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

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

December 2, 2018

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

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Cold Lake South AQM Station in the month of October 2018.

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

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

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

All data collected in October 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

As the LICA Environmental Program Manager and Data & Reporting Specialist, we 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 and Partisol samples. We are currently working with the airdata warehouse to set up codes for some VOC/PAH species that are missing in the parameter list. The results for these data will be submitted once all needed codes are available.

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

Respectfully,

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

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

Lily Lin
Data & Reporting Specialist
587-225-2248
monitoring@lica.ca

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

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

AMBIENT AIR MONITORING MONTHLY DATA REPORT

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

COLD LAKE SOUTH CONTINUOUS MONITORING STATION

JOB #: 2833-2018-10-1-C

October 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
5107 50 ST.
BONNYVILLE, ALBERTA
T9N 2J7

Attention: MIKE BISAGA

DATE: **November 23, 2018**

Prepared by: Maram Ghaleb

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

Reviewed by:

Wunmi Adekanmbi, M.Sc., EPt, PMP
Project Team Lead, Customer Service, Air Services

SUMMARY

In October 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Cold Lake Continuous Monitoring Station, near Cold Lake, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry & Community Association.

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

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

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

$PM_{2.5}$: One hour of downtime was incurred on October 1 at hour 11:00, due to datalogger activities surrounding the addition of another $PM_{2.5}$ channel that records minimum concentrations.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association Cold Lake South 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_2 (ppb)	172	48	0	0	0	2	13	2	12.0	NW	1	13	100.0
TRS (ppb)	-	-	-	-	0	1	16	1	3.9	WNW	0	1	100.0
THC (ppm)	-	-	-	-	2.07	2.75	24	1	1.1	ESE	2.30	24	100.0
CH_4 (ppm)	-	-	-	-	2.07	2.75	24	1	1.1	ESE	2.29	24	100.0
NMHC (ppm)	-	-	-	-	0.00	0.13	10	18	1.1	SSW	0.01	10	100.0
NO_2 (ppb)	159	-	0	-	3	36	26	7	6.2	SW	9	24	100.0
NO (ppb)	-	-	-	-	1	79	29	10	10.2	NW	9	25	100.0
NOx (ppb)	-	-	-	-	5	79	29	10	10.2	NW	18	25	100.0
O_3 (ppb)	82	-	0	-	22.3	52.4	17	15	10.7	WSW	34.4	18	100.0
$PM_{2.5}$ ($\mu g/m^3$)	80	30	0	0	3	27	9	7	0.9	NE	14	25	99.9
RELATIVE HUMIDITY (%)	-	-	-	-	66	98	12	7	1.2	NW	89	29	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	2.0	21.9	17	15	10.7	WSW	9.9	17	100.0
VECTOR WS (kph)	-	-	-	-	1.5	17.4	21	13	-	WNW	9.9	13	100.0
VECTOR WD (sec)	-	-	-	-	279 (W)	-	-	-	-	-	-	-	100.0

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

Exceedance Summary Report

SO_2 1-Hour Exceedances
Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO_2 24-Hour Exceedances
Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

NO_2 1-Hour Exceedances
Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

$PM_{2.5}$ 1-Hour Exceedances
Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

$PM_{2.5}$ 24-Hour Exceedances
Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O_3 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.

TABLE OF CONTENTS

1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO_2), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Methane (CH_4), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NOx), Nitric Oxides (NO), Nitrogen Dioxide (NO_2), Ozone (O_3), Particulate Matter 2.5 ($PM_{2.5}$), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO_2)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on October 17.

TOTAL REDUCED SULPHUR (TRS)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on October 16.

TOTAL HYDROCARBONS (THC), METHANE (CH_4) and NON-METHANE HYDROCARBONS (NMHC)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on October 17.

OXIDES OF NITROGEN (NOx), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO_2)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on October 17.
- The City of Cold Lake, Municipal Road and Environmental Service, carried out a clean-up activity around the station towards the end of the month. As a result, elevated concentrations were recorded by the analyzer during this period. As maximum instantaneous data do not undergo the standard data correction process that hourly average data are subjected to, the NO/NOx/NO_2 parameter relationship was not preserved on some maximum instantaneous data recorded during the said period.

OZONE (O_3)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on October 16.

PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime. This was incurred on October 1 at hour 11:00, due to datalogger activities surrounding the addition of another $PM_{2.5}$ channel that records minimum concentrations.
- The routine monthly check was performed on October 16.

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

- Operational time for the monitoring period was 100%.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 100%.

2.0 Project Personnel

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

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

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

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring
Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00212: Ambient O_3 Monitoring
Maxxam AIR SOP-00213: Ambient NO/NO_2/NOx Monitoring
MET One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer
Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
Ozone - Thermo 49i Photometric Analyzer
Particulate Matter ($PM_{2.5}$) - Thermo SHARP 5030 Unit
Wind System - Met One Unit
Relative Humidity - Met One Unit
Ambient Temperature - Met One Unit
Datalogger - Envista Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

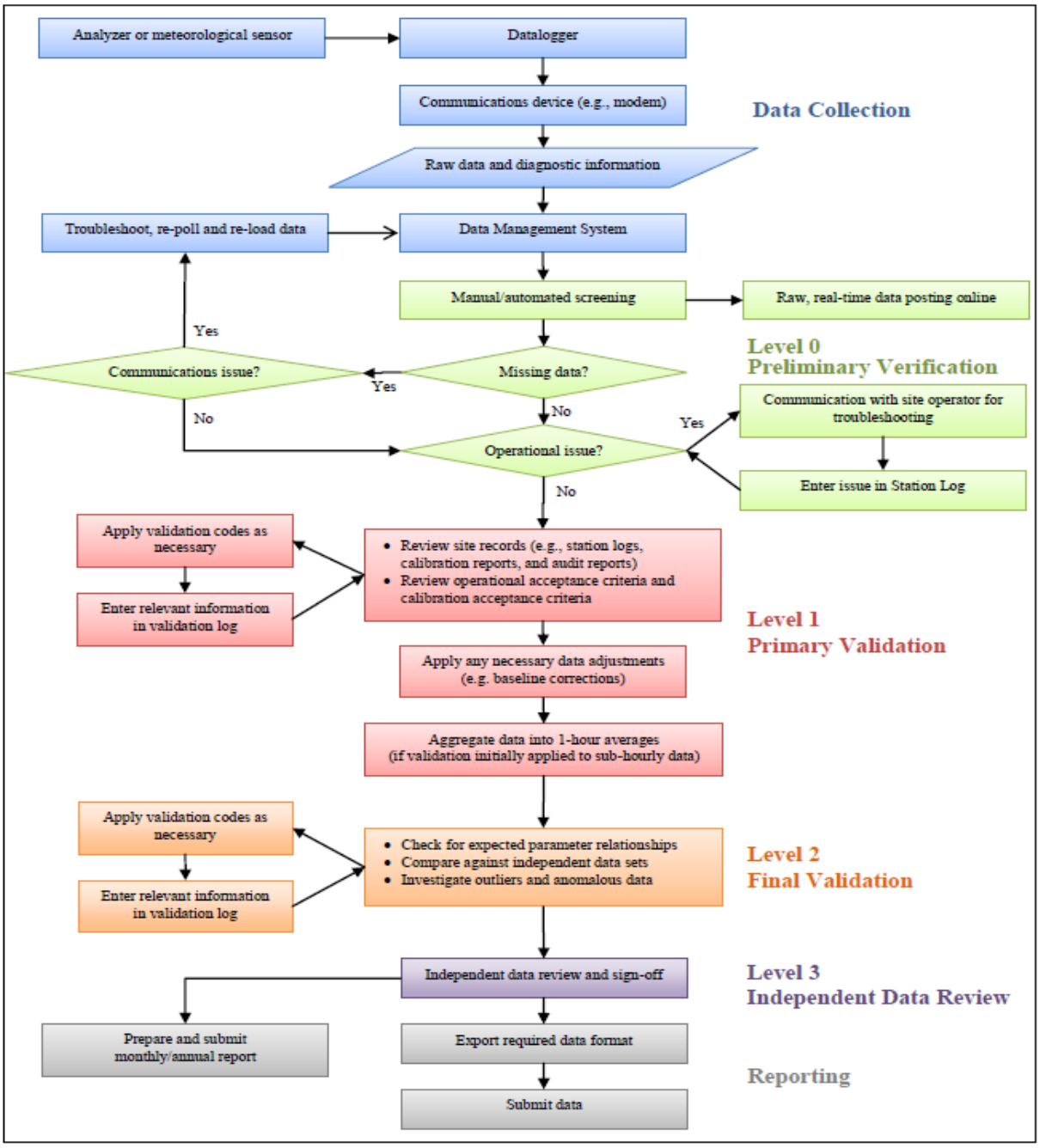
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

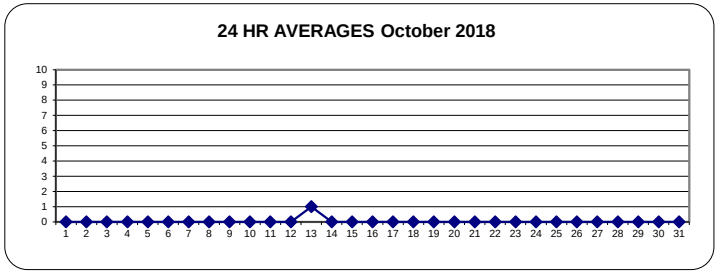
SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO_2 ppb)

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

STATUS FLAG CODES

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

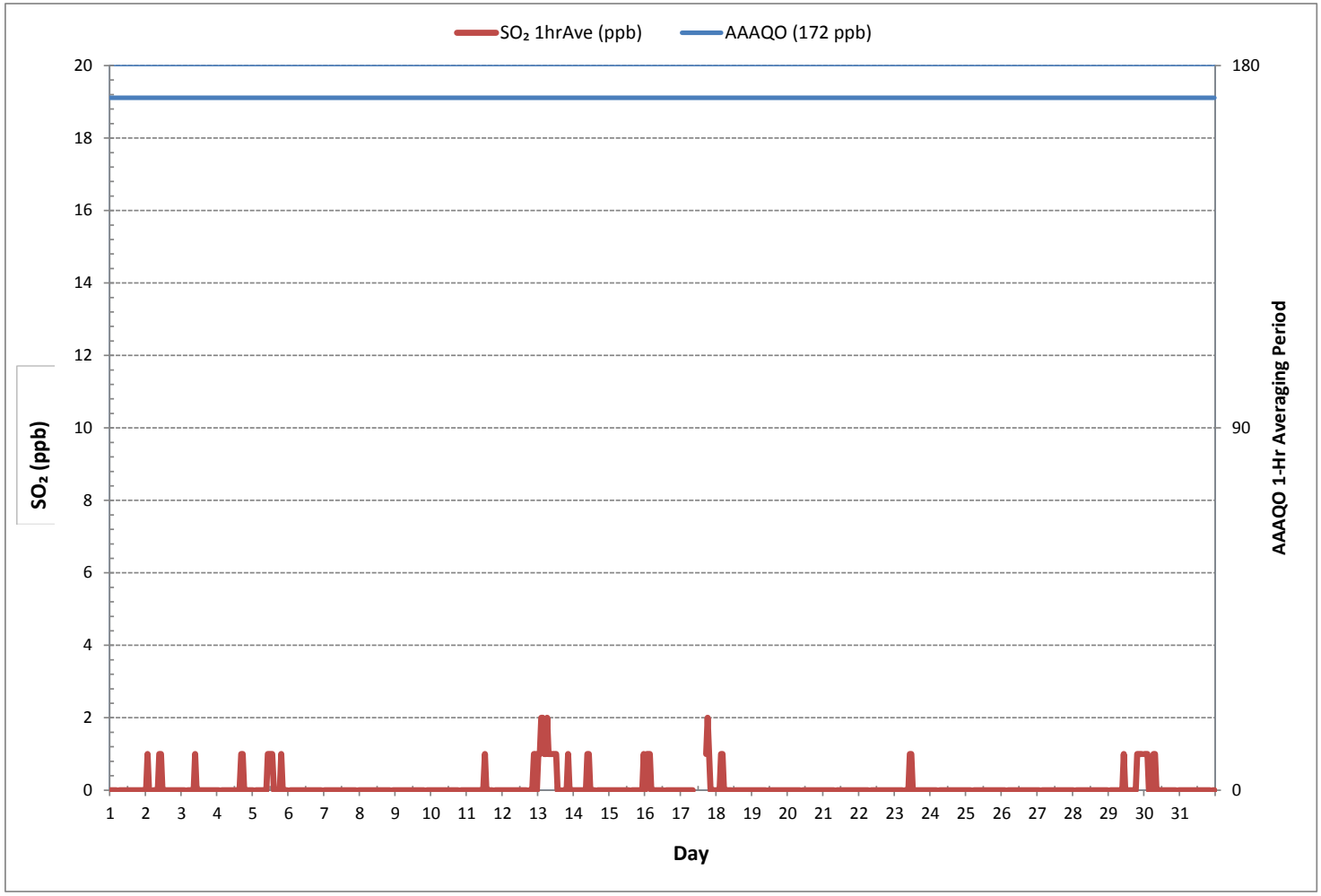


OBJECTIVE LIMIT: **ALBERTA ENVIRONMENT:** 1-HR 172 ppb | 24-HR 48 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0							
NUMBER OF 24-HR EXCEEDANCES:	0							
NUMBER OF NON-ZERO READINGS:	51							
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	0	ON DAY	1		
MAXIMUM 1-HR AVERAGE:	2	ppb	@ HOUR	2	ON DAY	13		
MAXIMUM 24-HR AVERAGE:	1	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:	0		MONTHLY AVERAGE:			0	ppb	

SULPHUR DIOXIDE Hourly Averages (SO_2 ppb)



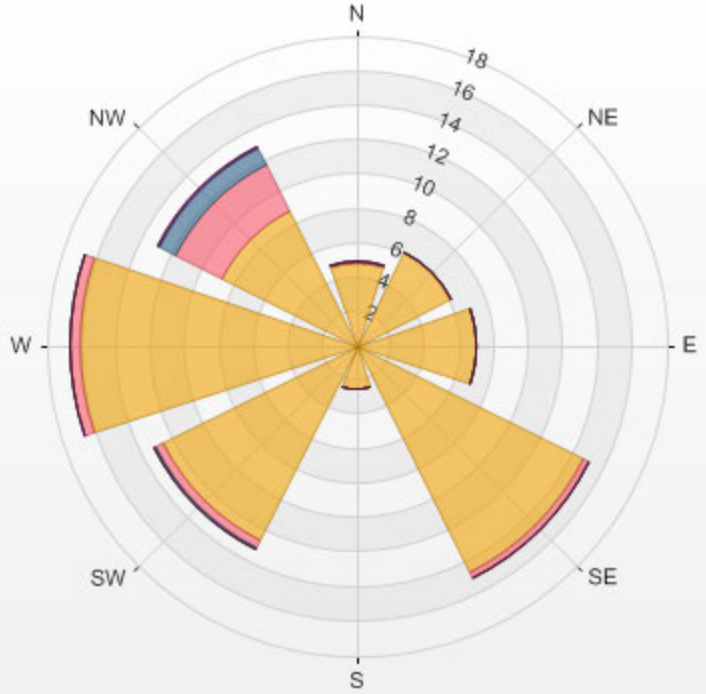
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-SO2[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.59% Calm Avg: 0.08 [ppb]

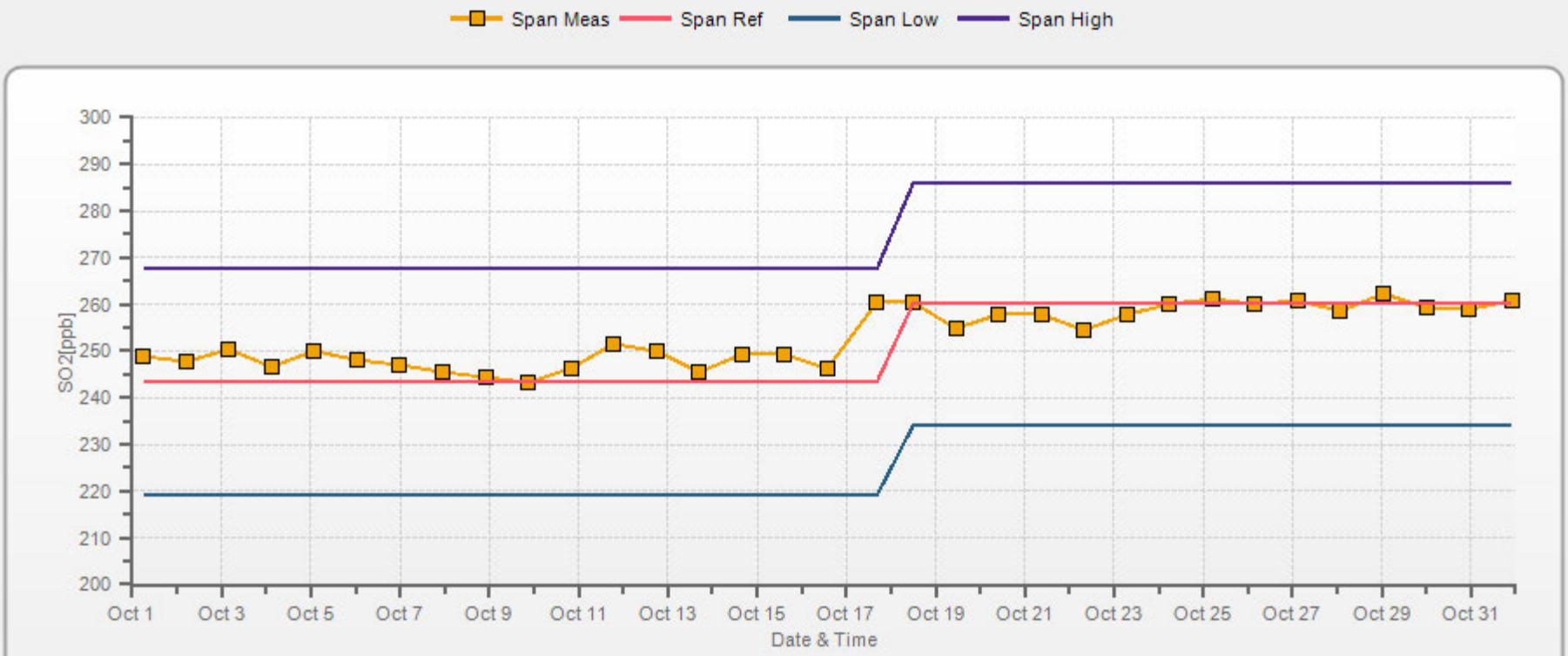
Direction	0.0-0.6	0.6-1.2	1.2-1.8	1.8-2.4	2.4-3.0	>3.0	Total
N	4.8	0.1	0.0	0.0	0.0	0.0	5.0
NE	6.1	0.0	0.0	0.0	0.0	0.0	6.1
E	7.0	0.0	0.0	0.0	0.0	0.0	7.0
SE	14.8	0.3	0.0	0.0	0.0	0.0	15.1
S	2.6	0.0	0.0	0.0	0.0	0.0	2.6
SW	12.6	0.4	0.1	0.0	0.0	0.0	13.2
W	16.1	0.6	0.0	0.0	0.0	0.0	16.6
NW	8.8	3.0	1.0	0.1	0.0	0.0	12.9
Summary	72.7	4.4	1.1	0.1	0.0	0.0	78.4

% Icon	Classes (ppb)	73	0.0-0.6	4	0.6-1.2	1	1.2-1.8	0	1.8-2.4	0	2.4-3.0	0	>3.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.59% Calm Poll Avg: 0.08[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/10 Type: Span



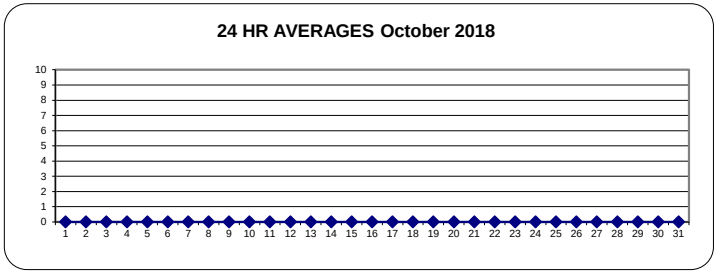
TOTAL REDUCED SULPHUR

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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

STATUS FLAG CODES

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

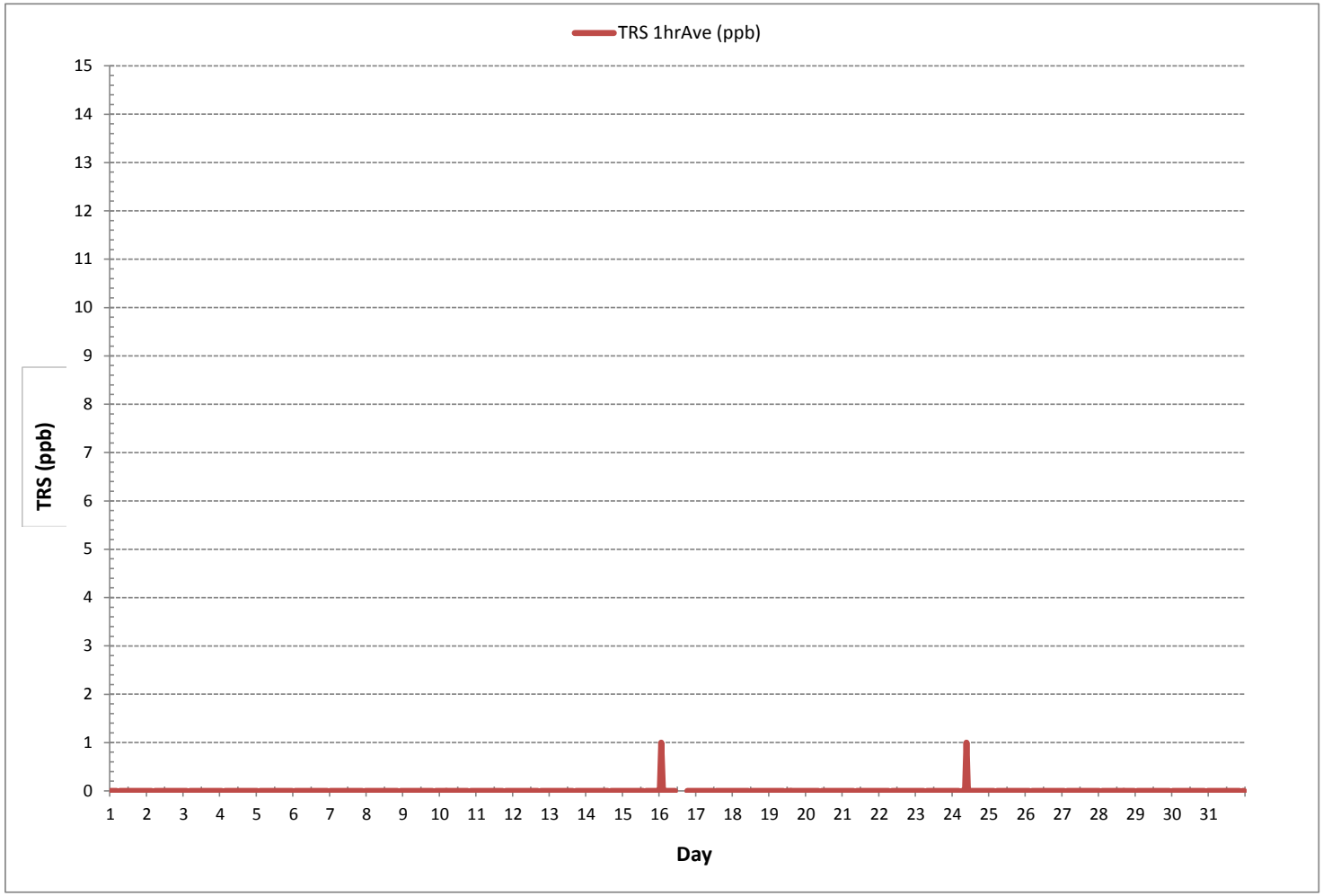


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:		2				
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	1	ppb	@ HOUR	1	ON DAY	16
MAXIMUM 24-HR AVERAGE:	0	ppb			ON DAY	1

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



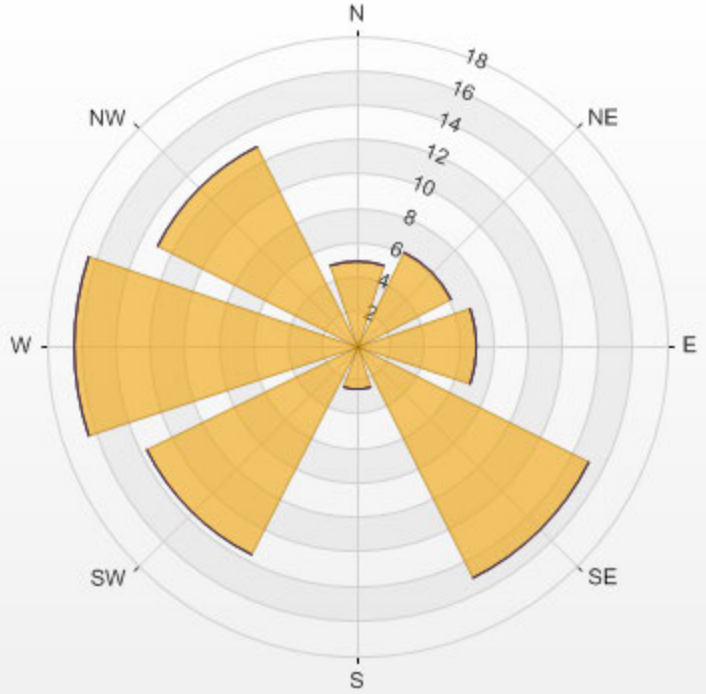
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-TRS[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.42% Calm Avg: 0.23 [ppb]

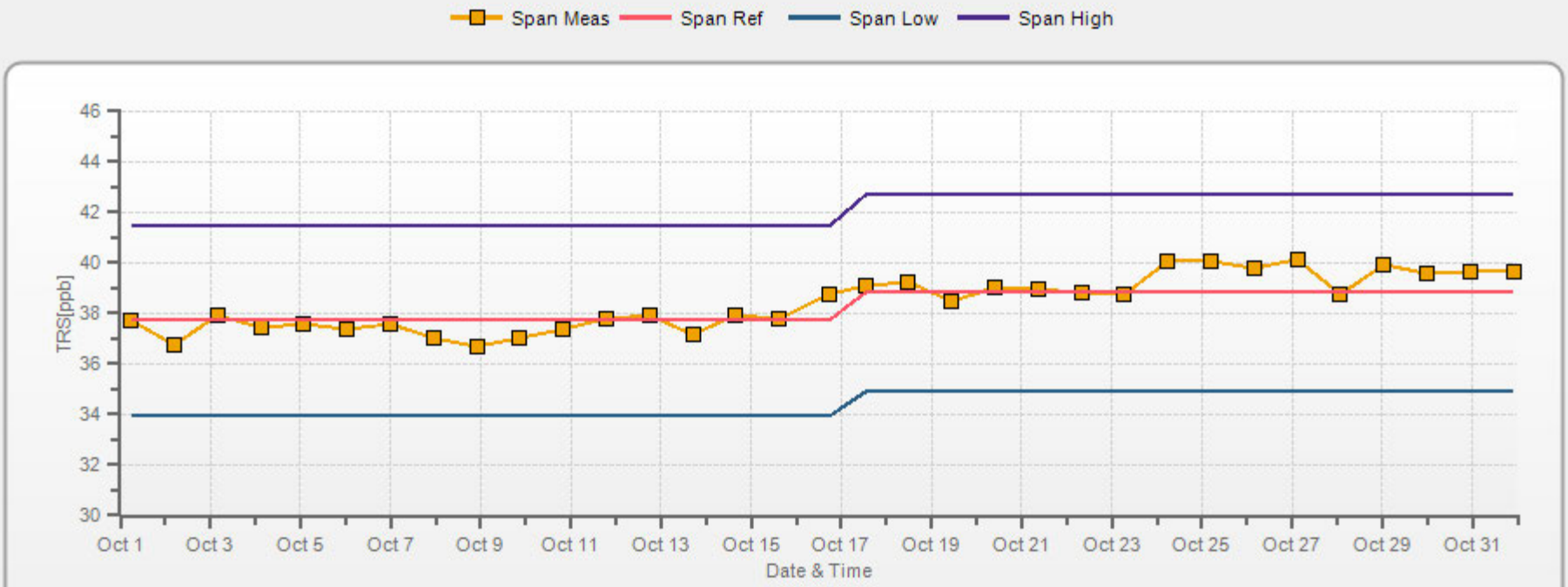
Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	5.0	0.0	0.0	0.0	5.0
NE	6.1	0.0	0.0	0.0	6.1
E	7.0	0.0	0.0	0.0	7.0
SE	15.0	0.0	0.0	0.0	15.0
S	2.6	0.0	0.0	0.0	2.6
SW	13.6	0.0	0.0	0.0	13.6
W	16.5	0.0	0.0	0.0	16.5
NW	12.9	0.0	0.0	0.0	12.9
Summary	78.6	0.0	0.0	0.0	78.6

%	Icon	Classes (ppb)	79	0.0-0.7	0	0.7-1.3	0	1.3-2.0	0	>2.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.42% Calm Poll Avg: 0.23[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/10 Type: Span



TOTAL HYDROCARBON

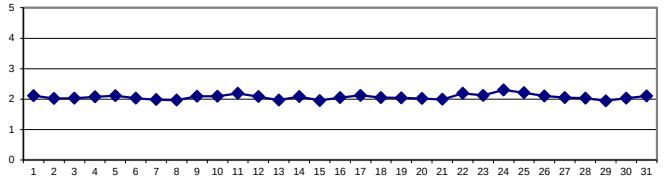
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST) / HR END (MST)	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
DAY																												
1	2.08	2.09	2.08	2.08	2.09	S	2.12	2.21	2.34	2.24	2.21	2.12	2.08	2.07	2.07	2.06	2.06	2.10	2.13	2.10	2.07	2.08	2.09	2.05	2.05	2.34	2.11	24
2	2.05	2.06	2.07	2.04	S	2.01	2.01	2.07	2.06	1.99	2.00	1.99	1.99	1.99	1.99	1.99	1.98	1.98	1.99	2.04	2.04	2.05	2.09	2.09	1.98	2.09	2.02	24
3	2.08	2.12	2.14	S	2.08	2.07	2.06	2.06	2.03	1.99	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.98	2.00	2.04	2.02	2.04	2.04	2.03	1.97	2.14	2.03	24
4	2.02	2.03	S	2.02	2.01	2.01	2.01	2.01	2.02	2.05	2.04	2.02	2.02	2.01	2.02	2.03	2.04	2.08	2.16	2.22	2.15	2.15	2.18	2.20	2.01	2.22	2.07	24
5	2.19	S	2.24	2.25	2.28	2.26	2.29	2.34	2.20	2.15	2.19	2.08	2.01	2.00	1.99	1.99	1.99	2.00	2.00	2.00	2.00	2.02	2.05	2.04	1.99	2.34	2.11	24
6	S	2.05	2.04	2.01	2.01	2.01	2.01	2.00	2.01	2.00	2.00	2.01	2.02	2.02	2.03	2.03	2.04	2.05	2.05	2.05	2.08	2.07	2.04	S	2.00	2.08	2.03	24
7	2.04	2.02	1.99	1.99	1.99	1.99	1.99	1.98	1.98	1.98	1.97	1.98	1.97	1.98	1.98	2.01	1.97	1.97	1.97	1.97	1.97	1.97	S	1.97	1.97	2.04	1.98	24
8	1.97	1.97	1.97	1.97	1.97	1.97	1.98	1.98	1.97	1.97	1.97	1.97	1.97	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.97	S	2.03	2.07	1.96	2.07	1.97	24
9	2.12	2.14	2.10	2.13	2.17	2.25	2.24	2.30	2.34	2.21	2.01	1.95	1.95	1.95	1.95	1.95	1.95	1.96	1.98	2.03	S	2.12	2.13	2.15	1.95	2.34	2.09	24
10	2.14	2.20	2.20	2.16	2.15	2.18	2.22	2.17	2.07	2.00	2.00	2.00	1.98	1.98	1.97	1.97	1.97	1.98	2.14	S	2.03	2.05	2.16	2.24	1.97	2.24	2.09	24
11	2.27	2.35	2.57	2.31	2.26	2.24	2.20	2.27	2.43	2.43	2.16	2.09	2.11	2.13	2.09	2.03	2.05	2.03	S	2.02	2.02	2.10	2.08	2.10	2.02	2.57	2.19	24
12	2.11	2.11	2.13	2.17	2.16	2.23	2.25	2.28	2.22	2.27	2.26	2.17	2.01	1.99	2.00	1.99	1.97	S	1.94	1.94	1.94	1.96	1.94	1.93	1.93	2.28	2.08	24
13	1.95	1.95	1.96	1.97	1.96	1.96	1.96	1.96	1.95	1.95	1.96	1.96	1.95	1.95	1.95	1.95	S	1.95	1.96	1.97	1.99	2.01	2.00	2.10	1.95	2.10	1.97	24
14	2.14	2.19	2.25	2.26	2.22	2.20	2.22	2.25	2.10	2.05	2.00	1.99	1.96	1.98	1.99	S	1.98	1.99	2.03	2.06	2.03	2.04	2.03	2.00	1.96	2.26	2.08	24
15	2.02	2.08	2.03	1.97	1.97	1.98	1.99	2.00	1.98	1.95	1.91	1.91	1.91	1.91	S	1.92	1.92	1.91	1.93	1.91	**1.90**	1.93	1.91	1.91	**1.90**	2.08	1.95	24
16	1.92	1.96	1.95	1.92	1.96	2.05	2.14	2.30	2.18	2.10	2.09	2.04	1.98	S	1.93	1.92	1.92	1.93	1.96	2.18	2.20	2.24	2.22	2.14	1.92	2.30	2.05	24
17	2.17	2.19	2.25	2.22	2.25	2.29	2.29	2.30	2.05	C	C	C	C	C	1.97	1.96	1.96	1.99	2.08	2.09	2.11	2.05	2.05	2.08	1.96	2.30	2.12	24
18	2.10	2.17	2.24	2.27	2.21	2.12	2.14	2.11	2.07	2.03	1.97	S	1.96	1.94	1.93	1.94	1.95	1.96	1.96	1.97	1.97	2.00	2.05	2.05	1.93	2.27	2.05	24
19	2.06	2.12	2.10	2.08	2.15	2.10	2.09	2.14	2.22	2.13	S	1.96	1.96	1.96	1.96	1.96	1.96	1.98	1.98	2.00	2.00	2.01	1.97	1.97	1.96	2.22	2.04	24
20	2.00	2.02	1.99	1.99	2.08	2.08	2.02	2.08	2.03	S	2.07	2.10	2.12	2.06	1.98	1.97	1.97	1.96	1.95	1.97	1.97	2.01	2.03	2.02	1.95	2.12	2.02	24
21	2.00	1.99	1.96	1.98	1.98	2.00	2.02	2.02	S	1.99	1.96	1.95	1.94	1.95	1.95	1.94	1.95	1.96	1.98	2.00	2.01	2.04	2.10	2.14	1.94	2.14	1.99	24
22	2.15	2.18	2.26	2.30	2.40	2.36	2.37	S	2.43	2.13	2.08	2.07	2.05	2.01	2.01	2.06	2.18	2.22	2.33	2.14	2.18	2.21	2.20	2.14	2.01	2.43	2.19	24
23	2.14	2.16	2.11	2.10	2.02	2.03	S	2.14	2.05	2.05	2.05	2.04	2.03	2.03	2.00	1.99	2.01	2.12	2.09	2.20	2.18	2.23	2.39	2.51	1.99	2.51	2.12	24
24	2.58	**2.75**	2.70	2.74	2.65	S	2.58	2.57	2.51	2.20	2.02	2.00	1.99	1.98	1.99	1.99	2.02	2.02	2.24	2.21	2.19	2.29	2.31	2.36	1.98	**2.75**	**2.30**	24
25	2.32	2.31	2.42	2.49	S	2.42	2.53	2.61	2.56	2.33	2.02	1.97	1.98	1.98	1.98	1.97	1.98	1.99	2.02	2.13	2.17	2.24	2.19	2.15	1.97	2.61	2.21	24
26	2.27	2.22	2.15	S	2.11	2.14	2.23	2.55	2.30	2.10	2.03	1.96	1.94	1.95	1.94	1.94	1.94	1.95	1.99	2.04	2.10	2.07	2.14	2.21	1.94	2.55	2.10	24
27	2.18	2.27	S	2.44	2.50	2.26	2.16	2.07	2.08	2.01	1.97	1.98	1.93	1.92	1.92	1.93	1.93	1.94	1.96	1.97	1.97	1.95	1.95	1.95	1.92	2.50	2.05	24
28	1.97	S	2.01	2.08	2.10	2.10	2.15	2.21	2.20	2.07	2.01	1.97	1.96	1.97	1.97	1.97	1.99	2.01	2.00	1.98	1.98	1.97	1.96	1.98	1.96	2.21	2.03	24
29	S	1.95	1.95	1.95	1.96	1.94	1.93	1.94	1.93	1.93	1.95	1.93	1.92	1.92	1.94	1.94	1.94	1.95	1.97	1.94	1.95	1.97	1.97	S	1.92	1.97	1.94	24
30	1.99	2.01	2.01	2.02	2.05	2.05	1.98	1.99	2.01	1.97	1.99	1.99	1.97	1.98	1.98	2.00	2.01	2.03	2.08	2.10	2.11	2.11	S	2.16	1.97	2.16	2.03	24
31	2.25	2.26	2.18	2.17	2.12	2.13	2.18	2.18	2.18	2.18	2.08	2.00	1.98	1.98	1.97	1.98	1.98	1.99	2.02	2.08	2.12	S	2.13	2.18	1.97	2.26	2.10	24
HOURLY MAX	2.58	2.75	2.70	2.74	2.65	2.42	2.58	2.61	2.56	2.43	2.26	2.17	2.12	2.13	2.09	2.06	2.18	2.22	2.33	2.22	2.20	2.29	2.39	2.51				
HOURLY AVG	2.11	2.14	2.14	2.14	2.13	2.12	2.15	2.17	2.15	2.08	2.03	2.01	1.99	1.98	1.98	1.98	1.98	2.00	2.03	2.04	2.05	2.07	2.08	2.10				

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

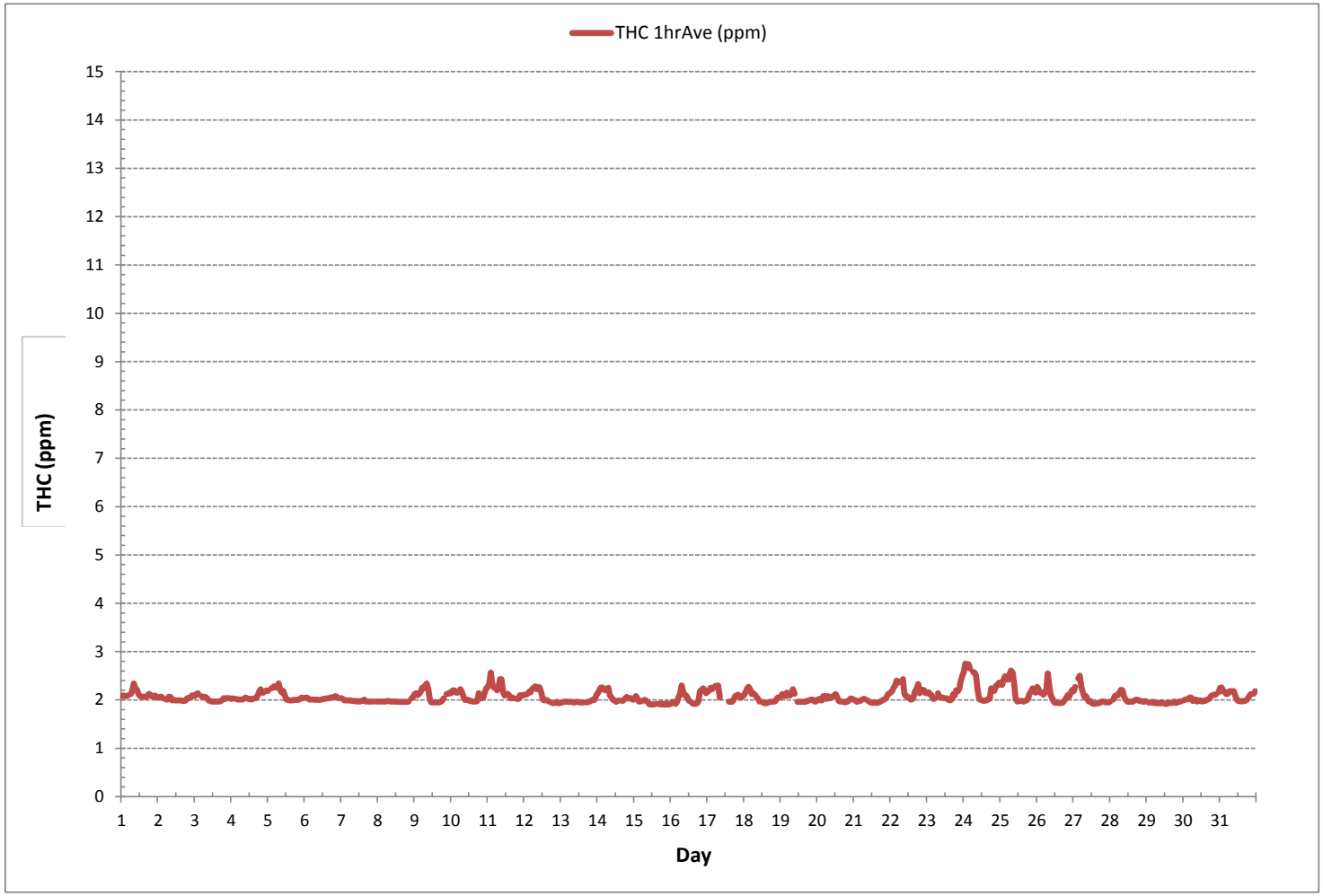
24 HR AVERAGES October 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			707				
MINIMUM 1-HR AVERAGE	1.90	ppm	@ HOUR	20	ON DAY	15	
MAXIMUM 1-HR AVERAGE:	2.75	ppm	@ HOUR	1	ON DAY	24	
MAXIMUM 24-HR AVERAGE:	2.30	ppm			ON DAY	24	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:			744	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	0.13		MONTHLY AVERAGE:			2.07	ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



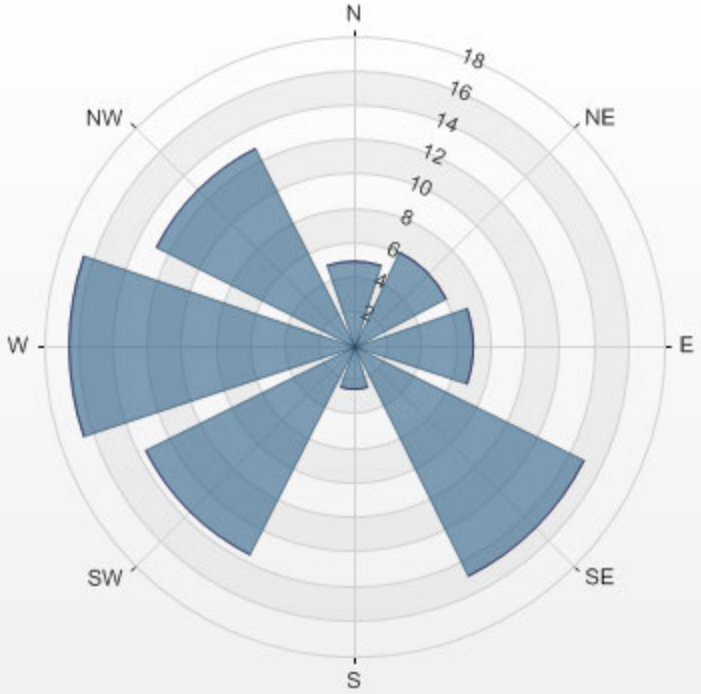
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-THC[ppm]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.50% Calm Avg: 2.20 [ppm]

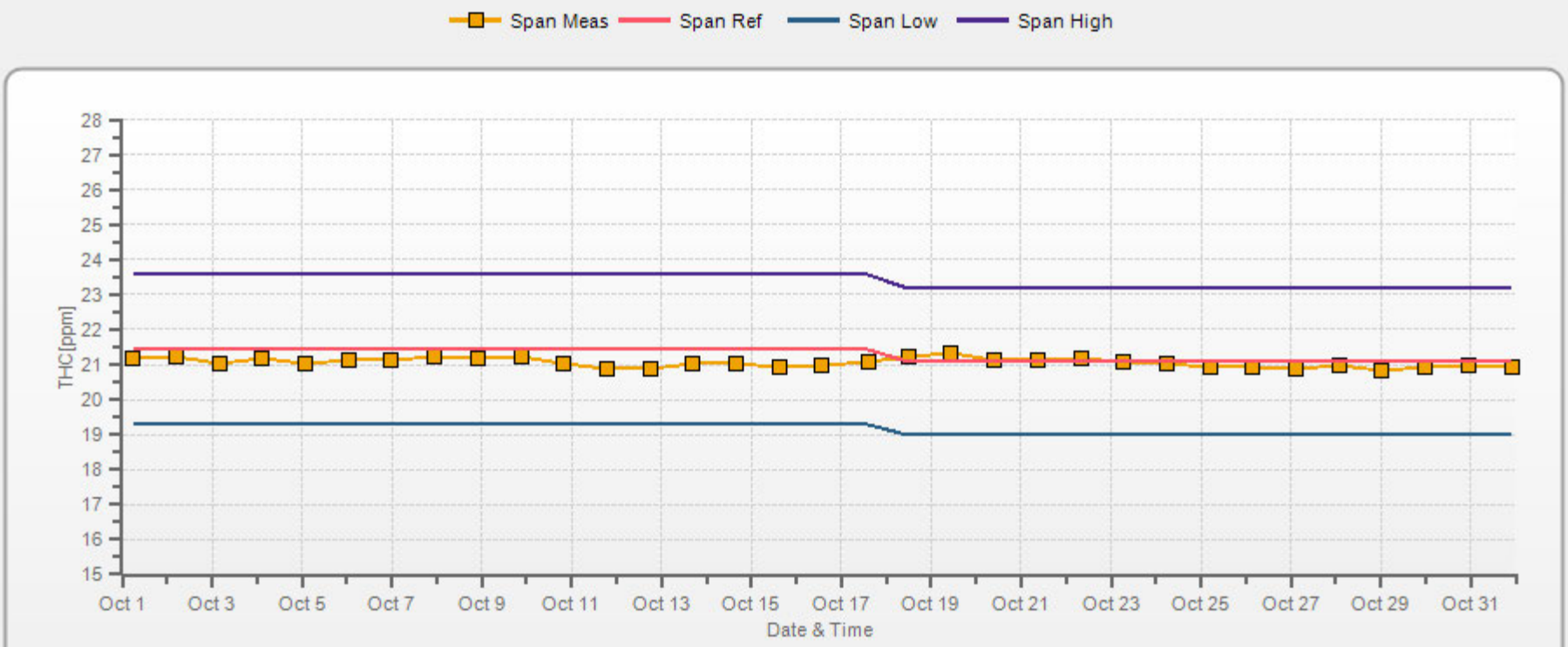
Direction	0.0-0.9	0.9-1.8	1.8-2.8	>2.8	Total
N	0.0	0.0	5.0	0.0	5.0
NE	0.0	0.0	6.1	0.0	6.1
E	0.0	0.0	6.9	0.0	6.9
SE	0.0	0.0	15.0	0.0	15.0
S	0.0	0.0	2.6	0.0	2.6
SW	0.0	0.0	13.6	0.0	13.6
W	0.0	0.0	16.6	0.0	16.6
NW	0.0	0.0	12.9	0.0	12.9
Summary	0.0	0.0	78.5	0.0	78.5

% Icon Classes (ppm)	0 0.0-0.9	0 0.9-1.8	79 1.8-2.8	0 >2.8

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.50% Calm Poll Avg: 2.20[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/10 Type: Span



METHANE

Maxxam
A Bureau Veritas Group Company

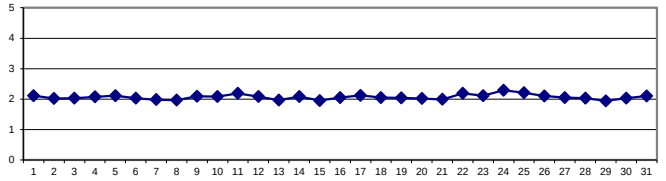
METHANE Hourly Averages (CH_4 ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.08	2.09	2.08	2.08	2.09	S	2.12	2.21	2.34	2.24	2.21	2.12	2.08	2.07	2.07	2.06	2.06	2.10	2.13	2.10	2.07	2.08	2.09	2.05	2.05	2.34	2.11	24
2	2.05	2.06	2.07	2.04	S	2.01	2.01	2.07	2.06	1.99	2.00	1.99	1.99	1.99	1.99	1.99	1.98	1.98	1.99	2.04	2.04	2.05	2.09	2.09	1.98	2.09	2.02	24
3	2.08	2.12	2.14	S	2.08	2.07	2.06	2.06	2.03	1.99	1.98	1.97	1.97	1.97	1.97	1.97	1.97	1.98	2.00	2.04	2.02	2.04	2.04	2.03	1.97	2.14	2.03	24
4	2.02	2.03	S	2.02	2.01	2.01	2.01	2.01	2.02	2.05	2.04	2.02	2.02	2.01	2.02	2.03	2.04	2.08	2.16	2.22	2.15	2.15	2.18	2.20	2.01	2.22	2.07	24
5	2.19	S	2.24	2.25	2.28	2.26	2.28	2.34	2.20	2.15	2.19	2.08	2.01	2.00	1.99	1.99	1.99	2.00	2.00	2.00	2.00	2.02	2.05	2.04	1.99	2.34	2.11	24
6	S	2.05	2.04	2.01	2.01	2.01	2.01	2.00	2.01	2.00	2.00	2.01	2.02	2.02	2.03	2.03	2.04	2.05	2.05	2.05	2.08	2.07	2.04	S	2.00	2.08	2.03	24
7	2.04	2.02	1.99	1.99	1.99	1.99	1.99	1.98	1.98	1.98	1.97	1.98	1.97	1.98	1.98	1.98	1.97	1.97	1.97	1.97	1.97	1.97	S	1.97	1.97	2.04	1.98	24
8	1.97	1.97	1.97	1.97	1.97	1.97	1.98	1.98	1.97	1.97	1.97	1.97	1.97	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.97	S	2.03	2.07	1.96	2.07	1.97	24
9	2.12	2.14	2.10	2.13	2.17	2.25	2.24	2.27	2.34	2.21	2.01	1.95	1.95	1.95	1.95	1.95	1.95	1.96	1.98	2.03	S	2.12	2.13	2.15	1.95	2.34	2.09	24
10	2.14	2.20	2.20	2.16	2.15	2.18	2.22	2.17	2.07	2.00	2.00	2.00	1.98	1.98	1.97	1.97	1.97	1.98	2.01	S	2.03	2.05	2.16	2.24	1.97	2.24	2.08	24
11	2.27	2.35	2.57	2.31	2.26	2.24	2.20	2.27	2.43	2.43	2.16	2.09	2.11	2.13	2.09	2.03	2.05	2.03	S	2.02	2.02	2.10	2.08	2.10	2.02	2.57	2.19	24
12	2.11	2.11	2.13	2.17	2.16	2.23	2.25	2.28	2.22	2.27	2.26	2.17	2.01	1.99	2.00	1.99	1.97	S	1.94	1.94	1.94	1.96	1.94	1.93	1.93	2.28	2.08	24
13	1.95	1.95	1.96	1.97	1.96	1.96	1.96	1.96	1.95	1.95	1.96	1.96	1.95	1.95	1.95	1.95	S	1.95	1.96	1.97	1.99	2.01	2.00	2.10	1.95	2.10	1.97	24
14	2.14	2.19	2.25	2.26	2.22	2.20	2.22	2.25	2.10	2.05	2.00	1.99	1.96	1.98	1.99	S	1.98	1.99	2.03	2.06	2.03	2.04	2.03	2.00	1.96	2.26	2.08	24
15	2.02	2.08	2.03	1.97	1.97	1.98	1.99	2.00	1.98	1.95	1.91	1.91	1.91	1.91	S	1.92	1.92	1.91	1.93	1.91	**1.90**	1.93	1.91	1.91	**1.90**	2.08	1.95	24
16	1.92	1.96	1.95	1.92	1.96	2.05	2.14	2.29	2.18	2.10	2.09	2.04	1.98	S	1.92	1.92	1.92	1.93	1.96	2.18	2.20	2.24	2.22	2.14	1.92	2.29	2.05	24
17	2.17	2.19	2.25	2.22	2.25	2.29	2.29	2.30	2.05	C	C	C	C	C	1.97	1.96	1.96	1.99	2.08	2.09	2.11	2.05	2.05	2.08	1.96	2.30	2.12	24
18	2.10	2.17	2.24	2.27	2.21	2.12	2.14	2.11	2.07	2.03	1.97	S	1.96	1.94	1.93	1.94	1.95	1.96	1.96	1.97	1.97	2.00	2.05	2.05	1.93	2.27	2.05	24
19	2.06	2.12	2.10	2.08	2.15	2.10	2.09	2.14	2.22	2.13	S	1.96	1.96	1.96	1.96	1.96	1.96	1.98	1.98	2.00	2.00	2.01	1.97	1.97	1.96	2.22	2.04	24
20	2.00	2.02	1.99	1.99	2.08	2.08	2.02	2.08	2.03	S	2.07	2.10	2.12	2.06	1.98	1.97	1.97	1.96	1.95	1.97	1.97	2.01	2.03	2.02	1.95	2.12	2.02	24
21	2.00	1.99	1.96	1.98	1.98	2.00	2.02	2.02	S	1.99	1.96	1.95	1.94	1.95	1.95	1.94	1.95	1.96	1.98	2.00	2.01	2.04	2.10	2.14	1.94	2.14	1.99	24
22	2.15	2.18	2.26	2.30	2.40	2.36	2.37	S	2.43	2.13	2.08	2.07	2.05	2.01	2.01	2.06	2.18	2.22	2.33	2.14	2.18	2.21	2.20	2.14	2.01	2.43	2.19	24
23	2.14	2.16	2.11	2.10	2.02	2.03	S	2.14	2.05	2.05	2.05	2.04	2.03	2.03	2.00	1.99	2.01	2.05	2.09	2.20	2.18	2.23	2.39	2.51	1.99	2.51	2.11	24
24	2.58	**2.75**	2.70	2.74	2.65	S	2.58	2.57	2.51	2.20	2.02	2.00	1.99	1.98	1.99	1.99	2.02	2.02	2.14	2.19	2.19	2.29	2.31	2.36	1.98	**2.75**	**2.29**	24
25	2.31	2.31	2.42	2.49	S	2.42	2.53	2.60	2.55	2.33	2.02	1.97	1.98	1.98	1.98	1.97	1.98	1.99	2.02	2.13	2.17	2.24	2.19	2.15	1.97	2.60	2.21	24
26	2.27	2.22	2.15	S	2.11	2.14	2.23	2.55	2.30	2.10	2.03	1.96	1.94	1.95	1.94	1.94	1.94	1.95	1.99	2.04	2.10	2.07	2.14	2.21	1.94	2.55	2.10	24
27	2.18	2.27	S	2.44	2.50	2.26	2.16	2.07	2.08	2.01	1.97	1.98	1.93	1.92	1.92	1.93	1.93	1.94	1.96	1.97	1.97	1.95	1.95	1.95	1.92	2.50	2.05	24
28	1.97	S	2.01	2.08	2.10	2.10	2.15	2.21	2.20	2.07	2.01	1.97	1.96	1.97	1.97	1.97	1.99	2.01	2.00	1.98	1.98	1.97	1.96	1.98	1.96	2.21	2.03	24
29	S	1.95	1.95	1.95	1.96	1.94	1.93	1.94	1.93	1.93	1.95	1.93	1.92	1.92	1.94	1.94	1.94	1.95	1.97	1.94	1.95	1.97	1.97	S	1.92	1.97	1.94	24
30	1.99	2.01	2.01	2.02	2.05	2.05	1.98	1.99	2.01	1.97	1.99	1.99	1.97	1.98	1.98	2.00	2.01	2.03	2.08	2.10	2.11	2.11	S	2.16	1.97	2.16	2.03	24
31	2.25	2.26	2.18	2.17	2.12	2.13	2.18	2.18	2.18	2.18	2.08	2.00	1.98	1.98	1.97	1.98	1.98	1.99	2.02	2.08	2.12	S	2.13	2.18	1.97	2.26	2.10	24
HOURLY MAX	2.58	2.75	2.70	2.74	2.65	2.42	2.58	2.60	2.55	2.43	2.26	2.17	2.12	2.13	2.09	2.06	2.18	2.22	2.33	2.22	2.20	2.29	2.39	2.51				
HOURLY AVG	2.11	2.14	2.14	2.14	2.13	2.12	2.15	2.17	2.15	2.08	2.03	2.01	1.99	1.98	1.98	1.98	1.98	2.00	2.02	2.04	2.05	2.07	2.08	2.10				

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

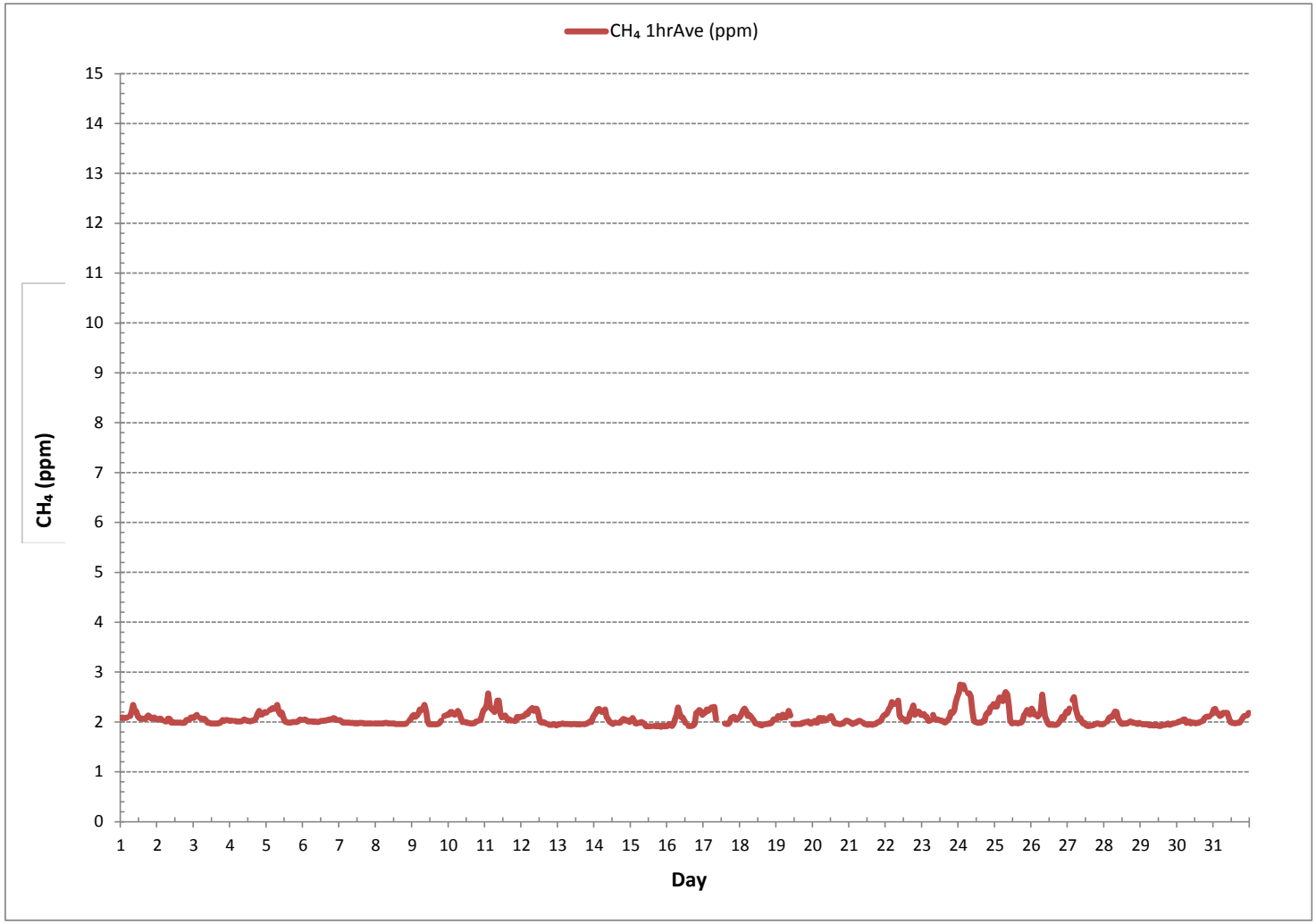
24 HR AVERAGES October 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			707				
MINIMUM 1-HR AVERAGE	1.90	ppm	@ HOUR	20	ON DAY	15	
MAXIMUM 1-HR AVERAGE:	2.75	ppm	@ HOUR	1	ON DAY	24	
MAXIMUM 24-HR AVERAGE:	2.29	ppm			ON DAY	24	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:			744	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	0.13		MONTHLY AVERAGE:			2.07	ppm

METHANE Hourly Averages (CH_4 ppm)



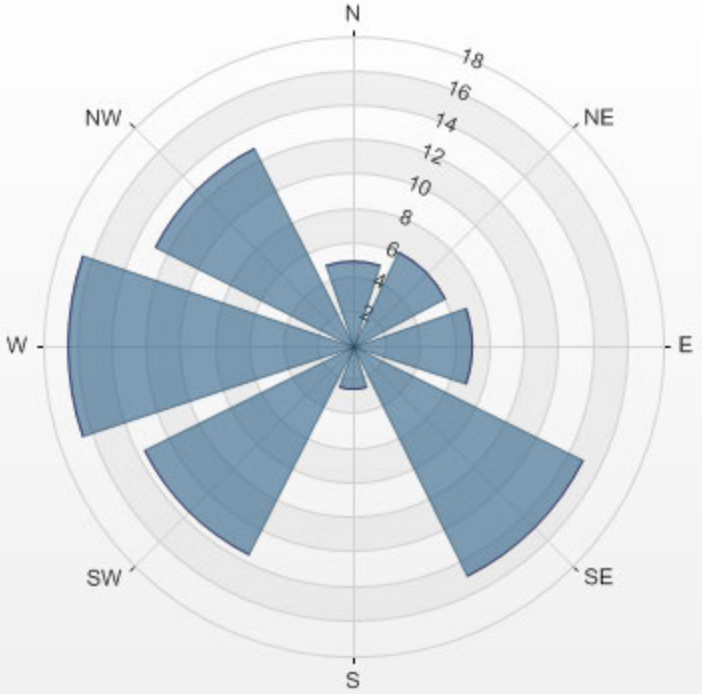
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-CH4[ppm]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.50% Calm Avg: 2.19 [ppm]

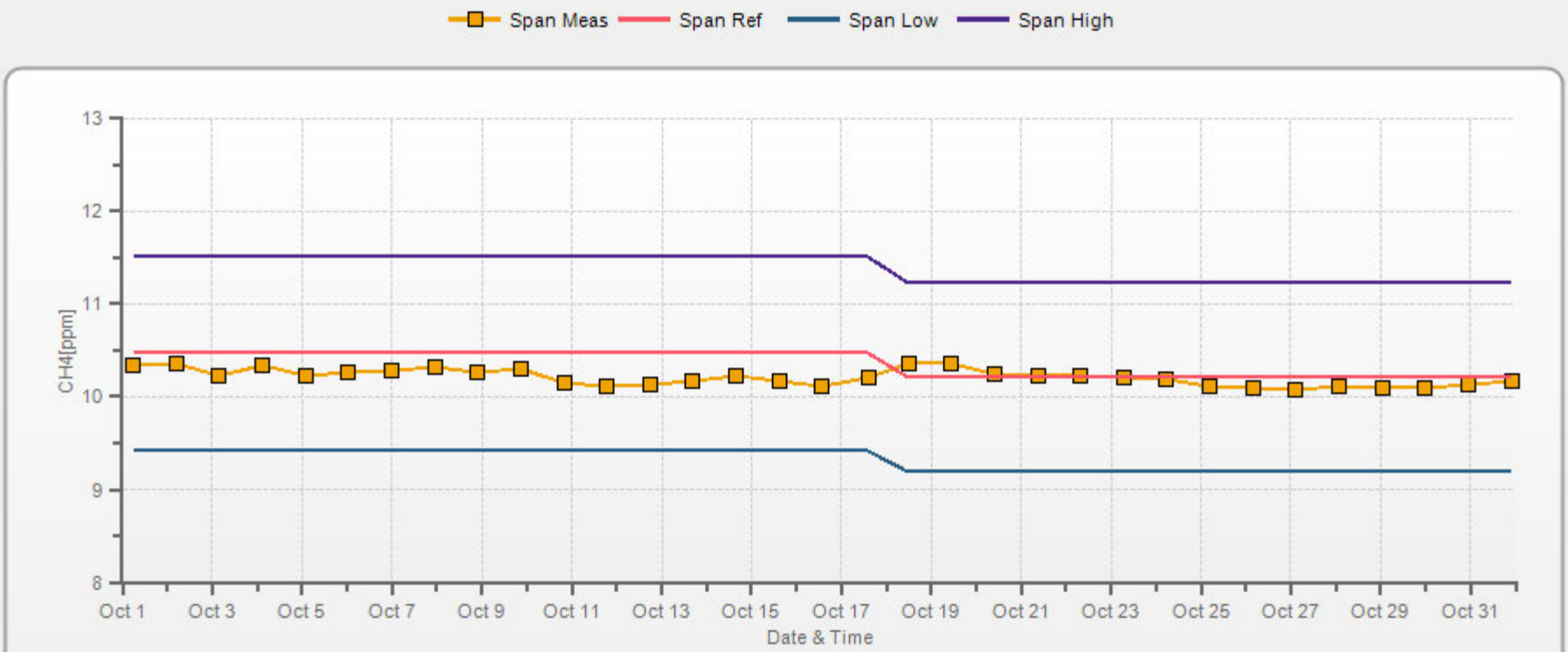
Direction	0.0-0.9	0.9-1.8	1.8-2.8	>2.8	Total
N	0.0	0.0	5.0	0.0	5.0
NE	0.0	0.0	6.1	0.0	6.1
E	0.0	0.0	6.9	0.0	6.9
SE	0.0	0.0	15.0	0.0	15.0
S	0.0	0.0	2.6	0.0	2.6
SW	0.0	0.0	13.6	0.0	13.6
W	0.0	0.0	16.6	0.0	16.6
NW	0.0	0.0	12.9	0.0	12.9
Summary	0.0	0.0	78.5	0.0	78.5

% Icon Classes (ppm)	0 0.0-0.9	0 0.9-1.8	79 1.8-2.8	0 >2.8

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-CH4[ppm] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.50% Calm Poll Avg: 2.19[ppm]



CH4[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/10 Type: Span



NON-METHANE HYDROCARBON

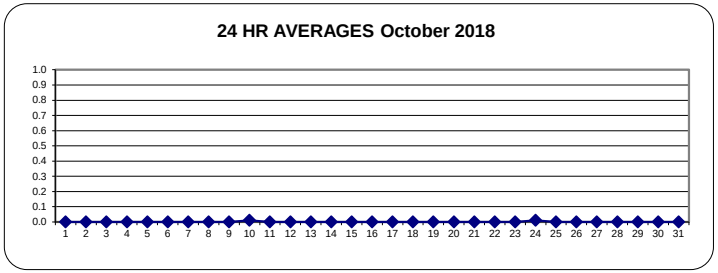
Maxxam
A Bureau Veritas Group Company

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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.00	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	**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
5	0.00	**S**	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	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	24
6	**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
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	0.03	0.00	0.00	0.00	0.00	0.00	0.00	**S**	0.00	0.00	0.03	0.00	24
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**S**	0.00	0.00	0.00	0.00	0.00	24
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**S**	0.00	0.00	0.00	0.00	0.03	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	0.00	0.00	**0.13**	**S**	0.00	0.00	0.00	0.00	0.00	**0.13**	**0.01**	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	0.00	0.00	**S**	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	0.00	0.00	0.00	**S**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
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	**S**	0.00	0.00	0.00	0.00	0.00	0.00	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	**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
16	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	**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	24
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**C**	**C**	**C**	**C**	**C**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	**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	0.00	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
20	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
21	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
22	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
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	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	24
24	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	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.11	0.01	24
25	0.01	0.00	0.00	0.00	**S**	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	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	24
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	0.00	0.00	0.00	0.00	0.00	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	**S**	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	0.00	0.00	0.00	**S**	0.00	0.00	0.00	0.00	0.00	24
HOURLY MAX	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.07	0.13	0.02	0.01	0.00	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	0.01	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

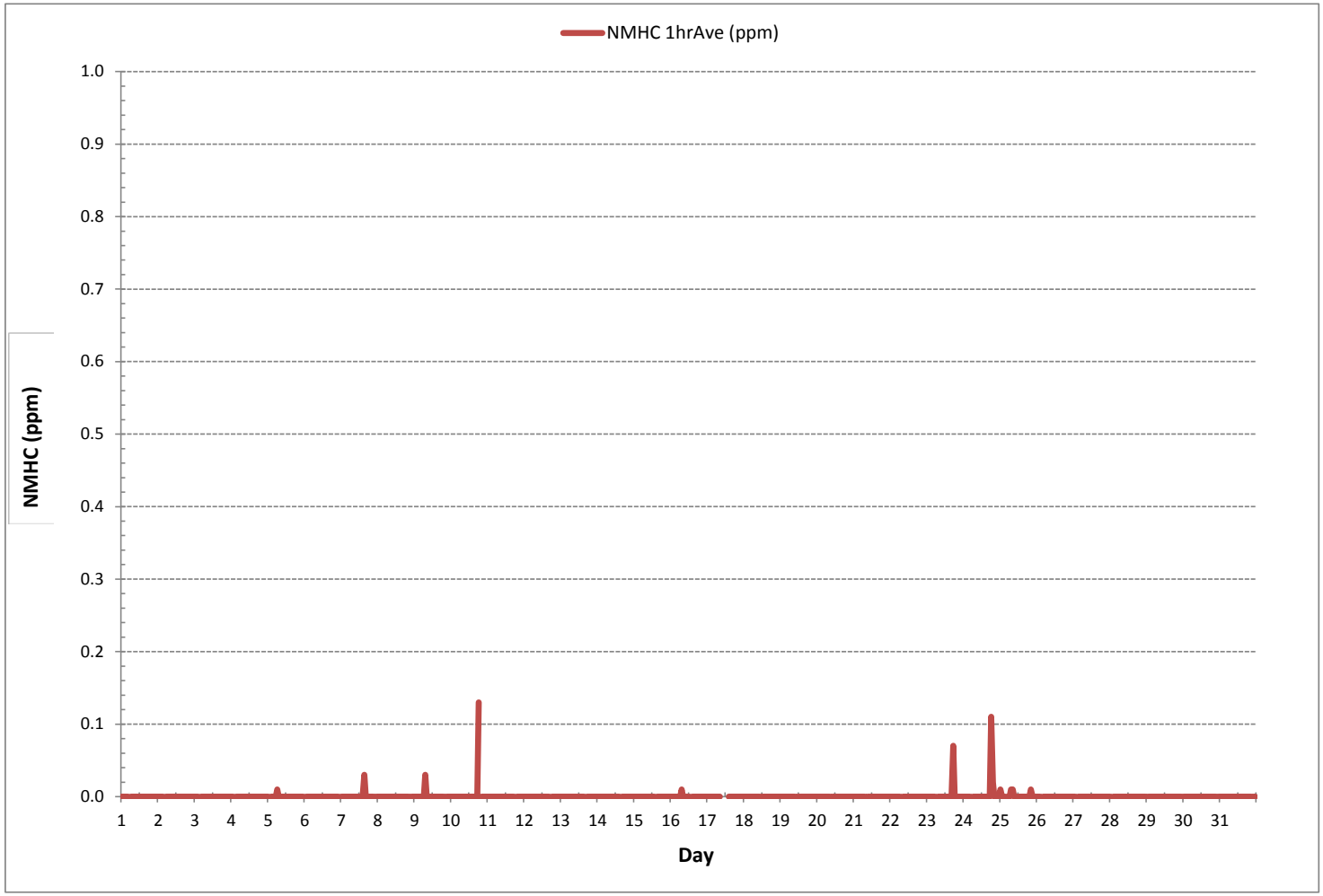


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:		12				
MINIMUM 1-HR AVERAGE	0.00	ppm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	0.13	ppm	@ HOUR	18	ON DAY	10
MAXIMUM 24-HR AVERAGE:	0.01	ppm			ON DAY	10

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.01		MONTHLY AVERAGE:	0.00	ppm

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-NMHC[ppm]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

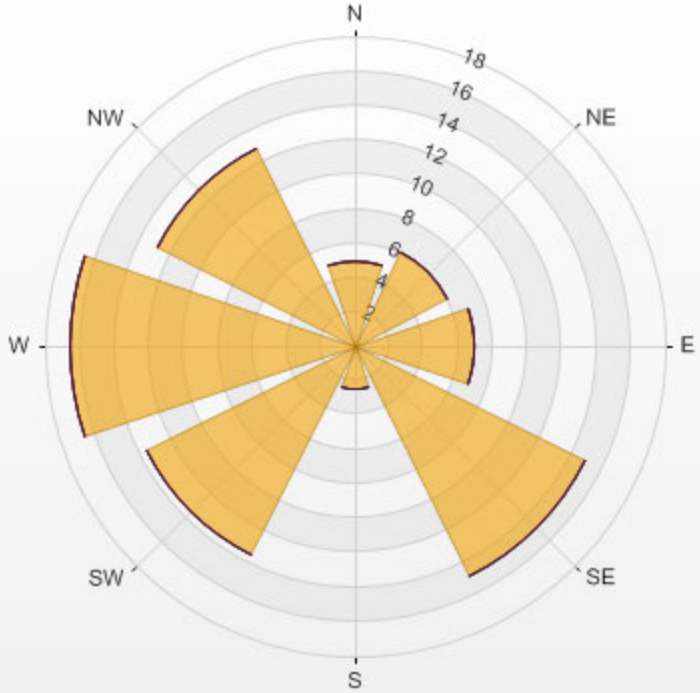
Calm: 21.50%

Calm Avg: 0.00 [ppm]

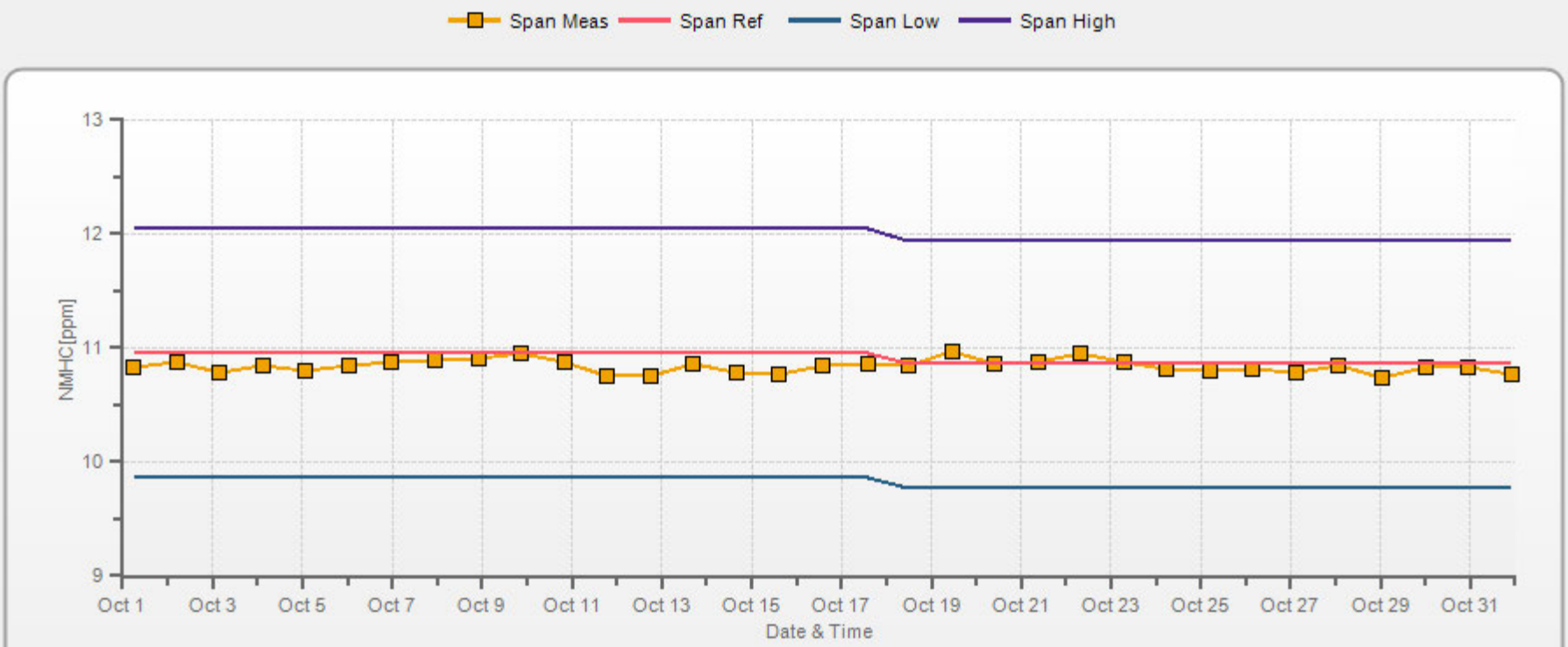
Direction	0.0-0.4	0.4-0.8	0.8-1.2	1.2-1.6	1.6-2.0	>2.0	Total
N	5.0	0.0	0.0	0.0	0.0	0.0	5.0
NE	6.1	0.0	0.0	0.0	0.0	0.0	6.1
E	6.9	0.0	0.0	0.0	0.0	0.0	6.9
SE	15.0	0.0	0.0	0.0	0.0	0.0	15.0
S	2.6	0.0	0.0	0.0	0.0	0.0	2.6
SW	13.6	0.0	0.0	0.0	0.0	0.0	13.6
W	16.6	0.0	0.0	0.0	0.0	0.0	16.6
NW	12.9	0.0	0.0	0.0	0.0	0.0	12.9
Summary	78.5	0.0	0.0	0.0	0.0	0.0	78.5

% Icon Classes (ppm)	79 0.0-0.4	0 0.4-0.8	0 0.8-1.2	0 1.2-1.6	0 1.6-2.0	0 >2.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NMHC[ppm] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.50% Calm Poll Avg: 0.00[ppm]



NMHC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/10 Type: Span



OXIDES OF NITROGEN

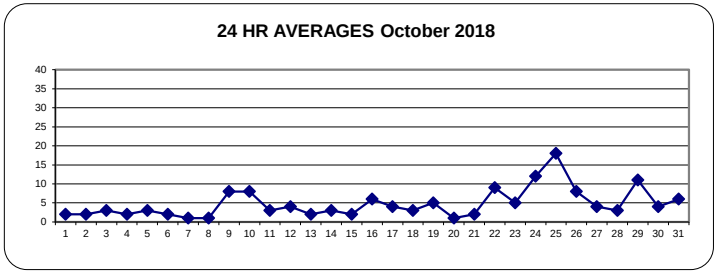
Maxxam
A Bureau Veritas Group Company

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1	**0**	0	1	1	**S**	4	3	3	2	3	3	1	1	3	1	1	2	3	2	2	1	1	1	**0**	4	2	24
2	1	2	2	1	**S**	1	1	3	2	2	3	0	1	0	0	0	0	0	1	2	3	3	3	4	0	4	2	24
3	3	4	5	**S**	5	4	6	6	3	2	1	0	0	0	0	0	0	0	1	8	9	14	6	2	0	14	3	24
4	2	3	**S**	1	0	2	2	2	1	1	1	1	1	1	1	1	1	2	4	4	2	2	2	2	0	4	2	24
5	2	**S**	3	2	2	3	8	9	6	5	6	5	2	1	1	1	0	1	1	2	2	2	4	7	0	9	3	24
6	**S**	11	8	2	2	1	1	3	2	1	1	1	1	1	1	2	3	3	3	4	2	2	1	**S**	1	11	2	24
7	3	2	1	1	1	1	1	2	2	1	0	0	0	1	1	1	1	1	1	1	1	0	**S**	2	0	3	1	24
8	2	1	1	1	1	2	2	1	1	1	1	1	0	0	0	1	1	1	1	0	1	**S**	5	5	0	5	1	24
9	8	9	6	5	4	14	9	13	14	10	4	0	0	0	0	0	0	2	7	13	**S**	24	20	15	0	24	8	24
10	10	22	18	11	8	11	32	25	18	1	0	0	0	0	1	1	1	2	7	**S**	5	5	4	3	0	32	8	24
11	10	10	5	2	3	3	4	5	6	4	3	2	2	2	2	2	2	2	**S**	2	2	3	2	2	2	10	3	24
12	2	2	3	4	3	4	7	8	8	11	10	8	3	2	2	1	1	**S**	1	1	2	4	1	1	1	11	4	24
13	2	2	3	3	2	3	3	3	2	2	2	2	1	1	1	0	**S**	1	1	3	4	5	3	4	0	5	2	24
14	5	6	5	4	3	4	4	4	2	3	2	1	0	1	1	**S**	1	2	2	3	3	3	4	4	0	6	3	24
15	4	4	4	2	2	3	5	7	5	2	0	0	0	0	**S**	1	0	0	1	1	1	2	1	3	0	7	2	24
16	2	4	6	7	5	10	13	28	22	5	5	3	4	**S**	2	2	2	4	6	4	5	4	3	2	2	28	6	24
17	3	2	1	1	3	4	5	17	7	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	4	4	4	3	4	1	17	4	24
18	3	4	4	5	4	4	6	6	7	4	1	**S**	2	1	0	1	1	1	0	1	1	3	3	3	0	7	3	24
19	3	4	4	4	5	4	7	12	9	7	**S**	2	2	2	1	1	2	6	8	9	9	6	1	0	0	12	5	24
20	0	0	1	1	1	1	2	1	2	**S**	2	3	3	3	1	1	1	1	0	1	1	2	3	3	0	3	1	24
21	2	2	1	2	2	2	3	3	**S**	3	1	1	0	0	0	0	0	1	2	3	3	3	7	7	0	7	2	24
22	4	4	11	22	25	12	26	**S**	43	10	4	3	2	1	1	1	3	6	5	3	2	2	3	3	1	43	9	24
23	3	2	2	2	2	2	**S**	4	3	3	3	3	2	2	3	2	7	14	11	7	15	12	7	12	2	15	5	24
24	8	14	12	12	5	**S**	9	16	31	32	4	3	3	4	4	5	8	13	18	17	14	18	17	16	3	32	12	24
25	9	8	18	18	**S**	16	20	33	63	46	7	2	3	4	10	3	4	12	14	23	23	36	19	13	2	63	**18**	24
26	16	11	4	**S**	3	6	18	46	17	9	5	2	2	2	1	1	1	3	8	4	6	6	8	7	1	46	8	24
27	5	8	**S**	6	8	8	6	6	5	4	3	3	1	1	1	1	1	1	5	3	2	2	2	2	1	8	4	24
28	3	**S**	3	4	4	5	11	9	7	3	2	1	2	1	1	2	4	3	2	2	2	2	1	2	1	11	3	24
29	**S**	3	2	2	3	3	2	12	30	46	**79**	5	11	11	9	1	1	2	2	2	2	4	5	**S**	1	**79**	11	24
30	6	6	5	3	4	5	5	8	5	3	3	2	3	3	3	4	4	5	5	6	4	4	**S**	4	2	8	4	24
31	5	4	3	3	2	3	6	10	9	7	7	5	4	4	3	4	4	8	11	12	10	**S**	7	6	2	12	6	24
HOURLY MAX	16	22	18	22	25	16	32	46	63	46	79	8	11	11	10	5	8	14	18	23	23	36	20	16				
HOURLY AVG	4	5	5	5	4	5	8	10	11	8	6	2	2	2	2	1	2	3	5	5	5	6	5	5				

STATUS FLAG CODES

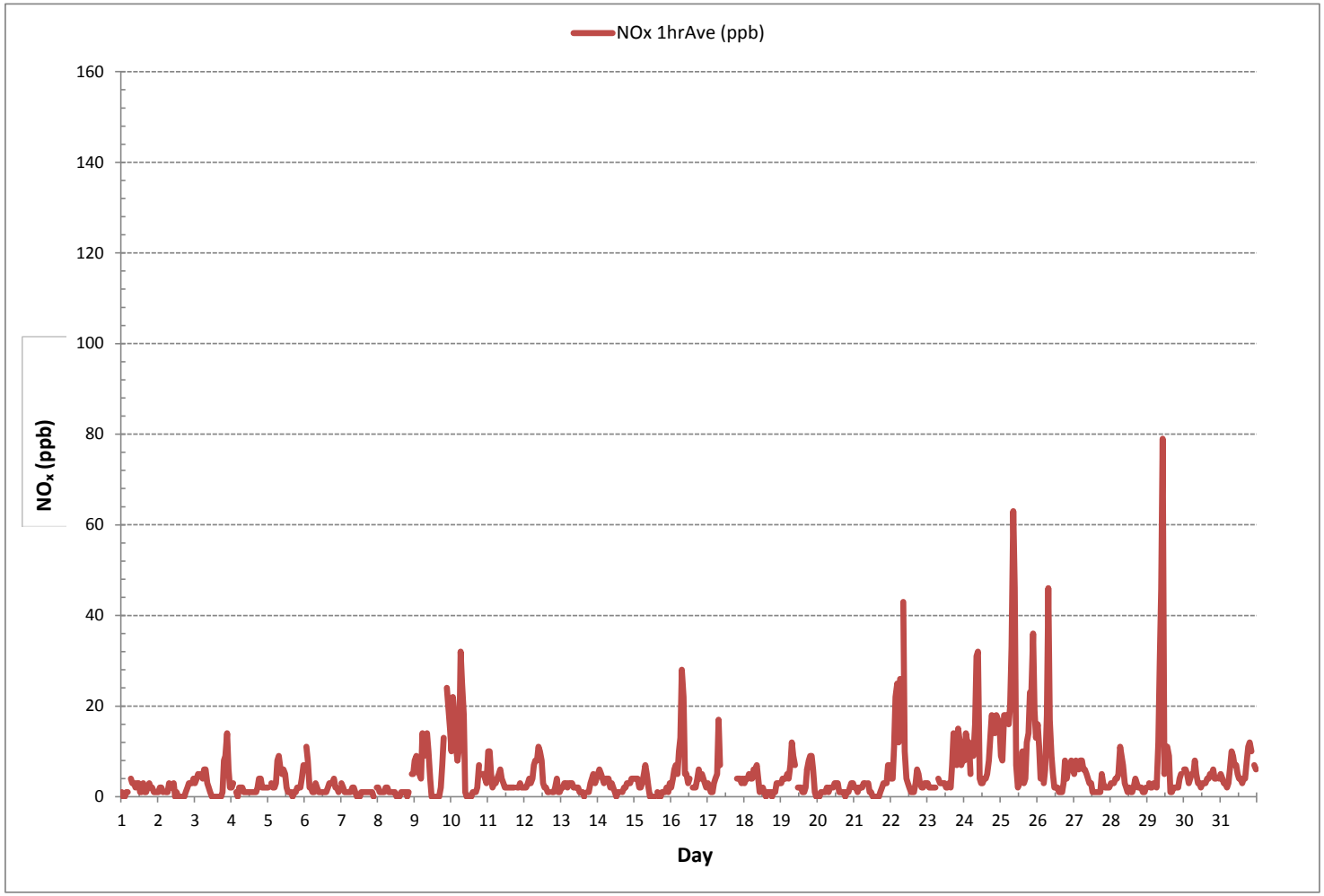
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			648				
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	1	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	79	ppb	@ HOUR	10	ON DAY	29	
MAXIMUM 24-HR AVERAGE:	18	ppb			ON DAY	25	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:			744	hrs
MONTHLY CALIBRATION TIME:	10	hrs	AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	7		MONTHLY AVERAGE:			5	ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



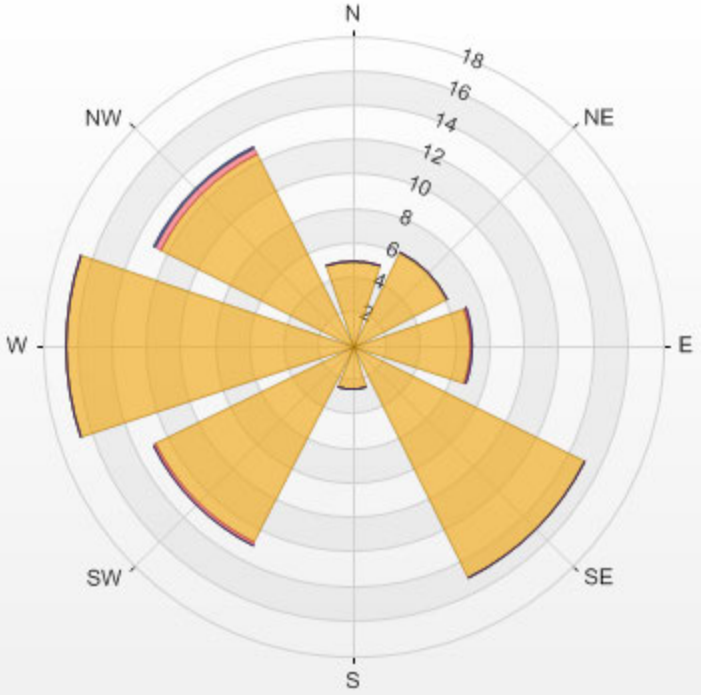
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-NOX[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.65% Calm Avg: 10.51 [ppb]

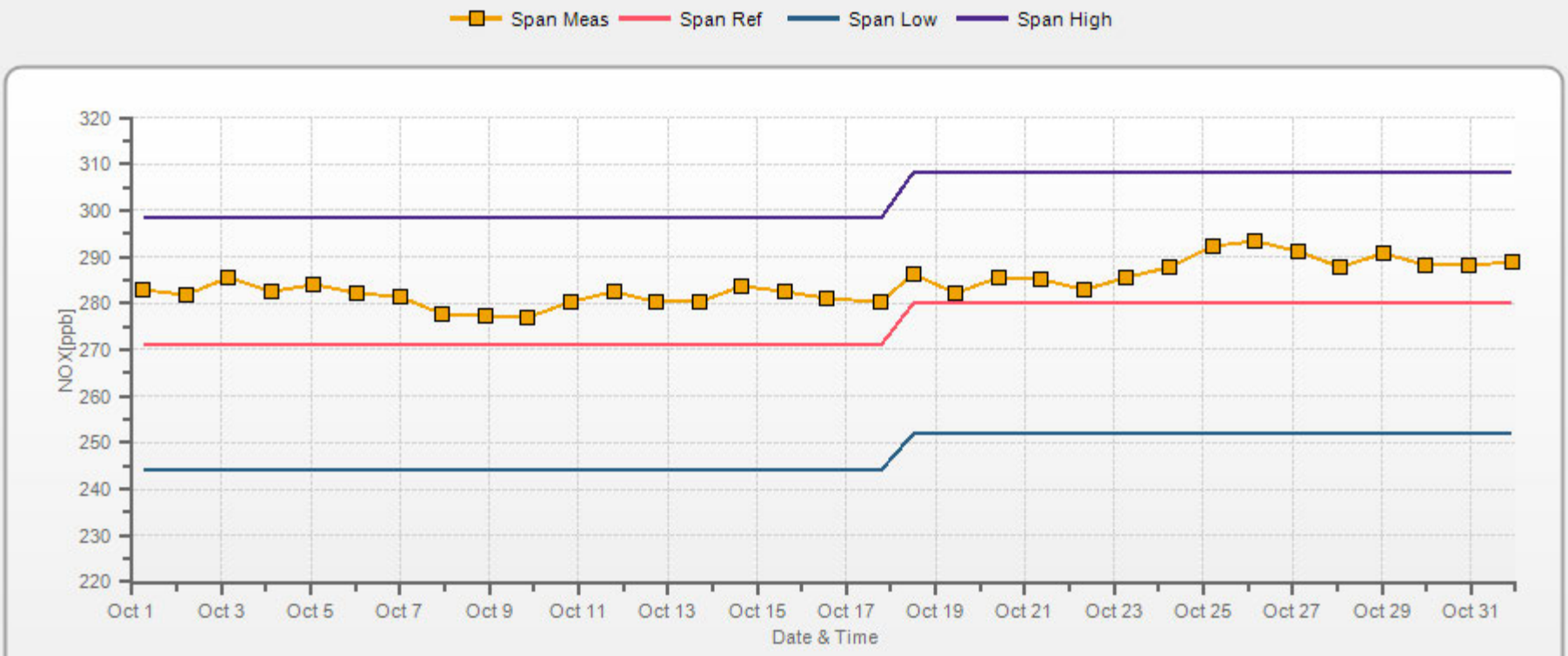
Direction	0.0-26.7	26.7-53.3	53.3-80.0	>80.0	Total
N	5.0	0.0	0.0	0.0	5.0
NE	6.1	0.0	0.0	0.0	6.1
E	6.8	0.1	0.0	0.0	7.0
SE	15.1	0.0	0.0	0.0	15.1
S	2.6	0.0	0.0	0.0	2.6
SW	12.8	0.1	0.0	0.0	13.0
W	16.7	0.0	0.0	0.0	16.7
NW	12.5	0.3	0.1	0.0	13.0
Summary	77.7	0.6	0.1	0.0	78.4

% Icon Classes (ppb)	78	0.0-26.7	1	26.7-53.3	0	53.3-80.0	0	>80.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.65% Calm Poll Avg: 10.51[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/10 Type: Span



NITRIC OXIDE

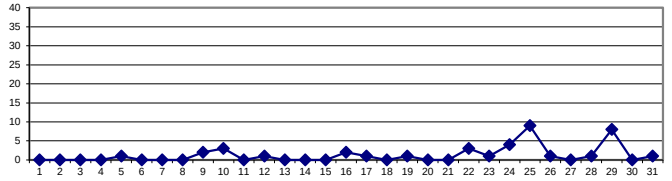
NITRIC OXIDE Hourly Averages (NO ppb)

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	1	1	1	1	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	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
3	0	0	0	**S**	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	2	0	24
4	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	1	0	24
5	0	**S**	0	0	0	0	1	2	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	24
6	**S**	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**S**	0	1	0	24
7	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	**S**	0	0	1	0	24
8	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**S**	0	0	0	1	0	24
9	1	1	0	0	0	6	2	7	8	5	2	0	0	0	0	0	0	0	0	2	**S**	9	6	3	0	9	2	24
10	2	10	7	2	1	3	20	17	12	0	0	0	0	0	0	0	0	0	0	**S**	0	0	0	0	0	20	3	24
11	2	1	0	0	0	0	0	1	1	1	1	0	1	1	0	0	0	0	**S**	0	0	0	0	0	0	2	0	24
12	0	0	0	0	1	2	2	3	2	4	3	3	1	1	0	0	0	**S**	0	0	0	0	0	0	0	4	1	24
13	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	**S**	0	0	0	0	0	0	0	0	1	0	24
14	0	0	0	0	0	0	0	2	1	1	1	0	0	0	0	**S**	0	0	0	0	0	0	0	0	0	2	0	24
15	0	0	0	0	0	0	0	1	1	1	0	0	0	0	**S**	0	0	0	0	0	0	0	0	0	0	1	0	24
16	0	0	0	0	0	1	4	17	14	1	1	1	1	**S**	0	0	0	1	1	0	0	0	0	0	0	17	2	24
17	0	0	0	0	1	0	0	8	2	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	0	0	0	0	0	0	8	1	24
18	0	0	0	0	0	0	0	0	1	1	0	**S**	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
19	0	0	0	0	0	0	1	2	2	2	**S**	0	0	1	0	0	0	1	0	0	1	0	0	0	0	2	1	24
20	0	0	0	0	0	0	0	0	0	**S**	0	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**	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
22	0	0	2	9	13	3	15	**S**	27	5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	27	3	24
23	0	0	0	0	0	0	**S**	0	0	1	1	1	1	0	1	0	1	1	1	1	2	1	0	2	0	2	1	24
24	1	4	2	4	0	**S**	4	10	20	19	2	1	1	1	1	1	0	0	0	1	0	4	2	4	0	20	4	24
25	1	2	8	9	**S**	9	12	23	42	47	2	1	1	2	8	0	0	0	1	7	8	19	6	1	0	47	**9**	24
26	2	1	0	**S**	0	0	6	10	5	3	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	10	1	24
27	0	1	**S**	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	24
28	0	**S**	0	0	0	0	2	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	24
29	**S**	0	0	0	0	0	0	8	21	39	**79**	1	8	8	7	0	0	0	0	0	0	0	0	**S**	0	**79**	8	24
30	0	0	0	0	1	0	0	1	1	1	0	0	1	1	0	1	0	0	0	0	0	0	**S**	0	0	1	0	24
31	0	0	0	0	0	0	3	5	5	2	3	2	1	1	0	0	0	0	1	1	0	**S**	0	0	0	5	1	24
HOURLY MAX	2	10	8	9	13	9	20	23	42	47	79	3	8	8	8	1	1	1	1	7	8	19	6	4				
HOURLY AVG	0	1	1	1	1	1	2	4	6	5	4	1	1	1	1	0	0	0	0	0	0	1	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 October 2018

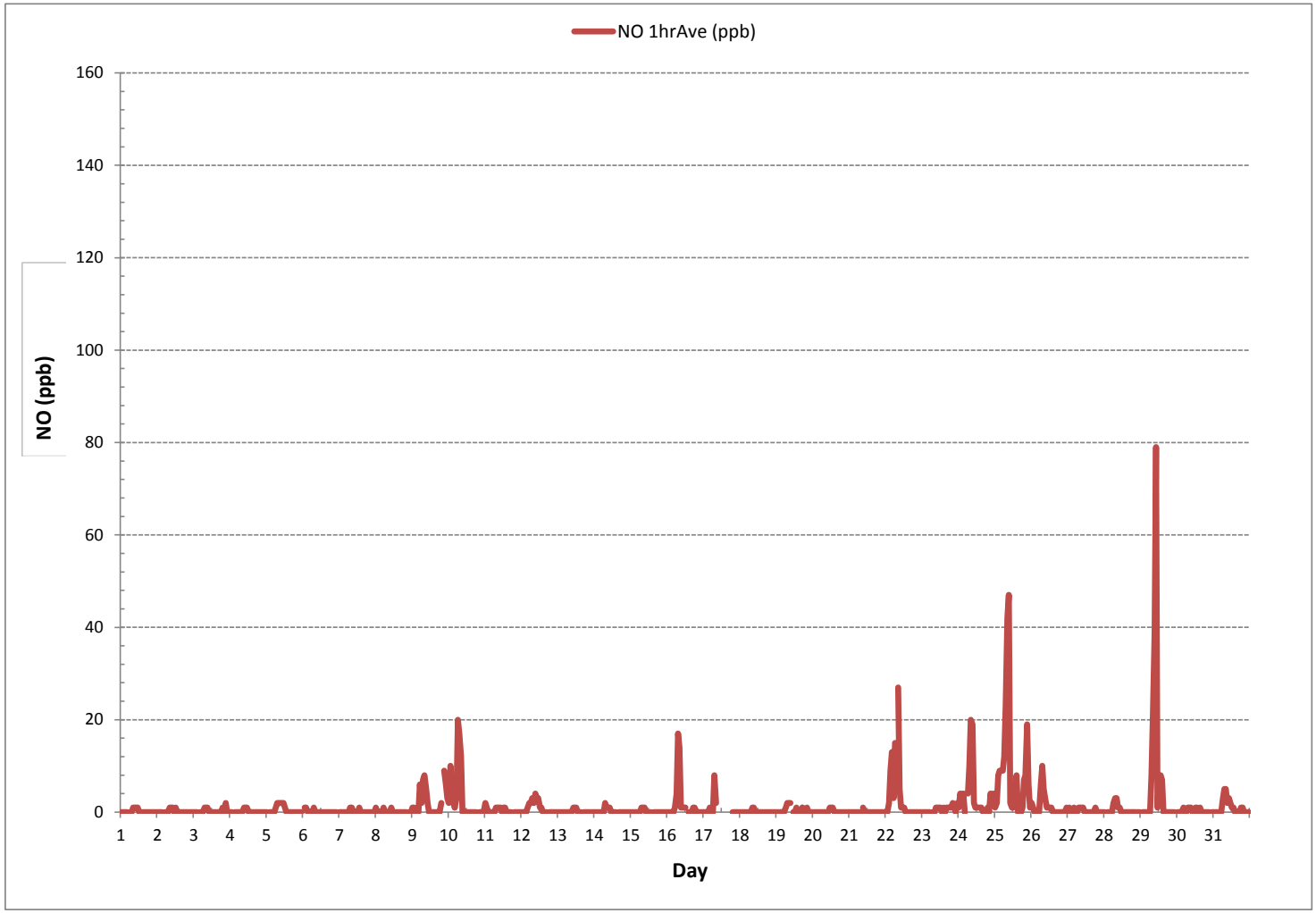


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:		215				
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	79	ppb	@ HOUR	10	ON DAY	29
MAXIMUM 24-HR AVERAGE:	9	ppb			ON DAY	25

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	10	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	5		MONTHLY AVERAGE:	1	ppb

NITRIC OXIDE Hourly Averages (NO ppb)



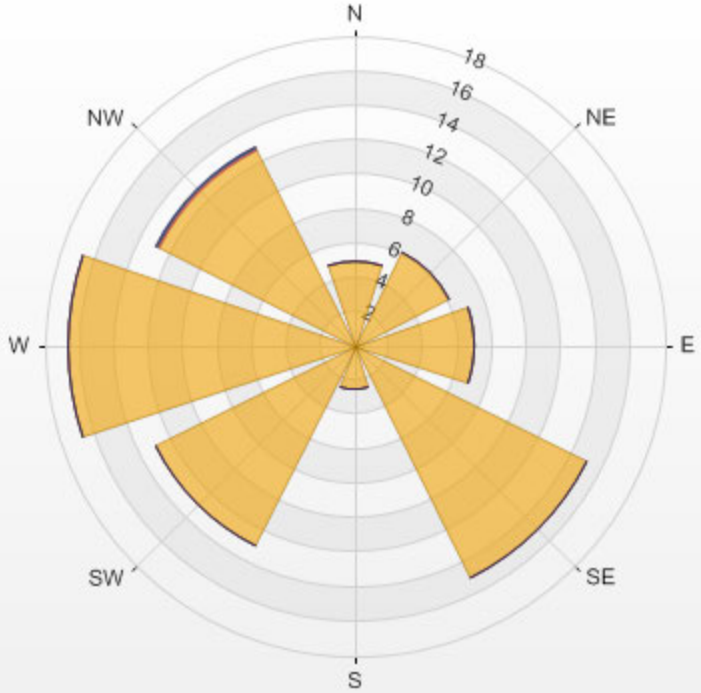
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-NO[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.65% Calm Avg: 3.51 [ppb]

Direction	0.0-26.7	26.7-53.3	53.3-80.0	>80.0	Total
N	5.0	0.0	0.0	0.0	5.0
NE	6.1	0.0	0.0	0.0	6.1
E	7.0	0.0	0.0	0.0	7.0
SE	15.1	0.0	0.0	0.0	15.1
S	2.6	0.0	0.0	0.0	2.6
SW	13.0	0.0	0.0	0.0	13.0
W	16.7	0.0	0.0	0.0	16.7
NW	12.7	0.1	0.1	0.0	13.0
Summary	78.1	0.1	0.1	0.0	78.4

% Icon Classes (ppb)	78 0.0-26.7	0 26.7-53.3	0 53.3-80.0	0 >80.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.65% Calm Poll Avg: 3.51[ppb]



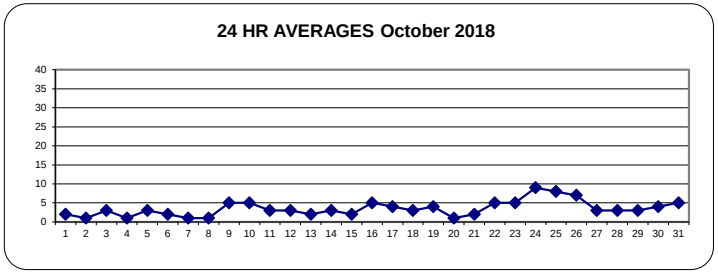
NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO_2 ppb)

HR START (MST) / HR END (MST) / DAY	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
1	1	**0**	0	1	1	**S**	4	3	3	2	2	2	0	0	2	1	1	2	3	2	2	1	1	1	**0**	4	2	24
2	1	2	2	1	**S**	1	1	3	2	1	2	0	0	0	0	0	0	0	1	2	3	3	3	4	0	4	1	24
3	3	3	4	**S**	5	4	6	5	2	1	0	0	0	0	0	0	0	0	1	7	8	12	5	1	0	12	3	24
4	1	2	**S**	1	0	2	2	2	1	1	1	0	0	0	1	1	1	2	4	4	2	2	2	2	0	4	1	24
5	2	**S**	3	2	2	3	7	7	4	3	4	3	2	1	1	1	0	1	1	2	2	2	4	7	0	7	3	24
6	**S**	10	7	2	1	1	1	2	1	1	0	0	1	1	1	1	2	3	3	4	2	2	1	**S**	0	10	2	24
7	3	2	1	1	0	0	1	1	1	1	0	0	0	1	0	1	1	1	1	0	0	0	**S**	1	0	3	1	24
8	1	1	0	0	1	1	2	1	0	1	1	0	0	0	0	0	0	1	1	0	1	**S**	5	5	0	5	1	24
9	7	8	6	5	3	8	7	5	6	4	2	0	0	0	0	0	0	2	6	11	**S**	15	14	12	0	15	5	24
10	9	12	11	9	7	9	12	8	7	0	0	0	0	0	1	1	1	2	7	**S**	5	5	4	3	0	12	5	24
11	8	9	5	2	3	3	4	5	5	3	2	2	2	2	2	2	2	2	**S**	2	2	3	2	2	2	9	3	24
12	2	2	3	4	2	3	4	6	6	7	6	5	2	2	2	1	1	**S**	1	1	2	4	1	1	1	7	3	24
13	2	2	3	3	2	3	3	3	2	2	1	1	1	1	0	0	**S**	1	1	3	4	5	3	4	0	5	2	24
14	5	6	4	4	3	3	4	2	2	2	1	1	0	1	1	**S**	1	2	2	3	3	3	4	4	0	6	3	24
15	4	4	3	2	2	3	5	6	4	1	0	0	0	0	**S**	1	0	0	1	1	1	2	1	3	0	6	2	24
16	2	4	6	7	5	9	9	10	8	4	4	3	3	**S**	2	2	2	4	5	4	4	4	3	2	2	10	5	24
17	3	2	1	1	2	3	5	9	5	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	4	4	4	3	4	1	9	4	24
18	3	4	4	5	4	4	6	6	6	3	1	**S**	2	1	0	0	1	1	0	1	1	3	3	3	0	6	3	24
19	3	4	4	4	5	4	6	9	7	5	**S**	1	1	1	1	1	2	5	8	9	8	6	1	0	0	9	4	24
20	0	0	1	1	1	1	1	1	2	**S**	2	2	2	2	1	1	1	1	0	1	1	2	3	3	0	3	1	24
21	2	2	1	2	1	2	3	3	**S**	3	1	1	0	0	0	0	0	1	2	3	3	2	7	7	0	7	2	24
22	4	4	8	13	12	9	11	**S**	16	6	2	2	1	1	0	1	3	6	5	3	2	2	3	3	0	16	5	24
23	3	2	1	2	2	2	**S**	3	2	2	2	2	1	2	3	2	6	13	10	6	13	11	7	10	1	13	5	24
24	7	11	10	8	5	**S**	6	6	10	14	2	3	3	3	3	3	7	12	18	16	13	14	15	13	2	18	**9**	24
25	8	7	9	8	**S**	7	7	10	22	0	5	2	2	2	1	3	4	12	14	17	15	17	13	11	0	22	8	24
26	14	10	4	**S**	3	5	11	**36**	12	6	3	2	2	1	1	1	1	3	8	4	6	6	8	6	1	**36**	7	24
27	5	7	**S**	6	7	8	6	5	4	3	2	2	1	1	0	1	1	1	5	3	2	1	2	2	0	8	3	24
28	3	**S**	3	4	4	4	9	7	5	2	1	1	1	1	1	2	3	3	2	2	1	1	1	2	1	9	3	24
29	**S**	3	2	2	2	2	2	4	9	8	0	4	4	3	2	1	1	1	2	2	2	4	5	**S**	0	9	3	24
30	6	6	5	3	3	4	5	7	5	2	2	2	2	2	2	3	3	4	5	5	4	4	**S**	4	2	7	4	24
31	4	4	3	2	2	2	4	5	4	4	4	3	3	3	3	3	4	8	10	11	10	**S**	7	6	2	11	5	24
HOURLY MAX	14	12	11	13	12	9	12	36	22	14	6	5	4	3	3	3	7	13	18	17	15	17	15	13				
HOURLY AVG	4	5	4	4	3	4	5	6	5	3	2	2	1	1	1	1	2	3	4	4	4	5	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



OBJECTIVE LIMIT:

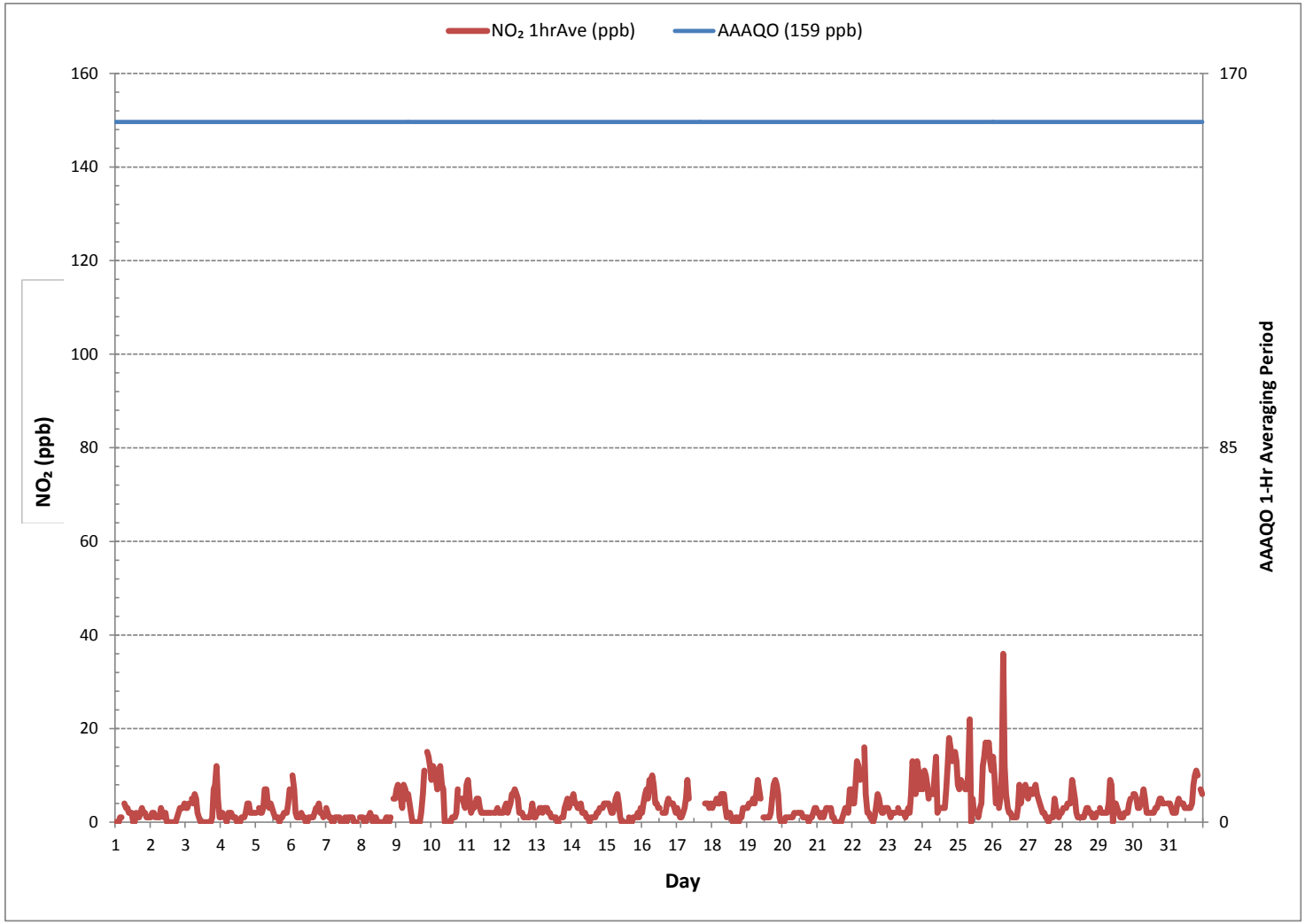
ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	621					
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	1	ON DAY	1
MAXIMUM 1-HR AVERAGE:	36	ppb	@ HOUR	7	ON DAY	26
MAXIMUM 24-HR AVERAGE:	9	ppb			ON DAY	24

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	10	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	4		MONTHLY AVERAGE:	3	ppb

NITROGEN DIOXIDE Hourly Averages (NO_2 ppb)



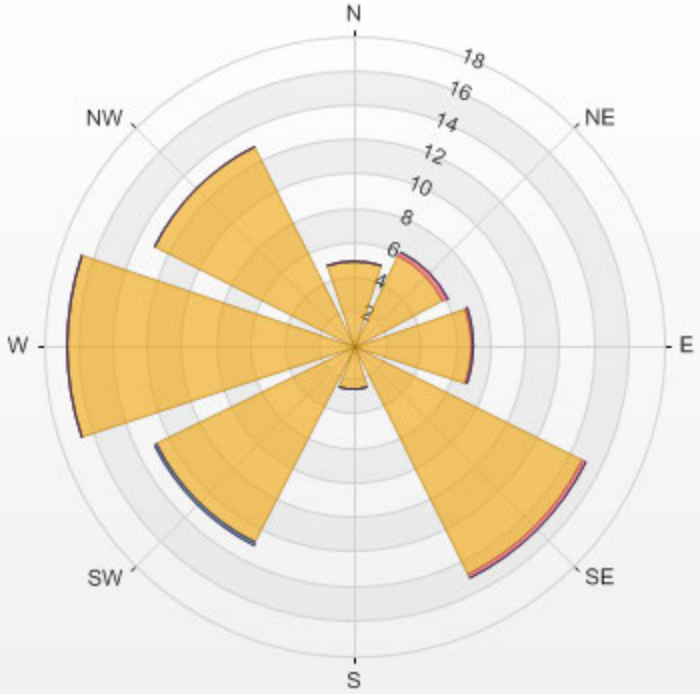
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-NO2[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.65% Calm Avg: 7.00 [ppb]

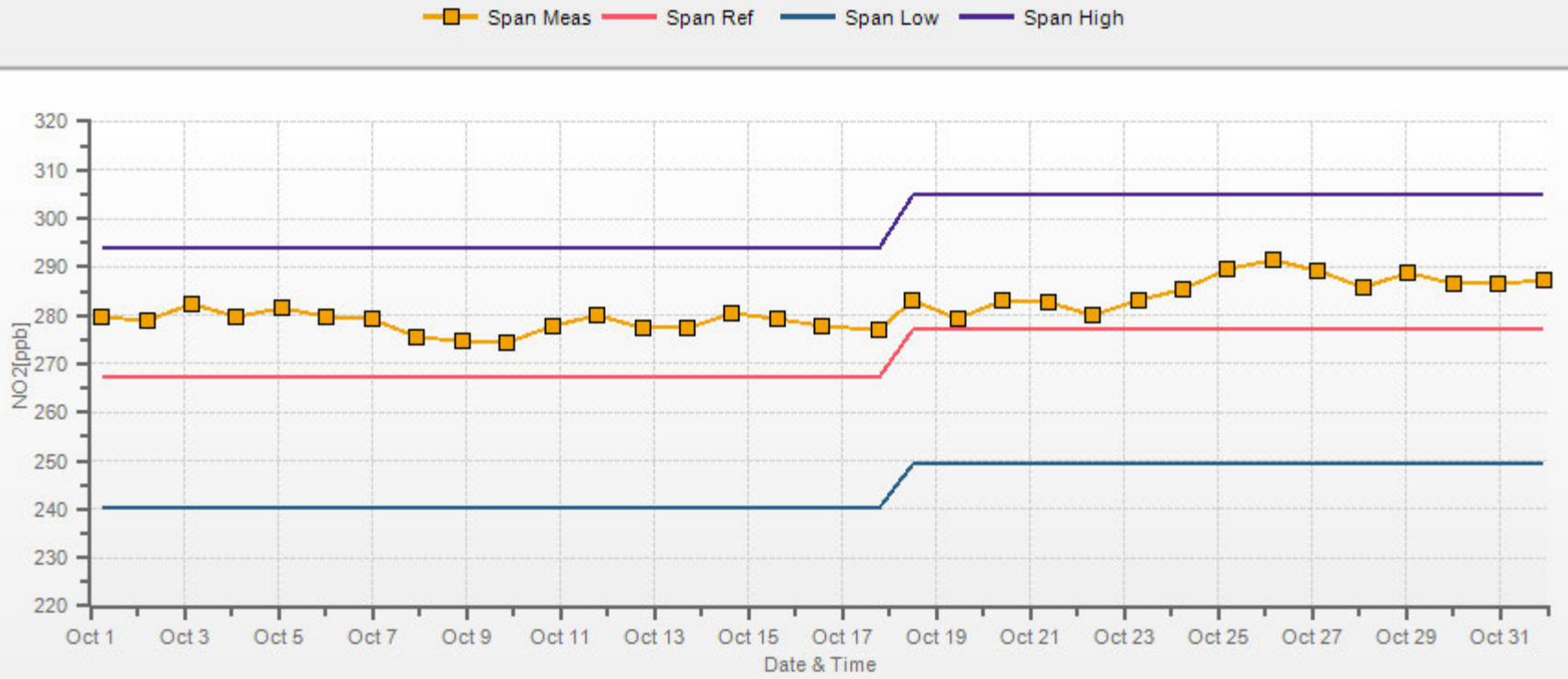
Direction	0.0-12.3	12.3-24.7	24.7-37.0	>37.0	Total
N	5.0	0.0	0.0	0.0	5.0
NE	5.8	0.3	0.0	0.0	6.1
E	6.8	0.1	0.0	0.0	7.0
SE	14.8	0.3	0.0	0.0	15.1
S	2.6	0.0	0.0	0.0	2.6
SW	12.8	0.0	0.1	0.0	13.0
W	16.7	0.0	0.0	0.0	16.7
NW	13.0	0.0	0.0	0.0	13.0
Summary	77.5	0.7	0.1	0.0	78.3

% Icon Classes (ppb)	77 0.0-12.3	1 12.3-24.7	0 24.7-37.0	0 >37.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.65% Calm Poll Avg: 7.00[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/10 Type: Span



OZONE

OZONE Hourly Averages (O_3 ppb)

HR START (MST) / HR END (MST)	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
DAY																												
1	24.2	24.7	24.7	23.3	22.1	S	18.4	18.3	18.4	20.3	21.9	26.5	29.1	30.6	29.6	30.8	29.8	24.7	20.1	21.6	26.9	28.3	26.2	25.6	18.3	30.8	24.6	24
2	24.4	22.7	22.8	23.2	S	24.8	24.8	21.1	23.1	27.7	27.0	29.3	30.5	32.0	33.9	33.6	32.8	32.0	30.4	25.5	25.8	26.7	25.0	23.4	21.1	33.9	27.1	24
3	23.3	23.2	21.3	S	22.7	23.3	20.8	21.5	24.9	28.9	31.2	31.9	32.9	34.8	34.7	34.5	33.6	31.5	27.1	17.0	14.8	7.9	16.6	21.7	7.9	34.8	25.2	24
4	23.9	23.2	S	24.4	25.0	23.6	23.0	23.3	24.0	24.2	23.8	25.0	26.4	28.1	29.8	33.0	37.1	34.0	28.0	26.2	28.4	28.8	29.7	29.5	23.0	37.1	27.1	24
5	29.1	S	26.3	24.4	22.8	20.5	12.1	12.3	17.4	20.0	22.2	28.1	31.7	31.7	32.1	32.9	34.2	33.0	29.9	28.3	26.7	19.3	13.6	16.8	12.1	34.2	24.6	24
6	S	10.2	14.8	24.0	24.5	24.8	25.4	24.8	25.1	25.5	25.8	26.0	25.9	26.2	26.7	25.5	24.2	23.0	20.9	18.2	16.7	16.8	20.1	S	10.2	26.7	22.5	24
7	12.9	15.7	22.0	22.2	22.0	22.5	21.7	21.5	23.7	24.1	23.6	23.3	23.8	24.2	24.7	24.8	25.0	25.6	26.2	27.5	28.0	28.8	S	28.7	12.9	28.8	23.6	24
8	29.5	28.7	26.2	26.4	26.6	26.6	25.5	28.5	30.6	30.4	30.4	30.8	31.5	31.0	30.6	30.4	31.0	31.0	31.2	30.7	23.6	S	11.5	7.8	7.8	31.5	27.4	24
9	3.8	2.7	4.9	5.9	6.1	1.3	1.5	4.3	9.3	15.5	25.6	30.1	30.2	30.2	30.7	30.4	30.2	24.9	15.6	5.8	S	0.9	1.9	2.5	0.9	30.7	13.7	24
10	3.8	0.7	1.0	1.4	2.0	2.4	0.9	2.1	15.1	27.9	27.9	28.5	30.6	30.3	30.3	29.4	29.0	25.3	13.8	S	11.0	11.4	14.7	11.5	0.7	30.6	15.3	24
11	7.0	7.7	16.5	20.9	20.8	18.8	16.7	15.6	14.8	18.1	21.8	24.1	24.4	24.4	24.6	24.3	23.5	24.0	S	24.2	22.4	20.3	18.6	17.4	7.0	24.6	19.6	24
12	16.2	16.3	15.2	9.1	6.4	2.5	2.1	5.1	6.8	5.8	7.2	9.4	16.0	19.6	20.6	23.0	28.1	S	31.1	31.7	30.1	26.8	28.9	30.3	2.1	31.7	16.9	24
13	28.5	28.2	27.6	26.9	27.3	26.2	25.3	26.2	27.3	27.7	28.7	29.2	30.7	31.1	31.5	32.8	S	31.6	30.7	29.1	27.3	19.5	13.8	16.8	13.8	32.8	27.1	24
14	12.2	9.3	14.7	16.4	14.7	14.9	9.1	10.6	20.0	21.5	26.0	28.1	29.8	30.0	29.0	S	28.9	27.0	24.0	22.5	22.1	21.1	19.8	20.3	9.1	30.0	20.5	24
15	24.1	24.6	27.2	30.9	30.4	28.4	25.8	24.3	26.3	30.4	33.0	34.6	35.7	36.8	S	38.9	37.7	35.1	32.4	32.0	30.9	28.4	27.8	25.6	24.1	38.9	30.5	24
16	26.5	23.0	19.2	16.5	8.5	4.5	1.3	1.3	7.1	18.3	20.0	C	C	C	C	C	C	C	14.6	12.3	14.5	13.6	11.3	16.8	1.3	26.5	13.5	24
17	13.8	6.3	2.6	2.5	1.5	7.0	7.8	4.3	21.2	29.2	34.1	37.9	S	48.4	50.5	**52.4**	51.6	48.3	47.8	50.6	48.5	44.1	38.5	36.8	1.5	**52.4**	29.8	24
18	29.8	28.3	27.8	30.2	32.3	33.5	30.1	31.2	31.4	35.6	38.2	S	39.0	40.6	41.2	40.9	40.1	39.1	39.5	37.9	36.4	32.0	29.5	26.4	26.4	41.2	**34.4**	24
19	25.8	24.3	24.3	24.2	20.3	20.3	16.8	10.3	18.7	24.1	S	33.2	32.6	30.7	31.8	31.6	31.4	30.4	26.4	18.4	21.5	20.1	35.5	36.7	10.3	36.7	25.6	24
20	35.1	34.6	33.5	32.3	32.3	31.5	29.3	27.7	26.0	S	26.5	25.4	24.8	28.5	37.8	40.4	39.9	40.8	40.6	38.8	37.0	32.2	30.0	29.6	24.8	40.8	32.8	24
21	27.5	29.7	30.9	29.2	29.1	27.5	26.6	26.1	S	31.9	34.3	36.0	36.3	36.2	36.0	35.9	35.5	33.9	30.3	28.5	22.7	17.3	10.8	8.3	8.3	36.3	28.7	24
22	9.6	8.2	3.7	0.9	0.6	1.5	0.9	S	4.2	21.5	26.7	27.9	30.7	35.3	36.2	35.4	31.7	26.0	26.5	29.2	29.1	28.2	26.0	23.9	0.6	36.2	20.2	24
23	24.6	26.3	27.0	28.2	27.9	27.1	S	25.0	25.9	26.5	28.3	29.8	33.4	35.7	31.7	35.8	25.3	16.2	19.6	17.3	6.9	5.9	6.5	3.3	3.3	35.8	23.2	24
24	4.2	1.1	1.7	1.2	1.7	S	1.0	1.5	2.6	14.9	28.4	30.7	31.2	32.0	33.7	33.5	28.9	22.4	9.9	6.5	6.8	2.7	2.6	1.8	1.0	33.7	13.1	24
25	2.4	1.7	0.6	0.7	S	0.7	**0.5**	0.8	1.6	6.1	21.4	25.6	26.6	28.0	28.4	29.4	25.5	12.6	7.1	2.0	1.0	1.7	1.0	3.2	**0.5**	29.4	9.9	24
26	2.8	6.5	13.9	S	14.6	11.1	9.6	6.0	15.4	22.4	28.1	31.1	33.2	34.9	36.0	35.4	34.5	28.5	18.7	18.2	11.1	12.1	7.1	7.2	2.8	36.0	19.1	24
27	7.2	6.5	S	7.4	8.6	13.1	16.8	18.3	21.6	25.2	29.8	30.9	33.1	33.0	33.2	32.8	32.3	31.3	24.4	24.8	29.2	30.3	27.4	25.5	6.5	33.2	23.6	24
28	24.4	S	19.0	20.2	19.1	12.2	4.8	3.7	10.0	21.7	26.9	28.1	29.6	32.7	33.2	32.4	30.2	31.0	30.9	31.0	31.0	30.4	30.2	27.6	3.7	33.2	24.4	24
29	S	25.5	25.8	25.1	24.6	23.7	23.1	18.1	16.0	15.3	15.0	18.6	22.3	23.1	22.1	22.4	20.6	19.5	16.8	18.4	19.4	15.3	13.5	S	13.5	25.8	20.2	24
30	12.7	9.9	7.7	2.8	1.8	5.9	13.2	9.2	12.6	23.2	23.2	23.6	22.6	20.3	19.3	16.9	13.8	14.8	13.3	9.8	8.5	7.3	S	6.6	1.8	23.6	13.0	24
31	7.3	7.3	8.0	8.7	8.0	5.9	1.5	1.5	1.6	9.4	15.6	19.3	23.7	24.8	28.0	26.8	24.2	17.1	9.7	5.0	3.6	S	10.5	7.9	1.5	28.0	12.0	24
HOURLY MAX	35.1	34.6	33.5	32.3	32.3	33.5	30.1	31.2	31.4	35.6	38.2	37.9	39.0	48.4	50.5	52.4	51.6	48.3	47.8	50.6	48.5	44.1	38.5	36.8				
HOURLY AVG	17.8	16.5	17.6	17.6	17.4	16.8	14.5	14.8	17.4	22.4	25.8	27.7	29.3	30.8	31.3	31.9	30.7	28.1	24.6	23.0	22.1	19.9	18.9	18.6				

