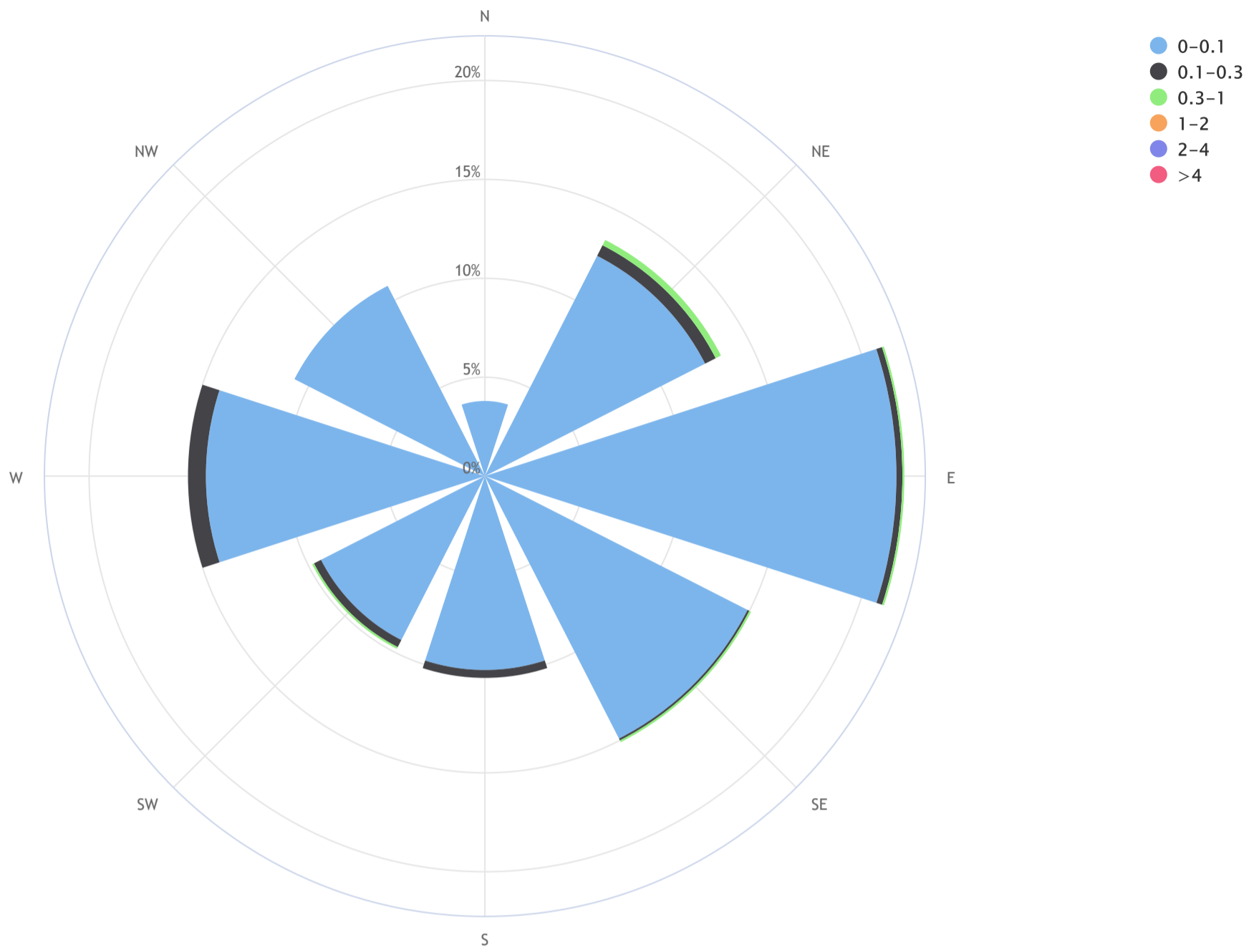
# NMHC[ppm] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



LICA-201901  
Page 295 of 350

Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_NMHC (ppm)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 0.0, CALM % = 0.7%



Direction	0-0.1	0.1-0.3	0.3-1	1-2	2-4	>4	TOTAL
N	3.8	0.0	0.0	0.0	0.0	0.0	3.8
NE	12.5	0.6	0.3	0.0	0.0	0.0	13.3
E	20.8	0.3	0.1	0.0	0.0	0.0	21.2
SE	14.9	0.1	0.1	0.0	0.0	0.0	15.1
S	9.8	0.4	0.0	0.0	0.0	0.0	10.2
SW	9.3	0.4	0.1	0.0	0.0	0.0	9.9
W	14.1	0.9	0.0	0.0	0.0	0.0	15.0
NW	10.8	0.0	0.0	0.0	0.0	0.0	10.8
Summary	95.9	2.7	0.7	0.0	0.0	0.0	99.3
CALM	0.7	0.0	0.0	0.0	0.0	0.0	0.7





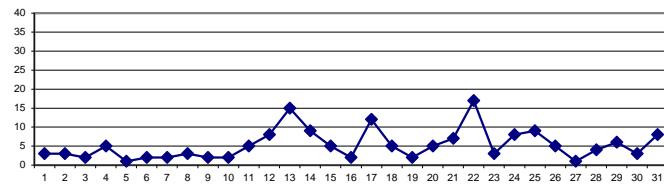
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	7	6	5	5	4	4	4	4	4	4	4	S	3	3	2	2	2	2	2	1	1	1	1	1	1	1	7	3	24
2	1	1	2	2	3	4	4	4	4	4	S	6	5	5	5	3	2	3	4	3	2	2	2	2	2	1	6	3	24
3	1	1	1	1	1	1	1	1	1	S	2	1	1	1	1	2	2	2	2	3	3	3	3	3	3	1	3	2	24
4	2	2	2	2	2	4	5	S	10	13	11	11	8	6	5	5	4	5	8	4	2	2	1	1	1	13	5	24	
5	1	1	1	1	1	1	S	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	2	1	24
6	1	1	1	1	1	S	1	1	2	2	2	2	2	2	2	2	2	3	2	5	6	5	3	3	1	6	2	24	
7	2	2	2	4	S	6	3	2	2	1	1	1	2	2	2	3	3	3	2	1	1	1	2	2	1	6	2	24	
8	2	1	1	S	1	3	4	2	2	1	2	2	2	2	2	2	2	2	3	4	8	9	20	1	20	3	24		
9	7	5	S	4	4	4	3	3	3	3	2	2	2	2	1	2	2	1	1	1	1	1	1	1	1	7	2	24	
10	1	S	1	1	1	1	1	1	0	1	0	C	C	C	C	C	C	C	C	5	3	2	2	3	0	5	2	24	
11	S	6	7	6	6	6	5	4	3	4	6	5	6	5	4	5	4	4	4	4	4	4	4	S	3	7	5	24	
12	4	4	4	5	4	5	4	5	4	4	4	5	5	7	8	9	10	12	13	12	11	14	14	S	14	4	14	8	24
13	14	16	15	16	17	15	20	17	18	18	29	29	26	25	20	17	10	8	7	5	4	S	4	4	4	29	15	24	
14	4	3	3	4	4	9	8	8	8	9	12	15	17	14	16	17	17	16	4	4	S	2	1	1	1	17	9	24	
15	3	3	5	4	3	2	3	2	4	6	6	2	4	19	2	2	4	5	7	S	9	6	5	3	2	19	5	24	
16	2	1	2	2	2	2	1	1	1	1	2	2	1	2	2	2	6	5	S	2	1	1	1	0	0	6	2	24	
17	0	1	2	2	1	4	5	9	18	11	13	18	17	16	14	11	13	S	19	20	15	21	22	21	0	22	12	24	
18	20	18	14	7	6	4	3	3	4	4	3	3	2	2	2	2	S	2	2	2	2	2	2	2	2	20	5	24	
19	2	2	2	2	1	2	2	2	2	2	2	2	2	2	S	1	1	1	1	1	1	1	1	1	1	2	2	24	
20	1	2	2	2	3	3	2	3	4	4	5	4	4	5	S	6	8	7	9	8	7	7	7	8	1	9	5	24	
21	8	13	16	21	14	6	14	10	9	10	7	6	4	S	2	2	2	2	3	3	3	3	2	4	9	2	21	7	24
22	7	6	6	7	9	9	10	16	19	16	13	14	S	22	22	27	33	30	28	20	14	27	18	17	6	33	17	24	
23	6	2	3	3	3	2	2	3	3	3	3	S	3	2	4	4	6	3	3	3	3	3	2	1	1	6	3	24	
24	1	1	1	1	3	4	6	7	9	8	S	9	11	13	16	10	6	12	12	13	12	7	10	10	1	16	8	24	
25	12	19	14	10	6	6	6	6	7	S	15	21	13	6	5	6	8	9	8	6	7	10	5	4	4	21	9	24	
26	6	6	6	6	8	7	11	9	S	12	12	8	3	2	2	2	2	2	2	2	2	3	4	2	2	12	5	24	
27	3	3	1	1	1	1	1	S	1	2	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	3	1	24	
28	1	2	2	3	4	6	S	15	10	6	3	1	1	1	1	1	2	3	3	4	4	4	11	1	15	4	24		
29	9	7	7	7	6	S	7	9	14	14	7	7	6	6	5	3	3	4	5	5	6	5	4	3	3	14	6	24	
30	3	3	3	3	S	3	3	2	2	2	3	3	3	3	3	4	3	4	4	6	6	5	4	4	2	6	3	24	
31	4	5	5	S	6	11	11	11	9	9	10	8	8	9	10	9	9	6	6	7	5	6	7	4	4	4	11	8	24
HOURLY MAX	20	19	16	21	17	15	20	17	19	18	29	29	26	25	22	27	33	30	28	20	15	27	22	21					
HOURLY AVG	5	5	5	5	4	5	5	6	6	6	6	7	6	6	6	6	6	5	6	5	5	5	4	5					

STATUS FLAG CODES

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

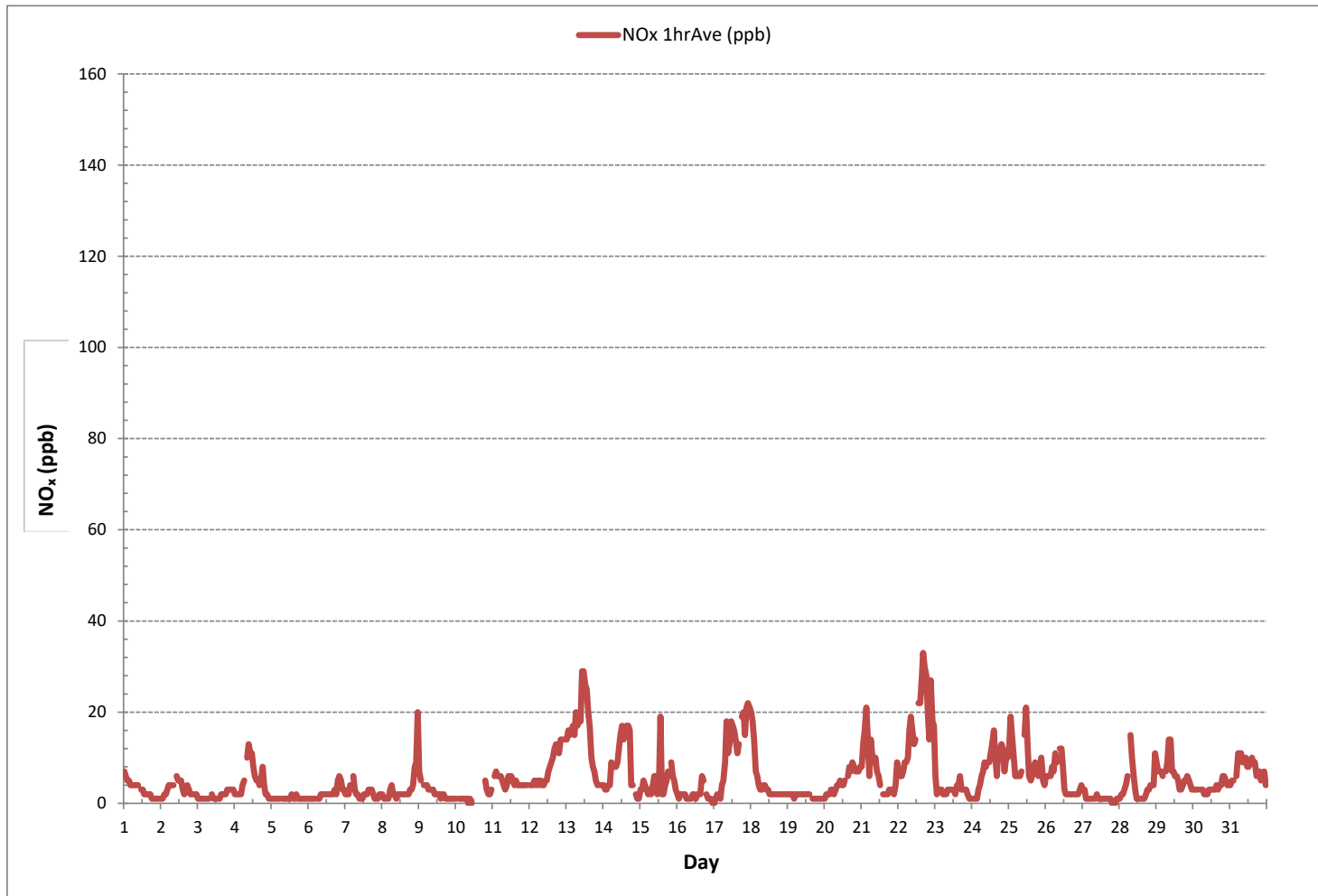
24 HR AVERAGES January 2019



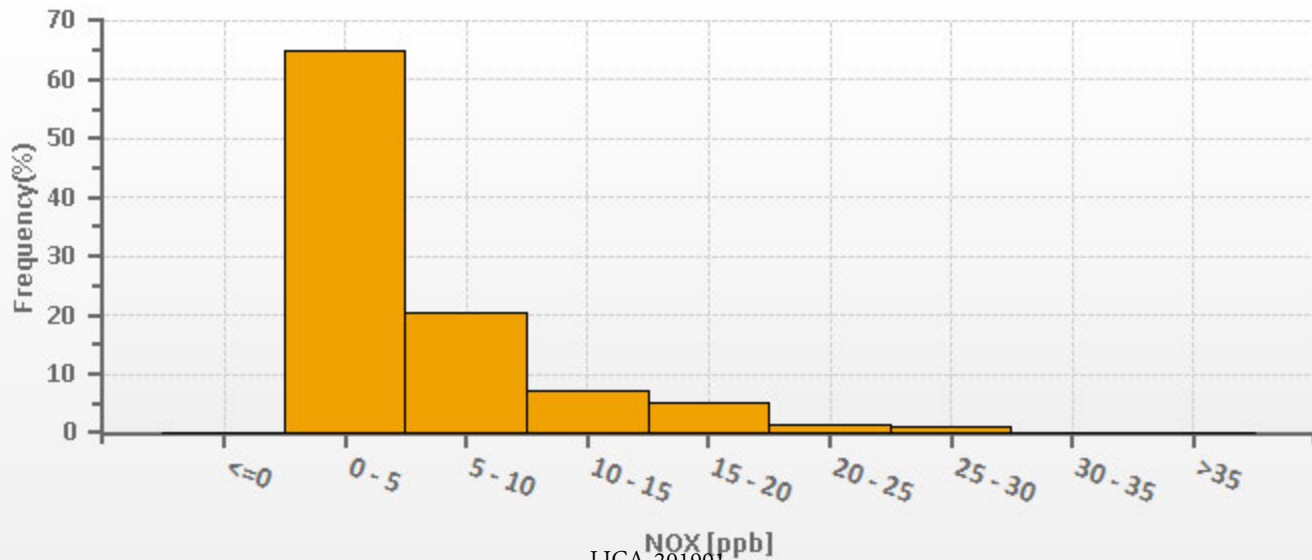
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	697			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	8	ON DAY 10
MAXIMUM 1-HR AVERAGE:	33	ppb @ HOUR	16	ON DAY 22
MAXIMUM 24-HR AVERAGE:	17	ppb		ON DAY 22
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	5		MONTHLY AVERAGE:	5 ppb

**OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)**

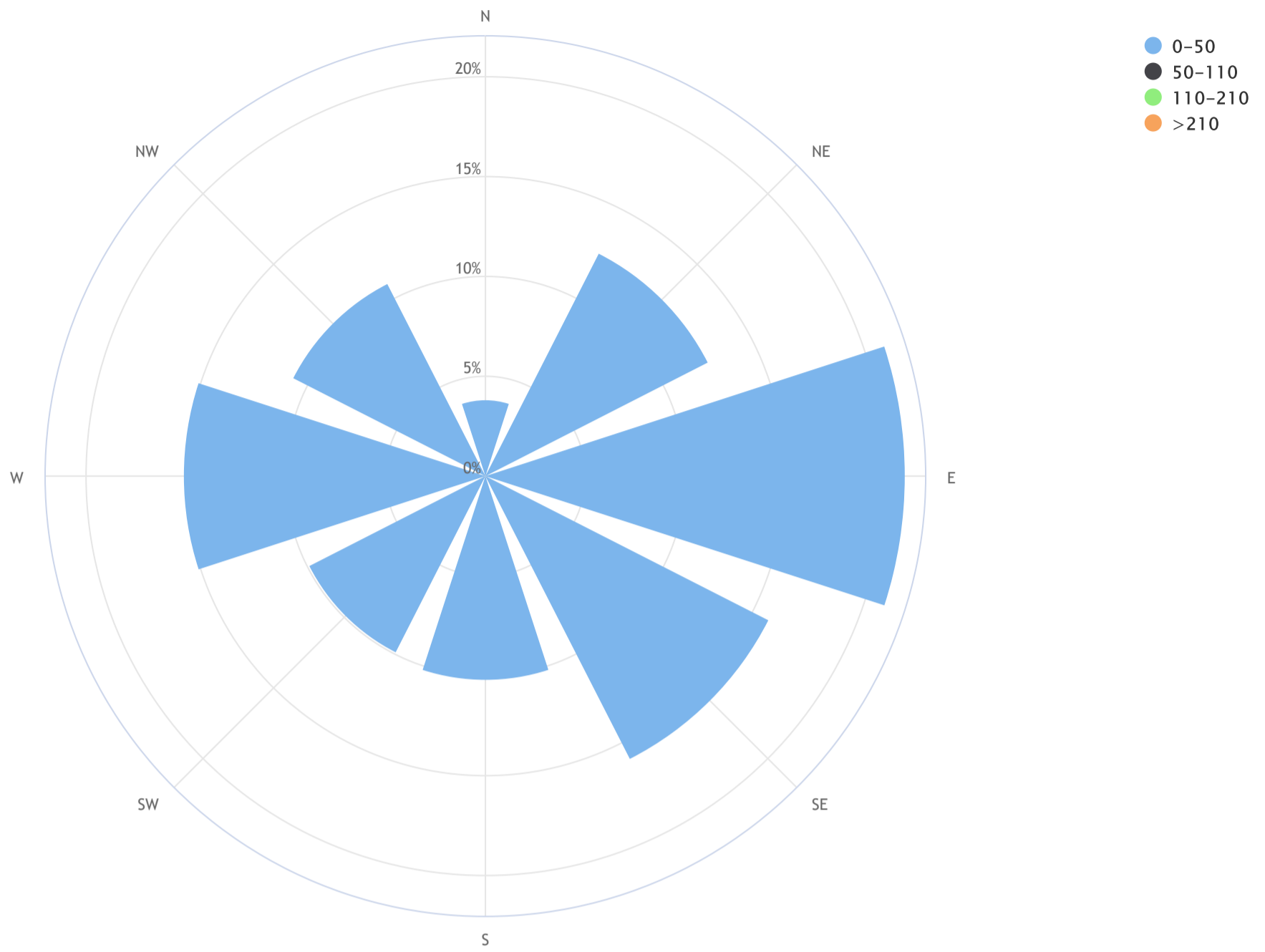


### NOX [ppb] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_NO<sub>x</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 12.8, CALM % = 0.7%



Direction	0-50	50-110	110-210	>210	TOTAL
N	3.8	0.0	0.0	0.0	3.8
NE	12.5	0.0	0.0	0.0	12.5
E	21.0	0.0	0.0	0.0	21.0
SE	15.9	0.0	0.0	0.0	15.9
S	10.2	0.0	0.0	0.0	10.2
SW	9.9	0.0	0.0	0.0	9.9
W	15.1	0.0	0.0	0.0	15.1
NW	10.8	0.0	0.0	0.0	10.8
Summary	99.3	0.0	0.0	0.0	99.3
CALM	0.7	0.0	0.0	0.0	0.7

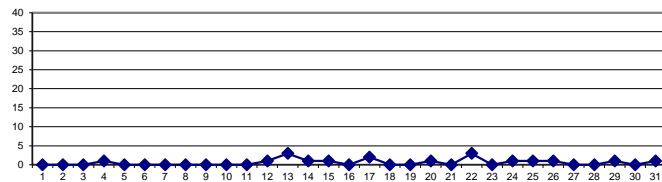
**NITRIC OXIDE Hourly Averages (NO ppb)**

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	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
2	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
3	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	
4	0	0	0	0	0	0	0	0	S	0	2	2	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1	24	
5	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	24	
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
7	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
8	0	0	0	S	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
9	0	0	S	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
10	0	S	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	24	
11	S	0	0	0	0	0	0	0	0	0	1	1	2	2	1	1	1	0	0	0	0	0	0	0	S	0	0	0	2	0	24	
12	0	0	0	0	0	0	0	0	0	1	1	2	3	3	3	2	1	0	0	0	0	0	0	S	0	0	0	0	3	1	24	
13	0	0	0	0	0	0	1	0	1	4	14	14	13	11	6	4	1	0	0	0	0	0	S	0	0	0	0	0	14	3	24	
14	0	0	0	0	0	0	0	0	0	1	4	5	7	5	5	3	1	0	0	0	0	S	0	0	0	0	0	0	7	1	24	
15	0	0	0	0	0	0	0	0	0	1	2	1	4	16	1	0	0	0	0	0	S	0	0	0	0	0	0	0	16	1	24	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	S	0	0	0	0	0	0	0	0	0	1	0	24	
17	0	0	0	0	0	0	0	0	0	1	3	6	9	8	7	5	3	1	S	0	1	1	0	0	0	0	0	0	9	2	24	
18	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24	
19	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	1	0	24	
20	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	S	1	1	0	1	1	0	0	0	0	0	0	0	2	1	24	
21	0	0	0	0	0	0	0	0	1	2	2	2	2	2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
22	0	0	0	0	0	0	1	3	6	5	6	S	10	8	8	7	2	3	0	0	1	0	0	0	0	0	0	0	10	3	24	
23	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
24	0	0	0	0	0	0	0	0	0	1	S	3	4	4	5	2	0	0	0	0	0	0	0	0	0	0	0	0	5	1	24	
25	0	0	0	0	0	0	0	0	0	0	S	6	11	6	2	1	1	0	0	0	0	0	0	0	0	0	0	0	11	1	24	
26	0	0	0	0	0	0	0	0	0	S	3	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	24	
27	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	24	
28	0	0	0	0	0	0	S	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
29	0	0	0	0	0	S	0	0	1	3	2	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1	24	
30	0	0	0	0	0	S	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
31	0	0	0	0	S	0	0	0	0	2	3	3	3	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	3	1	24	
HOURLY MAX	0	0	0	0	0	0	1	1	3	6	14	14	13	16	8	8	7	2	3	1	1	1	0	0	0	0	0					
HOURLY AVG	0	0	0	0	0	0	0	0	0	1	2	3	2	2	1	1	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

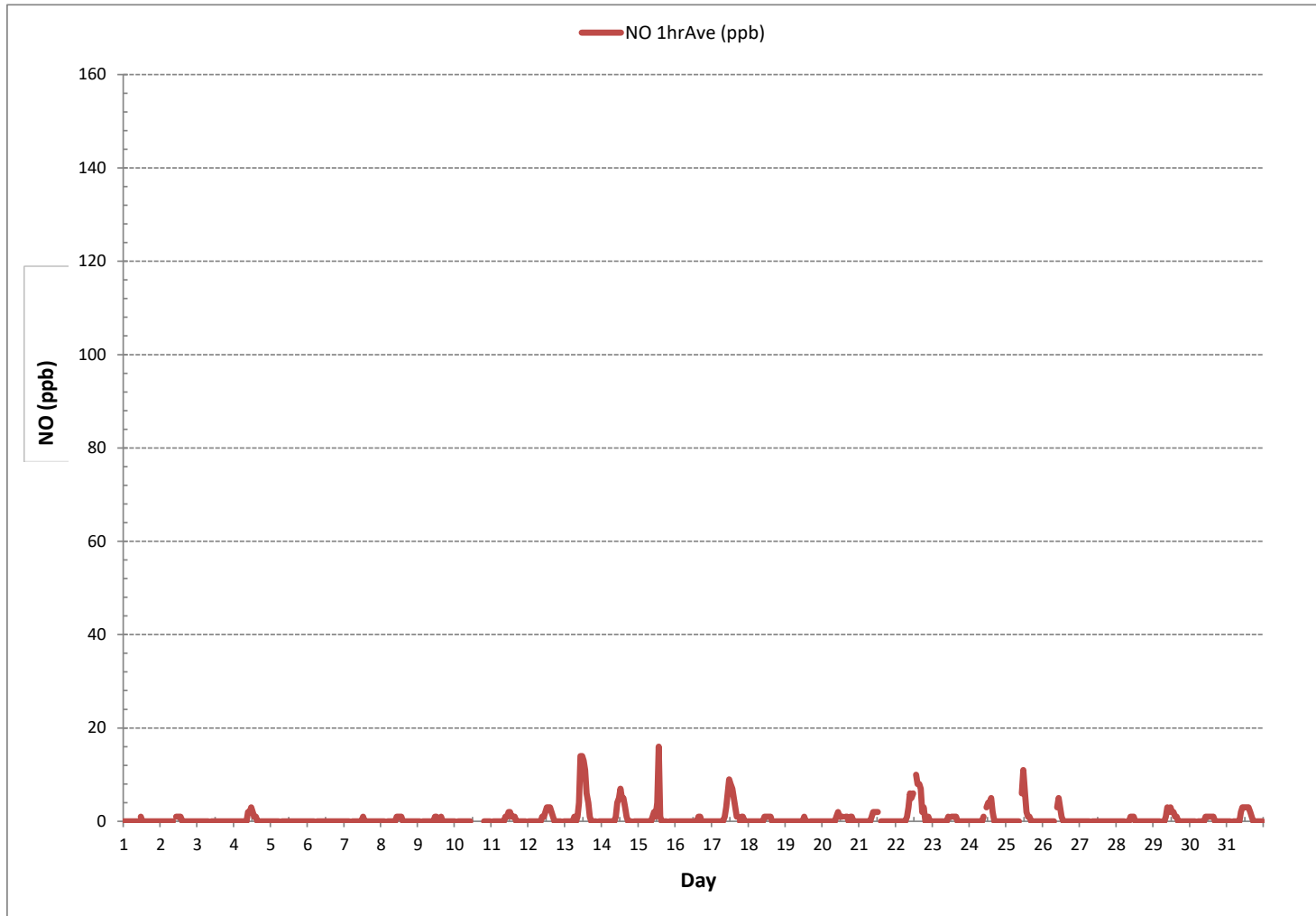
**24 HR AVERAGES January 2019**



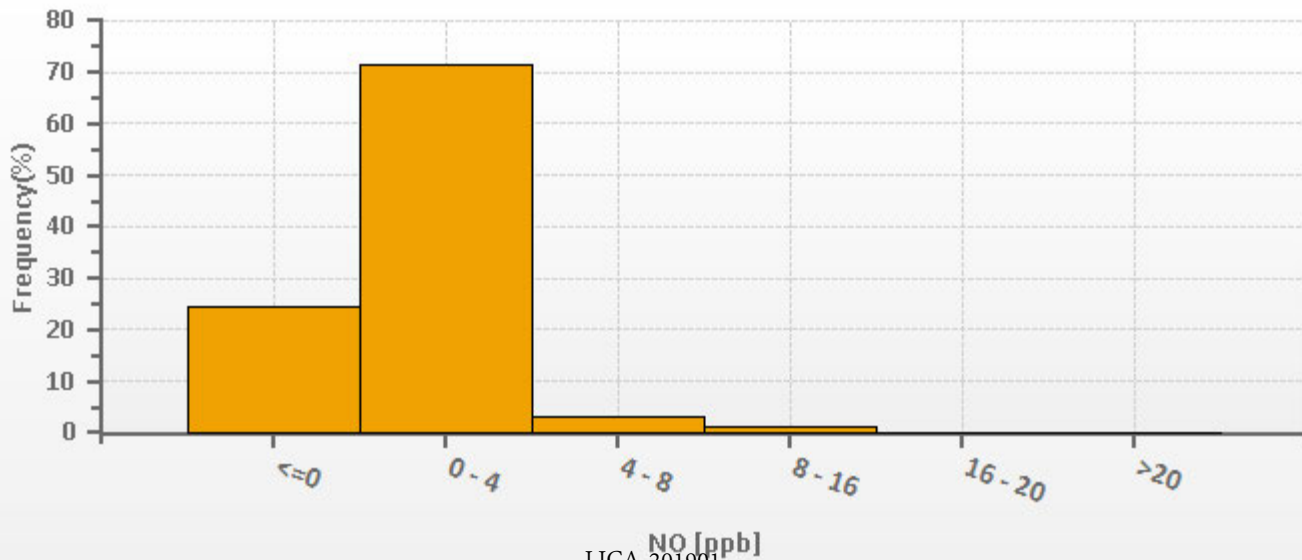
**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	149			
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	16 ppb @ HOUR	13	ON DAY	15
MAXIMUM 24-HR AVERAGE:	3 ppb		ON DAY	13
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	1 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)

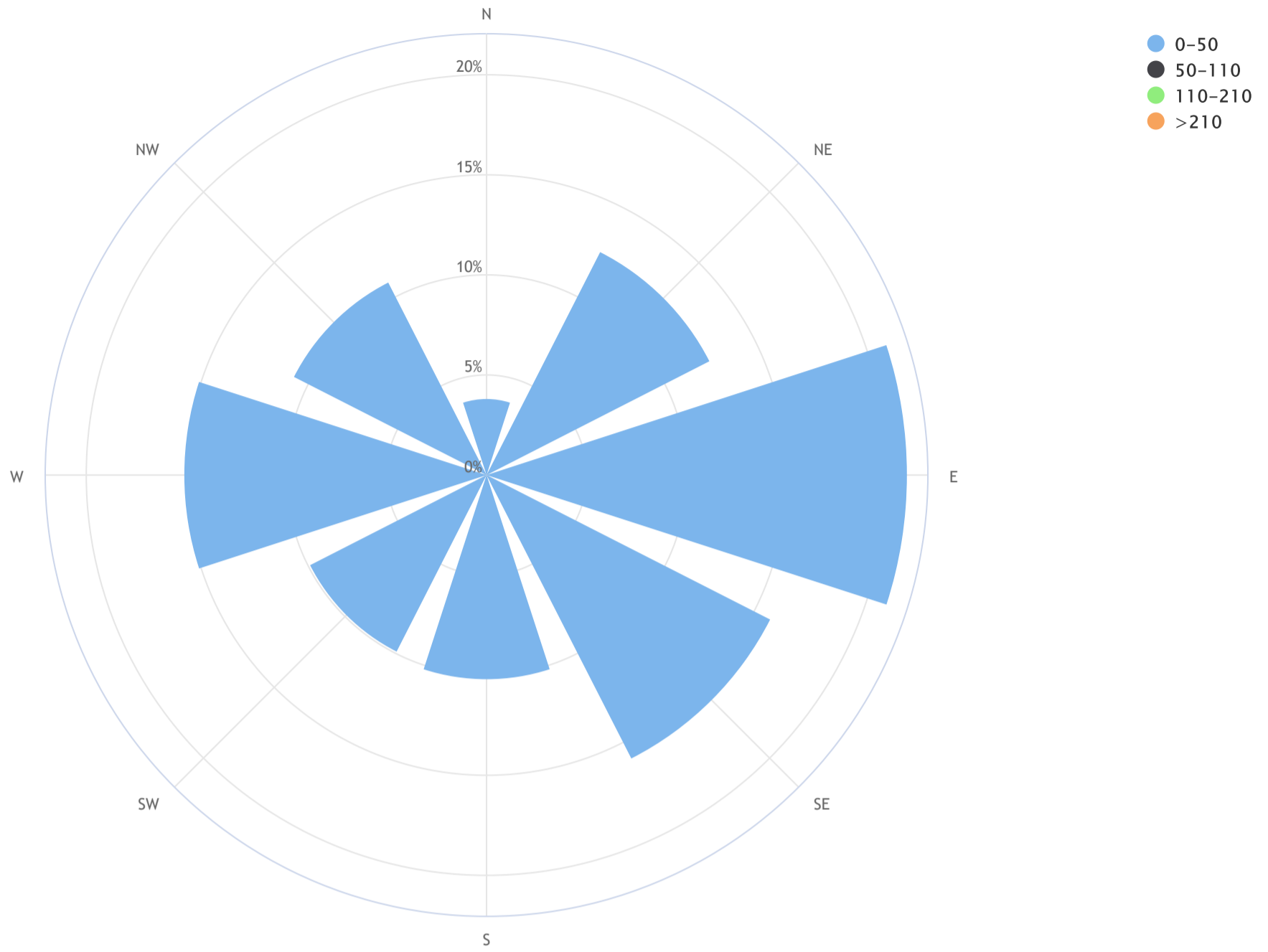


### NO [ppb] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_NO (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 2.0, CALM % = 0.7%



Direction	0-50	50-110	110-210	>210	TOTAL
N	3.8	0.0	0.0	0.0	3.8
NE	12.5	0.0	0.0	0.0	12.5
E	21.0	0.0	0.0	0.0	21.0
SE	15.9	0.0	0.0	0.0	15.9
S	10.2	0.0	0.0	0.0	10.2
SW	9.9	0.0	0.0	0.0	9.9
W	15.1	0.0	0.0	0.0	15.1
NW	10.8	0.0	0.0	0.0	10.8
Summary	99.3	0.0	0.0	0.0	99.3
CALM	0.7	0.0	0.0	0.0	0.7



**NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)**

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

**STATUS FLAG CODES**

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

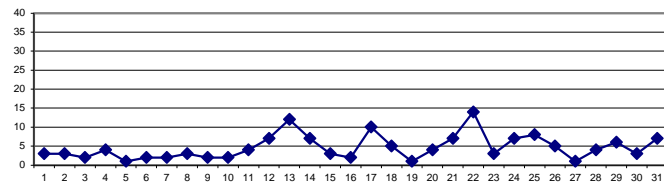
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

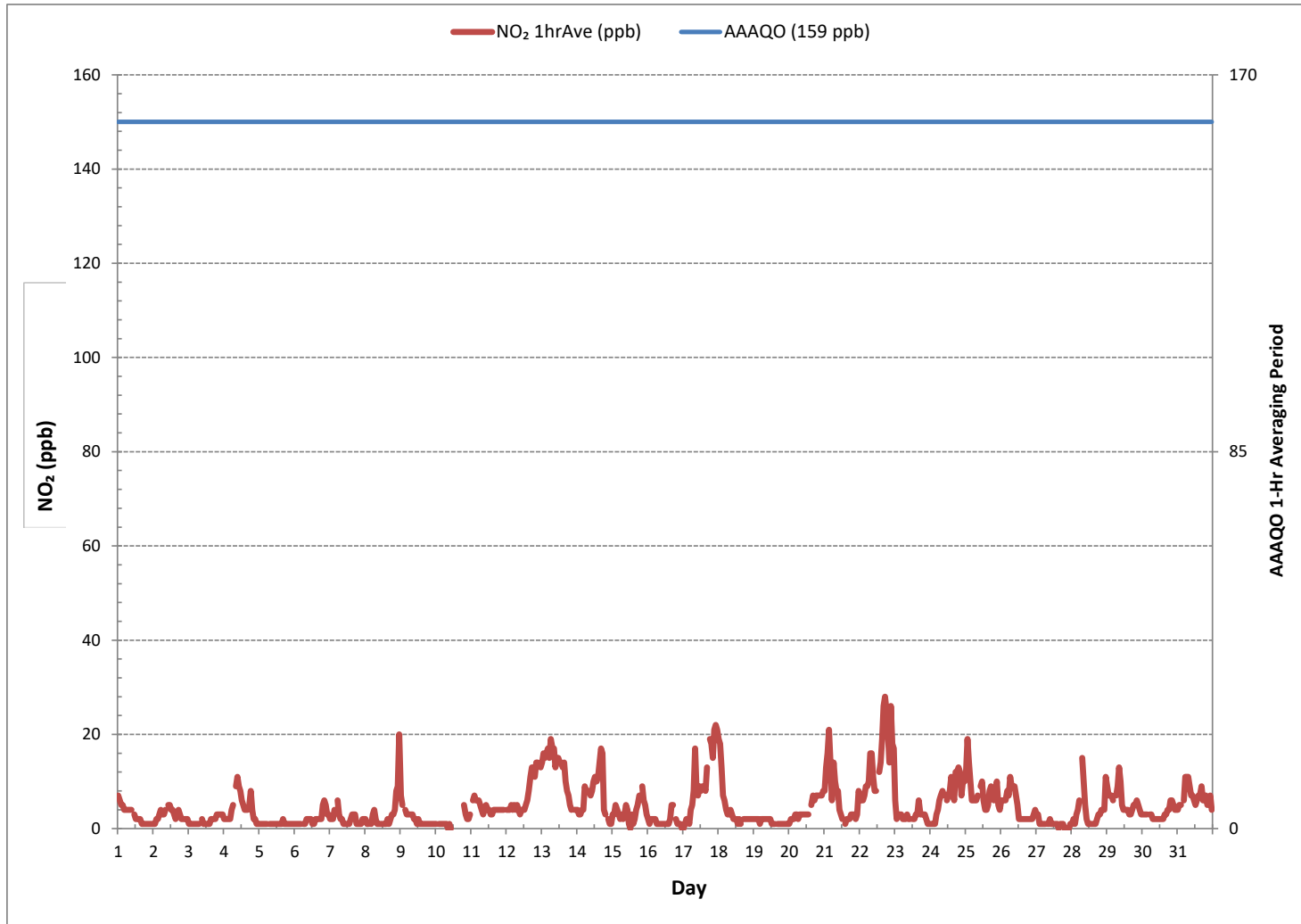
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	694			
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	8 ON DAY 10
MAXIMUM 1-HR AVERAGE:	28	ppb	@ HOUR	17 ON DAY 22
MAXIMUM 24-HR AVERAGE:	14	ppb		ON DAY 22
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	5		MONTHLY AVERAGE:	5 ppb

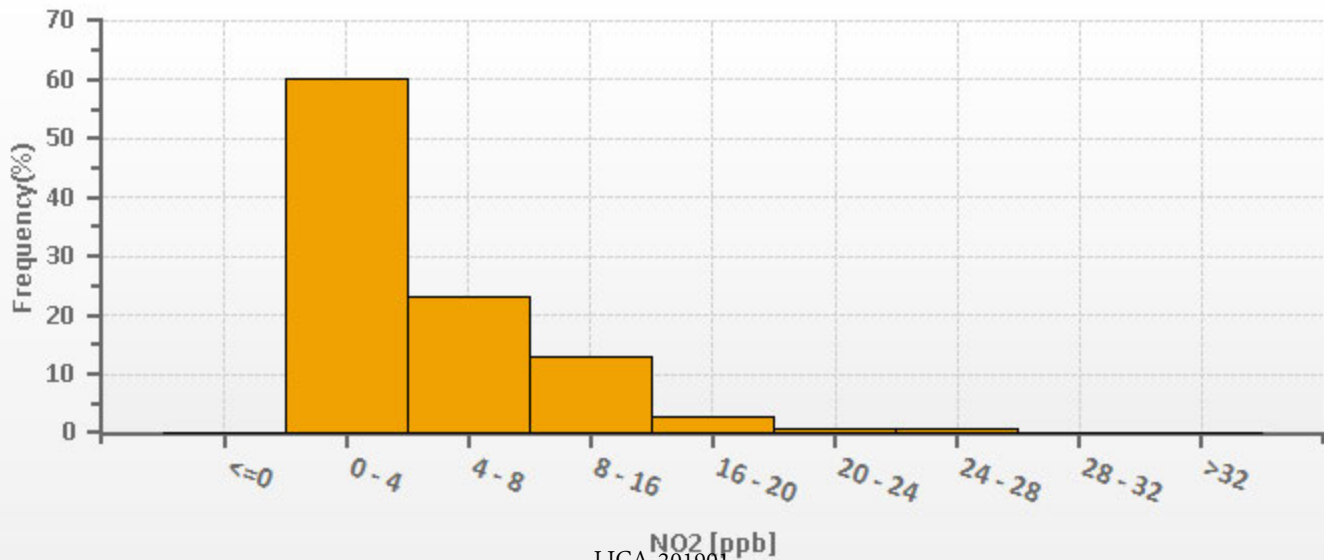
**24 HR AVERAGES January 2019**



NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)

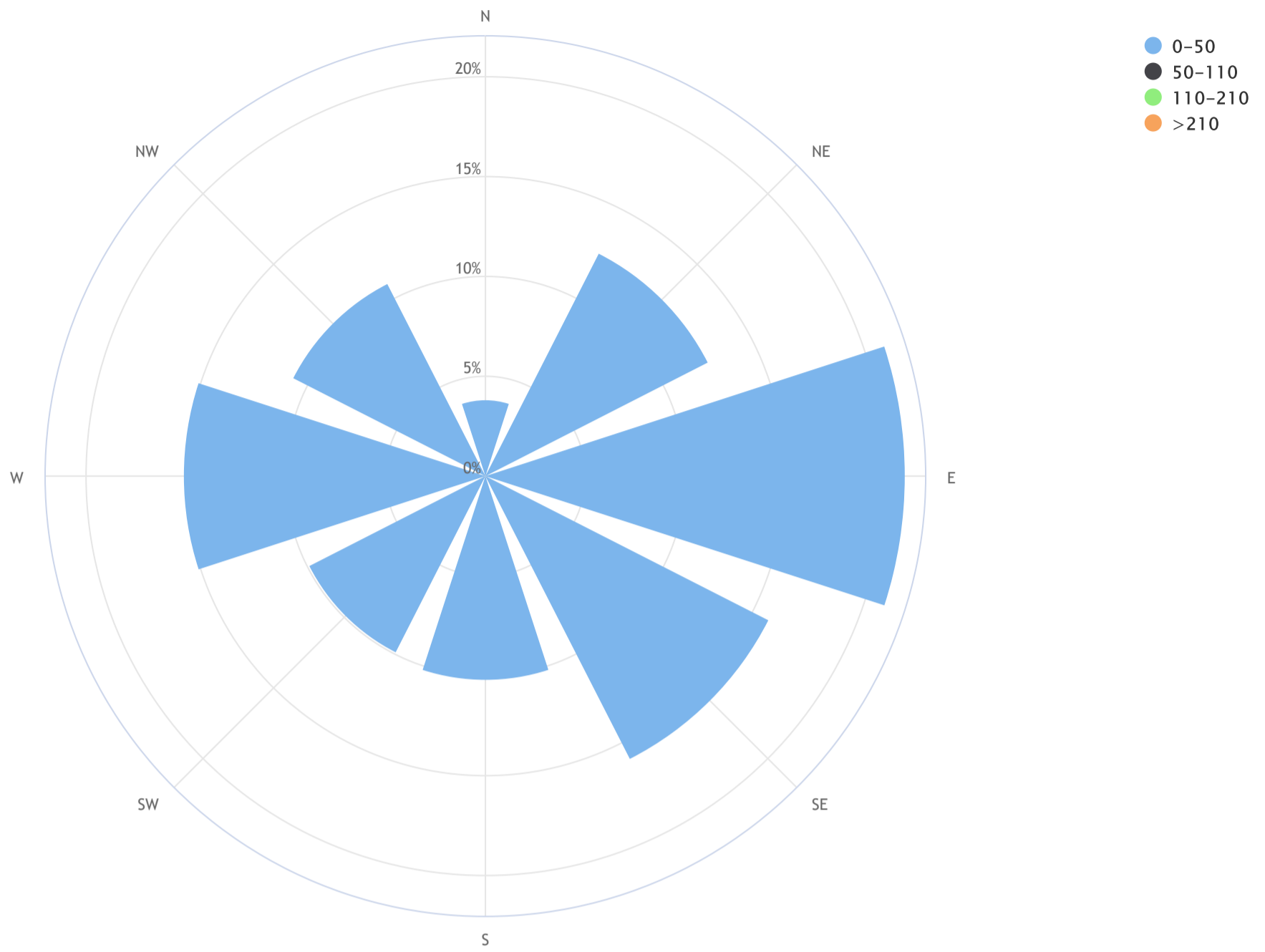


### NO2 [ppb] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_NO<sub>2</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 10.6, CALM % = 0.7%



Direction	0-50	50-110	110-210	>210	TOTAL
N	3.8	0.0	0.0	0.0	3.8
NE	12.5	0.0	0.0	0.0	12.5
E	21.0	0.0	0.0	0.0	21.0
SE	15.9	0.0	0.0	0.0	15.9
S	10.2	0.0	0.0	0.0	10.2
SW	9.9	0.0	0.0	0.0	9.9
W	15.1	0.0	0.0	0.0	15.1
NW	10.8	0.0	0.0	0.0	10.8
<b>Summary</b>	<b>99.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>99.3</b>
<b>CALM</b>	<b>0.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.7</b>



OZONE Hourly Averages (O<sub>3</sub> 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	19.3	21.6	22.2	21.7	23.1	24.3	26.2	27.4	29.5	30.5	S	37.1	38.3	38.6	38.7	38.4	38.4	38.2	38.6	37.8	37.2	36.7	36.2	36.0	19.3	38.7	32.0	24	
2	35.4	34.6	33.8	33.0	30.4	29.9	32.0	33.2	33.8	S	34.6	35.5	36.4	37.1	39.4	39.3	37.5	36.3	36.5	37.3	37.1	36.6	36.9	36.1	29.9	39.4	35.3	24	
3	37.5	37.5	38.6	38.5	38.3	38.5	37.9	37.9	S	36.9	37.8	38.7	38.9	40.2	40.6	39.2	37.3	35.8	35.7	34.4	33.3	32.6	31.7	31.6	31.6	40.6	36.9	24	
4	32.4	33.0	34.0	34.7	32.2	27.6	27.0	S	21.0	20.7	23.1	25.7	27.8	29.8	31.7	31.5	31.6	30.3	26.2	30.4	32.3	34.7	34.6	34.8	20.7	34.8	29.9	24	
5	35.1	35.8	36.4	35.5	36.2	36.7	S	36.8	36.0	35.2	35.6	35.5	34.5	34.3	35.3	35.4	34.1	34.3	33.9	34.0	34.2	34.3	36.1	35.4	33.9	36.8	35.2	24	
6	34.9	34.6	34.1	34.0	34.3	S	35.0	34.5	32.1	30.0	29.0	32.1	32.1	31.3	31.0	30.3	30.5	30.2	30.2	25.5	22.4	21.6	26.9	28.5	21.6	35.0	30.7	24	
7	29.8	30.4	29.6	25.7	S	22.1	24.3	29.6	32.4	33.0	32.3	34.3	32.8	33.2	33.5	33.0	32.0	32.1	35.3	36.1	36.0	35.7	34.6	34.6	22.1	36.1	31.8	24	
8	36.0	37.7	37.2	S	35.7	34.1	33.1	34.3	35.3	36.0	36.0	36.2	36.3	36.6	37.0	37.7	36.5	36.4	32.8	30.1	27.1	20.9	19.7	12.5	12.5	37.7	32.8	24	
9	28.6	31.7	S	34.7	32.6	30.2	31.9	32.5	33.6	33.5	33.8	34.1	34.5	34.8	35.2	35.2	34.4	34.0	34.6	34.6	35.5	36.1	35.5	35.2	28.6	36.1	33.8	24	
10	35.0	S	35.1	35.7	35.5	35.8	35.7	35.8	35.6	35.4	35.6	35.1	33.9	33.7	33.3	32.9	32.6	30.9	30.9	29.5	31.3	32.0	31.5	29.9	29.5	35.8	33.6	24	
11	S	25.9	23.8	23.6	22.7	25.1	28.8	30.0	31.8	31.4	C	C	C	C	C	C	30.8	30.1	29.5	29.4	28.9	28.8	28.7	S	22.7	31.8	28.1	24	
12	27.8	27.3	26.7	26.0	26.6	25.2	24.8	23.8	23.7	23.6	24.2	24.8	24.2	22.7	21.3	19.6	15.9	14.0	13.6	13.6	11.0	10.4	S	12.6	10.4	27.8	21.0	24	
13	14.4	13.0	11.4	7.3	8.1	9.5	4.2	6.1	5.4	9.6	9.2	11.6	13.7	12.8	12.2	11.7	15.0	16.9	16.9	19.8	17.8	S	17.5	17.1	4.2	19.8	12.2	24	
14	22.9	22.7	21.9	20.1	18.6	15.5	18.5	18.7	18.7	18.2	18.6	20.5	20.1	25.5	24.9	23.0	20.8	20.5	31.4	31.4	S	32.1	31.4	30.1	15.5	32.1	22.9	24	
15	23.9	21.1	21.5	23.9	26.8	29.1	27.5	30.1	29.3	28.2	29.9	32.7	33.4	32.4	33.4	32.9	30.8	28.9	25.8	S	24.4	27.5	29.9	31.3	21.1	33.4	28.5	24	
16	32.4	33.1	32.1	32.0	31.6	30.9	30.8	31.0	31.2	31.8	31.5	31.7	32.6	33.4	34.4	33.9	30.0	27.6	S	33.0	35.4	35.0	37.8	37.5	27.6	37.8	32.6	24	
17	36.1	34.7	35.0	34.8	34.4	31.1	29.3	23.7	15.4	21.7	24.6	24.0	26.2	27.8	27.9	29.1	24.4	S	17.0	16.7	18.7	12.6	9.5	10.2	9.5	36.1	24.6	24	
18	10.2	12.4	18.8	26.3	26.7	30.1	33.1	33.9	32.7	33.9	34.5	35.2	35.4	35.4	35.1	35.1	S	33.6	33.1	33.7	33.9	33.5	33.2	32.4	10.2	35.4	30.5	24	
19	32.1	32.4	33.3	33.1	34.4	34.2	34.7	34.0	34.1	35.0	34.0	34.7	35.1	36.0	36.7	S	39.1	39.7	40.1	40.6	40.5	41.0	40.3	39.5	32.1	41.0	36.3	24	
20	39.0	38.6	38.2	37.7	36.5	36.6	36.5	35.7	34.8	34.4	34.1	34.5	34.6	33.7	S	31.4	29.2	28.8	27.3	27.2	27.0	25.4	24.2	23.4	23.4	39.0	32.5	24	
21	22.5	17.4	15.1	10.3	14.8	21.7	13.5	17.5	19.6	20.0	23.2	24.2	24.9	S	27.9	27.4	27.2	26.1	24.4	24.9	24.7	24.4	23.5	18.2	10.3	27.9	21.4	24	
22	19.5	19.9	19.5	17.7	15.7	15.2	13.9	7.5	6.9	13.9	17.7	17.2	S	17.5	16.5	12.2	6.2	3.6	5.1	11.5	20.2	9.3	13.9	13.8	3.6	20.2	13.7	24	
23	22.3	21.2	24.7	29.0	31.8	33.0	33.6	33.8	34.1	34.8	35.8	S	37.3	37.0	36.1	35.6	33.0	35.1	34.8	34.2	34.5	34.3	35.7	36.7	21.2	37.3	33.0	24	
24	36.5	35.8	35.2	36.0	32.1	31.3	29.2	26.6	24.9	25.3	S	25.7	25.6	25.4	22.4	26.3	28.0	21.9	21.5	20.2	20.8	23.3	16.0	17.7	16.0	36.5	26.4	24	
25	14.5	8.0	14.3	19.5	23.5	22.4	21.1	20.7	19.1	S	17.5	19.1	24.2	29.5	32.3	31.6	29.2	27.1	27.2	27.4	24.8	21.7	29.1	29.6	8.0	32.3	23.2	24	
26	27.8	27.1	25.4	24.8	22.5	22.5	17.9	19.3	S	18.4	20.6	26.4	36.9	38.5	38.7	38.7	37.7	36.5	35.5	35.2	35.7	34.8	32.4	31.6	17.9	38.7	29.8	24	
27	32.1	34.0	37.9	38.3	37.4	35.5	29.8	S	40.2	37.5	38.7	37.7	38.6	39.2	39.5	40.2	39.4	39.4	40.3	41.3	42.8	44.0	44.0	43.4	29.8	44.0	38.7	24	
28	42.3	41.3	43.0	41.1	39.8	36.9	S	27.5	32.3	37.4	40.2	41.4	41.8	42.2	42.2	42.1	42.0	40.6	39.4	39.4	38.0	37.6	37.7	30.9	27.5	43.0	39.0	24	
29	30.3	32.7	31.3	30.3	28.1	S	28.0	23.8	21.0	25.7	33.1	35.3	35.8	36.6	37.9	40.3	40.1	39.1	38.0	36.3	35.2	35.2	36.2	36.6	21.0	40.3	33.3	24	
30	36.5	36.4	37.0	37.5	S	38.0	38.6	39.3	39.1	39.0	38.7	38.5	38.3	37.9	37.8	37.4	36.9	35.7	34.9	33.3	32.4	33.5	33.4	33.0	32.4	39.3	36.7	24	
31	32.5	31.6	30.4	S	28.1	22.5	21.1	20.1	21.9	24.5	25.5	27.7	28.0	27.4	25.9	26.4	24.0	24.7	24.7	24.7	26.2	24.8	22.5	26.1	20.1	32.5	25.7	24	
HOURLY MAX	42.3	41.3	43.0	41.1	39.8	38.5	38.6	39.3	40.2	39.0	40.2	41.4	41.8	42.2	42.2	42.1	42.0	40.6	40.3	41.3	42.8	44.0	44.0	43.4					
HOURLY AVG	29.3	28.8	29.3	29.1	28.9	28.5	27.5	27.8	27.8	28.8	29.7	30.6	32.1	32.4	32.4	32.0	30.8	30.3	29.8	30.1	30.0	29.7	30.0	28.9					

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

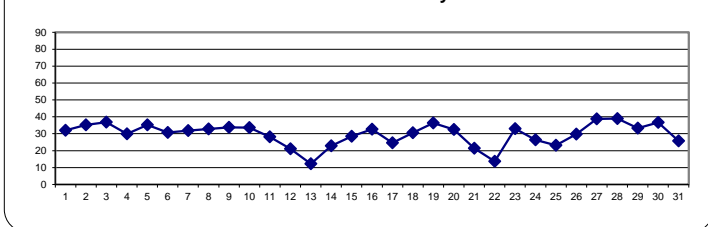
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

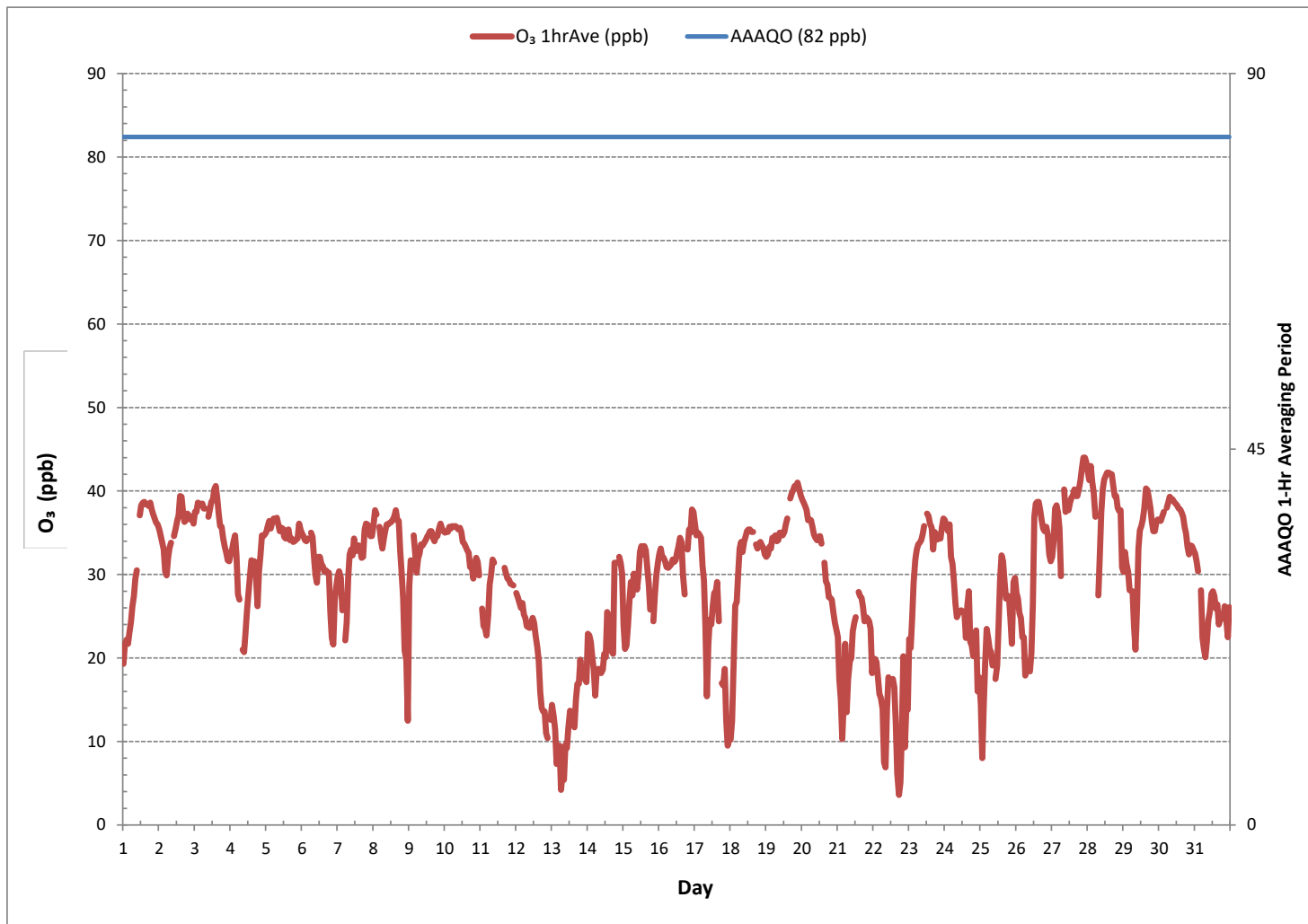
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	706			
MINIMUM 1-HR AVERAGE:	3.6	ppb	@ HOUR	17 ON DAY 22
MAXIMUM 1-HR AVERAGE:	44.0	ppb	@ HOUR	21 ON DAY 27
MAXIMUM 24-HR AVERAGE:	39.0	ppb		ON DAY 28
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	8.0		MONTHLY AVERAGE:	29.8 ppb

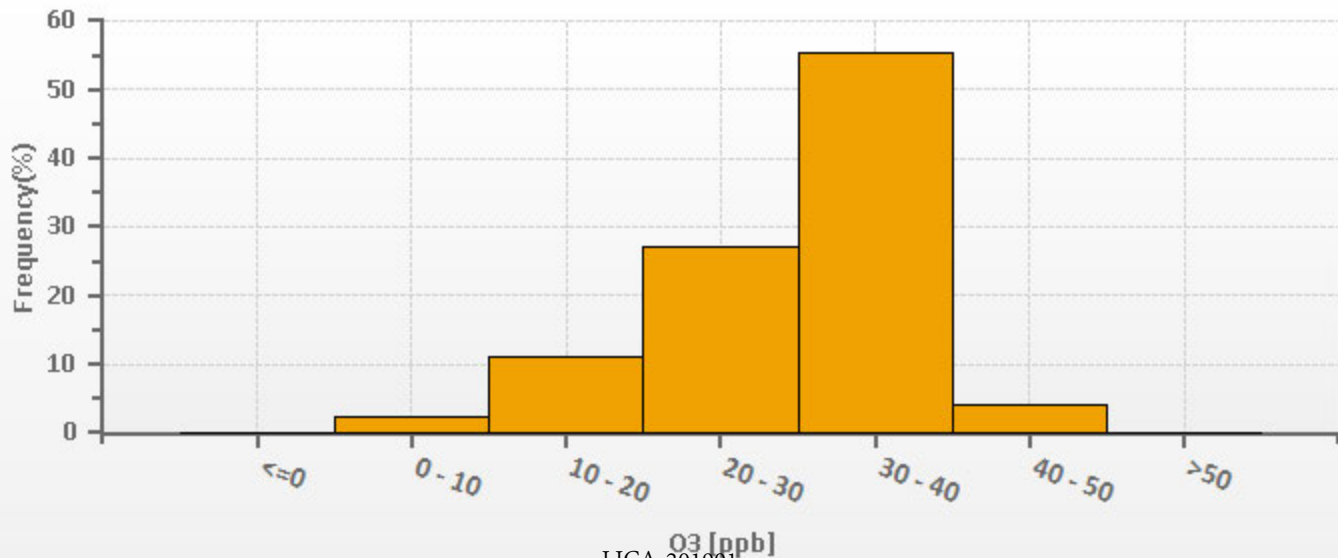
24 HR AVERAGES January 2019



OZONE Hourly Averages (O<sub>3</sub> ppb)



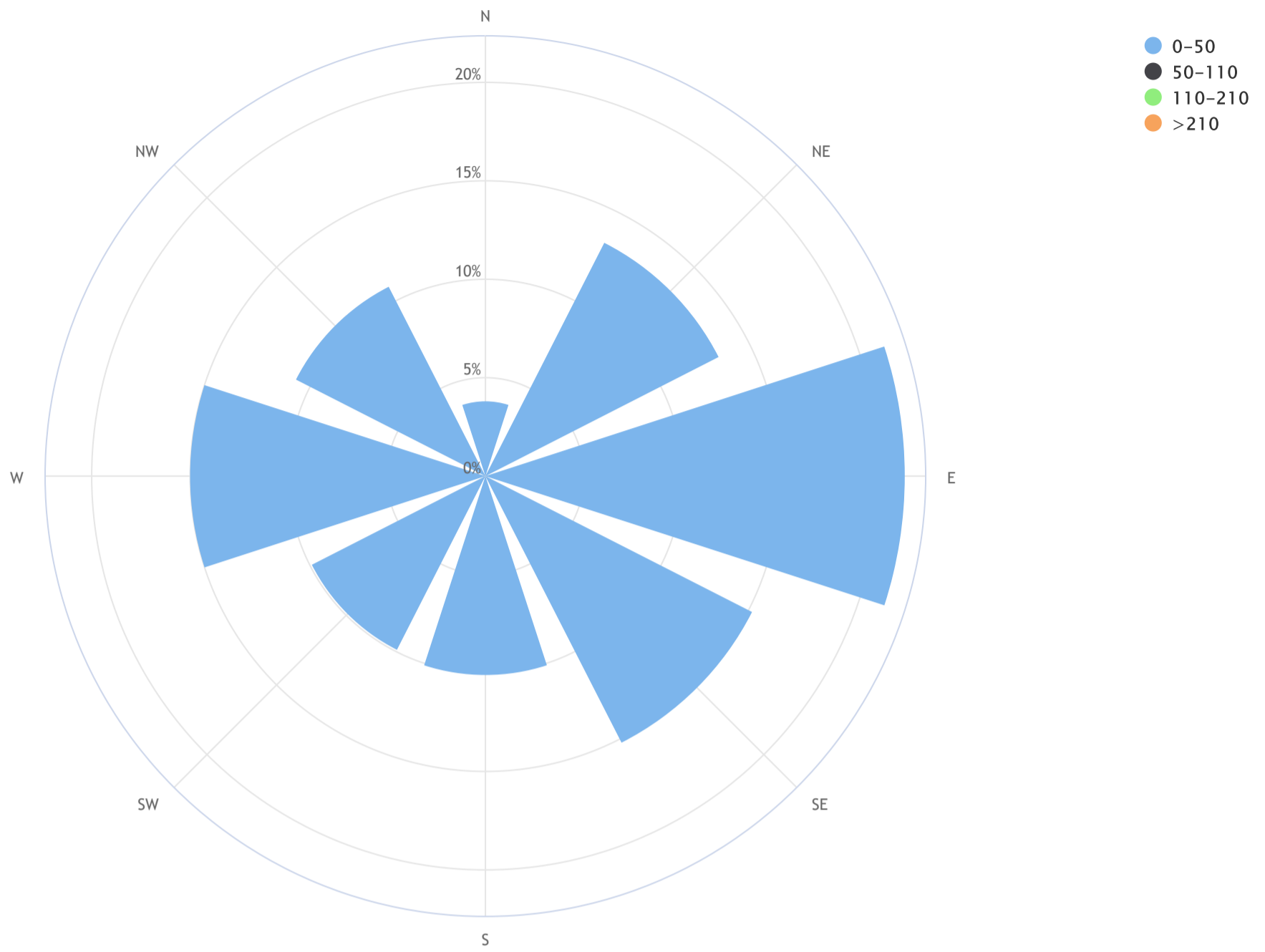
### O3 [ppb] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