STATUS FLAG CODES

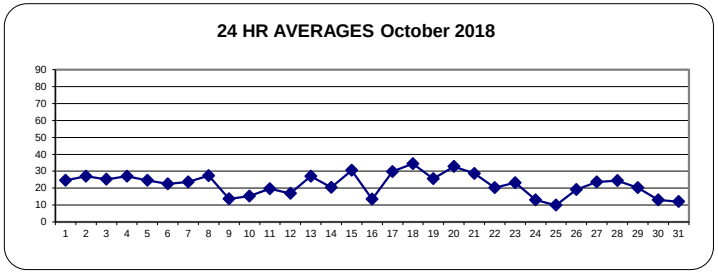
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

OBJECTIVE LIMIT: **ALBERTA ENVIRONMENT:** 1-HR 82 ppb

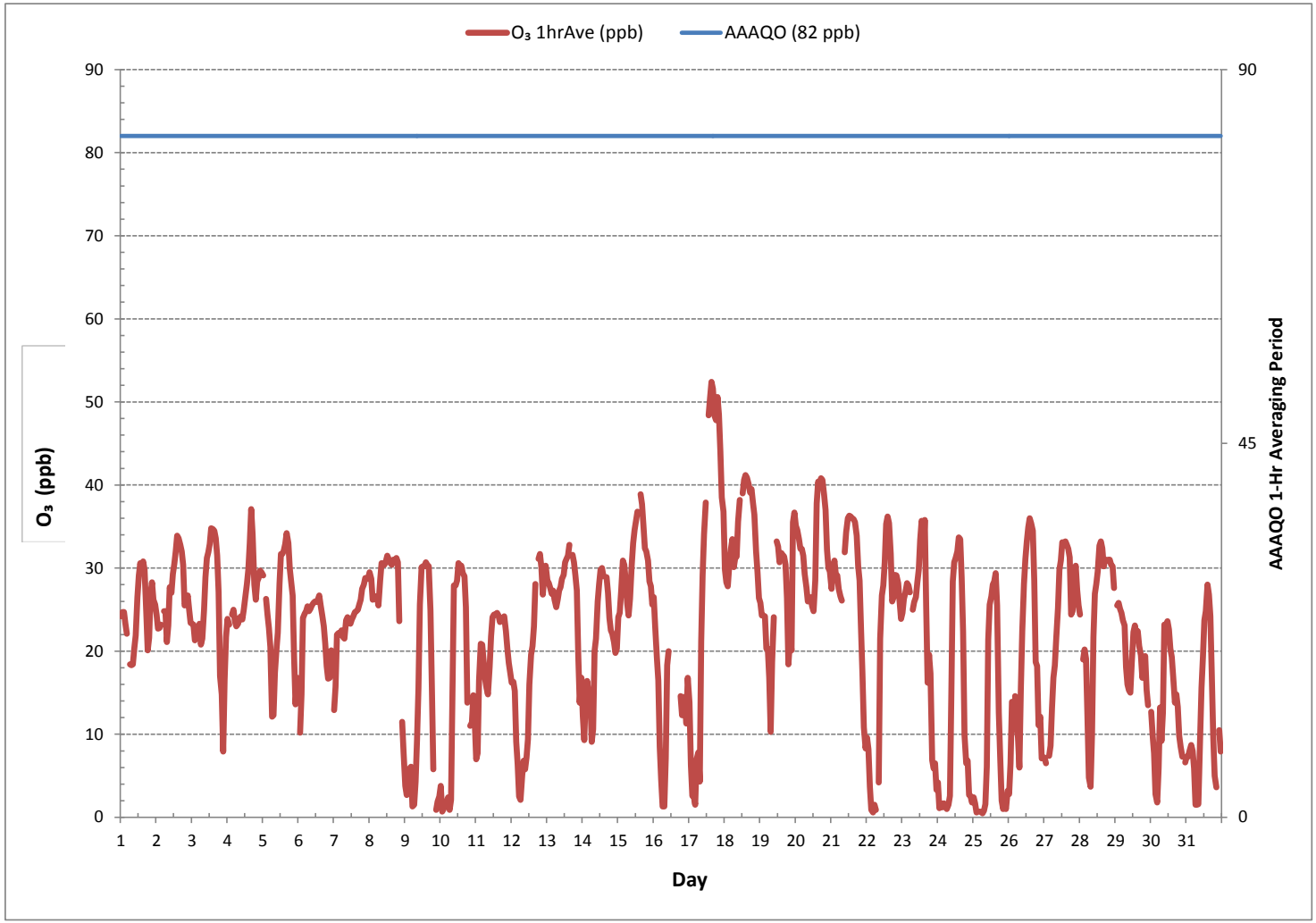
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	705					
MINIMUM 1-HR AVERAGE	0.5	ppb	@ HOUR	6	ON DAY	25
MAXIMUM 1-HR AVERAGE:	52.4	ppb	@ HOUR	15	ON DAY	17
MAXIMUM 24-HR AVERAGE:	34.4	ppb			ON DAY	18

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	10.6		MONTHLY AVERAGE:	22.3	ppb



OZONE Hourly Averages (O_3 ppb)



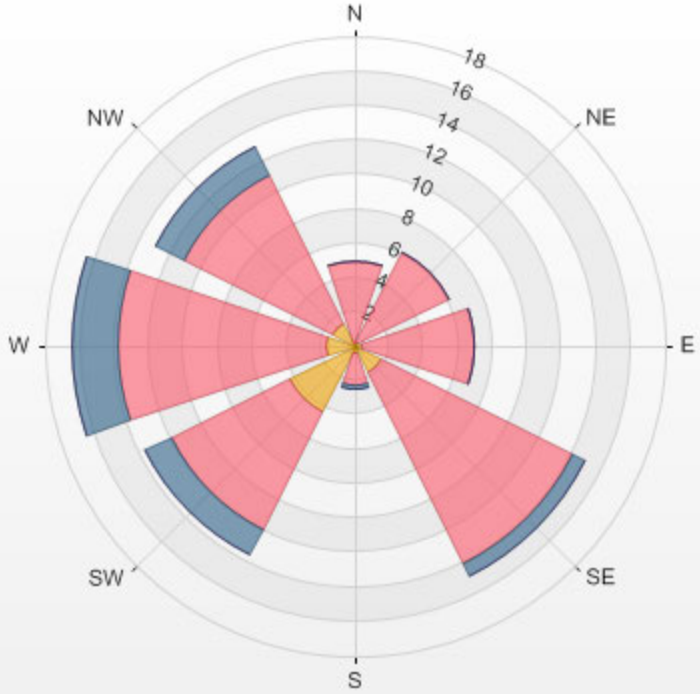
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-O3[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.42% Calm Avg: 8.01 [ppb]

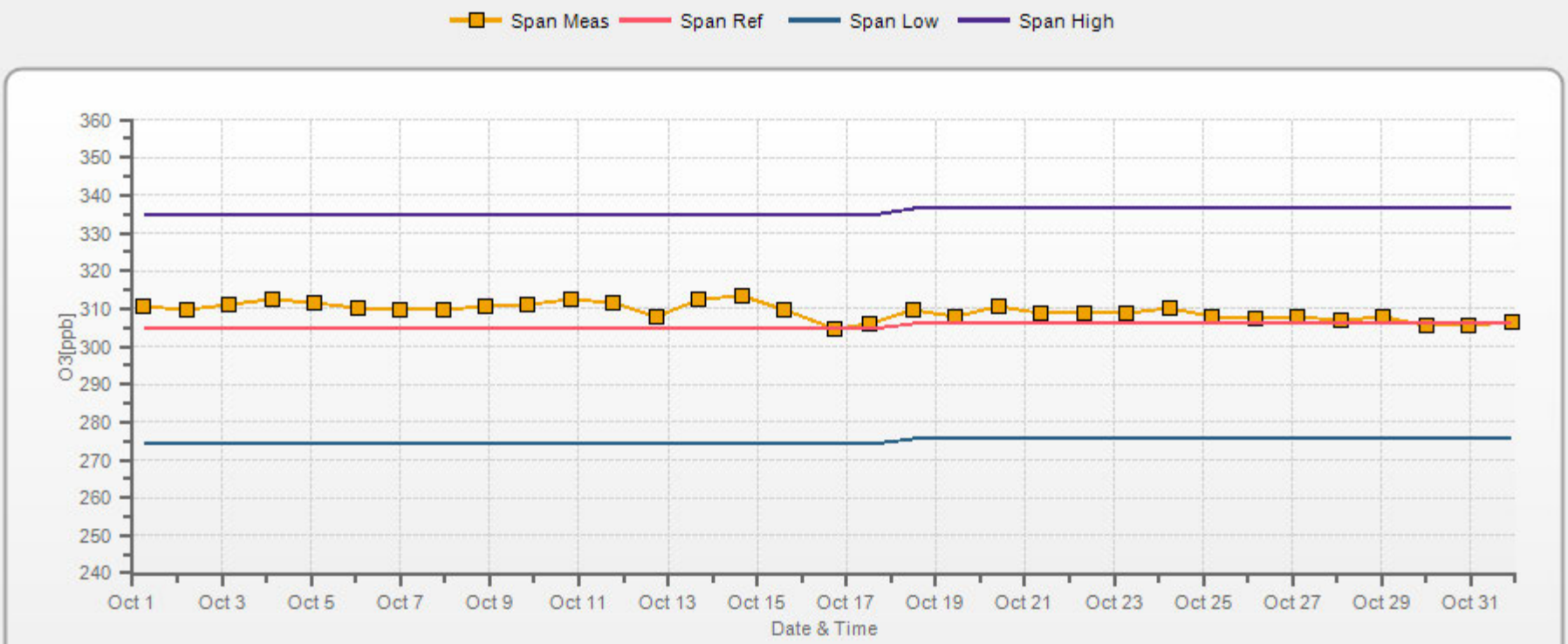
Direction	0.0-17.5	17.5-35.0	35.0-52.5	>52.5	Total
N	0.1	4.8	0.0	0.0	5.0
NE	0.3	5.8	0.0	0.0	6.1
E	0.4	6.5	0.0	0.0	7.0
SE	1.7	12.5	0.9	0.0	15.0
S	0.4	1.8	0.3	0.0	2.6
SW	4.3	7.7	1.7	0.0	13.6
W	1.7	12.1	2.7	0.0	16.5
NW	1.4	9.7	1.8	0.0	12.9
Summary	10.4	60.9	7.4	0.0	78.6

% Icon Classes (ppb)	10 0.0-17.5	61 17.5-35.0	7 35.0-52.5	0 >52.5

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.42% Calm Poll Avg: 8.01[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/10 Type: Span



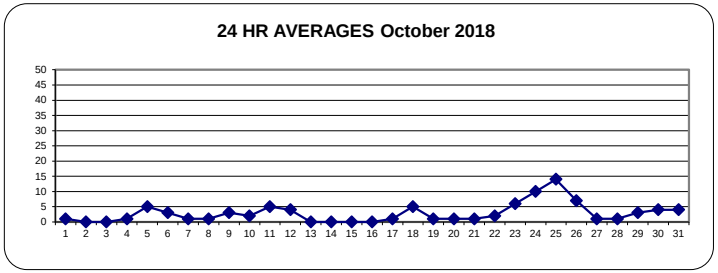
PARTICULATE MATTER 2.5

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

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

STATUS FLAG CODES

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

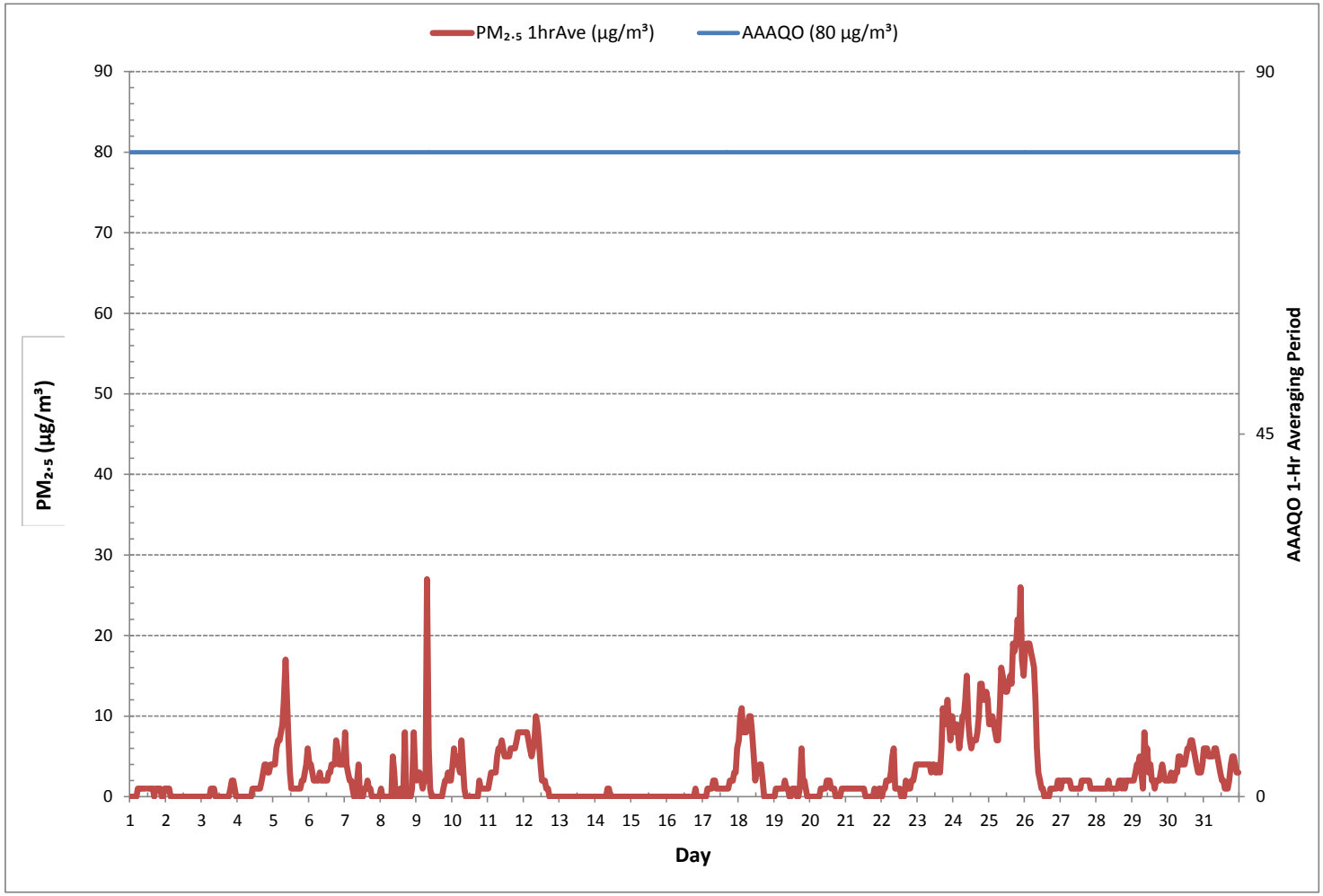


OBJECTIVE LIMIT: **ALBERTA ENVIRONMENT:** 1-HR 80 µg/m³ 24-HR 30 µg/m³

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	500					
MINIMUM 1-HR AVERAGE	0	µg/m³	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	27	µg/m³	@ HOUR	7	ON DAY	9
MAXIMUM 24-HR AVERAGE:	14	µg/m³			ON DAY	25
OPERATIONAL TIME:	743	hrs				
MONTHLY CALIBRATION TIME:	1	hrs	AMD OPERATION UPTIME:	99.9	%	
STANDARD DEVIATION:	4		MONTHLY AVERAGE:	3	µg/m³	

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



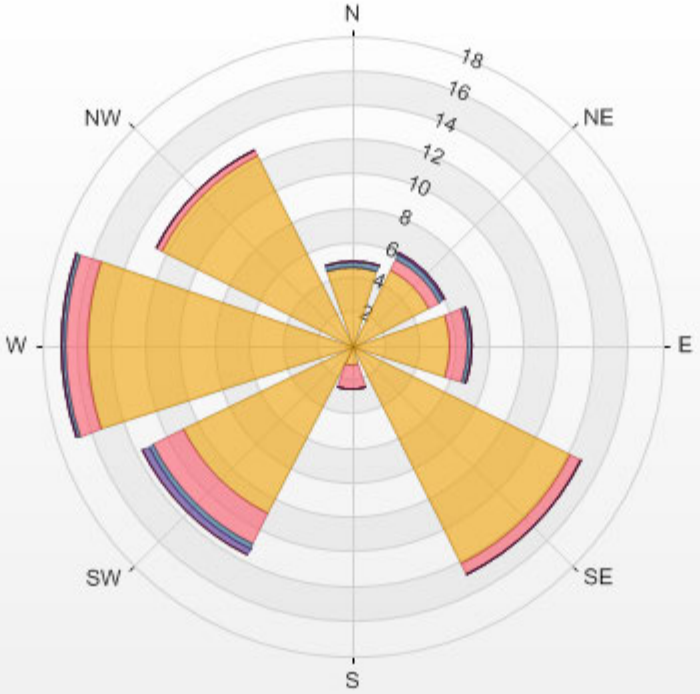
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.43% Calm Avg: 5.45 [ug/m3]

Direction	0.0-5.6	5.6-11.2	11.2-16.8	16.8-22.4	22.4-28.0	>28.0	Total
N	4.6	0.0	0.4	0.0	0.0	0.0	5.0
NE	5.0	0.7	0.3	0.1	0.0	0.0	6.1
E	5.7	1.1	0.3	0.0	0.0	0.0	7.0
SE	14.2	0.7	0.0	0.0	0.0	0.0	14.8
S	1.2	1.4	0.0	0.0	0.0	0.0	2.6
SW	10.9	2.0	0.3	0.4	0.0	0.0	13.6
W	15.4	1.4	0.1	0.0	0.0	0.0	16.8
NW	12.4	0.3	0.0	0.0	0.0	0.0	12.7
Summary	69.3	7.4	1.3	0.5	0.0	0.0	78.6

% Icon Classes (ug/m3(L))	69	0.0-5.6	7	5.6-11.2	1	11.2-16.8	1	16.8-22.4	0	22.4-28.0	0	>28.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.43% Calm Poll Avg: 5.45[ug/m3(L)]



WIND SPEED

Maxxam
A Bureau Veritas Group Company

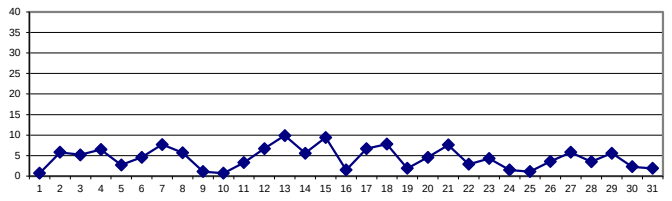
WIND SPEED Hourly Averages (WS kph)

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	4.3	6.3	5.9	2.9	3.9	2.9	2.6	2.5	2.3	1.9	3.0	3.0	1.6	4.0	3.3	3.2	1.8	0.2	1.4	4.0	3.8	5.0	3.7	5.1	0.2	6.3	0.7	24
2	4.8	5.0	5.0	7.3	7.8	7.7	4.2	4.5	6.9	6.1	6.3	7.7	7.8	8.2	11.9	12.1	12.5	8.6	5.4	3.6	5.1	6.1	6.5	6.4	3.6	12.5	5.8	24
3	6.2	7.2	5.9	5.5	6.7	7.4	6.5	5.9	6.7	11.9	12.0	13.1	11.1	14.0	11.3	10.9	7.8	4.8	2.5	0.9	1.5	1.9	2.7	4.3	0.9	14.0	5.2	24
4	4.4	4.4	7.0	5.8	7.7	6.8	8.5	10.1	10.3	8.4	6.9	8.0	8.8	9.0	8.6	9.0	6.1	3.9	3.5	5.0	5.7	3.1	3.6	3.8	3.1	10.3	6.5	24
5	3.1	2.8	2.5	2.7	2.7	2.3	1.4	3.7	6.3	7.0	7.9	7.6	10.9	10.6	8.1	6.5	6.9	6.4	7.8	6.4	3.5	0.7	1.7	2.9	0.7	10.9	2.7	24
6	1.9	1.8	3.6	4.4	6.3	7.0	8.7	7.5	8.8	10.7	10.9	10.0	8.6	7.8	5.8	5.4	4.8	3.2	1.9	1.0	1.1	2.3	3.3	2.3	1.0	10.9	4.6	24
7	0.4	1.9	6.4	7.2	8.6	11.0	7.0	5.7	7.5	7.4	6.6	6.8	8.2	8.7	6.5	8.8	9.3	8.1	10.1	11.6	12.1	12.0	9.8	8.4	0.4	12.1	7.7	24
8	9.6	7.2	9.2	11.8	9.3	7.5	5.4	8.5	10.2	8.0	7.3	6.8	5.6	5.3	5.6	5.4	6.4	5.2	5.1	3.5	0.2	0.9	**0.0**	0.1	**0.0**	11.8	5.7	24
9	0.1	0.4	0.5	0.9	0.6	0.3	0.5	0.9	1.0	1.4	3.3	4.2	2.9	6.2	4.5	5.0	5.3	1.1	0.2	0.4	0.6	0.8	1.2	0.7	0.1	6.2	1.1	24
10	0.2	0.7	0.3	0.7	0.6	0.6	0.4	0.4	3.6	6.9	5.3	3.0	1.8	2.6	3.0	3.8	2.2	1.5	1.1	0.4	1.3	2.3	1.4	0.7	0.2	6.9	0.7	24
11	0.9	1.7	3.1	1.8	2.0	2.0	2.4	2.9	2.9	3.4	4.7	4.7	5.7	7.0	7.4	5.7	5.2	5.1	3.6	4.0	3.7	3.2	1.7	3.0	0.9	7.4	3.3	24
12	3.5	5.0	3.6	1.2	1.2	0.7	1.6	1.2	3.0	4.3	5.0	6.2	9.7	13.5	15.4	16.2	17.2	13.1	16.2	13.0	9.8	9.8	13.5	11.8	0.7	17.2	6.7	24
13	11.2	11.8	12.0	13.4	11.7	13.1	10.6	10.5	12.2	15.9	16.0	11.8	13.1	12.3	13.0	12.8	9.9	7.5	7.7	6.9	4.2	2.4	2.6	4.1	2.4	16.0	**9.9**	24
14	3.2	2.0	4.7	4.8	4.1	2.6	1.1	1.8	3.5	5.3	9.5	10.0	9.5	9.0	9.7	6.5	8.0	5.0	5.5	5.9	6.3	6.4	6.7	6.2	1.1	10.0	5.6	24
15	10.2	10.6	9.7	10.3	9.5	7.6	7.0	8.1	10.4	11.3	12.6	13.9	13.2	15.1	17.0	16.4	12.1	6.5	4.8	5.6	5.7	3.9	9.1	8.2	3.9	17.0	9.4	24
16	5.6	3.9	3.4	2.2	1.1	1.0	1.3	0.3	1.0	3.4	4.8	4.8	4.1	3.8	3.7	4.8	2.1	1.4	2.3	1.7	2.0	2.4	1.0	1.7	0.3	5.6	1.5	24
17	2.0	1.2	1.6	1.1	0.5	4.8	2.6	3.0	8.1	8.4	10.4	11.0	13.0	11.6	11.0	10.7	10.5	9.3	9.7	8.4	9.2	6.9	4.9	5.4	0.5	13.0	6.7	24
18	5.1	4.6	5.7	6.2	7.1	6.4	5.6	6.4	6.7	9.8	8.2	11.4	10.0	13.6	14.9	14.4	13.8	13.9	8.6	7.2	6.1	6.2	6.7	5.7	4.6	14.9	7.8	24
19	6.2	6.0	6.0	5.5	6.2	6.1	2.3	5.0	7.0	8.3	8.2	14.0	13.7	12.0	10.5	6.3	7.4	3.5	2.8	2.1	2.7	1.8	8.0	11.5	1.8	14.0	1.9	24
20	10.5	10.9	7.2	6.9	10.8	8.0	5.9	7.0	0.6	5.3	7.5	10.9	10.5	8.8	16.0	13.7	9.1	11.6	11.7	8.6	8.7	4.6	6.1	7.3	0.6	16.0	4.6	24
21	5.9	7.8	7.4	8.5	7.3	8.0	8.2	8.1	9.5	12.2	12.4	13.9	14.5	**17.4**	14.6	13.0	9.8	5.2	5.4	4.6	2.6	2.7	0.7	0.4	0.4	**17.4**	7.6	24
22	0.5	0.9	1.1	1.2	0.8	2.1	0.9	1.9	1.4	3.8	5.2	5.0	5.4	6.8	6.5	6.4	3.6	3.8	4.5	4.6	5.4	5.1	3.0	3.9	0.5	6.8	2.9	24
23	4.3	5.0	6.2	7.4	6.9	7.3	5.7	6.1	7.4	7.8	7.2	8.1	6.7	5.9	5.3	5.5	2.1	2.7	2.5	1.0	0.9	1.1	0.1	1.1	0.1	8.1	4.3	24
24	0.3	1.1	0.5	0.7	0.7	0.4	0.2	0.5	0.2	2.6	3.9	4.5	6.1	5.6	4.7	5.5	3.2	2.2	0.8	1.1	0.3	0.6	1.2	0.6	0.2	6.1	1.5	24
25	0.8	0.2	0.7	0.8	0.8	0.4	0.8	0.2	0.1	1.3	3.6	3.9	7.6	5.1	5.4	2.7	1.3	0.6	0.4	1.3	0.3	1.4	0.8	0.2	0.1	7.6	1.1	24
26	2.4	1.3	2.3	1.3	2.2	0.4	1.6	6.2	5.0	6.5	8.6	9.4	10.2	11.3	10.3	7.5	5.2	3.3	1.4	1.0	1.6	0.8	0.7	0.6	0.4	11.3	3.6	24
27	0.1	0.4	2.4	1.7	3.5	6.1	6.2	6.3	6.4	7.9	10.7	11.0	12.6	12.9	13.5	11.0	8.6	4.7	0.8	4.3	5.3	6.2	3.9	5.4	0.1	13.5	5.8	24
28	6.4	4.0	2.6	5.6	5.1	0.9	1.5	1.1	1.3	4.0	4.7	5.9	6.2	7.7	10.5	7.4	4.0	5.5	6.0	5.4	5.7	6.1	7.8	5.5	0.9	10.5	3.5	24
29	6.6	5.8	7.7	6.1	3.1	3.6	8.3	8.5	8.6	9.7	10.2	10.9	10.8	11.1	10.1	9.4	6.7	6.9	6.9	8.6	10.1	9.1	7.9	7.7	3.1	11.1	5.6	24
30	6.5	4.0	2.0	1.1	1.3	2.0	1.5	0.9	3.2	3.5	5.1	3.7	4.3	4.0	3.3	3.6	4.3	2.7	1.9	1.3	1.3	1.3	1.0	2.3	0.9	6.5	2.3	24
31	2.9	1.4	2.2	1.4	1.5	0.5	0.6	1.4	0.9	4.6	7.6	7.2	5.4	4.9	5.2	3.1	3.2	1.3	0.2	0.1	1.1	2.6	1.8	0.0	0.0	7.6	1.9	24
HOURLY MAX	11.2	11.8	12.0	13.4	11.7	13.1	10.6	10.5	12.2	15.9	16.0	14.0	14.5	17.4	17.0	16.4	17.2	13.9	16.2	13.0	12.1	12.0	13.5	11.8				

STATUS FLAG CODES

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

24 HR AVERAGES October 2018

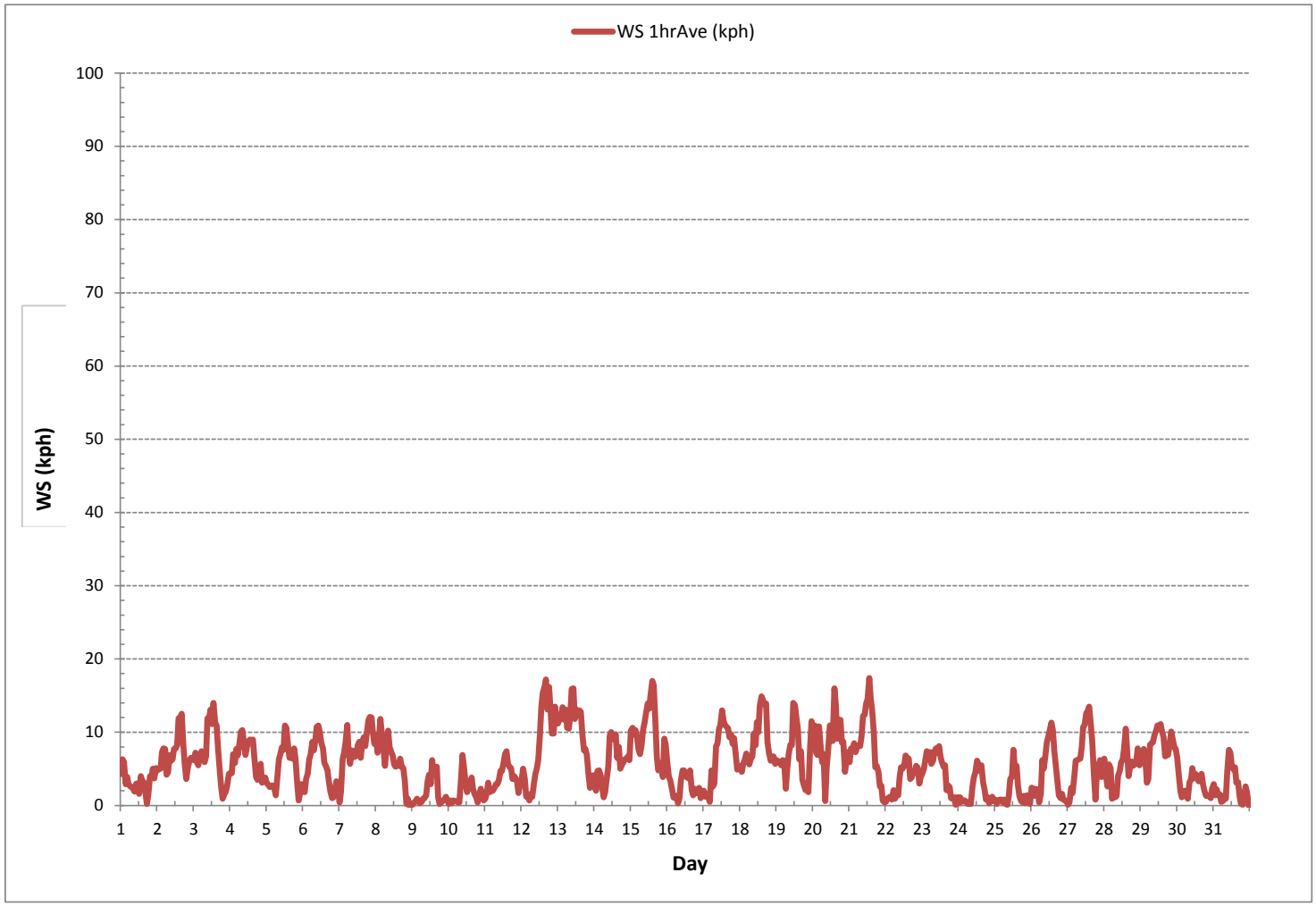


LAST CALIBRATION:	November 9, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			742				
MINIMUM 1-HR AVERAGE	0.0	kph	@ HOUR	22	ON DAY	8	
MAXIMUM 1-HR AVERAGE:	17.4	kph	@ HOUR	13	ON DAY	21	
MAXIMUM 24-HR AVERAGE:	9.9	kph			ON DAY	13	
			OPERATIONAL TIME:			744	hrs
MONTHLY CALIBRATION TIME:	0	hrs	AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	3.9		MONTHLY AVERAGE:			1.5	kph

WIND SPEED Hourly Averages (WS kph)



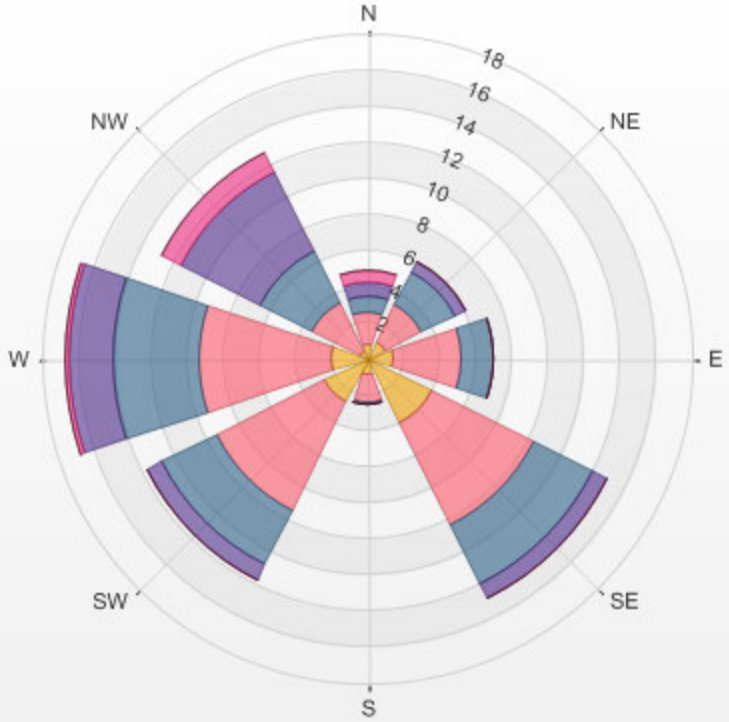
Wind: LICA COLD LAKE SOUTH
Monitor: WSP [kph]
Monthly: 18/10
Type: WindRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 21.37%

Direction	1.8-3.5	3.5-7.0	7.0-10.5	10.5-14.0	14.0-17.5	>17.5	Total
N	0.8	1.8	0.9	0.8	0.7	0.0	5.0
NE	1.1	2.3	2.0	0.7	0.0	0.0	6.1
E	1.5	3.8	1.8	0.0	0.0	0.0	7.0
SE	4.0	6.3	3.6	0.8	0.0	0.0	14.8
S	0.9	1.5	0.1	0.0	0.0	0.0	2.6
SW	2.7	6.7	3.4	0.9	0.0	0.0	13.7
W	2.0	7.4	4.7	2.4	0.3	0.0	16.8
NW	0.5	3.0	3.2	4.8	1.2	0.0	12.8
Summary	13.6	32.7	19.8	10.5	2.2	0.0	78.7

%	Icon	Classes (kph)											
14		1.8-3.5	33		3.5-7.0	20		7.0-10.5	10		10.5-14.0	2		14.0-17.5	0		>17.5

LICA COLD LAKE SOUTH 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 21.37% Calm Wind Avg Speed: 0.90(kph)



WIND DIRECTION

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

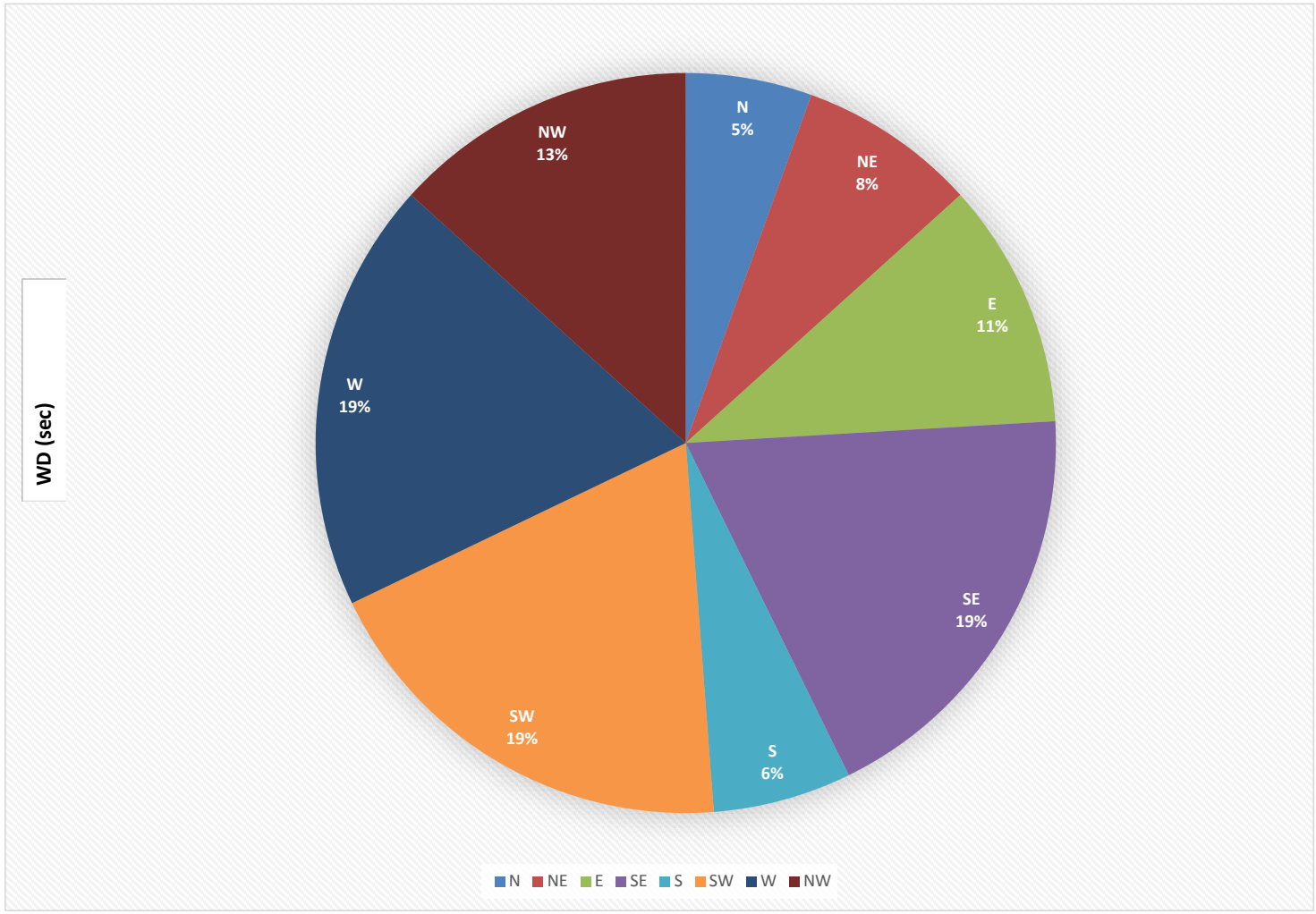
STATUS FLAG CODES

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

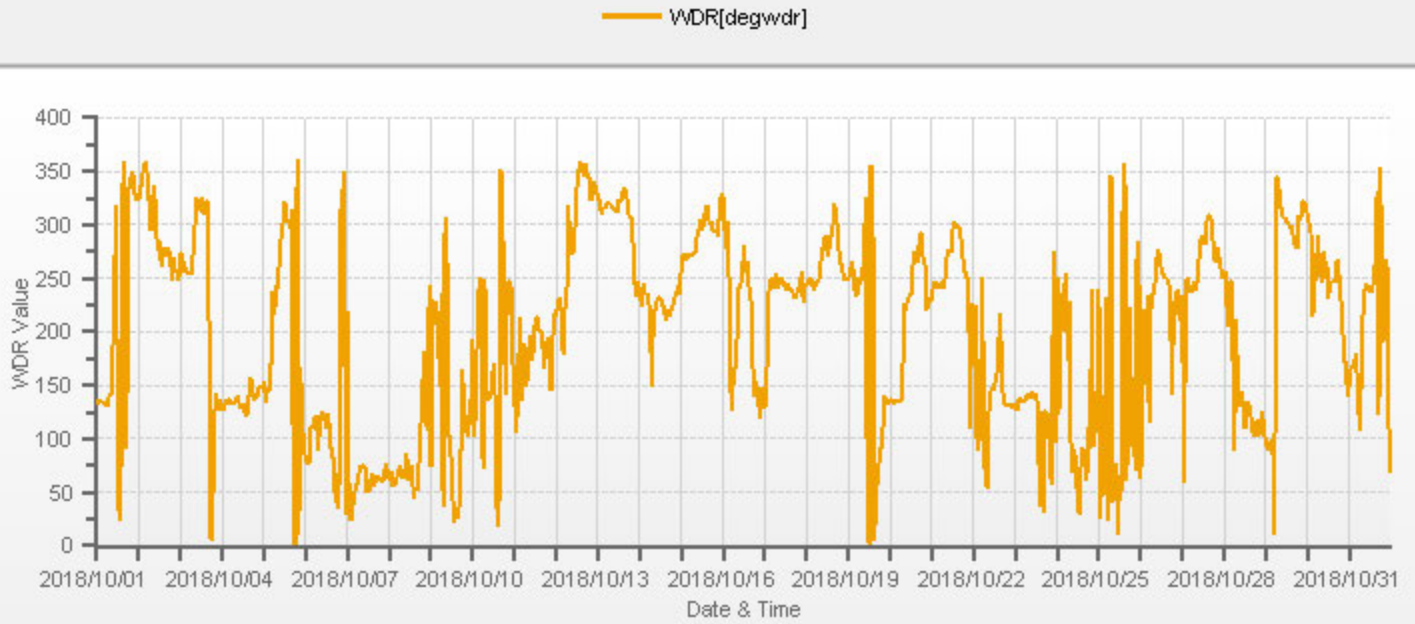
LAST CALIBRATION:	November 9, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	91		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	279 (W)	

WIND DIRECTION Hourly Averages (WD)



WDR[degwdr] Station: LICA COLD LAKE SOUTH Monthly: 18/10 Type: AVG 1 Hr. [1 Hr.]



STANDARD DEVIATION WIND DIRECTION

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	8	4	7	22	5	9	9	8	12	40	34	20	63	39	32	32	44	72	32	15	11	8	14	5	24
2	6	11	8	6	10	8	28	15	16	27	27	24	32	22	14	18	11	12	16	8	10	5	5	6	24
3	10	9	8	7	10	7	8	15	13	18	17	10	16	12	16	14	17	10	12	41	34	21	10	6	24
4	8	10	4	5	3	4	4	3	7	9	17	14	13	18	18	13	24	14	4	3	5	10	15	13	24
5	20	11	21	18	21	19	44	10	16	15	19	23	18	17	20	29	30	10	13	9	18	48	24	9	24
6	28	28	17	11	12	16	15	9	11	11	14	14	16	13	19	15	18	19	49	50	39	14	19	21	24
7	70	46	13	8	11	4	9	13	8	14	20	16	10	13	19	10	8	7	7	7	6	9	8	9	24
8	5	10	5	4	6	11	7	8	7	14	13	12	29	30	19	29	17	18	19	17	70	45	80	74	24
9	72	62	53	25	51	53	54	39	53	58	33	35	52	24	31	25	19	52	74	50	42	36	21	38	24
10	72	37	66	46	51	56	58	65	8	11	19	39	53	44	26	14	33	44	33	59	30	9	32	45	24
11	55	21	18	31	21	27	29	17	28	23	25	28	18	19	21	22	17	15	19	19	29	13	31	12	24
12	12	10	15	40	37	52	25	43	12	10	10	18	16	8	8	13	9	10	10	10	7	7	9	8	24
13	7	8	7	7	9	8	7	8	8	7	8	15	14	15	12	11	12	11	4	5	16	11	14	11	24
14	10	14	7	7	10	38	41	23	13	17	10	12	12	11	12	13	8	12	8	7	8	7	5	7	24
15	10	5	7	5	5	7	7	5	6	11	11	14	12	14	8	9	7	7	9	9	11	10	7	5	24
16	11	18	14	34	31	32	28	65	47	20	22	22	23	29	34	13	41	27	18	38	32	27	61	27	24
17	26	30	29	23	61	5	20	20	7	8	8	9	7	10	8	6	4	4	4	6	9	11	19	7	24
18	13	16	9	9	8	9	8	9	9	7	10	12	10	10	11	18	7	9	20	8	9	3	3	4	24
19	3	7	4	10	4	6	60	7	8	11	24	13	15	15	16	34	7	13	17	29	28	36	4	4	24
20	3	5	6	5	4	5	13	6	74	32	9	8	10	21	9	8	7	11	7	9	7	22	10	5	24
21	6	6	8	3	5	5	4	3	14	7	10	10	17	12	11	11	8	15	15	8	21	36	53	68	24
22	58	46	38	34	54	14	39	14	32	12	16	19	28	26	25	16	33	7	6	5	5	5	7	7	24
23	11	6	5	5	3	5	8	6	6	8	15	10	15	24	24	25	31	12	12	43	43	42	71	41	24
24	66	19	58	36	43	53	70	48	69	17	19	25	18	17	17	10	29	15	36	25	66	39	41	65	24
25	53	72	58	56	57	69	46	74	78	48	28	42	18	25	24	29	42	61	69	45	72	39	54	76	24
26	17	53	45	63	32	74	46	7	11	11	12	13	15	11	11	10	7	13	33	37	42	62	55	62	24
27	77	71	35	29	15	5	6	5	6	12	11	9	10	12	10	9	8	11	62	19	10	9	25	5	24
28	5	13	39	12	6	54	27	47	38	11	24	17	19	15	6	13	12	9	13	11	11	13	10	11	24
29	7	8	9	10	17	13	6	9	9	20	7	8	6	7	9	8	10	9	10	10	7	8	6	5	24
30	6	9	28	29	37	33	42	57	17	33	16	23	15	17	18	19	10	13	19	33	33	33	53	23	24
31	31	36	28	40	38	57	57	45	59	10	10	13	13	12	19	23	18	50	76	79	43	26	32	78	24

STATUS FLAG CODES

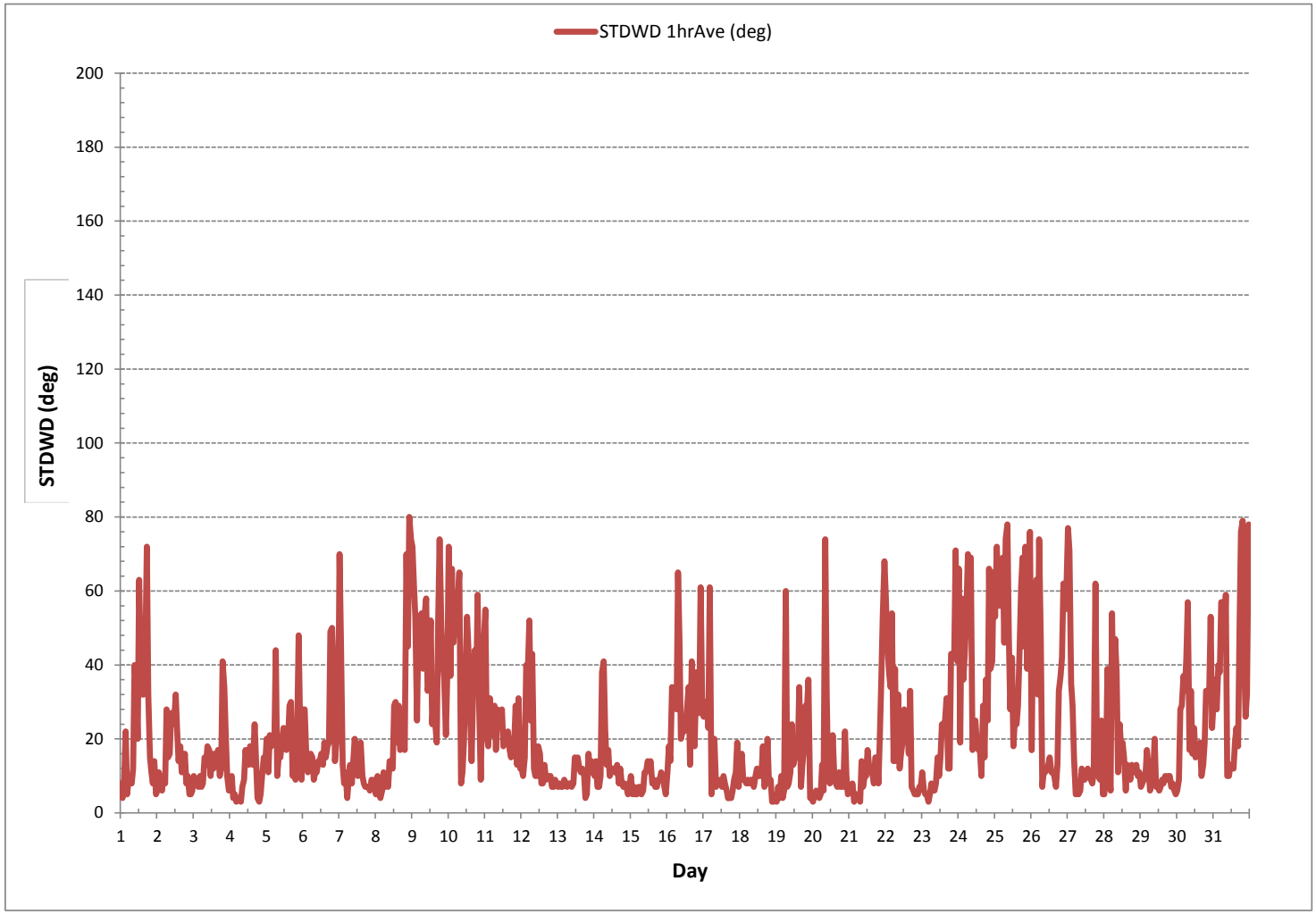
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: November 9, 2017

CALIBRATION TIME: 0 hrs

OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

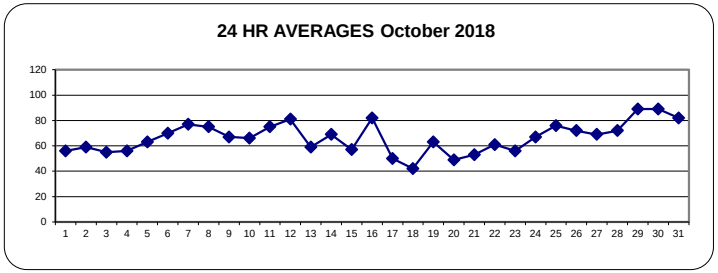
Maxxam
A Bureau Veritas Group Company

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	59	60	59	60	62	64	66	66	64	60	55	47	41	40	40	40	43	49	56	58	59	60	62	65	40	66	56	24
2	67	68	74	79	81	82	79	79	72	56	51	45	41	38	36	35	39	43	49	58	57	58	60	64	35	82	59	24
3	66	67	70	71	68	67	68	69	65	56	50	47	42	37	34	33	32	38	45	54	59	66	63	63	32	71	55	24
4	61	61	63	64	64	65	66	65	63	61	59	54	51	47	43	40	36	42	52	57	58	60	59	61	36	66	56	24
5	62	67	70	74	76	78	83	84	76	67	57	49	46	44	44	43	43	49	55	58	62	72	76	74	43	84	63	24
6	78	81	80	78	78	77	76	74	73	71	67	62	58	55	52	54	57	60	63	65	71	75	80	85	52	85	70	24
7	87	88	86	86	86	83	85	86	79	75	71	71	71	71	69	70	68	67	68	69	72	72	74	86	67	88	77	24
8	90	91	87	83	84	84	86	79	72	70	65	65	62	64	65	65	68	67	66	66	75	82	85	87	62	91	75	24
9	87	86	86	85	85	84	84	85	80	72	61	49	44	46	39	36	36	44	58	66	71	75	75	78	36	87	67	24
10	80	82	83	85	86	86	84	84	68	56	51	45	39	40	40	43	44	51	66	67	73	72	72	78	39	86	66	24
11	79	80	79	77	76	78	79	80	80	78	75	72	68	66	64	67	69	68	70	71	75	77	79	87	64	87	75	24
12	93	96	96	96	97	97	97	**98**	98	98	98	97	91	78	76	72	66	60	56	53	55	61	60	59	53	**98**	81	24
13	62	61	63	64	65	66	67	66	65	64	59	55	50	46	44	40	41	46	53	57	60	70	79	78	40	79	59	24
14	82	84	85	85	87	87	88	88	80	74	66	59	51	48	48	48	48	52	58	62	64	67	69	68	48	88	69	24
15	65	65	64	63	64	67	70	69	61	53	48	41	36	35	37	38	43	51	55	59	68	73	76	75	35	76	57	24
16	75	76	79	80	87	90	90	89	85	79	76	76	72	69	68	71	73	78	86	89	89	92	94	94	68	94	82	24
17	92	93	94	94	94	92	87	90	64	43	32	27	23	19	17	**15**	18	22	24	26	27	31	38	39	**15**	94	50	24
18	50	52	53	47	44	42	45	41	38	35	36	35	35	33	32	33	36	38	38	43	44	50	56	63	32	63	42	24
19	66	70	71	74	78	80	82	85	71	60	53	56	60	59	54	52	53	52	55	63	58	63	50	50	50	85	63	24
20	54	55	57	61	60	61	66	68	65	56	54	53	49	42	34	32	32	30	31	35	38	45	50	53	30	68	49	24
21	59	59	58	60	62	63	65	66	57	49	41	35	32	32	32	32	34	40	48	54	64	73	75	77	32	77	53	24
22	81	81	82	82	83	87	87	86	76	60	53	45	39	34	32	32	37	47	52	53	55	58	63	66	32	87	61	24
23	65	63	62	60	61	63	65	66	60	54	46	40	33	30	38	29	45	53	51	62	69	71	75	76	29	76	56	24
24	79	79	81	83	87	87	86	86	75	60	52	46	48	45	40	39	43	53	63	69	73	75	78	80	39	87	67	24
25	83	84	83	84	86	87	88	88	84	75	68	66	63	57	53	52	59	71	78	80	82	80	81	82	52	88	76	24
26	82	84	86	85	85	86	87	88	87	78	66	57	50	46	44	45	48	58	68	75	80	81	81	83	44	88	72	24
27	82	83	84	85	84	80	80	82	78	66	59	57	56	55	54	54	55	58	62	65	63	68	76	80	54	85	69	24
28	81	80	86	86	88	91	93	93	86	78	71	66	61	56	56	58	59	59	61	61	61	62	63	72	56	93	72	24
29	77	82	85	88	89	90	95	96	97	96	94	93	93	90	86	85	86	87	88	88	86	85	86	87	77	97	**89**	24
30	88	90	92	94	96	97	94	92	93	90	88	84	81	81	81	82	85	85	85	86	89	90	91	93	81	97	89	24
31	94	94	96	96	96	96	97	97	98	92	76	67	60	59	56	56	60	67	76	80	82	86	93	96	56	98	82	24
HOURLY MAX	94	96	96	96	97	97	97	98	98	98	98	97	93	90	86	85	86	87	88	89	89	92	94	96				
HOURLY AVG	75	76	77	78	79	79	80	80	75	67	61	57	53	50	49	48	50	54	59	63	66	69	72	74				

STATUS FLAG CODES

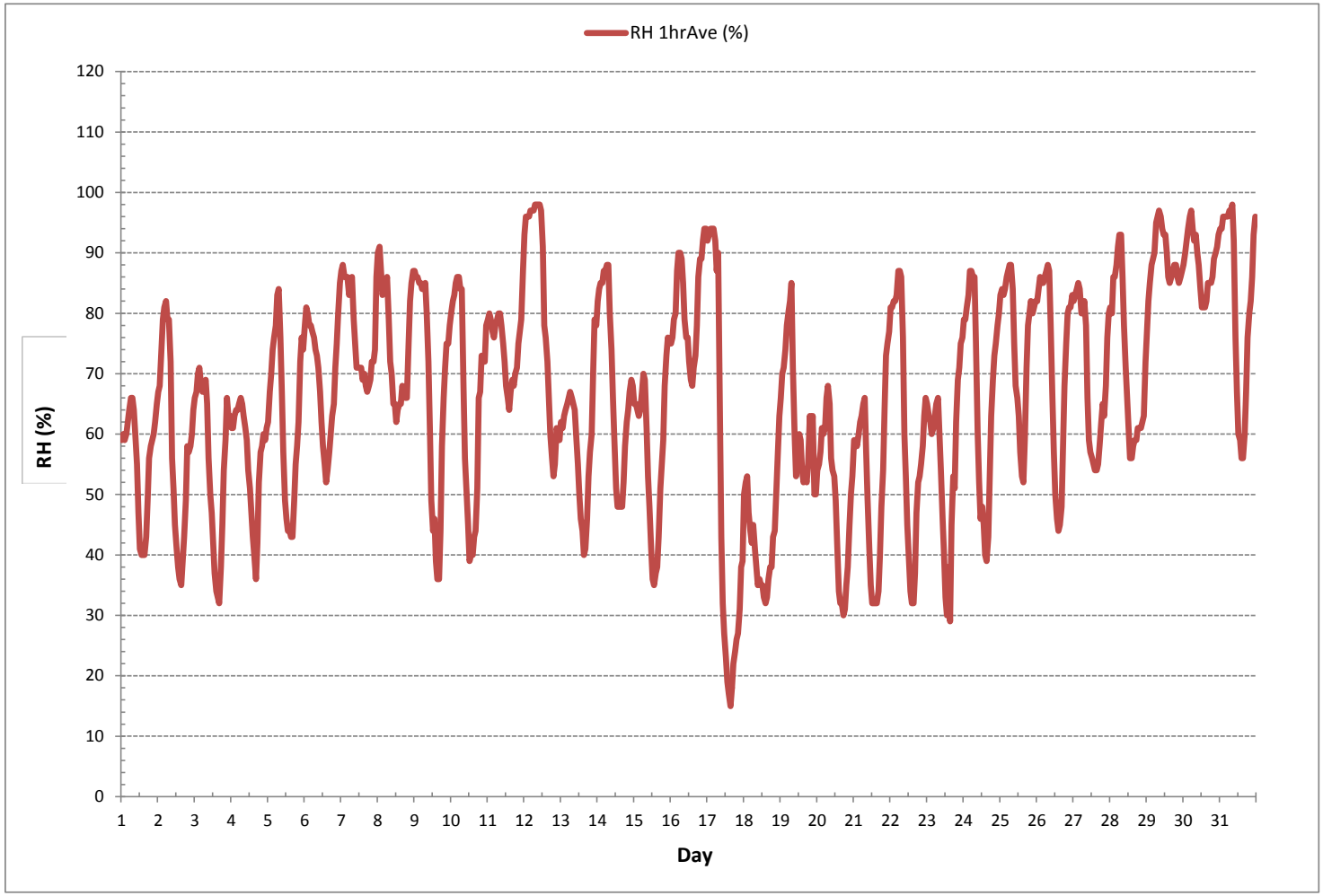
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	15	%	@ HOUR	15	ON DAY	17	
MAXIMUM 1-HR AVERAGE:	98	%	@ HOUR	7	ON DAY	12	
MAXIMUM 24-HR AVERAGE:	89	%			ON DAY	29	
			OPERATIONAL TIME:			744	hrs
			AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	18		MONTHLY AVERAGE:			66	%

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE

Maxxam
A Bureau Veritas Group Company

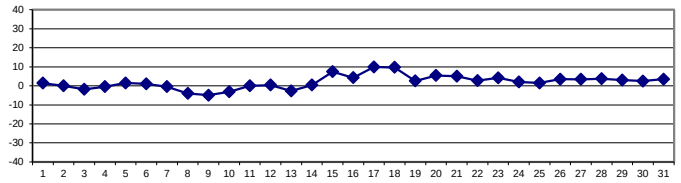
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST) / HR END (MST)	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
DAY																												
1	-1.0	-1.0	-0.9	-0.9	-1.1	-1.1	-1.3	-1.2	-0.5	0.9	2.1	3.5	4.8	4.9	4.6	4.5	4.1	3.5	2.5	1.9	1.8	1.6	1.0	0.2	-1.3	4.9	1.4	24
2	0.0	-0.2	-1.5	-2.2	-2.2	-2.2	-2.2	-1.9	-0.9	0.3	1.4	2.5	3.4	4.0	3.4	4.2	3.2	1.8	0.2	-1.6	-1.7	-2.0	-2.5	-3.1	-3.1	4.2	0.0	24
3	-3.6	-3.7	-4.1	-4.4	-3.5	-3.0	-3.0	-2.7	-1.2	0.8	0.9	0.7	1.0	1.5	2.3	2.1	2.0	0.4	-1.4	-3.2	-4.3	-5.7	-5.7	-5.6	-5.7	2.3	-1.8	24
4	-5.3	-5.4	-5.4	-5.6	-5.4	-5.3	-5.2	-4.6	-3.3	-1.7	-0.4	1.4	2.5	4.1	5.6	6.5	6.4	5.1	2.6	1.0	0.9	0.3	0.3	0.0	-5.6	6.5	-0.4	24
5	-0.1	-1.3	-1.2	-1.3	-0.9	-1.1	-2.4	-2.3	0.2	2.4	4.4	6.1	6.3	6.2	6.0	6.8	6.4	4.5	3.0	1.9	0.7	-1.6	-2.9	-2.6	-2.9	6.8	1.5	24
6	-3.6	-4.3	-3.5	-2.1	-1.9	-1.9	-2.1	-1.6	-1.2	-0.4	0.9	2.3	3.6	4.9	6.2	5.9	5.6	4.9	4.2	3.6	2.8	2.1	1.7	0.0	-4.3	6.2	1.1	24
7	-0.9	0.0	0.7	0.3	-0.3	-0.8	-1.0	-1.3	-1.0	-0.4	0.3	0.5	0.5	0.5	0.7	0.6	0.5	0.3	-0.1	-0.7	-1.2	-1.6	-2.0	-2.8	-2.8	0.7	-0.4	24
8	-3.2	-3.2	-2.9	-3.4	-4.0	-4.7	-4.8	-3.7	-3.4	-2.9	-2.5	-2.5	-2.3	-2.4	-2.5	-2.6	-3.1	-3.4	-3.6	-3.7	-5.4	-7.3	-8.5	-9.3	-9.3	-2.3	-4.0	24
9	-10.0	-10.4	-10.8	-11.1	-11.5	-11.7	**-11.9**	-10.8	-6.1	-2.9	-1.1	0.3	1.1	1.4	2.2	2.5	2.2	0.7	-2.4	-3.7	-4.7	-5.7	-6.2	-6.9	**-11.9**	2.5	-4.9	24
10	-7.6	-8.3	-8.9	-9.4	-10.0	-10.4	-10.6	-9.6	-2.7	0.0	0.6	1.6	2.9	3.2	3.4	3.1	3.3	1.2	-1.6	-2.0	-3.0	-2.6	-2.5	-3.4	-10.6	3.4	-3.1	24
11	-4.4	-4.0	-3.0	-2.7	-2.6	-2.3	-1.9	-1.5	-0.9	-0.3	0.4	0.9	1.8	2.5	2.9	2.7	2.4	2.0	1.7	1.4	1.3	1.0	1.1	0.9	-4.4	2.9	0.0	24
12	0.6	0.6	0.9	0.9	0.5	0.1	0.4	1.0	1.4	1.5	1.8	2.5	3.0	2.8	1.7	1.1	0.5	-0.2	-0.7	-1.3	-1.9	-2.2	-2.6	-3.8	-3.8	3.0	0.4	24
13	-4.3	-4.1	-4.5	-4.5	-4.5	-4.9	-4.6	-4.4	-4.0	-3.6	-2.6	-1.1	-0.2	1.0	1.4	1.8	1.6	0.0	-1.2	-2.1	-2.8	-4.4	-6.2	-6.3	-6.3	1.8	-2.7	24
14	-7.4	-8.0	-7.5	-7.2	-7.7	-7.7	-8.9	-8.5	-2.8	0.0	2.2	4.0	5.6	6.2	6.9	7.1	6.8	5.7	4.9	4.9	5.4	5.0	4.7	4.9	-8.9	7.1	0.4	24
15	5.2	4.8	4.5	4.7	4.5	3.8	3.2	3.8	6.1	9.1	10.5	11.7	12.6	12.9	12.2	11.8	10.6	9.1	8.4	7.5	6.3	5.6	5.6	5.7	3.2	12.9	7.5	24
16	5.2	4.7	4.0	3.0	0.1	-1.5	-2.0	-0.9	1.9	5.2	6.2	7.1	7.8	8.4	9.0	8.9	8.9	7.7	5.0	3.5	3.7	2.9	1.8	3.6	-2.0	9.0	4.3	24
17	3.3	1.1	-0.9	-1.7	-2.3	-1.8	-1.5	-1.9	5.2	10.4	13.6	16.5	18.3	20.5	21.7	**21.9**	19.8	17.4	15.7	15.0	14.6	13.2	10.8	9.9	-2.3	**21.9**	**9.9**	24
18	6.3	5.4	5.0	6.7	7.2	7.9	7.1	8.6	10.5	12.5	13.0	14.0	14.4	15.4	15.2	14.7	13.2	12.0	10.8	9.1	8.3	6.9	5.4	3.2	3.2	15.4	9.7	24
19	2.9	2.1	2.1	1.7	0.7	0.1	-0.9	-1.7	2.4	5.2	7.9	8.0	7.0	6.7	7.3	7.4	5.9	3.8	1.6	-0.9	-1.7	-3.0	-1.5	-1.0	-3.0	8.0	2.6	24
20	-1.7	-1.5	-1.5	-2.1	-1.6	-1.1	-1.0	-0.5	1.1	4.1	5.4	6.4	8.7	11.6	13.8	14.6	13.9	12.6	11.7	10.3	9.2	6.7	4.9	4.4	-2.1	14.6	5.4	24
21	2.6	2.7	3.4	2.9	2.3	1.8	1.2	1.0	3.6	6.3	8.7	10.5	11.7	12.0	12.1	12.1	11.1	8.9	6.3	4.3	1.7	-0.8	-1.8	-2.7	-2.7	12.1	5.1	24
22	-3.4	-3.8	-4.3	-4.8	-5.3	-5.7	-5.9	-5.8	-1.2	4.0	6.1	8.5	10.5	11.7	12.1	12.0	10.7	7.4	5.8	5.4	4.7	3.9	2.3	1.3	-5.9	12.1	2.8	24
23	1.2	1.6	1.5	1.8	1.1	0.5	-0.1	-0.4	1.5	3.6	6.2	8.6	11.7	13.4	12.3	13.9	10.6	7.0	5.8	2.6	0.6	-0.5	-1.6	-2.2	-2.2	13.9	4.2	24
24	-2.9	-3.2	-3.6	-4.0	-4.5	-4.8	-5.1	-5.0	-0.5	4.2	6.4	8.8	9.8	10.8	12.5	12.7	11.1	7.1	3.8	1.3	-0.1	-0.9	-1.1	-1.7	-5.1	12.7	2.1	24
25	-2.3	-2.5	-2.4	-2.2	-2.0	-2.3	-2.5	-2.6	-0.9	2.9	5.2	6.2	6.5	7.4	8.5	9.0	6.9	3.4	1.0	-0.1	-0.6	-0.2	0.1	0.4	-2.6	9.0	1.5	24
26	0.7	0.6	0.8	1.1	1.1	0.9	0.9	0.9	3.0	5.7	7.7	9.0	10.1	10.7	11.0	10.7	9.2	5.5	2.4	0.4	-1.3	-1.9	-2.0	-2.4	-2.4	11.0	3.5	24
27	-1.8	-1.8	-1.9	-2.8	-1.8	-0.4	0.2	0.1	1.8	4.9	6.4	6.8	7.1	7.5	7.5	7.5	7.1	6.7	5.8	5.1	5.7	5.3	3.7	3.6	-2.8	7.5	3.4	24
28	3.6	3.5	1.3	1.8	0.7	-1.3	-2.5	-3.1	-0.1	3.1	5.3	6.2	7.0	7.9	7.7	7.1	6.4	5.8	5.6	5.4	5.2	5.0	4.9	4.0	-3.1	7.9	3.8	24
29	3.5	3.3	3.2	3.1	3.1	2.9	2.2	1.1	1.3	1.3	2.4	2.8	3.4	3.8	3.9	3.8	3.8	3.5	3.4	3.3	3.2	3.1	2.9	2.6	1.1	3.9	3.0	24
30	2.3	2.3	1.5	0.2	-0.3	0.5	1.3	1.3	1.4	1.7	2.1	2.9	3.6	4.1	4.3	4.5	4.0	3.8	3.6	3.4	3.1	3.0	2.4	2.0	-0.3	4.5	2.5	24
31	2.2	2.2	2.1	2.1	1.8	1.5	0.6	0.3	0.6	2.1	4.1	5.8	7.3	7.5	7.5	7.4	6.8	5.1	3.7	3.0	2.8	2.7	2.8	2.8	0.3	7.5	3.5	24
HOURLY MAX	6.3	5.4	5.0	6.7	7.2	7.9	7.1	8.6	10.5	12.5	13.6	16.5	18.3	20.5	21.7	21.9	19.8	17.4	15.7	15.0	14.6	13.2	10.8	9.9				
HOURLY AVG	-0.8	-1.0	-1.2	-1.4	-1.6	-1.8	-2.1	-1.9	0.4	2.6	4.1	5.2	6.2	6.9	7.2	7.3	6.5	4.9	3.5	2.4	1.7	0.9	0.3	-0.1				

STATUS FLAG CODES

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

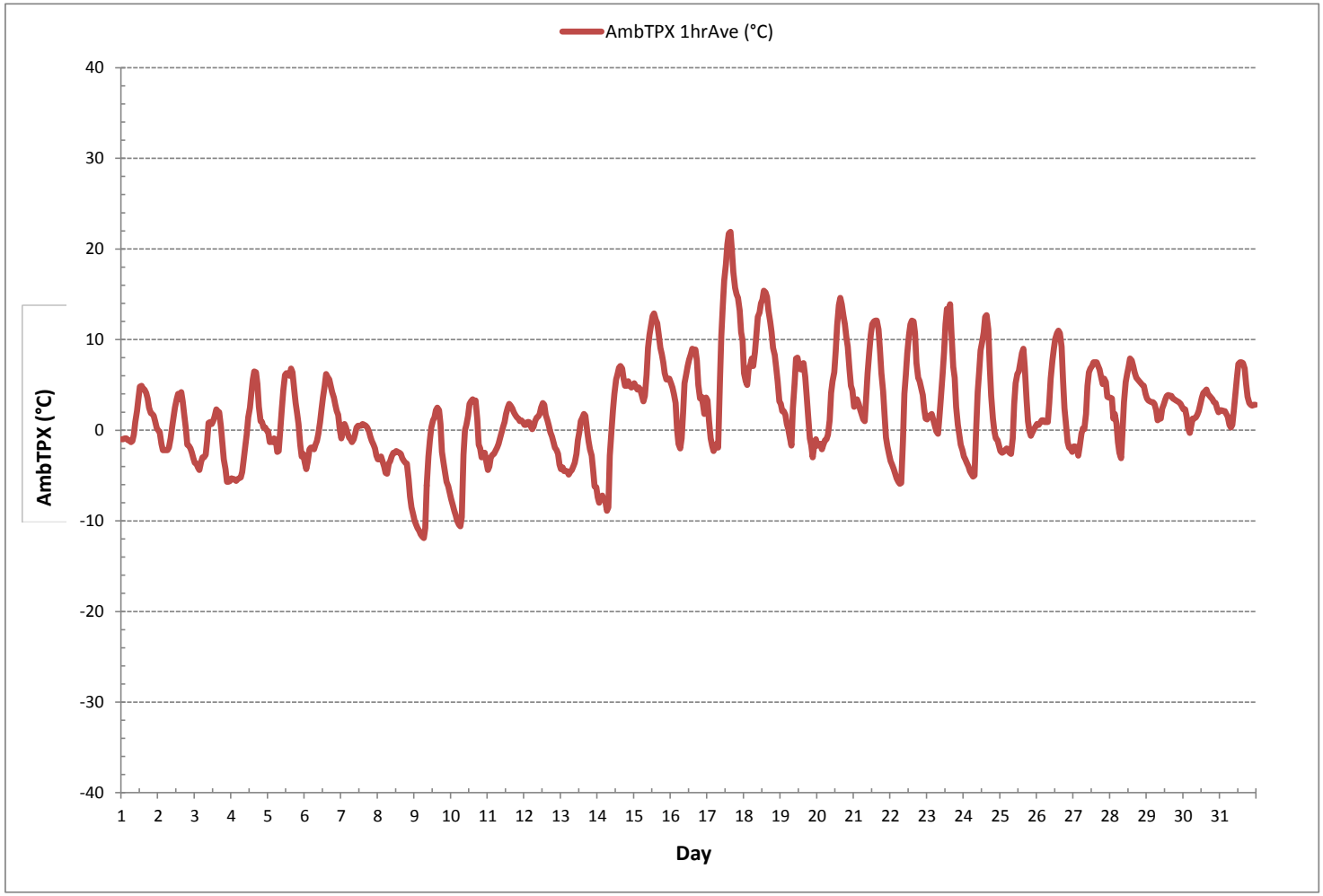
24 HR AVERAGES October 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-11.9	°C	@ HOUR	6	ON DAY	9	
MAXIMUM 1-HR AVERAGE:	21.9	°C	@ HOUR	15	ON DAY	17	
MAXIMUM 24-HR AVERAGE:	9.9	°C			ON DAY	17	
			OPERATIONAL TIME:			744	hrs
			AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	5.3		MONTHLY AVERAGE:			2.0	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE

Thermo 43i Sulphur Dioxide Analyzer Calibration

Date:	October 17, 2018	**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:	Cold Lake South	**Weather Conditions:**	Mix of sun and clouds		
Parameter:	Sulphur Dioxide	**Calibration Purpose:**	routine monthly		
Start Time 24 hr. (mst):	9:03	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	16:18	**Cal Gas Expiry Date:**	October 24, 2020		
Calibration Method:	Gas Dilution	**Converter Model & s/n (if applicable):**	n/a		

Analyzer:

Serial Number/Owner:	806528242	LICA	**Range ppb:**	500
Last Calibration Date:	September 5, 2018		**As Found C.F.:**	1.051
Previous C.F.:	0.997		**New C.F.:**	0.999

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date:	API id# 690 expires March 15, 2019
Cal Gas Cylinder I.D. # :	LL 104225
Cal Gas Conc. (ppm):	49.2

Standard Calibration Points for Ranges

Point	ppb
High	380
Mid	180
Low	90

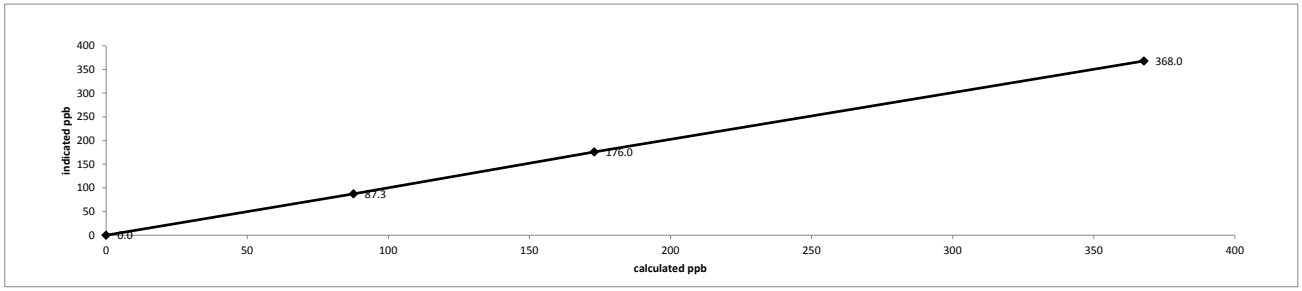
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

	Calibrator Flow Rates (cc/min)			Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	**Diluent**	**Cal Gas**	**Total**	**Concentration (ppb):**		
as found zero	4779	0.00	4779	0.0	0	n/a
as found high	4913	36.81	4950	365.9	348	1.051
adjusted zero	4940	0.00	4940	0.0	0	n/a
adjusted high	4909	36.97	4946	367.8	368	0.999
mid	4927	17.38	4944	173.0	176	0.983
low	4941	8.82	4950	87.7	87.3	1.004
calibrator zero	4940	0.00	4940	0.0	0	n/a
					Average C.F.=	0.995

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> or = 0.995**
Slope =	**0.998**	**0.95-1.05**
b (Intercept as % of full scale)=	**-0.09%**	**± 3% F.S.**
% change in C.F. from last cal=	**-5.45%**	**± 10%**

Thermo 43i Sulphur Dioxide Analyzer Calibration



	As found:		**As left:**
Bkg:	8.5	Bkg:	9.2
Coef:	0.944	Coef:	0.981
Pmt:	-624.2	Pmt:	-624.2
Flash:	762	Flash:	766
Internal:	30.6	Internal:	29.7
Chamber:	45.2	Chamber:	45.2
Perm Oven Gas:	45.01	Perm Oven Gas:	45.00
Perm Oven Heater:	44.26	Perm Oven Heater:	44.26
Pressure:	680.4	Pressure:	678.0
Sample Flow:	0.477	Sample Flow:	0.474
Lamp Intensity:	96	Lamp Intensity:	96
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	243.3	Expected Value:	260.0

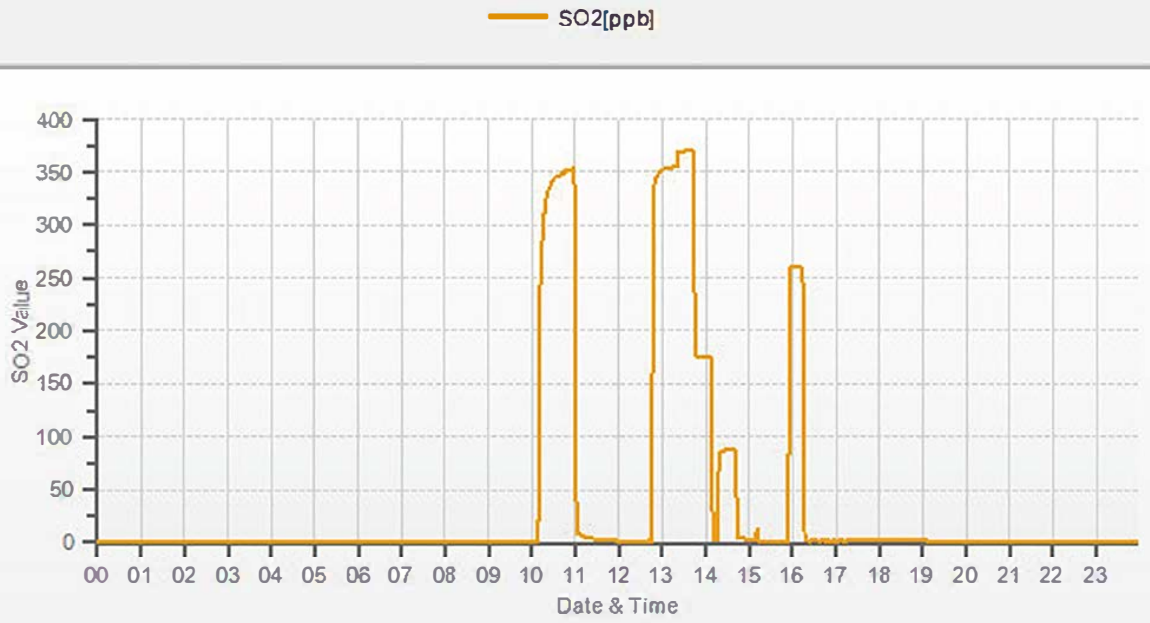
Comments:

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] Station: LICA COLD LAKE SOUTH Daily: 18/10/17 Type: AVG 1 Min. [1 Min.]



TOTAL REDUCED SULPHUR

Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	October 16, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	957	millibars
Company/Airshed:	LICA	**Thermometer/Station Temp:**	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	**Weather Conditions:**	Cloudy/Overcast		
Parameter:	Total Reduced Sulphur	**Calibration Purpose:**	routine monthly		
Start Time 24 hr. (mst):	11:29	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	17:19	**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:	September 5, 2018	**As Found C.F.:**	1.009
Previous C.F.:	1.000	**New C.F.:**	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date:	API id# 690 expires March 15, 2019
Cal Gas Cylinder I.D. # :	EY 0001003
Cal Gas Conc. (ppm):	9.55

Standard Calibration Points for Ranges

Point	ppb
High	78
Mid	38
Low	19

SO2 Scrubber Check (10 minutes):

Start/End Time 24 hr.:	11:36 / 11:53
SO2 Analyzer Range:	500
Target Concentration (ppb):	380
As Found Zero:	0.0
Analyzer Response: (ppb):	0.0
Zero Corrected Result (ppb):	0.0

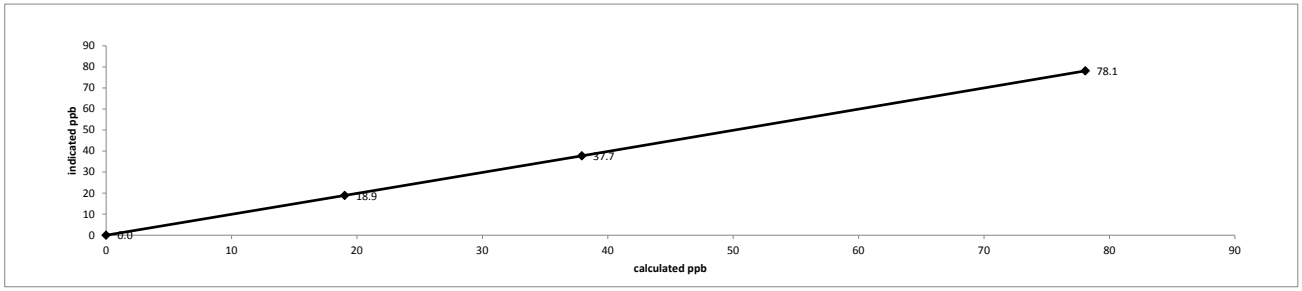
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	**Diluent**	**Cal Gas**	**Total**			
as found zero	7448	0.00	7448	0.0	0	n/a
as found high	7382	60.92	7443	78.2	77.5	1.009
adjusted zero	7452	0.00	7452	0.0	0	n/a
adjusted high	7381	60.84	7442	78.1	78.1	1.000
mid	7420	29.59	7450	37.9	37.7	1.006
low	7420	14.81	7435	19.0	18.9	1.007
calibrator zero	7448	0.00	7448	0.0	0	n/a
					Average C.F.=	1.004

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> or = 0.995**
Slope =	**0.999**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.10%**	**± 3% F.S.**
% change in C.F. from last cal=	**-0.86%**	**± 10%**

Thermo 450i Total Reduced Sulphur Analyzer Calibration



	As found:		As left:
Bkg:	15.3	Bkg:	15.4
Coef:	0.910	Coef:	0.928
Pmt:	-650.8	Pmt:	-650.8
Flash:	742	Flash:	742
Internal:	33.0	Internal:	32.6
Chamber:	45.0	Chamber:	45.2
Converter Temp:	825	Converter Temp:	825
Converter Set:	825	Converter Set:	825
Perm Oven Gas:	45.01	Perm Oven Gas:	45.00
Perm Oven Htr:	44.38	Perm Oven Htr:	44.37
Pressure:	638.2	Pressure:	638.2
Sample Flow:	0.493	Sample Flow:	0.495
Lamp Intensity:	92	Lamp Intensity:	92
Averaging Time:	120	Averaging Time:	120
Expected Value:	37.7	Expected Value:	38.8

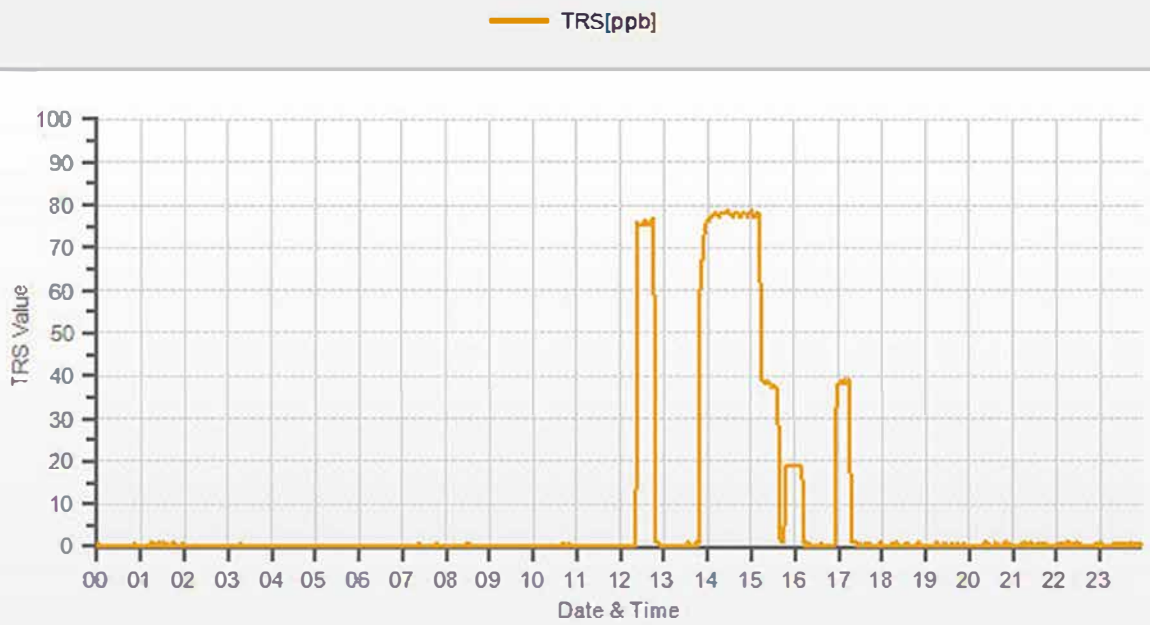
Comments:

The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

TRS[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/10/16 Type: AVG 1 Min. [1 Min.]



TOTAL HYDROCARBON

Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	October 17, 2018	**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:	Cold Lake South	**Weather Conditions:**	Mix of sun and clouds		
Parameter:	CH4 / NMHC / THC	**Calibration Purpose:**	routine monthly		
Start/End Time 24 hr. (mst):	9:02 / 14:14	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	**Cal Gas Expiry Date:**	October 18, 2025		

Analyzer:

Serial Number/Owner:	1180320044	LICA	**Correction Factors:**		
Measured Flow:	0.946		**Previous C.F.:**	**As Found C.F.:**	**New C.F.:**
Last Calibration Date:	September 5, 2018	**CH_4 =**	0.999	1.014	1.000
Range ppm:	20 CH4/20 NMHC/40 THC	**NMHC =**	1.001	1.006	1.000
		THC =	1.000	1.011	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018		
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018		
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019		
Cal Gas Cylinder I.D. # :	LL 119471		
CH4 Cylinder Conc.=	599.0	207.0	**=C_3H_8 Cylinder Conc.**
CH_4 expressed as C_3H_8=	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

Calibrator Flow Rates (cc/min)										Correction Factors:		
Point	**Diluent**	**Cal Gas**	**Total Flow**	**Calculated CH_4 (ppm)**	**Calculated NMHC (ppm)**	**Calculated THC (ppm)**	**Indicated CH_4 (ppm)**	**Indicated NMHC (ppm)**	**Indicated THC (ppm)**	**CH_4**	**NMHC**	**THC**
as found zero	2505	0.00	2505	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2448	55.49	2503	13.28	12.62	25.90	13.09	12.54	25.63	1.014	1.006	1.011
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	2451	55.48	2506	13.26	12.60	25.86	13.26	12.60	25.86	1.000	1.000	1.000
mid	2470	30.09	2500	7.21	6.85	14.06	7.19	6.86	14.06	1.003	0.999	1.000
low	2486	12.99	2499	3.11	2.96	6.07	3.10	2.97	6.07	1.004	0.996	1.000
calibrator zero	2505	0.00	2505	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
									Average C.F.=	1.002	0.998	1.000

Linear Regression/Calibration Results:

	CH_4	NMHC	THC	LIMITS
Correlation Coefficient =	**1.000**	**1.000**	**1.000**	**> or = 0.995**
Slope =	**1.000**	**1.000**	**1.000**	**0.95-1.05**
b (Intercept as % of full scale)=	**-0.04%**	**0.03%**	**0.00%**	**± 3% F.S.**
% change in C.F. from last cal=	**-1.55%**	**-0.54%**	**-1.05%**	**± 10%**

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply:	-297.4		Calibration History cnt'd:	NM Peak Area:	n/a
Temperatures:	Detector Oven:	175.0		Crucial Settings:	Methane Start:	n/a
	Filter:	175.1			Methane End:	n/a
	Column Oven:	75.6			Backflush:	n/a
	Internal:	35.5			NMHV Start:	n/a
Cylinder Pressures/reg.:	Carrier:	2400	50		NMHC End:	n/a
	Fuel:	1000	50	Run History>1:	Date:	Oct 17, 2018
	Span Gas:	1400	10		Time:	09:36
	Zero Air Generator:	42			CH_4 PK HT:	0
Internal Pressures:	Carrier:	29.4			CH_4 RT:	12.6
	Fuel:	44.2			CH_4 Baseline:	2886
	Air:	30.2			CH_4 LOD:	29
FID Status:	Status:	LIT			CH_4 SD:	9
	Counts:	32538			CH_4 CONC:	0.00
	Flame:	348.9			NM PK HT:	0
	Det Base:	175.1			NM Peak Area:	0
Flame and Power Stats:	Last Power On:	Sep 08, 2018			NM CONC:	0.00
	Flameouts:	1			NM Base Start:	2869
	Det Oven at Start:	170.5			NM Base End:	2863
	Col Oven at Start:	74.6			NM LOD:	4
Calibration History:	Time:	Jan 01, 1970/ERROR			NM Start IDX:	5
	Type:	n/a			NM End IDX:	59
	Status:	n/a			NM Max Slope:	9.1e-01
	Check/Adjust:	n/a			NM Min Slope:	-1.2e+00
	CH_4 Span Conc:	n/a			NM PT Count:	0
	CH_4 SP Ratio:	n/a		Expected Values:	Previous CH4:	10.47
	CH_4 RT:	n/a			Previous NMHC	10.95
	CH_4 PK IDX:	n/a			Previous THC:	21.42
	CH_4 PK HT:	n/a			New CH4:	10.21
	NM Span Conc:	n/a			New NMHC	10.86
	NM SP Ratio:	n/a			New THC:	21.07

Comments:

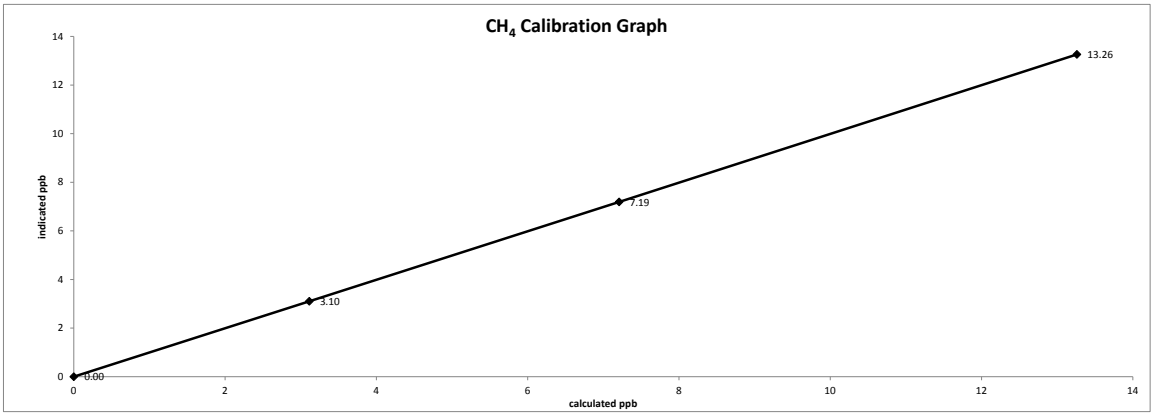
The analyzer sample inlet filter was changed.

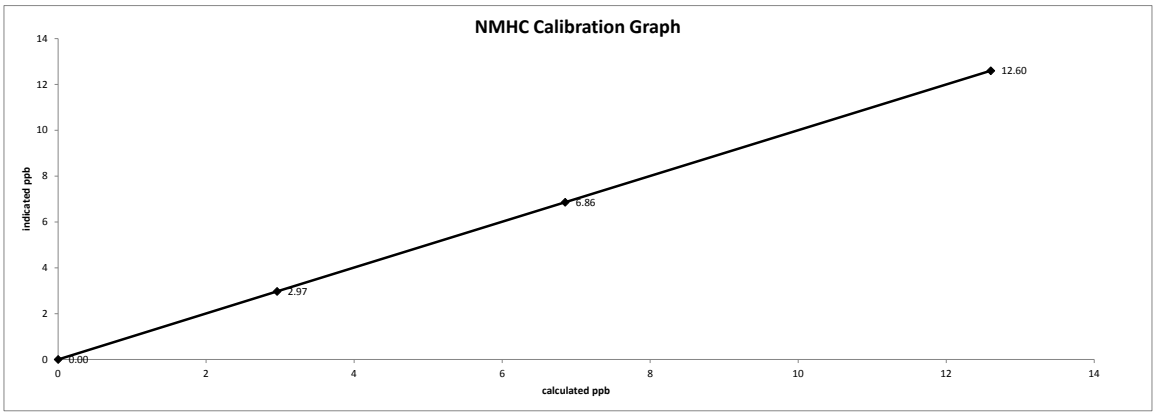
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

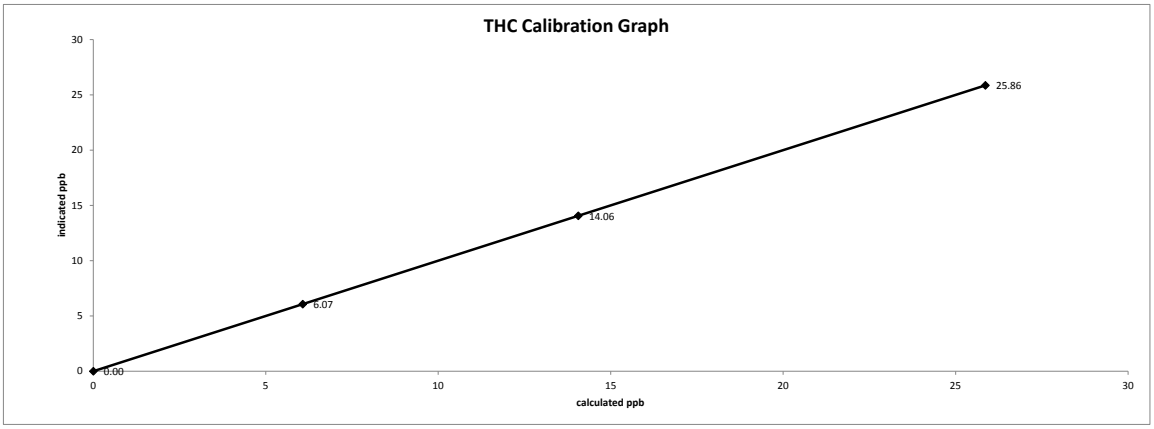
The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

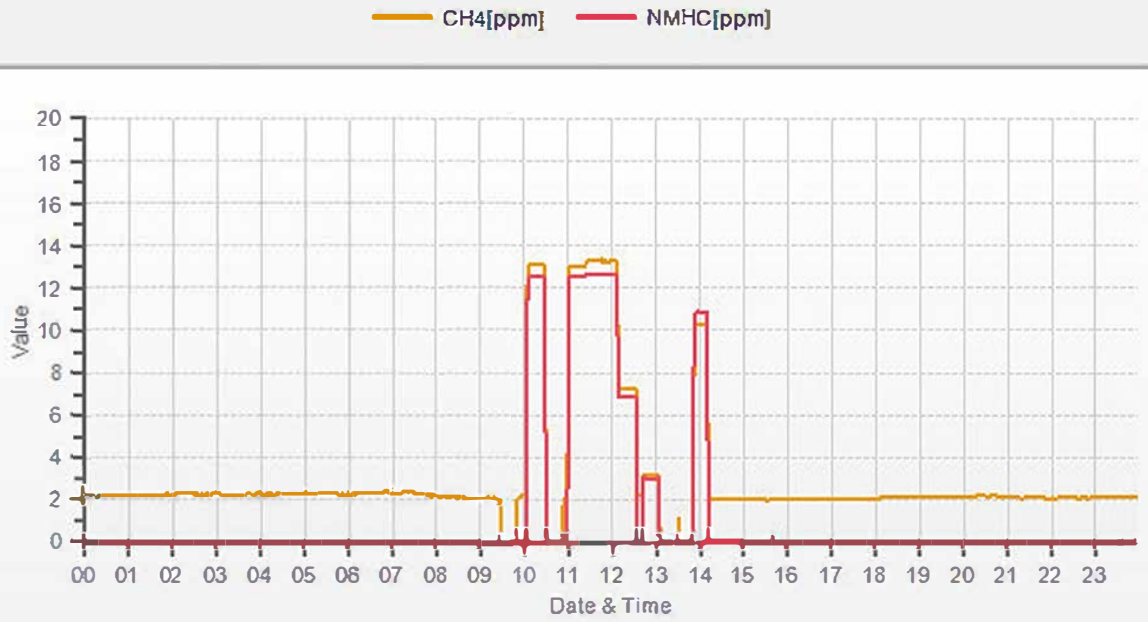
Date:	October 17, 2018	Start/End Time 24 hr. (mst):	9:02 / 14:14
Company/Airshed:	LICA	Calibration Purpose:	routine monthly
Location/Station Name:	Cold Lake South	Calibration Method:	Gas Dilution







Station: LICA COLD LAKE SOUTH Daily: 18/10/17 Type: AVG 1 Min. [1 Min.]



NITROGEN DIOXIDE

Thermo 42i NO-NO2-NOx Analyzer Calibration

Date:	October 17, 2018	**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:	Cold Lake South	**Weather Conditions:**	Mix of sun and clouds		
Start/End Time 24 hr. (mst):	9:02 / 18:29	**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:	1505664393	LICA
Last Calibration Date:	September 5, 2018	
Range ppb:	500	

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	0.999	1.008	1.000
NO_2 =	1.001	1.004	1.000
NOx =	0.998	1.008	0.999

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	
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: 500 ppb

Point	Target NO (ppb)	Target NO_2 (ppb)	Cc Ozone ?
High	**380**	**250**	**n/a**
Mid	**180**	**145**	**n/a**
Low	**90**	**50**	**n/a**
Extra Point #1	**n/a**	**n/a**	**n/a**
Extra Point #2	**n/a**	**n/a**	**n/a**

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	**Diluent**	**Cal Gas**	**Total Flow**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**		
as found zero	4779	0.0	4779	0	0	0.0	0.2	n/a	n/a
as found high	4913	36.8	4950	383.0	383.7	380.0	381.0	1.008	1.008
adjusted zero	4940	0.00	4940	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4909	36.97	4946	384.9	385.7	385.0	386.0	1.000	0.999
mid	4927	17.38	4944	181.0	181.4	183.0	183.0	0.989	0.991
low	4941	8.82	4950	91.8	91.9	92.0	92.0	0.997	0.999
calibrator zero	4940	0.00	4940	0	0	0.0	0.0	n/a	n/a
							Average C.F.=	0.996	0.997

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO_2	NO drop	NO_2 gain	NO_2 C.F.
Point	**Diluent**	**Cal Gas**	**Total Flow**	**volts or ppb**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**
NOx reference	4909	36.97	4946	0.0	386.0	386.0	0.0	0.0	0.0	
as found high NO2	4909	36.97	4946	250.0	140.0	385.0	245.0	246.0	245.0	1.004
adjusted high NO2	4909	36.97	4946	250.0	140.0	386.0	246.0	246.0	246.0	1.000
gpt mid	4909	36.97	4946	145.0	245.0	386.0	141.0	141.0	141.0	1.000
gpt low	4909	36.97	4946	55.0	330.0	386.0	56.0	56.0	56.0	1.000
									Average NO_2 C.F.=	1.000

Linear Regression/Calibration Results:

	NO	NOx	NO_2	LIMITS
Correlation Coefficient =	**1.000**	**1.000**	**1.000**	**> or = 0.995**
Slope =	**1.000**	**0.999**	**1.000**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.10%**	**0.06%**	**0.00%**	**± 3% F.S.**
% change in C.F. from last cal=	**-0.88%**	**-0.97%**	**-0.31%**	**± 10%**
NO2 converter efficiency			**1.00**	**0.96 to 1.04**

As found:		As left:	
NO Bkg:	4.2	NO Bkg:	4.3
NOx Bkg:	4.3	NOx Bkg:	4.6
NO Coef:	1.064	NO Coef:	1.076
NO2 Coef:	1.000	NO2 Coef:	1.000
NOx Coef:	0.999	NOx Coef:	0.999
PMT:	-854.7	PMT:	-855.1
Internal:	29.1	Internal:	27.0
Chamber:	50.1	Chamber:	50.4
Cooler:	-2.7	Cooler:	-2.9
NO2 Converter:	323.4	NO2 Converter:	326.6
NO2 Converter Set:	325.0	NO2 Converter Set:	325.0
Perm Oven Gas:	35.02	Perm Oven Gas:	35.00
Perm Oven Heater:	34.28	Perm Oven Heater:	34.25
Pressure:	181.7	Pressure:	181.1
Flow:	0.732	Flow:	0.725
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	5	Expected Value NO:	3
Expected Value NO2:	267	Expected Value NO2:	277
Expected Value NOx:	271	Expected Value NOx:	280

Comments:

The converter cooling fan filter was cleaned.

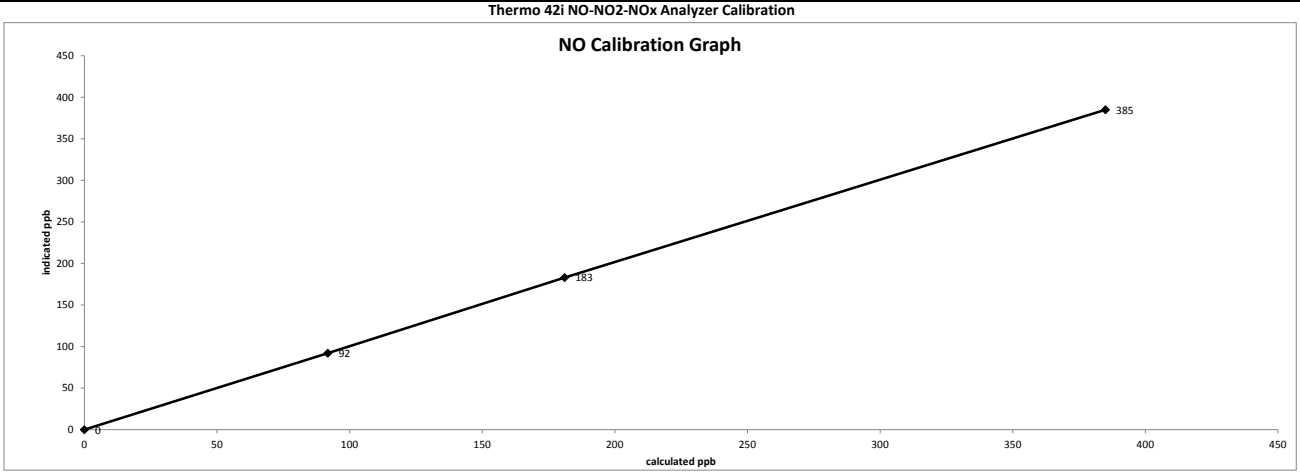
The analyzer sample inlet filter was changed.

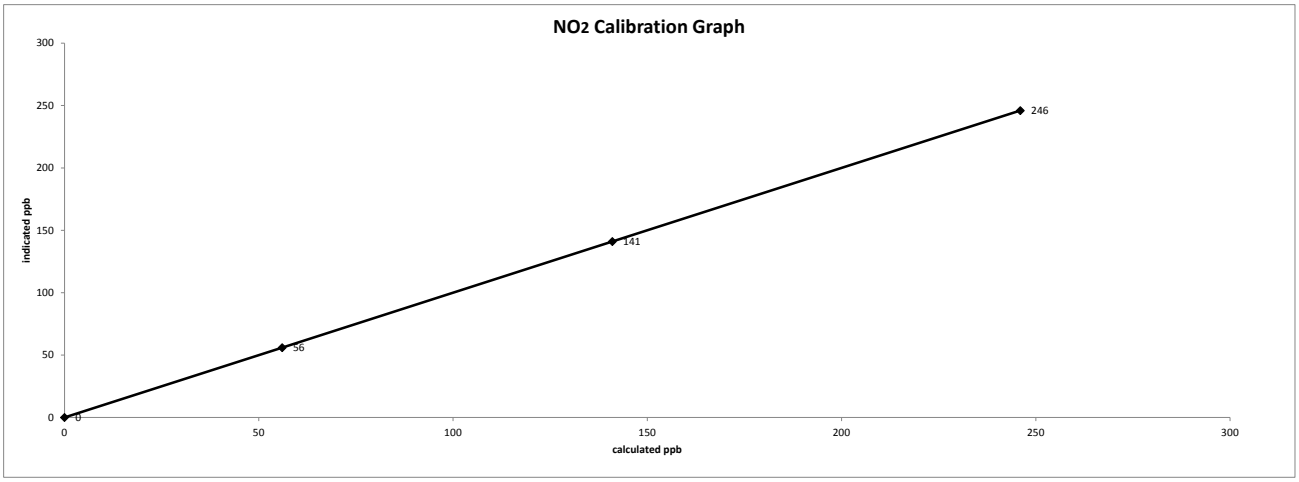
The manifold blower was found to be working normally.

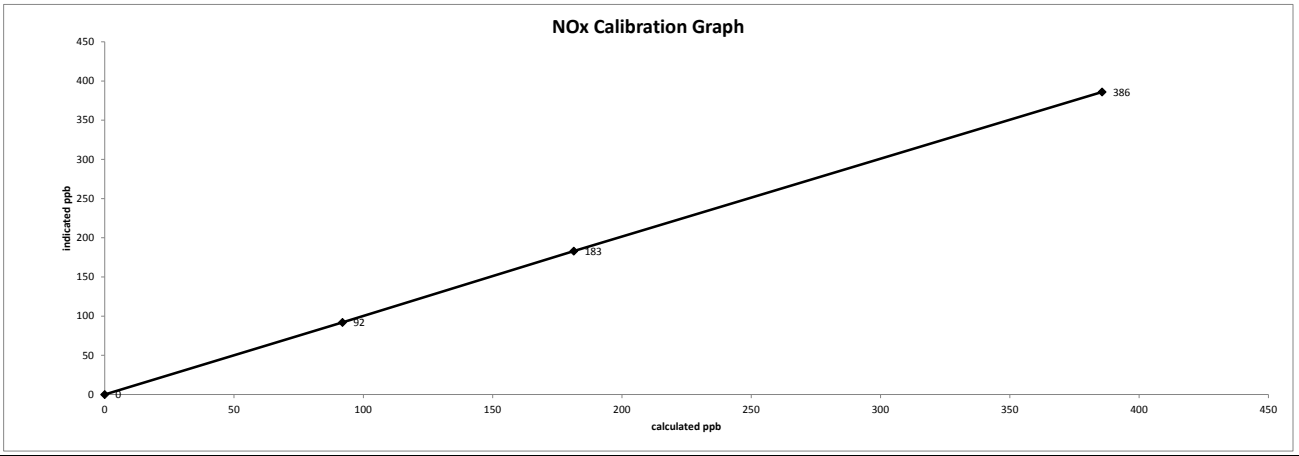
The analyzer cooling fan filter(s) were cleaned.

Date:	**October 17, 2018**	**Start/End Time 24 hr. (mst):**	**9:02 / 18:29**
Company/Airshed:	**LICA**	**Calibration Purpose:**	**routine monthly**
Location/Station Name:	**Cold Lake South**	**Calibration Method:**	**Gas Dilution & Gas Phase Titration**

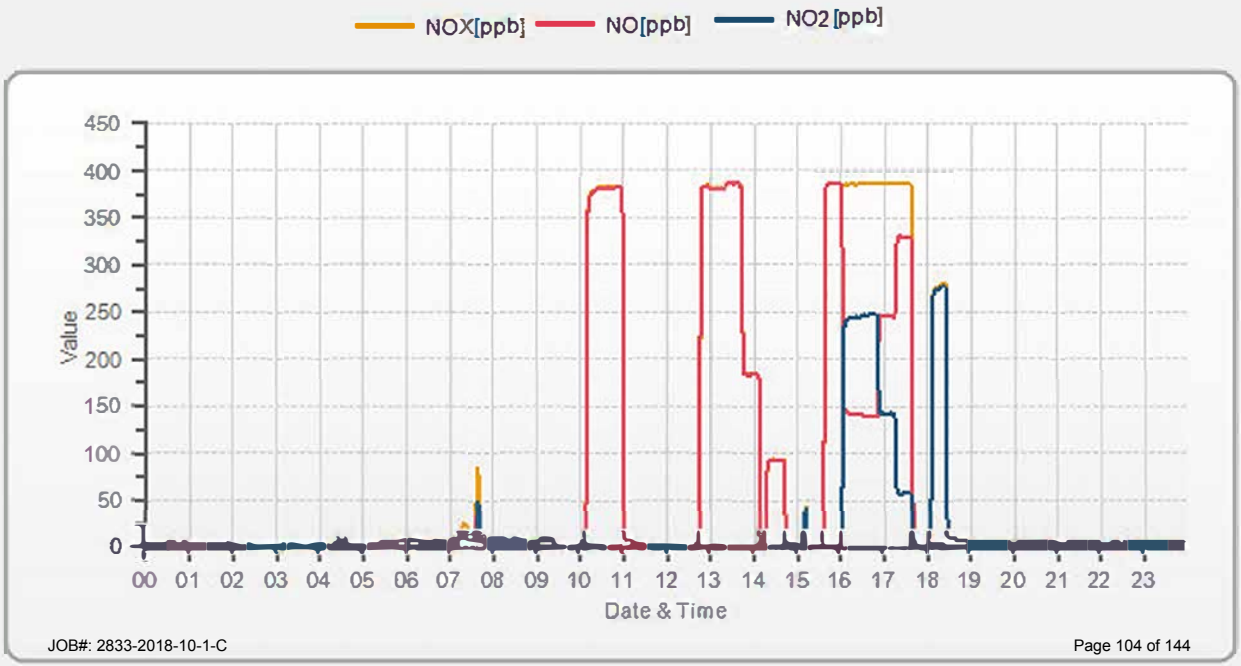
Thermo 42i NO-NO2-NOx Analyzer Calibration







Station: LICA COLD LAKE SOUTH Daily: 18/10/17 Type: AVG 1 Min. [1 Min.]



OZONE

Thermo 49i Ozone Analyzer Calibration

Date:	October 16, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	957	millibars
Company/Airshed:	LICA	**Thermometer/Station Temp:**	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	**Weather Conditions:**	Cloudy/Overcast		
Start/End Time 24 hr. (mst):	11:29 / 17:39	**Calibration Purpose:**	routine monthly		
Ozone Calibration Method:	Varying UV Lamp Power	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
G.P.T. Date:	n/a-done by Varying UV Lamp Power	**Cal Gas Expiry Date:**	n/a-done by Varying UV Lamp Power		

Analyzer:

Serial Number/Owner:	700419951 LICA	**Ozone Range ppb:**	500
Last Calibration Date:	September 5, 2018	**As Found C.F.:**	0.992
Previous Cal High Point C.F.:	1.001	**New C.F.:**	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
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**

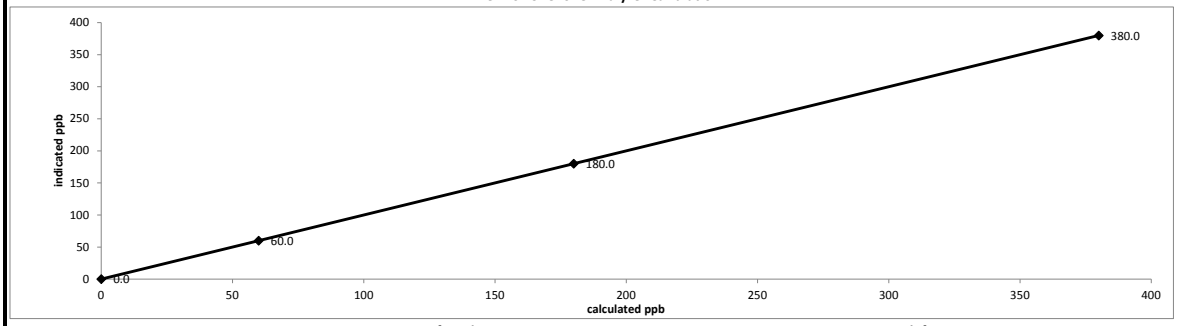
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	**Total Flow @ Point Start**	**Total Flow @ Point Finish**	**(ppb)**	**(ppb)**	**(ppb)**	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	383.0	0.992
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
					Average C.F.=	1.000

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> 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=	**0.88%**	**± 10%**

Thermo 49i Ozone Analyzer Calibration



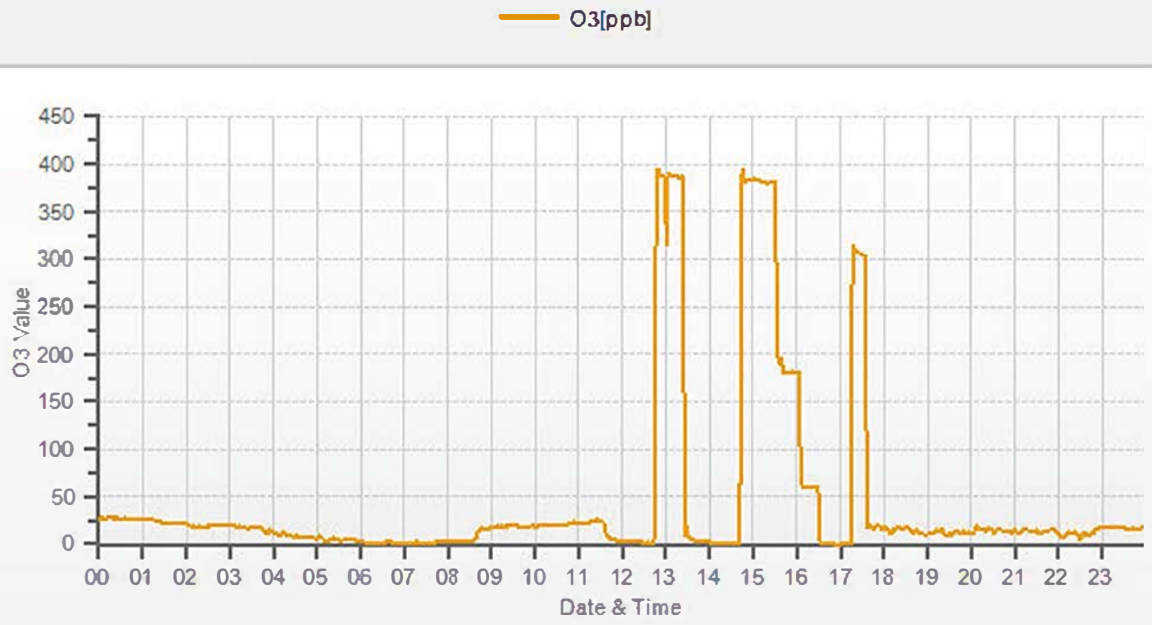
	As found:		As left:
O3 Bkg:	0.0	O3 Bkg:	0.0
O3 Coef:	1.059	O3 Coef:	1.051
Photo Lamp	9.6	Photo Lamp	9.6
O3 Lamp	8.1	O3 Lamp	5.7
Bench:	29.8	Bench:	29.4
Bench Lamp:	53.5	Bench Lamp:	53.5
O3 Lamp:	67.5	O3 Lamp:	67.5
Pressure:	710.1	Pressure:	712.3
Cell A lpm:	0.713	Cell A lpm:	0.714
Cell B lpm:	0.757	Cell B lpm:	0.758
O3 ppb:	7.8	O3 ppb:	0.0
Cell A ppb:	9.8	Cell A ppb:	9.7
Cell B ppb:	5.8	Cell B ppb:	-9.7
Cell A int (Hz):	78623	Cell A int (Hz):	78487
Cell B int (Hz):	80195	Cell B int (Hz):	80097
Expected Value:	304.4	Expected Value:	306.0

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 daily ZS check started at 13:00. The As Found High Point was started at 13:04.

O3[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/10/16 Type: AVG 1 Min. [1 Min.]



PARTICULATE MATTER

Thermo 5030 SHARP Monitor Audit

Date:	October 16, 2018	**Performed By/Reviewer:**	Alex Yakupov / Rob Fisher
Company:	LICA	**Start Time (mst):**	16:22
Station Name/Location:	Cold Lake South	**End Time (mst):**	16:57
Previous Audit Date:	September 4, 2018	**Calibration Purpose:**	routine monthly
Parameter:	PM 2.5	**Weather Conditions:**	Cloudy/Overcast

SHARP Information and Status:

Serial Number/Owner:	CM - 2209 LICA	**Status Code**	0
Approx. % Tape Reaming	50%	**Error Code**	0

Reference Standards/I.D./Cert. Date:

High Flow:	Airmetrics/Chinook High Maxxam ID #2 expires April 24, 2019
Digital Manometer:	Dwyer 475 Mark III id# 3 expires January 9, 2019
Temperature:	F.S. 170286131 expires April 19, 2019
Pressure:	F.S. 05544 expires January 15, 2019

As Found Temperatures, Pressure, Humidity:

	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)
SHARP:	9	n/a	n/a	n/a	956	n/a
Reference:	8.8	n/a	n/a	n/a	957.0	n/a
Difference:	0.2	n/a	n/a	n/a	1.0	n/a

Temp Limit: ± 4 °C
Pressure Limit: ± 13.33 hPa
RH Limit: ± 2%

As Left Temperature and Pressure (same as above if as found adequate):

	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)
SHARP:	9	n/a	n/a	n/a	956	n/a
Reference:	8.8	n/a	n/a	n/a	957.0	n/a
Difference:	0.2	n/a	n/a	n/a	1.0	n/a

Temp Limit: ± 4 °C
Pressure Limit: ± 13.33 hPa
RH Limit: ± 2%

Mass Foil Calibration:

	Mass Foil:		ZERO:		Span Sensitivity
Mass Foil ID:	n/a	**QLF:**	n/a	**OLD:**	n/a
Spanfoil Value (µg):	n/a	**CONFID:**	n/a	**NEW:**	n/a

Nephalometer Zero:

	As Found		As Left
Analog	n/a	**Analog**	n/a
NEPH	n/a	**NEPH**	n/a
C14	n/a	**C14**	n/a
Conc	n/a	**Conc**	n/a

Flow rate:

	As Found		As Left
SHARP AirFlow l/hr	1000	**SHARP AirFlow l/hr**	1000
Reference AirFlow (l/min)	16.65	**Reference AirFlow (l/min)**	16.65
Reference AirFlow (l/hr)	999	**Reference AirFlow (l/hr)**	999
% Difference:	0.1%	**Difference:**	0.1%

$$\%D = 100 \times \frac{Qm - Qi}{Qi}$$

Tolerance +/- 5%

Inlet Assembly:

	Yes/No?	If no, explain:
PM10 Inlet Cleaned	yes	
PM2.5 Cyclone Cleaned	yes	

Pump Assembly:

	Yes/No?	If no, explain:
Pump Inspected / Cleaned	yes	
Pump Vanes Replaced	no	not required

Comments:

WIND SYSTEM

Met One Instruments

Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H
Sensor Serial No.: F1644
Sensor Output Swing: 0V - 1.0V
Sensor Output Range: 0 - 50.0 MPS
Customer: Maxxam Analytics
Sales Order No.: 125713
Tested per PO: PO0000003392
Calibration Date: 11/09/2017
Calibrated by: David Frith DF
QC Inspection Byron Dawson

Instrument Condition Within Tolerance: As Found ___ As Left X
Corrective Action: No Adjustment ___ Adjust X Repair ___
Preventative Maintenance ___

As Found Test Date: N/A As Left Test Date 11/09/2017

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 Acquition	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

CALIBRATORS

Alberta Government

Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2018-559A

Company: Maxxam **Operator:** Chris W

Calibrator:				**Flow Measurement Device:**	
Make/Model	API 700			Make/Model	Mesa Defender 530
Serial Number	690			Serial Number	L-153351 H-152571
Last Verification Date	March 2016			Temperature (°C)	23.5 C
NO Cylinder S/N	LL108015			Barometric Pressure	695 mmHg
NO [PPM]	52.2	NOx [PPM]	52.3		
Expiry Date	Oct 2020				

Dilution Flow (sccm)

Pt. #1 5000 Pt. #2 5000 Pt. #3 5000

Gas Flow (sccm)

Pt. #1 80 Pt. #2 40 Pt. #3 20

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO_2	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
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)*

NO		**LIMITS**	**NOx**	
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_3 Conc	NO Decrease	NO	NO2	NOX	% Diff. Vs Audit gas	
4959	0.000	0.000	0.790	-0.001	0.789	NO_2	% 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)*

NO_2		**LIMITS**
Correlation=	1.0000	**≥ 0.995**
m (Slope)=	0.9946	**0.90-1.10**
b (Intercept % of FS)=	-0.1817	**± 3% F.S.**

AENV Standards		**NO_X Analyzer**	
Audit Calibrator		Make/Model	Teco 42i
Make/Model	Teco 146i	Serial/AMU Number	AMU 1868
Serial/AMU Number	AMU 1809	Last Calibration Date	March 14, 2018
SRM Gas Cylinder No.	APEX1170572	Full Scale (ppm)	1.0
Cylinder Conc. (ppm)	49.99	Cylinder Gas Expiry Date	November 2020

COMMENTS: Cylinder contains 47.9 ppm SO2.

Auditor: Al Clark Date: March 15, 2018

Operator Signature: Location: McIntyre Center Edmonton

Alberta Government

Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2018-133A

Company Maxxam **Operator:** Mike

Calibrator:

Make/Model	Sabio	
Serial Number	11900613	
Last Verification Date	March 16, 2018	
NO Cylinder S/N	LL104183	
NO [PPM]	50.8 NOx [PPM]	50.9
Expiry Date	October 24, 2020	

Flow Measurement Device:

Make/Model	Bios Definer 220
Serial Number	H=128686; L=129069
Temperature (°C)	22.9 C
Barometric Pressure	698 mmHg

Dilution Flow (sccm)

Pt. #1 5059 Pt. #2 5073 Pt. #3 5073

Gas Flow (sccm)

Pt. #1 77.5 Pt. #2 38.2 Pt. #3 19.1

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO_2	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)*

	NO	LIMITS	NOx
Correlation=	1.0000	≥ 0.990	1.0000
m (Slope)=	0.9975	0.90-1.10	0.9960
b (Intercept % of FS)=	-0.0616	± 3% F.S.	-0.0661

Flow	O_3 Conc	NO Decrease	NO	NO2	NOX	% Diff. Vs Audit gas	
5059	0.0	0.0000	0.7741	0.0000	0.7741	NO_2	% 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)*

	NO_2	LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9998	0.90-1.10
b (Intercept % of FS)=	0.0173	± 3% F.S.