LICA-201901  
Page 311 of 350

Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_O<sub>3</sub> (ppb)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 22.7, CALM % = 0.7%



Direction	0-50	50-110	110-210	>210	TOTAL
N	3.8	0.0	0.0	0.0	3.8
NE	13.3	0.0	0.0	0.0	13.3
E	21.3	0.0	0.0	0.0	21.3
SE	15.2	0.0	0.0	0.0	15.2
S	10.1	0.0	0.0	0.0	10.1
SW	9.9	0.0	0.0	0.0	9.9
W	15.0	0.0	0.0	0.0	15.0
NW	10.8	0.0	0.0	0.0	10.8
Summary	99.3	0.0	0.0	0.0	99.3
CALM	0.7	0.0	0.0	0.0	0.7





PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)

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

STATUS FLAG CODES

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

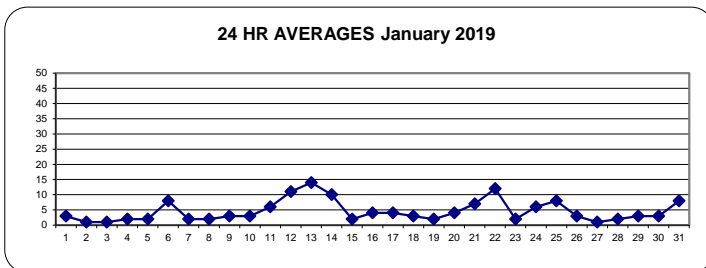
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m <sup>3</sup>	24-HR	29 µg/m <sup>3</sup>
----------------------	------	----------------------	-------	----------------------

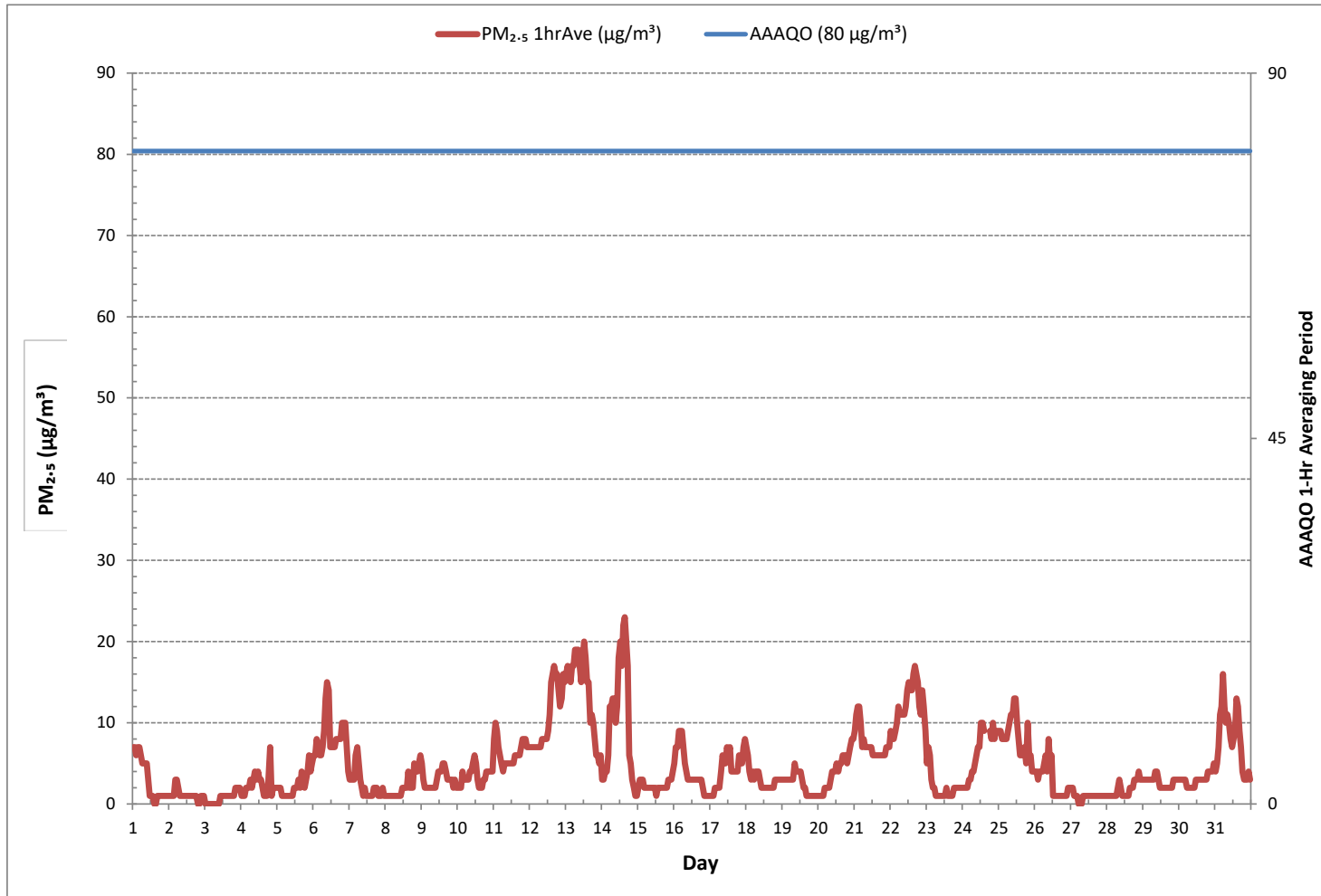
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	724			
MINIMUM 1-HR AVERAGE:	0 µg/m <sup>3</sup> @ HOUR	14	ON DAY	1
MAXIMUM 1-HR AVERAGE:	23 µg/m <sup>3</sup> @ HOUR	15	ON DAY	14
MAXIMUM 24-HR AVERAGE:	14 µg/m <sup>3</sup>		ON DAY	13
MONTHLY CALIBRATION TIME:	3 hrs	OPERATIONAL TIME:	744 hrs	
STANDARD DEVIATION:	4	AMD OPERATION UPTIME:	100.0 %	
		MONTHLY AVERAGE:	5 µg/m <sup>3</sup>	

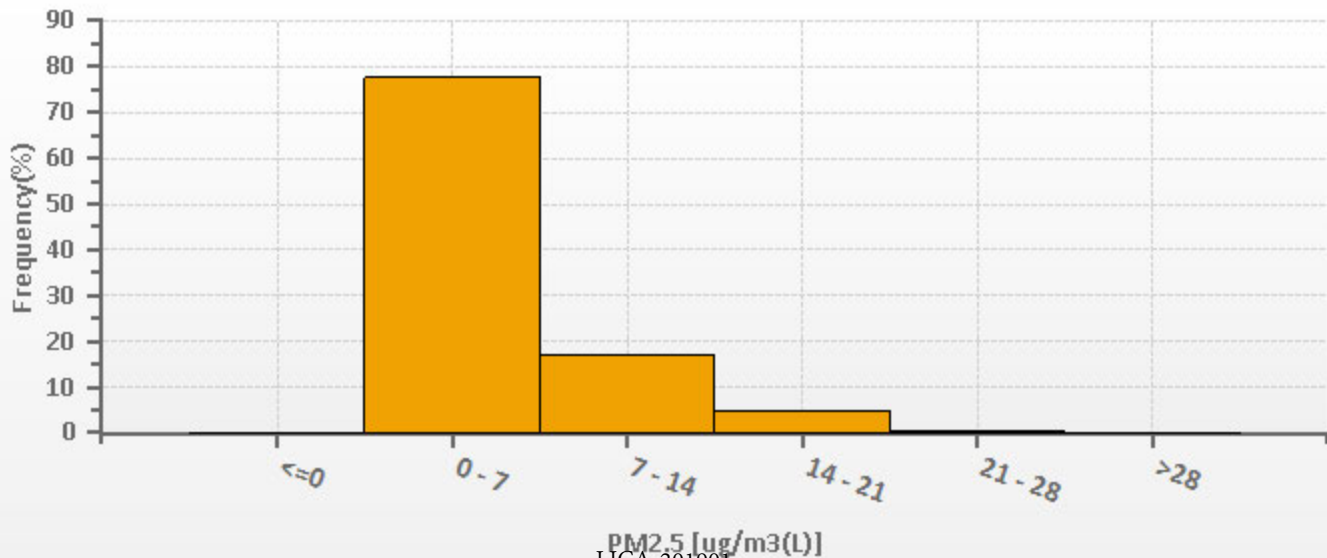
24 HR AVERAGES January 2019



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)



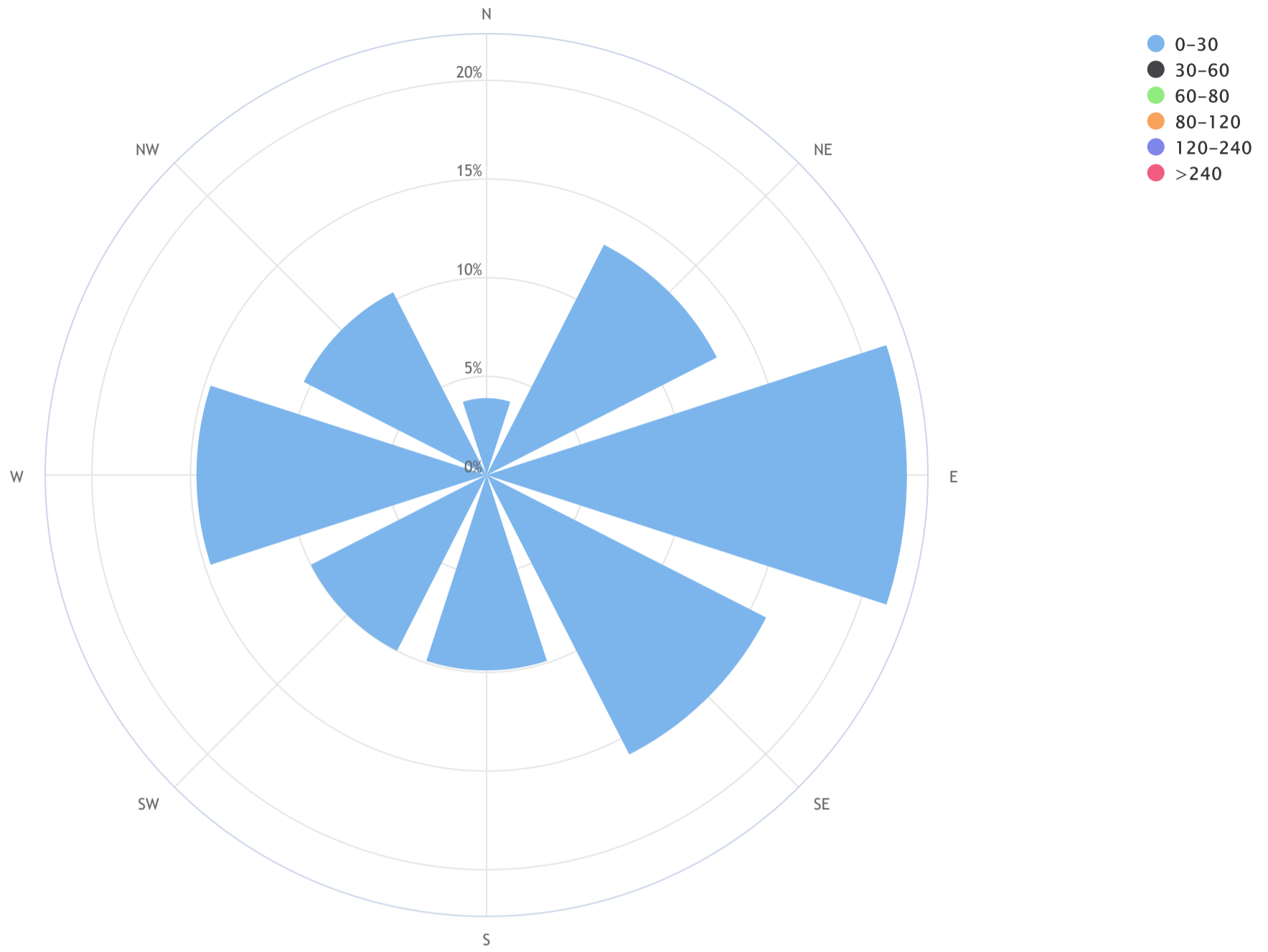
### PM2.5 [ug/m3(L)] Histogram: LICA Bonnyville East Monthly: 19/01 1 Hr.



LICA-201901

Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_PM2.5 (µg/m³)\_19/01

Pollutant Rose\_Wind Frequency (Blowing From)\_ CALM Avg = 6.3, CALM % = 0.8%



Direction	0-30	30-60	60-80	80-120	120-240	>240	TOTAL
N	3.9	0.0	0.0	0.0	0.0	0.0	3.9
NE	13.1	0.0	0.0	0.0	0.0	0.0	13.1
E	21.3	0.0	0.0	0.0	0.0	0.0	21.3
SE	15.9	0.0	0.0	0.0	0.0	0.0	15.9
S	9.9	0.0	0.0	0.0	0.0	0.0	9.9
SW	10.0	0.0	0.0	0.0	0.0	0.0	10.0
W	14.7	0.0	0.0	0.0	0.0	0.0	14.7
NW	10.4	0.0	0.0	0.0	0.0	0.0	10.4
<b>Summary</b>	<b>99.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>99.2</b>
<b>CALM</b>	<b>0.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.8</b>



WIND SPEED Hourly Averages (WS kph)

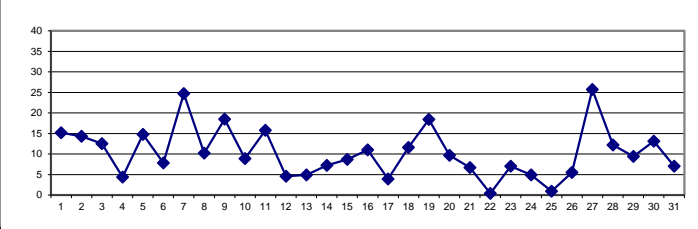
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	13.7	12.4	15.0	15.8	21.4	16.2	9.3	14.0	15.5	18.8	26.2	30.4	31.1	30.4	29.5	27.7	23.4	23.2	20.1	17.1	18.0	14.9	15.6	15.1	9.3	31.1	15.2	24
2	10.6	10.6	10.1	9.2	12.9	11.9	12.9	14.7	17.2	19.3	20.6	21.2	19.5	20.9	20.6	15.9	16.1	13.1	10.7	12.0	12.3	13.2	9.3	12.2	9.2	21.2	14.3	24
3	17.0	15.0	16.0	19.1	18.0	20.1	14.9	16.9	12.1	11.8	15.5	18.0	14.6	13.7	12.8	9.2	7.4	10.2	9.0	8.0	7.2	8.2	4.5	6.6	4.5	20.1	12.5	24
4	7.9	9.3	8.0	6.3	4.7	4.6	2.7	4.7	6.2	7.1	7.5	9.5	9.4	9.9	10.3	4.9	8.2	4.3	5.2	9.5	11.2	13.4	12.3	12.6	2.7	13.4	4.4	24
5	13.3	13.2	14.0	10.4	10.6	13.6	12.2	13.3	13.3	13.6	16.8	12.9	8.2	11.4	15.4	18.4	18.5	20.7	17.9	22.7	23.2	20.2	23.5	27.2	8.2	27.2	14.8	24
6	24.3	23.9	19.5	20.5	20.6	23.1	21.1	17.8	17.5	17.0	14.4	14.0	17.4	14.6	13.3	12.0	10.8	7.2	9.1	11.5	12.6	15.6	18.5	20.0	7.2	24.3	7.8	24
7	23.1	15.9	20.6	24.3	17.7	20.0	24.5	28.0	32.0	31.6	27.5	33.0	27.5	30.2	27.6	25.7	19.6	20.6	31.3	32.2	30.4	24.1	19.0	17.8	15.9	33.0	24.7	24
8	26.0	31.8	26.7	22.5	20.6	21.6	15.4	15.8	14.1	16.7	18.6	16.3	11.0	13.6	8.9	4.9	7.2	7.2	3.4	5.1	5.1	4.1	3.9	8.0	3.4	31.8	10.2	24
9	11.6	10.2	10.1	15.4	10.8	13.5	16.2	22.6	20.6	22.1	22.6	23.8	24.0	23.1	26.7	23.9	21.4	23.4	23.9	18.5	20.1	21.3	20.7	18.1	10.1	26.7	18.5	24
10	17.3	17.8	18.1	15.6	12.1	14.4	13.4	11.9	11.6	13.7	12.1	9.7	7.3	7.4	7.5	6.1	4.6	2.4	5.5	4.0	3.4	5.1	2.2	5.6	2.2	18.1	8.9	24
11	8.0	6.6	7.4	4.9	6.1	8.0	13.0	17.0	9.8	14.0	19.1	15.8	19.0	20.3	18.6	24.7	15.1	12.7	18.6	19.1	29.6	27.6	26.3	21.1	4.9	29.6	15.8	24
12	16.9	15.2	11.4	8.3	5.2	6.6	5.0	3.7	6.2	2.4	3.6	2.1	5.0	7.9	5.4	6.0	4.1	4.1	3.1	4.7	2.1	4.2	7.3	1.2	1.2	16.9	4.6	24
13	7.1	7.3	3.2	5.4	6.9	5.8	3.3	2.6	3.9	4.3	4.5	3.4	6.6	8.7	10.2	11.4	11.7	10.3	10.8	11.9	12.3	10.0	8.6	8.8	2.6	12.3	4.9	24
14	8.7	9.0	10.1	3.7	3.4	10.8	10.0	9.3	7.9	6.3	4.6	10.5	9.8	15.5	15.7	16.1	20.0	19.1	34.6	26.1	25.9	27.9	27.3	25.9	3.4	34.6	7.2	24
15	22.3	23.3	24.2	18.8	15.4	10.7	9.6	10.2	8.9	8.1	12.3	11.9	10.7	10.4	9.7	7.7	4.7	3.7	4.0	5.9	7.4	7.8	9.3	9.3	3.7	24.2	8.7	24
16	11.9	13.6	10.3	9.4	9.6	9.8	12.5	13.4	12.5	11.9	8.8	7.8	9.6	11.1	9.9	11.1	7.7	5.3	6.5	10.9	15.0	15.7	17.4	18.9	5.3	18.9	11.0	24
17	10.7	10.0	9.6	8.2	2.5	4.1	6.4	4.0	1.2	2.5	2.0	1.4	1.9	4.7	2.9	3.6	5.0	7.6	6.8	4.9	4.5	5.9	6.2	5.9	1.2	10.7	3.9	24
18	6.1	6.9	2.2	6.4	7.6	8.5	8.1	11.8	13.2	11.6	14.2	13.7	14.9	14.9	15.4	17.1	15.8	12.7	14.1	15.4	14.3	12.4	14.8	12.3	2.2	17.1	11.6	24
19	13.3	17.2	18.2	14.6	17.4	17.2	16.9	22.3	22.8	20.3	22.2	24.3	23.0	22.0	24.6	24.4	26.1	25.6	17.7	16.9	16.2	23.1	26.3	27.1	13.3	27.1	18.4	24
20	17.3	18.0	22.5	21.7	16.7	15.8	16.9	12.9	14.0	9.5	7.8	6.1	2.3	3.8	2.3	6.7	11.0	9.2	5.5	9.6	4.5	2.3	1.9	3.3	1.9	22.5	9.7	24
21	1.9	3.8	2.8	6.8	7.0	10.3	10.8	13.0	12.2	14.5	14.3	11.4	12.4	13.6	14.7	14.8	12.5	8.0	8.0	4.3	2.3	5.5	5.4	4.3	1.9	14.8	6.7	24
22	7.4	6.0	3.6	5.1	4.5	5.0	4.5	4.5	3.3	3.7	3.0	2.1	2.0	4.7	2.9	3.7	2.9	5.6	2.7	4.4	4.9	7.0	12.4	13.7	2.0	13.7	0.4	24
23	20.6	27.4	25.4	20.4	19.9	14.5	22.4	22.3	18.8	18.0	14.4	19.2	20.5	18.7	14.3	14.2	8.2	6.8	8.8	9.5	12.2	13.9	10.7	8.2	6.8	27.4	7.0	24
24	8.9	7.4	5.4	9.9	5.2	4.9	2.0	7.1	5.7	6.7	8.1	4.5	11.7	16.9	16.8	16.7	12.7	7.1	10.6	6.0	7.5	4.3	5.5	3.2	2.0	16.9	4.9	24
25	4.2	2.4	5.5	5.6	4.4	7.0	5.8	3.6	3.4	2.1	3.0	5.1	6.6	10.5	11.6	7.5	5.8	2.2	4.7	3.7	4.8	5.3	6.8	5.4	2.1	11.6	0.9	24
26	6.4	5.8	4.4	5.7	3.0	3.0	3.3	2.2	1.1	3.5	1.8	5.7	9.4	10.0	8.9	12.5	12.4	9.9	17.0	17.0	12.3	12.6	11.3	12.7	1.1	17.0	5.5	24
27	16.2	21.9	32.4	40.4	33.1	33.0	25.5	27.7	33.2	34.1	33.1	28.7	31.2	30.3	33.7	38.0	36.5	38.5	33.7	29.9	32.4	29.7	26.4	21.5	16.2	40.4	25.7	24
28	16.4	13.3	14.4	12.7	11.5	10.4	10.1	7.5	13.7	16.2	15.6	19.1	20.2	20.3	16.4	15.7	14.9	11.7	13.3	14.0	8.8	7.5	6.9	6.0	6.0	20.3	12.2	24
29	5.5	4.6	10.8	1.3	2.7	7.2	4.5	5.0	5.7	8.5	12.7	14.9	12.5	12.8	12.1	13.5	13.9	12.5	13.1	10.6	15.7	16.5	16.1	16.3	0.8	16.5	9.4	24
30	15.0	14.1	15.4	13.7	14.5	12.6	12.6	16.8	18.3	15.2	17.8	17.4	17.6	15.7	15.7	16.7	14.1	13.7	13.3	13.5	10.4	5.3	3.2	1.9	1.9	18.3	13.1	24
31	3.1	5.7	4.0	5.0	2.9	7.5	5.3	6.4	7.0	3.4	6.9	9.9	10.0	9.2	6.3	6.8	6.3	9.5	20.5	20.2	21.0	21.9	21.1	25.2	2.9	25.2	7.0	24
HOURLY MAX	26.0	31.8	32.4	40.4	33.1	33.0	25.5	28.0	33.2	34.1	33.1	33.0	31.2	30.4	33.7	38.0	36.5	38.5	34.6	32.2	32.4	29.7	27.3	27.2				

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

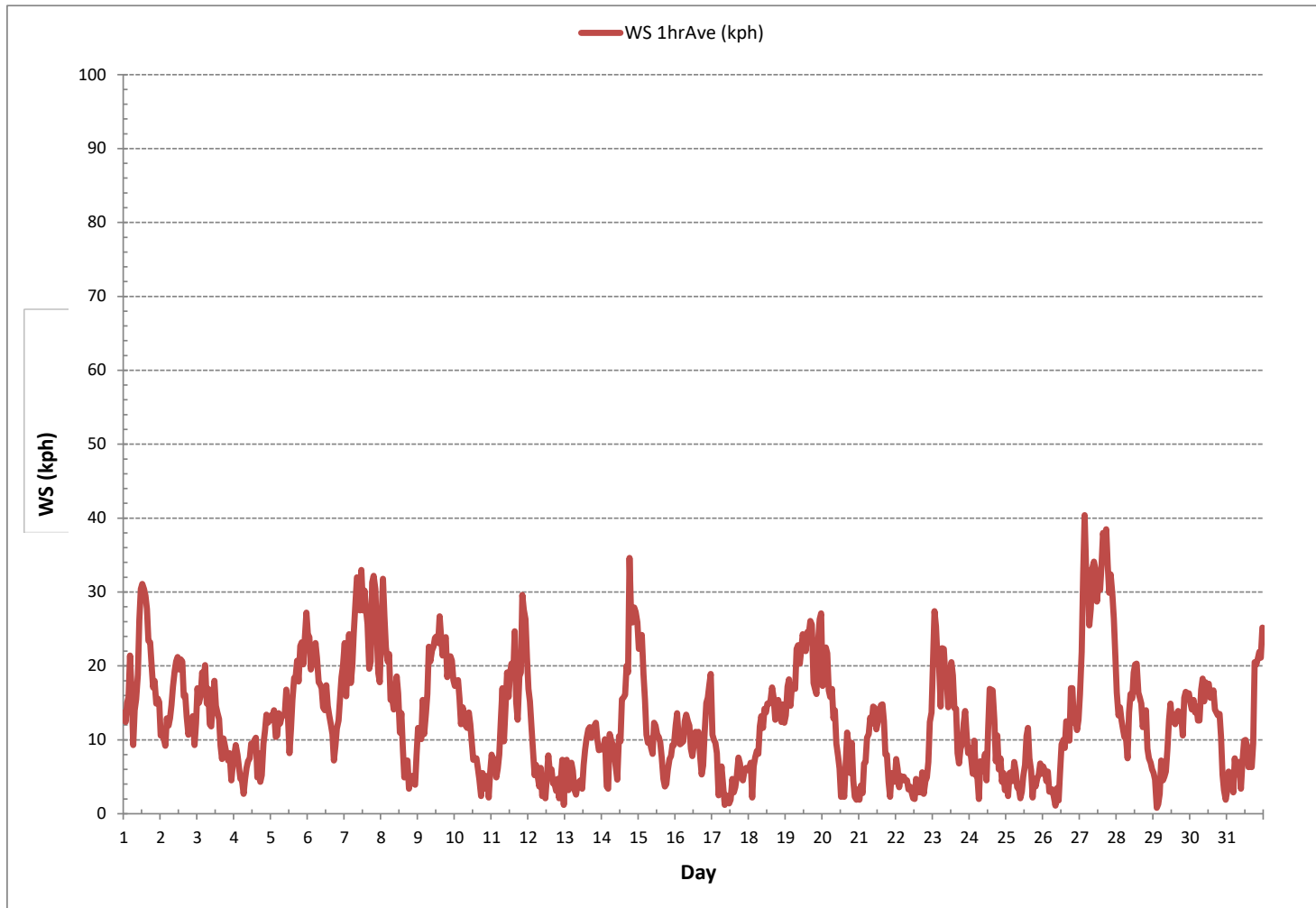
LAST CALIBRATION:	October 24, 2018
DECLINATION :	MAGNETIC DECLINATION 13 DEGREE EAST

24 HR AVERAGES January 2019



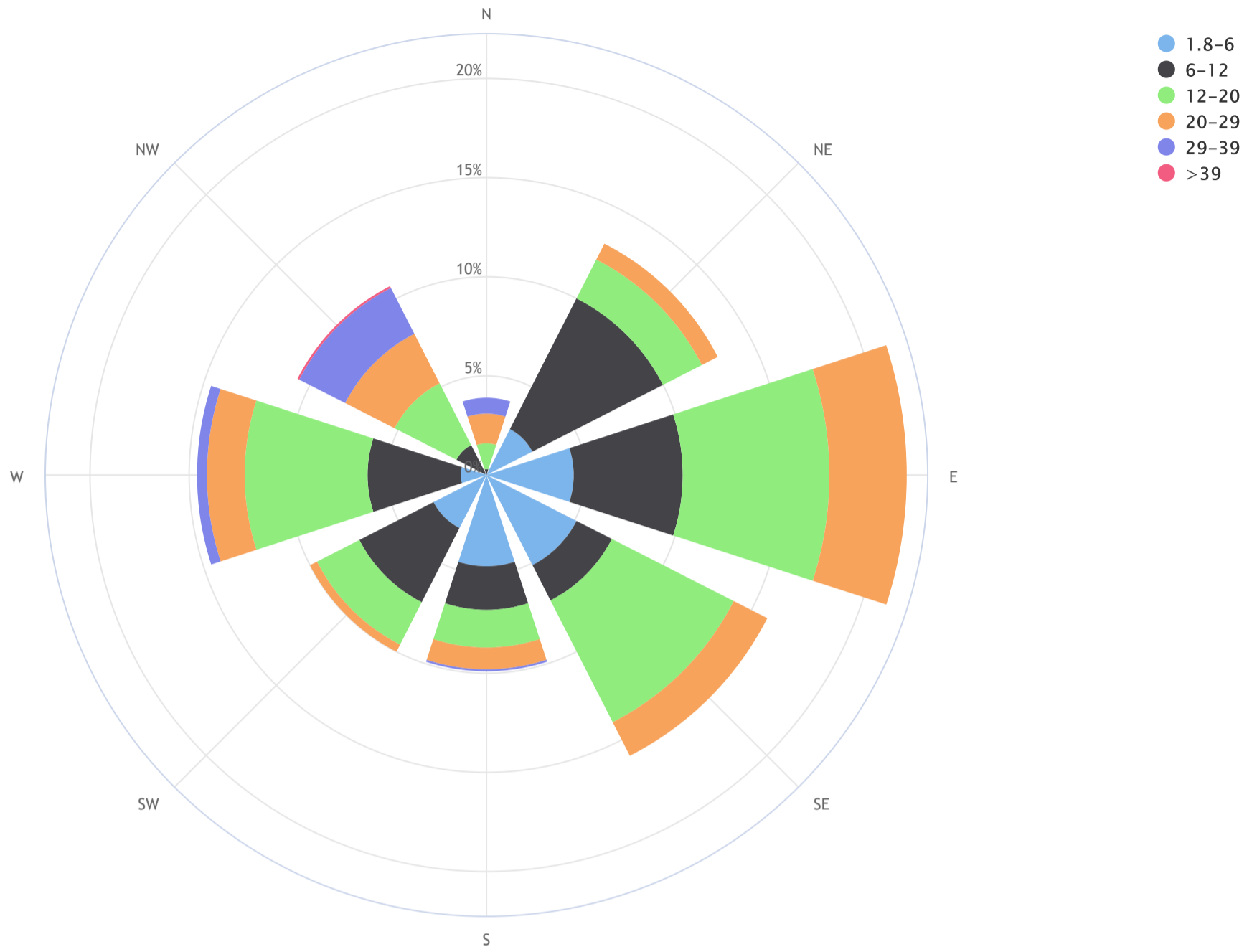
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.8 kph @ HOUR 2 ON DAY 29
MAXIMUM 1-HR AVERAGE:	40.4 kph @ HOUR 3 ON DAY 27
MAXIMUM 24-HR AVERAGE:	25.7 kph ON DAY 27
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMSD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	7.7
MONTHLY AVERAGE:	0.8 kph



Lakeland Industry & Community Association\_Bonnyville East Continuous Monitoring Station\_19/01

Wind Rose\_Wind Frequency (Blowing From)\_CALM Avg = 1.2\_CALM % = 0.8%



Direction	1.8-6	6-12	12-20	20-29	29-39	>39	TOTAL
N	0.0	0.3	1.3	1.5	0.8	0.0	3.9
NE	2.6	7.4	2.2	0.9	0.0	0.0	13.0
E	4.4	5.5	7.4	3.9	0.0	0.0	21.2
SE	5.1	2.0	6.9	1.9	0.0	0.0	15.9
S	4.6	2.2	1.9	1.1	0.1	0.0	9.8
SW	3.0	4.2	2.4	0.4	0.0	0.0	10.0
W	1.3	4.7	6.2	1.9	0.5	0.0	14.6
NW	0.1	1.6	3.5	2.8	2.6	0.1	10.7
Summary	21.1	27.8	31.7	14.4	4.0	0.1	99.2
CALM	0.8	0.0	0.0	0.0	0.0	0.0	0.8



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

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

STATUS FLAG CODES

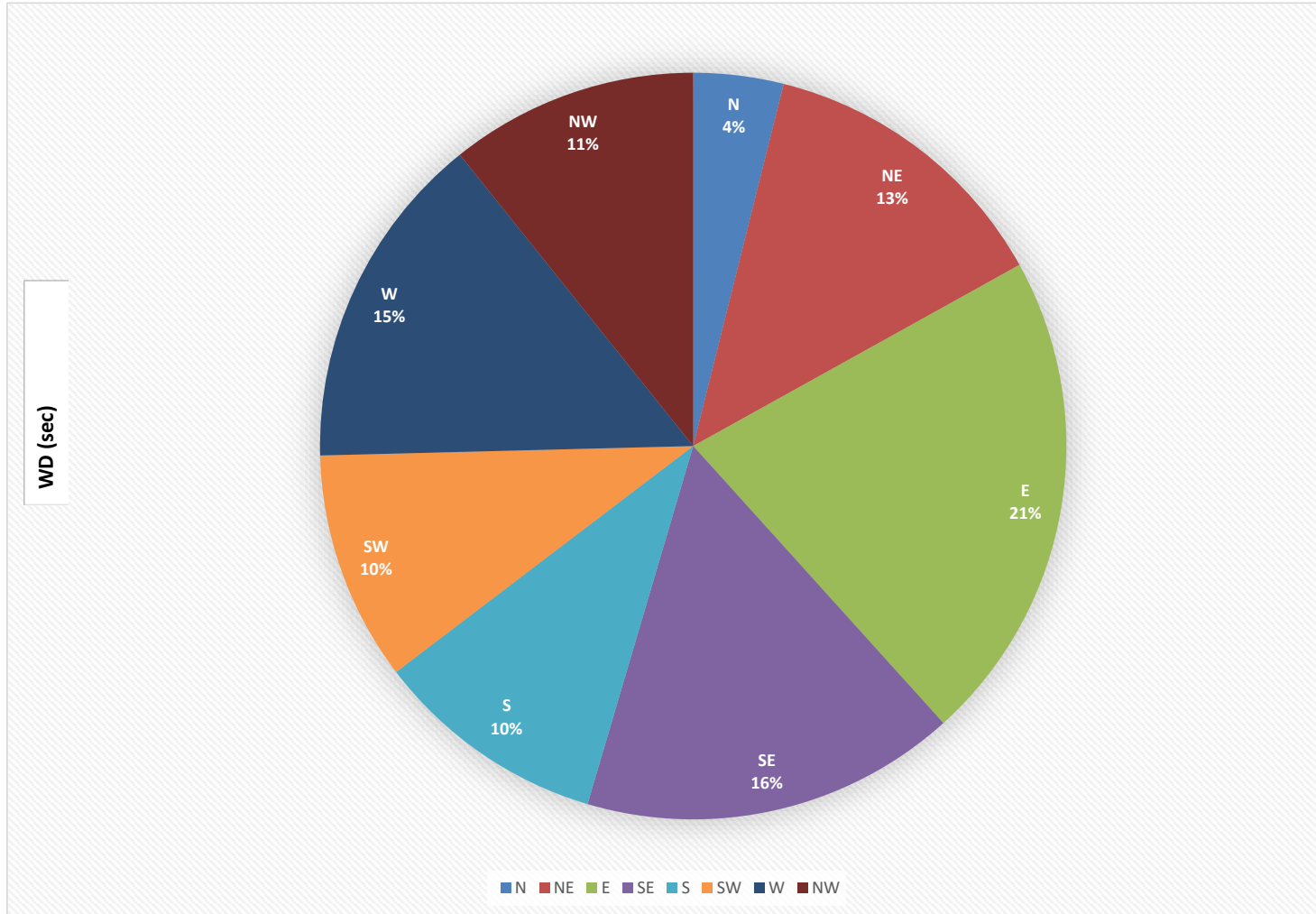
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	October 24, 2018
DECLINATION :	MAGNETIC DECLINATION 13 DEGREE EAST

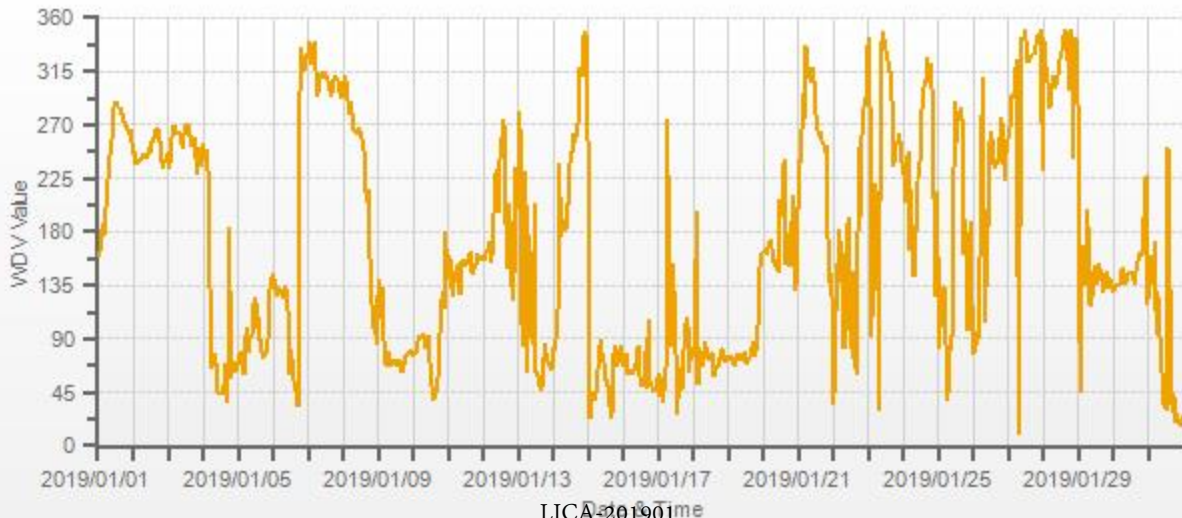
MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	94		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	33	(NNE)



**WIND DIRECTION Hourly Averages (WD)**



WDV[degwdr]



LICA-201901



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

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	5	6	8	8	5	6	10	9	9	9	7	7	7	7	7	7	6	5	5	4	2	2	2	2	24	
2	2	2	4	6	9	7	6	7	7	9	8	9	8	8	9	6	5	4	4	4	6	8	4	6	24	
3	9	9	10	7	6	7	6	6	3	5	7	6	6	6	5	4	3	2	2	3	2	2	2	2	24	
4	2	3	4	3	2	3	1	2	3	4	6	6	5	5	5	4	3	4	2	5	5	4	5	5	24	
5	4	4	4	5	5	4	5	4	4	4	4	5	7	5	4	4	4	4	5	4	4	5	6	6	24	
6	6	5	6	5	6	7	6	6	5	5	7	7	4	4	5	5	6	6	5	5	5	5	5	5	24	
7	5	6	5	5	6	5	7	7	6	6	6	6	6	5	6	7	7	7	6	6	6	7	7	7	24	
8	6	6	6	7	7	7	5	3	3	5	4	6	5	7	6	6	2	3	3	2	2	2	2	4	24	
9	6	5	7	6	6	5	4	3	4	4	4	4	4	5	4	4	4	4	4	4	4	4	4	4	24	
10	4	4	4	4	4	4	4	4	4	5	4	5	6	5	4	4	3	2	3	2	3	3	4	3	24	
11	4	2	1	3	3	3	6	6	5	6	6	6	6	5	5	5	6	6	6	8	6	6	5	6	24	
12	5	5	5	5	5	4	2	3	4	5	5	5	4	5	5	4	3	2	5	2	3	3	5	5	24	
13	4	4	3	2	2	2	3	2	2	4	5	4	5	5	4	5	5	3	4	4	4	4	4	4	24	
14	3	3	3	3	4	4	6	5	4	4	8	10	8	8	6	6	5	6	6	6	6	7	6	5	24	
15	11	6	5	5	5	4	2	3	2	3	4	4	5	5	6	5	4	4	4	1	3	5	5	5	24	
16	4	4	5	5	5	5	5	5	5	5	5	7	6	5	5	4	3	3	5	6	6	5	5	5	24	
17	2	3	4	5	6	2	2	4	3	2	2	5	8	4	5	3	2	1	3	2	2	1	2	2	24	
18	1	3	6	3	3	4	5	4	4	5	5	4	5	4	5	5	4	5	4	4	4	3	4	4	24	
19	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	7	6	24	
20	8	6	6	6	6	6	5	4	5	5	4	7	10	9	7	6	3	3	2	3	4	3	3	1	24	
21	3	4	6	5	7	5	4	4	4	3	3	6	5	5	6	5	6	2	6	6	5	3	4	4	24	
22	4	4	3	2	2	1	1	1	3	2	3	3	3	3	3	2	2	4	3	4	4	4	6	5	24	
23	7	12	11	9	9	7	9	10	9	5	6	6	6	6	4	4	3	3	2	1	1	1	2	3	24	
24	5	4	4	5	5	7	10	6	5	11	10	13	8	7	6	6	4	5	4	2	2	3	2	4	24	
25	5	6	5	6	5	4	5	6	5	5	7	5	5	5	6	5	4	3	2	4	3	3	4	4	24	
26	3	2	2	3	3	5	3	2	2	1	2	3	6	5	8	6	8	9	6	6	6	10	8	7	24	
27	8	6	8	7	7	6	8	11	10	7	7	9	7	6	6	7	6	7	6	7	8	7	8	10	24	
28	8	4	4	4	5	4	3	3	5	5	5	5	6	6	7	6	5	6	3	3	5	3	3	2	24	
29	4	4	3	4	4	2	5	5	6	6	6	6	5	5	5	5	5	5	5	5	5	6	6	5	24	
30	6	6	6	6	6	6	7	5	5	6	6	6	5	5	5	5	5	6	5	5	5	7	9	5	24	
31	6	4	5	4	5	4	5	4	3	4	4	4	5	5	6	5	4	5	6	5	6	5	6	5	24	

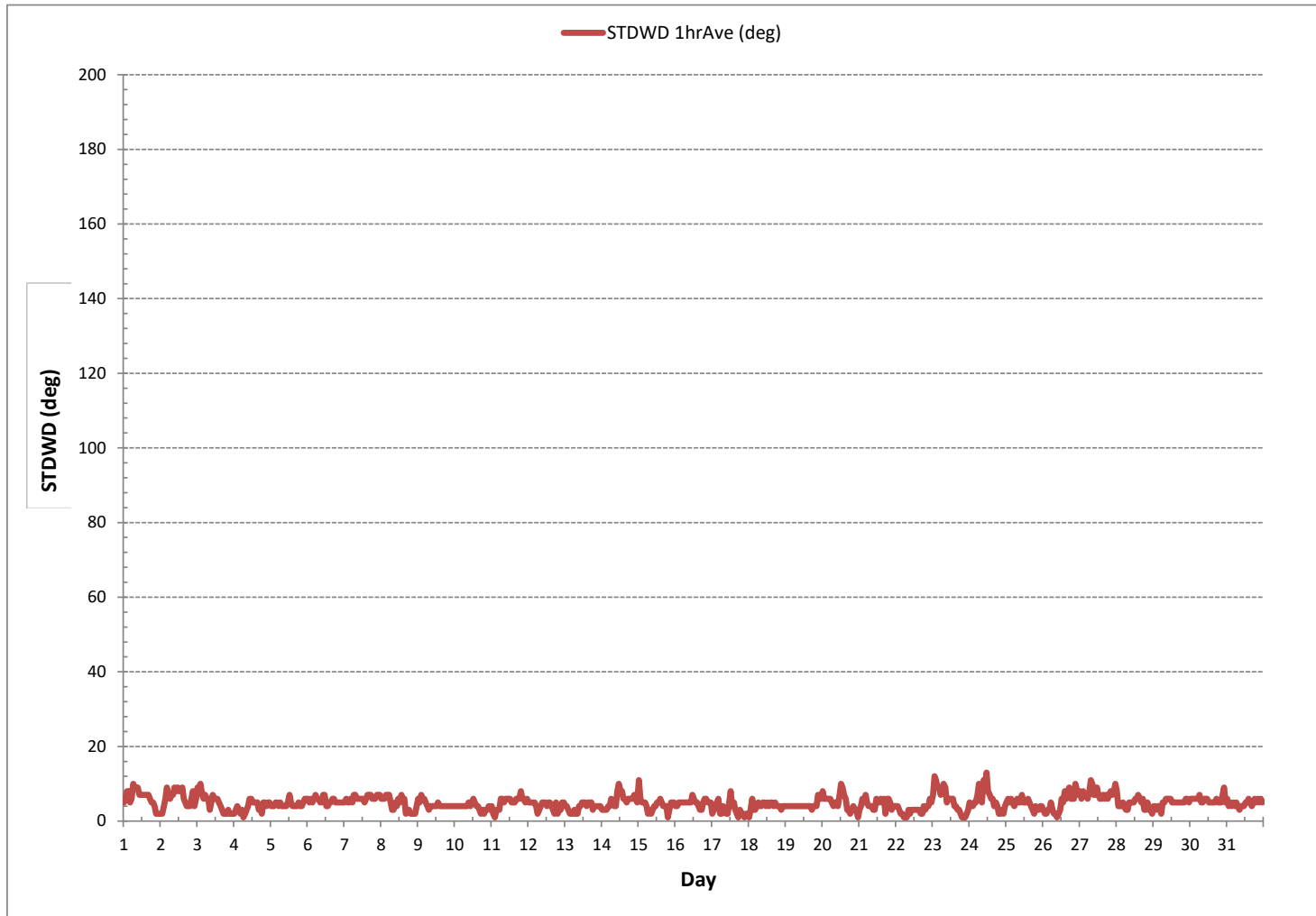
STATUS FLAG CODES

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: October 24, 2018

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)

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

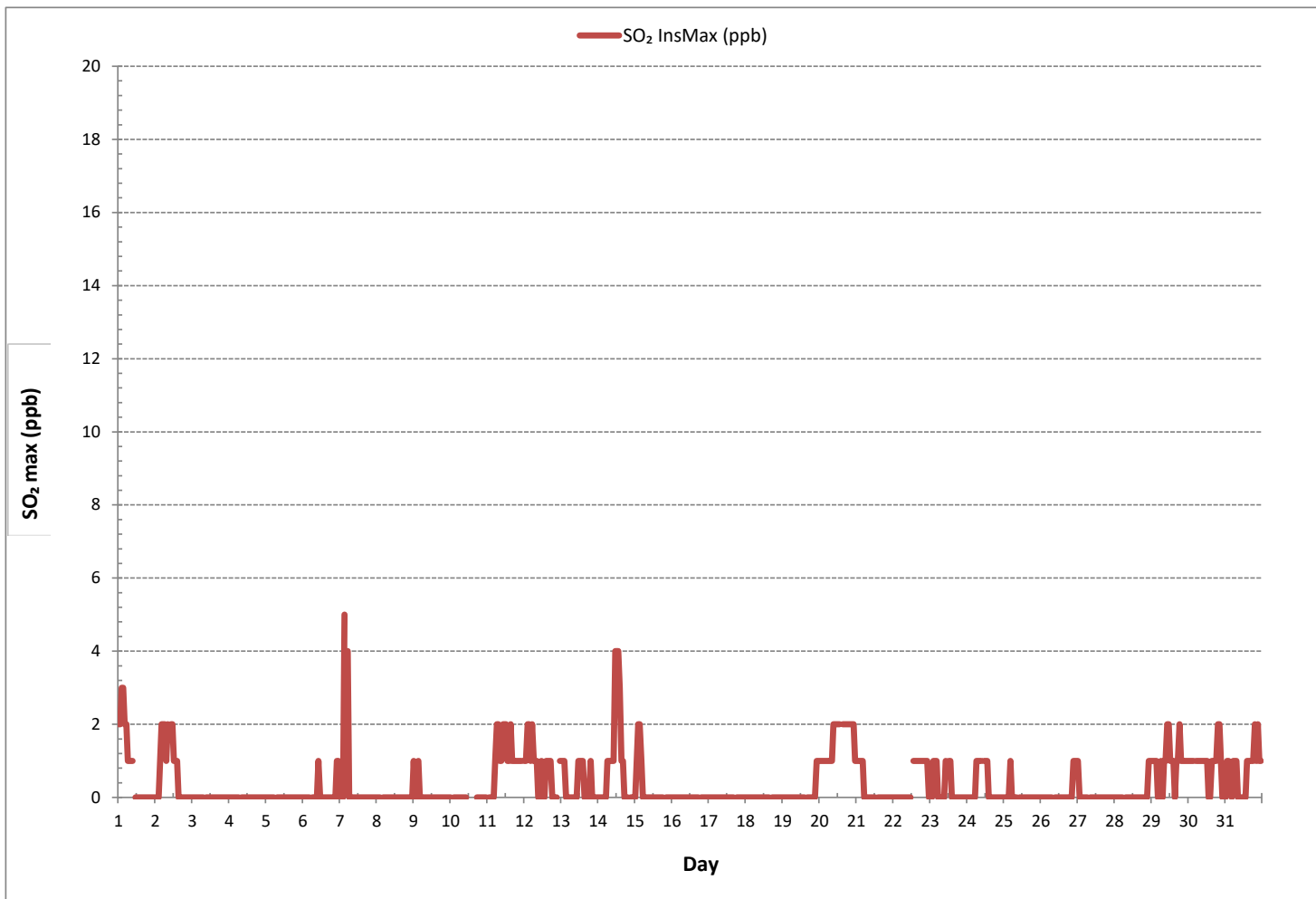
STATUS FLAG CODES

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:	198
MAXIMUM INSTANTANEOUS VALUE:	5 ppb @ HOUR 3 ON DAY 7
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S 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	S	0	0	0	0	0	0	1	0	1	0	0	1	0	0	1	0	24	
2	1	1	1	1	1	1	1	1	1	S	1	1	S1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23	
3	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	3	24	
4	2	2	1	1	2	S1	S1	C	C	C	C	C	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	22	
5	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	24	
6	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	1	24	
7	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	
8	0	0	0	S	0	0	S1	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	
9	0	0	S	0	0	0	S1	S1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	
10	0	S	0	0	0	0	0	0	0	0	0	C1	C1	C1	C1	C1	C1	C1	C1	0	0	0	0	0	0	0	0	16	
11	S	0	1	1	1	0	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	S	0	1	24	
12	1	1	1	1	0	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	S	1	0	1	24
13	1	1	1	1	1	1	1	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	4	24	
14	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	2	24	
15	1	1	1	1	1	1	S1	S1	1	1	1	1	1	1	0	0	0	1	S	1	1	1	0	0	0	0	1	22	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24	
17	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	S	1	1	1	1	1	1	1	0	1	24	
18	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	24	
19	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	24	
20	0	0	0	0	0	0	0	1	1	1	1	1	0	0	S	1	1	1	1	1	1	1	1	1	1	0	1	24	
21	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
22	1	1	1	S	3	5	2	1	1	2	2	2	S	1	1	1	1	1	2	1	1	1	1	1	1	1	5	24	
23	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
24	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
25	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
26	1	1	1	1	1	1	1	1	S	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	24	
27	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S1	1	1	1	23	
28	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
29	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
30	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
31	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
HOURLY MAX	2	2	1	5	3	5	2	4	2	2	3	2	1	1	1	1	1	1	2	1	1	1	3	1					
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

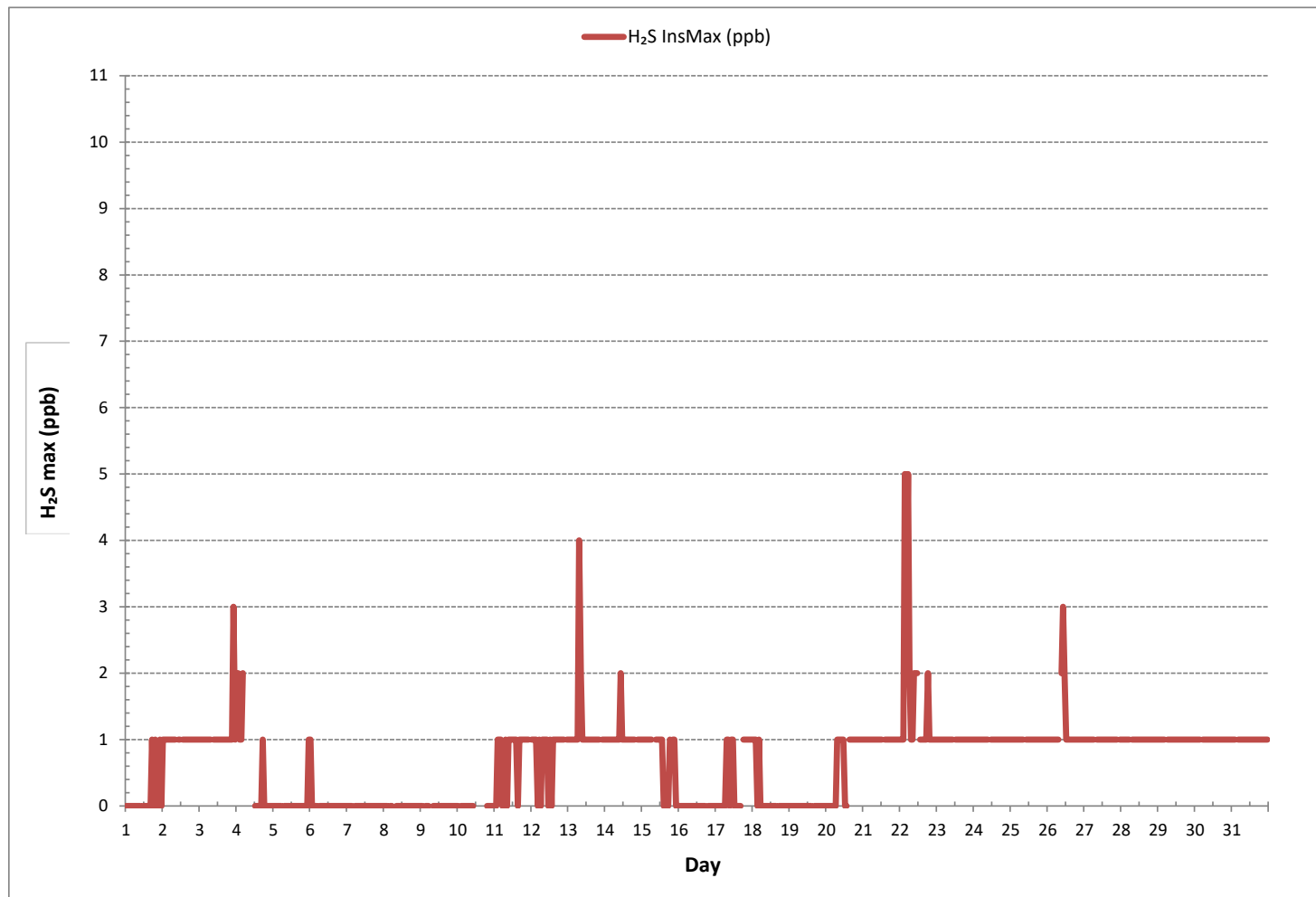
STATUS FLAG CODES

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:	433
MAXIMUM INSTANTANEOUS VALUE:	5 ppb @ HOUR 3 ON DAY 22
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	726 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)







LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.29	2.24	2.17	2.17	2.16	2.16	2.12	2.08	2.05	2.03	S	1.96	1.94	1.94	1.93	1.93	1.94	1.96	1.96	1.95	1.95	1.97	1.99	1.98	1.93	2.29	2.04	24
2	1.97	1.99	1.98	1.99	1.99	2.00	1.99	1.99	1.99	S	1.97	1.96	1.96	1.95	1.94	1.93	1.95	1.97	1.97	1.95	1.95	1.96	1.96	1.97	1.93	2.00	1.97	24
3	1.94	1.94	1.93	1.94	1.94	1.93	1.94	1.94	S	1.95	1.94	1.95	1.95	1.94	1.94	1.96	1.97	2.01	2.00	2.02	2.04	2.04	2.10	2.11	1.93	2.11	1.97	24
4	2.07	2.04	2.03	2.00	2.04	2.14	2.24	S	2.43	2.82	2.32	3.35	2.37	2.13	2.05	2.05	2.00	2.01	2.01	2.02	2.01	1.97	1.98	1.96	1.96	3.35	2.18	24
5	1.97	1.97	1.97	1.99	1.98	1.97	S	1.97	1.98	2.00	1.99	1.99	2.00	2.05	2.00	1.98	2.00	1.99	2.00	1.99	1.98	2.00	1.97	1.97	1.97	2.05	1.99	24
6	1.97	1.97	2.00	2.01	1.99	S	1.97	1.99	1.99	1.98	1.99	1.99	1.99	2.00	1.99	2.00	1.99	1.98	1.99	2.03	2.04	2.04	1.98	1.97	1.97	2.04	1.99	24
7	1.97	1.98	1.98	1.97	S	2.00	2.00	1.98	1.97	1.97	1.97	1.96	1.97	1.97	1.97	1.97	1.98	1.98	1.97	1.96	1.97	1.97	1.98	1.99	1.96	2.00	1.99	24
8	1.98	1.96	1.97	S	1.98	1.98	2.00	2.00	2.01	2.00	1.99	1.98	1.98	1.97	1.99	1.98	2.01	2.00	2.04	2.04	2.30	3.12	3.02	3.64	1.96	3.64	2.17	24
9	2.35	2.24	S	2.14	2.17	2.18	2.16	2.16	2.14	2.11	2.08	2.05	2.04	2.02	2.00	1.99	1.99	1.99	1.99	2.01	2.00	2.00	2.00	2.00	1.99	2.35	2.08	24
10	2.00	S	2.00	1.99	2.01	2.00	2.00	1.99	2.00	2.00	1.98	2.01	2.04	2.03	2.01	2.28	2.09	2.57	2.27	2.23	2.21	2.37	2.24	2.16	1.98	2.57	2.11	24
11	S	2.26	2.35	2.40	2.37	2.32	2.19	2.16	2.12	2.12	C	C	C	C	C	2.21	2.26	2.30	2.34	2.28	2.21	2.20	2.19	S	2.12	2.40	2.25	24
12	2.18	2.18	2.19	2.18	2.18	2.21	2.22	2.31	2.26	2.30	2.31	2.30	2.36	2.38	2.39	2.41	2.47	2.53	2.47	2.48	2.59	2.62	S	2.61	2.18	2.62	2.35	24
13	2.55	2.55	2.64	3.29	3.07	2.82	3.34	3.84	4.33	3.10	4.21	7.29	3.53	3.17	2.76	2.78	2.66	3.13	2.43	2.35	2.29	S	2.57	2.57	2.29	7.29	3.18	24
14	2.21	2.21	2.26	2.32	2.37	2.64	2.59	2.66	2.70	2.89	3.10	3.01	3.03	2.54	2.43	2.42	2.41	2.37	2.05	2.04	S	2.03	2.02	2.03	2.02	3.10	2.45	24
15	2.06	2.08	2.08	2.06	2.06	2.05	2.49	2.07	2.16	2.14	2.12	2.06	2.04	2.20	2.32	2.38	2.07	2.43	2.29	S	2.74	2.67	2.30	2.20	2.04	2.74	2.22	24
16	2.15	2.10	2.12	2.11	2.11	2.10	2.09	2.09	2.09	2.06	2.09	2.09	2.13	2.08	2.05	2.06	2.19	2.09	S	2.13	2.05	2.03	2.05	2.09	2.03	2.19	2.09	24
17	2.06	2.33	2.05	2.22	2.12	2.21	2.19	2.28	2.31	2.31	2.62	2.54	2.41	2.26	2.19	2.18	2.16	S	2.47	2.40	2.40	2.73	3.32	3.80	2.05	3.80	2.42	24
18	4.00	3.55	3.03	2.50	2.63	2.51	2.21	2.12	2.16	2.16	2.12	2.10	2.11	2.12	2.09	2.08	S	2.10	2.11	2.11	2.11	2.12	2.11	2.16	2.08	4.00	2.36	24
19	2.16	2.16	2.13	2.15	2.11	2.12	2.10	2.09	2.10	2.09	2.09	2.08	2.08	2.07	2.06	S	2.02	2.03	2.03	2.02	2.04	2.03	2.02	2.03	2.02	2.16	2.08	24
20	2.04	2.06	2.06	2.07	2.09	2.07	2.07	2.09	2.12	2.12	2.13	2.12	2.12	2.14	S	2.19	2.24	2.29	2.33	2.34	2.38	2.40	2.40	2.44	2.04	2.44	2.19	24
21	2.45	2.47	2.39	2.55	2.46	2.19	2.35	2.21	2.12	2.10	2.10	2.10	2.11	S	2.07	2.09	2.07	2.11	2.13	2.08	2.08	2.16	2.47	2.07	2.55	2.22	24	
22	2.38	2.36	2.48	2.56	2.56	2.54	2.56	3.50	4.09	2.72	2.40	2.53	S	15.61	7.16	7.27	8.22	5.68	5.08	4.37	2.70	2.47	2.39	2.44	2.36	15.61	4.18	24
23	2.11	2.04	2.03	2.02	2.01	2.01	2.00	1.99	2.00	2.01	2.00	S	1.99	1.98	1.97	1.97	1.99	2.02	2.05	2.08	2.08	2.14	2.08	2.05	1.97	2.14	2.03	24
24	2.06	2.05	2.05	2.05	2.11	2.11	2.12	2.20	2.30	2.22	S	2.18	2.11	2.18	2.28	2.10	2.03	2.05	2.07	2.08	2.10	2.11	3.08	3.20	2.03	3.20	2.21	24
25	3.17	3.28	2.91	2.45	2.21	2.28	2.27	2.23	2.26	S	2.26	2.26	2.26	2.14	2.08	2.08	2.07	2.13	2.10	2.06	2.21	2.63	2.16	2.17	2.06	3.28	2.33	24
26	2.29	2.30	2.35	2.43	2.60	2.47	2.57	2.44	S	2.46	2.50	2.28	2.00	1.96	1.98	1.98	1.98	1.99	1.97	1.96	1.95	1.97	2.00	2.01	1.95	2.60	2.19	24
27	1.99	1.98	1.94	1.93	1.94	1.94	1.96	S	1.97	1.98	1.97	1.98	1.98	1.98	1.97	1.98	1.97	1.97	1.97	1.96	1.95	1.95	1.96	1.97	1.93	1.99	1.97	24
28	1.98	1.99	1.99	1.99	2.00	2.02	S	2.08	2.06	2.03	1.98	1.94	1.93	1.94	1.94	1.94	1.96	1.99	2.01	2.02	2.08	2.10	2.04	2.08	1.93	2.10	2.00	24
29	2.11	2.05	2.12	2.10	2.14	S	2.18	2.41	2.59	2.41	2.15	2.10	2.19	2.26	2.19	2.11	2.08	2.15	2.26	2.37	2.41	2.29	2.21	2.18	2.05	2.59	2.22	24
30	2.16	2.15	2.14	2.12	S	2.11	2.11	2.11	2.09	2.09	2.09	2.09	2.09	2.06	2.04	2.05	2.06	2.08	2.10	2.10	2.10	2.10	2.11	2.11	2.04	2.16	2.10	24
31	2.12	2.14	2.17	S	2.26	2.52	2.51	2.47	2.51	2.42	2.37	2.32	2.27	2.29	2.26	2.19	2.16	2.12	2.05	2.01	2.01	2.01	2.02	2.01	2.01	2.52	2.23	24
HOURLY MAX	4.00	3.55	3.03	3.29	3.07	2.82	3.34	3.84	4.33	3.10	4.21	7.29	3.53	15.61	7.16	7.27	8.22	5.68	5.08	4.37	2.74	3.12	3.32	3.80				
HOURLY AVG	2.22	2.22	2.18	2.20	2.20	2.19	2.23	2.26	2.31	2.23	2.24	2.36	2.17	2.60	2.28	2.28	2.30	2.27	2.22	2.18	2.16	2.20	2.21	2.28				

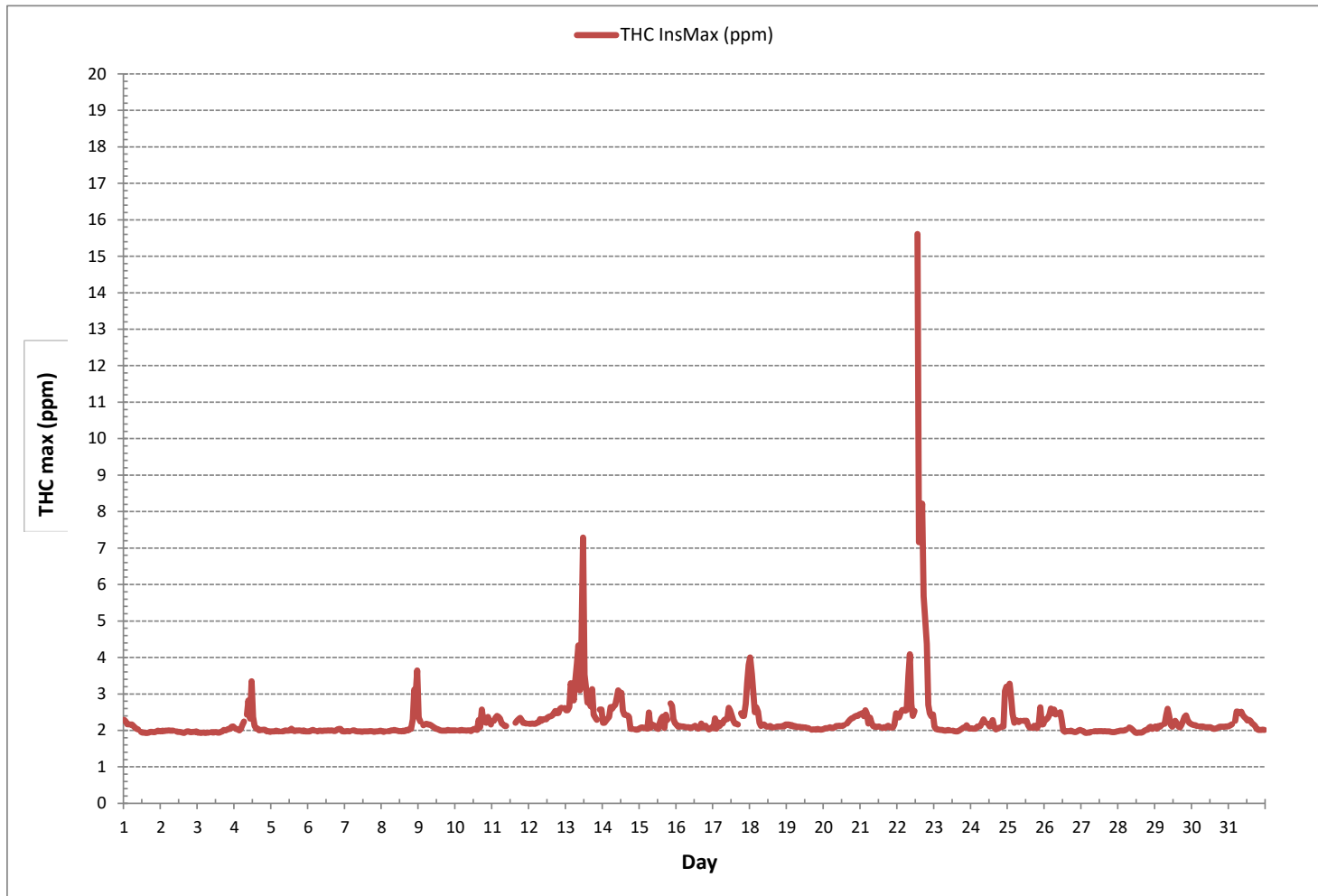
STATUS FLAG CODES

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:	707
MAXIMUM INSTANTANEOUS VALUE:	15.61 ppm @ HOUR 13 ON DAY 22
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	0.74

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

METHANE MAX Instantaneous Maximum (CH<sub>4</sub> 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	2.29	2.24	2.17	2.17	2.16	2.16	2.12	2.08	2.05	2.03	S	1.96	1.94	1.94	1.93	1.93	1.94	1.96	1.96	1.95	1.95	1.97	1.99	1.98	1.93	2.29	2.04	24
2	1.97	1.99	1.98	1.99	1.99	2.00	1.99	1.98	1.99	S	1.97	1.96	1.96	1.95	1.94	1.93	1.95	1.97	1.97	1.95	1.95	1.96	1.96	1.97	1.93	2.00	1.97	24
3	1.94	1.94	1.93	1.94	1.94	1.93	1.94	1.94	S	1.95	1.94	1.95	1.95	1.94	1.94	1.96	1.97	2.01	2.00	2.02	2.04	2.04	2.10	2.11	1.93	2.11	1.97	24
4	2.06	2.04	2.03	2.00	2.04	2.14	2.24	S	2.43	2.81	2.32	3.32	2.37	2.13	2.05	2.05	2.00	2.01	2.01	2.02	2.01	1.97	1.98	1.96	1.96	3.32	2.17	24
5	1.97	1.97	1.97	1.99	1.98	1.97	S	1.97	1.98	2.00	1.99	1.99	2.00	2.05	2.00	1.98	2.00	1.99	2.00	1.99	1.98	2.00	1.97	1.97	1.97	2.05	1.99	24
6	1.97	1.97	2.00	2.01	1.99	S	1.97	1.99	1.99	1.98	1.99	1.99	1.99	2.00	1.99	2.00	1.99	1.98	1.99	2.03	2.04	2.04	1.98	1.97	1.97	2.04	1.99	24
7	1.97	1.98	1.98	1.97	S	2.00	2.00	1.98	1.97	1.97	1.97	1.96	1.97	1.97	1.97	1.97	1.98	1.98	1.97	1.96	1.97	1.97	1.98	1.99	1.96	2.00	1.98	24
8	1.98	1.96	1.97	S	1.98	1.98	2.00	2.00	2.01	2.00	1.99	1.98	1.98	1.97	1.99	1.98	2.01	2.00	2.04	2.04	2.30	3.12	3.01	3.59	1.96	3.59	2.17	24
9	2.35	2.24	S	2.14	2.17	2.18	2.16	2.16	2.14	2.11	2.08	2.05	2.04	2.02	2.00	1.99	1.99	1.99	2.00	1.99	2.00	2.00	2.00	2.00	1.99	2.35	2.08	24
10	2.00	S	2.00	1.99	2.01	2.00	2.00	1.99	2.00	2.00	1.98	2.01	2.04	2.03	2.01	2.27	2.09	2.57	2.27	2.23	2.21	2.37	2.25	2.16	1.98	2.57	2.11	24
11	S	2.26	2.35	2.39	2.37	2.32	2.19	2.16	2.12	2.12	C	C	C	C	C	2.21	2.25	2.27	2.29	2.25	2.20	2.19	2.19	S	2.12	2.39	2.24	24
12	2.18	2.18	2.19	2.18	2.18	2.21	2.22	2.30	2.26	2.30	2.30	2.30	2.36	2.37	2.35	2.39	2.42	2.48	2.43	2.48	2.57	2.59	S	2.52	2.18	2.59	2.34	24
13	2.48	2.46	2.56	3.18	2.95	2.71	3.19	3.66	4.12	2.99	4.06	6.89	3.36	3.03	2.67	2.69	2.61	3.05	2.41	2.34	2.29	S	2.54	2.53	2.29	6.89	3.08	24
14	2.21	2.21	2.26	2.32	2.36	2.63	2.57	2.66	2.69	2.86	3.07	2.90	2.91	2.43	2.30	2.30	2.29	2.27	2.05	2.04	S	2.03	2.02	2.03	2.02	3.07	2.41	24
15	2.06	2.08	2.08	2.06	2.06	2.05	2.47	2.07	2.16	2.14	2.12	2.06	2.04	2.20	2.33	2.31	2.06	2.40	2.29	S	2.71	2.66	2.30	2.20	2.04	2.71	2.21	24
16	2.15	2.10	2.12	2.11	2.11	2.10	2.09	2.09	2.09	2.06	2.09	2.09	2.13	2.08	2.05	2.06	2.19	2.09	S	2.13	2.05	2.03	2.05	2.09	2.03	2.19	2.09	24
17	2.06	2.28	2.05	2.10	2.12	2.14	2.19	2.28	2.31	2.30	2.61	2.54	2.33	2.26	2.19	2.14	2.16	S	2.47	2.40	2.40	2.70	3.30	3.77	2.05	3.77	2.39	24
18	3.95	3.53	3.02	2.46	2.62	2.51	2.21	2.12	2.16	2.15	2.12	2.10	2.11	2.12	2.09	2.08	S	2.10	2.11	2.11	2.11	2.12	2.11	2.16	2.08	3.95	2.36	24
19	2.16	2.16	2.13	2.15	2.11	2.12	2.10	2.09	2.10	2.09	2.09	2.08	2.08	2.07	2.06	S	2.02	2.03	2.03	2.02	2.04	2.03	2.02	2.03	2.02	2.16	2.08	24
20	2.04	2.06	2.06	2.07	2.09	2.07	2.07	2.09	2.12	2.12	2.13	2.12	2.12	2.14	S	2.18	2.21	2.24	2.28	2.26	2.29	2.32	2.30	2.35	2.04	2.35	2.16	24
21	2.36	2.37	2.32	2.47	2.43	2.19	2.33	2.21	2.09	2.10	2.10	2.10	2.11	2.14	2.07	2.09	2.07	2.11	2.13	2.08	2.08	2.08	2.16	2.47	2.07	2.47	2.20	24
22	2.38	2.36	2.41	2.53	2.55	2.54	2.56	3.45	3.99	2.70	2.39	2.52	S	14.77	6.85	6.92	7.78	5.44	4.86	4.20	2.64	2.41	2.35	2.44	2.35	14.77	4.05	24
23	2.11	2.04	2.03	2.02	2.01	2.01	2.00	1.99	2.00	2.01	2.00	S	1.99	1.98	1.97	1.97	1.99	2.01	2.05	2.08	2.08	2.14	2.08	2.05	1.97	2.14	2.03	24
24	2.06	2.05	2.05	2.05	2.11	2.11	2.12	2.20	2.30	2.22	S	2.18	2.11	2.17	2.28	2.10	2.03	2.05	2.07	2.08	2.10	2.11	3.03	3.15	2.03	3.15	2.21	24
25	3.12	3.24	2.90	2.45	2.21	2.27	2.27	2.23	2.26	S	2.26	2.26	2.26	2.14	2.08	2.07	2.07	2.13	2.09	2.06	2.21	2.62	2.16	2.17	2.06	3.24	2.33	24
26	2.29	2.30	2.35	2.43	2.60	2.47	2.57	2.43	S	2.46	2.50	2.28	2.00	1.96	1.98	1.98	1.98	1.99	1.97	1.96	1.95	1.97	2.00	2.01	1.95	2.60	2.19	24
27	1.99	1.98	1.94	1.93	1.94	1.94	1.96	S	1.97	1.98	1.98	1.98	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.96	1.95	1.95	1.96	1.97	1.93	1.99	1.97	24
28	1.98	1.99	1.99	1.99	2.00	2.02	S	2.08	2.06	2.03	1.98	1.94	1.93	1.94	1.94	1.94	1.96	1.99	2.01	2.02	2.08	2.10	2.04	2.08	1.93	2.10	2.00	24
29	2.11	2.05	2.12	2.10	2.14	S	2.18	2.41	2.59	2.41	2.15	2.10	2.20	2.26	2.19	2.11	2.08	2.15	2.25	2.37	2.41	2.29	2.21	2.18	2.05	2.59	2.22	24
30	2.16	2.15	2.14	2.12	S	2.11	2.11	2.11	2.09	2.09	2.09	2.09	2.09	2.06	2.04	2.05	2.06	2.08	2.10	2.10	2.10	2.10	2.11	2.11	2.04	2.16	2.10	24
31	2.12	2.14	2.17	S	2.26	2.52	2.51	2.47	2.51	2.42	2.37	2.32	2.27	2.29	2.26	2.19	2.16	2.12	2.05	2.01	2.01	2.01	2.02	2.01	2.01	2.52	2.23	24
HOURLY MAX	3.95	3.53	3.02	3.18	2.95	2.71	3.19	3.66	4.12	2.99	4.06	6.89	3.36	14.77	6.85	6.92	7.78	5.44	4.86	4.20	2.71	3.12	3.30	3.77				
HOURLY AVG	2.22	2.21	2.18	2.18	2.19	2.19	2.22	2.25	2.29	2.22	2.24	2.35	2.16	2.56	2.26	2.26	2.28	2.25	2.20	2.17	2.16	2.20	2.21	2.27				

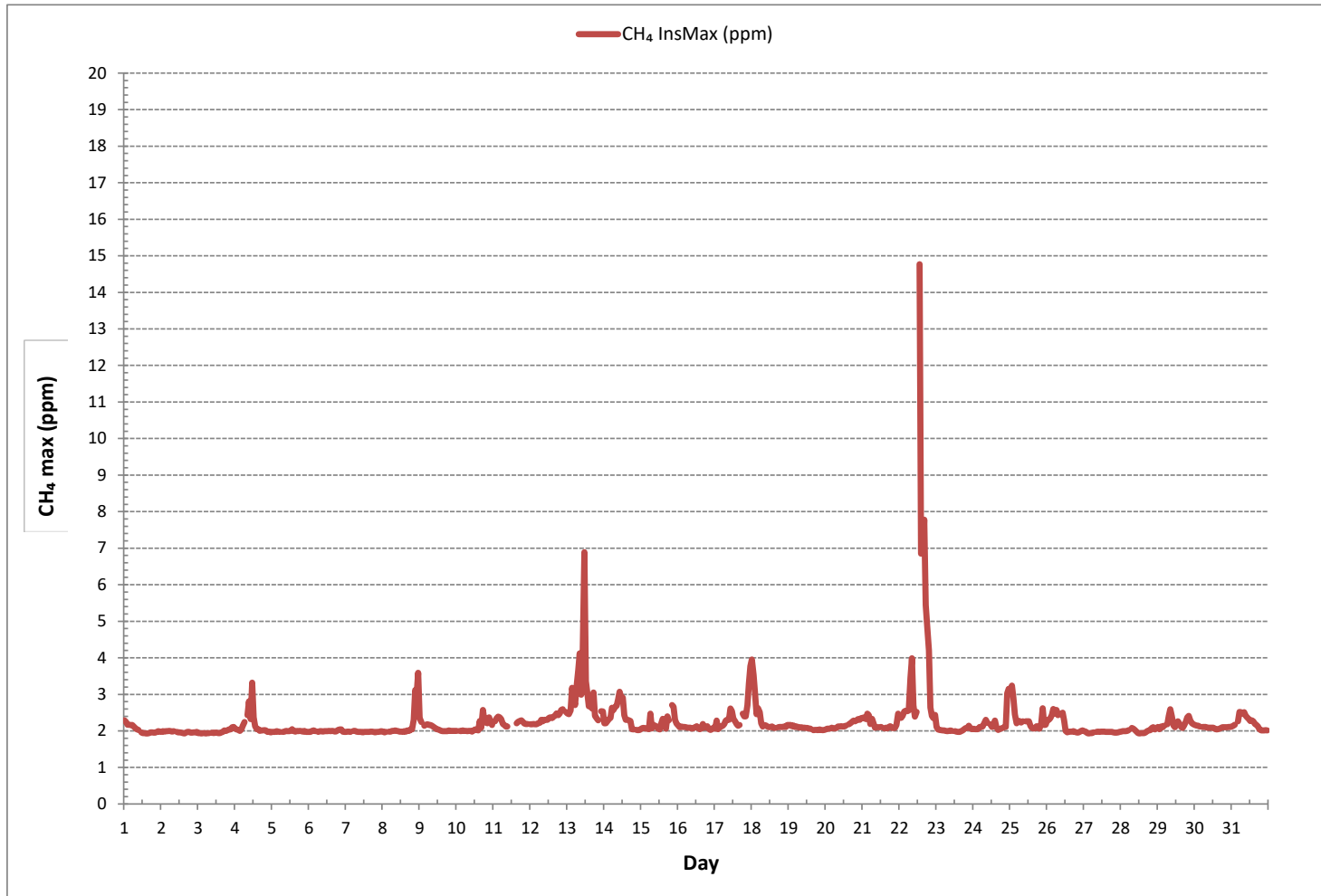
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	707
MAXIMUM INSTANTANEOUS VALUE:	14.77 ppm @ HOUR 13 ON DAY 22
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	0.69

METHANE MAX Instantaneous Maximum (CH<sub>4</sub> ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	24	
2	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	0.00	24	
3	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	0.00	0.00	24	
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.01	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	0.00	0.00	0.00	0.03	24	
5	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
6	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
7	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
8	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.06	0.00	0.06	24	
9	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24	
10	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24	
11	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	C	0.00	0.01	0.03	0.06	0.03	0.01	0.01	0.00	S	0.00	0.06	0.01	24	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.03	0.06	0.05	0.04	0.01	0.02	0.03	S	0.09	0.00	0.09	0.02	24	
13	0.08	0.09	0.09	0.11	0.13	0.11	0.16	0.19	0.22	0.11	0.15	0.40	0.16	0.14	0.10	0.09	0.04	0.09	0.02	0.01	0.00	S	0.03	0.03	0.00	0.40	0.11	24	
14	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.03	0.03	0.12	0.12	0.11	0.13	0.12	0.13	0.11	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.13	0.04	24
15	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.02	0.03	0.00	S	0.03	0.02	0.00	0.00	0.00	0.00	0.08	0.01	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	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
17	0.00	0.05	0.00	0.13	0.00	0.08	0.00	0.00	0.00	0.00	0.01	0.00	0.08	0.01	0.00	0.04	0.01	S	0.00	0.00	0.00	0.03	0.02	0.04	0.00	0.13	0.02	24	
18	0.06	0.03	0.01	0.04	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	0.06	0.01	24
19	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	0.00	0.00	24
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.01	0.03	0.05	0.05	0.08	0.09	0.09	0.10	0.10	0.00	0.10	0.03	24	
21	0.10	0.11	0.08	0.08	0.04	0.00	0.02	0.00	0.03	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	0.11	0.02	24
22	0.00	0.00	0.07	0.03	0.01	0.00	0.00	0.06	0.11	0.02	0.00	0.01	S	0.84	0.31	0.35	0.44	0.26	0.22	0.17	0.06	0.06	0.04	0.01	0.00	0.84	0.13	24	
23	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	0.00	24
24	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.05	0.01	24
25	0.06	0.05	0.02	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	0.01	0.01	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.06	0.01	24
26	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
27	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
28	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	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
29	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
30	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
31	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
HOURLY MAX	0.10	0.11	0.09	0.13	0.13	0.11	0.16	0.19	0.22	0.11	0.15	0.40	0.16	0.84	0.31	0.35	0.44	0.26	0.22	0.17	0.09	0.09	0.10	0.10					
HOURLY AVG	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.04	0.02	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01					

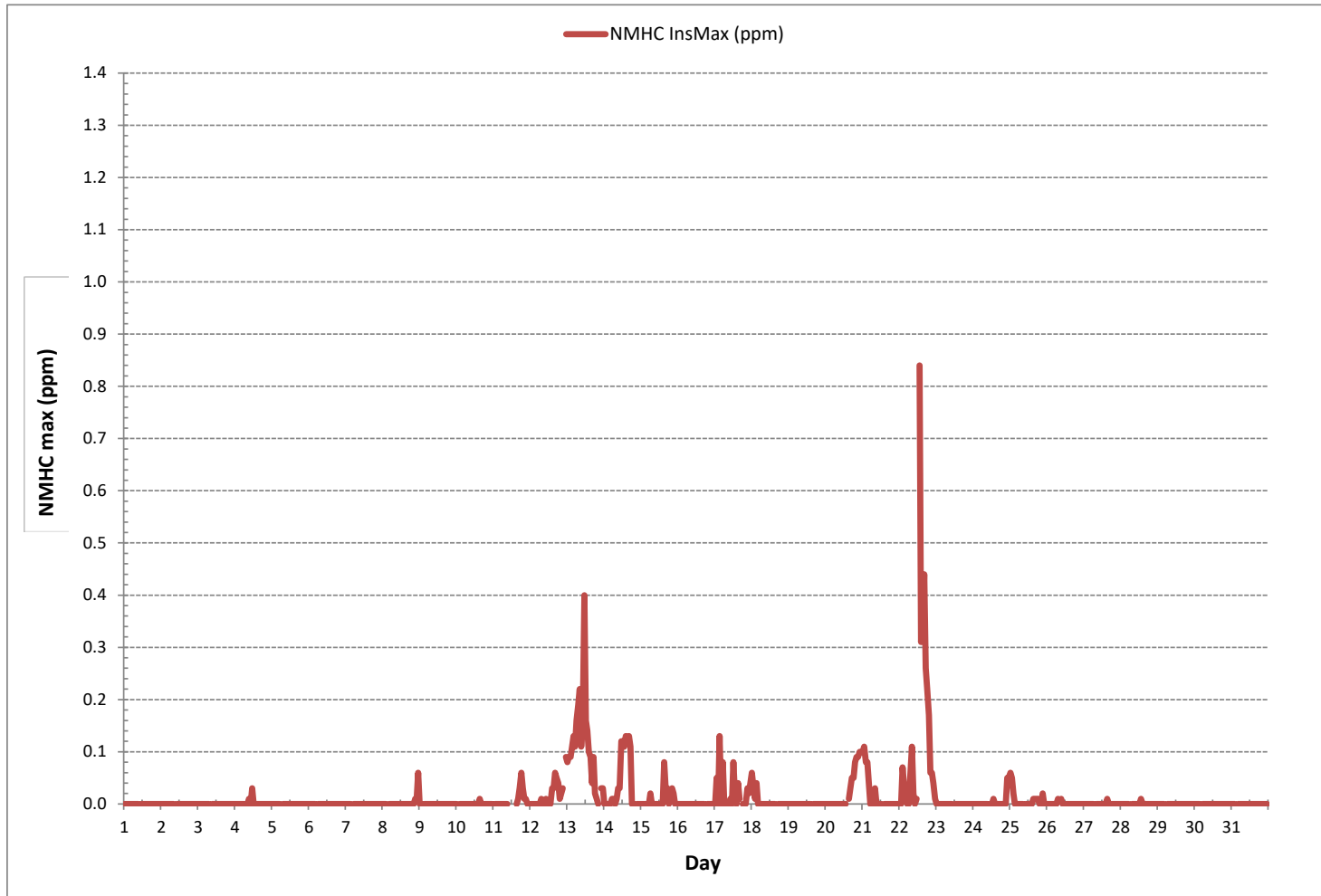
STATUS FLAG CODES

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:	127
MAXIMUM INSTANTANEOUS VALUE:	0.84 ppm @ HOUR 13 ON DAY 22
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	0.05

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	7	6	6	5	5	4	4	4	4	4	S	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	7	3	24	
2	1	1	2	2	3	4	3	3	4	S	6	5	5	5	3	2	3	3	3	2	2	2	1	1	1	1	6	3	24	
3	1	1	1	1	1	1	1	1	S	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	2	1	24
4	2	2	2	2	2	4	4	S	9	13	11	11	8	6	4	4	4	4	7	3	2	1	1	1	1	1	13	5	24	
5	1	1	0	1	0	0	S	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24	
6	1	1	1	1	1	S	1	1	1	2	2	2	2	1	1	1	2	2	2	2	5	6	5	3	2	1	6	2	24	
7	2	1	2	4	S	5	3	2	2	1	1	1	2	1	2	3	3	3	1	1	1	1	2	2	2	1	5	2	24	
8	1	0	1	S	1	2	3	2	1	1	1	1	1	1	1	1	1	1	3	2	4	8	8	19	0	19	3	24		
9	7	5	S	3	3	2	2	2	2	2	1	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	7	2	24	
10	1	S	1	1	1	1	1	0	0	1	1	C	C	C	C	C	C	C	C	6	3	3	3	4	0	6	2	24		
11	S	7	7	7	6	6	6	5	3	5	7	6	7	5	5	6	5	5	5	5	4	4	4	S	3	7	5	24		
12	5	5	5	5	4	5	5	5	5	5	6	6	8	9	10	10	12	14	13	12	15	15	S	14	4	15	8	24		
13	15	17	16	17	18	16	21	18	18	18	30	30	27	26	20	18	11	9	8	6	5	S	5	5	5	30	16	24		
14	4	4	4	5	5	10	8	9	9	10	13	16	18	15	17	18	18	17	5	4	S	3	2	1	1	18	9	24		
15	3	4	5	4	3	2	3	3	4	7	7	3	4	23	3	3	4	5	7	S	9	7	5	4	2	23	5	24		
16	3	2	2	2	2	2	2	1	2	1	2	2	2	2	2	3	8	6	S	3	1	1	1	1	1	8	2	24		
17	1	1	2	2	2	5	5	9	19	12	13	18	17	17	15	11	14	S	20	21	16	22	23	21	1	23	12	24		
18	20	18	14	7	6	5	4	3	4	4	4	3	2	2	3	2	S	3	3	2	2	2	2	2	2	2	20	5	24	
19	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	1	2	1	2	2	1	3	2	24		
20	2	2	2	2	3	3	3	3	4	4	6	4	4	5	S	6	9	7	10	8	8	7	8	8	2	10	5	24		
21	9	14	16	21	15	7	15	10	10	11	7	6	5	S	2	3	2	3	4	3	3	3	4	9	2	21	8	24		
22	7	7	7	8	10	9	10	17	20	18	13	14	S	22	23	28	33	30	29	21	15	28	19	18	7	33	18	24		
23	6	3	3	4	3	3	3	3	3	3	S	3	3	3	4	5	7	3	3	3	3	3	2	2	1	7	3	24		
24	2	2	2	2	3	4	6	8	9	8	S	9	12	13	17	11	6	13	13	13	12	7	11	11	2	17	8	24		
25	13	20	15	10	7	7	6	6	8	S	16	22	13	6	6	7	9	10	9	6	7	11	6	5	5	22	10	24		
26	6	6	7	7	8	7	12	10	S	12	12	9	3	2	2	2	2	3	2	2	2	2	4	4	2	12	6	24		
27	4	3	2	2	2	2	S	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	24		
28	1	2	2	3	4	6	S	16	11	6	3	2	2	1	1	2	2	3	4	4	4	5	4	12	1	16	4	24		
29	10	7	7	7	S	7	9	15	14	8	7	7	6	5	4	4	4	5	5	6	6	5	4	4	4	15	7	24		
30	4	4	3	3	S	3	3	3	3	3	3	3	3	4	3	4	4	4	5	6	7	5	5	5	3	7	4	24		
31	5	5	6	S	7	12	12	12	10	10	10	9	8	9	11	9	10	7	6	7	6	6	7	5	5	12	8	24		
HOURLY MAX	20	20	16	21	18	16	21	18	20	18	30	30	27	26	23	28	33	30	29	21	16	28	23	21						
HOURLY AVG	5	5	5	5	5	5	5	6	6	6	7	7	6	7	6	6	6	6	6	5	5	5	5	6						

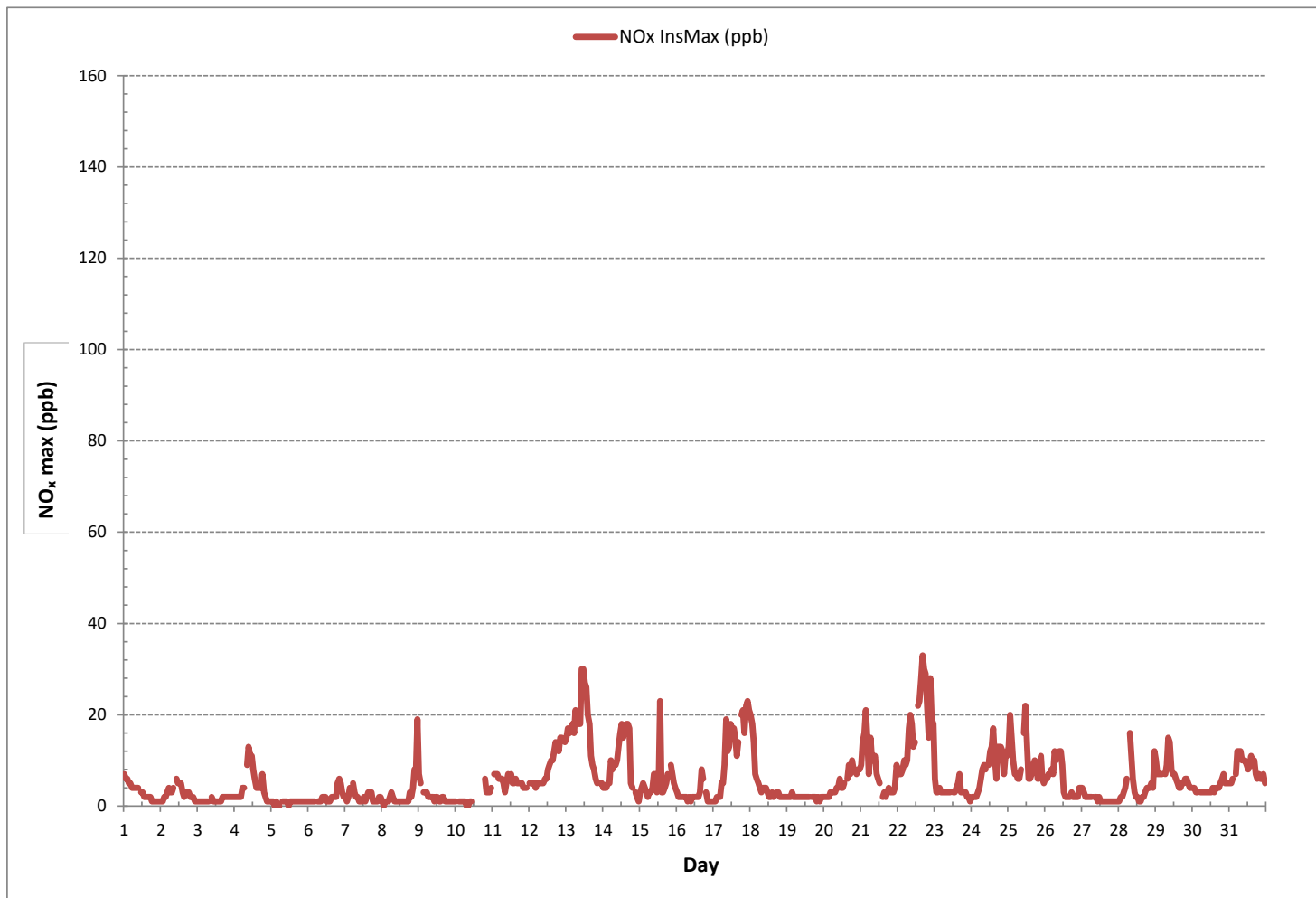
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	697
MAXIMUM INSTANTANEOUS VALUE:	33 ppb @ HOUR 16 ON DAY 22
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	6

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> 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	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	24	
2	0	0	0	0	0	0	0	0	0	0	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
3	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
4	0	0	0	0	0	0	0	0	S	0	2	2	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24
5	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	24
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
7	0	0	0	0	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	24
8	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
9	0	0	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	24
10	0	S	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	24
11	S	0	0	0	0	0	0	0	0	0	1	2	2	3	2	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	3	1	24
12	0	0	0	0	0	0	0	0	0	1	2	2	3	3	3	2	1	0	0	0	0	0	S	0	0	0	0	0	0	0	3	1	24
13	0	0	0	0	0	0	1	0	1	5	14	14	13	11	7	4	1	0	0	1	0	S	0	0	0	0	0	0	0	0	14	3	24
14	0	0	0	0	0	0	0	0	0	2	4	6	7	5	5	3	1	0	0	0	0	S	0	0	0	0	0	0	0	0	7	2	24
15	0	0	0	0	0	0	0	0	0	2	2	1	6	21	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	21	2	24
16	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	0	S	0	0	0	0	0	0	0	0	0	0	0	2	0	24
17	0	0	0	0	0	0	0	0	1	3	6	9	9	8	6	3	1	S	0	2	1	0	0	0	0	0	0	0	0	0	9	2	24
18	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
19	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
20	0	0	0	0	0	0	0	0	0	1	2	1	1	2	S	1	2	0	2	1	0	0	0	0	0	0	0	0	0	0	2	1	24
21	0	0	0	0	0	0	0	0	1	2	3	3	2	S	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3	1	24
22	0	0	0	0	0	0	1	3	6	5	6	S	10	8	8	7	2	3	0	0	2	0	0	0	0	0	0	0	0	0	10	3	24
23	0	0	0	0	0	0	0	0	1	1	S	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
24	0	0	0	0	0	0	0	1	1	S	3	4	5	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	24
25	0	0	0	0	0	0	0	0	0	S	6	12	6	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1	24
26	0	0	0	0	0	0	0	0	S	3	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	24
27	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	S	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
29	0	0	0	0	0	S	0	0	1	3	2	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	24
30	0	0	0	0	S	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
31	0	0	0	S	0	0	0	0	1	2	3	3	3	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	24
HOURLY MAX	0	0	0	0	0	0	1	1	3	6	14	14	13	21	8	8	7	2	3	2	1	2	1	1									
HOURLY AVG	0	0	0	0	0	0	0	0	0	1	2	3	2	3	2	1	1	0	0	0	0	0	0	0									

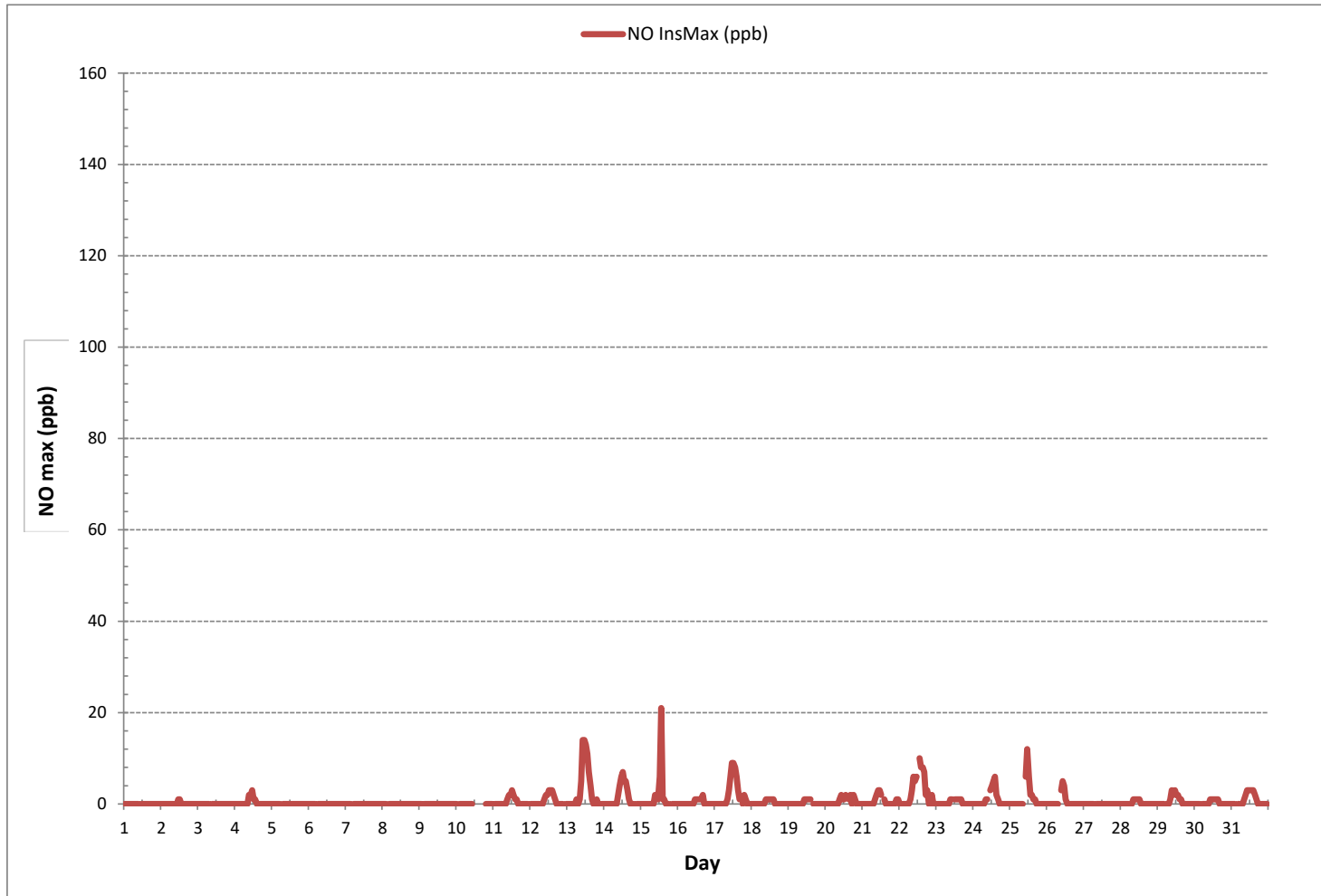
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	159
MAXIMUM INSTANTANEOUS VALUE:	21 ppb @ HOUR 13 ON DAY 15
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	744 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)

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

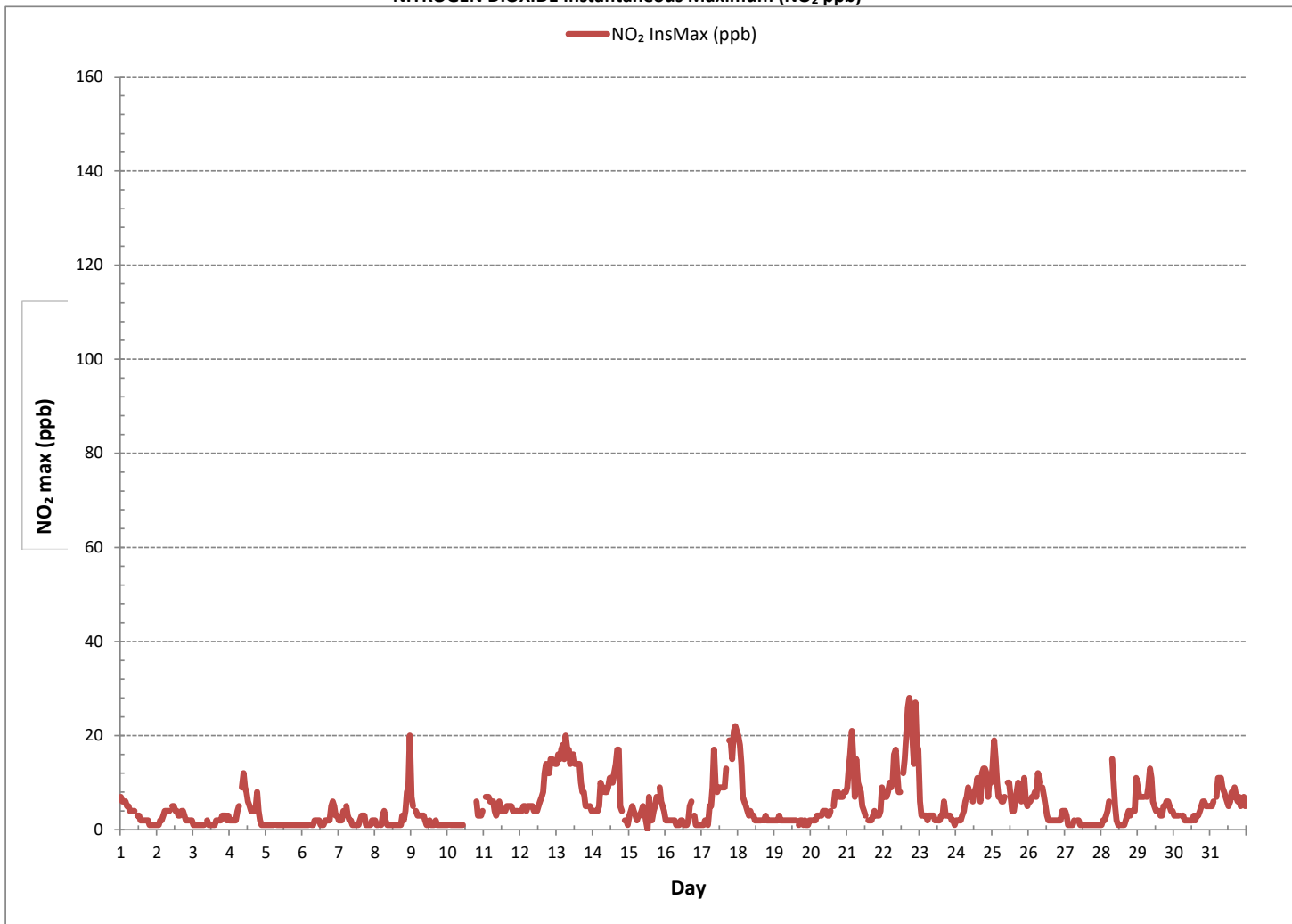
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	703
MAXIMUM INSTANTANEOUS VALUE:	28 ppb @ HOUR 17 ON DAY 22
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	5

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

OZONE Instantaneous Maximum (O<sub>3</sub> 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	19.2	21.6	22.1	21.6	23.1	24.3	26.2	27.4	29.5	30.4	S	37.1	38.3	38.6	38.4	38.3	38.1	38.5	37.7	37.1	36.6	36.1	35.9	19.2	38.6	31.9	24	
2	35.3	34.5	33.7	32.9	30.3	29.8	31.8	33.0	33.6	S	34.4	35.4	36.3	36.9	39.2	39.1	37.4	36.2	36.4	37.1	36.9	36.4	36.7	35.9	29.8	39.2	35.2	24
3	37.4	37.4	38.4	38.3	38.2	38.3	37.7	37.8	S	36.7	37.7	38.5	38.7	40.1	40.4	39.0	37.2	35.7	35.6	34.3	33.2	32.4	31.6	31.5	31.5	40.4	36.8	24
4	32.3	32.9	33.9	34.5	32.1	27.5	26.9	S	20.9	20.7	22.9	25.6	27.7	29.7	31.5	31.4	31.5	30.2	26.1	30.2	32.2	34.6	34.5	34.7	20.7	34.7	29.8	24
5	34.9	35.7	36.2	35.3	36.0	36.6	S	36.7	35.8	35.1	35.4	35.3	34.4	34.1	35.1	35.2	33.9	34.1	33.8	33.9	34.1	34.2	35.9	35.3	33.8	36.7	35.1	24
6	34.8	34.4	33.9	33.9	34.1	S	34.9	34.4	31.9	29.9	28.9	32.0	31.9	31.1	30.8	30.1	30.3	30.0	25.3	22.2	21.4	26.6	28.2	21.4	34.9	30.5	24	
7	29.6	30.1	29.4	25.4	S	21.9	24.1	29.4	32.2	32.8	32.1	34.1	32.6	33.0	33.3	32.9	31.9	32.0	35.2	36.0	35.8	35.6	34.5	34.5	21.9	36.0	31.7	24
8	36.0	37.7	37.2	S	35.7	34.0	33.0	34.3	35.3	35.9	35.9	36.1	36.2	36.5	36.9	37.6	36.4	36.3	32.8	30.1	27.1	20.8	19.7	12.6	12.6	37.7	32.8	24
9	28.5	31.7	S	34.6	32.6	30.1	31.8	32.4	33.5	33.4	33.8	34.1	34.5	34.7	35.1	35.2	34.4	33.9	34.5	34.6	35.5	36.0	35.5	35.2	28.5	36.0	33.7	24
10	35.0	S	35.1	35.6	35.5	35.8	35.7	35.8	35.6	35.4	35.6	35.2	33.9	33.7	33.4	32.9	32.7	30.9	31.0	29.6	31.3	32.1	31.5	29.9	29.6	35.8	33.6	24
11	S	26.0	23.8	23.7	22.8	25.2	28.8	30.0	31.7	31.4	C	C	C	C	C	C	30.7	30.0	29.5	29.3	28.9	28.8	28.7	S	22.8	31.7	28.1	24
12	27.8	27.3	26.7	26.0	26.6	25.2	24.8	23.8	23.7	23.6	24.2	24.7	24.1	22.6	21.2	19.5	15.9	14.0	13.6	13.5	10.9	10.3	S	12.7	10.3	27.8	21.0	24
13	14.4	12.9	11.3	7.3	8.0	9.5	4.2	6.1	5.3	9.5	9.1	11.5	13.6	12.7	12.1	11.7	14.9	16.8	16.8	19.7	17.8	S	17.3	17.0	4.2	19.7	12.2	24
14	22.8	22.6	21.7	20.0	18.5	15.5	18.3	18.5	18.5	18.0	18.4	20.3	19.9	25.3	24.7	22.8	20.6	20.3	31.2	31.2	S	31.9	31.3	29.9	15.5	31.9	22.7	24
15	23.7	20.9	21.3	23.6	26.5	28.9	27.2	29.8	29.0	28.0	29.6	32.4	33.2	32.3	33.1	32.6	30.5	28.7	25.6	S	24.3	27.3	29.6	31.0	20.9	33.2	28.2	24
16	32.1	32.8	31.8	31.8	31.4	30.7	30.6	30.7	30.9	31.5	31.3	31.5	32.4	33.2	34.2	33.7	30.2	27.6	S	32.9	35.2	34.9	37.7	37.3	27.6	37.7	32.5	24
17	35.9	34.5	34.9	34.6	34.2	31.1	29.3	23.8	15.3	21.7	24.5	23.9	26.0	27.7	27.7	29.0	24.3	S	17.1	16.8	18.9	12.5	9.5	10.1	9.5	35.9	24.5	24
18	10.1	12.4	18.9	26.3	26.6	30.1	33.1	33.8	32.6	33.9	34.4	35.2	35.4	35.4	35.1	35.0	S	33.6	33.1	33.7	33.8	33.4	33.1	32.4	10.1	35.4	30.5	24
19	32.1	32.3	33.2	33.0	34.3	34.2	34.7	33.9	34.0	35.0	34.9	34.6	35.0	35.8	36.6	S	39.0	39.6	40.0	40.5	40.4	41.0	40.2	39.4	32.1	41.0	36.2	24
20	38.9	38.5	38.1	37.6	36.4	36.5	36.5	35.6	34.7	34.3	34.2	34.4	34.5	33.6	S	31.4	29.4	28.8	27.5	27.3	26.9	25.4	24.1	23.3	23.3	38.9	32.5	24
21	22.5	17.4	15.1	10.3	14.7	21.7	13.6	17.5	19.6	20.0	23.2	24.1	24.9	S	27.9	27.4	27.2	26.0	24.4	24.9	24.6	24.3	23.5	18.2	10.3	27.9	21.4	24
22	19.5	19.8	19.5	17.7	15.6	15.2	13.9	7.5	7.0	14.1	17.8	17.3	S	17.5	16.5	12.2	6.1	3.6	5.1	11.5	20.2	9.5	13.8	13.7	3.6	20.2	13.7	24
23	22.2	21.0	24.6	28.9	31.7	32.9	33.5	33.6	33.9	34.7	35.6	S	37.2	36.9	35.9	35.5	32.9	34.9	34.6	34.0	34.3	34.1	35.5	36.5	21.0	37.2	32.8	24
24	36.3	35.6	35.1	35.8	32.0	31.2	29.0	26.4	24.7	25.1	S	25.5	25.5	25.2	22.2	26.1	27.8	21.8	21.3	20.2	20.6	23.3	15.9	17.9	15.9	36.3	26.3	24
25	14.4	7.8	14.1	19.3	23.3	22.2	20.9	20.4	18.8	S	17.3	18.8	24.0	29.3	32.1	31.4	29.0	27.1	27.1	27.2	24.6	21.6	28.8	29.4	7.8	32.1	23.0	24
26	27.6	26.9	25.2	24.6	22.2	22.4	17.7	19.2	S	18.2	20.4	26.3	36.7	38.2	38.5	38.5	37.5	36.3	35.3	35.0	35.5	34.6	32.2	31.3	17.7	38.5	29.6	24
27	31.9	33.8	37.7	38.1	37.2	35.3	29.6	S	40.0	37.3	38.5	37.6	38.4	39.1	39.4	40.1	39.2	39.3	40.2	41.2	42.7	43.9	43.9	43.3	29.6	43.9	38.6	24
28	42.2	41.2	43.0	41.1	39.8	36.9	S	27.7	32.4	37.4	40.2	41.4	41.8	42.2	42.2	42.1	41.9	40.6	39.4	39.4	38.0	37.6	37.7	31.1	27.7	43.0	39.0	24
29	30.4	32.7	31.4	30.5	28.2	S	28.1	23.8	21.1	25.8	33.1	35.3	35.8	36.7	37.9	40.4	40.2	39.1	38.0	36.4	35.3	35.2	36.2	36.7	21.1	40.4	33.4	24
30	36.5	36.5	37.0	37.5	S	38.1	38.7	39.4	39.2	39.1	38.8	38.5	38.4	37.9	37.8	37.4	36.9	35.8	34.9	33.4	32.4	33.6	33.4	33.0	32.4	39.4	36.7	24
31	32.5	31.6	30.4	S	28.0	22.6	21.1	20.1	22.0	24.6	25.6	27.7	28.1	27.4	25.9	26.5	24.0	24.8	24.8	24.8	26.3	24.9	22.5	26.2	20.1	32.5	25.8	24
HOURLY MAX	42.2	41.2	43.0	41.1	39.8	38.3	38.7	39.4	40.0	39.1	40.2	41.4	41.8	42.2	42.2	42.1	41.9	40.6	40.2	41.2	42.7	43.9	43.9	43.3				
HOURLY AVG	29.2	28.7	29.2	29.0	28.8	28.4	27.4	27.7	27.7	28.7	29.6	30.5	32.0	32.3	32.3	31.9	30.7	30.2	29.8	30.1	29.9	29.6	29.9	28.8				

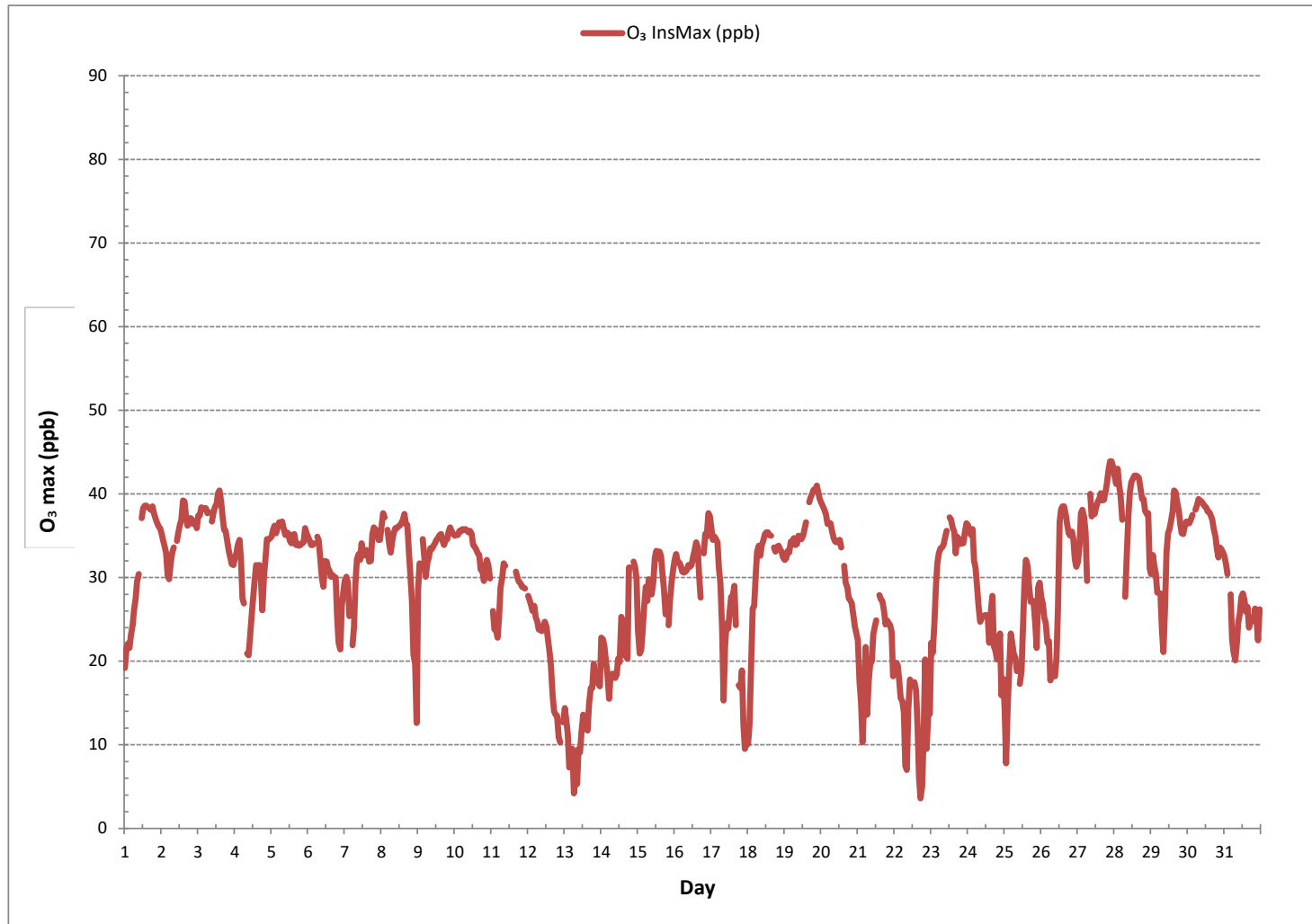
STATUS FLAG CODES

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:	706
MAXIMUM INSTANTANEOUS VALUE:	43.9 ppb @ HOUR 21 ON DAY 27
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	8.0

OZONE Instantaneous Maximum (O<sub>3</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Bonnyville East Continuous Monitoring Station - January 2019

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	14.6	14.1	17.7	18.1	23.3	17.7	11.8	17.9	19.2	23.3	30.0	36.0	36.6	35.6	35.0	32.1	27.2	26.0	21.8	18.2	18.5	14.6	15.1	14.7	11.8	36.6	22.5	24	
2	10.4	10.2	10.5	10.2	15.6	14.0	14.6	17.0	20.0	23.1	24.0	26.2	23.5	25.1	24.9	18.1	17.7	13.6	11.2	12.5	14.2	15.4	9.6	13.5	9.6	26.2	16.5	24	
3	21.3	19.0	20.3	21.9	20.0	22.6	16.3	18.8	12.4	12.7	18.0	20.3	16.2	15.0	14.1	9.4	7.4	9.8	8.7	7.9	7.3	7.9	4.6	6.6	4.6	22.6	14.1	24	
4	7.6	9.2	8.1	6.3	4.6	4.6	2.8	4.8	6.2	7.4	8.3	10.3	10.1	10.6	11.1	5.3	8.3	4.6	5.1	10.3	11.9	14.3	13.2	13.3	2.8	14.3	8.3	24	
5	14.0	13.7	14.5	11.0	11.5	14.1	12.9	13.9	13.7	14.1	17.3	13.6	9.1	12.0	16.0	19.0	19.2	21.5	19.4	24.0	23.8	21.7	26.4	30.5	9.1	30.5	17.0	24	
6	27.5	26.0	21.2	22.1	22.9	25.8	23.2	19.6	19.1	18.6	16.0	15.2	18.4	15.5	14.4	12.9	11.8	7.7	9.6	12.3	13.3	16.6	20.3	21.7	7.7	27.5	18.0	24	
7	25.3	17.3	22.3	26.2	19.5	21.8	28.4	32.0	35.6	34.5	30.2	36.5	30.2	32.9	31.2	29.4	22.4	23.2	34.7	35.7	33.8	27.2	22.0	20.5	17.3	36.5	28.0	24	
8	29.3	35.4	29.7	25.2	23.9	25.3	16.6	16.0	13.9	17.9	19.5	17.7	11.6	15.5	10.0	5.5	7.2	7.3	3.6	5.1	5.1	4.2	4.0	8.2	3.6	35.4	14.9	24	
9	12.7	10.8	11.5	16.9	11.6	14.1	17.0	22.9	21.6	23.5	23.6	25.2	25.1	24.8	27.9	25.2	22.7	25.0	25.1	19.5	21.0	22.1	21.5	18.9	10.8	27.9	20.4	24	
10	18.2	18.5	18.8	16.2	12.4	14.6	13.6	12.2	11.9	14.3	12.4	10.2	7.9	7.8	7.8	6.4	4.7	2.7	5.6	4.1	3.6	5.3	2.6	5.8	2.6	18.8	9.9	24	
11	8.3	6.4	6.9	5.0	6.0	8.2	14.7	19.0	10.7	15.4	21.9	17.3	21.0	22.3	20.4	27.3	17.1	14.4	20.9	23.0	32.9	30.8	28.8	23.2	5.0	32.9	17.6	24	
12	18.5	16.5	12.4	9.0	5.6	6.9	5.1	3.8	6.4	2.8	3.8	2.4	5.2	8.4	5.8	6.2	4.2	4.2	3.4	4.7	2.4	4.4	7.9	1.5	1.5	18.5	6.3	24	
13	7.3	7.3	3.4	5.2	6.7	5.8	3.6	2.8	4.0	4.5	4.6	3.8	7.0	9.2	10.6	11.9	12.6	11.0	11.1	12.2	12.8	10.2	8.8	9.0	2.8	12.8	7.7	24	
14	8.7	9.2	10.2	3.8	3.7	11.2	10.6	9.7	8.1	6.5	5.4	13.2	11.7	18.6	17.4	17.8	21.5	21.4	38.3	29.0	28.9	31.0	30.0	28.5	3.7	38.3	16.4	24	
15	24.8	25.6	26.6	20.7	16.9	11.4	9.5	10.5	8.7	8.2	12.6	12.4	11.2	10.9	10.5	8.2	4.8	4.0	4.3	5.8	7.3	8.2	9.7	9.8	4.0	26.6	11.8	24	
16	12.4	13.9	10.7	9.9	10.1	10.4	13.1	14.0	13.0	12.4	9.3	8.6	10.3	11.7	10.5	11.4	7.7	5.3	7.0	11.8	16.4	17.3	19.0	20.7	5.3	20.7	12.0	24	
17	10.5	10.2	10.1	8.4	3.0	4.2	6.2	4.1	1.6	2.7	2.2	1.7	2.4	5.0	3.2	3.7	5.1	7.2	6.7	4.9	4.4	5.8	6.0	5.7	1.6	10.5	5.2	24	
18	5.9	6.9	2.7	6.3	7.6	8.8	8.7	12.0	13.5	12.1	14.7	14.2	15.5	15.4	16.2	18.2	16.6	13.4	14.7	15.8	14.7	12.7	15.8	12.9	2.7	18.2	12.3	24	
19	13.9	17.7	18.7	15.2	18.0	17.9	17.6	23.1	23.5	21.4	22.8	25.0	24.0	23.0	25.5	25.4	26.7	26.1	18.4	17.3	16.8	25.8	29.0	30.5	13.9	30.5	21.8	24	
20	20.1	20.3	24.9	24.0	18.7	17.3	18.5	13.6	15.0	10.1	8.2	6.6	3.0	4.5	2.8	7.4	11.2	9.4	5.6	9.6	4.8	2.7	2.3	3.4	2.3	24.9	11.0	24	
21	2.1	3.9	3.4	7.3	7.7	11.0	11.3	13.7	12.8	14.7	14.7	12.6	13.4	14.4	16.3	16.0	13.8	7.9	8.7	4.8	2.6	5.7	5.8	4.5	2.1	16.3	9.6	24	
22	7.7	6.1	3.8	5.1	4.5	4.9	4.5	4.5	3.4	3.8	3.3	2.4	2.3	4.8	3.2	3.9	3.1	5.6	3.0	4.5	5.0	7.4	13.8	14.9	2.3	14.9	5.2	24	
23	22.7	30.8	29.0	22.6	22.1	15.4	24.9	25.2	20.6	19.6	15.7	21.4	22.8	20.3	15.1	14.9	8.2	6.9	8.5	9.1	11.7	13.2	10.4	8.3	6.9	30.8	17.5	24	
24	9.6	7.9	5.9	10.7	5.4	5.3	2.8	7.7	6.1	8.4	9.9	5.6	13.6	19.3	18.7	18.3	13.5	7.5	10.9	6.0	7.2	4.4	5.5	3.5	2.8	19.3	8.9	24	
25	4.5	2.9	5.8	6.1	4.7	7.2	6.1	3.9	3.7	2.6	3.6	5.5	7.0	11.3	13.1	7.9	5.9	2.5	4.7	3.9	4.9	5.5	7.1	5.6	2.5	13.1	5.7	24	
26	6.5	5.8	4.5	6.0	3.2	3.3	3.6	2.5	1.2	3.6	2.0	5.7	10.5	10.7	10.7	13.9	14.6	11.9	19.1	19.3	13.8	16.0	13.3	14.6	1.2	19.3	9.0	24	
27	19.8	24.7	38.5	48.1	39.4	37.5	29.3	33.5	38.5	39.0	37.6	32.2	35.5	33.8	38.5	43.1	41.0	43.1	38.4	34.5	36.8	34.0	29.8	24.6	19.8	48.1	35.5	24	
28	18.4	14.0	15.4	13.7	12.5	11.0	10.2	7.5	14.7	17.5	16.8	20.2	22.0	22.3	17.7	17.3	16.4	12.2	13.8	14.4	9.1	7.6	6.8	5.8	5.8	22.3	14.1	24	
29	5.8	4.7	1.0	1.7	2.9	7.0	4.6	5.4	6.2	9.3	13.7	16.1	13.3	13.6	12.7	14.3	14.9	13.3	13.9	11.1	16.7	18.0	17.3	17.5	1.0	18.0	10.6	24	
30	16.2	15.2	16.4	14.9	15.8	13.8	13.9	18.3	19.5	16.5	19.1	18.9	18.9	16.8	16.7	17.9	15.2	14.7	14.2	14.1	10.7	5.8	3.8	2.4	2.4	19.5	14.6	24	
31	3.5	6.0	4.3	5.2	3.3	7.6	5.7	6.5	7.1	3.7	7.1	10.2	10.7	9.7	6.6	7.2	6.4	10.2	22.6	21.8	22.8	23.8	23.5	27.4	3.3	27.4	10.9	24	
HOURLY MAX	29.3	35.4	38.5	48.1	39.4	37.5	29.3	33.5	38.5	39.0	37.6	36.5	36.6	35.6	38.5	43.1	41.0	43.1	38.4	35.7	36.8	34.0	30.0	30.5					

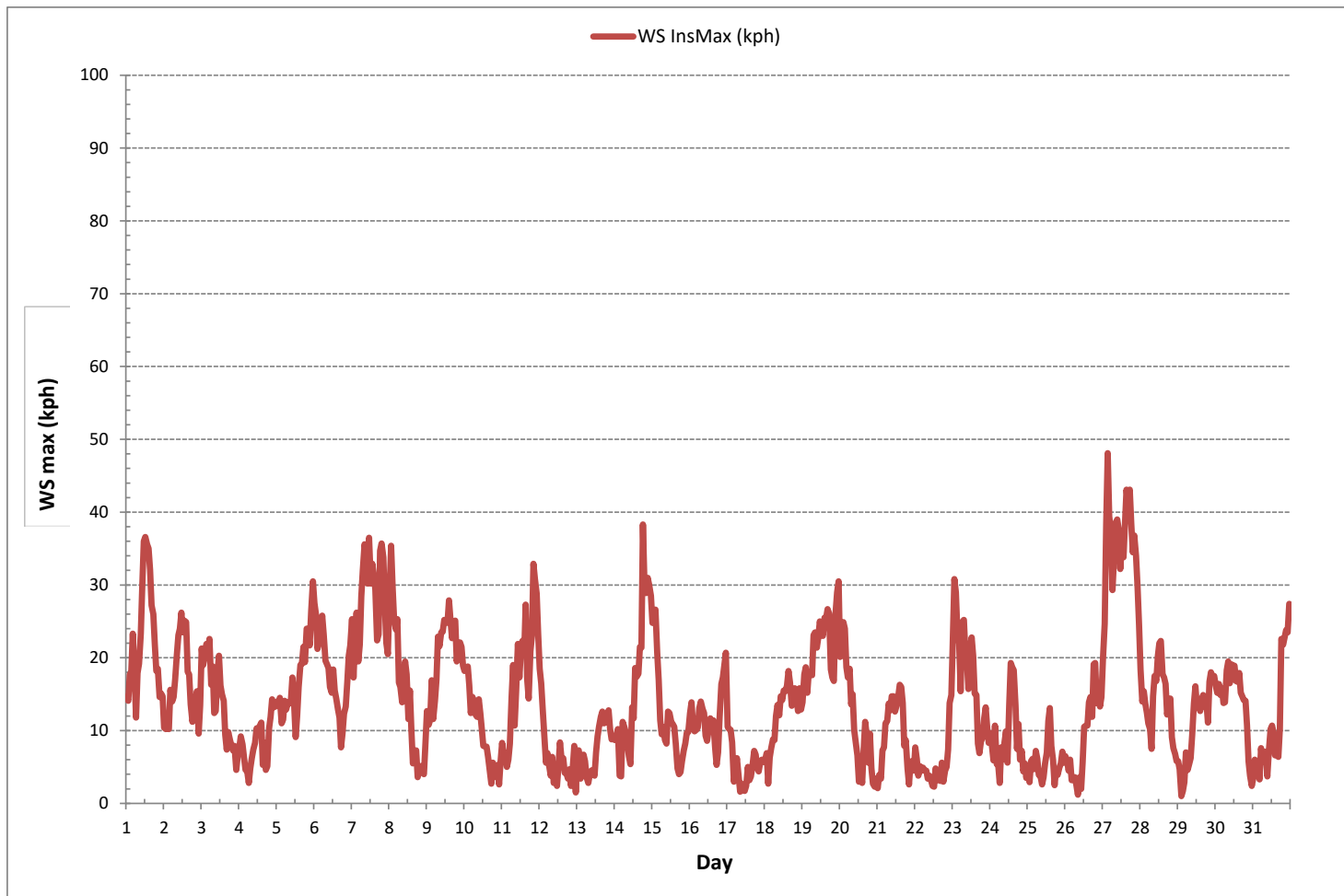
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	48.1	kph	@ HOUR	3	ON DAY	27
OPERATIONAL TIME:					744	hrs

WIND SPEED Instantaneous Maximum (WS kph)





## 1.0 Quality Control Activities

Quality control procedures are established to govern the performance of the monitoring equipment and to protect operational uptime. Data collected during QC/QA activities are assigned a data validation code to comply with the requirements outlined in Chapter 6, 4.1.1, DQ 4-A (AMD, 2016). Calibrations are deemed successful only if the AMD calibration acceptance limits are met (Chapter 7, 9.0, AMD 2016).