AENV Standards

Audit Calibrator

Make/Model	Thermo 146i
Serial/AMU Number	1809
SRM Gas Cylinder No.	APEX1170572
Cylinder Conc. (ppm)	49.99

NO_X Analyzer

Make/Model	Thermo 42i
Serial/AMU Number	1868
Last Calibration Date	August 16, 2018
Full Scale (ppm)	1.0
Cylinder Gas Expiry Date	November 15, 2020

COMMENTS:

Auditor: Shea Beaton Date: August 22, 2018

Operator Signature: Location: McIntyre Center Edmonton

CALIBRATION GASES

Alberta Government

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	Gas Flow/	Concentration	Cylinder
Dilution	Gas	Concentration (PPM)	Dilution Flow	Factor	Concentration
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:	**47.9**

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 [X]

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder [ ]

Auditor: Al Clark Date: December 13, 2017

Operator Signature: Al Clark Location: McIntyre Center Edmonton

Form No. F-GAS-002
Version No. 1.1

Alberta Government

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	Gas Flow/	Concentration	Cylinder
Dilution	Gas	Concentration (PPM)	Dilution Flow	Factor	Concentration
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:	**9.58**

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

Meets Manufacturer Tolerance. Use manufacturers stated concentration [X] **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: Location: McIntyre Center Edmonton

Alberta Government

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:

Make/Model	R&R MFC 201		
Serial Number	AMU 1690		
Last Verification Date	December 13, 2017		
Gas Type	CH4	Conc.	990.4
Cylinder Number	5604875	Expiry Date	July 2021
Gas Type	C3H8	Conc.	246.5
Cylinder Number	XF003845B	Expiry Date	July 2022

Flow Measurement Device:

Make/Model	Mesa Definer 220
Serial Number	H-133034 / L-132702
Temp.°C	23.1 C
B.P.	707 mmHg

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 (sccm)		Indicated Conc. (ppm)		Gas Flow/	Concentration	Cylinder Concentration	
Dilution	Gas	CH4	C3H8	Dilution Flow	Factor	CH4	C3H8
3500	0.0	0.00	0.00				
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:	**601**	**209**

	CH4	**C3H8**
Previous Stated Concentration PPM:	599	207
Percent variance from Stated:	**0**	**1**

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration [X] **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: Location: McIntyre Center Edmonton

Alberta Government

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:

Make/Model	Teco 146i		
Serial Number	AMU 1809		
Last Verification Date	December 13, 2017		
Gas Type	NO	Conc.	50.03
Cylinder Number	APEX 1223938		
Expiry Date	June 2020		

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 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/	Concentration	Cylinder Concentration	
Dilution	Gas	NO	NOX	Dilution Flow	Factor	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:	**51.3**	**51.1**

	NO	NOx
Previous Stated Concentration PPM:	51.5	51.6
Percent variance from Stated:	**0**	**1**

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration [X] **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

APPENDIX III
MAXIMUM INSTANTANEOUS DATA

SULPHUR DIOXIDE Instantaneous Maximum (SO_2 ppb)

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

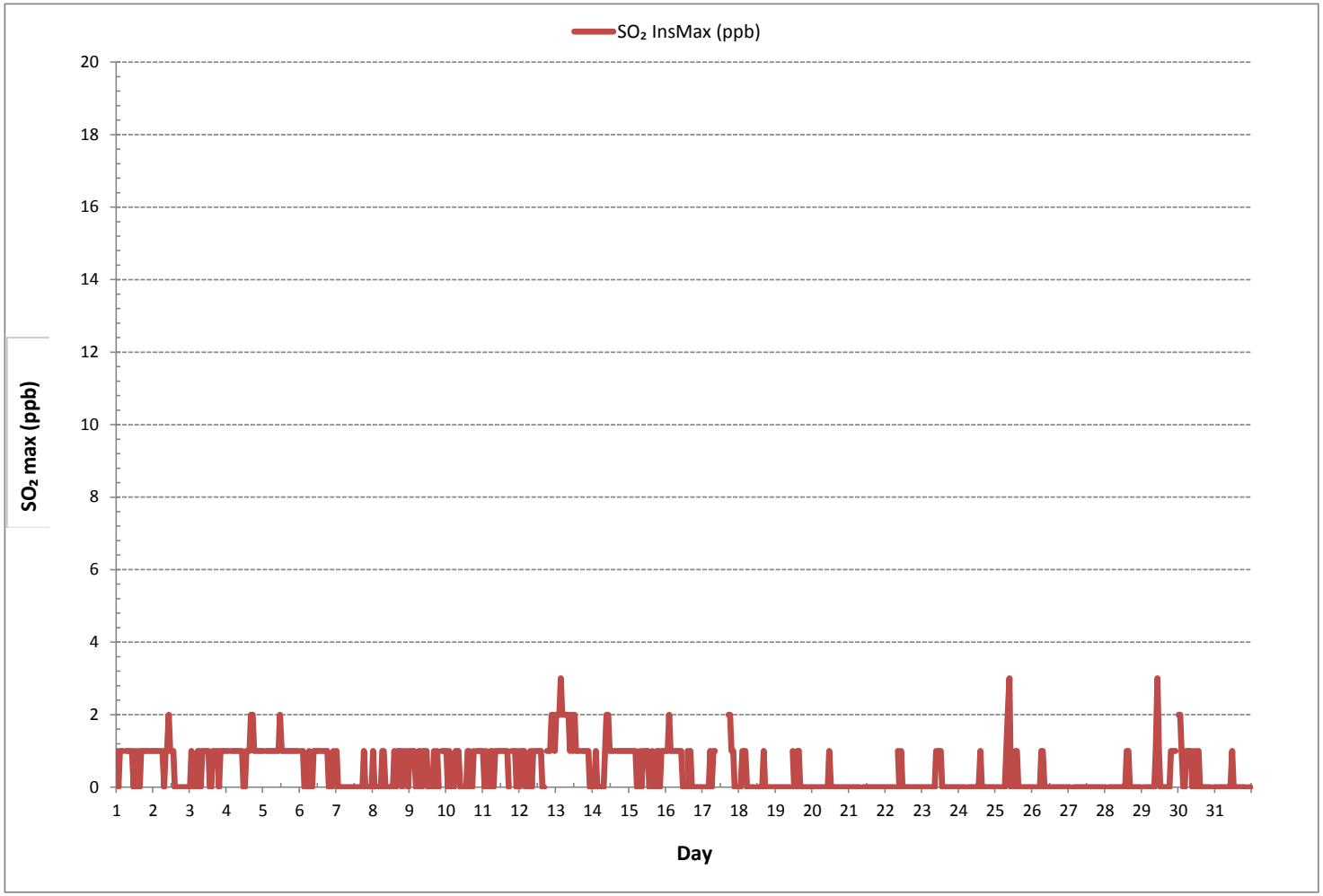
NUMBER OF NON-ZERO READINGS: 290

MAXIMUM INSTANTANEOUS VALUE: 3 ppb @ HOUR 3 ON DAY 13

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 8 hrs
STANDARD DEVIATION: 1

OPERATIONAL TIME: 744 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO_2 ppb)



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	0	1	1	0	S	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	0	24
2	1	0	0	0	S	1	0	1	0	1	1	1	1	1	0	0	0	1	1	1	0	0	0	0	0	1	1	24
3	0	0	0	S	0	0	0	0	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0	0	1	0	24
4	1	1	S	1	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0	1	0	24
5	0	S	1	0	0	1	0	1	0	0	0	1	1	1	1	1	0	0	1	0	0	1	1	1	0	1	1	24
6	S	1	1	0	0	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	0	0	1	S	0	1	1	24
7	0	0	1	0	0	0	0	0	1	0	1	1	1	1	0	0	1	0	1	1	1	1	S	0	0	1	0	24
8	0	1	0	1	0	1	1	0	1	0	0	1	1	0	0	1	1	1	1	1	0	S	0	1	0	1	1	24
9	1	0	1	0	0	0	0	1	1	0	1	0	1	0	0	1	1	1	1	0	S	1	1	0	0	1	1	24
10	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	0	1	1	0	S	0	1	1	0	0	1	1	24
11	1	0	1	1	0	0	1	1	1	1	1	0	0	1	1	1	1	0	S	1	1	1	1	1	0	1	1	24
12	0	1	0	1	1	0	0	1	1	1	1	1	1	0	0	0	1	S	0	0	1	1	1	0	0	1	1	24
13	1	1	0	0	0	1	1	1	0	1	1	1	0	1	1	0	S	1	0	1	1	1	0	0	0	1	1	24
14	0	1	1	1	1	1	1	0	0	1	0	1	0	0	1	S	0	0	1	0	1	1	1	0	0	1	1	24
15	1	1	1	1	1	1	1	1	1	1	1	0	1	1	S	1	1	0	0	0	0	1	1	1	0	1	1	24
16	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	C	C	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	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
26	1	1	1	S	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	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	2	1	1	1	1	1	1	1	1	1	1	1	1	S	1	2	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	S	1	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	2	1	2	2	2	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				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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

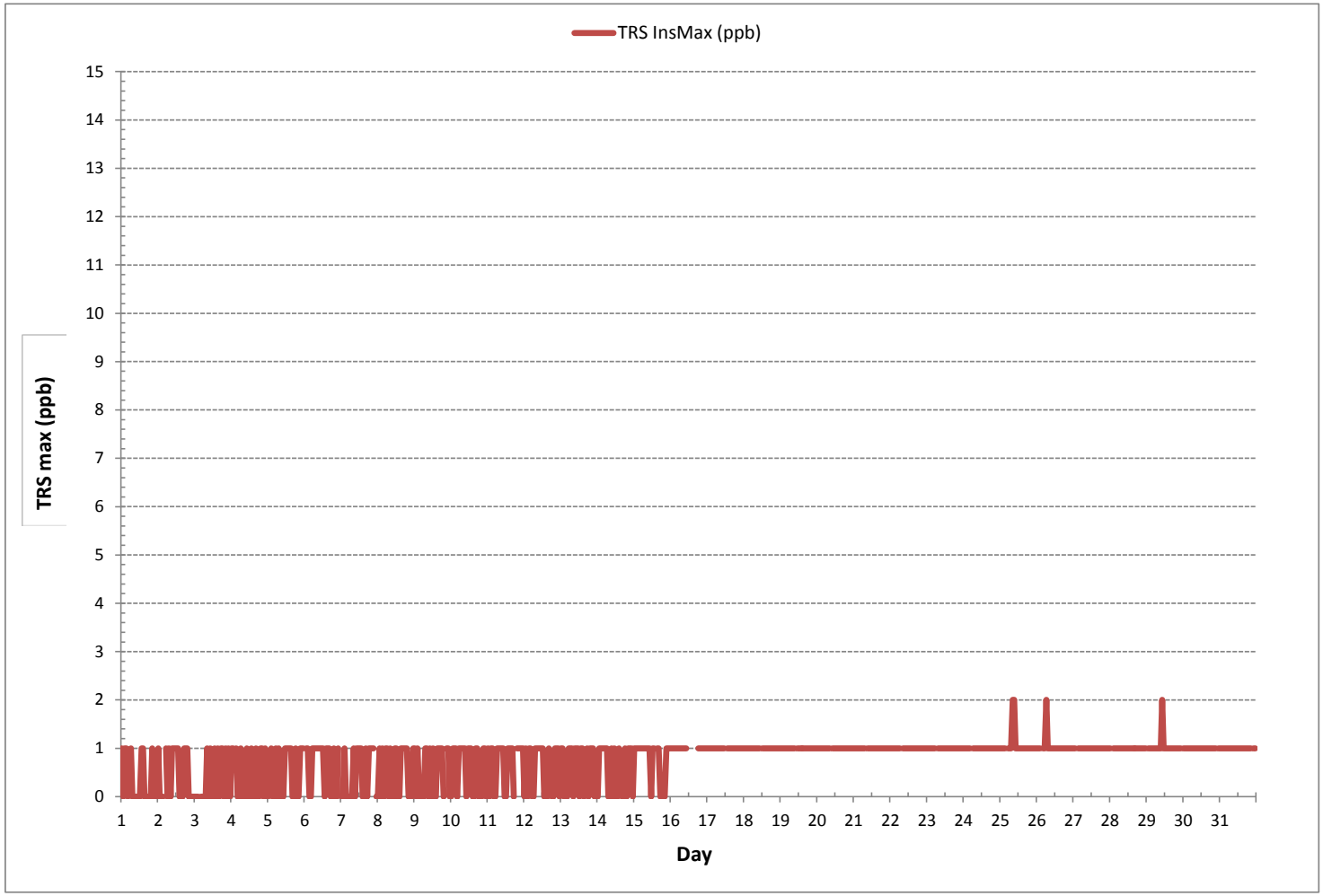
NUMBER OF NON-ZERO READINGS: 550

MAXIMUM INSTANTANEOUS VALUE: 2 ppb @ HOUR 8 ON DAY 25

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 7 hrs
STANDARD DEVIATION: 0

OPERATIONAL TIME: 744 hrs

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS 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	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.10	2.10	2.10	2.10	2.11	S	2.14	2.36	2.42	2.27	2.25	2.12	2.11	2.08	2.08	2.07	2.12	2.21	2.21	2.20	2.12	2.15	2.15	2.07	2.07	2.42	2.16	24
2	2.07	2.08	2.14	2.10	S	2.05	2.03	2.13	2.11	2.01	2.01	2.01	2.00	2.01	1.99	2.00	2.00	1.99	2.05	2.12	2.06	2.11	2.11	2.10	1.99	2.14	2.05	24
3	2.10	2.14	2.16	S	2.10	2.11	2.07	2.08	2.08	2.02	1.99	1.98	1.99	1.98	2.00	1.98	1.99	1.99	2.04	2.11	2.09	2.10	2.10	2.06	1.98	2.16	2.05	24
4	2.03	2.11	S	2.03	2.02	2.02	2.03	2.02	2.05	2.07	2.08	2.03	2.03	2.03	2.04	2.04	2.07	2.14	2.24	2.30	2.19	2.20	2.25	2.24	2.02	2.30	2.10	24
5	2.25	S	2.29	2.28	2.29	2.28	2.79	2.40	2.33	2.19	2.26	2.13	2.04	2.01	2.00	2.02	2.00	2.02	2.01	2.02	2.03	2.09	2.11	2.12	2.00	2.79	2.17	24
6	S	2.09	2.08	2.05	2.04	2.04	2.03	2.02	2.03	2.01	2.01	2.02	2.03	2.05	2.05	2.04	2.06	2.09	2.09	2.09	2.19	2.16	2.06	S	2.01	2.19	2.06	24
7	2.10	2.05	2.02	2.01	2.01	2.01	2.00	2.00	2.03	2.09	1.99	1.99	1.98	1.99	2.35	2.46	1.98	1.98	1.99	1.98	1.99	1.98	S	1.98	1.98	2.46	2.04	24
8	1.98	1.98	1.99	1.99	1.98	1.99	1.99	2.00	1.98	1.98	1.99	1.98	1.99	1.97	1.98	1.97	1.98	1.97	1.99	1.98	1.99	S	2.10	2.10	1.97	2.10	1.99	24
9	2.18	2.30	2.16	2.16	2.23	2.29	2.30	2.75	2.49	2.26	2.11	1.96	1.98	1.96	1.97	1.96	1.98	2.01	2.03	2.12	S	2.22	2.17	2.25	1.96	2.75	2.17	24
10	2.23	2.23	2.23	2.20	2.20	2.28	2.28	2.25	2.21	2.03	2.04	2.02	2.00	2.00	1.99	1.98	1.98	2.07	2.69	S	2.07	2.13	2.25	2.28	1.98	2.69	2.16	24
11	2.34	2.42	2.90	2.55	2.31	2.31	2.23	2.38	2.49	2.51	2.31	2.10	2.14	2.15	2.12	2.05	2.06	2.06	S	2.04	2.09	2.16	2.16	2.12	2.04	2.90	2.26	24
12	2.14	2.14	2.17	2.38	2.38	2.46	2.51	2.37	2.26	2.29	2.30	2.26	2.06	2.00	2.02	2.00	1.98	S	1.96	1.95	1.96	1.97	1.96	1.95	1.95	2.51	2.15	24
13	1.97	1.96	1.98	2.00	1.97	1.97	1.98	1.99	1.97	1.97	1.97	1.97	1.96	1.96	1.97	1.96	S	1.97	1.99	1.98	2.01	2.06	2.05	2.23	1.96	2.23	1.99	24
14	2.18	2.22	2.28	2.28	2.29	2.27	2.26	2.32	2.26	2.08	2.03	2.00	1.98	2.00	2.00	S	1.99	2.02	2.05	2.08	2.07	2.08	2.08	2.01	1.98	2.32	2.12	24
15	2.05	2.10	2.08	1.99	1.98	1.99	2.02	2.01	1.99	2.02	1.92	1.92	1.94	1.92	S	1.93	1.93	1.92	1.94	1.93	1.92	1.96	1.94	1.95	1.92	2.10	1.97	24
16	1.95	2.01	1.97	1.96	2.10	2.18	2.33	2.64	2.30	2.12	2.12	2.08	2.06	S	2.20	1.94	1.94	1.95	2.03	2.54	2.48	2.32	2.35	2.17	1.94	2.64	2.15	24
17	2.23	2.25	2.36	2.30	2.31	2.34	2.40	2.42	2.22	C	C	C	C	C	C	2.23	1.98	2.02	2.11	2.12	2.17	2.08	2.11	2.11	1.98	2.42	2.21	24
18	2.16	2.23	2.31	2.31	2.29	2.15	2.17	2.15	2.09	2.08	2.00	S	1.98	1.96	1.94	1.95	1.97	1.97	1.98	1.98	1.99	2.05	2.06	2.07	1.94	2.31	2.08	24
19	2.08	2.14	2.14	2.15	2.18	2.12	2.12	2.30	2.25	2.25	S	1.97	1.97	1.97	1.97	1.97	1.97	2.02	2.02	2.04	2.04	2.08	2.03	1.99	1.97	2.30	2.08	24
20	2.09	2.08	2.04	2.03	2.18	2.12	2.17	2.17	2.06	S	2.09	2.14	2.16	2.12	2.01	1.98	1.98	1.98	1.96	1.99	1.99	2.04	2.08	2.04	1.96	2.18	2.06	24
21	2.03	2.01	1.99	1.99	1.99	2.01	2.08	2.07	S	2.02	1.97	1.96	1.97	1.95	1.95	1.95	1.96	1.98	2.01	2.02	2.12	2.13	2.19	2.28	1.95	2.28	2.03	24
22	2.31	2.31	2.39	2.36	2.49	2.45	2.42	S	2.54	2.38	2.10	2.09	2.07	2.03	2.02	2.14	2.23	2.36	2.37	2.33	2.24	2.25	2.25	2.20	2.02	2.54	2.27	24
23	2.18	2.27	2.17	2.15	2.06	2.12	S	2.18	2.17	2.07	2.06	2.05	2.05	2.05	2.02	2.01	2.03	3.03	2.21	2.41	2.28	2.32	2.56	2.77	2.01	3.03	2.23	24
24	2.77	2.80	2.82	2.94	2.81	S	2.61	2.68	2.65	2.49	2.03	2.02	2.00	1.99	2.00	2.01	2.08	2.11	2.66	2.54	2.26	2.34	2.38	2.46	1.99	2.94	2.41	24
25	2.84	2.48	2.49	2.57	S	2.48	2.62	3.15	3.05	2.51	2.12	1.99	1.99	1.98	1.99	1.98	2.07	2.07	2.06	2.24	2.51	2.27	2.32	2.23	1.98	3.15	2.35	24
26	2.32	2.33	2.26	S	2.14	2.18	2.39	2.64	2.48	2.20	2.06	1.99	1.96	2.02	2.03	1.95	1.97	1.99	2.17	2.17	2.28	2.14	2.20	2.32	1.95	2.64	2.18	24
27	2.26	2.38	S	2.55	2.86	2.39	2.22	2.12	2.11	2.07	1.99	1.99	1.96	1.94	1.93	1.94	1.94	1.96	1.98	2.00	2.00	1.95	1.97	1.97	1.93	2.86	2.11	24
28	2.00	S	2.05	2.15	2.16	2.16	2.20	2.34	2.33	2.14	2.15	1.98	1.99	2.00	2.00	2.03	2.06	2.06	2.05	2.00	2.03	2.03	1.98	2.04	1.98	2.34	2.08	24
29	S	1.95	1.96	1.97	1.99	1.95	1.95	1.96	1.95	1.95	1.97	1.95	1.93	1.94	2.06	1.98	2.01	1.97	1.98	1.96	1.96	2.00	1.99	S	1.93	2.06	1.97	24
30	2.01	2.02	2.05	2.07	2.08	2.10	2.04	2.04	2.07	1.99	2.03	2.30	2.00	2.10	2.01	2.01	2.03	2.05	2.15	2.16	2.17	2.19	S	2.24	1.99	2.30	2.08	24
31	2.32	2.32	2.29	2.24	2.25	2.18	2.33	2.32	2.24	2.21	2.17	2.04	2.03	2.05	2.01	2.08	2.02	2.05	2.08	2.18	2.22	S	2.20	2.24	2.01	2.33	2.18	24
HOURLY MAX	2.84	2.80	2.90	2.94	2.86	2.48	2.79	3.15	3.05	2.51	2.31	2.30	2.16	2.15	2.35	2.46	2.23	3.03	2.69	2.54	2.51	2.34	2.56	2.77				
HOURLY AVG	2.18	2.19	2.20	2.20	2.20	2.17	2.22	2.28	2.24	2.15	2.07	2.04	2.01	2.01	2.02	2.02	2.01	2.07	2.10	2.12	2.12	2.12	2.14	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

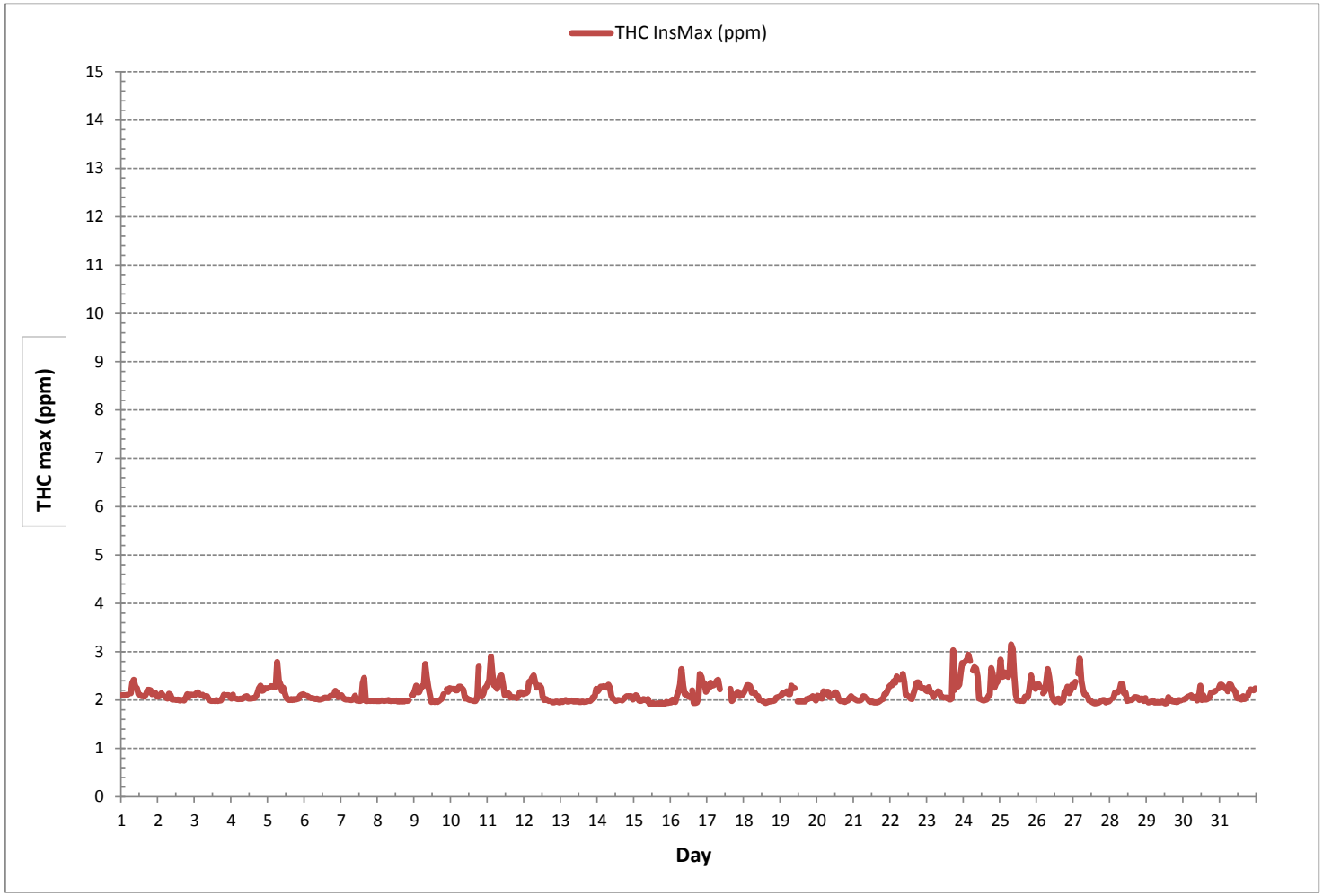
NUMBER OF NON-ZERO READINGS: 706

MAXIMUM INSTANTANEOUS VALUE: 3.15 ppm @ HOUR 7 ON DAY 25

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 6 hrs
STANDARD DEVIATION: 0.19

OPERATIONAL TIME: 744 hrs

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Maxxam
A Bureau Veritas Group Company

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

Cold Lake South Continuous Monitoring Station - October 2018

METHANE MAX Instantaneous Maximum (CH_4 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	2.10	2.10	2.10	2.10	2.11	S	2.14	2.36	2.42	2.27	2.25	2.12	2.11	2.08	2.08	2.07	2.12	2.21	2.21	2.20	2.12	2.15	2.15	2.07	2.07	2.42	2.16	24
2	2.07	2.08	2.14	2.10	S	2.05	2.03	2.13	2.11	2.01	2.01	2.01	2.00	2.01	1.99	2.00	2.00	1.99	2.05	2.12	2.06	2.11	2.11	2.10	1.99	2.14	2.05	24
3	2.10	2.14	2.16	S	2.10	2.11	2.07	2.08	2.08	2.02	1.99	1.98	1.99	1.98	2.00	1.98	1.99	1.99	2.04	2.11	2.09	2.10	2.10	2.06	1.98	2.16	2.05	24
4	2.03	2.11	S	2.03	2.02	2.02	2.03	2.02	2.05	2.07	2.08	2.03	2.03	2.03	2.04	2.04	2.07	2.14	2.24	2.30	2.19	2.20	2.25	2.24	2.02	2.30	2.10	24
5	2.25	S	2.29	2.28	2.29	2.28	2.33	2.40	2.33	2.19	2.26	2.13	2.04	2.01	2.00	2.02	2.00	2.02	2.01	2.02	2.03	2.09	2.11	2.12	2.00	2.40	2.15	24
6	S	2.09	2.08	2.05	2.04	2.04	2.03	2.02	2.03	2.01	2.01	2.02	2.03	2.05	2.05	2.04	2.06	2.09	2.09	2.09	2.19	2.16	2.06	S	2.01	2.19	2.06	24
7	2.10	2.05	2.02	2.01	2.01	2.01	2.00	2.00	2.03	2.09	1.99	1.99	1.98	1.99	1.99	2.01	1.98	1.98	1.99	1.98	1.99	1.98	S	1.98	1.98	2.10	2.01	24
8	1.98	1.98	1.99	1.99	1.98	1.99	1.99	2.00	1.98	1.98	1.99	1.98	1.99	1.97	1.98	1.97	1.98	1.97	1.99	1.98	1.99	S	2.10	2.10	1.97	2.10	1.99	24
9	2.18	2.30	2.16	2.16	2.23	2.29	2.30	2.42	2.49	2.26	2.11	1.96	1.98	1.96	1.97	1.96	1.98	2.01	2.03	2.12	S	2.22	2.17	2.25	1.96	2.49	2.15	24
10	2.23	2.23	2.23	2.20	2.20	2.28	2.28	2.25	2.21	2.03	2.04	2.02	2.00	2.00	1.99	1.98	1.98	2.07	2.07	S	2.07	2.13	2.25	2.28	1.98	2.28	2.13	24
11	2.34	2.42	2.90	2.55	2.31	2.31	2.23	2.38	2.49	2.51	2.31	2.10	2.14	2.15	2.12	2.05	2.06	2.06	S	2.04	2.09	2.16	2.16	2.12	2.04	2.90	2.26	24
12	2.14	2.14	2.17	2.38	2.38	2.46	2.51	2.37	2.26	2.29	2.30	2.26	2.06	2.00	2.02	2.00	1.98	S	1.96	1.95	1.96	1.97	1.96	1.95	1.95	2.51	2.15	24
13	1.97	1.96	1.98	2.00	1.97	1.97	1.98	1.99	1.97	1.97	1.97	1.97	1.96	1.96	1.97	1.96	S	1.97	1.99	1.98	2.01	2.06	2.05	2.23	1.96	2.23	1.99	24
14	2.18	2.22	2.28	2.28	2.29	2.27	2.26	2.32	2.26	2.08	2.03	2.00	1.98	2.00	2.00	S	1.99	2.02	2.05	2.08	2.07	2.08	2.08	2.01	1.98	2.32	2.12	24
15	2.05	2.10	2.08	1.99	1.98	1.99	2.02	2.01	1.99	2.02	1.92	1.92	1.94	1.92	S	1.93	1.93	1.92	1.94	1.93	1.92	1.96	1.94	1.95	1.92	2.10	1.97	24
16	1.95	2.01	1.97	1.96	2.10	2.18	2.33	2.47	2.30	2.12	2.12	2.08	2.06	S	1.94	1.94	1.94	1.95	2.03	2.54	2.48	2.32	2.35	2.17	1.94	2.54	2.14	24
17	2.23	2.25	2.36	2.30	2.31	2.34	2.40	2.42	2.22	C	C	C	C	C	C	1.97	1.98	2.02	2.11	2.12	2.17	2.08	2.11	2.11	1.97	2.42	2.19	24
18	2.16	2.23	2.31	2.31	2.29	2.15	2.17	2.15	2.09	2.08	2.00	S	1.98	1.96	1.94	1.95	1.97	1.97	1.98	1.98	1.99	2.05	2.06	2.07	1.94	2.31	2.08	24
19	2.08	2.14	2.14	2.15	2.18	2.12	2.12	2.30	2.25	2.25	S	1.97	1.97	1.97	1.97	1.97	1.97	2.02	2.02	2.04	2.04	2.08	2.03	1.99	1.97	2.30	2.08	24
20	2.09	2.08	2.04	2.03	2.18	2.12	2.17	2.17	2.06	S	2.09	2.14	2.16	2.12	2.01	1.98	1.98	1.98	1.96	1.99	1.99	2.04	2.08	2.04	1.96	2.18	2.06	24
21	2.03	2.01	1.99	1.99	1.99	2.01	2.08	2.07	S	2.02	1.97	1.96	1.97	1.95	1.95	1.95	1.96	1.98	2.01	2.02	2.12	2.13	2.19	2.28	1.95	2.28	2.03	24
22	2.31	2.31	2.39	2.36	2.49	2.45	2.42	S	2.54	2.38	2.10	2.09	2.07	2.03	2.02	2.14	2.23	2.36	2.37	2.33	2.24	2.25	2.25	2.20	2.02	2.54	2.27	24
23	2.18	2.27	2.17	2.15	2.06	2.12	S	2.18	2.17	2.07	2.06	2.05	2.05	2.05	2.02	2.01	2.03	2.23	2.21	2.41	2.28	2.32	2.56	2.77	2.01	2.77	2.19	24
24	2.77	2.80	2.82	**2.94**	2.81	S	2.61	2.68	2.65	2.49	2.03	2.02	2.00	1.99	2.00	2.01	2.08	2.11	2.23	2.31	2.26	2.34	2.38	2.46	1.99	**2.94**	2.38	24
25	2.42	2.48	2.49	2.57	S	2.48	2.62	2.68	2.74	2.51	2.12	1.99	1.99	1.98	1.99	1.98	2.07	2.07	2.06	2.24	2.22	2.27	2.32	2.23	1.98	2.74	2.28	24
26	2.32	2.33	2.26	S	2.14	2.18	2.39	2.64	2.48	2.20	2.06	1.99	1.96	2.02	2.03	1.95	1.97	1.99	2.17	2.17	2.28	2.14	2.20	2.32	1.95	2.64	2.18	24
27	2.26	2.38	S	2.55	2.60	2.39	2.22	2.12	2.11	2.07	1.99	1.99	1.96	1.94	1.93	1.94	1.94	1.96	1.98	2.00	2.00	1.95	1.97	1.97	1.93	2.60	2.10	24
28	2.00	S	2.05	2.15	2.16	2.16	2.20	2.34	2.33	2.14	2.15	1.98	1.99	2.00	2.00	2.03	2.06	2.06	2.05	2.00	2.03	2.03	1.98	2.04	1.98	2.34	2.08	24
29	S	1.95	1.96	1.97	1.99	1.95	1.95	1.96	1.95	1.95	1.97	1.95	1.93	1.94	2.06	1.98	2.01	1.97	1.98	1.96	1.96	2.00	1.99	S	1.93	2.06	1.97	24
30	2.01	2.02	2.05	2.07	2.08	2.10	2.04	2.04	2.07	1.99	2.03	2.30	2.00	2.10	2.01	2.01	2.03	2.05	2.15	2.16	2.17	2.19	S	2.24	1.99	2.30	2.08	24
31	2.32	2.32	2.29	2.24	2.25	2.18	2.33	2.32	2.24	2.21	2.17	2.04	2.03	2.05	2.01	2.08	2.02	2.05	2.08	2.18	2.22	S	2.20	2.24	2.01	2.33	2.18	24
HOURLY MAX	2.77	2.80	2.90	2.94	2.81	2.48	2.62	2.68	2.74	2.51	2.31	2.30	2.16	2.15	2.12	2.14	2.23	2.36	2.37	2.54	2.48	2.34	2.56	2.77				
HOURLY AVG	2.17	2.19	2.20	2.20	2.19	2.17	2.21	2.24	2.23	2.15	2.07	2.04	2.01	2.01	2.00	2.00	2.01	2.04	2.07	2.11	2.11	2.12	2.14	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: 706

MAXIMUM INSTANTANEOUS VALUE: 2.94 ppm @ HOUR 3 ON DAY 24

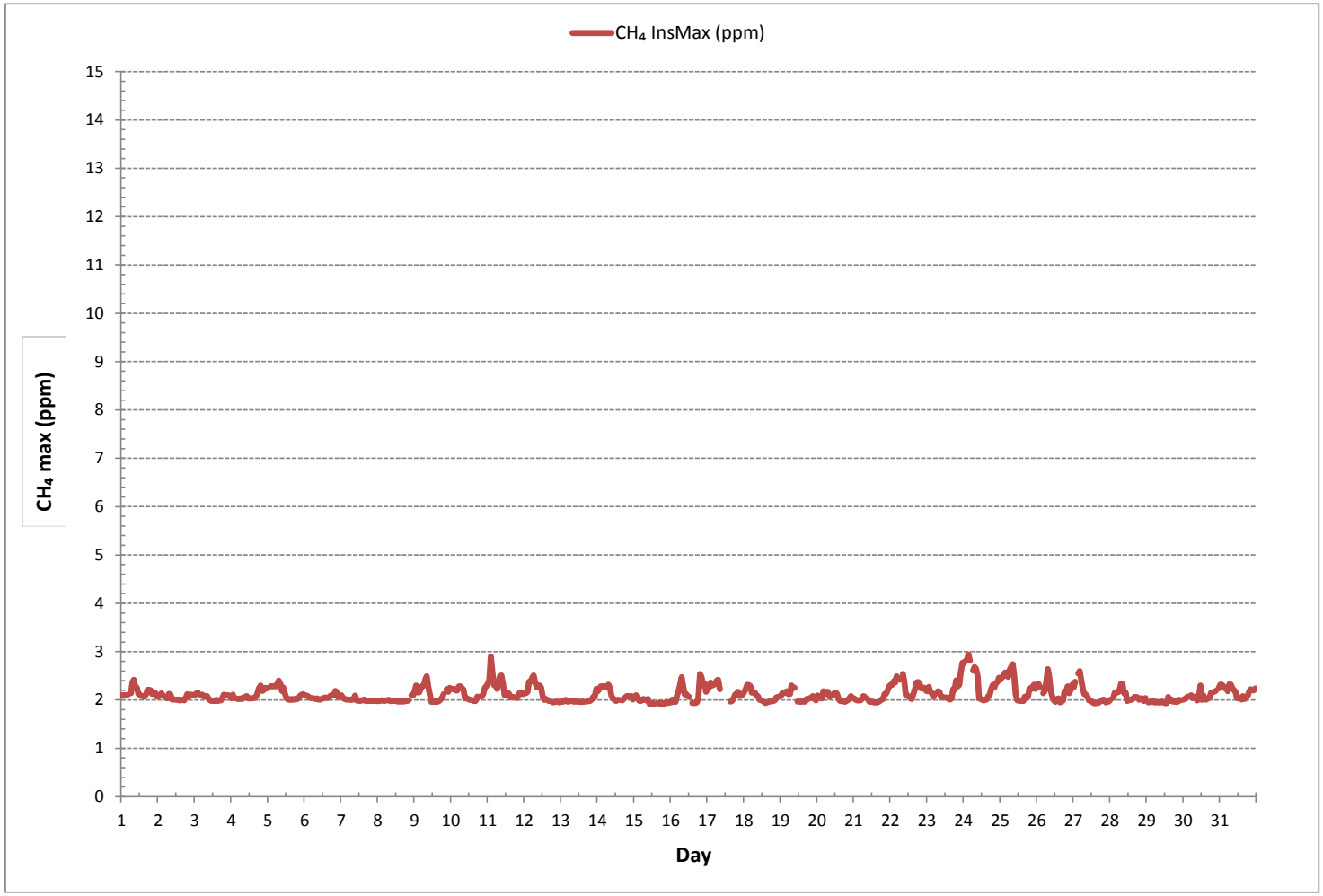
IZS CALIBRATION TIME: 32 hrs

MONTHLY CALIBRATION TIME: 6 hrs

STANDARD DEVIATION: 0.17

OPERATIONAL TIME: 744 hrs

METHANE MAX Instantaneous Maximum (CH_4 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	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.00	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	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
5	0.00	S	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.02	24
6	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
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	0.37	0.48	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.48	0.04	24
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	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	0.44	0.02	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	0.00	0.00	0.69	S	0.00	0.00	0.00	0.00	0.00	0.69	0.03	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	0.00	0.00	S	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	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
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	S	0.00	0.00	0.00	0.00	0.00	0.00	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	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
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	S	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.03	24
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C	C	C	C	C	C	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.01	24
18	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
19	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
20	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
21	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
22	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
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	**0.80**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.80**	0.03	24
24	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	0.51	0.37	0.00	0.00	0.00	0.00	0.00	0.51	0.04	24
25	0.47	0.00	0.00	0.00	S	0.00	0.00	0.56	0.66	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	0.00	0.00	0.66	0.09	24
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24
27	0.00	0.00	S	0.00	0.27	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	0.27	0.01	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	S	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	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	24
HOURLY MAX	0.47	0.00	0.00	0.00	0.27	0.00	0.49	0.56	0.66	0.00	0.00	0.00	0.00	0.00	0.37	0.48	0.00	0.80	0.69	0.37	0.31	0.00	0.00	0.00				
HOURLY AVG	0.02	0.00	0.00	0.00	0.01	0.00	0.02	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.03	0.04	0.01	0.01	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

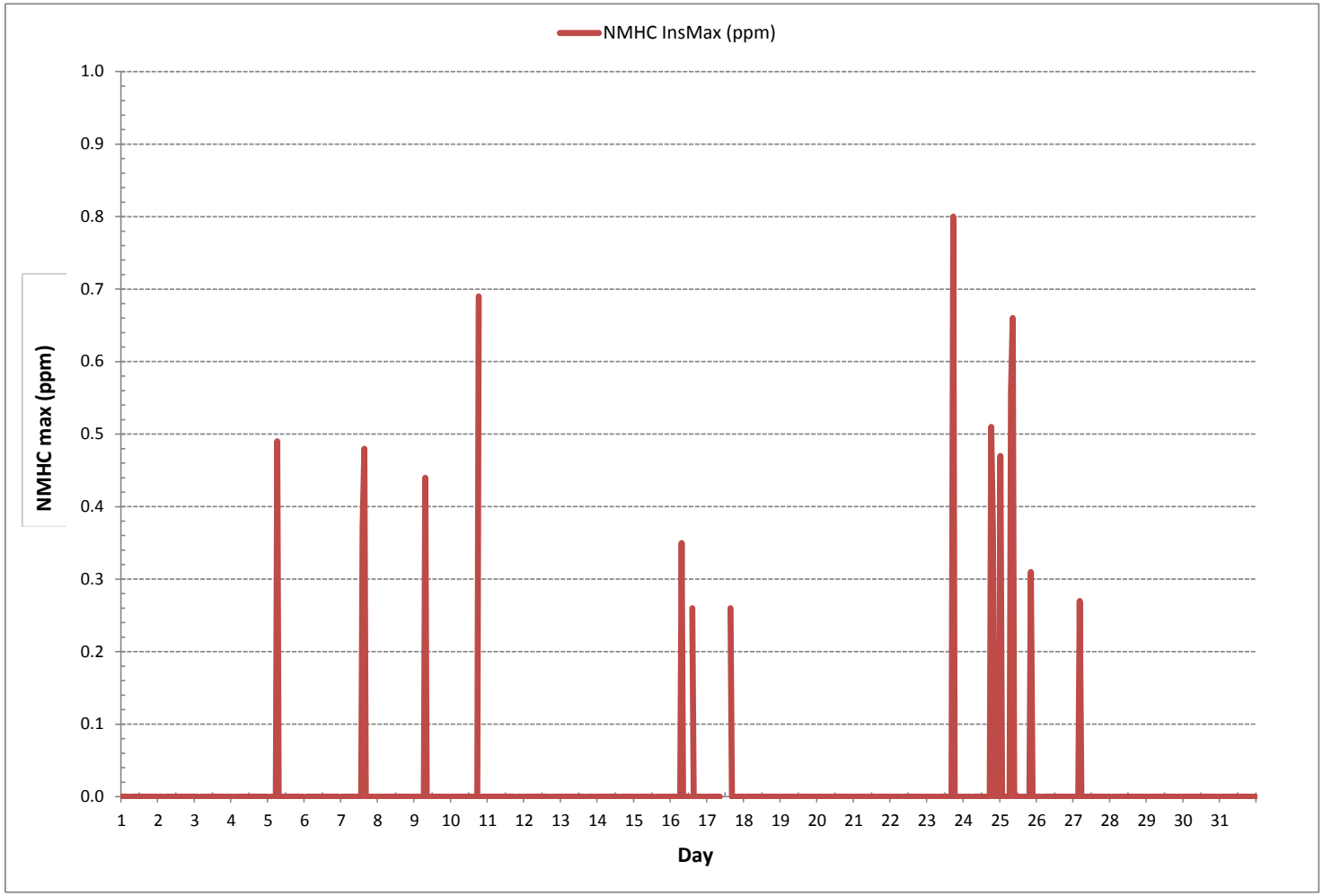
NUMBER OF NON-ZERO READINGS: 16

MAXIMUM INSTANTANEOUS VALUE: 0.80 ppm @ HOUR 17 ON DAY 23

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 6 hrs
STANDARD DEVIATION: 0.07

OPERATIONAL TIME: 744 hrs

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	4	2	2	4	6	S	8	6	9	5	6	3	2	2	7	3	3	9	7	5	5	2	3	3	2	9	5	24
2	3	5	3	3	S	3	5	6	5	7	18	3	13	4	2	2	1	2	3	4	7	7	5	7	1	18	5	24
3	6	6	7	S	7	7	10	10	6	4	3	5	2	4	1	1	2	2	5	16	17	32	14	6	1	32	8	24
4	6	9	S	5	2	8	4	5	4	4	4	5	3	3	3	6	3	4	9	8	4	5	4	4	2	9	5	24
5	4	S	6	5	4	5	24	12	10	9	9	7	5	3	2	2	2	4	3	3	8	4	11	11	2	24	7	24
6	S	22	16	5	4	3	4	8	5	5	2	5	3	3	3	5	7	6	6	7	5	3	3	S	2	22	6	24
7	9	5	3	2	2	4	5	4	10	3	2	4	3	6	2	3	11	5	4	4	3	2	S	4	2	11	4	24
8	6	5	4	2	3	6	4	4	2	4	4	5	3	2	2	7	3	4	3	5	5	S	9	8	2	9	4	24
9	13	17	10	12	9	21	16	23	25	15	9	2	1	4	2	4	2	8	14	35	S	45	33	25	1	45	15	24
10	16	31	25	18	14	23	44	44	45	4	3	3	2	2	3	6	4	11	11	S	10	8	7	9	2	45	15	24
11	20	19	11	6	7	5	8	10	8	6	6	3	4	4	4	4	4	3	S	4	5	5	4	3	3	20	7	24
12	3	3	4	10	18	15	11	47	11	15	12	15	13	8	5	3	1	S	2	2	3	6	3	2	1	47	9	24
13	3	4	4	4	4	5	5	4	4	3	3	4	3	3	2	2	S	3	3	5	7	10	6	9	2	10	4	24
14	7	8	7	8	6	11	9	20	4	5	4	3	2	3	3	S	3	3	4	4	4	5	6	6	2	20	6	24
15	5	6	6	5	4	6	10	10	7	5	2	1	1	1	S	2	1	2	3	3	2	4	3	5	1	10	4	24
16	3	10	7	13	10	20	24	50	45	7	8	5	6	S	4	5	10	19	18	8	9	9	8	4	3	50	13	24
17	6	6	3	2	10	7	9	88	10	C	C	C	C	C	C	C	C	C	C	5	5	5	4	5	2	88	12	24
18	4	6	7	7	7	7	10	7	9	8	3	S	3	2	4	2	2	2	2	2	3	5	5	6	2	10	5	24
19	7	6	7	8	7	5	35	23	12	11	S	4	5	4	3	4	8	13	15	13	19	16	4	1	1	35	10	24
20	1	1	3	2	1	2	6	4	4	S	4	3	7	4	3	1	2	1	1	1	3	3	3	4	1	7	3	24
21	2	4	3	4	4	4	5	6	S	5	2	2	2	1	1	1	1	2	6	4	7	8	10	15	1	15	4	24
22	10	10	22	31	31	20	40	S	54	42	6	4	5	3	2	2	7	10	9	9	4	5	6	6	2	54	15	24
23	8	5	3	3	3	3	S	13	4	3	7	10	4	5	13	6	17	24	18	27	36	15	12	19	3	36	11	24
24	12	20	17	30	7	S	19	29	47	60	18	5	5	6	11	14	14	22	23	24	18	32	23	28	5	60	21	24
25	21	15	23	28	S	29	30	280	385	170	20	4	6	14	65	8	10	19	19	34	31	54	32	17	4	385	57	24
26	21	18	9	S	6	9	349	435	121	20	9	3	7	5	3	4	2	7	13	9	11	14	13	16	2	435	48	24
27	10	14	S	11	20	9	10	9	6	5	4	3	3	1	1	1	1	2	29	4	4	4	4	6	1	29	7	24
28	5	S	12	5	6	12	17	23	21	6	5	4	5	2	3	5	6	6	4	3	3	3	2	4	2	23	7	24
29	S	5	5	3	5	7	3	54	109	163	**498**	6	59	70	48	2	2	3	4	3	3	6	5	S	2	**498**	48	24
30	6	7	7	5	5	6	12	21	8	6	3	3	9	7	8	9	5	7	6	8	5	7	S	7	3	21	7	24
31	8	5	5	5	3	14	19	18	14	8	11	8	5	9	7	8	11	21	21	21	14	S	8	9	3	21	11	24
HOURLY MAX	21	31	25	31	31	29	349	435	385	170	498	15	59	70	65	14	17	24	29	35	36	54	33	28				
HOURLY AVG	8	9	8	8	7	10	25	42	33	21	24	5	6	6	7	4	5	8	9	9	9	11	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

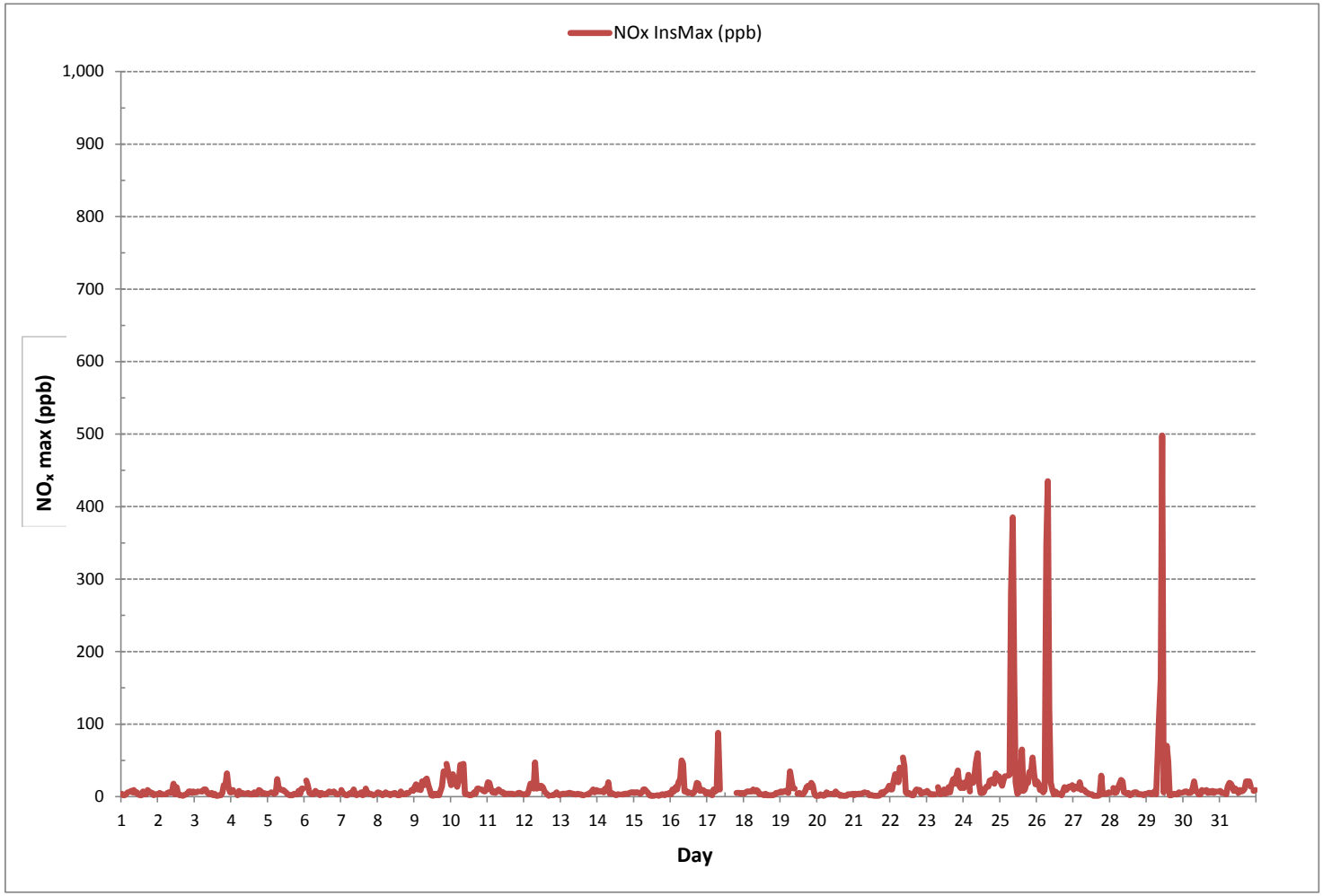
NUMBER OF NON-ZERO READINGS: 702

MAXIMUM INSTANTANEOUS VALUE: 498 ppb @ HOUR 10 ON DAY 29

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 10 hrs
STANDARD DEVIATION: 36

OPERATIONAL TIME: 744 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x 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	1	0	0	1	1	S	2	1	5	1	2	1	1	1	1	1	1	2	0	0	1	0	1	0	0	5	1	24
2	0	1	0	1	S	1	3	2	1	3	7	1	6	1	0	0	0	0	0	0	2	3	2	1	0	7	2	24
3	2	2	2	S	2	2	2	2	1	1	1	4	0	2	0	0	0	0	1	4	2	9	1	1	0	9	2	24
4	1	2	S	1	0	2	1	1	1	2	2	5	2	1	1	3	2	0	1	0	1	0	0	0	0	5	1	24
5	0	S	1	1	0	0	9	3	4	4	4	3	1	1	0	1	1	1	1	0	2	0	1	2	0	9	2	24
6	S	5	3	1	1	1	1	2	1	1	1	2	1	1	1	2	3	1	1	1	0	0	0	S	0	5	1	24
7	1	1	2	1	1	1	2	2	3	2	1	2	1	2	2	1	4	2	2	2	2	1	S	1	1	4	2	24
8	2	2	2	1	1	2	2	1	1	2	2	2	1	1	1	3	1	2	1	3	0	S	0	1	0	3	2	24
9	4	5	1	2	2	11	5	14	16	8	6	1	1	2	0	2	1	3	4	21	S	25	15	7	0	25	7	24
10	4	16	12	7	4	10	32	30	32	2	1	2	1	1	1	2	1	1	1	S	1	1	0	1	0	32	7	24
11	6	4	1	1	2	1	1	2	1	1	4	1	2	1	1	1	1	0	S	0	5	0	0	0	0	6	2	24
12	0	0	1	0	11	9	5	30	3	5	5	6	7	4	1	1	0	S	0	0	0	0	0	0	0	30	4	24
13	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	S	0	0	0	1	2	0	2	0	2	1	24
14	0	0	2	1	2	3	3	16	1	1	1	1	0	1	1	S	0	0	0	0	1	1	1	1	0	16	2	24
15	1	1	1	1	1	1	2	1	2	1	1	0	0	0	S	0	0	0	0	0	0	1	0	0	0	2	1	24
16	0	2	1	3	1	7	10	35	32	2	2	2	2	S	1	1	2	11	7	2	2	1	2	1	0	35	5	24
17	1	1	1	1	6	2	2	37	3	C	C	C	C	C	C	C	C	C	C	0	0	0	0	0	0	37	4	24
18	0	1	2	1	1	1	0	1	2	1	0	S	1	0	1	0	0	0	0	1	0	1	1	2	0	2	1	24
19	2	2	2	2	0	0	19	8	4	3	S	1	3	2	1	1	3	3	2	2	5	2	1	0	0	19	3	24
20	0	0	1	0	0	0	2	1	1	S	1	1	3	2	1	0	0	0	0	0	1	0	0	1	0	3	1	24
21	0	2	2	2	1	1	1	1	S	1	1	0	0	0	0	1	0	1	1	1	0	2	2	3	0	3	1	24
22	3	3	9	15	17	9	28	S	46	25	4	1	4	1	5	1	2	1	1	2	1	1	1	1	1	46	8	24
23	2	1	1	0	1	0	S	4	1	1	3	7	2	2	4	1	6	5	2	16	15	3	2	6	0	16	4	24
24	2	9	6	15	1	S	13	21	30	37	17	1	1	3	4	19	3	1	1	8	1	15	5	15	1	37	10	24
25	8	8	12	18	S	21	21	106	223	495	11	2	3	90	108	2	4	3	3	15	16	34	14	4	2	495	53	24
26	6	4	2	S	2	1	179	73	29	11	3	1	3	1	1	1	0	0	2	0	1	3	2	4	0	179	14	24
27	1	4	S	1	10	1	2	3	1	1	1	1	0	1	0	0	0	0	11	1	2	2	1	2	0	11	2	24
28	1	S	3	1	2	2	5	9	11	2	2	3	2	1	2	1	1	2	1	0	1	1	0	1	0	11	2	24
29	S	1	1	1	1	2	1	73	76	172	**723**	1	81	78	61	0	0	1	1	1	0	0	0	S	0	**723**	58	24
30	0	1	1	2	1	1	4	12	1	4	1	1	3	3	5	5	3	3	1	2	0	2	S	3	0	12	3	24
31	2	1	1	2	1	8	11	12	10	5	5	3	3	3	3	3	3	6	5	3	1	S	0	1	0	12	4	24
HOURLY MAX	8	16	12	18	17	21	179	106	223	495	723	7	81	90	108	19	6	11	11	21	16	34	15	15				
HOURLY AVG	2	3	3	3	3	3	12	17	18	27	28	2	5	7	7	2	1	2	2	3	2	4	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

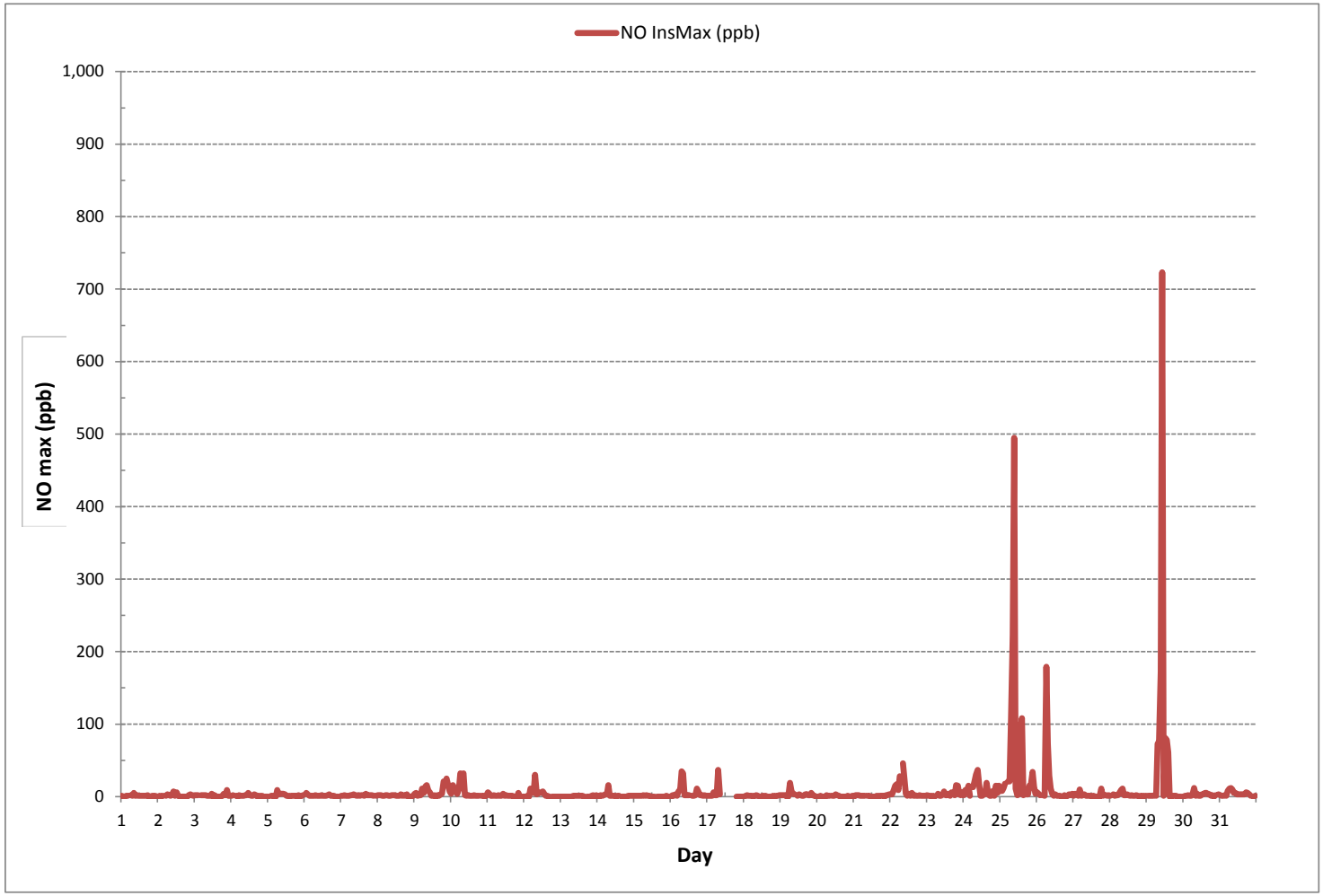
NUMBER OF NON-ZERO READINGS: 561

MAXIMUM INSTANTANEOUS VALUE: 723 ppb @ HOUR 10 ON DAY 29

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 10 hrs
STANDARD DEVIATION: 37

OPERATIONAL TIME: 744 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



NITROGEN DIOXIDE Instantaneous Maximum (NO_2 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	2	2	3	4	S	7	6	4	3	4	2	2	2	6	3	3	7	7	5	5	2	3	3	2	7	4	24
2	3	4	3	2	S	3	4	4	4	4	11	2	7	2	1	2	1	2	3	4	6	5	5	6	1	11	4	24
3	6	5	6	S	6	6	9	8	5	3	2	2	1	2	1	1	2	2	5	15	15	23	12	6	1	23	6	24
4	5	7	S	4	2	6	4	4	3	2	3	2	2	2	2	3	2	3	8	8	4	4	4	4	2	8	4	24
5	3	S	5	5	4	5	16	10	6	5	5	5	3	3	2	2	2	3	3	3	6	4	10	10	2	16	5	24
6	S	17	13	4	3	2	3	6	4	4	1	3	2	2	2	3	5	5	5	6	5	3	2	S	1	17	5	24
7	8	4	2	1	1	2	3	3	7	2	2	2	2	4	2	3	7	3	2	2	2	1	S	3	1	8	3	24
8	4	4	2	1	2	4	3	3	1	2	2	3	2	2	2	5	3	2	3	2	4	S	9	7	1	9	3	24
9	10	12	9	10	6	10	11	10	10	7	5	1	1	3	1	3	1	8	12	16	S	24	18	17	1	24	9	24
10	13	16	14	12	11	14	16	13	14	3	2	2	1	2	3	4	3	10	11	S	10	8	6	8	1	16	9	24
11	14	15	10	4	6	5	8	8	6	5	3	3	3	3	3	3	3	3	S	4	4	5	4	3	3	15	5	24
12	3	3	4	9	7	7	8	19	8	9	8	10	6	4	4	2	1	S	2	2	3	6	3	2	1	19	6	24
13	3	3	4	4	4	5	5	4	3	3	2	3	2	2	2	1	S	3	3	5	6	8	6	7	1	8	4	24
14	7	8	6	6	5	9	7	10	3	3	2	2	1	2	2	S	3	3	3	4	4	4	5	6	1	10	5	24
15	5	6	5	4	4	5	9	9	6	4	2	1	1	1	S	2	1	1	3	3	2	3	3	5	1	9	4	24
16	3	8	7	10	9	13	14	15	14	5	6	4	5	S	4	4	8	8	12	6	8	8	7	3	3	15	8	24
17	5	5	2	2	4	7	8	53	7	C	C	C	C	C	C	C	C	C	C	5	5	5	4	4	2	53	8	24
18	4	5	6	6	6	6	10	7	8	6	3	S	3	2	2	2	2	2	2	2	3	5	5	5	2	10	4	24
19	4	5	6	6	7	5	17	15	8	8	S	3	3	3	2	3	6	10	13	12	15	14	4	1	1	17	7	24
20	1	1	2	2	1	2	5	3	3	S	3	2	5	3	2	1	2	1	1	1	3	3	3	4	1	5	2	24
21	2	3	2	3	4	3	4	5	S	4	2	1	1	1	1	1	1	1	6	4	6	6	10	13	1	13	4	24
22	8	8	14	16	14	12	15	S	21	17	3	3	3	2	1	2	4	10	9	7	4	4	5	6	1	21	8	24
23	6	4	2	2	3	3	S	9	3	3	4	4	3	4	10	5	10	19	15	14	23	14	11	13	2	23	8	24
24	11	12	12	15	6	S	11	8	18	23	7	4	3	5	7	9	12	21	23	21	17	18	19	16	3	23	13	24
25	13	9	12	11	S	10	10	217	306	111	10	3	4	5	14	6	9	16	17	19	18	20	18	13	3	306	38	24
26	16	15	8	S	5	9	227	**401**	98	11	6	3	5	4	3	3	2	7	12	9	10	11	12	12	2	**401**	39	24
27	9	12	S	9	11	9	9	8	5	4	3	3	2	1	1	1	1	2	18	4	3	2	3	4	1	18	5	24
28	4	S	10	5	6	9	14	14	11	4	4	2	3	2	2	3	5	5	3	2	2	2	2	3	2	14	5	24
29	S	4	3	3	4	5	3	19	49	91	243	5	35	44	30	1	2	3	3	3	3	5	5	S	1	243	26	24
30	6	7	6	4	4	6	9	10	7	3	3	3	6	5	3	7	4	6	6	6	5	5	S	6	3	10	5	24
31	6	5	4	3	3	6	8	8	5	5	5	5	3	6	5	5	8	15	17	18	13	S	8	7	3	18	7	24
HOURLY MAX	16	17	14	16	14	14	227	401	306	111	243	10	35	44	30	9	12	21	23	21	23	24	19	17				
HOURLY AVG	6	7	6	6	5	6	16	30	22	12	12	3	4	4	4	3	4	6	8	7	7	8	7	7				

STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS: 702

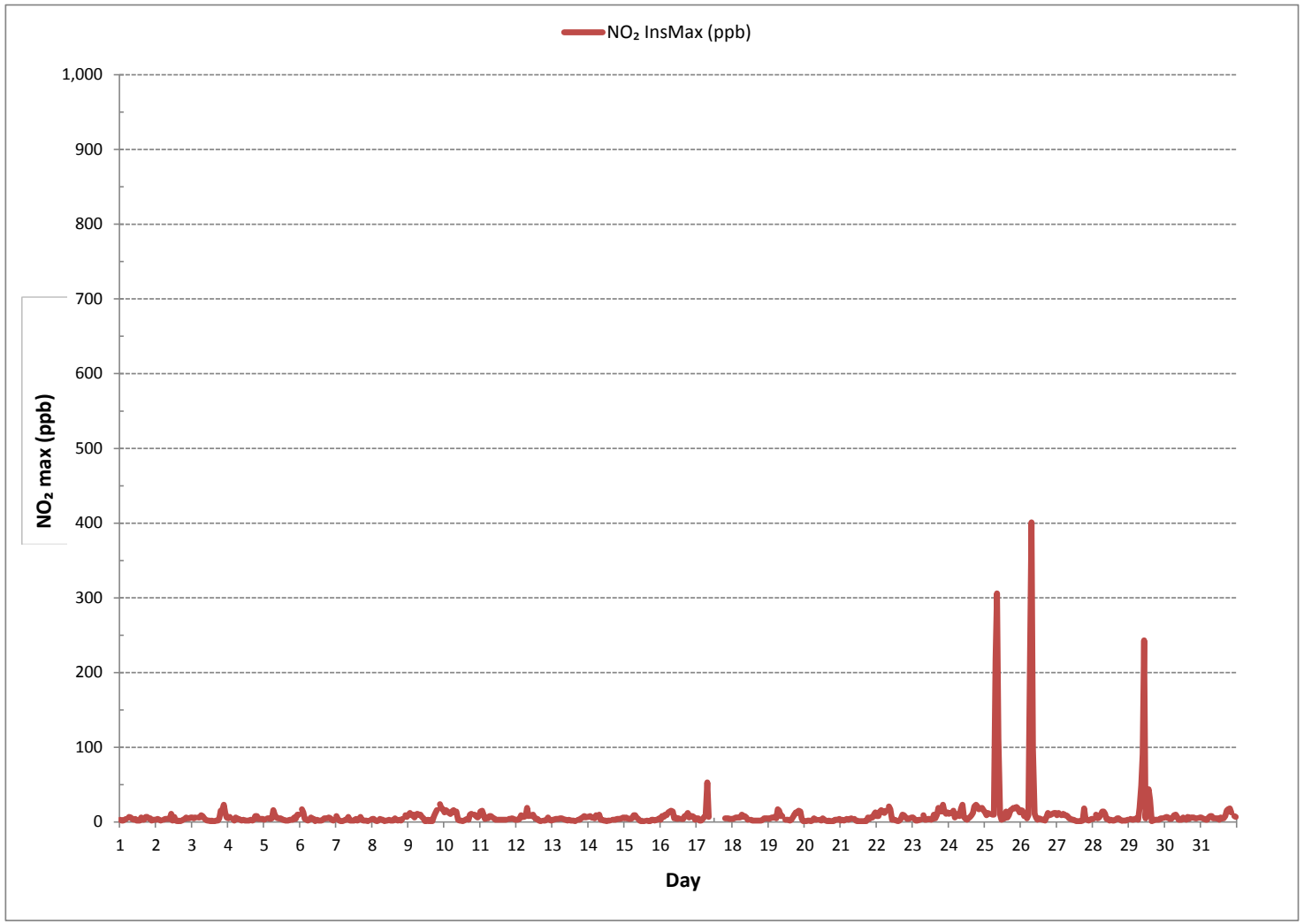
MAXIMUM INSTANTANEOUS VALUE: 401 ppb @ HOUR 7 ON DAY 26

VAR-VARIOUS

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 10 hrs
STANDARD DEVIATION: 25

OPERATIONAL TIME: 744 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO_2 ppb)



OZONE Instantaneous Maximum (O_3 ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	25.2	25.1	25.2	24.3	23.0	S	19.9	19.3	19.8	21.2	24.1	26.7	30.2	31.4	31.2	31.3	31.5	28.9	23.5	26.6	27.9	28.7	27.9	26.7	19.3	31.5	26.1	24
2	25.3	23.7	23.3	23.7	S	25.5	26.4	22.0	26.4	28.7	28.9	30.0	31.3	33.6	34.9	34.2	33.2	33.0	31.7	28.8	26.5	27.8	25.9	24.3	22.0	34.9	28.2	24
3	24.0	23.5	22.5	S	23.6	24.1	23.2	23.0	27.5	30.5	32.8	32.7	34.5	35.3	35.3	35.1	34.7	32.5	30.6	24.0	20.0	13.5	22.2	24.8	13.5	35.3	27.4	24
4	25.0	25.2	S	25.0	25.2	24.9	23.8	23.9	24.3	24.6	24.6	25.5	27.3	29.1	31.3	36.1	38.2	35.7	32.3	28.3	30.1	30.0	30.6	30.2	23.8	38.2	28.3	24
5	30.3	S	27.5	25.6	23.4	22.4	17.5	15.9	19.4	21.2	24.8	31.1	33.2	32.7	32.8	33.8	34.6	34.1	31.3	28.9	28.4	21.5	16.7	20.1	15.9	34.6	26.4	24
6	S	14.2	22.0	25.0	25.1	25.8	25.9	25.8	25.6	25.8	26.3	26.3	26.1	26.9	27.0	26.4	25.3	24.3	22.7	20.6	19.2	19.0	21.1	S	14.2	27.0	23.9	24
7	17.3	21.3	22.6	22.6	22.6	22.9	22.7	22.6	24.5	25.7	23.9	23.8	24.7	24.6	25.3	25.3	25.5	26.2	27.1	28.0	28.6	29.3	S	29.6	17.3	29.6	24.6	24
8	30.2	30.6	26.9	26.7	27.1	27.5	26.1	30.6	31.2	31.2	31.1	32.0	32.2	31.7	31.4	31.3	32.3	32.3	32.4	31.6	30.0	S	13.4	9.2	9.2	32.4	28.6	24
9	8.2	4.7	7.8	8.7	8.8	3.2	3.2	6.7	12.5	22.1	29.3	30.9	31.1	30.8	31.2	30.9	30.6	29.7	20.9	8.1	S	2.7	4.5	8.0	2.7	31.2	16.3	24
10	9.1	3.4	4.8	3.0	4.3	3.7	2.6	2.7	26.3	29.0	28.7	30.4	31.4	31.1	31.2	30.4	29.8	28.2	17.6	S	15.3	16.6	20.0	16.2	2.6	31.4	18.1	24
11	12.5	14.3	21.0	23.3	22.3	20.1	19.2	19.2	16.1	20.4	23.7	24.7	24.8	24.9	25.2	24.7	23.8	24.2	S	24.6	23.2	21.1	19.8	17.9	12.5	25.2	21.3	24
12	16.9	17.2	16.4	13.6	9.7	4.7	5.8	6.4	7.3	6.5	7.7	12.1	20.5	20.6	22.8	24.0	31.1	S	31.9	32.3	31.1	28.0	31.2	31.2	4.7	32.3	18.6	24
13	30.0	28.6	28.2	27.3	27.9	27.4	25.8	26.7	27.5	28.3	29.4	30.2	31.5	31.6	32.5	33.1	S	32.9	31.3	30.4	28.1	25.6	19.1	20.9	19.1	33.1	28.4	24
14	16.1	11.7	18.1	18.1	18.2	19.0	15.5	18.0	21.8	24.1	27.7	29.5	30.5	30.6	29.6	S	29.6	28.3	25.4	23.4	22.6	21.9	20.2	21.3	11.7	30.6	22.7	24
15	25.6	25.1	29.5	31.4	30.9	29.7	27.3	25.3	28.1	33.0	33.4	35.8	36.6	37.3	S	39.5	38.2	36.7	33.7	32.5	32.4	29.9	28.6	26.5	25.1	39.5	31.6	24
16	27.1	25.8	20.7	19.3	13.1	9.4	2.9	2.6	17.9	19.3	22.6	C	C	C	C	C	C	C	18.5	16.6	20.0	16.7	17.5	17.8	2.6	27.1	16.9	24
17	16.3	9.6	3.9	3.5	2.3	12.6	13.4	12.9	26.3	31.9	36.7	41.0	S	51.5	52.3	**53.6**	52.9	50.8	50.7	51.6	50.5	46.1	42.6	39.2	2.3	**53.6**	33.3	24
18	35.1	32.5	30.7	31.8	34.6	34.9	31.7	31.9	33.0	36.8	39.7	S	40.5	41.2	41.6	42.0	40.9	40.5	41.3	38.4	37.9	34.4	30.6	29.7	29.7	42.0	36.2	24
19	27.4	26.7	25.2	25.9	22.3	21.8	20.8	16.3	21.3	25.8	S	34.0	34.0	31.8	33.0	32.6	33.8	33.6	31.5	21.5	32.5	30.3	36.7	37.2	16.3	37.2	28.5	24
20	36.1	35.3	34.4	33.1	32.6	32.3	30.6	28.5	27.0	S	27.0	26.1	25.6	33.9	40.1	41.1	40.4	41.3	41.0	39.9	37.7	35.9	31.3	30.4	25.6	41.3	34.0	24
21	30.0	30.3	31.9	30.4	29.5	28.0	27.3	26.6	S	33.0	35.3	36.3	36.5	36.5	36.1	36.1	36.0	35.1	32.7	30.1	28.6	25.4	14.2	12.3	12.3	36.5	30.4	24
22	14.0	12.8	8.3	2.6	0.7	3.0	2.3	S	5.8	28.0	27.6	29.0	34.0	35.8	36.5	36.4	33.6	30.0	28.6	30.3	29.6	29.1	27.5	25.9	0.7	36.5	22.2	24
23	26.3	27.4	28.5	28.5	28.4	27.5	S	25.7	26.7	27.4	29.2	31.2	35.5	36.6	36.3	38.1	36.1	24.4	26.2	26.3	15.2	8.4	12.3	7.1	7.1	38.1	26.5	24
24	8.9	2.0	5.8	2.0	2.4	S	2.3	2.5	5.3	26.4	30.3	32.6	32.1	33.3	34.7	35.1	33.3	25.5	13.7	9.1	10.2	7.5	4.3	3.9	2.0	35.1	15.8	24
25	3.8	3.6	1.1	2.3	S	1.1	0.8	1.7	2.7	20.6	25.8	26.7	27.6	28.7	30.4	30.3	29.4	16.8	9.9	5.7	2.2	2.7	1.9	5.2	0.8	30.4	12.2	24
26	4.5	13.1	16.2	S	15.4	15.2	12.0	10.5	17.9	26.4	30.3	33.1	34.8	36.4	36.6	36.0	35.3	33.9	24.7	21.8	14.0	17.3	10.7	13.3	4.5	36.6	22.2	24
27	9.5	10.3	S	9.5	12.6	13.9	18.2	21.3	22.4	28.6	31.0	31.7	33.8	33.4	33.5	33.2	32.5	32.1	30.9	28.4	30.5	30.7	29.4	26.8	9.5	33.8	25.4	24
28	25.3	S	23.5	21.4	20.5	17.7	10.1	6.5	17.9	24.9	28.6	29.0	31.7	33.6	33.9	34.2	31.3	32.1	32.0	31.9	31.8	31.1	30.8	29.5	6.5	34.2	26.5	24
29	S	26.0	26.2	25.7	25.2	25.1	24.7	20.8	19.0	18.0	16.9	21.6	23.4	25.2	23.4	23.7	21.4	20.6	17.6	19.4	20.1	17.4	14.1	S	14.1	26.2	21.6	24
30	13.5	11.1	9.2	3.9	2.4	16.7	21.4	22.2	23.4	24.2	24.0	24.7	24.4	21.3	20.3	19.3	14.7	16.9	15.6	11.1	11.9	11.9	S	9.1	2.4	24.7	16.2	24
31	9.1	8.8	9.9	9.8	9.7	9.2	3.4	6.0	3.0	13.6	17.9	22.3	25.5	26.0	30.9	29.3	26.3	25.7	17.0	7.9	4.7	S	12.2	9.1	3.0	30.9	14.7	24
HOURLY MAX	36.1	35.3	34.4	33.1	34.6	34.9	31.7	31.9	33.0	36.8	39.7	41.0	40.5	51.5	52.3	53.6	52.9	50.8	50.7	51.6	50.5	46.1	42.6	39.2				
HOURLY AVG	20.1	18.8	19.7	18.9	18.8	18.9	16.9	17.5	20.3	25.2	27.3	29.0	30.5	31.9	32.5	33.0	32.3	30.6	27.5	25.3	24.7	22.8	21.3	20.8				

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

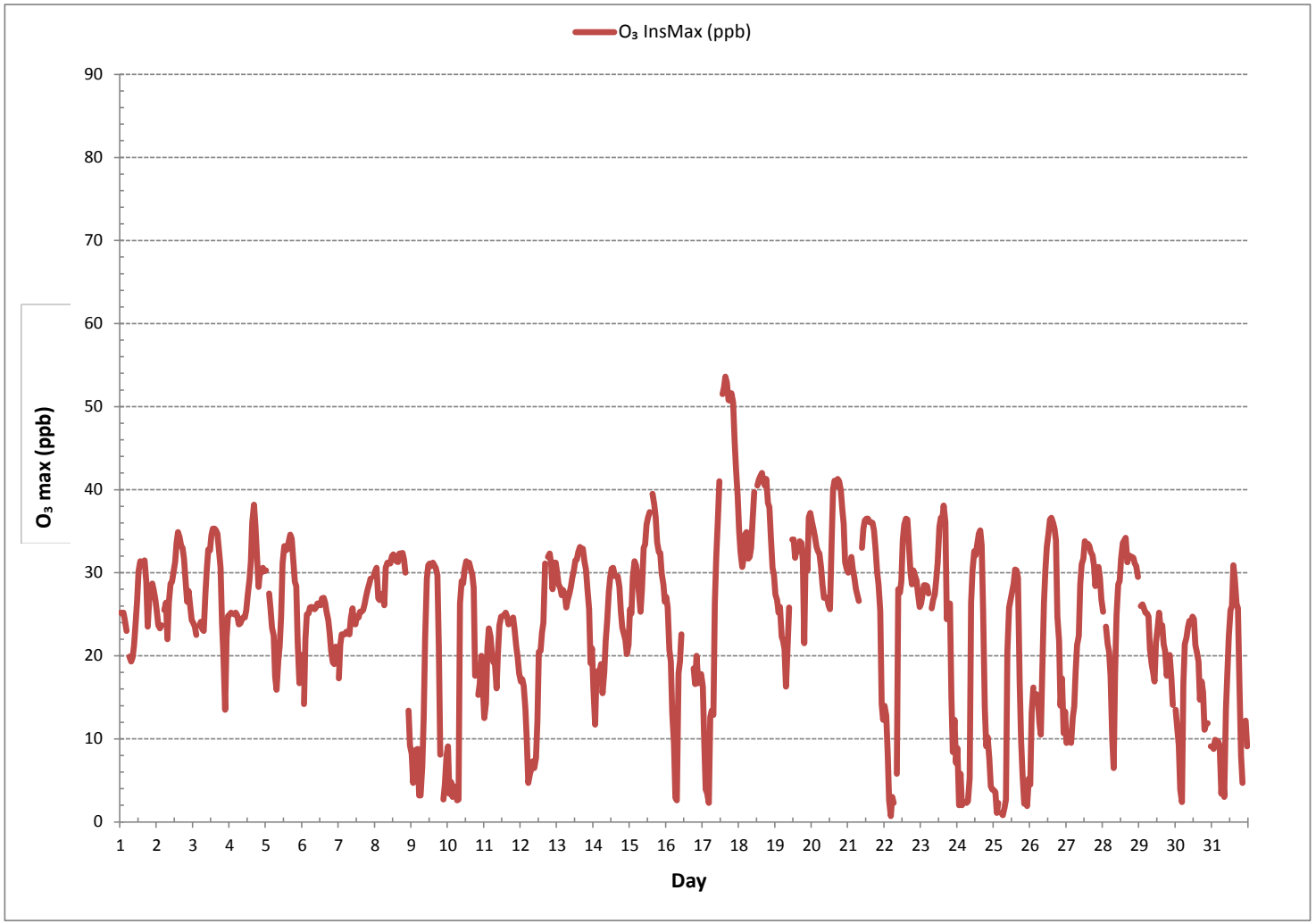
NUMBER OF NON-ZERO READINGS: 705

MAXIMUM INSTANTANEOUS VALUE: 53.6 ppb @ HOUR 15 ON DAY 17

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 7 hrs
STANDARD DEVIATION: 10.0

OPERATIONAL TIME: 744 hrs

OZONE Instantaneous Maximum (O_3 ppb)



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	11.4	13.5	14.4	10.6	8.8	11.5	12.0	6.9	7.5	9.6	10.1	6.9	15.9	15.4	11.3	10.1	10.1	2.9	8.6	12.0	9.3	12.3	9.6	11.8	2.9	15.9	10.5	24
2	12.5	13.5	15.4	20.3	19.6	20.3	14.4	14.2	22.7	20.1	21.4	35.4	31.5	31.8	49.6	39.5	45.9	36.2	23.5	14.0	14.0	17.4	15.9	15.7	12.5	49.6	23.5	24
3	17.4	21.3	19.3	17.9	18.2	23.3	19.6	19.6	20.1	34.1	34.9	30.5	33.0	35.4	42.7	45.9	23.5	16.6	12.0	11.5	12.0	17.4	10.8	12.0	10.8	45.9	22.9	24
4	13.0	13.5	15.9	12.8	16.2	16.4	22.7	20.3	22.5	24.8	18.4	21.5	23.2	24.5	22.5	28.6	27.4	12.7	8.4	11.5	13.0	12.3	12.3	13.5	8.4	28.6	17.8	24
5	13.2	10.1	8.8	10.5	12.0	12.7	12.7	12.3	15.9	18.6	22.0	23.7	33.7	29.6	22.1	22.4	25.4	15.9	20.8	17.4	14.1	5.9	13.0	12.7	5.9	33.7	16.9	24
6	11.8	12.3	14.7	14.2	21.0	20.8	28.6	22.5	27.5	30.8	32.0	31.3	34.0	24.9	19.6	14.7	16.9	9.1	8.1	7.1	3.7	5.9	12.7	13.2	3.7	34.0	18.2	24
7	5.5	13.5	18.1	22.7	22.7	26.2	20.3	17.1	22.7	20.8	20.8	25.9	21.0	28.2	23.3	24.2	24.2	22.3	28.6	39.1	30.8	34.7	27.9	27.1	5.5	39.1	23.7	24
8	28.6	23.7	24.7	30.5	27.6	26.6	21.0	23.7	27.0	22.3	23.5	19.6	19.8	20.3	19.1	19.8	17.6	17.6	19.7	12.8	2.1	7.4	22.7	19.3	2.1	30.5	20.7	24
9	8.9	9.6	17.4	21.3	15.2	7.4	18.6	10.6	10.6	13.0	14.0	16.7	19.6	20.8	17.4	15.2	21.5	8.5	6.2	2.3	2.5	3.3	7.1	9.3	2.3	21.5	12.4	24
10	17.4	13.8	8.8	18.7	23.2	20.1	20.1	17.6	12.6	16.7	15.9	16.2	13.2	14.4	9.8	11.1	7.9	5.9	3.3	2.6	11.0	10.8	12.7	10.1	2.6	23.2	13.1	24
11	11.0	12.0	9.1	12.7	10.3	10.8	10.3	11.3	11.3	14.6	17.4	21.5	22.0	22.5	30.5	23.2	22.5	20.1	16.6	17.4	13.7	10.1	9.8	11.0	9.1	30.5	15.5	24
12	12.0	13.5	12.3	11.3	11.0	11.0	6.4	11.0	9.8	14.7	13.5	17.4	38.3	42.7	58.1	54.1	55.9	41.8	57.9	48.7	30.8	31.0	52.5	36.3	6.4	58.1	28.8	24
13	31.3	32.3	29.1	32.5	29.6	31.5	31.8	28.3	32.5	40.1	40.1	36.7	35.7	34.0	38.8	37.7	31.8	23.0	19.6	18.1	13.7	12.5	10.4	15.7	10.4	40.1	28.6	24
14	14.0	12.1	14.7	14.7	12.5	16.2	3.1	11.0	13.2	18.1	25.2	26.9	27.9	25.5	34.5	25.2	26.9	26.2	16.2	19.7	20.9	17.6	19.3	20.4	3.1	34.5	19.2	24
15	39.9	34.7	33.0	31.4	31.8	22.0	17.6	22.2	34.2	34.9	35.5	38.3	41.8	48.6	45.9	44.4	34.9	19.1	16.9	18.1	14.9	11.5	26.2	20.5	11.5	48.6	**29.9**	24
16	17.9	9.3	10.1	8.4	3.6	10.8	6.9	11.0	9.8	9.6	13.1	15.2	14.1	12.3	13.5	11.5	7.1	4.6	6.7	6.9	8.4	8.4	7.4	9.9	3.6	17.9	9.8	24
17	8.6	6.4	11.1	3.8	11.0	10.5	11.5	16.9	22.7	25.2	34.9	32.7	33.5	34.7	32.9	33.0	26.5	24.9	25.9	25.0	24.7	17.9	18.8	13.5	3.8	34.9	21.1	24
18	16.7	13.3	14.2	16.4	22.1	18.8	15.4	18.6	18.8	30.3	23.5	37.1	34.2	43.2	58.6	43.9	35.4	41.0	38.5	20.5	18.2	14.4	14.2	12.5	12.5	58.6	25.8	24
19	12.3	14.8	13.0	12.6	14.2	14.1	15.2	15.9	19.8	20.3	23.5	50.6	38.1	44.7	31.6	22.5	16.9	15.1	7.6	12.5	11.0	12.5	21.0	27.9	7.6	50.6	20.3	24
20	23.0	25.3	21.8	19.1	25.2	21.8	15.4	17.2	15.2	18.6	25.2	29.6	28.3	37.4	53.5	57.8	37.9	41.3	46.4	26.2	23.7	19.6	16.7	18.9	15.2	57.8	27.7	24
21	16.6	23.7	20.5	20.8	21.0	20.4	18.8	19.8	34.5	37.1	37.4	49.6	53.7	56.6	54.0	37.9	29.3	15.3	15.9	12.1	7.5	12.0	4.2	10.8	4.2	56.6	26.2	24
22	12.5	4.7	17.6	11.3	10.9	12.3	16.7	18.1	5.1	11.8	17.9	19.6	23.5	28.1	24.0	21.0	16.2	10.1	10.5	11.9	12.5	14.7	10.6	10.5	4.7	28.1	14.7	24
23	13.0	12.5	17.9	19.1	16.9	18.6	15.7	16.9	18.1	17.5	20.8	20.5	19.9	20.3	19.9	19.8	8.6	10.1	8.1	4.2	3.0	10.3	2.1	10.8	2.1	20.8	14.4	24
24	2.4	3.2	2.5	2.6	2.4	2.5	2.5	2.5	3.0	10.3	10.5	14.0	15.2	15.5	13.2	15.7	10.1	6.2	3.5	3.1	2.8	3.2	4.9	4.2	2.4	15.7	6.5	24
25	4.8	4.9	5.5	6.8	4.8	6.2	4.7	28.4	23.3	20.3	14.1	14.2	18.1	15.2	14.0	9.3	7.1	5.8	5.4	6.0	5.9	7.6	8.8	7.6	4.7	28.4	10.4	24
26	6.2	9.6	11.3	10.3	7.9	8.6	9.1	16.8	16.0	25.2	33.0	35.7	35.7	44.4	30.3	23.6	15.2	9.7	10.5	11.0	6.3	7.1	3.8	5.7	3.8	44.4	16.4	24
27	2.8	5.8	13.2	7.2	14.4	15.9	17.1	16.7	16.7	42.9	46.9	32.3	58.6	55.9	**63.0**	28.1	22.5	15.2	7.0	15.4	14.9	18.4	12.0	11.8	2.8	**63.0**	23.1	24
28	15.3	13.5	11.0	15.9	11.8	5.2	3.3	5.4	6.7	10.7	14.2	16.5	19.3	23.2	28.3	24.7	15.5	19.7	19.6	22.3	19.6	25.4	22.4	16.7	3.3	28.3	16.1	24
29	16.9	16.4	22.7	20.3	13.5	9.8	23.7	20.2	21.0	24.2	25.9	27.6	28.6	28.8	29.3	27.4	20.8	19.1	18.8	25.2	25.9	22.0	19.1	18.9	9.8	29.3	21.9	24
30	14.2	10.4	8.1	4.0	3.7	6.3	9.1	5.4	11.3	11.8	15.7	12.7	12.7	12.3	9.1	12.7	14.4	10.3	7.9	6.3	4.7	5.0	5.3	7.6	3.7	15.7	9.2	24
31	10.1	6.7	8.2	7.4	6.7	5.2	3.5	6.4	5.7	14.7	18.4	15.7	15.9	13.3	15.7	11.3	9.3	5.2	4.2	4.1	3.6	9.7	7.5	2.3	2.3	18.4	8.8	24
HOURLY MAX	39.9	34.7	33.0	32.5	31.8	31.5	31.8	28.4	34.5	42.9	46.9	50.6	58.6	56.6	63.0	57.8	55.9	41.8	57.9	48.7	30.8	34.7	52.5	36.3				

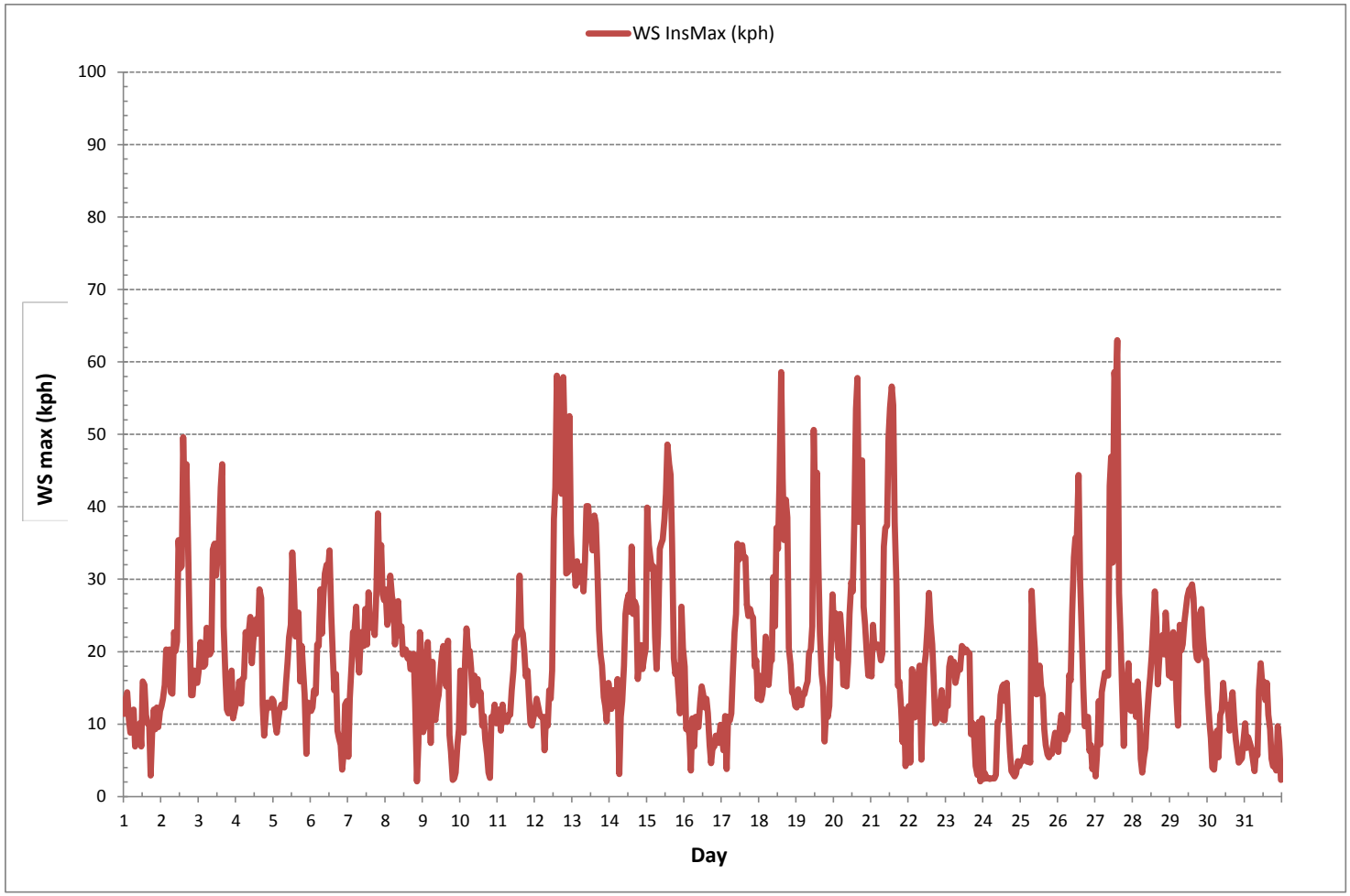
STATUS FLAG CODES

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:	63.0	kph	@ HOUR	14	ON DAY	27
OPERATIONAL TIME:						744 hrs

WIND SPEED Instantaneous Maximum (WS kph)



APPENDIX IV
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	**EPA Approval or Code of Practice Registration #** (if applicable)
YES	**NA**
Company Name (if applicable)	**Industrial Operation Name** (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	**COLD LAKE SOUTH CONTINUOUS MONITORING STATION**
Name of the Representative of the Person Responsible	**Position / Title of the Representative of the Person Responsible**
Mike Bisaga	**Environment Monitoring Program Manager**
Is an External Party Certifying the Report?	
■ **Yes** ☐ **No**	
Name of External Person Certifying the Report	**Position / Title of External Person Certifying the Report**
Wunmi Adekanmbi	**Project Team Lead, Customer Service - Air Services**
Company Name for External Person Certifying the Report	**Identification of Qualifications / Professional Designations of the External Person Certifying the Report**
Maxxam Analytics, A Bureau Veritas Group Company	**M.Sc., EPt., PMP**

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.

Signature of the External Person Certifying the Report

23-Nov-2018

Report Issued Date (dd-mon-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM

Validation Certificate Form

Client:	Lakeland Industry & Community Association	**Project #:**	2833-2018-10-1-C
Site:	Cold Lake South Continuous Monitoring Station	**Contact:**	Mike Bisaga

Level 0 Preliminary Verification	Maram Ghaleb	**Date**	21-Nov-2018
Level 1 Primary Validation	Maram Ghaleb	**Date**	21-Nov-2018
Level 2 Final Validation	Maram Ghaleb	**Date**	23-Nov-2018
Level 3 Independent Data Review		**Date**	23-Nov-2018
Post-Final Validation	**NA**	**Date**	**NA**

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

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

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

December 10, 2018

Subject: Monthly Report Submission for the LICA Maskwa station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Maskwa AQM Station in the month of October 2018.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO_2), Hydrogen Sulphide (H_2S), Total Hydrocarbon (THC), Oxides of Nitrogen (NOx), Nitric Oxides (NO), Nitrogen Dioxide (NO_2), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

All data collected in October was compliant with the requirements outlined in the Air Monitoring Directive 2016 (AMD 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement. The operational uptime was 7.9% for the CH4 and NMHC channels. The Thermo 55i Methane/Non-Methane Hydrocarbon analyzer was removed from the site, and a Thermo 51C THC analyzer was installed. No CH4 and NMHC data was collected on the 51C analyzer. The AMD's monthly data completeness criteria (Chapter 6, Section 4.1.3, DQ 4-C) was not applicable to these channels in the October monitoring period.

THC/CH4/NMHC: The Thermo 55i Methane/Non-Methane analyzer (s/n: 1236656107), was replaced with an alternate model, Thermo 51C Total Hydrocarbon analyzer (s/n: 46609738), On October 3. The Thermo 55i was removed from the site to be installed at LICA Bonnyville-East station. No Methane and Non-Methane Hydrocarbon was collected on the Thermo 51C analyzer.

Precipitation: configuration error occurred during the datalogger upgrade on May 31 and was corrected on November 1. Consequently, data collected during this time frame, at rates greater than or equal to 0.3 millimeter /minute, might be compromised and should therefore be used with caution.

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

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

Respectfully,

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

Lily Lin
Data & Reporting Specialist
587-225-2248
monitoring@lica.ca

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

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

AMBIENT AIR MONITORING MONTHLY DATA REPORT

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

MASKWA CONTINUOUS MONITORING STATION

JOB #: 2833-2018-10-30-C

October 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
5107 50 ST.
BONNYVILLE, ALBERTA
T9N 2J7

Attention: MIKE BISAGA

DATE: **November 29, 2018**

Prepared by: Maram Ghaleb

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

Reviewed by:

Wunmi Adekanmbi, M.Sc., EPt, PMP
Project Team Lead, Customer Service, Air Services

SUMMARY

In October 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

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

With the exception of CH_4 and NMHC, the operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.
The operational uptime was 7.9% for the CH_4 and NMHC channels. The Thermo 55i Methane/Non-Methane Hydrocarbon analyzer was removed from site, and a Thermo 51C THC analyzer was installed. No CH_4 and NMHC data was collected on the 51C analyzer. The AMD's monthly data completeness criteria (Chapter 6, Section 4.1.3, DQ 4-C) was not applicable to these channels in the October monitoring period.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

THC/CH_4/NMHC:

• On October 3, the LICA-owned resident Thermo 55i Methane/Non-Methane analyzer (s/n: 1236656107), was replaced with an alternate model, Thermo 51c Total Hydrocarbon analyzer (s/n: 46609738), also LICA-owned, upon client request. Three hours of downtime were incurred due to this analyzer replacement event.
• On October 12, a repeat calibration was performed on the Thermo 51c analyzer, to correct a biased low zero drift. Six hours of downtime were incurred as a result.

Precipitation: A configuration error occurred during the datalogger upgrade on May 31, and was corrected on November 1. Consequently, data collected during this time frame, at rates greater than or equal to 0.3 mm/min, might be compromised and should therefore be used with caution.

The summary of results is presented on the following pages.

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

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

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_2 (ppb)	172	48	0	0	1	21	18	22	5.9	WNW	3	15	100.0
H_2S (ppb)	10	3	0	0	0	3	24	17	1.4	SE	1	24	100.0
THC (ppm)	-	-	-	-	2.11	3.85	8	22	0.3	E	2.25	11	98.8
CH_4 (ppm)	-	-	-	-	1.99	2.16	1	9	1.2	SW	2.02	1	7.9
NMHC (ppm)	-	-	-	-	0.00	0.00	1	0	4.0	SE	0.00	1	7.9
NO_2 (ppb)	159	-	0	-	4	30	18	22	5.9	WNW	8	17	100.0
NO (ppb)	-	-	-	-	1	32	25	7	0.2	NNE	4	25	100.0
NOx (ppb)	-	-	-	-	5	55	25	7	0.2	NNE	11	17	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	72	100	12	0	7.2	SSW	98	29	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	938	954	9	10	4.5	ENE	952	9	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	1.4	21.8	17	14	5.4	WSW	10.4	17	100.0
PRECIPITATION (mm)	-	-	-	-	6.6	0.0	29	4	5.8	NNE	0.0	29	100.0
VECTOR WS (kph)	-	-	-	-	0.9	11.7	12	14	-	N	8.1	7	100.0
VECTOR WD (sec)	-	-	-	-	284 (WNW)	-	-	-	-	-	-	-	100.0

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

Exceedance Summary Report

SO_2 1-Hour Exceedances

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

SO_2 24-Hour Exceedances

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

H_2S 1-Hour Exceedances

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

H_2S 24-Hour Exceedances

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

NO_2 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.

TABLE OF CONTENTS

1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO_2), Hydrogen Sulphide (H_2S), Total Hydrocarbon (THC), Methane (CH_4), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NOx), Nitric Oxides (NO), Nitrogen Dioxide (NO_2), Particulate Matter 2.5 ($PM_{2.5}$), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO_2)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on October 12.

HYDROGEN SULPHIDE (H_2S)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on October 12.

TOTAL HYDROCARBONS (THC), METHANE (CH_4) and NON-METHANE HYDROCARBONS (NMHC)

- Operational time for the monitoring period was 98.8% for THC, equivalent to 9 hours of downtime. The CH_4/NMHC channel operational uptime was 7.9%. The AMD's monthly data completeness criteria (Chapter 6, Section 4.1.3, DQ 4-C) was not applicable to these channels in the October monitoring period.
- Following a successful shutdown calibration on October 3, the LICA-owned resident analyzer, Thermo 55i Methane/ Non- Methane (s/n: 1236656107), was removed to be installed at another LICA station, upon client request. An alternate analyzer model, Thermo 51c Total Hydrocarbon (s/n: 46609738), which is also LICA-owned and monitors THC only, was installed. A successful installation calibration was subsequently completed. Three hours of downtime were incurred on October 3 due to this analyzer replacement event. No methane and Non-methane hydrocarbon data was collected on the Thermo 51 C analyzer.
- A repeat calibration was performed on October 12 to correct a biased low zero drift, incurring 6 hours of downtime.

OXIDES OF NITROGEN (NOx), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO_2)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on October 12.

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

- Operational time for the monitoring period was 100%.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 100%.

PRECIPITATION (PRECIP)

- Operational time for the monitoring period was 100%.
- A precipitation sensor audit was performed on October 12. The result was satisfactory.
- A configuration error occurred during the datalogger upgrade on May 31, and was corrected on November 1. Consequently, data collected during this time frame, at rates greater than or equal to 0.3 mm/min, might be compromised and should therefore be used with caution.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 100%.

2.0 Project Personnel

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

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

With the exception of CH_4 and NMHC, the operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.
The operational uptime was 7.9% for the CH_4 and NMHC channels. The Thermo 55i Methane/Non-Methane Hydrocarbon analyzer was removed from the site, and a Thermo 51C THC analyzer was installed. No CH_4 and NMHC data was collected on the 51C analyzer. The AMD's monthly data completeness criteria (Chapter 6, Section 4.1.3, DQ 4-C) was not applicable to these channels in the October monitoring period.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

4.0 Calculations and Results

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

5.0 Methods and Procedures

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

Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring
Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00213: Ambient NO/NO_2/NOx Monitoring
Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - Thermo 43I - TLE UV Fluorescent Analyzer
Hydrogen Sulphide - Thermo 450i UV Fluorescent Analyzer
Total Hydrocarbons - Thermo 51C FID Analyzer
Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
Wind System - RM Young Unit
Relative Humidity - Rotronic Hygroclip Unit
Barometric Pressure - Met One Unit
Ambient Temperature - Rotronic Hygroclip Unit
Precipitation - Met One Unit
Datalogger - Envidas Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

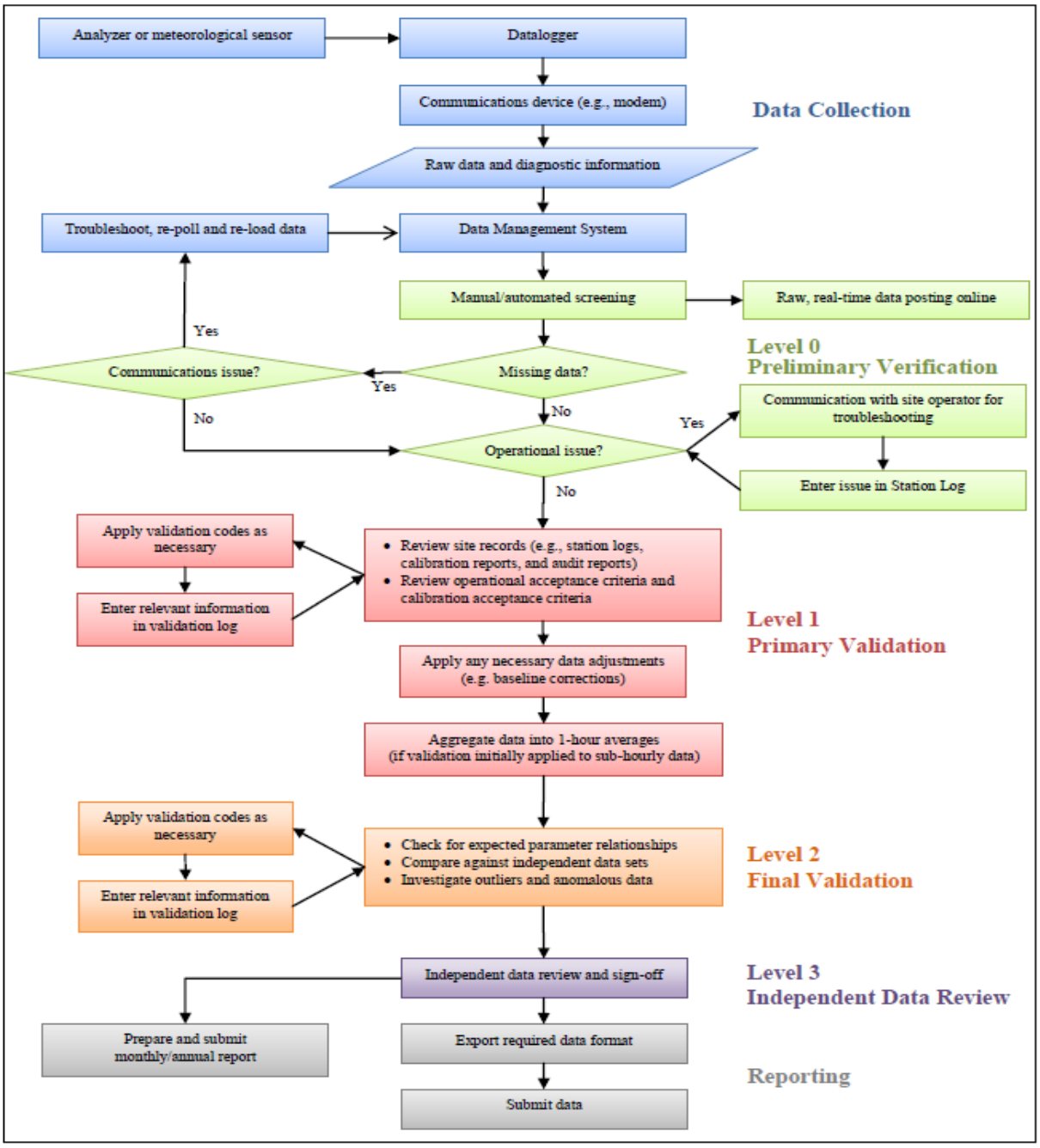
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

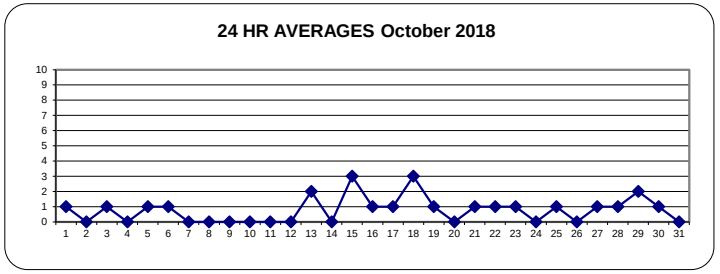
SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO_2 ppb)

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

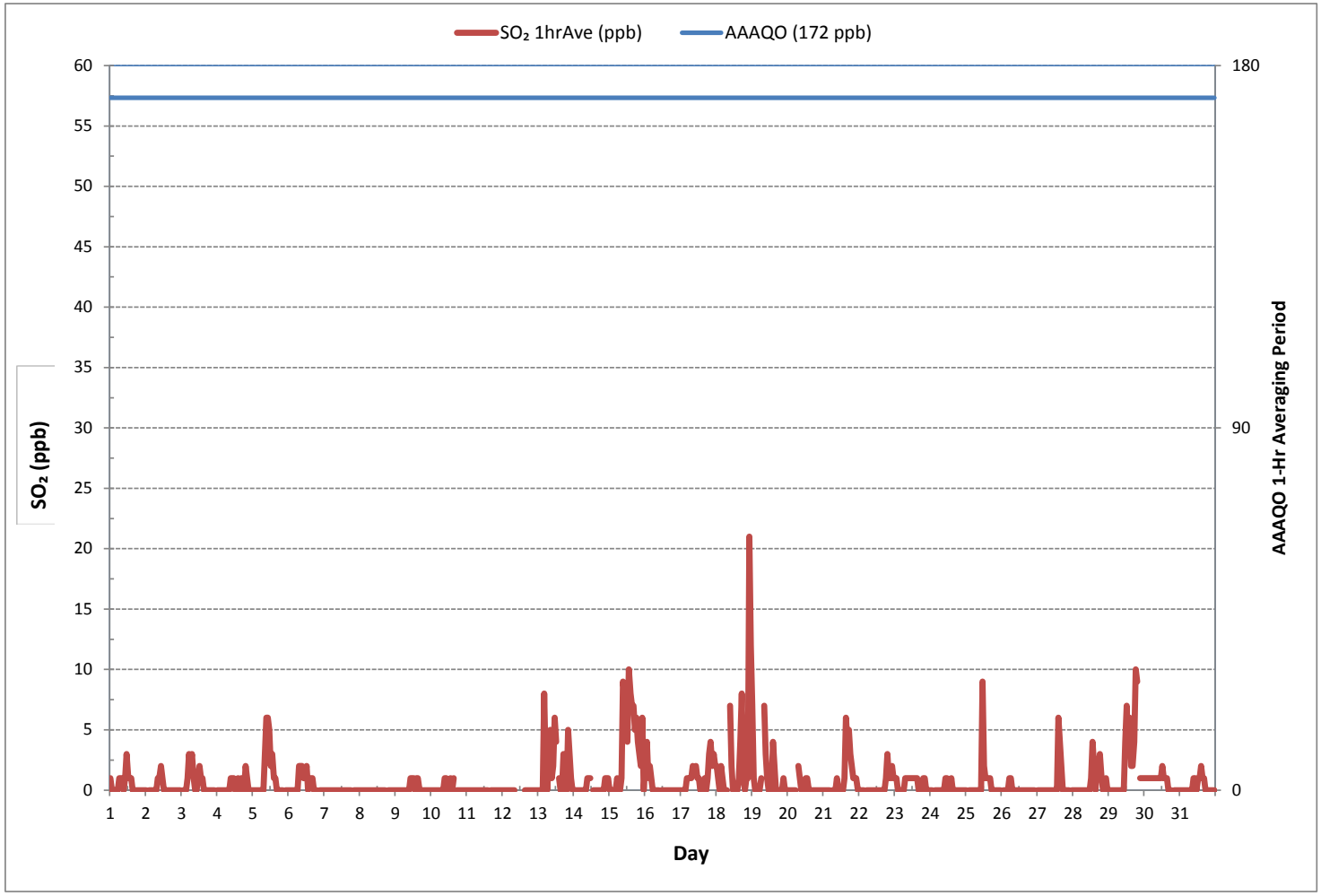


OBJECTIVE LIMIT: **ALBERTA ENVIRONMENT:** 1-HR 172 ppb | 24-HR 48 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:		0				
NUMBER OF 24-HR EXCEEDANCES:		0				
NUMBER OF NON-ZERO READINGS:		222				
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	1	ON DAY	1
MAXIMUM 1-HR AVERAGE:	21	ppb	@ HOUR	22	ON DAY	18
MAXIMUM 24-HR AVERAGE:	3	ppb			ON DAY	15
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:		744	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:		100.0	%
STANDARD DEVIATION:	2		MONTHLY AVERAGE:		1	ppb

SULPHUR DIOXIDE Hourly Averages (SO_2 ppb)



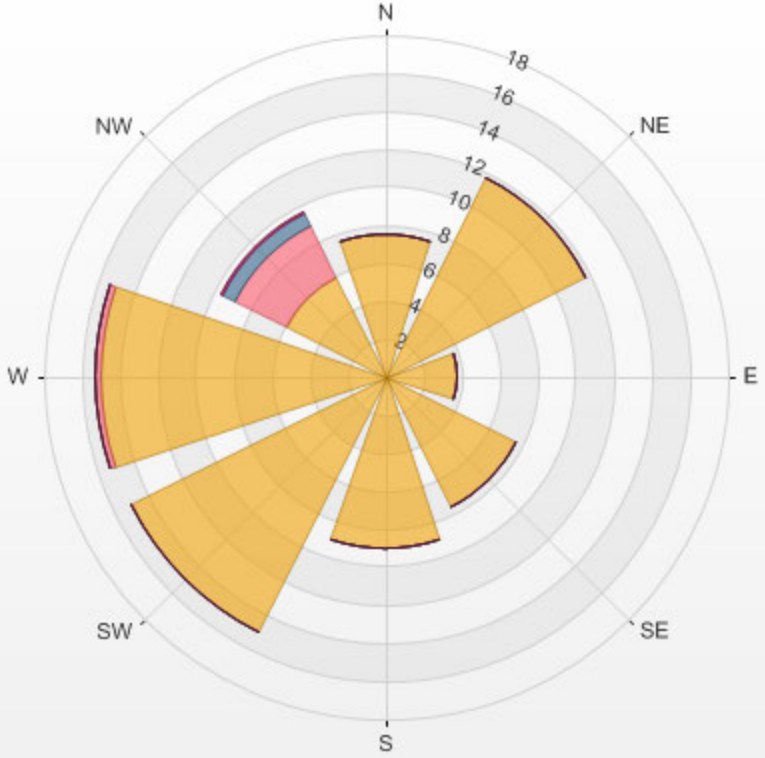
Wind: LICA MASKWA
Poll.: LICA MASKWA-SO2[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 20.11% Calm Avg: 0.38 [ppb]

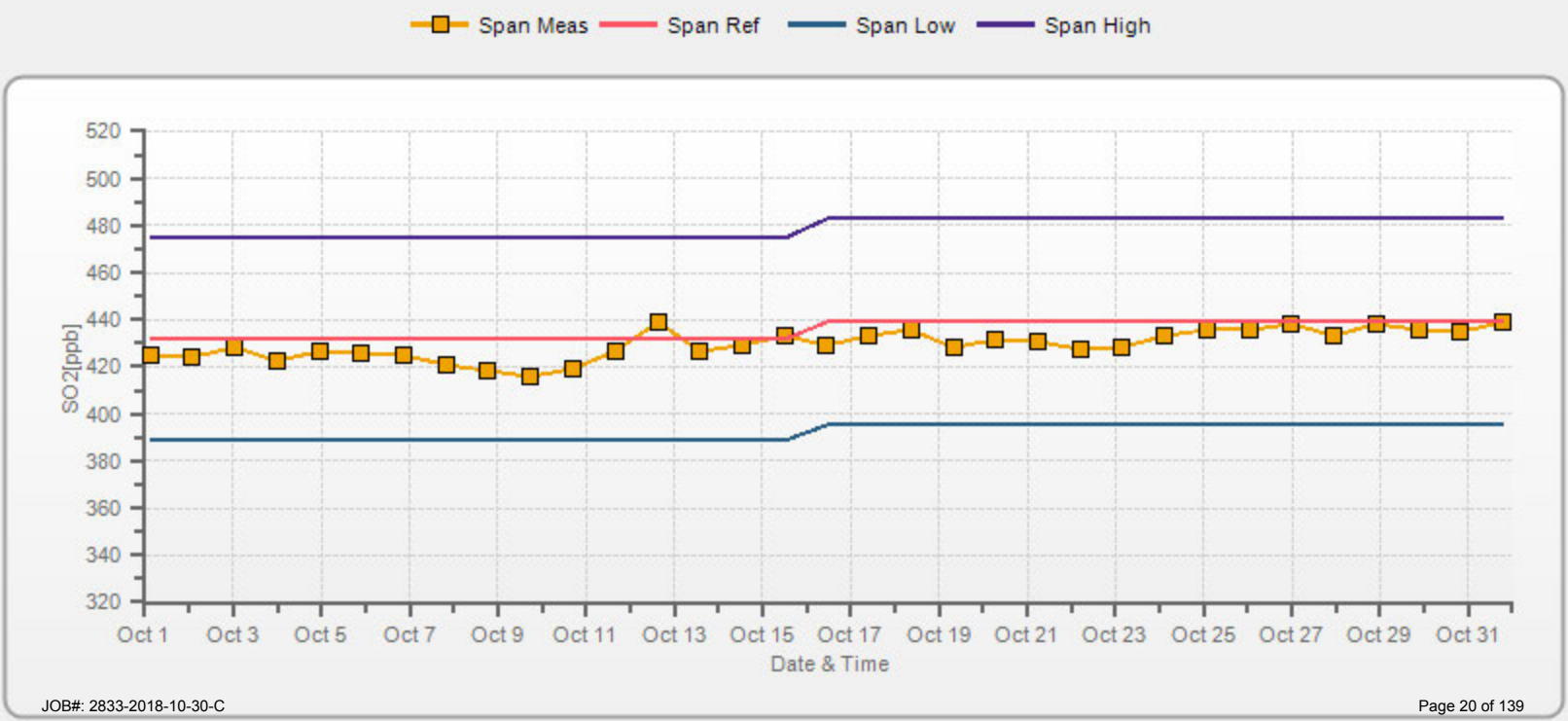
Direction	0.0-4.4	4.4-8.8	8.8-13.2	13.2-17.6	17.6-22.0	>22.0	Total
N	7.5	0.0	0.0	0.0	0.0	0.0	7.5
NE	11.8	0.0	0.0	0.0	0.0	0.0	11.8
E	3.8	0.0	0.0	0.0	0.0	0.0	3.8
SE	7.7	0.0	0.0	0.0	0.0	0.0	7.7
S	9.1	0.0	0.0	0.0	0.0	0.0	9.1
SW	15.0	0.0	0.0	0.0	0.0	0.0	15.0
W	15.0	0.3	0.0	0.0	0.0	0.0	15.3
NW	5.8	3.1	0.7	0.0	0.1	0.0	9.8
Summary	75.6	3.4	0.7	0.0	0.1	0.0	79.9

% Icon Classes (ppb)	76 0.0-4.4	3 4.4-8.8	1 8.8-13.2	0 13.2-17.6	0 17.6-22.0	0 >22.0

LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 20.11% Calm Poll Avg: 0.38[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 18/10 Type: Span



HYDROGEN SULPHIDE

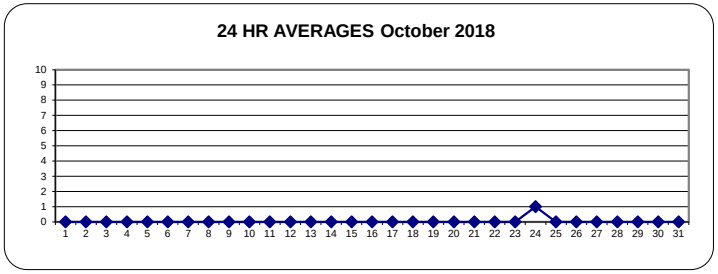
Maxxam
A Bureau Veritas Group Company

HYDROGEN SULPHIDE Hourly Averages (H_2S 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	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	24
2	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	**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	24
4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	**S**	0	0	1	0	24
5	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
6	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	**S**	0	0	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	**S**	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	**S**	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	**S**	0	0	0	0	0	1	0	1	0	24
10	1	1	1	2	1	0	0	0	0	1	0	0	0	0	0	0	**S**	0	0	0	0	0	0	0	0	2	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	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**C**	**C**	**C**	**C**	**C**	**C**	**C**	0	0	0	0	0	0	24
13	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	**S**	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	1	1	**S**	0	1	0	0	1	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	24
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	24
18	0	0	0	0	0	0	0	0	**S**	1	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	0	24
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	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	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	24
22	0	0	0	0	**S**	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
23	0	0	1	**S**	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	1	1	1	0	1	0	24
24	1	0	**S**	2	1	1	1	1	0	0	0	0	0	0	0	0	0	**3**	3	2	1	1	1	0	0	**3**	**1**	24
25	0	**S**	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	1	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	**S**	0	0	0	24
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**S**	0	0	1	0	24
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	**S**	1	1	0	1	0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**S**	0	0	0	0	1	0	24
30	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	24
HOURLY MAX	1	1	1	2	1	1	1	1	1	1	1	1	0	1	1	1	1	3	3	2	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				

STATUS FLAG CODES

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



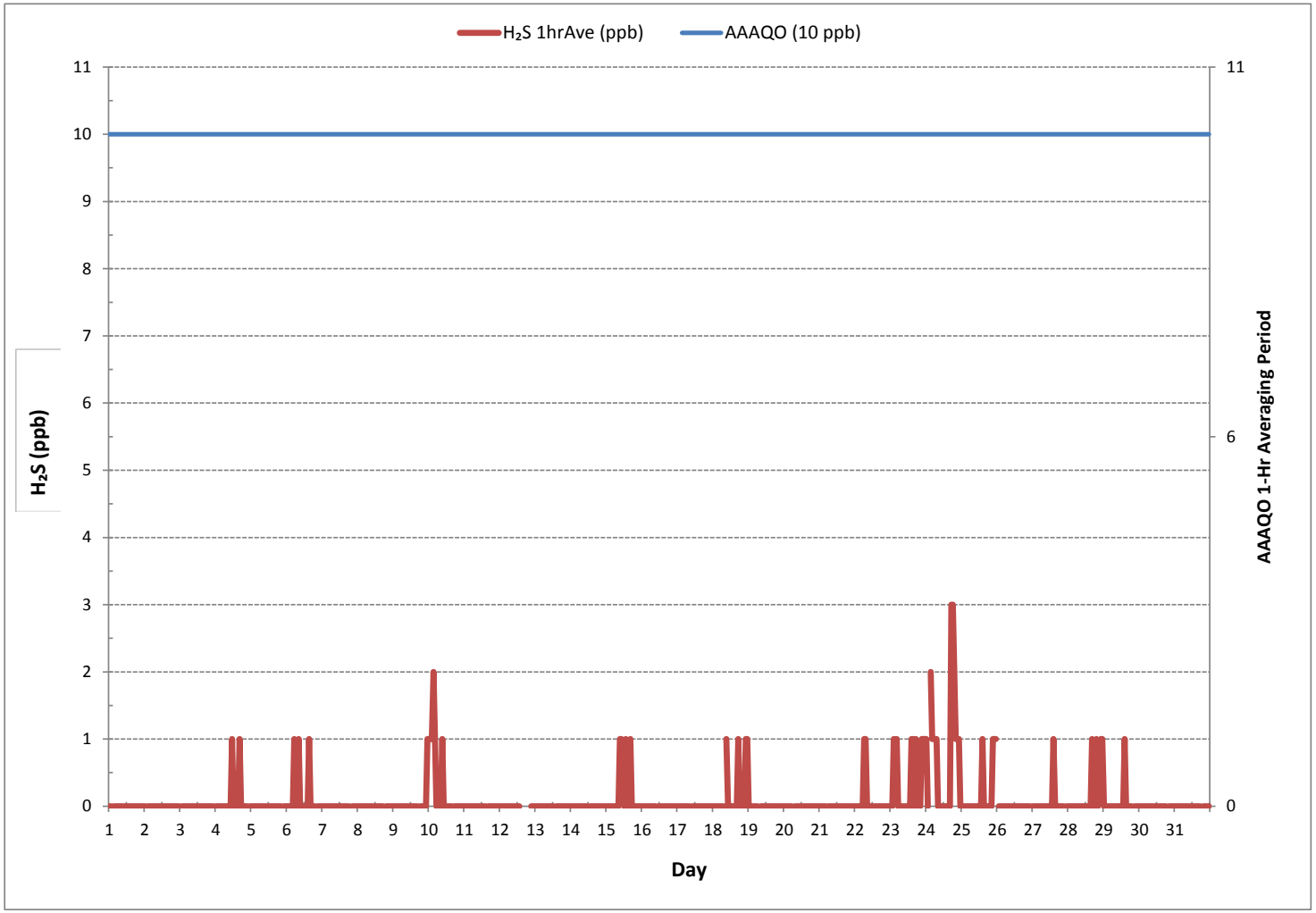
OBJECTIVE LIMIT: **ALBERTA ENVIRONMENT:** 1-HR 10 ppb | 24-HR 3 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	52					
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	3	ppb	@ HOUR	17	ON DAY	24
MAXIMUM 24-HR AVERAGE:	1	ppb			ON DAY	24

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

HYDROGEN SULPHIDE Hourly Averages (H_2S ppb)



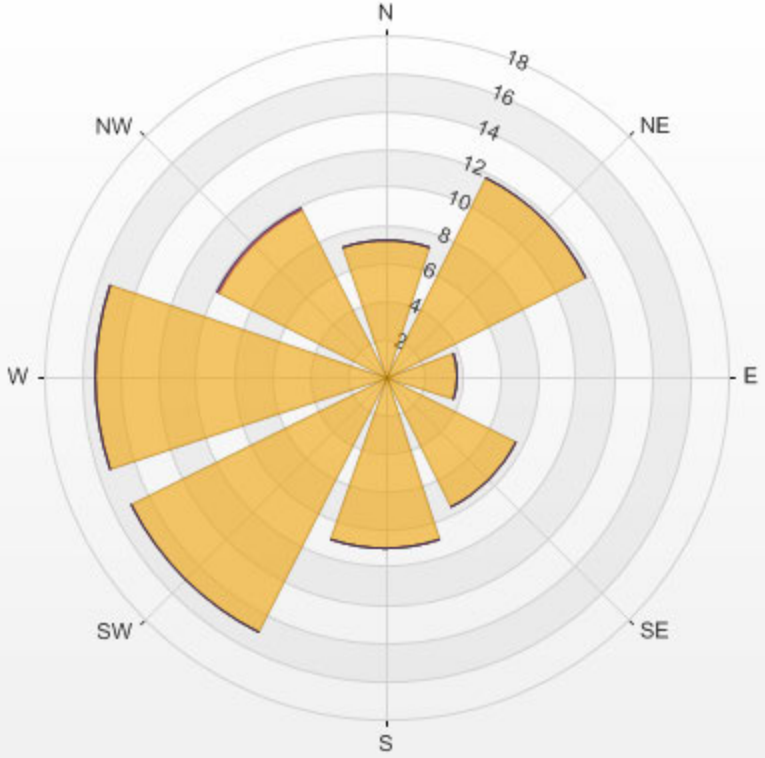
Wind: LICA MASKWA
Poll.: LICA MASKWA-H2S[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 20.14% Calm Avg: 0.29 [ppb]

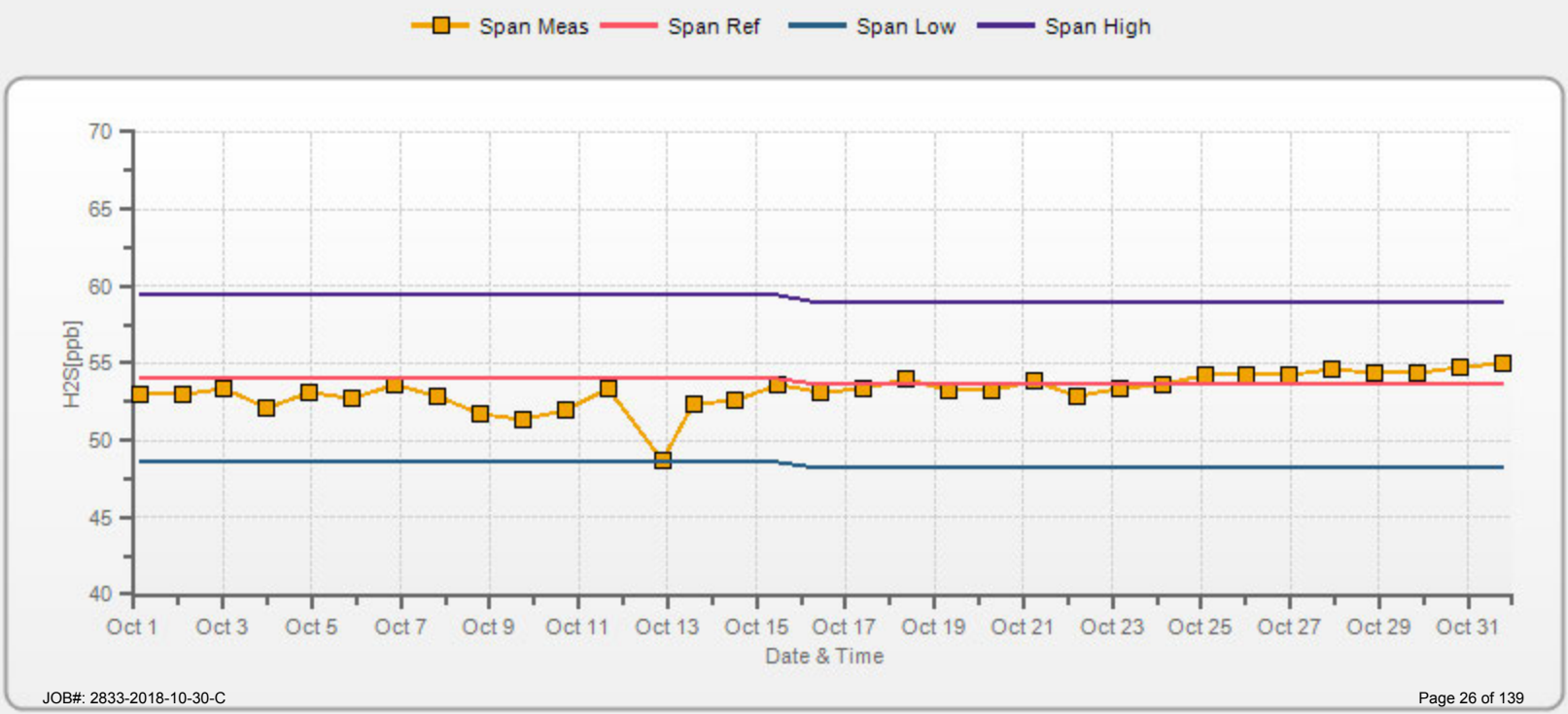
Direction	0.0-1.3	1.3-2.7	2.7-4.0	>4.0	Total
N	7.2	0.0	0.0	0.0	7.2
NE	11.8	0.0	0.0	0.0	11.8
E	3.8	0.0	0.0	0.0	3.8
SE	7.7	0.0	0.0	0.0	7.7
S	9.1	0.0	0.0	0.0	9.1
SW	15.0	0.0	0.0	0.0	15.0
W	15.3	0.0	0.0	0.0	15.3
NW	9.8	0.1	0.0	0.0	9.9
Summary	79.7	0.1	0.0	0.0	79.9

% Icon Classes (ppb)	80 0.0-1.3	0 1.3-2.7	0 2.7-4.0	0 >4.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 20.14% Calm Poll Avg: 0.29[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 18/10 Type: Span