A daily zero-span test procedure is performed for each gaseous parameter by challenging the analyzer with a zero-air source and span gas. Daily review of the data ensures the zero and span check are within the required acceptance limits and do not deviate more than  $\pm 10\%$  from the expected value. The total zero-span cycle is complete within an hour with the zero phase commencing at the beginning of the scheduled hour. This QC activity is conducted in accordance with Chapter 7, 4.0, Cal 4-A (AMD, 2016).

The allowable time for a zero-span check is one hour per calendar day. The time allotted for the zero-span check does not contribute to downtime and is identified with a data validation code of "S". If any additional zero-span response checks are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "S1". The initiation of an additional zero-span check may be warranted during the investigation of operational issues or suspect data.

Each month, a scheduled multipoint calibration is performed on each gas analyzer. Prior to any adjustments, an as-found response test is completed to obtain the zero reading of the analyzer and the response to the highest span concentration. The zero and high point test gases are then re-introduced into the analyzer to establish the zero and high set-points. Once these adjustments are satisfactory, a mid-point and a low-point test concentration is introduced. Additional multi-point calibrations are required if any of the conditions, outlined in Chapter 7, 2.1, Cal 2G (AMD, 2016) exist.

The time allotted for the first multi-point calibration is not considered downtime and is identified with a data validation code of "C". If any additional as-found response checks or multipoint calibrations are performed, the time accrued during the QC activity is considered downtime and is identified with a data validation code of "C1".

A mechanical wind system undergoes annual calibration, as a minimum, while an ultrasonic wind system is factory calibrated every two years (Chapter 6, 6.0, Cal 6-A, AMD 2016). Supplementary to this, a visual inspection of the equipment is performed during each scheduled monthly site visit.

The time allotted for the wind system calibration is not considered downtime and is identified with a data validation code of "C". If function checks or additional calibrations are performed, the time accrued during the QC activity is not considered downtime and is identified with a data validation code of "Q" and "C", respectively. If QC activity goes beyond 10% of the monthly operating time, the time exceeding 10% is considered downtime and is assigned a data validation code of "C1". Data identified with a data validation code of "Q" is in accordance with Chapter 6, 4.1.3 (AMD, 2016) which states QA/QC activities are not included when calculating data completeness.

Where passive sampling is in practice, quality control samples will be deployed in accordance with Chapter 4, 3.0, 3.1.3. Method blanks, replicate samples and spiked blanks are exposed and handled in the same manner as each passive sample. To comply with the data submission requirements in Chapter 9, 3.1, the replicate and corresponding passive sample concentrations are reportable data values and have not been averaged.

As recommended in Chapter 6, 4.2 (AMD 2016), daily data review is conducted to verify data and avoid significant data losses. Automated flags, originating from the data-logger, and data anomalies are reviewed and may prompt the need to dispatch a technician for investigation and/or corrective action. Additionally, there are several automated alarm scenarios that serve to screen raw data, alert technicians and elicit investigation or corrective action.

Comparisons of the measured ambient concentrations to the corresponding AAAQO are assessed using the significant figures protocol in Chapter 9, 3.1.2. If the measurement is near the set objective, raw data may undergo necessary data adjustments to confirm a true exceedance. Should an exceedance occur, Maxxam will formally notify the client; however, the reporting protocol to AEP is defined by the client and may not involve Maxxam. Exceedance events are acknowledged in the report, based on the information available at the time.

## 2.0 Data Verification and Validation

The data validation procedures, outlined in Chapter 6, 4.0, AMD 2016, are used to accept, reject and qualify data. The data verification and validation process, and the current Data Collection and Management Process Flow Chart have been compiled from sections 4.2 to 4.6 (AMD, 2016) and are shown below.

Baseline adjustments are applied by interpolation between two valid zero checks, as determined by the Data Acquisition System. In the event that zero check results are not reliable, data may be adjusted by applying a constant offset to data collected between two adjacent zero checks. Both adjustment approaches are deemed acceptable by the AMD.

Table 1 (Chapter 6) outlines the quantitative parameter relationships to be considered and dictates that data adjustments are applied equally for NO/NO<sub>2</sub>/NO<sub>x</sub> and CH<sub>4</sub>/NMHC/THC parameters. Below zero adjustments are applied to 1-hour averages, in accordance with Table 2 (Chapter 6), and are done after baseline corrections.

Instantaneous data, where provided, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

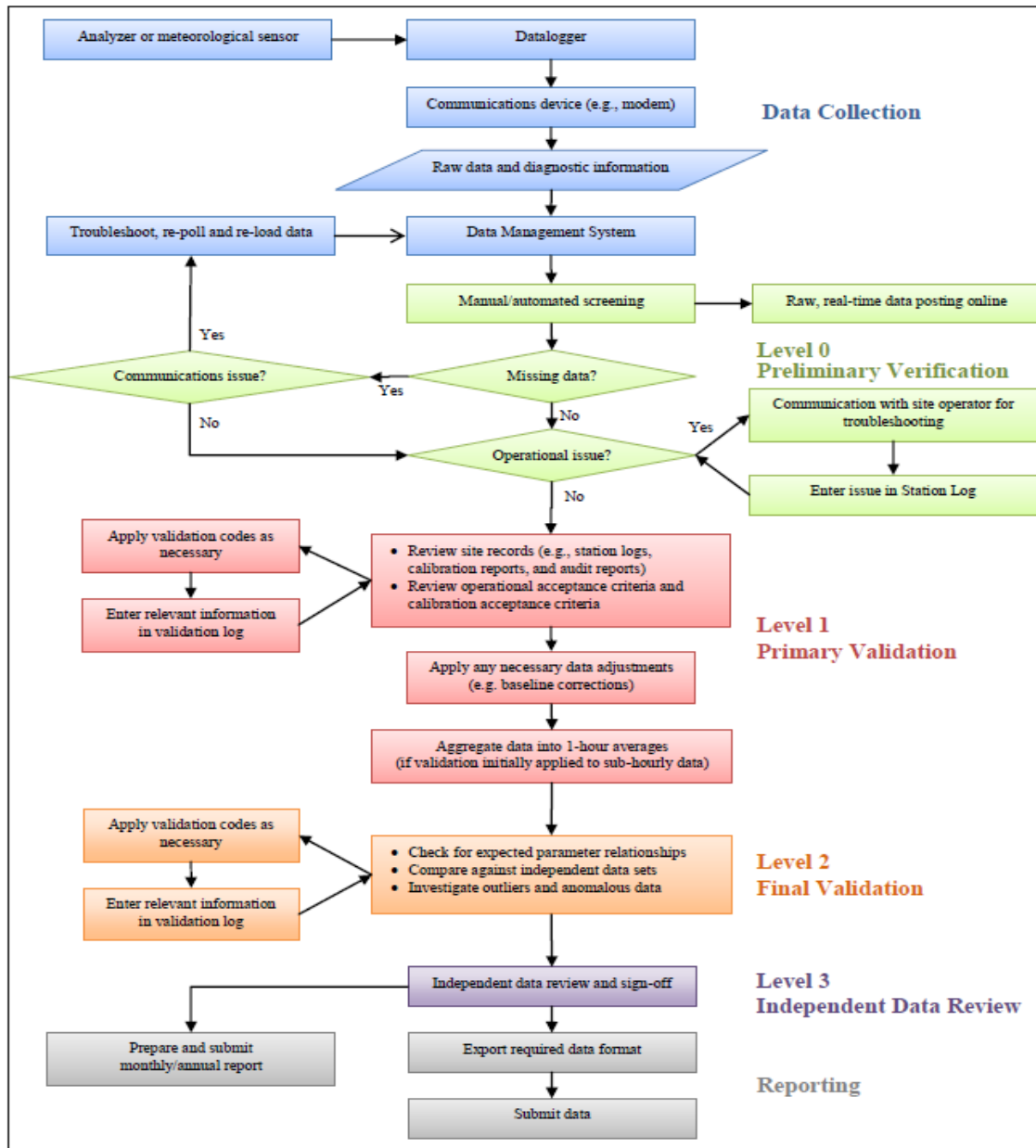
All calculations and reporting of results follow the methods described in the AMD, 2016.

There were no deviations from the prescribed methods.

**AMD Data Verification and Validation Process**

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

<p><b>Level 0 Preliminary Verification</b></p>	<p>Level 0 data are raw data obtained directly from the data acquisition system (DAS). At this level, data undergoes a certain amount of manual or automated screening and flagging. Screening checks include: a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/data-logger 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.</p>
<p><b>Level 1 Primary Validation</b></p>	<p>Primary validation involves more thorough evaluation and documentation of issues identified during data screening, along with appropriate application of data validation codes. Level 1 activities 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.</p>
<p><b>Level 2 Final Validation</b></p>	<p>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. At this level of review, some general knowledge of pollutant and meteorological behavior can be used to determine if data is suspect.</p>
<p><b>Level 3 Independent Data Review</b></p>	<p>Level 3 validation involves a final cursory review of validated data, and is completed by an individual independent of both field operations and primary data validation. At this level, a final independent QA review/endorsement is performed before data is submitted to Alberta Environment and Parks.</p>
<p><b>Post-Final Validation</b></p>	<p>The Post-Final Validation step serves to re-evaluate validated data for errors or omissions discovered and/or suspected after the initial monthly data submittal. This level of validation is performed on an annual basis, when annual reporting is required or requested.</p>



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



### Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2019-01-39-C</u>
<b>Site:</b> <u>Bonnyville East Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u><i>bimadeniji</i></u>	Date <u>22- Feb- 2019</u>
Level 1 Primary Validation	<u><i>bimadeniji</i></u>	Date <u>22- Feb- 2019</u>
Level 2 Final Validation	<u><i>bimadeniji</i></u>	Date <u>25- Feb- 2019</u>
Level 3 Independent Data Review	<u><i>msalmbg</i></u>	Date <u>27- Feb- 2019</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

<b>Notes</b>
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.

**This page is intentionally blank and marks the conclusion of this report**



**Lakeland Industry & Community Association**

**JANUARY 2019**

**Ambient Air Monitoring Calibration Report**

**- COLD LAKE SOUTH STATION-**

**CAL-LICA-201901-01174**

**Station Operation and Maintenance:**

Maxxam Analytics

**Data Validation and Report:**

Maxxam Analytics

March 15, 2019

Alberta Environment and Parks (AEP)  
[Air.Reporting@gov.ab.ca](mailto:Air.Reporting@gov.ab.ca)

March 15, 2019

**Subject:**

**January 2019 Ambient Air Monitoring Calibration Report Submission for the LICA Cold Lake South Station**

---

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring calibration report for the LICA Cold Lake South AQM Station in the month of January 2019. This calibration report includes equipment calibration records, calibrator performance audit records and calibration gas audit records for the equipment that were used this month. This calibration report is prepared by the LICA network contractor.

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

Respectfully,




Michael Bisaga  
Technical Program Manager  
Lakeland Industry & Community Association  
780-266-7068  
[monitoring@lica.ca](mailto:monitoring@lica.ca)



Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[monitoring@lica.ca](mailto:monitoring@lica.ca)





**JANUARY 1 - 31, 2019**  
**MONTHLY CALIBRATION REPORT**  
**Project #: 2833-2019-01-23-C**  
**LICA-201901**

**Prepared for:**

**Lakeland Industry & Community Association**

**Mike Bisaga**

5107 50 St.

Bonnyville, Alberta T9N 2J7

monitoring@lica.ca

780-266-7068

**Monitoring Station**

**Cold Lake South Continuous Monitoring  
Station**

**Date of Report Issuance: February 27, 2019**



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

CAL-LICA-201901-01174



### Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

Date:	January 8, 2019	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	959	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	21	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:16	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:03	Cal Gas Expiry Date:	October 24, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	11800260018   LICA	Range ppb:	500		
Last Calibration Date:	December 28, 2018	As Found C.F.:	1.000		
Previous C.F.:	1.000	New C.F.:	1.000		

Calibration Standards:	Standard Calibration Points for Ranges
Low Flow Meter ID/Expiry Date:	N/A
High Flow Meter ID/Expiry Date:	N/A
Calibrator ID/Expiry Date:	API id# 690 expires March 15, 2019
Cal Gas Cylinder I.D. #:	LL 104225
Cal Gas Conc. (ppm):	49.2

Point	ppb
High	380
Mid	180
Low	90

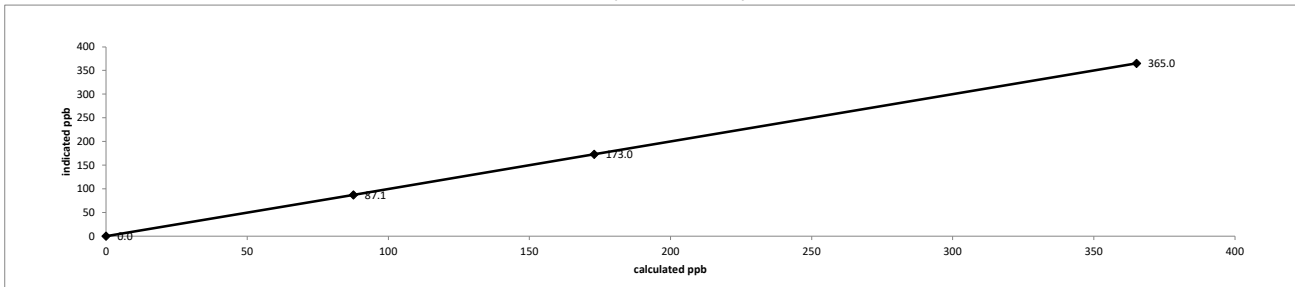
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	4895	0.00	4895	0.0	0	n/a
as found high	4940	36.94	4977	365.2	365	1.000
adjusted zero	4895	0.00	4895	0.0	0	n/a
adjusted high	4940	36.94	4977	365.2	365	1.000
mid	4927	17.38	4944	173.0	173	1.000
low	4941	8.82	4950	87.7	87.1	1.006
calibrator zero	4895	0.00	4895	0.0	0	n/a
Average C.F. =						1.002

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale) =	0.04%		± 3% F.S.
% change in C.F. from last cal =	-0.05%		± 10%

Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

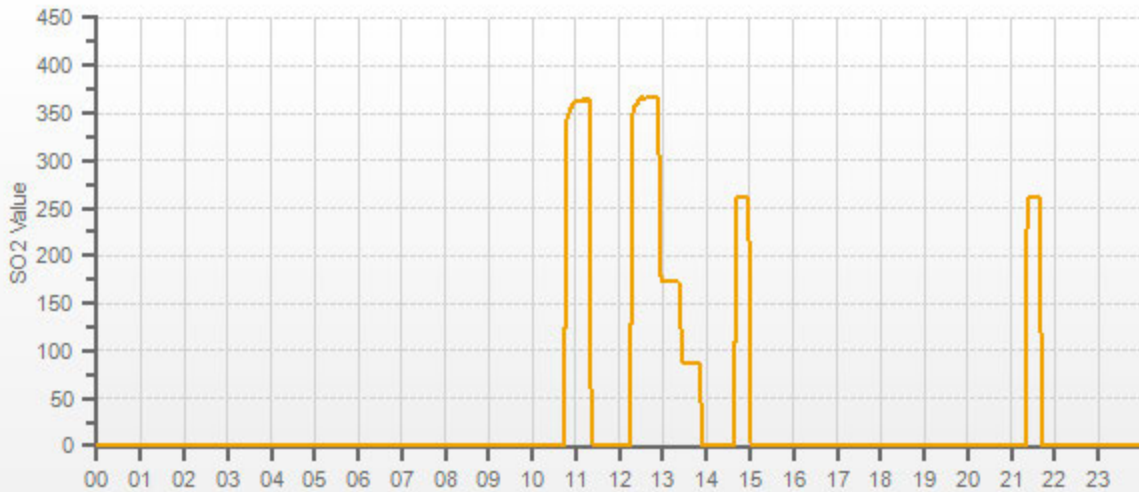


As found:		As left:	
Bkg:	1.75	Bkg:	1.76
Coef:	1.018	Coef:	1.020
Pmt:	-690.8	Pmt:	-690.4
Flash:	1027	Flash:	1026
Internal:	32.6	Internal:	32.6
Chamber:	45.3	Chamber:	44.8
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Heater:	44.28	Perm Oven Heater:	44.28
Pressure:	695.9	Pressure:	696.2
Sample Flow:	0.457	Sample Flow:	0.458
Lamp Intensity:	91	Lamp Intensity:	91
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	274.0	Expected Value:	260.0

Comments:

The analyzer sample inlet filter was changed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

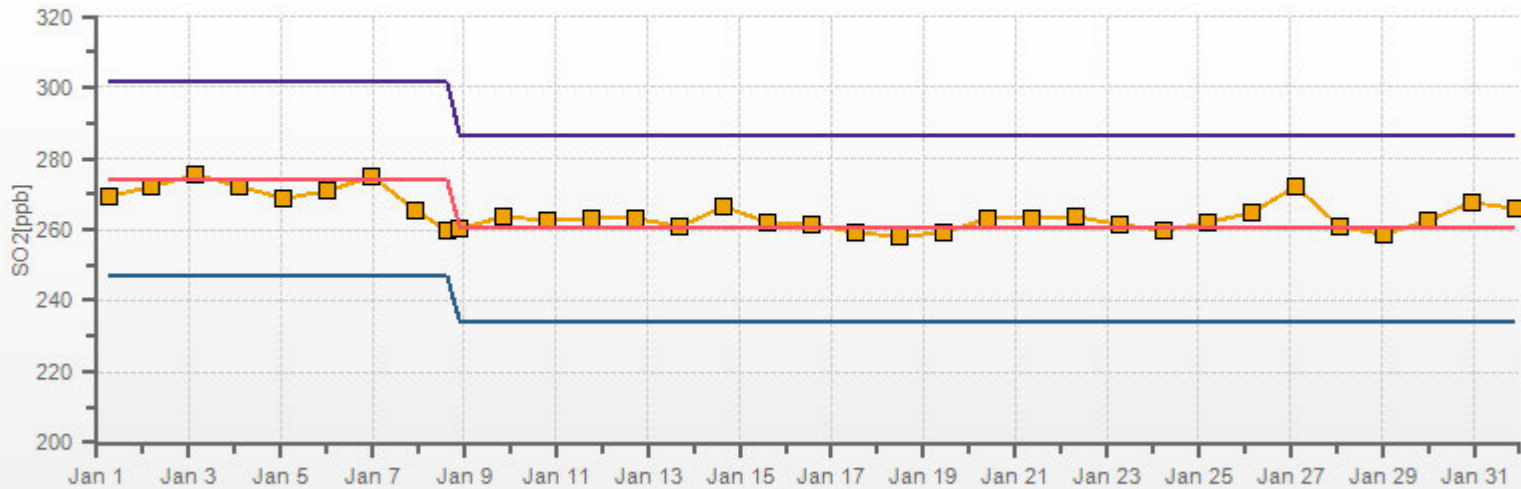
SO2[ppb]



CAL-LICA-2019-01-01-174

SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 19/01 Type: Span

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



CAL-LICA-2019-01-0174



### Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	January 8, 2019	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	959	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	21	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny		
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:16	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:03	Cal Gas Expiry Date:	October 20, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	CDNOVA / Model CDN 101 / #501		
Analyzer:					
Serial Number/Owner:	812728560   LICA	Range ppb:	100		
Last Calibration Date:	December 13, 2018	As Found C.F.:	0.994		
Previous C.F.:	0.999	New C.F.:	1.000		

Calibration Standards:	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):
Low Flow Meter ID/Expiry Date:	N/A	Start/End Time 24 hr.:
High Flow Meter ID/Expiry Date:	N/A	SO2 Analyzer Range:
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019	Target Concentration (ppb):
Cal Gas Cylinder I.D. #:	EY 0001003	As Found Zero:
Cal Gas Conc. (ppm):	9.55	Analyzer Response: (ppb):
		Zero Corrected Result (ppb):

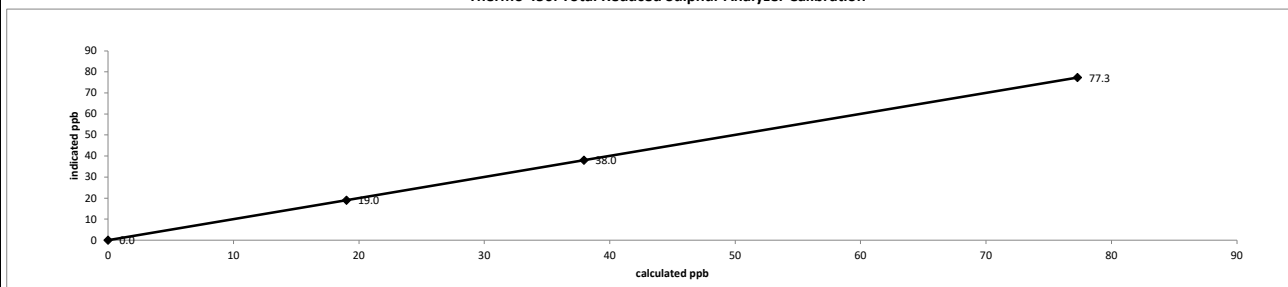
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7500	0.00	7500	0.0	0	n/a
as found high	7479	61.03	7540	77.3	77.8	0.994
adjusted zero	7500	0.00	7500	0.0	0	n/a
adjusted high	7479	61.03	7540	77.3	77.3	1.000
mid	7420	29.60	7450	37.9	38	0.999
low	7420	14.80	7435	19.0	19	1.001
calibrator zero	7500	0.00	7500	0.0	0	n/a
Average C.F. =						1.000

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale) =	-0.01%		± 3% F.S.
% change in C.F. from last cal =	0.54%		± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration

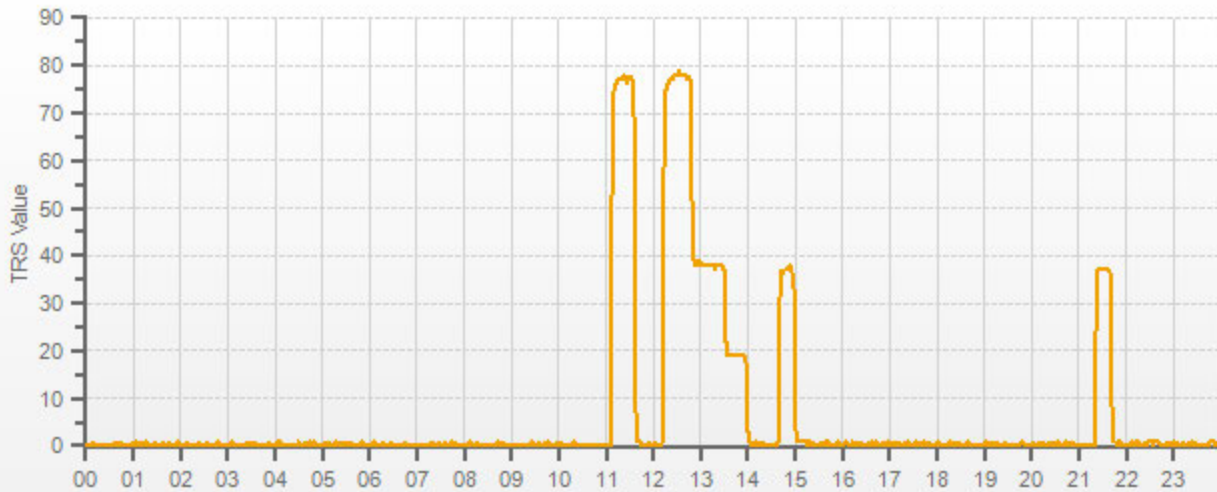


As found:		As left:	
Bkg:	14.9	Bkg:	15.0
Coef:	0.899	Coef:	0.906
Pmt:	-650.5	Pmt:	-650.8
Flash:	743	Flash:	745
Internal:	34.1	Internal:	34.0
Chamber:	45.2	Chamber:	45.1
Converter Temp:	825	Converter Temp:	825
Converter Set:	825	Converter Set:	825
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Htr:	44.36	Perm Oven Htr:	44.37
Pressure:	641.6	Pressure:	647.0
Sample Flow:	0.495	Sample Flow:	0.495
Lamp Intensity:	91	Lamp Intensity:	91
Averaging Time:	120	Averaging Time:	120
Expected Value:	38.9	Expected Value:	37.0

Comments:

The analyzer sample inlet filter was changed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

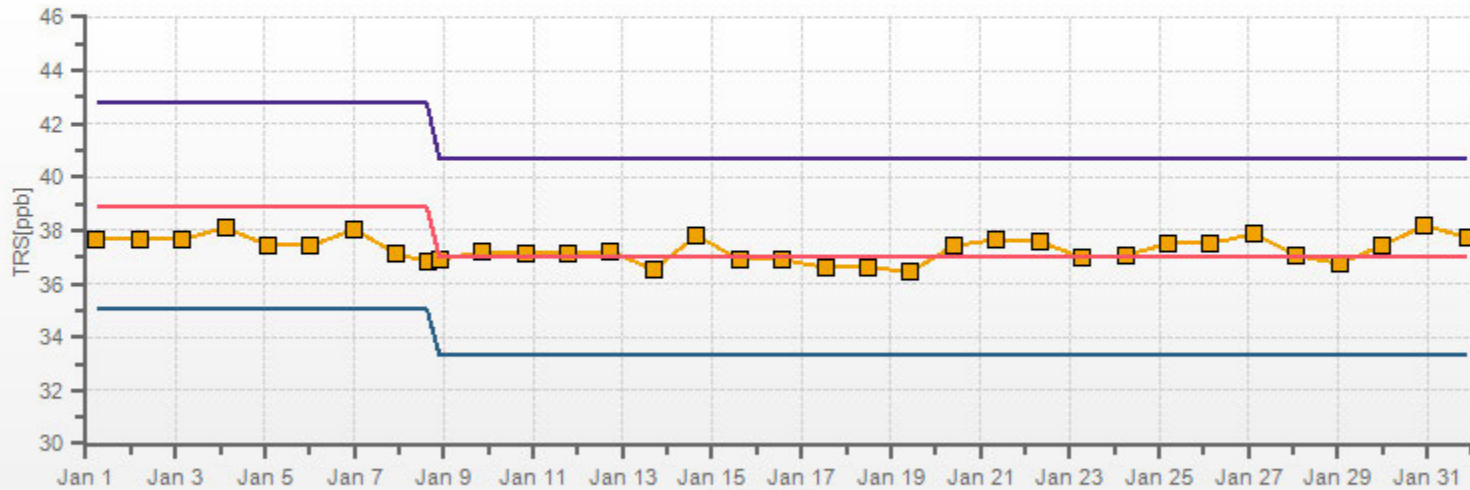
— TRS[ppb]



CAL-LICA-201901-01174

TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 19/01 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201901-01174



### Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	January 9, 2019	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	955	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	21	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Cloudy/Overcast		
Parameter:	CH4 / NMHC / THC	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	9:53 / 13:47	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	October 18, 2025		

Analyzer:		Correction Factors:			
Serial Number/Owner:	1180030034   LICA	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1.116	CH <sub>4</sub> =	1.000	0.998	1.000
Last Calibration Date:	December 28, 2018	NMHC =	1.000	1.001	1.000
Range ppm:	20 CH4/20 NMHC/40 THC	THC =	1.000	0.999	1.000

Calibration Standards:		Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
Low Flow Meter ID/Expiry Date:	N/A	Point	CH4	NMHC	THC
High Flow Meter ID/Expiry Date:	N/A	High	13.00	13.00	26.00
Calibrator ID/Expiry Date:	API id# 690 expires March 15, 2019	Mid	7.00	7.00	14.00
Cal Gas Cylinder I.D. #:	LL 19471	Low	3.00	3.00	6.00
CH4 Cylinder Conc.:	599.0   207.0 = C <sub>2</sub> H <sub>6</sub> Cylinder Conc.				
CH <sub>4</sub> expressed as C <sub>2</sub> H <sub>6</sub> =	569.3   1168.3 = total CH4 equivalent				

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

Point	Calibrator Flow Rates (cc/min)			Calculated CH <sub>4</sub> (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH <sub>4</sub> (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH <sub>4</sub>	NMHC	THC
as found zero	2500	0.00	2500	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2468	56.03	2524	13.30	12.64	25.93	13.32	12.63	25.95	0.998	1.001	0.999
adjusted zero	2500	0.00	2500	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2468	56.03	2524	13.30	12.64	25.93	13.30	12.64	25.94	1.000	1.000	1.000
mid	2469	31.00	2500	7.43	7.06	14.49	7.44	7.01	14.46	0.998	1.007	1.002
low	2486	14.00	2500	3.35	3.19	6.54	3.38	3.12	6.51	0.992	1.022	1.005
calibrator zero	2500	0.00	2500	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
Average C.F. =										0.997	1.009	1.002

**Linear Regression/Calibration Results:**

	CH <sub>4</sub>	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	1.001	1.000	0.95-1.05
b (Intercept as % of full scale) =	0.06%	-0.18%	-0.05%	± 3% F.S.
% change in C.F. from last cal =	0.17%	-0.05%	0.06%	± 10%

**As Left Instrument Diagnostics:**

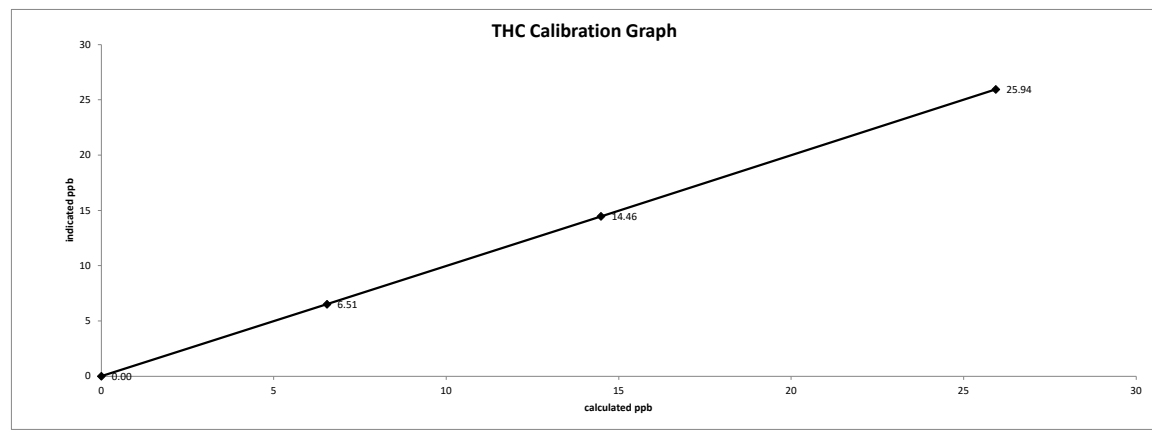
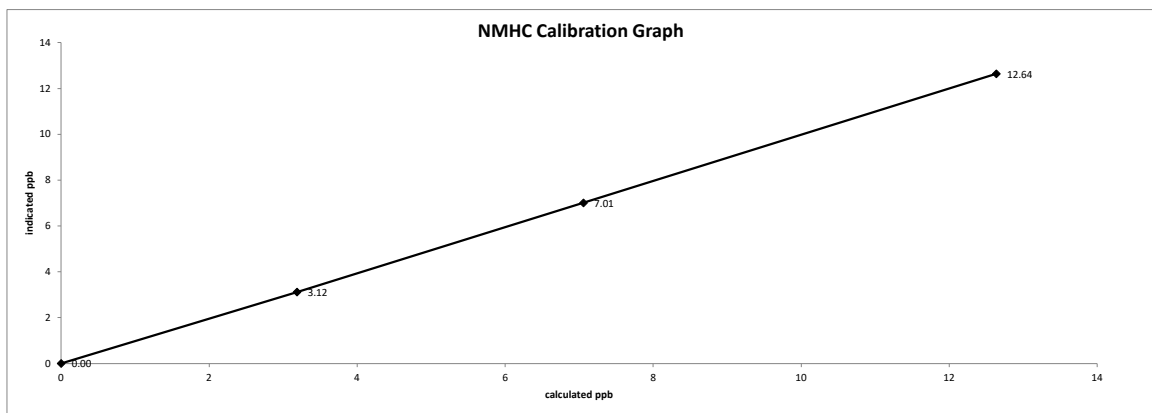
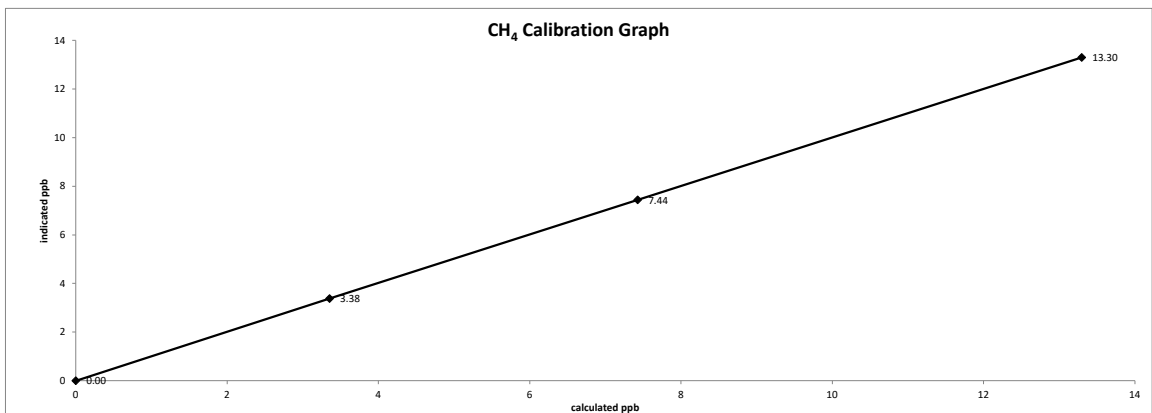
Interface Board Voltages:	Bias Supply: -303.3	Calibration History cnt'd:	NM Peak Area: 72259
Temperatures:	Detector Oven: 175.0	Crucial Settings:	Methane Start: n/a
	Filter: 175.0		Methane End: n/a
	Column Oven: 75.0		Backflush: n/a
	Internal: 36.5		NMHV Start: n/a
Cylinder Pressures/reg.:	Carrier: 2200   50	Run History>1:	NMHC End: n/a
	Fuel: 1700   50		Date: Jan 09, 2019
	Span Gas: 1500   10		Time: 10:04
	Zero Air Generator: 42		CH <sub>4</sub> PK HT: 0
Internal Pressures:	Carrier: 26.8		CH <sub>4</sub> RT: 8.0
	Fuel: 32.5		CH <sub>4</sub> Baseline: 54
	Air: 24.6		CH <sub>4</sub> LOD: 6
FID Status:	Status: LIT		CH <sub>4</sub> SD: 2
	Counts: 11091		CH <sub>4</sub> CONC: 0.00
	Flame: 338.2		NM PK HT: 4
	Det Base: 175.0		NM Peak Area: 0
Flame and Power Stats:	Last Power On: Dec 27, 2018		NM CONC: 0.00
	Flameouts: 1		NM Base Start: 51
	Det Oven at Start: 19.4		NM Base End: 16
	Col Oven at Start: 18.3		NM LOD: 11
Calibration History:	Time: Dec 28, 2018 / 10:30		NM Start IDX: 67
	Type: SPAN		NM End IDX: 92
	Status: GOOD		NM Max Slope: 3.5e-01
	Check/Adjust: ADJUST		NM Min Slope: -1.4e+00
	CH <sub>4</sub> Span Conc: 13.25		NM PT Count: 0
	CH <sub>4</sub> SP Ratio: 0.000713	Expected Values:	Previous CH <sub>4</sub> : 10.14
	CH <sub>4</sub> RT: 13.6		Previous NMHC: 11.2
	CH <sub>4</sub> PK IDX: 28		Previous THC: 21.34
	CH <sub>4</sub> PK HT: 18592		New CH <sub>4</sub> : 10.19
	NM Span Conc: 12.60		New NMHC: 11.36
	NM SP Ratio: 0.000174		New THC: 21.55

**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.  
 The manifold blower was found to be working normally.

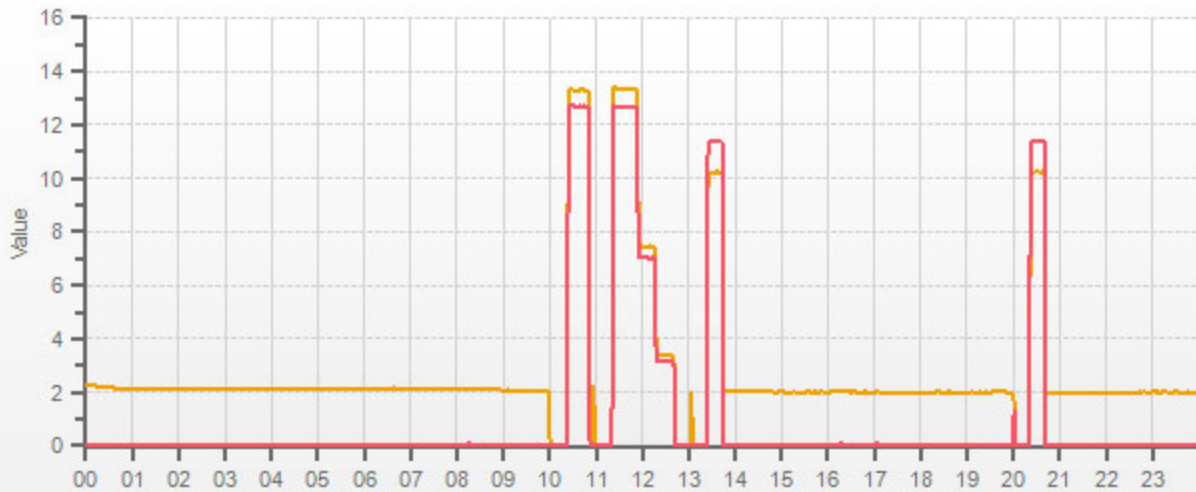


Date: January 9, 2019  
Company/Airshed: LICA  
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:53 / 13:47  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution



CH4[ppm] NMHC[ppm]



CAL-LICA-201901-01174



### Thermo 55i Methane/Non-Methane Analyzer Calibration

<b>Date:</b> January 25, 2019	<b>Barometer/B.P./units:</b> F.S. #05544, expires Jan 17, 2020    946    millibars
<b>Company/Airshed:</b> LICA	<b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019    22    °C
<b>Location/Station Name:</b> Cold Lake South	<b>Weather Conditions:</b> Mix of sun and clouds
<b>Parameter:</b> CH4 / NMHC / THC	<b>Calibration Purpose:</b> installation
<b>Start/End Time 24 hr. (mst):</b> 13:22 / 16:27	<b>Performed By/Reviewer:</b> Alex Yakupov    Rob Fisher
<b>Calibration Method:</b> Gas Dilution	<b>Cal Gas Expiry Date:</b>

<b>Analyzer:</b>		<b>Correction Factors:</b>		
<b>Serial Number/Owner:</b> 1180320044    LICA	<b>Measured Flow:</b> 0.946	<b>Previous C.F.:</b>	<b>As Found C.F.:</b>	<b>New C.F.:</b>
<b>Last Calibration Date:</b> n/a	<b>Range ppm:</b> 20 CH4/20 NMHC/40 THC	CH <sub>4</sub> = n/a	n/a	1.000
		NMHC = n/a	n/a	1.000
		THC = n/a	n/a	1.000

**Calibration Standards:**

Low Flow Meter ID/Expiry Date: N/A  
 High Flow Meter ID/Expiry Date: N/A  
 Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019  
 Cal Gas Cylinder I.D. #: LL 29687  
 CH<sub>4</sub> Cylinder Conc. = 598.0    198.0    =C<sub>2</sub>H<sub>6</sub> Cylinder Conc.  
 CH<sub>4</sub> expressed as C<sub>2</sub>H<sub>6</sub> = 544.5    1142.5    =total CH<sub>4</sub> equivalent

Point	CH <sub>4</sub>	NMHC	THC
High	13.00	13.00	26.00
Mid	7.00	7.00	14.00
Low	3.00	3.00	6.00

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

Calibrator Flow Rates (cc/min)							Correction Factors:					
Point	Diluent	Cal Gas	Total Flow	Calculated CH <sub>4</sub> (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH <sub>4</sub> (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	CH <sub>4</sub>	NMHC	THC
adjusted zero	2499	0.00	2499	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2433	56.42	2489	13.56	12.34	25.90	13.56	12.34	25.91	1.000	1.000	1.000
mid	2438	30.60	2469	7.41	6.75	14.16	7.32	6.69	14.02	1.012	1.009	1.010
low	2475	13.10	2488	3.15	2.87	6.02	3.18	2.96	6.15	0.990	0.969	0.978
calibrator zero	2499	0.00	2499	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
<b>Average C.F.=</b>										1.001	0.992	0.996

**Linear Regression/Calibration Results:**

	CH <sub>4</sub>	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.996	0.998	0.95-1.05
b (Intercept as % of full scale)=	-0.02%	0.15%	0.08%	± 3% F.S.
% change in C.F. from last cal=	n/a	n/a	n/a	n/a

**As Left Instrument Diagnostics:**

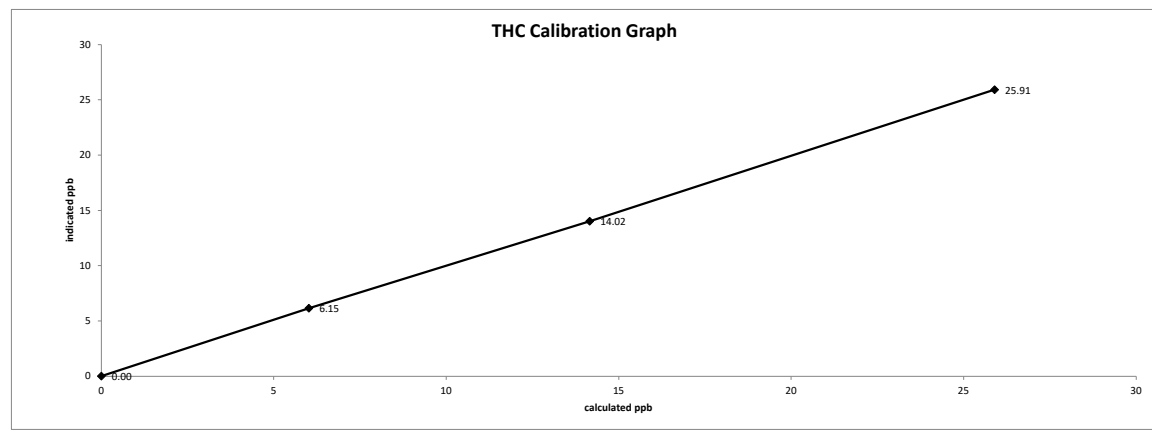
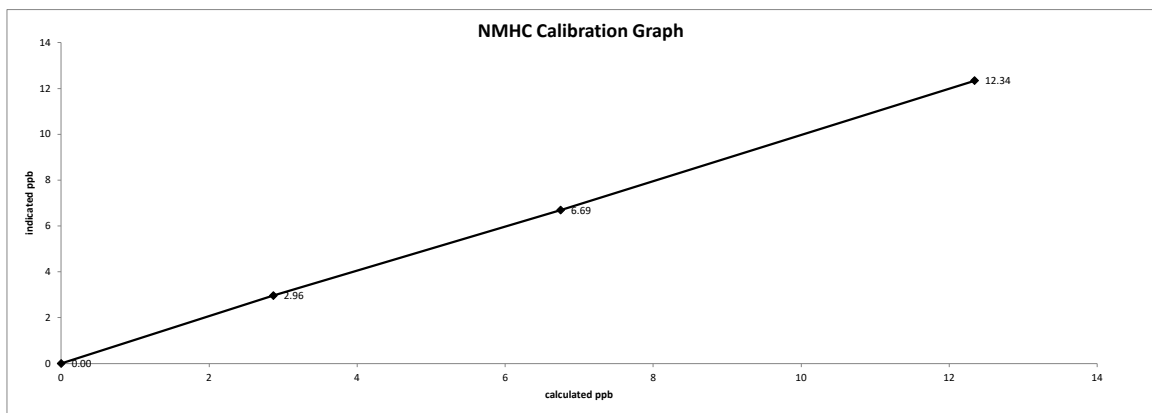
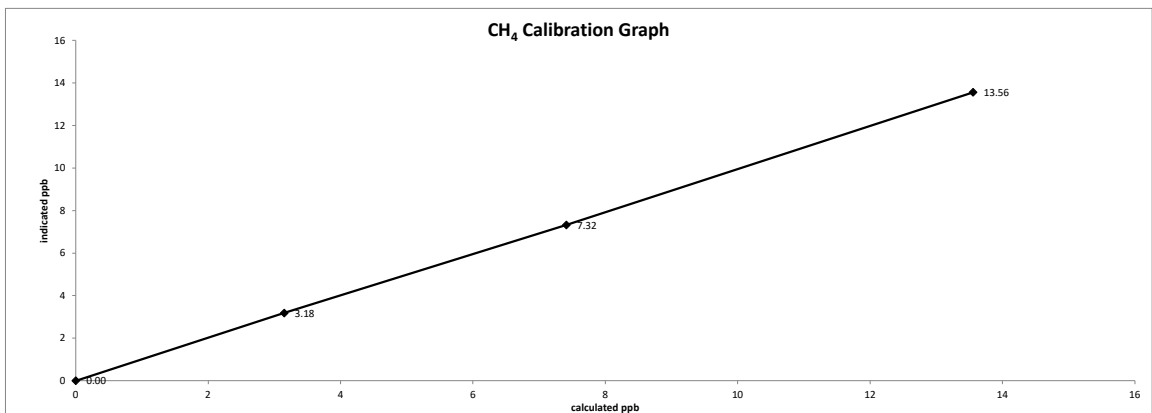
<b>Interface Board Voltages:</b> Bias Supply: -296.9 <b>Temperatures:</b> Detector Oven: 175.0 Filter: 175.0 Column Oven: 75.0 Internal: 34.2 <b>Cylinder Pressures/reg.:</b> Carrier: 1900    50 Fuel: 1100    50 Span Gas: 1200    10 Zero Air Generator: 42 <b>Internal Pressures:</b> Carrier: 29.4 Fuel: 44.2 Air: 30.2 <b>FID Status:</b> Status: LIT Counts: 35584 Flame: 340.6 Det Base: 175.0 <b>Flame and Power Stats:</b> Last Power On: Jan 25, 2019 / 12:09 Flameouts: 1 Det Oven at Start: 14.4 Col Oven at Start: 17.1 <b>Calibration History:</b> Time: n/a Type: n/a Status: n/a Check/Adjust: n/a CH <sub>4</sub> Span Conc: n/a CH <sub>4</sub> SP Ratio: n/a CH <sub>4</sub> RT: n/a CH <sub>4</sub> PK IDX: n/a CH <sub>4</sub> PK HT: n/a NM Span Conc: n/a NM SP Ratio: n/a	<b>Calibration History cnt'd:</b> NM Peak Area: n/a <b>Crucial Settings:</b> Methane Start: n/a Methane End: n/a Backflush: n/a NMHV Start: n/a NMHC End: n/a <b>Run History&gt;1:</b> Date: Jan 25, 2019 Time: 13:32 CH <sub>4</sub> PK HT: 0 CH <sub>4</sub> RT: 13.4 CH <sub>4</sub> Baseline: 1352 CH <sub>4</sub> LOD: 26 CH <sub>4</sub> SD: 12 CH <sub>4</sub> CONC: 0.00 NM PK HT: 0 NM Peak Area: 0 NM CONC: 0.00 NM Base Start: 3162 NM Base End: 3224 NM LOD: 13 NM Start IDX: 7 NM End IDX: 93 NM Max Slope: 2.7e+00 NM Min Slope: -5.8e-01 NM PT Count: 0 <b>Expected Values:</b> Previous CH <sub>4</sub> : n/a Previous NMHC: n/a Previous THC: n/a New CH <sub>4</sub> : 10.06 New NMHC: 10.70 New THC: 20.75
--	---

**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.  
 The manifold blower was found to be working normally.

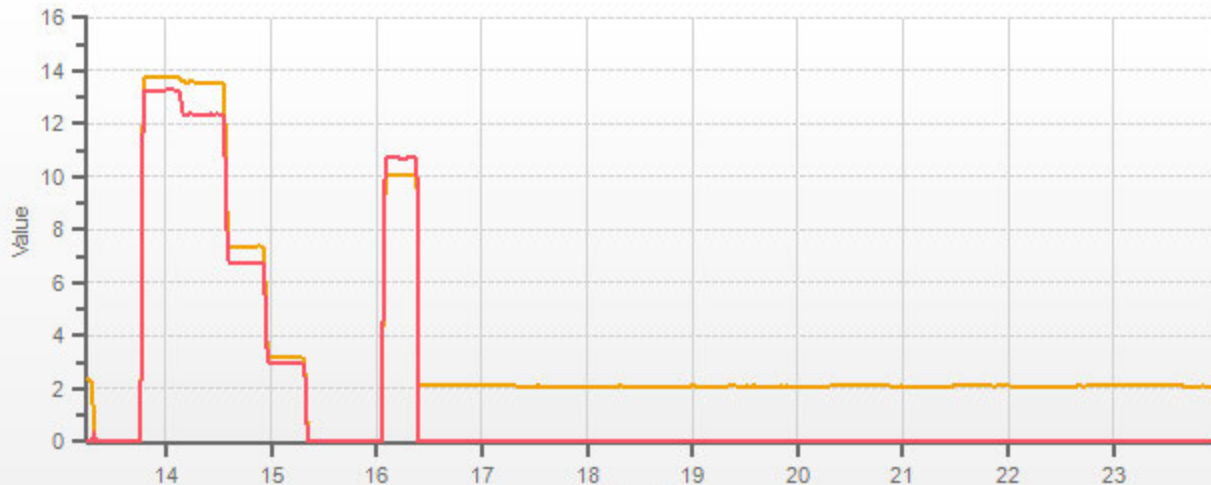
The analyzer was installed to replace the faulty AEP analyzer.

Date: January 25, 2019  
Company/Airshed: LICA  
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 13:22 / 16:27  
Calibration Purpose: installation  
Calibration Method: Gas Dilution



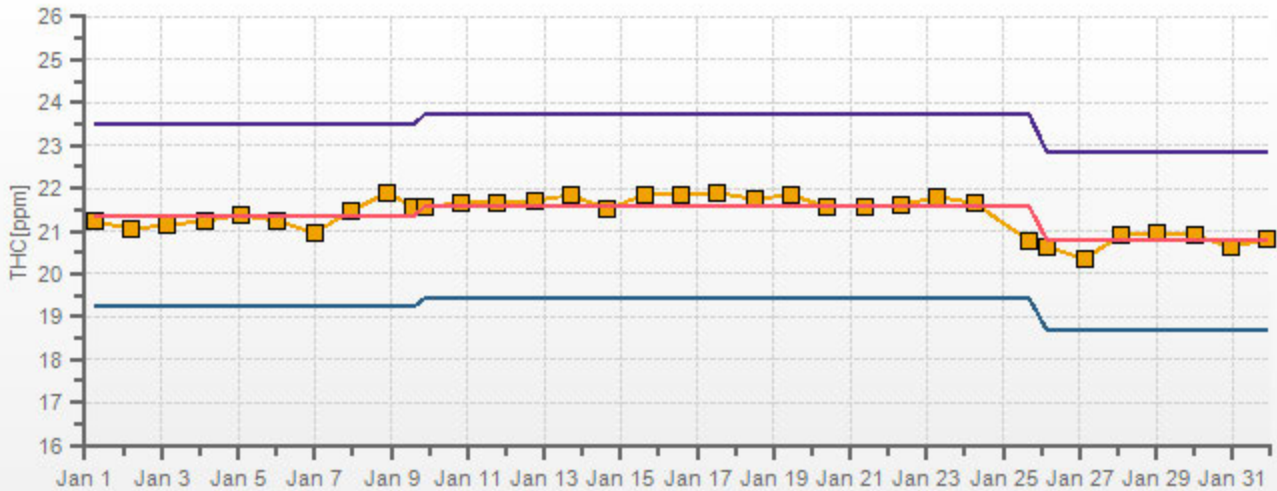
CH4[ppm] NMHC[ppm]



CAL-LICA-201901-01174

THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 19/01 Type: Span

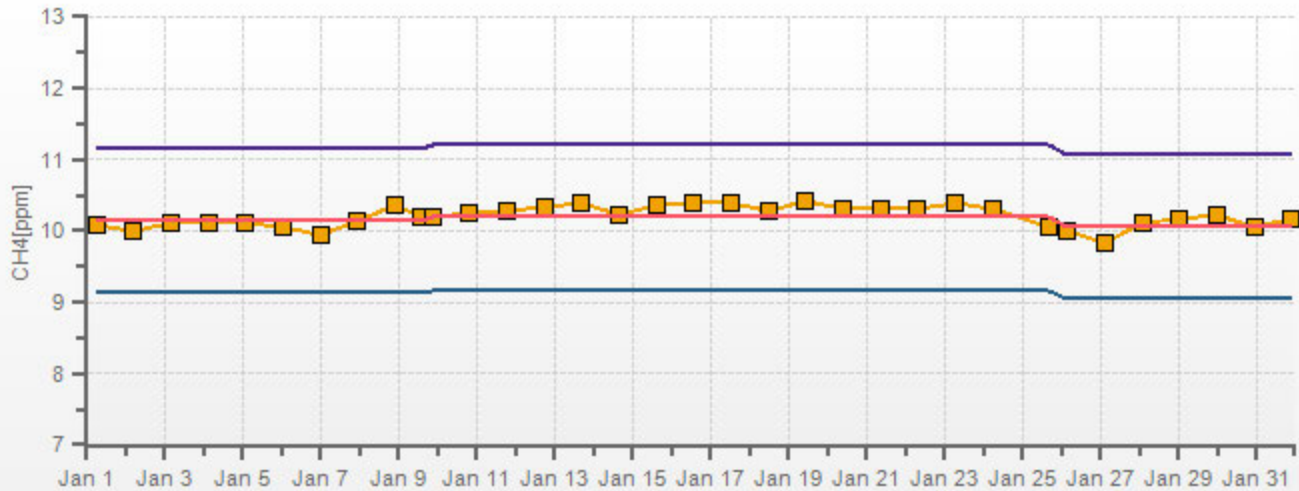
■ Span Meas 
 — Span Ref 
 — Span Low 
 — Span High



CAL-LICA-201901-01174

CH4[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 19/01 Type: Span

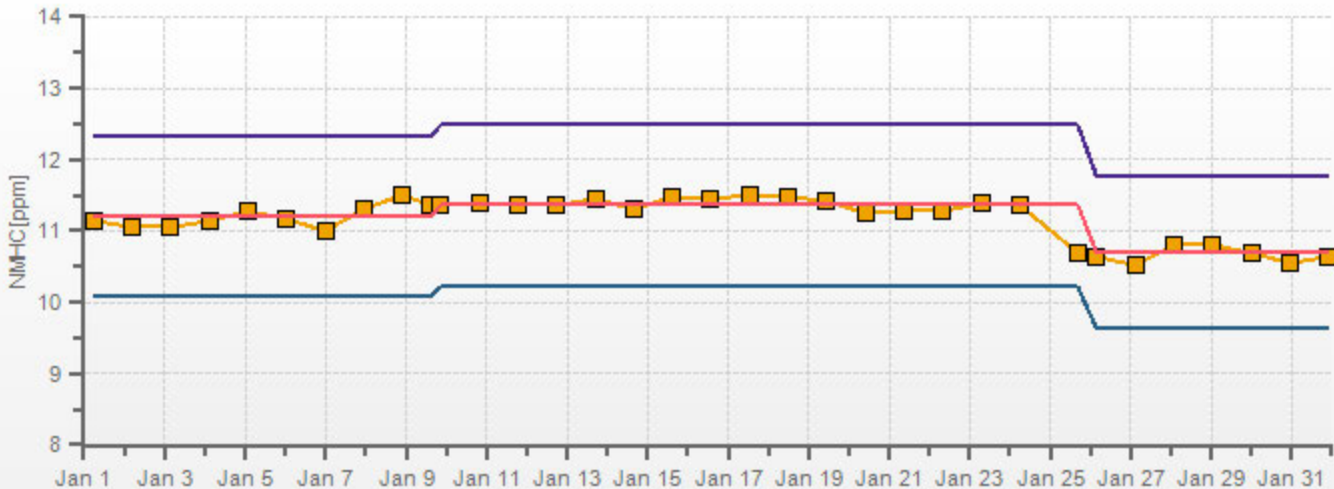
Span Meas Span Ref Span Low Span High



CAL-LICA-201901-0174

NMHC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 19/01 Type: Span

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



CAL-LICA-201901-01174





## Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: January 8, 2019	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	959	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	21	°C
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny		
Start/End Time 24 hr. (mst): 10:16 / 17:10	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone?: No	Performed By/Reviewer: Alex Yakupov	Rob Fisher	
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: October 24, 2020		

<b>Analyzer:</b> Serial Number/Owner: 1505664393   LICA Last Calibration Date: December 13, 2018 Range ppb: 500	<b>Correction Factors:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.001</td> <td>0.998</td> <td>1.001</td> </tr> <tr> <td>NO<sub>2</sub> =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>0.997</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.001	0.998	1.001	NO <sub>2</sub> =	1.000	1.000	1.000	NOx =	1.000	0.997	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.001	0.998	1.001														
NO <sub>2</sub> =	1.000	1.000	1.000														
NOx =	1.000	0.997	1.000														

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5   51.6	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Standard Calibration Points for a Range of: 500 ppb</th> </tr> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO<sub>2</sub> (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>250</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>145</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>50</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Standard Calibration Points for a Range of: 500 ppb				Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?	High	380	250	n/a	Mid	180	145	n/a	Low	90	50	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Standard Calibration Points for a Range of: 500 ppb																													
Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?																										
High	380	250	n/a																										
Mid	180	145	n/a																										
Low	90	50	n/a																										
Extra Point #1	n/a	n/a	n/a																										
Extra Point #2	n/a	n/a	n/a																										

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	4895	0.0	4895	0	0	0.0	-0.1	n/a	n/a
as found high	4940	36.9	4977	382.2	383.0	383.0	384.0	0.998	0.997
adjusted zero	4895	0.00	4895	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4940	36.94	4977	382.2	383.0	382.0	383.0	1.001	1.000
mid	4927	17.38	4944	181.0	181.4	181.0	181.0	1.000	1.002
low	4941	8.82	4950	91.8	91.9	91.0	91.0	1.008	1.010
calibrator zero	4895	0.00	4895	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.003	1.004

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4940	36.94	4977	0.0	382.0	383.0	1.0	0.0	1.0	
as found high NO2	4940	36.94	4977	255.0	132.0	383.0	251.0	250.0	250.0	1.000
adjusted high NO2	4940	36.94	4977	255.0	132.0	383.0	251.0	250.0	250.0	1.000
gpt mid	4940	36.94	4977	150.0	234.0	383.0	149.0	148.0	148.0	1.000
gpt low	4940	36.94	4977	50.0	331.0	383.0	52.0	51.0	51.0	1.000
Average NO <sub>2</sub> C.F.=										1.000

**Linear Regression/Calibration Results:**

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	0.999	1.003	0.95-1.05
b (Intercept as % of full scale)=	-0.05%	-0.09%	0.12%	± 3% F.S.
% change in C.F. from last cal=	0.30%	0.29%	0.00%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	4.3	NO Bkg:	4.3
NOx Bkg:	4.6	NOx Bkg:	4.5
NO Coef:	1.070	NO Coef:	1.058
NO2 Coef:	0.996	NO2 Coef:	0.996
NOx Coef:	0.999	NOx Coef:	1.001
PMT:	-854.7	PMT:	-854.7
Internal:	29.1	Internal:	29.0
Chamber:	50.2	Chamber:	50.3
Cooler:	-3.0	Cooler:	-3.0
NO2 Converter:	326.8	NO2 Converter:	323.2
NO2 Converter Set:	325.0	NO2 Converter Set:	325.0
Perm Oven Gas:	35.01	Perm Oven Gas:	35.00
Perm Oven Heater:	34.27	Perm Oven Heater:	34.26
Pressure:	182.9	Pressure:	184.1
Flow:	0.745	Flow:	0.745
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	2	Expected Value NO:	2
Expected Value NO2:	270	Expected Value NO2:	277
Expected Value NOx:	272	Expected Value NOx:	279

**Comments:**

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

The analyzer cooling fan filter(s) were cleaned.

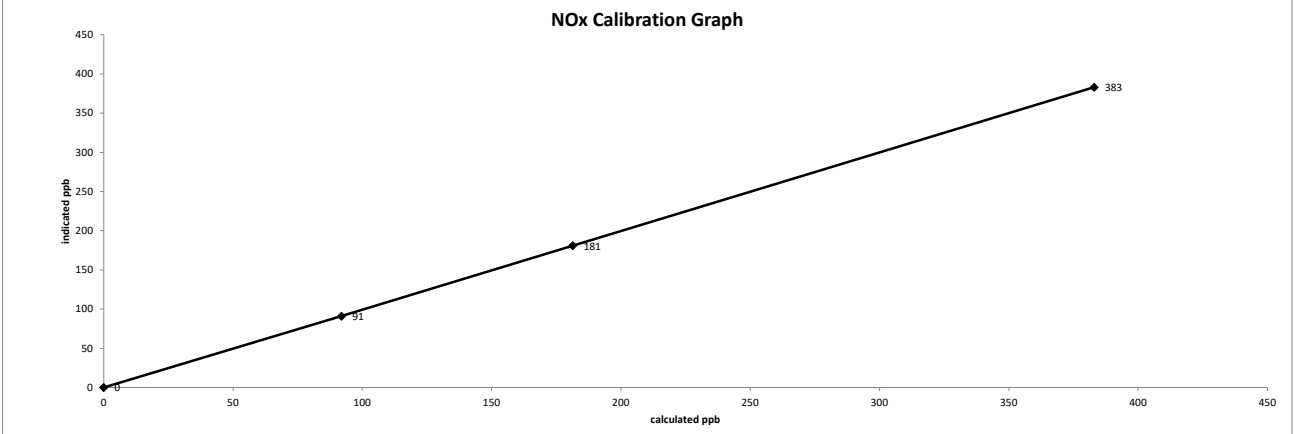
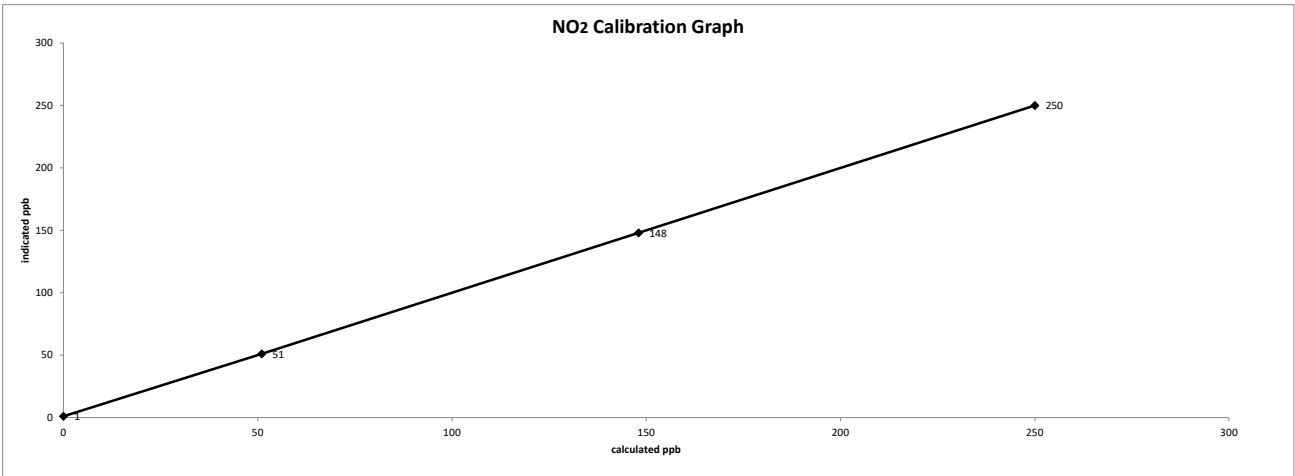
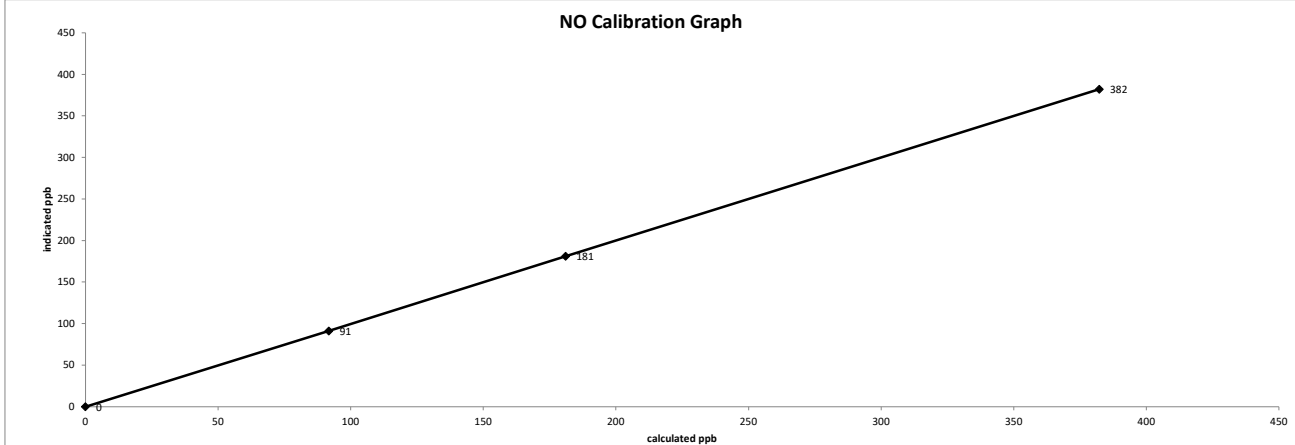
The converter cooling fan filter was cleaned.

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

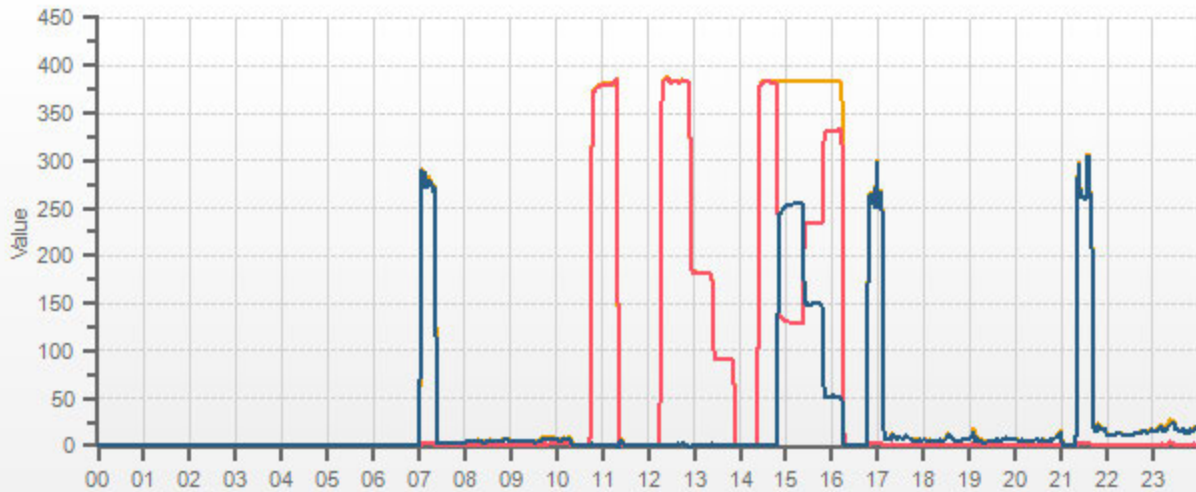
Date: January 8, 2019  
 Company/Airshed: LICA  
 Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 10:16 / 17:10  
 Calibration Purpose: routine monthly  
 Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



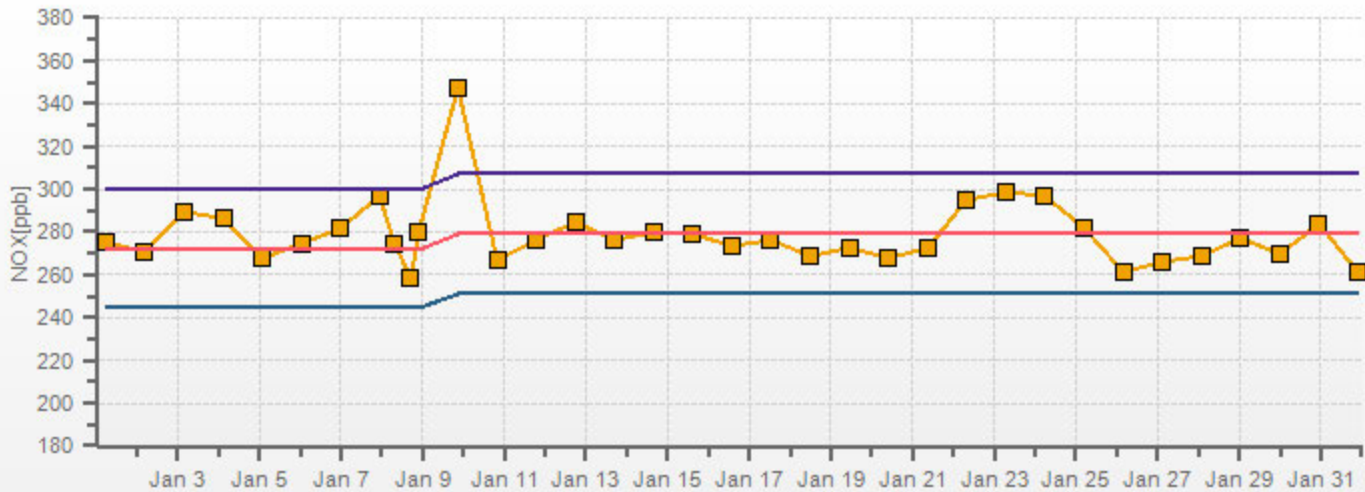
NOX[ppb] NO[ppb] NO2[ppb]



CAL-LICA-2019-01-01-174

NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 19/01 Type: Span

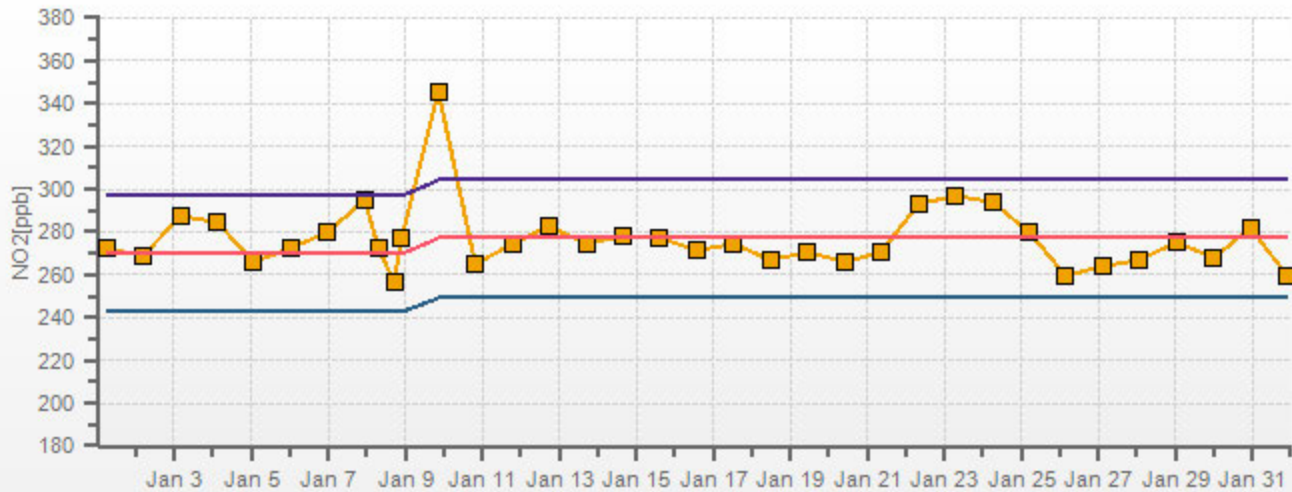
Span Meas Span Ref Span Low Span High



CAL-LICA-2019-01-01-174

NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 19/01 Type: Span

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



CAL-LICA-2019-01-01-174



## Thermo 49i Ozone Analyzer Calibration

<b>Date:</b> January 9, 2019 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> Cold Lake South <b>Start/End Time 24 hr. (mst):</b> 9:52 / 15:12 <b>Ozone Calibration Method:</b> Varying UV Lamp Power <b>G.P.T. Date:</b> n/a-done by Varying UV Lamp Power <b>Analyzer:</b> <b>Serial Number/Owner:</b> 700419951 LICA <b>Last Calibration Date:</b> December 14, 2018 <b>Previous Cal High Point C.F.:</b> 1.000	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019   955   millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019   21   °C <b>Weather Conditions:</b> Cloudy/Overcast <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher <b>Cal Gas Expiry Date:</b> n/a-done by Varying UV Lamp Power <b>Ozone Range ppb:</b> 500 <b>As Found C.F.:</b> 1.000 <b>New C.F.:</b> 1.000
---	---

<b>Calibration Standards:</b>	
Low Flow Meter ID/Expiry Date:	N/A
High Flow Meter ID/Expiry Date:	N/A
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019
Cal Gas Cylinder I.D. #:	N/A

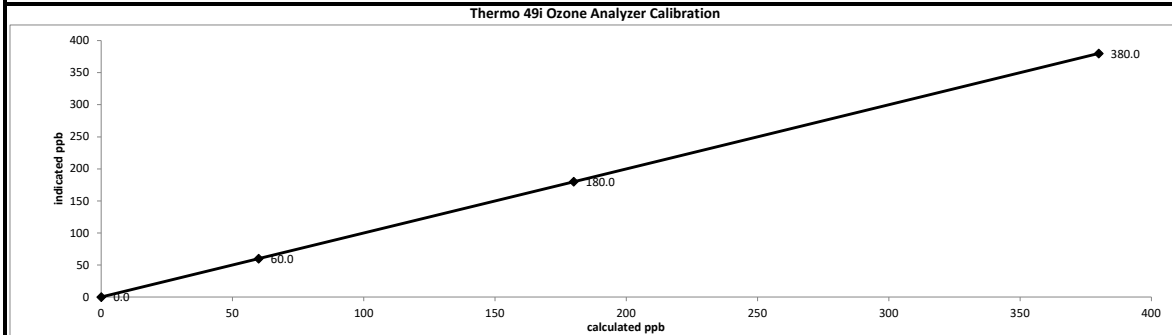
Point	AMD Required Range of Ozone Calibration Points
High	300-400 ppb
Mid	150-200 ppb
Low	50-75 ppb

**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	1.0	n/a
as found high	5000	5000	380.0	380.0	381.0	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
<b>Average C.F.=</b>						1.000

**Linear Regression/Calibration Results:**

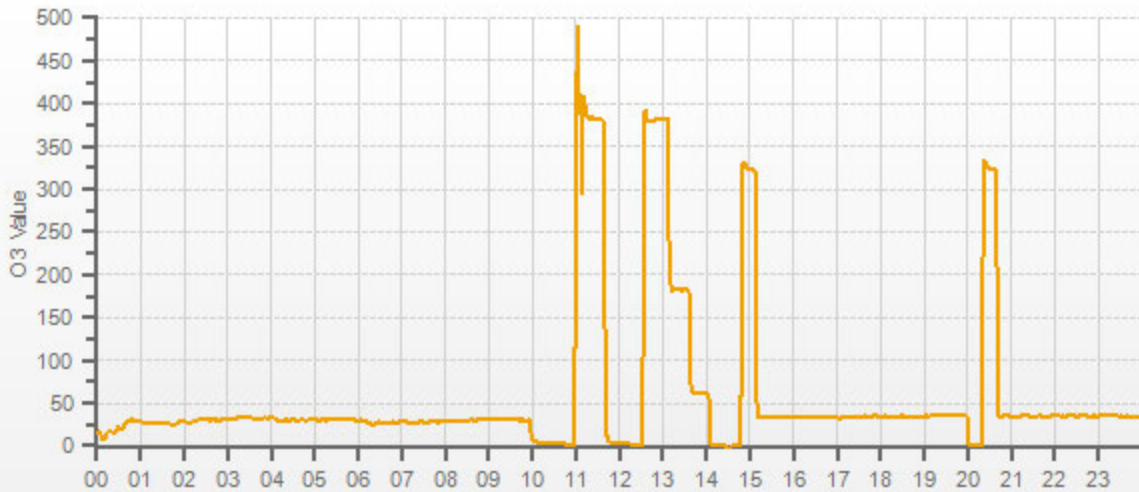
Correlation Coefficient =	1.000		<b>LIMITS</b>
Slope =	1.000		> or = 0.995
b (Intercept as % of full scale)=	0.00%		0.95-1.05
% change in C.F. from last cal=	0.00%		± 3% F.S.
			± 10%



**Comments:**  
 The analyzer sample inlet filter was changed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

Due to operator error, the calibrator was reset to produce required 380 ppb. The As-Found High point starts at 11:19.

O3[ppb]



CAL-LICA-2019-01-01-174



## Thermo 49i Ozone Analyzer Calibration

<b>Date:</b> January 29, 2019 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> Cold Lake South <b>Start/End Time 24 hr. (mst):</b> 10:51 / 12:31 <b>Ozone Calibration Method:</b> Varying UV Lamp Power <b>G.P.T. Date:</b> n/a-done by Varying UV Lamp Power  <b>Analyzer:</b> <b>Serial Number/Owner:</b> 700419951   LICA <b>Last Calibration Date:</b> January 9, 2019 <b>Previous Cal High Point C.F.:</b> 1.000	<b>Barometer/B.P./units:</b> F.S. #005544, expires Jan 17, 2020   959   millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019   22   °C <b>Weather Conditions:</b> Mix of sun and clouds <b>Calibration Purpose:</b> as found <b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher <b>Cal Gas Expiry Date:</b> n/a-done by Varying UV Lamp Power  <b>Ozone Range ppb:</b> 500 <b>As Found C.F.:</b> 0.999 <b>New C.F.:</b> n/a
---	---

<b>Calibration Standards:</b> <b>Low Flow Meter ID/Expiry Date:</b> N/A <b>High Flow Meter ID/Expiry Date:</b> N/A <b>Calibrator ID/Expiry Date:</b> Sabio id# 11900613 expires August 22, 2019 <b>Cal Gas Cylinder I.D. #:</b> N/A	<table border="1" style="margin: auto;"> <thead> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </tbody> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
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	0.7	n/a
as found high	5000	5000	380.0	380.0	381.0	0.999

Average C.F.=

**Linear Regression/Calibration Results:**

Correlation Coefficient =	n/a	<b>LIMITS</b>
Slope =	n/a	n/a
b (Intercept as % of full scale)=	n/a	n/a
% change in C.F. from last cal=	-0.08%	+/- 10%

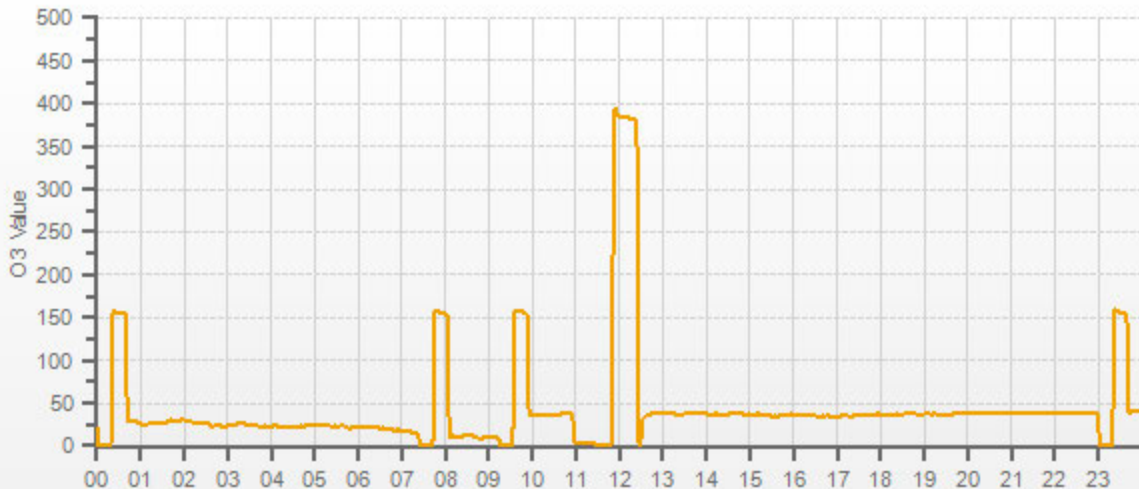
As found:	As left:
O3 Bkg: 0.0	O3 Bkg: 0.0
O3 Coef: 1.048	O3 Coef: 1.048
Photo Lamp: 9.6	Photo Lamp: 9.6
O3 Lamp: 8.0	O3 Lamp: 8.0
Bench: 30.2	Bench: 30.2
Bench Lamp: 53.5	Bench Lamp: 53.5
O3 Lamp: 67.4	O3 Lamp: 67.4
Pressure: 713.2	Pressure: 712.0
Cell A lpm: 0.712	Cell A lpm: 0.712
Cell B lpm: 0.756	Cell B lpm: 0.756
O3 ppb: 2.1	O3 ppb: 0.5
Cell A ppb: 22.2	Cell A ppb: 10.8
Cell B ppb: -16.9	Cell B ppb: -9.9
Cell A int (Hz): 76594	Cell A int (Hz): 76580
Cell B int (Hz): 78594	Cell B int (Hz): 78599
Expected Value: 322.0	Expected Value: 322.0

**Comments:**  
The manifold blower was found to be working normally.

The As Found calibration was completed because SPAN check failed. The ZERO/SPAN check pump was rebuilt.

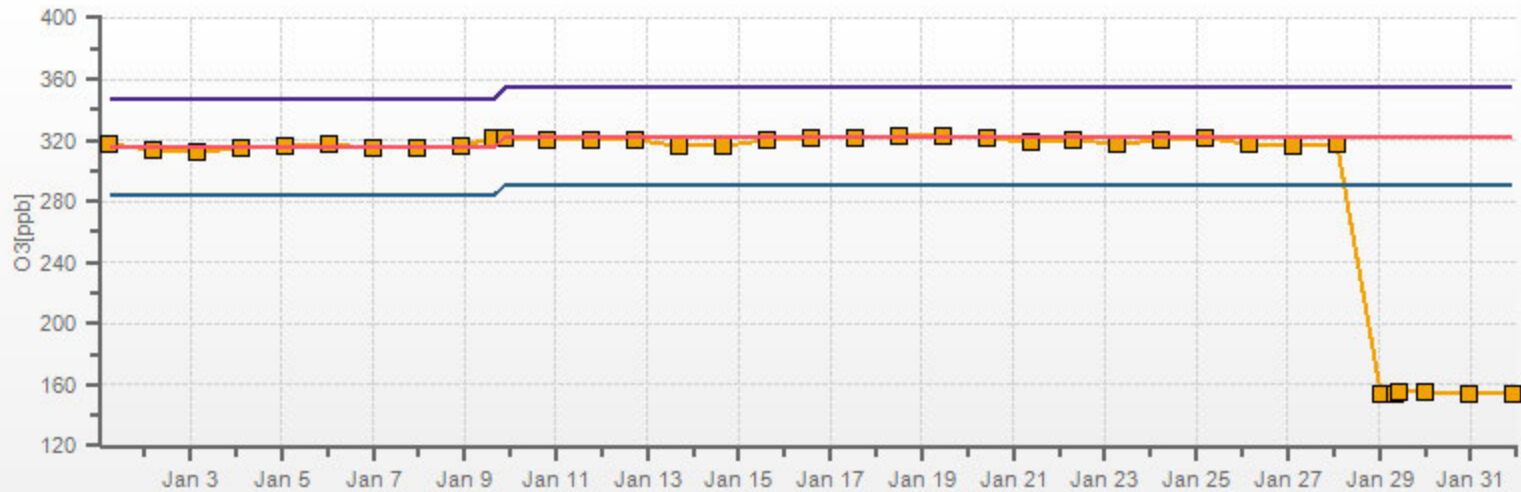


O3[ppb]



CAL-LICA-201901-01174

Span Meas Span Ref Span Low Span High



CAL-LICA-2019-01-01-74



## Thermo 5030 SHARP Monitor Monthly Check

Date: January 25, 2019  
 Company: LICA  
 Station Name/Location: Cold Lake South  
 Previous Audit Date: December 14, 2018  
 Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Rob Fisher  
 Start Time (mst): 16:34  
 End Time (mst): 17:25  
 Calibration Purpose: routine monthly  
 Weather Conditions: Mix of sun and clouds

### SHARP Information and Status:

Serial Number: CM - 2209 Status: 0.00  
 Approx Tape remaining: 40% Error Code: 0.00

### Reference Standards:

#### Air Flow

	Manometer	Orifice	Pressure:	Temperature:
Make:	Dwyer	Airmetrics	Fisher Scientific	Fisher Scientific
Model:	475 Mark III	Chinook / High	FB61291	11745843
Serial Number:	#3	#2	#05544	170286131
Calibration Expiration Date:	January 17, 2020	April 24, 2019	January 17, 2020	April 19, 2019

### As found temperature and pressure:

Tolerance +/- 4°C	Tolerance +/- 13.33 hPa
SHARP T1 °C: <u>-6.0</u>	SHARP P3 (hPa): <u>946.000</u>
Reference °C: <u>-5.7</u>	Reference (hPa): <u>947.000</u>
Difference °C: <u>0.3</u>	Difference (hPa): <u>-1.000</u>

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

Tolerance +/- 4°C	Tolerance +/- 13.33 hPa
SHARP T1 °C: <u>-6.0</u>	SHARP P3 (hPa): <u>946.000</u>
Reference °C: <u>-5.7</u>	Reference (hPa): <u>947.000</u>
Difference °C: <u>0.3</u>	Difference : <u>-1.000</u>

### As found flows:

Targets: 1000 l/hr / <90%	Flow Tolerance 16.67 lpm +/- 0.67 lpm
SHARP AirFlow l/hr <u>1000.00</u>	SHARP Airflow (l/min) <u>16.67</u>
Pump Voltage (%) <u>50.30</u>	Reference AirFlow (l/min) <u>16.67</u>
	Difference (l/min) <u>0.00</u>

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

Targets: 1000 l/hr / <90%	Flow Tolerance 16.67 lpm +/- 0.67 lpm
SHARP AirFlow l/hr <u>1000.00</u>	SHARP Airflow (l/min) <u>16.67</u>
Pump Voltage (%) <u>50.30</u>	Reference AirFlow (l/min) <u>16.67</u>
	Difference (l/min) <u>0.00</u>

### Inlet Assembly:

	Yes/No?	If No, give reason
PM10 Inlet Cleaned	yes	
PM2.5 Cyclone Cleaned	yes	

### Comments:



Company: Maxxam Operator: Chris W

<b>Calibrator:</b>				<b>Flow Measurement Device:</b>			
Make/Model	<u>API 700</u>			Make/Model	<u>Mesa Defender 530</u>		
Serial Number	<u>690</u>			Serial Number	<u>L-153351 H-152571</u>		
Last Verification Date	<u>March 2016</u>			Temperature (°C)	<u>23.5 C</u>		
NO Cylinder S/N	<u>LL108015</u>			Barometric Pressure	<u>695 mmHg</u>		
NO [PPM]	<u>52.2</u>	NOx [PPM]	<u>52.3</u>				
Expiry Date	<u>Oct 2020</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 <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4959	75.0	0.789	0.791	0.793	0.000	0.793	1%	0%
4971	36.5	0.383	0.384	0.384	0.000	0.384	0%	0%
4967	18.2	0.191	0.192	0.191	0.000	0.191	0%	-1%
Absolute Average Percent Difference							0%	0%

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

<b>NO</b>		<b>LIMITS</b>		<b>NOx</b>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0054	<b>0.90-1.10</b>		m (Slope)=	1.0031
b (Intercept % of FS)=	-0.0583	± 3% F.S.		b (Intercept % of FS)=	-0.0795

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
4959	0.000	0.000	0.790	-0.001	0.789	NO <sub>2</sub>	% Diff. Limit
4959	0.500	0.497	0.293	0.493	0.786	-1%	± 10%
4959	0.275	0.273	0.517	0.269	0.787	-1%	± 10%
4959	0.100	0.102	0.688	0.099	0.787	-2%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

<b>NO<sub>2</sub></b>		<b>LIMITS</b>
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9946	<b>0.90-1.10</b>
b (Intercept % of FS)=	-0.1817	± 3% F.S.

<b>AENV Standards</b>		<b>NO<sub>x</sub> Analyzer</b>	
<b>Audit Calibrator</b>		Make/Model	<u>Teco 42i</u>
Make/Model	<u>Teco 146i</u>	Serial/AMU Number	<u>AMU 1868</u>
Serial/AMU Number	<u>AMU 1809</u>	Last Calibration Date	<u>March 14, 2018</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 47.9 ppm SO<sub>2</sub>.

Auditor: Al Clark Date: March 15, 2018  
 Operator Signature: *Chris W* Location: McIntyre Center Edmonton

Company Maxxam Operator: Mike

<b>Calibrator:</b>		<b>Flow Measurement Device:</b>	
Make/Model	<u>Sabio</u>	Make/Model	<u>Bios Definer 220</u>
Serial Number	<u>11900613</u>	Serial Number	<u>H=128686; L=129069</u>
Last Verification Date	<u>March 16, 2018</u>	Temperature (°C)	<u>22.9 C</u>
NO Cylinder S/N	<u>LL104183</u>	Barometric Pressure	<u>698 mmHg</u>
NO [PPM]	<u>50.8</u>	NOx [PPM]	<u>50.9</u>
Expiry Date	<u>October 24, 2020</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5059</u>	Pt. #2	<u>5073</u>
		Pt. #3	<u>5073</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>38.2</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 <sub>2</sub>	NOx	NO	NOx
5124	0.0	0.0000	0.0000	0.0000	-0.0001	0.0000	Limit ± 10%	
5059	77.5	0.7782	0.7797	0.7763	0.0005	0.7767	0%	0%
5073	38.2	0.3825	0.3833	0.3794	0.0000	0.3795	-1%	-1%
5073	19.1	0.1913	0.1916	0.1904	0.0000	0.1904	0%	-1%
Absolute Average Percent Difference							1%	1%

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

<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9975	0.90-1.10		m (Slope)=	0.9960
b (Intercept % of FS)=	-0.0616	± 3% F.S.		b (Intercept % of FS)=	-0.0661

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
5059	0.0	0.0000	0.7741	0.0000	0.7741	NO <sub>2</sub>	% Diff. Limit
5059	500.0	0.4918	0.2823	0.4916	0.7739	0%	± 10%
5059	275.0	0.2774	0.4967	0.2780	0.7747	0%	± 10%
5059	100.0	0.1031	0.6710	0.1032	0.7743	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

<u>NO<sub>2</sub></u>		<u>LIMITS</u>	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9998	0.90-1.10	
b (Intercept % of FS)=	0.0173	± 3% F.S.	

<b>AENV Standards</b>		<b>NO<sub>x</sub> Analyzer</b>	
<b>Audit Calibrator</b>			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>August 16, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 15, 2020</u>

COMMENTS: \_\_\_\_\_

Auditor: Shea Beaton Date: August 22, 2018  
Operator Signature: \_\_\_\_\_ Location: McIntyre Center Edmonton



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-482CGA

**Company:** Maxxam **Operator's Name:** Mike  
**Cylinder #:** LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair  
**Expiry Date:** October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&amp;R MFC 201</u>	Make/Model: <u>Mesa Definer 220</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>H-133034 / L-132702</u>
Last Verification Date: <u>December 13, 2017</u>	Temp. °C: <u>23.4 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>707 mmHg</u>
Cylinder Number: <u>CAL016625</u>	
Expiry Date: <u>January 2019</u>	

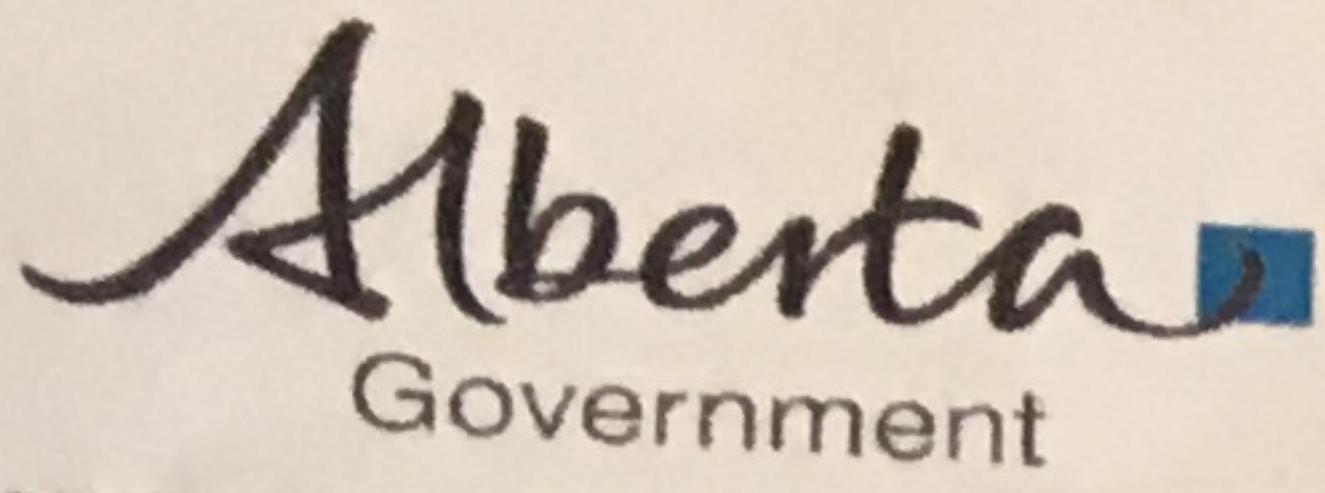
**Reference Analyzer:**  
 Make/Model: Teco 43C Serial/AMU Number: 1623  
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0  
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000			
4989	79.5	0.764	0.01594	62.755	47.9
4995	39.6	0.380	0.00793	126.136	47.9
4992	19.6	0.188	0.00393	254.694	47.9
Average Cylinder Concentration:					<b>47.9</b>

Previous Stated Concentration PPM: 49.2  
 Percent variance from Stated: 3

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: December 13, 2017  
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike  
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%) 2 Certified By: Praxair  
 Expiry Date: October 2020

**Reference Calibrator and Gas:**  
 Make/Model: Sabio 2010  
 Serial Number: AMU 2092  
 Last Verification Date: January 17, 2018  
 Gas Type: H2S Conc. 20.43  
 Cylinder Number: CAL015272  
 Expiry Date: January 2019

**Flow Measurement Device:**  
 Make/Model: Mesa Defender 530  
 Serial Number: H-153961 / L-153874  
 Temp. °C: 23.0 C  
 B.P. 697 mmHg

**Reference Analyzer:**  
 Make/Model: Teco 450i Serial/AMU Number: 1980  
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1  
 Last Calibration: Date: Jan 17/18 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	<del>0.0000</del>	<del>0.0000</del>	<del>0.0000</del>
5051	39.6	0.0753	0.00784	127.551	9.60
5028	20.2	0.0387	0.00402	248.911	9.63
5033	10.5	0.0198	0.00209	479.333	9.49
Average Cylinder Concentration:					<b>9.58</b>

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

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

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: [Signature]

Location: McIntyre Center Edmonton







# Calibration Gas Audit

## CH<sub>4</sub> / C<sub>3</sub>H<sub>8</sub> Cylinder Gas

File No. 2019-393CGA

**Company:** Maxxam **Operators name:** Alex  
**Cylinder #:** LL29687 **Conc CH<sub>4</sub> (PPM)** 598/198 **Tolerance (%)** 1 **Certified By:** Praxair  
**Expiry Date:** August 2026

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Sabio 2010</u>	Make/Model	<u>Mesa Definer 220</u>		
Serial Number	<u>AMU 2092</u>	Serial Number	<u>H-133034 / L-132702</u>		
Last Verification Date	<u>January 14, 2019</u>	Temp. °C	<u>23.8 C</u>		
Gas Type	<u>CH<sub>4</sub></u>	Conc.	<u>990.4</u>		
Cylinder Number	<u>05604875</u>	Expiry Date	<u>July 2021</u>		
Gas Type	<u>C<sub>3</sub>H<sub>8</sub></u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF003845B</u>	Expiry Date	<u>July 2022</u>		

**Reference Analyzer:**  
**Make/Model** Teco 55i **Serial/AMU Number:** 2221  
**Instrument Settings** **Zero:** N/A **Span:** N/A **Range:** 20.0  
**Last Calibration:** **Date:** Jan 14/19 **C.F.** 1.000 **Done By:** Shea Beaton

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH <sub>4</sub>	C <sub>3</sub> H <sub>8</sub>			CH <sub>4</sub>	C <sub>3</sub> H <sub>8</sub>
5000	0.0	0.00	0.00	<del>0.02</del>	<del>51.48</del>	<del>603</del>	<del>209</del>
3990	77.5	11.71	11.18	0.02	51.48	603	209
3976	39.1	5.87	5.71	0.01	101.69	597	211
3986	20.0	2.96	2.86	0.01	199.30	590	207
Average Cylinder Concentration:						<b>597</b>	<b>209</b>

<b><u>CH<sub>4</sub></u></b>	<b><u>C<sub>3</sub>H<sub>8</sub></u></b>
Previous Stated Concentration PPM: <u>598</u>	Previous Stated Concentration PPM: <u>198</u>
Percent variance from Stated: <u>0</u>	Percent variance from Stated: <u>6</u>

**Cylinder gas tolerances based on CH<sub>4</sub> only**

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:** January 15, 2019  
**Operator Signature:** **Location:** McIntyre Center Edmonton



# Calibration Gas Audit

## NO Cylinder Gas

File No. 2017-483CGA

**Company:** Maxxam                      **Operators name:** Mike

Cylinder #: LL104225    Conc (PPM) 51.5/51.6    Tolerance (%) 2    Certified By: Praxair

Expiry Date: October 2020

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>December 13, 2017</u>			Temp. °C	<u>23.4 C</u>
Gas Type	<u>NO</u>	Conc.	<u>50.03</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>APEX 1223938</u>				
Expiry Date	<u>June 2020</u>				

**Reference Analyzer:**

Make/Model Teco 42i                      Serial/AMU Number: 1868

Instrument Settings    Zero: 4.7                      Span: 1.004                      Range: 1.0

Last Calibration:                      Date: Dec12/17                      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				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						<b>51.3</b>	<b>51.1</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</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

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark                      Date: December 13, 2017

Operator Signature: *Al Clark*                      Location: McIntyre Center Edmonton



**Lakeland Industry & Community Association**

**JANUARY 2019**

**Ambient Air Monitoring Calibration Report**

**- MASKWA STATION-**

**CAL-LICA-201901-01248**

**Station Operation and Maintenance:**

Maxxam Analytics

**Data Validation and Report:**

Maxxam Analytics

March 15, 2019

Alberta Environment and Parks (AEP)  
[Air.Reporting@gov.ab.ca](mailto:Air.Reporting@gov.ab.ca)

March 15, 2019

**Subject:**

**January 2019 Ambient Air Monitoring Calibration Report Submission for the LICA Maskwa Station**

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring calibration report for the LICA Maskwa AQM Station in the month of January 2019. This calibration report includes equipment calibration records, calibrator performance audit records and calibration gas audit records for the equipment that were used this month. This calibration report is prepared by the LICA network contractor.

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

Respectfully,



Michael Bisaga  
Technical Program Manager  
Lakeland Industry & Community Association  
780-266-7068  
[monitoring@lica.ca](mailto:monitoring@lica.ca)



Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[monitoring@lica.ca](mailto:monitoring@lica.ca)



**JANUARY 1 - 31, 2019**  
**MONTHLY CALIBRATION REPORT**  
**Project #: 2833-2019-01-24-C**  
**LICA-201901**

**Prepared for:**

**Lakeland Industry & Community Association**  
**Mike Bisaga**  
5107 50 St.  
Bonnyville, Alberta T9N 2J7  
monitoring@lica.ca  
780-266-7068

**Monitoring Station**

**Maskwa Continuous Monitoring Station**

**Date of Report Issuance: February 28, 2019**

**Maxxam**



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7  
CAL-LICA-201901-01248



### Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

Date: January 4, 2019	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	923	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name: Maskwa	Weather Conditions: Cloudy/Overcast		
Parameter: Sulphur Dioxide	Calibration Purpose: routine monthly		
Start Time 24 hr. (mst): 11:20	Performed By/Reviewer: Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst): 16:22	Cal Gas Expiry Date: October 24, 2020		
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a		
Analyzer: Serial Number/Owner: 1180930031   LICA	Range ppb: 1000		
Last Calibration Date: December 4, 2018	As Found C.F.: 1.002		
Previous C.F.: 1.001	New C.F.: 1.001		

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2	<b>Standard Calibration Points for Ranges</b> <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								

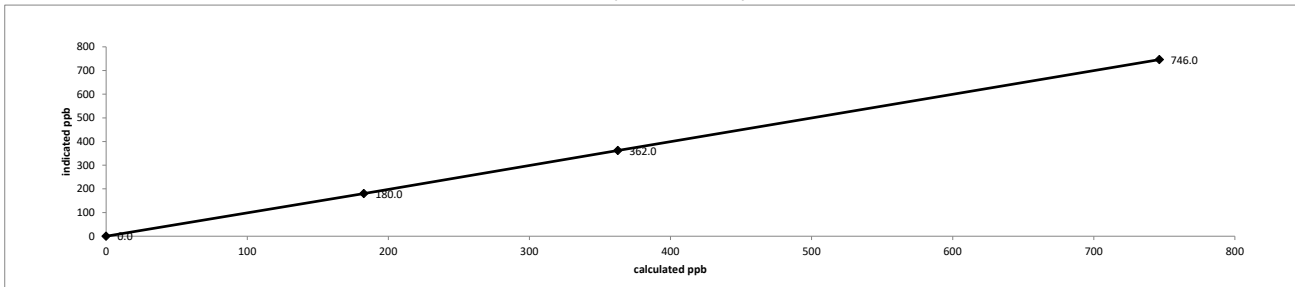
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5007	0.00	5007	0.0	0	n/a
as found high	4934	76.01	5010	746.4	745	1.002
adjusted zero	5007	0.00	5007	0.0	0	n/a
adjusted high	4934	76.01	5010	746.4	746	1.001
mid	4925	36.58	4962	362.7	362	1.002
low	4933	18.38	4951	182.6	180	1.015
calibrator zero	5007	0.00	5007	0.0	0	n/a
<b>Average C.F. =</b>						<b>1.006</b>

**Linear Regression/Calibration Results:**

Correlation Coefficient =	<u>1.000</u>	<b>LIMITS</b>
Slope =	<u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) =	<u>0.11%</u>	0.95-1.05
% change in C.F. from last cal =	<u>-0.09%</u>	± 3% F.S.
		± 10%

**Thermo 431-TLE Sulphur Dioxide Analyzer Calibration**



<b>As found:</b> Bkg: 2.13 Coef: 0.961 Pmt: -700.4 Flash: 995 Internal: 29.8 Chamber: 45.0 Perm Oven Gas: 35.00 Perm Oven Heater: 34.26 Pressure: 662.8 Sample Flow: 0.454 Lamp Intensity: 91 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 431.0	<b>As left:</b> Bkg: 2.12 Coef: 0.958 Pmt: -701.2 Flash: 992 Internal: 29.8 Chamber: 45.0 Perm Oven Gas: 35.00 Perm Oven Heater: 34.26 Pressure: 664.3 Sample Flow: 0.455 Lamp Intensity: 89 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 431.0
--	---

**Comments:**

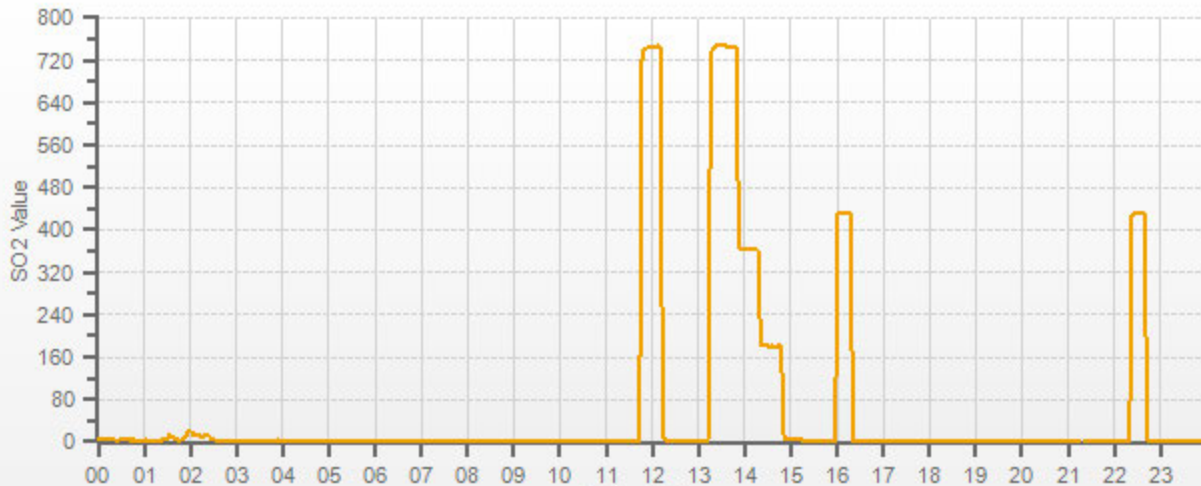
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

The expected span value did not change after calibration.

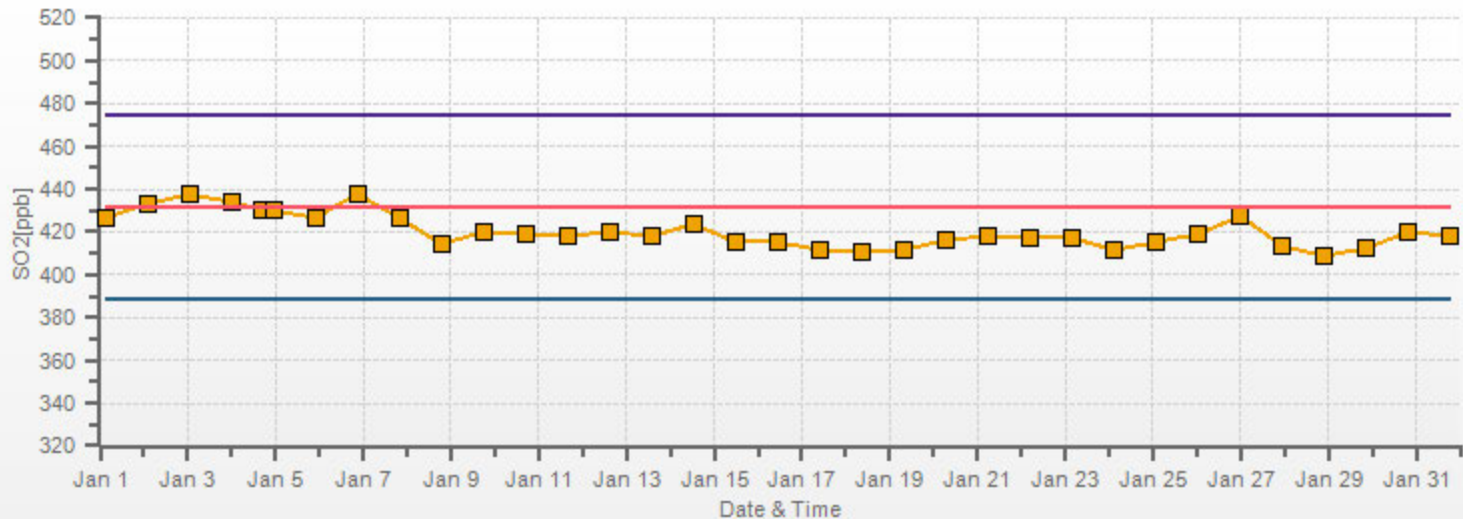
SO2[ppb]



CAL-LICA-201901-01248



SO2[ppb] Calibration: LICA MASKWA Monthly: 19/01 Type: Span



CAL-LICA-201901-01248

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



### Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	January 4, 2019	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	923	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name:	Maskwa	Weather Conditions:	Cloudy/Overcast		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	11:20	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	17:58	Cal Gas Expiry Date:	October 20, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	CM 17360005   LICA	Range ppb:	100		
Last Calibration Date:	December 31, 2018	As Found C.F.:	0.919		
Previous C.F.:	0.999	New C.F.:	1.000		

Calibration Standards:	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):
Low Flow Meter ID/Expiry Date:		Start/End Time 24 hr.:
High Flow Meter ID/Expiry Date:		SO2 Analyzer Range:
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019	Target Concentration (ppb):
Cal Gas Cylinder I.D. #:	EY 0001003	As Found Zero:
Cal Gas Conc. (ppm):	9.55	Analyzer Response (ppb):
		Zero Corrected Result (ppb):

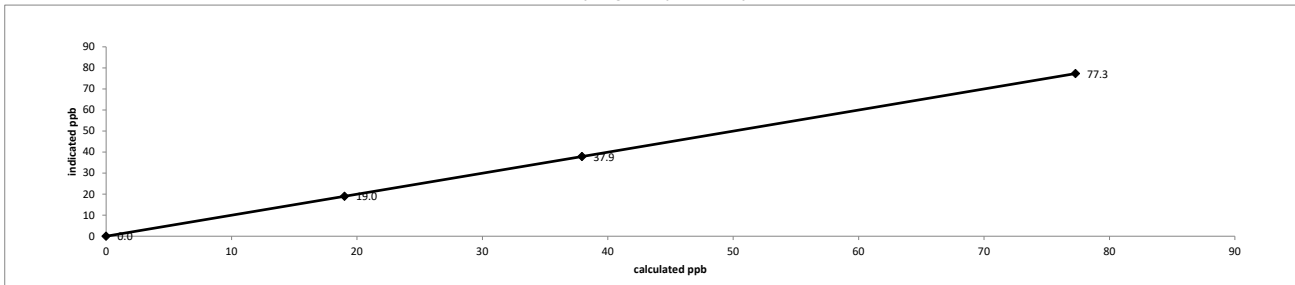
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7499	0.00	7499	0.0	0	n/a
as found high	7479	61.03	7540	77.3	84.1	0.919
adjusted zero	7499	0.00	7499	0.0	0	n/a
adjusted high	7479	61.03	7540	77.3	77.3	1.000
mid	7420	29.60	7450	37.9	37.9	1.001
low	7420	14.80	7435	19.0	19	1.001
calibrator zero	7499	0.00	7499	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		0.95-1.05
b (Intercept as % of full scale) =	0.01%		± 3% F.S.
% change in C.F. from last cal =	7.99%		± 10%

Thermo 450i Hydrogen Sulphide Analyzer Calibration



As found:		As left:	
Bkg:	20.1	Bkg:	19.7
Coef:	0.894	Coef:	0.856
Pmt:	-602.7	Pmt:	-602.4
Flash:	809	Flash:	810
Internal:	33.9	Internal:	33.3
Chamber:	45.1	Chamber:	45.1
Converter Temp:	327.0	Converter Temp:	322.6
Converter Set:	325.0	Converter Set:	325.0
Perm Oven Gas:	35.00	Perm Oven Gas:	35.00
Perm Oven Htr:	34.30	Perm Oven Htr:	34.32
Pressure:	560.3	Pressure:	560.9
Sample Flow:	0.939	Sample Flow:	0.940
Lamp Intensity:	91	Lamp Intensity:	89
Averaging Time:	120	Averaging Time:	120
Expected Value:	49.2	Expected Value:	48.8

Comments:

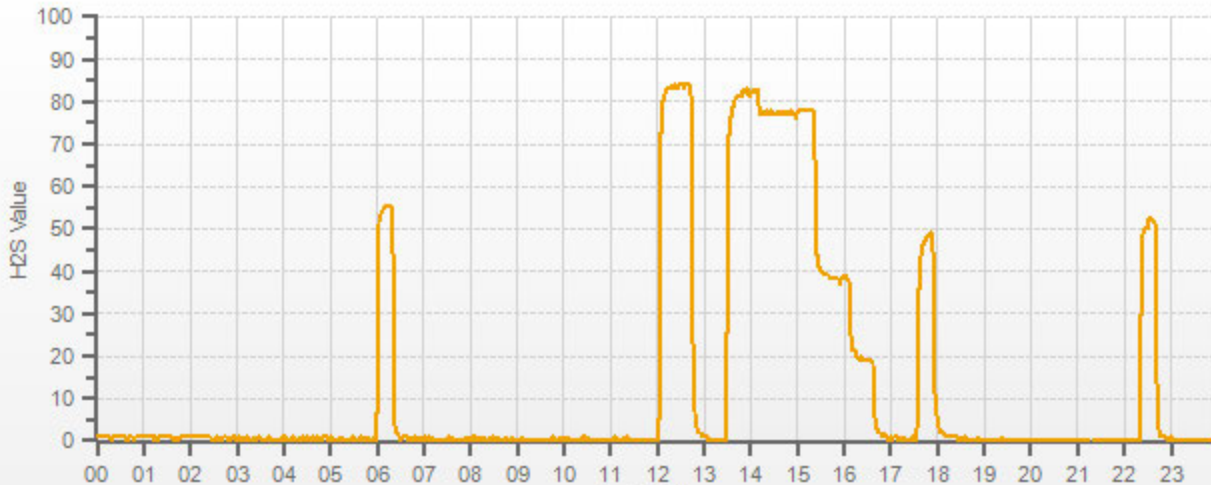
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

The silica gel container was removed after the As-Found High point to improve the stability. The adjusted high point was held longer to achieve a stability of +/-0.5ppb.

H2S[ppb]



CAL-LICA-201901-01248



### Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	January 23, 2019	Barometer/B.P./units:	F.S #05544, expires Jan 17, 2020	946	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	Mix of sun and clouds		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	shut down		
Start Time 24 hr. (mst):	12:40	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:35	Cal Gas Expiry Date:	October 20, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	CM 17360005   LICA	Range ppb:	100		
Last Calibration Date:	January 4, 2019	As Found C.F.:	1.020		
Previous C.F.:	1.000	New C.F.:	n/a		

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date:	N/A								
High Flow Meter ID/Expiry Date:	N/A								
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019								
Cal Gas Cylinder I.D. #:	EY 0001003								
Cal Gas Conc. (ppm):	9.55								
	<table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								

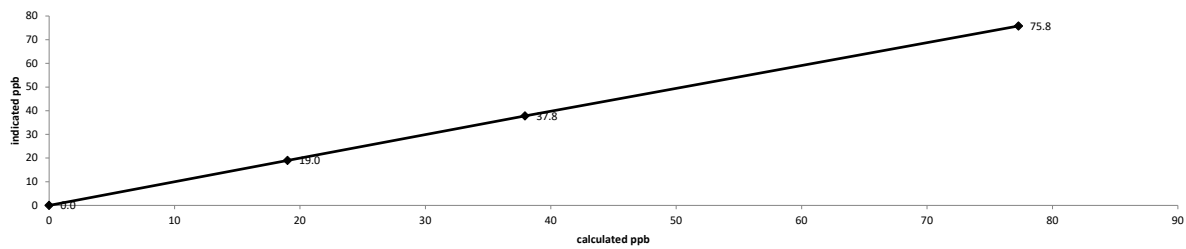
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7499	0.00	7499	0.0	0	n/a
as found high	7479	61.03	7540	77.3	75.8	1.020
mid	7420	29.60	7450	37.9	37.8	1.004
low	7420	14.80	7435	19.0	19	1.001
Average C.F. =						1.008

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.021		0.90-1.10
b (Intercept as % of full scale) =	-0.27%		± 3% F.S.
% change in C.F. from last cal =	-1.98%		± 10%

Thermo 450i Hydrogen Sulphide Analyzer Calibration



As found:	As left:
Bkg: 19.4	Bkg: n/a
Coef: 0.856	Coef: n/a
Pmt: -602.4	Pmt: n/a
Flash: 811	Flash: n/a
Internal: 34.0	Internal: n/a
Chamber: 45.1	Chamber: n/a
Converter Temp: 327.3	Converter Temp: n/a
Converter Set: 325.0	Converter Set: n/a
Perm Oven Gas: 35.00	Perm Oven Gas: n/a
Perm Oven Htr: 34.30	Perm Oven Htr: n/a
Pressure: 572.8	Pressure: n/a
Sample Flow: 0.957	Sample Flow: n/a
Lamp Intensity: 91	Lamp Intensity: n/a
Averaging Time: 120	Averaging Time: n/a
Expected Value: 51.5	Expected Value: n/a

Comments:

The SO2 scrubber check was not performed, see comments below.  
 The manifold blower was found to be working normally.  
 No zero adjustment was required/made.

A shutdown calibration was completed to renew SO2 scrubber beads. SO2 scrubber check was completed during monthly calibration on Jan 4, 2019



### Thermo 450i Hydrogen Sulphide Analyzer Calibration

<b>Date:</b> January 23, 2019	<b>Barometer/B.P./units:</b> F.S. # 05544, expires Jan 17, 2020	946	millibars
<b>Company/Airshed:</b> LICA	<b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019	22	°C
<b>Location/Station Name:</b> Maskwa	<b>Weather Conditions:</b>	Mix of sun and clouds	
<b>Parameter:</b> Hydrogen Sulphide	<b>Calibration Purpose:</b>	post repair	
<b>Start Time 24 hr. (mst):</b> 16:38	<b>Performed By/Reviewer:</b>	Alex Yakupov	Rob Fisher
<b>End Time 24 hr. (mst):</b> 20:45	<b>Cal Gas Expiry Date:</b>	October 20, 2020	
<b>Calibration Method:</b> Gas Dilution	<b>Converter Model &amp; s/n (if applicable):</b>	n/a	
<b>Analyzer:</b>			
<b>Serial Number/Owner:</b> CM 17360005   LICA	<b>Range ppb:</b>	100	
<b>Last Calibration Date:</b> January 4, 2019	<b>As Found C.F.:</b>	n/a	
<b>Previous C.F.:</b> 1.000	<b>New C.F.:</b>	1.000	

<b>Calibration Standards:</b>	<b>Standard Calibration Points for Ranges</b>	<b>SO2 Scrubber Check (10 minutes):</b>								
<b>Low Flow Meter ID/Expiry Date:</b> N/A	<table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	<b>Start/End Time 24 hr.:</b> 17:06 / 17:22
Point	ppb									
High	78									
Mid	38									
Low	19									
<b>High Flow Meter ID/Expiry Date:</b> N/A		<b>SO2 Analyzer Range:</b> 1000								
<b>Calibrator ID/Expiry Date:</b> Sabio id# 11900613 expires August 22, 2019		<b>Target Concentration (ppb):</b> 780								
<b>Cal Gas Cylinder I.D. #:</b> EY 0001003		<b>As Found Zero:</b> 1.1								
<b>Cal Gas Conc. (ppm):</b> 9.55		<b>Analyzer Response: (ppb):</b> 1.1								
		<b>Zero Corrected Result (ppb):</b> 0.0								

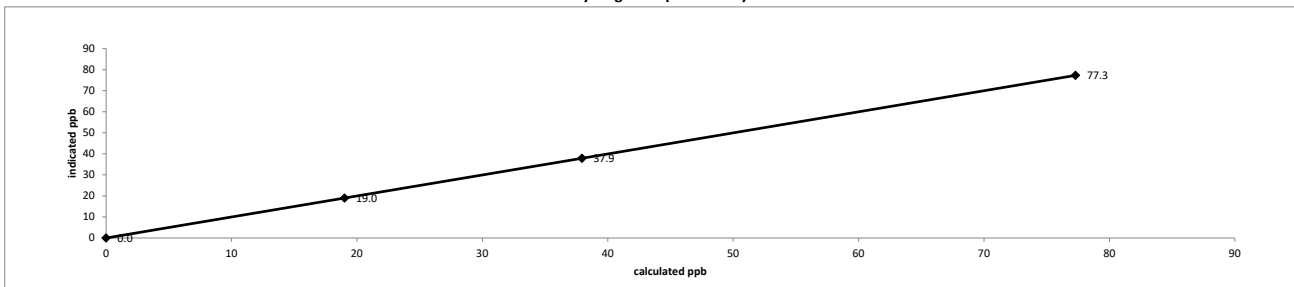
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total	Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
adjusted zero	7499	0.00	7499	0.0	0	n/a
adjusted high	7479	61.03	7540	77.3	77.3	1.000
mid	7420	29.60	7450	37.9	37.9	1.001
low	7420	14.80	7435	19.0	19	1.001
calibrator zero	7499	0.00	7499	0.0	0	n/a
<b>Average C.F. =</b>						<b>1.001</b>

**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b>	<b>1.000</b>	<b>LIMITS</b>	<b>&gt; or = 0.995</b>
<b>Slope =</b>	<b>1.000</b>		<b>0.95-1.05</b>
<b>b (Intercept as % of full scale) =</b>	<b>0.01%</b>		<b>± 3% F.S.</b>
<b>% change in C.F. from last cal =</b>	<b>n/a</b>		<b>n/a</b>

**Thermo 450i Hydrogen Sulphide Analyzer Calibration**

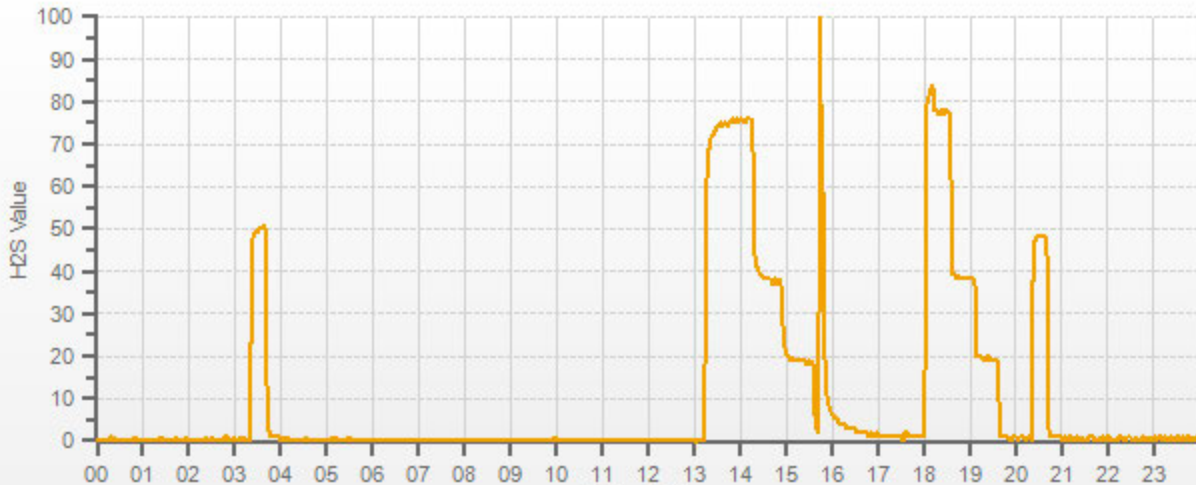


As found:	As left:
Bkg:	n/a
Coef:	n/a
Pmt:	n/a
Flash:	n/a
Internal:	n/a
Chamber:	n/a
Converter Temp:	n/a
Converter Set:	n/a
Perm Oven Gas:	n/a
Perm Oven Htr:	n/a
Pressure:	n/a
Sample Flow:	n/a
Lamp Intensity:	n/a
Averaging Time:	n/a
Expected Value:	n/a
Bkg:	17.7
Coef:	0.791
Pmt:	-602.0
Flash:	810
Internal:	34.0
Chamber:	45.0
Converter Temp:	322.8
Converter Set:	325.0
Perm Oven Gas:	35.00
Perm Oven Htr:	34.31
Pressure:	572.8
Sample Flow:	0.954
Lamp Intensity:	90
Averaging Time:	120
Expected Value:	47.9

**Comments:**

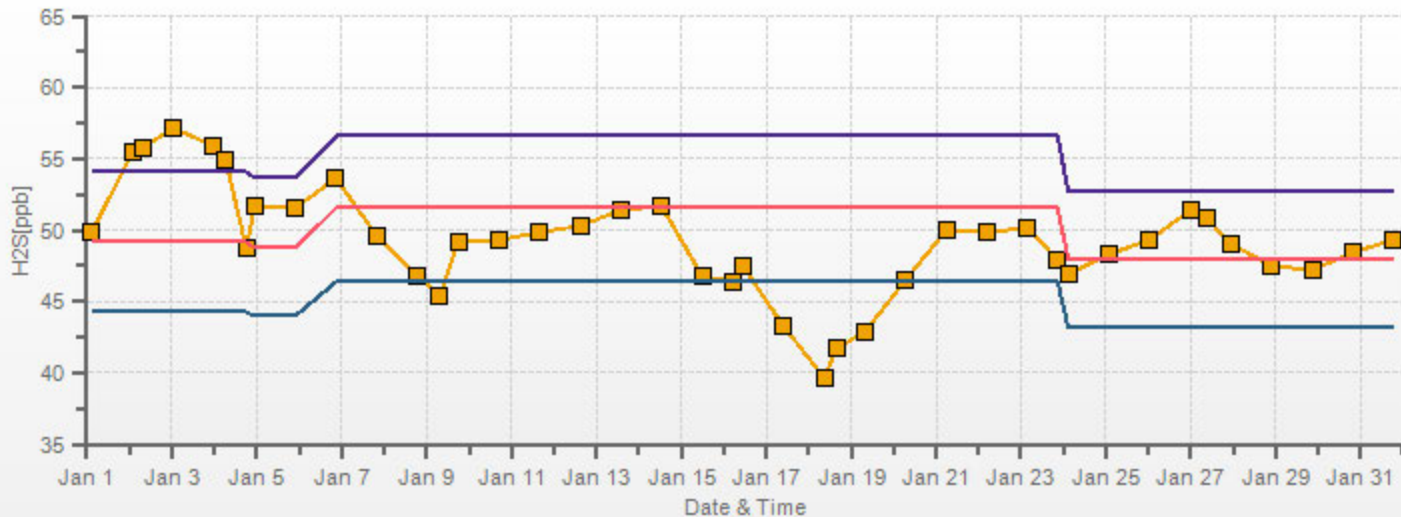
SO2 scrubber beads were renewed to fix periodic drifts and sensitivity on ambient temperature fluctuations.