TOTAL HYDROCARBON

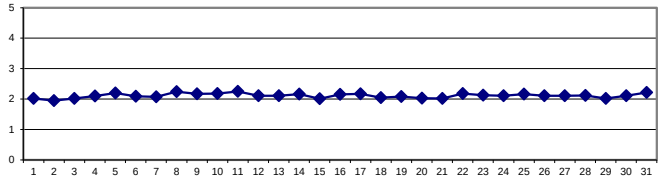
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST) / HR END (MST)	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
DAY																											
1	2.02	2.02	S	2.01	2.01	2.03	2.05	2.07	2.12	2.16	2.11	2.04	1.99	1.99	1.98	1.97	1.97	1.98	1.99	1.98	1.99	1.99	1.99	2.01	1.97	2.16	2.02	24
2	2.01	S	2.00	1.98	1.95	1.95	1.96	1.95	1.95	1.94	1.94	1.94	1.94	1.93	1.94	1.94	1.93	1.94	1.94	1.95	1.95	1.96	1.97	1.98	1.93	2.01	1.95	24
3	S	1.99	1.98	1.99	1.97	1.97	1.96	2.01	1.93	C	C	Y	Y	Y	C	C	C	C	2.13	2.10	2.10	2.08	2.10	S	1.93	2.13	2.02	21
4	2.07	2.07	2.06	2.05	2.06	2.08	2.11	2.12	2.11	2.05	2.07	2.04	2.02	2.04	2.04	2.05	2.04	2.07	2.17	2.25	2.25	2.24	S	2.28	2.02	2.28	2.10	24
5	2.32	2.37	2.41	2.37	2.33	2.30	2.33	2.30	2.29	2.23	2.16	2.08	2.07	2.05	2.02	2.03	2.10	2.23	2.09	2.09	2.10	S	2.10	2.13	2.02	2.41	2.20	24
6	2.10	2.12	2.16	2.12	2.14	2.09	2.09	2.10	2.07	2.06	2.06	2.06	2.06	2.05	2.11	2.06	2.06	2.08	2.11	2.11	S	2.14	2.13	2.09	2.05	2.16	2.09	24
7	2.07	2.09	2.10	2.10	2.09	2.09	2.09	2.10	2.09	2.08	2.07	2.07	2.07	2.06	2.05	2.06	2.06	2.05	2.06	S	2.05	2.07	2.06	2.07	2.05	2.10	2.07	24
8	2.06	2.08	2.09	2.09	2.09	2.09	2.10	2.11	2.10	2.09	2.08	2.07	2.06	2.05	2.04	2.03	2.05	2.05	S	2.08	2.11	2.34	3.85	3.84	2.03	3.85	2.24	24
9	2.46	2.24	2.21	2.22	2.21	2.23	2.20	2.22	2.23	2.12	2.12	2.09	2.09	2.08	2.10	2.10	2.08	S	2.11	2.13	2.12	2.13	2.15	2.26	2.08	2.46	2.17	24
10	2.28	2.22	2.20	2.21	2.18	2.20	2.24	2.24	2.29	2.20	2.16	2.14	2.09	2.08	2.08	2.09	S	2.08	2.11	2.14	2.17	2.24	2.27	2.26	2.08	2.29	2.18	24
11	2.28	2.29	2.32	2.33	2.34	2.35	2.25	2.21	2.20	2.28	2.39	2.46	2.35	2.31	2.27	S	2.14	2.13	2.13	2.12	2.18	2.16	2.16	2.16	2.12	2.46	2.25	24
12	2.14	2.12	2.07	2.06	2.07	2.12	2.13	2.17	2.06	C1	C1	C1	C1	C1	C1	2.12	2.08	2.09	2.12	2.15	2.15	2.15	2.15	2.12	2.06	2.17	2.11	18
13	2.15	2.13	2.14	2.14	2.16	2.13	2.11	2.11	2.12	2.12	2.09	2.06	2.04	S	2.04	2.06	2.06	2.07	2.09	2.12	2.14	2.13	2.22	2.17	2.04	2.22	2.11	24
14	2.19	2.19	2.21	2.23	2.22	2.30	2.68	2.52	2.33	2.27	2.17	2.07	S	2.02	2.00	2.00	1.98	2.01	2.03	2.03	2.03	2.05	2.08	2.11	1.98	2.68	2.16	24
15	2.00	1.96	1.95	1.95	1.97	1.99	1.97	1.98	2.01	2.09	2.06	S	1.95	1.99	1.96	1.96	2.01	2.00	2.09	2.12	2.07	2.04	2.05	2.04	1.95	2.12	2.01	24
16	2.06	2.05	2.06	2.08	2.10	2.19	2.22	2.22	2.20	2.15	S	2.17	2.23	2.12	2.13	2.09	2.14	2.13	2.08	2.09	2.07	2.29	2.25	2.29	2.05	2.29	2.15	24
17	2.32	2.35	2.33	2.30	2.35	2.32	2.29	2.28	2.30	S	2.41	2.32	2.05	1.97	2.00	2.01	1.96	1.91	1.98	2.01	2.09	2.12	2.09	2.15	1.91	2.41	2.17	24
18	2.17	2.11	2.09	2.34	2.31	2.13	2.03	2.00	S	2.03	1.97	1.91	1.90	1.86	1.87	1.91	1.96	2.19	1.98	1.99	2.02	2.05	2.19	2.23	1.86	2.34	2.05	24
19	2.11	2.01	2.02	2.01	2.02	2.03	2.05	S	2.08	2.05	2.06	2.07	2.07	2.08	2.07	2.07	2.09	2.12	2.12	2.14	2.14	2.20	2.16	2.13	2.01	2.20	2.08	24
20	2.12	2.11	2.12	2.11	2.11	2.12	S	2.08	2.13	2.15	2.18	2.19	2.15	1.99	1.87	1.82	1.86	1.87	1.90	1.94	1.98	1.99	2.01	1.98	1.82	2.19	2.03	24
21	1.98	2.00	2.03	2.04	2.04	S	2.06	2.06	2.04	2.05	2.02	1.97	1.95	1.92	1.93	1.96	1.99	2.07	2.06	2.01	2.03	2.07	2.05	2.06	1.92	2.07	2.02	24
22	2.06	2.09	2.18	2.36	S	2.17	2.17	2.18	2.24	2.19	2.15	2.22	2.22	2.12	2.06	2.03	2.15	2.26	2.31	2.25	2.19	2.19	2.22	2.23	2.03	2.36	2.18	24
23	2.23	2.22	2.25	S	2.27	2.19	2.12	2.16	2.18	2.17	2.20	2.13	2.07	1.99	1.99	1.97	2.02	2.06	2.08	2.08	2.09	2.16	2.14	2.16	1.97	2.27	2.13	24
24	2.17	2.13	S	2.16	2.16	2.15	2.17	2.21	2.15	2.12	2.10	2.07	2.00	2.00	1.98	1.96	2.01	2.08	2.09	2.14	2.15	2.17	2.15	2.19	1.96	2.21	2.11	24
25	2.15	S	2.19	2.20	2.20	2.19	2.17	2.24	2.19	2.22	2.11	2.15	2.08	2.02	2.05	2.07	2.10	2.11	2.14	2.24	2.26	2.28	2.20	2.20	2.02	2.28	2.16	24
26	S	2.19	2.20	2.26	2.31	2.28	2.24	2.16	2.11	2.08	2.03	2.00	1.94	1.92	1.93	1.93	1.96	2.02	2.07	2.11	2.13	2.29	2.24	S	1.92	2.31	2.11	24
27	2.27	2.40	2.31	2.23	2.19	2.16	2.27	2.29	2.11	2.01	2.01	2.01	2.00	1.99	2.05	2.05	2.04	2.02	2.03	2.01	2.00	2.01	S	2.01	1.99	2.40	2.11	24
28	2.02	2.04	2.06	2.09	2.13	2.24	2.29	2.26	2.29	2.19	2.09	2.13	2.14	2.09	2.09	2.06	2.10	2.09	2.11	2.07	2.04	S	2.02	2.02	2.02	2.29	2.12	24
29	1.99	1.96	1.94	1.95	1.94	1.94	1.94	1.96	1.97	1.99	1.99	2.00	2.02	2.09	2.09	2.09	2.08	2.12	2.10	2.06	S	2.05	2.08	2.10	1.94	2.12	2.02	24
30	2.09	2.10	2.09	2.07	2.08	2.09	2.09	2.06	2.04	2.05	2.05	2.24	2.09	2.11	2.12	2.12	2.14	2.13	2.07	S	2.09	2.10	2.22	2.31	2.04	2.31	2.11	24
31	2.31	2.32	2.35	2.30	2.26	2.23	2.22	2.23	2.24	2.29	2.28	2.16	2.20	2.14	2.16	2.14	2.16	2.15	S	2.14	2.19	2.23	2.19	2.12	2.12	2.35	2.22	24
HOURLY MAX	2.46	2.40	2.41	2.37	2.35	2.35	2.68	2.52	2.33	2.29	2.41	2.46	2.35	2.31	2.27	2.14	2.16	2.26	2.31	2.25	2.26	2.34	3.85	3.84				
HOURLY AVG	2.14	2.14	2.14	2.15	2.14	2.15	2.15	2.15	2.14	2.12	2.11	2.10	2.07	2.04	2.04	2.03	2.05	2.07	2.08	2.09	2.10	2.14	2.19	2.20				

STATUS FLAG CODES

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

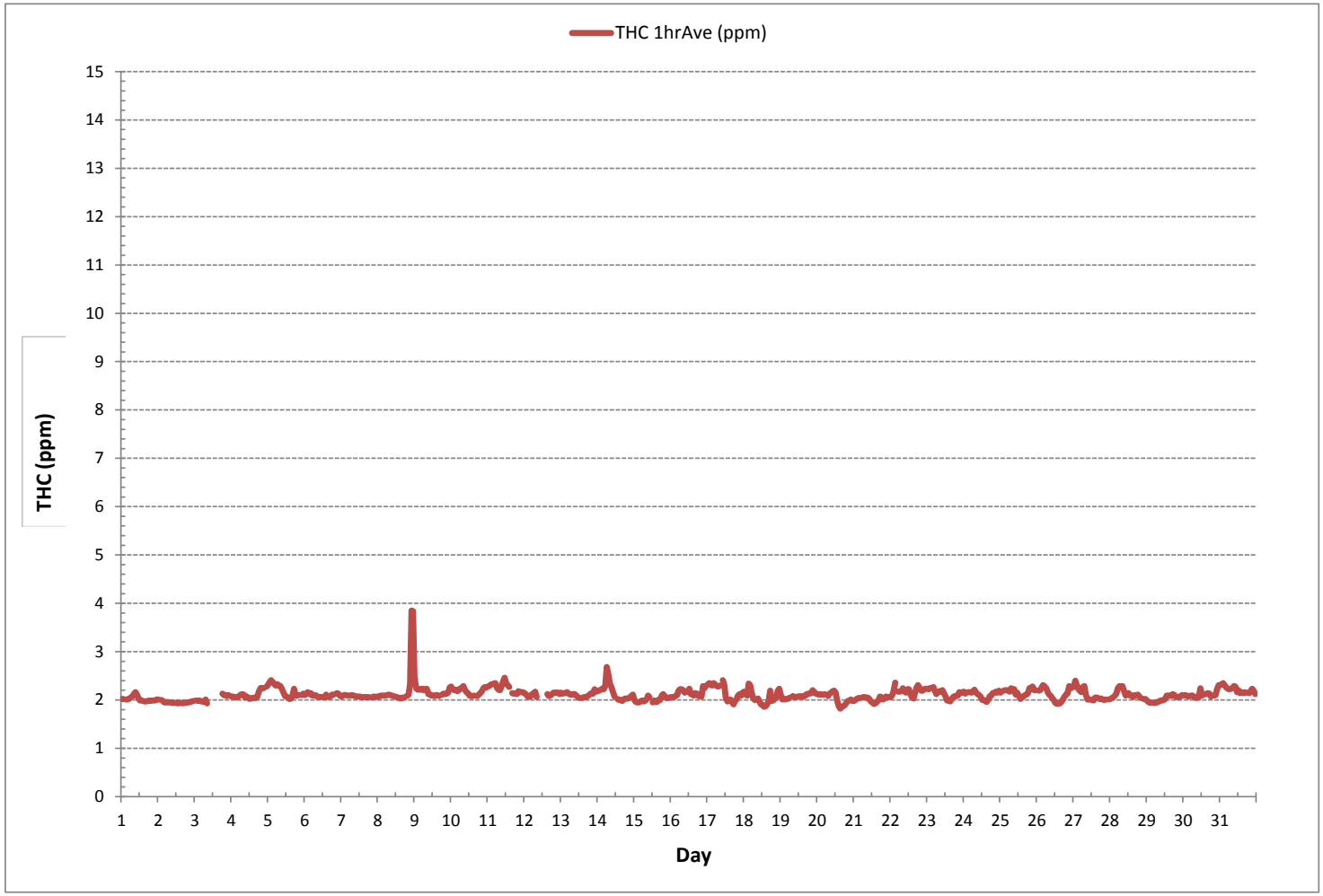
24 HR AVERAGES October 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			697				
MINIMUM 1-HR AVERAGE	1.82	ppm	@ HOUR	15	ON DAY	20	
MAXIMUM 1-HR AVERAGE:	3.85	ppm	@ HOUR	22	ON DAY	8	
MAXIMUM 24-HR AVERAGE:	2.25	ppm			ON DAY	11	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:			735	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:			98.8	%
STANDARD DEVIATION:	0.14		MONTHLY AVERAGE:			2.11	ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



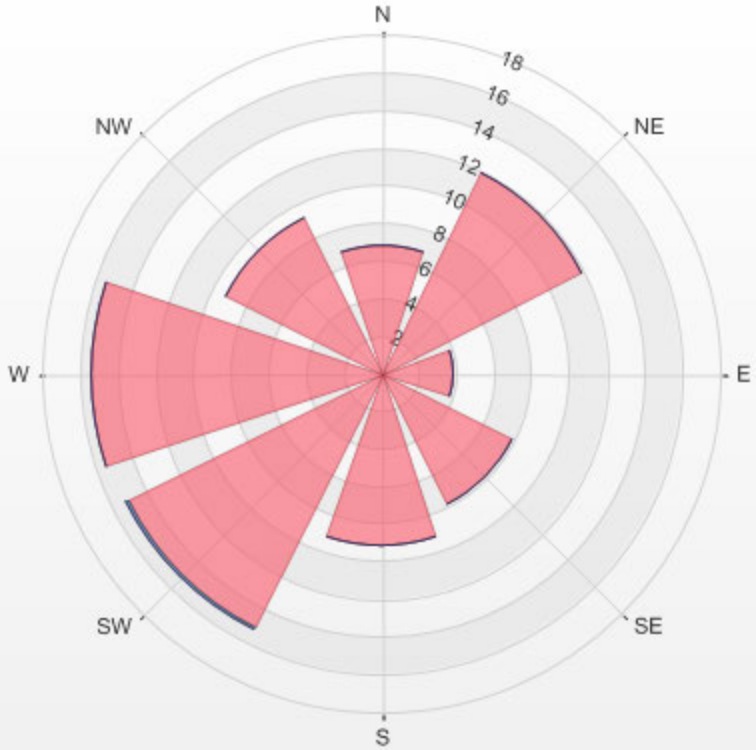
Wind: LICA MASKWA
Poll.: LICA MASKWA-THC[ppm]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 20.37% Calm Avg: 2.18 [ppm]

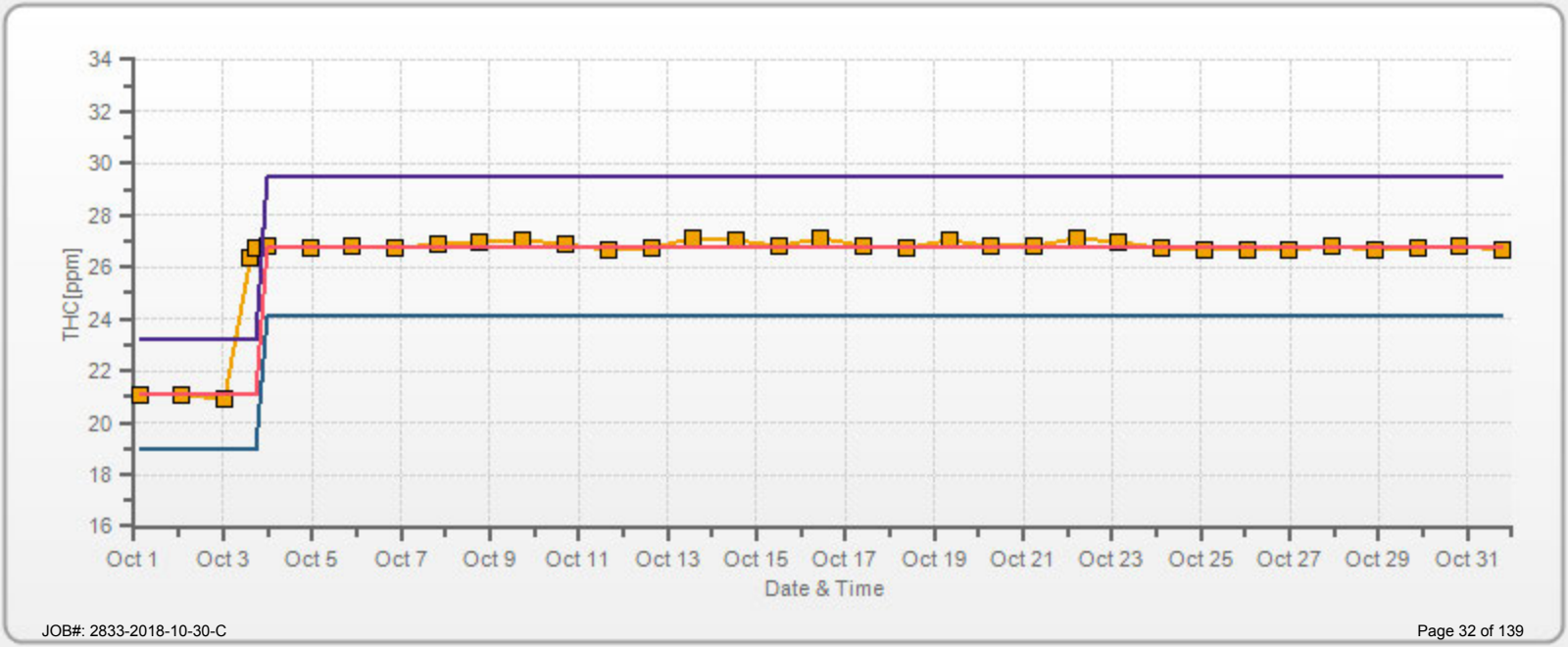
Direction	0.0-1.3	1.3-2.6	2.6-3.9	>3.9	Total
N	0.0	6.9	0.0	0.0	6.9
NE	0.0	11.9	0.0	0.0	11.9
E	0.0	3.9	0.0	0.0	3.9
SE	0.0	7.8	0.0	0.0	7.8
S	0.0	9.2	0.0	0.0	9.2
SW	0.0	15.1	0.1	0.0	15.2
W	0.0	15.5	0.0	0.0	15.5
NW	0.0	9.3	0.0	0.0	9.3
Summary	0.0	79.5	0.1	0.0	79.6

%	Icon	Classes (ppm)	0	0.0-1.3	79	1.3-2.6	0	2.6-3.9	0	>3.9

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 20.37% Calm Poll Avg: 2.18[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 18/10 Type: Span



METHANE

Maxxam
A Bureau Veritas Group Company

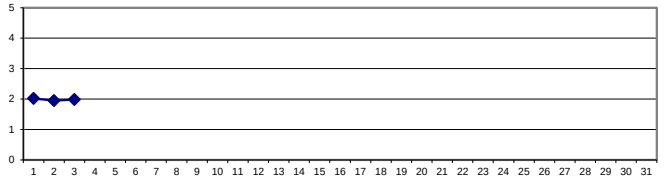
METHANE Hourly Averages (CH_4 ppm)

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	2.02	2.02	S	2.01	2.01	2.03	2.05	2.07	2.12	**2.16**	2.11	2.04	1.99	1.99	1.98	1.97	1.97	1.98	1.99	1.98	1.99	1.99	1.99	2.01	1.97	**2.16**	**2.02**	24
2	2.01	S	2.00	1.98	1.95	1.95	1.96	1.95	1.95	1.94	1.94	1.94	1.94	**1.93**	1.94	1.94	1.93	1.94	1.94	1.95	1.95	1.96	1.97	1.98	**1.93**	2.01	1.95	24
3	S	1.99	1.98	1.99	1.97	1.97	1.96	2.01	1.93	C	C	-	-	-	-	-	-	-	-	-	-	-	-	-	1.93	2.01	1.98	11
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
HOURLY MAX	2.02	2.02	2.00	2.01	2.01	2.03	2.05	2.07	2.12	2.16	2.11	2.04	1.99	1.99	1.98	1.97	1.97	1.98	1.99	1.98	1.99	1.99	1.99	2.01				
HOURLY AVG	2.02	2.01	1.99	1.99	1.98	1.98	1.99	2.01	2.00	2.05	2.03	1.99	1.97	1.96	1.96	1.96	1.95	1.96	1.97	1.97	1.97	1.98	1.98	2.00				

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

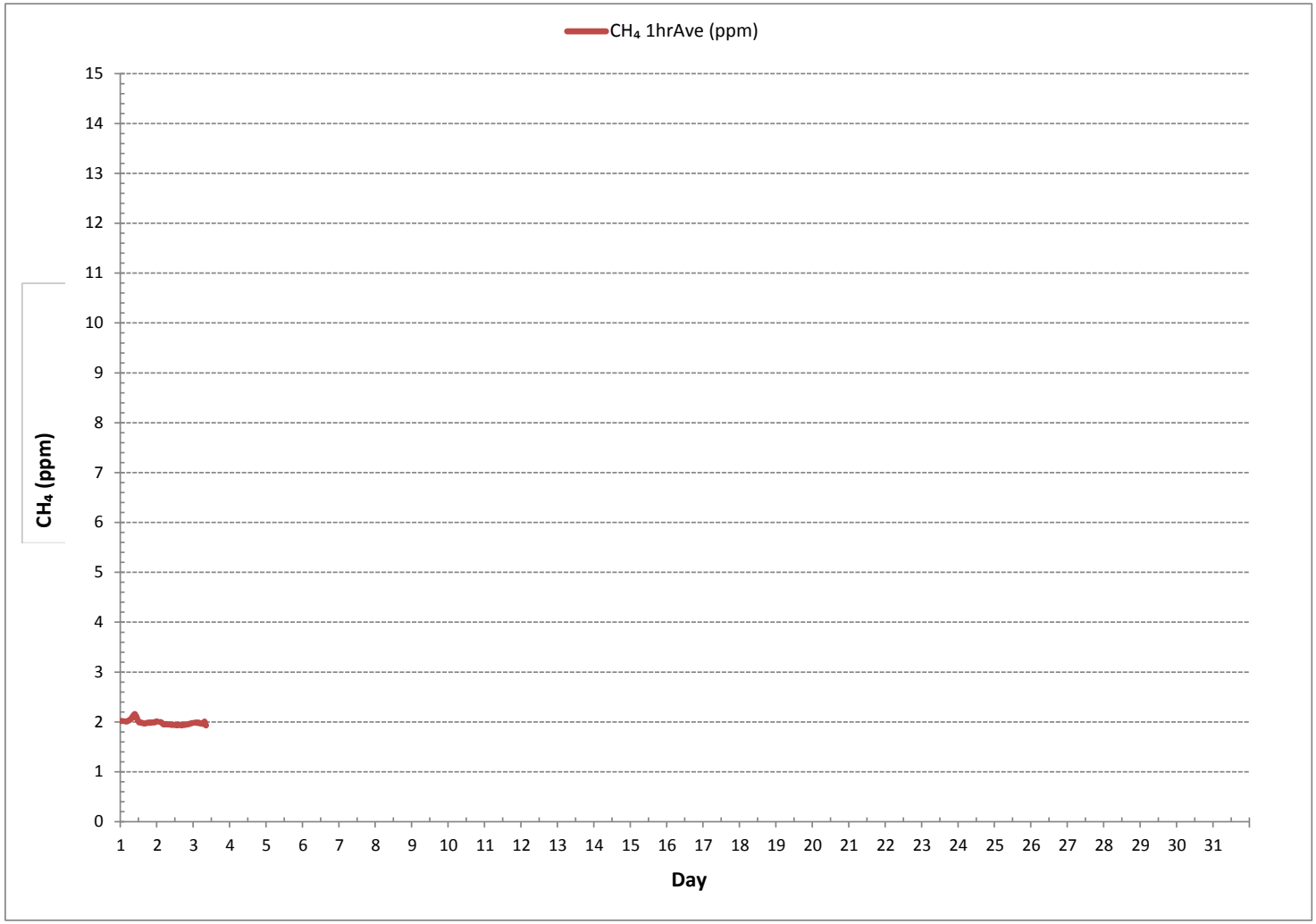
24 HR AVERAGES October 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			54				
MINIMUM 1-HR AVERAGE	1.93	ppm	@ HOUR	13	ON DAY	2	
MAXIMUM 1-HR AVERAGE:	2.16	ppm	@ HOUR	9	ON DAY	1	
MAXIMUM 24-HR AVERAGE:	2.02	ppm			ON DAY	1	
IZS CALIBRATION TIME:	3	hrs	OPERATIONAL TIME:			59	hrs
MONTHLY CALIBRATION TIME:	2	hrs	AMD OPERATION UPTIME:			7.9	%
STANDARD DEVIATION:	0.05		MONTHLY AVERAGE:			1.99	ppm

METHANE Hourly Averages (CH_4 ppm)



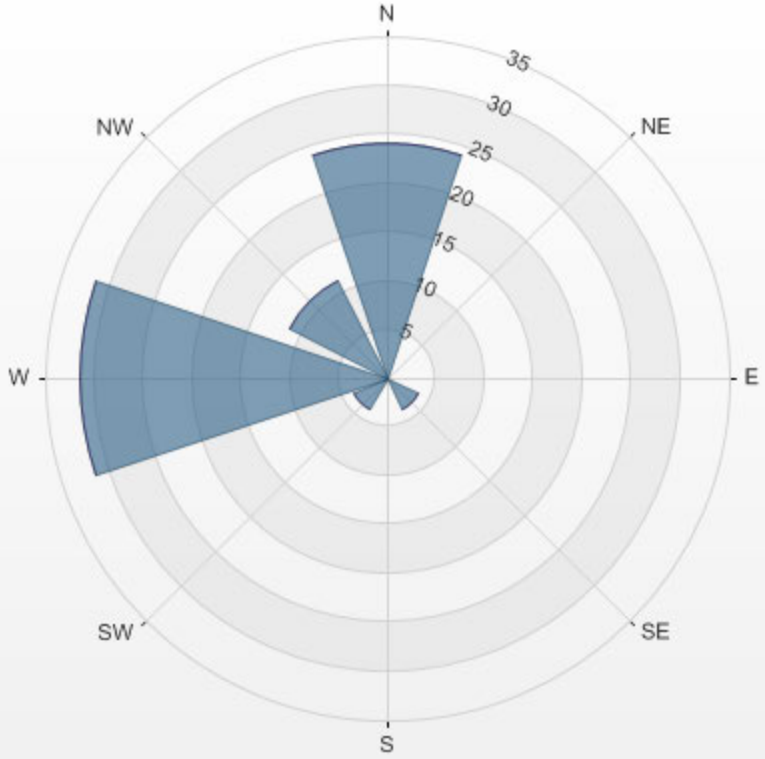
Wind: LICA MASKWA
Poll.: LICA MASKWA-CH4[ppm]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 25.93% Calm Avg: 2.03 [ppm]

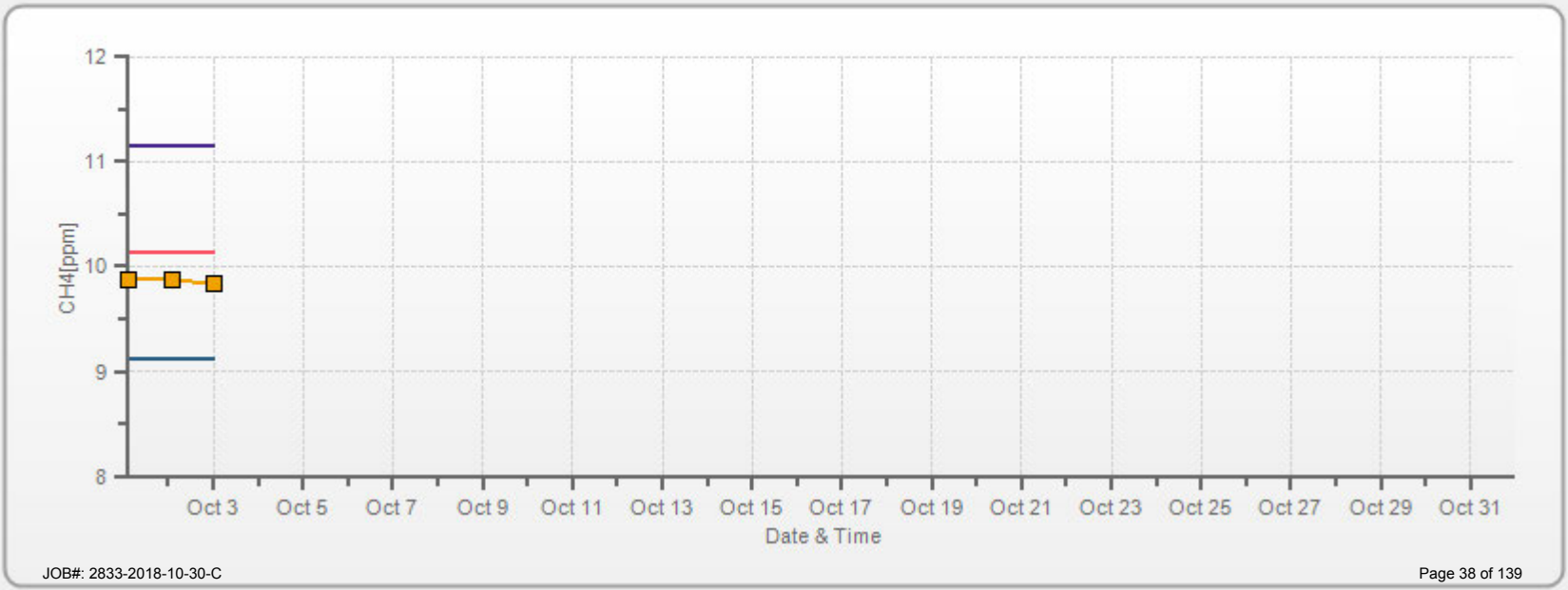
Direction	0.0-0.7	0.7-1.4	1.4-2.2	>2.2	Total
N	0.0	0.0	24.1	0.0	24.1
NE	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0
SE	0.0	0.0	3.7	0.0	3.7
S	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	3.7	0.0	3.7
W	0.0	0.0	31.5	0.0	31.5
NW	0.0	0.0	11.1	0.0	11.1
Summary	0.0	0.0	74.1	0.0	74.1

%	Icon	Classes (ppm)							
0		0.0-0.7	0		0.7-1.4	74		1.4-2.2	0		>2.2

LICA MASKWA Poll.: LICA MASKWA-CH4[ppm] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 25.93% Calm Poll Avg: 2.03[ppm]



CH4[ppm] Calibration: LICA MASKWA Monthly: 18/10 Type: Span



NON-METHANE HYDROCARBON

Maxxam
A Bureau Veritas Group Company

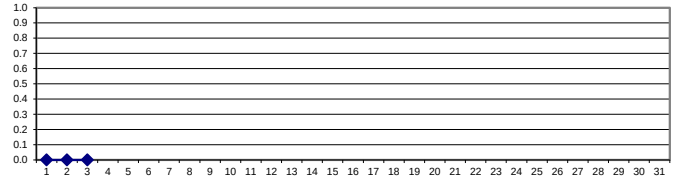
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	0.00	0.00	0.00	**C**	**C**	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	11
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
HOURLY MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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

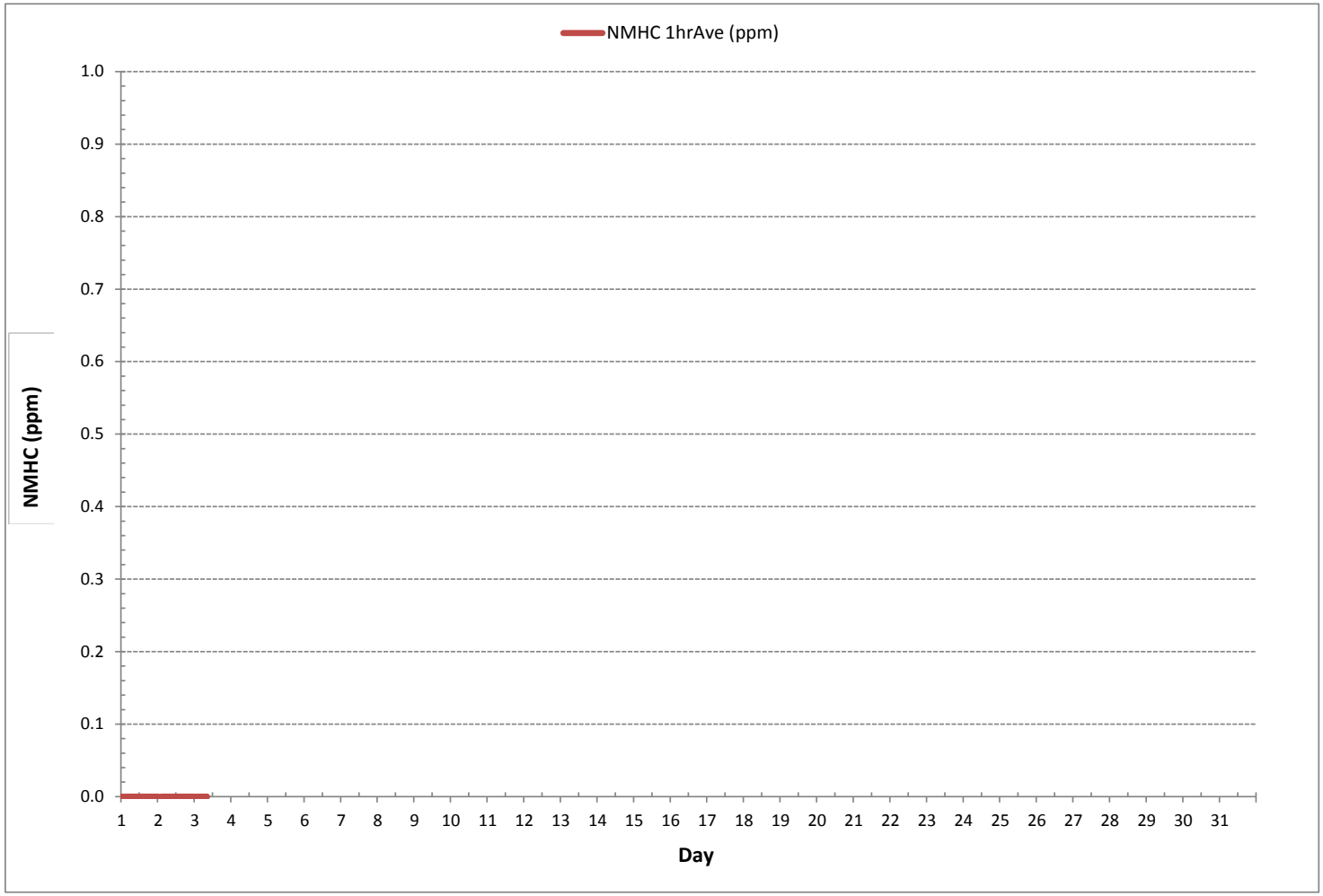
24 HR AVERAGES October 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			0				
MINIMUM 1-HR AVERAGE	0.00	ppm	@ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	0.00	ppm	@ HOUR	0	ON DAY	1	
MAXIMUM 24-HR AVERAGE:	0.00	ppm			ON DAY	1	
IZS CALIBRATION TIME:	3	hrs	OPERATIONAL TIME:			59	hrs
MONTHLY CALIBRATION TIME:	2	hrs	AMD OPERATION UPTIME:			7.9	%
STANDARD DEVIATION:	0.00		MONTHLY AVERAGE:			0.00	ppm

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



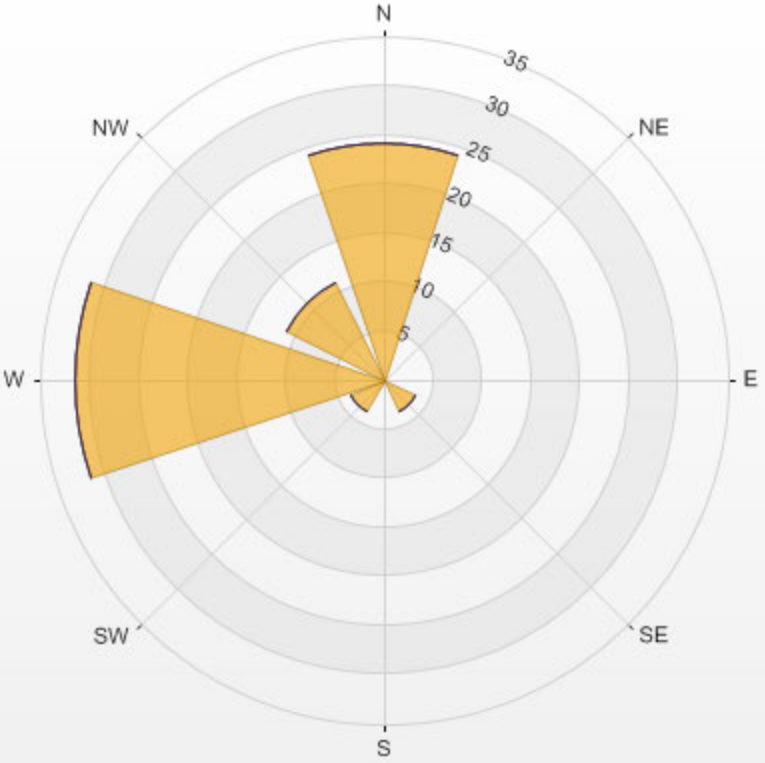
Wind: LICA MASKWA
Poll.: LICA MASKWA-NMHC[ppm]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 25.93% Calm Avg: 0.00 [ppm]

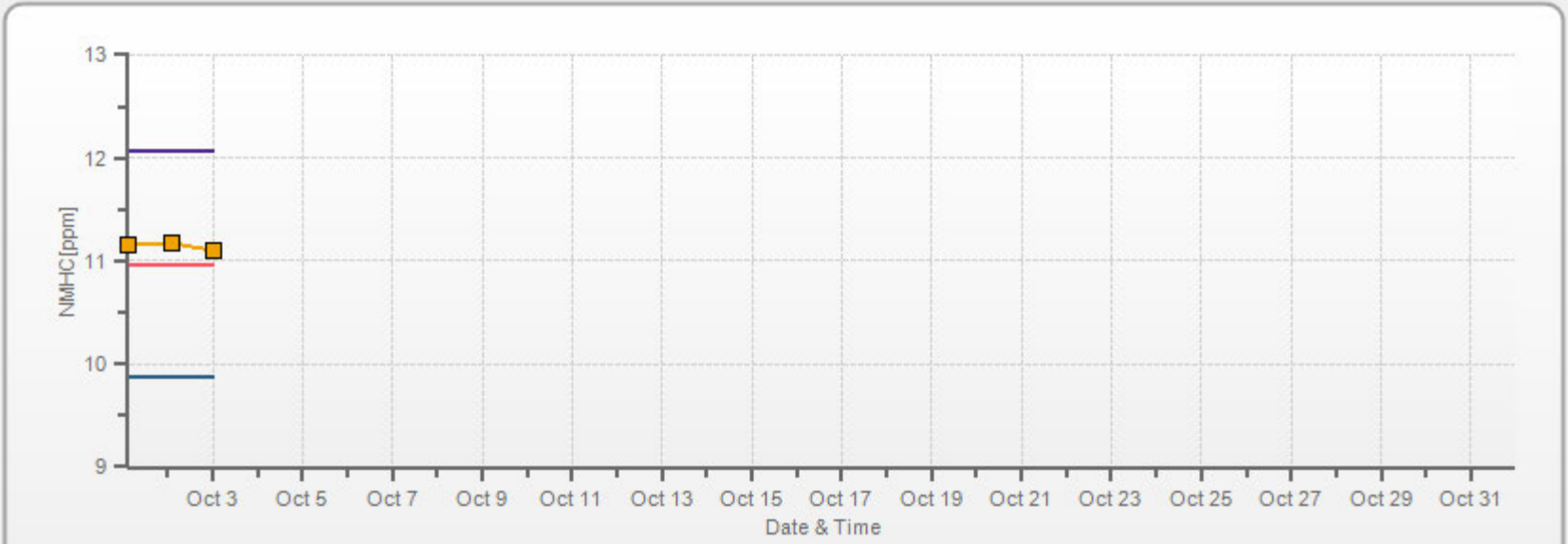
Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	24.1	0.0	0.0	0.0	24.1
NE	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0
SE	3.7	0.0	0.0	0.0	3.7
S	0.0	0.0	0.0	0.0	0.0
SW	3.7	0.0	0.0	0.0	3.7
W	31.5	0.0	0.0	0.0	31.5
NW	11.1	0.0	0.0	0.0	11.1
Summary	74.1	0.0	0.0	0.0	74.1

% Icon Classes (ppm)	74 0.0-0.7	0 0.7-1.3	0 1.3-2.0	0 >2.0

LICA MASKWA Poll.: LICA MASKWA-NMHC[ppm] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 25.93% Calm Poll Avg: 0.00[ppm]



NMHC[ppm] Calibration: LICA MASKWA Monthly: 18/10 Type: Span



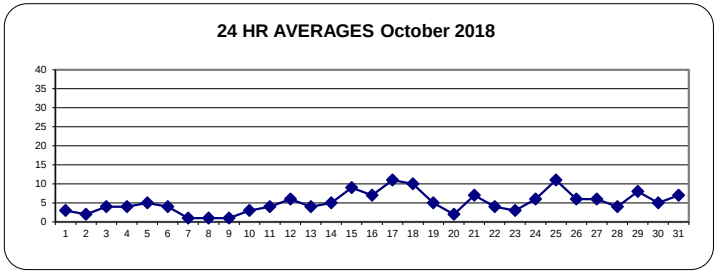
OXIDES OF NITROGEN

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST) / HR END (MST)	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
DAY																												
1	2	**0**	**S**	1	1	2	4	5	5	3	4	7	5	4	2	1	1	1	1	1	1	3	1	3	**0**	7	3	24
2	2	**S**	5	3	2	2	4	3	3	2	6	4	1	0	0	3	0	4	0	1	2	1	1	1	0	6	2	24
3	**S**	3	2	3	14	29	14	9	2	1	0	3	3	2	2	0	0	1	1	0	1	0	0	**S**	0	29	4	24
4	2	1	1	1	1	11	15	7	4	3	4	4	2	2	2	1	2	1	2	8	5	2	**S**	5	1	15	4	24
5	5	5	4	4	4	6	11	13	16	12	9	9	3	4	3	3	1	2	2	3	1	**S**	3	2	1	16	5	24
6	1	6	6	1	1	1	3	11	10	9	5	5	7	1	5	3	3	1	1	2	**S**	3	3	1	1	11	4	24
7	1	1	1	0	0	3	3	5	3	0	0	2	0	0	0	0	0	0	0	**S**	1	0	0	1	0	5	1	24
8	1	1	1	1	1	1	1	1	3	3	2	1	1	1	0	0	1	2	**S**	4	1	2	2	1	0	4	1	24
9	0	0	0	0	0	0	1	1	12	0	3	2	3	1	2	2	0	**S**	0	0	0	0	2	1	0	12	1	24
10	0	0	0	0	0	0	0	7	18	8	5	1	0	2	1	3	**S**	3	1	1	4	4	5	5	0	18	3	24
11	3	3	2	4	3	4	5	10	3	3	4	5	4	4	3	**S**	4	3	3	2	3	4	4	4	2	10	4	24
12	4	5	6	6	6	9	16	14	6	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	2	2	4	2	1	1	1	16	6	24
13	1	1	1	1	19	2	1	6	9	2	4	12	7	**S**	3	1	1	5	0	1	11	7	4	2	0	19	4	24
14	1	2	4	3	4	7	20	11	8	7	6	3	**S**	2	1	1	1	2	3	3	4	7	9	7	1	20	5	24
15	2	1	1	0	2	9	1	1	3	20	16	**S**	9	20	14	12	16	7	18	9	11	13	11	1	0	20	9	24
16	5	9	3	5	5	8	7	22	27	6	**S**	8	8	4	4	3	4	4	3	2	2	9	4	4	2	27	7	24
17	4	13	5	6	9	17	23	35	29	**S**	15	12	6	1	1	2	5	4	7	12	14	9	9	8	1	35	**11**	24
18	6	5	4	11	11	7	5	7	**S**	17	6	3	2	1	2	4	9	22	6	1	8	15	43	26	1	43	10	24
19	14	5	2	2	2	3	14	**S**	19	7	3	3	2	2	9	6	5	1	0	0	0	7	2	0	0	19	5	24
20	0	0	0	1	1	1	**S**	6	3	5	6	5	5	3	2	1	1	1	0	0	0	0	1	0	0	6	2	24
21	0	2	1	1	2	**S**	12	28	4	2	2	1	1	0	2	15	11	13	13	10	7	9	9	7	0	28	7	24
22	3	3	3	2	**S**	4	5	3	4	5	3	4	4	3	2	2	2	3	6	7	3	4	5	5	2	7	4	24
23	4	4	2	**S**	5	3	3	4	5	5	4	3	3	3	3	2	2	2	1	4	5	2	2	1	1	5	3	24
24	1	1	**S**	2	2	1	5	6	12	13	14	11	9	9	5	13	2	2	3	2	4	2	3	5	1	14	6	24
25	1	**S**	23	7	14	1	5	**55**	22	8	7	23	6	6	4	6	5	4	9	3	9	7	3	17	1	**55**	11	24
26	**S**	4	5	12	9	14	23	25	10	2	1	2	2	1	1	1	1	3	1	2	4	3	3	**S**	1	25	6	24
27	8	8	8	6	5	5	10	16	10	5	4	1	1	1	17	9	9	1	4	3	3	3	**S**	4	1	17	6	24
28	2	5	7	5	1	2	4	4	15	5	2	2	4	10	6	1	5	5	9	1	1	**S**	2	2	1	15	4	24
29	2	2	2	2	7	4	6	7	8	8	4	12	17	12	18	8	9	10	22	17	**S**	5	6	6	2	22	8	24
30	5	5	5	7	6	8	8	11	3	1	4	6	6	5	5	4	4	3	1	**S**	5	3	5	7	1	11	5	24
31	6	6	6	5	4	4	7	12	9	12	10	7	7	5	9	6	7	5	**S**	13	10	7	6	4	4	13	7	24
HOURLY MAX	14	13	23	12	19	29	23	55	29	20	16	23	17	20	18	15	16	22	22	17	14	15	43	26				
HOURLY AVG	3	3	4	3	5	6	8	12	10	6	5	6	4	4	4	4	4	4	4	4	4	5	5	5				

STATUS FLAG CODES

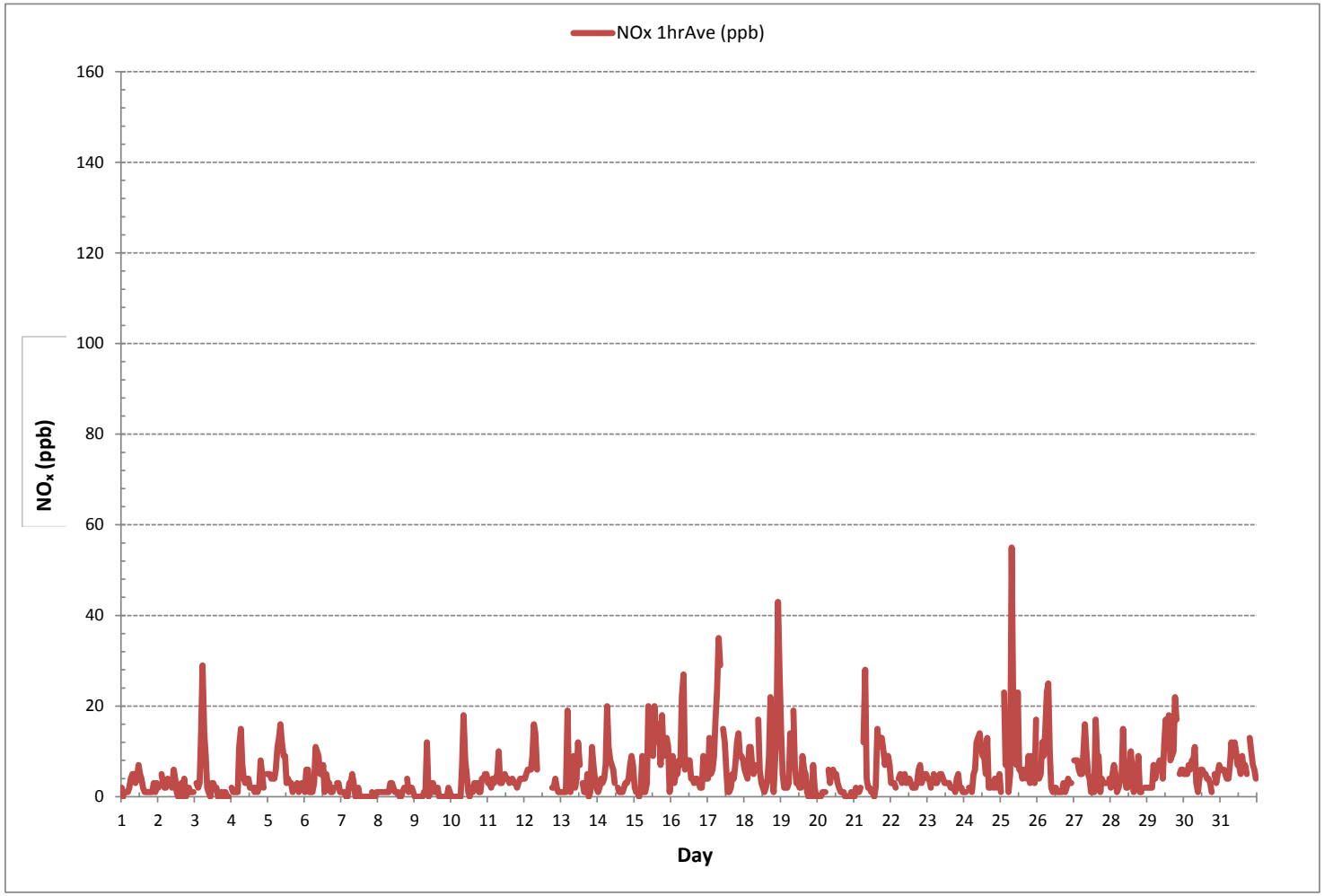
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:		641					
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	1	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	55	ppb	@ HOUR	7	ON DAY	25	
MAXIMUM 24-HR AVERAGE:	11	ppb			ON DAY	17	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:			744	hrs
MONTHLY CALIBRATION TIME:	9	hrs	AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	6		MONTHLY AVERAGE:			5	ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



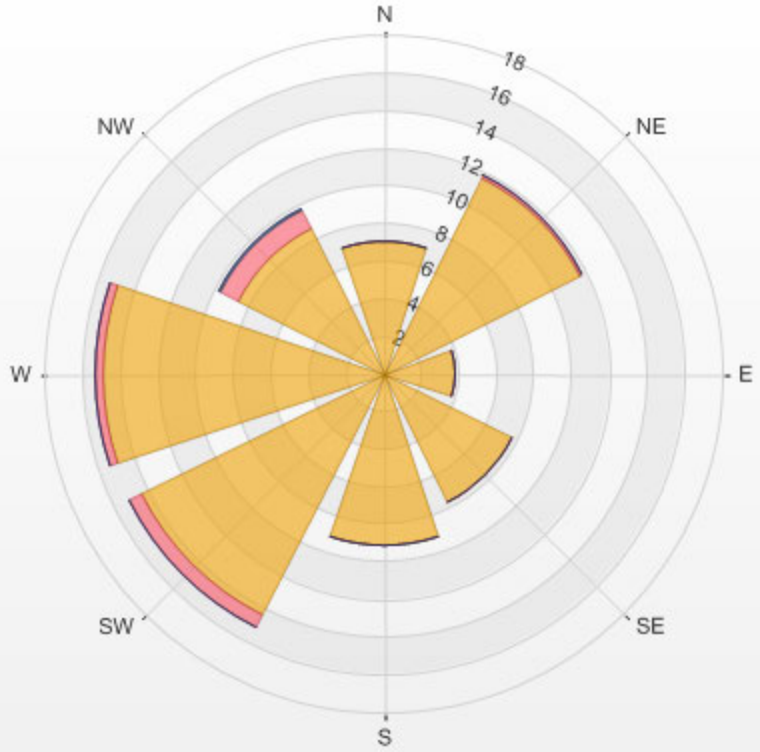
Wind: LICA MASKWA
Poll.: LICA MASKWA-NOX[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 20.20% Calm Avg: 4.87 [ppb]

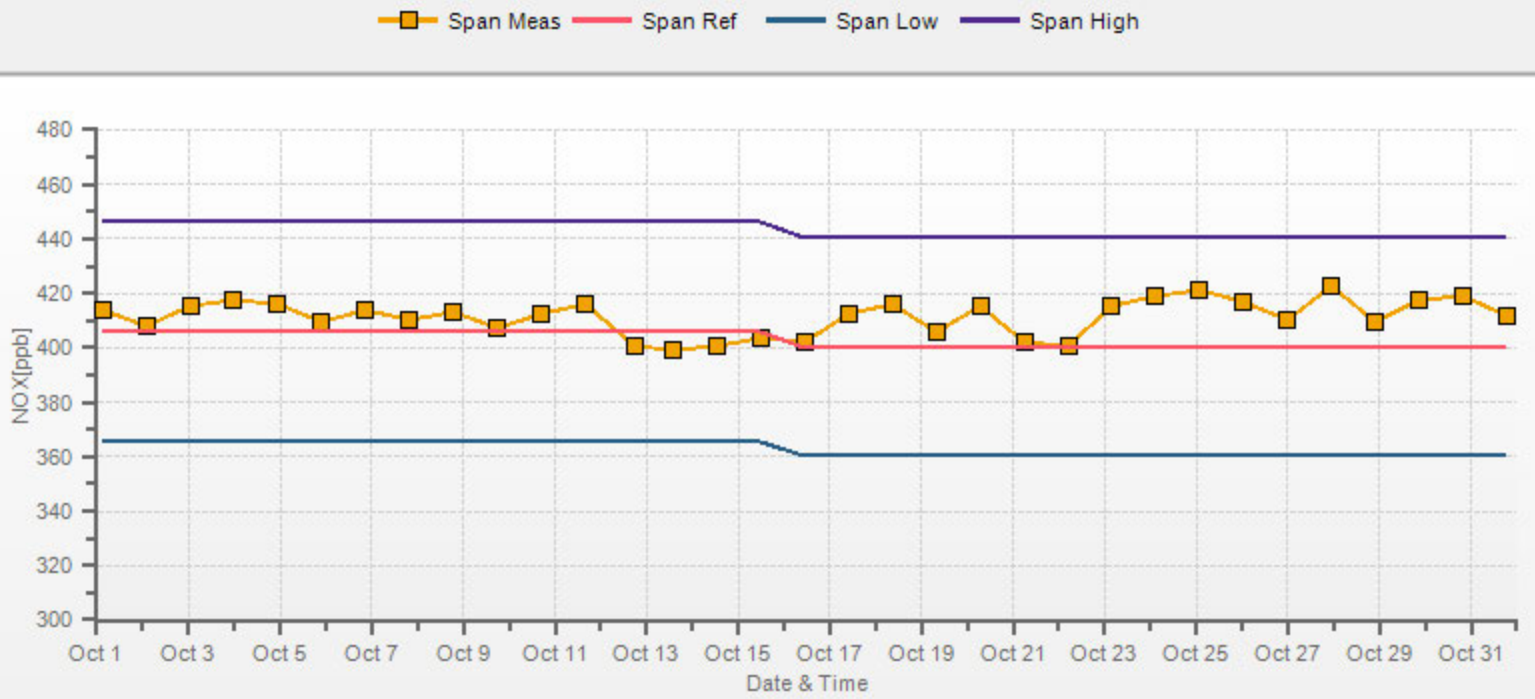
Direction	0.0-18.7	18.7-37.3	37.3-56.0	>56.0	Total
N	7.1	0.0	0.0	0.0	7.1
NE	11.7	0.1	0.0	0.0	11.8
E	3.8	0.0	0.0	0.0	3.8
SE	7.7	0.0	0.0	0.0	7.7
S	9.1	0.0	0.0	0.0	9.1
SW	14.4	0.7	0.0	0.0	15.1
W	14.9	0.4	0.0	0.0	15.4
NW	8.7	1.0	0.1	0.0	9.8
Summary	77.4	2.3	0.1	0.0	79.8

% Icon Classes (ppb)	77 0.0-18.7	2 18.7-37.3	0 37.3-56.0	0 >56.0

LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 20.20% Calm Poll Avg: 4.87[ppb]



NOX[ppb] Calibration: LICA MASKWA Monthly: 18/10 Type: Span



NITRIC OXIDE

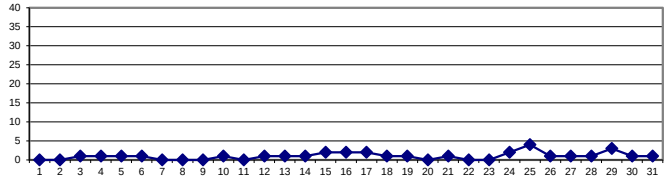
NITRIC OXIDE Hourly Averages (NO ppb)

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	1	1	1	3	1	1	0	0	0	0	0	0	0	0	0	0	**0**	3	0	24
2	0	**S**	0	0	0	0	0	0	1	1	3	1	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0	24
3	**S**	0	0	0	1	4	1	2	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	**S**	0	4	1	24
4	0	0	0	0	0	2	6	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	**S**	0	0	6	1	24
5	0	0	0	0	0	1	1	2	6	5	4	4	1	1	1	1	0	0	0	0	0	**S**	0	0	0	6	1	24
6	0	1	1	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	**S**	0	0	0	0	2	1	24
7	0	0	0	0	0	1	1	2	1	0	0	1	0	0	0	0	0	0	0	**S**	0	0	0	0	0	2	0	24
8	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	**S**	0	0	0	0	0	0	1	0	24
9	0	0	0	0	0	0	0	0	6	0	1	1	1	1	1	0	0	**S**	0	0	0	0	0	0	0	6	0	24
10	0	0	0	0	0	0	0	4	12	3	1	0	0	0	0	0	**S**	0	0	0	0	0	0	0	0	12	1	24
11	0	0	0	0	0	0	0	2	0	0	1	1	1	1	0	**S**	0	0	0	0	0	0	0	0	0	2	0	24
12	0	0	0	0	0	2	6	4	1	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	0	0	0	0	0	0	0	6	1	24
13	0	0	0	0	6	0	0	2	3	1	2	6	3	**S**	1	0	0	1	0	0	1	0	0	0	0	6	1	24
14	0	0	0	0	0	0	2	2	2	3	2	1	**S**	0	0	0	0	0	0	0	0	0	0	0	0	3	1	24
15	0	0	0	0	0	0	0	0	1	8	6	**S**	3	7	4	3	3	1	3	1	0	0	2	0	0	8	2	24
16	1	1	0	0	0	0	1	12	18	1	**S**	2	2	1	1	0	0	0	0	0	0	0	5	0	0	18	2	24
17	0	7	0	0	0	3	4	13	12	**S**	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	13	2	24
18	0	0	0	0	0	1	0	0	**S**	4	1	0	0	0	1	1	2	5	0	0	0	0	13	5	0	13	1	24
19	2	0	0	0	0	1	2	**S**	7	2	1	1	0	0	3	2	1	0	0	0	0	0	0	0	0	7	1	24
20	0	0	0	0	0	0	**S**	0	0	2	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	2	0	24
21	0	0	0	0	0	**S**	1	8	2	0	0	0	0	0	0	5	2	2	0	0	0	0	0	0	0	8	1	24
22	0	0	0	0	**S**	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
23	0	0	0	**S**	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
24	0	0	**S**	0	0	0	3	1	6	7	8	5	3	4	1	4	0	0	1	0	1	0	0	1	0	8	2	24
25	0	**S**	13	1	3	0	2	**32**	11	3	2	11	2	2	0	1	0	0	0	0	1	1	0	4	0	**32**	**4**	24
26	**S**	0	0	3	2	3	6	8	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	**S**	0	8	1	24
27	0	0	0	0	0	0	0	3	3	1	1	0	0	0	6	2	1	0	0	0	0	0	**S**	0	0	6	1	24
28	0	0	0	0	0	0	0	1	8	2	0	1	1	2	1	0	0	0	0	0	0	**S**	0	0	0	8	1	24
29	0	0	0	0	2	1	3	3	2	2	1	5	7	4	8	2	1	3	8	6	**S**	0	1	1	0	8	3	24
30	1	1	0	1	0	1	0	1	0	0	1	1	2	1	1	0	0	0	0	**S**	0	0	0	0	0	2	1	24
31	0	0	0	0	0	0	2	6	2	4	4	3	3	1	2	1	0	0	**S**	3	0	0	0	0	0	6	1	24
HOURLY MAX	2	7	13	3	6	4	6	32	18	8	8	11	7	7	8	5	3	5	8	6	1	5	13	5				
HOURLY AVG	0	0	0	0	0	1	1	4	4	2	2	2	1	1	1	1	0	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

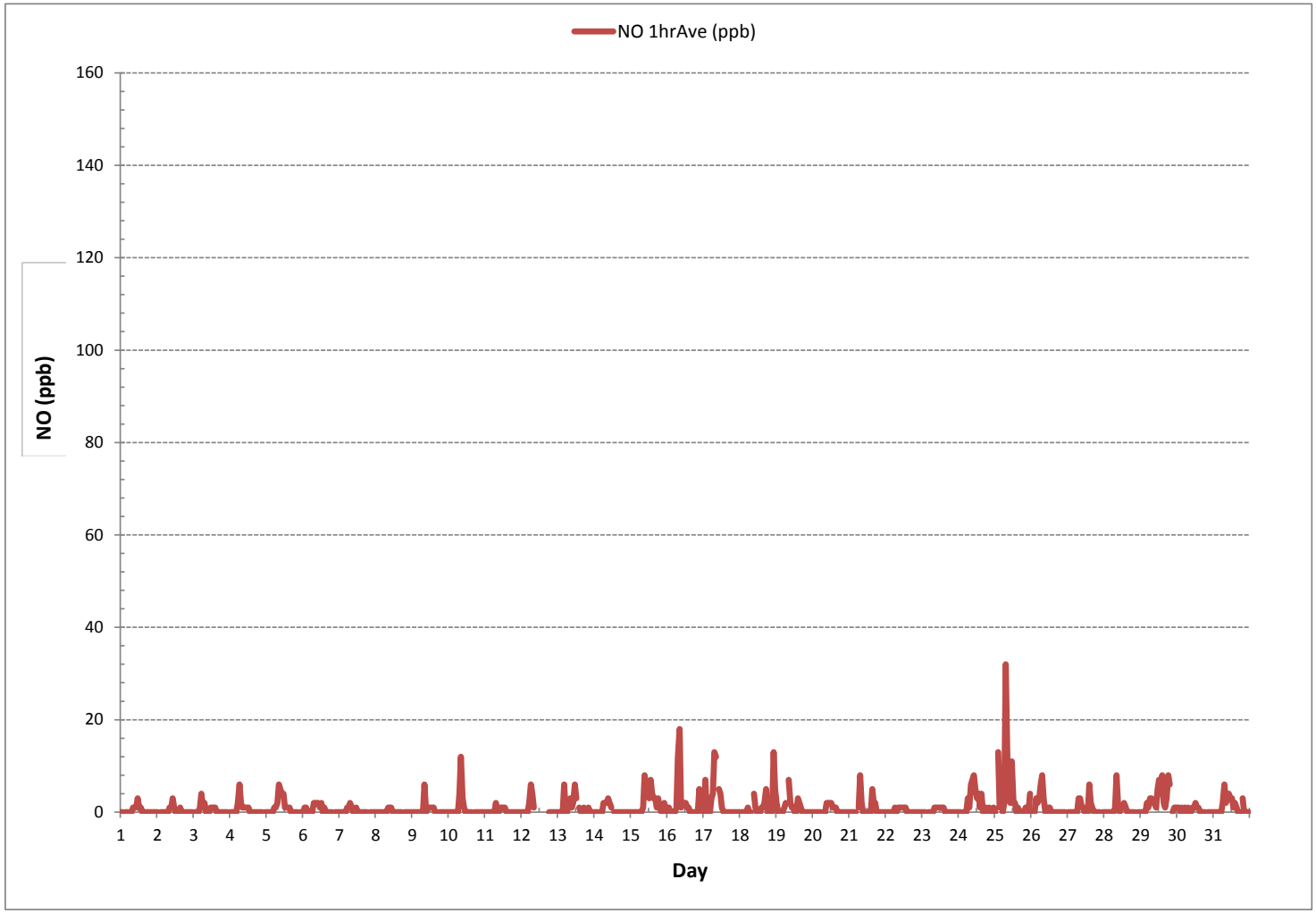
24 HR AVERAGES October 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			256				
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	32	ppb	@ HOUR	7	ON DAY	25	
MAXIMUM 24-HR AVERAGE:	4	ppb			ON DAY	25	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:			744	hrs
MONTHLY CALIBRATION TIME:	9	hrs	AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	2		MONTHLY AVERAGE:			1	ppb

NITRIC OXIDE Hourly Averages (NO ppb)



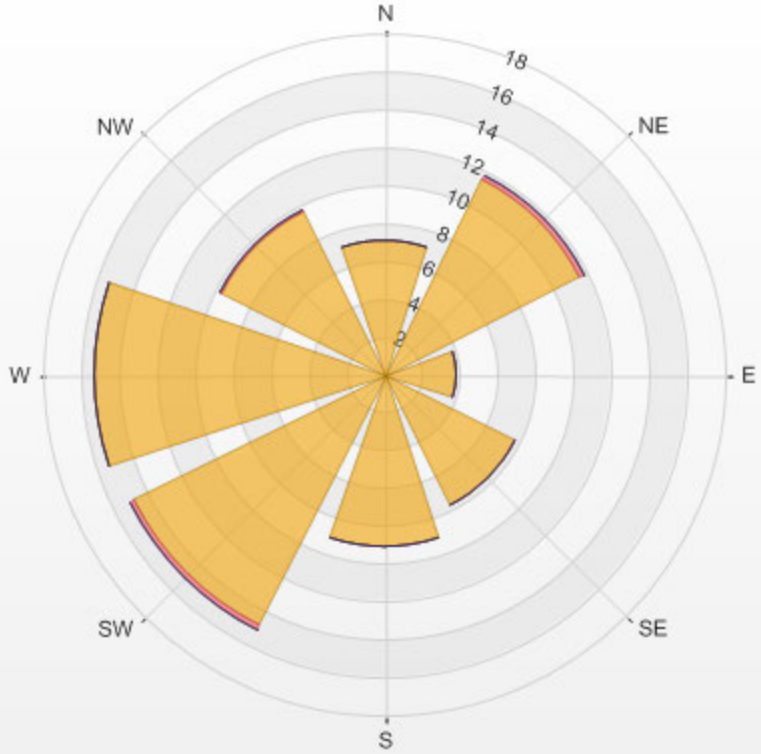
Wind: LICA MASKWA
Poll.: LICA MASKWA-NO[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 20.20% Calm Avg: 1.01 [ppb]

Direction	0.0-11.0	11.0-22.0	22.0-33.0	>33.0	Total
N	7.1	0.0	0.0	0.0	7.1
NE	11.5	0.3	0.0	0.0	11.8
E	3.8	0.0	0.0	0.0	3.8
SE	7.7	0.0	0.0	0.0	7.7
S	9.1	0.0	0.0	0.0	9.1
SW	14.8	0.3	0.0	0.0	15.1
W	15.4	0.0	0.0	0.0	15.4
NW	9.7	0.1	0.0	0.0	9.8
Summary	79.1	0.7	0.0	0.0	79.8

% Icon Classes (ppb)	79 0.0-11.0	1 11.0-22.0	0 22.0-33.0	0 >33.0

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 20.20% Calm Poll Avg: 1.01[ppb]



NITROGEN DIOXIDE

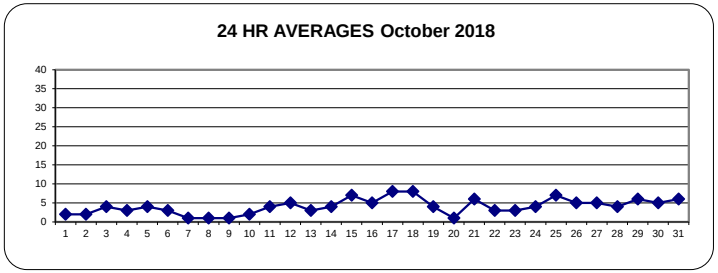
NITROGEN DIOXIDE Hourly Averages (NO_2 ppb)

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

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

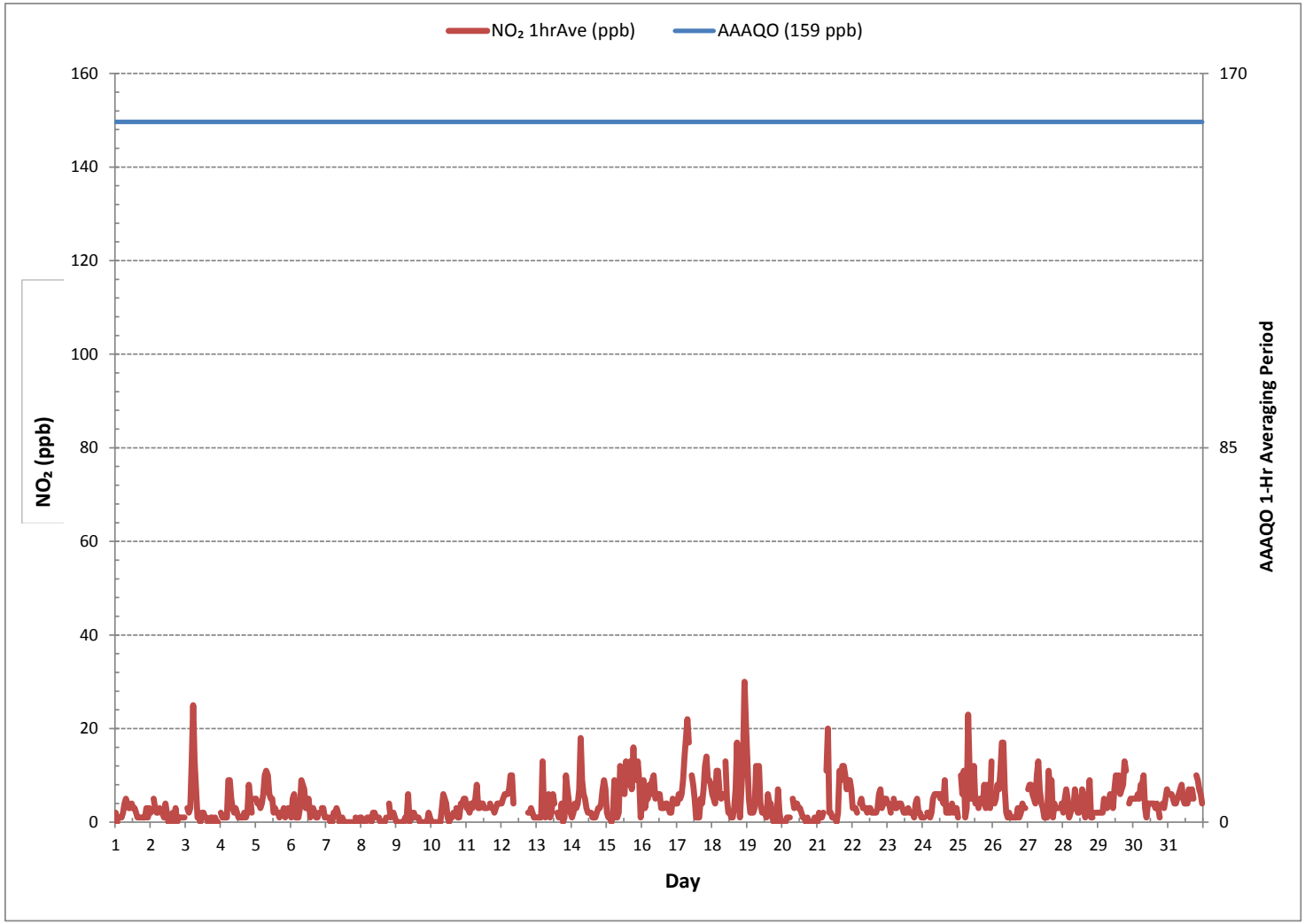


MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:		0				
NUMBER OF NON-ZERO READINGS:		633				
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	1	ON DAY	1
MAXIMUM 1-HR AVERAGE:	30	ppb	@ HOUR	22	ON DAY	18
MAXIMUM 24-HR AVERAGE:	8	ppb			ON DAY	17

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	9	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	4		MONTHLY AVERAGE:	4	ppb

NITROGEN DIOXIDE Hourly Averages (NO_2 ppb)



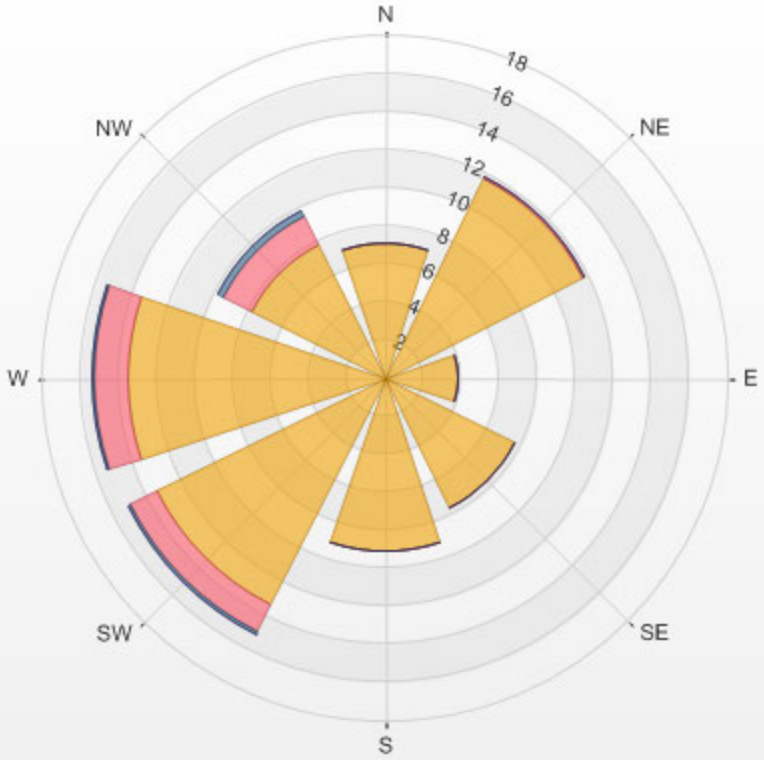
Wind: LICA MASKWA
Poll.: LICA MASKWA-NO2[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 20.20% Calm Avg: 3.86 [ppb]

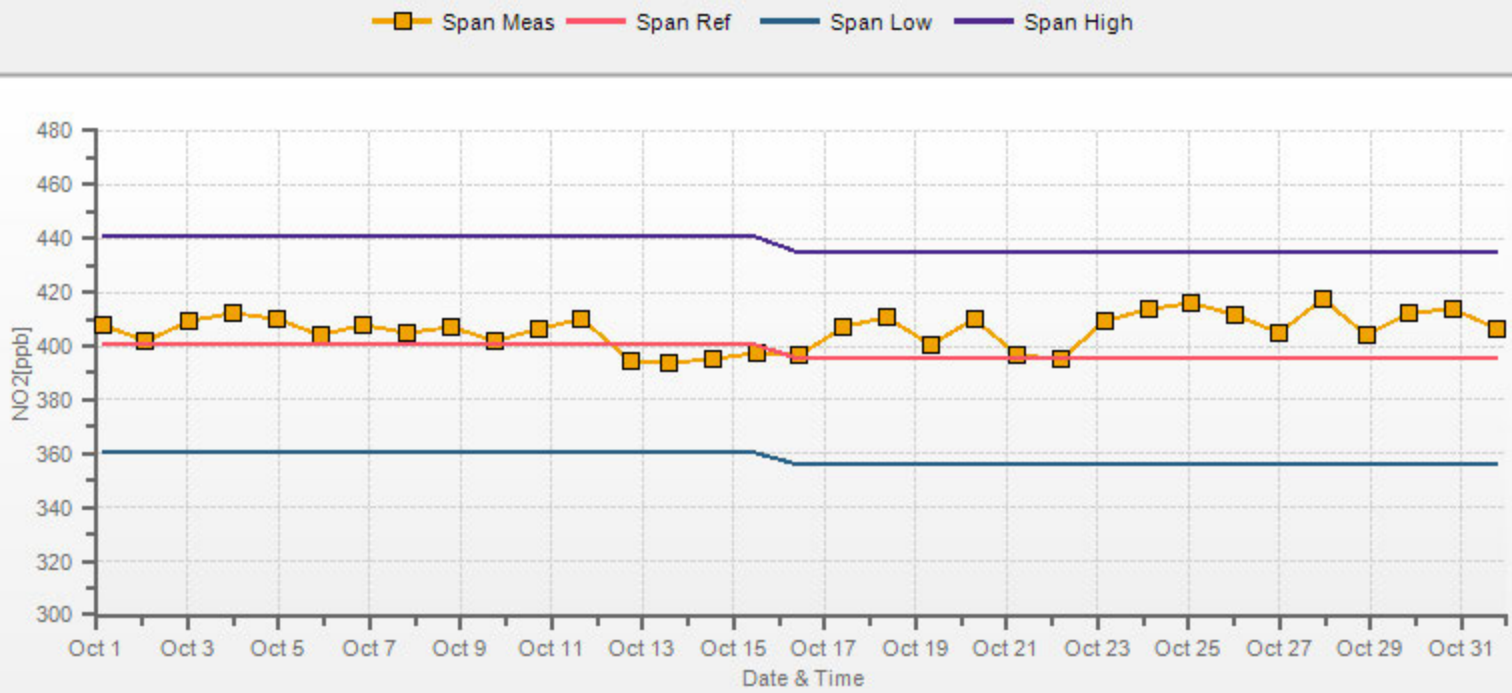
Direction	0.0-10.3	10.3-20.7	20.7-31.0	>31.0	Total
N	7.1	0.0	0.0	0.0	7.1
NE	11.7	0.1	0.0	0.0	11.8
E	3.8	0.0	0.0	0.0	3.8
SE	7.7	0.0	0.0	0.0	7.7
S	9.1	0.0	0.0	0.0	9.1
SW	13.4	1.6	0.1	0.0	15.1
W	13.5	1.7	0.1	0.0	15.4
NW	7.8	1.7	0.3	0.0	9.8
Summary	74.1	5.1	0.6	0.0	79.8

% Icon Classes (ppb)	74 0.0-10.3	5 10.3-20.7	1 20.7-31.0	0 >31.0

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 20.20% Calm Poll Avg: 3.86[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 18/10 Type: Span



WIND SPEED

Maxxam
A Bureau Veritas Group Company

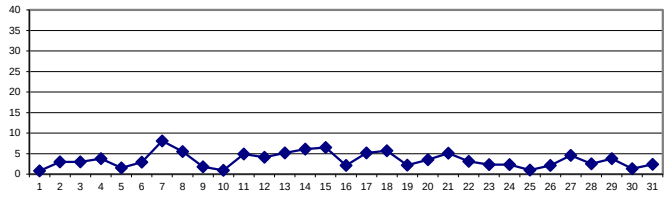
WIND SPEED Hourly Averages (WS kph)

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	4.0	3.5	1.5	0.8	0.7	1.3	0.4	0.4	**0.0**	1.2	1.8	1.5	0.8	3.7	3.6	3.1	2.3	2.7	2.9	2.4	2.0	0.3	0.6	2.3	**0.0**	4.0	0.8	24
2	0.9	0.8	1.3	3.9	5.0	0.9	1.9	4.0	4.0	4.4	4.9	5.6	5.7	7.2	7.3	8.5	7.3	5.7	3.0	3.1	3.1	2.9	2.1	3.9	0.8	8.5	3.0	24
3	4.4	2.8	3.4	4.2	4.5	5.6	4.5	6.1	5.8	7.1	6.8	6.7	6.8	6.8	5.9	6.0	6.2	4.0	2.5	2.4	1.2	1.7	0.6	3.8	0.6	7.1	3.0	24
4	5.2	4.3	5.6	3.5	1.5	1.2	2.0	2.2	1.5	3.1	3.3	4.5	5.8	5.2	6.0	5.4	4.5	2.8	5.0	6.3	6.2	7.2	6.6	5.7	1.2	7.2	3.8	24
5	4.6	5.0	5.9	7.5	6.7	3.4	2.5	3.2	3.0	4.3	4.7	5.1	4.8	4.6	4.5	4.2	4.9	5.3	3.6	4.0	1.7	0.9	0.8	2.6	0.8	7.5	1.5	24
6	1.9	1.6	1.8	1.3	0.9	3.0	3.3	5.9	5.3	7.1	7.3	6.2	5.0	5.6	1.9	4.0	3.6	1.9	2.0	2.7	1.8	1.5	4.9	4.5	0.9	7.3	2.9	24
7	6.2	7.0	5.8	7.3	7.5	8.3	8.9	8.6	7.4	6.4	6.2	7.4	8.2	8.0	9.2	7.4	7.4	8.0	10.9	11.5	9.3	8.9	8.7	10.8	5.8	11.5	**8.1**	24
8	10.1	10.2	10.9	10.1	9.7	7.7	7.8	7.3	8.8	7.8	6.4	6.8	7.1	6.1	3.9	3.6	4.6	5.7	0.5	0.5	0.6	0.3	0.3	0.1	0.1	10.9	5.5	24
9	0.6	0.5	0.3	0.3	0.9	1.9	1.3	1.6	3.0	4.0	4.5	4.1	2.6	4.1	4.0	2.2	3.2	3.0	3.0	1.5	1.0	1.3	0.6	0.4	0.3	4.5	1.8	24
10	0.7	0.7	1.0	0.9	0.4	0.0	0.8	0.7	2.2	0.8	3.4	4.4	3.8	3.6	2.1	0.3	1.7	0.5	0.7	0.6	0.6	2.6	1.3	1.4	0.0	4.4	0.9	24
11	1.6	1.1	0.4	1.5	2.8	2.9	1.9	2.9	3.6	5.0	5.2	4.9	6.6	8.2	7.6	8.0	8.8	5.7	6.6	7.6	7.2	6.3	5.9	6.1	0.4	8.8	4.9	24
12	7.2	5.2	3.0	3.0	2.0	2.3	2.1	2.2	2.8	4.3	3.1	5.2	9.0	10.7	**11.7**	11.5	10.3	9.7	10.4	6.6	4.1	5.8	8.3	5.0	2.0	**11.7**	4.1	24
13	5.7	6.8	6.1	5.8	7.4	6.3	6.5	6.9	7.2	7.1	7.3	6.8	7.5	7.4	6.6	6.7	6.1	5.6	4.8	2.6	2.2	1.6	2.8	1.9	1.6	7.5	5.2	24
14	3.4	3.9	3.2	3.7	3.2	5.5	4.1	6.3	5.1	6.3	7.3	6.8	7.9	9.9	10.4	10.2	10.4	6.1	6.5	7.4	5.7	5.3	4.9	3.8	3.2	10.4	6.1	24
15	7.5	7.8	6.7	7.0	7.2	6.0	6.5	6.9	8.4	8.5	9.4	8.4	9.0	8.9	9.0	7.5	6.6	4.6	4.2	4.5	4.5	5.4	4.4	2.3	2.3	9.4	6.5	24
16	1.4	1.2	1.7	1.7	0.8	0.7	0.7	0.2	1.2	3.4	2.8	4.6	3.6	3.3	4.8	3.3	3.8	3.1	0.9	2.0	2.5	0.6	5.5	6.3	0.2	6.3	2.1	24
17	3.3	1.9	4.2	4.4	4.5	3.8	4.5	5.3	7.0	8.3	10.2	6.2	6.5	5.4	5.4	6.0	4.9	6.5	7.0	6.1	4.1	4.1	3.6	5.0	1.9	10.2	5.2	24
18	3.9	2.4	4.2	5.9	4.2	5.9	7.5	5.8	5.8	6.0	4.4	5.6	7.4	10.6	9.6	7.8	7.3	8.6	6.2	8.0	7.8	6.1	5.9	5.7	2.4	10.6	5.7	24
19	3.9	3.4	3.0	2.2	3.1	4.0	1.5	4.1	6.4	6.4	7.6	9.4	7.8	7.4	6.2	5.2	5.7	3.2	3.1	3.1	2.9	1.4	3.1	5.8	1.4	9.4	2.2	24
20	7.7	5.5	3.7	4.5	4.4	4.4	4.4	5.1	5.7	6.6	6.3	8.2	6.5	6.6	8.2	11.6	10.4	9.3	7.4	5.5	7.1	7.0	6.8	6.5	3.7	11.6	3.5	24
21	5.0	4.3	4.4	3.9	2.7	3.3	4.0	3.5	7.6	10.0	10.3	9.8	10.3	10.1	9.2	9.0	7.1	4.1	2.8	2.3	1.9	1.8	0.7	0.5	0.5	10.3	5.1	24
22	0.2	0.8	0.4	0.7	1.2	0.2	0.2	0.6	0.9	2.7	4.5	5.9	5.8	6.3	6.3	7.5	5.2	3.2	4.2	5.8	6.7	5.5	4.5	2.8	0.2	7.5	3.1	24
23	3.5	2.3	2.0	2.3	1.7	2.6	2.2	3.1	3.8	3.6	5.7	5.2	6.1	5.4	4.5	3.9	3.3	3.0	3.8	0.9	0.4	1.2	0.5	0.4	0.4	6.1	2.3	24
24	2.0	1.0	0.6	1.2	1.9	1.0	1.3	2.1	3.1	4.4	3.9	5.0	5.3	5.7	3.9	3.5	1.4	1.4	0.8	1.8	0.6	2.2	2.4	2.2	0.6	5.7	2.3	24
25	0.7	2.6	3.0	2.5	1.5	1.7	2.2	0.2	1.3	2.6	2.9	1.1	1.8	3.3	3.4	1.8	1.7	0.7	0.8	0.7	0.5	0.5	0.4	0.4	0.2	3.4	1.0	24
26	1.5	1.2	1.4	0.7	1.1	2.4	2.0	2.6	2.4	6.0	7.5	4.9	5.9	5.4	4.8	3.4	2.1	1.5	2.5	0.9	1.6	1.9	0.8	0.7	0.7	7.5	2.1	24
27	1.3	2.0	1.9	4.3	2.9	2.5	5.6	4.7	4.4	8.7	8.2	7.9	9.8	10.5	9.5	7.0	4.8	2.6	1.9	6.1	5.8	4.3	3.7	2.2	1.3	10.5	4.6	24
28	2.8	2.1	1.1	2.8	1.8	1.9	1.1	0.3	3.5	2.5	3.5	4.0	4.6	5.9	4.8	4.0	3.6	3.4	3.1	5.8	4.9	5.4	6.2	4.3	0.3	6.2	2.5	24
29	3.5	4.6	3.4	2.5	5.8	4.5	4.7	5.4	4.3	4.0	5.6	5.6	6.2	7.6	7.4	7.7	6.7	4.8	5.2	5.1	4.5	3.9	2.9	2.2	2.2	7.7	3.8	24
30	2.2	2.4	2.1	2.0	2.0	1.1	1.6	0.6	1.8	2.3	3.6	2.8	3.2	3.3	3.1	3.0	2.0	1.7	1.9	1.8	0.4	1.0	1.8	3.5	0.4	3.6	1.3	24
31	2.5	3.2	3.7	4.7	4.2	2.5	4.2	3.5	2.8	2.1	2.5	4.2	4.5	5.0	5.3	3.6	3.4	1.9	1.0	0.5	0.5	1.0	0.7	1.1	0.5	5.3	2.4	24
HOURLY MAX	10.1	10.2	10.9	10.1	9.7	8.3	8.9	8.6	8.8	10.0	10.3	9.8	10.3	10.7	11.7	11.6	10.4	9.7	10.9	11.5	9.3	8.9	8.7	10.8				

STATUS FLAG CODES

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

24 HR AVERAGES October 2018

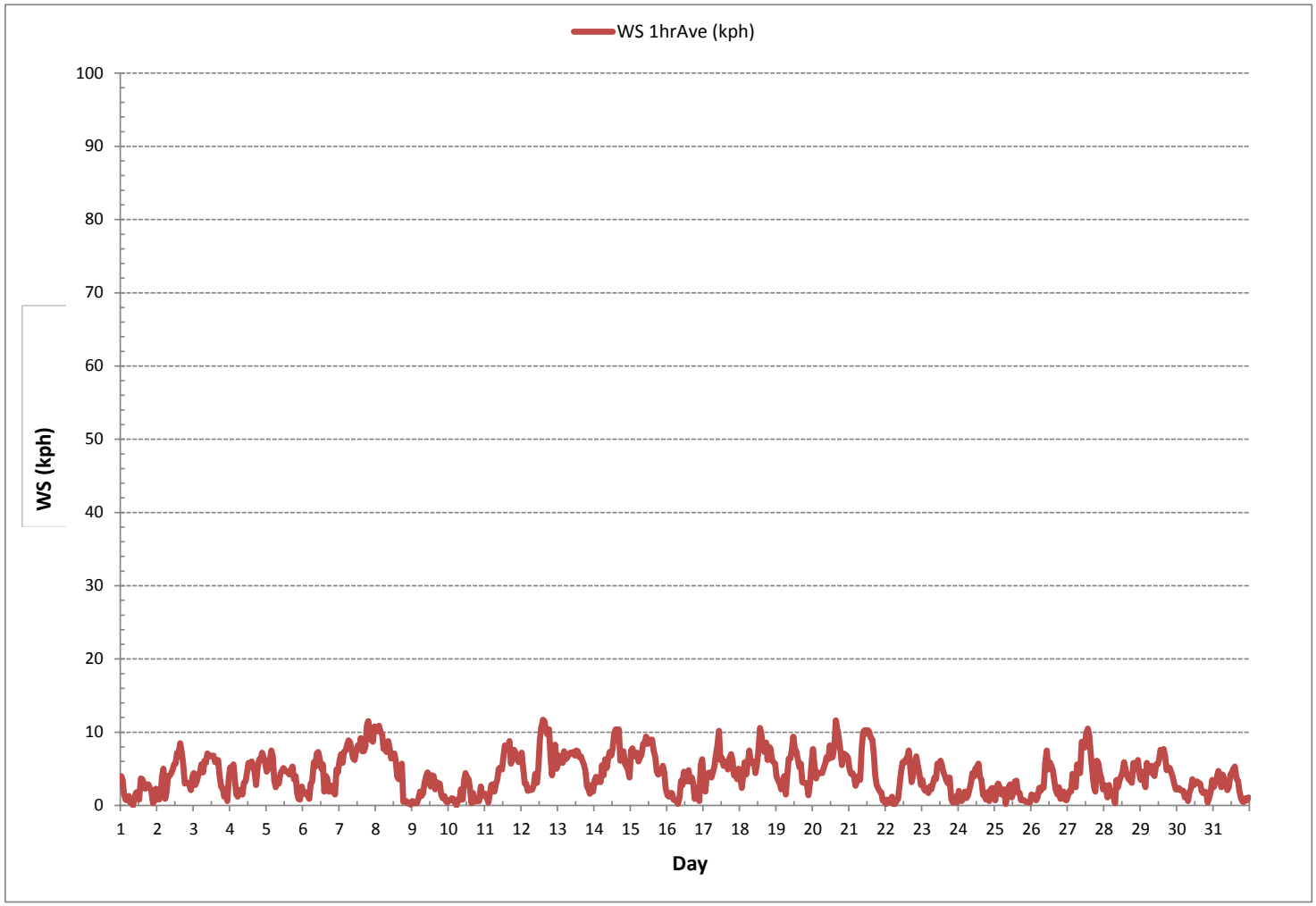


LAST CALIBRATION:	September 17, 2018
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			742				
MINIMUM 1-HR AVERAGE	0.0	kph	@ HOUR	8	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	11.7	kph	@ HOUR	14	ON DAY	12	
MAXIMUM 24-HR AVERAGE:	8.1	kph			ON DAY	7	
			OPERATIONAL TIME:			744	hrs
MONTHLY CALIBRATION TIME:	0	hrs	AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	2.6		MONTHLY AVERAGE:			0.9	kph

WIND SPEED Hourly Averages (WS kph)



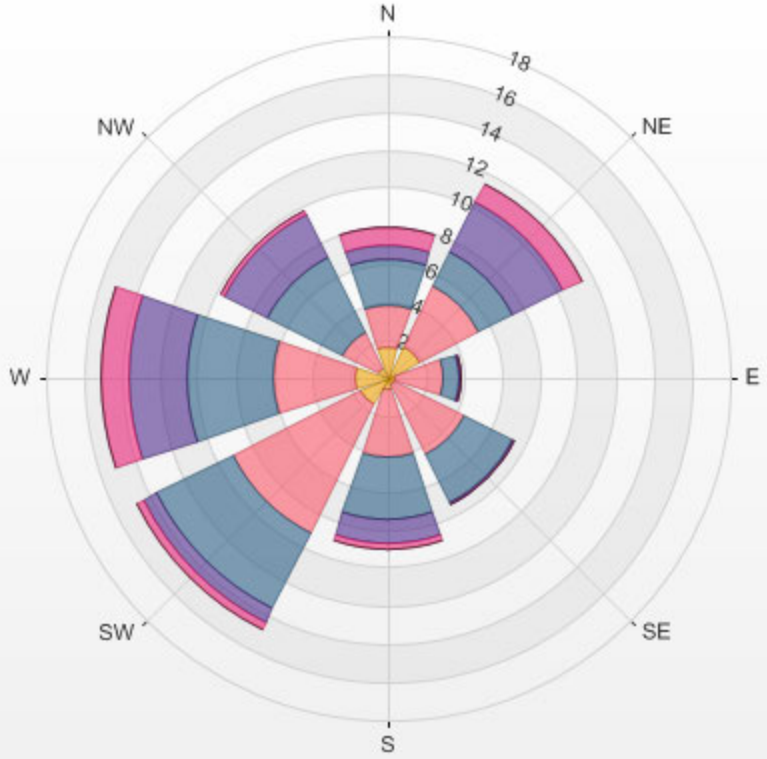
Wind: LICA MASKWA
Monitor: WSP [kph]
Monthly: 18/10
Type: WindRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 20.56%

Direction	1.8-2.4	2.4-4.7	4.7-7.1	7.1-9.4	9.4-11.8	>11.8	Total
N	1.6	2.3	2.4	0.7	0.9	0.0	7.9
NE	1.9	3.5	2.0	3.0	1.1	0.0	11.4
E	0.4	2.6	0.8	0.1	0.0	0.0	3.9
SE	0.4	4.2	2.8	0.1	0.0	0.0	7.5
S	0.7	3.5	3.4	1.2	0.3	0.0	9.0
SW	1.6	7.5	4.4	0.8	0.4	0.0	14.8
W	1.8	4.3	4.6	3.0	1.5	0.0	15.1
NW	0.5	2.2	4.4	2.6	0.1	0.0	9.8
Summary	8.9	30.0	24.9	11.4	4.3	0.0	79.4

% Icon Classes (kph)	9 1.8-2.4	30 2.4-4.7	25 4.7-7.1	11 7.1-9.4	4 9.4-11.8	0 >11.8

LICA MASKWA 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 20.56% Calm Wind Avg Speed: 0.94(kph)



WIND DIRECTION

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

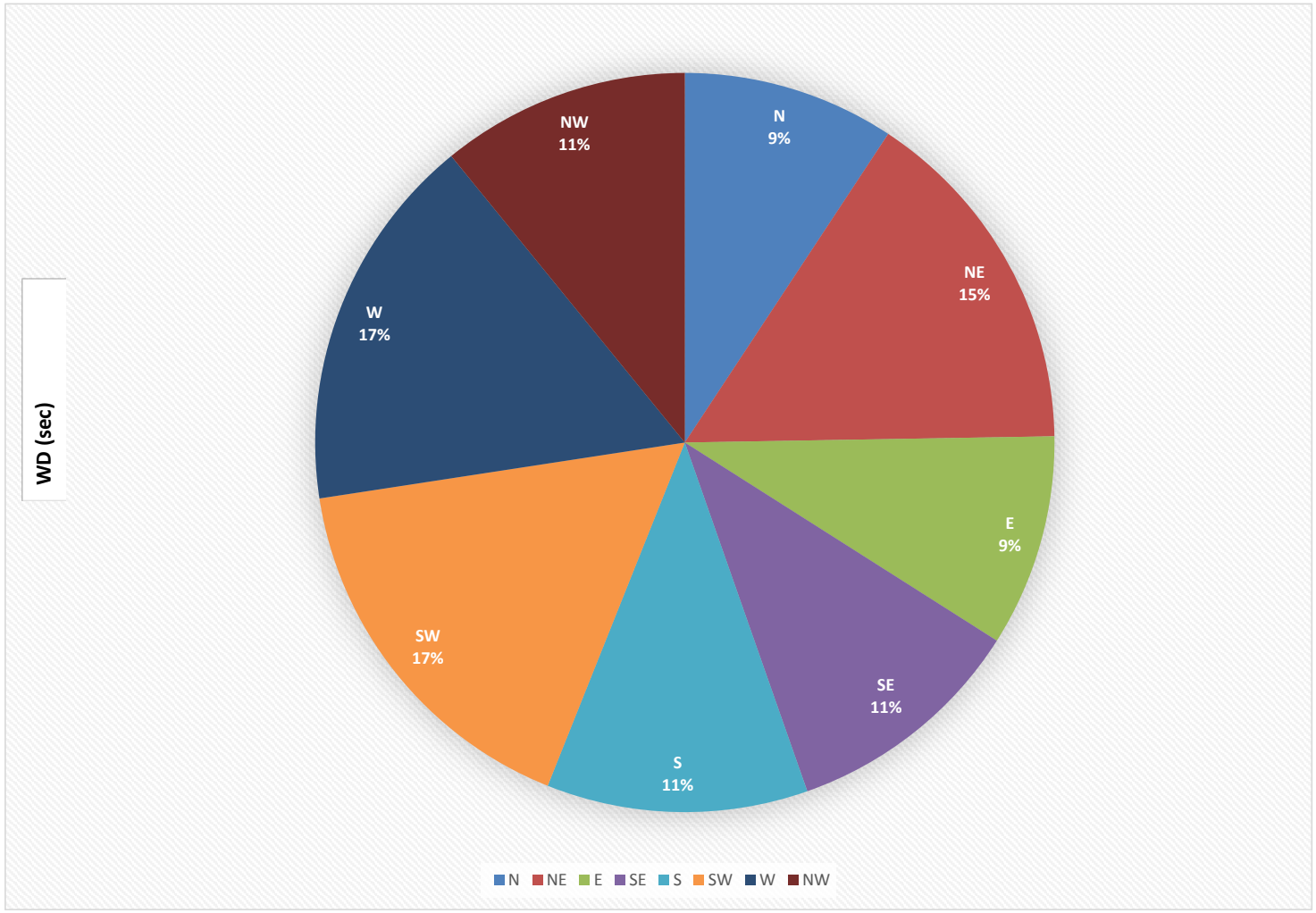
STATUS FLAG CODES

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

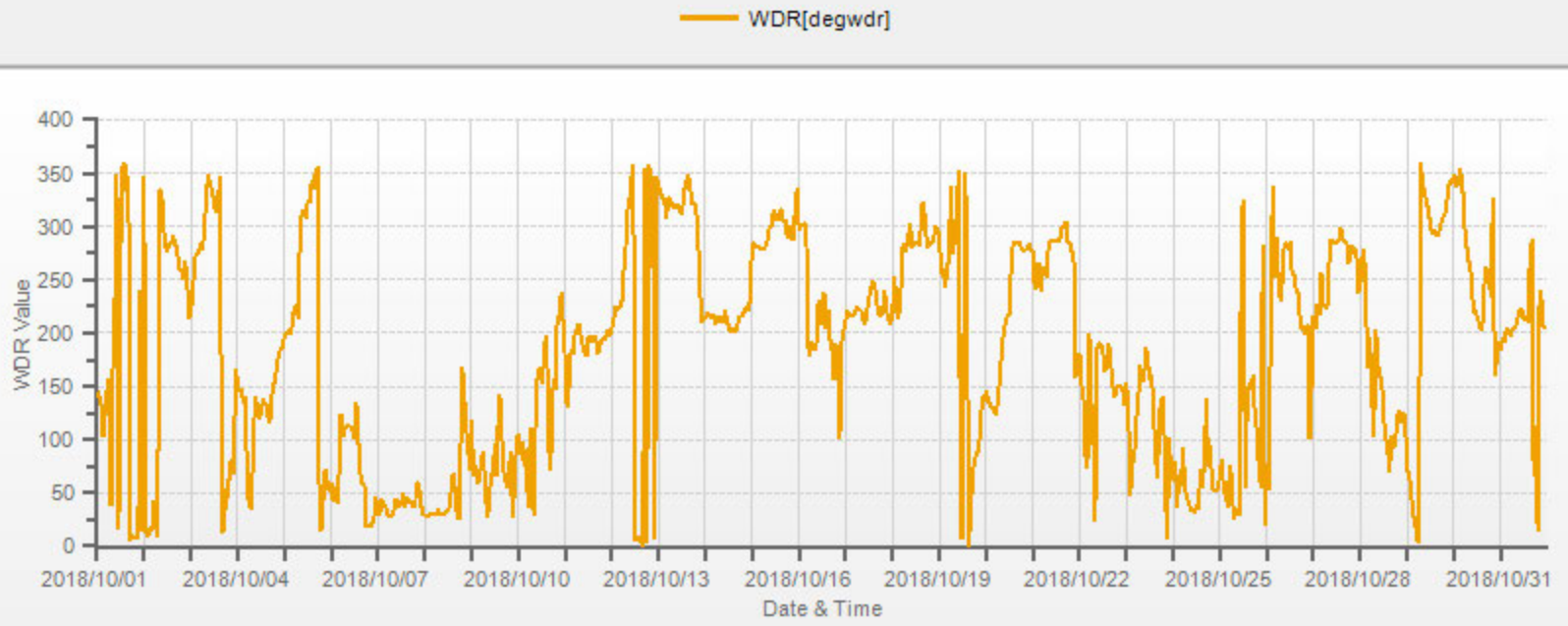
LAST CALIBRATION:	September 17, 2018
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	102		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	284 (WNW)	

WIND DIRECTION Hourly Averages (WD)



WDR[degwdr] Station: LICA MASKWA Monthly: 18/10 Type: AVG 1 Hr. [1 Hr.]



STANDARD DEVIATION WIND DIRECTION

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	8	12	15	34	18	23	40	29	73	33	44	60	72	34	19	29	30	10	10	13	14	31	45	12	24
2	26	16	15	10	10	40	17	21	20	27	26	29	23	22	17	9	10	11	11	13	19	15	18	9	24
3	6	15	9	7	11	8	11	19	22	20	18	23	22	25	31	23	19	10	11	13	26	21	36	11	24
4	6	9	8	12	20	28	17	7	28	32	30	23	21	23	20	19	10	12	4	6	11	7	7	7	24
5	8	8	5	6	7	11	11	9	28	16	19	18	22	28	30	26	15	14	8	7	12	14	18	12	24
6	13	19	29	18	43	16	20	9	12	11	18	18	20	30	54	41	22	30	17	12	15	21	7	11	24
7	7	7	15	9	10	6	5	5	7	15	17	12	15	15	13	14	13	12	6	7	14	14	9	4	24
8	4	4	5	5	5	5	4	6	7	7	9	15	19	19	33	36	23	9	33	44	22	22	39	48	24
9	28	41	21	25	13	19	35	20	9	19	27	41	52	34	29	52	17	12	7	15	14	19	30	25	24
10	20	22	10	29	18	59	30	40	9	67	26	20	31	28	29	68	31	35	25	33	27	9	17	13	24
11	21	21	66	34	14	12	20	13	13	14	13	17	14	10	13	10	8	9	10	8	7	8	7	6	24
12	6	8	12	12	13	12	24	21	17	15	18	15	9	9	8	9	11	11	12	14	19	12	10	14	24
13	14	13	12	13	11	11	11	12	11	12	12	15	17	21	21	17	16	11	11	19	19	32	13	16	24
14	7	6	8	9	11	6	9	5	8	9	11	13	13	8	8	7	5	7	8	8	9	7	7	18	24
15	5	5	6	6	6	6	4	5	7	11	12	13	16	12	12	12	14	17	13	9	11	10	15	17	24
16	26	37	25	23	24	36	47	68	27	17	23	16	23	32	20	21	14	17	23	12	33	69	23	6	24
17	14	22	14	9	5	5	5	5	5	5	4	14	11	18	15	14	10	5	5	7	13	17	8	6	24
18	8	14	18	6	16	13	8	12	12	14	13	13	8	8	7	20	19	10	9	6	5	6	9	9	24
19	17	10	9	11	13	21	50	10	12	15	16	15	19	22	14	27	11	14	18	14	19	34	17	11	24
20	9	14	13	9	12	11	13	17	15	17	11	10	17	31	11	7	6	7	6	8	6	7	6	6	24
21	7	20	14	10	11	12	7	14	9	8	7	9	8	9	13	11	13	15	9	19	33	30	40	37	24
22	64	49	38	34	37	58	53	40	10	19	18	21	22	21	19	15	14	7	6	5	6	6	9	11	24
23	11	31	14	18	20	24	28	13	15	22	18	18	21	22	21	35	11	15	9	32	50	6	53	44	24
24	24	23	31	18	17	17	21	15	13	9	14	11	16	12	25	19	22	21	57	15	22	15	18	21	24
25	32	14	19	14	26	18	18	37	8	14	25	56	42	40	20	20	31	57	49	57	62	48	56	39	24
26	13	50	38	59	41	31	28	10	24	10	8	22	20	25	22	21	14	23	11	51	15	17	55	34	24
27	18	27	27	9	15	10	6	7	19	9	10	9	9	9	10	12	13	33	17	8	9	8	17	12	24
28	19	20	46	11	31	25	41	53	22	19	20	28	17	13	19	18	15	23	15	12	12	11	10	19	24
29	11	16	12	17	5	9	8	9	15	11	13	14	12	9	9	8	8	10	12	15	19	14	20	21	24
30	23	19	27	29	34	45	19	58	27	32	24	34	24	21	17	19	27	22	16	23	56	38	32	11	24
31	17	14	15	8	17	16	8	16	14	15	23	21	22	17	8	35	21	27	28	65	34	34	20	30	24

STATUS FLAG CODES

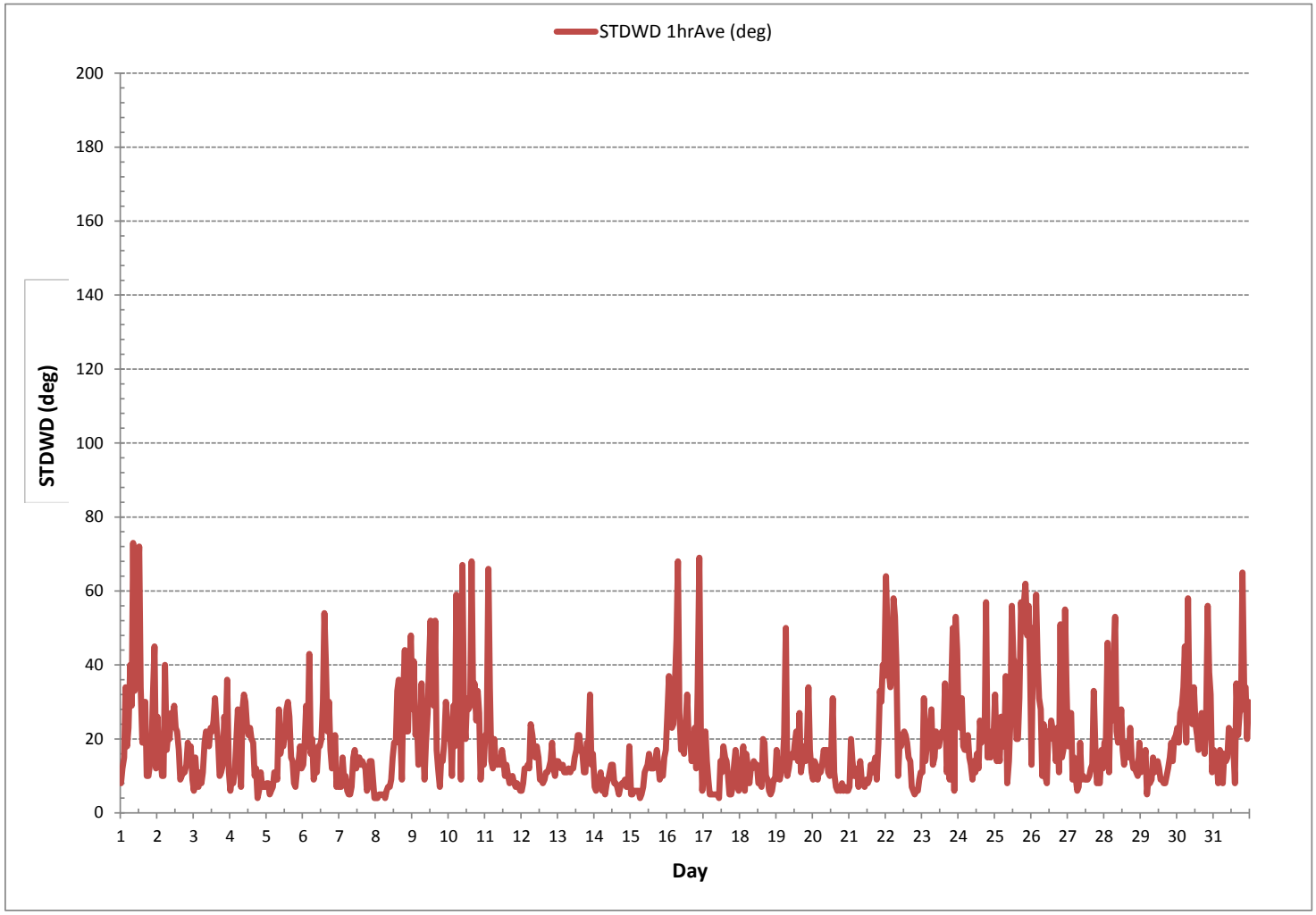
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: September 17, 2018

CALIBRATION TIME: 0 hrs

OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



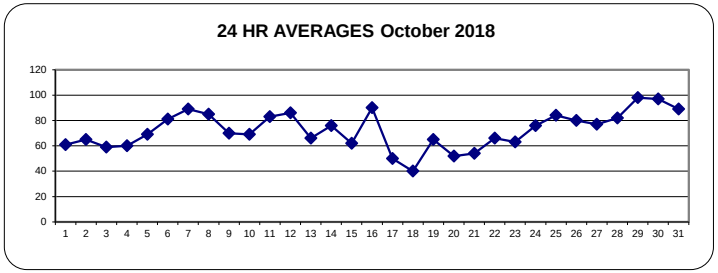
RELATIVE HUMIDITY

RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	59	60	61	65	67	70	72	74	69	61	56	48	44	42	43	44	46	51	59	65	71	78	83	82	42	83	61	24
2	83	85	90	92	91	89	88	82	70	63	56	47	44	38	39	43	45	49	55	57	59	62	66	70	38	92	65	24
3	74	76	77	78	74	69	68	68	69	62	55	49	41	37	34	34	36	42	49	53	61	67	74	75	34	78	59	24
4	66	64	62	64	68	76	79	78	69	62	57	48	45	45	44	46	49	53	60	59	57	58	59	62	44	79	60	24
5	66	71	74	75	78	83	88	88	79	68	60	51	51	50	46	48	54	62	67	70	75	79	83	87	46	88	69	24
6	92	92	93	92	93	92	90	88	81	75	70	67	65	61	58	65	76	81	80	83	85	86	92	95	58	95	81	24
7	96	96	98	97	96	98	97	96	96	91	85	83	81	80	80	78	78	80	81	84	81	85	96	96	78	98	89	24
8	96	95	95	93	90	89	89	87	85	84	82	73	71	72	72	71	73	74	83	93	95	91	91	91	71	96	85	24
9	91	92	89	90	90	92	92	90	89	82	66	57	44	35	29	32	42	48	53	60	67	76	81	85	29	92	70	24
10	87	88	90	92	91	91	91	90	85	68	56	47	40	37	37	39	44	52	63	70	71	70	75	81	37	92	69	24
11	85	83	86	86	84	85	85	85	86	86	85	83	80	77	75	74	74	75	77	77	81	83	89	99	74	99	83	24
12	**100**	100	100	100	100	100	100	100	100	99	99	97	88	85	81	79	70	64	60	60	68	68	67	69	60	**100**	86	24
13	70	68	71	72	74	75	75	74	74	71	66	59	55	50	45	43	47	54	59	64	69	74	82	87	43	87	66	24
14	89	85	91	95	94	94	95	92	86	84	77	68	63	58	50	48	51	57	63	68	71	76	78	79	48	95	76	24
15	70	67	66	65	66	69	71	70	63	56	47	40	38	41	41	42	47	52	60	70	78	83	87	92	38	92	62	24
16	93	88	85	85	96	100	100	98	89	84	86	84	83	78	78	81	83	89	100	100	99	100	98	94	78	100	90	24
17	95	98	98	94	94	85	79	71	59	50	47	39	24	16	**14**	15	18	22	25	26	28	29	32	36	**14**	98	50	24
18	36	38	36	42	41	37	33	36	39	38	39	36	37	35	35	38	41	40	42	44	43	47	50	52	33	52	40	24
19	58	66	71	79	81	81	85	83	70	60	60	64	68	62	58	54	55	61	59	54	54	62	59	49	49	85	65	24
20	51	54	60	63	65	69	72	73	71	70	67	61	55	44	36	30	32	34	36	39	39	41	43	44	30	73	52	24
21	47	52	55	57	61	65	66	69	57	47	41	37	35	34	34	35	38	42	51	58	68	71	82	88	34	88	54	24
22	89	91	91	92	93	95	96	94	85	66	51	47	43	40	36	33	39	50	55	54	55	59	62	72	33	96	66	24
23	73	73	83	88	87	84	77	72	64	55	49	44	39	34	34	35	41	51	49	59	72	76	83	86	34	88	63	24
24	86	90	88	93	94	96	95	95	88	78	66	54	47	43	39	41	48	64	74	84	88	87	89	91	39	96	76	24
25	93	96	93	93	95	98	99	99	97	83	77	65	56	54	60	62	70	81	89	90	87	91	95	94	54	99	84	24
26	93	95	96	98	96	91	92	97	94	82	68	58	51	47	45	47	55	69	80	86	94	92	93	94	45	98	80	24
27	89	89	90	79	80	84	83	88	83	72	68	67	67	66	63	63	66	69	72	71	76	82	87	90	63	90	77	24
28	90	90	96	100	100	100	99	99	100	92	80	71	73	75	71	74	72	71	74	69	66	68	68	73	66	100	82	24
29	86	94	98	99	100	100	100	100	100	100	100	100	100	98	96	96	97	98	97	98	98	98	98	99	86	100	**98**	24
30	99	99	97	98	100	100	100	99	99	98	97	94	91	92	93	93	93	94	96	97	97	98	100	100	91	100	97	24
31	100	100	100	100	100	100	100	100	99	97	82	70	66	63	69	68	71	81	86	89	91	97	100	100	63	100	89	24
HOURLY MAX	100	100	100	100	100	100	100	100	100	100	100	100	100	98	96	96	97	98	100	100	99	100	100	100				
HOURLY AVG	81	82	83	84	85	86	86	85	80	74	68	62	58	54	53	53	56	62	66	69	72	75	79	81				

STATUS FLAG CODES

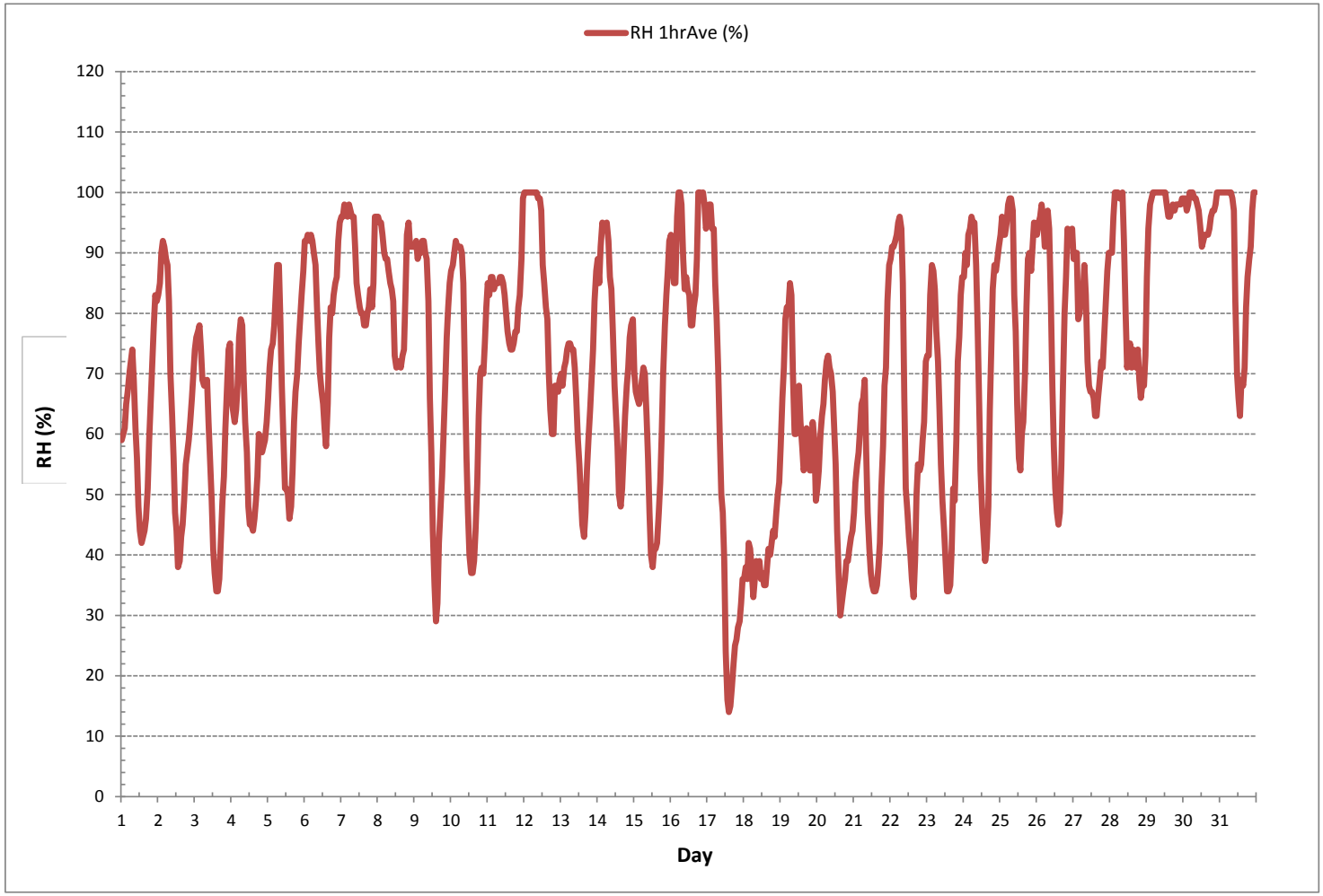
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	14	%	@ HOUR	14	ON DAY	17	
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	0	ON DAY	12	
MAXIMUM 24-HR AVERAGE:	98	%			ON DAY	29	
			OPERATIONAL TIME:			744	hrs
			AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	20		MONTHLY AVERAGE:			72	%

RELATIVE HUMIDITY Hourly Averages (RH %)



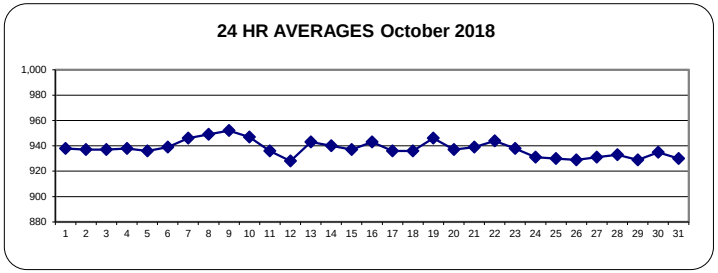
BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	940	939	938	938	937	937	937	937	937	937	938	938	938	938	938	938	938	938	939	939	939	940	940	940	937	940	938	24
2	940	940	940	940	940	940	940	940	940	940	939	939	938	937	936	935	934	934	933	933	933	932	932	932	932	940	937	24
3	932	932	932	932	933	933	934	935	936	937	937	938	938	939	939	939	940	940	940	940	940	940	940	941	932	941	937	24
4	941	941	940	940	940	940	939	939	940	940	940	939	939	939	938	938	937	937	936	936	936	936	936	935	935	941	938	24
5	935	934	934	934	934	934	934	934	935	936	936	937	937	937	937	937	938	938	938	938	938	938	938	938	934	938	936	24
6	938	938	938	938	938	938	939	939	939	939	939	939	939	939	939	939	939	939	940	940	941	941	941	941	938	941	939	24
7	942	943	943	943	944	944	944	945	945	946	946	946	946	946	946	946	947	947	947	947	947	947	948	947	942	948	946	24
8	948	948	948	948	949	949	949	950	950	950	950	950	950	950	950	950	949	949	949	949	949	949	949	950	948	950	949	24
9	950	950	950	950	950	951	951	952	952	953	**954**	954	954	953	953	953	952	952	952	951	951	951	951	950	950	**954**	**952**	24
10	950	950	949	949	949	949	948	948	948	948	948	948	947	947	946	946	945	945	944	944	944	944	943	943	943	950	947	24
11	942	942	941	941	941	940	940	939	939	939	939	938	937	936	935	934	934	933	932	931	930	930	929	928	928	942	936	24
12	927	926	926	925	924	924	**923**	923	923	924	924	924	925	926	927	929	930	932	933	934	935	936	937	937	**923**	937	928	24
13	938	939	939	939	940	940	941	942	942	943	944	944	944	945	945	945	945	945	946	946	946	946	946	946	938	946	943	24
14	945	945	945	944	944	943	943	943	942	942	942	942	941	940	939	938	937	936	935	934	933	932	932	931	931	945	940	24
15	932	932	932	933	933	934	935	935	936	937	937	938	938	938	938	939	939	939	940	940	940	941	942	942	932	942	937	24
16	943	943	943	944	943	943	944	944	944	945	945	945	945	945	944	944	944	944	943	942	942	941	941	941	941	945	943	24
17	940	939	938	938	938	937	937	937	937	938	938	938	938	937	937	936	935	934	934	934	933	933	933	932	932	940	936	24
18	932	932	932	932	932	933	933	934	934	935	935	936	936	936	936	936	937	938	938	938	939	940	940	941	932	941	936	24
19	942	942	943	943	943	943	944	944	945	946	948	948	949	949	949	949	949	948	947	947	947	946	946	945	942	949	946	24
20	945	944	943	942	940	939	938	937	937	937	936	936	935	935	935	934	934	935	935	935	936	936	936	936	934	945	937	24
21	936	936	936	937	937	937	937	937	938	939	939	940	940	940	941	941	941	941	942	942	942	942	943	943	936	943	939	24
22	944	944	944	944	944	944	944	944	945	946	946	946	946	946	945	945	944	943	943	943	943	942	942	942	942	946	944	24
23	941	941	941	940	940	939	939	939	939	939	939	939	939	938	938	938	937	936	935	935	934	934	934	933	933	941	938	24
24	933	933	932	932	932	931	932	931	932	932	933	933	932	932	932	932	931	930	930	930	930	930	929	929	929	933	931	24
25	929	929	929	930	930	929	930	930	930	931	932	932	932	932	932	932	931	931	930	930	930	930	930	930	929	932	930	24
26	930	930	930	930	930	930	930	930	930	931	931	931	930	930	930	929	929	928	927	926	926	927	926	926	926	931	929	24
27	926	926	927	927	927	927	928	928	929	930	931	931	931	931	932	933	933	933	934	934	935	935	935	935	926	935	931	24
28	936	936	936	936	935	935	935	934	935	935	935	935	934	933	933	932	932	931	931	930	930	929	928	928	928	936	933	24
29	927	926	926	925	925	925	926	926	927	928	929	929	930	930	930	931	931	932	932	932	933	933	933	934	925	934	929	24
30	934	934	934	934	934	934	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	935	934	934	934	935	935	24
31	934	934	933	933	932	931	931	930	930	930	930	931	930	930	929	929	929	929	928	928	929	929	929	929	928	934	930	24
HOURLY MAX	950	950	950	950	950	951	951	952	952	953	954	954	954	953	953	953	952	952	952	951	951	951	951	950				
HOURLY AVG	938	938	937	937	937	937	937	937	938	938	939	939	938	938	938	938	938	938	938	938	938	938	938	937				

STATUS FLAG CODES

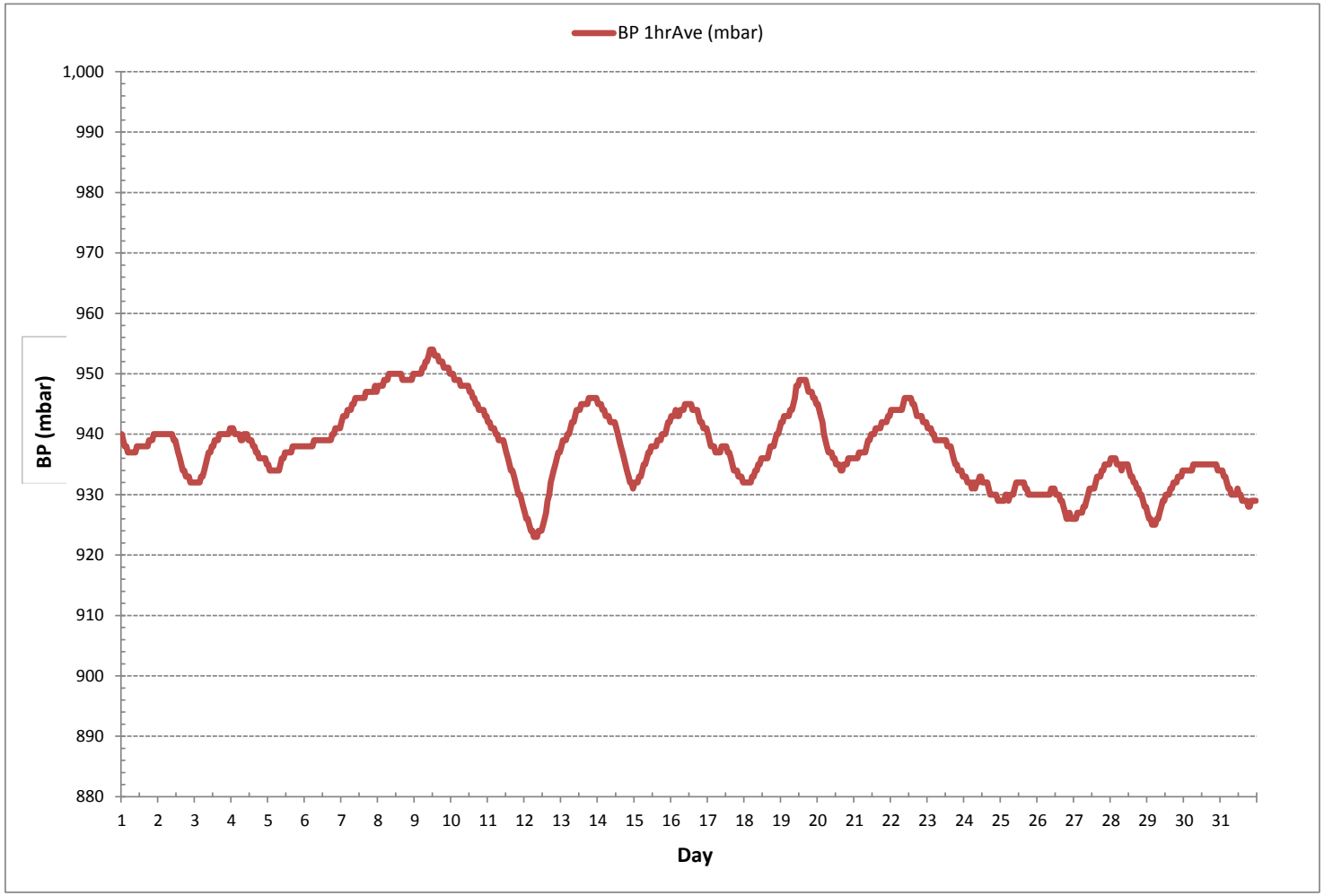
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	923	mbar	@ HOUR	6	ON DAY	12	
MAXIMUM 1-HR AVERAGE:	954	mbar	@ HOUR	10	ON DAY	9	
MAXIMUM 24-HR AVERAGE:	952	mbar			ON DAY	9	
			OPERATIONAL TIME:			744	hrs
			AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	7		MONTHLY AVERAGE:			938	mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