H2S[ppb]



CAL-LICA-201901-01248

H2S[ppb] Calibration: LICA MASKWA Monthly: 19/01 Type: Span



CAL-LICA-201901-01248

Span Meas Span Ref Span Low Span High



### Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	January 4, 2019	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	923	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name:	Maskwa	Weather Conditions:	Cloudy/Overcast		
Parameter:	CH4 / NMHC / THC	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	17:15 / 21:13	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	October 18, 2025		

Analyzer:		Correction Factors:			
Serial Number/Owner:	1108930026   LICA	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1114	CH <sub>4</sub> =	1.000	0.999	1.000
Last Calibration Date:	December 5, 2018	NMHC =	1.000	1.010	1.000
Range ppm:	20 CH4/20 NMHC/40 THC	THC =	1.000	1.004	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	N/A	Standard Calibration Points for Analyzer Range of 20/20/40 ppm			
High Flow Meter ID/Expiry Date:	N/A	Point	CH4	NMHC	THC
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019	High	13.00	13.00	26.00
Cal Gas Cylinder I.D. #:	LL 119471	Mid	7.00	7.00	14.00
CH4 Cylinder Conc. =	599.0   207.0 = C <sub>2</sub> H <sub>6</sub> Cylinder Conc.	Low	3.00	3.00	6.00
CH <sub>4</sub> expressed as C <sub>2</sub> H <sub>6</sub> =	569.3   1168.3 = total CH4 equivalent				

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

Point	Calibrator Flow Rates (cc/min)			Calculated CH <sub>4</sub> (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH <sub>4</sub> (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH <sub>4</sub>	NMHC	THC
as found zero	2501	0.00	2501	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2444	55.43	2499	13.29	12.63	25.91	13.30	12.50	25.80	0.999	1.010	1.004
adjusted zero	2501	0.00	2501	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2444	55.43	2499	13.29	12.63	25.91	13.29	12.63	25.91	1.000	1.000	1.000
mid	2441	29.90	2471	7.25	6.89	14.14	7.22	6.82	14.04	1.004	1.010	1.007
low	2481	12.90	2494	3.10	2.94	6.04	3.12	2.95	6.08	0.993	0.998	0.994
calibrator zero	2501	0.00	2501	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
Average C.F. =										0.999	1.003	1.000

**Linear Regression/Calibration Results:**

Correlation Coefficient =	CH <sub>4</sub>	NMHC	THC	LIMITS
	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	0.999	0.999	0.95-1.05
b (Intercept as % of full scale) =	0.02%	-0.05%	0.00%	± 3% F.S.
% change in C.F. from last cal =	0.10%	-1.01%	-0.44%	± 10%

**As Left Instrument Diagnostics:**

Interface Board Voltages:	Bias Supply: -301.0	Calibration History cnt'd:	NM Peak Area: 61796
Temperatures:	Detector Oven: 175.0	Crucial Settings:	Methane Start: n/a
	Filter: 175.0		Methane End: n/a
	Column Oven: 74.9		Backflush: n/a
	Internal: 29.8		NMHV Start: n/a
Cylinder Pressures/reg.:	Carrier: 800   50	Run History>1:	NMHC End: n/a
	Fuel: 2000   50		Date: Jan 4, 2019
	Span Gas: 1200   13		Time: 17:09
	Zero Air Generator: 50		CH <sub>4</sub> PK HT: 0
Internal Pressures:	Carrier: 28.5		CH <sub>4</sub> RT: 13.0
	Fuel: 42.9		CH <sub>4</sub> Baseline: -250
	Air: 30.5		CH <sub>4</sub> LOD: 18
FID Status:	Status: LIT		CH <sub>4</sub> SD: 6
	Counts: 16705		CH <sub>4</sub> CONC: 0.00
	Flame: 384.9		NM PK HT: 0
	Det Base: 175.0		NM Peak Area: 0
Flame and Power Stats:	Last Power On: Dec 4, 2018		NM CONC: 0.00
	Flameouts: 3		NM Base Start: -246
	Det Oven at Start: 22.7		NM Base End: -238
	Col Oven at Start: 21.6		NM LOD: 15
Calibration History:	Time: Dec 5, 2018 / 13:14		NM Start IDX: 41
	Type: SPAN		NM End IDX: 92
	Status: GOOD		NM Max Slope: 8.6e-01
	Check/Adjust: ADJUST		NM Min Slope: -4.0e-01
	CH <sub>4</sub> Span Conc: 13.29		NM PT Count: 0
	CH <sub>4</sub> SP Ratio: 0.00106	Expected Values:	Previous CH <sub>4</sub> : 10.03
	CH <sub>4</sub> RT: 13.8		Previous NMHC: 11.05
	CH <sub>4</sub> PK IDX: 29		Previous THC: 21.09
	CH <sub>4</sub> PK HT: 12530		New CH <sub>4</sub> : 10.11
	NM Span Conc: 12.63		New NMHC: 11.07
	NM SP Ratio: 0.000204		New THC: 21.17

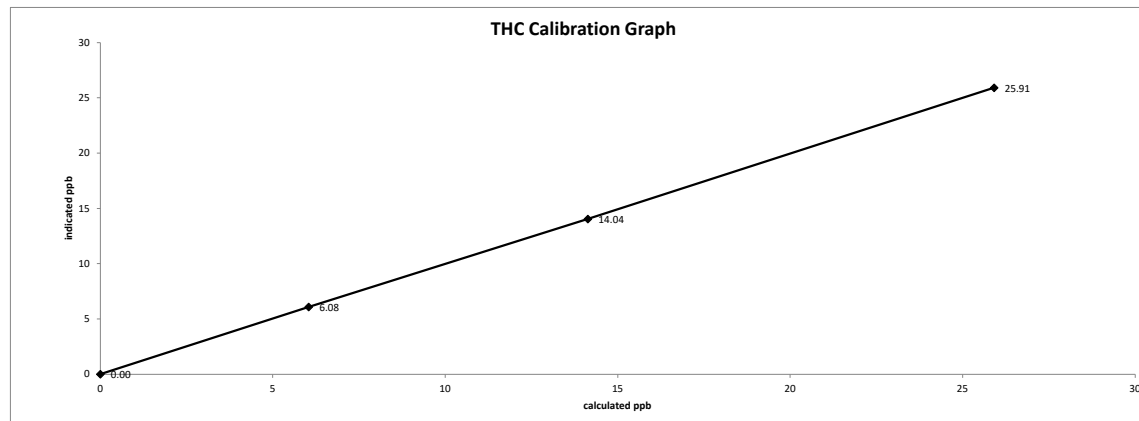
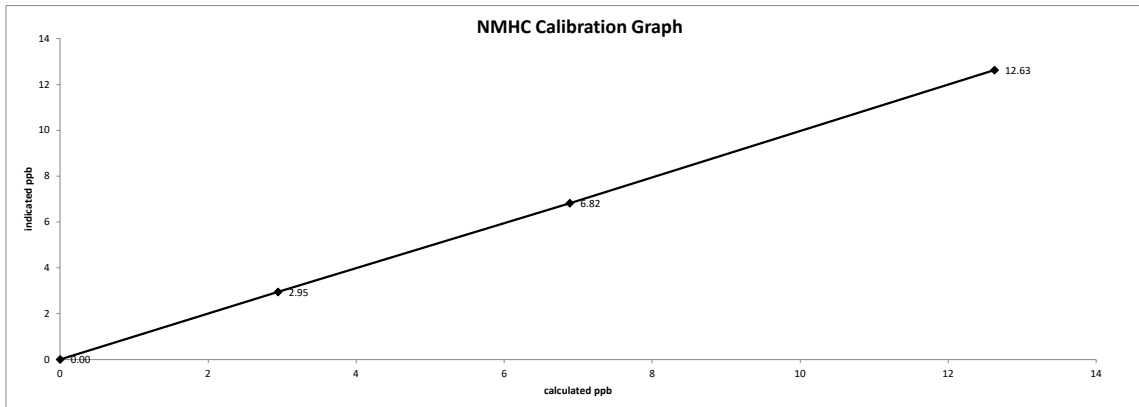
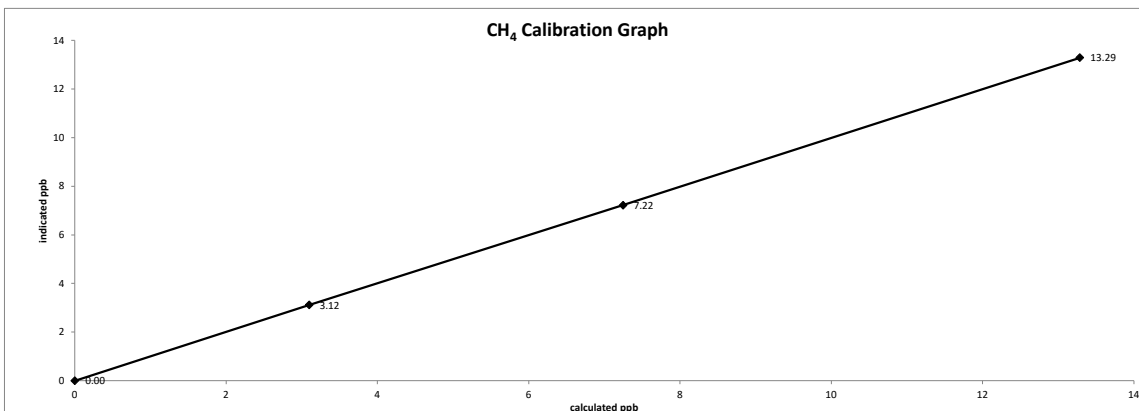
**Comments:**  
 The analyzer sample inlet filter was changed.  
 A new hydrogen cylinder was installed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

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

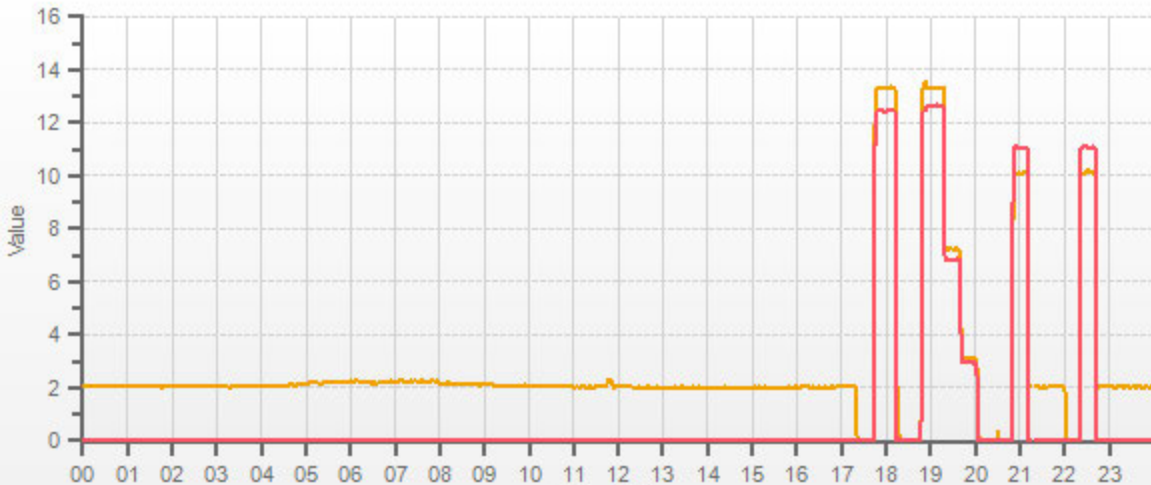


Date: January 4, 2019  
Company/Airshed: LICA  
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 17:15 / 21:13  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution

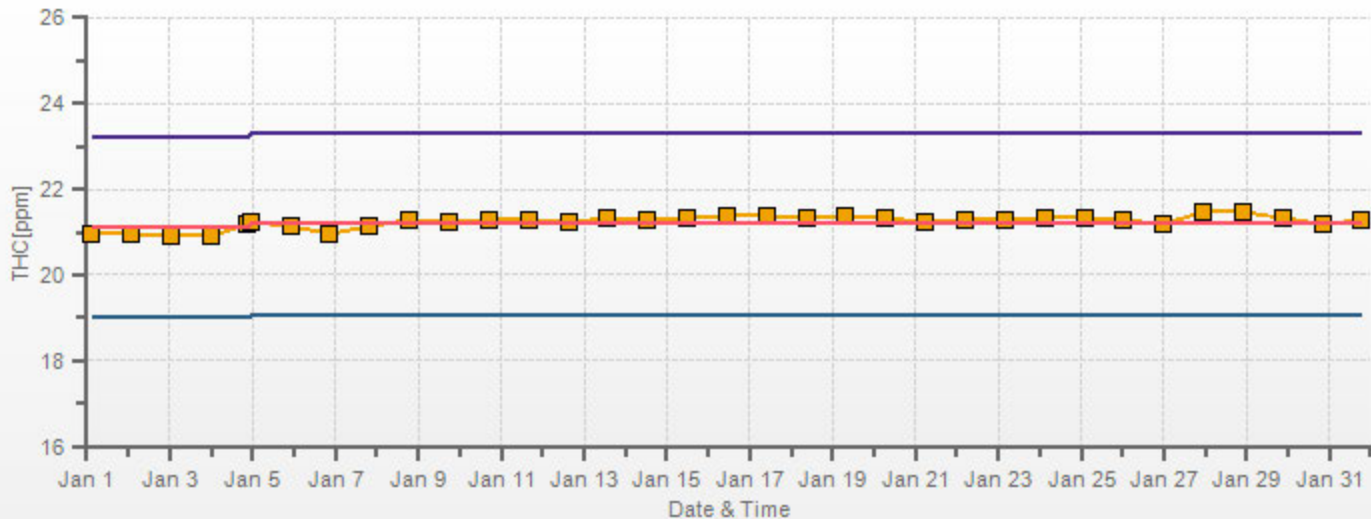


CH4[ppm] NMHC[ppm]



CAL-LICA-201901-01248

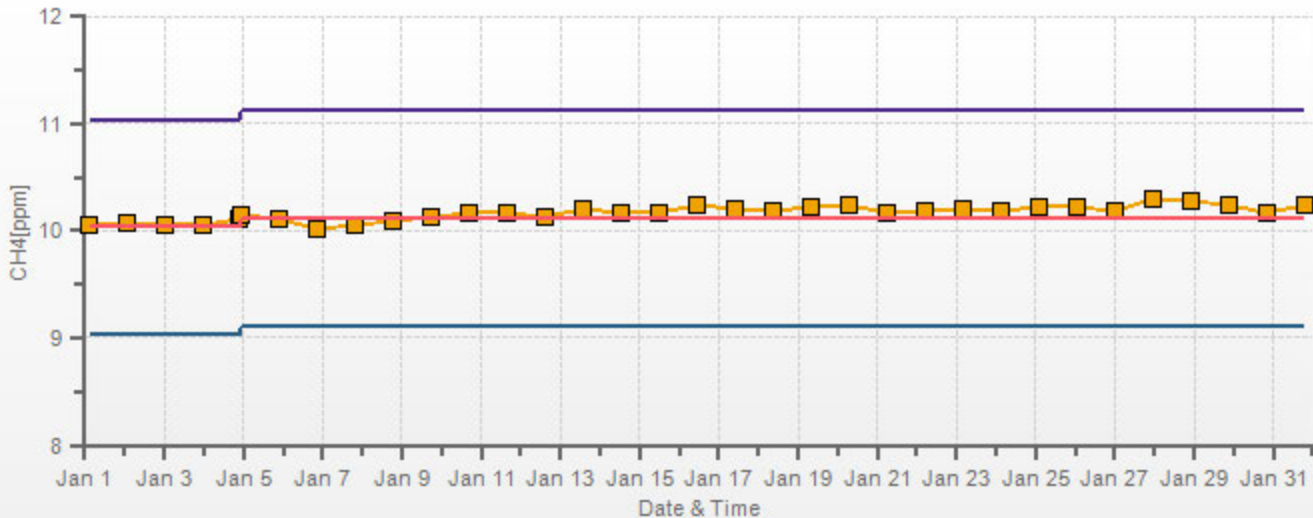
THC[ppm] Calibration: LICA MASKWA Monthly: 19/01 Type: Span



CAL-LICA-201901-01248

Span Meas Span Ref Span Low Span High

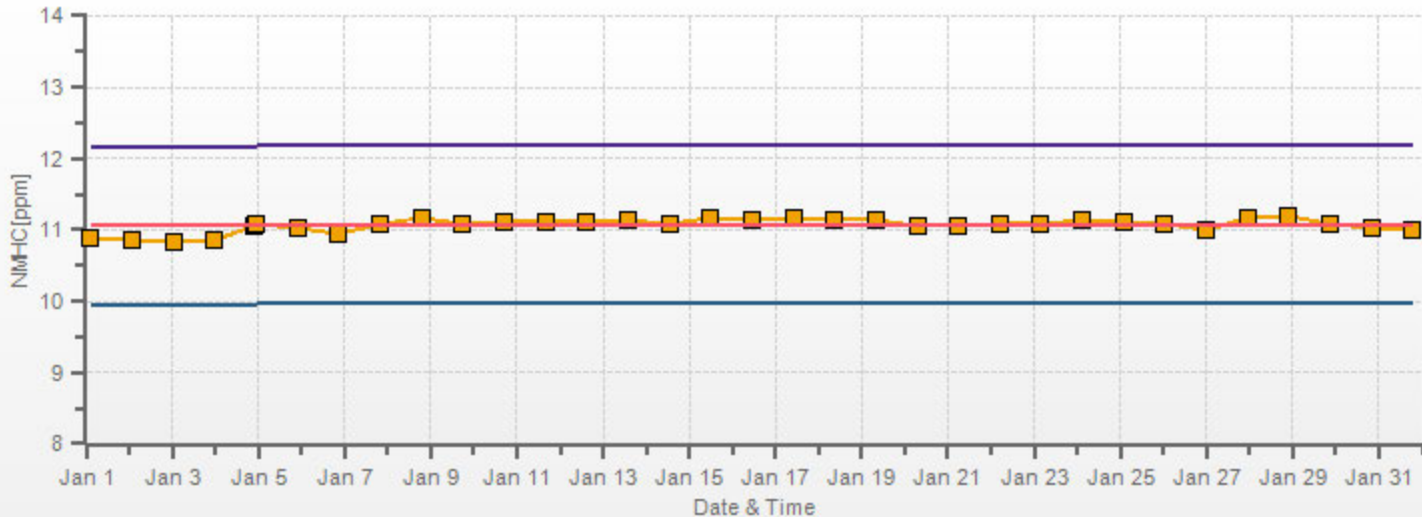
CH4[ppm] Calibration: LICA MASKWA Monthly: 19/01 Type: Span



CAL-LICA-201901-01248

Span Meas Span Ref Span Low Span High

NMHC[ppm] Calibration: LICA MASKWA Monthly: 19/01 Type: Span



CAL-LICA-201901-01248

Span Meas Span Ref Span Low Span High



## Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: January 4, 2019	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	923	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name: Maskwa	Weather Conditions: Cloudy/Overcast		
Start/End Time 24 hr. (mst): 11:20 / 18:15	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone?: No	Performed By/Reviewer: Alex Yakupov	Rob Fisher	
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: October 24, 2020		

Analyzer: Serial Number/Owner: 1180930028   LICA Last Calibration Date: December 4, 2018 Range ppb: 1000	Correction Factors: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO = 1.000</td> <td>0.978</td> <td>1.000</td> </tr> <tr> <td>NO<sub>2</sub> = 1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx = 1.000</td> <td>0.976</td> <td>1.000</td> </tr> </tbody> </table>	Previous C.F.:	As Found C.F.:	New C.F.:	NO = 1.000	0.978	1.000	NO <sub>2</sub> = 1.000	1.000	1.000	NOx = 1.000	0.976	1.000
Previous C.F.:	As Found C.F.:	New C.F.:											
NO = 1.000	0.978	1.000											
NO <sub>2</sub> = 1.000	1.000	1.000											
NOx = 1.000	0.976	1.000											

Calibration Standards: Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5   51.6	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 NO<sub>2</sub> (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 <sub>2</sub> (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 <sub>2</sub> (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	5007	0.0	5007	0	0	0.0	0.0	n/a	n/a
as found high	4934	76.0	5010	781.3	782.9	799.0	802.0	0.978	0.976
adjusted zero	5007	0.00	5007	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4934	76.01	5010	781.3	782.9	781.0	783.0	1.000	1.000
mid	4925	36.58	4962	379.7	380.4	380.0	381.0	0.999	0.998
low	4933	18.38	4951	191.2	191.6	191.0	192.0	1.001	0.998
calibrator zero	5007	0.00	5007	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.000	0.999

**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 <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4934	76.01	5010	0.0	782.0	783.0	1.0	0.0	1.0	
as found high NO2	4934	76.01	5010	500.0	279.0	783.0	504.0	503.0	503.0	1.000
adjusted high NO2	4934	76.01	5010	500.0	279.0	783.0	504.0	503.0	503.0	1.000
gpt mid	4934	76.01	5010	275.0	509.0	783.0	274.0	273.0	273.0	1.000
gpt low	4934	76.01	5010	100.0	682.0	783.0	101.0	100.0	100.0	1.000
Average NO <sub>2</sub> C.F.=										1.000

**Linear Regression/Calibration Results:**

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	1.000	1.002	0.95-1.05
b (Intercept as % of full scale)=	0.01%	0.03%	0.06%	± 3% F.S.
% change in C.F. from last cal=	2.21%	2.39%	0.00%	± 10%
NO <sub>2</sub> converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	2.6	NO Bkg:	2.5
NOx Bkg:	2.6	NOx Bkg:	2.6
NO Coef:	0.971	NO Coef:	0.949
NO <sub>2</sub> Coef:	1.000	NO <sub>2</sub> Coef:	1.000
NOx Coef:	1.000	NOx Coef:	0.999
PMT:	-866.9	PMT:	-866.5
Internal:	29.1	Internal:	29.4
Chamber:	50.4	Chamber:	50.4
Cooler:	-3.0	Cooler:	-3.0
NO <sub>2</sub> Converter:	322.6	NO <sub>2</sub> Converter:	324.2
NO <sub>2</sub> Converter Set:	325.0	NO <sub>2</sub> Converter Set:	325.0
Perm Oven Gas:	45.00	Perm Oven Gas:	45.01
Perm Oven Heater:	44.16	Perm Oven Heater:	44.18
Pressure:	254.3	Pressure:	255.2
Flow:	0.542	Flow:	0.545
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	4	Expected Value NO:	4
Expected Value NO <sub>2</sub> :	401	Expected Value NO <sub>2</sub> :	405
Expected Value NOx:	404	Expected Value NOx:	409

**Comments:**

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

The converter cooling fan filter was cleaned.

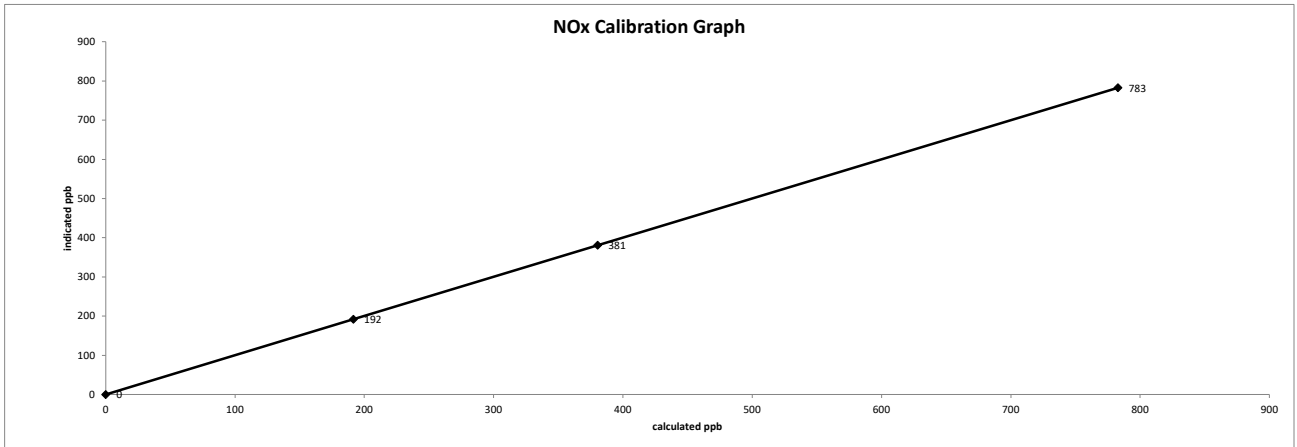
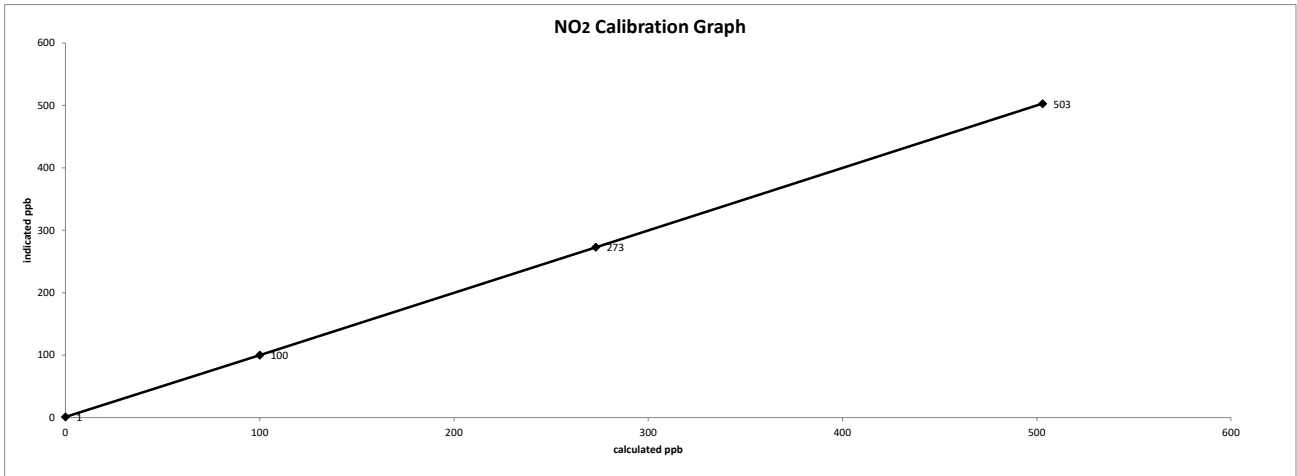
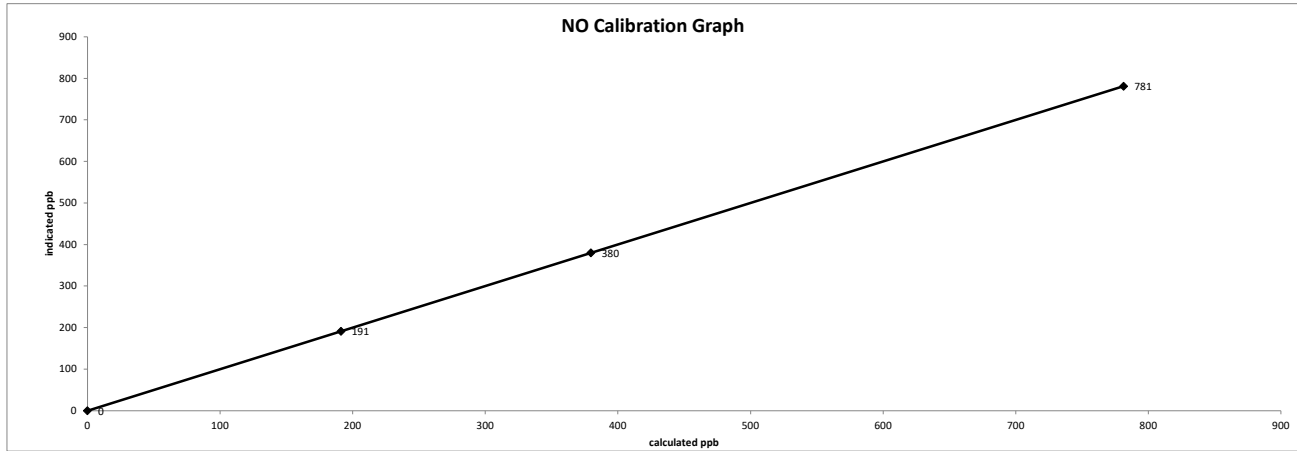
No high point NO<sub>2</sub> adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

The analyzer cooling fan filter(s) were cleaned.

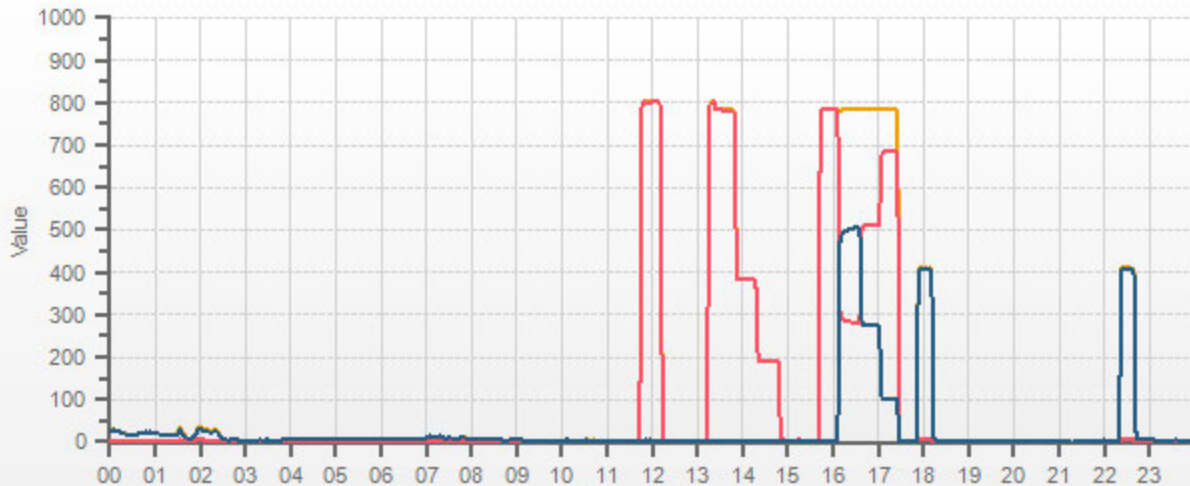
Date: January 4, 2019  
 Company/Airshed: LICA  
 Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 11:20 / 18:15  
 Calibration Purpose: routine monthly  
 Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



— NOX[ppb] — NO[ppb] — NO2[ppb]



CAL-LICA-201901-01248



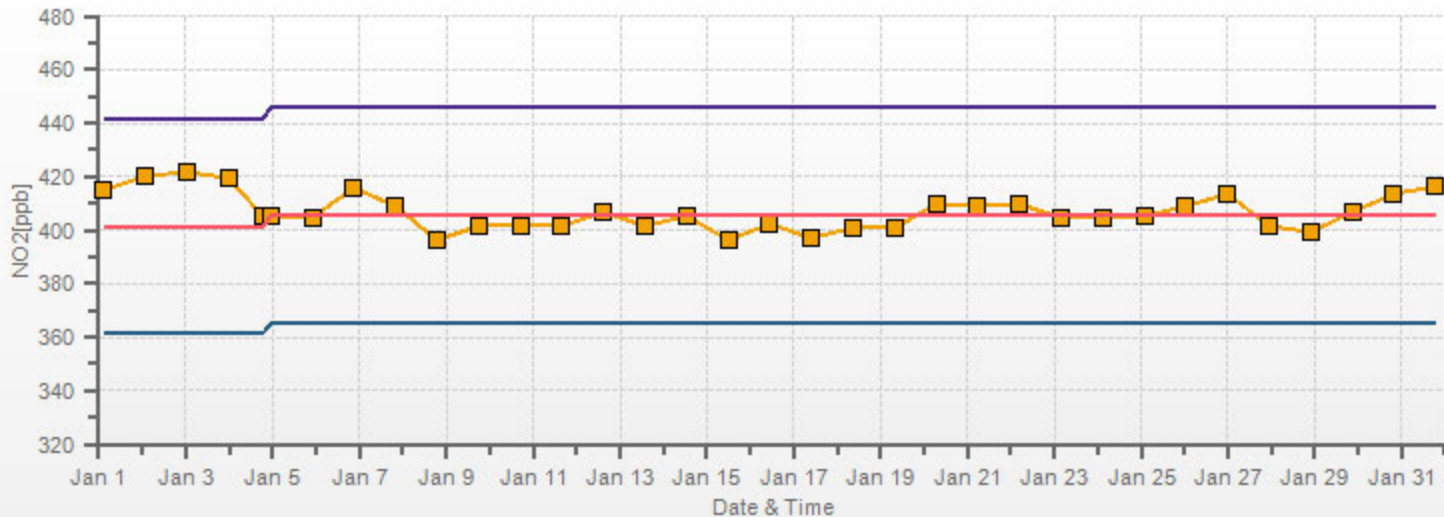
NOX[ppb] Calibration: LICA MASKWA Monthly: 19/01 Type: Span



CAL-LICA-201901-01248

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

NO2[ppb] Calibration: LICA MASKWA Monthly: 19/01 Type: Span



CAL-LICA-201901-01248

Span Meas Span Ref Span Low Span High



# Meteorological Sensor Audit/Calibration

## Location Information

Company:	LICA	Performed By:	Alex Yakupov
Audit Location:	Maskwa	Reviewed By:	Rob Fisher
Audit Date:	September 17, 2018	Start/End Time (mst):	9:36 / 12:48
Calibration Purpose:	installation	Weather Conditions:	Cloudy/Overcast

## Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1 V
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200 km/h
Serial #:	161465	Direction Voltage Output Range:	0-1 V
Previous Cal/Audit Date:	May 17, 2018	Direction Unit Output Range:	0-360 degrees

## Wind Calibrator Information

Calibrator I.D. and Expiry Date: Model 18860-90/18802 SN: CA 4744; expiration May 18, 2019

## Wind Speed Audit Data **\*\*+/- 2% of the average correction factor is the limit\*\***

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.1	0.1	-
1000	18.4	18.5	18.5	0.995
2000	36.9	36.9	36.9	1.000
3000	55.3	55.4	55.4	0.998
4000	73.7	73.8	73.8	0.999
5000	92.2	92.3	92.3	0.999
6000	110.6	110.8	110.8	0.998
7000	129.0	129.3	129.3	0.998
8000	147.4	147.7	147.7	0.998
9000	165.9	166.1	166.1	0.999
10000	184.3	184.9	184.9	0.997
The audit meets AMD requirements.			Average Correction Factor=	0.998

## Wind Direction Audit Data **\*\*+/- 3° of the absolute average degrees difference for all points is the limit\*\***

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	355	0.3	0.1	0.2
30	330	30	329	-0.4	0.7	0.5
60	300	62	300	-1.9	-0.3	1.1
90	270	91	270	-1.3	-0.3	0.8
120	240	121	241	-1.0	-0.8	0.9
150	210	152	212	-1.7	-1.7	1.7
180	180	181	182	-1.1	-2.0	1.6
210	150	211	152	-1.1	-1.8	1.5
240	120	241	122	-0.5	-1.8	1.2
270	90	270	91	-0.1	-0.8	0.5
300	60	300	61	0.4	-0.6	0.5
330	30	330	31	-0.1	-0.7	0.4
355	0	354	0	0.6	0.3	0.5
The audit meets AMD requirements.			Average Absolute Degrees Difference=		0.9	

Comments:



## Meteorological System Checklist

Date:	January 24, 2019		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	Maskwa		
<b>Unit:</b>	<b>Make:</b>	<b>Model:</b>	<b>Serial #:</b>
Precipitation Sampler:	Met One - Heated Rain Gauge	Part 387	F4418
<b>PRECIPITATION SENSOR CHECK</b>			
<b>Checklist:</b>	<b>Reply:</b>	<b>Comments:</b>	
Previous check date:	October 12, 2018	n/a	
Is the sensor Level?	yes	n/a	
Is the heater operating properly?	yes	The ticking device is iced and blocked. (The channel was left in "M" on Jan 23)	
Are the bucket drain holes clean?	yes	Iced and blocked. The issue fixed on Jan 24, 2019 at 10:30	
Is the screen on the housing? (screen should be on between July and September)	no	Screens removed for Winter season	
Is the housing clean?	yes	n/a	
Is the area around the housing clean and free from obstacles?	yes	n/a	
<b>TIP TEST - Slowly pour water until 10 tip are heard. (10 tips = 1 ml)</b>			
<b># of Tips</b>	<b>Data Logger Response (ml):</b>	<b>Manual Specification = +/- 0.1 ml</b>	
<b>10</b>	1.00	0.00	

Company: <u>Maxxam</u>		Operator: <u>Chris W</u>	
<b>Calibrator:</b>		<b>Flow Measurement Device:</b>	
Make/Model	<u>API 700</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>690</u>	Serial Number	<u>L-153351 H-152571</u>
Last Verification Date	<u>March 2016</u>	Temperature (°C)	<u>23.5 C</u>
NO Cylinder S/N	<u>LL108015</u>	Barometric Pressure	<u>695 mmHg</u>
NO [PPM]	<u>52.2</u>	NOx [PPM]	<u>52.3</u>
Expiry Date	<u>Oct 2020</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 <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4959	75.0	0.789	0.791	0.793	0.000	0.793	1%	0%
4971	36.5	0.383	0.384	0.384	0.000	0.384	0%	0%
4967	18.2	0.191	0.192	0.191	0.000	0.191	0%	-1%
Absolute Average Percent Difference							0%	0%

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

<b>NO</b>	<b>LIMITS</b>	<b>NOx</b>
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0054	<b>0.90-1.10</b>	m (Slope)= 1.0031
b (Intercept % of FS)= -0.0583	± 3% F.S.	b (Intercept % of FS)= -0.0795

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
4959	0.000	0.000	0.790	-0.001	0.789	NO <sub>2</sub>	% Diff. Limit
4959	0.500	0.497	0.293	0.493	0.786	-1%	± 10%
4959	0.275	0.273	0.517	0.269	0.787	-1%	± 10%
4959	0.100	0.102	0.688	0.099	0.787	-2%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

<b>NO<sub>2</sub></b>	<b>LIMITS</b>	
Correlation= 1.0000	≥ 0.995	
m (Slope)= 0.9946	<b>0.90-1.10</b>	
b (Intercept % of FS)= -0.1817	± 3% F.S.	

<b>AENV Standards</b>	<b>NO<sub>x</sub> Analyzer</b>
<b>Audit Calibrator</b>	Make/Model <u>Teco 42i</u>
Make/Model <u>Teco 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU 1809</u>	Last Calibration Date <u>March 14, 2018</u>
SRM Gas Cylinder No. <u>APEX1170572</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>49.99</u>	Cylinder Gas Expiry Date <u>November 2020</u>

COMMENTS: Cylinder contains 47.9 ppm SO<sub>2</sub>.

Auditor: Al Clark  
Operator Signature: *Chris W*

Date: March 15, 2018  
Location: McIntyre Center Edmonton

Company Maxxam Operator: Mike

<b>Calibrator:</b>		<b>Flow Measurement Device:</b>	
Make/Model	<u>Sabio</u>	Make/Model	<u>Bios Definer 220</u>
Serial Number	<u>11900613</u>	Serial Number	<u>H=128686; L=129069</u>
Last Verification Date	<u>March 16, 2018</u>	Temperature (°C)	<u>22.9 C</u>
NO Cylinder S/N	<u>LL104183</u>	Barometric Pressure	<u>698 mmHg</u>
NO [PPM]	<u>50.8</u>	NOx [PPM]	<u>50.9</u>
Expiry Date	<u>October 24, 2020</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5059</u>	Pt. #2	<u>5073</u>
		Pt. #3	<u>5073</u>
Gas Flow (sccm)			
Pt. #1	<u>77.5</u>	Pt. #2	<u>38.2</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 <sub>2</sub>	NOx	NO	NOx
5124	0.0	0.0000	0.0000	0.0000	-0.0001	0.0000	Limit ± 10%	
5059	77.5	0.7782	0.7797	0.7763	0.0005	0.7767	0%	0%
5073	38.2	0.3825	0.3833	0.3794	0.0000	0.3795	-1%	-1%
5073	19.1	0.1913	0.1916	0.1904	0.0000	0.1904	0%	-1%
Absolute Average Percent Difference							1%	1%

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

<u>NO</u>		<u>LIMITS</u>		<u>NOx</u>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9975	0.90-1.10		m (Slope)=	0.9960
b (Intercept % of FS)=	-0.0616	± 3% F.S.		b (Intercept % of FS)=	-0.0661

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
5059	0.0	0.0000	0.7741	0.0000	0.7741	NO <sub>2</sub>	% Diff. Limit
5059	500.0	0.4918	0.2823	0.4916	0.7739	0%	± 10%
5059	275.0	0.2774	0.4967	0.2780	0.7747	0%	± 10%
5059	100.0	0.1031	0.6710	0.1032	0.7743	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

<u>NO<sub>2</sub></u>		<u>LIMITS</u>	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9998	0.90-1.10	
b (Intercept % of FS)=	0.0173	± 3% F.S.	

<u>AENV Standards</u>		<u>NO<sub>x</sub> Analyzer</u>	
<u>Audit Calibrator</u>			
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>August 16, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 15, 2020</u>

COMMENTS: \_\_\_\_\_

Auditor: Shea Beaton Date: August 22, 2018  
Operator Signature: \_\_\_\_\_ Location: McIntyre Center Edmonton



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-482CGA

**Company:** Maxxam **Operator's Name:** Mike  
**Cylinder #:** LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair  
**Expiry Date:** October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&amp;R MFC 201</u>	Make/Model: <u>Mesa Definer 220</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>H-133034 / L-132702</u>
Last Verification Date: <u>December 13, 2017</u>	Temp. °C: <u>23.4 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>707 mmHg</u>
Cylinder Number: <u>CAL016625</u>	
Expiry Date: <u>January 2019</u>	

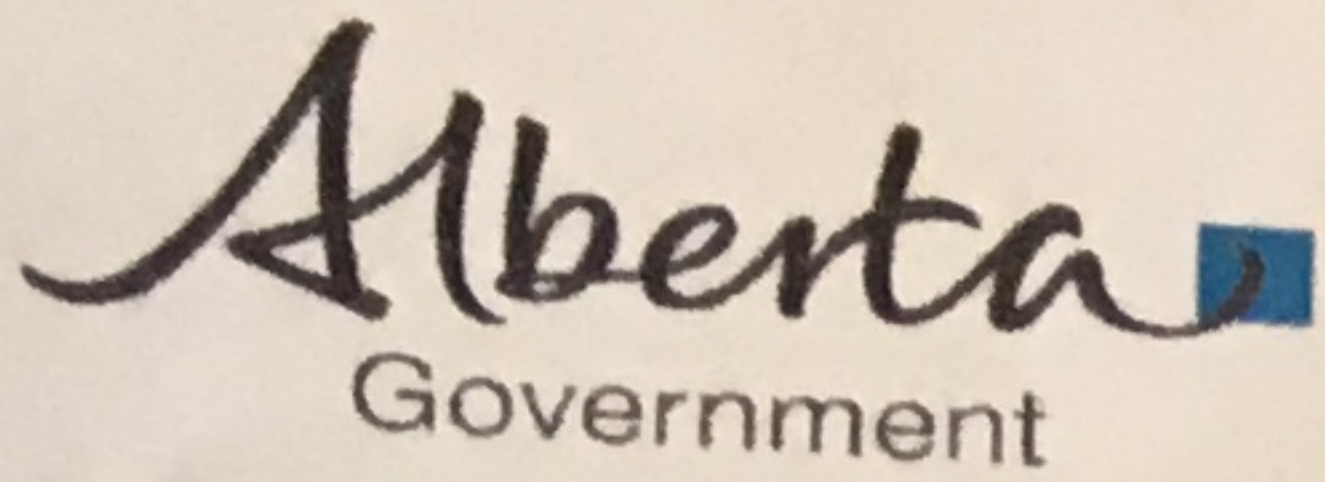
**Reference Analyzer:**  
 Make/Model: Teco 43C Serial/AMU Number: 1623  
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0  
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	<del>0.000</del>	<del>0.000</del>	<del>0.000</del>
4989	79.5	0.764	0.01594	62.755	47.9
4995	39.6	0.380	0.00793	126.136	47.9
4992	19.6	0.188	0.00393	254.694	47.9
Average Cylinder Concentration:					<b>47.9</b>

Previous Stated Concentration PPM: 49.2  
 Percent variance from Stated: 3

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: December 13, 2017  
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike  
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%): 2 Certified By: Praxair  
 Expiry Date: October 2020

**Reference Calibrator and Gas:**  
 Make/Model: Sabio 2010  
 Serial Number: AMU 2092  
 Last Verification Date: January 17, 2018  
 Gas Type: H2S Conc. 20.43  
 Cylinder Number: CAL015272  
 Expiry Date: January 2019

**Flow Measurement Device:**  
 Make/Model: Mesa Defender 530  
 Serial Number: H-153961 / L-153874  
 Temp. °C: 23.0 C  
 B.P.: 697 mmHg

**Reference Analyzer:**  
 Make/Model: Teco 450i Serial/AMU Number: 1980  
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1  
 Last Calibration: Date: Jan 17/18 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	<del>0.0000</del>	<del>0.0000</del>	<del>0.0000</del>
5051	39.6	0.0753	0.00784	127.551	9.60
5028	20.2	0.0387	0.00402	248.911	9.63
5033	10.5	0.0198	0.00209	479.333	9.49
Average Cylinder Concentration:					<b>9.58</b>

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

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

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: *Al Clark*

Location: McIntyre Center Edmonton







# Calibration Gas Audit

## NO Cylinder Gas

File No. 2017-483CGA

**Company:** Maxxam                      **Operators name:** Mike

Cylinder #: LL104225    Conc (PPM) 51.5/51.6    Tolerance (%) 2    Certified By: Praxair

Expiry Date: October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model <u>Teco 146i</u>	Make/Model <u>Mesa Definer 220</u>
Serial Number <u>AMU 1809</u>	Serial Number <u>H-133034 / L-132702</u>
Last Verification Date <u>December 13, 2017</u>	Temp. °C <u>23.4 C</u>
Gas Type <u>NO</u> Conc. <u>50.03</u>	B.P. <u>707 mmHg</u>
Cylinder Number <u>APEX 1223938</u>	
Expiry Date <u>June 2020</u>	

**Reference Analyzer:**

Make/Model Teco 42i                      Serial/AMU Number: 1868

Instrument Settings                      Zero: 4.7                      Span: 1.004                      Range: 1.0

Last Calibration:                      Date: Dec12/17                      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				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						<b>51.3</b>	<b>51.1</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</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

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark                      Date: December 13, 2017

Operator Signature: *Al Clark*                      Location: McIntyre Center Edmonton



**Lakeland Industry & Community Association**

**JANUARY 2019**

**Ambient Air Monitoring Calibration Report**

**- ST. LINA STATION-**

**CAL-LICA-201901-01250**

**Station Operation and Maintenance:**

Maxxam Analytics

**Data Validation and Report:**

Maxxam Analytics

March 15, 2019

Alberta Environment and Parks (AEP)  
[Air.Reporting@gov.ab.ca](mailto:Air.Reporting@gov.ab.ca)

March 15, 2019

**Subject:**

**January 2019 Ambient Air Monitoring Calibration Report Submission for the LICA St. Lina Station**

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring calibration report for the LICA St. Lina AQM Station in the month of January 2019. This calibration report includes equipment calibration records, calibrator performance audit records and calibration gas audit records for the equipment that were used this month. This calibration report is prepared by the LICA network contractor.

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


Respectfully,



Michael Bisaga  
Technical Program Manager  
Lakeland Industry & Community Association  
780-266-7068  
[monitoring@lica.ca](mailto:monitoring@lica.ca)



Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[monitoring@lica.ca](mailto:monitoring@lica.ca)



**JANUARY 1 - 31, 2019**  
**MONTHLY CALIBRATION REPORT**  
**Project #: 2833-2019-01-25-C**  
**LICA-201901**

**Prepared for:**

**Lakeland Industry & Community Association**

**Mike Bisaga**

5107 50 St.  
Bonnyville, Alberta T9N 2J7  
monitoring@lica.ca  
780-266-7068

**St. Lina Continuous Monitoring Station**

**Date of Report Issuance: February 28, 2019**



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

CAL-LICA-201901-01250



### Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

Date:	January 21, 2019	Barometer/B.P./units:	F.S.# 05544 expires Jan 17, 2020	930	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mix of sun and clouds		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	13:04	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	17:41	Cal Gas Expiry Date:	October 24, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	1180930030   LICA	Range ppb:	1000		
Last Calibration Date:	December 17, 2018	As Found C.F.:	1.025		
Previous C.F.:	1.000	New C.F.:	1.000		

Calibration Standards:	Standard Calibration Points for Ranges
Low Flow Meter ID/Expiry Date:	N/A
High Flow Meter ID/Expiry Date:	N/A
Calibrator ID/Expiry Date:	API id# 690 expires March 15, 2019
Cal Gas Cylinder I.D. #:	LL 104225
Cal Gas Conc. (ppm):	49.2

Point	ppb
High	780
Mid	380
Low	190

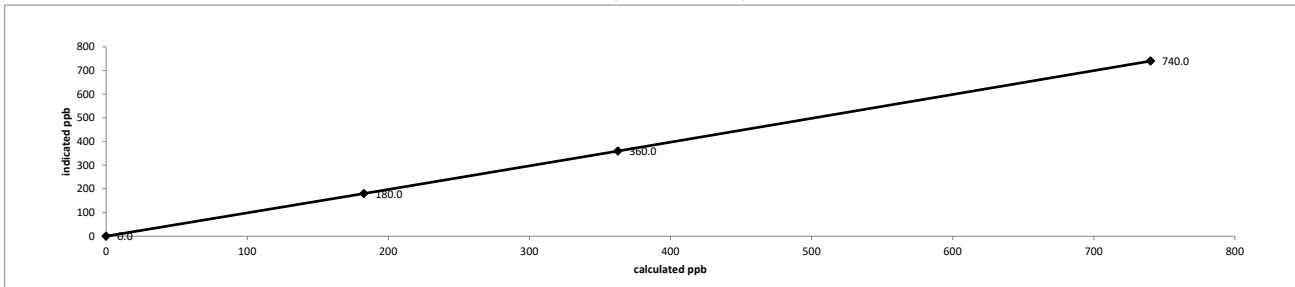
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5037	0.00	5037	0.0	0	n/a
as found high	4958	75.74	5034	740.2	722	1.025
adjusted zero	5037	0.00	5037	0.0	0	n/a
adjusted high	4958	75.74	5034	740.2	740	1.000
mid	4925	36.58	4962	362.7	360	1.008
low	4933	18.38	4951	182.6	180	1.015
calibrator zero	5037	0.00	5037	0.0	0	n/a
Average C.F. =						1.008

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		0.95-1.05
b (Intercept as % of full scale) =	0.16%		± 3% F.S.
% change in C.F. from last cal =	-2.53%		± 10%

Thermo 431-TLE Sulphur Dioxide Analyzer Calibration



As found:		As left:	
Bkg:	3.83	Bkg:	3.94
Coef:	1.056	Coef:	1.080
Pmt:	-696.0	Pmt:	-697.5
Flash:	1000	Flash:	1000
Internal:	32.4	Internal:	33.8
Chamber:	45.0	Chamber:	45.2
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Heater:	44.15	Perm Oven Heater:	44.16
Pressure:	671.7	Pressure:	670.2
Sample Flow:	0.435	Sample Flow:	0.435
Lamp Intensity:	91	Lamp Intensity:	91
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	644.0	Expected Value:	622.0

Comments:

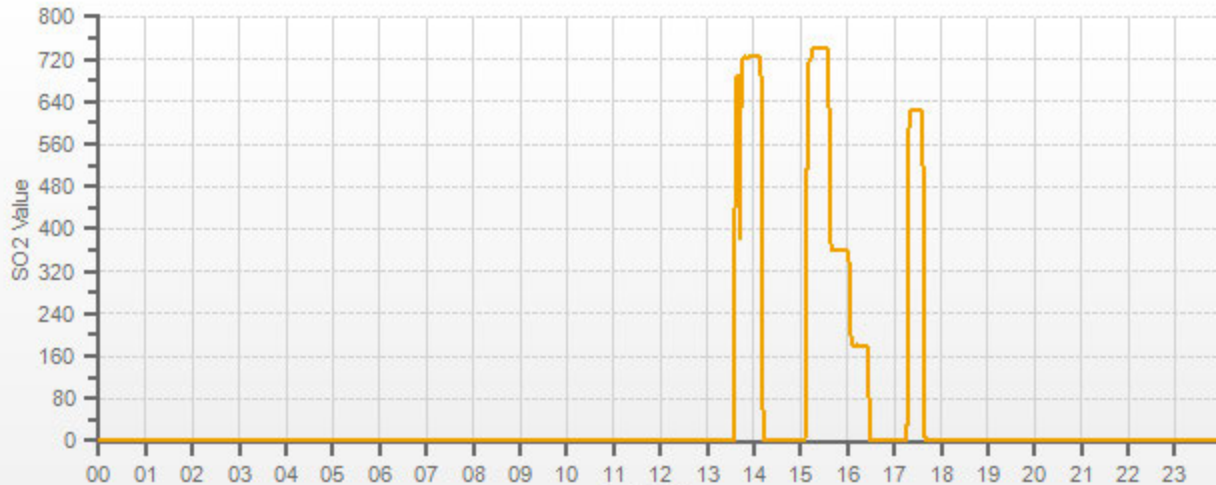
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

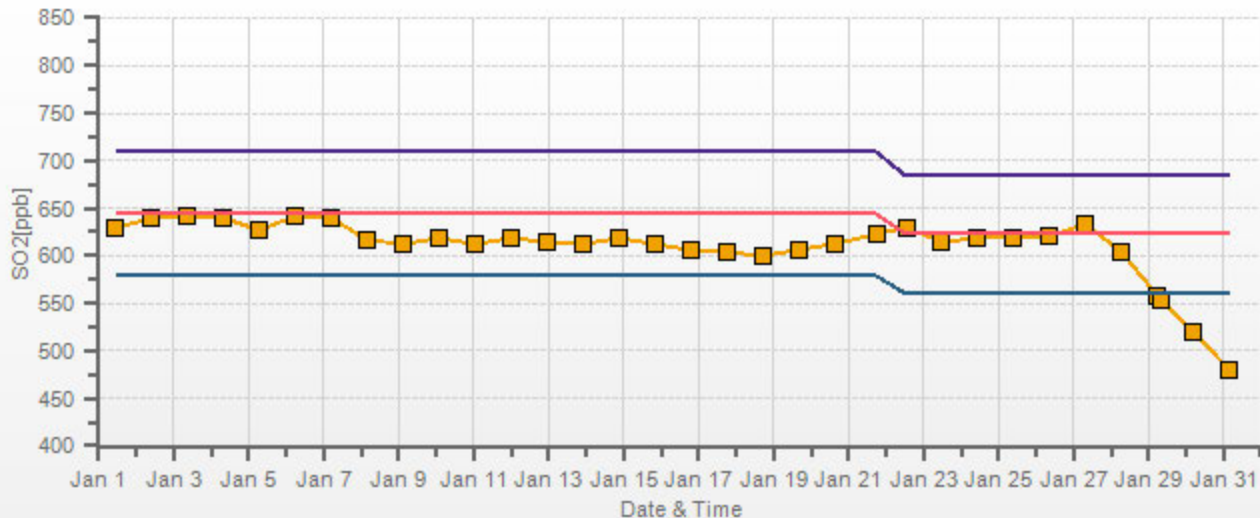
The calibrator was reset to deliver the required concentration prior to the As-Found High point. The As-Found High started at 13:45.

SO2[ppb]



CAL-LICA-201901-01250

SO2[ppb] Calibration: LICA ST. LINA Monthly: 19/01 Type: Span



CAL-LICA-201901-01250

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





### Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	January 18, 2019	Barometer/B.P./units:	Station BP gauge	933	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Cloudy/Overcast		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	shut down		
Start Time 24 hr. (mst):	11:41	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	14:44	Cal Gas Expiry Date:	October 20, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	CM 18010058   LICA	Range ppb:	100		
Last Calibration Date:	December 17, 2018	As Found C.F.:	1.057		
Previous C.F.:	0.999	New C.F.:	n/a		

Calibration Standards:		Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):
Low Flow Meter ID/Expiry Date:	N/A	Point	ppb
High Flow Meter ID/Expiry Date:	N/A	High	78
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019	Mid	38
Cal Gas Cylinder I.D. #:	EY 0001003	Low	19
Cal Gas Conc. (ppm):	9.55		
			Start/End Time 24 hr.: 11:50 / 12:05
			SO2 Analyzer Range: 1000
			Target Concentration (ppb): 780
			As Found Zero: 0.6
			Analyzer Response: (ppb): 0.6
			Zero Corrected Result (ppb): 0.0

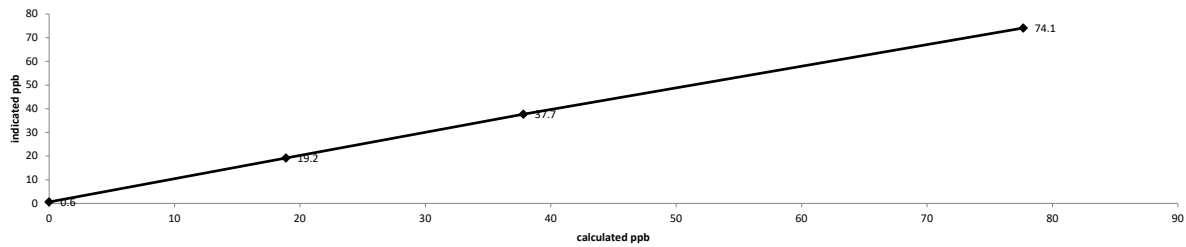
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	0.6	n/a
as found high	7439	61.00	7500	77.7	74.1	1.057
mid	7469	29.70	7499	37.8	37.7	1.019
low	7470	14.80	7485	18.9	19.2	1.015
Average C.F. =						1.030

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.058		0.90-1.10
b (Intercept as % of full scale) =	-1.22%		± 3% F.S.
% change in C.F. from last cal =	-5.78%		± 10%

Thermo 450i Hydrogen Sulphide Analyzer Calibration



**As found:**

Bkg:	33.0
Coef:	0.912
Pmt:	-634.2
Flash:	908
Internal:	34.6
Chamber:	45.2
Converter Temp:	326.5
Converter Set:	325.0
Perm Oven Gas:	45.00
Perm Oven Htr:	44.11
Pressure:	588.7
Sample Flow:	0.830
Lamp Intensity:	91
Averaging Time:	120
Expected Value:	30.7

**As left:**

Bkg:	n/a
Coef:	n/a
Pmt:	n/a
Flash:	n/a
Internal:	n/a
Chamber:	n/a
Converter Temp:	n/a
Converter Set:	n/a
Perm Oven Gas:	n/a
Perm Oven Htr:	n/a
Pressure:	n/a
Sample Flow:	n/a
Lamp Intensity:	n/a
Averaging Time:	n/a
Expected Value:	n/a

Comments:

The manifold blower was found to be working normally.

A Shut-down calibration was completed to renew SO2 scrubber beads.



## Thermo 450i Hydrogen Sulphide Analyzer Calibration

<b>Date:</b> January 18, 2019	<b>Barometer/B.P./units:</b> Station BP gauge	933	millibars
<b>Company/Airshed:</b> LICA	<b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019	22	°C
<b>Location/Station Name:</b> St. Lina	<b>Weather Conditions:</b> Cloudy/Overcast		
<b>Parameter:</b> Hydrogen Sulphide	<b>Calibration Purpose:</b> post repair		
<b>Start Time 24 hr. (mst):</b> 15:02	<b>Performed By/Reviewer:</b> Alex Yakupov	Rob Fisher	
<b>End Time 24 hr. (mst):</b> 18:24	<b>Cal Gas Expiry Date:</b> October 20, 2020		
<b>Calibration Method:</b> Gas Dilution	<b>Converter Model &amp; s/n (if applicable):</b> n/a		
<b>Analyzer:</b>			
<b>Serial Number/Owner:</b> CM 18010058   LICA	<b>Range ppb:</b> 100		
<b>Last Calibration Date:</b> December 17, 2018	<b>As Found C.F.:</b> n/a		
<b>Previous C.F.:</b> 0.999	<b>New C.F.:</b> 1.000		

<b>Calibration Standards:</b>	<b>Standard Calibration Points for Ranges</b>	<b>SO2 Scrubber Check (10 minutes):</b>								
<b>Low Flow Meter ID/Expiry Date:</b> 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	<b>Start/End Time 24 hr.:</b> 15:08 / 15:27
Point	ppb									
High	78									
Mid	38									
Low	19									
<b>High Flow Meter ID/Expiry Date:</b> N/A		<b>SO2 Analyzer Range:</b> 1000								
<b>Calibrator ID/Expiry Date:</b> API id# 690 expires March 15, 2019		<b>Target Concentration (ppb):</b> 780								
<b>Cal Gas Cylinder I.D. #:</b> EY 0001003		<b>As Found Zero:</b> 3.5								
<b>Cal Gas Conc. (ppm):</b> 9.55		<b>Analyzer Response: (ppb):</b> 3.5								
		<b>Zero Corrected Result (ppb):</b> 0.0								

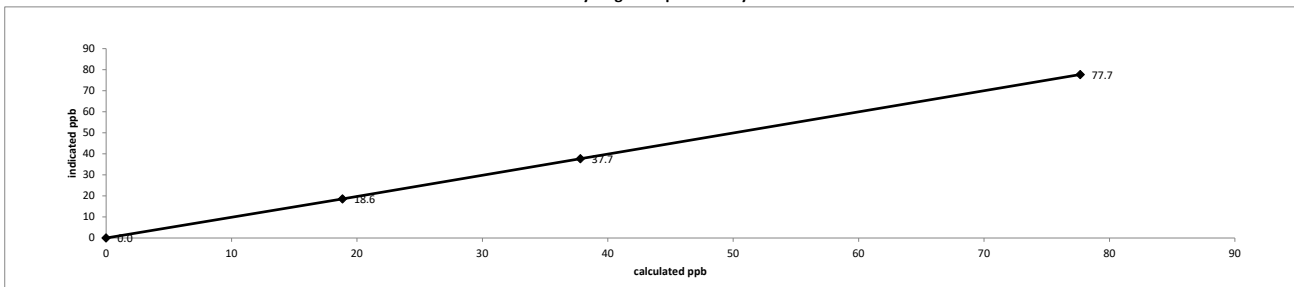
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
adjusted zero	7500	0.00	7500	0.0	0	n/a
adjusted high	7439	61.00	7500	77.7	77.7	1.000
mid	7469	29.70	7499	37.8	37.7	1.003
low	7484	14.80	7499	18.8	18.6	1.013
calibrator zero	7500	0.00	7500	0.0	0	n/a
<b>Average C.F. =</b>						<b>1.005</b>

**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b> 1.000	<b>LIMITS</b>
<b>Slope =</b> 0.999	> or = 0.995
<b>b (Intercept as % of full scale) =</b> 0.13%	0.95-1.05
<b>% change in C.F. from last cal =</b> n/a	± 3% F.S.
	n/a

**Thermo 450i Hydrogen Sulphide Analyzer Calibration**



<b>As found:</b>	<b>As left:</b>
Bkg: n/a	Bkg: 31.4
Coef: n/a	Coef: 0.837
Pmt: n/a	Pmt: -633.8
Flash: n/a	Flash: 904
Internal: n/a	Internal: 34.2
Chamber: n/a	Chamber: 45.2
Converter Temp: n/a	Converter Temp: 323.6
Converter Set: n/a	Converter Set: 325.0
Perm Oven Gas: n/a	Perm Oven Gas: 45.00
Perm Oven Htr: n/a	Perm Oven Htr: 44.08
Pressure: n/a	Pressure: 588.4
Sample Flow: n/a	Sample Flow: 0.828
Lamp Intensity: n/a	Lamp Intensity: 89
Averaging Time: n/a	Averaging Time: 120
Expected Value: n/a	Expected Value: 28.1

**Comments:**

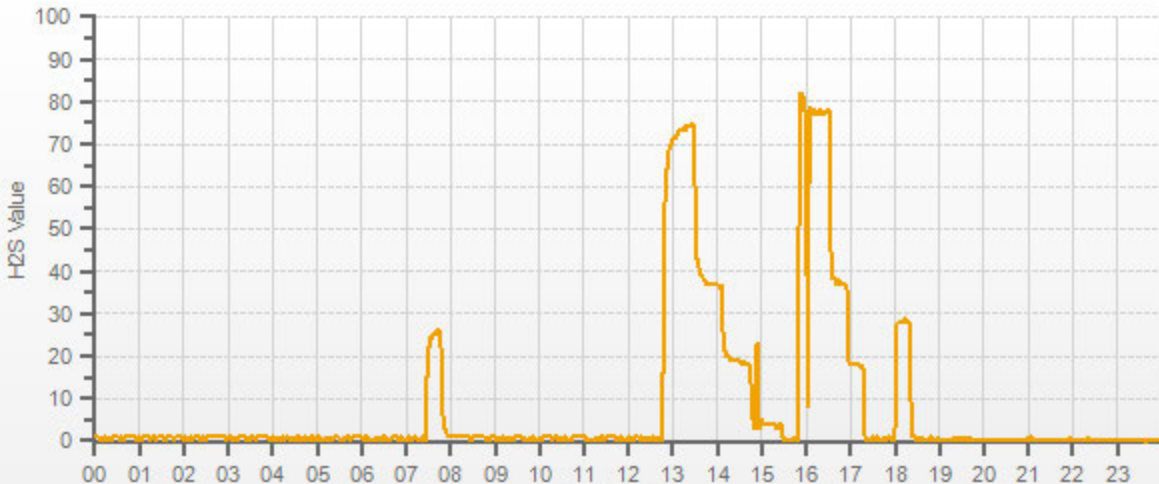
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

A Post-repair calibration was completed after SO2 scrubber beads were renewed in the SO2 scrubber. The scheduled ZS check interfered with calibration at 16:00. The Adjusted High restarted at 16:07.

H2S[ppb]



CAL-LICA-201901-01250

H2S[ppb] Calibration: LICA ST. LINA Monthly: 19/01 Type: Span



CAL-LICA-201901-01250

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



### Thermo 55i Methane/Non-Methane Analyzer Calibration

<b>Date:</b> January 21, 2019	<b>Barometer/B.P./units:</b> F.S. # 05544 expires Jan 17, 2020   930   millibars
<b>Company/Airshed:</b> LICA	<b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019   23   °C
<b>Location/Station Name:</b> St. Lina	<b>Weather Conditions:</b> Mix of sun and clouds
<b>Parameter:</b> CH4 / NMHC / THC	<b>Calibration Purpose:</b> routine monthly
<b>Start/End Time 24 hr. (mst):</b> 13:04 / 17:28	<b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher
<b>Calibration Method:</b> Gas Dilution	<b>Cal Gas Expiry Date:</b> August 1, 2026

<b>Analyzer:</b>	<b>Correction Factors:</b>												
<b>Serial Number/Owner:</b> 1180930025   LICA	<b>Previous C.F.:</b>												
<b>Measured Flow:</b> 1242	<b>As Found C.F.:</b>												
<b>Last Calibration Date:</b> December 18, 2018	<b>New C.F.:</b>												
<b>Range ppm:</b> 20 CH4/20 NMHC/40 THC	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>CH<sub>4</sub> =</td> <td>1.000</td> <td>0.969</td> <td>1.000</td> </tr> <tr> <td>NMHC =</td> <td>1.000</td> <td>0.955</td> <td>1.000</td> </tr> <tr> <td>THC =</td> <td>1.000</td> <td>0.963</td> <td>1.000</td> </tr> </table>	CH <sub>4</sub> =	1.000	0.969	1.000	NMHC =	1.000	0.955	1.000	THC =	1.000	0.963	1.000
CH <sub>4</sub> =	1.000	0.969	1.000										
NMHC =	1.000	0.955	1.000										
THC =	1.000	0.963	1.000										

**Calibration Standards:**

<b>Low Flow Meter ID/Expiry Date:</b> N/A	<b>Standard Calibration Points for Analyzer Range of 20/20/40 ppm</b>
<b>High Flow Meter ID/Expiry Date:</b> N/A	
<b>Calibrator ID/Expiry Date:</b> Sabio id# 11900613 expires August 22, 2019	
<b>Cal Gas Cylinder I.D. #:</b> LL 29687	
<b>CH4 Cylinder Conc.:</b> 598.0   198.0 =C <sub>2</sub> H <sub>6</sub> Cylinder Conc.	
<b>CH<sub>4</sub> expressed as C<sub>2</sub>H<sub>6</sub>:</b> 544.5   1142.5 =total CH4 equivalent	

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

Point	Calibrator Flow Rates (cc/min)			Calculated CH <sub>4</sub> (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH <sub>4</sub> (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH <sub>4</sub>	NMHC	THC
as found zero	2500	0.00	2500	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2428	56.80	2485	13.67	12.45	26.11	14.11	13.03	27.13	0.969	0.955	0.963
adjusted zero	2500	0.00	2500	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2428	56.80	2485	13.67	12.45	26.11	13.67	12.45	26.12	1.000	1.000	1.000
mid	2438	30.60	2469	7.41	6.75	14.16	7.38	6.76	14.14	1.004	0.998	1.001
low	2475	13.10	2488	3.15	2.87	6.02	3.17	2.94	6.11	0.993	0.975	0.985
calibrator zero	2500	0.00	2500	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
<b>Average C.F. =</b>										0.999	0.991	0.995

**Linear Regression/Calibration Results:**

	CH <sub>4</sub>	NMHC	THC	LIMITS
<b>Correlation Coefficient =</b>	1.000	1.000	1.000	> or = 0.995
<b>Slope =</b>	0.999	0.998	0.999	0.95-1.05
<b>b (Intercept as % of full scale) =</b>	0.02%	0.16%	0.09%	± 3% F.S.
<b>% change in C.F. from last cal =</b>	3.13%	4.48%	3.74%	± 10%

**As Left Instrument Diagnostics:**

<b>Interface Board Voltages:</b>	<b>Calibration History cnt'd:</b>
<b>Temperatures:</b>	<b>Crucial Settings:</b>
<b>Cylinder Pressures/reg.:</b>	<b>Run History&gt;1:</b>
<b>Internal Pressures:</b>	<b>Expected Values:</b>
<b>FID Status:</b>	
<b>Flame and Power Stats:</b>	
<b>Calibration History:</b>	

**Comments:**

The analyzer sample inlet filter was changed.

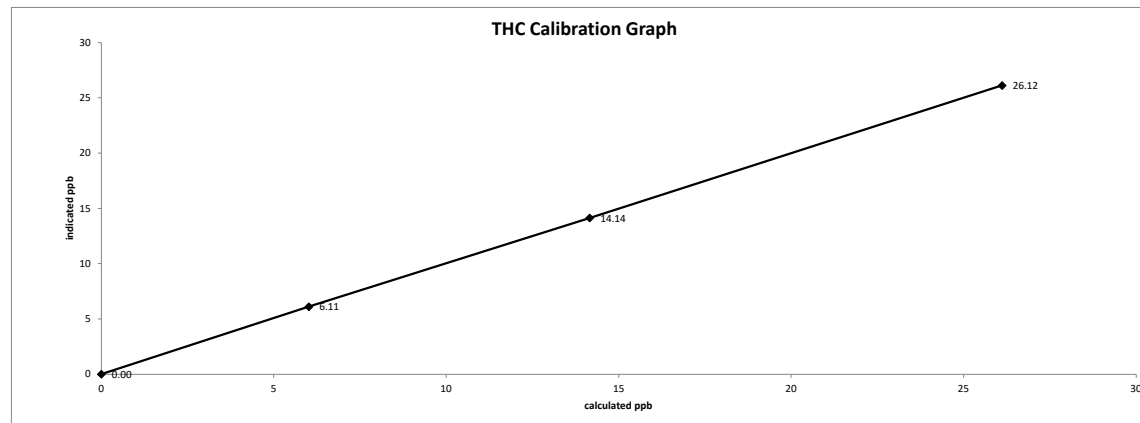
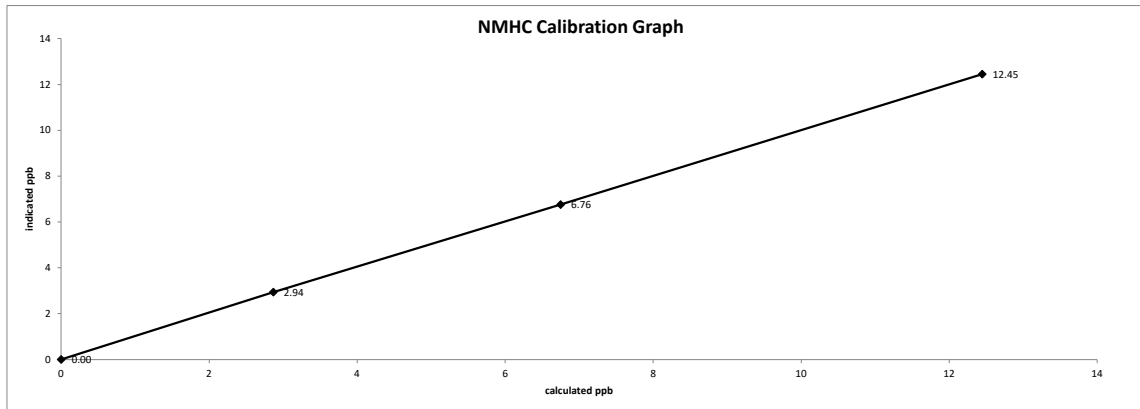
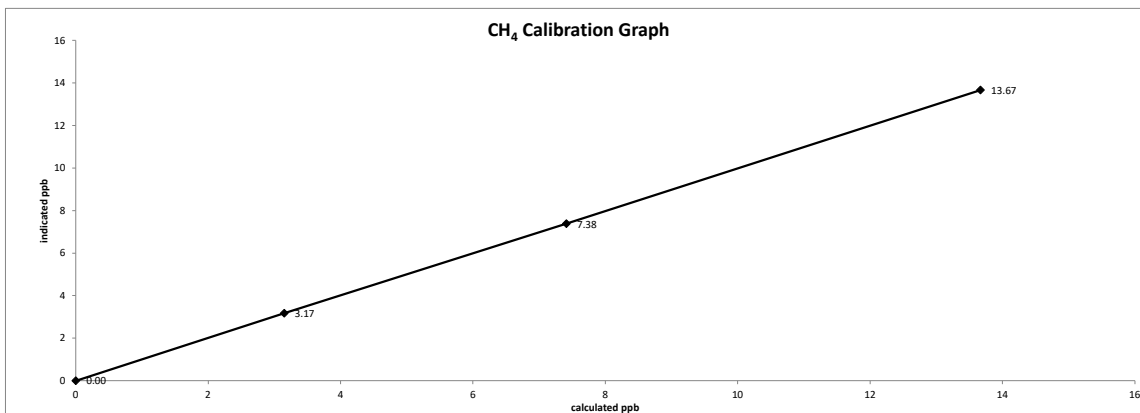
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

The analyzer cooling fan filter(s) were cleaned.

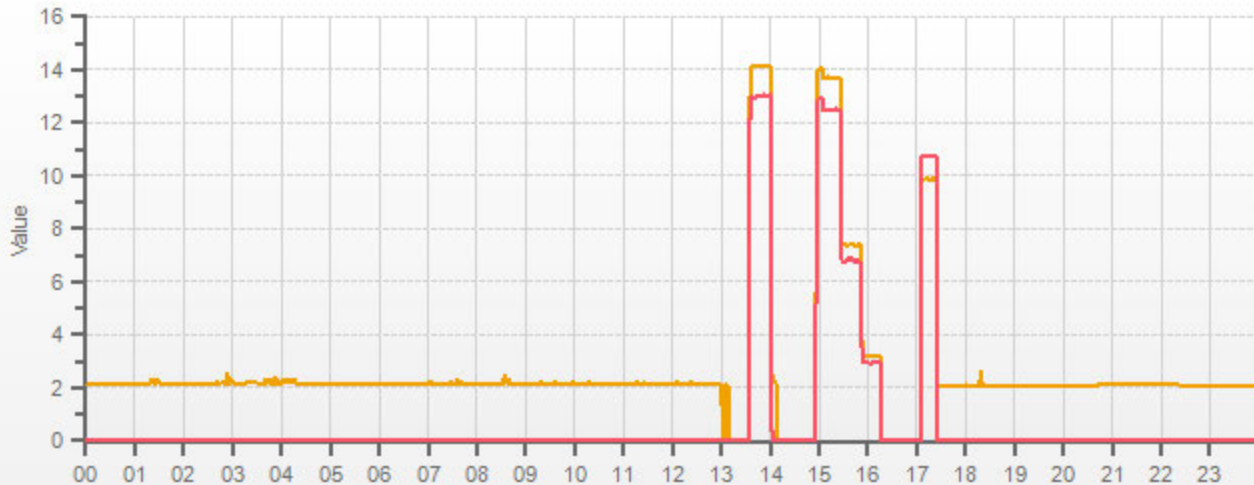
The manifold blower was found to be working normally.

Date: January 21, 2019  
Company/Airshed: LICA  
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 13:04 / 17:28  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution

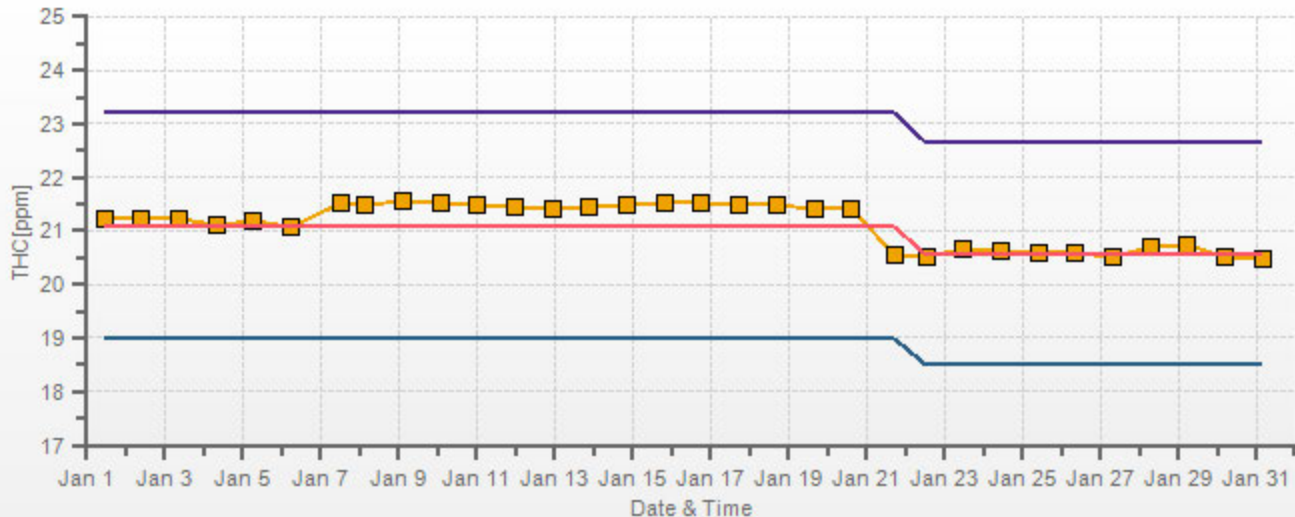


CH4[ppm] NMHC[ppm]



CAL-LICA 201901-01250

THC[ppm] Calibration: LICA ST. LINA Monthly: 19/01 Type: Span

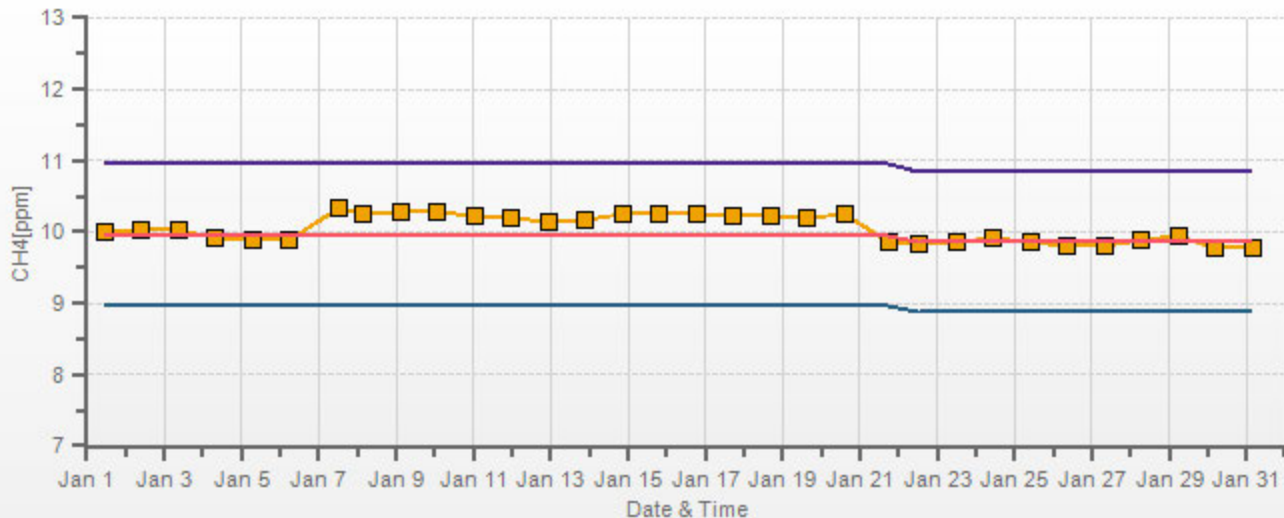


CAL-LICA-201901-01250

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

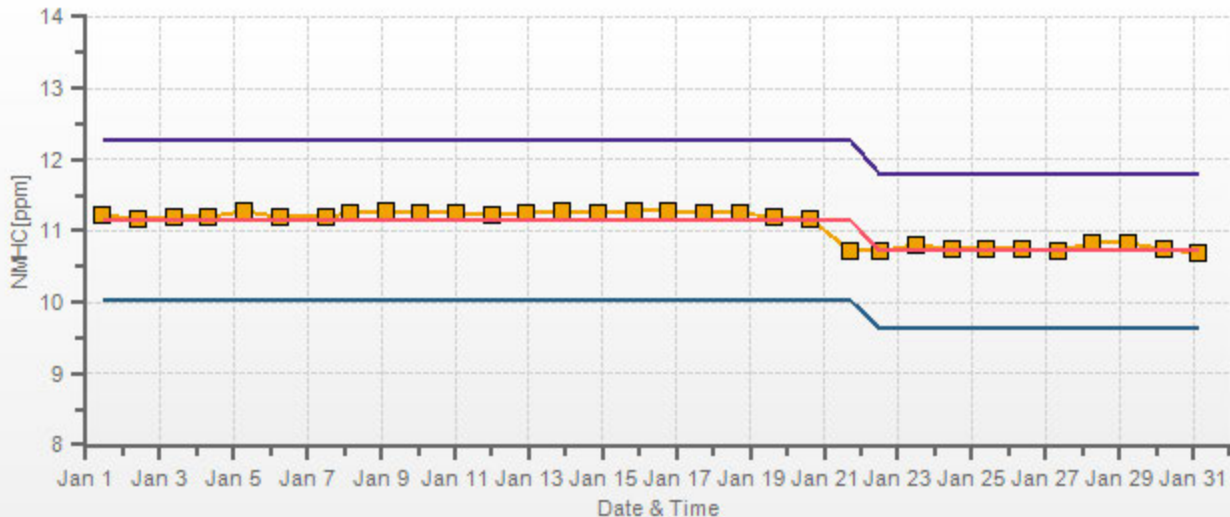


CH4[ppm] Calibration: LICA ST. LINA Monthly: 19/01 Type: Span



CAL-LICA-201901-01250

Span Meas Span Ref Span Low Span High



CAL-LICA-201901-01250

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



## Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: January 21, 2019 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 13:04 / 19:56 G.P.T. to be used for Ozone?: No Calibration Method: Gas Dilution & Gas Phase Titration	Barometer/B.P./units: F. S. # 05544 expires Jan 17, 2020    930    millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019    23    °C Weather Conditions: Mix of sun and clouds Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov    Rob Fisher Cal Gas Expiry Date: October 24, 2020
--	--

Analyzer:  Serial Number/Owner: 1180930029    LICA Last Calibration Date: December 17, 2018 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>1.004</td> <td>1.000</td> </tr> <tr> <td>NO<sub>2</sub> =</td> <td>1.000</td> <td>0.998</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.004</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.004	1.000	NO <sub>2</sub> =	1.000	0.998	1.000	NOx =	1.000	1.004	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.004	1.000														
NO <sub>2</sub> =	1.000	0.998	1.000														
NOx =	1.000	1.004	1.000														

Calibration Standards:  Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5    51.6	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 NO<sub>2</sub> (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 <sub>2</sub> (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 <sub>2</sub> (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	5037	0.0	5037	0	0	0.0	0.0	n/a	n/a
as found high	4958	75.7	5034	774.9	776.4	772.0	773.0	1.004	1.004
adjusted zero	5037	0.00	5037	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4958	75.74	5034	774.9	776.4	775.0	776.0	1.000	1.000
mid	4925	36.58	4962	379.7	380.4	377.0	377.0	1.007	1.009
low	4933	18.38	4951	191.2	191.6	189.0	189.0	1.012	1.014
calibrator zero	5037	0.00	5037	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.006	1.008

**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 <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4958	75.74	5034	0.0	775.0	776.0	1.0	0.0	1.0	
as found high NO2	4958	75.74	5034	500.0	275.0	777.0	502.0	500.0	501.0	0.998
adjusted high NO2	4958	75.74	5034	500.0	275.0	776.0	501.0	500.0	500.0	1.000
gpt mid	4958	75.74	5034	275.0	503.0	776.0	273.0	272.0	272.0	1.000
gpt low	4958	75.74	5034	100.0	676.0	776.0	100.0	99.0	99.0	1.000
Average NO <sub>2</sub> C.F.=										1.000

**Linear Regression/Calibration Results:**

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	1.000	1.002	0.95-1.05
b (Intercept as % of full scale)=	-0.14%	-0.16%	0.06%	± 3% F.S.
% change in C.F. from last cal=	-0.37%	-0.43%	0.20%	± 10%
NO2 converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	5.2	NO Bkg:	5.2
NOx Bkg:	5.4	NOx Bkg:	5.4
NO Coef:	1.147	NO Coef:	1.151
NO2 Coef:	0.995	NO2 Coef:	0.999
NOx Coef:	0.999	NOx Coef:	1.000
PMT:	-824.4	PMT:	-824.4
Internal:	29.7	Internal:	30.5
Chamber:	50.0	Chamber:	49.9
Cooler:	-3.0	Cooler:	-3.1
NO2 Converter:	322.6	NO2 Converter:	322.4
NO2 Converter Set:	325.0	NO2 Converter Set:	325.0
Perm Oven Gas:	45.01	Perm Oven Gas:	45.00
Perm Oven Heater:	44.18	Perm Oven Heater:	44.17
Pressure:	256.0	Pressure:	256.3
Flow:	0.534	Flow:	0.536
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	3	Expected Value NO:	3
Expected Value NO2:	401	Expected Value NO2:	390
Expected Value NOx:	405	Expected Value NOx:	393

**Comments:**

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

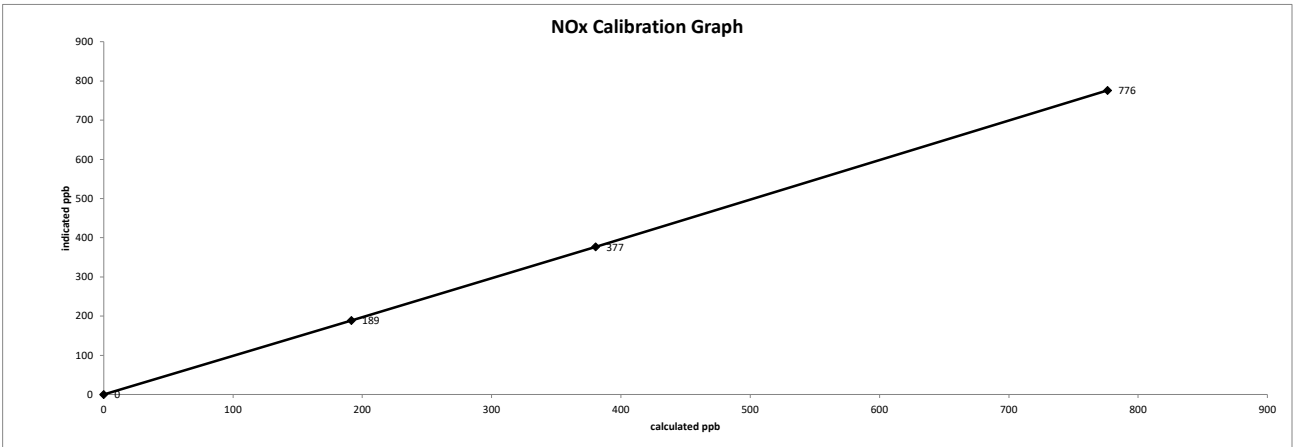
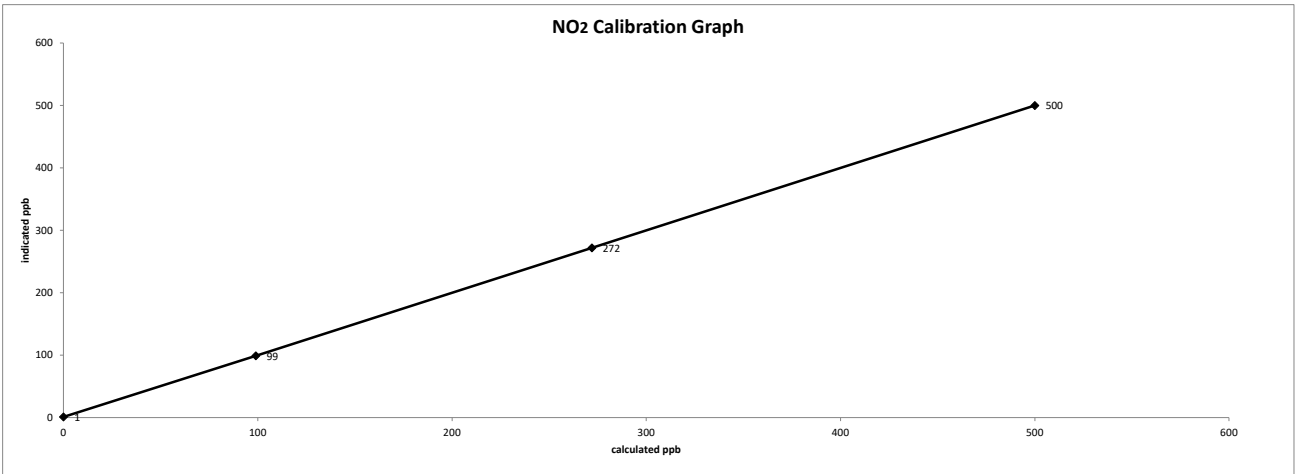
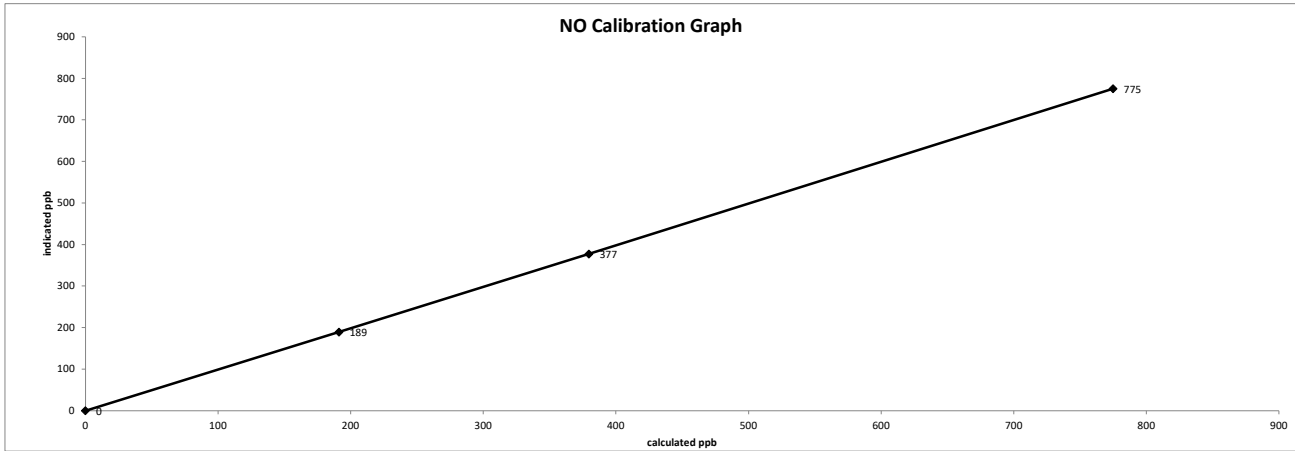
The analyzer cooling fan filter(s) were cleaned.

The converter cooling fan filter was cleaned.

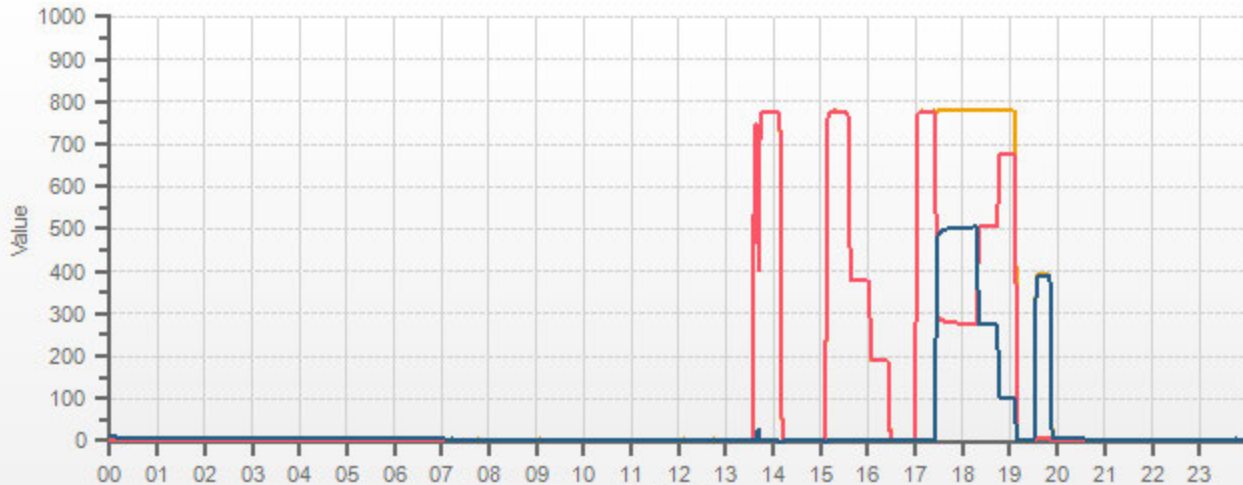
Date: January 21, 2019  
 Company/Airshed: LICA  
 Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 13:04 / 19:56  
 Calibration Purpose: routine monthly  
 Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration

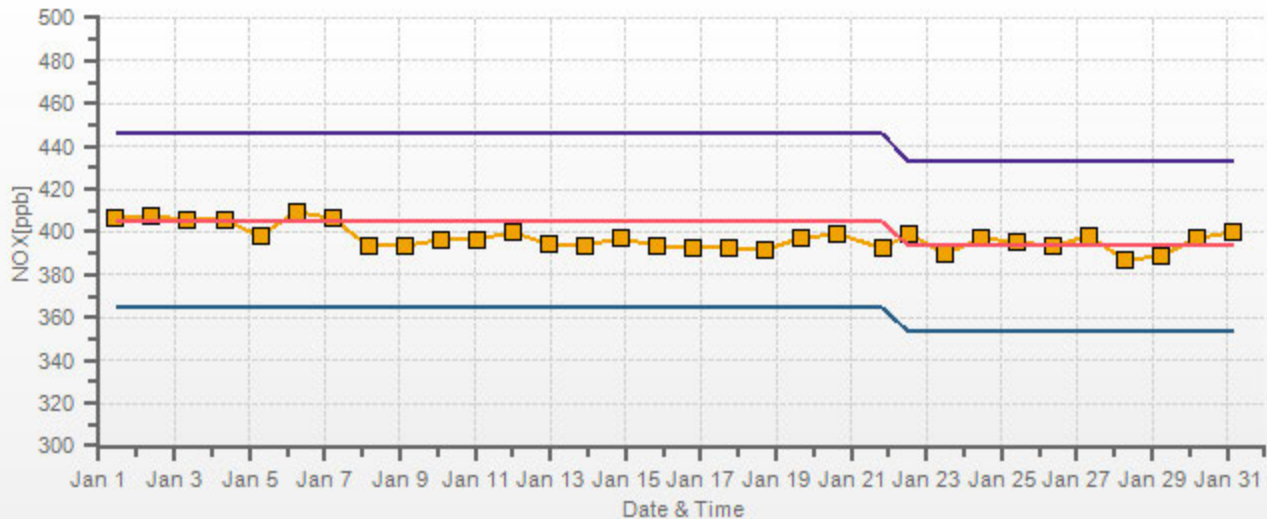


— NOX[ppb] — NO[ppb] — NO2[ppb]



CAL-LICA-201901-01250

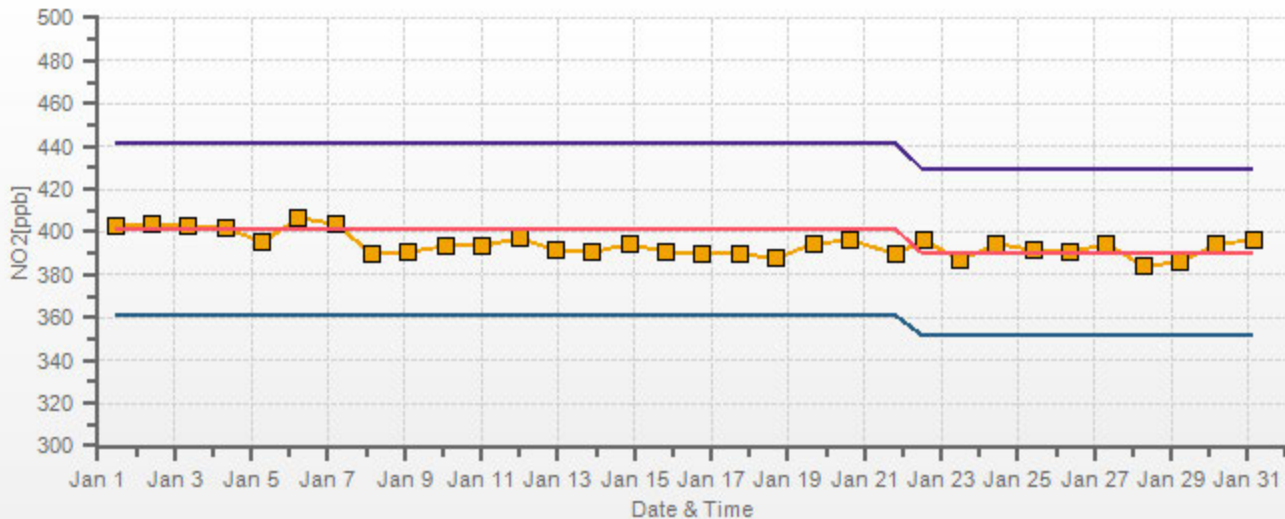
NOX[ppb] Calibration: LICA ST. LINA Monthly: 19/01 Type: Span



CAL-LICA-201901-01250

Span Meas Span Ref Span Low Span High

NO2[ppb] Calibration: LICA ST. LINA Monthly: 19/01 Type: Span



CAL-LICA-201901-01250

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



## Thermo 49i Ozone Analyzer Calibration

<b>Date:</b> January 18, 2019 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> St. Lina <b>Start/End Time 24 hr. (mst):</b> 11:41 / 18:08 <b>Ozone Calibration Method:</b> Varying UV Lamp Power <b>G.P.T. Date:</b> n/a-done by Varying UV Lamp Power <b>Analyzer:</b> <b>Serial Number/Owner:</b> 10022540371   LICA <b>Last Calibration Date:</b> December 18, 2019 <b>Previous Cal High Point C.F.:</b> 1.000	<b>Barometer/B.P./units:</b> Station BP gauge   933   millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019   22   °C <b>Weather Conditions:</b> Cloudy/Overcast <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher <b>Cal Gas Expiry Date:</b> n/a-done by Varying UV Lamp Power <b>Ozone Range ppb:</b> 500 <b>As Found C.F.:</b> 1.000 <b>New C.F.:</b> 1.000
--	--

<b>Calibration Standards:</b>	
Low Flow Meter ID/Expiry Date:	N/A
High Flow Meter ID/Expiry Date:	N/A
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019
Cal Gas Cylinder I.D. #:	N/A

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

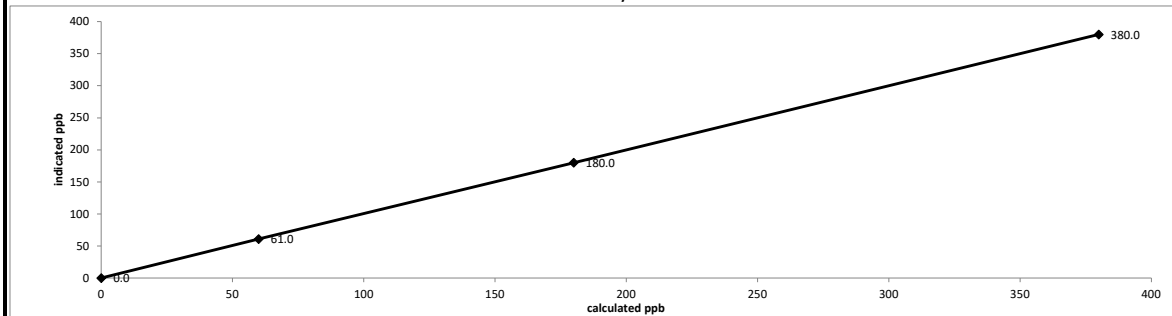
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	380.0	1.000
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	61.0	0.984
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
<b>Average C.F.=</b>						0.995

**Linear Regression/Calibration Results:**

Correlation Coefficient =	1.000	<b>LIMITS</b>
Slope =	1.001	> or = 0.995
b (Intercept as % of full scale)=	-0.08%	0.95-1.05
% change in C.F. from last cal=	0.00%	± 3% F.S.
		± 10%

**Thermo 49i Ozone Analyzer Calibration**



**As found:**

O3 Bkg:	-0.7
O3 Coef:	1.005
Photo Lamp:	10.7
O3 Lamp:	8.2
Bench:	29.7
Bench Lamp:	53.8
O3 Lamp:	67.9
Pressure:	685.0
Cell A lpm:	0.735
Cell B lpm:	0.780
O3 ppb:	-4.2
Cell A ppb:	1.7
Cell B ppb:	-10.1
Cell A int (Hz):	71857
Cell B int (Hz):	91209
Expected Value:	373.0

**As left:**

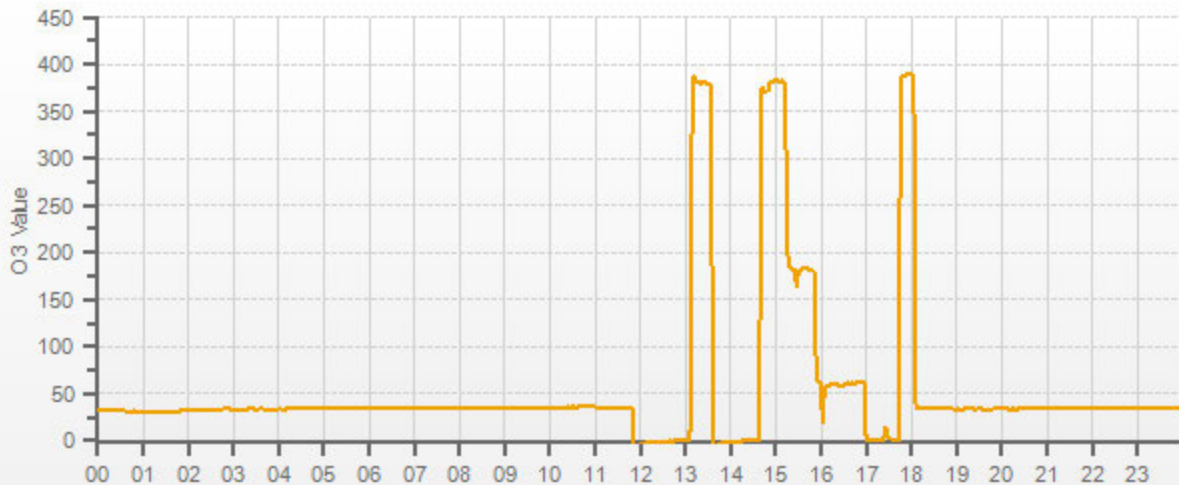
O3 Bkg:	-0.7
O3 Coef:	1.020
Photo Lamp:	10.7
O3 Lamp:	5.7
Bench:	29.9
Bench Lamp:	53.6
O3 Lamp:	67.8
Pressure:	685.6
Cell A lpm:	0.735
Cell B lpm:	0.780
O3 ppb:	0.7
Cell A ppb:	0.7
Cell B ppb:	-1.7
Cell A int (Hz):	71856
Cell B int (Hz):	91200
Expected Value:	388.0

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

The scheduled ZS check interfered with the calibration at 16:00. The low point restarted at 16:38.



O3[ppb]



CAL-LICA-201901-01250

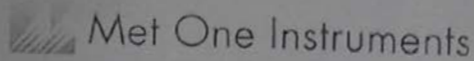
O3[ppb] Calibration: LICA ST. LINA Monthly: 19/01 Type: Span



CAL-LICA-201901-01250

Span Meas Span Ref Span Low Span High





# Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H  
 Sensor Output Swing: 0V - 1.0V  
 Customer: MAXXAM Analytics  
 Tested per PO: 35-67600  
 Calibrated by: David Frith *DF*

Sensor Serial No.: H12635  
 Sensor Output Range: 0 - 50.0 MPS  
 Sales Order No.: 122618  
 Calibration Date: 05/25/2017

QC Inspection *Chris Paul*

Instrument Condition Within Tolerance: As Found  As Left   
 Corrective Action: No Adjustment  Adjust  Repair   
 Preventative Maintenance

As Found Test Date: N/A As Left Test Date: 05/25/2017

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.  
 All Work Performed per Customer Purchase Order Requirements.  
 Calibration Document No. 50.5-6100

### Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	1/26/2017	1/26/2022	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none  
 Humidity 20 to 70% Radiation none

**Firmware Version: 3194-01 R2.62**

*The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements*



## Meteorological System Checklist

Date:	January 29, 2019		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	St. Lina		
<b>Unit:</b>	<b>Make:</b>	<b>Model:</b>	<b>Serial #:</b>
Precipitation Sampler:	Met One - Heated Rain Gauge	Part 387	n/a
<b>PRECIPITATION SENSOR CHECK</b>			
<b>Checklist:</b>	<b>Reply:</b>	<b>Comments:</b>	
Previous check date:	October 11, 2018		
Is the sensor Level?	yes		
Is the heater operating properly?	yes		
Are the bucket drain holes clean?	yes		
Is the screen on the housing? (screen should be on between July and September)	no	Removed for Winter season	
Is the housing clean?	yes		
Is the area around the housing clean and free from obstacles?	yes		
<b>TIP TEST - Slowly pour water until 10 tip are heard. (10 tips = 1 ml)</b>			
<b># of Tips</b>	<b>Data Logger Response (ml):</b>	<b>Manual Specification = +/- 0.1 ml</b>	
<b>10</b>	1.00	0.00	

Company: <u>Maxxam</u>		Operator: <u>Chris W</u>	
<b>Calibrator:</b>		<b>Flow Measurement Device:</b>	
Make/Model	<u>API 700</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>690</u>	Serial Number	<u>L-153351 H-152571</u>
Last Verification Date	<u>March 2016</u>	Temperature (°C)	<u>23.5 C</u>
NO Cylinder S/N	<u>LL108015</u>	Barometric Pressure	<u>695 mmHg</u>
NO [PPM]	<u>52.2</u>	NOx [PPM]	<u>52.3</u>
Expiry Date	<u>Oct 2020</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 <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4959	75.0	0.789	0.791	0.793	0.000	0.793	1%	0%
4971	36.5	0.383	0.384	0.384	0.000	0.384	0%	0%
4967	18.2	0.191	0.192	0.191	0.000	0.191	0%	-1%
Absolute Average Percent Difference							0%	0%

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

<u>NO</u>	<u>LIMITS</u>	<u>NOx</u>
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0054	0.90-1.10	m (Slope)= 1.0031
b (Intercept % of FS)= -0.0583	± 3% F.S.	b (Intercept % of FS)= -0.0795

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
4959	0.000	0.000	0.790	-0.001	0.789	NO <sub>2</sub>	% Diff. Limit
4959	0.500	0.497	0.293	0.493	0.786	-1%	± 10%
4959	0.275	0.273	0.517	0.269	0.787	-1%	± 10%
4959	0.100	0.102	0.688	0.099	0.787	-2%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

<u>NO<sub>2</sub></u>	<u>LIMITS</u>
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9946	0.90-1.10
b (Intercept % of FS)= -0.1817	± 3% F.S.

<b>AENV Standards</b>	<b>NO<sub>x</sub> Analyzer</b>
<b>Audit Calibrator</b>	Make/Model <u>Teco 42i</u>
Make/Model <u>Teco 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU 1809</u>	Last Calibration Date <u>March 14, 2018</u>
SRM Gas Cylinder No. <u>APEX1170572</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>49.99</u>	Cylinder Gas Expiry Date <u>November 2020</u>

COMMENTS: Cylinder contains 47.9 ppm SO<sub>2</sub>.

Auditor: Al Clark  
Operator Signature: *Al Clark*

Date: March 15, 2018  
Location: McIntyre Center Edmonton

Company: Maxxam

Operator: Mike

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>NA</u>
Serial Number	<u>11900613</u>	Serial Number	<u>NA</u>
Oven Temperature	<u>49.7</u>	Temperature (°C)	<u>22.9</u>
Last Verification Date	<u>March 16, 2017</u>	Barometric Pressure	<u>698mmHg</u>

**Flow Measurements**

Pt. No. 1 NA Pt. No. 2 NA Pt. No. 3 NA

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.000	0.001		
5000	0.400	0.383	-4%	± 10%
5000	0.200	0.192	-4%	± 10%
5000	0.100	0.097	-4%	± 10%
Absolute Average Percent Difference			4%	± 10%

**LINEAR REGRESSION ANALYSIS**

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

<u>O<sub>3</sub></u>		<u>LIMITS</u>
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9554	0.90-1.10
b (Intercept % of FS)=	0.2160	± 3% F.S.

**AENV Standards**

**Audit Calibrator**

Make/Model Thermo 49iPS  
Serial/AMU Number 1808  
Ozone Standard Thermo 49iPS

**Ozone Analyzer**

Make/Model Thermo 49i  
Serial/AMU Number 1843  
Last Calibration Date August 16, 2018  
Full Scale (ppm) 0.5

COMMENTS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Auditor: Shea Beaton

Date: August 22, 2018

Operator Signature:

Location: McIntyre Center Edmonton



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-482CGA

**Company:** Maxxam **Operator's Name:** Mike  
**Cylinder #:** LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair  
**Expiry Date:** October 2020

**Reference Calibrator and Gas:**  
**Make/Model:** R&R MFC 201  
**Serial Number:** AMU 1690  
**Last Verification Date:** December 13, 2017  
**Gas Type:** SO2 **Conc.** 98.07  
**Cylinder Number:** CAL016625  
**Expiry Date:** January 2019

**Flow Measurement Device:**  
**Make/Model:** Mesa Definer 220  
**Serial Number:** H-133034 / L-132702  
**Temp. °C:** 23.4 C  
**B.P.** 707 mmHg

**Reference Analyzer:**  
**Make/Model:** Teco 43C **Serial/AMU Number:** 1623  
**Instrument Settings:** **Zero:** 10.0 **Span:** 1.006 **Range:** 1.0  
**Last Calibration:** **Date:** Dec12/17 **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	<del>0.00000</del>	<del>0.00000</del>	<del>0.000</del>
4989	79.5	0.764	0.01594	62.755	47.9
4995	39.6	0.380	0.00793	126.136	47.9
4992	19.6	0.188	0.00393	254.694	47.9
Average Cylinder Concentration:					<b>47.9</b>

Previous Stated Concentration PPM: 49.2  
 Percent variance from Stated: 3

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:** December 13, 2017  
**Operator Signature:** *Al Clark* **Location:** McIntyre Center Edmonton





# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike  
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%) 2 Certified By: Praxair  
 Expiry Date: October 2020

**Reference Calibrator and Gas:**  
 Make/Model: Sabio 2010  
 Serial Number: AMU 2092  
 Last Verification Date: January 17, 2018  
 Gas Type: H2S Conc. 20.43  
 Cylinder Number: CAL015272  
 Expiry Date: January 2019

**Flow Measurement Device:**  
 Make/Model: Mesa Defender 530  
 Serial Number: H-153961 / L-153874  
 Temp. °C: 23.0 C  
 B.P.: 697 mmHg

**Reference Analyzer:**  
 Make/Model: Teco 450i Serial/AMU Number: 1980  
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1  
 Last Calibration: Date: Jan 17/18 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			
5051	39.6	0.0753	0.00784	127.551	9.60
5028	20.2	0.0387	0.00402	248.911	9.63
5033	10.5	0.0198	0.00209	479.333	9.49
Average Cylinder Concentration:					<b>9.58</b>

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

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

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: *Al Clark*

Location: McIntyre Center Edmonton





# Calibration Gas Audit

## NO Cylinder Gas

File No. 2017-483CGA

**Company:** Maxxam                      **Operators name:** Mike

Cylinder #: LL104225    Conc (PPM) 51.5/51.6    Tolerance (%) 2    Certified By: Praxair

Expiry Date: October 2020

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>December 13, 2017</u>			Temp. °C	<u>23.4 C</u>
Gas Type	<u>NO</u>	Conc.	<u>50.03</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>APEX 1223938</u>				
Expiry Date	<u>June 2020</u>				

**Reference Analyzer:**

Make/Model Teco 42i                      Serial/AMU Number: 1868

Instrument Settings    Zero: 4.7                      Span: 1.004                      Range: 1.0

Last Calibration:                      Date: Dec12/17                      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				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						<b>51.3</b>	<b>51.1</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</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

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark                      Date: December 13, 2017

Operator Signature: *Al Clark*                      Location: McIntyre Center Edmonton



**Lakeland Industry & Community Association**

**JANUARY 2019**

**Ambient Air Monitoring Calibration Report**

**- BONNYVILLE EAST STATION-**

**CAL-LICA-201901-01608**

**Station Operation and Maintenance:**

Maxxam Analytics

**Data Validation and Report:**

Maxxam Analytics

March 15, 2019

Alberta Environment and Parks (AEP)  
[Air.Reporting@gov.ab.ca](mailto:Air.Reporting@gov.ab.ca)

March 15, 2019

**Subject:**

**January 2019 Ambient Air Monitoring Calibration Report Submission for the LICA Bonnyville East Station**

---

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring calibration report for the LICA Bonnyville East AQM Station in the month of January 2019. This calibration report includes equipment calibration records, calibrator performance audit records and calibration gas audit records for the equipment that were used this month. This calibration report is prepared by the LICA network contractor.

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


Respectfully,



Michael Bisaga  
Technical Program Manager  
Lakeland Industry & Community Association  
780-266-7068  
[monitoring@lica.ca](mailto:monitoring@lica.ca)



Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[monitoring@lica.ca](mailto:monitoring@lica.ca)



**JANUARY 1 - 31, 2019**  
**MONTHLY CALIBRATION REPORT**  
**Project #: 2833-2019-01-39-C**  
**LICA-201901**

**Prepared for:**

**Lakeland Industry & Community Association**

**Mike Bisaga**

5107 50 St.

Bonnyville, Alberta T9N 2J7

monitoring@lica.ca

780-266-7068

**Monitoring Station**

**Bonnyville East Continuous Monitoring  
Station**

**Date of Report Issuance: February 28, 2019**



#1 - 2080 39 Avenue NE, Calgary AB, T2E 6P7

CAL-LICA-201901-01608



### Thermo 431-TLE Sulphur Dioxide Analyzer Calibration

<b>Date:</b> January 10, 2019 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> Bonnyville - East <b>Parameter:</b> Sulphur Dioxide <b>Start Time 24 hr. (mst):</b> 11:35 <b>End Time 24 hr. (mst):</b> 16:25 <b>Calibration Method:</b> Gas Dilution	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019    943    millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019    22    °C <b>Weather Conditions:</b> Cloudy/Overcast <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov    Rob Fisher <b>Cal Gas Expiry Date:</b> October 24, 2020 <b>Converter Model &amp; s/n (if applicable):</b> n/a
<b>Analyzer:</b> <b>Serial Number/Owner:</b> 1180320043    LICA <b>Last Calibration Date:</b> December 10, 2018 <b>Previous C.F.:</b> 1.000	<b>Range ppb:</b> 1000 <b>As Found C.F.:</b> 0.978 <b>New C.F.:</b> 1.000

<b>Calibration Standards:</b> <b>Low Flow Meter ID/Expiry Date:</b> N/A <b>High Flow Meter ID/Expiry Date:</b> N/A <b>Calibrator ID/Expiry Date:</b> API id# 690 expires March 15, 2019 <b>Cal Gas Cylinder I.D. #:</b> LL 104225 <b>Cal Gas Conc. (ppm):</b> 49.2	<b>Standard Calibration Points for Ranges</b> <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								

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

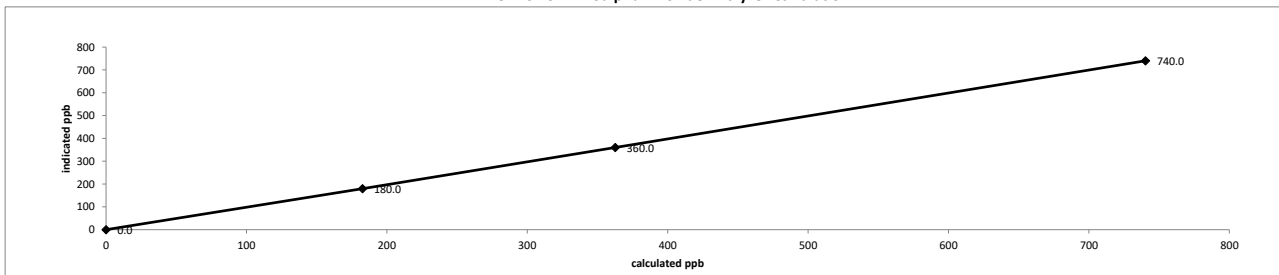
Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	5037	0.00	5037	0.0	0	n/a
as found high	4958	75.74	5034	740.2	757	0.978
adjusted zero	5037	0.00	5037	0.0	0	n/a
adjusted high	4958	75.74	5034	740.2	740	1.000
mid	4925	36.58	4962	362.7	360	1.008
low	4933	18.38	4951	182.6	180	1.015
calibrator zero	5037	0.00	5037	0.0	0	n/a

Average C.F. = 1.008

**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b> 1.000	<b>LIMITS</b>
<b>Slope =</b> 0.999	> or = 0.995
<b>b (Intercept as % of full scale) =</b> 0.16%	0.95-1.05
<b>% change in C.F. from last cal =</b> 2.21%	± 3% F.S.
	± 10%

**Thermo 431-TLE Sulphur Dioxide Analyzer Calibration**

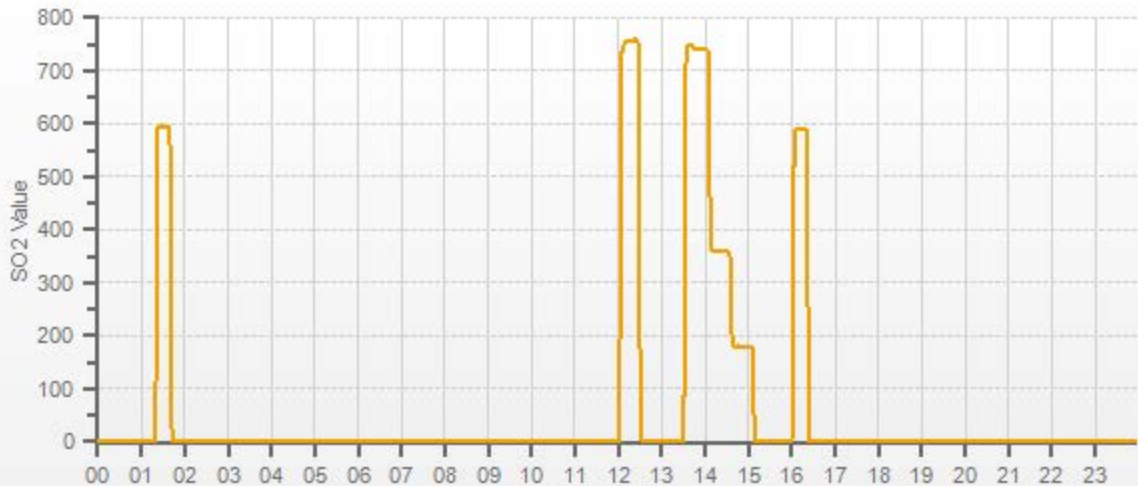


<b>As found:</b> Bkg: 4.53 Coef: 0.982 Pmt: -676.0 Flash: 1094 Internal: 33.7 Chamber: 45.0 Perm Oven Gas: 45.00 Perm Oven Heater: 44.25 Pressure: 682.9 Sample Flow: 0.459 Lamp Intensity: 90 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 598.0	<b>As left:</b> Bkg: 4.53 Coef: 0.971 Pmt: -676.4 Flash: 1094 Internal: 35.5 Chamber: 45.0 Perm Oven Gas: 45.00 Perm Oven Heater: 44.27 Pressure: 683.2 Sample Flow: 0.460 Lamp Intensity: 90 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 589.0
---	--

**Comments:**

The analyzer sample inlet filter was changed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

SO2[ppb]



CAL-LICA-201901-01608



SO2[ppb] Calibration: LICA Bonnyville East Monthly: 19/01 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-2019-01-01608



### Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	January 4, 2019	Barometer/B.P./units:	F.S. 10528 expires January 15, 2019	926	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 10528 expires January 15, 2019	22	°C
Location/Station Name:	Bonnyville East	Weather Conditions:	Mainly clear		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	6:50	Performed By/Reviewer:	Chris Wesson		
End Time 24 hr. (mst):	11:46	Cal Gas Expiry Date:	November 7, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	Internal		
Analyzer:		Range ppb:	100		
Serial Number/Owner:	CM1760002   LICA	As Found C.F.:	0.993		
Last Calibration Date:	December 21, 2018	New C.F.:	1.000		
Previous C.F.:	1.001				

Calibration Standards:		Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):
Low Flow Meter ID/Expiry Date:	N/A	Point	Start/End Time 24 hr.:
High Flow Meter ID/Expiry Date:	N/A	High	SO2 Analyzer Range:
Calibrator ID/Expiry Date:	Sabio id# 17100415 expires August 21, 2019	Mid	Target Concentration (ppb):
Cal Gas Cylinder I.D. #:	LL119432	Low	As Found Zero:
Cal Gas Conc. (ppm):	10.3		Analyzer Response: (ppb):
			Zero Corrected Result (ppb):

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

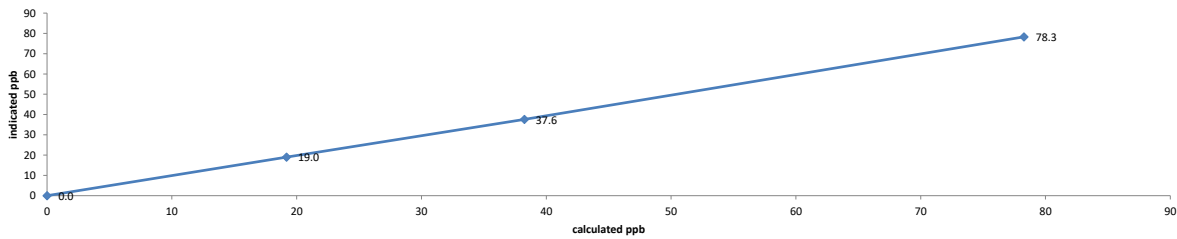
Point	Diluent	Cal Gas	Total	Calculated Concentration (ppb)	Indicated Concentration (ppb)	Correction Factors (C.F.):
as found zero	7499	0.00	7499	0.0	0.5	n/a
as found high	7442	57.10	7499	78.3	79.3	0.993
adjusted zero	7499	0.00	7499	0.0	0	n/a
adjusted high	7442	57.10	7499	78.3	78.3	1.000
mid	7471	27.90	7499	38.2	37.6	1.017
low	7486	14.00	7500	19.2	19	1.010
calibrator zero	7498	0.00	7498	0.0	0.5	n/a

Average C.F. = 1.009

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale) =	0.22%		± 3% F.S.
% change in C.F. from last cal =	0.76%		± 10%

Thermo 450i Hydrogen Sulphide Analyzer Calibration



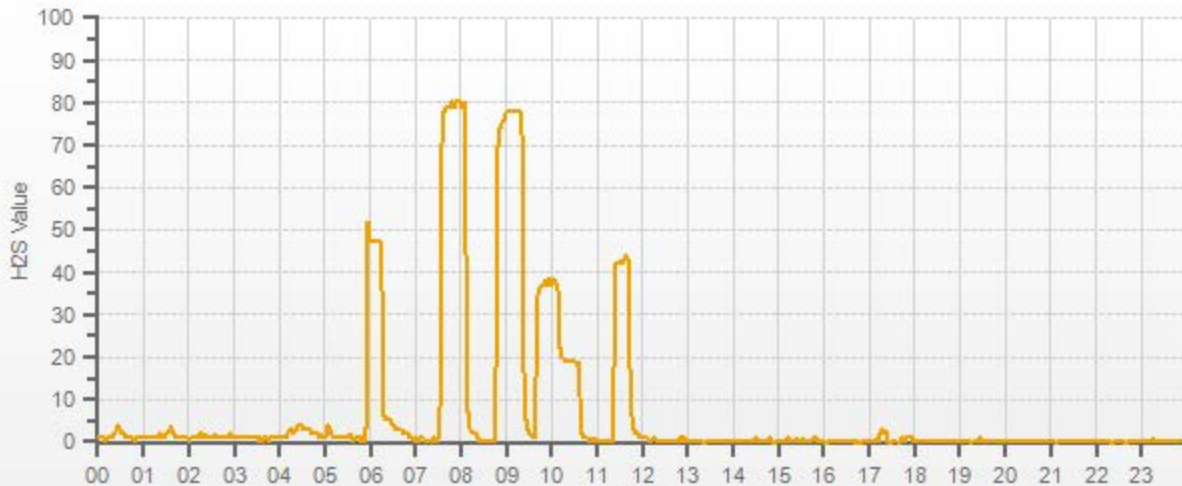
As found:	As left:
Bkg: 18.6	Bkg: 19.6
Coef: 1.236	Coef: 1.254
Pmt: -638.6	Pmt: -639.0
Flash: 777	Flash: 776
Internal: 33.7	Internal: 34.4
Chamber: 45.2	Chamber: 45.1
Converter Temp: 327.8	Converter Temp: 327.8
Converter Set: 325.0	Converter Set: 325.0
Perm Oven Gas: 45.00	Perm Oven Gas: 45.00
Perm Oven Htr: 43.92	Perm Oven Htr: 43.93
Pressure: 552.9	Pressure: 552.6
Sample Flow: 0.941	Sample Flow: 0.940
Lamp Intensity: 90	Lamp Intensity: 91
Averaging Time: 120	Averaging Time: 120
Expected Value: 41.7	Expected Value: 41.7

Comments:

The analyzer sample inlet filter was changed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

Operator error 09:21-09:39 (change from high to mid). Incorrect target entered. Mid-point follows. No effect on calibration validity.