Maxxam
A Bureau Veritas Group Company

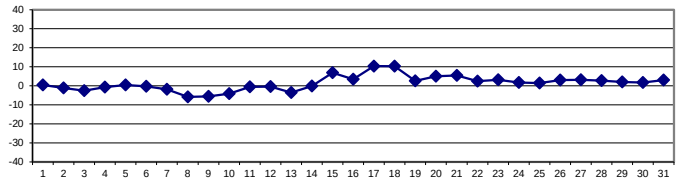
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-1.2	-1.1	-1.1	-1.6	-1.7	-1.7	-1.9	-1.8	-0.8	0.4	1.6	3.1	3.8	4.4	3.8	3.8	3.4	2.6	1.4	0.9	0.2	-1.1	-2.2	-1.7	-2.2	4.4	0.5	24
2	-2.6	-3.7	-4.6	-3.7	-2.9	-2.5	-2.6	-2.5	-1.7	-1.1	0.1	1.6	1.9	3.1	3.2	2.1	1.7	0.5	-1.1	-1.6	-2.0	-2.5	-3.1	-3.6	-4.6	3.2	-1.1	24
3	-4.3	-4.7	-4.6	-4.3	-3.1	-2.3	-2.4	-2.1	-1.4	-0.9	-0.6	-0.2	0.3	1.4	1.8	1.6	0.5	-0.9	-2.8	-3.6	-5.3	-6.6	-7.4	-6.8	-7.4	1.8	-2.5	24
4	-5.5	-5.5	-5.2	-5.4	-6.2	-7.2	-7.5	-6.9	-3.7	-1.2	0.5	2.9	4.2	4.7	5.0	5.0	4.8	3.5	1.7	1.8	2.0	1.6	0.9	0.2	-7.5	5.0	-0.7	24
5	-0.6	-1.3	-1.1	-0.7	-0.9	-1.7	-2.8	-2.4	-0.3	1.7	3.0	4.6	4.4	4.9	5.7	5.4	3.7	1.6	0.4	-0.3	-1.6	-2.7	-3.7	-4.5	-4.5	5.7	0.5	24
6	-4.6	-4.8	-5.1	-5.1	-4.9	-3.2	-2.5	-1.8	-1.1	-0.1	1.2	2.1	2.6	3.7	4.7	3.9	2.7	2.3	1.9	1.4	1.2	0.9	0.1	-0.6	-5.1	4.7	-0.2	24
7	-0.6	-1.1	-1.7	-1.7	-1.7	-2.1	-2.6	-2.7	-2.2	-1.7	-1.3	-1.1	-0.9	-0.7	-0.8	-0.7	-0.9	-1.3	-1.8	-2.4	-2.7	-2.9	-3.5	-4.2	-4.2	-0.6	-1.8	24
8	-4.6	-5.0	-5.3	-5.5	-5.8	-6.5	-6.9	-6.1	-5.3	-4.6	-4.2	-3.6	-3.6	-3.8	-3.9	-3.9	-4.0	-4.5	-6.3	-8.6	-9.5	-9.2	-9.1	-9.2	-9.5	-3.6	-5.8	24
9	-10.4	-11.3	-12.0	-12.4	**-12.7**	-12.6	-12.4	-10.8	-7.3	-3.7	-1.5	-0.4	0.8	1.4	2.4	2.6	1.5	-0.4	-2.1	-3.6	-4.8	-6.1	-7.1	-7.9	**-12.7**	2.6	-5.5	24
10	-8.7	-9.3	-9.8	-10.3	-10.6	-11.0	-11.4	-10.4	-6.3	-1.6	0.2	0.7	1.2	1.3	1.5	1.7	1.6	-0.1	-2.4	-3.6	-3.2	-2.4	-2.7	-3.5	-11.4	1.7	-4.1	24
11	-3.8	-3.0	-3.1	-2.5	-1.9	-2.0	-1.8	-1.7	-1.4	-1.0	-0.7	-0.1	0.7	1.4	1.6	1.8	1.7	1.2	1.0	0.8	0.6	0.5	0.4	0.0	-3.8	1.8	-0.5	24
12	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.9	1.4	1.6	1.8	2.0	2.0	1.1	0.5	-0.2	-0.7	-1.4	-1.7	-2.4	-2.8	-3.2	-4.2	-5.0	-5.0	2.0	-0.4	24
13	-5.3	-5.0	-5.3	-5.6	-5.8	-5.9	-5.6	-5.3	-5.0	-4.4	-3.3	-1.8	-1.0	0.1	0.9	1.1	0.4	-0.9	-1.9	-2.8	-3.6	-4.9	-6.5	-7.3	-7.3	1.1	-3.5	24
14	-7.4	-6.6	-7.3	-7.5	-7.2	-7.1	-7.6	-6.4	-4.0	-2.7	-0.2	2.7	4.4	5.6	6.4	6.9	6.3	5.4	5.1	4.9	4.3	3.3	3.0	2.8	-7.6	6.9	-0.1	24
15	4.5	4.9	4.7	4.8	4.6	4.1	4.1	4.6	6.6	8.7	9.8	10.9	11.4	10.9	10.8	10.6	9.4	8.1	7.2	6.1	5.3	5.2	4.7	3.6	3.6	11.4	6.9	24
16	2.8	2.8	2.7	2.4	-0.1	-1.9	-2.1	-0.9	1.8	4.1	5.2	6.1	6.7	7.7	8.0	7.9	7.7	6.4	3.6	2.6	2.4	0.1	2.6	4.6	-2.1	8.0	3.5	24
17	3.7	1.8	1.3	1.9	1.1	1.5	2.1	3.2	5.7	7.8	9.2	13.1	17.4	20.6	**21.8**	21.5	19.4	17.0	15.7	15.3	14.2	13.3	11.1	9.4	1.1	**21.8**	**10.4**	24
18	9.1	8.0	8.6	7.4	7.6	9.8	11.2	10.7	10.2	12.2	12.3	13.5	13.3	14.3	14.1	13.3	12.2	10.9	9.4	8.8	8.7	7.6	7.6	7.1	7.1	14.3	10.3	24
19	5.8	3.6	2.5	1.1	1.0	1.1	0.1	0.5	3.4	5.5	6.8	6.4	5.5	5.9	6.2	6.4	5.0	2.4	0.2	-0.9	-1.3	-2.5	-2.1	-1.2	-2.5	6.8	2.6	24
20	-1.2	-1.4	-2.1	-2.4	-1.9	-2.0	-1.5	-0.1	0.6	1.8	3.2	5.2	7.3	11.2	13.3	13.7	12.6	11.5	10.2	9.2	9.1	8.6	7.9	7.4	-2.4	13.7	5.0	24
21	6.4	5.2	4.3	4.0	3.0	2.1	1.9	1.4	4.5	6.8	8.3	9.5	10.5	11.2	11.7	11.3	10.2	8.7	5.7	3.9	1.8	1.2	-1.1	-2.3	-2.3	11.7	5.4	24
22	-2.7	-3.5	-4.0	-4.6	-5.2	-5.4	-5.8	-5.6	-2.9	2.8	6.3	7.6	9.2	10.4	11.3	11.0	9.4	6.4	5.4	5.6	5.4	4.3	3.4	1.1	-5.8	11.3	2.5	24
23	0.7	0.6	-1.3	-2.1	-2.4	-2.3	-1.3	-0.3	1.5	3.8	5.8	7.8	9.9	11.7	12.3	11.3	8.9	5.8	6.4	4.1	1.0	-0.1	-1.4	-2.4	-2.4	12.3	3.2	24
24	-2.9	-2.8	-3.3	-4.0	-4.5	-4.6	-4.9	-4.9	-2.0	1.5	5.4	8.3	9.9	11.0	12.7	12.2	9.7	5.8	3.0	0.7	-0.4	-0.6	-1.2	-1.1	-4.9	12.7	1.8	24
25	-1.6	-2.1	-1.3	-1.3	-1.9	-2.7	-2.7	-2.9	-2.0	1.5	3.4	6.2	8.4	9.0	7.4	7.2	5.3	2.8	0.8	0.2	0.7	-0.3	-0.5	0.0	-2.9	9.0	1.4	24
26	0.1	-0.4	-0.2	-0.7	0.3	1.5	1.8	1.3	3.1	5.7	7.3	8.6	9.5	10.4	10.5	9.8	7.4	4.0	1.6	0.0	-1.6	-1.4	-2.2	-1.8	-2.2	10.5	3.1	24
27	-1.0	-0.5	-0.9	0.3	0.2	-0.1	0.4	-0.1	1.6	5.0	5.7	5.4	5.6	6.2	6.9	6.4	6.0	5.4	4.8	5.1	4.7	3.6	3.0	2.9	-1.0	6.9	3.2	24
28	3.1	2.8	0.8	-0.4	-2.0	-2.4	-3.2	-3.8	-2.2	1.5	4.2	5.7	5.3	5.3	5.9	5.7	5.2	4.6	4.3	4.8	4.8	4.9	4.7	4.3	-3.8	5.9	2.7	24
29	3.4	2.9	2.6	2.2	1.3	0.7	0.2	0.3	0.5	0.9	1.5	2.1	2.5	2.8	3.1	3.0	2.9	2.7	2.6	2.3	2.2	2.0	1.7	1.6	0.2	3.4	2.0	24
30	1.6	1.5	1.3	0.9	0.8	0.5	0.5	0.7	0.8	1.2	1.4	1.8	2.5	2.8	2.8	3.0	2.9	2.7	2.7	2.7	2.8	2.5	1.9	1.9	0.5	3.0	1.8	24
31	1.8	1.6	1.6	1.6	1.5	1.1	1.0	1.0	1.1	1.7	4.3	6.4	7.3	7.2	6.1	6.0	5.4	3.8	2.8	2.4	2.4	2.5	2.4	2.4	1.0	7.3	3.1	24
HOURLY MAX	9.1	8.0	8.6	7.4	7.6	9.8	11.2	10.7	10.2	12.2	12.3	13.5	17.4	20.6	21.8	21.5	19.4	17.0	15.7	15.3	14.2	13.3	11.1	9.4				
HOURLY AVG	-0.8	-1.2	-1.6	-1.8	-2.0	-2.1	-2.1	-1.8	-0.2	1.7	3.1	4.4	5.3	6.0	6.4	6.2	5.2	3.8	2.5	1.7	1.1	0.5	-0.1	-0.4				

STATUS FLAG CODES

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

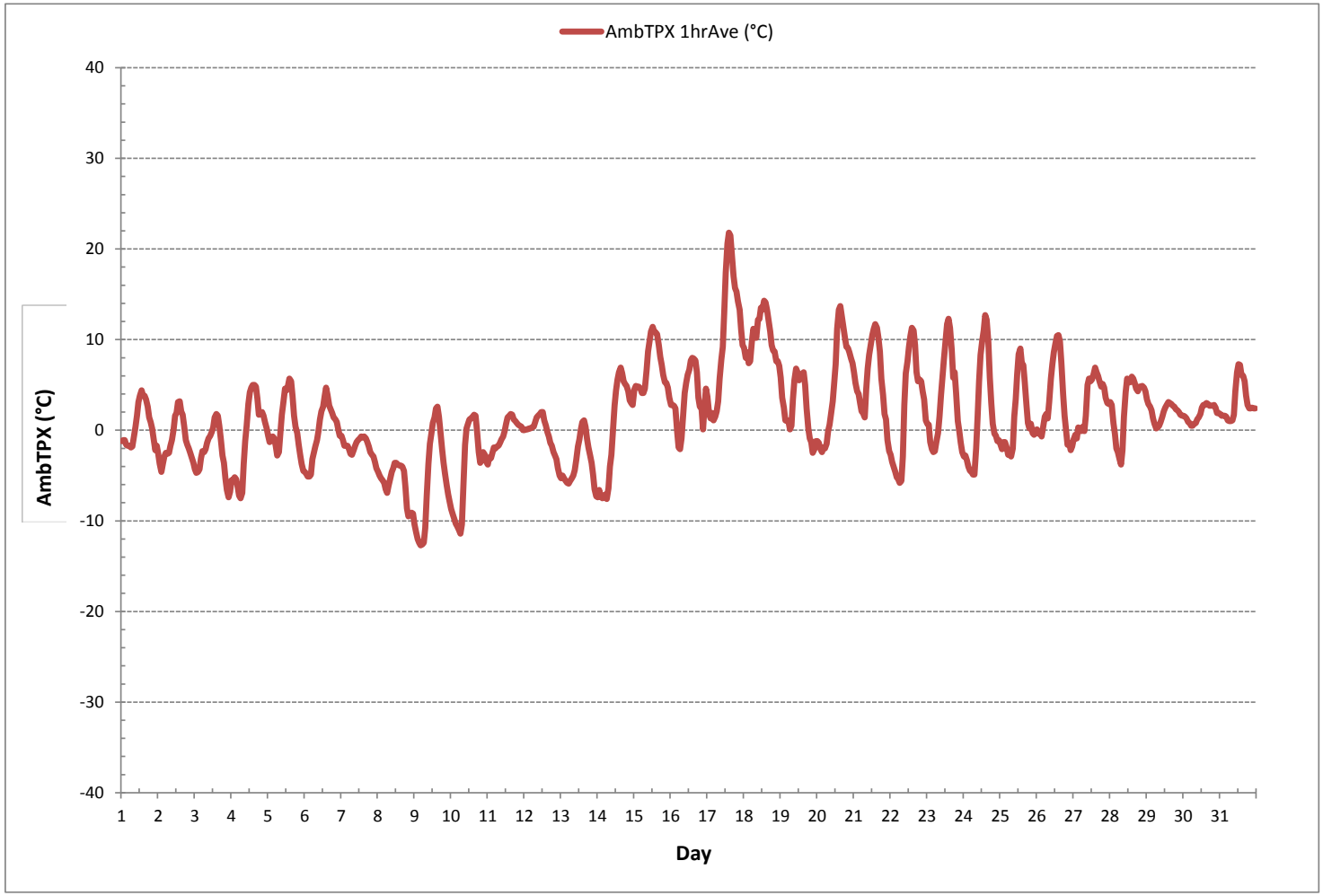
24 HR AVERAGES October 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-12.7	°C	@ HOUR	4	ON DAY	9	
MAXIMUM 1-HR AVERAGE:	21.8	°C	@ HOUR	14	ON DAY	17	
MAXIMUM 24-HR AVERAGE:	10.4	°C			ON DAY	17	
			OPERATIONAL TIME:			744	hrs
			AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	5.3		MONTHLY AVERAGE:			1.4	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

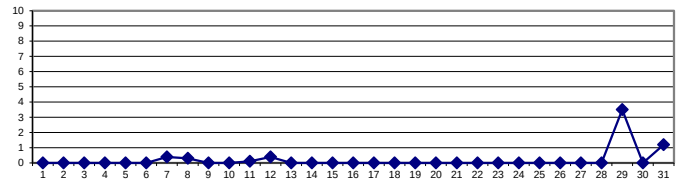
PRECIPITATION Hourly Totals (mm)

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	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.2	0.4	24
8	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	24
12	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	**C**	**C**	**C**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.2	0.3	**0.8**	0.8	0.5	0.4	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.8**	**3.5**	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.0	0.6	1.2	24
HOURLY MAX	0.2	0.1	0.2	0.3	0.8	0.8	0.5	0.4	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.6				
HOURLY SUM	0.4	0.2	0.2	0.3	0.8	0.9	0.5	0.4	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.9				

STATUS FLAG CODES

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

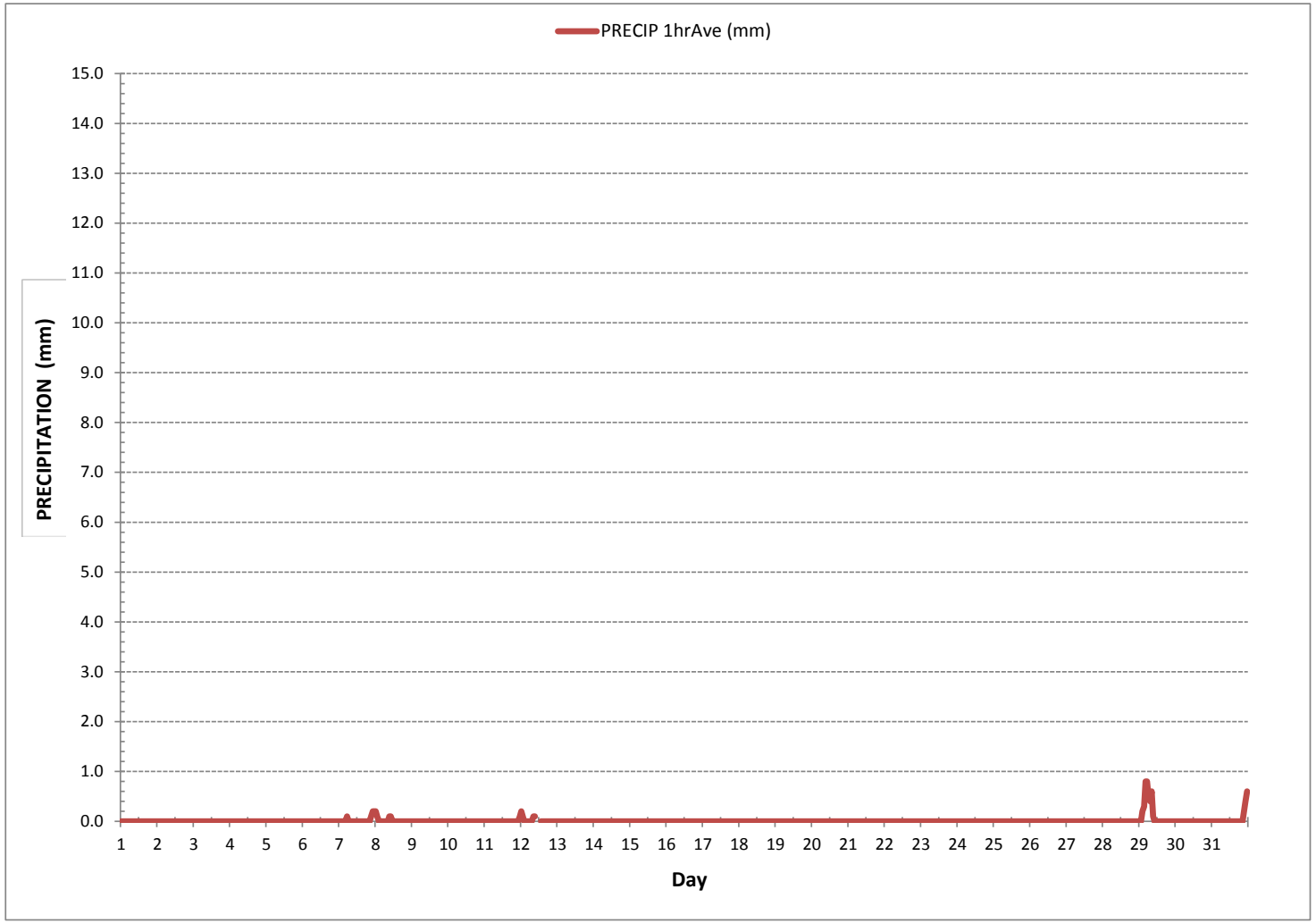
24 HR TOTALS October 2018



MONTHLY SUMMARY

MINIMUM 1-HR TOTAL:		0.0	mm	@ HOUR	0	ON DAY	1	
MAXIMUM 1-HR TOTAL:		0.8	mm	@ HOUR	4	ON DAY	29	
MAXIMUM 24-HR TOTAL:		3.5	mm			ON DAY	29	
MONTHLY TOTAL	6.6	mm						
				OPERATIONAL TIME:			744	hrs
				AMD OPERATION UPTIME:			100.0	%
STANDARD DEVIATION:	0.1			MONTHLY AVERAGE:			0.0	mm

PRECIPITATION Hourly Totals (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE

Thermo 43I-TLE Sulphur Dioxide Analyzer Calibration

Date:	October 12, 2018	**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	22	°C
Location/Station Name:	Maskwa	**Weather Conditions:**	Cloudy/Overcast		
Parameter:	Sulphur Dioxide	**Calibration Purpose:**	routine monthly		
Start Time 24 hr. (mst):	9:23	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:11	**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:	September 2, 2018	**As Found C.F.:**	1.020
Previous C.F.:	1.000	**New C.F.:**	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date:	API id# 690 expires March 15, 2019
Cal Gas Cylinder I.D. # :	LL 104225
Cal Gas Conc. (ppm):	49.2

Standard Calibration Points for Ranges

Point	ppb
High	780
Mid	380
Low	190

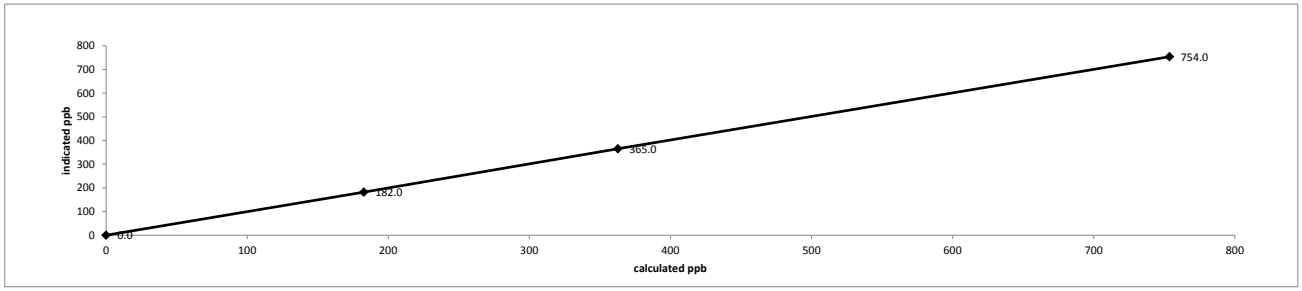
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	**Diluent**	**Cal Gas**	**Total**			
as found zero	4775	0.00	4775	0.0	0.1	n/a
as found high	4883	75.96	4959	753.6	739	1.020
adjusted zero	4775	0.00	4775	0.0	0	n/a
adjusted high	4883	75.96	4959	753.6	754	1.000
mid	4925	36.58	4962	362.7	365	0.994
low	4933	18.38	4951	182.6	182	1.004
calibrator zero	4775	0.00	4775	0.0	0	n/a
					Average C.F.=	0.999

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> or = 0.995**
Slope =	**0.999**	**0.95-1.05**
b (Intercept as % of full scale)=	**-0.01%**	**± 3% F.S.**
% change in C.F. from last cal=	**-1.99%**	**± 10%**

Thermo 43I-TLE Sulphur Dioxide Analyzer Calibration



	As found:		**As left:**
Bkg:	1.88	Bkg:	2.16
Coef:	0.963	Coef:	0.977
Pmt:	-701.5	Pmt:	-700.8
Flash:	980	Flash:	980
Internal:	30.7	Internal:	30.6
Chamber:	45.2	Chamber:	44.9
Perm Oven Gas:	35.00	Perm Oven Gas:	35.00
Perm Oven Heater:	34.26	Perm Oven Heater:	34.26
Pressure:	661.0	Pressure:	663.1
Sample Flow:	0.453	Sample Flow:	0.455
Lamp Intensity:	92	Lamp Intensity:	92
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	431.0	Expected Value:	439.0

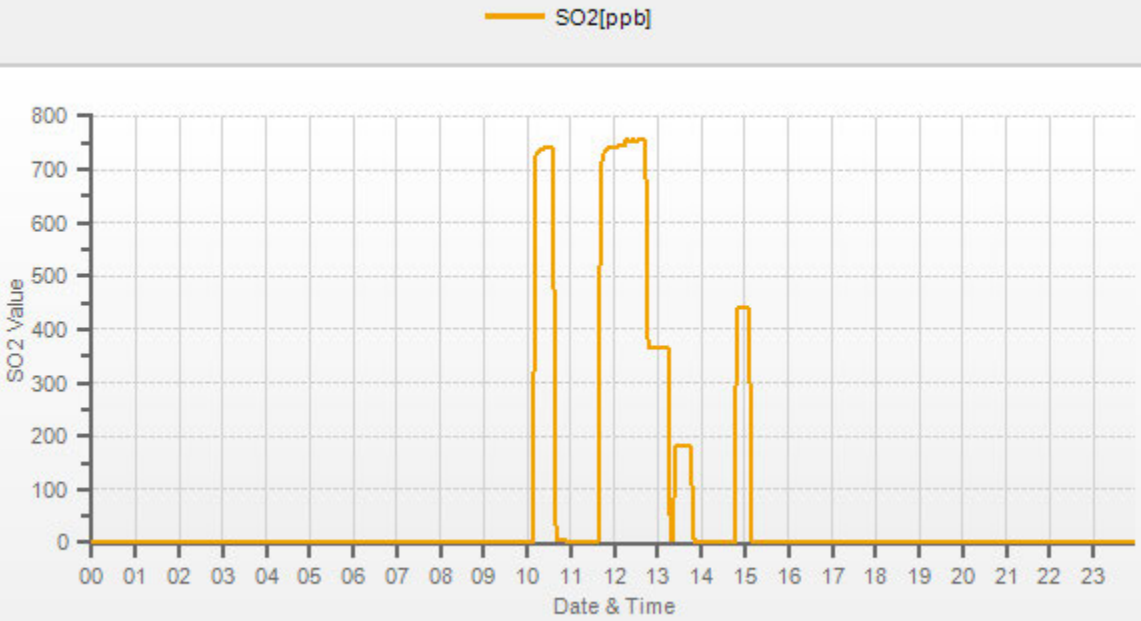
Comments:

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] Station: LICA MASKWA Daily: 18/10/12 Type: AVG 1 Min. [1 Min.]



HYDROGEN SULPHIDE

Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	October 12, 2018	**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	22	°C
Location/Station Name:	Maskwa	**Weather Conditions:**	Cloudy/Overcast		
Parameter:	Hydrogen Sulphide	**Calibration Purpose:**	routine monthly		
Start Time 24 hr. (mst):	14:19	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	21:09	**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:	September 3, 2018	**As Found C.F.:**	1.016
Previous C.F.:	1.000	**New C.F.:**	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019
Cal Gas Cylinder I.D. # :	EY 0001003
Cal Gas Conc. (ppm):	9.55

Standard Calibration Points for Ranges

Point	ppb
High	78
Mid	38
Low	19

SO2 Scrubber Check (10 minutes):

Start/End Time 24 hr.:	14:22 / 14:38
SO2 Analyzer Range:	1000
Target Concentration (ppb):	780
As Found Zero:	1.4
Analyzer Response: (ppb):	1.4
Zero Corrected Result (ppb):	0.0

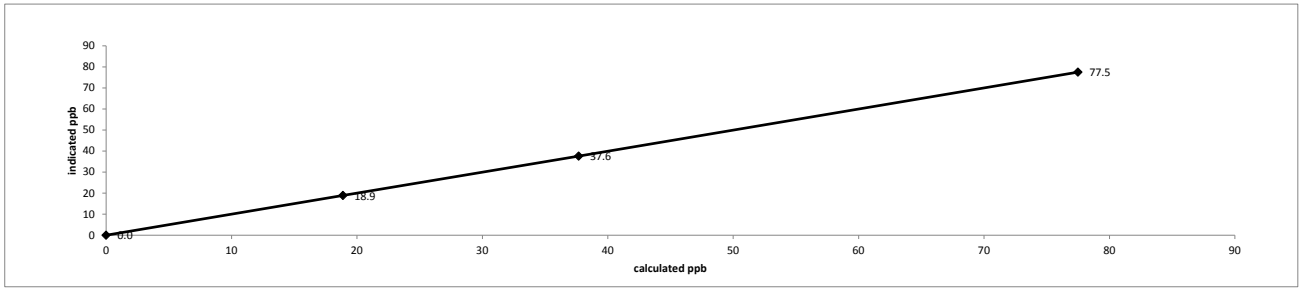
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	**Diluent**	**Cal Gas**	**Total**			
as found zero	7543	0.00	7543	0.0	1.4	n/a
as found high	7483	61.21	7544	77.5	77.7	1.016
adjusted zero	7543	0.00	7543	0.0	0.0	n/a
adjusted high	7483	61.21	7544	77.5	77.5	1.000
mid	7549	29.90	7579	37.7	37.6	1.002
low	7557	14.97	7572	18.9	18.9	0.999
calibrator zero	7543	0.00	7543	0.0	0.0	n/a
					Average C.F.=	1.000

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> or = 0.995**
Slope =	**1.000**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.03%**	**± 3% F.S.**
% change in C.F. from last cal=	**-1.55%**	**± 10%**

Thermo 450i Hydrogen Sulphide Analyzer Calibration



As found:		As left:	
Bkg:	16.5	Bkg:	18.4
Coef:	0.851	Coef:	0.871
Pmt:	-602.0	Pmt:	-602.4
Flash:	811	Flash:	810
Internal:	34.4	Internal:	32.8
Chamber:	45.0	Chamber:	45.1
Converter Temp:	323.3	Converter Temp:	323.1
Converter Set:	325.0	Converter Set:	325.0
Perm Oven Gas:	35.00	Perm Oven Gas:	35.00
Perm Oven Htr:	34.31	Perm Oven Htr:	34.29
Pressure:	564.9	Pressure:	570.1
Sample Flow:	0.944	Sample Flow:	0.948
Lamp Intensity:	91	Lamp Intensity:	91
Averaging Time:	120	Averaging Time:	120
Expected Value:	54.0	Expected Value:	53.6

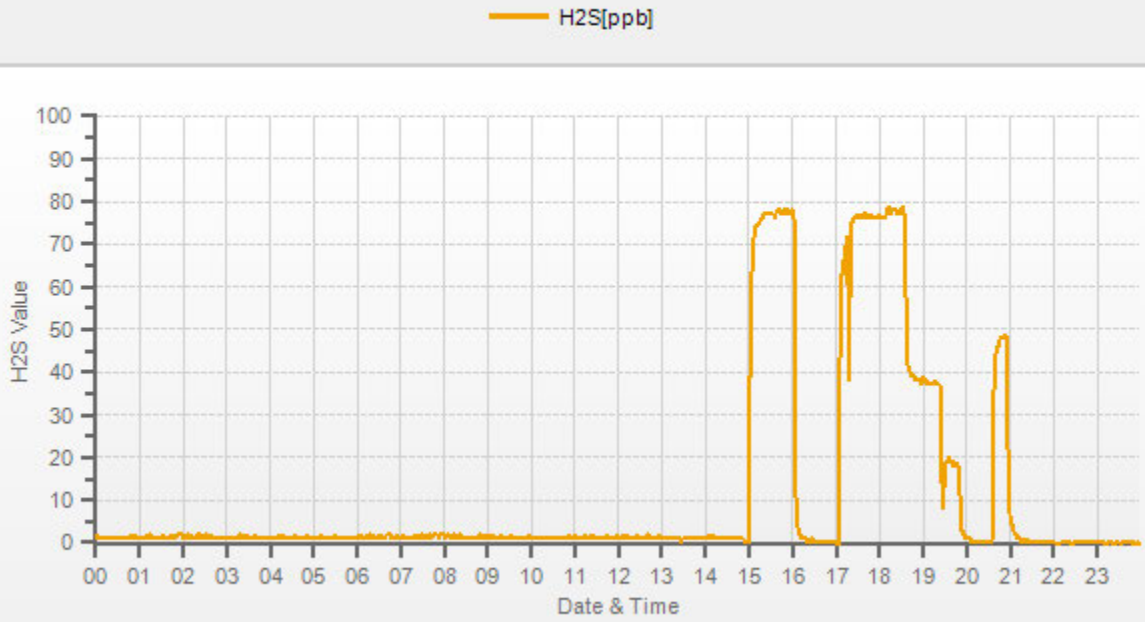
Comments:

The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

H2S[ppb] Station: LICA MASKWA Daily: 18/10/12 Type: AVG 1 Min. [1 Min.]



TOTAL HYDROCARBON

Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	October 3, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	936	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:	CH4 / NMHC / THC	**Calibration Purpose:**	shut down		
Start/End Time 24 hr. (mst):	9:08 / 11:02	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	**Cal Gas Expiry Date:**	October 18, 2025		

Analyzer:

Serial Number/Owner:	1236656107	LICA
Measured Flow:	1108	
Last Calibration Date:	September 3, 2018	
Range ppm:	20 CH4/20 NMHC/40 THC	

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
CH_4 =	1.000	1.029	n/a
NMHC =	1.000	0.996	n/a
THC =	1.000	1.013	n/a

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018		
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018		
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_3H_8 Cylinder Conc.**
CH_4 expressed as C_3H_8=	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

Calibrator Flow Rates (cc/min)										Correction Factors:		
Point	**Diluent**	**Cal Gas**	**Total Flow**	**Calculated CH_4 (ppm)**	**Calculated NMHC (ppm)**	**Calculated THC (ppm)**	**Indicated CH_4 (ppm)**	**Indicated NMHC (ppm)**	**Indicated THC (ppm)**	**CH_4**	**NMHC**	**THC**
as found zero	3478	0.00	3478	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	3475	78.13	3553	13.17	12.52	25.69	12.80	12.57	25.37	1.029	0.996	1.013
mid	3486	42.97	3529	7.29	6.93	14.22	7.11	7.04	14.15	1.026	0.985	1.005
low	3491	19.03	3510	3.25	3.09	6.33	3.21	3.10	6.31	1.012	0.996	1.004
									Average C.F.=	1.022	0.992	1.007

Linear Regression/Calibration Results:

	CH_4	NMHC	THC	LIMITS
Correlation Coefficient =	**1.000**	**1.000**	**1.000**	**> or = 0.995**
Slope =	**0.971**	**1.005**	**0.988**	**0.90-1.10**
b (Intercept as % of full scale)=	**0.13%**	**0.07%**	**0.10%**	**± 3% F.S.**
% change in C.F. from last cal=	**-2.91%**	**0.42%**	**-1.26%**	**± 10%**

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply:	-292.8	Calibration History cnt'd:	NM Peak Area:	90183
Temperatures:	Detector Oven:	175.1	Crucial Settings:	Methane Start:	n/a
	Filter:	175.1		Methane End:	n/a
	Column Oven:	75.0		Backflush:	n/a
	Internal:	32.1		NMHV Start:	n/a
Cylinder Pressures/reg.:	Carrier:	1500 50		NMHC End:	n/a
	Fuel:	1400 55	Run History>1:	Date:	Oct 3, 2018
	Span Gas:	1500 13		Time:	09:18
	Zero Air Generator:	50		CH_4 PK HT:	0
Internal Pressures:	Carrier:	31.1		CH_4 RT:	8.0
	Fuel:	40.3		CH_4 Baseline:	2266
	Air:	30.8		CH_4 LOD:	58
FID Status:	Status:	LIT		CH_4 SD:	19
	Counts:	26316		CH_4 CONC:	0.00
	Flame:	360.3		NM PK HT:	0
	Det Base:	175.1		NM Peak Area:	0
Flame and Power Stats:	Last Power On:	Sep 2, 2018		NM CONC:	0.00
	Flameouts:	1		NM Base Start:	2196
	Det Oven at Start:	35.7		NM Base End:	2206
	Col Oven at Start:	32.0		NM LOD:	7
Calibration History:	Time:	Sep 3, 2018 / 11:15		NM Start IDX:	41
	Type:	SPAN		NM End IDX:	88
	Status:	GOOD		NM Max Slope:	5.7e-01
	Check/Adjust:	ADJUST		NM Min Slope:	-3.4e-01
	CH_4 Span Conc:	14.45		NM PT Count:	0
	CH_4 SP Ratio:	0.000766	Expected Values:	Previous CH4:	10.13
	CH_4 RT:	13.4		Previous NMHC	10.96
	CH_4 PK IDX:	27		Previous THC:	21.08
	CH_4 PK HT:	18874		New CH4:	n/a
	NM Span Conc:	13.72		New NMHC	n/a
	NM SP Ratio:	0.000151		New THC:	n/a

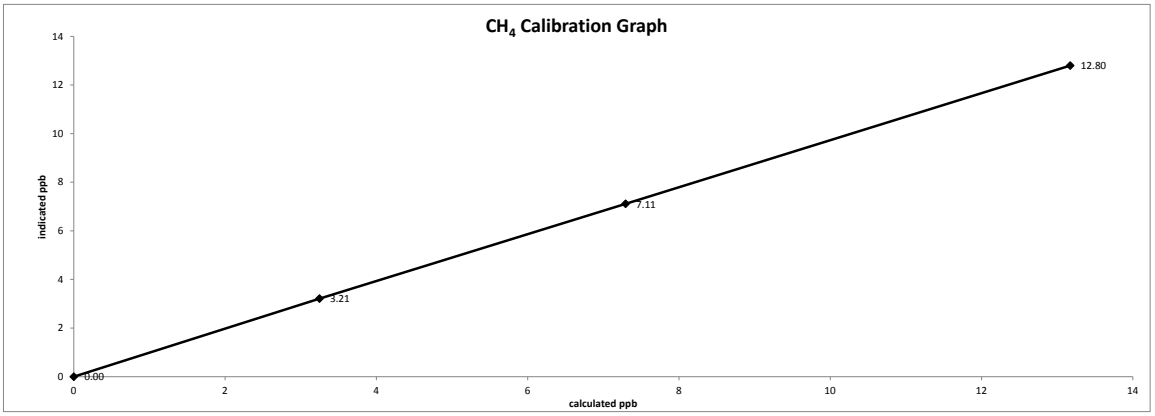
Comments:

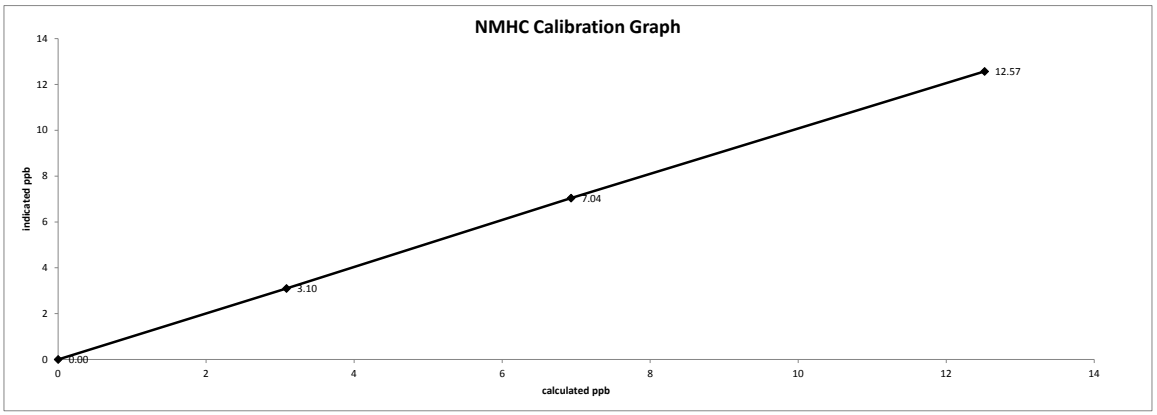
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

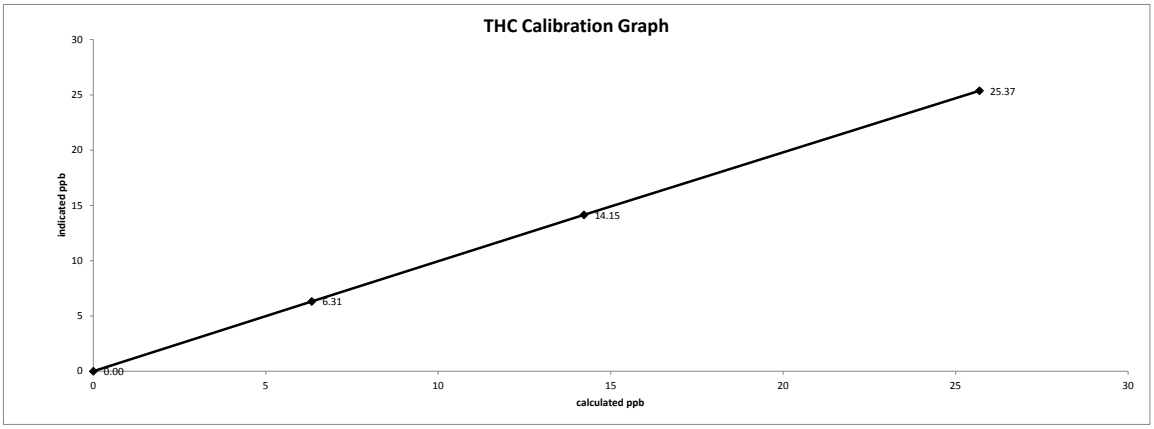
The manifold blower was found to be working normally.

Shutdown calibration was completed to re-install the analyzer at the Bonnyville monitoring site.

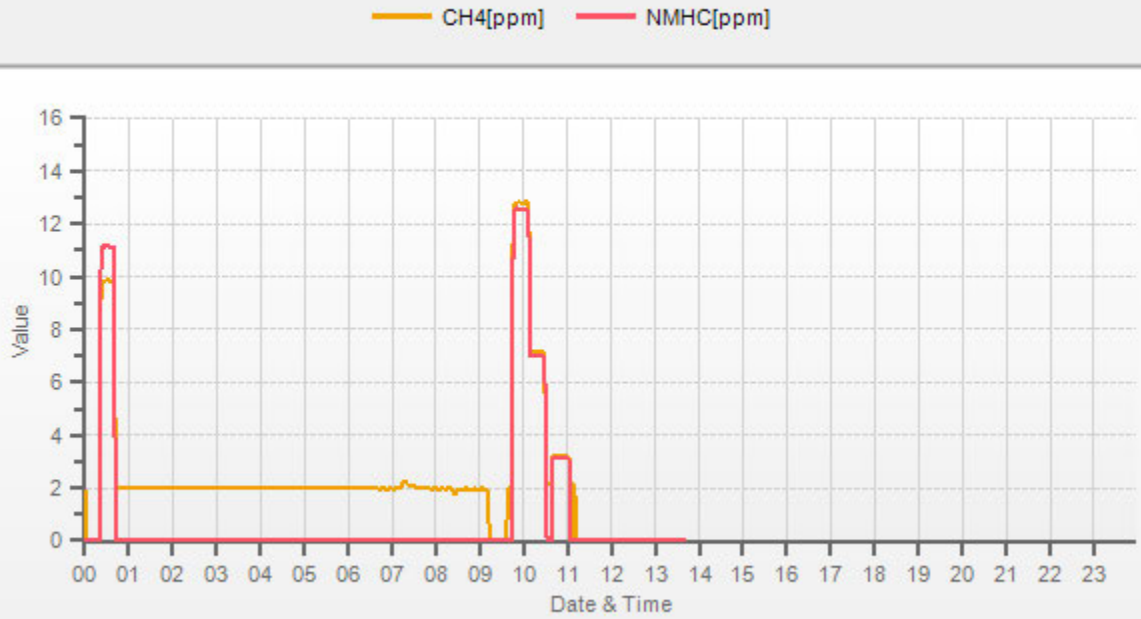
Date:	October 3, 2018	Start/End Time 24 hr. (mst):	9:08 / 11:02
Company/Airshed:	LICA	Calibration Purpose:	shut down
Location/Station Name:	Maskwa	Calibration Method:	Gas Dilution







Station: LICA MASKWA Daily: 18/10/03 Type: AVG 1 Min. [1 Min.]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	October 03, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	936	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:	Total Hydrocarbon	**Calibration Purpose:**	installation		
Start/End Time 24 hr. (mst):	14:01 / 17:35	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	**Cal Gas Expiry Date:**	October 18, 2025		

Analyzer:

Serial Number/Owner:	46609738 LICA	**Range ppm:**	50	
Last Calibration Date:	n/a	**As Found C.F.:**	n/a	
Previous Cal High Point C.F.:	n/a	**New C.F.:**	1.000	

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	
Calibrator ID/Expiry Date:	API id# 690 expires March 15, 2019	
Cal Gas Cylinder I.D. # :	LL 119471	
CH_4/C_3H_8 Cylinder Conc. (ppm):	599.0	207.0
CH_4 as propane/total CH_4 equivalents (ppm):	569.3	1168.3

Standard Calibration Points for a Range of: 50 ppm

Point	Target ppm
High	38
Mid	18
Low	9

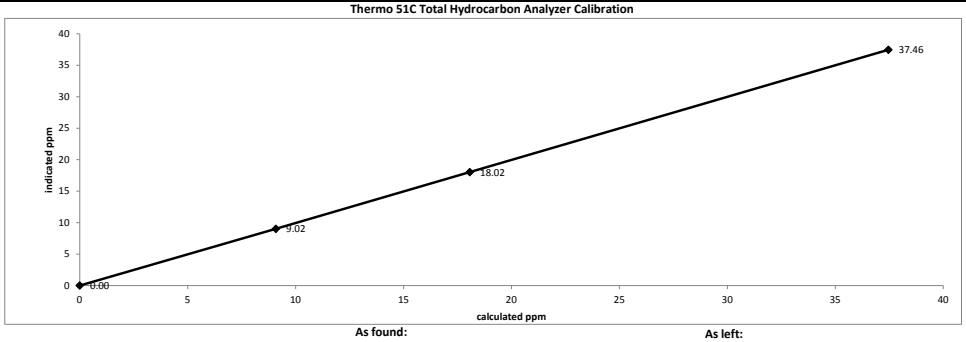
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	**Diluent**	**Cal Gas**	**Total**	**(ppm)**	**(ppm)**	
adjusted zero	2478	0.00	2478	0.0	0.00	n/a
adjusted high	2480	82.15	2562	37.46	37.46	1.000
mid	2479	38.94	2518	18.07	18.02	1.003
low	2484	19.46	2503	9.08	9.02	1.007
calibrator zero	2478	0.00	2478	0.00	0.00	n/a
					Average C.F.=	1.003

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> or = 0.995**
Slope =	**1.000**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.07%**	**± 3% F.S.**
% change in C.F. from last cal=	**n/a**	**n/a**

Thermo 51C Total Hydrocarbon Analyzer Calibration



	As found:		**As left:**
measurement alarms:	n/a	measurement alarms:	None
service alarms:	n/a	service alarms:	None
cnt:	n/a	cnt:	2785
rng:	n/a	rng:	1
try:	n/a	try:	2
flm:	n/a	flm:	216.1
det:	n/a	det:	125.2
Flame:	n/a	Flame:	216
Filter:	n/a	Filter:	125
Base:	n/a	Base:	125
Sample psi:	n/a	Sample psi:	07.52
Internal Air Pressure:	n/a	Internal Air Pressure:	20
Internal Fuel Pressure:	n/a	Internal Fuel Pressure:	13
Cylinder/Regulator Pressures: H2 Cylinder (psi):	n/a	H2 Cylinder (psi):	1400
H2 cylinder reg set (psi):	n/a	H2 cylinder reg set (psi):	30
Zero Air Gen Pressure:	n/a	Zero Air Gen Pressure:	39
Span Cylinder (psi):	n/a	Span Cylinder (psi):	2000
Span Cylinder reg set (psi):	n/a	Span Cylinder reg set (psi):	24
Measured Flow:	n/a	Measured Flow:	0.884
Expected Value:	n/a	Expected Value:	26.77

Comments:

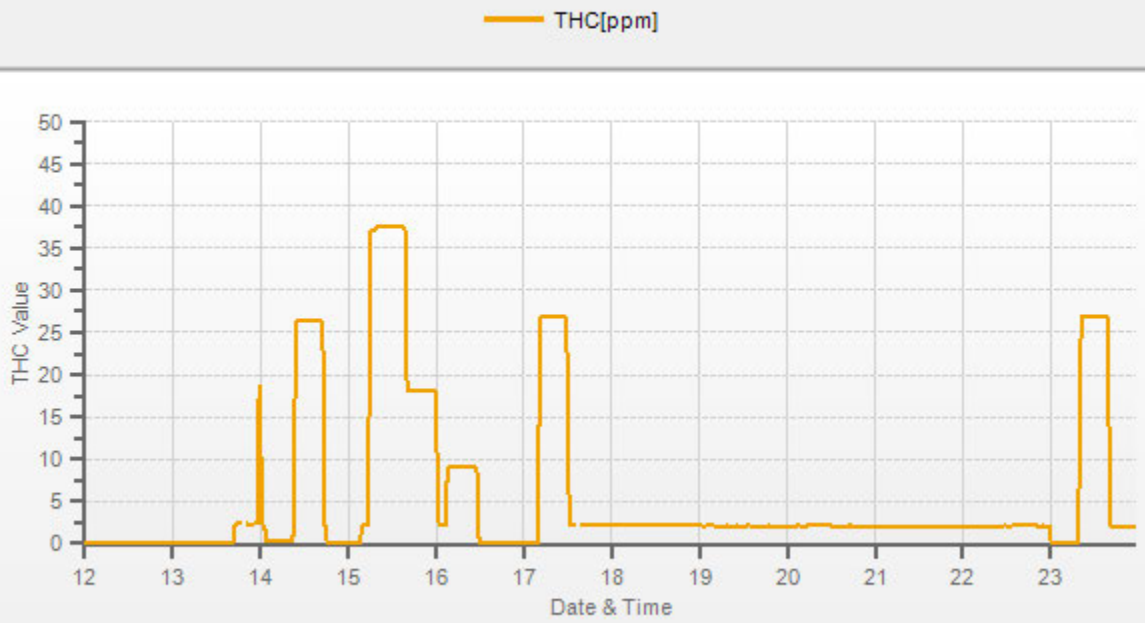
The analyzer sample inlet filter was changed.

A new span gas cylinder was installed.

The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

The THC analyzer was installed to replace a 55i NMHC analyzer.

THC[ppm] Station: LICA MASKWA Daily: 18/10/03 Type: AVG 1 Min. [1 Min.]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	October 12, 2018	**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	22	°C
Location/Station Name:	Maskwa	**Weather Conditions:**	Cloudy/Overcast		
Parameter:	Total Hydrocarbon	**Calibration Purpose:**	repeat		
Start/End Time 24 hr. (mst):	9:23 / 14:59	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	**Cal Gas Expiry Date:**	October 18, 2025		
Analyzer:					
Serial Number/Owner:	436609738 LICA	**Range ppm:**	50		
Last Calibration Date:	October 3, 2018	**As Found C.F.:**	0.992		
Previous Cal High Point C.F.:	1.000	**New C.F.:**	1.000		

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019	
Cal Gas Cylinder I.D. # :	LL 119471	
CH_4/C_3H_8 Cylinder Conc. (ppm):	599.0	207.0
CH_4 as propane/total CH_4 equivalents (ppm):	569.3	1168.3

Standard Calibration Points for a Range of: 50 ppm

Point	Target ppm
High	**38**
Mid	**18**
Low	**9**

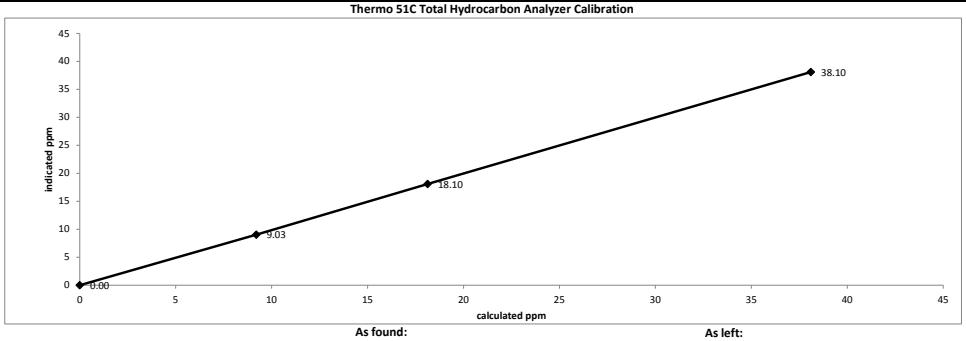
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	**Diluent**	**Cal Gas**	**Total**	**(ppm)**	**(ppm)**	
as found zero	2492	0.00	2492	0.0	-0.42	n/a
as found high	2415	81.40	2496	38.10	38.00	0.992
adjusted zero	2492	0.00	2492	0.00	0.00	n/a
adjusted high	2415	81.40	2496	38.10	38.10	1.000
mid	2457	38.73	2496	18.13	18.10	1.002
low	2450	19.44	2469	9.20	9.03	1.019
calibrator zero	2492	0.00	2492	0.0	0.00	n/a
					Average C.F.=	1.007

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> or = 0.995**
Slope =	**0.999**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.15%**	**± 3% F.S.**
% change in C.F. from last cal=	**0.84%**	**± 10%**

Thermo 51C Total Hydrocarbon Analyzer Calibration



	As found:	As left:
measurement alarms:	None	None
service alarms:	None	None
cnt:	2520	2552
rng:	1	1
try:	2	2
flm:	212.2	212.6
det:	125.5	125.5
Flame:	212	212
Filter:	125	125
Base:	125	125
Sample psi:	07.51	07.51
Internal Air Pressure:	20	20
Internal Fuel Pressure:	13	13
Cylinder/Regulator Pressures: H2 Cylinder (psi):	1100	1100
H2 cylinder reg set (psi):	30	30
Zero Air Gen Pressure:	42	42
Span Cylinder (psi):	1900	1900
Span Cylinder reg set (psi):	24	24
Measured Flow:	0.881	n/a
Expected Value:	26.77	26.77

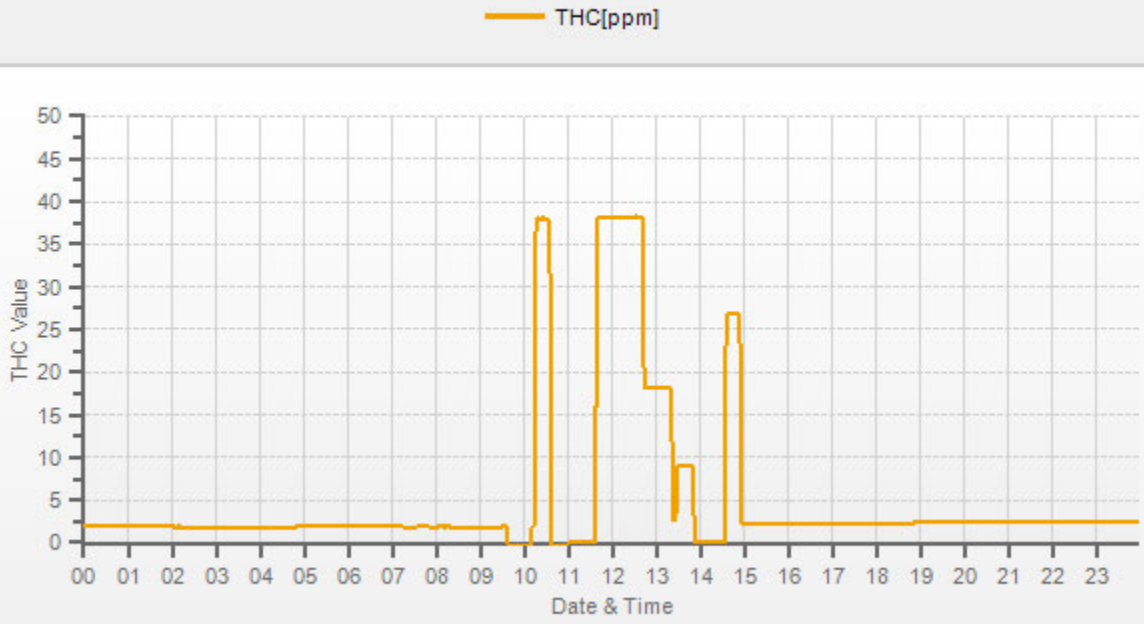
Comments:

The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

Repeat calibration was completed to correct for a zero drift. The SPAN value did not change after calibration.

THC[ppm] Station: LICA MASKWA Daily: 18/10/12 Type: AVG 1 Min. [1 Min.]



NITROGEN DIOXIDE

Thermo 42i NO-NO2-NOx Analyzer Calibration

Date:	October 12, 2018	**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	22	°C
Location/Station Name:	Maskwa	**Weather Conditions:**	Cloudy/Overcast		
Start/End Time 24 hr. (mst):	9:23 / 17:45	**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:	September 2, 2018	
Range ppb:	1000	

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	1.000	0.970	1.000
NO_2 =	1.000	1.000	1.000
NOx =	1.000	0.966	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	
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

Point	Target NO (ppb)	Target NO_2 (ppb)	Cc Ozone ?
High	**780**	**500**	**n/a**
Mid	**380**	**275**	**n/a**
Low	**190**	**100**	**n/a**
Extra Point #1	**n/a**	**n/a**	**n/a**
Extra Point #2	**n/a**	**n/a**	**n/a**

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	**Diluent**	**Cal Gas**	**Total Flow**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**		
as found zero	4775	0.0	4775	0	0	0.0	0.0	n/a	n/a
as found high	4883	76.0	4959	788.9	790.4	813.0	818.0	0.970	0.966
adjusted zero	4775	0.00	4775	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4883	75.96	4959	788.9	790.4	789.0	790.0	1.000	1.000
mid	4925	36.58	4962	379.7	380.4	384.0	385.0	0.989	0.988
low	4933	18.38	4951	191.2	191.6	193.0	193.0	0.991	0.993
calibrator zero	4775	0.00	4775	0	0	0.0	0.0	n/a	n/a
							Average C.F.=	0.993	0.994

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO_2	NO drop	NO_2 gain	NO_2 C.F.
Point	**Diluent**	**Cal Gas**	**Total Flow**	**volts or ppb**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**
NOx reference	4883	75.96	4959	0.0	793.0	794.0	1.0	0.0	1.0	
as found high NO2	4883	75.96	4959	510.0	282.0	794.0	512.0	511.0	511.0	1.000
adjusted high NO2	4883	75.96	4959	510.0	282.0	794.0	512.0	511.0	511.0	1.000
gpt mid	4883	75.96	4959	275.0	521.0	796.0	275.0	272.0	274.0	0.993
gpt low	4883	75.96	4959	100.0	696.0	796.0	100.0	97.0	99.0	0.980
									Average NO_2 C.F.=	0.991

Linear Regression/Calibration Results:

	NO	NOx	NO_2	LIMITS
Correlation Coefficient =	**1.000**	**1.000**	**1.000**	**> or = 0.995**
Slope =	**1.000**	**1.001**	**1.002**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.16%**	**0.16%**	**0.18%**	**± 3% F.S.**
% change in C.F. from last cal=	**2.97%**	**3.38%**	**0.00%**	**± 10%**
NO2 converter efficiency			**1.00**	**0.96 to 1.04**

As found:		As left:	
NO Bkg:	2.7	NO Bkg:	2.7
NOx Bkg:	2.8	NOx Bkg:	2.8
NO Coef:	1.060	NO Coef:	1.027
NO2 Coef:	1.000	NO2 Coef:	1.000
NOx Coef:	1.003	NOx Coef:	0.999
PMT:	-866.5	PMT:	-866.5
Internal:	30.0	Internal:	29.9
Chamber:	50.1	Chamber:	50.5
Cooler:	-3.0	Cooler:	-3.0
NO2 Converter:	326.3	NO2 Converter:	326.3
NO2 Converter Set:	325.0	NO2 Converter Set:	325.0
Perm Oven Gas:	44.98	Perm Oven Gas:	45.01
Perm Oven Heater:	44.16	Perm Oven Heater:	44.19
Pressure:	252.5	Pressure:	254.0
Flow:	0.545	Flow:	0.548
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	5	Expected Value NO:	6
Expected Value NO2:	400	Expected Value NO2:	395
Expected Value NOx:	405	Expected Value NOx:	400

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

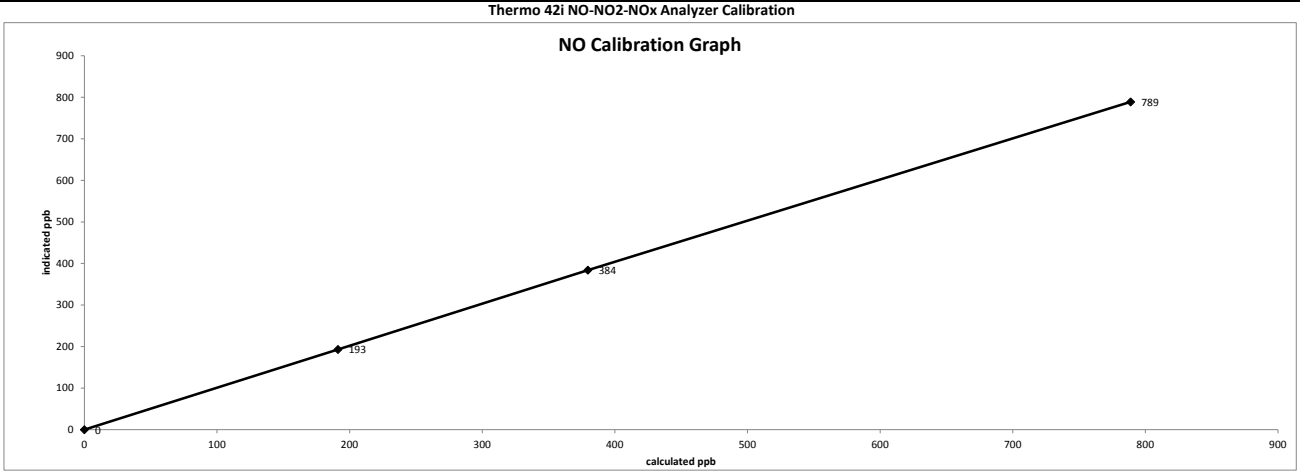
The converter cooling fan filter was cleaned.

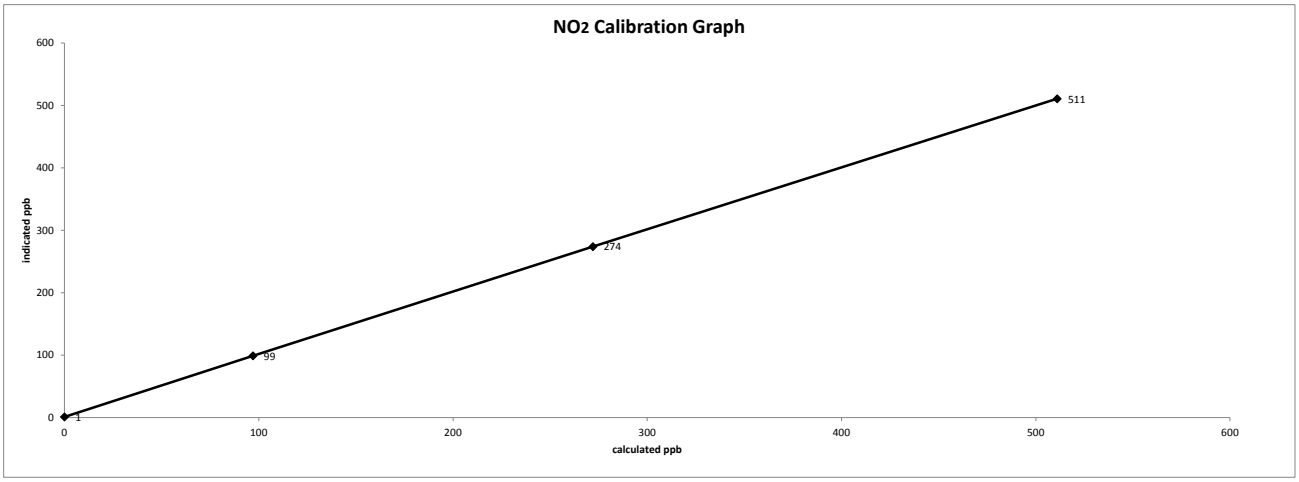
No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

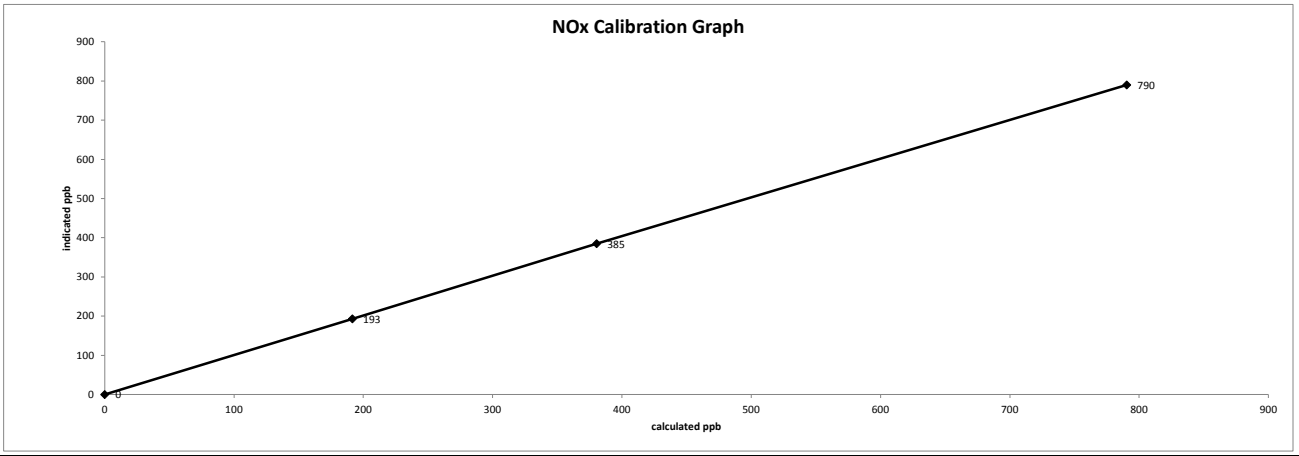
The analyzer cooling fan filter(s) were cleaned.

Date:	**October 12, 2018**	**Start/End Time 24 hr. (mst):**	**9:23 / 17:45**
Company/Airshed:	**LICA**	**Calibration Purpose:**	**routine monthly**
Location/Station Name:	**Maskwa**	**Calibration Method:**	**Gas Dilution & Gas Phase Titration**

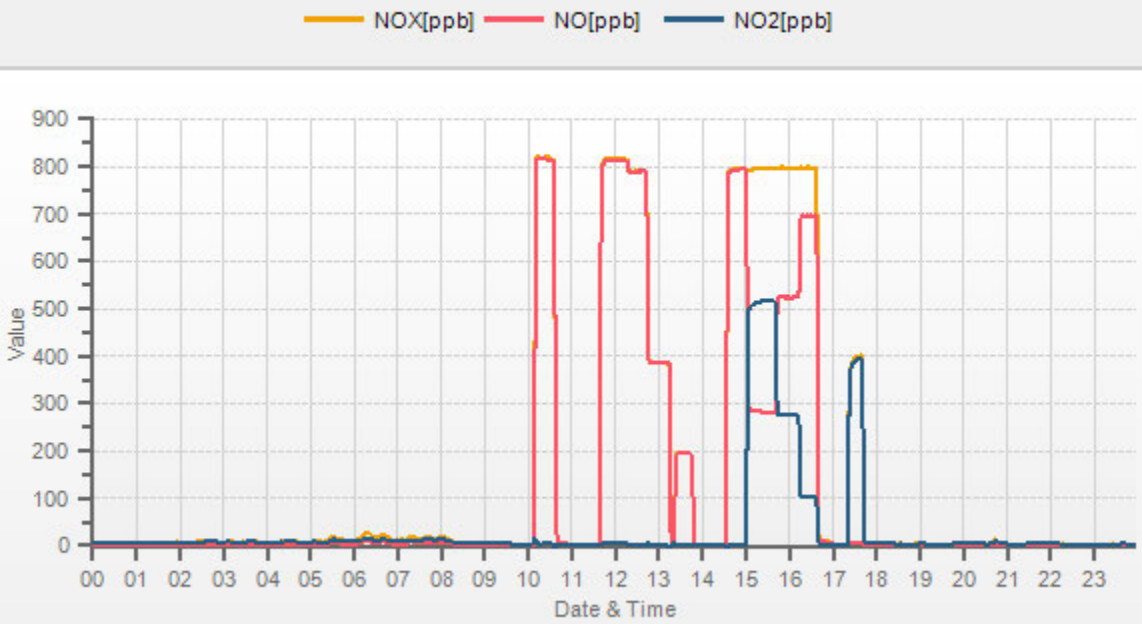
Thermo 42i NO-NO2-NOx Analyzer Calibration







Station: LICA MASKWA Daily: 18/10/12 Type: AVG 1 Min. [1 Min.]



WIND SYSTEM

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 CHECK

Meteorological System Checklist

Date:	October 12, 2018		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	Maskwa		
Unit:	**Make:**	**Model:**	**Serial #:**
Precipitation Sampler:	Met One - Heated Rain Gauge	Part 387	F4418

PRECIPITATION SENSOR CHECK

Checklist:	Reply:	Comments:
Previous check date:	June 21, 2018	n/a
Is the sensor Level?	yes	n/a
Is the heater operating properly?	yes	n/a
Are the bucket drain holes clean?	yes	n/a
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

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

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

CALIBRATORS

Alberta Government

Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2018-559A

Company: Maxxam **Operator:** Chris W

Calibrator:				**Flow Measurement Device:**	
Make/Model	API 700			Make/Model	Mesa Defender 530
Serial Number	690			Serial Number	L-153351 H-152571
Last Verification Date	March 2016			Temperature (°C)	23.5 C
NO Cylinder S/N	LL108015			Barometric Pressure	695 mmHg
NO [PPM]	52.2	NOx [PPM]	52.3		
Expiry Date	Oct 2020				

Dilution Flow (sccm)

Pt. #1 5000 Pt. #2 5000 Pt. #3 5000

Gas Flow (sccm)

Pt. #1 80 Pt. #2 40 Pt. #3 20

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO_2	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
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)*

NO		**LIMITS**	**NOx**	
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_3 Conc	NO Decrease	NO	NO2	NOX	% Diff. Vs Audit gas	
4959	0.000	0.000	0.790	-0.001	0.789	NO_2	% 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)*

NO_2		**LIMITS**
Correlation=	1.0000	**≥ 0.995**
m (Slope)=	0.9946	**0.90-1.10**
b (Intercept % of FS)=	-0.1817	**± 3% F.S.**

AENV Standards		**NO_X Analyzer**	
Audit Calibrator		Make/Model	Teco 42i
Make/Model	Teco 146i	Serial/AMU Number	AMU 1868
Serial/AMU Number	AMU 1809	Last Calibration Date	March 14, 2018
SRM Gas Cylinder No.	APEX1170572	Full Scale (ppm)	1.0
Cylinder Conc. (ppm)	49.99	Cylinder Gas Expiry Date	November 2020

COMMENTS: Cylinder contains 47.9 ppm SO2.

Auditor: Al Clark Date: March 15, 2018

Operator Signature: Location: McIntyre Center Edmonton

Alberta Government

Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2018-133A

Company Maxxam **Operator:** Mike

Calibrator:

Make/Model	Sabio	
Serial Number	11900613	
Last Verification Date	March 16, 2018	
NO Cylinder S/N	LL104183	
NO [PPM]	50.8 NOx [PPM]	50.9
Expiry Date	October 24, 2020	

Flow Measurement Device:

Make/Model	Bios Definer 220
Serial Number	H=128686; L=129069
Temperature (°C)	22.9 C
Barometric Pressure	698 mmHg

Dilution Flow (sccm)

Pt. #1 5059 Pt. #2 5073 Pt. #3 5073

Gas Flow (sccm)

Pt. #1 77.5 Pt. #2 38.2 Pt. #3 19.1

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO_2	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)*

	NO	LIMITS	NOx
Correlation=	1.0000	≥ 0.990	1.0000
m (Slope)=	0.9975	0.90-1.10	0.9960
b (Intercept % of FS)=	-0.0616	± 3% F.S.	-0.0661

Flow	O_3 Conc	NO Decrease	NO	NO2	NOX	% Diff. Vs Audit gas	
5059	0.0	0.0000	0.7741	0.0000	0.7741	NO_2	% 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)*

	NO_2	LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9998	0.90-1.10
b (Intercept % of FS)=	0.0173	± 3% F.S.

AENV Standards

Audit Calibrator

Make/Model	Thermo 146i
Serial/AMU Number	1809
SRM Gas Cylinder No.	APEX1170572
Cylinder Conc. (ppm)	49.99

NO_X Analyzer

Make/Model	Thermo 42i
Serial/AMU Number	1868
Last Calibration Date	August 16, 2018
Full Scale (ppm)	1.0
Cylinder Gas Expiry Date	November 15, 2020

COMMENTS:

Auditor: Shea Beaton Date: August 22, 2018

Operator Signature: Location: McIntyre Center Edmonton

CALIBRATION GASES

Alberta Government

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	Gas Flow/	Concentration	Cylinder
Dilution	Gas	Concentration (PPM)	Dilution Flow	Factor	Concentration
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:	**47.9**

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 [X]

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder [ ]

Auditor: Al Clark Date: December 13, 2017

Operator Signature: Al Clark Location: McIntyre Center Edmonton

Form No. F-GAS-002
Version No. 1.1

Alberta Government

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	Gas Flow/	Concentration	Cylinder
Dilution	Gas	Concentration (PPM)	Dilution Flow	Factor	Concentration
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:	**9.58**

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

Meets Manufacturer Tolerance. Use manufacturers stated concentration [X] **COMMENTS:** Used AEP regulator

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration [ ]

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder [ ]

Auditor: Al Clark

Operator Signature: Al Clark

Date: January 18, 2018

Location: McIntyre Center Edmonton

Alberta Government

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:

Make/Model	R&R MFC 201		
Serial Number	AMU 1690		
Last Verification Date	December 13, 2017		
Gas Type	CH4	Conc.	990.4
Cylinder Number	5604875	Expiry Date	July 2021
Gas Type	C3H8	Conc.	246.5
Cylinder Number	XF003845B	Expiry Date	July 2022

Flow Measurement Device:

Make/Model	Mesa Definer 220
Serial Number	H-133034 / L-132702
Temp.°C	23.1 C
B.P.	707 mmHg

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 (sccm)		Indicated Conc. (ppm)		Gas Flow/	Concentration	Cylinder Concentration	
Dilution	Gas	CH4	C3H8	Dilution Flow	Factor	CH4	C3H8
3500	0.0	0.00	0.00				
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:	**601**	**209**

	CH4	C3H8
Previous Stated Concentration PPM:	599	207
Percent variance from Stated:	**0**	**1**

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration [X] **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: Location: McIntyre Center Edmonton

Alberta Government

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:

Make/Model	Teco 146i		
Serial Number	AMU 1809		
Last Verification Date	December 13, 2017		
Gas Type	NO	Conc.	50.03
Cylinder Number	APEX 1223938		
Expiry Date	June 2020		

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 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/	Concentration	Cylinder Concentration	
Dilution	Gas	NO	NOX	Dilution Flow	Factor	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:	**51.3**	**51.1**

	NO	NOx
Previous Stated Concentration PPM:	51.5	51.6
Percent variance from Stated:	**0**	**1**

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration [X] **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

APPENDIX LLL

a ! ·La ¦ a Lb{¢ ! b¢ ! b9h ¦ { 5 ! ¢ !

SULPHUR DIOXIDE Instantaneous Maximum (SO_2 ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	5	0	S	0	0	1	2	2	1	1	4	6	3	1	1	3	1	1	1	1	1	0	0	0	0	6	2	24
2	0	S	0	0	0	0	0	1	1	2	8	6	3	1	0	0	0	2	0	0	0	0	0	0	0	8	1	24
3	S	0	0	0	2	6	5	16	8	1	2	13	9	6	8	1	0	0	0	0	0	0	0	S	0	16	4	24
4	0	0	0	0	0	0	0	0	1	1	1	2	1	1	1	1	2	0	1	3	3	0	S	1	0	3	1	24
5	1	0	0	1	1	0	0	0	12	26	21	13	7	11	6	8	0	1	0	0	0	S	1	0	0	26	5	24
6	0	0	0	0	0	0	1	3	4	4	4	3	5	1	3	6	6	0	0	0	S	0	0	0	0	6	2	24
7	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	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
9	0	0	0	0	0	0	0	0	0	0	2	2	2	3	4	2	0	S	0	0	0	0	0	0	0	4	1	24
10	0	0	0	0	0	0	0	0	1	2	2	0	1	2	1	2	S	2	0	0	0	0	0	0	0	2	1	24
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	0	0	1	0	24
12	0	0	0	1	0	0	0	0	1	C	C	C	C	C	C	C	0	0	0	0	1	0	0	0	0	1	0	24
13	0	0	1	1	19	10	1	11	12	5	6	13	9	S	3	0	7	11	2	2	12	5	1	0	0	19	6	24
14	0	0	0	0	0	0	0	0	1	1	1	1	S	0	0	0	0	0	0	0	0	1	1	1	0	1	0	24
15	0	0	0	0	0	1	0	0	4	17	16	S	11	22	19	16	15	14	13	8	5	4	20	0	0	22	8	24
16	13	12	2	7	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	2	24
17	0	0	0	0	1	1	2	3	2	S	2	2	2	0	0	0	3	2	2	5	5	3	3	3	0	5	2	24
18	3	1	2	2	1	1	2	2	S	20	6	1	1	0	0	7	17	21	7	0	1	4	35	22	0	35	7	24
19	19	2	0	0	0	0	3	S	28	21	1	0	0	0	13	11	1	0	0	0	1	3	2	0	0	28	5	24
20	0	0	0	0	0	0	S	2	1	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	2	0	24
21	0	2	0	0	0	S	0	0	0	1	2	0	0	0	2	15	11	10	8	3	3	2	2	1	0	15	3	24
22	0	0	0	0	S	0	0	0	0	1	0	0	0	0	0	0	0	1	3	4	1	2	2	2	0	4	1	24
23	1	1	0	S	0	0	1	1	1	1	1	1	2	2	1	1	0	0	0	1	2	0	0	0	0	2	1	24
24	0	0	S	0	0	0	0	0	0	0	2	3	1	2	2	0	0	0	0	0	0	0	0	0	0	3	1	24
25	0	S	1	0	0	0	0	0	0	0	2	20	3	1	1	1	1	0	0	0	0	0	0	0	0	20	1	24
26	S	0	0	0	0	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	5	0	24
27	0	0	0	1	0	0	0	0	0	2	1	0	0	0	16	19	7	1	1	0	1	0	S	1	0	19	2	24
28	0	0	1	0	0	0	0	0	0	0	0	1	1	7	5	1	3	5	4	1	1	S	1	1	0	7	1	24
29	1	1	0	0	0	0	0	0	0	0	0	12	13	9	22	5	3	11	17	15	S	1	1	1	0	22	5	24
30	1	1	1	2	1	2	2	2	1	1	2	2	2	2	1	1	0	0	0	S	0	0	0	0	0	2	1	24
31	0	0	0	0	0	0	0	1	1	1	1	0	1	1	3	4	2	0	S	0	0	1	0	0	0	4	1	24
HOURLY MAX	19	12	2	7	19	10	5	16	28	26	21	20	13	22	22	19	17	21	17	15	12	5	35	22				
HOURLY AVG	2	1	0	1	1	1	1	2	3	4	3	4	3	3	4	4	3	3	2	1	1	1	2	1				

STATUS FLAG CODES

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

MONTHLY SUMMARY

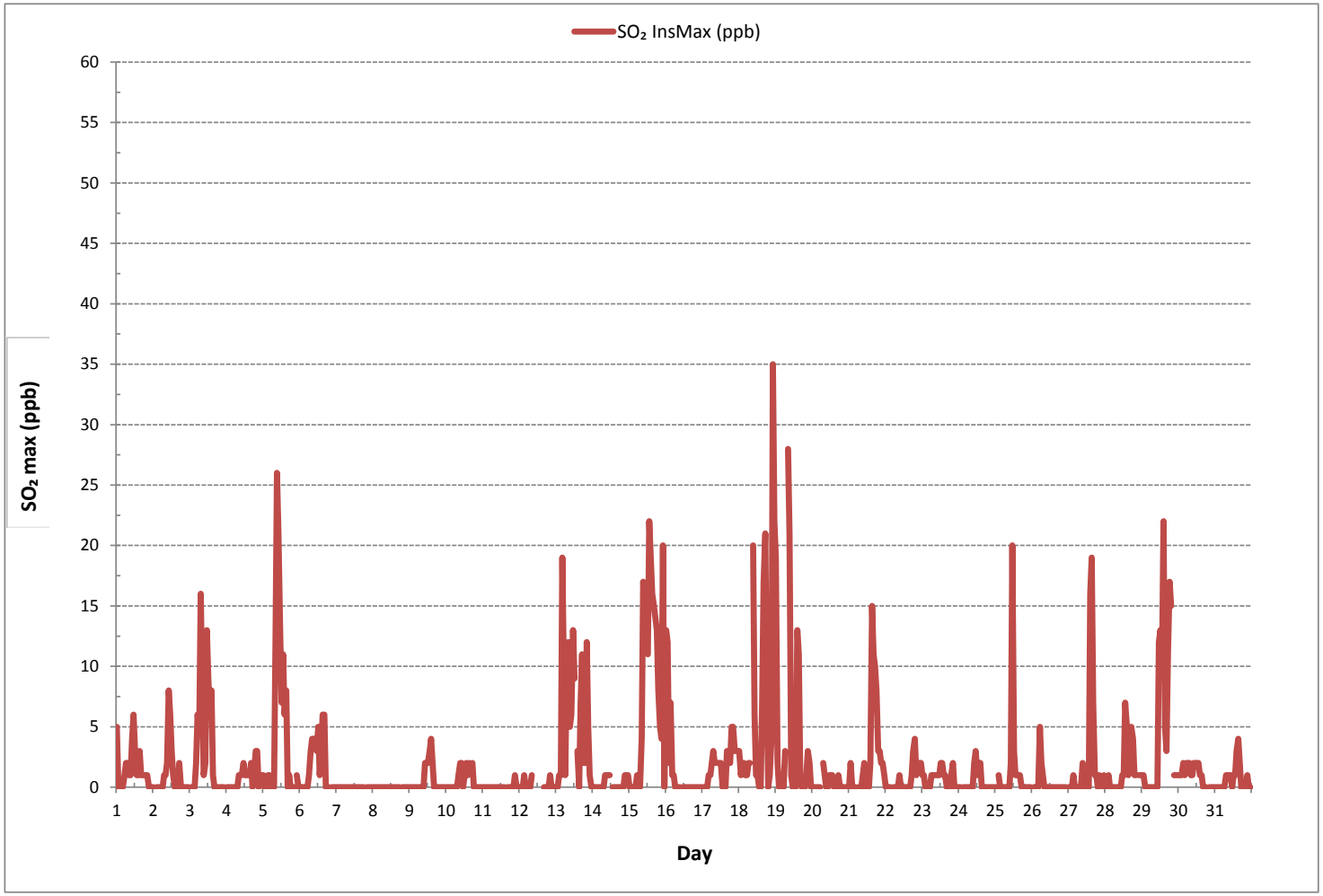
NUMBER OF NON-ZERO READINGS: 307

MAXIMUM INSTANTANEOUS VALUE: 35 ppb @ HOUR 22 ON DAY 18

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 7 hrs
STANDARD DEVIATION: 4

OPERATIONAL TIME: 744 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO_2 ppb)



HYDROGEN SULPHIDE Instantaneous Maximum (H_2S 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	S	1	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	1	2	2	2	1	2	2	24
2	2	S	2	2	1	2	1	2	1	2	2	2	1	2	2	2	1	2	1	2	2	1	2	2	1	2	2	24
3	S	1	1	2	2	2	2	2	1	1	2	2	1	2	1	2	1	1	1	1	1	1	1	S	1	2	2	24
4	2	1	1	1	1	1	3	3	2	2	2	3	2	1	2	2	3	2	2	1	2	2	S	2	1	3	2	24
5	2	2	1	2	2	2	2	2	2	2	2	1	1	2	1	2	1	2	1	2	2	S	2	2	1	2	2	24
6	1	1	2	2	2	4	2	1	3	2	2	2	2	2	2	3	3	2	2	1	S	2	2	2	1	4	2	24
7	2	2	1	2	1	2	2	2	1	1	1	2	1	1	2	1	2	2	2	S	2	2	1	2	1	2	2	24
8	2	1	2	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	S	1	2	2	1	2	1	2	2	24
9	2	2	1	2	2	2	2	1	2	1	2	2	2	1	2	2	2	S	2	2	2	2	2	3	1	3	2	24
10	3	2	3	4	4	2	2	2	4	4	1	2	2	2	2	2	S	2	2	2	2	2	2	2	1	4	2	24
11	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	24
12	2	2	2	2	2	2	2	2	2	2	2	2	2	2	C	C	C	C	C	C	C	C	0	0	0	2	2	24
13	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	0	0	0	0	0	0	1	0	24
14	0	0	0	0	0	0	0	1	0	0	0	0	S	0	0	0	0	1	0	0	0	0	1	0	0	1	0	24
15	0	0	0	0	0	0	0	0	1	1	1	S	1	2	0	1	1	1	1	1	1	1	1	1	0	2	1	24
16	1	1	0	0	1	1	1	1	1	0	S	0	1	0	0	1	0	0	1	1	0	1	1	1	0	1	1	24
17	1	1	1	1	0	0	1	1	1	S	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
18	0	0	0	0	0	1	0	0	S	1	1	0	0	0	0	1	1	2	1	1	0	1	2	2	0	2	1	24
19	1	1	1	0	1	1	1	S	2	1	0	1	1	1	1	1	1	1	0	0	0	1	1	0	0	2	1	24
20	1	1	1	0	0	1	S	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	1	1	24
21	1	0	1	1	1	S	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
22	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	24
23	1	1	1	S	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	2	1	1	2	1	24
24	1	1	S	3	2	1	2	1	1	1	1	1	1	1	1	1	1	5	5	2	2	2	1	1	1	5	2	24
25	1	S	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	2	1	24
26	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	S	1	2	1	24
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	S	1	1	2	1	24
28	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	2	2	2	S	3	3	1	3	1	24
29	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	2	1	2	1	S	1	1	1	1	3	1	24
30	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
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	3	2	3	4	4	4	3	3	4	4	2	3	2	2	3	3	3	5	5	2	2	2	3	3				
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				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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

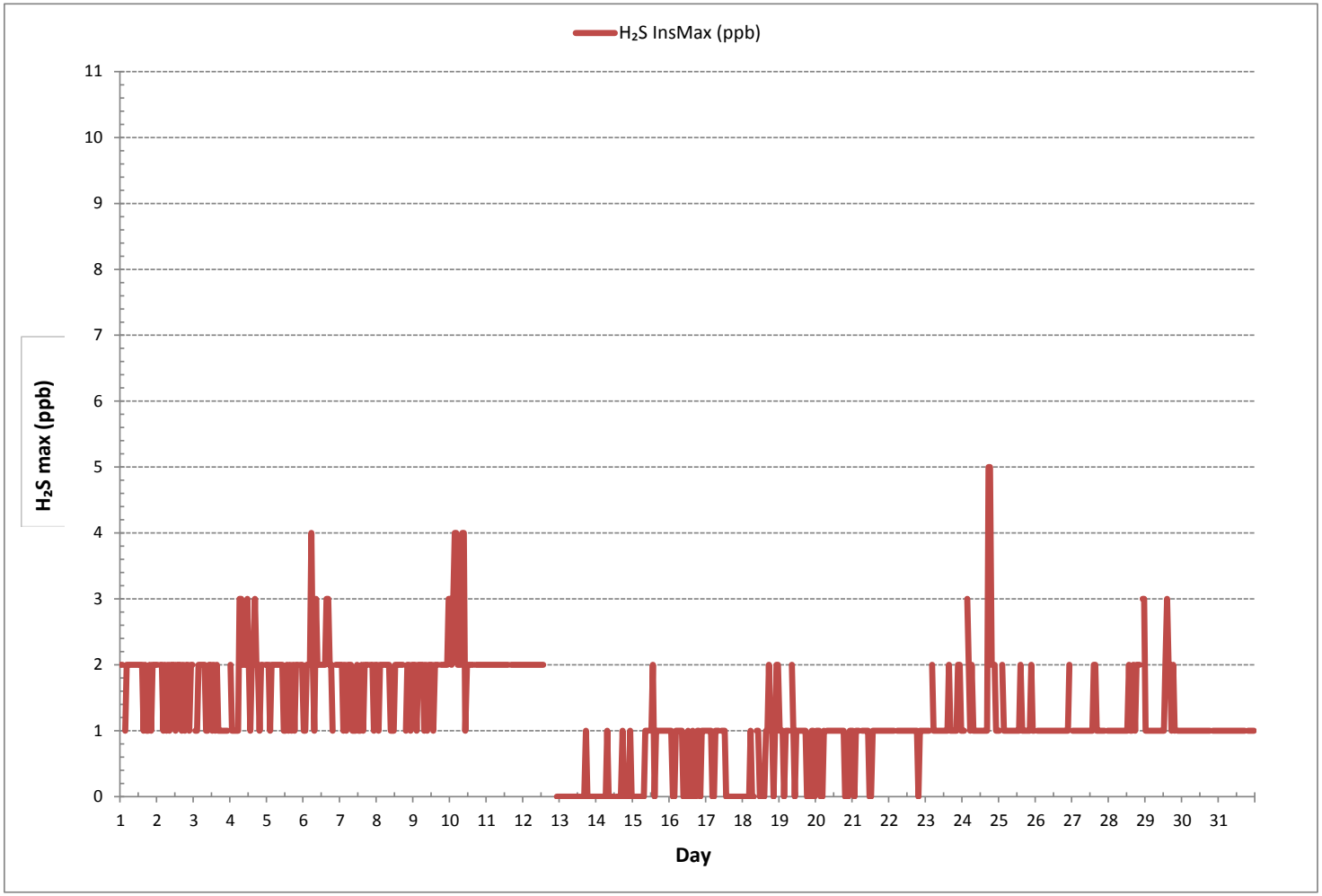
NUMBER OF NON-ZERO READINGS: 602

MAXIMUM INSTANTANEOUS VALUE: 5 ppb @ HOUR 17 ON DAY 24

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 8 hrs
STANDARD DEVIATION: 1

OPERATIONAL TIME: 744 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H_2S ppb)



TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST) / HR END (MST)	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
DAY																												
1	2.04	2.03	S	2.02	2.03	2.06	2.08	2.09	2.18	2.19	2.14	2.07	2.01	2.00	2.00	1.99	1.98	1.99	2.01	1.99	2.01	2.01	2.02	2.04	1.98	2.19	2.04	24
2	2.03	S	2.03	2.02	1.97	1.97	1.97	1.97	1.96	1.96	1.96	1.96	1.95	1.97	1.99	1.98	1.95	1.97	1.96	1.97	1.97	1.98	1.99	1.99	1.95	2.03	1.98	24
3	S	2.00	2.00	2.00	2.00	1.99	1.98	2.28	1.96	C	C	Y	Y	Y	C	C	C	C	2.08	2.03	2.06	2.00	2.06	S	1.96	2.28	2.03	21
4	1.98	1.97	1.94	1.92	1.91	1.94	2.00	1.97	1.99	1.85	1.86	1.83	1.78	1.79	1.79	1.77	1.75	1.77	1.90	1.93	1.92	1.89	S	1.94	1.75	2.00	1.89	24
5	1.98	2.03	2.07	2.04	2.01	1.99	1.99	1.97	1.99	1.92	1.87	1.77	1.81	1.75	1.71	1.75	2.00	2.07	2.06	1.80	1.79	S	1.80	1.83	1.71	2.07	1.91	24
6	1.81	1.89	1.99	1.83	1.87	1.83	1.83	1.86	1.81	1.81	1.83	1.78	1.78	1.77	1.89	1.85	1.79	1.81	1.83	1.84	S	1.91	1.92	1.85	1.77	1.99	1.84	24
7	1.84	1.85	1.86	1.87	1.88	1.87	1.88	1.90	2.06	1.88	1.89	1.99	1.90	1.91	1.90	1.91	1.91	1.91	1.93	S	1.95	1.95	1.94	1.95	1.84	2.06	1.91	24
8	1.94	1.96	1.98	1.98	1.99	1.99	2.00	2.02	1.99	1.99	1.97	1.98	1.96	1.96	1.95	1.94	1.98	1.96	S	2.04	2.05	**6.78**	6.56	5.89	1.94	**6.78**	2.56	24
9	2.98	2.18	2.14	2.19	2.14	2.16	2.14	2.18	2.20	2.05	2.06	2.09	2.01	2.02	2.02	2.05	2.01	S	2.04	2.17	2.07	2.05	2.06	2.31	2.01	2.98	2.14	24
10	2.23	2.16	2.12	2.11	2.10	2.15	2.17	2.22	2.24	2.18	2.05	2.03	1.95	1.93	1.93	1.94	S	1.92	1.97	1.99	2.05	2.11	2.07	2.06	1.92	2.24	2.07	24
11	2.09	2.12	2.12	2.12	2.14	2.14	2.06	1.95	1.98	2.02	2.19	2.22	2.11	2.02	2.13	S	1.87	1.82	1.83	1.83	1.87	1.86	1.85	1.85	1.82	2.22	2.01	24
12	1.83	1.81	1.79	1.75	1.79	1.81	1.82	1.78	1.81	C1	C1	C1	C1	C1	C1	2.21	2.17	2.19	2.25	2.28	2.30	2.30	2.31	2.31	1.75	2.31	2.03	18
13	2.34	2.34	2.36	2.38	2.44	2.39	2.38	2.43	2.42	2.59	2.43	2.42	2.42	S	2.41	2.43	2.55	2.43	2.43	2.52	2.51	2.49	2.75	2.54	2.34	2.75	2.45	24
14	2.52	2.51	2.54	2.56	2.54	2.84	3.04	2.94	2.69	2.58	2.53	2.39	S	2.32	2.28	2.28	2.26	2.28	2.29	2.29	2.29	2.31	2.35	2.36	2.26	3.04	2.48	24
15	2.29	2.20	2.19	2.18	2.19	2.21	2.19	2.18	2.35	2.37	2.31	S	2.21	2.27	2.23	2.24	2.29	2.30	2.41	2.41	2.47	2.32	2.41	2.31	2.18	2.47	2.28	24
16	2.41	2.36	2.43	2.40	2.42	2.54	2.54	2.96	2.65	2.52	S	2.53	2.61	2.45	2.44	2.41	2.43	2.43	2.38	2.38	2.37	2.79	2.57	2.58	2.36	2.96	2.50	24
17	2.59	3.02	2.65	2.57	2.63	2.62	2.55	2.53	2.56	S	2.67	2.67	2.35	2.19	2.25	2.25	2.20	2.13	2.18	2.22	2.32	2.33	2.31	2.35	2.13	3.02	2.44	24
18	2.38	2.33	2.38	2.56	2.55	2.52	2.23	2.20	S	2.27	2.24	2.12	2.11	2.17	2.16	2.23	2.39	2.60	2.42	2.25	2.30	2.42	2.62	2.61	2.11	2.62	2.35	24
19	2.53	2.33	2.34	2.35	2.37	2.41	2.48	S	2.56	2.41	2.41	2.41	2.44	2.41	2.92	2.92	2.43	2.45	2.45	2.48	2.58	2.58	2.51	2.51	2.33	2.92	2.49	24
20	2.44	2.40	2.41	2.41	2.39	2.40	S	2.35	2.40	2.41	2.45	2.46	2.44	2.35	2.15	2.08	2.11	2.13	2.16	2.20	2.22	2.25	2.26	2.23	2.08	2.46	2.31	24
21	2.23	2.26	2.27	2.27	2.28	S	2.30	2.32	2.31	2.38	2.34	2.27	2.23	2.21	2.31	2.33	2.43	2.45	2.48	2.36	2.49	2.52	2.42	2.44	2.21	2.52	2.34	24
22	2.46	2.57	2.69	2.91	S	2.61	2.59	2.58	2.71	2.66	2.53	2.69	2.67	2.53	2.44	2.42	2.58	2.63	2.69	2.66	2.55	2.53	2.57	2.57	2.42	2.91	2.60	24
23	2.57	2.56	2.60	S	2.62	2.62	2.45	2.47	2.47	2.47	2.65	2.43	2.38	2.30	2.26	2.24	2.29	2.32	2.35	2.32	2.34	2.52	2.39	2.42	2.24	2.65	2.44	24
24	2.41	2.35	S	2.38	2.37	2.36	2.44	2.44	2.37	2.41	2.32	2.29	2.21	2.25	2.20	2.15	2.29	2.32	2.30	2.36	2.35	2.36	2.34	2.38	2.15	2.44	2.33	24
25	2.34	S	2.48	2.41	2.39	2.37	2.38	2.46	2.47	2.48	2.30	2.39	2.26	2.21	2.23	2.25	2.27	2.29	2.31	2.71	2.46	2.50	2.40	2.39	2.21	2.71	2.38	24
26	S	2.37	2.41	2.46	2.48	2.50	2.48	2.36	2.27	2.24	2.18	2.17	2.10	2.06	2.08	2.08	2.12	2.23	2.25	2.27	2.28	2.74	2.56	S	2.06	2.74	2.30	24
27	2.57	2.74	2.68	2.45	2.37	2.33	2.51	2.50	2.42	2.25	2.22	2.20	2.20	2.18	2.32	2.35	2.31	2.26	2.27	2.24	2.24	2.26	S	2.24	2.18	2.74	2.35	24
28	2.26	2.28	2.30	2.31	2.44	2.61	2.66	2.48	2.51	2.46	2.30	2.36	2.38	2.29	2.33	2.24	2.34	2.32	2.30	2.24	2.20	S	2.18	2.21	2.18	2.66	2.35	24
29	2.19	2.16	2.12	2.13	2.11	2.12	2.13	2.14	2.16	2.18	2.18	2.26	2.28	2.37	2.49	2.38	2.41	2.41	2.40	2.36	S	2.30	2.31	2.35	2.11	2.49	2.26	24
30	2.33	2.33	2.33	2.30	2.31	2.32	2.32	2.30	2.28	2.29	2.31	4.71	2.34	2.37	2.38	2.38	2.41	2.39	2.37	S	2.35	2.37	2.55	2.60	2.28	4.71	2.46	24
31	2.58	2.56	2.60	2.54	2.48	2.45	2.43	2.44	2.44	2.49	2.50	2.37	2.38	2.34	2.34	2.38	2.36	2.34	S	2.34	2.41	2.50	2.46	2.37	2.34	2.60	2.44	24
HOURLY MAX	2.98	3.02	2.69	2.91	2.63	2.84	3.04	2.96	2.71	2.66	2.67	4.71	2.67	2.53	2.92	2.92	2.58	2.63	2.69	2.71	2.58	6.78	6.56	5.89				
HOURLY AVG	2.28	2.26	2.27	2.25	2.24	2.27	2.27	2.28	2.27	2.26	2.24	2.32	2.19	2.16	2.19	2.19	2.20	2.21	2.22	2.22	2.23	2.45	2.43	2.40				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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

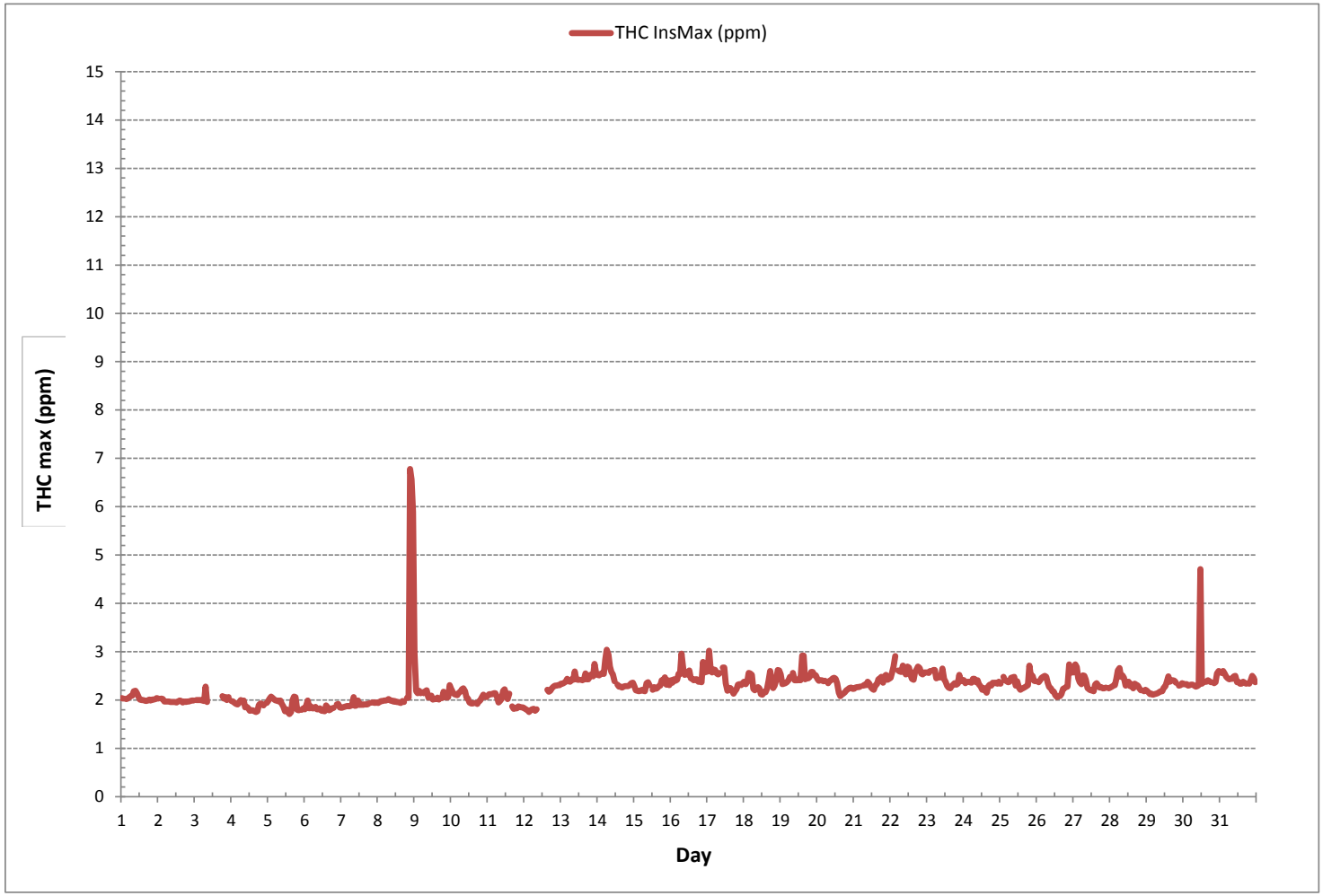
NUMBER OF NON-ZERO READINGS: 697

MAXIMUM INSTANTANEOUS VALUE: 6.78 ppm @ HOUR 21 ON DAY 8

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 6 hrs
STANDARD DEVIATION: 0.38

OPERATIONAL TIME: 735 hrs

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



METHANE MAX Instantaneous Maximum (CH_4 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	2.03	S	2.02	2.03	2.06	2.08	2.09	2.18	2.19	2.14	2.07	2.01	2.00	2.00	1.99	1.98	1.99	2.01	1.99	2.01	2.01	2.02	2.04	1.98	2.19	**2.04**	24
2	2.03	S	2.03	2.02	1.97	1.97	1.97	1.97	1.96	1.96	1.96	1.96	1.95	1.97	1.99	1.98	1.95	1.97	1.96	1.97	1.97	1.98	1.99	1.99	1.95	2.03	1.98	24
3	S	2.00	2.00	2.00	2.00	1.99	1.98	**2.28**	1.96	C	C	-	-	-	-	-	-	-	-	-	-	-	-	-	1.96	**2.28**	2.03	11
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
HOURLY MAX	2.04	2.03	2.03	2.02	2.03	2.06	2.08	2.28	2.18	2.19	2.14	2.07	2.01	2.00	2.00	1.99	1.98	1.99	2.01	1.99	2.01	2.01	2.02	2.04				
HOURLY AVG	2.04	2.02	2.02	2.01	2.00	2.01	2.01	2.11	2.03	2.08	2.05	2.02	1.98	1.99	2.00	1.99	1.97	1.98	1.99	1.98	1.99	2.00	2.01	2.02				

STATUS FLAG CODES

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

MONTHLY SUMMARY

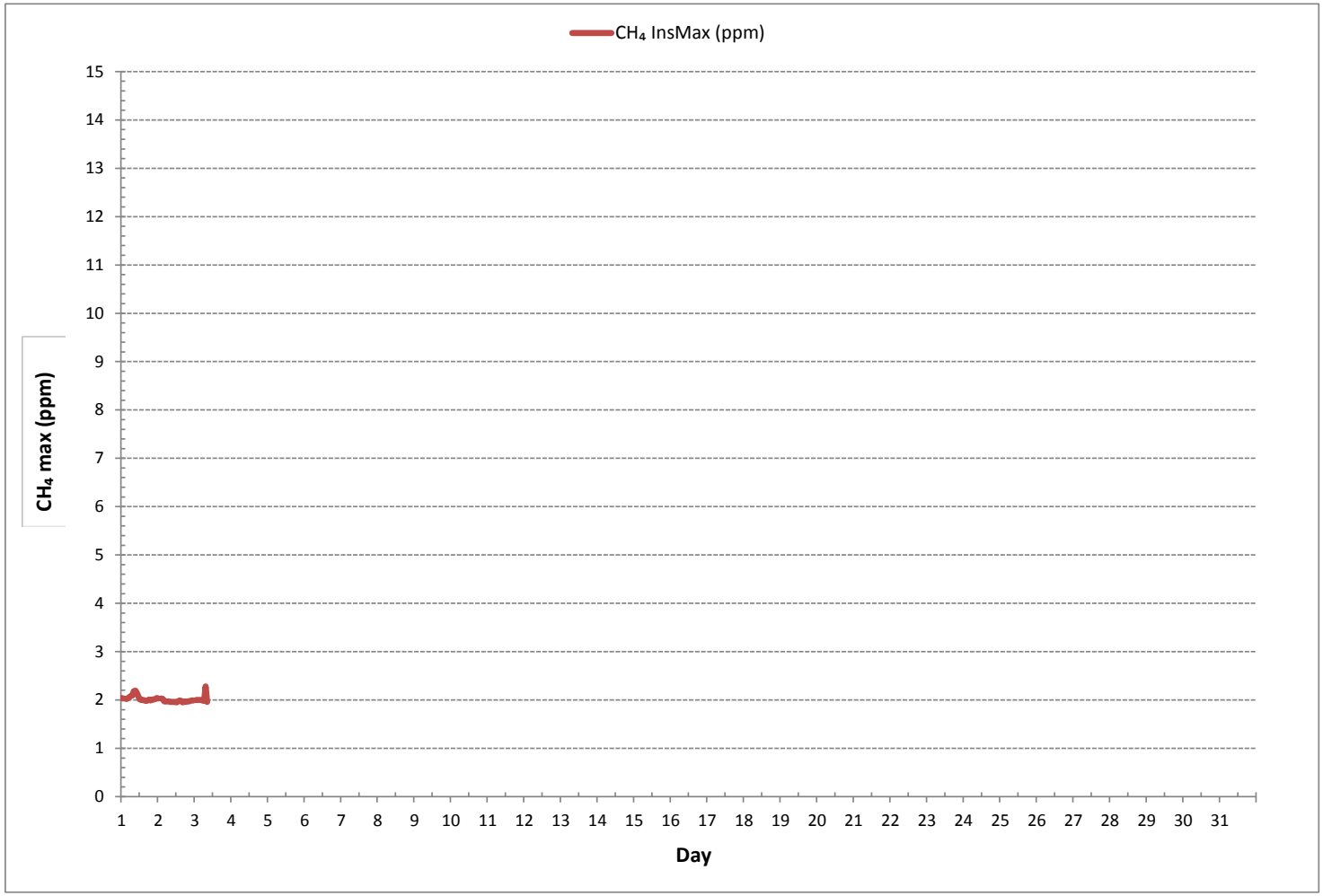
NUMBER OF NON-ZERO READINGS: 54

MAXIMUM INSTANTANEOUS VALUE: 2.28 ppm @ HOUR 7 ON DAY 3

IZS CALIBRATION TIME: 3 hrs
MONTHLY CALIBRATION TIME: 2 hrs
STANDARD DEVIATION: 0.06

OPERATIONAL TIME: 59 hrs

METHANE MAX Instantaneous Maximum (CH_4 ppm)



NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	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	**C**	**C**	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	11
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
HOURLY MAX	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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

MONTHLY SUMMARY

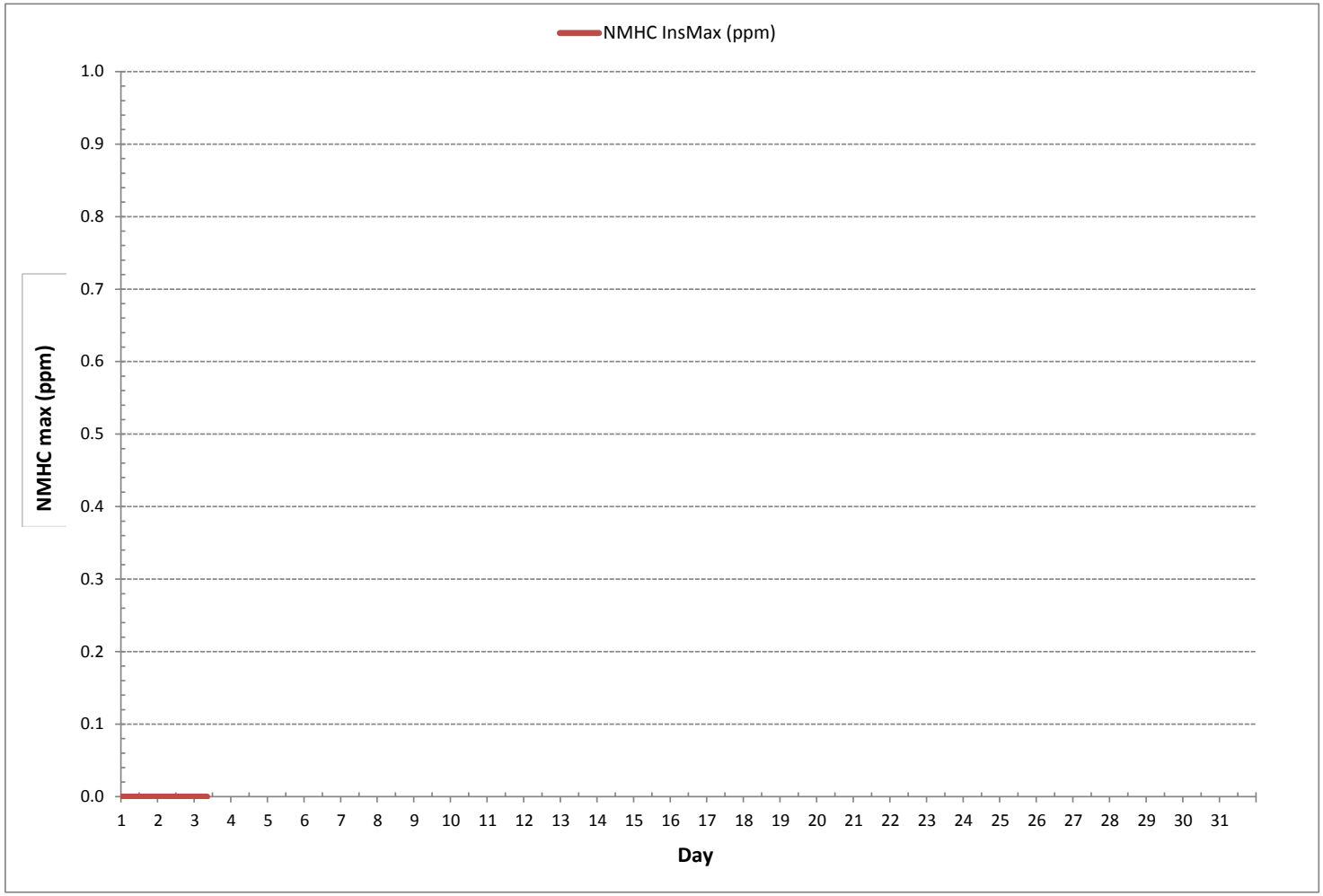
NUMBER OF NON-ZERO READINGS: 0

MAXIMUM INSTANTANEOUS VALUE: 0.00 ppm @ HOUR 0 ON DAY 1

IZS CALIBRATION TIME: 0 hrs
MONTHLY CALIBRATION TIME: 2 hrs
STANDARD DEVIATION: 0.00

OPERATIONAL TIME: 59 hrs

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	10	1	S	3	2	4	6	9	8	4	10	14	9	7	7	11	3	1	2	2	2	6	2	8	1	14	6	24
2	3	S	7	6	6	5	9	11	5	5	18	13	5	3	2	24	8	13	1	6	28	2	1	3	1	28	8	24
3	S	5	3	15	26	38	26	36	8	3	2	20	12	13	15	12	4	5	4	1	16	1	1	S	1	38	12	24
4	3	3	2	2	1	38	64	22	16	4	7	8	6	3	3	2	8	2	3	11	10	3	S	8	1	64	10	24
5	7	14	5	4	5	14	19	18	34	46	26	23	16	19	12	14	2	3	5	6	2	S	6	3	2	46	13	24
6	2	18	19	1	3	2	8	17	23	20	17	10	16	4	11	18	20	4	5	6	S	7	8	1	1	23	11	24
7	5	3	2	2	1	20	13	14	13	1	7	11	3	1	2	1	1	1	1	S	2	1	1	2	1	20	5	24
8	2	2	2	3	3	11	6	3	11	8	8	9	6	4	5	1	4	6	S	13	2	16	4	3	1	16	6	24
9	1	1	1	1	1	2	2	4	42	3	12	8	8	12	13	7	1	S	2	1	1	3	4	3	1	42	6	24
10	2	1	1	1	1	1	2	59	85	20	9	3	3	4	3	5	S	7	3	2	10	8	7	10	1	85	11	24
11	4	4	4	10	4	6	8	28	5	4	11	8	9	6	7	S	6	4	5	4	5	5	12	5	4	28	7	24
12	5	7	8	7	8	18	28	15	17	C	C	C	C	C	C	C	C	C	6	6	12	5	6	3	3	28	10	24
13	3	3	3	5	39	15	6	27	27	21	24	29	23	S	10	4	26	32	5	8	20	11	9	8	3	39	16	24
14	3	5	8	7	13	15	44	17	23	11	8	13	S	4	3	2	2	4	4	4	5	10	11	10	2	44	10	24
15	5	1	1	1	5	20	6	7	22	35	35	S	24	44	42	28	33	22	48	18	20	21	36	2	1	48	21	24
16	27	22	9	13	7	11	28	50	70	13	S	12	12	21	7	7	5	4	4	3	3	42	8	4	3	70	16	24
17	5	101	8	7	15	39	37	49	49	S	18	32	9	2	2	6	9	18	9	16	18	12	10	10	2	101	21	24
18	10	8	8	12	21	20	19	31	S	39	16	12	11	1	27	20	40	48	21	2	19	31	66	45	1	66	23	24
19	32	10	3	3	3	14	41	S	58	40	10	13	5	7	30	22	16	1	1	2	6	13	8	1	1	58	15	24
20	1	1	1	1	1	1	S	7	5	27	18	7	18	6	33	16	8	4	1	1	8	2	7	1	1	33	8	24
21	1	5	3	1	4	S	21	53	42	5	5	3	2	1	7	37	24	33	27	14	13	18	10	10	1	53	15	24
22	6	5	5	3	S	9	14	7	7	7	3	8	7	4	2	5	2	6	11	11	4	5	6	6	2	14	6	24
23	5	4	3	S	6	5	5	5	6	6	5	5	4	4	4	3	2	4	2	7	8	4	2	2	2	8	4	24
24	2	2	S	3	4	2	73	14	107	44	61	33	26	30	19	49	9	2	28	2	29	6	46	64	2	107	29	24
25	8	S	192	33	42	13	54	98	79	15	22	50	9	12	6	33	7	7	30	15	20	16	7	43	6	192	35	24
26	S	14	14	25	24	42	43	44	64	11	2	5	27	7	2	2	3	6	2	4	5	4	4	S	2	64	16	24
27	18	25	19	12	9	8	12	60	36	15	12	8	1	3	39	37	19	4	7	7	14	12	S	12	1	60	17	24
28	3	11	11	10	2	7	13	9	46	14	3	4	6	20	13	5	11	15	13	3	3	S	5	5	2	46	10	24
29	5	5	5	6	13	9	13	13	12	24	7	33	35	30	52	19	17	24	39	34	S	7	10	10	5	52	18	24
30	14	11	12	14	13	17	14	25	7	3	7	14	18	10	6	5	6	4	2	S	14	5	8	8	2	25	10	24
31	7	7	7	7	6	6	22	150	11	16	15	62	27	8	23	13	15	14	S	45	16	11	11	7	6	150	22	24
HOURLY MAX	32	101	192	33	42	42	73	150	107	46	61	62	35	44	52	49	40	48	48	45	29	42	66	64				
HOURLY AVG	7	10	13	7	10	14	22	30	31	16	14	16	12	10	14	14	11	10	10	9	11	10	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

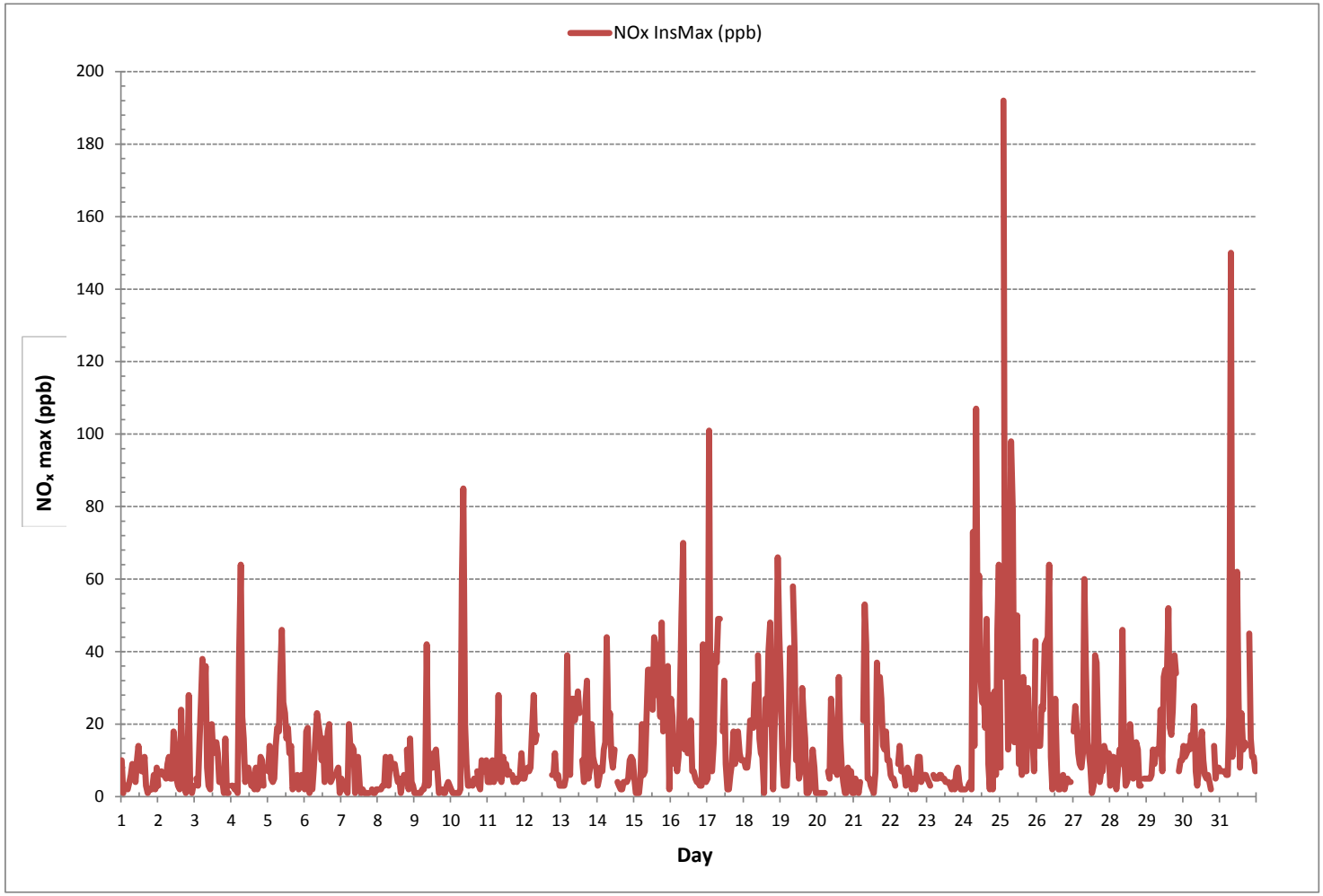
NUMBER OF NON-ZERO READINGS: 703

MAXIMUM INSTANTANEOUS VALUE: 192 ppb @ HOUR 2 ON DAY 25

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 9 hrs
STANDARD DEVIATION: 17

OPERATIONAL TIME: 744 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x 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	1	2	1	4	6	3	2	4	5	0	0	0	0	0	0	0	1	0	6	1	24
2	0	S	0	1	1	0	2	3	2	2	8	6	2	1	1	14	4	2	0	2	14	0	0	0	0	14	3	24
3	S	0	0	7	3	8	3	27	2	1	1	8	8	5	6	7	2	1	0	0	1	0	0	S	0	27	4	24
4	0	0	0	0	0	14	34	12	5	1	2	3	2	1	1	0	1	0	0	0	0	0	S	0	0	34	3	24
5	0	5	0	0	0	5	3	4	17	26	12	11	7	7	4	4	0	0	0	1	0	S	0	0	0	26	5	24
6	0	5	4	0	0	0	1	4	7	6	7	4	7	1	3	4	5	1	0	1	S	1	1	0	0	7	3	24
7	1	1	0	0	0	9	6	6	6	0	3	4	1	0	2	0	0	0	0	S	0	0	0	0	0	9	2	24
8	1	0	0	1	1	4	2	1	5	3	3	4	2	2	2	0	1	2	S	0	0	1	0	0	0	5	2	24
9	0	0	0	0	0	0	0	1	24	1	5	3	3	5	5	2	0	S	0	0	0	0	0	0	0	24	2	24
10	0	0	0	0	0	0	0	43	66	11	2	1	1	1	1	0	S	0	0	0	1	0	0	0	0	66	6	24
11	0	0	0	0	0	1	1	10	1	1	3	4	3	1	2	S	0	0	0	0	0	0	4	0	0	10	1	24
12	0	1	0	1	0	6	15	5	6	C	C	C	C	C	C	C	C	C	1	2	2	1	1	0	0	15	3	24
13	0	0	0	1	17	5	3	10	11	10	12	16	12	S	3	1	8	11	1	1	2	0	0	0	0	17	5	24
14	0	0	0	0	1	1	19	4	10	4	4	7	S	0	1	0	0	0	0	0	0	0	0	0	0	19	2	24
15	0	0	0	0	0	0	1	4	8	17	16	S	9	18	21	10	15	3	29	2	2	2	12	0	0	29	7	24
16	6	3	1	2	0	0	16	36	52	4	S	4	4	8	2	1	0	0	0	0	0	25	2	0	0	52	7	24
17	0	82	3	1	1	27	12	25	25	S	7	22	2	0	0	1	0	4	0	0	0	0	0	0	0	82	9	24
18	0	0	0	0	3	13	1	5	S	13	7	3	3	0	29	8	16	16	3	0	0	2	30	15	0	30	7	24
19	8	0	0	0	0	6	15	S	31	19	4	5	1	2	14	8	3	0	0	0	0	0	0	0	0	31	5	24
20	0	0	0	0	0	0	S	0	0	12	8	3	9	2	32	11	3	0	0	0	3	0	3	0	0	32	4	24
21	0	0	0	0	0	S	4	22	38	1	1	1	0	0	2	14	8	11	1	0	0	1	0	0	0	38	5	24
22	0	0	0	0	S	0	5	1	3	3	1	5	3	1	0	1	0	0	0	0	0	0	0	0	0	5	1	24
23	0	0	0	S	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
24	0	0	S	0	0	0	67	5	81	30	49	16	16	14	8	20	1	0	13	0	13	1	21	31	0	81	17	24
25	2	S	149	10	17	4	30	70	48	6	10	29	3	5	1	16	0	0	4	4	13	6	1	24	0	149	20	24
26	S	2	2	12	12	22	21	21	38	3	0	1	19	5	0	0	0	0	0	0	0	0	0	S	0	38	7	24
27	7	5	3	2	1	0	1	39	15	5	3	2	0	0	19	14	5	0	0	0	1	0	S	0	0	39	5	24
28	1	0	0	0	0	1	4	4	35	6	1	1	1	6	3	0	1	1	0	0	0	S	0	0	0	35	3	24
29	1	1	1	2	5	4	5	7	5	13	3	15	17	13	31	7	5	10	21	16	S	2	3	3	1	31	8	24
30	5	4	3	3	3	3	0	7	2	0	2	11	7	4	1	1	0	0	0	S	4	0	1	0	0	11	3	24
31	0	0	0	1	0	0	13	134	3	7	9	34	16	2	13	2	1	4	S	25	2	0	1	0	0	134	12	24
HOURLY MAX	8	82	149	12	17	27	67	134	81	30	49	34	19	18	32	20	16	16	29	25	14	25	30	31				
HOURLY AVG	1	4	6	1	2	4	9	17	18	7	6	8	6	4	7	5	3	2	3	2	2	1	3	3				

STATUS FLAG CODES

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

MONTHLY SUMMARY

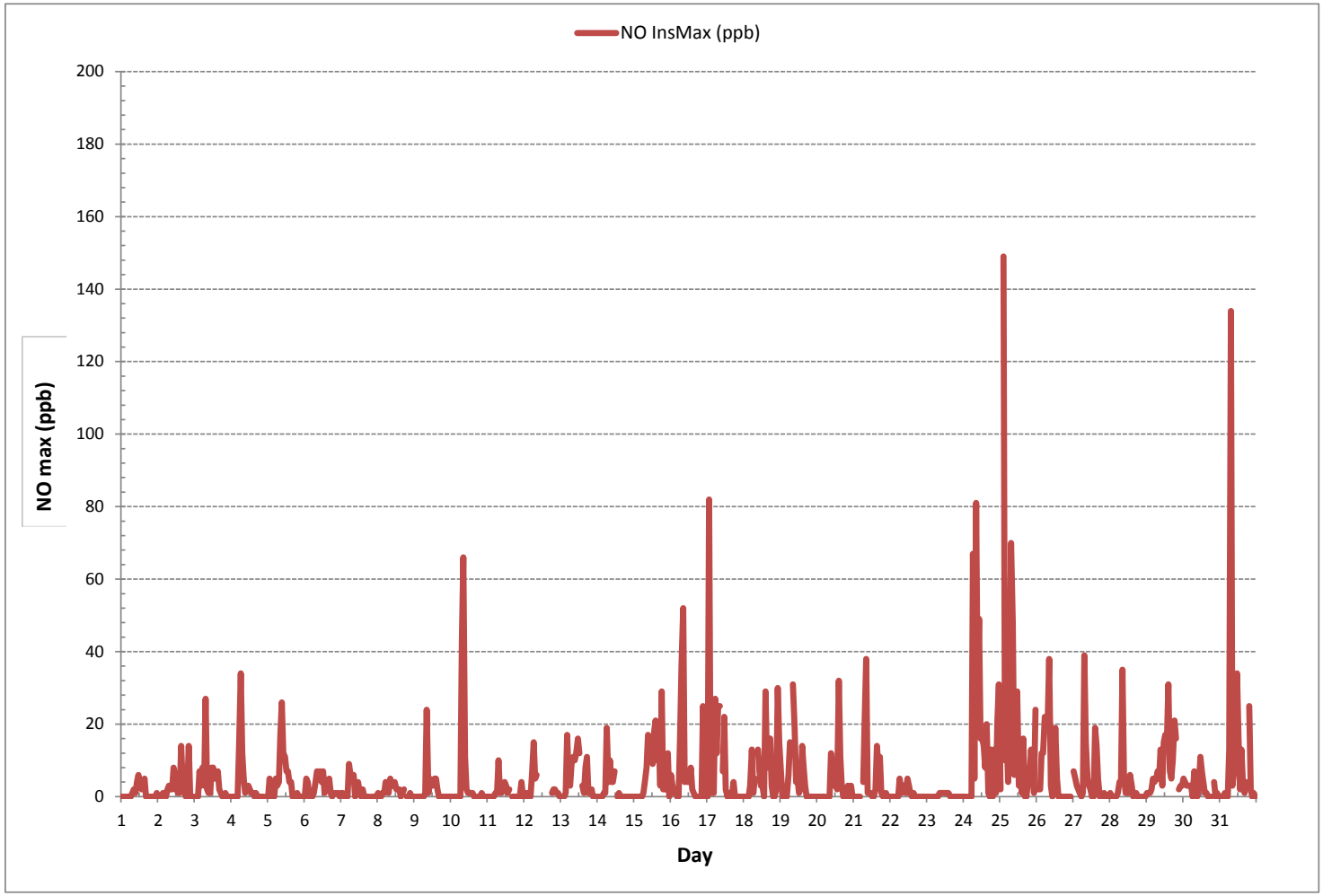
NUMBER OF NON-ZERO READINGS: 417

MAXIMUM INSTANTANEOUS VALUE: 149 ppb @ HOUR 2 ON DAY 25

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 9 hrs
STANDARD DEVIATION: 12

OPERATIONAL TIME: 744 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



NITROGEN DIOXIDE Instantaneous Maximum (NO_2 ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	10	1	S	3	2	4	6	8	6	3	6	8	6	5	4	6	2	1	2	2	2	6	2	8	1	10	5	24
2	3	S	7	5	5	5	8	8	4	3	9	7	3	2	2	12	3	11	1	4	14	2	2	3	1	14	5	24
3	S	5	3	10	23	31	24	18	6	2	1	11	9	8	9	6	2	4	4	1	14	1	1	S	1	31	9	24
4	3	3	2	2	1	25	31	13	11	3	5	6	4	2	2	2	7	2	3	11	10	3	S	8	1	31	7	24
5	7	9	5	4	5	11	16	14	17	20	14	12	9	12	8	10	2	3	5	6	2	S	6	3	2	20	9	24
6	2	14	15	1	2	2	7	13	16	14	11	7	10	3	9	14	16	3	4	6	S	6	8	1	1	16	8	24
7	4	2	2	1	1	11	7	8	7	1	4	7	2	1	1	1	1	1	0	S	2	1	1	2	0	11	3	24
8	2	1	2	2	2	8	4	2	7	5	5	5	4	3	4	1	4	4	S	13	2	15	4	3	1	15	4	24
9	1	1	1	1	1	2	2	3	18	2	7	5	5	7	8	5	1	S	2	1	1	3	4	3	1	18	4	24
10	2	1	1	1	1	1	2	17	23	10	7	3	3	3	3	5	S	7	3	2	9	8	7	9	1	23	5	24
11	4	4	4	10	4	5	7	18	5	4	8	5	6	4	5	S	6	4	5	4	5	5	9	5	4	18	6	24
12	5	6	7	7	7	12	15	10	12	C	C	C	C	C	C	C	C	C	4	5	10	4	5	3	3	15	7	24
13	3	3	3	4	23	11	4	17	16	11	12	15	12	S	7	3	17	21	4	8	18	11	8	8	3	23	10	24
14	3	5	7	7	12	14	25	15	13	7	5	6	S	4	3	2	2	4	4	4	5	9	10	9	2	25	8	24
15	5	1	1	1	5	20	4	3	14	18	20	S	14	26	22	20	21	19	30	16	19	20	24	2	1	30	14	24
16	20	19	8	10	7	11	12	14	22	8	S	8	9	13	5	5	5	4	4	3	3	17	6	4	3	22	9	24
17	5	21	6	7	14	17	26	28	26	S	11	11	7	2	2	5	9	13	9	16	18	12	10	10	2	28	12	24
18	10	8	8	12	18	13	18	26	S	26	12	8	8	1	4	13	27	32	21	2	19	29	38	31	1	38	17	24
19	25	10	3	3	3	9	27	S	27	22	6	8	4	5	16	14	13	1	1	2	6	13	8	1	1	27	10	24
20	1	1	1	1	1	2	S	7	5	14	11	5	9	4	12	7	6	4	1	1	5	2	5	1	1	14	5	24
21	1	5	3	1	4	S	18	32	8	4	4	2	1	1	5	23	17	22	26	14	13	17	10	10	1	32	11	24
22	6	5	5	3	S	9	9	7	4	5	3	5	5	3	2	4	2	6	11	11	4	5	6	6	2	11	5	24
23	5	4	3	S	6	5	5	5	5	4	4	3	4	3	3	3	2	4	2	7	8	3	3	2	2	8	4	24
24	2	2	S	3	3	2	11	10	31	16	20	18	14	16	12	29	8	2	15	2	16	5	24	33	2	33	13	24
25	6	S	43	23	26	9	26	31	31	9	12	21	7	9	5	17	6	7	26	11	16	12	6	20	5	43	16	24
26	S	12	12	16	13	21	24	25	26	7	2	4	10	4	2	2	3	6	2	4	5	4	4	S	2	26	9	24
27	12	20	16	10	8	8	12	21	21	10	8	6	1	2	21	23	14	4	7	7	14	12	S	12	1	23	12	24
28	3	11	11	10	2	5	10	5	14	8	2	3	5	14	11	4	10	14	13	3	3	S	5	5	2	14	8	24
29	5	5	4	6	8	5	8	6	8	11	4	17	18	17	22	12	12	14	19	18	S	5	8	7	4	22	10	24
30	9	8	9	11	10	16	14	18	6	2	5	7	11	7	5	5	5	4	2	S	10	5	8	8	2	18	8	24
31	7	7	7	7	5	5	10	21	8	9	8	31	11	7	12	11	14	12	S	20	15	11	10	7	5	31	11	24
HOURLY MAX	25	21	43	23	26	31	31	32	31	26	20	31	18	26	22	29	27	32	30	20	19	29	38	33				
HOURLY AVG	6	7	7	6	7	10	13	14	14	9	8	9	7	6	8	9	8	8	8	7	9	8	8	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: 702

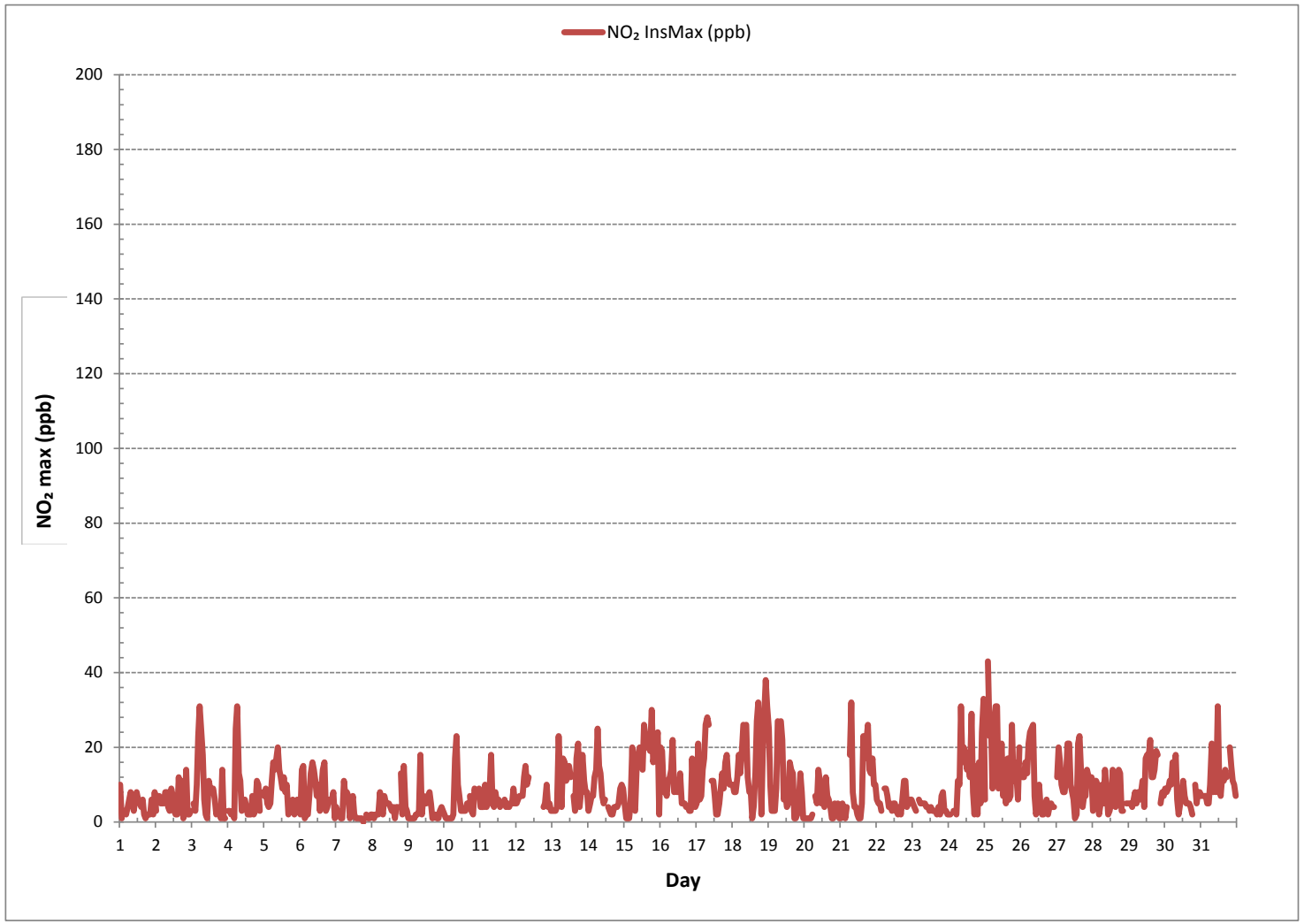
MAXIMUM INSTANTANEOUS VALUE: 43 ppb @ HOUR 2 ON DAY 25

VAR-VARIOUS

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 9 hrs
STANDARD DEVIATION: 7

OPERATIONAL TIME: 744 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO_2 ppb)



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	6.0	7.3	4.2	3.5	2.4	2.7	1.9	1.4	1.9	2.7	3.6	5.0	6.8	7.4	5.9	6.4	5.1	4.7	4.4	4.5	3.3	1.9	2.1	4.9	1.4	7.4	4.2	24
2	2.6	2.5	3.3	6.0	6.8	2.9	3.9	5.7	8.5	8.2	8.8	11.0	10.6	13.6	15.2	14.6	11.7	11.5	6.1	6.6	6.0	7.4	4.5	4.7	2.5	15.2	7.6	24
3	4.9	4.8	5.6	8.6	7.8	10.4	7.2	10.6	10.8	12.7	11.7	15.9	14.1	15.9	13.4	11.5	8.6	6.6	3.4	3.6	2.6	2.7	1.8	5.8	1.8	15.9	8.4	24
4	7.4	6.3	8.5	7.1	5.0	2.0	2.1	2.7	4.8	6.8	5.5	9.3	10.1	9.3	9.7	8.3	7.4	5.6	6.5	8.5	9.1	11.6	8.6	7.7	2.0	11.6	7.1	24
5	7.2	6.8	8.3	8.0	7.9	5.4	4.3	3.9	5.9	7.1	8.0	9.7	10.9	10.4	9.9	7.7	9.8	9.5	4.7	5.2	3.8	2.2	2.4	4.1	2.2	10.9	6.8	24
6	3.9	2.9	2.5	2.7	3.0	7.5	6.4	10.6	12.6	16.3	11.8	12.4	9.2	9.0	7.9	7.2	5.2	3.5	3.9	3.7	2.7	3.8	5.2	7.7	2.5	16.3	6.7	24
7	6.6	7.6	7.7	11.0	9.0	8.4	10.4	8.9	7.8	9.4	8.0	10.1	11.2	11.7	11.3	9.9	10.5	10.2	14.5	14.4	15.5	16.2	12.3	11.0	6.6	16.2	10.6	24
8	11.1	10.7	10.8	10.9	9.7	8.7	8.8	8.7	9.4	9.4	9.1	8.8	9.7	9.9	8.5	8.2	7.5	7.4	2.5	2.4	1.5	1.3	1.0	1.4	1.0	11.1	7.4	24
9	1.5	1.5	1.4	0.9	2.1	2.5	2.1	2.8	3.3	5.8	7.8	8.0	8.2	7.4	8.7	6.5	4.8	4.8	3.4	2.0	1.9	2.4	2.3	1.4	0.9	8.7	3.9	24
10	1.5	2.1	1.6	1.9	1.6	0.5	1.7	2.0	2.9	5.6	5.5	7.1	5.5	5.9	4.0	2.8	4.0	1.5	1.6	1.4	2.0	4.2	2.9	2.1	0.5	7.1	3.0	24
11	1.5	1.8	1.8	2.9	4.2	4.3	3.6	4.9	5.1	6.8	7.7	8.2	9.1	9.8	10.0	11.9	12.6	8.8	9.1	13.3	10.2	8.0	6.8	8.2	1.5	13.3	7.1	24
12	8.0	6.9	5.3	4.3	3.6	3.3	4.2	2.4	6.0	6.6	5.8	11.0	13.3	17.3	16.7	16.8	16.9	**19.7**	17.3	12.5	9.2	10.6	13.9	13.5	2.4	**19.7**	10.2	24
13	13.2	16.3	12.0	13.0	12.4	12.2	13.1	12.7	13.3	14.1	12.2	12.4	13.3	14.9	13.0	19.0	11.9	11.6	9.6	6.7	5.7	3.3	3.0	2.7	2.7	19.0	11.3	24
14	4.0	4.1	3.7	3.6	4.0	6.1	4.8	7.7	7.1	8.4	10.5	10.0	10.7	13.3	13.6	12.9	12.7	9.1	9.5	11.1	7.7	7.8	6.4	7.0	3.6	13.6	8.2	24
15	12.2	11.3	10.4	12.1	9.9	8.7	10.6	9.7	11.8	14.0	14.0	16.7	16.8	18.4	15.7	15.0	13.5	10.4	7.8	7.6	8.1	7.7	7.5	5.9	5.9	18.4	11.5	24
16	4.8	4.7	3.8	4.3	2.4	1.6	1.8	1.8	4.0	4.4	4.5	6.7	6.0	5.5	5.5	5.0	4.6	3.4	1.6	3.7	4.3	4.2	9.3	8.7	1.6	9.3	4.4	24
17	7.9	4.4	7.3	6.8	5.7	5.2	5.8	6.9	8.2	9.9	11.4	8.7	10.1	8.9	10.9	12.0	10.3	8.8	9.1	8.6	7.9	6.6	4.8	5.0	4.4	12.0	8.0	24
18	5.5	4.7	5.8	7.4	5.7	9.5	13.5	10.7	7.9	9.5	8.4	9.9	12.6	17.3	18.0	19.3	15.1	18.3	10.5	12.5	12.5	9.8	9.4	8.5	4.7	19.3	10.9	24
19	7.8	6.1	5.9	4.6	7.7	6.1	6.4	6.4	10.7	13.3	12.6	16.5	11.9	11.9	12.4	10.0	7.5	4.6	3.7	4.6	5.0	3.6	9.4	8.8	3.6	16.5	8.2	24
20	13.5	11.0	7.5	7.7	10.0	7.9	9.2	11.4	9.4	8.9	10.7	10.7	9.4	16.9	14.4	18.2	18.9	16.6	11.5	12.0	12.6	11.0	11.3	9.9	7.5	18.9	**11.7**	24
21	8.5	8.1	8.8	8.1	4.3	6.4	6.5	5.5	14.6	16.4	18.8	16.3	16.1	14.8	17.1	16.0	18.1	7.5	4.6	4.3	3.6	4.1	1.7	1.7	1.7	18.8	9.7	24
22	1.8	1.7	1.5	1.6	3.1	1.7	1.3	1.6	1.6	5.1	7.0	8.6	8.4	10.5	9.0	11.7	9.1	4.0	5.8	8.6	8.7	6.5	7.1	3.6	1.3	11.7	5.4	24
23	6.9	7.2	2.4	3.1	2.9	4.7	4.8	8.4	7.4	6.3	8.2	8.3	10.7	9.5	6.4	5.6	4.4	4.1	5.8	3.9	2.3	1.8	1.7	1.6	1.6	10.7	5.3	24
24	4.1	2.7	1.6	3.4	2.9	2.3	2.2	3.2	3.7	4.3	4.7	6.1	6.4	7.2	5.9	4.3	3.8	1.7	2.1	2.5	2.9	3.1	3.6	3.3	1.6	7.2	3.7	24
25	2.7	3.6	5.0	3.5	2.1	3.3	3.8	1.2	3.3	3.9	5.1	3.7	4.9	6.1	5.8	4.1	2.2	2.8	2.3	2.2	1.9	1.7	1.9	1.4	1.2	6.1	3.3	24
26	2.8	4.0	2.7	3.4	5.4	5.2	5.9	4.2	4.7	11.1	12.0	9.8	12.3	10.0	9.5	8.3	4.2	2.6	4.1	2.8	2.3	3.2	2.1	1.4	1.4	12.3	5.6	24
27	2.2	2.8	3.2	5.0	5.0	4.9	6.0	5.5	11.5	13.0	13.6	13.1	17.9	18.0	17.8	12.1	8.7	5.4	5.2	11.1	9.7	8.0	6.2	4.4	2.2	18.0	8.8	24
28	4.7	5.7	3.8	3.4	4.2	4.1	2.7	1.4	6.0	3.5	5.6	6.4	6.5	8.6	7.4	6.6	6.0	5.8	7.1	9.8	8.3	9.7	11.7	8.5	1.4	11.7	6.1	24
29	5.4	7.4	5.5	4.5	6.2	6.7	7.5	7.3	8.4	7.1	10.4	10.5	10.2	12.2	13.8	13.1	10.1	8.3	13.0	9.1	8.7	9.0	6.6	5.4	4.5	13.8	8.6	24
30	4.2	5.2	4.3	4.5	5.4	2.8	4.9	3.0	4.4	4.0	6.6	6.0	4.8	4.5	3.9	5.1	5.1	4.5	4.7	3.7	2.7	2.3	2.8	4.5	2.3	6.6	4.3	24
31	3.9	5.8	5.6	6.3	6.2	4.4	5.5	4.9	5.2	3.3	3.9	6.0	5.6	6.6	6.3	11.1	9.0	2.8	1.8	2.0	1.5	2.3	1.6	2.2	1.5	11.1	4.7	24
HOURLY MAX	13.5	16.3	12.0	13.0	12.4	12.2	13.5	12.7	14.6	16.4	18.8	16.7	17.9	18.4	18.0	19.3	18.9	19.7	17.3	14.4	15.5	16.2	13.9	13.5				

STATUS FLAG CODES

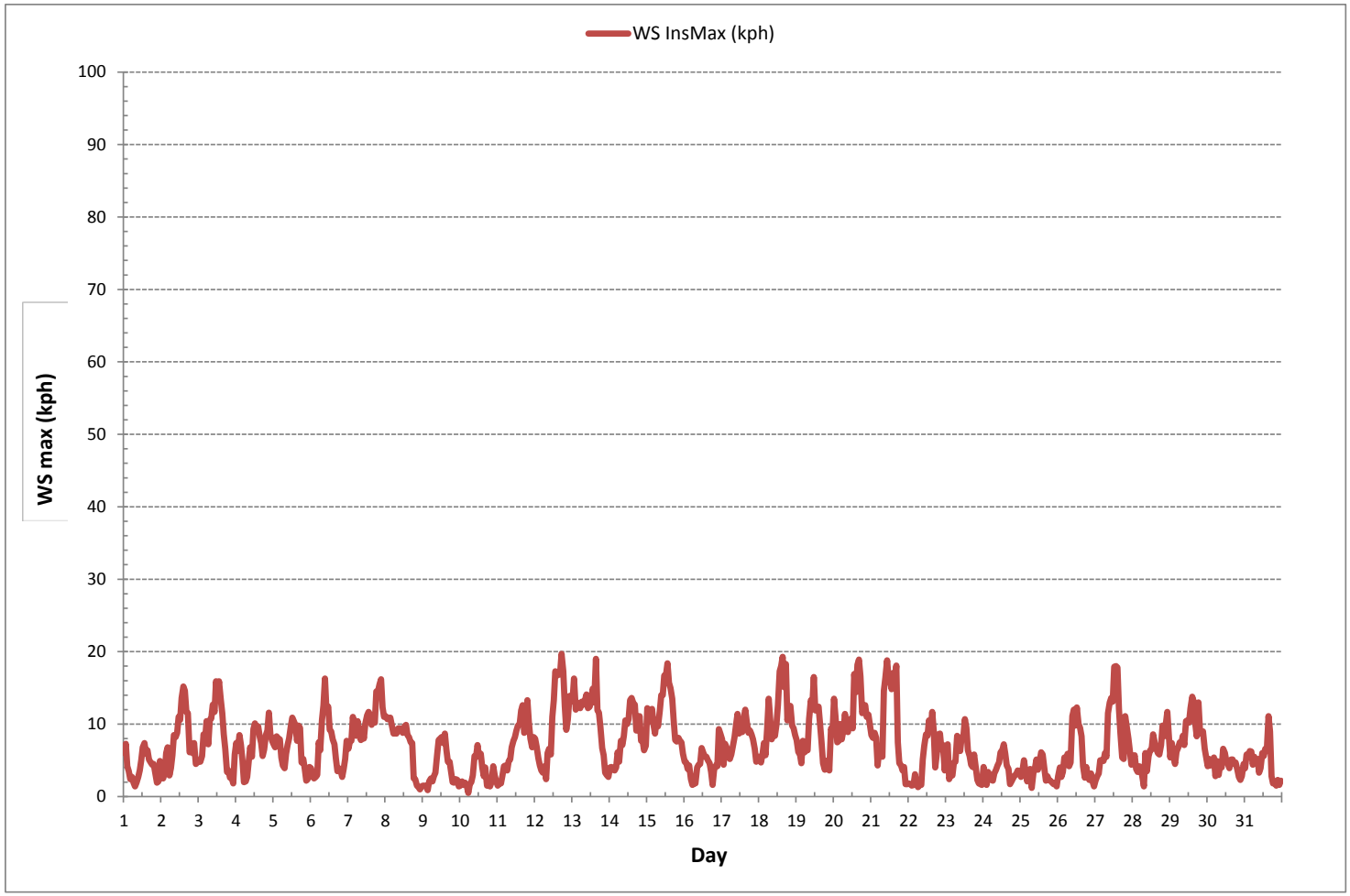
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE: 19.7 kph @ HOUR 17 ON DAY 12

OPERATIONAL TIME: 744 hrs

WIND SPEED Instantaneous Maximum (WS kph)



APPENDIX IV
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	**EPA Approval or Code of Practice Registration #** (if applicable)
YES	**NA**
Company Name (if applicable)	**Industrial Operation Name** (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	**Maskwa Continuous Monitoring Station**
Name of the Representative of the Person Responsible	**Position / Title of the Representative of the Person Responsible**
Mike Bisaga	**Environment Monitoring Program Manager**
Is an External Party Certifying the Report?	
■ **Yes** ☐ **No**	
Name of External Person Certifying the Report	**Position / Title of External Person Certifying the Report**
Wunmi Adekanmbi	**Project Team Lead, Customer Service, Air Services**
Company Name for External Person Certifying the Report	**Identification of Qualifications / Professional Designations of the External Person Certifying the Report**
Maxxam Analytics, A Bureau Veritas Group Company	**M.Sc., EPt., PMP**

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.

Signature of the External Person Certifying the Report

29 - Nov -2018

Report Issued Date (dd-mon-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM

Validation Certificate Form

Client:	Lakeland Industry & Community Association	**Project #:**	2833-2018-10-30-C
Site:	Maskwa Continuous Monitoring Station	**Contact:**	Mike Bisaga

Level 0 Preliminary Verification	Maram Ghaleb	**Date**	26 - Nov - 2018
Level 1 Primary Validation	Maram Ghaleb	**Date**	26 - Nov - 2018
Level 2 Final Validation	Maram Ghaleb	**Date**	27 - Nov - 2018
Level 3 Independent Data Review		**Date**	29 - Nov - 2018
Post-Final Validation	**NA**	**Date**	**NA**

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

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

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

December 10, 2018

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

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA St. Lina AQM Station in the month of October 2018.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO_2), Hydrogen Sulphide (H_2S), Total Hydrocarbon (THC), Oxides of Nitrogen (NOx), Nitric Oxides (NO), Nitrogen Dioxide (NO_2), Ozone (O_3), Particulate Matter 2.5 ($PM_{2.5}$), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

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

All data collected in October 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

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

Precipitation: configuration error occurred during the datalogger upgrade on May 30 and was corrected on November 1. Consequently, data collected during this time frame, at rates greater than or equal to 0.3 millimeter /minute, might be compromised and should therefore be used with caution.

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.

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

Respectfully,

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

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

Lily Lin
Data & Reporting Specialist
587-225-2248
monitoring@lica.ca

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

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

AMBIENT AIR MONITORING MONTHLY DATA REPORT

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

ST. LINA CONTINUOUS MONITORING STATION

JOB #: 2833-2018-10-31-C

October 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
5107 50 ST.
BONNYVILLE, ALBERTA
T9N 2J7

Attention: MIKE BISAGA

DATE: **November 28, 2018**

Prepared by: Maram Ghaleb

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

Reviewed by:

Wunmi Adekanmbi, M.Sc., EPt, PMP
Project Team Lead, Customer Service, Air Services

SUMMARY

In October 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry and Community Association.

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

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

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

Power failure: Two power failure events occurred on October 12 and October 17, respectively. Downtime ranging from eight to ten hours were recorded across parameters due the power failures and the subsequent analyzer recovery periods.

H_2S: A repeat calibration was performed on October 28 to correct biased high zero and span drifts, incurring six hours of downtime.

NOx/NO/NO_2: One hour of downtime was recorded on October 12 at hour 08:00, due to an additional zero-span check performed to assess a biased high drift in span response.

WS/WD/STDWD: Four hours of downtime were recorded on October 29 due to anomalous WS spikes that were consequently invalidated, along with the corresponding WD and STDWD data.

Precipitation: A configuration error occurred during the datalogger upgrade on May 30, and was corrected on November 1. Consequently, data collected during this time frame, at rates greater than or equal to 0.3 mm/min, might be compromised and should therefore be used with caution.

The summary of results is presented on the following pages.

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

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

Monthly Continuous Data Summary

Lakeland Industry & Community Association St. Lina 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_2 (ppb)	172	48	0	0	0	5	17	18	16.3	WSW	1	17	98.9
H_2S (ppb)	10	3	0	0	0	1	10	2	12.1	SE	0	10	98.0
THC (ppm)	-	-	-	-	2.07	2.85	24	13	7.3	E	2.31	24	98.7
CH_4 (ppm)	-	-	-	-	2.07	2.79	24	13	7.3	E	2.31	24	98.7
NMHC (ppm)	-	-	-	-	0.00	0.06	1	0	7.3	SSE	0.00	1	98.7
NO_2 (ppb)	159	-	0	-	2	10	17	16	20.9	WSW	5	24	98.7
NO (ppb)	-	-	-	-	0	2	9	8	3.5	ENE	1	24	98.7
NOx (ppb)	-	-	-	-	2	10	17	16	20.9	WSW	5	24	98.7
O_3 (ppb)	82	-	0	-	28.0	56.4	17	14	23.7	WSW	40.9	17	98.9
$PM_{2.5}$ (µg/m³)	80	30	0	0	4	17	3	19	7.2	NE	11	11	98.9
RELATIVE HUMIDITY (%)	-	-	-	-	68	100	11	23	7.7	SW	96	30	98.9
BAROMETRIC PRESSURE (millibar)	-	-	-	-	930	944	9	12	4.5	ESE	942	9	98.9
AMBIENT TEMPERATURE (°C)	-	-	-	-	2.6	21.8	17	14	23.7	WSW	12.4	17	98.9
PRECIPITATION (mm)	-	-	-	-	17.0	1.5	29	5	X	X	3.9	29	98.9
VECTOR WS (kph)	-	-	-	-	3.0	25.8	12	16	-	N	16.6	17	98.4
VECTOR WD (sec)	-	-	-	-	264 (W)	-	-	-	-	-	-	-	98.4

** Precipitation: data represents the total (sum) for the indicated time frame.*
X = Invalid WS/WD value.

Exceedance Summary Report

SO_2 1-Hour Exceedances
Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO_2 24-Hour Exceedances
Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

H_2S 1-Hour Exceedances
Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

H_2S 24-Hour Exceedances
Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

NO_2 1-Hour Exceedances
Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

$PM_{2.5}$ 1-Hour Exceedances
Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

$PM_{2.5}$ 24-Hour Exceedances
Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O_3 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.

TABLE OF CONTENTS

1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO_2), Hydrogen Sulphide (H_2S), Total Hydrocarbon (THC), Methane (CH_4), Non-Methane Hydrocarbon (NMHC), Oxides of Nitrogen (NOx), Nitric Oxides (NO), Nitrogen Dioxide (NO_2), Ozone (O_3), Particulate Matter 2.5 ($PM_{2.5}$), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

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

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

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

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

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

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

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

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

SULPHUR DIOXIDE (SO_2)

• Operational time for the monitoring period was 98.9%, equivalent to 8 hours of downtime.
• The routine monthly calibration was performed on October 10.
• Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively. Minute data recorded at 12:02 – 12:05 on October 12 and 10:05 – 10:14 on October 17, were flagged as recovery period and the corresponding hour was re-averaged.
• One instance of maximum instantaneous data was invalidated on October 12 at hour 13:00 due to missing minute data that could not be recovered.

HYDROGEN SULPHIDE (H_2S)

• Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime.
• The routine monthly calibration was performed on October 10.
• Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively. Hour 12:00 of October 12 was flagged as recovery period, incurring an additional hour of downtime. Minute data recorded at 10:05 – 10:14 on October 17 were flagged as recovery period and the corresponding hour was re-averaged.
• The analyzer exhibited biased high zero and span drifts beginning on October 25. This prompted a site visit on October 28, where a successful repeat calibration was completed. No further issues were identified. Six hours of downtime were, however, incurred due to the additional quality check.
• One instance of maximum instantaneous data was invalidated on October 12 at hour 13:00 due to missing minute data that could not be recovered.

TOTAL HYDROCARBONS (THC), METHANE (CH_4) and NON-METHANE HYDROCARBONS (NMHC)

• Operational time for the monitoring period was 98.7%, equivalent to 10 hours of downtime.
• The routine monthly calibration was performed on October 11.
• Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively. Hour 12:00 of October 12 and hour 10:00 of October 17 were flagged as recovery period, incurring two additional hours of downtime.
• Elevated minute concentrations were observed on October 25 from 08:50 to 08:52. These minutes were excluded and the corresponding hourly average was re-calculated. The corresponding maximum instantaneous data at hour 08:00 was also invalidated.
• One instance of maximum instantaneous data was invalidated on October 2 at hour 11:00, due to an anomalous spike. The anomalous minute data was removed and the hourly concentration was re-averaged.
• One instance of maximum instantaneous data was invalidated on October 12 at hour 13:00 due to missing minute data that could not be recovered.

OXIDES OF NITROGEN (NOx), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO_2)

- Operational time for the monitoring period was 98.7%, equivalent to 10 hours of downtime.
- The routine monthly calibration was performed on October 10.
- Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively. Hour 12:00 of October 12 was flagged as recovery period, incurring an additional hour of downtime. Minute data recorded at 10:05 – 10:14 on October 17 were flagged as recovery period and the corresponding hour was re-averaged.
- One hour of downtime was recorded on October 15 at hour 08:00, due to an additional zero-span check performed to assess a biased high drift in span response.
- One instance of maximum instantaneous data was invalidated on October 12 at hour 13:00 due to missing minute data that could not be recovered.

OZONE (O_3)

- Operational time for the monitoring period was 98.9%, equivalent to 8 hours of downtime.
- The routine monthly calibration was performed on October 11.
- Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively. Minute data recorded at 10:05 – 10:14 on October 17 were flagged as recovery period and the corresponding hour was re-averaged.
- One instance of maximum instantaneous data was invalidated on October 12 at hour 13:00 due to missing minute data that could not be recovered.

PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)

- Operational time for the monitoring period was 98.9%, equivalent to 8 hours of downtime.
- The routine monthly check was performed on October 11.
- Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively. Minute data recorded at 12:02 – 12:05 on October were flagged as recovery period and the corresponding hour was re-averaged.

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

- Operational time for the monitoring period was 98.4%, equivalent to 12 hours of downtime.
- Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively.
- For undetermined reasons, anomalous WS spikes were recorded on October 29 at hours 04:00 – 07:00, and were therefore invalidated, along with the corresponding WD and STDWD data. Four hours of downtime were incurred as a result.
- One instance of maximum instantaneous data was invalidated on October 12 at hour 13:00 due to missing minute data that could not be recovered.
- 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.

RELATIVE HUMIDITY (RH)

• Operational time for the monitoring period was 98.9%, equivalent to 8 hours of downtime.
• Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively.

BAROMETRIC PRESSURE (BP)

• Operational time for the monitoring period was 98.9%, equivalent to 8 hours of downtime.
• Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively.

PRECIPITATION (PRECIP)

• Operational time for the monitoring period was 98.9%, equivalent to 8 hours of downtime.
• A precipitation sensor check was conducted on October 11. The result was satisfactory.
• A configuration error occurred during the datalogger upgrade on May 30, and was corrected on November 1. Consequently, data collected during this time frame, at rates greater than or equal to 0.3 mm/min, might be compromised and should therefore be used with caution.
• Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively.

AMBIENT TEMPERATURE (AmbTPX)

• Operational time for the monitoring period was 98.9%, equivalent to 8 hours of downtime.
• Two power failure events occurred on October 12, between hours 05:00 and 11:00, and October 17 at hour 09:00, incurring 7 hours and 1 hour of downtime, respectively.

2.0 Project Personnel

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

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

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

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (November, 2018).

4.0 Calculations and Results

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

A THC/CH_4/NMHC spike was recorded between 08:50 - 08:52 on October 25 and deemed to be valid data by Maxxam Analytics. At LICA's request, minute data recorded during this period of time was discarded as other monitoring parameters did not support this spike event. The corresponding hourly average was re-calculated.

5.0 Methods and Procedures

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

Maxxam AIR SOP-00001: Methane, Non-Methane Hydrocarbon Analyzer Monitoring
Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00212: Ambient O_3 Monitoring
Maxxam AIR SOP-00213: Ambient NO/NO_2/NOx Monitoring
Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance
MET One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - Thermo 43I-TLE UV Fluorescent Analyzer
Hydrogen Sulphide - Thermo 450i UV Fluorescent Analyzer
Methane, Non-Methane Hydrocarbon - Thermo 55i FID Analyzer
Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
Ozone - Thermo 49i Photometric Analyzer
Particulate Matter ($PM_{2.5}$) - Thermo SHARP 5030i Unit
Wind System - Met One Unit
Relative Humidity - Campbell Scientific Unit
Barometric Pressure - Met One Unit
Ambient Temperature - Campbell Scientific Unit
Precipitation - Met One Unit
Datalogger - Envista Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

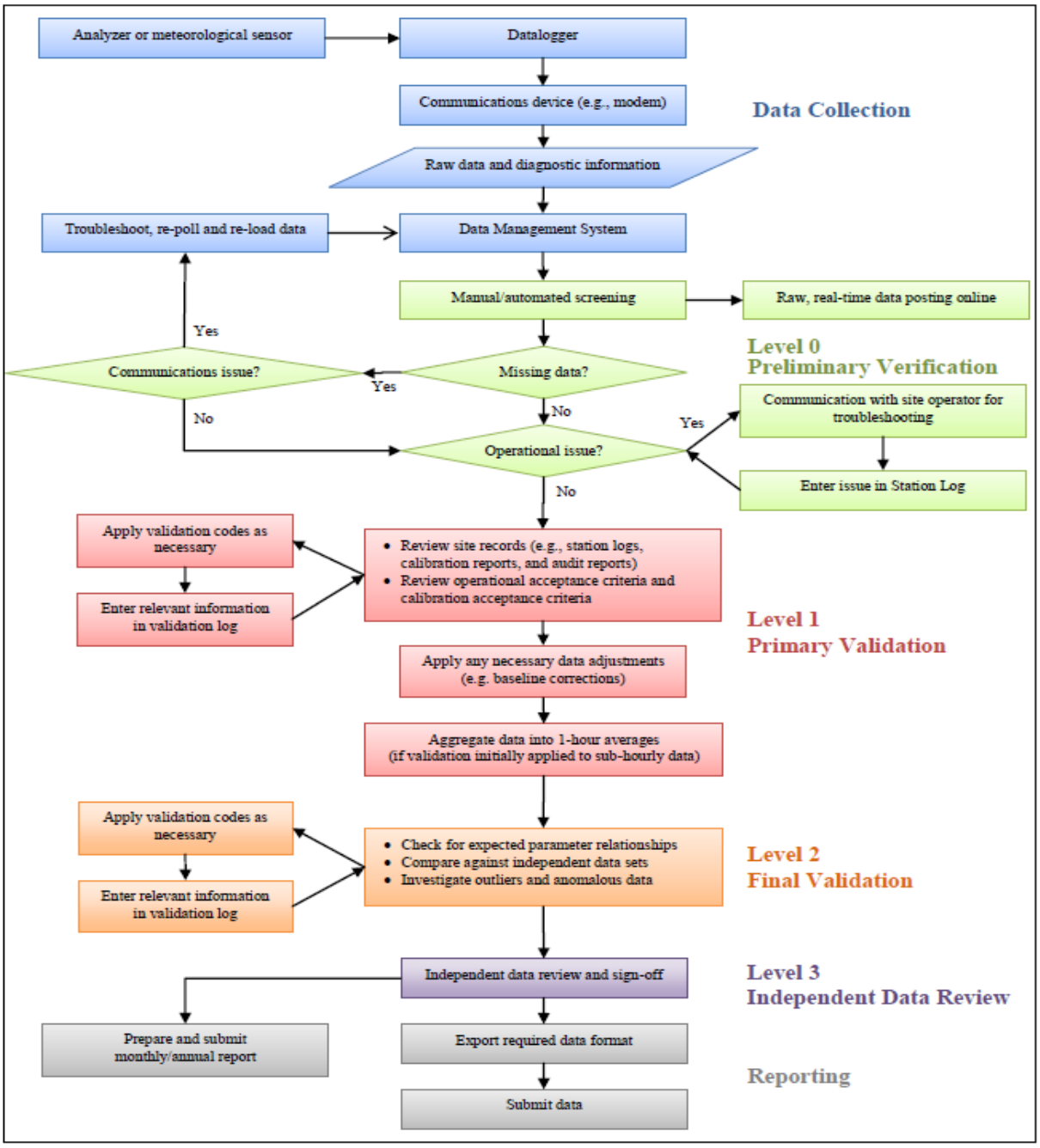
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

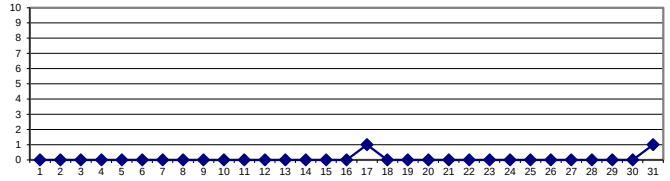
SULPHUR DIOXIDE Hourly Averages (SO_2 ppb)

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

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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 October 2018

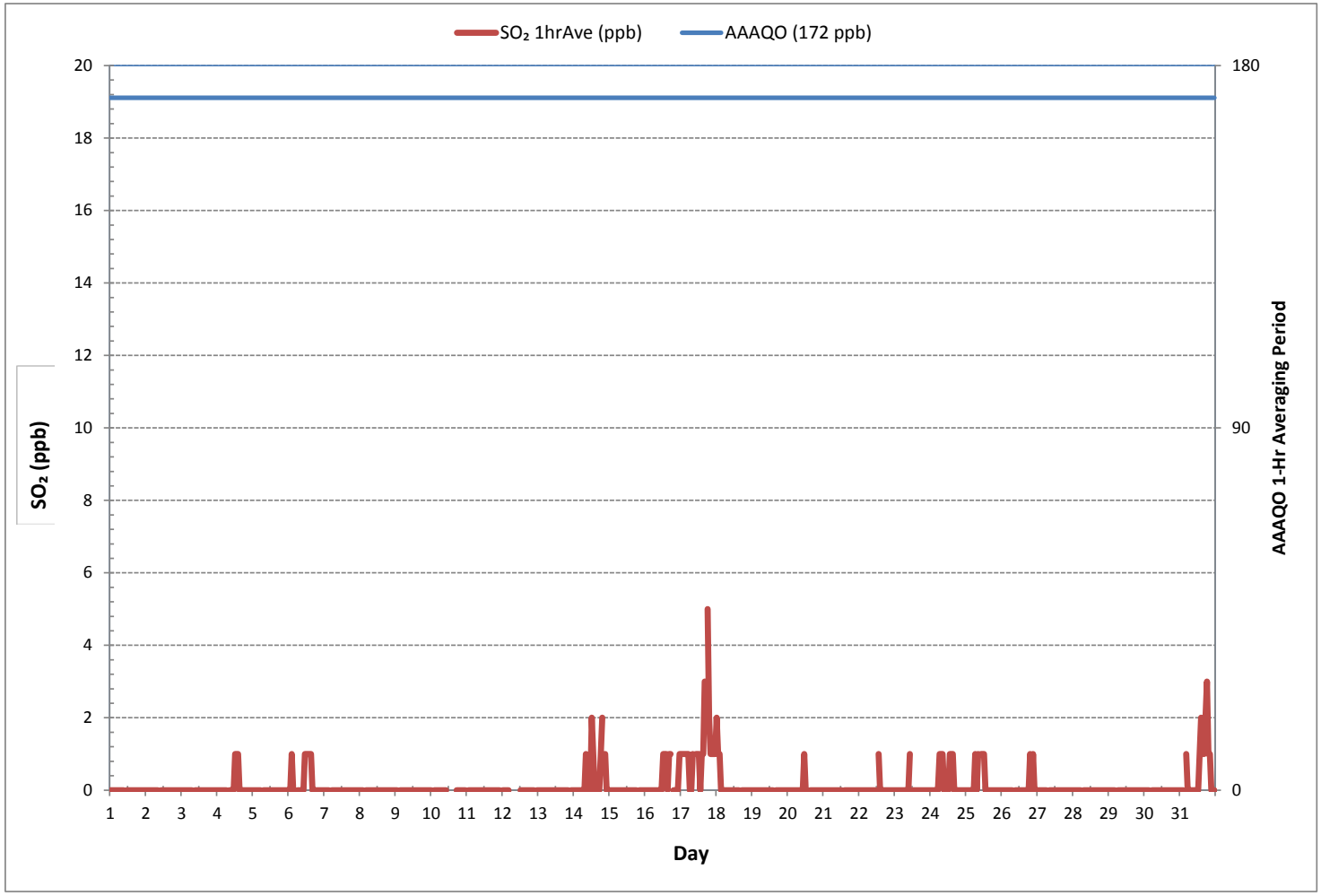


OBJECTIVE LIMIT: **ALBERTA ENVIRONMENT:** 1-HR 172 ppb | 24-HR 48 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:			0				
NUMBER OF 24-HR EXCEEDANCES:			0				
NUMBER OF NON-ZERO READINGS:			68				
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	5	ppb	@ HOUR	18	ON DAY	17	
MAXIMUM 24-HR AVERAGE:	1	ppb			ON DAY	17	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:			736	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:			98.9	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:			0	ppb

SULPHUR DIOXIDE Hourly Averages (SO_2 ppb)



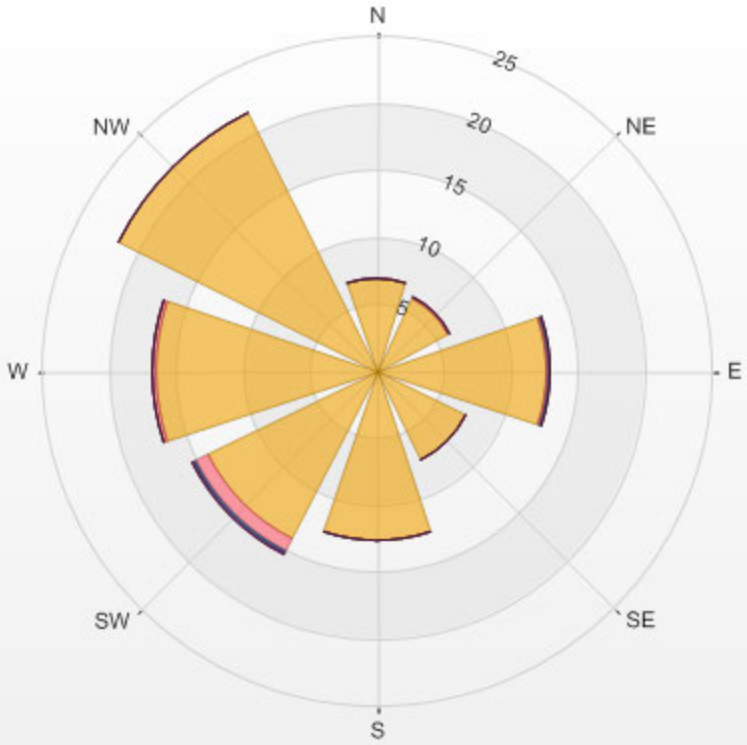
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-SO2[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppb]

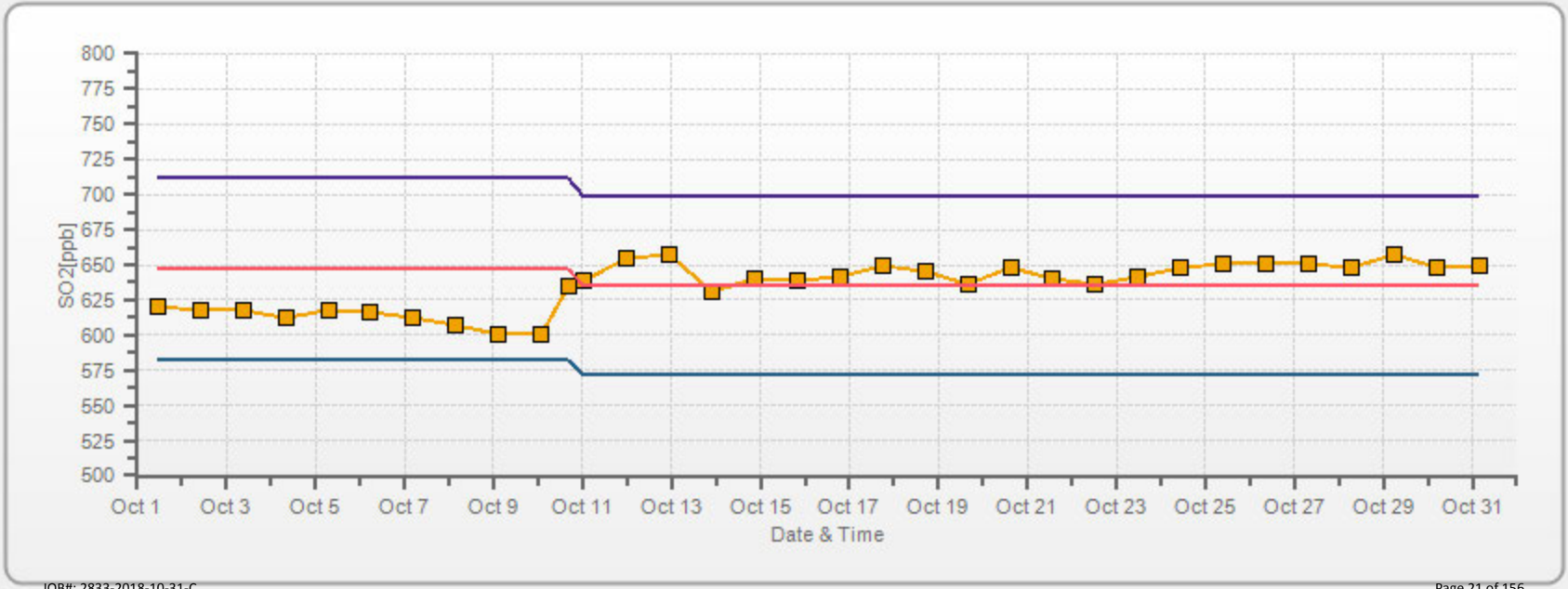
Direction	0.0-1.2	1.2-2.4	2.4-3.6	3.6-4.8	4.8-6.0	>6.0	Total
N	6.9	0.0	0.0	0.0	0.0	0.0	6.9
NE	6.0	0.1	0.0	0.0	0.0	0.0	6.2
E	12.7	0.1	0.1	0.0	0.0	0.0	12.9
SE	7.5	0.0	0.0	0.0	0.0	0.0	7.5
S	12.7	0.0	0.0	0.0	0.0	0.0	12.7
SW	14.1	1.0	0.1	0.1	0.0	0.0	15.4
W	16.6	0.3	0.0	0.0	0.0	0.0	16.8
NW	21.6	0.0	0.0	0.0	0.0	0.0	21.6
Summary	98.0	1.6	0.3	0.1	0.0	0.0	100.0

% Icon Classes (ppb)	98	0.0-1.2	2	1.2-2.4	0	2.4-3.6	0	3.6-4.8	0	4.8-6.0	0	>6.0

LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



SO2[ppb] Calibration: LICA ST. LINA Monthly: 18/10 Type: Span



HYDROGEN SULPHIDE

Maxxam
A Bureau Veritas Group Company

HYDROGEN SULPHIDE Hourly Averages (H_2S ppb)

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

STATUS FLAG CODES

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

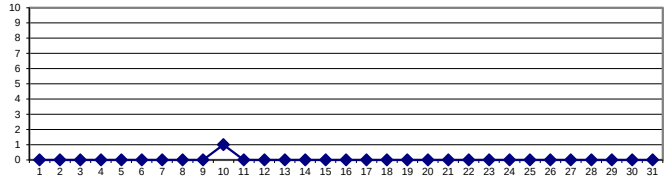
OBJECTIVE LIMIT: **ALBERTA ENVIRONMENT:** 1-HR 10 ppb | 24-HR 3 ppb

MONTHLY SUMMARY

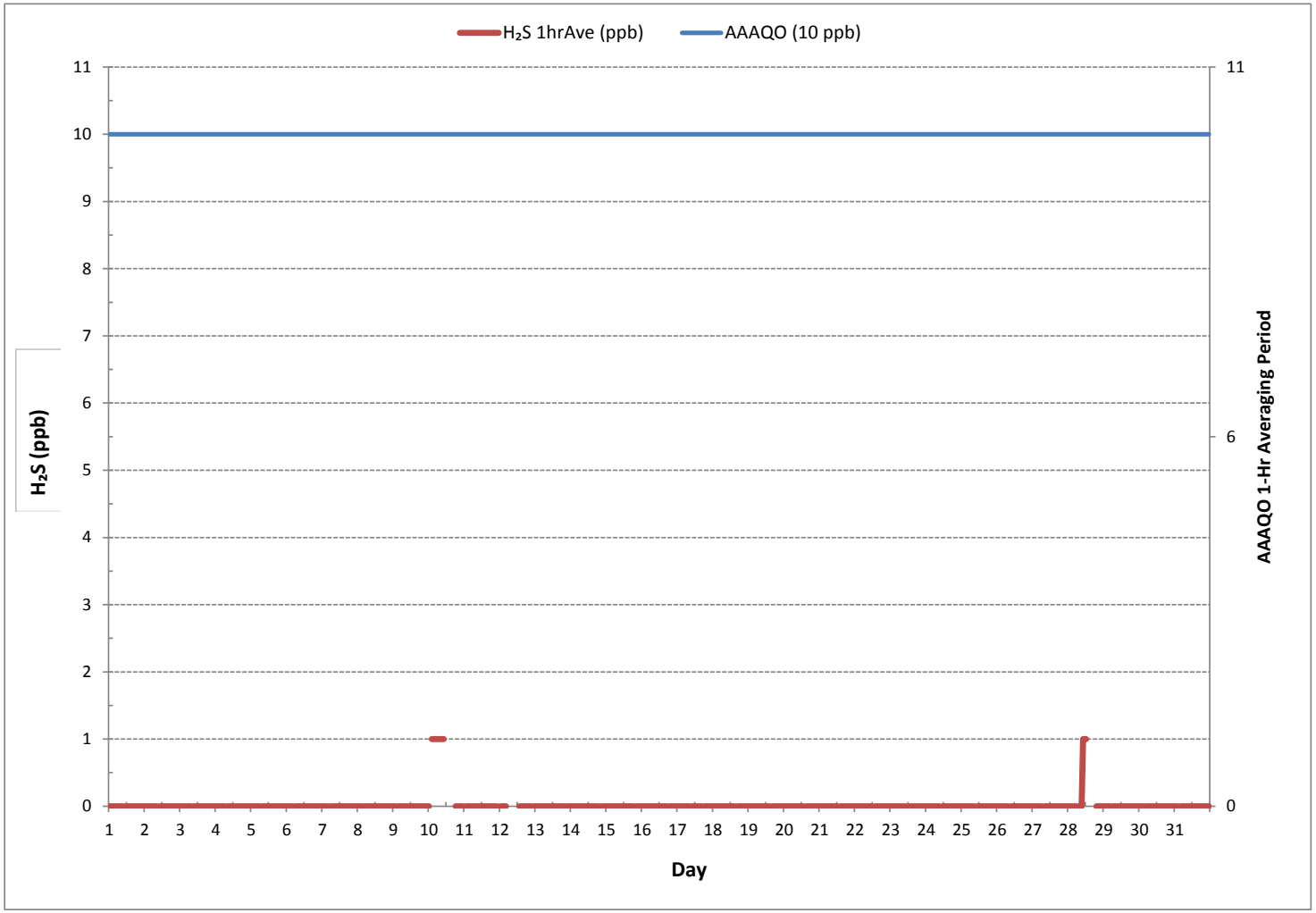
NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	12					
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	1	ppb	@ HOUR	2	ON DAY	10
MAXIMUM 24-HR AVERAGE:	0	ppb			ON DAY	10

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	729	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	98.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

24 HR AVERAGES October 2018



HYDROGEN SULPHIDE Hourly Averages (H_2S ppb)



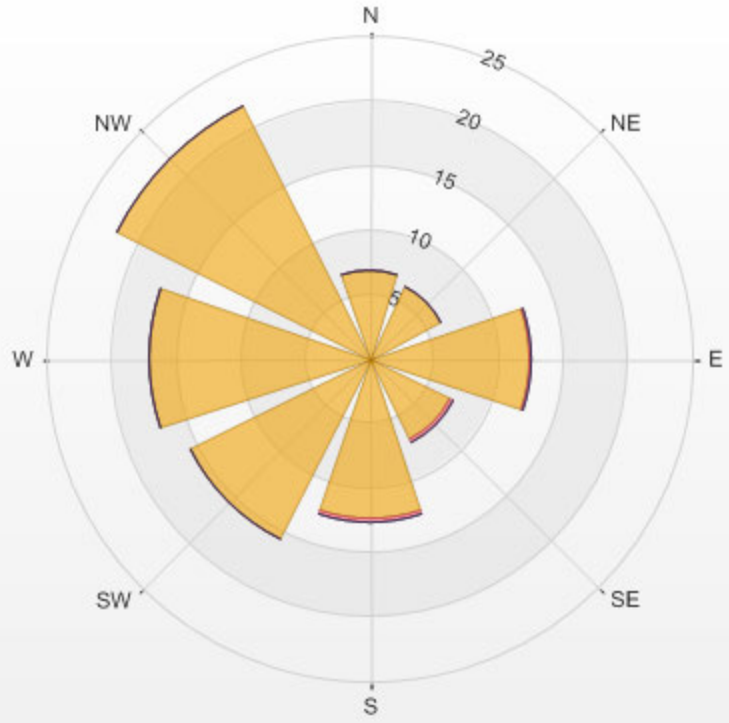
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-H2S[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppb]

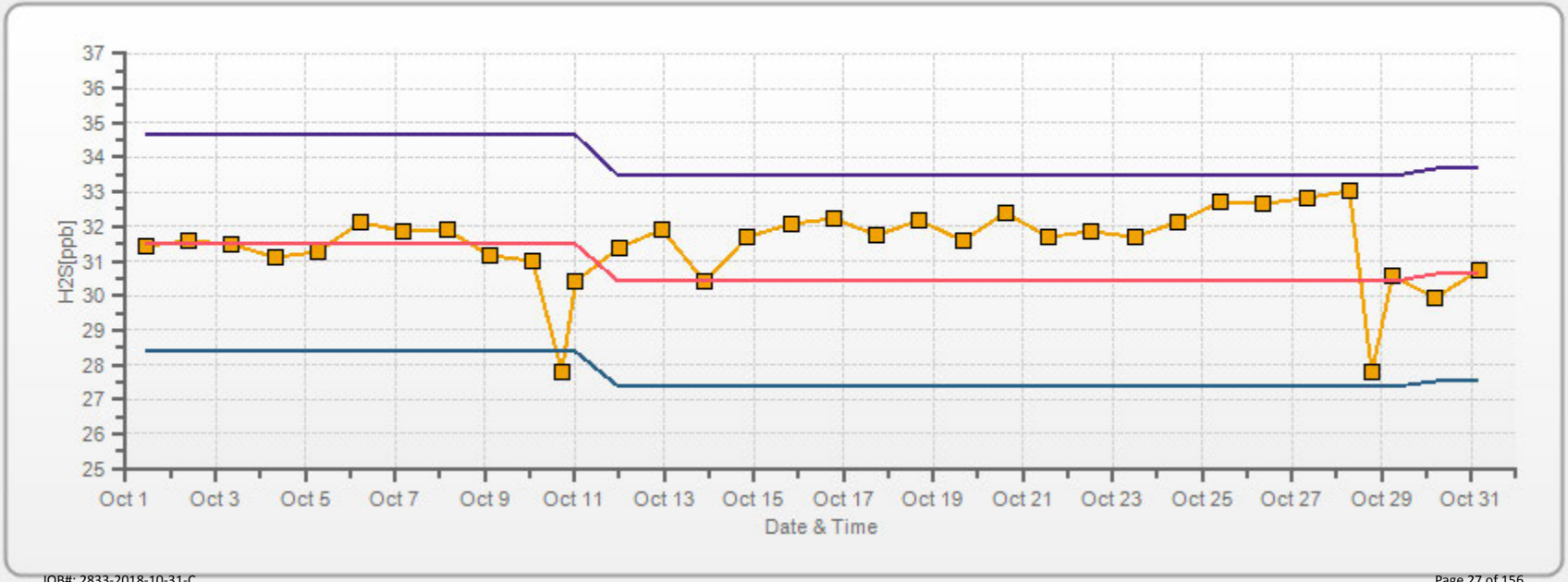
Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	6.8	0.0	0.0	0.0	6.8
NE	6.3	0.0	0.0	0.0	6.3
E	12.4	0.2	0.0	0.0	12.5
SE	7.0	0.3	0.0	0.0	7.3
S	12.4	0.3	0.0	0.0	12.7
SW	15.6	0.0	0.0	0.0	15.6
W	17.0	0.0	0.0	0.0	17.0
NW	21.8	0.0	0.0	0.0	21.8
Summary	99.3	0.7	0.0	0.0	100.0

%	Icon	Classes (ppb)							
99		0.0-0.7	1		0.7-1.3	0		1.3-2.0	0		>2.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



H2S[ppb] Calibration: LICA ST. LINA Monthly: 18/10 Type: Span



TOTAL HYDROCARBON

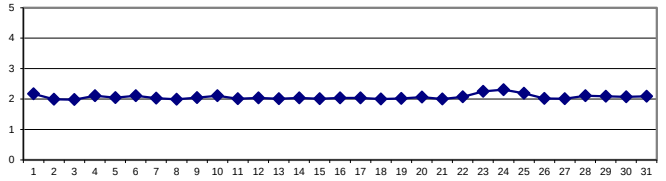
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.14	2.28	2.29	2.42	2.45	2.42	2.44	2.42	2.41	2.23	S	2.02	2.02	2.01	2.01	2.02	2.10	2.01	2.02	2.01	2.02	2.02	2.03	2.02	2.01	2.45	2.17	24
2	2.02	2.01	2.01	2.01	2.00	2.00	2.00	1.99	1.98	S	1.97	1.99	1.98	1.99	1.97	1.98	2.00	1.99	2.01	1.98	1.98	1.98	1.98	1.97	1.97	2.02	1.99	24
3	2.02	1.98	1.97	1.97	1.97	1.97	1.97	1.98	S	1.98	1.98	1.98	1.96	**1.94**	1.96	1.97	1.96	1.94	1.96	1.99	2.00	2.00	2.01	2.01	**1.94**	2.02	1.98	24
4	2.00	2.04	2.09	2.11	2.16	2.16	2.20	S	2.29	2.31	2.35	2.35	2.29	2.16	2.10	1.99	1.96	1.96	1.96	1.98	1.98	2.00	2.03	2.04	1.96	2.35	2.11	24
5	2.03	2.02	2.03	2.05	2.05	2.06	S	2.08	2.08	2.29	2.21	2.06	2.00	2.01	1.99	2.01	1.98	1.96	1.97	1.99	2.00	2.06	2.04	2.06	1.96	2.29	2.05	24
6	2.11	2.09	2.06	2.07	2.08	S	2.12	2.15	2.12	2.13	2.17	2.26	2.23	2.16	2.06	2.02	2.00	2.05	2.08	2.07	2.11	2.12	2.11	2.19	2.00	2.26	2.11	24
7	2.19	2.04	2.06	2.12	S	2.17	2.18	2.09	2.04	2.01	2.01	2.00	2.00	2.01	1.99	1.98	1.99	1.98	1.98	1.98	1.98	1.99	1.98	1.98	1.98	2.19	2.03	24
8	1.98	1.98	1.99	S	1.98	1.99	1.98	1.98	1.99	1.99	1.99	1.99	1.99	2.00	1.98	2.00	1.99	1.99	1.99	1.99	1.99	1.99	1.98	1.96	1.96	2.00	1.99	24
9	1.95	2.07	S	2.05	2.09	2.06	2.20	2.26	2.22	2.08	2.02	1.98	1.99	2.02	1.99	1.98	2.01	2.02	2.00	1.99	2.00	2.02	2.07	2.03	1.95	2.26	2.05	24
10	2.02	S	2.01	2.02	2.04	2.15	2.31	2.40	2.40	2.34	2.32	2.24	2.15	2.10	2.03	2.04	2.01	2.03	2.01	2.01	2.01	2.02	2.01	1.98	1.98	2.40	2.11	24
11	S	1.97	1.97	1.97	1.99	1.99	1.99	1.98	1.99	C	C	C	C	C	2.01	2.00	2.02	2.04	2.04	2.03	2.04	2.05	2.05	S	1.97	2.05	2.01	24
12	2.07	2.05	2.07	2.08	2.08	P	P	P	P	P	P	P	R	2.05	2.04	2.00	2.04	2.03	2.06	2.01	2.00	2.00	S	2.00	2.00	2.08	2.04	16
13	2.01	1.99	1.96	1.99	1.98	2.01	2.00	2.01	2.00	2.02	2.03	1.98	2.00	2.02	2.02	2.01	2.01	2.01	2.02	2.07	2.09	S	2.02	2.02	1.96	2.09	2.01	24
14	2.02	2.03	2.05	2.06	2.05	2.09	2.11	2.11	2.08	2.05	2.04	2.02	2.01	2.01	2.00	2.01	2.02	2.03	2.04	2.04	S	2.03	2.02	2.01	2.00	2.11	2.04	24
15	2.00	1.98	1.97	1.97	2.02	1.97	1.96	1.97	1.97	1.97	1.99	2.02	2.03	2.08	2.01	2.01	2.06	2.02	2.04	S	2.07	2.08	2.08	2.08	1.96	2.08	2.01	24
16	2.11	2.12	2.01	2.09	2.01	2.01	2.02	2.04	2.05	2.08	2.04	2.01	2.01	2.00	2.00	1.99	2.05	2.03	S	2.07	2.05	2.05	2.07	2.08	1.99	2.12	2.04	24
17	2.08	2.08	2.07	2.08	2.08	2.08	2.07	2.06	2.06	P	R	2.04	2.03	2.01	1.99	1.99	2.03	S	2.03	2.03	2.03	2.03	2.03	2.04	1.99	2.08	2.04	22
18	2.06	2.06	2.05	2.04	2.03	1.99	1.97	1.99	2.02	2.01	1.99	1.98	1.97	1.99	2.01	1.99	S	2.03	2.00	1.98	1.98	1.97	1.98	1.98	1.97	2.06	2.00	24
19	1.98	1.99	1.99	2.00	1.99	2.00	2.00	2.03	2.02	2.01	2.00	2.01	2.00	2.00	2.00	S	2.00	2.01	2.04	2.04	2.03	2.05	2.06	2.16	1.98	2.16	2.02	24
20	2.23	2.17	2.16	2.15	2.07	2.06	2.08	2.09	2.10	2.10	2.09	2.08	2.05	2.04	S	1.98	1.98	2.00	2.05	1.99	1.99	1.99	1.98	1.98	1.98	2.23	2.06	24
21	1.99	2.00	2.01	2.00	2.00	2.00	1.99	1.99	1.98	1.97	1.97	1.98	1.99	S	1.98	2.02	2.06	2.02	1.99	1.99	2.00	2.05	2.00	2.04	1.97	2.06	2.00	24
22	2.06	1.99	2.06	2.08	2.06	2.08	2.10	2.06	2.07	2.08	2.04	2.03	S	2.03	2.04	2.03	2.04	2.05	2.06	2.08	2.11	2.11	2.12	2.15	1.99	2.15	2.07	24
23	2.18	2.20	2.22	2.28	2.35	2.36	2.33	2.34	2.34	2.30	2.28	S	2.27	2.20	2.14	2.13	2.24	2.27	2.22	2.17	2.17	2.25	2.26	2.25	2.13	2.36	2.25	24
24	2.20	2.26	2.32	2.35	2.37	2.44	2.37	2.35	2.38	2.43	S	2.37	2.34	**2.46**	2.31	2.29	2.37	2.32	2.28	2.21	2.18	2.14	2.17	2.28	2.14	**2.46**	**2.31**	24
25	2.23	2.26	2.27	2.32	2.32	2.45	2.27	2.32	2.28	S	2.22	2.17	2.14	2.11	2.10	2.04	2.26	2.07	2.10	2.12	2.11	2.09	2.02	2.01	2.01	2.45	2.19	24
26	2.04	2.05	2.09	2.05	2.12	2.01	2.01	2.01	S	2.00	1.99	2.00	2.00	2.00	1.99	2.00	2.03	2.00	2.00	2.00	2.01	2.00	2.02	2.04	1.99	2.12	2.02	24
27	2.05	2.04	2.02	2.02	2.01	2.00	2.01	S	2.06	2.05	2.02	2.00	1.99	2.01	2.02	2.02	2.00	1.99	1.98	1.98	2.01	2.03	1.99	1.98	1.98	2.06	2.01	24
28	1.98	1.99	2.01	2.01	2.02	2.03	S	2.06	2.06	2.05	2.03	2.02	2.09	2.31	2.15	2.19	2.24	2.27	2.25	2.17	2.16	2.16	2.18	2.16	1.98	2.31	2.11	24
29	2.20	2.18	2.12	2.15	2.12	S	2.03	2.02	2.04	2.07	2.09	2.09	2.05	2.09	2.13	2.05	2.08	2.09	2.12	2.07	2.05	2.11	2.08	2.06	2.02	2.20	2.09	24
30	2.13	2.07	2.04	2.10	S	2.09	2.09	2.12	2.13	2.11	2.12	2.10	2.06	2.02	1.99	2.00	2.02	2.03	2.02	2.03	2.05	2.06	2.06	2.06	1.99	2.13	2.07	24
31	2.06	2.06	2.05	S	2.07	2.08	2.09	2.10	2.11	2.11	2.10	2.09	2.07	2.09	2.09	2.06	2.06	2.10	2.14	2.12	2.12	2.13	2.13	2.09	2.05	2.14	2.09	24
HOURLY MAX	2.23	2.28	2.32	2.42	2.45	2.45	2.44	2.42	2.41	2.43	2.35	2.37	2.34	2.46	2.31	2.29	2.37	2.32	2.28	2.21	2.18	2.25	2.26	2.28				
HOURLY AVG	2.07	2.07	2.07	2.09	2.09	2.10	2.10	2.11	2.12	2.11	2.08	2.07	2.06	2.07	2.04	2.03	2.05	2.04	2.05	2.04	2.04	2.05	2.05	2.06				

STATUS FLAG CODES

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

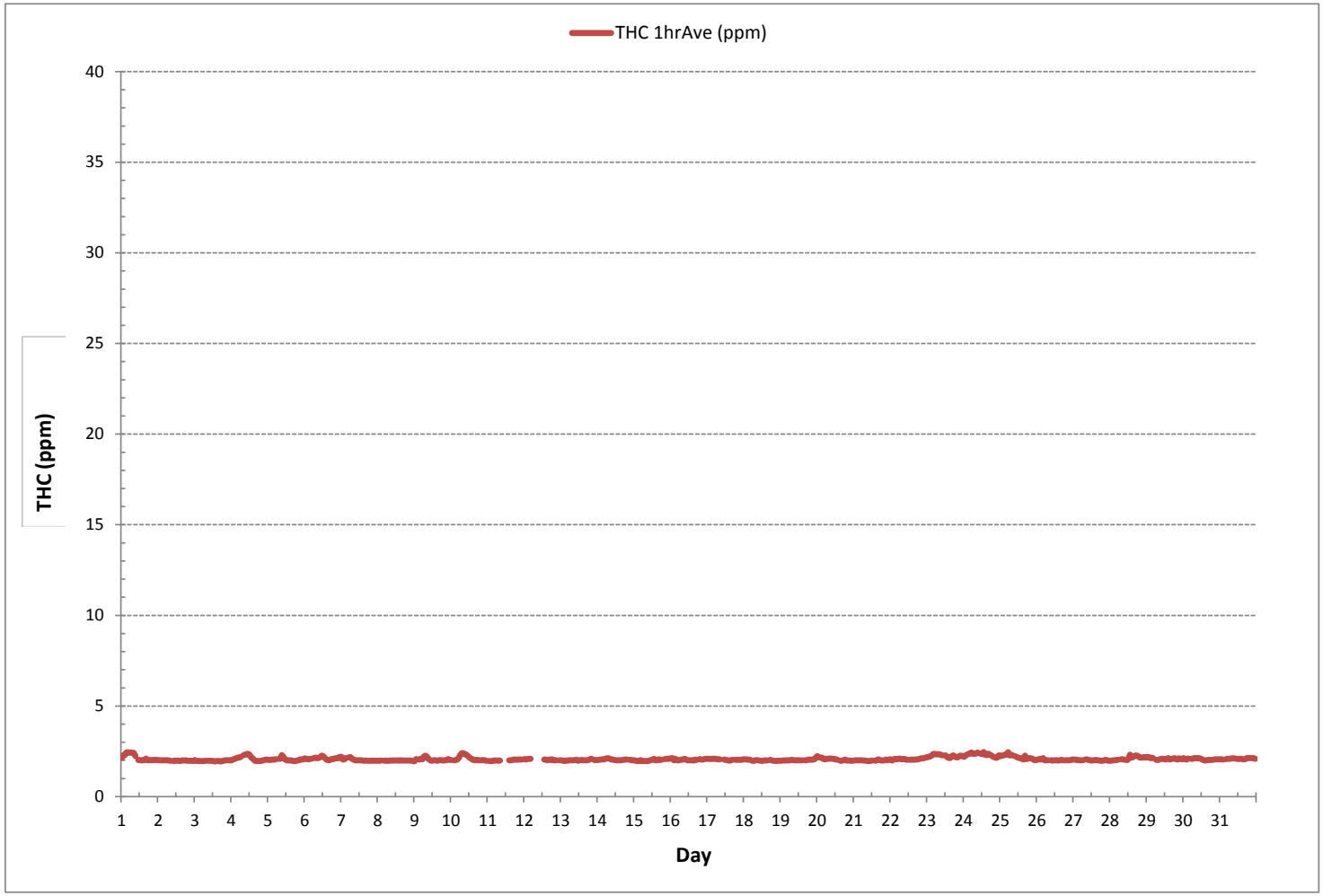
24 HR AVERAGES October 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			697				
MINIMUM 1-HR AVERAGE		1.94	ppm	@ HOUR	13	ON DAY	3
MAXIMUM 1-HR AVERAGE:		2.85	ppm	@ HOUR	13	ON DAY	24
MAXIMUM 24-HR AVERAGE:		2.31	ppm			ON DAY	24
IZS CALIBRATION TIME:	32	hrs		OPERATIONAL TIME:		734	hrs
MONTHLY CALIBRATION TIME:	5	hrs		AMD OPERATION UPTIME:		98.7	%
STANDARD DEVIATION:	0.10			MONTHLY AVERAGE:		2.07	ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



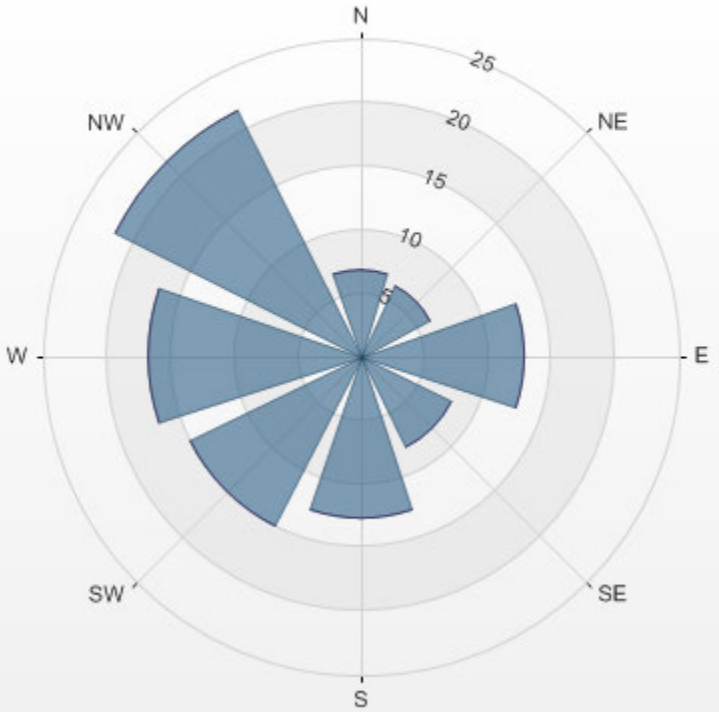
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-THC[ppm]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppm]

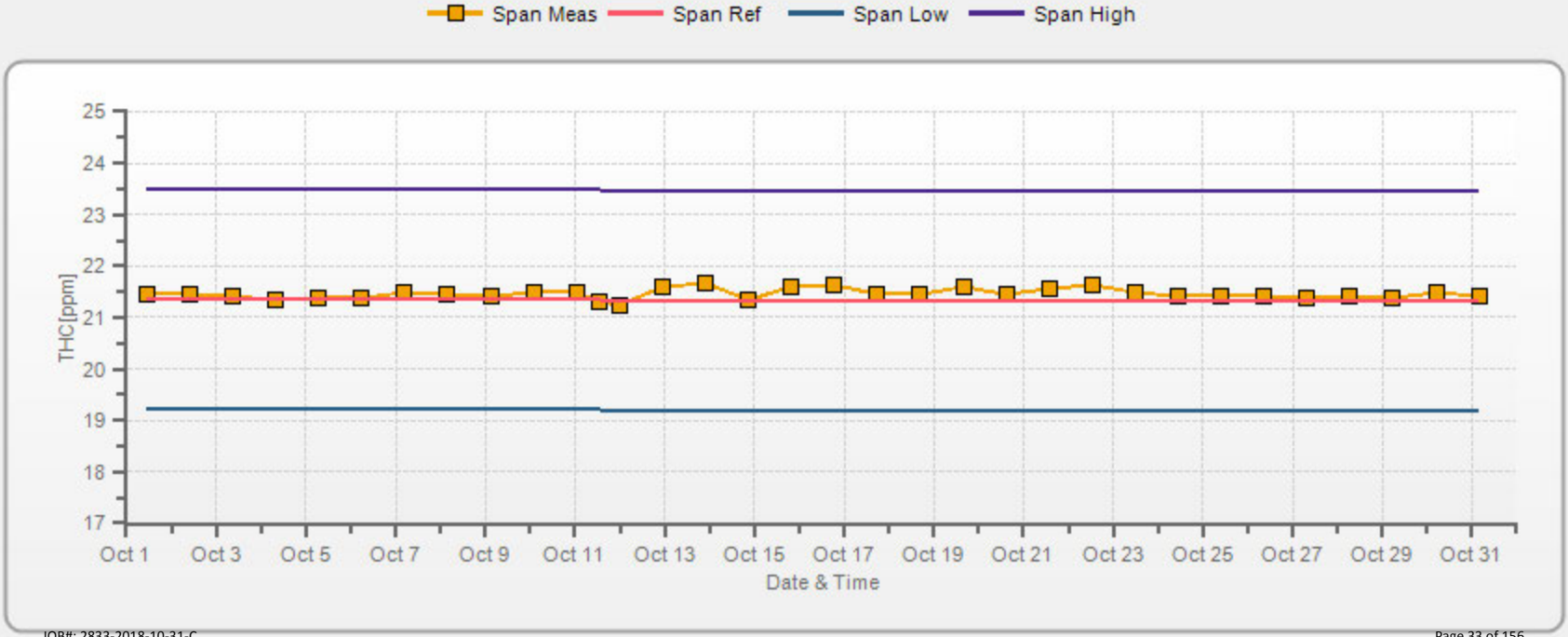
Direction	0.0-0.8	0.8-1.6	1.6-2.5	>2.5	Total
N	0.0	0.0	6.8	0.0	6.8
NE	0.0	0.0	6.2	0.0	6.2
E	0.0	0.0	13.0	0.0	13.0
SE	0.0	0.0	8.1	0.0	8.1
S	0.0	0.0	12.7	0.0	12.7
SW	0.0	0.0	15.0	0.0	15.0
W	0.0	0.0	16.7	0.0	16.7
NW	0.0	0.0	21.6	0.0	21.6
Summary	0.0	0.0	100.0	0.0	100.0

% Icon Classes (ppm)	0 0.0-0.8	0 0.8-1.6	100 1.6-2.5	0 >2.5

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



THC[ppm] Calibration: LICA ST. LINA Monthly: 18/10 Type: Span



METHANE

Maxxam
A Bureau Veritas Group Company

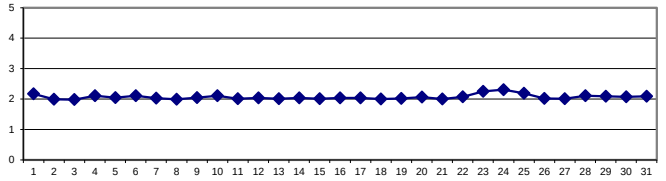
METHANE Hourly Averages (CH_4 ppm)

HR START (MST) / HR END (MST)	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
DAY																												
1	2.14	2.28	2.29	2.42	2.45	2.42	2.44	2.42	2.41	2.23	S	2.02	2.02	2.01	2.01	2.02	2.10	2.01	2.02	2.01	2.02	2.02	2.03	2.02	2.01	2.45	2.17	24
2	2.02	2.01	2.01	2.01	2.00	2.00	2.00	1.99	1.98	S	1.97	1.99	1.98	1.99	1.97	1.98	2.00	1.99	2.01	1.98	1.98	1.98	1.98	1.97	1.97	2.02	1.99	24
3	2.02	1.98	1.97	1.97	1.97	1.97	1.97	1.98	S	1.98	1.98	1.98	1.96	**1.94**	1.96	1.97	1.96	1.94	1.96	1.99	2.00	2.00	2.01	2.01	**1.94**	2.02	1.98	24
4	2.00	2.04	2.09	2.11	2.16	2.16	2.20	S	2.29	2.31	2.35	2.35	2.29	2.16	2.10	1.99	1.96	1.96	1.96	1.98	1.98	2.00	2.03	2.04	1.96	2.35	2.11	24
5	2.03	2.02	2.03	2.05	2.05	2.06	S	2.08	2.08	2.29	2.21	2.06	2.00	2.01	1.99	2.01	1.98	1.96	1.97	1.99	2.00	2.06	2.04	2.06	1.96	2.29	2.05	24
6	2.11	2.09	2.06	2.07	2.08	S	2.12	2.15	2.12	2.13	2.17	2.26	2.23	2.16	2.06	2.02	2.00	2.05	2.08	2.07	2.11	2.12	2.11	2.19	2.00	2.26	2.11	24
7	2.19	2.04	2.06	2.12	S	2.17	2.18	2.09	2.04	2.01	2.01	2.00	2.00	2.01	1.99	1.98	1.99	1.98	1.98	1.98	1.98	1.99	1.98	1.97	1.97	2.19	2.03	24
8	1.98	1.98	1.99	S	1.98	1.99	1.98	1.98	1.99	1.99	1.99	1.99	1.99	2.00	1.98	2.00	1.99	1.99	1.99	1.99	1.99	1.99	1.98	1.96	1.96	2.00	1.99	24
9	1.95	2.07	S	2.05	2.09	2.06	2.20	2.26	2.22	2.08	2.02	1.98	1.99	2.02	1.99	1.98	2.01	2.02	2.00	1.99	2.00	2.02	2.07	2.03	1.95	2.26	2.05	24
10	2.02	S	2.01	2.02	2.04	2.15	2.31	2.40	2.40	2.34	2.32	2.24	2.15	2.10	2.03	2.04	2.01	2.03	2.01	2.01	2.01	2.02	2.01	1.98	1.98	2.40	2.11	24
11	S	1.97	1.97	1.97	1.99	1.99	1.99	1.98	1.99	C	C	C	C	C	2.01	2.00	2.02	2.04	2.04	2.03	2.04	2.05	2.05	S	1.97	2.05	2.01	24
12	2.07	2.05	2.07	2.07	2.08	P	P	P	P	P	P	P	R	2.05	2.04	2.00	2.04	2.03	2.06	2.01	2.00	2.00	S	2.00	2.00	2.08	2.04	16
13	2.01	1.99	1.96	1.99	1.98	2.01	2.00	2.01	2.00	2.02	2.03	1.98	2.00	2.02	2.02	2.01	2.01	2.01	2.02	2.07	2.09	S	2.02	2.02	1.96	2.09	2.01	24
14	2.02	2.03	2.05	2.06	2.05	2.09	2.11	2.11	2.08	2.05	2.04	2.02	2.01	2.01	2.00	2.01	2.02	2.03	2.04	2.04	S	2.03	2.02	2.01	2.00	2.11	2.04	24
15	2.00	1.98	1.97	1.97	2.02	1.97	1.96	1.97	1.97	1.97	1.99	2.02	2.03	2.08	2.01	2.01	2.06	2.02	2.04	S	2.07	2.08	2.08	2.08	1.96	2.08	2.01	24
16	2.11	2.12	2.01	2.09	2.01	2.01	2.02	2.04	2.05	2.08	2.04	2.01	2.01	2.00	2.00	1.99	2.05	2.03	S	2.07	2.05	2.05	2.07	2.08	1.99	2.12	2.04	24
17	2.08	2.08	2.07	2.08	2.08	2.08	2.07	2.06	2.06	P	R	2.04	2.03	2.01	1.99	1.99	2.03	S	2.03	2.03	2.03	2.03	2.03	2.04	1.99	2.08	2.04	22
18	2.06	2.06	2.05	2.04	2.03	1.99	1.97	1.99	2.02	2.01	1.99	1.98	1.97	1.98	2.01	1.99	S	2.03	2.00	1.98	1.98	1.97	1.98	1.98	1.97	2.06	2.00	24
19	1.98	1.99	1.99	2.00	1.99	2.00	2.00	2.03	2.02	2.01	2.00	2.01	2.00	2.00	2.00	S	2.00	2.01	2.04	2.04	2.03	2.05	2.06	2.16	1.98	2.16	2.02	24
20	2.23	2.17	2.16	2.15	2.07	2.06	2.08	2.09	2.10	2.10	2.09	2.08	2.05	2.04	S	1.98	1.98	2.00	2.05	1.99	1.99	1.99	1.98	1.98	1.98	2.23	2.06	24
21	1.99	2.00	2.01	2.00	2.00	1.99	1.99	1.99	1.98	1.97	1.97	1.98	1.99	S	1.98	2.01	2.06	2.02	1.99	1.99	2.00	2.05	2.00	2.04	1.97	2.06	2.00	24
22	2.06	1.99	2.06	2.08	2.06	2.08	2.10	2.06	2.07	2.07	2.04	2.03	S	2.03	2.04	2.03	2.04	2.05	2.06	2.08	2.11	2.11	2.12	2.15	1.99	2.15	2.07	24
23	2.18	2.20	2.22	2.28	2.35	2.36	2.33	2.34	2.34	2.30	2.28	S	2.27	2.20	2.14	2.13	2.24	2.27	2.21	2.17	2.17	2.25	2.26	2.25	2.13	2.36	2.25	24
24	2.20	2.26	2.32	2.35	2.37	2.44	2.37	2.35	2.38	2.43	S	2.37	2.34	**2.46**	2.31	2.29	2.37	2.32	2.28	2.21	2.18	2.13	2.17	2.28	2.13	**2.46**	**2.31**	24
25	2.23	2.26	2.27	2.32	2.32	2.45	2.27	2.32	2.28	S	2.22	2.17	2.14	2.11	2.10	2.04	2.26	2.07	2.10	2.12	2.11	2.09	2.02	2.01	2.01	2.45	2.19	24
26	2.04	2.05	2.09	2.05	2.12	2.01	2.01	2.01	S	2.00	1.99	2.00	2.00	2.00	1.99	2.00	2.03	2.00	2.00	2.00	2.01	2.00	2.02	2.04	1.99	2.12	2.02	24
27	2.05	2.04	2.02	2.02	2.01	2.00	2.01	S	2.06	2.05	2.02	2.00	1.99	2.01	2.02	2.02	2.00	1.99	1.98	1.98	2.01	2.03	1.99	1.98	1.98	2.06	2.01	24
28	1.98	1.99	2.01	2.01	2.02	2.03	S	2.06	2.06	2.05	2.03	2.02	2.09	2.31	2.15	2.19	2.24	2.27	2.25	2.17	2.16	2.16	2.18	2.16	1.98	2.31	2.11	24
29	2.20	2.18	2.12	2.15	2.12	S	2.03	2.02	2.04	2.07	2.09	2.09	2.05	2.09	2.13	2.05	2.07	2.09	2.12	2.07	2.05	2.11	2.08	2.06	2.02	2.20	2.09	24
30	2.13	2.07	2.04	2.10	S	2.09	2.09	2.12	2.13	2.11	2.12	2.10	2.06	2.02	1.99	2.00	2.02	2.03	2.02	2.03	2.05	2.06	2.06	2.06	1.99	2.13	2.07	24
31	2.06	2.06	2.05	S	2.07	2.08	2.09	2.10	2.11	2.11	2.10	2.09	2.07	2.09	2.09	2.06	2.06	2.10	2.14	2.12	2.12	2.13	2.13	2.09	2.05	2.14	2.09	24
HOURLY MAX	2.23	2.28	2.32	2.42	2.45	2.45	2.44	2.42	2.41	2.43	2.35	2.37	2.34	2.46	2.31	2.29	2.37	2.32	2.28	2.21	2.18	2.25	2.26	2.28				
HOURLY AVG	2.07	2.07	2.07	2.09	2.09	2.10	2.10	2.11	2.12	2.11	2.08	2.07	2.06	2.07	2.04	2.03	2.05	2.04	2.05	2.04	2.04	2.05	2.05	2.06				

STATUS FLAG CODES

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

24 HR AVERAGES October 2018

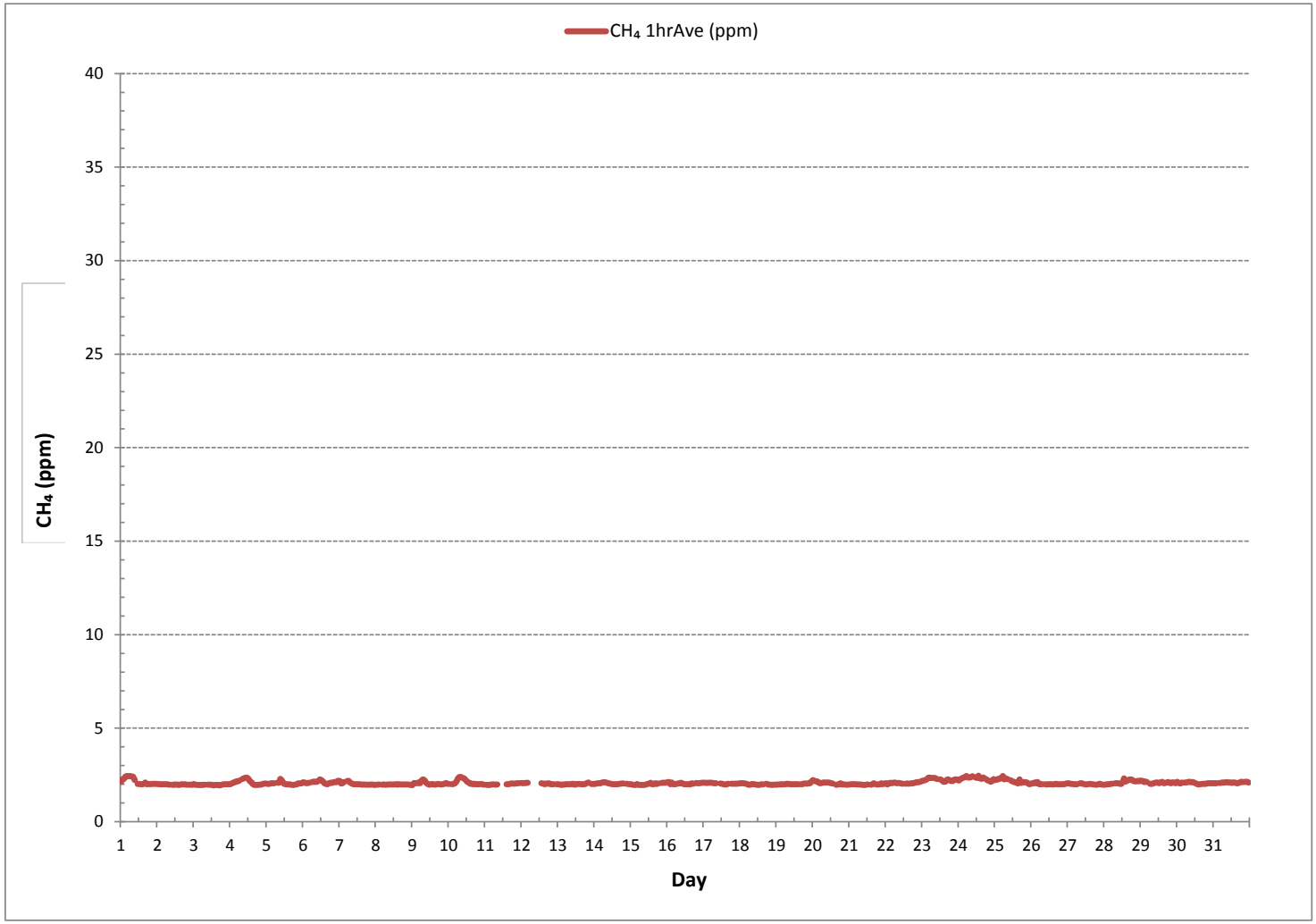


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:		697				
MINIMUM 1-HR AVERAGE	1.94	ppm	@ HOUR	13	ON DAY	3
MAXIMUM 1-HR AVERAGE:	2.79	ppm	@ HOUR	13	ON DAY	24
MAXIMUM 24-HR AVERAGE:	2.31	ppm			ON DAY	24

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	734	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	98.7	%
STANDARD DEVIATION:	0.10		MONTHLY AVERAGE:	2.07	ppm

METHANE Hourly Averages (CH_4 ppm)



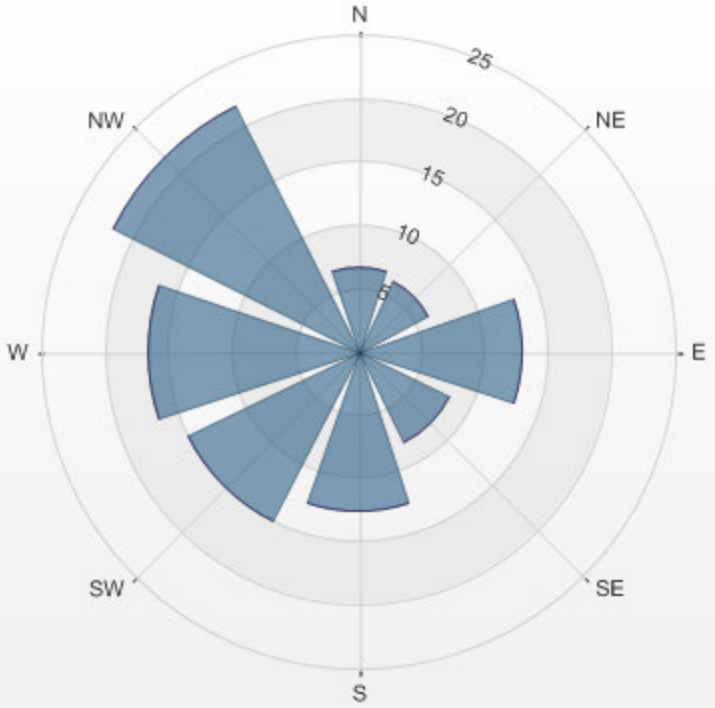
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-CH4[ppm]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppm]

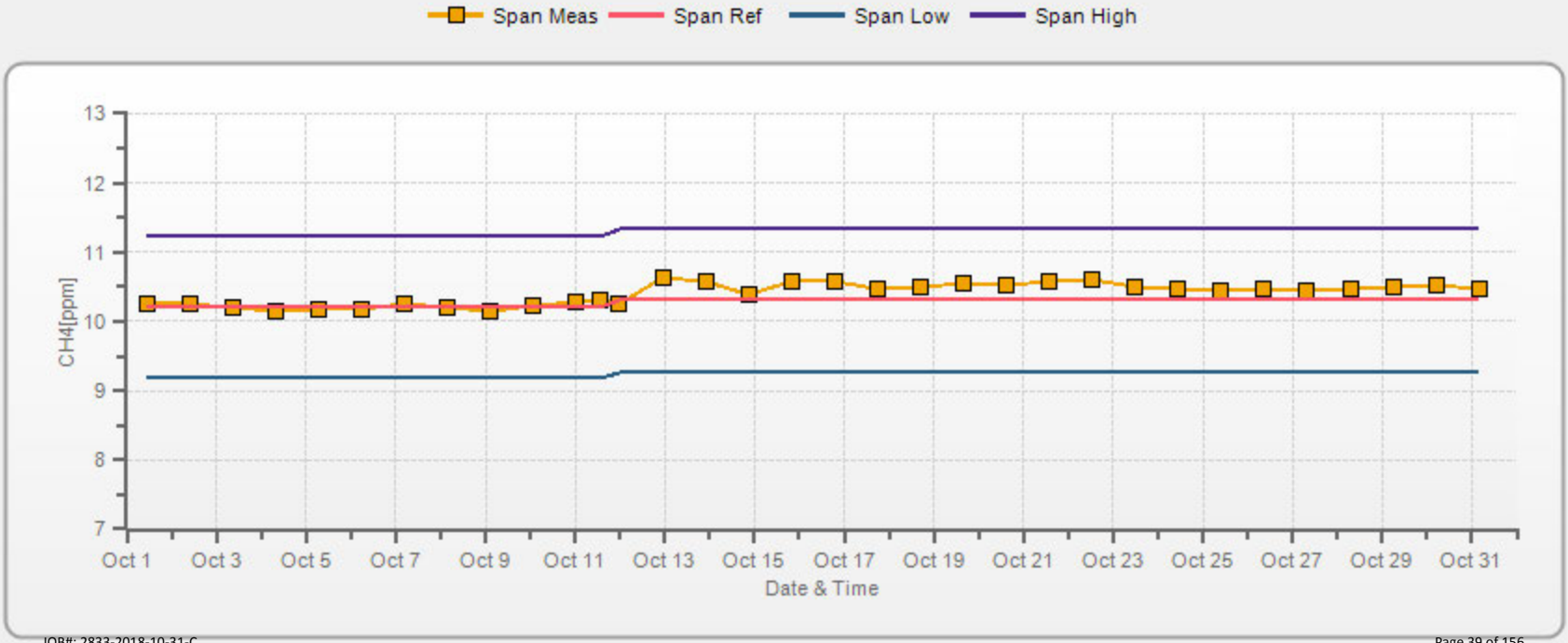
Direction	0.0-0.8	0.8-1.6	1.6-2.5	>2.5	Total
N	0.0	0.0	6.8	0.0	6.8
NE	0.0	0.0	6.2	0.0	6.2
E	0.0	0.0	13.0	0.0	13.0
SE	0.0	0.0	8.1	0.0	8.1
S	0.0	0.0	12.7	0.0	12.7
SW	0.0	0.0	15.0	0.0	15.0
W	0.0	0.0	16.7	0.0	16.7
NW	0.0	0.0	21.6	0.0	21.6
Summary	0.0	0.0	100.0	0.0	100.0

% Icon	Classes (ppm)							
	0	0.0-0.8	0	0.8-1.6	100	1.6-2.5	0	>2.5

LICA ST. LINA Poll.: LICA ST. LINA-CH4[ppm] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



CH4[ppm] Calibration: LICA ST. LINA Monthly: 18/10 Type: Span



NON-METHANE HYDROCARBON

Maxxam
A Bureau Veritas Group Company

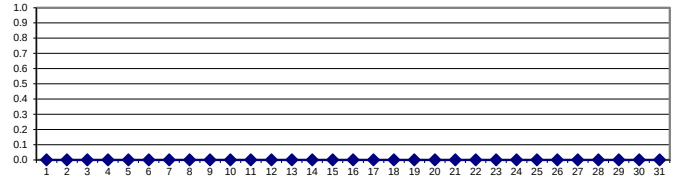
NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)

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	**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	**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	**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	**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	0.00	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	**C**	**C**	**C**	**C**	**C**	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
12	0.00	0.00	0.00	0.00	0.00	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**R**	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	16
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
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	**S**	0.00	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	**P**	**R**	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	22
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	**S**	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	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	**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
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	0.00	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	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	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
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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

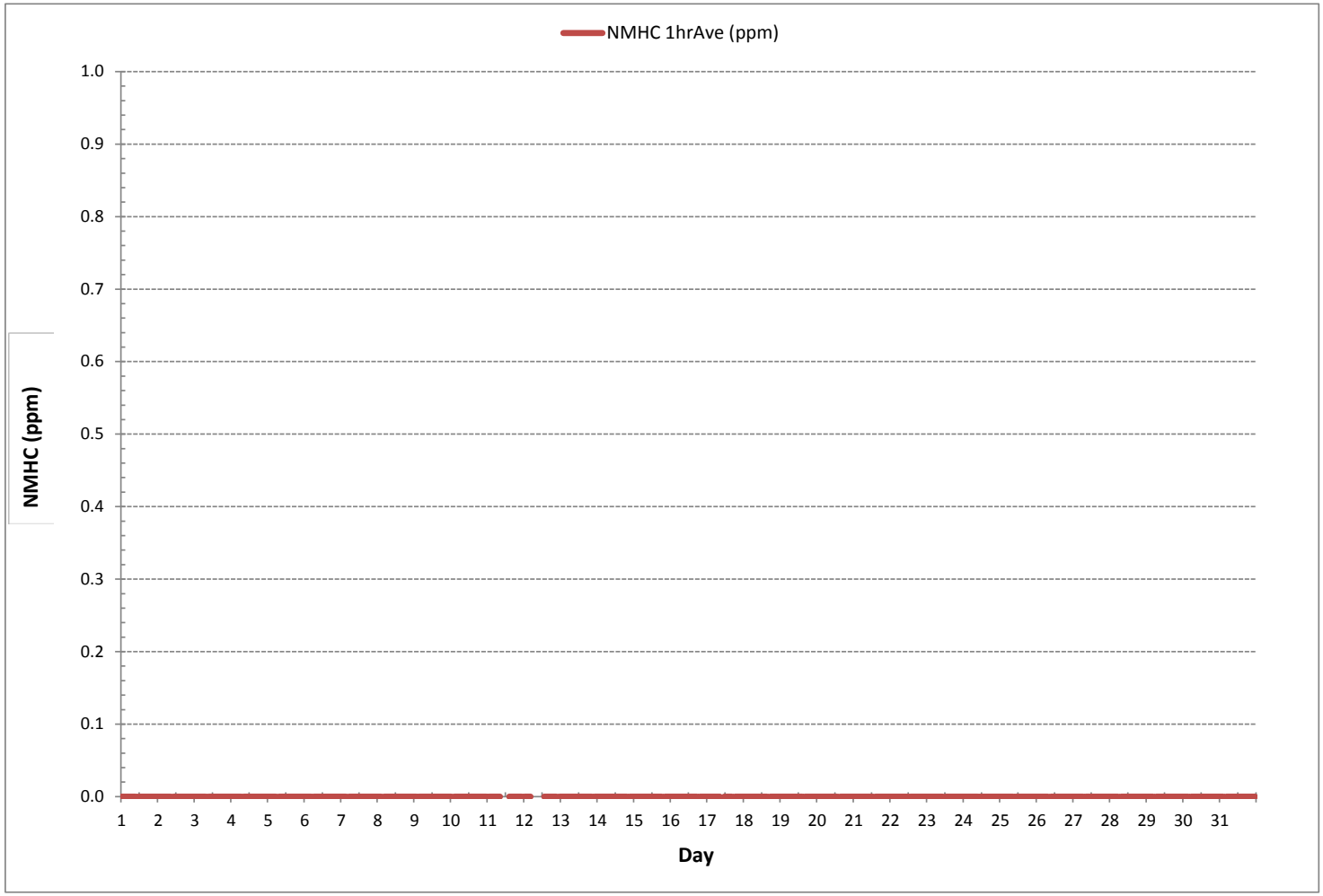
24 HR AVERAGES October 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			0				
MINIMUM 1-HR AVERAGE	0.00	ppm	@ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	0.06	ppm	@ HOUR	0	ON DAY	1	
MAXIMUM 24-HR AVERAGE:	0.00	ppm			ON DAY	1	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:			734	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:			98.7	%
STANDARD DEVIATION:	0.00		MONTHLY AVERAGE:			0.00	ppm

NON-METHANE HYDROCARBONS Hourly Averages (NMHC ppm)



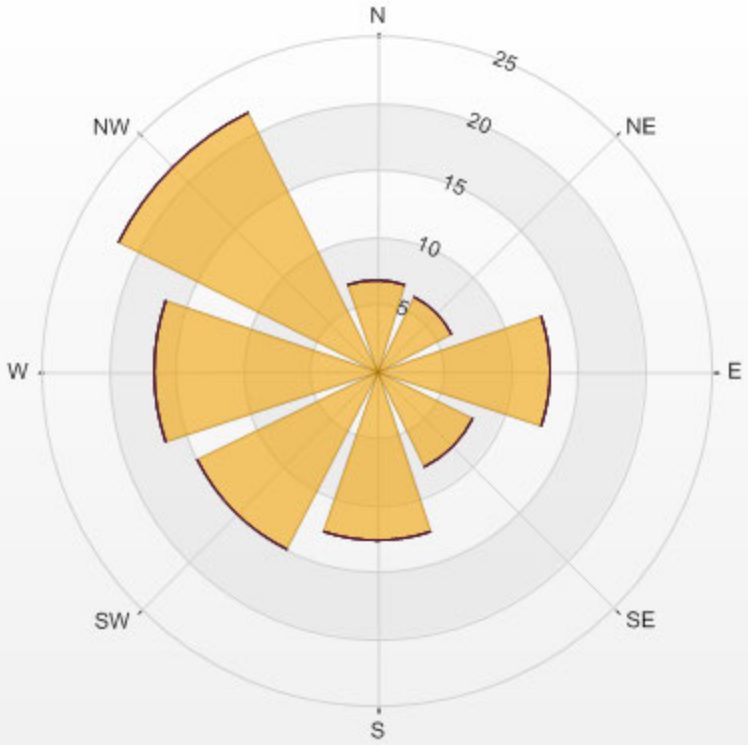
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-NMHC[ppm]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppm]

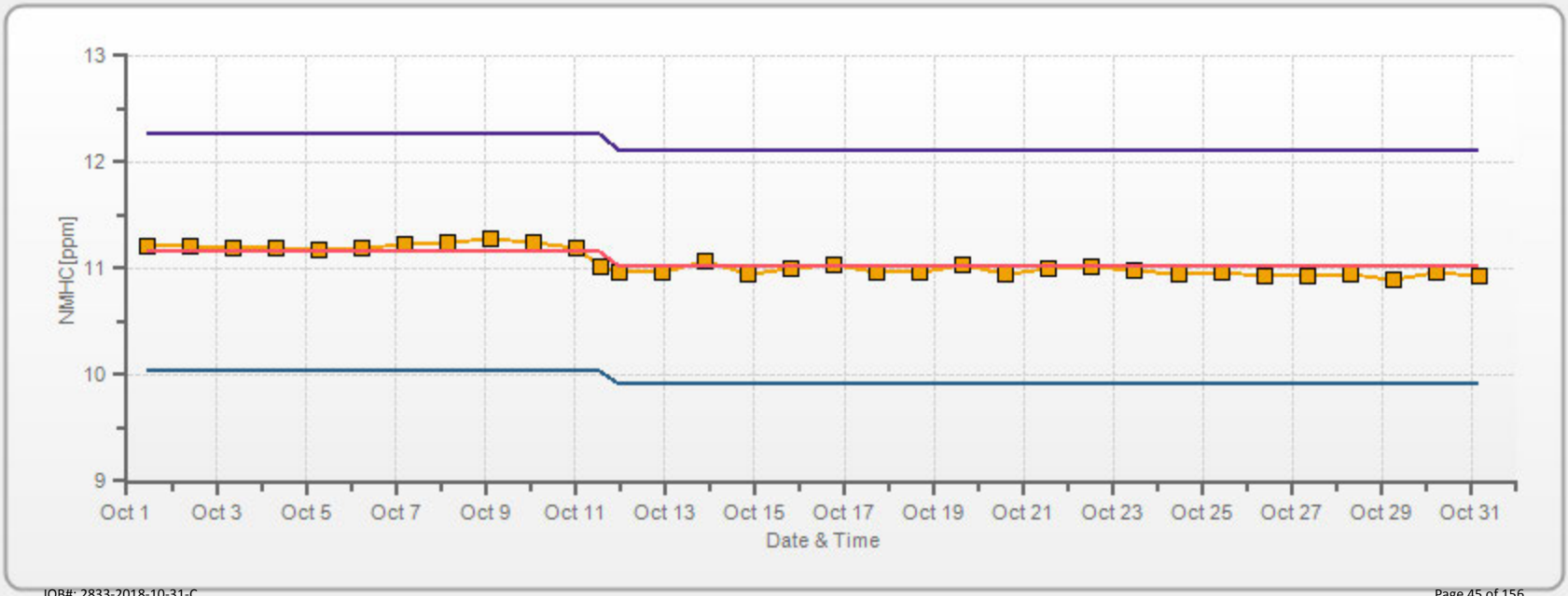
Direction	0-0.074	0.074-0.148	0.148-0.222	0.222-0.296	0.296-0.37	>0.4	Total
N	6.8	0.0	0.0	0.0	0.0	0.0	6.8
NE	6.2	0.0	0.0	0.0	0.0	0.0	6.2
E	13.0	0.0	0.0	0.0	0.0	0.0	13.0
SE	8.1	0.0	0.0	0.0	0.0	0.0	8.1
S	12.7	0.0	0.0	0.0	0.0	0.0	12.7
SW	15.0	0.0	0.0	0.0	0.0	0.0	15.0
W	16.7	0.0	0.0	0.0	0.0	0.0	16.7
NW	21.6	0.0	0.0	0.0	0.0	0.0	21.6
Summary	100.0	0.0	0.0	0.0	0.0	0.0	100.0

% Icon Classes (ppm)	100	0-0.074	0	0.074-0.148	0	0.148-0.222	0	0.222-0.296	0	0.296-0.37	0	>0.4

LICA ST. LINA Poll.: LICA ST. LINA-NMHC[ppm] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



NMHC[ppm] Calibration: LICA ST. LINA Monthly: 18/10 Type: Span



OXIDES OF NITROGEN

Maxxam
A Bureau Veritas Group Company

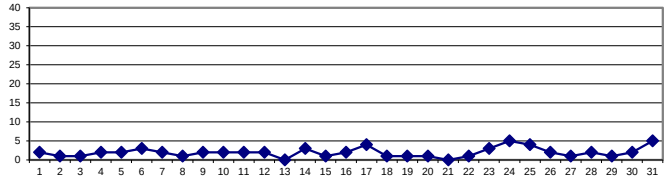
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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

24 HR AVERAGES October 2018

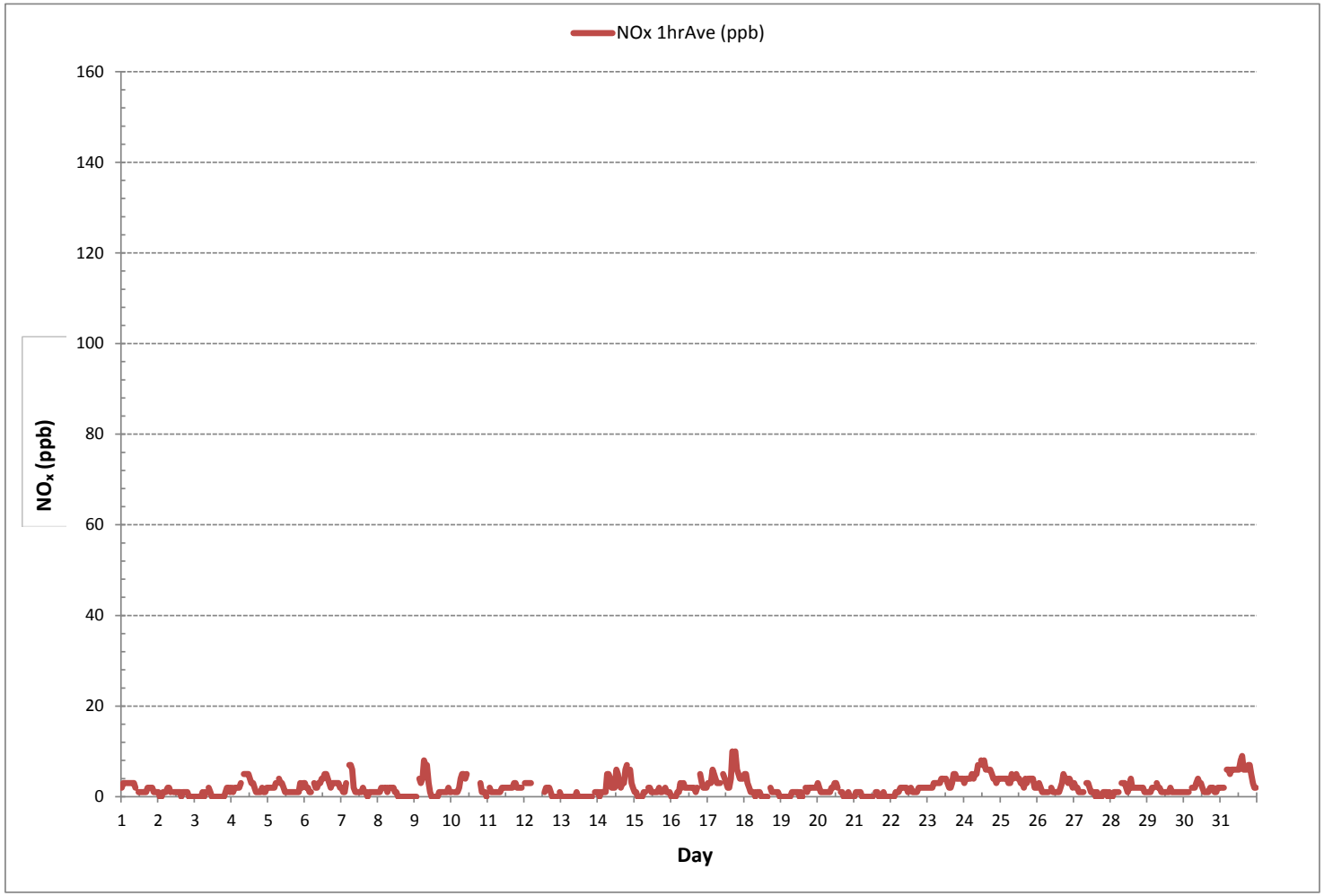


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:		571				
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	1	ON DAY	2
MAXIMUM 1-HR AVERAGE:	10	ppb	@ HOUR	16	ON DAY	17
MAXIMUM 24-HR AVERAGE:	5	ppb			ON DAY	24

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	734	hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	98.7	%
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	2	ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



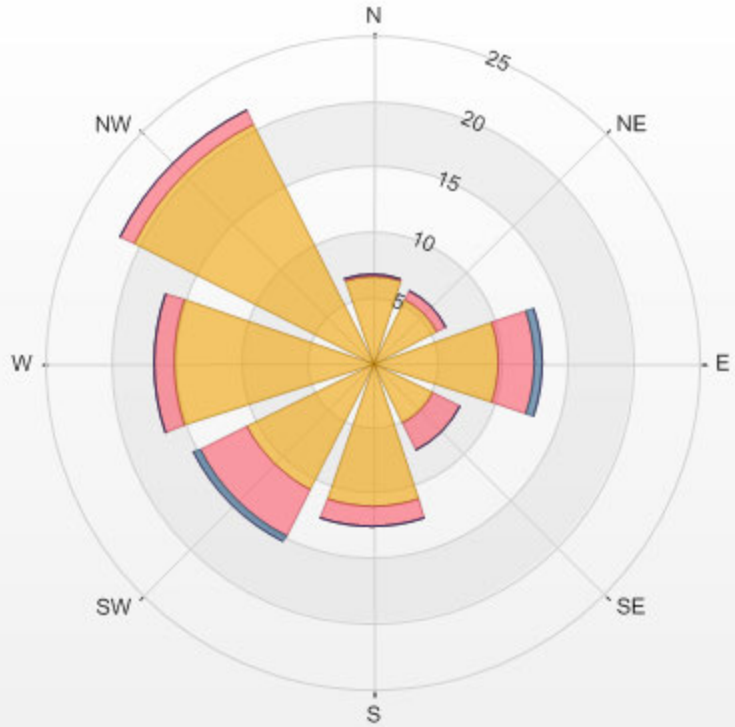
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-NOX[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppb]

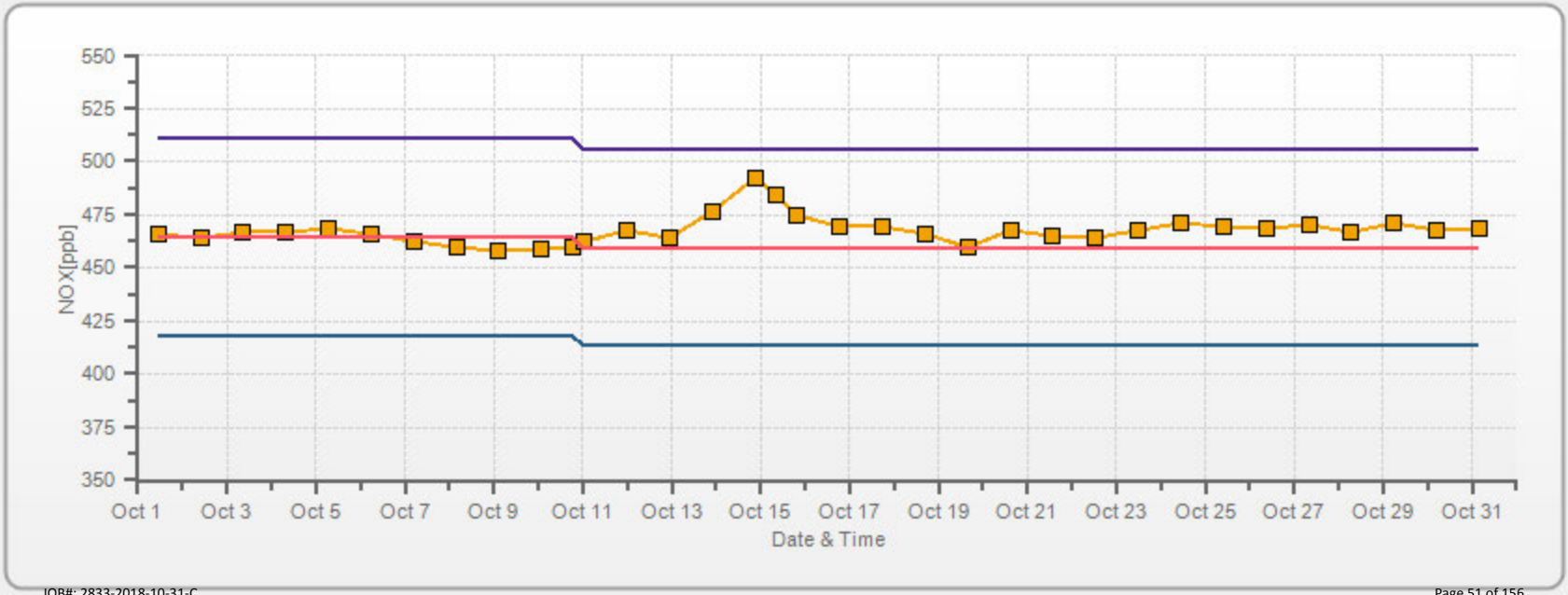
Direction	0.0-3.7	3.7-7.3	7.3-11.0	>11.0	Total
N	6.7	0.1	0.0	0.0	6.8
NE	5.5	0.7	0.0	0.0	6.2
E	9.7	2.8	0.6	0.0	13.0
SE	5.2	2.3	0.0	0.0	7.5
S	11.0	1.6	0.0	0.0	12.6
SW	10.9	3.9	0.6	0.0	15.3
W	15.2	1.6	0.0	0.0	16.8
NW	20.4	1.3	0.0	0.0	21.7
Summary	84.5	14.3	1.2	0.0	100.0

%	Icon	Classes (ppb)	85	0.0-3.7	14	3.7-7.3	1	7.3-11.0	0	>11.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



NOX[ppb] Calibration: LICA ST. LINA Monthly: 18/10 Type: Span



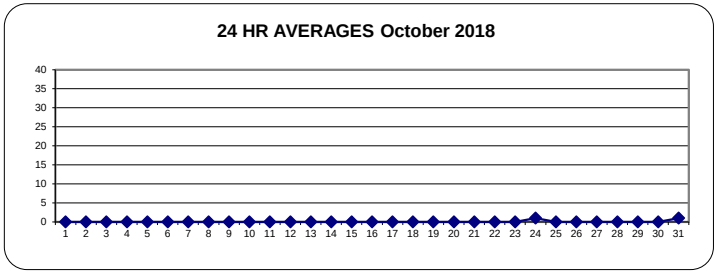
NITRIC OXIDE

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	1	**S**	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	**S**	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	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**	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
5	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	1	0	24
6	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	1	0	24
7	0	0	0	0	**S**	0	0	1	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	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
9	0	0	**S**	0	0	0	0	1	**2**	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	24
10	0	**S**	0	0	0	0	0	0	1	1	1	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	0	0	0	0	0	0	1	0	24
11	**S**	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	**S**	0	1	0	24
12	0	0	0	0	0	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**R**	0	0	0	0	0	0	0	0	0	**S**	0	0	0	0	16
13	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
14	0	0	0	0	0	0	0	0	1	1	1	1	2	2	1	1	0	0	0	0	**S**	0	0	0	0	2	0	24
15	0	0	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	23
16	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	**S**	1	0	0	0	0	0	1	0	24
17	0	0	0	0	0	0	0	0	0	**P**	2	1	0	0	0	0	1	**S**	0	0	0	0	0	0	0	2	0	23
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	0	0	0	0	24
20	0	0	0	0	0	0	0	0	0	0	1	1	1	0	**S**	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	**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	1	1	0	**S**	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
23	0	0	0	0	0	0	0	0	1	1	1	**S**	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	1	2	**S**	2	2	2	1	1	0	0	0	0	0	0	0	0	0	2	**1**	24
25	0	0	0	0	0	0	0	1	1	**S**	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	24
26	0	0	0	0	0	0	0	0	**S**	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	24
27	0	0	0	0	0	0	0	**S**	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	24
28	0	0	0	0	0	0	**S**	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
29	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
30	0	0	0	0	**S**	0	0	0	1	2	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	2	0	24
31	0	0	0	**S**	0	0	0	2	1	1	2	2	1	2	2	1	0	0	0	0	0	0	0	0	0	2	1	24
HOURLY MAX	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	1	1	1	1	1	0	1	0	0				
HOURLY AVG	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0				

STATUS FLAG CODES

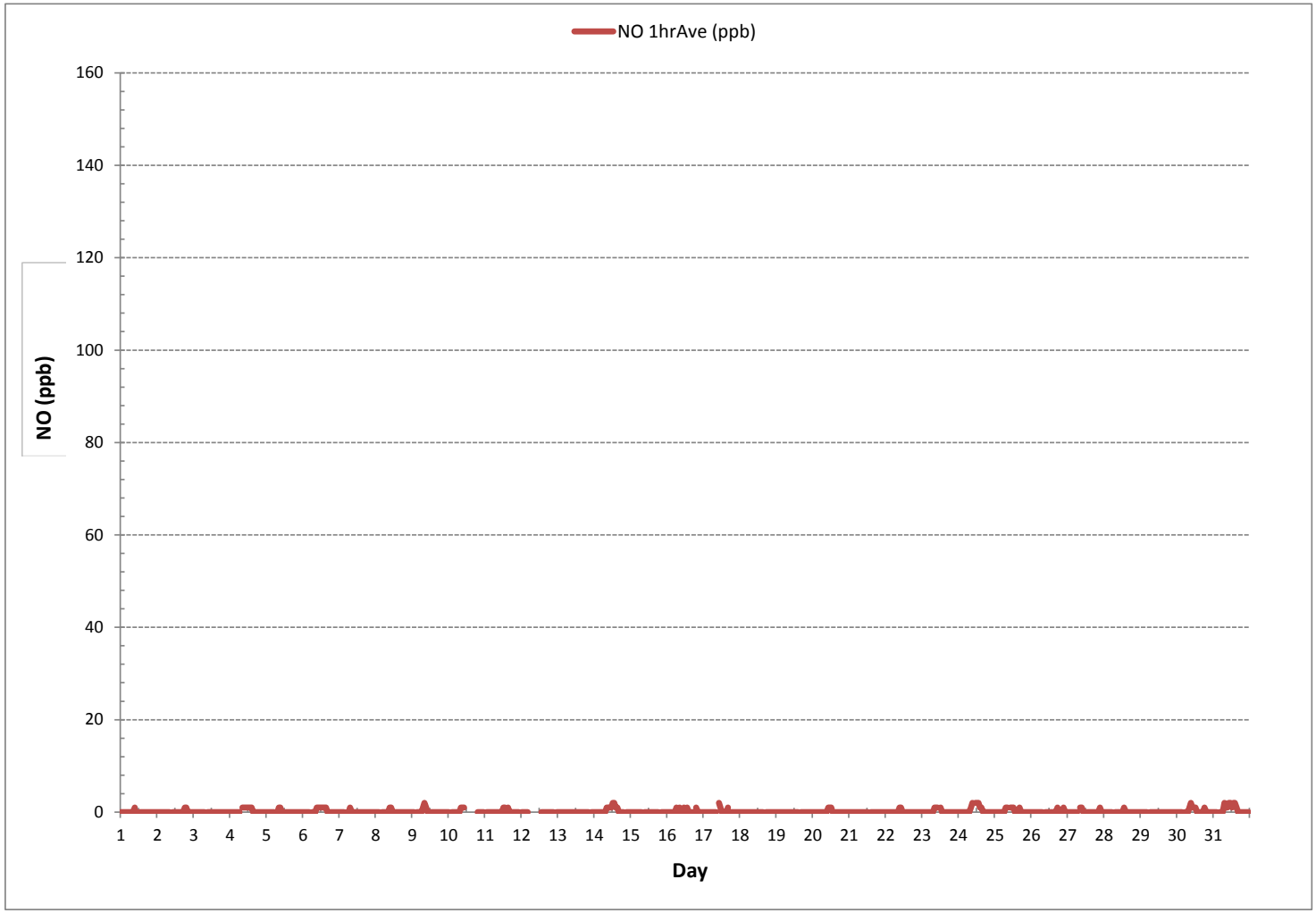
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:			90				
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	2	ppb	@ HOUR	8	ON DAY	9	
MAXIMUM 24-HR AVERAGE:	1	ppb			ON DAY	24	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:			734	hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:			98.7	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:			0	ppb

NITRIC OXIDE Hourly Averages (NO ppb)



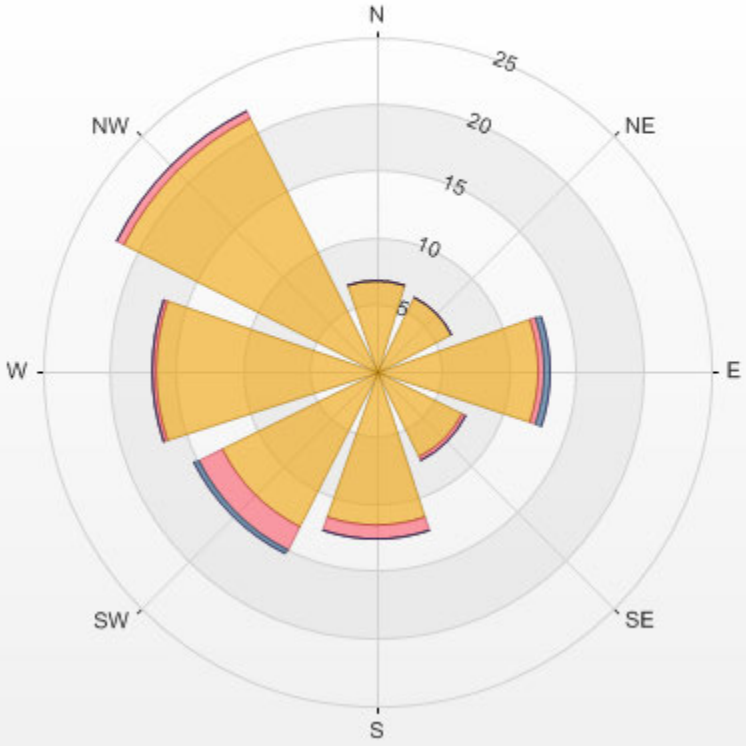
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-NO[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppb]

Direction	0.0-1.0	1.0-2.0	2.0-3.0	>3.0	Total
N	6.8	0.0	0.0	0.0	6.8
NE	6.2	0.0	0.0	0.0	6.2
E	12.2	0.4	0.4	0.0	13.0
SE	7.2	0.3	0.0	0.0	7.5
S	11.6	1.0	0.0	0.0	12.6
SW	13.0	1.9	0.4	0.0	15.3
W	16.5	0.3	0.0	0.0	16.8
NW	21.1	0.6	0.0	0.0	21.7
Summary	94.7	4.5	0.9	0.0	100.0

% Icon Classes (ppb)	95 0.0-1.0	4 1.0-2.0	1 2.0-3.0	0 >3.0

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



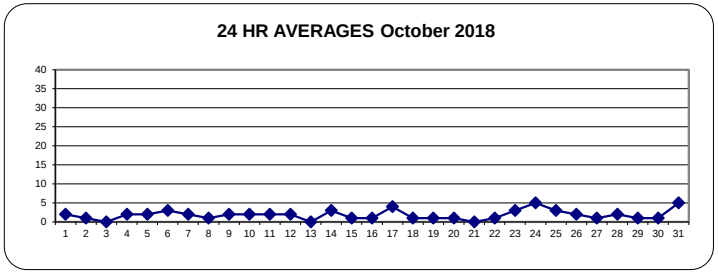
NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO_2 ppb)