H2S[ppb]



CAL-LICA-201901-01608



### Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date: January 10, 2019	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	943	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Bonnyville - East	Weather Conditions: Cloudy/Overcast		
Parameter: Hydrogen Sulphide	Calibration Purpose: shut down		
Start Time 24 hr. (mst): 11:35	Performed By/Reviewer: Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst): 14:02	Cal Gas Expiry Date: October 20, 2020		
Calibration Method: Gas Dilution	Converter Model & s/n (if applicable): n/a		
Analyzer: Serial Number/Owner: CM 17360002   LICA	Range ppb: 100		
Last Calibration Date: January 4, 2019	As Found C.F.: 0.965		
Previous C.F.: 1.000	New C.F.: n/a		

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: N/A High Flow Meter ID/Expiry Date: N/A Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55	<b>Standard Calibration Points for Ranges</b> <table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></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	<b>SO2 Scrubber Check (10 minutes):</b> Start/End Time 24 hr.: 11:42 / 11:59 SO2 Analyzer Range: 1000 Target Concentration (ppb): 780 As Found Zero: 0.0 Analyzer Response: (ppb): 0.0 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

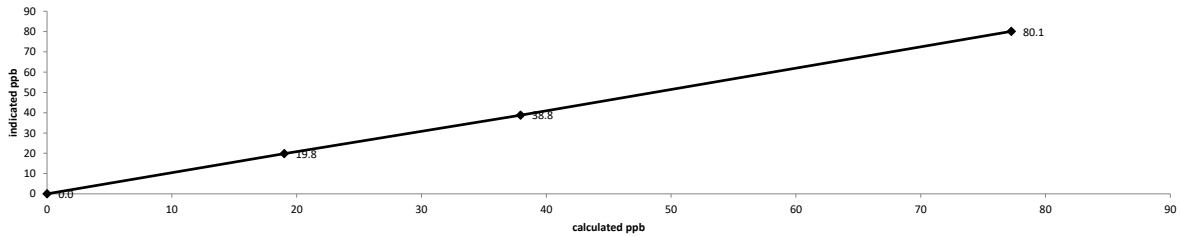
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

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	n/a
as found high	7479	61.00	7540	77.3	80.1	0.965
mid	7420	29.60	7450	37.9	38.8	0.978
low	7420	14.80	7435	19.0	19.8	0.960
<b>Average C.F. =</b>						<b>0.968</b>

**Linear Regression/Calibration Results:**

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.966		0.90-1.10
b (Intercept as % of full scale) =	0.07%		± 3% F.S.
% change in C.F. from last cal =	3.54%		± 10%

**Thermo 450i Hydrogen Sulphide Analyzer Calibration**



<b>As found:</b> Bkg: 19.5 Coef: 1.254 Pmt: -639.4 Flash: 778 Internal: 33.0 Chamber: 45.0 Converter Temp: 325.4 Converter Set: 325.0 Perm Oven Gas: 45.00 Perm Oven Htr: 43.92 Pressure: 560.1 Sample Flow: 0.951 Lamp Intensity: 90 Averaging Time: 120 Expected Value: 47.5	<b>As left:</b> Bkg: n/a Coef: n/a Pmt: n/a Flash: n/a Internal: n/a Chamber: n/a Converter Temp: n/a Converter Set: n/a Perm Oven Gas: n/a Perm Oven Htr: n/a Pressure: n/a Sample Flow: n/a Lamp Intensity: n/a Averaging Time: n/a Expected Value: n/a
---	--

**Comments:**

The manifold blower was found to be working normally.

A Shutdown calibration was completed to renew SO2 scrubber beads as an attempt to find the problem with unpredictable SPAN drift.



### Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	January 10, 2019	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	943	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Bonnyville - East	Weather Conditions:	Cloudy/Overcast		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	post repair		
Start Time 24 hr. (mst):	14:30	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	18:01	Cal Gas Expiry Date:	October 20, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:	Serial Number/Owner: CM 17360002   LICA	Range ppb:	100		
Last Calibration Date:	January 4, 2019	As Found C.F.:	n/a		
Previous C.F.:	1.000	New C.F.:	0.999		

Calibration Standards:	Low Flow Meter ID/Expiry Date: N/A	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):								
High Flow Meter ID/Expiry Date: N/A	Calibrator ID/Expiry Date: Sabio id# 11900613 expires August 22, 2019	<table border="1"> <tr><td>Point</td><td>ppb</td></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.: 14:44 / 15:04
Point	ppb										
High	78										
Mid	38										
Low	19										
Cal Gas Cylinder I.D. #: EY 0001003	Cal Gas Conc. (ppm): 9.55		SO2 Analyzer Range: 1000								
			Target Concentration (ppb): 780								
			As Found Zero: 1.0								
			Analyzer Response: (ppb): 1.0								
			Zero Corrected Result (ppb): 0.0								

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

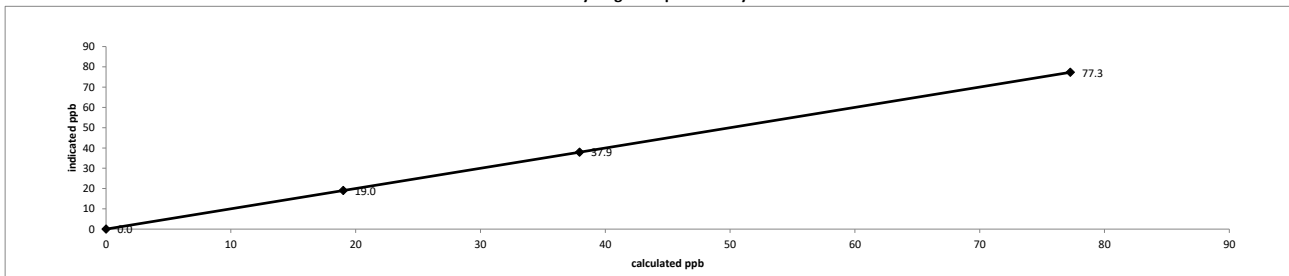
Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
adjusted zero	7500	0.00	7500	0.0	0	n/a
adjusted high	7479	61.00	7540	77.3	77.3	0.999
mid	7420	29.60	7450	37.9	37.9	1.001
low	7420	14.80	7435	19.0	19	1.001
calibrator zero	7500	0.00	7500	0.0	0	n/a

Average C.F.= 1.000

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		0.95-1.05
b (Intercept as % of full scale)=	0.02%		± 3% F.S.
% change in C.F. from last cal=	n/a		n/a

#### Thermo 450i Hydrogen Sulphide Analyzer Calibration



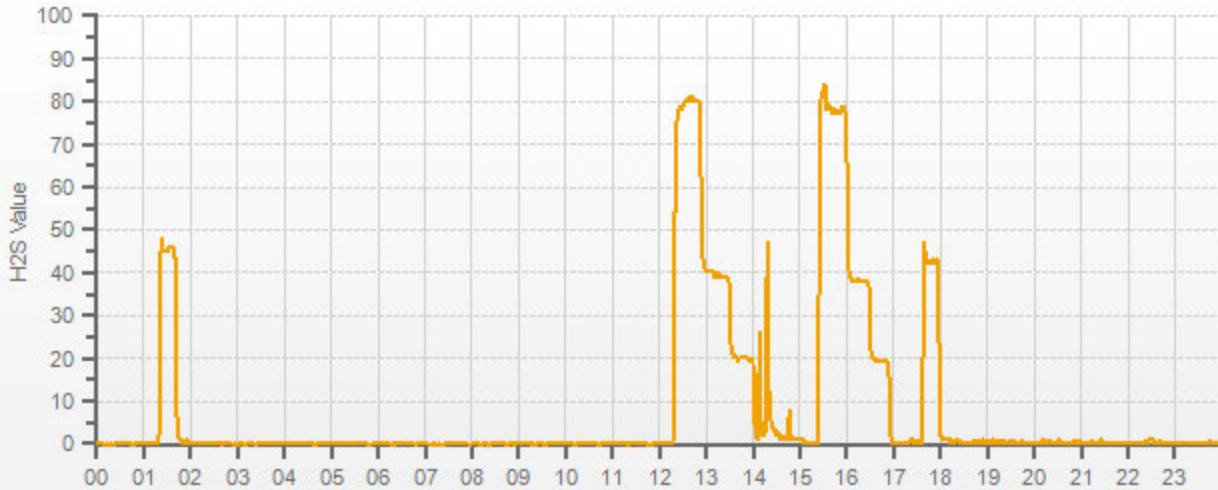
As found:	As left:
Bkg: n/a	Bkg: 17.4
Coef: n/a	Coef: 1.145
Pmt: n/a	Pmt: -639.0
Flash: n/a	Flash: 779
Internal: n/a	Internal: 35.2
Chamber: n/a	Chamber: 45.0
Converter Temp: n/a	Converter Temp: 327.3
Converter Set: n/a	Converter Set: 325.0
Perm Oven Gas: n/a	Perm Oven Gas: 45.00
Perm Oven Htr: n/a	Perm Oven Htr: 43.93
Pressure: n/a	Pressure: 561.0
Sample Flow: n/a	Sample Flow: 0.950
Lamp Intensity: n/a	Lamp Intensity: 90
Averaging Time: n/a	Averaging Time: 120
Expected Value: n/a	Expected Value: 42.9

Comments:

The analyzer sample inlet filter was changed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

A Post-repair calibration was completed after SO2 scrubber beads were renewed.

H2S[ppb]



CAL-LICA-201901-01608

H2S[ppb] Calibration: LICA Bonnyville East Monthly: 19/01 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-2019-01-01608



### Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	January 11, 2019	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	950	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Bonnyville - East	Weather Conditions:	Mainly sunny		
Parameter:	CH4 / NMHC / THC	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	10:21 / 14:28	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	October 18, 2025		

Analyzer:		Correction Factors:			
Serial Number/Owner:	1236656107   LICA	Previous C.F.:	As Found C.F.:	New C.F.:	
Measured Flow:	1.113	CH <sub>4</sub> =	1.000	1.026	1.000
Last Calibration Date:	December 7, 2018	NMHC =	1.000	1.017	1.000
Range ppm:	20 CH4/20 NMHC/40 THC	THC =	1.000	1.022	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date: N/A  
 High Flow Meter ID/Expiry Date: N/A  
 Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019  
 Cal Gas Cylinder I.D. #: LL 119471  
 CH4 Cylinder Conc.: 599.0 | 207.0 = C<sub>2</sub>H<sub>6</sub> Cylinder Conc.  
 CH<sub>4</sub> expressed as C<sub>2</sub>H<sub>6</sub>: 569.3 | 1168.3 = total CH4 equivalent

Standard Calibration Points for Analyzer Range of 20/20/40 ppm

Point	CH4	NMHC	THC
High	13.00	13.00	26.00
Mid	7.00	7.00	14.00
Low	3.00	3.00	6.00

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

Point	Calibrator Flow Rates (cc/min)			Calculated CH <sub>4</sub> (ppm)	Calculated NMHC (ppm)	Calculated THC (ppm)	Indicated CH <sub>4</sub> (ppm)	Indicated NMHC (ppm)	Indicated THC (ppm)	Correction Factors:		
	Diluent	Cal Gas	Total Flow							CH <sub>4</sub>	NMHC	THC
as found zero	2501	0.00	2501	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2468	56.03	2524	13.30	12.64	25.93	12.96	12.42	25.38	1.026	1.017	1.022
adjusted high	2468	56.03	2524	13.30	12.64	25.93	13.30	12.64	25.94	1.000	1.000	1.000
mid	2469	31.00	2500	7.43	7.06	14.49	7.48	7.06	14.54	0.993	1.000	0.996
low	2486	14.00	2500	3.35	3.19	6.54	3.40	3.22	6.62	0.987	0.990	0.988
calibrator zero	2501	0.00	2501	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
Average C.F.=										0.993	0.997	0.995

Linear Regression/Calibration Results:

	CH <sub>4</sub>	NMHC	THC	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	0.999	1.000	0.95-1.05
b (Intercept as % of full scale) =	0.13%	0.06%	0.10%	± 3% F.S.
% change in C.F. from last cal =	-2.60%	-1.74%	-2.18%	± 10%

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply:	-293.0	Calibration History cnt'd:	NM Peak Area:	84055
Temperatures:	Detector Oven:	175.1	Crucial Settings:	Methane Start:	n/a
	Filter:	175.1		Methane End:	n/a
	Column Oven:	75.1		Backflush:	n/a
	Internal:	34.2		NMHV Start:	n/a
Cylinder Pressures/reg.:	Carrier:	600   50	Run History>1:	NMHC End:	n/a
	Fuel:	1000   50		Date:	Jan 11, 2019
	Span Gas:	900   22		Time:	10:29
	Zero Air Generator:	48		CH <sub>4</sub> PK HT:	0
Internal Pressures:	Carrier:	31.0		CH <sub>4</sub> RT:	8.0
	Fuel:	40.3		CH <sub>4</sub> Baseline:	2437
	Air:	31.7		CH <sub>4</sub> LOD:	40
FID Status:	Status:	LIT		CH <sub>4</sub> SD:	13
	Counts:	27612		CH <sub>4</sub> CONC:	0.00
	Flame:	365.0		NM PK HT:	0
	Det Base:	175.0		NM Peak Area:	0
Flame and Power Stats:	Last Power On:	Oct 18, 2018 / 11:03		NM CONC:	0.00
	Flameouts:	1		NM Base Start:	2352
	Det Oven at Start:	23.1		NM Base End:	2367
	Col Oven at Start:	22.3		NM LOD:	20
Calibration History:	Time:	Dec 07, 2018 / 15:16		NM Start IDX:	18
	Type:	SPAN		NM End IDX:	66
	Status:	GOOD		NM Max Slope:	6.9e-01
	Check/Adjust:	ADJUST		NM Min Slope:	-4.9e-01
	CH <sub>4</sub> Span Conc:	13.27	Expected Values:	NM PT Count:	0
	CH <sub>4</sub> SP Ratio:	0.000799		Previous CH4:	10.02
	CH <sub>4</sub> RT:	14.0		Previous NMHC:	11.06
	CH <sub>4</sub> PK IDX:	30		Previous THC:	21.08
	CH <sub>4</sub> PK HT:	16609		New CH4:	10.32
	NM Span Conc:	12.61		New NMHC:	11.32
	NM SP Ratio:	0.00015		New THC:	21.65

Comments:

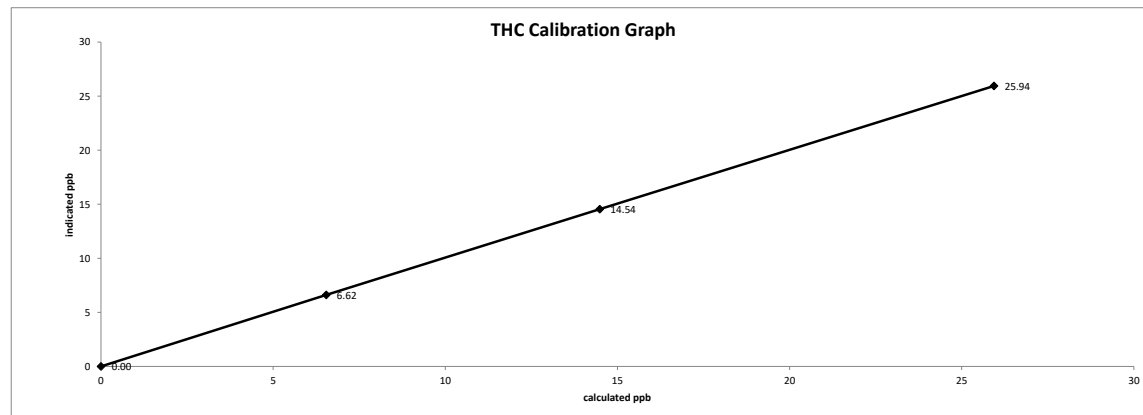
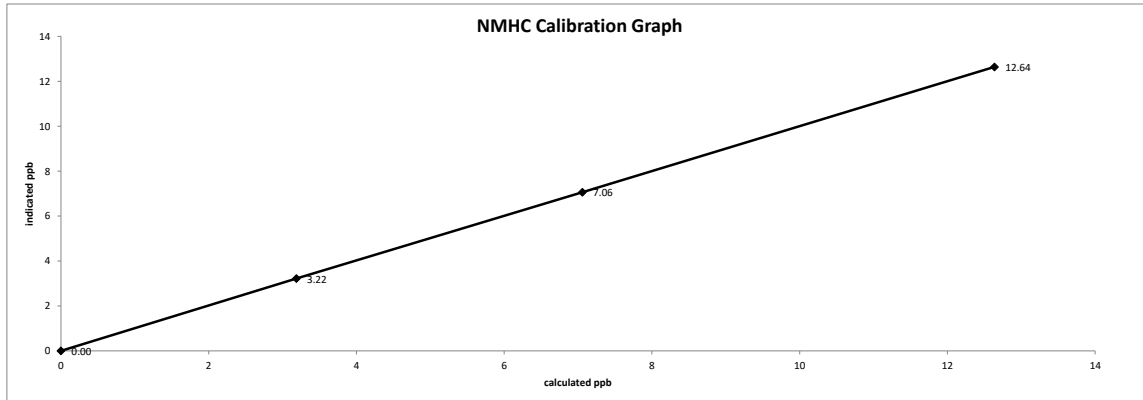
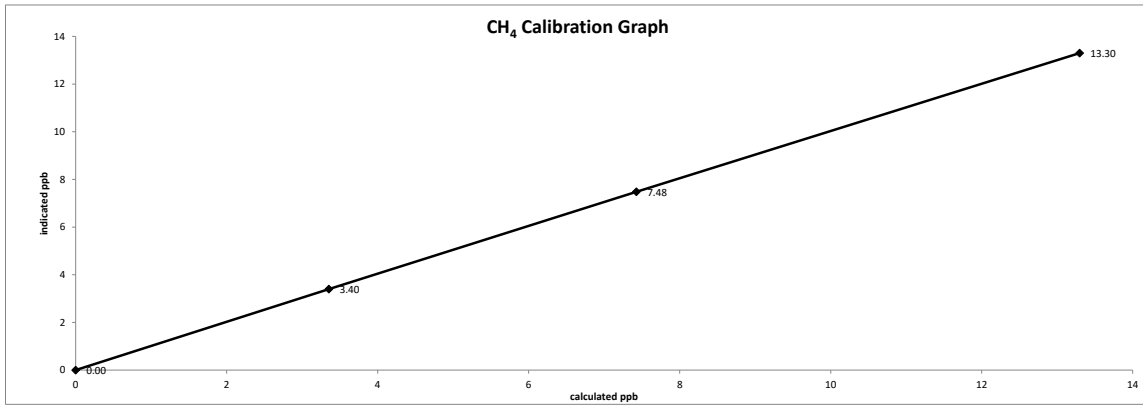
The analyzer sample inlet filter was changed.  
 No zero adjustment was required/made.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

The High adjust point was started due to operator error at 11:35 prior to the Zero Adjust point. The Zero Adjust point was re-started from the beginning at 11:42.

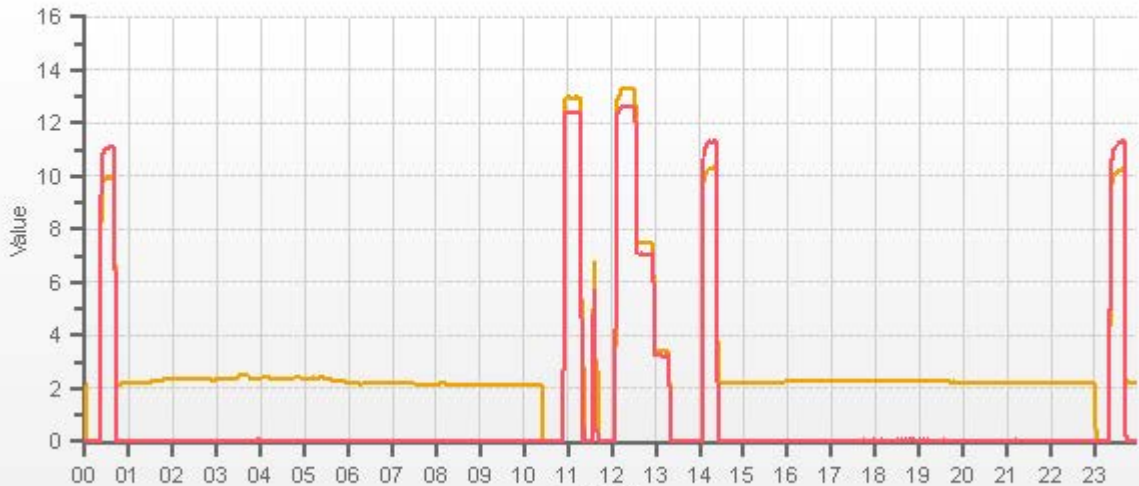


Date: January 11, 2019  
Company/Airshed: LICA  
Location/Station Name: Bonnyville - East

Start/End Time 24 hr. (mst): 10:21 / 15:22  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution



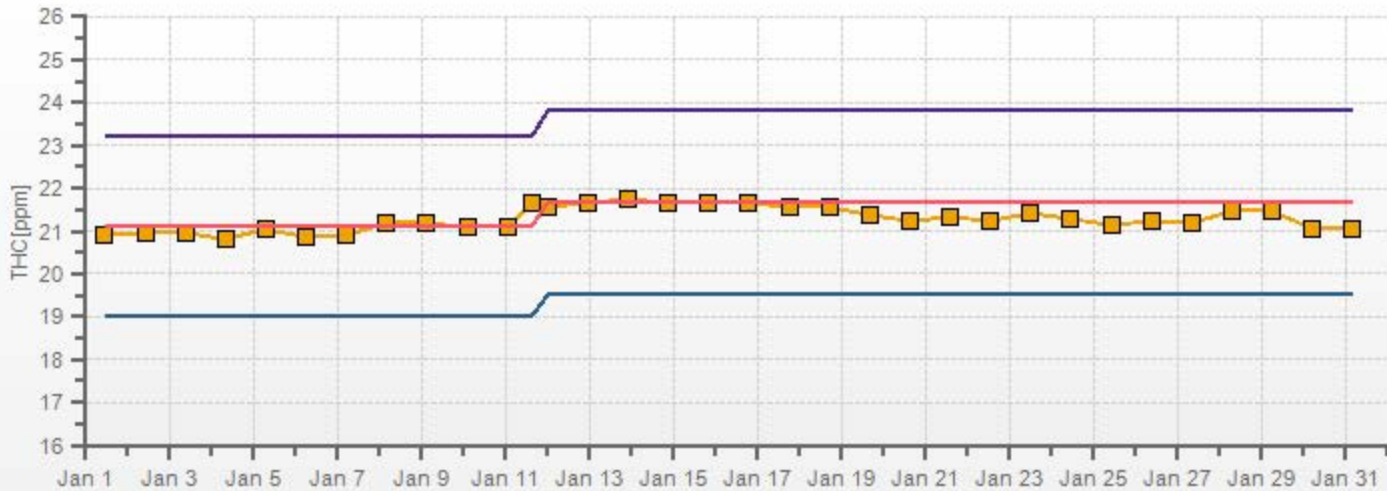
CH4[ppm] NMHC[ppm]



CAL-LICA-201901-01608

THC[ppm] Calibration: LICA Bonnyville East Monthly: 19/01 Type: Span

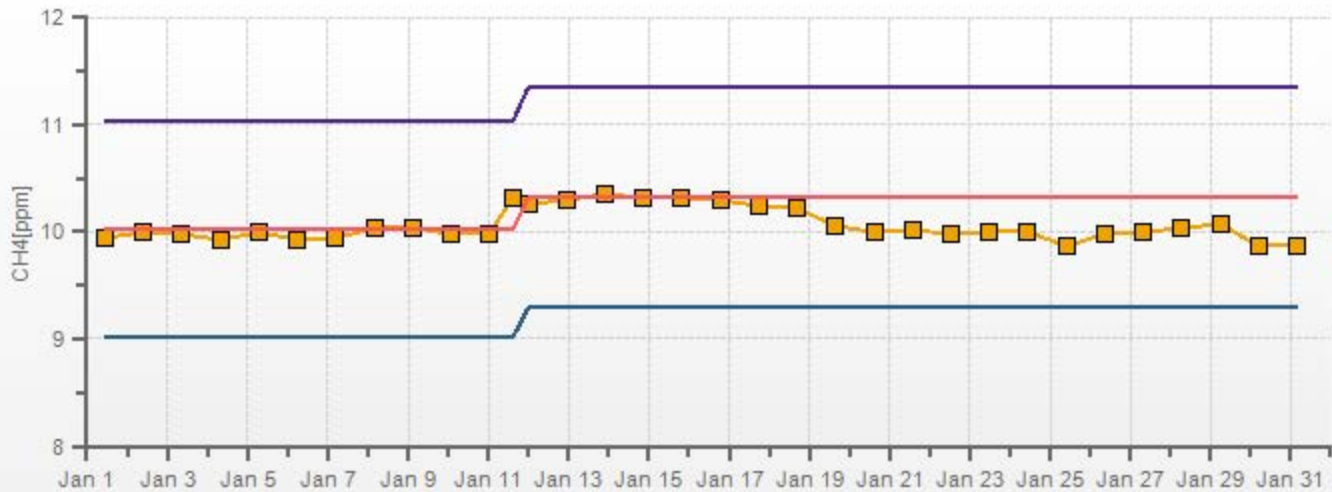
Span Meas Span Ref Span Low Span High



CAL-LICA-201901-01608

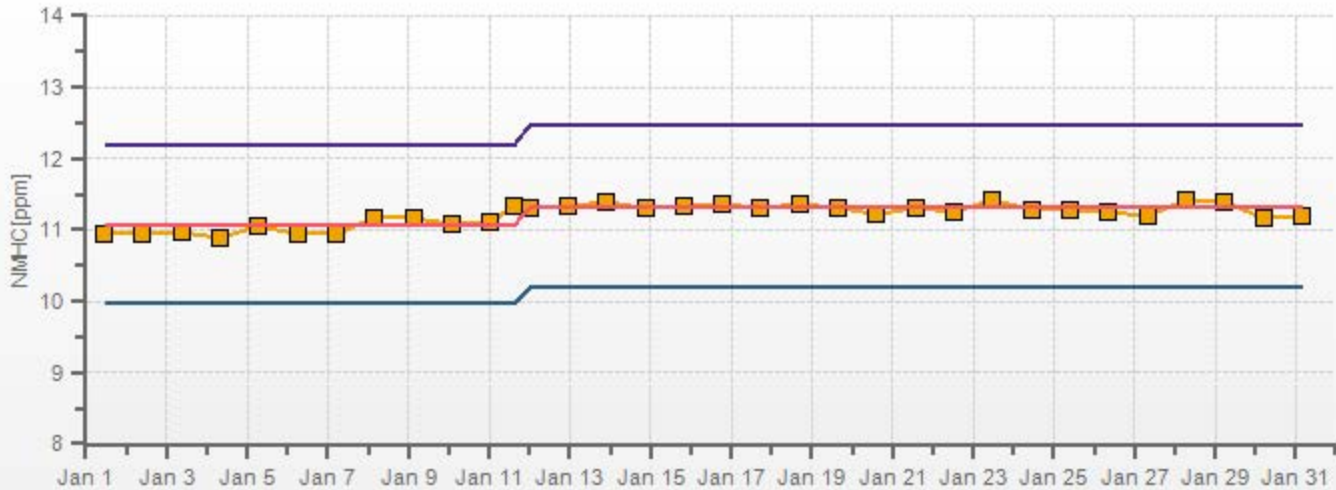
CH4[ppm] Calibration: LICA Bonnyville East Monthly: 19/01 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-201901-01608

Span Meas Span Ref Span Low Span High



CAL-LICA-201901-01608



## Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: January 10, 2019	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	943	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Bonnyville - East	Weather Conditions: Cloudy/Overcast		
Start/End Time 24 hr. (mst): 11:35 / 18:21	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone? No	Performed By/Reviewer: Alex Yakupov	Rob Fisher	
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: October 24, 2020		

<b>Analyzer:</b>		<b>Correction Factors:</b>		
Serial Number/Owner: 1180930027   LICA	NO =	Previous C.F.: 1.000	As Found C.F.: 0.990	New C.F.: 1.000
Last Calibration Date: December 30, 2018	NO <sub>2</sub> =	1.000	1.000	1.000
Range ppb: 1000	NOx =	1.000	0.992	1.000

<b>Calibration Standards:</b>		<b>Standard Calibration Points for a Range of: 1000 ppb</b>			
Low Flow Meter ID/Expiry Date: N/A	High Flow Meter ID/Expiry Date: N/A	Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?
Calibrator ID/Expiry Date: API id# 690 expires March 15, 2019	Cal Gas Cylinder I.D. #: LL 104225	High	780	500	n/a
Cal Gas Conc. (ppm): 51.5   51.6		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	5037	0.0	5037	0	0	-0.3	-0.6	n/a	n/a
as found high	4958	75.7	5034	774.9	776.4	782.0	782.0	0.990	0.992
adjusted zero	5037	0.00	5037	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4958	75.74	5034	774.9	776.4	775.0	776.0	1.000	1.000
mid	4925	36.58	4962	379.7	380.4	377.0	378.0	1.007	1.006
low	4933	18.38	4951	191.2	191.6	189.0	189.0	1.012	1.014
calibrator zero	5037	0.00	5037	0	0	0.0	0.0	n/a	n/a
								Average C.F.=	1.006   1.007

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 <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4958	75.74	5034	0.0	777.0	778.0	1.0	0.0	1.0	
as found high NO2	4958	75.74	5034	500.0	276.0	278.0	502.0	501.0	501.0	1.000
adjusted high NO2	4958	75.74	5034	500.0	276.0	278.0	502.0	501.0	501.0	1.000
gpt mid	4958	75.74	5034	270.0	505.0	778.0	273.0	272.0	272.0	1.000
gpt low	4958	75.74	5034	100.0	679.0	780.0	101.0	98.0	100.0	0.980
										Average NO <sub>2</sub> C.F.= 0.993

Linear Regression/Calibration Results:				LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10% 0.96 to 1.04
Correlation Coefficient =	NO	NOx	NO <sub>2</sub>	
Slope =	1.000	1.000	1.000	
b (Intercept as % of full scale) =	0.999	1.000	1.003	
% change in C.F. from last cal =	-0.14%	-0.14%	0.14%	
NO <sub>2</sub> converter efficiency	0.95%	0.80%	0.00%	

As found:		As left:	
NO Bkg:	7.0	NO Bkg:	6.7
NOx Bkg:	7.4	NOx Bkg:	6.8
NO Coef:	0.846	NO Coef:	0.853
NO <sub>2</sub> Coef:	0.995	NO <sub>2</sub> Coef:	0.995
NOx Coef:	0.999	NOx Coef:	0.999
PMT:	-906.1	PMT:	-906.1
Internal:	30.5	Internal:	32.3
Chamber:	50.3	Chamber:	50.0
Cooler:	-2.9	Cooler:	-2.9
NO <sub>2</sub> Converter:	323.9	NO <sub>2</sub> Converter:	325.0
NO <sub>2</sub> Converter Set:	325.0	NO <sub>2</sub> Converter Set:	325.0
Perm Oven Gas:	44.98	Perm Oven Gas:	45.00
Perm Oven Heater:	44.22	Perm Oven Heater:	44.25
Pressure:	205.2	Pressure:	206.4
Flow:	0.703	Flow:	0.706
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	3	Expected Value NO:	3
Expected Value NO <sub>2</sub> :	332	Expected Value NO <sub>2</sub> :	352
Expected Value NOx:	335	Expected Value NOx:	356

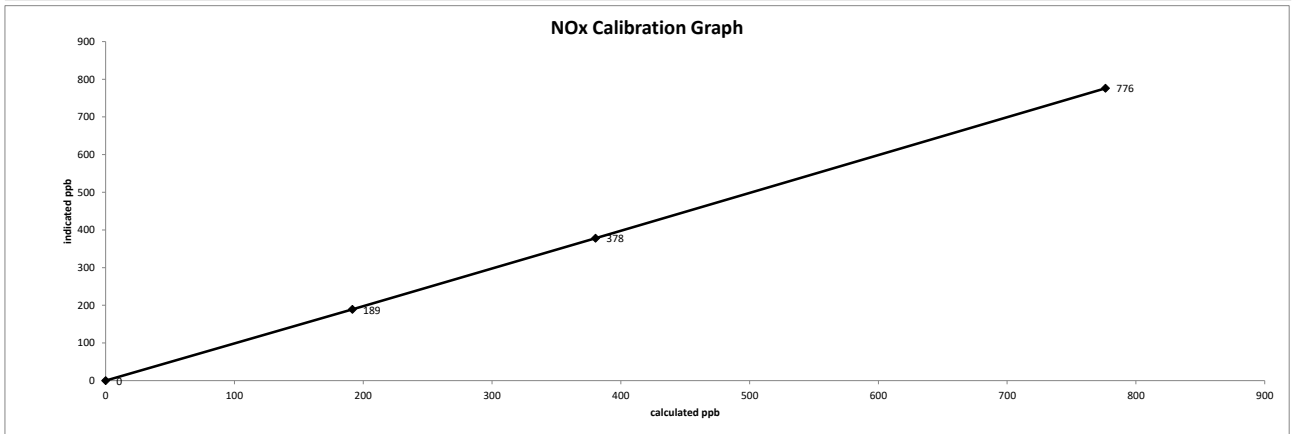
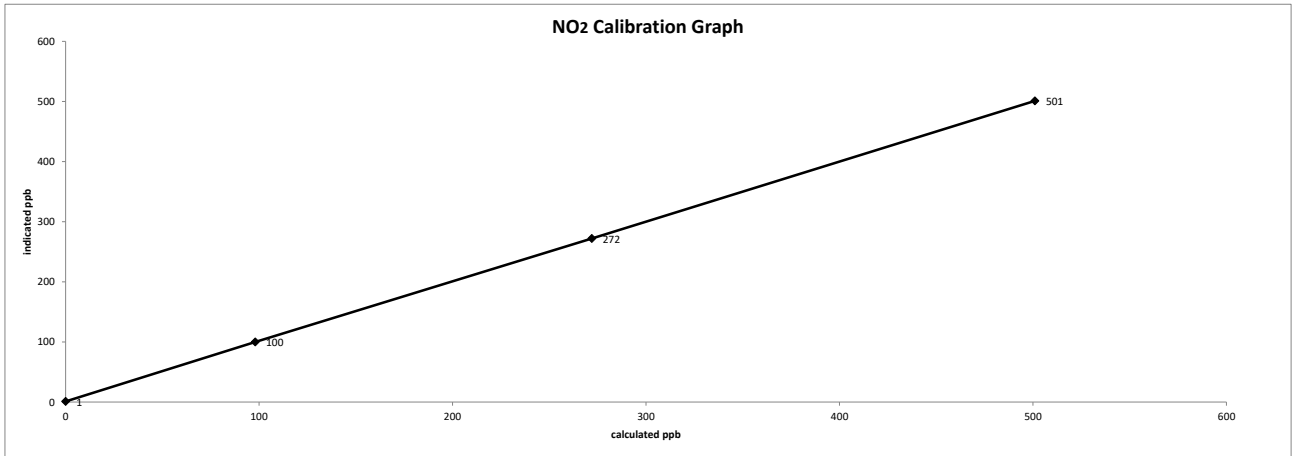
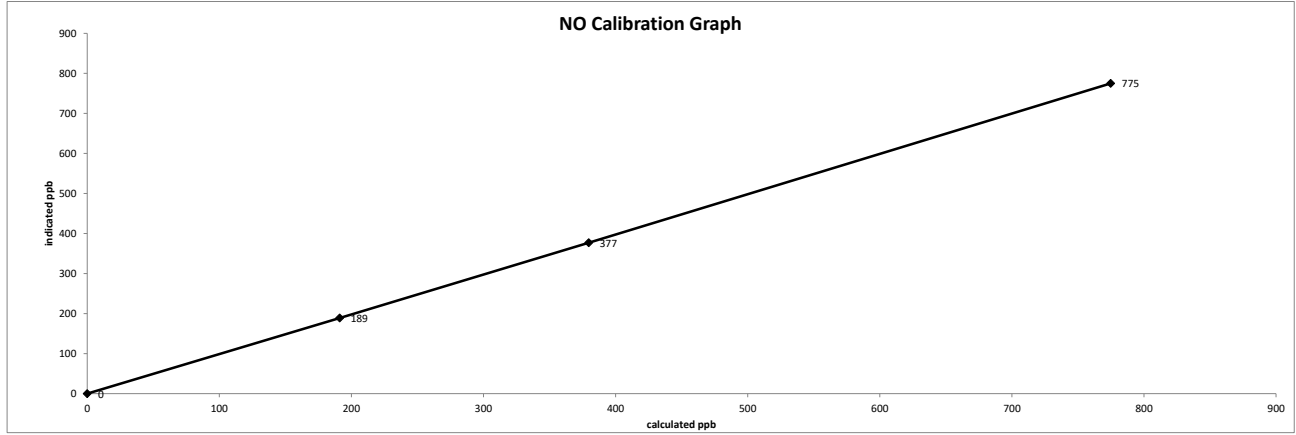
**Comments:**  
 The analyzer sample inlet filter was changed.  
 The manifold blower was found to be working normally.  
 The converter cooling fan filter was cleaned.  
 No high point NO<sub>2</sub> adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.  
 The analyzer cooling fan filter(s) were cleaned.

At 16:56 for a few seconds the datalogger stopped recording all data. The graphs for all analyzers instantly dropped and recovered to the previous values. Also, the datalogger graph displayed the same behavior. This is not the analyzer issue but a network/datalogger/switch connection error. The Mid point of the NOx GPT was stable within 24 minutes.

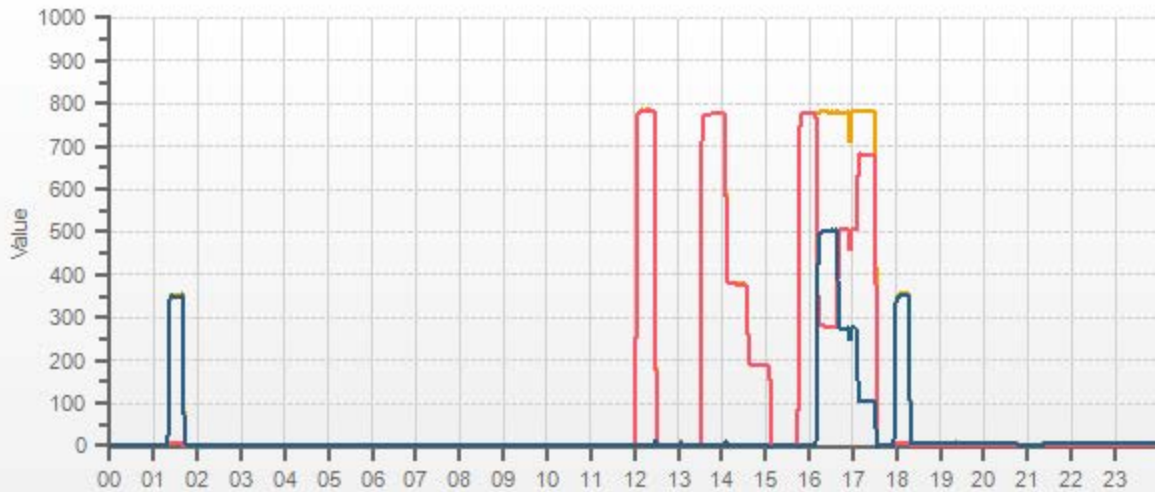
Date: January 10, 2019  
 Company/Airshed: LICA  
 Location/Station Name: Bonnyville - East

Start/End Time 24 hr. (mst): 11:35 / 18:21  
 Calibration Purpose: routine monthly  
 Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration



— NOX[ppb] — NO[ppb] — NO2[ppb]



CAL-LICA-201901-01608



NOX[ppb] Calibration: LICA Bonnyville East Monthly: 19/01 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-2019-01-01608

Page 22 of 36

NO2[ppb] Calibration: LICA Bonnyville East Monthly: 19/01 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-2019-01-01608



## Thermo 49i Ozone Analyzer Calibration

<b>Date:</b> January 11, 2019 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> Bonnyville - East <b>Start/End Time 24 hr. (mst):</b> 10:21 / 15:22 <b>Ozone Calibration Method:</b> Varying UV Lamp Power <b>G.P.T. Date:</b> n/a-done by Varying UV Lamp Power <b>Analyzer:</b> <b>Serial Number/Owner:</b> 1002240372   LICA <b>Last Calibration Date:</b> December 7, 2018 <b>Previous Cal High Point C.F.:</b> 1.000	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019   950   millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019   22   °C <b>Weather Conditions:</b> Mainly sunny <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher <b>Cal Gas Expiry Date:</b> n/a-done by Varying UV Lamp Power <b>Ozone Range ppb:</b> 500 <b>As Found C.F.:</b> 1.000 <b>New C.F.:</b> 1.000
---	--

<b>Calibration Standards:</b>	
Low Flow Meter ID/Expiry Date:	N/A
High Flow Meter ID/Expiry Date:	N/A
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019
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

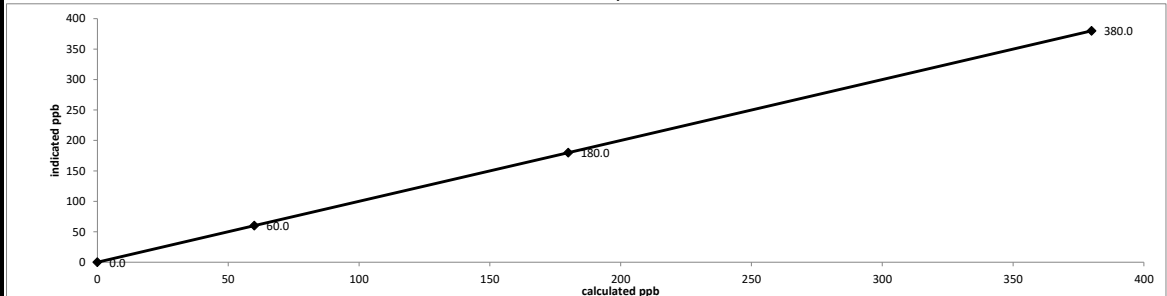
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

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	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale)=	0.00%		± 3% F.S.
% change in C.F. from last cal=	0.00%		± 10%

**Thermo 49i Ozone Analyzer Calibration**

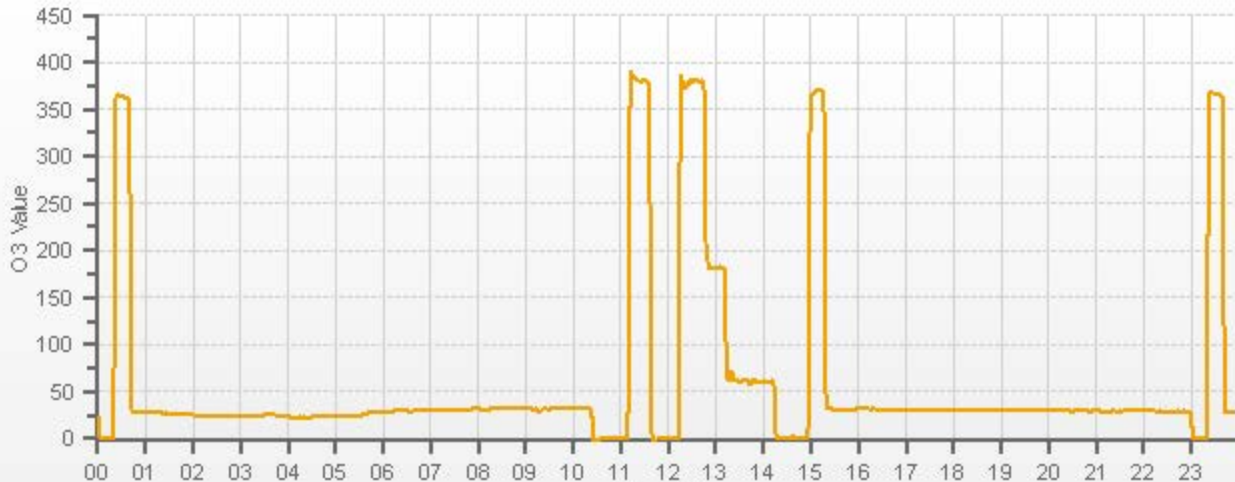


<b>As found:</b> O3 Bkg: 0.1 O3 Coef: 1.033 Photo Lamp: 14.2 O3 Lamp: 9.3 Bench: 31.8 Bench Lamp: 54.1 O3 Lamp: 68.1 Pressure: 700.9 Cell A lpm: 0.760 Cell B lpm: 0.764 O3 ppb: -0.1 Cell A ppb: -0.1 Cell B ppb: -1.9 Cell A int (Hz): 76316 Cell B int (Hz): 77967 Expected Value: 357.0	<b>As left:</b> O3 Bkg: 0.1 O3 Coef: 1.040 Photo Lamp: 14.2 O3 Lamp: 9.3 Bench: 32.0 Bench Lamp: 54.1 O3 Lamp: 68.0 Pressure: 700.3 Cell A lpm: 0.760 Cell B lpm: 0.763 O3 ppb: 0.1 Cell A ppb: -2.0 Cell B ppb: 2.2 Cell A int (Hz): 76292 Cell B int (Hz): 77913 Expected Value: 370.0
---	--

**Comments:**  
 The analyzer sample inlet filter was changed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

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

O3[ppb]



CAL-LICA-2019-01-01608

O3[ppb] Calibration: LICA Bonnyville East Monthly: 19/01 Type: Span

Span Meas Span Ref Span Low Span High



CAL-LICA-2019-01-01608



## Thermo 5030i SHARP Monitor Calibration

<b>Date:</b> January 24, 2019	<b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher
<b>Company:</b> LICA	<b>Start Time (mst):</b> 15:29
<b>Station Name/Location:</b> Bonnyville - East	<b>End Time (mst):</b> 18:02
<b>Previous Audit Date:</b> October 22, 2018	<b>Calibration Purpose:</b> Quarterly
<b>Parameter:</b> PM 2.5	<b>Weather Conditions:</b> Light snow

<b>SHARP 5030i Information and Status:</b>		
<b>Serial Number:</b> CM 17071016	<b>Filter Tape Counter</b>	294

<b>Reference Standards: Air Flow</b>						
	<b>Manometer</b>	<b>Orifice</b>	<b>Pressure:</b>		<b>Temp / RH:</b>	
<b>Make:</b>	Dwyer	Chinook	Fisher Scientific		Fisher Scientific	
<b>Model:</b>	475 Mk.III	CHN0901	FB61291		11-661-7A	11745843
<b>Serial Number:</b>	#3	#2	130168457	05544	170286131	
<b>Expiry Date:</b>	January 17, 2020	April 24, 2019	January 17, 2020		April 19, 2019	

<b>Ambient Temperature (°C)</b>						
<b>As Found:</b>			<b>As Left: (same as found if acceptable)</b>			
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>
#1	-11.62	-11.9	0.3	-11.62	-11.9	0.3
#2	-11.68	-11.9	0.2	-11.68	-11.9	0.2
#3	-11.67	-11.9	0.2	-11.67	-11.9	0.2
<b>Average</b>	<b>-11.7</b>	<b>-11.9</b>	<b>0.2</b>	<b>-11.7</b>	<b>-11.9</b>	<b>0.2</b>
<i>Temp Limit: ± 2°C</i>						

<b>Ambient Relative Humidity (%RH)</b>						
<b>As Found:</b>			<b>As Left: (same as found if acceptable)</b>			
	<b>Reference</b>	<b>SHARP</b>	<b>Offset (ZERO)</b>	<b>Reference</b>	<b>SHARP</b>	<b>Offset (ZERO)</b>
#1	78.21	77.5	0.7	78.21	77.5	0.7
#2	78.14	77.4	0.7	78.14	77.4	0.7
#3	78.22	77.4	0.8	78.22	77.4	0.8
<b>Average</b>	<b>78.2</b>	<b>77.4</b>	<b>0.8</b>	<b>78.2</b>	<b>77.4</b>	<b>0.8</b>
<i>RH Limit: ± 2 %RH</i>						

<b>Flow Temperature (°C)</b>						
<b>As Found:</b>			<b>As Left: (same as found if acceptable)</b>			
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>
#1	21.20	20.2	1.0	21.20	20.2	1.0
#2	21.24	20.3	0.9	21.24	20.3	0.9
#3	21.21	20.2	1.0	21.21	20.2	1.0
<b>Average</b>	<b>21.2</b>	<b>20.2</b>	<b>1.0</b>	<b>21.2</b>	<b>20.2</b>	<b>1.0</b>
<i>Temp Limit: ± 2°C</i>						

<b>Barometric Pressure (mmHg)</b>						
<b>As Found:</b>			<b>As Left: (same as found if acceptable)</b>			
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>
#1	708.2	708.5	-0.3	708.2	708.5	-0.3
<i>BP Limit: ± 2 mmHg</i>						

<b>Nephelometer Relative Humidity (%RH)</b>						
<b>As Found:</b>			<b>As Left: (same as found if acceptable)</b>			
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>
#1	15.56	16.8	-1.2	15.56	15.6	0.0
<i>RH Limit: ± 2 %RH</i>						

<b>Nephelometer Temperature (°C)</b>						
<b>As Found:</b>			<b>As Left: (same as found if acceptable)</b>			
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>
#1	21.20	20.6	0.6	21.20	20.6	0.6
<i>Temp Limit: ± 2°C</i>						

<b>Nephelometer Source Level</b>						
<b>As Found:</b>			<b>As Left: (same as found if acceptable)</b>			
	<b>Variable</b>	<b>Value</b>		<b>Variable</b>	<b>Value</b>	
	IRED	66		IRED	66	
	SRC LEVEL	48		SRC LEVEL	48	
<i>IRED Limit (as found): 60-70 mA Adjusted IRED Limit (as left): 65 mA</i>						

<b>Detector Calibration (Auto)</b>						
<b>As Found:</b>			<b>As Left:</b>			
Detector Auto Calibration Completed: YES			<b>Variable</b>	<b>Value</b>		
			HIGH VOLT	1420		
			BETA REF TH	390		
			ALPHA TH	980		
			DIFF HV	2		

<b>Mass Coefficient (Auto)</b>						
<b>Zero</b>			<b>Span</b>			
<b>Variable</b>	<b>Value</b>		<b>Variable</b>	<b>Value</b>		
MASS COEF	7009.8		MASS COEF	7016.6		<b>Foil Set: CM9258</b>
FOIL VALUE	0		FOIL VALUE	1328		
Beta Avg	9952		Beta Avg	8236		
difference	Foil set 9258		difference	0.1		

<b>Flow Calibration (L/min)</b>						
<b>As Found:</b>			<b>As Left: (same as found if acceptable)</b>			
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>
#1	16.65	16.64	0.01	16.65	16.64	0.01
#2	16.65	16.65	0.00	16.65	16.65	0.00
#3	16.66	16.67	-0.01	16.66	16.67	-0.01
<b>Average</b>	<b>16.65</b>	<b>16.65</b>	<b>0.00</b>	<b>16.65</b>	<b>16.65</b>	<b>0.00</b>
<i>Flow Limit: 16.67 ± 0.33 L/min</i>						

<b>Leak Check (L/min)</b>						
<b>Without Leak Check Adapter</b>			<b>With leak Check Adapter</b>			
	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>	<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>
#1	16.65	16.66	-0.01	16.63	16.63	0.00
						<i>Leak Limit: 0.08 L/min</i>
						<b>LEAK RATE: 0.01</b>



# Meteorological Sensor Audit/Calibration

## Location Information

Company:	LICA	Performed By:	Alex Yakupov
Audit Location:	Bonnyville East	Reviewed By:	Rob Fisher
Audit Date:	October 24, 2018	Start/End Time (mst):	12:56 / 14:01
Calibration Purpose:	installation	Weather Conditions:	Mainly sunny

## Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1 V
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200 km/h
Serial #:	56778	Direction Voltage Output Range:	0-1 V
Previous Cal/Audit Date:	n/a or unknown	Direction Unit Output Range:	0-360 degrees

## Wind Calibrator Information

Calibrator I.D. and Expiry Date: Model 18860-90/18802 SN: CA 4744, calibrated on May 18, 2018

## Wind Speed Audit Data **\*\*+/- 2% of the average correction factor is the limit\*\***

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.0	0.0	-
1000	18.4	18.4	18.4	1.000
2000	36.9	36.8	36.8	1.003
3000	55.3	55.4	55.4	0.998
4000	73.7	73.8	73.8	0.999
5000	92.2	92.2	92.2	1.000
6000	110.6	110.6	110.6	1.000
7000	129.0	129.0	129.0	1.000
8000	147.4	147.4	147.4	1.000
9000	165.9	165.8	166.0	1.000
10000	184.3	184.0	184.4	1.001
The audit meets AMD requirements.			Average Correction Factor=	1.000

## Wind Direction Audit Data **\*\*+/- 3° of the absolute average degrees difference for all points is the limit\*\***

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	355	0.0	0.0	0.0
30	330	30	331	0.0	-0.6	0.3
60	300	60	301	0.0	-0.8	0.4
90	270	90	271	0.0	-1.0	0.5
120	240	121	241	-0.6	-0.8	0.7
150	210	151	211	-0.8	-1.3	1.1
180	180	181	182	-0.9	-1.8	1.4
210	150	211	152	-1.0	-2.3	1.7
240	120	240	121	-0.3	-1.4	0.9
270	90	270	92	0.0	-2.0	1.0
300	60	300	62	0.1	-1.6	0.9
330	30	330	31	-0.1	-1.0	0.6
355	0	355	0	0.0	0.3	0.2
The audit meets AMD requirements.			Average Absolute Degrees Difference=		0.7	

## Comments:

Company: <u>Maxxam</u>		Operator: <u>Chris W</u>	
<b>Calibrator:</b>		<b>Flow Measurement Device:</b>	
Make/Model	<u>API 700</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>690</u>	Serial Number	<u>L-153351 H-152571</u>
Last Verification Date	<u>March 2016</u>	Temperature (°C)	<u>23.5 C</u>
NO Cylinder S/N	<u>LL108015</u>	Barometric Pressure	<u>695 mmHg</u>
NO [PPM]	<u>52.2</u>	NOx [PPM]	<u>52.3</u>
Expiry Date	<u>Oct 2020</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 <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4959	75.0	0.789	0.791	0.793	0.000	0.793	1%	0%
4971	36.5	0.383	0.384	0.384	0.000	0.384	0%	0%
4967	18.2	0.191	0.192	0.191	0.000	0.191	0%	-1%
Absolute Average Percent Difference							0%	0%

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

<b>NO</b>		<b>LIMITS</b>		<b>NOx</b>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0054	<b>0.90-1.10</b>		m (Slope)=	1.0031
b (Intercept % of FS)=	-0.0583	± 3% F.S.		b (Intercept % of FS)=	-0.0795

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
4959	0.000	0.000	0.790	-0.001	0.789	NO <sub>2</sub>	% Diff. Limit
4959	0.500	0.497	0.293	0.493	0.786	-1%	± 10%
4959	0.275	0.273	0.517	0.269	0.787	-1%	± 10%
4959	0.100	0.102	0.688	0.099	0.787	-2%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

<b>NO<sub>2</sub></b>		<b>LIMITS</b>	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9946	<b>0.90-1.10</b>	
b (Intercept % of FS)=	-0.1817	± 3% F.S.	

<p align="center"><b>AENV Standards</b> Audit Calibrator</p> <p>Make/Model <u>Teco 146i</u></p> <p>Serial/AMU Number <u>AMU 1809</u></p> <p>SRM Gas Cylinder No. <u>APEX1170572</u></p> <p>Cylinder Conc. (ppm) <u>49.99</u></p>	<p align="center"><b>NO<sub>x</sub> Analyzer</b></p> <p>Make/Model <u>Teco 42i</u></p> <p>Serial/AMU Number <u>AMU 1868</u></p> <p>Last Calibration Date <u>March 14, 2018</u></p> <p>Full Scale (ppm) <u>1.0</u></p> <p>Cylinder Gas Expiry Date <u>November 2020</u></p>
--	--

COMMENTS: Cylinder contains 47.9 ppm SO<sub>2</sub>.

Auditor: Al Clark

Operator Signature:

Date: March 15, 2018

Location: McIntyre Center Edmonton



Company Maxxam Operator: Mike

<b>Calibrator:</b>		<b>Flow Measurement Device:</b>	
Make/Model	<u>Sabio</u>	Make/Model	<u>Bios Definer 220</u>
Serial Number	<u>17100415</u>	Serial Number	<u>H=128686; L=129069</u>
Last Verification Date	<u>May 16, 2017</u>	Temperature (°C)	<u>22.2 C</u>
NO Cylinder S/N	<u>LL104183</u>	Barometric Pressure	<u>706.1mmHg</u>
NO [PPM]	<u>50.8</u>	NOx [PPM]	<u>50.9</u>
Expiry Date	<u>October 24, 2020</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5120</u>	Pt. #2	<u>5121</u>
Pt. #3	<u>5128</u>		
Gas Flow (sccm)			
Pt. #1	<u>77.4</u>	Pt. #2	<u>37.8</u>
Pt. #3	<u>19</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO <sub>2</sub>	NOx	NO	NOx
5136	0.0	0.0000	0.0000	0.0001	-0.0002	0.0001	Limit ± 10%	
5120	77.4	0.7680	0.7695	0.7793	0.0003	0.7796	1%	1%
5121	37.8	0.3750	0.3757	0.3802	0.0000	0.3802	1%	1%
5128	19.0	0.1882	0.1885	0.1908	0.0005	0.1909	1%	1%
Absolute Average Percent Difference							1%	1%

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

<b>NO</b>		<b>LIMITS</b>		<b>NOx</b>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0146	0.90-1.10		m (Slope)=	1.0130
b (Intercept % of FS)=	-0.0074	± 3% F.S.		b (Intercept % of FS)=	-0.0059

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
5120	0.0	0.0000	0.7794	0.0005	0.7799	NO <sub>2</sub>	% Diff. Limit
5120	500.0	0.4827	0.2967	0.4854	0.7806	0%	± 10%
5120	275.0	0.2672	0.5122	0.2676	0.7798	0%	± 10%
5120	90.0	0.0896	0.6898	0.0890	0.7787	-1%	± 10%
Absolute Average Percent Difference						0%	± 10%

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

<b>NO<sub>2</sub></b>		<b>LIMITS</b>
Correlation=	1.0000	≥ 0.995
m (Slope)=	1.0053	0.90-1.10
b (Intercept % of FS)=	-0.0370	± 3% F.S.

<b>AENV Standards</b>		<b>NO<sub>x</sub> Analyzer</b>	
<b>Audit Calibrator</b>		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>August 16, 2018</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Cylinder Gas Expiry Date	<u>November 15, 2020</u>

COMMENTS: \_\_\_\_\_

Auditor: Shea Beaton Date: August 21, 2018  
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

Company: Maxxam

Operator: Mike

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>NA</u>
Serial Number	<u>11900613</u>	Serial Number	<u>NA</u>
Oven Temperature	<u>49.7</u>	Temperature (°C)	<u>22.9</u>
Last Verification Date	<u>March 16, 2017</u>	Barometric Pressure	<u>698mmHg</u>

**Flow Measurements**

Pt. No. 1 NA Pt. No. 2 NA Pt. No. 3 NA

Calibrator Flow (sccm)	Calculated Concentration (ppm)	Indicated Concentration (ppm)	% Difference	
			vs Audit Gas	% Diff. Limit
Zero Air	0.000	0.001		
5000	0.400	0.383	-4%	± 10%
5000	0.200	0.192	-4%	± 10%
5000	0.100	0.097	-4%	± 10%
Absolute Average Percent Difference			4%	± 10%

**LINEAR REGRESSION ANALYSIS**

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

<u>O<sub>3</sub></u>		<u>LIMITS</u>
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9554	0.90-1.10
b (Intercept % of FS)=	0.2160	± 3% F.S.

**AENV Standards**

**Audit Calibrator**

Make/Model	<u>Thermo 49iPS</u>
Serial/AMU Number	<u>1808</u>
Ozone Standard	<u>Thermo 49iPS</u>

**Ozone Analyzer**

Make/Model	<u>Thermo 49i</u>
Serial/AMU Number	<u>1843</u>
Last Calibration Date	<u>August 16, 2018</u>
Full Scale (ppm)	<u>0.5</u>

COMMENTS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Auditor: Shea Beaton

Date: August 22, 2018

Operator Signature:

Location: McIntyre Center Edmonton



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-482CGA

**Company:** Maxxam **Operator's Name:** Mike  
**Cylinder #:** LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair  
**Expiry Date:** October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&amp;R MFC 201</u>	Make/Model: <u>Mesa Definer 220</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>H-133034 / L-132702</u>
Last Verification Date: <u>December 13, 2017</u>	Temp. °C: <u>23.4 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P. <u>707 mmHg</u>
Cylinder Number: <u>CAL016625</u>	
Expiry Date: <u>January 2019</u>	

**Reference Analyzer:**  
 Make/Model: Teco 43C Serial/AMU Number: 1623  
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0  
 Last Calibration: Date: Dec12/17 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	<del>0.000</del>	<del>0.000</del>	<del>0.000</del>
4989	79.5	0.764	0.01594	62.755	47.9
4995	39.6	0.380	0.00793	126.136	47.9
4992	19.6	0.188	0.00393	254.694	47.9
Average Cylinder Concentration:					<b>47.9</b>

Previous Stated Concentration PPM: 49.2  
 Percent variance from Stated: 3

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: December 13, 2017  
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton





# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike  
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%) 2 Certified By: Praxair  
 Expiry Date: October 2020

**Reference Calibrator and Gas:**  
 Make/Model: Sabio 2010  
 Serial Number: AMU 2092  
 Last Verification Date: January 17, 2018  
 Gas Type: H2S Conc. 20.43  
 Cylinder Number: CAL015272  
 Expiry Date: January 2019

**Flow Measurement Device:**  
 Make/Model: Mesa Defender 530  
 Serial Number: H-153961 / L-153874  
 Temp. °C: 23.0 C  
 B.P.: 697 mmHg

**Reference Analyzer:**  
 Make/Model: Teco 450i Serial/AMU Number: 1980  
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1  
 Last Calibration: Date: Jan 17/18 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	<del>0.00784</del>	<del>248.911</del>	<del>9.60</del>
5051	39.6	0.0753	0.00784	127.551	9.60
5028	20.2	0.0387	0.00402	248.911	9.63
5033	10.5	0.0198	0.00209	479.333	9.49
Average Cylinder Concentration:					<b>9.58</b>

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

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

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: *Al Clark*

Location: McIntyre Center Edmonton



# Calibration Gas Audit

## CH4 / C3H8 Cylinder Gas

File No. 2017-481CGA

**Company:** Maxxam                      **Operators name:** Mike

Cylinder #: LL119471    Conc CH4 (PPM)    599/207    Tolerance (%) 2    Certified By: Praxair

Expiry Date: October 2025

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&amp;R MFC 201</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 1690</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>December 13, 2017</u>			Temp. °C	<u>23.1 C</u>
Gas Type	<u>CH4</u>	Conc.	<u>990.4</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>5604875</u>	Expiry Date	<u>July 2021</u>		
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF003845B</u>	Expiry Date	<u>July 2022</u>		

**Reference Analyzer:**

Make/Model Teco 55i                      Serial/AMU Number: 2108

Instrument Settings    Zero: N/A                      Span: N/A                      Range: 20.0

Last Calibration:                      Date: Dec 12/17                      C.F. 1.000                      Done By: Al Clark

Calibrator Flows (scem)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
3500	0.0	0.00	0.00	<del>0.02</del>	<del>45.00</del>	<del>603</del>	<del>209</del>
3618	80.4	13.41	12.75	0.02	45.00	603	209
3547	39.8	6.73	6.47	0.01	89.12	600	210
3560	19.8	3.34	3.21	0.01	179.80	601	210
Average Cylinder Concentration:						<b>601</b>	<b>209</b>

<b>CH4</b>	<b>C3H8</b>
Previous Stated Concentration PPM: <u>599</u>	<u>207</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

**Cylinder gas tolerances based on CH4 only**

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: December 13, 2017

Operator Signature: *Al Clark*                      Location: McIntyre Center Edmonton



# Calibration Gas Audit

## NO Cylinder Gas

File No. 2017-483CGA

**Company:** Maxxam                      **Operators name:** Mike

Cylinder #: LL104225    Conc (PPM) 51.5/51.6    Tolerance (%) 2    Certified By: Praxair

Expiry Date: October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model <u>Teco 146i</u>	Make/Model <u>Mesa Definer 220</u>
Serial Number <u>AMU 1809</u>	Serial Number <u>H-133034 / L-132702</u>
Last Verification Date <u>December 13, 2017</u>	Temp. °C <u>23.4 C</u>
Gas Type <u>NO</u> Conc. <u>50.03</u>	B.P. <u>707 mmHg</u>
Cylinder Number <u>APEX 1223938</u>	
Expiry Date <u>June 2020</u>	

**Reference Analyzer:**

Make/Model Teco 42i                      Serial/AMU Number: 1868

Instrument Settings                      Zero: 4.7                      Span: 1.004                      Range: 1.0

Last Calibration:                      Date: Dec12/17                      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				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						<b>51.3</b>	<b>51.1</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</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

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark                      Date: December 13, 2017

Operator Signature: *Al Clark*                      Location: McIntyre Center Edmonton