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

STATUS FLAG CODES

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



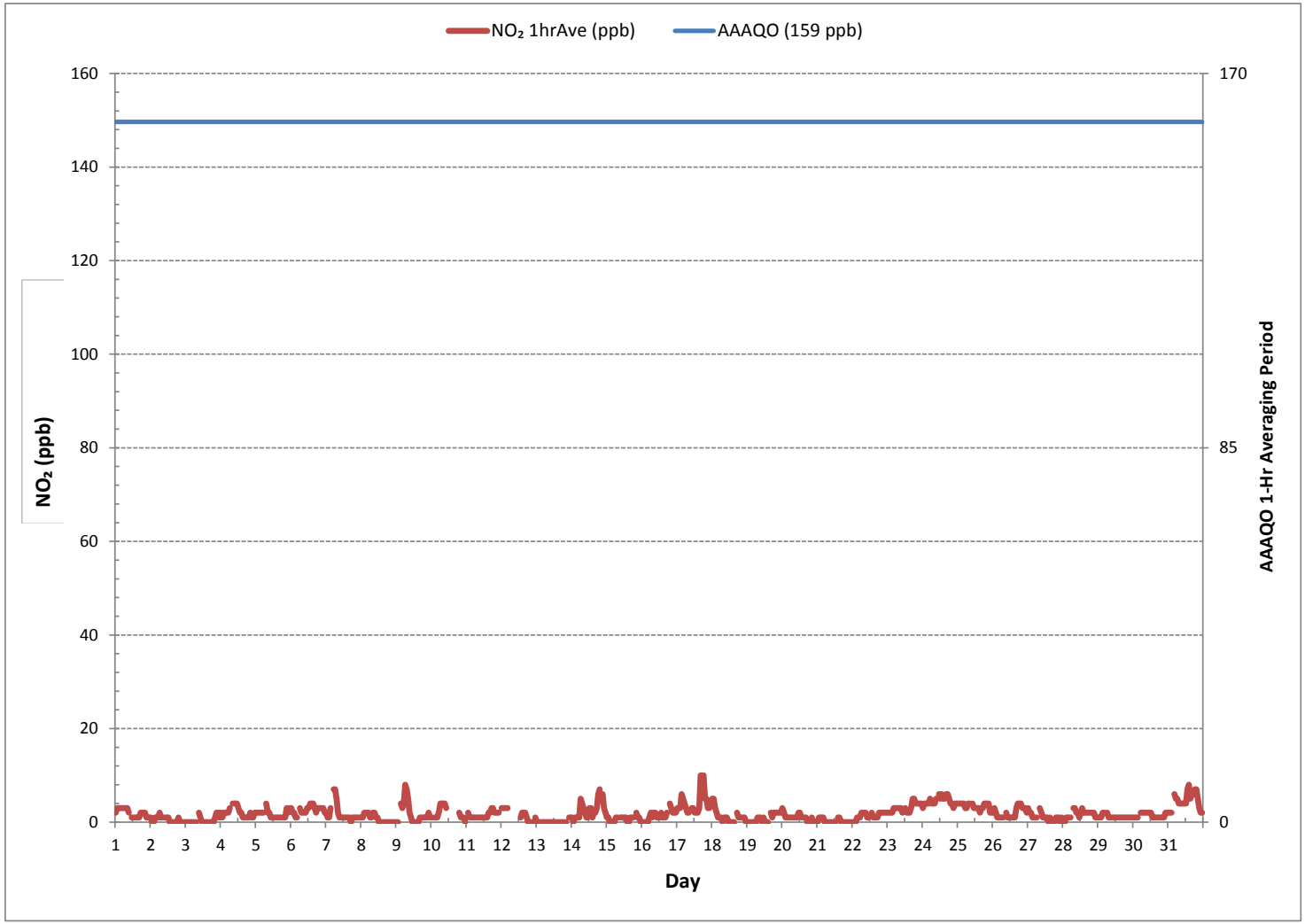
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	555					
MINIMUM 1-HR AVERAGE	0	ppb	@ HOUR	1	ON DAY	2
MAXIMUM 1-HR AVERAGE:	10	ppb	@ HOUR	16	ON DAY	17
MAXIMUM 24-HR AVERAGE:	5	ppb			ON DAY	24
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:		734	hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:		98.7	%
STANDARD DEVIATION:	2		MONTHLY AVERAGE:		2	ppb

NITROGEN DIOXIDE Hourly Averages (NO_2 ppb)



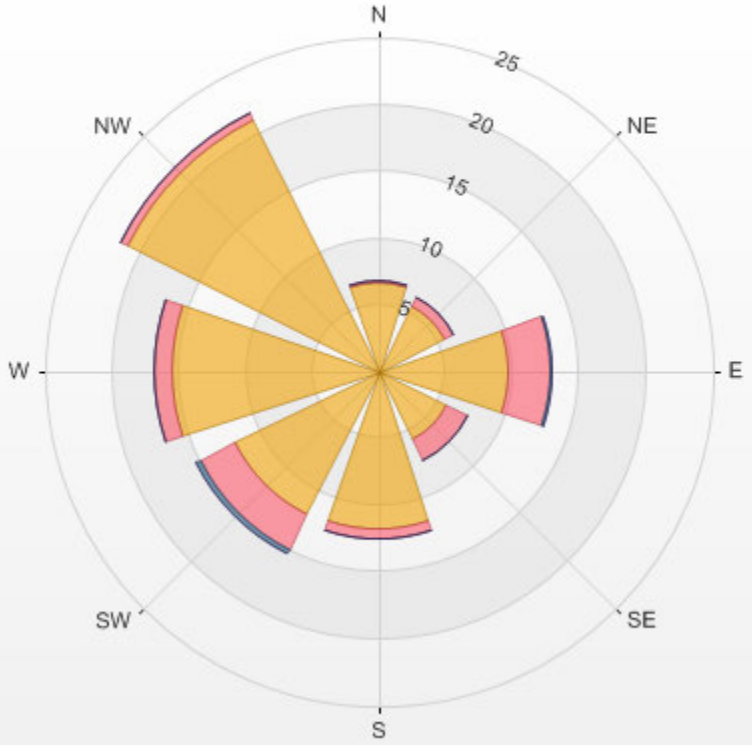
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-NO2[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppb]

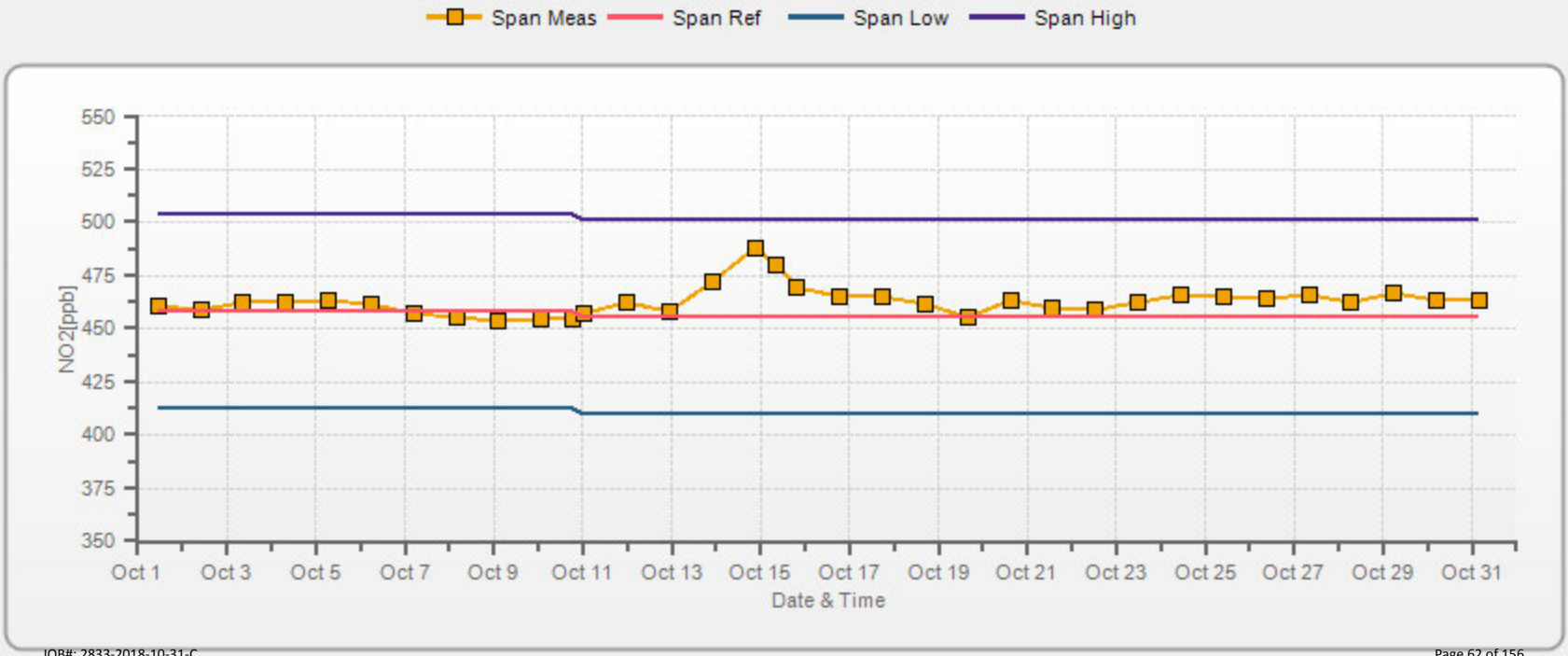
Direction	0.0-3.7	3.7-7.3	7.3-11.0	>11.0	Total
N	6.7	0.1	0.0	0.0	6.8
NE	5.5	0.7	0.0	0.0	6.2
E	9.7	3.2	0.1	0.0	13.0
SE	5.6	1.9	0.0	0.0	7.5
S	11.9	0.7	0.0	0.0	12.6
SW	12.0	2.9	0.4	0.0	15.3
W	15.5	1.3	0.0	0.0	16.8
NW	21.0	0.7	0.0	0.0	21.7
Summary	87.8	11.6	0.6	0.0	100.0

%	Icon	Classes (ppb)	88	0.0-3.7	12	3.7-7.3	1	7.3-11.0	0	>11.0

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



NO2[ppb] Calibration: LICA ST. LINA Monthly: 18/10 Type: Span



OZONE

OZONE Hourly Averages (O_3 ppb)

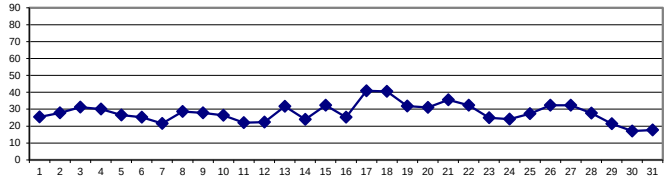
HR START (MST) / HR END (MST)	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
DAY																												
1	23.1	21.6	20.5	19.4	18.4	17.9	17.5	17.3	18.2	22.1	S	30.9	30.7	31.8	31.8	32.1	31.9	30.3	28.8	29.4	29.0	27.2	27.0	27.0	17.3	32.1	25.4	24
2	27.3	27.7	27.9	24.9	22.1	21.4	20.0	20.1	22.5	S	27.9	28.9	29.5	31.1	31.9	32.6	32.2	32.5	31.1	30.0	30.2	29.7	30.1	29.9	20.0	32.6	27.9	24
3	30.6	30.8	30.5	30.7	30.2	28.9	28.3	26.9	S	29.2	30.6	33.4	33.9	33.8	33.0	32.9	32.7	32.7	32.3	33.5	31.7	30.4	30.9	30.3	26.9	33.9	31.2	24
4	29.8	28.6	26.6	26.1	24.6	22.7	21.6	S	20.5	20.8	23.1	26.1	30.5	33.9	34.8	38.6	40.5	39.9	38.1	35.9	34.6	33.6	31.6	29.9	20.5	40.5	30.1	24
5	29.4	28.2	25.8	23.0	20.4	18.1	S	18.5	20.7	22.6	26.2	31.0	33.0	33.7	33.4	32.8	32.1	31.0	28.4	27.1	25.5	23.5	24.7	23.7	18.1	33.7	26.6	24
6	22.9	23.3	24.4	24.0	23.2	S	21.4	21.6	22.1	23.2	24.7	25.8	28.2	27.3	29.7	30.9	31.1	31.3	28.0	26.7	23.5	22.3	21.5	21.7	21.4	31.3	25.2	24
7	23.3	24.4	23.5	18.6	S	12.5	11.3	13.4	18.2	21.1	22.1	22.3	23.4	23.3	23.3	23.0	23.5	22.9	22.5	23.2	23.8	23.4	24.9	26.0	11.3	26.0	21.5	24
8	25.2	25.5	23.9	S	25.3	24.9	25.3	26.1	26.5	27.4	28.1	29.7	31.1	31.3	31.6	31.5	31.5	31.6	31.8	31.5	30.4	30.3	30.0	30.2	23.9	31.8	28.7	24
9	30.3	28.9	S	24.3	23.8	23.3	17.7	18.0	20.7	26.5	28.6	30.5	31.0	31.7	32.8	32.5	31.8	31.5	31.7	30.7	30.2	28.8	26.9	26.2	17.7	32.8	27.8	24
10	28.8	S	31.9	31.2	29.2	25.4	21.1	18.2	17.6	21.6	23.2	24.6	27.1	28.1	30.9	31.2	33.4	31.8	28.8	27.5	25.9	24.1	22.0	23.0	17.6	33.4	26.4	24
11	S	23.2	23.1	22.3	20.6	21.2	20.8	20.8	19.8	C	C	C	C	C	C	C	25.9	22.8	21.5	22.0	22.0	21.9	21.4	S	19.8	25.9	22.0	24
12	18.7	17.2	15.4	13.5	12.2	P	P	P	P	P	P	P	18.9	18.6	18.3	20.9	25.9	28.7	28.9	29.9	30.9	30.6	S	28.5	12.2	30.9	22.3	17
13	27.5	28.3	29.6	28.4	29.6	30.8	30.1	28.8	29.1	30.4	31.2	33.1	33.5	34.0	34.1	34.0	34.2	34.3	34.6	34.0	34.0	S	32.7	32.1	27.5	34.6	31.7	24
14	32.2	31.0	28.2	26.6	25.8	22.2	14.9	15.7	17.9	20.7	21.2	20.8	20.0	23.5	27.4	27.0	26.3	24.9	21.2	19.5	S	22.9	28.0	31.8	14.9	32.2	23.9	24
15	34.5	36.9	36.2	35.6	34.8	33.6	32.7	31.5	30.7	31.2	32.0	33.7	34.5	33.6	33.2	32.8	31.5	31.0	30.2	S	29.0	28.2	28.1	28.1	28.1	36.9	32.3	24
16	27.9	27.8	27.5	26.6	25.3	22.9	19.9	17.6	14.4	16.7	20.7	23.2	23.4	27.4	29.7	30.8	27.1	26.6	S	24.8	28.4	31.4	31.4	29.6	14.4	31.4	25.3	24
17	27.7	27.0	27.8	25.5	27.1	30.2	31.0	31.8	35.0	P	40.8	46.6	51.3	55.1	**56.4**	54.1	48.2	S	47.8	51.1	49.5	48.0	45.6	42.7	25.5	**56.4**	**40.9**	23
18	39.6	39.9	42.6	43.7	44.5	43.0	42.3	40.8	39.4	39.0	39.7	41.3	41.8	41.7	42.0	42.2	S	40.6	39.8	38.9	38.4	37.6	37.0	36.8	36.8	44.5	40.6	24
19	35.9	35.3	35.0	35.0	34.8	34.2	33.7	29.0	30.1	32.0	33.7	34.1	34.0	33.9	33.4	S	32.5	32.0	29.6	27.6	27.5	25.8	26.4	25.1	25.1	35.9	31.8	24
20	24.4	26.1	24.6	24.1	24.5	24.6	23.8	22.2	21.6	22.6	24.4	26.4	30.2	34.3	S	43.2	42.7	42.0	40.7	39.7	38.6	38.7	38.4	38.1	21.6	43.2	31.1	24
21	36.0	34.0	33.0	34.0	32.7	32.5	33.5	33.9	34.4	36.0	36.8	37.7	38.0	S	37.5	36.8	36.8	36.5	36.0	35.7	35.9	36.4	36.1	35.6	32.5	38.0	35.5	24
22	36.2	36.2	33.6	29.1	29.6	28.9	25.6	29.0	30.2	27.8	31.5	34.0	S	37.3	38.2	38.8	37.2	35.2	33.2	32.3	31.4	30.1	29.2	27.7	25.6	38.8	32.3	24
23	27.3	26.7	26.4	24.4	22.5	21.7	20.9	20.6	21.1	22.0	23.9	S	27.2	30.3	32.9	33.8	28.3	24.4	23.2	23.3	23.1	22.7	23.6	24.4	20.6	33.8	25.0	24
24	26.2	22.4	20.3	21.0	21.0	20.6	21.5	22.0	21.2	19.7	S	23.2	25.6	24.4	26.1	25.7	24.1	24.3	25.8	27.3	28.6	31.1	28.4	26.7	19.7	31.1	24.2	24
25	26.9	26.1	24.1	22.9	23.5	21.8	22.8	20.7	23.1	S	22.3	24.9	28.3	31.2	31.9	34.9	35.1	30.7	27.6	27.3	27.2	28.0	33.6	36.6	20.7	36.6	27.4	24
26	33.4	30.4	28.4	31.4	30.2	28.6	27.8	26.8	S	27.0	31.1	34.2	35.6	37.4	36.2	35.1	34.0	33.7	34.0	34.2	34.8	34.6	33.9	32.0	26.8	37.4	32.4	24
27	29.9	29.4	30.9	32.1	31.0	29.7	29.1	S	23.8	25.7	31.6	35.3	36.5	35.8	35.9	36.1	36.9	35.6	35.2	34.0	32.8	32.3	32.0	33.1	23.8	36.9	32.4	24
28	34.1	32.0	28.8	28.4	28.9	27.5	S	22.2	24.7	24.7	26.8	31.8	32.1	27.8	30.4	28.9	28.4	27.8	26.8	25.9	25.3	24.5	24.1	23.4	22.2	34.1	27.6	24
29	22.4	21.5	20.1	17.8	19.3	S	21.5	23.2	22.5	22.6	20.9	21.1	20.4	22.7	23.7	23.8	23.5	22.5	21.5	22.6	21.6	19.7	19.3	18.4	17.8	23.8	21.4	24
30	17.4	17.4	16.9	14.3	S	14.1	11.4	**9.3**	9.3	10.1	10.2	13.7	19.6	25.9	29.3	27.6	22.6	20.0	21.1	18.9	18.2	17.1	15.0	13.5	**9.3**	29.3	17.1	24
31	14.7	15.3	14.8	S	12.0	11.3	11.1	10.4	11.7	13.4	16.5	18.6	19.6	19.0	20.1	26.5	25.2	22.7	18.3	16.4	19.5	23.9	23.6	22.6	10.4	26.5	17.7	24
HOURLY MAX	39.6	39.9	42.6	43.7	44.5	43.0	42.3	40.8	39.4	39.0	40.8	46.6	51.3	55.1	56.4	54.1	48.2	42.0	47.8	51.1	49.5	48.0	45.6	42.7				
HOURLY AVG	28.1	27.4	26.7	26.2	25.8	24.8	23.5	22.7	23.1	24.5	27.0	29.2	30.0	31.0	32.1	32.8	31.6	30.4	30.0	29.4	29.4	28.6	28.6	28.5				

STATUS FLAG CODES

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

OBJECTIVE LIMIT: **ALBERTA ENVIRONMENT:** 1-HR 82 ppb

24 HR AVERAGES October 2018

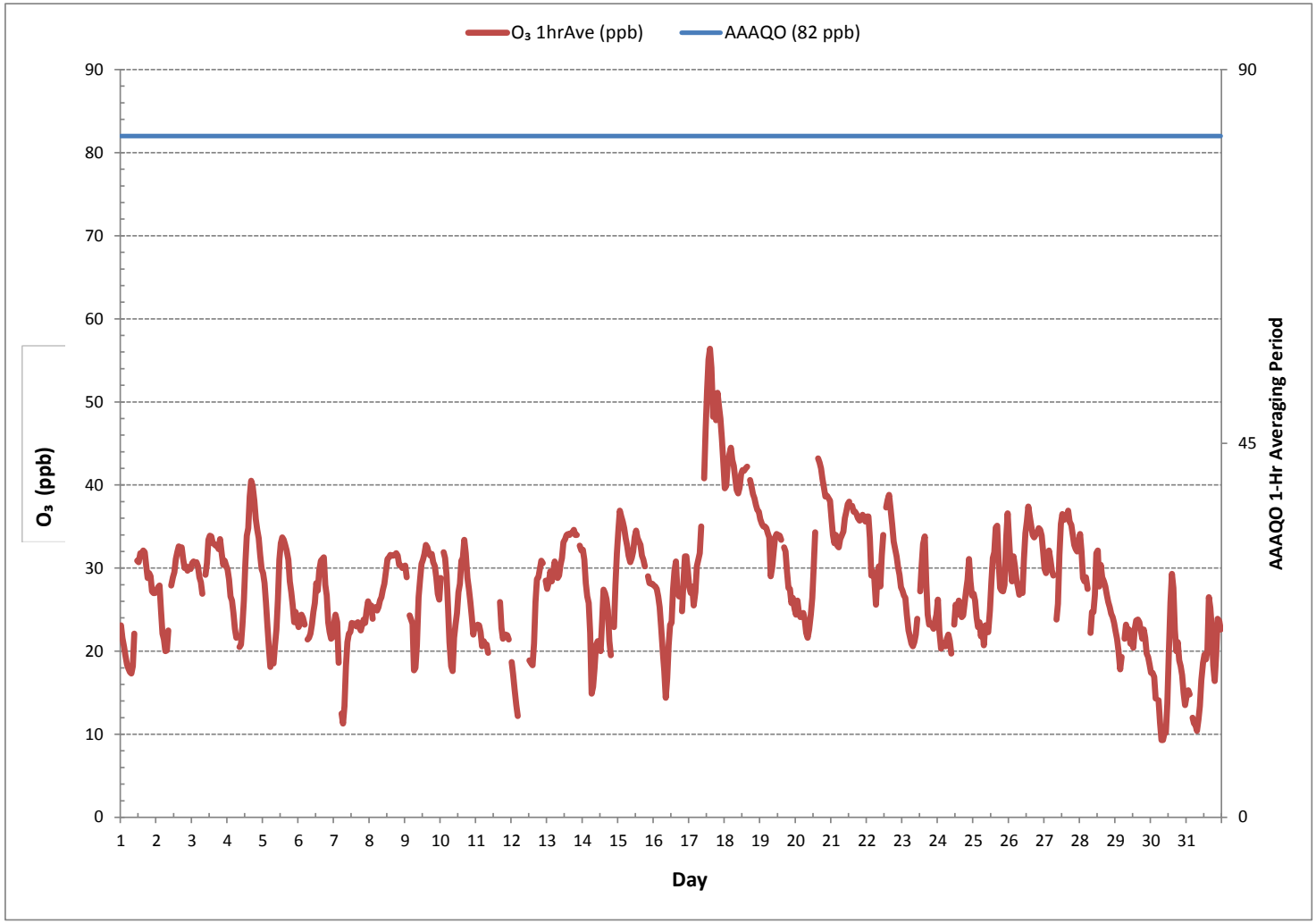


MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	697					
MINIMUM 1-HR AVERAGE	9.3	ppb	@ HOUR	7	ON DAY	30
MAXIMUM 1-HR AVERAGE:	56.4	ppb	@ HOUR	14	ON DAY	17
MAXIMUM 24-HR AVERAGE:	40.9	ppb			ON DAY	17

IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	736	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	98.9	%
STANDARD DEVIATION:	7.1		MONTHLY AVERAGE:	28.0	ppb

OZONE Hourly Averages (O_3 ppb)



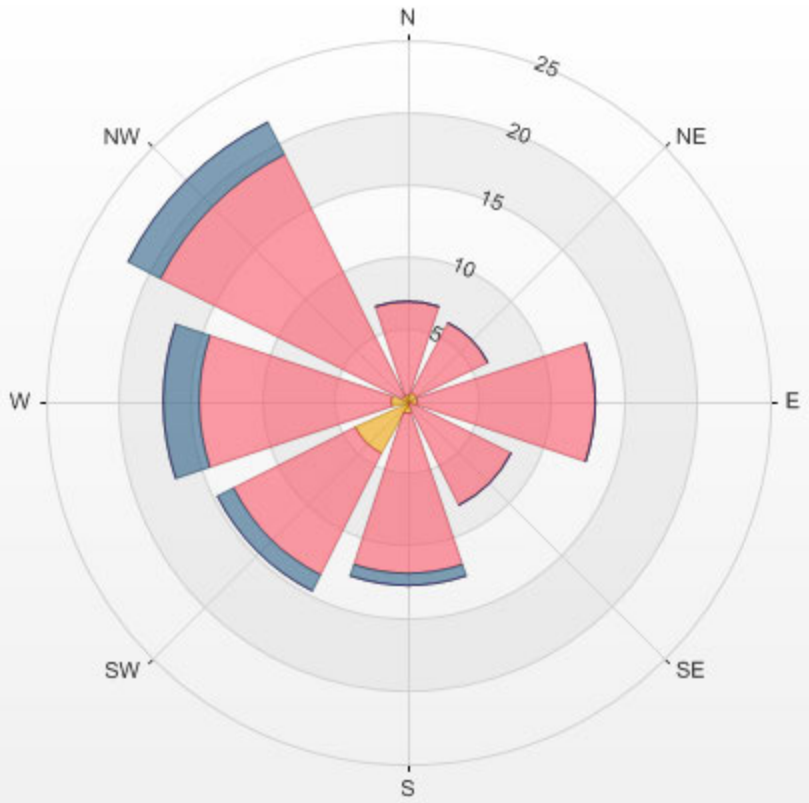
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-O3[ppb]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ppb]

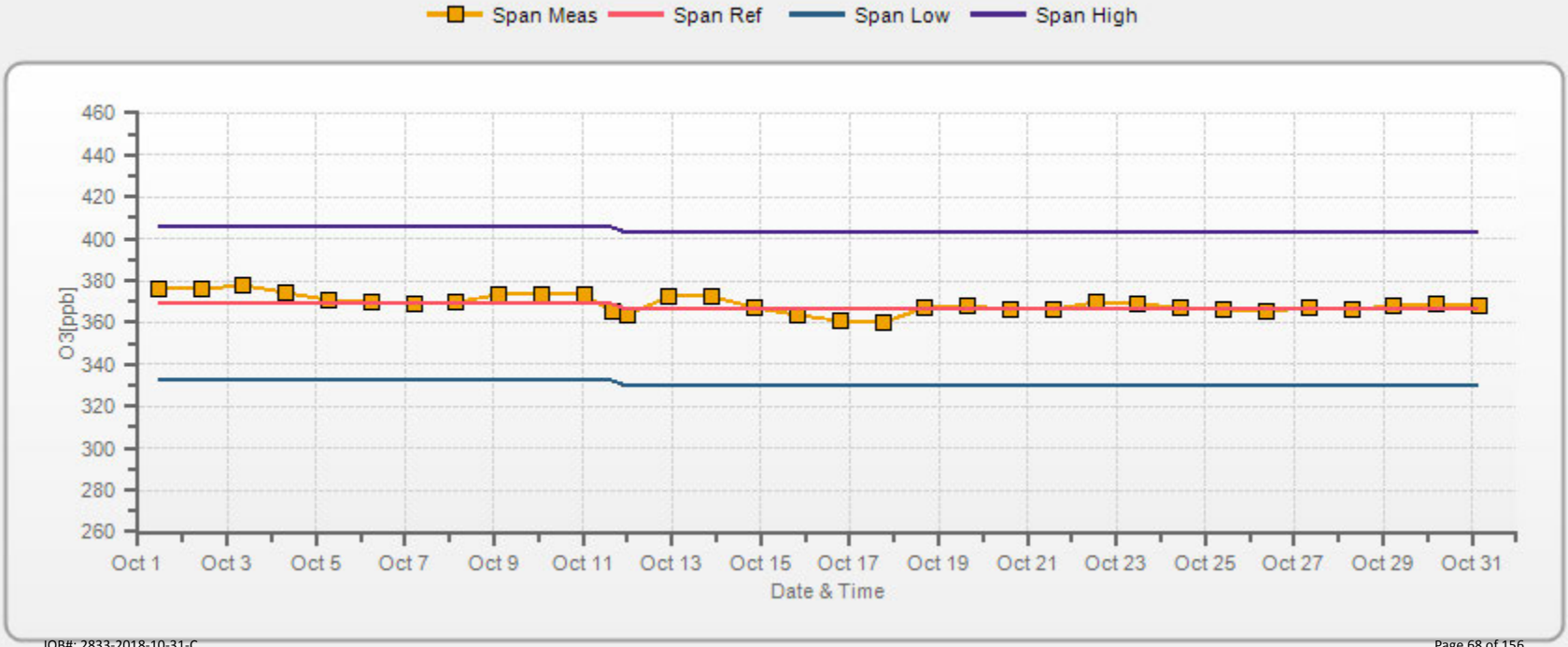
Direction	0.0-18.8	18.8-37.7	37.7-56.5	>56.5	Total
N	0.4	6.5	0.0	0.0	6.9
NE	0.7	5.5	0.0	0.0	6.2
E	0.7	12.3	0.0	0.0	13.0
SE	0.1	7.9	0.0	0.0	8.1
S	0.9	11.0	0.9	0.0	12.7
SW	4.0	9.4	1.3	0.0	14.7
W	1.2	13.3	2.5	0.0	16.9
NW	0.4	18.7	2.5	0.0	21.6
Summary	8.5	84.5	7.1	0.0	100.0

% Icon Classes (ppb)	8 0.0-18.8	84 18.8-37.7	7 37.7-56.5	0 >56.5

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



O3[ppb] Calibration: LICA ST. LINA Monthly: 18/10 Type: Span



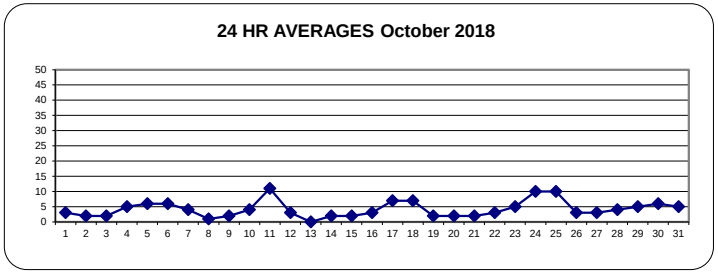
PARTICULATE MATTER 2.5

PARTICULATE MATTER < 2.5 MICRONS Hourly Averages ($PM_{2.5}$ µg/m^3)

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

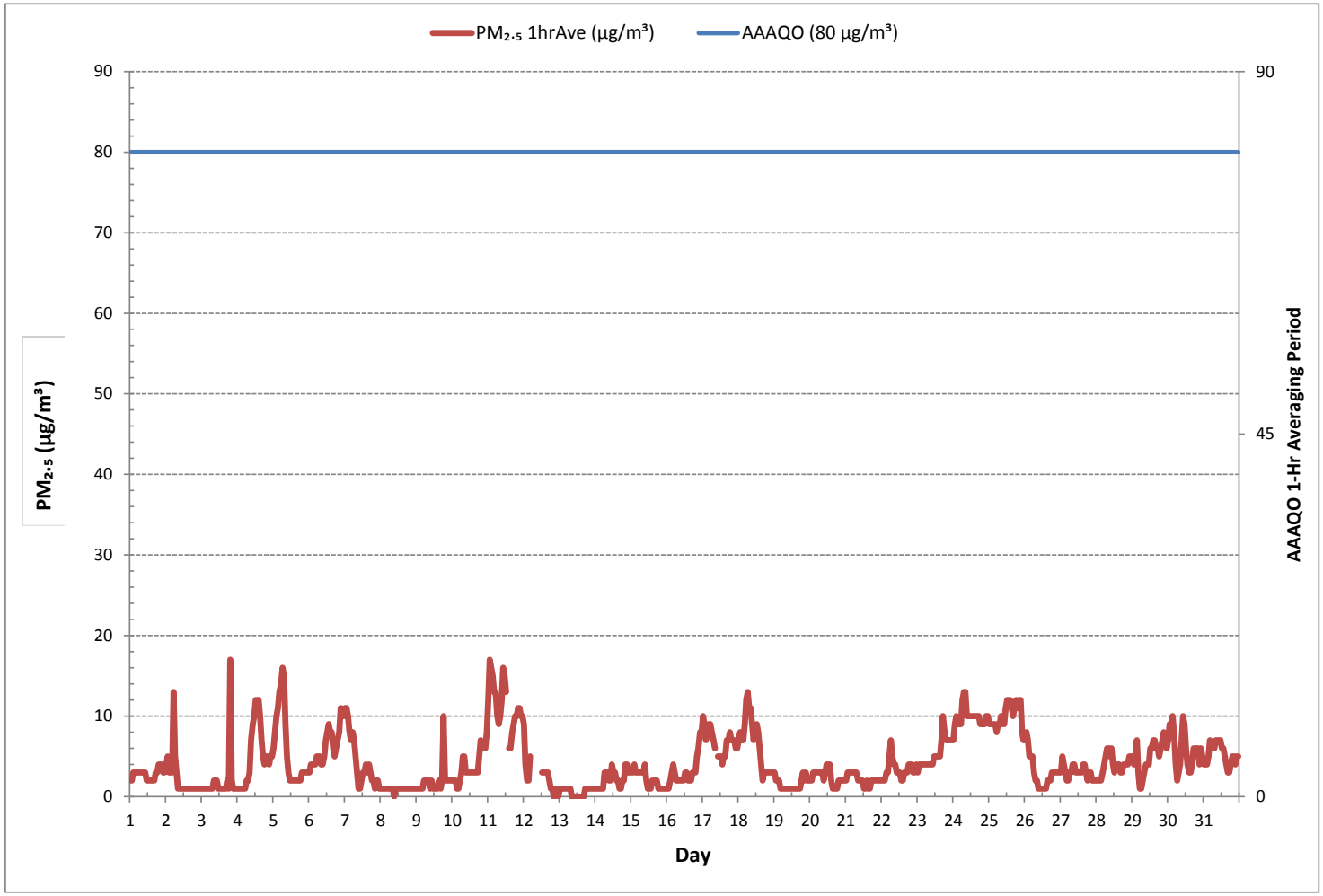


OBJECTIVE LIMIT: **ALBERTA ENVIRONMENT:** 1-HR 80 µg/m^3 | 24-HR 30 µg/m^3

MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:			0				
NUMBER OF 24-HR EXCEEDANCES:			0				
NUMBER OF NON-ZERO READINGS:			723				
MINIMUM 1-HR AVERAGE	0	µg/m^3	@ HOUR	9	ON DAY	8	
MAXIMUM 1-HR AVERAGE:	17	µg/m^3	@ HOUR	19	ON DAY	3	
MAXIMUM 24-HR AVERAGE:	11	µg/m^3			ON DAY	11	
			OPERATIONAL TIME:			736	hrs
MONTHLY CALIBRATION TIME:	1	hrs	AMD OPERATION UPTIME:			98.9	%
STANDARD DEVIATION:	3		MONTHLY AVERAGE:			4	µg/m^3

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



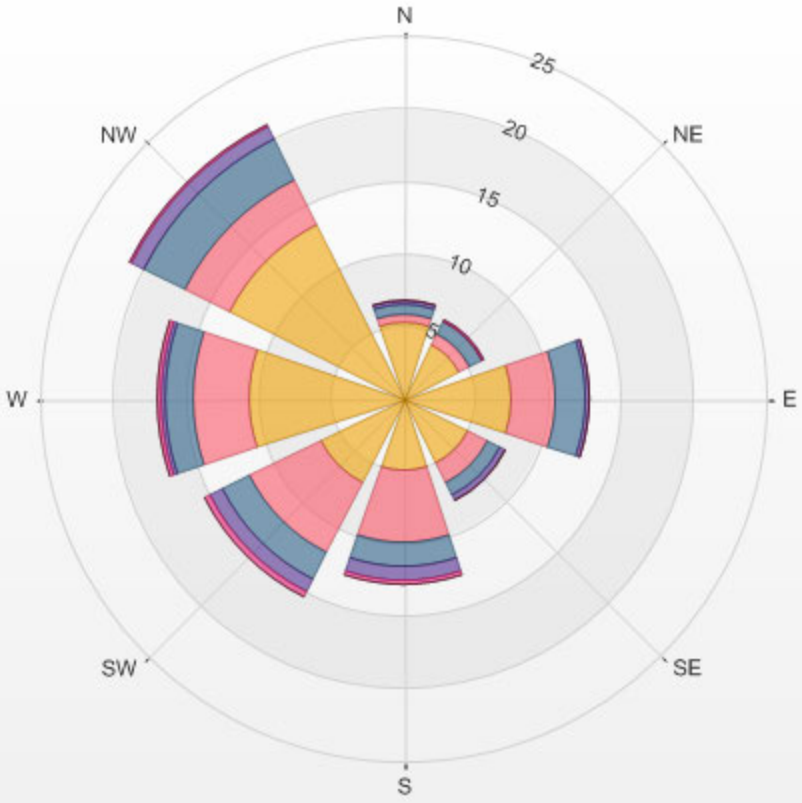
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-PM25[ug/m3]
Monthly: 18/10
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00% Calm Avg: 0.00 [ug/m3]

Direction	0.0-3.6	3.6-7.2	7.2-10.8	10.8-14.4	14.4-18.0	>18.0	Total
N	5.3	0.6	0.7	0.3	0.0	0.0	6.8
NE	4.2	0.8	1.0	0.0	0.1	0.0	6.2
E	7.4	3.0	2.2	0.3	0.0	0.0	12.9
SE	4.9	1.5	1.0	0.4	0.0	0.0	7.8
S	4.9	5.1	1.6	1.0	0.3	0.0	12.9
SW	6.4	5.5	2.1	1.0	0.4	0.0	15.3
W	10.7	3.8	1.9	0.3	0.3	0.0	17.0
NW	13.4	3.4	3.3	1.0	0.1	0.0	21.2
Summary	57.3	23.7	13.7	4.1	1.2	0.0	100.0

%	Icon	Classes (ug/m3(L))	57	0.0-3.6	24	3.6-7.2	14	7.2-10.8	4	10.8-14.4	1	14.4-18.0	0	>18.0

LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



WIND SPEED

Maxxam
A Bureau Veritas Group Company

WIND SPEED Hourly Averages (WS kph)

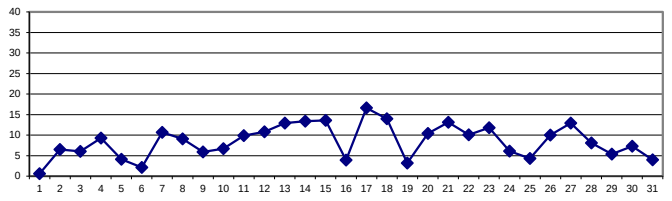
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	7.3	7.7	6.4	6.9	5.7	5.2	5.3	4.6	4.6	3.9	3.1	3.3	3.2	3.4	4.4	2.6	3.3	5.3	6.0	6.5	7.7	7.0	6.7	6.5	2.6	7.7	0.6	24
2	6.0	6.6	7.6	9.5	6.6	5.4	5.2	5.4	5.5	6.4	6.8	7.1	8.4	11.4	11.5	12.6	11.0	9.8	8.5	8.5	9.2	8.1	9.3	10.1	5.2	12.6	6.5	24
3	11.5	10.6	12.8	13.2	13.0	11.4	11.0	10.1	10.0	11.4	10.6	12.1	14.2	11.9	12.1	10.5	7.3	7.1	5.9	7.2	7.0	7.1	8.3	8.7	5.9	14.2	6.0	24
4	10.2	11.3	11.8	9.5	9.1	10.3	10.5	7.7	9.6	8.6	9.6	9.0	10.5	12.4	11.2	12.9	12.1	11.5	8.9	10.1	12.2	12.8	13.4	12.6	7.7	13.4	9.3	24
5	14.6	12.5	11.8	11.7	12.8	11.7	10.2	9.3	10.3	8.7	9.6	10.8	12.9	11.4	11.8	10.4	8.7	9.1	7.9	7.2	9.5	11.6	12.8	11.7	7.2	14.6	4.1	24
6	10.9	10.4	12.1	12.1	12.0	11.7	12.8	11.4	12.9	13.9	10.3	7.5	11.8	10.4	9.9	14.7	13.8	8.1	9.6	9.6	9.3	9.6	7.2	6.4	6.4	14.7	2.1	24
7	7.9	5.9	6.4	6.3	5.2	6.1	7.5	10.7	12.3	15.3	13.9	11.3	10.8	10.6	13.1	13.1	13.7	12.2	12.5	13.6	15.0	16.3	17.5	13.3	5.2	17.5	10.7	24
8	12.1	10.9	11.5	12.4	12.1	10.9	11.5	11.9	11.1	11.2	10.4	10.5	8.7	7.8	7.0	7.1	6.8	8.4	9.0	7.8	6.5	7.4	7.9	8.4	6.5	12.4	9.1	24
9	9.0	5.7	6.7	7.5	6.7	8.1	7.1	4.8	3.5	6.0	9.2	8.6	4.5	5.8	4.7	2.7	4.1	4.2	5.8	8.5	9.2	10.0	7.3	7.1	2.7	10.0	5.9	24
10	7.4	9.2	12.1	11.7	11.2	10.1	7.2	7.6	6.4	7.1	8.2	8.1	9.3	10.7	9.7	8.8	10.5	6.1	6.9	6.9	6.1	5.4	7.7	7.9	5.4	12.1	6.7	24
11	6.9	6.4	6.6	4.8	6.1	7.5	8.9	9.6	9.8	9.7	9.5	12.5	11.8	13.0	14.9	16.4	14.7	10.7	12.0	13.9	12.6	9.7	7.3	7.7	4.8	16.4	9.9	24
12	6.9	7.8	8.4	7.8	7.5	**P**	**P**	**P**	**P**	**P**	**P**	**P**	16.6	17.3	10.6	25.6	**25.8**	20.6	14.3	15.1	17.0	15.5	14.4	14.5	6.9	**25.8**	10.8	17
13	13.3	13.2	13.1	12.7	12.9	14.4	10.8	13.7	15.8	16.8	19.3	19.6	18.7	19.4	19.3	18.3	13.5	12.9	12.0	8.3	7.0	6.0	7.7	8.3	6.0	19.6	12.9	24
14	7.7	10.6	10.2	12.0	13.0	8.8	11.0	14.8	13.4	11.5	11.9	13.3	15.7	17.7	22.0	21.3	16.5	14.7	14.6	16.1	16.7	15.5	15.4	16.0	7.7	22.0	13.4	24
15	15.1	15.0	14.8	14.0	18.6	16.4	12.8	11.5	12.2	13.8	16.3	18.5	19.4	17.6	18.1	15.3	14.4	13.2	9.1	10.9	11.1	8.6	9.1	9.1	8.6	19.4	13.6	24
16	8.7	7.3	8.0	5.2	6.1	5.6	5.1	5.3	3.8	4.9	6.6	7.2	2.3	2.7	4.3	3.9	5.4	7.3	8.7	9.7	9.7	10.7	12.3	13.1	2.3	13.1	3.9	24
17	12.6	12.7	15.3	17.8	15.3	15.8	18.5	19.1	20.8	**P**	18.2	19.1	20.7	21.7	23.7	24.3	20.9	20.1	16.3	15.9	9.9	8.8	10.6	9.8	8.8	24.3	**16.6**	23
18	10.4	10.9	10.5	12.1	11.9	14.5	14.4	12.9	12.2	11.0	13.1	16.6	21.3	22.1	25.2	22.5	17.9	14.4	11.3	10.7	9.8	11.9	12.2	12.7	9.8	25.2	14.0	24
19	13.4	12.6	12.1	11.4	11.9	12.0	12.0	13.1	12.3	11.7	13.5	15.1	13.7	11.4	7.1	7.2	6.9	8.8	12.8	16.6	11.9	12.7	14.3	13.9	6.9	16.6	3.2	24
20	16.5	17.5	16.5	18.2	21.7	21.1	22.8	19.0	14.2	15.0	18.0	13.3	12.0	14.6	18.8	20.0	19.5	18.7	12.6	10.3	16.3	14.9	11.8	10.0	10.0	22.8	10.4	24
21	12.4	15.9	16.2	15.2	12.8	12.6	14.3	15.3	14.9	14.6	16.8	17.8	18.3	21.8	19.7	16.4	13.4	9.8	9.7	9.8	9.5	11.0	9.1	7.5	7.5	21.8	13.1	24
22	6.8	7.7	4.0	7.7	8.6	9.7	10.4	13.6	11.6	13.2	13.5	11.0	13.1	15.5	14.7	16.0	12.3	13.0	12.8	13.1	12.5	13.0	12.9	13.5	4.0	16.0	10.1	24
23	14.6	14.8	13.1	14.1	13.8	12.7	12.7	14.0	14.7	12.4	10.0	10.4	11.5	10.2	9.7	11.1	10.9	14.0	13.9	12.8	11.6	12.3	10.3	9.7	9.7	14.8	11.8	24
24	10.4	9.4	9.7	10.2	10.0	10.0	10.1	8.3	5.8	5.7	6.6	6.6	6.0	7.3	6.5	4.8	5.2	4.7	4.9	7.9	9.0	6.0	2.8	8.7	2.8	10.4	6.1	24
25	9.0	8.1	7.1	9.6	6.7	8.6	11.0	8.4	7.5	5.0	7.6	9.0	7.2	7.0	7.1	5.8	4.3	6.5	6.2	7.0	5.9	6.3	8.4	5.6	4.3	11.0	4.3	24
26	10.3	11.6	15.6	14.9	11.0	9.7	12.1	10.7	11.8	12.3	12.0	13.7	17.4	16.5	9.6	11.9	5.2	6.3	4.9	6.2	8.5	10.0	10.3	10.8	4.9	17.4	10.0	24
27	13.9	11.5	11.4	12.2	11.6	12.2	12.3	13.0	13.0	15.3	18.2	20.0	18.4	16.2	15.0	16.7	14.9	17.7	13.1	14.4	10.0	8.9	7.9	7.4	7.4	20.0	12.9	24
28	8.6	6.4	8.1	7.5	7.5	8.0	10.2	10.5	12.3	11.1	11.0	12.7	14.8	12.5	13.5	13.7	14.3	11.9	10.2	13.7	13.2	12.2	13.1	14.3	6.4	14.8	8.1	24
29	11.3	9.8	5.7	3.6	**X**	**X**	**X**	**X**	19.1	12.0	12.3	13.6	13.5	13.6	14.9	15.8	13.8	10.7	9.2	8.8	10.2	9.2	9.1	6.9	3.6	19.1	5.4	20
30	3.7	6.3	5.7	1.1	**0.8**	5.9	5.4	4.6	6.8	8.5	8.8	8.6	9.1	9.9	11.4	8.8	11.3	13.0	10.6	10.0	9.8	10.0	8.8	9.2	**0.8**	13.0	7.3	24
31	8.2	9.0	8.2	8.8	11.1	10.1	10.1	10.6	10.7	8.7	7.5	6.5	8.0	7.3	6.2	5.4	1.5	6.1	7.9	7.4	8.1	6.0	5.6	5.3	1.5	11.1	4.0	24
HOURLY MAX	16.5	17.5	16.5	18.2	21.7	21.1	22.8	19.1	20.8	16.8	19.3	20.0	21.3	22.1	25.2	25.6	25.8	20.6	16.3	16.6	17.0	16.3	17.5	16.0				

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

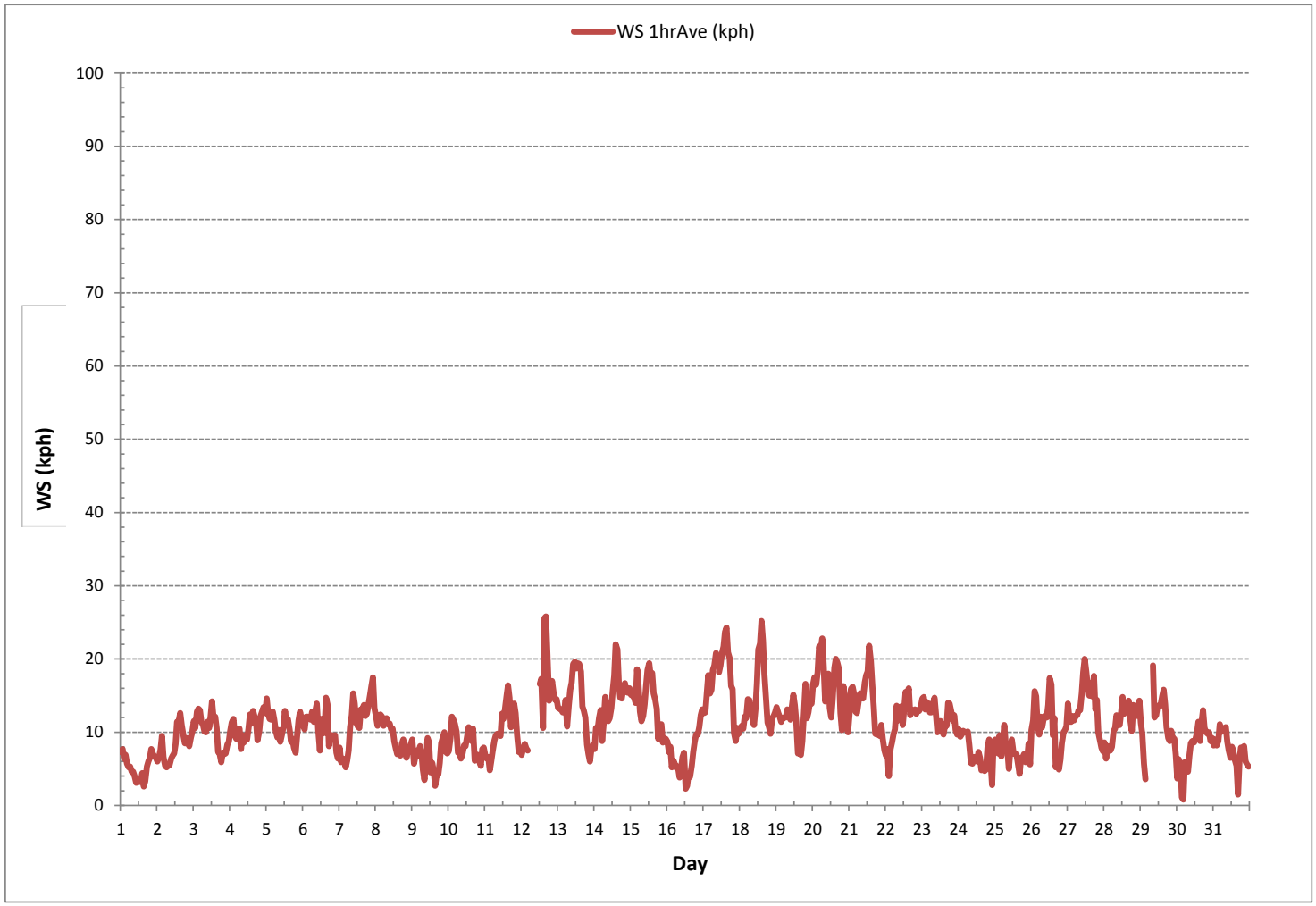
24 HR AVERAGES October 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:		732					
MINIMUM 1-HR AVERAGE	0.8	kph	@ HOUR	4	ON DAY	30	
MAXIMUM 1-HR AVERAGE:	25.8	kph	@ HOUR	16	ON DAY	12	
MAXIMUM 24-HR AVERAGE:	16.6	kph			ON DAY	17	
			OPERATIONAL TIME:			732	hrs
MONTHLY CALIBRATION TIME:	0	hrs	AMD OPERATION UPTIME:			98.4	%
STANDARD DEVIATION:	4.1		MONTHLY AVERAGE:			3.0	kph

WIND SPEED Hourly Averages (WS kph)



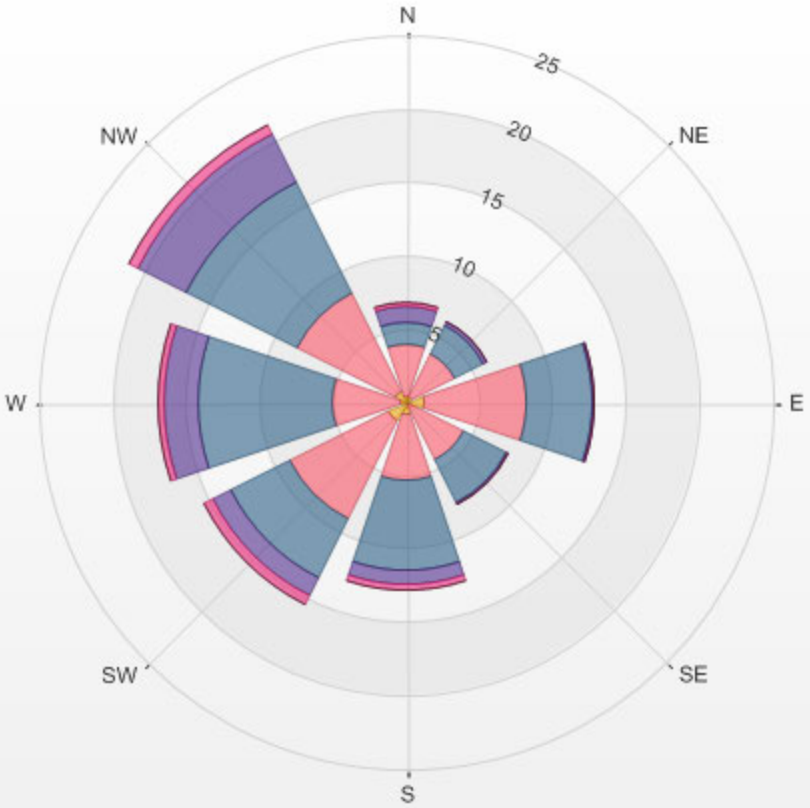
Wind: LICA ST. LINA
Monitor: WSP [kph]
Monthly: 18/10
Type: WindRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.00%

Direction	0.4-5.2	5.2-10.4	10.4-15.5	15.5-20.7	20.7-25.9	>25.9	Total
N	0.4	3.6	1.5	1.1	0.3	0.0	6.8
NE	0.4	3.3	2.2	0.3	0.0	0.0	6.2
E	1.2	7.0	4.5	0.1	0.0	0.0	12.9
SE	0.1	4.2	3.3	0.1	0.0	0.0	7.8
S	0.8	4.5	6.2	1.0	0.4	0.0	12.9
SW	1.4	7.5	4.5	1.4	0.7	0.0	15.4
W	0.4	4.6	9.2	2.3	0.4	0.0	16.9
NW	0.8	7.5	8.5	3.7	0.7	0.0	21.2
Summary	5.6	42.2	39.8	10.0	2.5	0.0	100.0

%	Icon	Classes (kph)											
6		0.4-5.2	42		5.2-10.4	40		10.4-15.5	10		15.5-20.7	2		20.7-25.9	0		>25.9

LICA ST. LINA 2018/10/01 00:00 - 2018/10/31 23:00 Calm: 0.00%



WIND DIRECTION

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

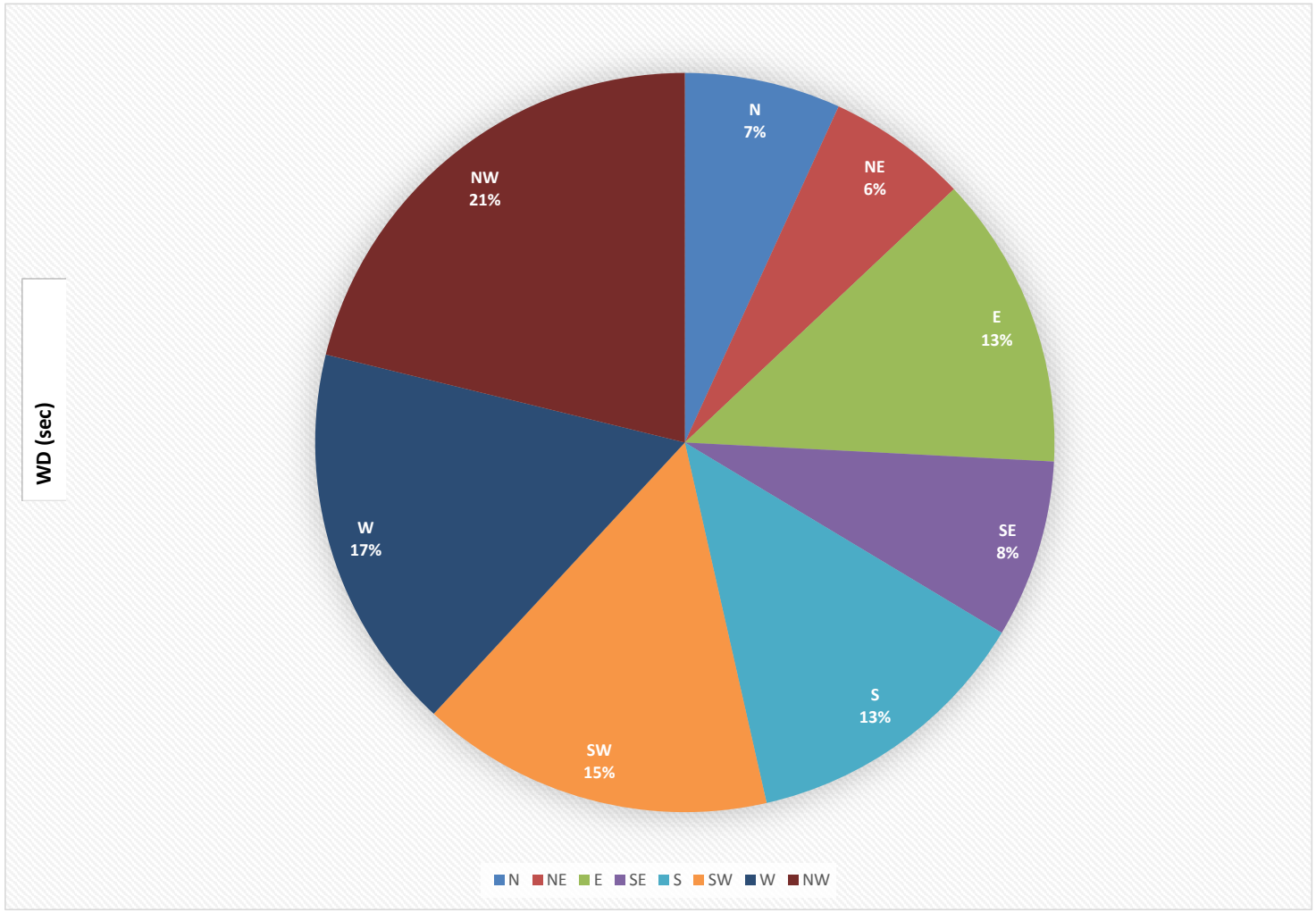
STATUS FLAG CODES

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

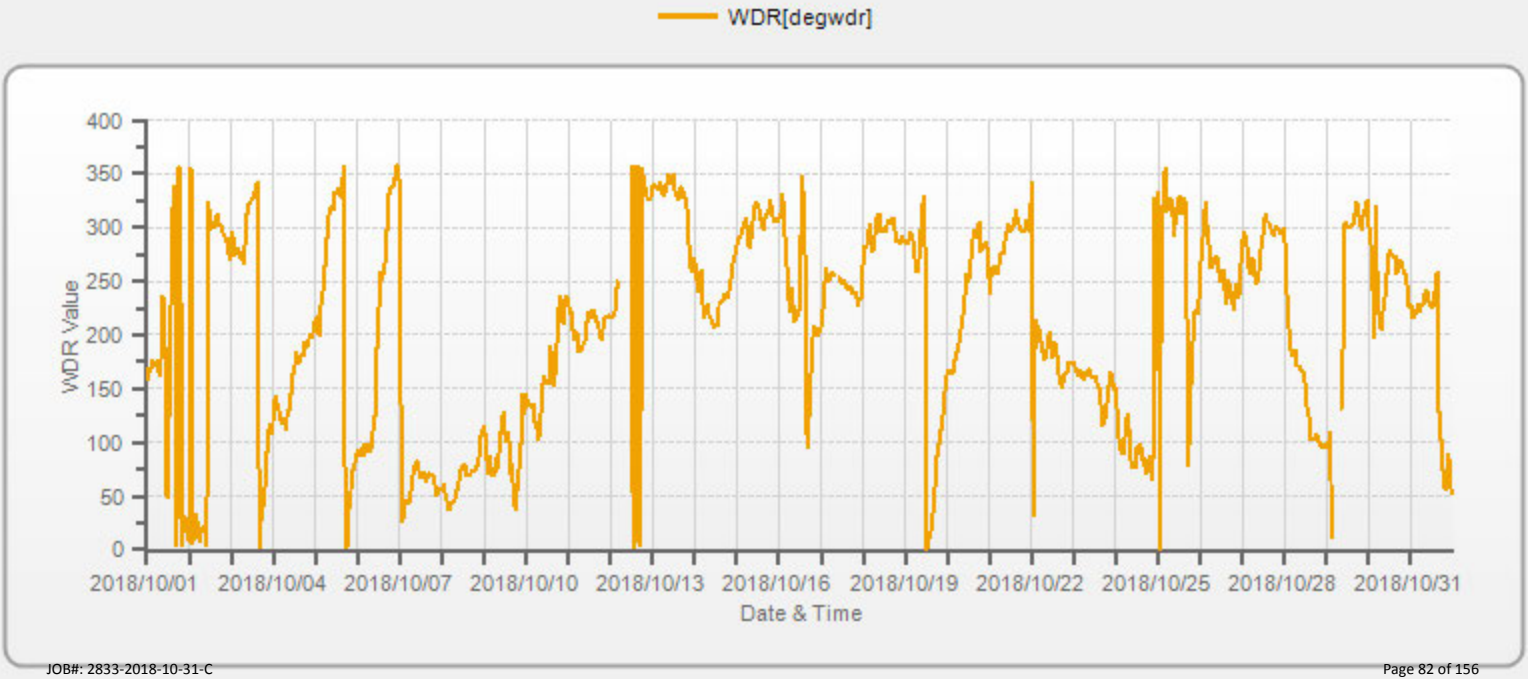
LAST CALIBRATION:	May 25, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	732	hrs
STANDARD DEVIATION:	95		AMD OPERATION UPTIME:	98.4	%
			MONTHLY AVERAGE:	264 (W)	

WIND DIRECTION Hourly Averages (WD)



WDR[degwdr] Station: LICA ST. LINA Monthly: 18/10 Type: AVG 1 Hr. [1 Hr.]



STANDARD DEVIATION WIND DIRECTION

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	9	4	5	4	4	11	3	7	11	17	47	34	44	48	21	28	36	9	5	4	9	4	4	3	24
2	7	7	3	10	13	14	8	7	12	14	22	22	29	20	24	26	14	8	8	5	8	4	6	10	24
3	7	9	5	4	4	4	6	7	10	10	13	11	11	19	12	16	20	16	7	6	18	10	12	4	24
4	9	4	4	5	5	3	4	9	9	9	15	14	17	15	21	13	9	5	8	5	3	3	3	7	24
5	3	3	7	6	5	6	12	8	6	11	11	14	10	18	10	11	13	7	14	9	9	6	4	6	24
6	5	7	6	6	5	7	7	6	7	10	16	29	21	13	14	8	11	17	6	5	3	8	9	21	24
7	11	17	9	7	7	5	6	6	7	6	8	10	11	11	9	6	7	6	5	5	6	4	4	5	24
8	5	9	6	5	5	5	5	5	6	10	9	10	15	19	17	16	16	9	16	9	10	11	16	10	24
9	10	6	13	6	12	7	8	24	18	23	18	22	44	19	28	46	18	26	12	3	10	11	17	16	24
10	16	10	6	2	4	7	12	6	10	14	10	16	18	16	21	19	14	36	8	11	11	5	10	6	24
11	8	12	6	11	8	7	5	6	9	9	14	10	11	15	10	7	9	5	6	5	9	5	7	5	24
12	4	7	10	7	13	**P**	**P**	**P**	**P**	**P**	**P**	**P**	5	16	48	6	5	6	9	4	4	4	4	5	17
13	6	5	6	6	4	3	5	4	7	8	8	9	8	10	11	7	9	5	8	12	7	19	5	9	24
14	12	5	8	7	5	13	3	6	4	5	11	10	8	8	8	5	4	6	3	5	7	4	6	3	24
15	4	4	5	4	5	5	5	9	8	9	7	9	9	10	9	8	6	7	5	5	6	6	6	9	24
16	6	10	4	16	9	5	8	8	12	15	14	12	37	42	40	49	14	12	11	13	4	3	4	4	24
17	7	11	5	3	4	4	4	2	3	**P**	7	5	5	7	6	7	6	3	3	2	4	8	6	12	23
18	18	13	12	11	6	5	10	10	13	13	11	10	11	11	6	7	6	6	6	6	6	3	6	3	24
19	3	4	2	2	4	7	11	6	9	10	10	10	12	11	17	13	11	11	10	3	11	6	7	5	24
20	6	5	4	7	5	3	4	10	5	6	11	11	14	19	22	8	7	8	7	6	7	6	6	13	24
21	8	5	5	5	4	6	6	3	6	9	9	11	13	10	11	11	8	4	5	5	10	6	6	15	24
22	27	6	46	6	8	6	3	2	8	3	8	13	9	11	12	7	7	3	4	3	3	5	3	4	24
23	3	3	3	4	2	7	3	3	4	9	11	10	13	15	17	9	10	5	4	4	6	6	5	5	24
24	5	10	9	2	3	6	8	6	20	14	13	13	16	16	13	16	8	5	5	5	4	12	43	8	24
25	16	9	16	15	30	10	6	12	9	29	18	23	15	23	11	17	31	7	20	10	6	8	3	5	24
26	9	8	9	17	8	5	7	9	7	8	10	11	10	11	12	4	15	13	13	8	5	9	5	18	24
27	4	5	7	7	4	4	4	5	8	6	11	10	14	8	11	9	6	8	6	8	9	8	8	8	24
28	14	35	14	7	8	8	8	6	5	5	10	14	10	14	12	7	5	7	8	6	9	10	4	4	24
29	4	4	16	35	**X**	**X**	**X**	**X**	4	13	17	7	7	7	8	5	9	6	6	11	11	8	7	12	20
30	20	12	16	67	72	4	13	19	11	8	11	9	8	10	9	15	12	3	3	3	5	7	8	6	24
31	11	6	6	8	4	10	5	5	4	10	11	7	6	6	25	27	56	12	17	10	17	22	6	12	24

STATUS FLAG CODES

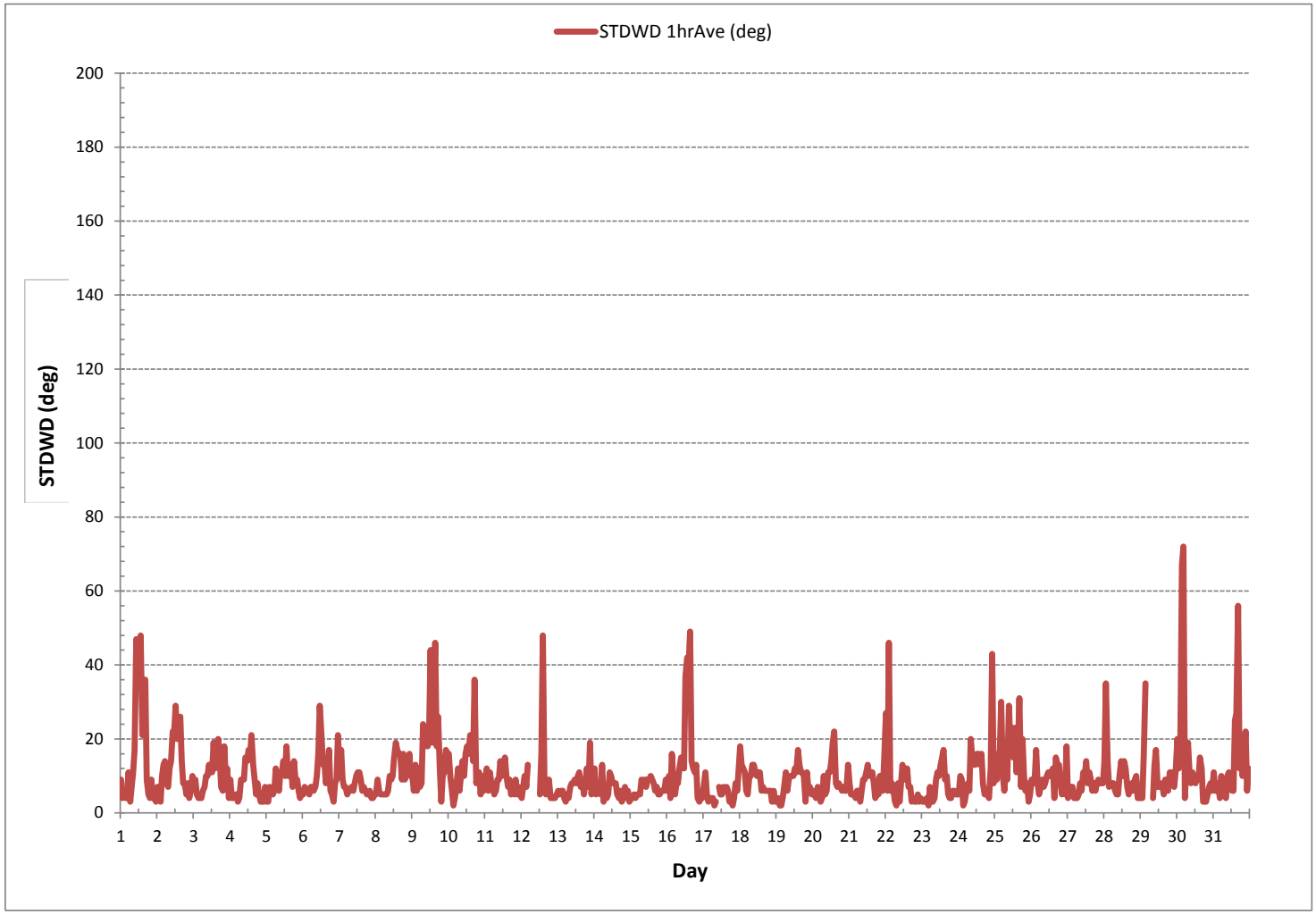
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs

OPERATIONAL TIME: 732 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

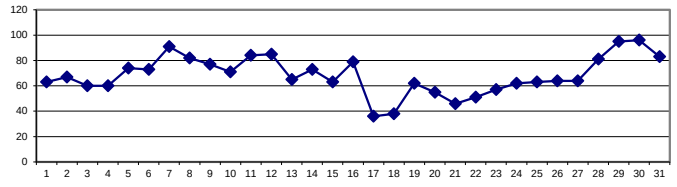
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	66	68	70	72	73	74	75	76	74	69	57	49	51	48	49	46	47	50	54	57	61	69	73	74	46	76	63	24
2	75	76	75	82	90	93	93	89	82	73	62	57	52	48	45	43	47	49	56	59	61	64	65	67	43	93	67	24
3	65	65	68	67	67	70	71	72	69	68	65	58	53	52	51	49	50	52	57	57	57	56	55	58	49	72	60	24
4	60	64	68	69	71	74	75	79	77	75	66	55	48	46	43	40	39	41	46	52	54	59	65	71	39	79	60	24
5	74	78	83	89	92	95	95	91	84	77	69	57	52	49	47	49	54	62	72	80	84	83	79	78	47	95	74	24
6	80	81	79	81	82	84	86	86	83	73	63	56	51	52	51	53	58	63	67	73	81	87	91	92	51	92	73	24
7	92	91	92	92	96	98	98	97	96	92	88	87	86	84	83	84	92	95	91	88	87	92	95	96	83	98	91	24
8	96	96	95	94	93	94	92	90	87	84	81	77	74	73	71	72	72	74	73	76	80	80	79	75	71	96	82	24
9	74	80	88	92	92	95	94	92	89	80	80	76	68	66	65	62	63	67	72	76	74	66	70	72	62	95	77	24
10	78	77	73	69	67	71	76	79	77	69	65	67	63	60	55	55	53	59	77	81	83	85	89	90	53	90	71	24
11	90	90	90	91	93	92	93	93	92	91	88	87	78	65	61	61	68	75	77	78	80	92	98	**100**	61	**100**	84	24
12	100	100	100	100	100	**P**	**P**	**P**	**P**	**P**	**P**	**P**	95	93	94	87	78	72	71	68	66	67	71	76	66	100	85	17
13	76	70	69	74	74	74	77	78	74	68	63	58	54	51	50	52	56	58	58	60	61	64	70	73	50	78	65	24
14	77	81	86	89	88	93	95	92	89	84	80	72	65	56	49	53	55	59	62	65	66	65	62	59	49	95	73	24
15	58	55	55	55	54	56	60	62	59	56	52	47	46	48	53	59	63	79	82	83	84	85	84	83	46	85	63	24
16	85	88	91	93	96	97	96	96	94	91	85	82	76	63	56	54	63	71	76	80	73	66	64	67	54	97	79	24
17	68	65	60	55	52	50	50	50	42	**P**	30	24	19	16	**15**	16	18	20	24	26	27	29	30	32	**15**	68	36	23
18	32	32	31	31	31	33	33	36	37	36	35	34	33	32	31	32	34	40	46	48	50	55	57	58	31	58	38	24
19	61	63	63	61	62	63	65	71	64	54	47	44	45	46	46	49	55	66	73	76	77	82	80	82	44	82	62	24
20	80	78	82	83	81	79	78	80	79	72	62	52	44	37	30	25	26	27	32	37	37	38	40	43	25	83	55	24
21	50	53	54	53	58	61	60	58	54	45	39	35	30	30	32	33	35	40	44	45	47	48	52	54	30	61	46	24
22	51	52	62	70	68	69	69	63	59	59	49	41	36	32	30	30	33	39	43	47	51	53	56	60	30	70	51	24
23	62	63	65	68	70	72	74	74	68	61	53	47	43	38	36	36	42	48	52	55	57	58	58	58	36	74	57	24
24	57	66	73	74	74	76	75	73	69	66	58	54	50	48	46	47	51	56	58	59	63	59	65	68	46	76	62	24
25	68	68	78	79	78	84	76	83	74	71	66	57	49	48	45	41	43	54	59	59	61	64	59	57	41	84	63	24
26	64	67	75	83	92	96	98	96	88	79	65	54	48	44	46	47	48	48	47	47	48	48	49	54	44	98	64	24
27	60	62	67	75	78	74	70	75	73	60	47	42	40	46	46	47	47	57	66	80	79	79	81	81	40	81	64	24
28	81	88	94	94	93	93	96	89	78	76	67	65	64	65	64	66	71	74	76	84	91	93	94	95	64	96	81	24
29	96	96	96	97	99	100	100	100	99	99	98	97	96	93	88	85	88	90	92	93	95	93	92	92	85	100	95	24
30	94	96	97	99	99	100	100	100	100	100	100	97	95	94	91	90	93	95	94	97	96	94	95	97	90	100	**96**	24
31	95	94	94	91	92	95	97	97	94	89	80	74	71	69	65	57	61	67	73	76	83	90	97	98	57	98	83	24
HOURLY MAX	100	100	100	100	100	100	100	100	100	100	100	97	96	94	94	90	93	95	94	97	96	94	98	100				
HOURLY AVG	73	74	77	78	79	80	81	81	77	73	65	60	57	55	53	52	55	60	64	67	68	70	71	73				

STATUS FLAG CODES

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

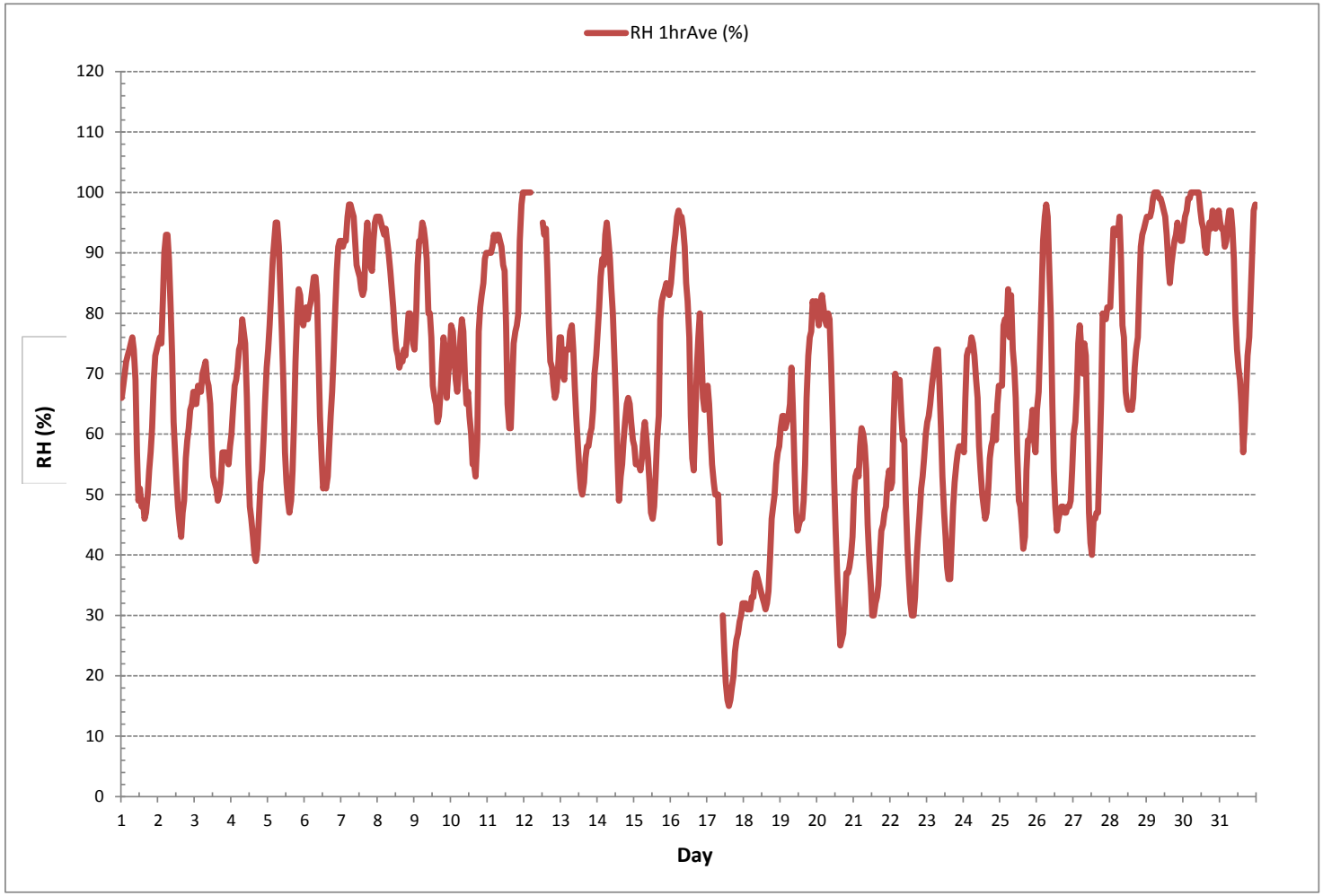
24 HR AVERAGES October 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	15	%	@ HOUR	14	ON DAY	17	
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	23	ON DAY	11	
MAXIMUM 24-HR AVERAGE:	96	%			ON DAY	30	
			OPERATIONAL TIME:			736	hrs
			AMD OPERATION UPTIME:			98.9	%
STANDARD DEVIATION:	19		MONTHLY AVERAGE:			68	%

RELATIVE HUMIDITY Hourly Averages (RH %)



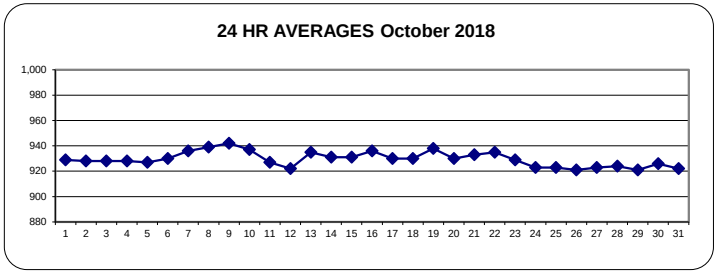
BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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

STATUS FLAG CODES

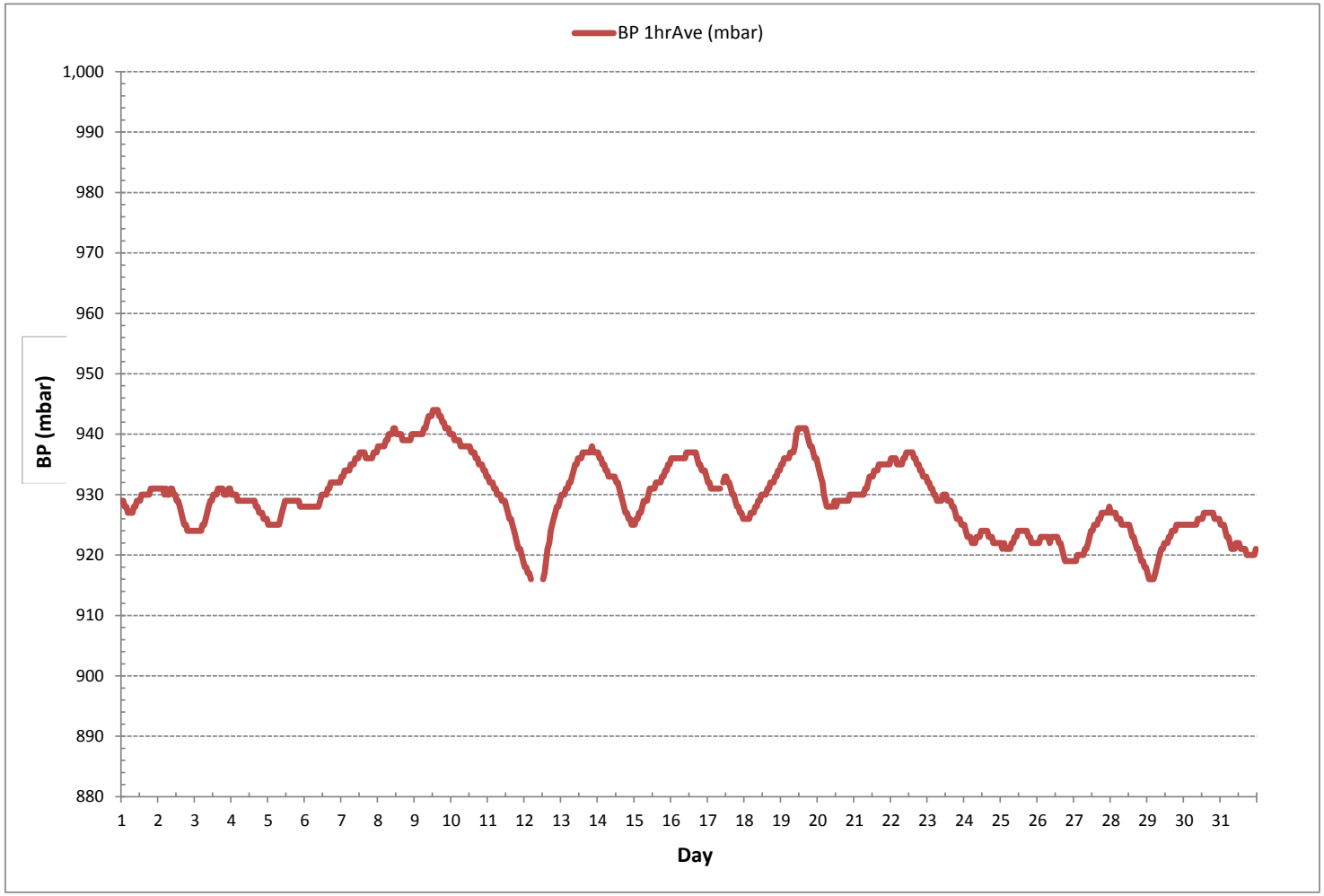
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	916	mbar	@ HOUR	4	ON DAY	12	
MAXIMUM 1-HR AVERAGE:	944	mbar	@ HOUR	12	ON DAY	9	
MAXIMUM 24-HR AVERAGE:	942	mbar			ON DAY	9	
			OPERATIONAL TIME:			736	hrs
			AMD OPERATION UPTIME:			98.9	%
STANDARD DEVIATION:	6		MONTHLY AVERAGE:			930	mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

Maxxam
A Bureau Veritas Group Company

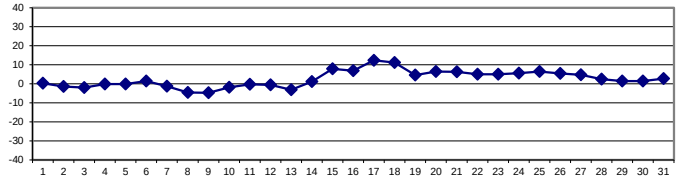
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-2.4	-2.3	-2.3	-2.4	-2.4	-2.4	-2.3	-2.1	-1.2	0.2	1.9	3.3	2.7	3.6	3.2	3.4	3.2	2.5	1.8	1.4	0.9	-0.2	-0.5	-0.5	-2.4	3.6	0.3	24
2	-0.9	-1.4	-2.0	-3.3	-4.2	-4.7	-4.4	-3.4	-2.4	-1.5	-0.5	0.1	1.1	2.0	2.2	2.6	1.4	0.5	-0.8	-1.7	-2.2	-2.8	-3.0	-3.7	-4.7	2.6	-1.4	24
3	-3.5	-3.8	-4.2	-4.1	-3.7	-3.9	-3.8	-3.4	-2.2	-1.2	-0.4	0.3	1.2	1.2	1.4	1.7	0.8	-0.5	-2.3	-3.0	-3.4	-3.4	-3.5	-4.1	-4.2	1.7	-2.0	24
4	-4.3	-4.5	-4.8	-5.0	-5.4	-5.6	-5.3	-5.0	-3.3	-2.0	0.1	2.1	4.6	5.6	6.7	7.0	6.4	5.3	3.5	1.9	1.2	0.6	-0.3	-1.3	-5.6	7.0	-0.1	24
5	-1.6	-1.8	-2.3	-3.1	-3.6	-4.0	-3.2	-2.5	-1.5	0.1	1.7	3.8	4.6	5.0	5.1	5.1	4.1	2.1	0.3	-1.2	-2.0	-2.3	-2.2	-1.9	-4.0	5.1	-0.1	24
6	-2.0	-2.4	-2.3	-2.4	-2.4	-2.5	-2.6	-2.4	-1.5	0.6	2.7	4.7	6.2	6.3	6.9	7.0	6.4	5.8	4.5	3.4	1.7	0.4	-0.4	-0.7	-2.6	7.0	1.5	24
7	-0.5	-0.2	-0.3	-0.5	-0.9	-1.1	-1.2	-1.4	-1.4	-1.3	-1.1	-0.7	-0.4	-0.2	-0.2	-0.6	-1.4	-1.8	-1.7	-1.7	-1.9	-2.6	-3.4	-3.7	-3.7	-0.2	-1.3	24
8	-3.8	-3.9	-4.3	-4.8	-5.3	-5.6	-5.7	-5.9	-5.6	-5.0	-4.0	-3.8	-3.6	-3.5	-3.3	-3.5	-3.8	-4.3	-4.6	-4.9	-5.1	-5.2	-5.2	-5.4	-5.9	-3.3	-4.6	24
9	-5.4	-6.2	-7.5	-8.4	-8.3	**-9.1**	-8.9	-7.8	-6.6	-5.2	-5.1	-4.1	-2.4	-1.9	-1.1	-0.1	-0.4	-1.4	-2.4	-3.5	-3.6	-3.4	-4.6	-4.9	**-9.1**	-0.1	-4.7	24
10	-4.8	-4.3	-4.0	-3.9	-3.7	-4.3	-4.4	-4.4	-3.8	-2.6	-1.4	-0.5	0.9	1.2	2.1	2.4	1.8	0.2	-1.2	-2.0	-2.1	-1.6	-1.6	-1.6	-4.8	2.4	-1.8	24
11	-1.7	-1.9	-2.0	-2.1	-2.2	-2.0	-2.0	-2.0	-1.8	-1.3	-0.4	0.1	1.2	2.4	2.8	2.5	1.8	1.0	0.9	0.8	0.9	0.4	0.1	0.1	-2.2	2.8	-0.2	24
12	0.3	0.5	0.7	0.9	1.0	**P**	**P**	**P**	**P**	**P**	**P**	**P**	1.8	1.6	0.5	-0.1	-1.0	-1.4	-1.8	-1.6	-2.0	-2.5	-3.0	-3.4	-3.4	1.8	-0.6	17
13	-3.9	-4.5	-5.0	-5.5	-5.9	-6.1	-6.3	-6.2	-5.3	-4.1	-2.9	-1.7	-0.7	0.0	0.4	-0.1	-1.1	-1.3	-1.4	-1.6	-1.9	-2.6	-3.3	-3.4	-6.3	0.4	-3.1	24
14	-3.9	-4.7	-5.5	-5.4	-5.0	-5.9	-6.5	-5.5	-4.0	-1.3	0.7	2.9	5.0	6.7	7.7	7.3	6.3	5.5	5.2	5.4	5.9	5.8	5.9	5.8	-6.5	7.7	1.2	24
15	5.7	6.2	6.3	6.9	7.6	7.3	6.6	6.1	7.3	8.6	9.9	11.3	11.5	11.2	10.7	9.8	9.2	7.8	7.3	7.1	6.7	6.5	6.4	6.2	5.7	11.5	7.9	24
16	5.8	5.1	4.6	4.3	4.0	3.6	3.6	3.8	4.5	5.3	6.8	7.6	8.8	11.0	12.6	13.0	11.1	9.4	8.3	7.3	7.0	6.8	6.4	5.5	3.6	13.0	6.9	24
17	4.8	4.5	4.6	5.5	5.8	5.8	5.6	5.8	8.0	**P**	13.2	15.8	18.8	20.9	**21.8**	21.8	20.3	18.3	16.4	15.4	14.7	13.8	12.7	11.6	4.5	**21.8**	**12.4**	23
18	11.5	11.0	11.0	10.6	11.0	11.2	12.1	11.5	11.8	12.6	13.2	14.3	14.7	14.9	14.1	13.7	12.4	11.0	9.5	8.7	8.1	6.9	6.3	5.6	5.6	14.9	11.2	24
19	4.7	3.9	3.4	3.4	3.3	2.9	2.2	0.8	2.4	5.0	7.4	9.0	9.6	9.6	9.7	9.2	8.0	5.6	3.9	2.7	1.9	0.9	1.0	0.6	0.6	9.7	4.6	24
20	0.7	0.7	0.4	0.3	0.5	0.8	0.8	0.8	1.3	3.0	5.1	8.2	11.4	13.5	14.7	14.7	13.9	12.4	11.1	9.3	8.5	8.4	8.0	7.3	0.3	14.7	6.5	24
21	5.0	3.9	3.9	4.0	2.9	2.2	2.6	3.1	4.3	6.8	8.3	9.5	11.0	11.4	11.3	11.2	10.4	8.7	7.3	6.3	5.6	5.5	4.7	3.9	2.2	11.4	6.4	24
22	4.4	4.3	1.9	0.3	0.2	0.0	-0.6	0.8	2.4	3.7	6.4	8.3	9.6	10.6	11.2	10.9	10.0	8.1	7.1	6.0	5.4	4.7	4.0	3.3	-0.6	11.2	5.1	24
23	2.9	2.6	2.2	1.3	0.6	0.0	-0.5	-0.5	0.9	3.0	5.6	7.5	9.3	11.2	12.0	11.8	10.4	8.0	6.5	5.8	5.4	5.1	5.1	5.0	-0.5	12.0	5.1	24
24	5.2	3.1	1.5	1.2	1.3	0.9	0.8	1.1	2.5	3.8	6.2	7.8	9.3	10.2	10.8	10.6	9.7	8.3	7.9	7.4	6.5	7.2	5.9	5.4	0.8	10.8	5.6	24
25	5.4	5.3	3.2	3.0	3.0	1.9	3.1	1.7	3.0	4.3	5.4	7.9	9.8	10.2	11.5	13.0	11.8	8.8	7.5	7.7	7.2	6.5	7.2	7.3	1.7	13.0	6.5	24
26	5.7	5.1	3.8	4.5	3.7	2.8	2.1	1.8	2.7	4.0	6.1	8.1	9.3	9.5	8.7	8.4	7.4	6.9	6.5	6.0	5.3	5.1	5.0	4.2	1.8	9.5	5.5	24
27	4.4	4.1	4.0	3.4	2.8	2.8	2.5	1.3	1.8	4.2	6.8	8.2	8.8	8.2	8.4	7.7	7.2	5.9	5.2	4.2	4.1	3.6	3.2	3.1	1.3	8.8	4.8	24
28	3.0	1.6	0.2	0.1	0.2	-0.2	-1.8	-1.2	0.5	1.4	3.2	5.2	5.5	5.8	5.9	5.2	4.4	3.9	3.7	3.1	2.6	2.4	2.2	2.2	-1.8	5.9	2.5	24
29	1.9	1.8	1.7	1.3	0.5	0.1	0.1	0.3	0.5	0.8	1.1	1.6	1.8	2.3	2.8	2.8	2.4	2.1	2.1	1.8	1.4	1.5	1.7	1.6	0.1	2.8	1.5	24
30	1.2	1.0	0.8	0.3	0.3	-0.5	-1.7	-2.8	-2.3	-0.9	0.4	1.8	2.6	3.5	4.1	4.3	3.8	3.1	2.8	2.7	2.8	2.8	2.3	1.9	-2.8	4.3	1.4	24
31	1.9	2.0	1.8	1.8	1.0	0.1	-0.6	-1.2	-0.8	0.5	2.7	4.4	4.9	5.1	6.0	6.6	5.7	4.6	3.7	3.3	3.4	3.0	2.3	2.1	-1.2	6.6	2.7	24
HOURLY MAX	11.5	11.0	11.0	10.6	11.0	11.2	12.1	11.5	11.8	12.6	13.2	15.8	18.8	20.9	21.8	21.8	20.3	18.3	16.4	15.4	14.7	13.8	12.7	11.6				
HOURLY AVG	1.2	0.8	0.3	0.1	-0.1	-0.5	-0.7	-0.6	0.3	1.4	3.3	4.8	5.8	6.4	6.8	6.8	5.9	4.7	3.8	3.1	2.7	2.3	1.9	1.6				

STATUS FLAG CODES

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

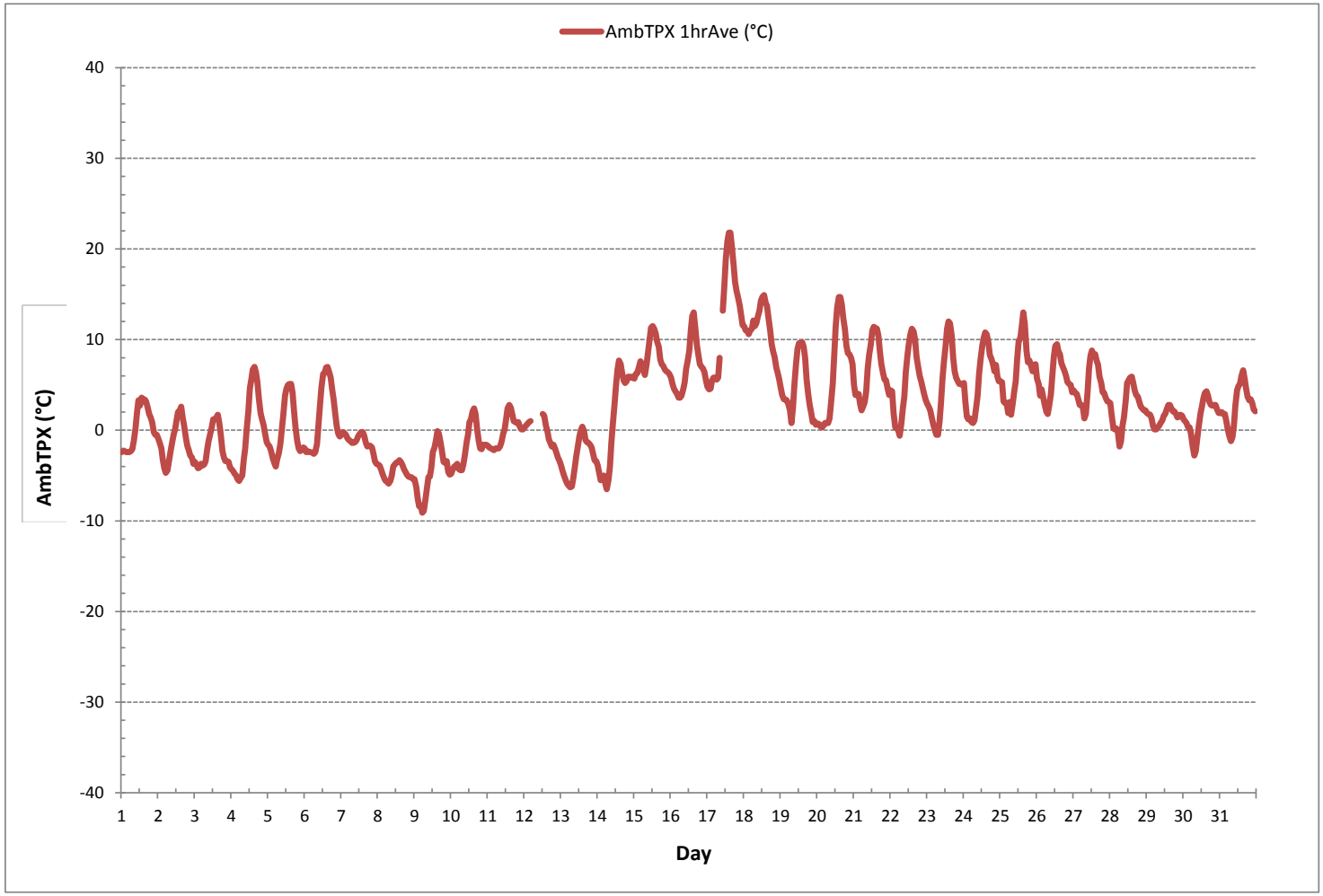
24 HR AVERAGES October 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-9.1	°C	@ HOUR	5	ON DAY	9	
MAXIMUM 1-HR AVERAGE:	21.8	°C	@ HOUR	14	ON DAY	17	
MAXIMUM 24-HR AVERAGE:	12.4	°C			ON DAY	17	
			OPERATIONAL TIME:			736	hrs
			AMD OPERATION UPTIME:			98.9	%
STANDARD DEVIATION:	5.2		MONTHLY AVERAGE:			2.6	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

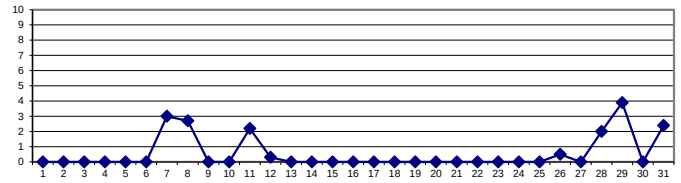
PRECIPITATION Hourly Totals (mm)

HR START (MST) / HR END (MST)	0:00 0:59	1:00 1:59	2:00 2:59	3:00 3:59	4:00 4:59	5:00 5:59	6:00 6:59	7:00 7:59	8:00 8:59	9:00 9:59	10:00 10:59	11:00 11:59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18:59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	23:00 23:59	DAILY MIN.	DAILY MAX.	24-HR SUM	RDGS.
DAY																												
1	**0.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.5	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.1	0.5	0.3	0.1	0.0	0.6	3.0	24
8	0.0	0.2	0.6	0.4	0.2	0.2	0.2	0.0	0.1	0.1	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.7	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.2	0.5	0.0	1.2	2.2	24
12	0.1	0.0	0.0	0.0	0.0	**P**	**P**	**P**	**P**	**P**	**P**	**P**	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	17
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**P**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	0.0	0.0	0.5	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	0.5	0.5	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.4	0.4	0.1	0.1	0.0	1.0	2.0	24
29	0.0	0.0	0.1	0.5	1.0	**1.5**	0.6	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	**1.5**	**3.9**	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1	0.5	0.6	0.0	1.1	2.4	24
HOURLY MAX	0.1	0.2	0.6	0.5	1.0	1.5	0.6	0.2	0.1	0.1	0.1	0.4	0.2	0.0	0.2	0.0	0.3	0.1	0.1	1.0	0.4	1.1	1.2	0.6				
HOURLY SUM	0.1	0.2	0.7	1.4	1.7	2.3	1.0	0.3	0.2	0.1	0.1	0.4	0.2	0.0	0.2	0.0	0.3	0.1	0.1	1.0	0.7	2.5	2.1	1.3				

STATUS FLAG CODES

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

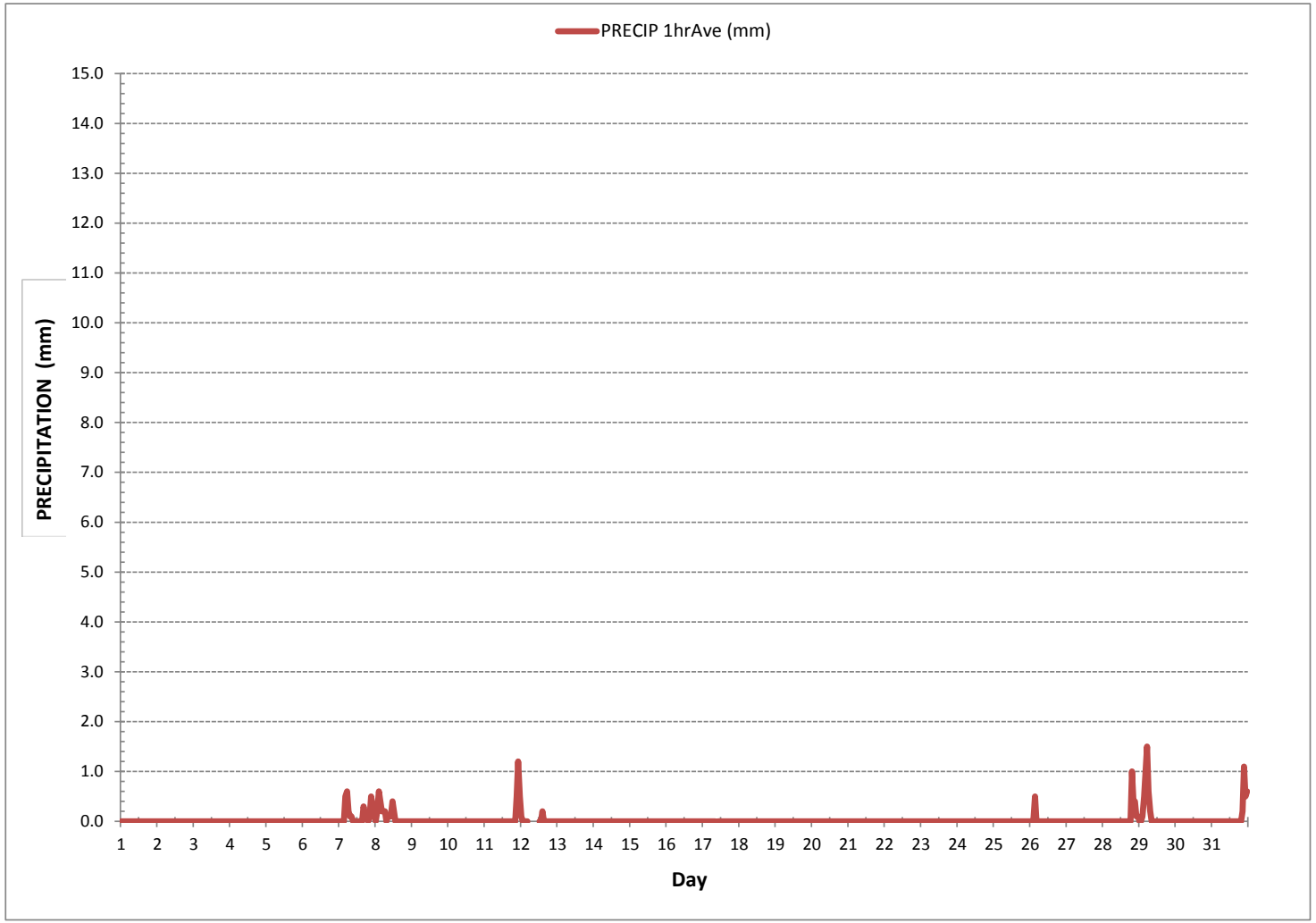
24 HR TOTALS October 2018



MONTHLY SUMMARY

MINIMUM 1-HR TOTAL:		0.0	mm	@ HOUR	0	ON DAY	1	
MAXIMUM 1-HR TOTAL:		1.5	mm	@ HOUR	5	ON DAY	29	
MAXIMUM 24-HR TOTAL:		3.9	mm			ON DAY	29	
MONTHLY TOTAL	17.0	mm						
				OPERATIONAL TIME:			736	hrs
				AMD OPERATION UPTIME:			98.9	%
STANDARD DEVIATION:		0.1		MONTHLY TOTAL:				mm

PRECIPITATION Hourly Totals (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE

Thermo 43I-TLE Sulphur Dioxide Analyzer Calibration

Date:	October 10, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	938	millibars
Company/Airshed:	LICA	**Thermometer/Station Temp:**	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	**Weather Conditions:**	A few clouds		
Parameter:	Sulphur Dioxide	**Calibration Purpose:**	routine monthly		
Start Time 24 hr. (mst):	10:51	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	16:23	**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:	September 12, 2018	**As Found C.F.:**	1.055
Previous C.F.:	1.000	**New C.F.:**	1.001

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date:	API id# 690 expires March 15, 2019
Cal Gas Cylinder I.D. # :	LL 104225
Cal Gas Conc. (ppm):	49.2

Standard Calibration Points for Ranges

Point	ppb
High	780
Mid	380
Low	190

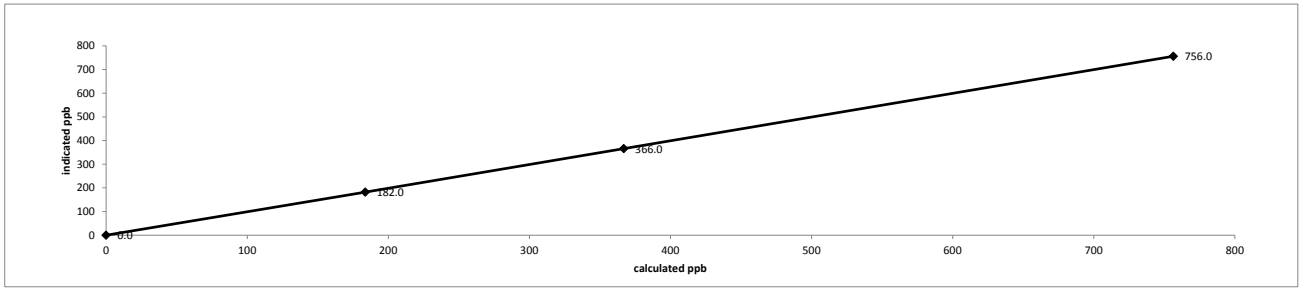
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	**Diluent**	**Cal Gas**	**Total**			
as found zero	4944	0.00	4944	0.0	0.1	n/a
as found high	4870	76.04	4946	756.4	717	1.055
adjusted zero	4944	0.00	4944	0.0	0.0	n/a
adjusted high	4870	76.04	4946	756.4	756	1.001
mid	4915	36.93	4952	366.9	366	1.002
low	4932	18.48	4950	183.7	182	1.009
calibrator zero	4946	0.00	4946	0.0	0	n/a
					Average C.F.=	1.004

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> or = 0.995**
Slope =	**0.998**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.19%**	**± 3% F.S.**
% change in C.F. from last cal=	**-5.51%**	**± 10%**

Thermo 43I-TLE Sulphur Dioxide Analyzer Calibration



As found:		As left:	
Bkg:	3.32	Bkg:	3.80
Coef:	0.991	Coef:	1.042
Pmt:	-694.9	Pmt:	-696.3
Flash:	984	Flash:	984
Internal:	29.6	Internal:	28.9
Chamber:	45.3	Chamber:	44.9
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Heater:	44.15	Perm Oven Heater:	44.14
Pressure:	675.3	Pressure:	674.7
Sample Flow:	0.443	Sample Flow:	0.443
Lamp Intensity:	0.90	Lamp Intensity:	0.90
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	642.0	Expected Value:	635.0

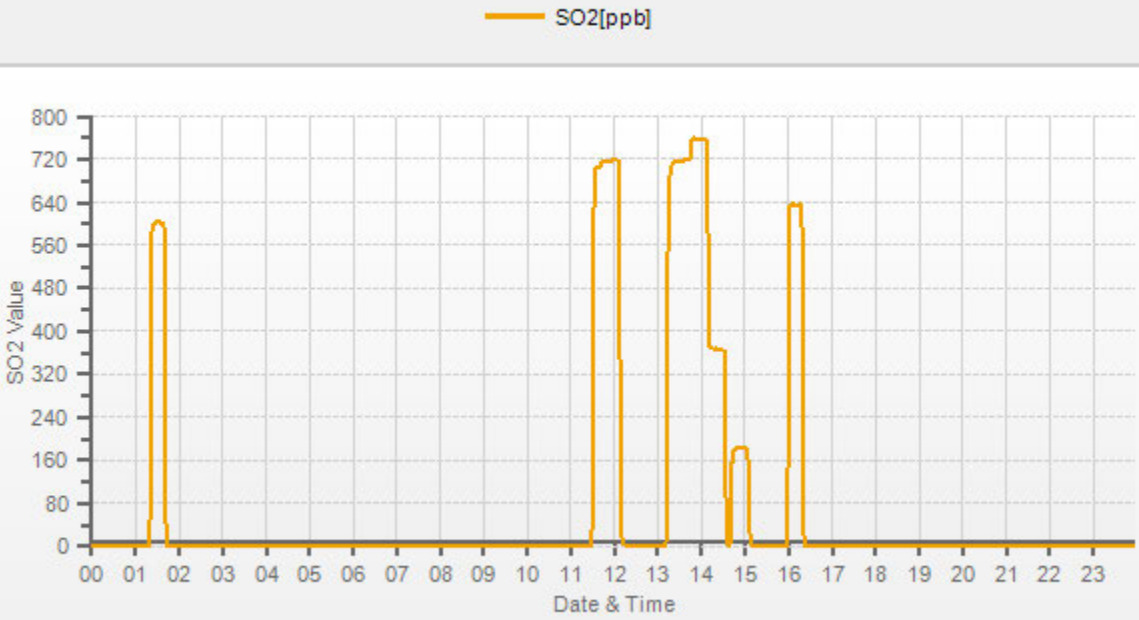
Comments:

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] Station: LICA ST. LINA Daily: 18/10/10 Type: AVG 1 Min. [1 Min.]



HYDROGEN SULPHIDE

Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	October 10, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	938	millibars
Company/Airshed:	LICA	**Thermometer/Station Temp:**	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	**Weather Conditions:**	A few clouds		
Parameter:	Hydrogen Sulphide	**Calibration Purpose:**	routine monthly		
Start Time 24 hr. (mst):	10:51	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	17:20	**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:	September 11, 2018	**As Found C.F.:**	1.005
Previous C.F.:	0.995	**New C.F.:**	0.999

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019
Cal Gas Cylinder I.D. # :	EY 0001003
Cal Gas Conc. (ppm):	9.55

Standard Calibration Points for Ranges

Point	ppb
High	78
Mid	38
Low	19

SO2 Scrubber Check (10 minutes):

Start/End Time 24 hr.:	11:06 / 11:22
SO2 Analyzer Range:	1000
Target Concentration (ppb):	780
As Found Zero:	1.5
Analyzer Response: (ppb):	1.5
Zero Corrected Result (ppb):	0.0

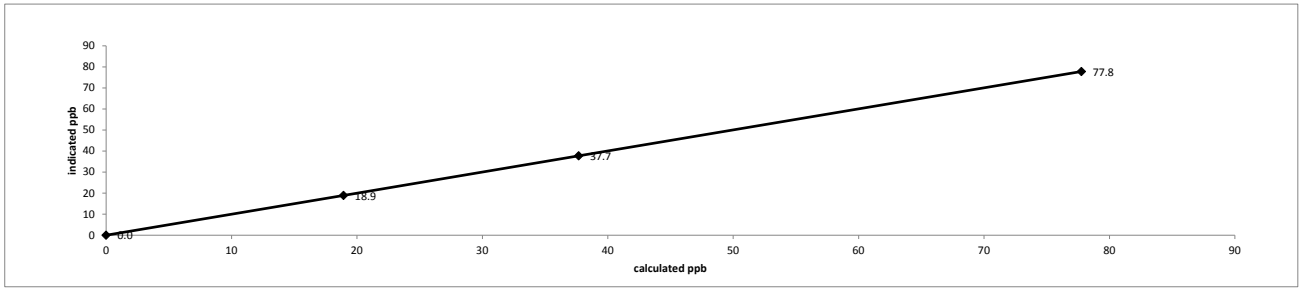
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	**Diluent**	**Cal Gas**	**Total**			
as found zero	7556	0.00	7556	0.0	1.5	n/a
as found high	7496	61.54	7558	77.8	78.9	1.005
adjusted zero	7556	0.00	7556	0.0	0.0	n/a
adjusted high	7496	61.54	7558	77.8	77.8	0.999
mid	7546	29.89	7576	37.7	37.7	0.999
low	7554	15.00	7569	18.9	18.9	1.001
calibrator zero	7556	0.00	7556	0.0	0.0	n/a
					Average C.F.=	1.000

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> or = 0.995**
Slope =	**0.999**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.03%**	**± 3% F.S.**
% change in C.F. from last cal=	**-0.97%**	**± 10%**

Thermo 450i Hydrogen Sulphide Analyzer Calibration



	As found:		As left:
Bkg:	27.2	Bkg:	29.4
Coef:	0.887	Coef:	0.898
Pmt:	-634.2	Pmt:	-634.2
Flash:	904	Flash:	904
Internal:	32.4	Internal:	31.2
Chamber:	45.3	Chamber:	45.2
Converter Temp:	324.4	Converter Temp:	323.3
Converter Set:	325.0	Converter Set:	325.0
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Htr:	44.08	Perm Oven Htr:	44.06
Pressure:	589.9	Pressure:	586.9
Sample Flow:	0.834	Sample Flow:	0.834
Lamp Intensity:	90	Lamp Intensity:	90
Averaging Time:	120	Averaging Time:	120
Expected Value:	31.5	Expected Value:	30.4

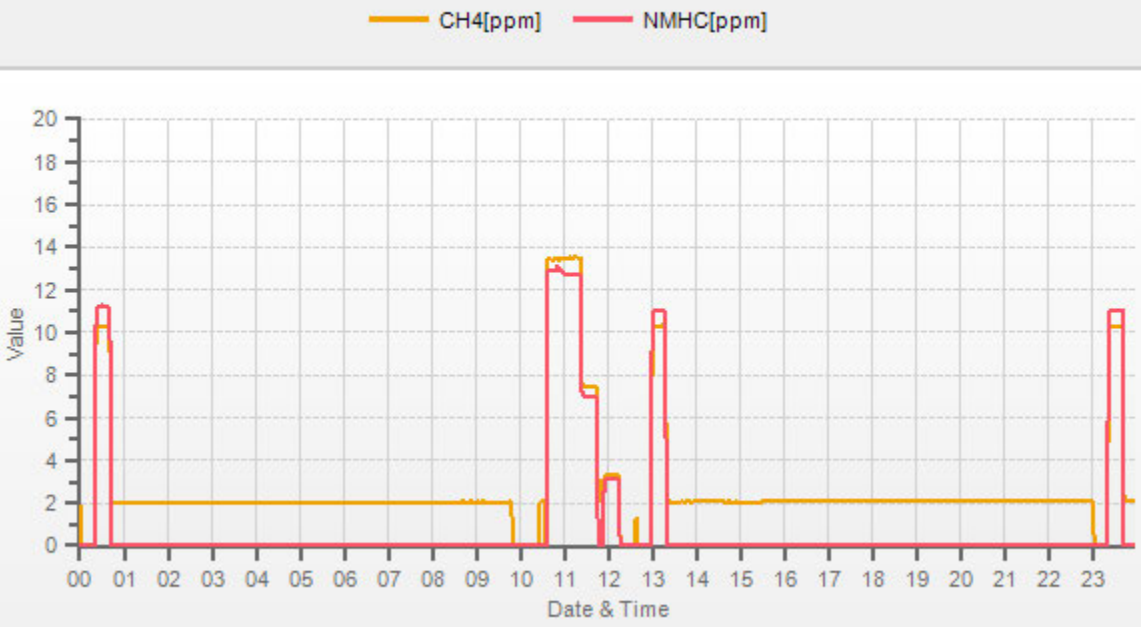
Comments:

The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

Station: LICA ST. LINA Daily: 18/10/11 Type: AVG 1 Min. [1 Min.]



Thermo 450i Hydrogen Sulphide Analyzer Calibration

Date:	October 28, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	924	millibars
Company/Airshed:	LICA	**Thermometer/Station Temp:**	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	**Weather Conditions:**	A few clouds		
Parameter:	Hydrogen Sulphide	**Calibration Purpose:**	repeat		
Start Time 24 hr. (mst):	13:37	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	18:44	**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:	October 10, 2018	**As Found C.F.:**	0.936
Previous C.F.:	0.999	**New C.F.:**	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date:	Sabio id# 11900613 expires August 22, 2019
Cal Gas Cylinder I.D. # :	EY 0001003
Cal Gas Conc. (ppm):	9.55

Standard Calibration Points for Ranges

Point	ppb
High	78
Mid	38
Low	19

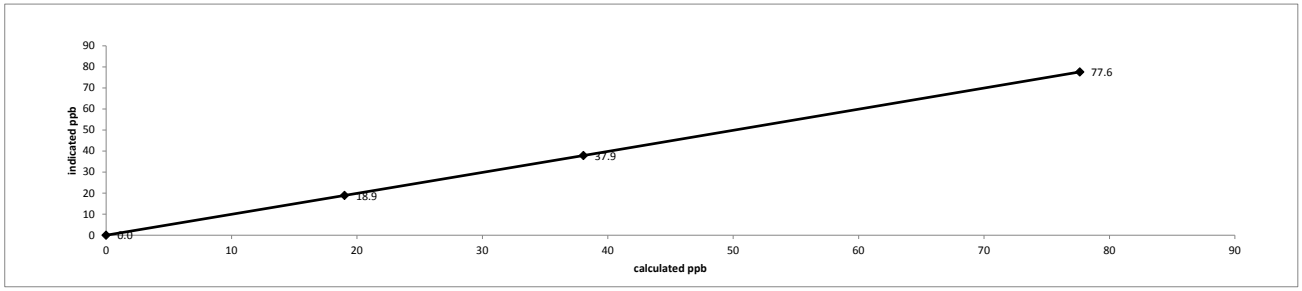
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	**Diluent**	**Cal Gas**	**Total**			
as found zero	7520	0.00	7520	0.0	1.5	n/a
as found high	7450	60.88	7511	77.4	84.2	0.936
adjusted zero	7520	0.00	7520	0.0	0	n/a
adjusted high	7460	61.14	7521	77.6	77.6	1.000
mid	7448	29.80	7478	38.1	37.9	1.004
low	7471	14.90	7486	19.0	18.9	1.006
calibrator zero	7520	0.00	7520	0.0	0	n/a
					Average C.F.=	1.003

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	**1.000**	**> or = 0.995**
Slope =	**1.000**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.07%**	**± 3% F.S.**
% change in C.F. from last cal=	**6.31%**	**± 10%**

Thermo 450i Hydrogen Sulphide Analyzer Calibration



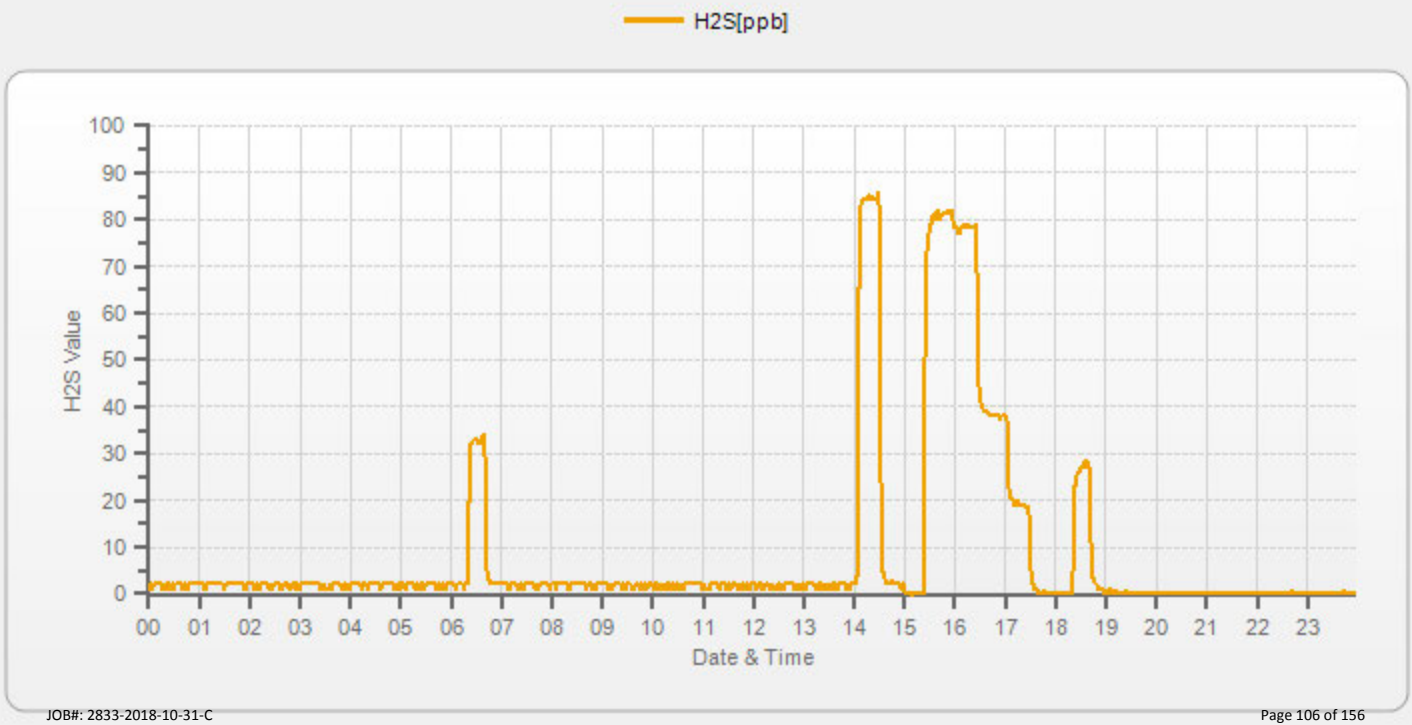
As found:		As left:	
Bkg:	29.6	Bkg:	30.3
Coef:	0.898	Coef:	0.867
Pmt:	-633.8	Pmt:	-634.2
Flash:	905	Flash:	903
Internal:	32.7	Internal:	32.5
Chamber:	45.0	Chamber:	44.9
Converter Temp:	329.3	Converter Temp:	326.0
Converter Set:	325.0	Converter Set:	325.0
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Htr:	44.09	Perm Oven Htr:	44.07
Pressure:	580.3	Pressure:	577.0
Sample Flow:	0.823	Sample Flow:	0.821
Lamp Intensity:	90	Lamp Intensity:	90
Averaging Time:	120	Averaging Time:	120
Expected Value:	30.4	Expected Value:	30.4

Comments:

The SO2 scrubber check was not performed, see comments below.
The manifold blower was found to be working normally.

A repeat calibration was completed to correct for a Zero and a Span drift.

H2S[ppb] Station: LICA ST. LINA Daily: 18/10/28 Type: AVG 1 Min. [1 Min.]



TOTAL HYDROCARBON

Thermo 55i Methane/Non-Methane Analyzer Calibration

Date:	October 11, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	929	millibars
Company/Airshed:	LICA	**Thermometer/Station Temp:**	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	**Weather Conditions:**	A few clouds		
Parameter:	CH4 / NMHC / THC	**Calibration Purpose:**	routine monthly		
Start/End Time 24 hr. (mst):	9:42 / 13:22	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	**Cal Gas Expiry Date:**	October 18, 2025		

Analyzer:

Serial Number/Owner:	1180930025	LICA
Measured Flow:	1245	
Last Calibration Date:	September 11, 2018	
Range ppm:	20 CH4/20 NMHC/40 THC	

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
CH_4 =	1.005	0.999	1.000
NMHC =	0.999	0.990	1.000
THC =	1.002	0.994	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018		
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018		
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_3H_8 Cylinder Conc.**
CH_4 expressed as C_3H_8=	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

Calibrator Flow Rates (cc/min)										Correction Factors:		
Point	**Diluent**	**Cal Gas**	**Total Flow**	**Calculated CH_4 (ppm)**	**Calculated NMHC (ppm)**	**Calculated THC (ppm)**	**Indicated CH_4 (ppm)**	**Indicated NMHC (ppm)**	**Indicated THC (ppm)**	**CH_4**	**NMHC**	**THC**
as found zero	2962	0.00	2962	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
as found high	2960	67.90	3028	13.43	12.76	26.20	13.45	12.90	26.35	0.999	0.990	0.994
adjusted zero	2962	0.00	2962	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
adjusted high	2960	67.90	3028	13.43	12.76	26.20	13.43	12.76	26.19	1.000	1.000	1.000
mid	2960	36.72	2997	7.34	6.97	14.31	7.42	7.01	14.44	0.989	0.995	0.991
low	2962	15.95	2978	3.21	3.05	6.26	3.24	3.08	6.32	0.990	0.990	0.990
calibrator zero	2962	0.00	2962	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a
									Average C.F.=	0.993	0.995	0.994

Linear Regression/Calibration Results:

	CH_4	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)=	**0.14%**	**0.10%**	**0.12%**	**± 3% F.S.**
% change in C.F. from last cal=	**0.63%**	**0.95%**	**0.78%**	**± 10%**

As Left Instrument Diagnostics:

Interface Board Voltages:	Bias Supply:	-295.9		Calibration History cnt'd:	NM Peak Area:	82132
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:	27.1			NMHV Start:	n/a
Cylinder Pressures/reg.:	Carrier:	1200	55		NMHC End:	n/a
	Fuel:	1700	56	Run History>1:	Date:	Oct 11, 2018
	Span Gas:	1000	10		Time:	10:16
	Zero Air Generator:	44			CH_4 PK HT:	0
Internal Pressures:	Carrier:	32.0			CH_4 RT:	8.0
	Fuel:	48.1			CH_4 Baseline:	3773
	Air:	36.2			CH_4 LOD:	37
FID Status:	Status:	LIT			CH_4 SD:	12
	Counts:	41600			CH_4 CONC:	0.00
	Flame:	405.0			NM PK HT:	0
	Det Base:	175.1			NM Peak Area:	0
Flame and Power Stats:	Last Power On:	Aug 23, 2018			NM CONC:	0.00
	Flameouts:	2			NM Base Start:	3720
	Det Oven at Start:	43.5			NM Base End:	3774
	Col Oven at Start:	24.8			NM LOD:	51
Calibration History:	Time:	Sep 11, 2018 / 13:58			NM Start IDX:	4
	Type:	SPAN			NM End IDX:	98
	Status:	GOOD			NM Max Slope:	2.2e+00
	Check/Adjust:	ADJUST			NM Min Slope:	-7.5e-01
	CH_4 Span Conc:	13.31			NM PT Count:	0
	CH_4 SP Ratio:	0.000715		Expected Values:	Previous CH4:	10.28
	CH_4 RT:	13.4			Previous NMHC	11.15
	CH_4 PK IDX:	27			Previous THC:	21.35
	CH_4 PK HT:	18608			New CH4:	10.30
	NM Span Conc:	12.65			New NMHC	11.01
	NM SP Ratio:	0.000154			New THC:	21.31

Comments:

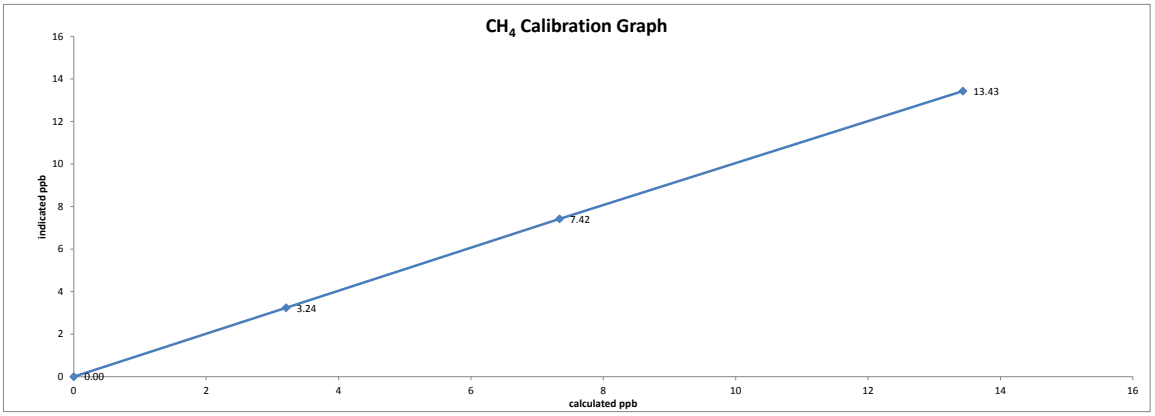
The analyzer sample inlet filter was changed.

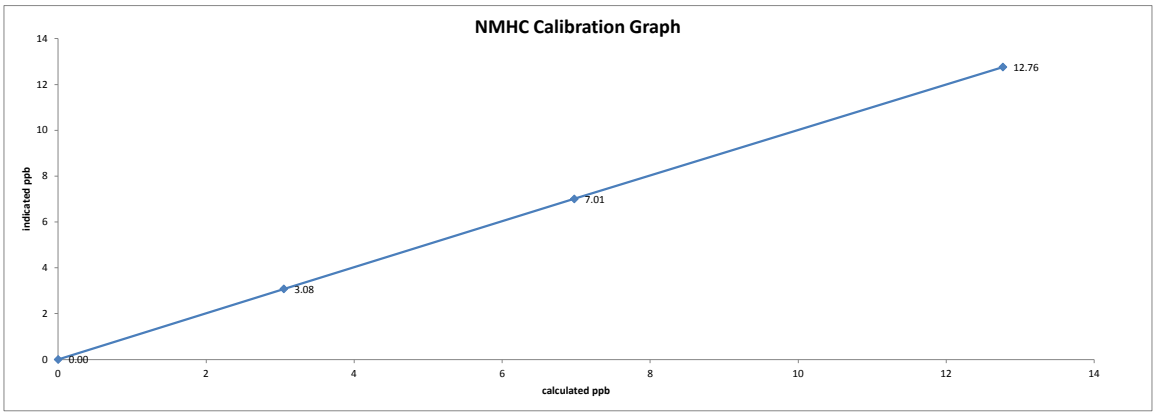
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

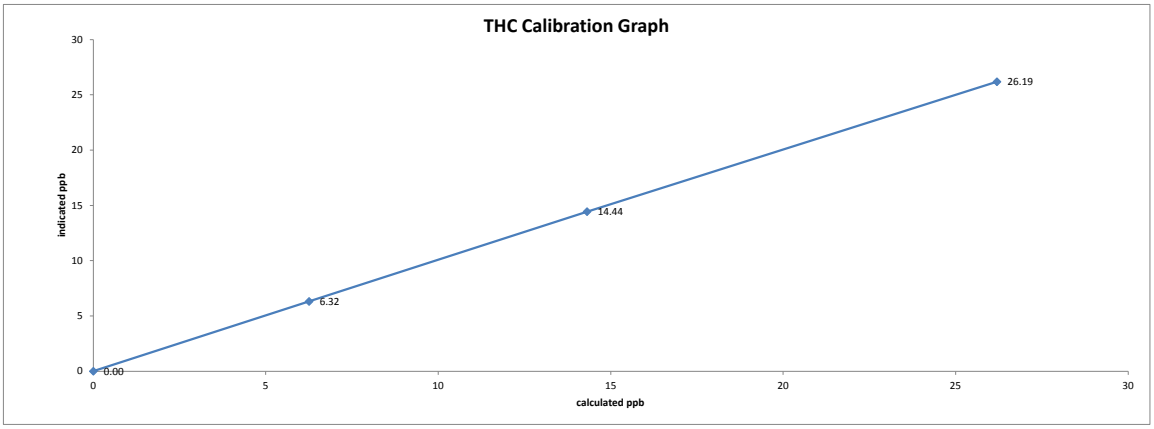
The analyzer cooling fan filter(s) were cleaned.

The manifold blower was found to be working normally.

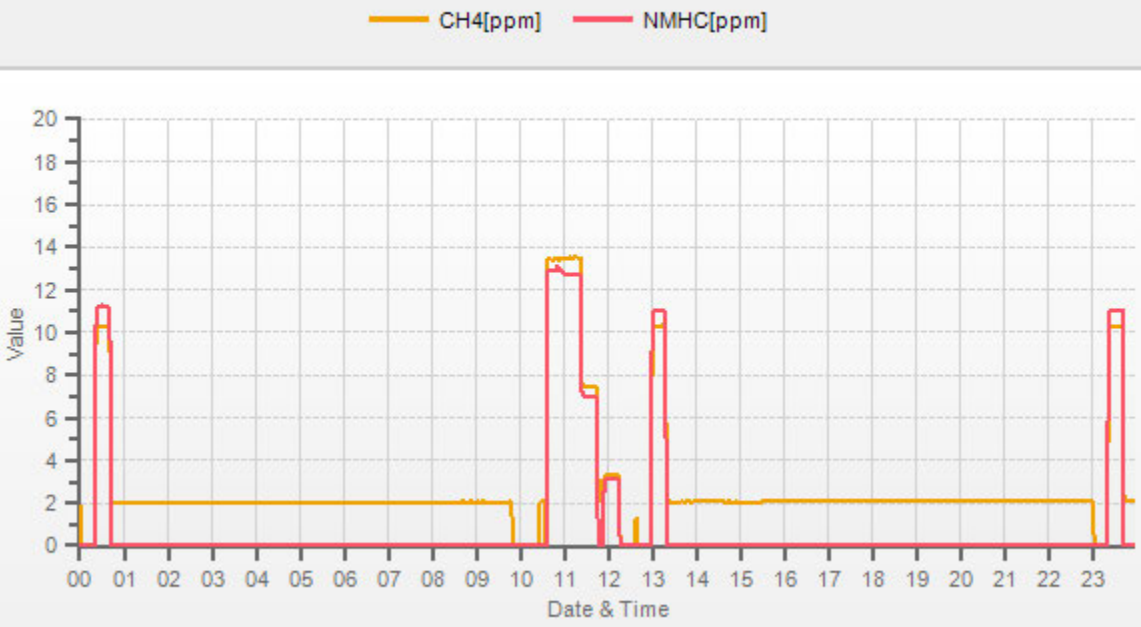
Date:	October 11, 2018	Start/End Time 24 hr. (mst):	9:42 / 13:22
Company/Airshed:	LICA	Calibration Purpose:	routine monthly
Location/Station Name:	St. Lina	Calibration Method:	Gas Dilution







Station: LICA ST. LINA Daily: 18/10/11 Type: AVG 1 Min. [1 Min.]



NITROGEN DIOXIDE

Thermo 42i NO-NO2-NOx Analyzer Calibration

Date:	October 10, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	938	millibars
Company/Airshed:	LICA	**Thermometer/Station Temp:**	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	**Weather Conditions:**	A few clouds		
Start/End Time 24 hr. (mst):	10:51 / 18:37	**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:	1180930029	LICA
Last Calibration Date:	September 12, 2018	
Range ppb:	1000	

Correction Factors:

	Previous C.F.:	As Found C.F.:	New C.F.:
NO =	1.000	0.994	1.000
NO_2 =	1.000	1.000	1.000
NOx =	1.000	0.994	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	
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

Point	Target NO (ppb)	Target NO_2 (ppb)	Cc Ozone ?
High	**780**	**500**	**n/a**
Mid	**380**	**275**	**n/a**
Low	**190**	**100**	**n/a**
Extra Point #1	**n/a**	**n/a**	**n/a**
Extra Point #2	**n/a**	**n/a**	**n/a**

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

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	**Diluent**	**Cal Gas**	**Total Flow**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**		
as found zero	4944	0.0	4944	0	0	0.1	0.1	n/a	n/a
as found high	4870	76.0	4946	791.8	793.3	797.0	798.0	0.994	0.994
adjusted zero	4944	0.00	4944	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4870	76.04	4946	791.8	793.3	792.0	793.0	1.000	1.000
mid	4915	36.93	4952	384.1	384.8	385.0	386.0	0.998	0.997
low	4932	18.48	4950	192.3	192.6	193.0	194.0	0.996	0.993
calibrator zero	4944	0.00	4944	0	0	0.0	0.0	n/a	n/a
							Average C.F.=	0.998	0.997

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

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO_2	NO drop	NO_2 gain	NO_2 C.F.
Point	**Diluent**	**Cal Gas**	**Total Flow**	**volts or ppb**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**	**(ppb)**
NOx reference	4870	76.04	4946	0.0	793.0	795.0	1.0	0.0	1.0	
as found high NO2	4870	76.04	4946	500.0	290.0	794.0	504.0	503.0	503.0	1.000
adjusted high NO2	4870	76.04	4946	500.0	290.0	795.0	504.0	503.0	503.0	1.000
gpt mid	4870	76.04	4946	275.0	520.0	794.0	274.0	273.0	273.0	1.000
gpt low	4870	76.04	4946	105.0	687.0	794.0	107.0	106.0	106.0	1.000
									Average NO_2 C.F.=	1.000

Linear Regression/Calibration Results:

	NO	NOx	NO_2	LIMITS
Correlation Coefficient =	**1.000**	**1.000**	**1.000**	**> or = 0.995**
Slope =	**1.000**	**1.001**	**1.002**	**0.95-1.05**
b (Intercept as % of full scale)=	**0.04%**	**0.08%**	**0.06%**	**± 3% F.S.**
% change in C.F. from last cal=	**0.64%**	**0.58%**	**0.00%**	**± 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:	5.3	NOx Bkg:	5.3
NO Coef:	1.155	NO Coef:	1.048
NO2 Coef:	1.000	NO2 Coef:	0.995
NOx Coef:	1.001	NOx Coef:	1.000
PMT:	-824.0	PMT:	-824.0
Internal:	27.4	Internal:	26.6
Chamber:	50.1	Chamber:	50.6
Cooler:	-3.0	Cooler:	-2.7
NO2 Converter:	325.3	NO2 Converter:	326.3
NO2 Converter Set:	325.0	NO2 Converter Set:	325.0
Perm Oven Gas:	45.01	Perm Oven Gas:	45.01
Perm Oven Heater:	44.16	Perm Oven Heater:	44.15
Pressure:	256.3	Pressure:	256.6
Flow:	0.538	Flow:	0.536
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	5	Expected Value NO:	5
Expected Value NO2:	458	Expected Value NO2:	455
Expected Value NOx:	464	Expected Value NOx:	459

Comments:

The converter cooling fan filter was cleaned.

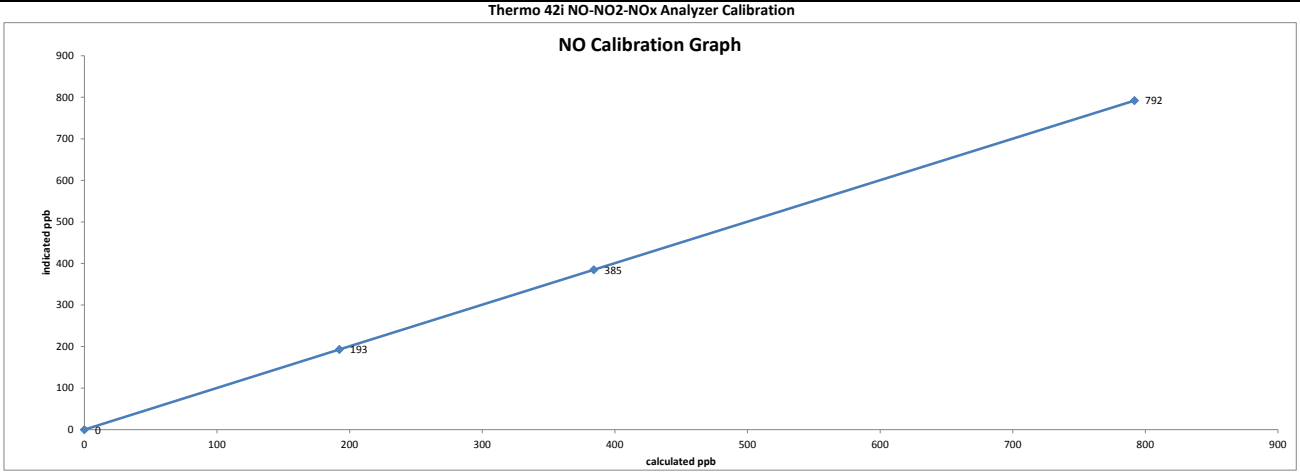
The analyzer sample inlet filter was changed.

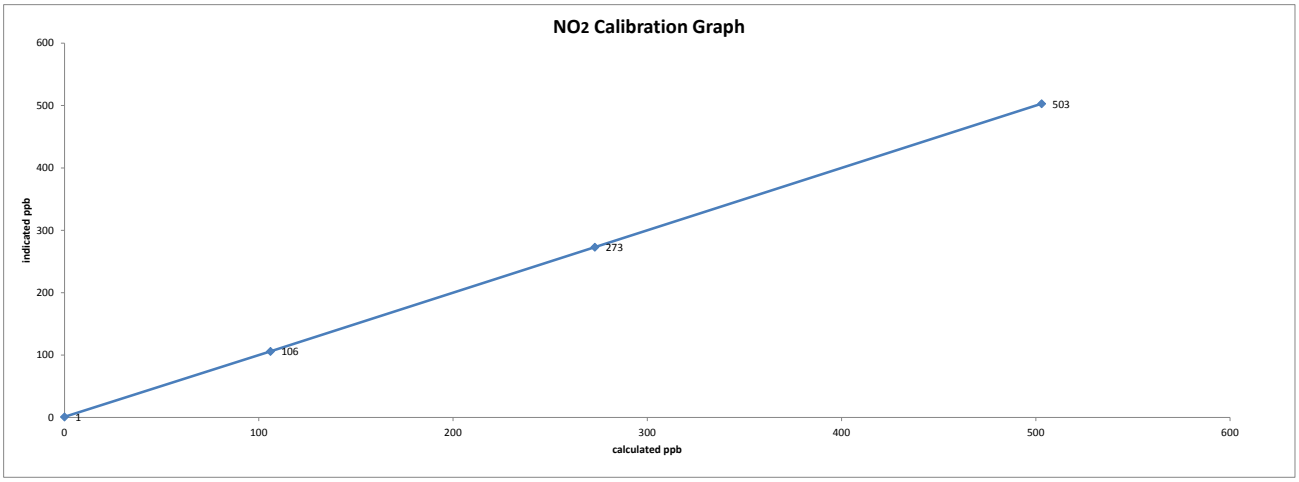
The manifold blower was found to be working normally.

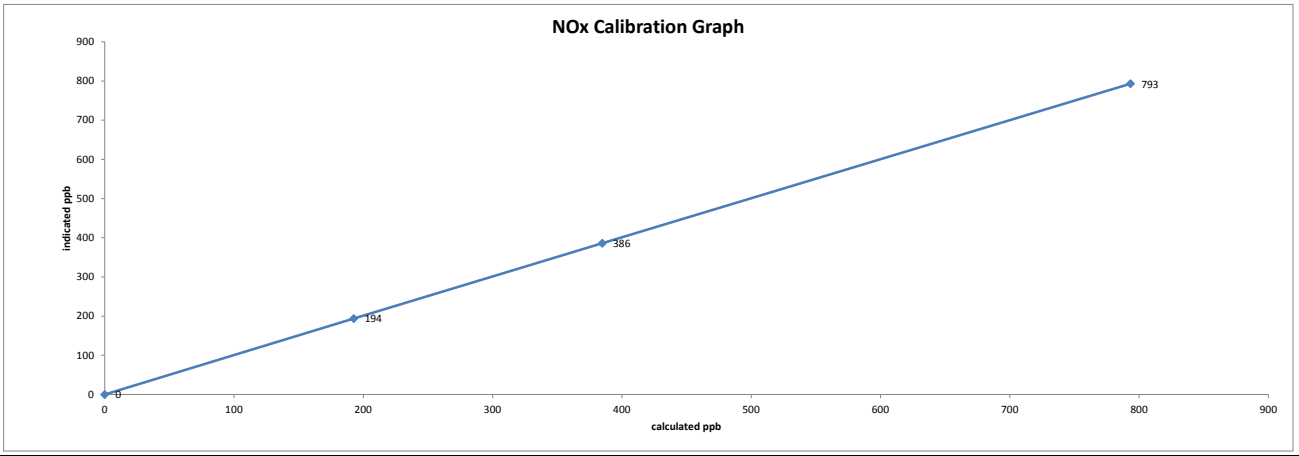
The analyzer cooling fan filter(s) were cleaned.

Date:	**October 10, 2018**	**Start/End Time 24 hr. (mst):**	**10:51 / 18:37**
Company/Airshed:	**LICA**	**Calibration Purpose:**	**routine monthly**
Location/Station Name:	**St. Lina**	**Calibration Method:**	**Gas Dilution & Gas Phase Titration**

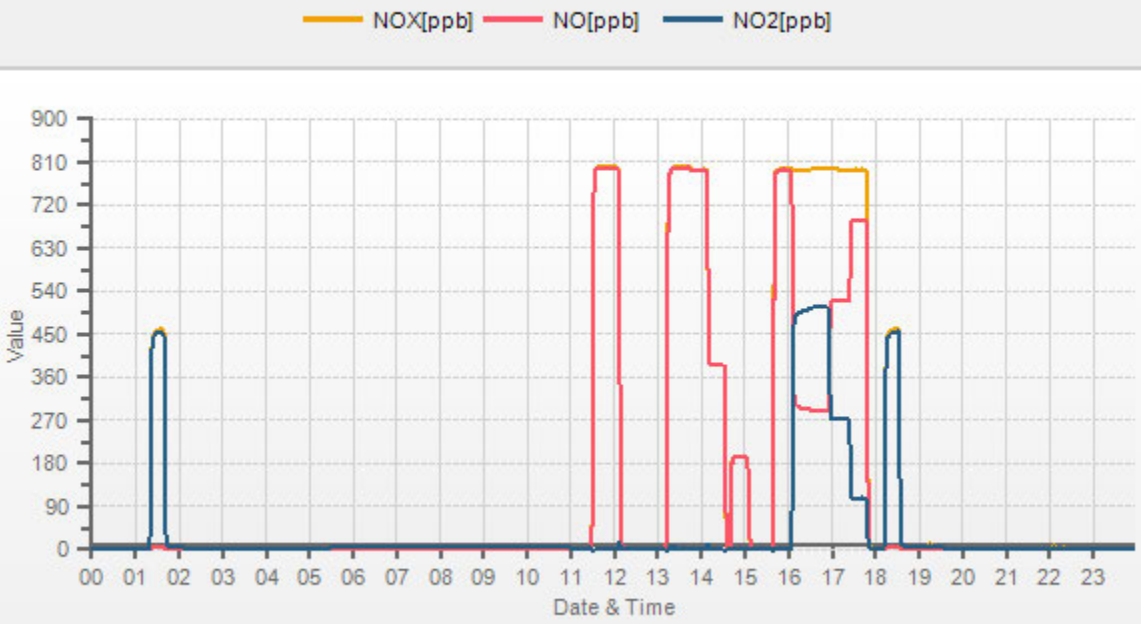
Thermo 42i NO-NO2-NOx Analyzer Calibration







Station: LICA ST. LINA Daily: 18/10/10 Type: AVG 1 Min. [1 Min.]



OZONE

Thermo 49i Ozone Analyzer Calibration

Date:	October 11, 2018	**Barometer/B.P./units:**	F.S. 05544 expires January 15, 2019	929	millibars
Company/Airshed:	LICA	**Thermometer/Station Temp:**	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	**Weather Conditions:**	A few clouds		
Start/End Time 24 hr. (mst):	9:43 / 15:33	**Calibration Purpose:**	routine monthly		
Ozone Calibration Method:	Varying UV Lamp Power	**Performed By/Reviewer:**	Alex Yakupov	Rob Fisher	
G.P.T. Date:	n/a-done by Varying UV Lamp Power	**Cal Gas Expiry Date:**	n/a-done by Varying UV Lamp Power		

Analyzer:

Serial Number/Owner:	1002240371 LICA	**Ozone Range ppb:**	500
Last Calibration Date:	September 12, 2018	**As Found C.F.:**	0.989
Previous Cal High Point C.F.:	1.000	**New C.F.:**	1.000

Calibration Standards:

Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
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

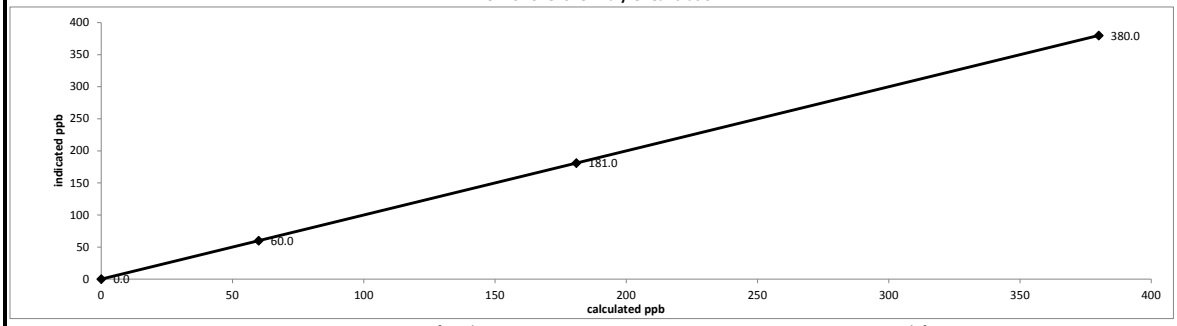
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	**Total Flow @ Point Start**	**Total Flow @ Point Finish**	**(ppb)**	**(ppb)**	**(ppb)**	
as found zero	5000	5000	0.0	n/a	-0.3	n/a
as found high	5000	5000	380.0	380.0	384.0	0.989
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	181.0	181.0	181.0	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:

		LIMITS
Correlation Coefficient =	**1.000**	**> 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=	**1.12%**	**± 10%**

Thermo 49i Ozone Analyzer Calibration

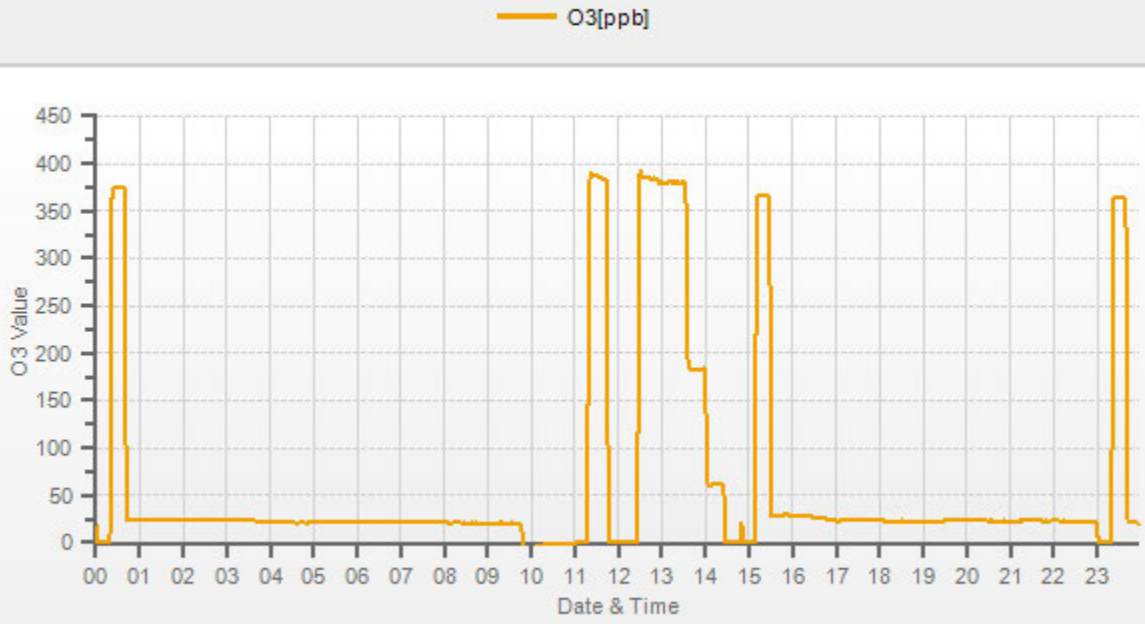


	As found:		As left:
O3 Bkg:	-0.3	O3 Bkg:	-0.4
O3 Coef:	1.019	O3 Coef:	1.010
Photo Lamp	10.7	Photo Lamp	10.7
O3 Lamp	8.2	O3 Lamp	8.2
Bench:	27.4	Bench:	26.7
Bench Lamp:	53.6	Bench Lamp:	53.6
O3 Lamp:	67.7	O3 Lamp:	67.7
Pressure:	680.6	Pressure:	678.5
Cell A lpm:	0.731	Cell A lpm:	0.730
Cell B lpm:	0.776	Cell B lpm:	0.780
O3 ppb:	-2.8	O3 ppb:	0.4
Cell A ppb:	2.1	Cell A ppb:	0.0
Cell B ppb:	-7.6	Cell B ppb:	0.4
Cell A int (Hz):	74393	Cell A int (Hz):	74415
Cell B int (Hz):	93638	Cell B int (Hz):	93667
Expected Value:	369.0	Expected Value:	366.0

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.

O3[ppb] Station: LICA ST. LINA Daily: 18/10/11 Type: AVG 1 Min. [1 Min.]



PARTICULATE MATTER

Thermo 5030i SHARP Monitor Monthly Audit

Date:	October 11, 2018	**Performed By/Reviewer:**	Alex Yakupov / Robert Fisher
Company:	LICA	**Start Time (mst):**	12:56
Station Name/Location:	St Lina	**End Time (mst):**	13:52
Previous Audit Date:	September 19, 2018	**Calibration Purpose:**	Monthly
Parameter:	PM 2.5	**Weather Conditions:**	A few clouds

SHARP 5030i Information and Status:

Serial Number:	CM17091001	**Filter Tape Counter**	461 / 0

Reference Standards:

	Air Flow			
	Manometer	**Orifice**	**Pressure:**	**Temp / RH:**
Make:	Dwyer	Chinook	Fisher Scientific	Fisher Scientific
Model:	475 Mk.III	CHN0901	FB 1291	11-661-7A, 11745843
Serial Number:	#3	#2	130168457 / 05544	170286131
Calibration Date:	January 9, 2019	April 24, 2019	January 15, 2019	April 19, 2019

Ambient Temperature (°C)

	Reference	SHARP	Difference
#1	2.62	2.6	0.0

Range	Action
< ± 2°C	OK
2-3 °C	Recalibrate
> 3°C	*Fail*

Ambient Relative Humidity (%RH)

As Found:

	Reference	SHARP	Difference
#1	69.90	70.4	-0.5

Range	Action
< ± 2 %RH	OK
2-5 %RH	Recalibrate
> 5 %RH	*Fail*

Barometric Pressure (mmHg)

As Found:

	Reference	SHARP	Difference
#1	695.3	697.5	-2.2

Range	Action
< ± 10 mmHg	OK
10-12 mmHg	Recalibrate
> 12 %RH	*Fail*

Flow Audit (L/min)

As Found:

	Reference	SHARP			
#1	16.74	16.79	% Difference	0.199840128	
#2	16.62	16.64			
#3	16.68	16.71			
Average	16.68	16.71			

Range	Action
< ± 4%	OK
4-5%	Recalibrate
>5%	*Fail*

Leak Check (L/min)

	Without Leak Check Adapter			With leak Check Adapter			
	Reference	**SHARP**	**Difference**	**Reference**	**SHARP**	**Difference**	
#1	16.68	16.71	-0.03	16.62	16.64	-0.02	*Leak Limit: 0.08 L/min*
					LEAK RATE:	**0.01**	

WIND SYSTEM

Met One Instruments

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.: L22618
Calibration Date: 05/25/2017

QC Inspection Chris Pal

Instrument Condition Within Tolerance: As Found ___ As Left X
Corrective Action: No Adjustment ___ Adjust X Repair ___
Preventative Maintenance ___

As Found Test Date: N/A As Left Test Date 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 Acquition	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 CHECK

Meteorological System Checklist

Date:	October 11, 2018		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	St. Lina		
Unit:	**Make:**	**Model:**	**Serial #:**
Precipitation Sampler:	Met One - Heated Rain Gauge	Part 387	n/a

PRECIPITATION SENSOR CHECK

Checklist:	Reply:	Comments:
Previous check date:	June 26, 2018	n/a
Is the sensor Level?	yes	n/a
Is the heater operating properly?	yes	n/a
Are the bucket drain holes clean?	yes	cleaned
Is the screen on the housing? (screen should be on between July and September	no	The screen has been removed for Winter season
Is the housing clean?	yes	cleaned
Is the area around the housing clean and free from obstacles?	yes	n/a

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

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

CALIBRATORS

Alberta Government

Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2018-559A

Company: Maxxam **Operator:** Chris W

Calibrator:				Flow Measurement Device:	
Make/Model	API 700			Make/Model	Mesa Defender 530
Serial Number	690			Serial Number	L-153351 H-152571
Last Verification Date	March 2016			Temperature (°C)	23.5 C
NO Cylinder S/N	LL108015			Barometric Pressure	695 mmHg
NO [PPM]	52.2	NOx [PPM]	52.3		
Expiry Date	Oct 2020				

Dilution Flow (sccm)

Pt. #1 5000 Pt. #2 5000 Pt. #3 5000

Gas Flow (sccm)

Pt. #1 80 Pt. #2 40 Pt. #3 20

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO_2	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
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)*

NO		LIMITS	NOx	
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_3 Conc	NO Decrease	NO	NO2	NOX	% Diff. Vs Audit gas	
4959	0.000	0.000	0.790	-0.001	0.789	NO_2	% 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)*

NO_2		LIMITS
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9946	0.90-1.10
b (Intercept % of FS)=	-0.1817	± 3% F.S.

AENV Standards Audit Calibrator		NO_X Analyzer	
Make/Model	Teco 146i	Make/Model	Teco 42i
Serial/AMU Number	AMU 1809	Serial/AMU Number	AMU 1868
SRM Gas Cylinder No.	APEX1170572	Last Calibration Date	March 14, 2018
Cylinder Conc. (ppm)	49.99	Full Scale (ppm)	1.0
		Cylinder Gas Expiry Date	November 2020

COMMENTS: Cylinder contains 47.9 ppm SO2.

Auditor: Al Clark Date: March 15, 2018

Operator Signature: Location: McIntyre Center Edmonton

Alberta Government

Calibrator Performance Audit

Oxides Of Nitrogen

File No. 2018-133A

Company Maxxam **Operator:** Mike

Calibrator:			**Flow Measurement Device:**	
Make/Model	Sabio		Make/Model	Bios Definer 220
Serial Number	11900613		Serial Number	H=128686; L=129069
Last Verification Date	March 16, 2018		Temperature (°C)	22.9 C
NO Cylinder S/N	LL104183		Barometric Pressure	698 mmHg
NO [PPM]	50.8 NOx [PPM]	50.9		
Expiry Date	October 24, 2020			

Dilution Flow (sccm)

Pt. #1 5059 Pt. #2 5073 Pt. #3 5073

Gas Flow (sccm)

Pt. #1 77.5 Pt. #2 38.2 Pt. #3 19.1

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO_2	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)*

NO		**LIMITS**	**NOx**	
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_3 Conc	NO Decrease	NO	NO2	NOX	% Diff. Vs Audit gas	
						NO_2	% Diff. Limit
5059	0.0	0.0000	0.7741	0.0000	0.7741		
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)*

NO_2		**LIMITS**
Correlation=	1.0000	**≥ 0.995**
m (Slope)=	0.9998	**0.90-1.10**
b (Intercept % of FS)=	0.0173	**± 3% F.S.**

AENV Standards		**NO_X Analyzer**	
Audit Calibrator			
Make/Model	Thermo 146i	Make/Model	Thermo 42i
Serial/AMU Number	1809	Serial/AMU Number	1868
SRM Gas Cylinder No.	APEX1170572	Last Calibration Date	August 16, 2018
Cylinder Conc. (ppm)	49.99	Full Scale (ppm)	1.0
		Cylinder Gas Expiry Date	November 15, 2020

COMMENTS:

Auditor: Shea Beaton Date: August 22, 2018

Operator Signature: Location: McIntyre Center Edmonton

CALIBRATION GASES

Alberta Government

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	Gas Flow/	Concentration	Cylinder
Dilution	Gas	Concentration (PPM)	Dilution Flow	Factor	Concentration
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:	**47.9**

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 [X]

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder [ ]

Auditor: Al Clark Date: December 13, 2017

Operator Signature: Al Clark Location: McIntyre Center Edmonton

Form No. F-GAS-002
Version No. 1.1

Alberta Government

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:	**9.58**

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

Meets Manufacturer Tolerance. Use manufacturers stated concentration [X] **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: Location: McIntyre Center Edmonton

Alberta Government

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:

Make/Model	R&R MFC 201		
Serial Number	AMU 1690		
Last Verification Date	December 13, 2017		
Gas Type	CH4	Conc.	990.4
Cylinder Number	5604875	Expiry Date	July 2021
Gas Type	C3H8	Conc.	246.5
Cylinder Number	XF003845B	Expiry Date	July 2022

Flow Measurement Device:

Make/Model	Mesa Definer 220
Serial Number	H-133034 / L-132702
Temp.°C	23.1 C
B.P.	707 mmHg

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 (sccm)		Indicated Conc. (ppm)		Gas Flow/	Concentration	Cylinder Concentration	
Dilution	Gas	CH4	C3H8	Dilution Flow	Factor	CH4	C3H8
3500	0.0	0.00	0.00				
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:	**601**	**209**

	CH4	**C3H8**
Previous Stated Concentration PPM:	599	207
Percent variance from Stated:	**0**	**1**

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration [X] **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: Location: McIntyre Center Edmonton

Alberta Government

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:

Make/Model	Teco 146i		
Serial Number	AMU 1809		
Last Verification Date	December 13, 2017		
Gas Type	NO	Conc.	50.03
Cylinder Number	APEX 1223938		
Expiry Date	June 2020		

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 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/	Concentration	Cylinder Concentration	
Dilution	Gas	NO	NOX	Dilution Flow	Factor	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:	**51.3**	**51.1**

	NO	NOx
Previous Stated Concentration PPM:	51.5	51.6
Percent variance from Stated:	**0**	**1**

Cylinder gas tolerances based on NO only

Meets Manufacturer Tolerance. Use manufacturers stated concentration [X] **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

APPENDIX III
MAXIMUM INSTANTANEOUS DATA

SULPHUR DIOXIDE Instantaneous Maximum (SO_2 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	0	0	1	1	1	0	0	0	1	0	24
2	0	0	0	0	0	0	0	0	1	S	1	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	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	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	24
5	0	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	24
6	1	1	1	1	1	S	0	0	0	1	1	1	2	1	1	1	1	0	1	0	0	0	0	0	0	2	1	24
7	0	0	0	0	S	1	0	1	1	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	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	24
10	0	S	0	0	0	0	0	0	1	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	1	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	0	S	0	0	0	24
12	0	0	0	0	0	P	P	P	P	P	P	P	P	X	0	0	0	0	0	0	0	0	S	0	0	0	0	15
13	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
14	0	0	0	0	0	0	0	0	1	0	0	1	2	2	0	0	0	0	2	2	S	1	0	0	0	2	1	24
15	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
16	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	S	0	0	0	0	1	0	1	0	24
17	0	0	1	1	1	0	0	0	1	P	P	1	0	0	1	2	4	S	6	3	1	1	1	1	0	6	1	22
18	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	2	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	24
20	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	1	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	0	S	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	2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24
24	0	0	0	0	0	0	1	1	1	0	S	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	24
25	0	0	0	0	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
26	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	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	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	24
29	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
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	24
31	0	0	0	S	1	0	0	0	0	0	0	0	0	1	2	1	1	3	3	2	1	0	0	0	0	3	1	24
HOURLY MAX	2	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	4	3	6	3	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				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	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

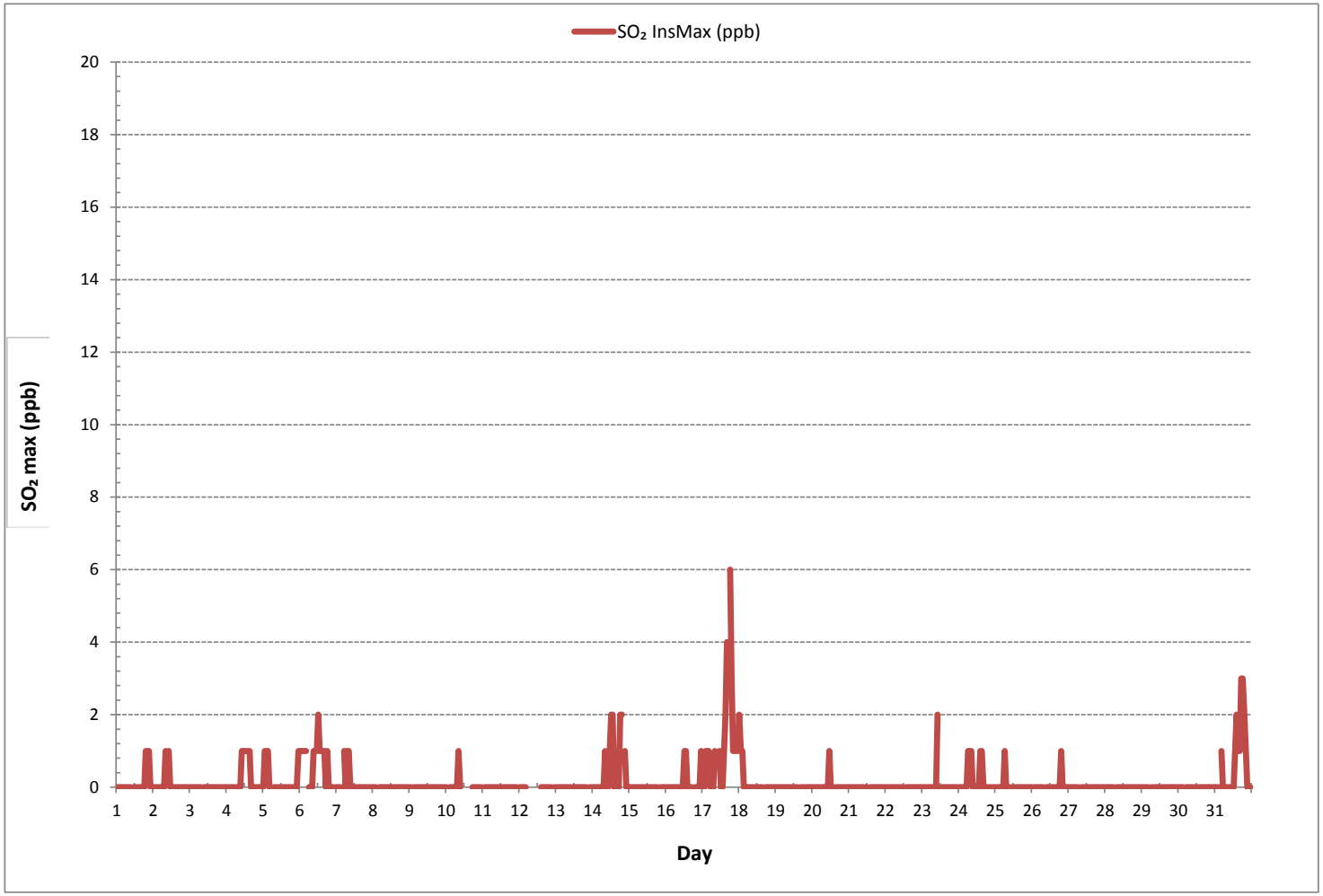
NUMBER OF NON-ZERO READINGS: 78

MAXIMUM INSTANTANEOUS VALUE: 6 ppb @ HOUR 18 ON DAY 17

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 7 hrs
STANDARD DEVIATION: 0

OPERATIONAL TIME: 733 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO_2 ppb)



HYDROGEN SULPHIDE Instantaneous Maximum (H_2S ppb)

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

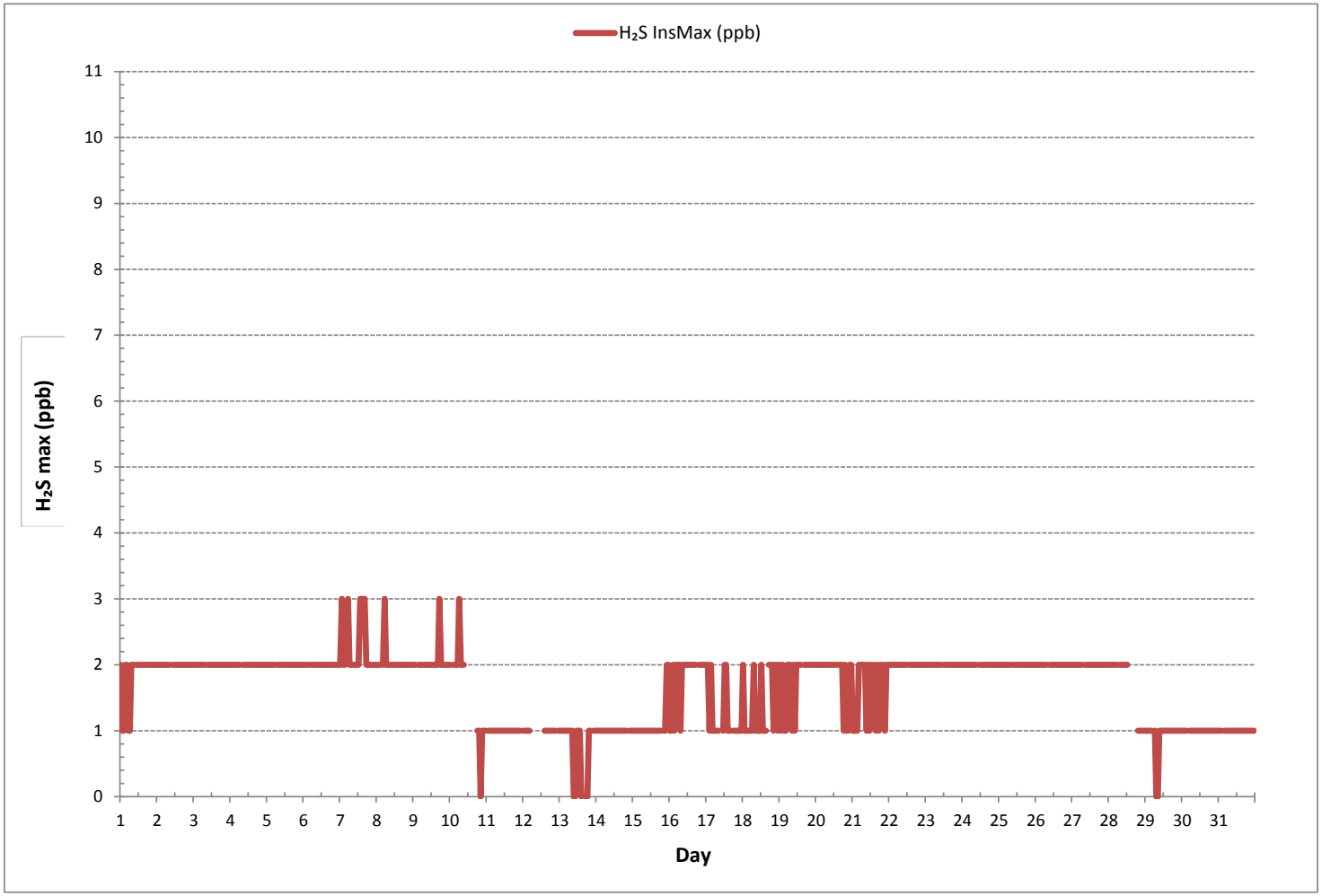
NUMBER OF NON-ZERO READINGS: 677

MAXIMUM INSTANTANEOUS VALUE: 3 ppb @ HOUR 1 ON DAY 7

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 8 hrs
STANDARD DEVIATION: 1

OPERATIONAL TIME: 727 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H_2S 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	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.20	2.33	2.33	2.50	2.50	2.45	2.47	2.47	2.47	2.36	S	2.05	2.04	2.04	2.03	2.09	3.19	2.06	2.03	2.02	2.03	2.04	2.04	2.04	2.02	3.19	2.25	24
2	2.04	2.05	2.03	2.03	2.01	2.02	2.02	2.00	1.99	S	2.00	X	2.01	2.04	2.02	2.05	2.04	2.16	2.17	2.04	2.09	2.00	1.99	1.98	1.98	2.17	2.03	23
3	2.45	2.10	1.98	2.09	2.00	1.99	1.98	1.99	S	2.02	2.07	2.27	2.19	1.97	1.98	1.99	2.00	1.96	1.98	2.01	2.16	2.13	2.21	2.13	1.96	2.45	2.07	24
4	2.12	2.11	2.27	2.15	2.49	2.17	2.30	S	2.32	2.34	2.40	2.37	2.36	2.20	2.15	2.06	1.99	1.99	2.00	2.02	2.03	2.02	2.05	2.06	1.99	2.49	2.17	24
5	2.05	2.04	2.05	2.06	2.07	2.08	S	2.16	2.34	3.35	3.22	3.32	2.13	2.15	2.17	2.31	2.53	2.04	1.98	2.01	2.03	2.09	2.09	2.26	1.98	3.35	2.28	24
6	2.31	2.25	2.28	2.36	2.26	S	2.37	2.30	2.22	2.17	2.21	2.33	2.30	2.19	2.10	2.04	2.03	2.27	2.11	2.11	2.32	2.14	2.20	3.08	2.03	3.08	2.26	24
7	2.76	2.16	2.13	2.18	S	2.20	2.20	2.18	2.31	2.09	2.09	2.08	2.09	2.09	2.05	2.11	2.04	2.04	2.03	2.02	2.00	2.00	1.99	2.01	1.99	2.76	2.12	24
8	2.00	2.02	2.01	S	2.01	2.00	1.99	2.02	2.00	2.14	2.03	2.12	2.11	2.34	2.15	2.15	2.13	2.13	2.15	2.27	2.13	2.21	2.21	2.05	1.99	2.34	2.10	24
9	2.07	2.72	S	2.18	2.16	2.09	2.26	2.49	2.45	2.34	2.16	2.17	2.09	2.24	2.12	2.01	2.21	2.25	2.03	2.02	2.02	2.11	2.12	2.10	2.01	2.72	2.19	24
10	2.06	S	2.04	2.05	2.07	2.37	3.44	2.65	2.65	2.38	2.36	2.31	2.20	2.13	2.05	2.08	2.04	2.06	2.04	2.03	2.03	2.04	2.04	2.00	2.00	3.44	2.22	24
11	S	1.99	1.99	2.00	2.01	2.02	2.01	2.00	2.02	C	C	C	C	C	2.03	2.03	2.12	2.06	2.07	2.04	2.06	2.06	2.06	S	1.99	2.12	2.03	24
12	2.09	2.06	2.12	2.31	2.11	P	P	P	P	P	P	P	P	X	2.10	2.10	2.10	2.11	2.24	2.11	2.03	2.06	S	2.14	2.03	2.31	2.12	15
13	2.08	2.06	2.09	2.19	2.07	2.06	2.22	2.11	2.06	2.62	2.06	2.05	2.02	2.03	2.03	2.04	2.07	2.04	2.16	2.70	2.56	S	2.04	2.09	2.02	2.70	2.15	24
14	2.03	2.04	2.14	2.07	2.07	2.11	2.13	2.17	2.10	2.06	2.05	2.04	2.03	2.04	2.03	2.03	2.04	2.04	2.11	2.05	S	2.04	2.03	2.02	2.02	2.17	2.06	24
15	2.11	1.99	2.01	2.13	2.64	2.02	1.97	1.98	1.99	2.00	2.08	2.24	2.33	2.53	2.14	2.16	2.37	2.13	2.17	S	2.17	2.42	2.33	2.33	1.97	2.64	2.18	24
16	2.51	2.73	2.26	2.89	2.14	2.03	2.04	2.05	2.08	2.14	2.06	2.06	2.03	2.15	2.15	2.02	2.28	2.25	S	2.10	2.08	2.07	2.10	2.10	2.02	2.89	2.19	24
17	2.09	2.18	2.08	2.09	2.10	2.09	2.10	2.07	2.07	P	P	2.06	2.05	2.03	2.00	2.03	2.05	S	2.04	2.06	2.05	2.05	2.04	2.05	2.00	2.18	2.07	22
18	2.17	2.24	2.10	2.09	2.16	2.01	1.99	2.18	2.29	2.24	2.21	2.07	2.07	2.27	2.21	2.06	S	2.18	2.21	1.99	2.03	2.00	2.09	2.00	1.99	2.29	2.12	24
19	1.99	1.99	2.00	2.02	2.00	2.06	2.01	2.05	2.05	2.02	2.01	2.02	2.09	2.01	2.01	S	2.01	2.02	2.14	2.09	2.14	2.06	2.23	2.19	1.99	2.23	2.05	24
20	2.27	2.21	2.26	2.19	2.10	2.09	2.09	2.11	2.13	2.12	2.10	2.10	2.06	2.06	S	1.99	1.99	2.20	2.28	2.01	2.01	2.06	2.03	2.07	1.99	2.28	2.11	24
21	2.10	2.03	2.05	2.05	2.02	2.01	2.01	2.01	2.00	1.99	2.00	2.01	2.01	S	2.01	2.19	2.30	2.19	2.09	2.03	2.09	2.29	2.19	2.67	1.99	2.67	2.10	24
22	2.94	2.01	2.24	2.13	2.12	2.11	2.13	2.10	2.09	2.17	2.06	2.05	S	2.04	2.05	2.04	2.07	2.08	2.14	2.10	2.12	2.14	2.16	2.21	2.01	2.94	2.14	24
23	2.21	2.26	2.25	2.36	2.37	2.39	2.37	2.38	2.37	2.33	2.31	S	2.30	2.27	2.16	2.17	2.34	2.29	2.28	2.19	2.20	2.29	2.27	2.27	2.16	2.39	2.29	24
24	2.22	2.38	2.34	2.43	2.40	2.69	2.60	2.61	2.56	2.51	S	2.45	2.40	2.53	2.40	2.38	2.61	2.48	2.31	2.27	2.22	2.16	2.53	2.81	2.16	2.81	2.45	24
25	3.34	**4.66**	4.66	2.64	3.62	3.82	3.01	3.05	X	S	2.41	2.21	2.18	2.18	2.55	2.22	3.37	2.15	2.13	2.14	2.14	2.13	2.09	2.09	2.09	**4.66**	2.76	23
26	2.11	2.09	2.25	2.32	2.67	2.02	2.02	2.02	S	2.02	2.00	2.02	2.01	2.01	2.01	2.01	2.52	2.03	2.02	2.02	2.02	2.02	2.05	2.07	2.00	2.67	2.10	24
27	2.08	2.06	2.07	2.03	2.02	2.03	2.06	S	2.07	2.10	2.05	2.02	2.01	2.12	2.16	2.17	2.21	2.11	2.02	2.05	2.27	2.85	2.19	2.07	2.01	2.85	2.12	24
28	2.21	2.17	2.03	2.02	2.03	2.08	S	2.07	2.08	2.08	2.04	2.04	2.19	2.39	2.39	2.34	2.48	2.50	2.46	2.32	2.45	2.37	2.30	2.31	2.02	2.50	2.23	24
29	2.68	2.37	2.31	2.25	2.15	S	2.10	2.13	2.14	2.23	2.24	2.33	2.31	2.64	2.83	2.23	2.31	2.45	2.36	2.35	2.48	2.43	2.29	2.24	2.10	2.83	2.34	24
30	3.25	2.60	2.18	3.09	S	2.12	2.12	2.14	2.19	2.13	2.14	2.14	2.09	2.06	2.01	2.10	2.03	2.04	2.03	2.04	2.07	2.07	2.08	2.07	2.01	3.25	2.21	24
31	2.09	2.23	2.07	S	2.15	2.09	2.10	2.11	2.12	2.12	2.13	2.10	2.18	2.10	2.12	2.17	2.11	2.43	2.48	2.21	2.48	2.54	2.70	2.10	2.07	2.70	2.21	24
HOURLY MAX	3.34	4.66	4.66	3.09	3.62	3.82	3.44	3.05	2.65	3.35	3.22	3.32	2.40	2.64	2.83	2.38	3.37	2.50	2.48	2.70	2.56	2.85	2.70	3.08				
HOURLY AVG	2.29	2.27	2.22	2.24	2.22	2.19	2.22	2.20	2.19	2.23	2.17	2.19	2.14	2.17	2.14	2.11	2.25	2.16	2.14	2.11	2.15	2.16	2.16	2.19				

STATUS FLAG CODES

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

MONTHLY SUMMARY

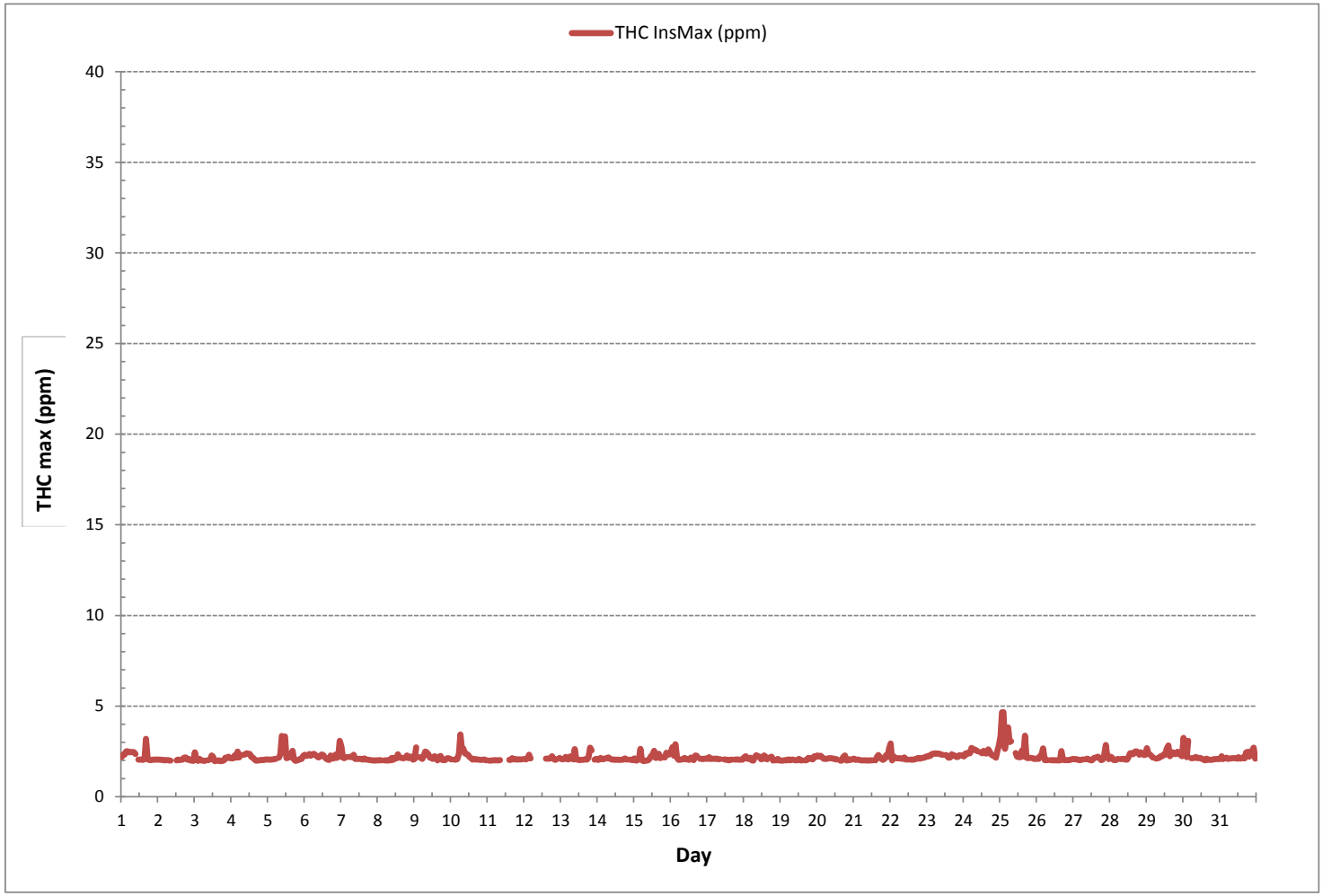
NUMBER OF NON-ZERO READINGS: 694

MAXIMUM INSTANTANEOUS VALUE: 4.66 ppm @ HOUR 1 ON DAY 25

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 5 hrs
STANDARD DEVIATION: 0.27

OPERATIONAL TIME: 731 hrs

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)



Maxxam
A Bureau Veritas Group Company

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

St. Lina Continuous Monitoring Station - October 2018

METHANE MAX Instantaneous Maximum (CH_4 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	2.20	2.33	2.33	2.50	2.50	2.45	2.47	2.47	2.44	2.36	S	2.05	2.04	2.04	2.03	2.09	3.22	2.06	2.03	2.02	2.03	2.04	2.04	2.04	2.02	3.22	2.25	24
2	2.04	2.05	2.03	2.03	2.01	2.02	2.02	2.00	1.99	S	2.00	X	2.01	2.04	2.02	2.05	2.04	2.16	2.17	2.04	2.09	2.00	1.99	1.98	1.98	2.17	2.03	23
3	2.45	2.10	1.98	2.09	2.00	1.99	1.98	1.99	S	2.02	2.07	2.27	2.19	1.97	1.98	1.99	2.00	1.96	1.98	2.01	2.16	2.13	2.21	2.13	1.96	2.45	2.07	24
4	2.12	2.08	2.11	2.15	2.49	2.17	2.30	S	2.32	2.34	2.40	2.37	2.36	2.20	2.15	2.06	1.99	1.99	2.00	2.02	1.99	2.02	2.05	2.06	1.99	2.49	2.16	24
5	2.05	2.04	2.05	2.06	2.07	2.08	S	2.16	2.34	3.35	3.22	3.32	2.13	2.15	2.17	2.31	2.53	1.99	1.98	2.01	2.03	2.09	2.09	2.26	1.98	3.35	2.28	24
6	2.31	2.25	2.28	2.36	2.26	S	2.37	2.30	2.22	2.17	2.21	2.33	2.30	2.19	2.10	2.04	2.03	2.27	2.11	2.11	2.32	2.14	2.20	3.08	2.03	3.08	2.26	24
7	2.76	2.16	2.13	2.18	S	2.20	2.20	2.18	2.31	2.09	2.09	2.08	2.09	2.09	2.05	2.11	2.04	2.04	2.03	2.02	2.00	2.00	1.99	1.99	1.99	2.76	2.12	24
8	2.00	2.02	2.01	S	2.01	2.00	1.99	1.99	2.00	2.14	2.03	2.12	2.11	2.35	2.15	2.15	2.13	2.13	2.15	2.27	2.13	2.21	2.21	2.05	1.99	2.35	2.10	24
9	2.07	2.72	S	2.18	2.16	2.09	2.26	2.49	2.45	2.34	2.16	2.17	2.09	2.24	2.12	2.01	2.21	2.25	2.03	2.02	2.02	2.11	2.12	2.10	2.01	2.72	2.19	24
10	2.06	S	2.04	2.05	2.07	2.37	3.44	2.65	2.65	2.38	2.36	2.31	2.20	2.13	2.05	2.08	2.04	2.06	2.04	2.03	2.03	2.04	2.04	2.00	2.00	3.44	2.22	24
11	S	1.99	1.99	2.00	2.01	2.02	2.01	2.00	2.02	C	C	C	C	C	2.03	2.03	2.12	2.06	2.07	2.04	2.06	2.06	2.06	S	1.99	2.12	2.03	24
12	2.09	2.06	2.08	2.16	2.11	P	P	P	P	P	P	P	P	X	2.10	2.10	2.10	2.11	2.24	2.11	2.03	2.06	S	2.14	2.03	2.24	2.11	15
13	2.08	2.06	2.09	2.19	2.07	2.06	2.22	2.11	2.06	2.62	2.06	2.05	2.02	2.03	2.03	2.04	2.07	2.04	2.16	2.70	2.56	S	2.03	2.09	2.02	2.70	2.15	24
14	2.03	2.04	2.14	2.07	2.07	2.11	2.13	2.13	2.10	2.06	2.05	2.04	2.02	2.04	2.03	2.03	2.04	2.04	2.11	2.05	S	2.04	2.03	2.02	2.02	2.14	2.06	24
15	2.11	1.99	1.99	2.14	2.64	1.97	1.97	1.98	1.98	2.00	2.08	2.24	2.33	2.53	2.14	2.16	2.37	2.13	2.17	S	2.17	2.42	2.33	2.33	1.97	2.64	2.18	24
16	2.51	2.73	2.26	2.89	2.14	2.03	2.04	2.05	2.08	2.14	2.06	2.06	2.03	2.02	2.02	2.02	2.28	2.25	S	2.10	2.08	2.07	2.10	2.10	2.02	2.89	2.18	24
17	2.09	2.09	2.08	2.09	2.09	2.09	2.10	2.07	2.07	P	P	2.06	2.05	2.03	2.00	2.03	2.05	S	2.04	2.04	2.05	2.05	2.04	2.05	2.00	2.10	2.06	22
18	2.17	2.08	2.10	2.09	2.16	2.01	1.99	2.18	2.29	2.24	2.21	2.07	2.07	2.27	2.21	2.06	S	2.18	2.21	1.99	2.03	1.98	2.09	2.00	1.98	2.29	2.12	24
19	1.99	1.99	2.00	2.02	2.00	2.06	2.01	2.05	2.03	2.02	2.01	2.02	2.01	2.01	2.01	S	2.01	2.02	2.14	2.09	2.14	2.06	2.23	2.19	1.99	2.23	2.05	24
20	2.27	2.21	2.18	2.19	2.10	2.09	2.09	2.11	2.11	2.12	2.10	2.10	2.06	2.06	S	1.99	1.99	2.20	2.28	2.01	2.01	2.06	2.03	2.07	1.99	2.28	2.11	24
21	2.10	2.03	2.02	2.02	2.02	2.01	2.01	2.01	2.00	1.99	2.00	2.01	2.01	S	2.01	2.15	2.30	2.19	2.09	2.03	2.09	2.29	2.19	2.67	1.99	2.67	2.10	24
22	2.94	2.01	2.24	2.13	2.12	2.11	2.13	2.10	2.08	2.09	2.06	2.05	S	2.04	2.05	2.04	2.07	2.08	2.14	2.10	2.12	2.14	2.16	2.17	2.01	2.94	2.14	24
23	2.21	2.26	2.25	2.36	2.37	2.39	2.37	2.38	2.37	2.33	2.31	S	2.30	2.27	2.16	2.17	2.34	2.29	2.27	2.19	2.20	2.29	2.27	2.27	2.16	2.39	2.29	24
24	2.22	2.38	2.34	2.39	2.40	2.69	2.60	2.61	2.56	2.51	S	2.45	2.40	2.53	2.40	2.38	2.61	2.48	2.31	2.27	2.22	2.16	2.53	2.81	2.16	2.81	2.45	24
25	3.34	**4.66**	4.66	2.64	3.62	3.82	3.01	3.05	X	S	2.41	2.21	2.18	2.18	2.55	2.22	3.37	2.15	2.13	2.14	2.14	2.13	2.09	2.09	2.09	**4.66**	**2.76**	23
26	2.11	2.09	2.25	2.32	2.67	2.02	2.02	2.02	S	2.02	2.00	2.02	2.01	2.01	2.00	2.01	2.52	2.03	2.01	2.02	2.02	2.02	2.05	2.07	2.00	2.67	2.10	24
27	2.08	2.06	2.07	2.03	2.02	2.02	2.06	S	2.07	2.10	2.05	2.02	2.01	2.12	2.16	2.17	2.21	2.11	2.02	2.05	2.27	2.85	2.19	2.07	2.01	2.85	2.12	24
28	2.21	2.17	2.02	2.02	2.03	2.08	S	2.07	2.08	2.08	2.04	2.04	2.19	2.39	2.39	2.34	2.48	2.50	2.46	2.32	2.45	2.37	2.30	2.31	2.02	2.50	2.23	24
29	2.68	2.37	2.31	2.25	2.15	S	2.10	2.13	2.14	2.23	2.24	2.33	2.31	2.64	2.83	2.23	2.31	2.45	2.36	2.35	2.48	2.43	2.29	2.24	2.10	2.83	2.34	24
30	3.25	2.60	2.18	3.09	S	2.12	2.12	2.14	2.19	2.13	2.14	2.14	2.09	2.06	2.01	2.10	2.03	2.04	2.03	2.04	2.07	2.07	2.08	2.07	2.01	3.25	2.21	24
31	2.09	2.23	2.07	S	2.08	2.09	2.10	2.11	2.12	2.12	2.13	2.10	2.18	2.10	2.10	2.17	2.11	2.43	2.48	2.21	2.48	2.54	2.70	2.10	2.07	2.70	2.21	24
HOURLY MAX	3.34	4.66	4.66	3.09	3.62	3.82	3.44	3.05	2.65	3.35	3.22	3.32	2.40	2.64	2.83	2.38	3.37	2.50	2.48	2.70	2.56	2.85	2.70	3.08				
HOURLY AVG	2.29	2.26	2.21	2.23	2.22	2.18	2.22	2.20	2.19	2.23	2.17	2.19	2.14	2.17	2.14	2.11	2.25	2.16	2.14	2.11	2.15	2.16	2.16	2.19				

STATUS FLAG CODES

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

MONTHLY SUMMARY

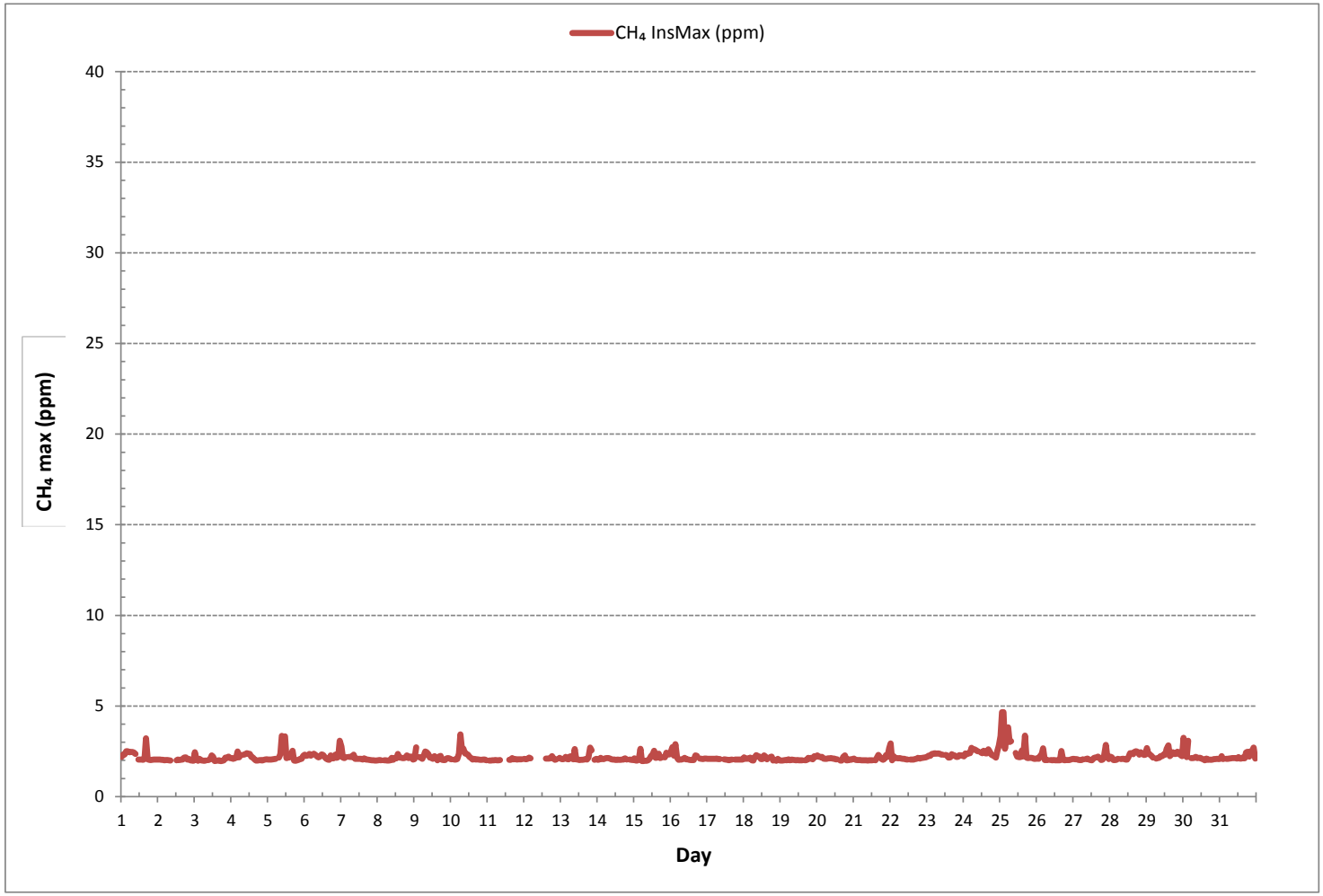
NUMBER OF NON-ZERO READINGS: 694

MAXIMUM INSTANTANEOUS VALUE: 4.66 ppm @ HOUR 1 ON DAY 25

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 5 hrs
STANDARD DEVIATION: 0.27

OPERATIONAL TIME: 731 hrs

METHANE MAX Instantaneous Maximum (CH_4 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	0.05	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	0.00	0.05	0.00	24
2	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	X	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	23
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.04	0.00	24
4	0.00	0.03	0.17	0.00	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	0.00	0.04	0.00	0.00	0.00	0.00	0.17	0.01	24
5	0.00	0.01	0.00	0.01	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.07	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.07	0.01	24
6	0.00	0.02	0.00	0.00	0.00	S	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.06	0.01	24
7	0.00	0.01	0.03	0.03	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	0.01	0.06	0.00	0.06	0.01	24
8	0.00	0.00	0.00	S	0.00	0.00	0.00	0.05	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	0.04	0.00	0.00	0.05	0.00	24
9	0.00	0.00	S	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	24
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	C	C	C	C	C	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	S	0.00	0.01	0.00	24
12	0.00	0.01	0.07	0.24	0.00	P	P	P	P	P	P	P	P	X	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.00	S	0.00	0.00	0.24	0.03	15
13	0.01	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	0.07	S	0.03	0.00	0.00	0.07	0.01	24
14	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.00	0.01	0.00	0.00	S	0.00	0.00	0.01	0.00	0.05	0.01	24
15	0.00	0.00	0.02	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.14	0.01	0.00	0.00	0.00	0.02	0.00	0.00	S	0.00	0.04	0.00	0.07	0.00	0.14	0.02	24
16	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	0.13	0.13	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.01	24
17	0.00	0.12	0.00	0.00	0.01	0.01	0.01	0.02	0.00	P	P	0.01	0.00	0.00	0.01	0.00	0.01	S	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.12	0.01	22
18	0.00	0.18	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.00	0.05	0.04	0.00	S	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.18	0.02	24
19	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.09	0.02	0.00	S	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.00	0.00	0.09	0.01	24
20	0.00	0.00	0.12	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	S	0.00	0.01	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.01	24
21	0.00	0.00	0.04	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	S	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.17	0.01	24
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.00	0.00	S	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.00	0.06	0.00	0.09	0.01	24
23	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	S	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.01	24
24	0.00	0.00	0.00	0.10	0.00	0.00	0.02	0.00	0.00	0.00	S	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	0.10	0.01	24
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	X	S	0.00	0.01	0.03	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.01	0.00	0.03	0.01	23
26	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	S	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	24
27	0.00	0.00	0.00	0.00	0.01	0.00	0.00	S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.01	0.00	0.06	0.00	24
28	0.00	0.01	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	0.02	0.00	0.00	0.00	0.00	0.03	0.00	24
29	0.00	0.00	0.00	0.05	0.02	S	0.00	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	0.02	0.00	0.00	0.00	0.00	0.05	0.01	24
30	0.00	0.02	0.00	0.00	S	0.00	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	0.00	0.00	0.02	0.00	24
31	0.00	0.00	0.00	S	0.08	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.08	0.01	24
HOURLY MAX	0.02	0.18	0.17	0.24	0.08	0.06	0.02	0.05	0.06	0.09	0.01	0.14	0.09	0.13	0.13	0.17	0.04	0.07	0.10	0.04	0.07	0.04	0.06	0.07				
HOURLY AVG	0.00	0.01	0.02	0.02	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	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

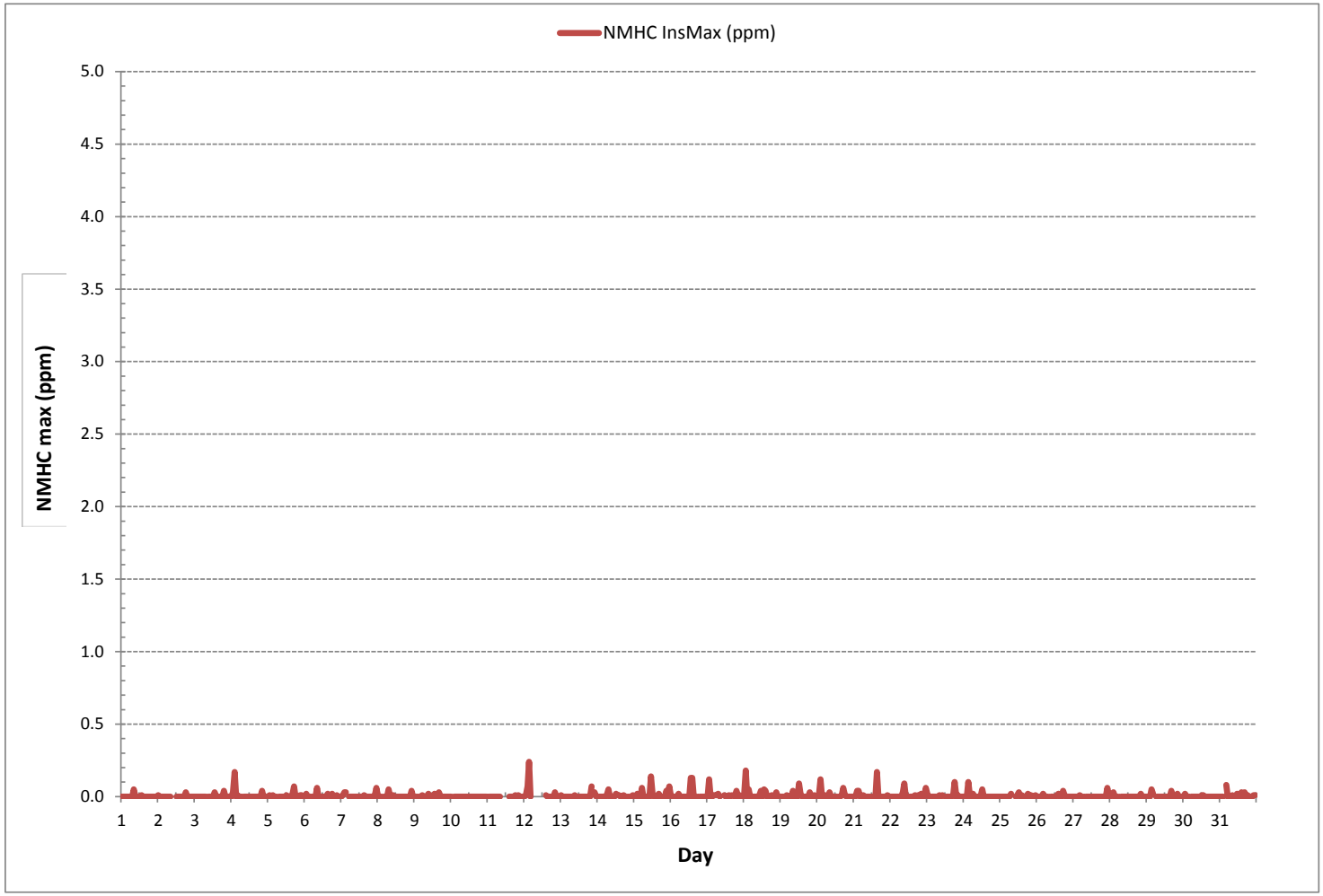
NUMBER OF NON-ZERO READINGS: 147

MAXIMUM INSTANTANEOUS VALUE: 0.24 ppm @ HOUR 3 ON DAY 12

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 5 hrs
STANDARD DEVIATION: 0.02

OPERATIONAL TIME: 731 hrs

NON-METHANE HYDROCARBONS Instantaneous Maximum (NMHC ppm)



OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	3	3	3	4	4	4	4	4	4	4	S	4	2	1	2	3	6	6	7	6	3	2	1	2	1	7	4	24
2	2	1	1	2	2	2	4	3	2	S	3	2	9	6	9	5	8	7	21	13	1	2	0	1	0	21	5	24
3	1	1	1	0	6	14	2	3	S	7	2	3	2	1	2	2	1	1	1	2	2	3	3	2	0	14	3	24
4	3	2	3	2	3	3	4	S	6	5	6	6	5	4	9	7	2	2	3	2	3	2	2	10	2	10	4	24
5	2	2	3	3	5	8	S	7	23	23	8	3	2	2	1	13	2	2	1	1	3	4	4	4	1	23	6	24
6	4	3	3	2	2	S	5	3	3	4	4	5	6	6	6	5	5	5	5	4	3	3	3	3	2	6	4	24
7	2	2	2	5	S	8	7	8	4	2	1	5	5	3	5	4	3	1	1	1	1	2	2	2	1	8	3	24
8	2	2	2	S	4	2	2	2	2	3	3	2	1	1	1	1	1	1	1	1	1	1	1	0	0	4	1	24
9	0	0	S	5	5	6	9	9	8	6	2	2	1	1	1	1	1	2	5	1	1	2	2	2	0	9	3	24
10	2	S	3	2	2	4	5	6	6	6	C	C	C	C	C	C	C	C	C	12	2	2	11	1	1	12	5	24
11	S	4	2	2	8	2	2	2	7	9	4	3	6	8	4	9	5	9	5	4	3	3	3	S	2	9	5	24
12	6	3	3	4	6	P	P	P	P	P	P	P	P	X	3	4	4	3	2	1	2	2	S	4	1	6	3	15
13	1	1	1	1	3	1	1	1	2	5	4	1	2	1	2	1	2	4	2	2	6	S	3	4	1	6	2	24
14	7	1	1	1	3	3	7	8	9	3	6	4	11	12	9	13	11	9	8	14	S	8	6	2	1	14	7	24
15	2	1	1	1	1	2	4	3	S1	5	4	4	2	4	5	5	7	4	5	S	5	3	1	1	1	7	3	23
16	1	1	1	1	10	5	36	7	15	5	7	21	2	4	6	10	2	3	S	18	10	3	2	3	1	36	7	24
17	3	3	4	6	9	4	4	5	6	P	P	4	3	6	9	11	14	S	15	8	25	5	11	5	3	25	8	22
18	6	6	5	3	3	1	4	2	4	4	4	1	1	1	1	2	S	5	4	1	2	3	7	1	1	7	3	24
19	1	1	1	1	1	1	6	16	3	1	1	25	1	3	2	S	3	2	3	3	3	3	3	3	1	25	4	24
20	4	2	2	2	1	1	1	4	2	8	3	4	9	3	S	2	4	3	2	3	9	1	4	2	1	9	3	24
21	1	2	1	1	3	1	1	2	1	2	1	0	1	S	4	5	2	1	2	3	4	1	1	1	0	5	2	24
22	1	1	1	2	2	2	3	3	3	4	22	2	S	3	3	2	1	2	2	2	2	2	2	2	1	22	3	24
23	2	2	2	3	3	3	3	3	4	4	4	S	5	3	2	3	4	6	6	4	4	5	5	4	2	6	4	24
24	4	6	5	5	5	5	5	6	6	8	S	10	8	9	8	7	7	7	6	5	4	4	27	4	4	27	7	24
25	4	4	4	4	4	5	5	38	6	S	6	7	5	6	6	6	32	3	6	6	5	5	4	3	3	38	8	24
26	4	3	3	2	2	2	6	11	S	3	2	8	7	5	10	3	19	29	29	5	6	22	3	5	2	29	8	24
27	3	3	2	2	1	1	2	S	8	8	4	2	3	1	1	3	1	3	1	7	5	32	1	6	1	32	4	24
28	1	1	1	1	1	2	S	5	3	3	3	2	3	5	3	2	3	3	2	2	2	2	2	2	1	5	2	24
29	2	2	2	2	3	S	16	3	5	4	3	2	3	2	2	5	2	4	3	1	1	3	2	3	1	16	3	24
30	2	2	2	2	S	3	8	5	13	40	6	4	13	4	2	15	4	12	17	7	3	2	2	7	2	40	8	24
31	10	2	3	S	8	7	10	29	14	7	15	20	14	12	14	9	7	7	9	9	7	5	3	3	2	29	10	24
HOURLY MAX	10	6	5	6	10	14	36	38	23	40	22	25	14	12	14	15	32	29	29	18	25	32	27	10				
HOURLY AVG	3	2	2	2	4	4	6	7	6	7	5	6	5	4	5	5	6	5	6	5	4	5	4	3				

STATUS FLAG CODES

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

MONTHLY SUMMARY

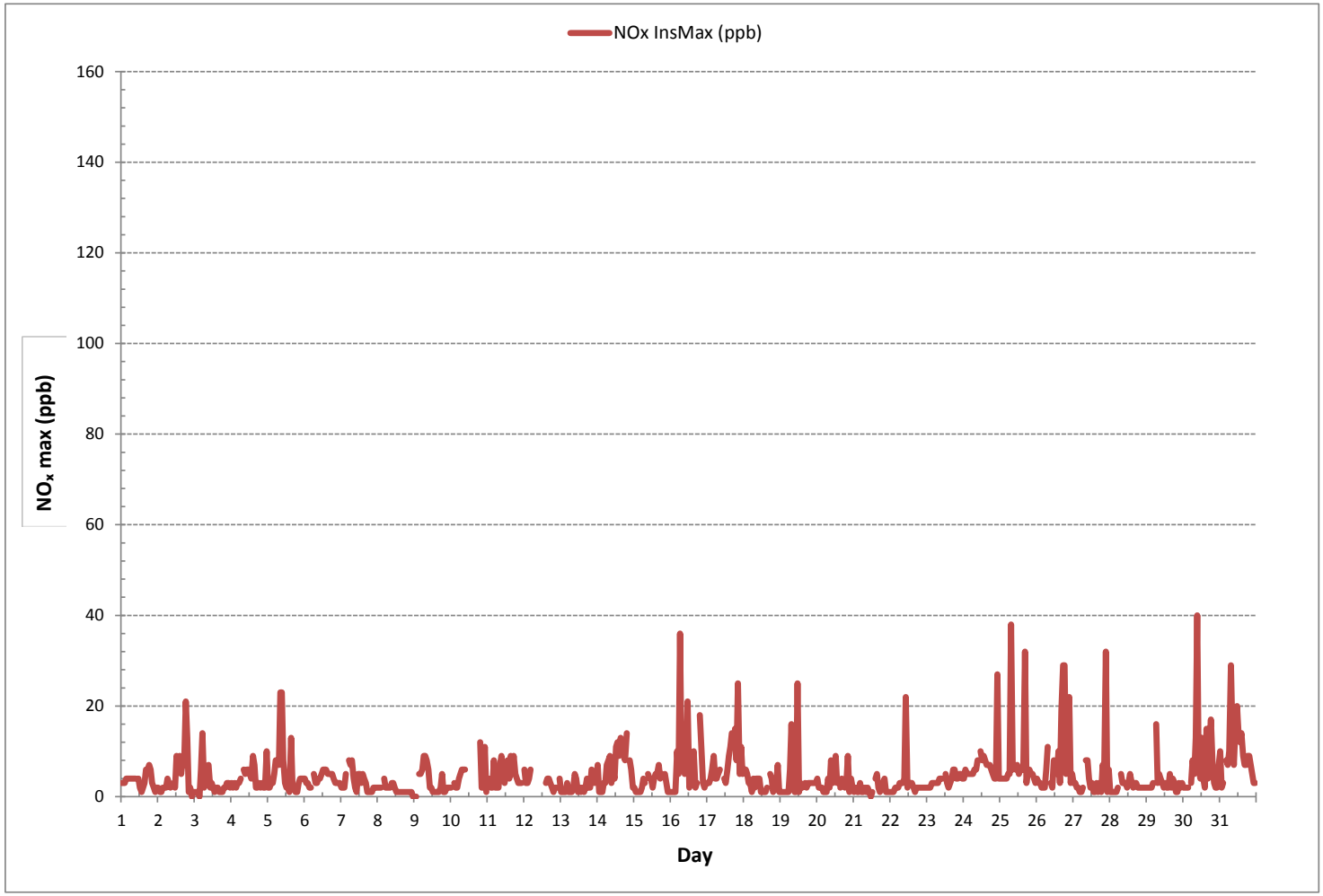
NUMBER OF NON-ZERO READINGS: 685

MAXIMUM INSTANTANEOUS VALUE: 40 ppb @ HOUR 9 ON DAY 30

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 9 hrs
STANDARD DEVIATION: 5

OPERATIONAL TIME: 732 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x 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	1	1	S	1	0	0	0	2	2	1	1	1	0	0	0	0	0	2	0	24
2	0	0	0	0	0	0	0	0	0	S	1	0	2	6	4	2	3	4	13	7	0	1	0	0	0	13	2	24
3	0	0	0	0	4	8	1	2	S	2	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	8	1	24
4	0	0	0	0	0	0	0	S	1	1	2	1	1	1	3	3	0	0	0	0	0	0	0	6	0	6	1	24
5	0	0	0	0	1	5	S	1	14	14	4	1	0	0	0	7	0	0	0	0	0	0	0	0	0	14	2	24
6	0	0	0	0	0	S	0	0	0	1	1	1	2	1	1	1	0	1	0	0	0	0	0	0	0	2	0	24
7	0	0	0	0	S	0	0	1	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	24
8	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	1	0	24
9	0	0	S	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24
10	0	S	0	0	0	0	0	0	1	1	C	C	C	C	C	C	C	C	C	4	0	0	4	0	0	4	1	24
11	S	0	0	0	4	0	0	0	3	3	1	1	4	4	1	7	1	2	0	0	0	0	0	S	0	7	1	24
12	0	0	0	0	2	P	P	P	P	P	P	P	P	X	0	1	0	0	0	0	1	1	S	0	0	2	0	15
13	0	0	0	0	1	0	0	0	1	3	2	0	1	0	1	0	0	2	0	0	2	S	0	1	0	3	1	24
14	3	0	0	0	1	0	0	2	3	1	7	1	8	5	23	7	3	4	3	2	S	0	1	0	0	23	3	24
15	0	0	0	0	0	1	2	1	S1	5	1	1	0	2	7	2	5	1	1	S	2	1	0	0	0	7	2	23
16	0	0	0	0	7	2	23	3	8	2	3	7	1	1	2	4	0	0	S	8	2	0	0	0	0	23	3	24
17	0	0	0	0	2	0	0	3	2	P	P	1	1	2	2	2	2	S	2	1	10	0	3	0	0	10	2	22
18	0	0	0	0	0	0	1	0	1	3	1	0	0	0	0	1	S	1	1	0	0	1	6	0	0	6	1	24
19	0	0	0	0	0	0	2	7	1	0	0	12	0	1	0	S	0	0	0	0	0	0	0	0	0	12	1	24
20	0	0	0	0	0	0	0	1	0	3	1	1	5	1	S	0	1	1	0	2	3	0	1	0	0	5	1	24
21	0	0	0	0	1	0	0	0	0	2	0	0	0	S	1	1	0	0	0	1	1	0	0	0	0	2	0	24
22	0	0	0	0	0	0	0	0	0	1	21	0	S	0	0	0	0	0	0	0	0	0	0	0	0	21	1	24
23	0	0	0	0	0	0	0	0	1	1	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	0	0	1	2	S	3	2	3	2	1	1	0	0	0	0	0	14	0	0	14	1	24
25	0	0	0	0	0	0	1	31	1	S	2	2	1	2	2	2	17	0	0	0	0	0	0	0	0	31	3	24
26	0	0	0	0	0	0	3	7	S	0	0	5	3	1	6	0	8	16	16	0	1	12	0	3	0	16	4	24
27	0	0	0	0	0	0	0	S	3	5	1	0	2	0	0	1	0	1	0	3	2	16	0	3	0	16	2	24
28	0	0	0	0	0	0	S	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
29	0	0	0	0	0	S	9	1	3	3	2	0	1	1	1	3	0	1	1	0	0	1	0	1	0	9	1	24
30	0	0	0	0	S	0	5	2	7	34	3	1	9	2	1	8	3	6	15	7	0	0	0	4	0	34	5	24
31	8	0	0	S	1	0	4	28	7	3	9	9	7	4	5	2	0	0	0	0	0	0	0	0	0	28	4	24
HOURLY MAX	8	0	0	0	7	8	23	31	14	34	21	12	9	6	23	8	17	16	16	8	10	16	14	6				
HOURLY AVG	0	0	0	0	1	1	2	3	2	3	3	2	2	1	2	2	2	1	2	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

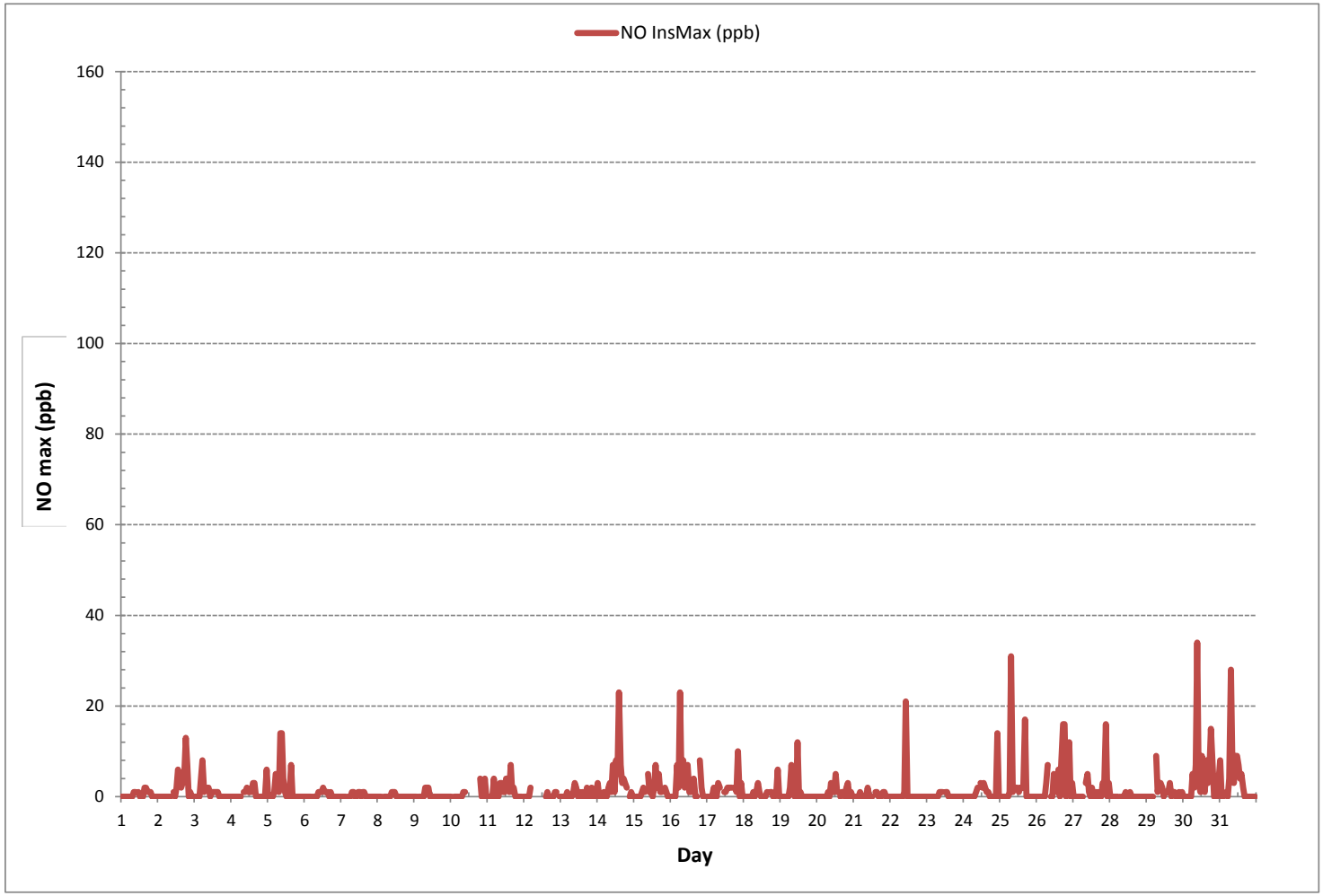
NUMBER OF NON-ZERO READINGS: 271

MAXIMUM INSTANTANEOUS VALUE: 34 ppb @ HOUR 9 ON DAY 30

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 9 hrs
STANDARD DEVIATION: 3

OPERATIONAL TIME: 732 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)



NITROGEN DIOXIDE Instantaneous Maximum (NO_2 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	3	4	4	4	4	4	3	3	S	3	2	1	2	2	4	6	7	5	3	2	2	2	1	7	3	24
2	2	1	1	2	2	2	4	3	2	S	3	2	7	2	5	3	6	4	9	6	1	1	1	1	1	9	3	24
3	1	1	1	1	2	6	1	2	S	6	2	2	1	1	2	2	1	1	1	2	2	3	3	2	1	6	2	24
4	3	2	3	2	3	3	4	S	6	4	4	4	4	3	7	4	2	2	3	2	4	2	2	5	2	7	3	24
5	3	3	3	3	5	4	S	6	9	9	4	2	2	2	2	7	2	2	2	2	3	4	4	4	2	9	4	24
6	4	3	3	2	2	S	5	3	3	3	3	4	5	5	5	5	5	4	4	3	3	3	3	3	2	5	4	24
7	3	2	2	5	S	8	7	7	4	2	1	4	4	2	4	3	2	1	1	1	2	2	2	2	1	8	3	24
8	2	2	2	S	4	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	24
9	1	1	S	5	5	6	9	9	7	4	2	1	1	1	1	1	1	2	5	1	2	2	2	2	1	9	3	24
10	2	S	3	2	2	4	5	6	6	5	C	C	C	C	C	C	C	C	C	8	2	2	7	2	2	8	4	24
11	S	4	2	2	4	2	2	2	4	6	4	2	2	4	3	5	4	7	4	4	3	3	3	S	2	7	4	24
12	6	4	4	4	4	P	P	P	P	P	P	P	P	X	3	3	4	2	2	1	2	1	S	4	1	6	3	15
13	1	1	1	1	2	1	1	1	1	2	2	1	1	1	1	1	2	3	2	2	5	S	3	3	1	5	2	24
14	5	1	1	1	2	3	7	6	6	2	3	3	5	7	4	6	7	5	9	12	S	8	5	2	1	12	5	24
15	2	1	1	1	1	2	2	2	S1	3	3	3	2	2	2	3	3	3	4	S	3	2	1	1	1	4	2	23
16	1	1	1	1	3	3	14	3	10	3	4	15	2	3	4	6	2	3	S	10	7	3	2	3	1	15	4	24
17	3	3	4	7	8	4	4	3	4	P	P	4	3	4	7	10	12	S	13	8	15	5	8	5	3	15	6	22
18	6	6	5	3	3	1	3	2	3	2	3	1	1	1	1	1	S	4	3	1	1	2	2	1	1	6	3	24
19	1	1	1	1	1	1	4	9	2	1	1	13	1	2	1	S	3	2	3	3	3	3	3	3	1	13	3	24
20	4	3	2	2	2	2	2	3	2	5	2	3	4	2	S	2	3	2	2	1	6	1	2	1	1	6	3	24
21	1	2	2	1	3	1	1	1	1	1	1	1	1	S	3	3	1	1	2	2	3	1	1	1	1	3	1	24
22	1	1	1	2	2	2	3	3	2	3	4	2	S	3	2	2	2	3	3	2	2	2	2	3	1	4	2	24
23	2	2	2	3	3	3	3	3	3	3	3	S	5	3	2	2	4	6	6	5	5	5	5	5	2	6	4	24
24	4	6	5	5	5	5	5	5	5	6	S	7	6	7	6	6	7	7	6	5	5	4	13	4	4	13	6	24
25	4	5	4	5	5	5	5	9	5	S	6	5	4	5	4	4	16	4	6	6	5	5	4	4	4	16	5	24
26	4	4	4	2	2	2	3	4	S	3	2	3	4	4	4	3	11	15	14	5	5	10	4	3	2	15	5	24
27	3	3	2	2	2	1	2	S	5	5	3	1	2	1	1	2	1	2	1	4	3	16	1	4	1	16	3	24
28	1	1	1	1	1	2	S	5	3	3	3	2	2	4	3	3	3	3	3	2	2	2	2	2	1	5	2	24
29	2	2	2	2	3	S	8	2	4	2	2	2	2	2	2	2	2	3	2	1	2	2	2	2	1	8	2	24
30	2	2	2	2	S	3	4	3	7	7	4	3	5	3	2	8	2	6	3	4	2	2	2	3	2	8	3	24
31	5	2	3	S	7	7	6	6	7	5	7	11	7	8	10	7	7	7	9	9	7	5	3	3	2	11	7	24
HOURLY MAX	6	6	5	7	8	8	14	9	10	9	7	15	7	8	10	10	16	15	14	12	15	16	13	5				
HOURLY AVG	3	2	2	3	3	3	4	4	4	4	3	4	3	3	3	4	4	4	4	4	4	3	3	3				

STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS: 691

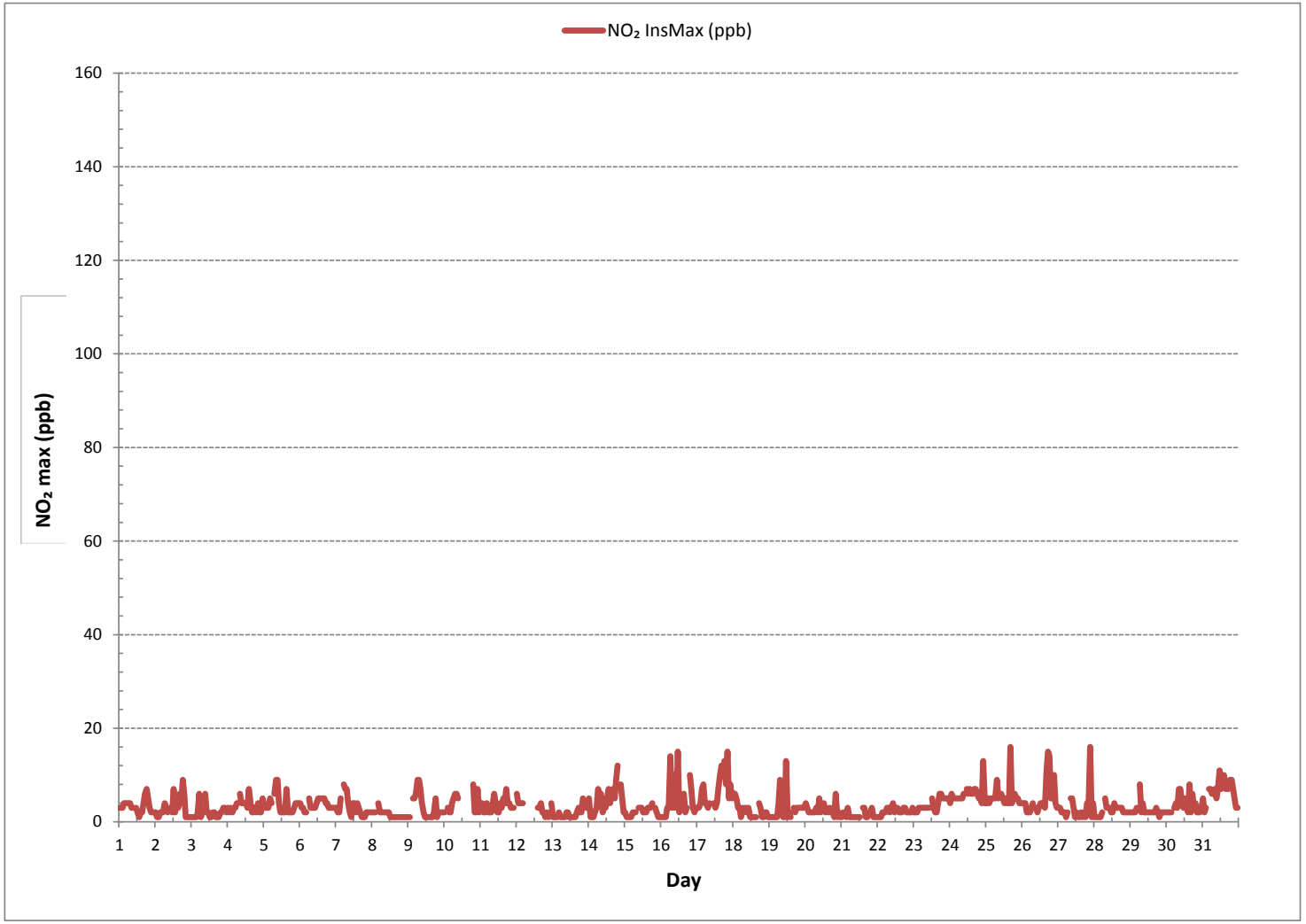
MAXIMUM INSTANTANEOUS VALUE: 16 ppb @ HOUR 16 ON DAY 25

VAR-VARIOUS

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 9 hrs
STANDARD DEVIATION: 2

OPERATIONAL TIME: 732 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO_2 ppb)



OZONE Instantaneous Maximum (O_3 ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	24.4	22.6	21.3	20.3	19.2	18.6	18.3	18.1	19.5	26.0	S	32.2	31.7	32.9	32.8	33.3	33.0	31.8	30.3	30.7	30.5	28.5	28.1	28.2	18.1	33.3	26.6	24
2	28.2	28.7	29.0	27.5	23.2	23.1	22.1	23.0	23.9	S	29.4	30.0	30.4	33.1	32.7	34.0	33.5	33.7	32.0	31.0	30.9	30.4	30.6	31.0	22.1	34.0	29.2	24
3	31.2	31.2	31.3	31.5	31.1	30.1	29.0	27.5	S	30.1	32.8	34.5	35.0	34.7	33.9	34.0	34.0	33.8	33.1	35.8	33.8	31.6	31.7	31.7	27.5	35.8	32.3	24
4	30.6	30.4	27.9	27.7	26.0	23.5	22.8	S	21.9	22.4	26.0	27.5	36.2	35.2	37.0	40.9	41.7	40.6	39.8	37.8	35.4	34.9	33.1	31.1	21.9	41.7	31.8	24
5	30.1	29.3	27.9	24.6	21.8	20.0	S	19.6	22.3	25.1	28.9	32.9	33.9	34.4	34.4	34.1	33.6	32.6	30.7	28.2	26.5	24.5	26.4	25.3	19.6	34.4	28.1	24
6	23.5	24.4	25.1	25.1	24.0	S	22.5	22.4	22.7	25.2	26.0	27.5	29.8	29.4	32.2	32.4	32.6	32.5	31.4	28.3	25.2	23.5	22.9	23.2	22.4	32.6	26.6	24
7	25.1	25.5	24.6	23.1	S	13.5	12.7	17.5	20.4	22.2	23.1	23.7	24.7	25.2	24.8	24.1	24.7	24.1	23.5	24.1	24.9	25.0	26.5	26.8	12.7	26.8	23.0	24
8	26.2	28.1	24.8	S	26.1	25.5	26.1	26.8	27.5	28.3	28.9	31.5	31.9	32.2	32.3	32.5	32.7	32.7	32.7	33.0	31.5	31.0	31.0	31.0	24.8	33.0	29.7	24
9	31.2	29.8	S	25.9	24.8	24.8	22.1	22.2	22.6	31.0	30.1	31.5	33.2	33.0	33.6	33.3	32.8	32.5	35.5	31.6	31.2	30.5	28.8	28.4	22.1	35.5	29.6	24
10	31.7	S	32.6	32.0	30.7	28.1	23.1	19.9	19.1	23.6	24.3	26.2	28.6	30.7	32.2	32.5	35.6	33.4	30.5	28.8	27.7	26.0	23.3	24.5	19.1	35.6	28.0	24
11	S	24.2	24.2	23.9	21.8	22.2	21.9	21.8	20.7	C	C	C	C	C	C	C	28.5	23.9	22.6	23.4	23.3	22.8	22.8	S	20.7	28.5	23.2	24
12	20.5	18.8	17.5	15.1	13.5	P	P	P	P	P	P	P	P	X	20.2	22.3	30.0	30.4	30.1	32.1	31.9	31.7	S	29.8	13.5	32.1	24.6	15
13	28.6	30.0	31.2	29.8	30.9	32.4	32.3	29.9	30.1	31.8	33.2	34.1	34.4	34.8	35.1	35.3	35.9	36.0	35.9	35.5	35.0	S	34.4	33.4	28.6	36.0	33.0	24
14	33.4	32.2	30.6	27.9	26.7	26.3	18.8	17.0	20.3	22.2	22.4	21.6	21.3	28.0	28.7	28.2	27.7	26.2	24.1	20.5	S	25.4	31.5	33.1	17.0	33.4	25.8	24
15	36.5	37.8	37.5	36.4	35.6	34.6	33.8	32.8	31.9	31.9	33.5	34.8	35.4	35.0	34.1	33.4	32.5	32.8	31.0	S	29.7	28.9	28.6	28.7	28.6	37.8	33.4	24
16	28.7	28.4	28.4	27.4	26.8	24.5	23.7	19.1	18.2	20.1	23.1	24.9	26.5	30.3	31.1	32.8	28.2	27.7	S	26.6	31.1	33.2	32.5	31.3	18.2	33.2	27.2	24
17	28.8	28.2	28.9	27.4	30.3	31.5	32.1	33.9	36.9	P	P	50.6	52.9	57.1	**58.0**	57.6	49.4	S	50.3	52.4	51.2	49.1	47.8	44.7	27.4	**58.0**	42.8	22
18	41.2	42.8	45.5	45.1	45.4	44.7	43.7	42.2	40.5	39.9	41.5	42.6	42.9	43.1	43.0	43.5	S	42.2	40.8	39.9	39.3	38.8	37.8	37.8	37.8	45.5	41.9	24
19	37.0	36.2	35.8	35.8	35.6	35.2	35.0	31.3	32.2	33.7	34.6	35.3	34.9	34.9	34.7	S	33.5	33.1	32.5	29.2	29.5	27.1	27.8	26.4	26.4	37.0	33.1	24
20	26.5	27.1	25.8	25.0	25.3	25.4	25.1	23.2	22.5	24.4	25.4	29.0	32.5	41.0	S	44.2	44.0	43.0	41.9	40.8	39.5	39.5	39.4	39.0	22.5	44.2	32.6	24
21	38.6	35.2	34.4	35.3	33.5	33.7	34.7	34.9	35.8	37.4	37.9	38.5	39.0	S	38.3	37.8	37.7	37.3	37.1	36.7	37.0	37.1	36.8	36.8	33.5	39.0	36.6	24
22	37.0	37.0	36.8	33.0	31.3	30.6	27.2	31.4	31.6	29.8	33.6	35.8	S	38.3	39.4	40.0	39.0	36.7	34.5	33.1	32.6	31.4	30.3	28.9	27.2	40.0	33.9	24
23	28.1	27.4	27.3	26.7	23.5	22.8	21.7	21.4	22.0	23.8	24.9	S	29.1	32.8	34.2	35.0	33.0	26.6	24.3	24.6	24.3	23.8	24.6	26.2	21.4	35.0	26.4	24
24	27.3	27.3	21.1	21.9	22.4	21.7	22.6	22.9	22.7	22.5	S	25.6	27.4	26.4	27.4	26.9	26.0	25.1	27.3	28.8	30.8	31.9	31.7	27.8	21.1	31.9	25.9	24
25	28.5	26.9	26.6	24.6	27.1	23.4	24.2	23.5	24.1	S	24.9	26.8	31.1	33.0	34.9	37.1	38.3	34.0	30.2	28.5	29.0	31.1	37.8	41.8	23.4	41.8	29.9	24
26	42.0	33.4	30.2	35.3	33.8	30.0	29.8	29.1	S	29.5	33.7	36.8	37.3	39.1	37.7	36.8	35.3	35.5	35.1	35.6	35.7	36.1	35.6	34.4	29.1	42.0	34.7	24
27	31.0	30.7	32.6	33.8	33.4	31.1	30.1	S	25.6	28.9	34.6	37.2	37.2	36.7	36.6	37.7	38.0	36.5	36.1	35.3	33.9	33.4	33.0	34.5	25.6	38.0	33.8	24
28	34.8	34.7	30.2	29.9	29.7	28.9	S	23.6	25.8	25.7	29.3	33.9	33.4	31.4	32.4	29.9	29.4	28.8	27.8	27.5	26.4	25.8	25.7	24.5	23.6	34.8	29.1	24
29	23.3	22.6	22.3	19.6	21.8	S	22.7	24.7	24.1	24.4	22.0	22.2	22.2	24.6	25.2	24.9	24.9	23.8	22.9	24.1	23.3	21.0	20.3	19.3	19.3	25.2	22.9	24
30	18.8	18.7	19.3	18.1	S	16.1	13.2	13.5	10.8	11.9	13.4	16.9	23.6	29.4	30.6	30.1	24.0	22.2	22.5	20.6	19.9	18.5	16.8	15.1	10.8	30.6	19.3	24
31	17.6	16.9	16.7	S	14.4	13.3	12.3	12.1	13.0	15.0	21.1	20.5	21.5	20.3	24.5	29.6	27.2	24.1	21.5	18.7	24.1	31.9	25.4	23.8	12.1	31.9	20.2	24
HOURLY MAX	42.0	42.8	45.5	45.1	45.4	44.7	43.7	42.2	40.5	39.9	41.5	50.6	52.9	57.1	58.0	57.6	49.4	43.0	50.3	52.4	51.2	49.1	47.8	44.7				
HOURLY AVG	29.7	28.9	28.2	27.9	27.2	26.3	25.1	24.5	24.6	26.4	28.4	30.9	32.1	33.5	33.5	34.3	33.2	31.8	31.6	30.8	30.8	30.1	30.1	30.0				

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

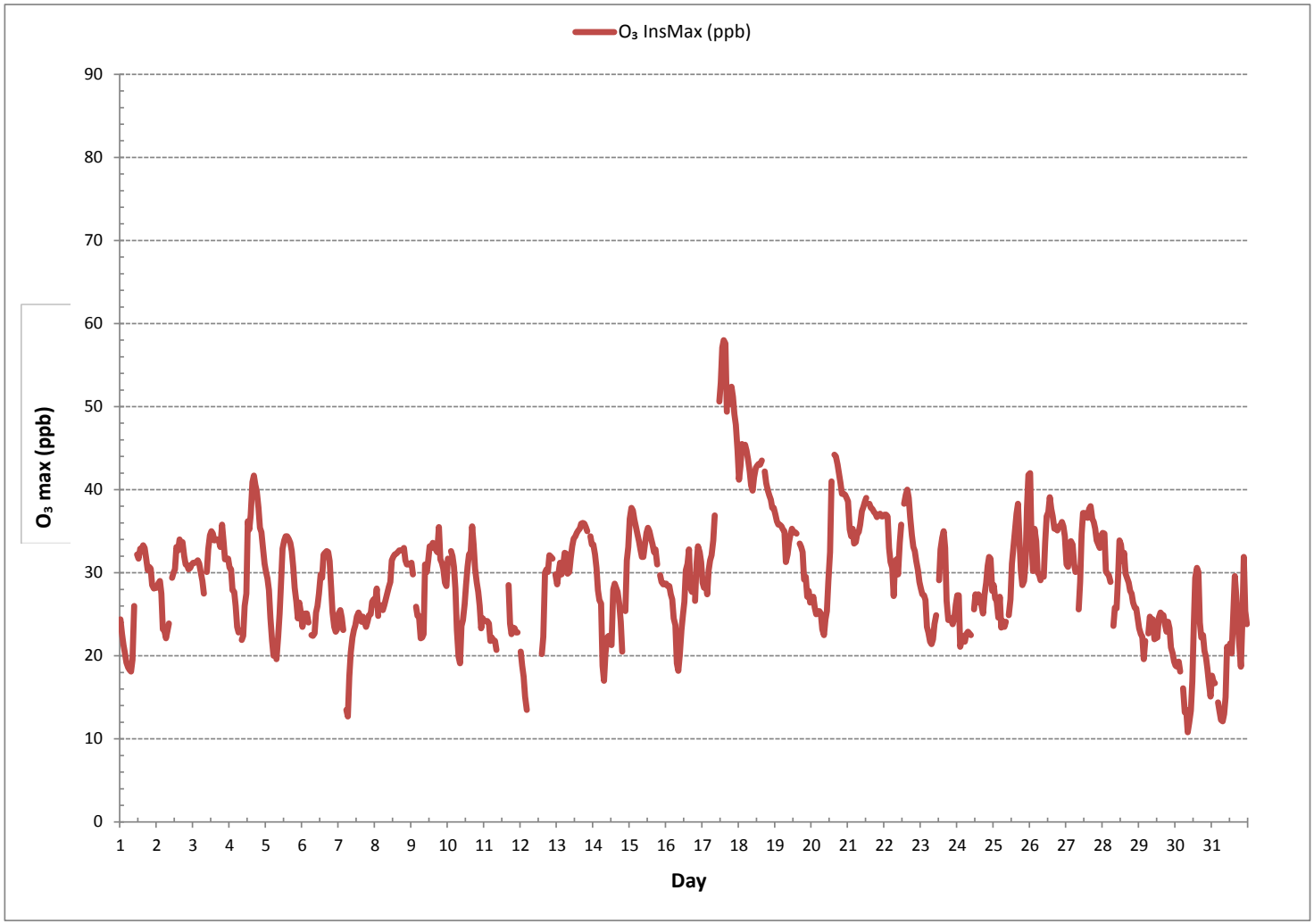
NUMBER OF NON-ZERO READINGS: 694

MAXIMUM INSTANTANEOUS VALUE: 58.0 ppb @ HOUR 14 ON DAY 17

IZS CALIBRATION TIME: 32 hrs
MONTHLY CALIBRATION TIME: 7 hrs
STANDARD DEVIATION: 7.0

OPERATIONAL TIME: 733 hrs

OZONE Instantaneous Maximum (O_3 ppb)



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	15.9	14.3	13.2	11.6	9.0	8.6	8.6	7.9	9.7	9.9	13.4	13.2	15.6	13.6	12.5	9.7	11.9	12.3	12.3	16.0	21.9	16.2	13.8	13.6	7.9	21.9	12.7	24
2	11.6	13.6	20.7	27.0	18.2	10.9	10.1	15.8	14.2	17.6	17.8	18.9	33.1	28.7	34.0	32.7	29.2	26.1	19.5	19.3	21.1	15.1	16.0	17.1	10.1	34.0	20.3	24
3	23.0	21.9	22.4	23.2	23.9	22.8	21.0	17.6	23.5	27.4	24.1	28.9	38.5	31.6	34.8	30.0	23.7	19.1	13.0	12.1	10.5	10.3	12.5	12.1	10.3	38.5	22.0	24
4	16.2	20.6	21.1	16.7	15.6	16.5	18.2	16.2	22.2	17.8	21.0	19.1	30.5	31.8	28.9	30.0	32.0	26.1	19.3	18.1	27.2	30.9	27.8	24.8	15.6	32.0	22.9	24
5	27.2	21.7	24.3	20.0	19.5	15.6	19.7	20.6	23.1	17.8	20.4	27.2	29.4	30.0	29.8	24.3	22.8	23.7	26.5	14.1	19.6	27.6	26.5	30.7	14.1	30.7	23.4	24
6	30.9	23.0	23.7	21.7	23.2	25.0	27.0	21.1	27.2	30.9	22.1	19.1	32.9	27.2	25.9	30.2	34.8	21.3	27.6	23.2	19.1	20.4	15.8	14.3	14.3	34.8	24.5	24
7	17.1	13.8	11.9	16.0	12.5	12.7	16.7	24.3	26.3	43.8	41.0	29.8	28.7	39.2	30.0	33.8	38.8	31.1	32.0	32.7	42.5	38.1	39.7	29.4	11.9	43.8	28.4	24
8	28.3	29.4	26.7	28.5	29.4	28.9	25.4	28.9	26.3	26.3	30.3	27.8	25.0	19.3	19.1	19.3	21.1	19.1	20.8	22.4	14.9	15.8	27.0	21.5	14.9	30.3	24.2	24
9	22.4	8.4	11.0	11.9	10.3	10.8	11.0	11.4	8.6	15.8	22.8	21.5	17.6	15.8	13.4	13.6	10.8	10.6	9.7	10.5	12.5	14.3	10.5	10.3	8.4	22.8	13.1	24
10	9.0	16.2	19.3	20.0	22.6	18.6	13.8	14.3	13.8	17.8	17.4	16.9	25.2	28.9	26.9	22.8	24.3	15.1	11.9	11.9	10.3	9.9	15.6	17.8	9.0	28.9	17.5	24
11	18.0	12.9	12.1	9.9	11.2	16.5	15.8	18.9	25.7	20.4	21.5	24.6	26.3	28.5	30.5	36.8	28.5	21.9	29.6	33.1	34.0	17.4	15.4	15.1	9.9	36.8	21.8	24
12	10.5	11.9	12.7	12.1	12.9	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**P**	**X**	50.4	61.1	61.8	**62.2**	40.1	46.2	39.9	37.1	28.8	32.0	10.5	**62.2**	34.6	15
13	30.3	35.3	32.4	25.0	33.8	31.8	28.5	29.2	39.9	44.5	53.0	50.6	51.3	44.3	44.9	40.5	36.6	32.9	30.5	25.0	16.5	11.0	12.6	14.7	11.0	53.0	33.1	24
14	13.0	16.9	13.8	15.8	17.8	14.0	19.5	20.7	20.2	22.4	23.7	26.3	30.5	34.4	36.6	37.0	27.8	25.0	25.0	28.0	27.6	24.6	28.7	33.1	13.0	37.0	24.3	24
15	27.5	32.9	31.8	31.1	41.4	36.1	26.5	23.9	30.2	30.0	35.7	39.9	44.0	44.7	43.8	32.2	33.8	29.8	19.9	26.3	23.7	17.4	19.5	22.1	17.4	44.7	31.0	24
16	19.1	14.0	15.1	13.0	9.7	8.6	10.4	10.1	8.8	10.3	12.1	12.9	10.6	12.7	16.0	15.1	10.6	13.2	14.3	16.0	18.9	16.2	19.9	20.4	8.6	20.4	13.7	24
17	20.6	19.7	21.3	30.2	21.5	25.4	32.9	28.9	33.1	**P**	**P**	30.5	33.6	39.0	47.3	42.5	34.4	29.4	27.4	23.2	19.0	13.6	16.7	14.5	13.6	47.3	27.5	22
18	18.0	23.0	22.6	24.3	27.8	37.7	35.3	34.2	31.8	26.3	32.0	54.7	56.0	57.1	54.3	51.9	41.4	39.0	24.5	21.5	19.1	21.5	22.2	20.9	18.0	57.1	33.2	24
19	22.6	21.5	22.0	22.1	20.2	19.1	17.4	16.5	21.0	25.8	28.0	34.0	34.6	30.7	21.5	15.8	13.6	16.1	38.6	39.2	29.8	22.6	29.4	35.1	13.6	39.2	24.9	24
20	39.9	40.1	36.1	43.8	50.1	52.8	54.7	47.5	25.0	28.9	27.6	23.7	23.4	45.8	50.6	51.3	46.0	56.1	34.6	19.7	36.4	32.9	24.3	19.7	19.7	56.1	**38.0**	24
21	17.6	36.8	31.6	28.9	23.5	18.4	39.4	25.8	27.6	34.2	36.6	43.6	54.3	48.6	49.7	42.3	30.7	24.1	17.1	18.0	18.0	22.6	17.6	15.1	15.1	54.3	30.1	24
22	11.4	11.0	9.7	10.1	12.3	12.3	14.0	24.8	25.2	28.8	26.1	27.6	28.9	34.4	37.0	40.3	34.6	25.2	26.1	28.3	27.2	29.7	25.5	26.9	9.7	40.3	24.1	24
23	31.1	29.4	28.5	28.9	28.9	27.6	22.8	29.4	32.0	30.1	19.5	20.8	28.0	21.7	20.2	22.8	20.6	26.9	24.3	21.9	21.5	19.9	17.8	14.9	14.9	32.0	24.6	24
24	16.5	13.6	12.9	18.6	14.0	14.5	17.3	14.0	10.5	11.0	16.0	15.0	12.5	15.4	12.8	9.7	11.0	7.1	7.3	12.1	12.3	8.4	9.9	13.4	7.1	18.6	12.7	24
25	15.6	12.5	13.6	16.2	13.2	14.5	17.8	16.1	17.1	14.5	16.2	23.3	17.7	15.8	18.8	20.6	10.3	10.2	9.9	8.6	7.7	9.0	10.1	9.0	7.7	23.3	14.1	24
26	25.0	20.8	34.6	35.3	25.6	15.4	16.3	15.8	20.2	31.3	21.7	24.5	34.8	46.4	17.8	20.2	11.6	9.0	9.4	8.4	11.2	14.5	16.9	18.7	8.4	46.4	21.1	24
27	26.3	21.7	22.8	19.1	17.8	17.8	21.3	19.3	23.7	31.8	50.1	50.4	45.3	35.5	34.8	44.0	41.9	47.1	30.7	47.1	25.0	20.8	15.6	13.9	13.9	50.4	30.1	24
28	16.9	12.5	12.1	11.2	9.5	14.7	17.3	16.0	25.4	29.2	25.9	32.7	31.1	26.3	27.8	38.3	37.6	39.0	23.7	30.3	43.4	37.7	37.7	37.5	9.5	43.4	26.4	24
29	36.2	18.2	14.3	16.2	**X**	**X**	**X**	**X**	33.8	30.5	29.0	34.8	31.8	30.3	31.1	34.2	31.3	24.6	19.5	22.8	19.3	22.8	21.0	13.8	13.8	36.2	25.8	20
30	8.8	11.0	10.5	9.1	8.8	8.4	8.1	7.7	14.5	16.0	16.0	16.9	18.4	20.6	22.1	17.3	21.0	20.6	16.7	14.7	17.1	14.5	12.5	13.9	7.7	22.1	14.4	24
31	15.1	14.0	12.3	12.3	14.9	14.1	14.0	13.8	15.1	12.9	12.6	11.0	13.4	12.7	13.2	12.8	5.3	9.0	11.6	14.5	17.8	13.8	14.0	9.0	5.3	17.8	12.9	24
HOURLY MAX	39.9	40.1	36.1	43.8	50.1	52.8	54.7	47.5	39.9	44.5	53.0	54.7	56.0	57.1	54.3	61.1	61.8	62.2	40.1	47.1	43.4	38.1	39.7	37.5				

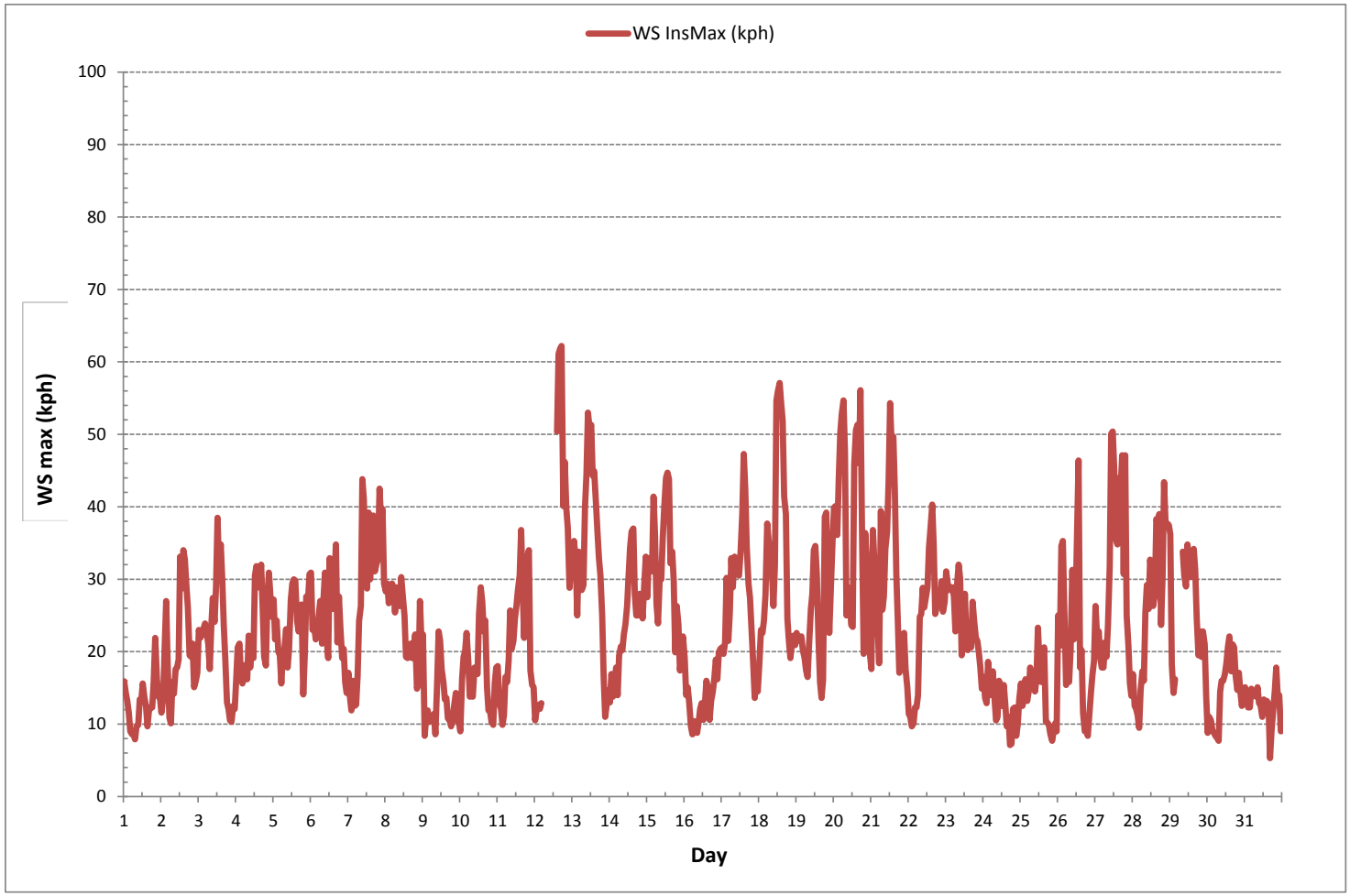
STATUS FLAG CODES

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:	62.2	kph	@ HOUR	17	ON DAY	12
OPERATIONAL TIME:					729	hrs

WIND SPEED Instantaneous Maximum (WS kph)



APPENDIX IV
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	**EPA Approval or Code of Practice Registration #** (if applicable)
YES	**NA**
Company Name (if applicable)	**Industrial Operation Name** (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	**ST. LINA CONTINUOUS MONITORING STATION**
Name of the Representative of the Person Responsible	**Position / Title of the Representative of the Person Responsible**
Mike Bisaga	**Environment Monitoring Program Manager**
Is an External Party Certifying the Report?	
■ **Yes** ☐ **No**	
Name of External Person Certifying the Report	**Position / Title of External Person Certifying the Report**
Wunmi Adekanmbi	**Project Team Lead, Customer Service - Air Services**
Company Name for External Person Certifying the Report	**Identification of Qualifications / Professional Designations of the External Person Certifying the Report**
Maxxam Analytics, A Bureau Veritas Group Company	**M.Sc., EPt., PMP**

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.

Signature of the External Person Certifying the Report

28 - Nov - 2018

Report Issued Date (dd-mon-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM

Validation Certificate Form

Client:	Lakeland Industry & Community Association	**Project #:**	2833-2018-10-31-C
Site:	St. Lina Continuous Monitoring Station	**Contact:**	Mike Bisaga

Level 0 Preliminary Verification	Maram Ghaleb	**Date**	20 - Nov -2018
Level 1 Primary Validation	Maram Ghaleb	**Date**	20 - Nov -2018
Level 2 Final Validation	Maram Ghaleb	**Date**	23 - Nov -2018
Level 3 Independent Data Review		**Date**	28 - Nov -2018
Post-Final Validation	**NA**	**Date**	**NA**

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